NWB Annual Report **Year being reported:** 2009

License No: 1BR-SAR0916 **Issued Date:** March 8, 2009
Expiry Date: January 30, 2016

Project Name: CAM-F Sarcpa Lake Long-Term Monitoring

Licensee: Indian and Northern Affairs Canada

Mailing Address:
PO Box 2200
Iqaluit NU
X0A 0H0

Name of Company filing Annual Report (if different from Name of Licensee please clarify relationship between the two entities, if applicable):

N/A

General Background Information on the Project (*optional):

The CAM-F Intermediate Distant Early Warning (DEW) Line Site was constructed in 1957 and subsequently abandoned in 1963. It was converted to a scientific research station in 1977 under the Science Institute of the Northwest Territories and Canada, Department of Indian and Northern Affairs and operated seasonally until 1988. The site is located on the Melville Peninsula, approximately 85 km west of Hall Beach, and 100 km south-west of Igloolik, Nunavut.

Both years of the planned two year remediation phase of the CAM-F Sarcpa Lake Remediation Project have been completed and all equipment and personnel have been demobilized from the site. The site is now undergoing long-term monitoring which involves a 1-2 day site visit during monitoring years.

The second year of the 25-year long-term monitoring at the CAM-F site was completed in August of 2009.

Licence Requirements: the licensee must provide the following information in accodance with

Part B Item 1

A summary report of water use and waste disposal activities, including, but not limited to: methods of obtaining water; sewage and greywater management; drill waste management; solid and hazardous waste management.

Water Source(s):	Monitoring wells - water samples only	
Water Quantity:	N/A	Quantity Allowable Domestic (cu.m)
	< 0.025	Actual Quantity Used Domestic (cu.m)
	N/A	Quantity Allowable Drilling (cu.m)
	N/A	Total Quantity Used Drilling (cu.m)

Waste Management and/or Disposal

- ✓ Solid Waste Disposal
- ☐ Sewage
- ☐ Drill Waste
- ☐ Greywater
- ☐ Hazardous
- ☐ Other:

Additional Details:

The Long-term Monitoring team visited site August 24 and 25, 2009. Activities were based out of the Community of Hall Beach. Minimal (< 0.05 m3) domestic waste generated during on site activites (lunch bags, paper, etc.) was removed from site and disposed of in Hall Beach.

A list of unauthorized discharges and a summary of follow-up actions taken.

Spill No.: No Spills (as reported to the Spill Hot-line)
Date of Spill:
Date of Notification to an Inspector:
Additional Details: (impacts to water, mitigation measures, short/long term monitoring, etc)

N/A

Revisions to the Spill Contingency Plan

No Spill Contingency Plan (SCP) submitted or approved

Additional Details:

N/A

Revisions to the Abandonment and Restoration Plan

No Abandonment and Restoration (AR) Plan submitted or approved

Additional Details:

N/A

Progressive Reclamation Work Undertaken

Additional Details (i.e., work completed and future works proposed)

WORK COMPLETED

• Demobilization (April 2008)
  - Remove equipment from site
  - Transport hazardous material south for proper disposal
• Long-Term Monitoring (August 2008)
  - Year 1 of the long-term monitoring plan has been completed
• Long-Term Monitoring (August 2009)
  - Year 2 of the long-term monitoring plan has been completed

FUTURE WORK PROPOSED

• Long-Term Monitoring
- Started in 2008, continues until 2032
- Year 3 of the of the 25-year long term monitoring plan scheduled for August 2010.

Results of the Monitoring Program including:

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where sources of water are utilized;

Details attached

Additional Details:

GPS locations of the Monitoring Wells appear in the Table provided in this template.

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where wastes associated with the licence are deposited;

Not Applicable (N/A)

Additional Details:

N/A

Results of any additional sampling and/or analysis that was requested by an Inspector

No additional sampling requested by an Inspector or the Board

Additional Details: (date of request, analysis of results, data attached, etc)

N/A

Any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.

No additional sampling requested by an Inspector or the Board

Additional Details: (Attached or provided below)

N/A

Any responses or follow-up actions on inspection/compliance reports

No inspection and/or compliance report issued by INAC

Additional Details: (Dates of Report, Follow-up by the Licensee)

N/A

Any additional comments or information for the Board to consider

In accordance with the requirements of the licence under Part B Section 1, please find attached as Appendix A to this, the 2009 1BR SAR0916 Annual Water Licence Report, a report dated Nov. 27, 2009 and titled *Long-Term Monitoring, 2009 CAM-F, Sarcpa Lake, Nunavut* hereafter referred to as the 2009 LTM Report.

The 2009 LTM Report contains the information required under Part B Section 1 of the licence, specifically:

a. Table B-8 in Appendix B of the 2009 LTM Report provides summaries of all data generated under the Long Term Monitoring Program to date.

b. An Executive Summary of the 2009 LTM Report appears on the second page.

Date Submitted:	March 26, 2010	
Submitted/Prepared by:	Natalie Plato	
Contact Information:	**Tel:**	(867) 975-4730
	Fax:	(867) 975-4736
	email:	natalie.plato@inac-ainc.gc.ca

GPS Coordinates for water sources utilized

Source Description	Latitude			Longitude		
	° Deg	` Min	" Sec	° Deg	` Min	" Sec
Monitoring Well (MW) 1	68	33	6.798	-83	18	52.25
MW 2	68	33	5.982	-83	18	42.54
MW 3	68	33	5.244	-83	18	43.87
MW 4	68	32	49.03	-83	18	17.8
MW 5	68	32	45.21	-83	18	20.28
MW 6	68	32	45.52	-83	18	22.94

GPS Locations of areas of waste disposal

Location Description (type)	Latitude			Longitude		
	° Deg	` Min	" Sec	° Deg	` Min	" Sec
Not Applicable						

APPENDIX A: Executive Summary (Inuktitut)

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ᐱᓕᕆᐊᑦ 1697-0901

ᐊᑯᓂᒧᑦ ᑐᕌᖓᔪᒥᒃ ᖃᐅᔨᓴᕐᓂᖓ
CAM-F, ᓴᖅᐸᒥ ᑕᓯᕐᒥ, ᓄᓇᕗᑦ

ᐊᐅᓚᑦᑎᔾᔪᑎᖓᐅᔪᖅ ᓇᐃᓈᖅᑕᐅᓯᒪᔪᖅ

ᐊᕙᑎᓕᕆᔾᑯᑦ ᓇᖏᓂᕆᔭᐅᔪᑦ ᑕᐃᔭᐅᔪᑦ FRANZ Environmental Inc. (FRANZ) ᐃᑲᓇᐃᔭᖅᑎᑕᐅᓚᐅᕐᒪᑕ ᐃᓄᓕᕐᕆᑦᑎᕐᑯᓐᓄᑦ ᑲᓇᑕᒥ ᖃᐅᔨᓴᕐᑯᔭᐅᓪᓗᑎᒃ ᑐᒃᓕᖅᑴᕐᒥᒃ ᐊᕐᕋᒎᒥᒃ ᐊᑯᓂᐅᔪᒧᑦ ᐱᓕᕆᐊᖑᔪᓂᒃ ᑎᐅᓚᐅᓐᕕᓂᐅᔪᓂᒃ, CAM-F ᒪᓕᒐᕐᑲᖅᑎᑕᐅᓪᓗᑎᒃ ᓴᖅᐸᒥ ᑕᓯᒥᒃ ᐊᑯᓂᐅᔪᒥᒃ ᖃᐅᔨᓴᖅᑎᑕᐅᔪᓂᒃ ᐃᓄᓕᕆᔨᑦᑎᕐᑯᓐᓄᑦ. ᑖᒃᑯᐊ ᐱᓕᕆᐊᖑᓂᖏᑦ ᐱᔮᖅᑕᐅᓚᐅᖅᑐᑦ ᐃᓄᓕᕆᔨᑦᑎᕐᑯᓐᓄᑦ ᑳᓐᑐᑏᒃᑳᖅᑎᑕᐅᓯᒪᔪᓂᒃ ᓈᓴᐅᑎᓕᖕᒥᒃ 01-09-6038, ᖃᐅᔨᕆᐊᖅᑕᐅᓂᕐᒧᑦ ᓈᓴᐅᑎᓕᖕᒥᒃ 01−ᒥᒃ, ᑎᑎᕐᑲᕐᕕᓕᖕᓂᒃ 1632- 11/01-09-6038.

ᑕᐃᓐᓇ ᐃᓂᖓ CAM-F ᓴᖅᐸᒥ ᑕᓯᕐᒥ Melville Peninsula−ᓄᕙᐊᓗᐊᓃᒻᒪᑦ, ᕿᑭᖅᑖᓗᖕᒥᐅᓂ ᐊᕙᒃᑐᖅᓯᒪᓂᕐᒥ ᓄᓇᕗᒻᒥ. ᑕᓐᓇ ᐃᓂᖓ CAM-F−ᒦᑦᑐᖅ ᐅᖓᓯᓗᐊᖏᑦᑐᖅ ᑎᐅᓚᐃᓐᑯᑦ ᐃᓂᕕᓂᖏᓐᓂᒃ ᓴᓗᒻᒪᖅᓴᖅᑕᐅᕙᓪᓕᐊᓚᐅᖅᓯᒪᔪᒥ 2005−ᒥᒃ 2008−ᒥᓗ. ᐲᔭᖅᑕᐅᕚᓂᖓᒪᑕ ᓴᓗᒻᒪᖅᓴᖅᑕᐅᓕᓚᐅᖅᓯᒪᔪᑦ ᓱᕈᕐᓇᖅᑐᐃᑦ ᐊᒃᑕᑯᐃᑦ ᑐᕐᑯᓐᓇᖅᑐᕐᑲᖏᑦᑐᓂᒃ ᓱᕈᖅᓯᒪᔪᓪᓗ ᓄᓇᐃᑦ ᑕᐅᕙᓂ ᐱᕐᑯᑎᕐᑲᕐᕕᕕᓂᕐᒥ.

ᖃᐅᔨᓴᖅᑕᐅᕙᓪᓕᐊᓚᐅᖅᑐᑦ ᐋᒍᓯ 24, 25-ᒥᓗ, 2009−ᒥ, ᖃᓂᓐᓂᖅᑴᕐᒥᔅᓯᑎᒃ ᓄᓇᓕᖕᒥ, ᓴᓂᕋᔭᖕᒪ 85 ᑭᓛᒥᑕᒥᑦᑐᒥᒃ ᑲᓐᓇᖕᒐᓂ.

ᐃᓚᒃᓴᔭᕆᔭᐅᕐᑲᑦᑕᖅᑐᕕᓃᑦ ᐊᑐᖅᑕᐅᓯᒪᔪᑦ ᖃᐅᔨᔭᐅᓂᖏᑦ ᖃᐅᔨᓴᖅᑕᐅᓚᐅᕐᒥᔪᑦ ᐃᓂᕕᓂᑐᕐᑳᓂᑦᑐᓂᒃ ᐊᒻᒪᓗ ᓴᕿᐅᒪᔭᐅᓕᖅᑐᓂᒃ ᒪᓕᒐᕐᓂᒃ. ᑲᓇᑕᒥ ᒪᓕᒐᐅᐃᑦ ᑲᓇᑕᒥ ᑲᑎᒪᔨᓂᒃ ᒥᓂᔅᑕᖏᑦ ᐊᕙᑎᓕᕆᓂᕐᒧᑦ ᐊᑐᖅᑕᐅᖏᓐᓇᓚᐅᖅᑐᑦ. ᑕᐃᒃᑯᓇᓂ ᒪᓕᒐᕐᓂᒃ ᓇᓗᓇᐃᒃᑯᑕᕐᑲᖏᒡᒍᑐᓂ, ᑲᓇᑕᒥ ᐊᕙᒃᑐᖅᓯᒪᔪᓂ ᐊᐅᓚᑦᑎᓃᑦ ᑐᑭᓯᓂᐊᕐᕕᐅᓯᒪᕐᑲᑦᑕᓚᐅᖅᑐᑦ.

ᑐᖓᕕᐅᓪᓗᑎᒃ ᐃᓚᒃᓴᔭᐃᑦ ᐊᒻᒪᓗ ᓄᓇᐅᑉ ᓂᓪᓚᓱᖕᓂᖓᓂ ᖃᐅᔨᒪᔭᐅᔪᑦ ᐊᒻᒪᓗ ᑕᐅᑐᒃᑕᐅᔪᓂᒃ ᐊᒻᒪᓗ ᐊᔾᔨᓕᐊᖑᓯᒪᔪᓂᒃ ᖃᐅᔨᓴᖅᑕᐅᔪᓂᒃ, ᑐᑭᑖᓚᐅᖅᑐᑦ ᐃᒫᒃ: ᑕᐅᕙᓐᓇ ᐃᓂᕕᓂᕆᔭᐅᔪᖅ ᐊᓯᔾᔨᖅᓯᒪᓗᐊᖏᑦᑐᖅ ᑕᐃᒪᖓᑦ ᑭᖑᓪᓕᖅᑴᕐᒥᒃ ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᓯᒪᔪᒥᒃ, ᐋᒍᓯ 2008−ᖑᑎᓪᓗᒍ; ᐱᕐᑯᑎᖏᑦ ᓱᓕ ᐊᐅᓚᑕᐅᕗᑦ ᑕᐃᒫᒃ ᐊᐅᓚᑕᐅᔾᔅᓴᐅᒪᐅᑕᐅᓯᒪᒐᒥᒃ; ᐊᒻᒪᓗ ᐃᓂᖓ ᐅᓗᕆᐊᓇᕐᓂᕐᑲᖏᑦᑐᖅ ᐊᕙᑎᑐᕐᑲᕐᒧᑦ.

ᐅᑯᐊ ᐊᐅᓚᑦᑎᔨᓄᑦ ᑐᕌᖓᔪᑦ ᓇᐃᓈᖅᑕᐅᓯᒪᔪᑦ ᐅᓂᒃᑲᓕᐊᑦ ᐅᕐᑲᓖᖅᑕᐅᔭᕆᐊᕐᑲᖅᑐᑦ ᐃᓚᒋᓗᒋᑦ ᐱᒻᒪᕆᐅᓂᖅᓴᐃᑦ ᐅᓂᒃᑳᓕᐊᑦ, ᑕᐃᒫᒃᓴᐃᓐᓇᖅ ᐃᓱᕐᑲᕐᒥᖕᒪᑕ ᐅᕐᑲᐅᓯᐅᓯᒪᔪᓂᒃ ᐃᓗᓕᖏᓐᓂ ᐊᕙᒃᑐᖅᑕᐅᓯᒪᔪᓂ 8.0−ᖓᓂ.

APPENDIX B: Executive Summary (English)

EXECUTIVE SUMMARY

FRANZ Environmental Inc. (FRANZ) was retained by Indian and Northern Affairs Canada (INAC) to conduct a second year of long-term monitoring activities at the former DEW Line site, CAM-F, as prescribed by INAC's CAM-F Sarcpa Lake Long-Term Monitoring Plan. This project was completed under INAC standing offer number 01-09-6038, call-up number 01, file number 1632-11/01-09-6038.

The CAM-F Sarcpa Lake site is located on the Melville Peninsula, within the Baffin Region of Nunavut. CAM-F was an intermediate Distant Early Warning (DEW) Line Site at which a remediation project was conducted between 2005 and 2008. After demolition, remediation consisted of disposal of hazardous waste and contaminated soils in on-site facilities.

Monitoring efforts were conducted on August 24 and 25, 2009 while based out of the nearest community, Hall Beach, approximately 85 km to the east.

The chemical data obtained through the investigation were compared to historic site data as well as established guidelines. Federal guidelines from the Canadian Council of Ministers of the Environment (CCME) were used preferentially. For parameters not covered by CCME guidelines, provincial authorities were consulted.

Based on chemical and ground temperature data analysis as well as visual and photographic investigations, it was determined that: the site remains little changed from the last monitoring event, in August 2008; its facilities continue to operate as designed; and the site poses no imminent threat to the natural environment.

This executive summary should be read in conjunction with the main report and is subject to the same limitations described in Section 8.0.

APPENDIX C: LONG-TERM MONITORING 2009 CAM-F DEW LINE SITE, NU

FRANZ ENVIRONMENTAL INC.

◆ CONSULTING ◆ ENGINEERING ◆ TECHNOLOGIES ◆

Long-Term Monitoring, 2009
CAM-F, Sarcpa Lake, Nunavut

FINAL REPORT

Prepared for:

Indian and Northern Affairs Canada
Nunavut Regional Office
P.O. Box 2200
Iqaluit, Nunavut
X0A 0H0

Prepared by:

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Fax: (613) 721-0029

Project No. 1697-0901
November 27, 2009

EXECUTIVE SUMMARY

FRANZ Environmental Inc. (FRANZ) was retained by Indian and Northern Affairs Canada (INAC) to conduct a second year of long-term monitoring activities at the former DEW Line site, CAM-F, as prescribed by INAC's CAM-F Sarcpa Lake Long-Term Monitoring Plan. This project was completed under INAC standing offer number 01-09-6038, call-up number 01, file number 1632-11/01-09-6038.

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Monitoring efforts were conducted on August 24 and 25, 2009 while based out of the nearest community, Hall Beach, approximately 85 km to the east.

The chemical data obtained through the investigation were compared to historic site data as well as established guidelines. Federal guidelines from the Canadian Council of Ministers of the Environment (CCME) were used preferentially. For parameters not covered by CCME guidelines, provincial authorities were consulted.

Based on chemical and ground temperature data analysis as well as visual and photographic investigations, it was determined that: the site remains little changed from the last monitoring event, in August 2008; its facilities continue to operate as designed; and the site poses no imminent threat to the natural environment.

This executive summary should be read in conjunction with the main report and is subject to the same limitations described in Section 8.0.

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LIST OF FIGURES (Appendix A)

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1.0 INTRODUCTION

FRANZ Environmental Inc. (FRANZ) was retained by Indian and Northern Affairs Canada – Nunavut Regional Office (INAC) to conduct long-term monitoring activities at the former DEW Line sites CAM-F and FOX-C. This project was completed under INAC standing offer number 01-09-6038, call-up number 01, file number 1632-11/01-09-6038.

This report describes the monitoring activities completed for INAC and was prepared in accordance with the INAC Request for Proposal (RFP) dated May 28, 2009, the FRANZ Proposal No. P-2893, dated June 5, 2009, the Call-up Details, dated June 22, 2009 and the Project Initiating Meeting Minutes, dated June 24, 2009.

Throughout this report the INAC DEW Line site CAM-F will be referenced as “the Site”.

1.1 Project Objectives

The objective of the 2009 long-term monitoring was to complete the 2009 monitoring program at the CAM-F site as described in the CAM-F Sarcpa Lake Long-Term Monitoring Plan. This included visual observations and chemical analyses to determine whether the site infrastructure is performing as designed.

1.2 Scope of Work

The work plan for the 2009 field work was based on the CAM-F Sarcpa Lake Long-Term Monitoring Plan prepared by INAC, the UMA/AECOM report on the 2008 monitoring program, the UMA/AECOM borehole logs and well installation records and the Biogénie thermistor installation records.

The scope of work as described in the 2007 Long-Term Monitoring Plan was as follows:

1. Visual Monitoring of the Non-Hazardous Waste Landfill (NHWL) and Secure Soil Disposal Facility (SSDF), including:
    - Checking the physical integrity of the SSDF and NHWL and observing any evidence of erosion, ponding, frost action, settlement and lateral movement and completing a Visual Monitoring Checklist.
    - Taking photographs to document the condition of the SSDF/NHWL and substantiate the recorded observations.
2. Active Layer Water Monitoring of the SSDF, including:
    - Collection of samples from the two monitoring wells installed downgradient of the SSDF and the one well installed upgradient.

- Examination and analysis of the samples for colour, odour, hardness, pH, conductivity, temperature, inorganic elements (arsenic, cadmium, chromium, cobalt, copper, lead, nickel, and zinc), polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (TPH), major ions, total dissolved solids (TDS) and total suspended solids (TSS).

3. Soil Monitoring in the area around the SSDF, including:
    - The collection of soil samples from the toe of the SSDF in the vicinity of the monitoring wells.
    - Analysis of the soil samples for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, lead, nickel, and zinc), PCBs and TPH.
4. Thermal Monitoring of the SSDF, including:
    - Collection of data from automatic data loggers attached to 4 thermistor strings with beads at selected intervals to provide ground temperature profiles at various locations within the SSDF.
5. Preparation of a 2009 monitoring program report.

The following tasks were necessary to fulfill the scope:

a) Preparation of a health and safety plan;
b) Preparation of a sampling plan for soil and groundwater;
c) Excavation of test pits;
d) Collection of soil samples for chemical analysis;
e) Obtaining groundwater samples from wells for chemical analysis;
f) Inspection of thermistor installations and collection of data logger information;
g) Interpretation of analytical data;
h) Visual inspection and photo documentation of the site;
i) Interviewing local residents and officials to understand land use and wildlife trends; and
j) Reporting.

2.0 BACKGROUND INFORMATION

2.1 Site Description

CAM-F Sarcpa Lake, Nunavut was an Intermediate Distant Early Warning (DEW) Line site, constructed in 1957 and later abandoned in 1963. It was converted into a scientific research station in 1977 under the Science Institute of the Northwest Territories and Canada, Department of Indian and Northern Affairs, and operated seasonally until 1988. A remediation project was conducted at the site between 2005 and 2008. The remediation involved the demolition and disposal of buildings, structures and other debris, as well as the cleanup of hazardous materials. Contaminated soil was excavated and either shipped off site or placed in a secure soil disposal facility on site.

The CAM-F site consists of two main parts - the station area and the former construction camp area at Sarcpa Lake. Before remediation was completed in 2008, site facilities consisted of an airstrip, small module train, warehouse, garage, a Quonset hut, an Inuit house, two former landfill areas, and petroleum, oil and lubricants (POL) storage facilities. Before the remediation was completed, the site contained approximately 10,000 barrels of unknown contents, a radar tower that had been dismantled, other site debris and contaminated soil. There were also some miscellaneous waste and chemical leftovers from the time the site was a research facility. The beach area at Sarcpa Lake included a former construction camp that consisted primarily of scattered barrels of unknown contents (in and around the lake), abandoned construction equipment, and a small machine shop and generator pad.

Two structures, which are still present, were constructed during remediation, from July 2006 to September 2007: the Secure Soil Disposal Facility (SSDF) and the Non-Hazardous Waste Landfill (NHWL) (Figures A-1 and A-2, Appendix A, respectively).

The SSDF was designed to contain non-hazardous, contaminated soils. The design was based on the characteristics of the contaminants in the soil and the local geothermal and permafrost properties. The design uses permafrost as the primary containment barrier with both the contents and perimeter berms remaining in a frozen state. It was assumed that the SSDF would reach a frozen state within 3-4 years of construction, and ground temperature data loggers were installed at each of the four corners of the facility to monitor the freeze back of the contents and berms. The thickness of the cover material was calculated to prevent the thaw of the contaminated soil even after 10 consecutive 1-in-100 warm years. The initial design was modified in 2007 and an additional metre of cover was added increasing the total cover material from 2.3 to 3.3 metres, in response to Arctic climate change studies. The SSDF contains the following:

- Tier II contaminated soil (as presented in the CAM-F Long-Term Monitoring Plan, Table 2, with concentrations of metals and PCBs below criteria presented there); and
- Petroleum hydrocarbon (PHC) contaminated soils (benzene, toluene, ethylbenzene and xylenes (BTEX), PHC fractions F1 and F2).

The NHWL was designed to contain non-hazardous materials only. It was constructed on the natural ground surface with the organic matter stripped and consists of four perimeter berms constructed of granular material. The non-hazardous waste was placed in the landfill in layers consisting of 0.5 m lifts of waste covered by 0.15 m of granular fill. Once all the layers were completed a final cover consisting of a minimum of 1.0 m of granular fill was used to cap the landfill. The NHWL contains the following:

- Tier I contaminated soil (i.e., soil with lead content between 200 and 500 parts per million (ppm) and PCB content between 1 and 5 ppm)
- Petroleum hydrocarbon fractions F3 and F4 contaminated soil
- Non-hazardous demolition debris, such as timbers, plywood, and sheet metal
- Non-hazardous site debris, such as scrap metal and wood
- Non-hazardous debris/soil excavated from landfills
- Creosote timbers
- Double-bagged asbestos

Groundwater at the site is not used for water supply purposes. The area is used by hunters, who often make use of the Inuit house.

2.2 Previous Monitoring Programs

Prior to the field program, FRANZ reviewed the following reports pertaining to the CAM-F DEW Line site:

- CAM-F Sarcpa Lake Long-Term Monitoring Plan, January 23, 2007, Indian and Northern Affairs Canada
- CAM-F Borehole Logs, UMA/AECOM, July 24, 2006.
- CAM-F SSDF Monitoring Well Installations, February 17, 2005, UMA Engineering Ltd.
- Long Term Monitoring 2008, CAM-F DEW Line Site, NU, January 8, 2009, UMA Engineering Ltd.
- FOX-C Ekaluguad Fjord Long-Term Monitoring Plan, March 23, 2008, Indian and Northern Affairs Canada
- Abandoned Military Site Remediation Protocol, December 2008, Indian and Northern Affairs Canada, Contaminated Sites Program.

The 2009 monitoring program was the second of a proposed 10 that are scheduled over a 25 year period. Information from the 2008 investigation was incorporated into this year's sampling plan. Data collected in 2008 was combined with the latest data, as well as that from pre-landfill construction in 2006 and 2007, and analyzed.

As part of the investigation, a FRANZ representative interviewed members of the Hall Beach Hunters and Trappers Association staff and those knowledgeable about surrounding areas. Land use by both humans and wildlife were discussed and pertinent information documented in this report.

3.0 REGULATORY GUIDELINES

3.1 Soil

The soil analytical results were compared to the Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines, specifically the *Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health* (CSQGs) and the *Canada-Wide Standards for Petroleum Hydrocarbons in Soil* (CWS-PHC). These guidelines are applied to most federal contaminated sites. The guidelines are numerical limits intended to maintain, improve or protect environmental quality and human health at contaminated sites. They are derived using toxicological data and aesthetic considerations.

The *Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health* (CCME, 1999) are a subsection of the Canadian Environmental Quality Guidelines. The soil quality guidelines are derived to approximate a no- to low- effect level (or threshold level) based only on scientific data, including toxicology, fate, and behaviour. The guidelines are based on direct contact, ingestion, and inhalation toxicity data, and check mechanisms to ensure that the guidelines are protective of receptors exposed indirectly to contaminants. Fact sheets are provided for 32 compounds. The benzene, toluene, ethylbenzene and xylenes fact sheets were used to obtain regulatory criteria for this report.

The *Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil* (CCME, 2008a) (CWS-PHC) present criteria for petroleum hydrocarbons in soil. These numerical standards are based on the assessment and consistent management of risks posed to humans, plants, animals and environmental processes under four common land uses (agricultural, residential/parkland, commercial and industrial). Under Tier 1 of the CWS, specific numerical levels are presented for the four land uses, two soil textures (coarse and fine) and the four defined petroleum hydrocarbon fractions (F1 (nC_6-nC_{10}); F2 (nC_{10}-nC_{16}); F3 (nC_{16}-nC_{34}); F4 (nC_{34}+)).

The CWS-PHC also include the option to generate Tier 2 levels where site-specific information indicates that site conditions exist that modify human or ecological exposure to PHC contamination. Such conditions may alter risks significantly relative to the generic conditions used to derive Tier 1 levels. A third tier in the CWS-PHC involves developing site-specific cleanup levels and management options using general and site-specific information in conducting a risk assessment.

As a preliminary and conservative determination of protection of human health and the environment at the site, Tier 1 levels are applied to all analytical results. The appropriate levels are presented with the laboratory analytical data in tables. The rationale for the selection of the appropriate criteria is discussed below.

The standards or guidelines adopted for this evaluation are presented as follows:

- *Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health* (CCME, 1999, with updates) for residential/parkland use, including fact sheets for benzene, toluene, ethylbenzene, and xylenes. Non-potable groundwater is stipulated and grain size analysis indicates that predominant soil type is coarse-grained material (>50% of material is > 75 µm).
- *Canada-Wide Standards for Petroleum Hydrocarbons (CWS-PHC) in Soil* (CCME, 2008a) - Tier 1 commercial land use, coarse-grained soil, non-potable groundwater.
- *CAM-F Sarcpa Lake Long-Term Monitoring Plan* (INAC, 2007). DEW Line Cleanup Criteria – Tier II Contaminated Criteria. (where these criteria are more stringent than the above criteria.)

BTEX Compounds

For the BTEX compounds specifically, the Canadian Soil Quality Guidelines (CSQGs) were used to determine the appropriate pathway-specific guidelines. For benzene, for example, the 2004 update was used, with the following assumptions:

- Residential/Parkland land use
- Coarse-grained soils
- 10^{-5} acceptable incremental risk
- With applicable guidelines the most conservative of:
    - Soil dermal contact guideline
    - Soil ingestion guideline
    - Eco soil contact

The groundwater check (drinking water) pathway was excluded, as groundwater in the area of Sarcpa Lake is not used as a source of potable water. With its exclusion, the most conservative guideline for benzene applicable at the site is related to the protection of the pathway for the inhalation of indoor air (slab on grade), at 0.095 mg/kg; however, there are no buildings near either the NHWL or the SSDF (the house used as a hunting shelter is sufficiently far from both that it is not likely to be affected by vapour intrusion). The most conservative remaining guideline is therefore the ecological soil contact guideline, at 31 mg/kg. A similar process was used to determine the most conservative applicable guideline value for toluene, ethylbenzene and xylenes.

Petroleum Hydrocarbons

For petroleum hydrocarbons, the CWS-PHC was used to determine the appropriate pathway-specific guidelines. Pathway-specific guidelines can be found in the CWS-PHC Technical Supplement (CCME, 2008c).

The CAM-F DEW line site is a federal site, and is therefore exempt from territorial regulation; however, the future disposition of the site may make it subject to territorial environmental guidelines. Because the Nunavut environmental guidelines are based on the work of the CCME, the federal and territorial guidelines often coincide.

The governing guideline for soil at contaminated sites in Nunavut is the *Environmental Guideline for Contaminated Site Remediation* (EGCSR), published by the Government of Nunavut in March, 2009. The criteria for Petroleum Hydrocarbons (PHC) in soil are found in Section 2.4, and are adapted from the Canadian Council of Ministers of the Environment's (CCME's) Canada-Wide Standards for Petroleum Hydrocarbons in Soil (CWS-PHC). The criteria for other compounds in soil are found in Table A-4 of Appendix 4 of the EGCSR, and are obtained from the CSQGs, published in the *Canadian Environmental Quality Guidelines* (CCME, 1999, updated 2007). The criteria are numerical limits intended to maintain, improve or protect environmental quality and human health at contaminated sites. Because the EGCSR is based on federal standards and has been updated recently, FRANZ does not expect that there are any discrepancies between the federal standards applied to the site and the Nunavut guidelines.

3.2 Groundwater

Federal standards for groundwater are provided by the CCME for several circumstances. If groundwater is a source of drinking water, the *Guidelines for Canadian Drinking Water Quality* apply. Other guidelines for water include the *Canadian Water Quality Guidelines for Protection of Agricultural Water Uses*, the *Canadian Water Quality Guidelines for the Protection of Aquatic Life*, and the *Guidelines for Canadian Recreational Water Quality*.

At the site, groundwater is not used for drinking water or agricultural uses, and is not adjacent to a water body, where the aquatic life or recreational water quality guidelines might be considered to apply. Therefore, FRANZ has adopted effects-based standards for groundwater, considered to be protective of human and environmental health, from a provincial jurisdiction, Ontario.

Ontario's 2004 *Environmental Protection Act* (EPA), specifically Sections XV.1 and XV.2, outlines the regulatory requirements in Ontario for environmental site assessment, remediation, and the filing of records of site condition (RSCs).

The background and effects-based standards are set out in the document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*" (Standards Document), dated March 9, 2004. Six tables are presented in the document, variously presenting standards for background, potable and non-potable and stratified site conditions. FRANZ has adopted the *Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition* (Table 3) for use at the site, with Residential/Parkland land use and coarse-grained soil.

4.0 INVESTIGATIVE METHODOLOGY

The monitoring program was carried out at the CAM-F DEW Line site on August 24 and 25, 2009. During the field investigations, weather conditions were mostly cloudy with temperatures ranging from approximately 4 to 10^{o} C. The program consisted of the following:

- Completing a Health & Safety Plan;
- Visually observing and photographically documenting the physical integrity of the landfills;
- Collecting landfill temperature data from previously installed thermistor strings;
- Measuring headspace vapour concentrations in the soil samples and various physical parameters in the water samples;
- Submission of soil and groundwater samples for applicable laboratory analysis; and
- Gathering information from knowledgeable persons regarding local wildlife and human activity.

The field investigation procedures are described below.

4.1 Health & Safety Plan

Before commencing with site activities, a site-specific health and safety plan (HASP) was developed. The HASP identified and provided mitigative actions for potential physical and chemical hazards associated with the work involved in the site assessment. The HASP also contained a listing of emergency contact numbers and provided protocols to follow in the event of an emergency.

A copy of the plan was presented to INAC for their review and agreement before site activities began. Prior to conducting any work on-site, the plan was distributed and discussed with all personnel involved in the investigative program. A copy of the HASP has been retained on file at FRANZ.

4.2 Visual Inspections

The Secure Soil Disposal Facility (SSDF), Non-Hazardous Waste Landfill (NHWL), and surrounding areas were visually observed to assess the landfills' physical integrity, including evidence for erosion, ponding, frost action, settlement and lateral movement. A visual monitoring checklist, as presented in the CAM-F Long-Term Monitoring Plan, was completed for each landfill and is found in Table 5-1 and Table 6-1 in Sections 5.3 and 6.3, respectively. Photographs were also taken to document the condition of the structures and substantiate the recorded observations. Photos were taken from the exact same viewpoints as presented in the 2008 monitoring report (see Figure A-1 and Figure A-2, Appendix A) in order maintain consistency, facilitating the assessment of any temporal changes.

4.3 Wildlife Survey

FRANZ made observations of the natural environment at the time of the site visit and recorded the observations in field notes. Observations included direct sightings of wildlife, other evidence of wildlife (e.g., droppings, tracks, feathers/fur), wildlife activities (migrating, nesting, etc.), numerical estimates of wildlife, and vegetation observations. Where possible, observations by FRANZ were compared to previously recorded observations.

As part of the investigation, a FRANZ representative interviewed members of the Hall Beach Hunters and Trappers Association staff and those knowledgeable about surrounding areas. Land use by both humans and wildlife and changes in use in previous years were discussed.

4.4 Thermistor Monitoring

Four sets of thermistor strings were installed at the corners of the SSDF in September 2007. Each consists of 11 or 12 temperature sensing beads connected to a Lakewood Systems UltraLogger data logger that is programmed to record values twice daily – at 0h00 and 12h00 – on a continual basis.

At the time of inspection all thermistor strings appeared to be functioning well. Data from the period August 2008 to August 2009 were downloaded from each logger, using a laptop and portable power supply, and inspected on site to ensure completeness. Data logger battery voltages were noted and a visual inspection of the housing equipment was performed. Each logger was then restarted to begin collecting temperature information anew.

The SSDF ground temperature record, containing continuous information since September 2007, was updated and trends highlighted. A discussion, along with plots of temperature versus depth and time, is presented in section 5.4. The annual maintenance report, which also contains a basic description of the data logger systems, can be found in Table B-11, Appendix B. Raw data is provided on the attached CD-ROM.

4.5 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/assets/pdf/pn_1101_e.pdf); and
- 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/assets/pdf/pn_1103_e.pdf).

Wells were purged of three well volumes as specified in the ToR except where poor recharge rates made it necessary to sample sooner. In-situ field measurements of water quality included temperature, conductivity, dissolved oxygen, turbidity, total dissolved solids, pH and oxidation-reduction potential. Sampling took place when these parameters stabilized. The total metals samples were not acidified and were not filtered (as requested in the ToR). A summary of the status of the monitoring wells is found in Table 5-1, Section 5.3.

A summary of the samples that were collected and submitted for laboratory analysis during the groundwater sampling activities is provided in Table 4-1 below.

Table 4-1: Summary of groundwater sample collection near the SSDF.

SSDF Area	Sample
Upgradient	MW0604-01
Downgradient	MW0605-01
	MW0606-01
	DUP-01*

Note: * indicates a blind field duplicate of the sample listed directly above.

All samples were stored immediately in laboratory sample bottles (for laboratory analysis). Water samples for laboratory analysis were stored in laboratory supplied coolers equipped with ice from the time of collection until delivery to the laboratory.

4.6 Test Pitting

Soil sampling was completed by manual test pitting. Samples were collected within a two to four metre radius of the monitoring wells at the toe of the SSDF. Two additional samples were also collected at each of the two upgradient bench mark locations. Composite soil samples were collected from the side wall of each test pit at two discrete intervals: 0 – 10 cm and 40 to 50 cm below ground surface.

Test pit soil samples are identified with the prefix “TP” or “BM”, based on their origin in a test pit (TP) or adjacent to a survey benchmark (BM) followed by numbers corresponding to the adjacent monitoring well or bench mark, respectively. Test pitting was performed using a shovel and stainless steel trowel, decontaminated with Alconox between sample collections. Fresh, sterile gloves were used at each sample location.

Field monitoring of combustible gas concentrations using an RKI Eagle portable multi-gas detector was conducted for each test pit where soil samples were analysed for PHCs. Soil stratigraphy was logged and photos taken before backfilling the test pits with excavated soil.

Test pit locations for the SSDF area are indicated in Figure A-1, Appendix A. No test pits were excavated as part of the NHWL monitoring program.

As with groundwater, all samples were placed in laboratory sample jars that were stored in laboratory supplied coolers equipped with ice from the time of collection until delivery to the laboratory.

4.7 Sampling and Field Screening

Soil samples were collected from each test pit and, based on predetermined locations and field screening, were submitted for laboratory analysis. Professional judgment and soil vapour screening (described below) were used to determine whether additional test pit locations were required beyond those prescribed in the Long-Term Monitoring Plan.

The soil sampling program included advancing five test pits (TP0904, TP0905, TP0906, BM1 and BM2) both up- and downgradient of the SSDF. A total of 12 soil samples were collected and submitted for laboratory analysis for petroleum hydrocarbons (PHCs) fractions F1-F4 and benzene, toluene, ethylbenzene and xylenes (BTEX) as well as metals and polychlorinated biphenyls (PCBs). Two field duplicate samples (DUP-01 and DUP-02) were submitted for analysis for QA/QC purposes. One soil sample (TP0904-01), next to the SSDF, was analyzed for grain size to determine which soil type (coarse or fine) from the Canada-Wide Standards for Petroleum Hydrocarbons in Soil was appropriate.

A summary of the samples that were collected and submitted for laboratory analysis during the test pitting activities is provided in Table 4-2 below.

Table 4-2: Summary of soil sample collection near the SSDF.

SSDF Area	Sample	Depth (mbgs)
Upgradient	TP0904-01	0 – 0.1
	TP0904-02	0.4 – 0.5
	TP-BM1-01	0 – 0.1
	TP-BM1-02	0.4 – 0.5
	TP-BM2-01	0 – 0.1
	TP-BM2-02	0.4 – 0.5
Downgradient	TP0905-01	0 – 0.1
	TP0905-02	0.4 – 0.5
	DUP-02*	0.4 – 0.5
	TP0906-01	0 – 0.1
	DUP-01*	0 – 0.1

SSDF Area	Sample	Depth (mbgs)
	TP0906-02	0.4 – 0.5

Note: * indicates a blind field duplicate of the sample listed above.
mbgs = metres below ground surface.

Soil samples were collected from each test pit and placed into glass jars. Discrete soil samples and blind duplicates were collected as grab samples using disposable nitrile gloves for each sample.

Soil Vapour Screening

FRANZ field personnel screened all soil samples collected by measuring combustible vapour levels in the headspace of bagged samples. Field screening was conducted using a consistent procedure as follows. A standard soil volume, approximately 50% of the volume of a 1L polyethylene bag, was placed in a bag. The bagged sample was then allowed to equilibrate to ambient air temperatures. After equilibration, a combustible gas indicator (CGI) probe was inserted into the bags and the maximum concentrations of combustible vapours were recorded. Field screening was also conducted by visual (e.g., evidence of staining and debris) and olfactory observations.

An RKI Eagle CGI, Type 401 was available for screening vapours where petroleum hydrocarbon impacts were suspected. The CGI measures the concentration of combustible gas in parts per million (ppm) or as a percentage of the lower explosive limit (% LEL). While the CGI provides quantitative results, these measurements are not as accurate or reproducible as laboratory measurements due to the variability of field conditions. Given these limitations, the CGI is typically best used as a screening tool to identify areas where additional investigation may be required. Instrument calibration using a standard calibration gas was conducted, prior to FRANZ's field personnel's departure for the Site.

The instrument has a methane sensor that can be turned on and off. The methane sensor was turned off for all measurements unless noted otherwise (i.e., measurements do not include methane concentrations). The CGI displays measurements in increments of 5 ppm. Concentrations equal to or less than 60 ppm were considered to be an indication of the absence of significant petroleum hydrocarbon impacts, although with the heavy fractions of PHC on the site, this was not always a reliable indicator. In all cases, olfactory and visual observations were reported together with CGI measurements.

Possibly due in part to the low temperatures of the soils as test pit depths increased and the relatively low volatility of heating oil, the CGI readings were low. Although attempts were made

to have the soil equilibrate to ambient air temperatures, this was not always practical, given the very low soil temperatures.

4.8 Quality Assurance and Quality Control

Field personnel employed FRANZ's Quality Assurance/Quality Control (QA/QC) protocols, including appropriate techniques for soil sampling, sample storage, shipping and handling, as well as collection of duplicates.

4.8.1 Field

Soil samples collected for potential laboratory analysis were placed in laboratory prepared 125 ml glass jars fitted with screw-tight Teflon-lined lids. Groundwater samples were collected from monitoring wells and placed in appropriately sized and prepared laboratory vessels. Sample numbers were clearly marked on the containers. The soil jars and water bottles were filled to capacity with minimum headspace and stored in coolers with cold packs to moderate temperature fluctuations during transport to the laboratory. To prevent cross contamination, samples were collected with fresh nitrile gloves. Where soil samples were impossible to obtain by hand, a stainless steel trowel was used and decontaminated between samples.

As a quality control measure, two soil and one groundwater blind field duplicate samples were collected and analyzed for PHC fractions F1-F4, BTEX, metals and PCBs.

The samples were transported to the project laboratory accompanied by a Chain of Custody form. Copies of the Chain of Custody forms are attached in Appendix D.

Analytical results from these samples were compared with results from previous years.

4.8.2 Laboratory

To assess the reliability of the laboratory data, duplicate samples were taken for approximately every five samples collected by FRANZ. Two blind field duplicates were collected in the soil sampling program, and one blind field duplicate was collected in the groundwater sampling program.

For soil duplicates, FRANZ personnel generated the duplicate samples by alternately placing approximately 50 percent of the sample volume into the primary sample container and then placing the same amount into the duplicate container. The field staff continued placing aliquots of approximately 50 percent of the container volume into each container until both containers were filled.

Analytical data quality was assessed by submission of the following:

- Soil samples TP0906-1 (primary) and DUP-01 (soil duplicate), and TP0905-2 (primary) and DUP-02 (soil duplicate) were analyzed for total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs) and metals.
- Groundwater samples MW0606-1 (primary) and DUP-01 (water duplicate) were analyzed TPH, PCBs, metals, conductivity, pH, colour and temperature.

Sampling procedures and laboratory analytical precision are evaluated by calculating the relative percent difference (RPD) for a sample and duplicate pair according the following equation:

$$RPD = | X_1 - X_2 | / X_{avg} \times 100$$

where: X_1 and X_2 are the duplicate concentrations and X_{avg} is the mean of these two values. The duplicate results were evaluated using criteria developed by Zeiner (1994), which draws from several data validation guidelines developed by the United States Environmental Protection Agency (USEPA). According to these criteria, the RPD for duplicate samples should be less than 20% for aqueous samples, and less than 40% for solid samples. RPDs can only be calculated when the compound is detected in both the original and the duplicate sample at a concentration five times above the reportable detection limit (or method detection limit - MDL). Alternative criteria are used to evaluate duplicate pairs where one or both of the results are less than five times the MDL, or where one or both of the results is less than the MDL (i.e. nd or 'not-detected'). The alternative criteria used for the evaluation of the data, adapted from Zeiner (1994), are presented in the table below. When both concentrations are less than the MDL, no calculation/evaluation criterion is required.

Table 4-3: Criteria for the Evaluation of Blind and Duplicate Sample Results

Scenario	Result A	Result B	Criteria for Acceptance	
			Aqueous (water)	Soil (Soil)
A	nd	nd	Acceptable precision; no evaluation required	
B	nd	positive	result B – 0.5 x MDL < MDL	result B – 0.5 x MDL < 2 x MDL
C	positive and > 5 x MDL	positive and > 5 x MDL	RPD < 20%	RPD < 40%
D	positive and < or = 5 x MDL	positive	|result B – result A| < MDL[1]	|result B – result A| < 2 x MDL[1]

Source: Zeiner, S.T., Realistic Criteria for the Evaluation of Field Duplicate Sample Results, Proceedings of Superfund XV, November 29-December 1, 1994, Sheraton Washington Hotel, Washington, D.C. – modified to use Method Detection Limit (MDL) or Reportable Detection Limit (RDL) in lieu of the Quantitation Limit (QL), the Instrument Detection Limit (IDL) and/or Laboratory Reporting Limit (LRL).

Notes:

nd – not detected

RPD – relative percent difference, |result A - result B| / |(result A + result B)/2|

1. When result reported was less than half the quantitation limit, half the limit was used in the equation.

The precision is considered acceptable when the evaluation criteria are met or when both results are below the MDL. When the evaluation criteria are not satisfied, the following apply:

- nd vs. positive – unacceptable precision: the positive result is considered an estimate and the nd result is considered inconclusive.
- Positive vs. positive – unacceptable precision: the results are considered an estimate.

4.9 Laboratory Analytical Program

Soil samples were screened for visual and olfactory indicators of impacts. Soil and groundwater samples were sent to Maxxam Analytics in Ottawa, Ontario for chemical analysis for various target compounds in soil previously identified. Maxxam is certified by the Canadian Association for Laboratory Accreditation, Inc. (CALA) and has an internal QA/QC protocol. The laboratory QA/QC documentation is provided with the analytical report and was reviewed by FRANZ as part of the QA/QC protocol. The laboratory results and chain of custody forms are presented in Appendix D.

5.0 SECURE SOIL DISPOSAL FACILITY (SSDF)

5.1 Area Summary

Monitoring of the SSDF consisted in part of a visual inspection to assess its physical integrity, and by collecting evidence for erosion, ponding, frost action, settlement and lateral movement. Groundwater and soil samples were also collected at locations up- and downgradient of the SSDF. A plan view indicating the locations of groundwater monitoring wells, soil samples and photographic viewpoints can be seen in Figure A-1, Appendix A. The visual inspection report, including supporting photos and drawing, is presented in the following pages.

5.2 Photographic Record

The photographic record of the SSDF (and other areas of the site) was completed as per the Terms of Reference. Those portions of the record referenced in the body of this document are included in Appendix F. The complete photographic record, of full-sized photographs, is contained in the attached CD-ROM.

5.3 Visual Inspection Report

The visual inspection of the SSDF and surrounding area was conducted on August 24 and 25, 2009. The visual monitoring checklist provided in the CAM-F Long-Term Monitoring Plan was completed and is included as Table 5-1 of this report.

Settlement

Minor settlement was observed in 2008 on the top of the SSDF. This area of settlement has become less obvious in 2009 as it has grown to occupy most of the width of the southern half of the SSDF, giving the top a general downward slope toward the south. The depth of settling over the area is small; it has taken place to approximately the same depth as in 2008. There is no evidence of significant infiltration. As in 2008, no ponding was observed on top of the landfill. See Table 5-1 for details.

Ponding was observed in areas set back from the toe of the SSDF by several metres in multiple locations on all sides.

Erosion

The small preferred-drainage channels observed in 2008 at the toe on the southeast side of the SSDF are still apparent. Based on a comparison with photo documentation from 2008, there does not appear to be significant change in any of these channels.

Rip rap has been exposed in a small, localized amounts, where fines have been washed out on some of the structure's slopes. A few small, scattered potholes have formed. These

observations were also made in 2008 and it would appear that conditions have not appreciably worsened. See Table 5-1 for details.

The erosion observed in 2009 has not increased significantly since the 2008 landfill inspection.

Frost Action

No evidence of heaving or cracking was observed of the SSDF. Additionally, no frost action was observed at the surface (0-10 cm depth) or subsurface (40-50 cm depth) near the monitoring wells.

Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

Staining

One area (< 1 m^2) of staining was noted on top of the SSDF (Photo 5) although it does not appear to be related to facility failure. Given that the stain is both small and found on top of the landfill, it is likely that it was deposited by something external to the SSDF and is thus not an indication of the facility's operation.

Seepage Points

Evidence of seepage observed in 2008 – the darker, wet looking ring on the berms from the ground to about 2.5 m below the top of the SSDF – was not apparent, likely due to the lack of recent rainfall. Erosion rills and small potholes on side slopes indicate seepage has occurred. The actual seepage flows, however, appeared to be equal with what was observed in 2008. See Table 5-1 for details.

Debris

Other than the small wood bench on top of the landfill surface, exposed debris was not observed.

Discussion

Based on the minimal or non-existent erosion, settlement, frost action, burrowing, staining and seepage observed, the performance of the SSDF, with respect to containment, was rated as satisfactory. Only the area of settlement has increased marginally since 2008, but this does not compromise the structure's integrity or performance. The visual inspection report, including supporting photos and drawing, is presented in the following pages.

Table 5-1: CAM-F Sarcpa Lake – Landfill Visual Inspection

Date:	August 25, 2009
Landfill:	Secure Soil Disposal Facility (SSDF)

1. Erosion	Answer
a) Is erosion occurring on the surface or berms of the landfill?	Yes
i) Are there preferred drainage channels?	Yes
ii) Is there sloughing of material?	Minor
b) What is the extent of the erosion? *(percentage of surface area)*	< 5%
i) Is it localized or continuous?	Localized
c) Where is the erosion occurring? South facing slope and southern half of surface.	
d) Explanation: The three main preferred drainage channels are same as those photographed in 2008, extending southward from the southern toe (Photo 6, Photo 7 and Photo 8). The extent of the channel eroded in Photo 6 can be seen from the top of the SSDF, heading south, away from the SSDF (Photo 9). A fourth channel is also present off the southwest corner, as seen in Photo 10. Based on a comparison with photo documentation from 2008, there does not appear to be significant change in any of these channels. Minor erosion on the southwest facing slope and the southern corner is again observed, with small amounts of exposed rip rap (Photo 11 and Photo 12) and scattered potholes (Photo 13). Minor erosion of fines on the top, exposing larger sized material can be seen in Photo 14 but is relatively insignificant. Ponding was observed along all sides of the SSDF in areas set back from the toe by several metres in multiple locations (Photo 3 and Photo 10 for examples and Figure A-1, Appendix A, for all locations).	

2. Settlement	Answer
a) Is there differential settlement occurring on the surface?	Yes
i) Are there low areas or depressions?	Yes
ii) Are voids forming?	No
b) What is the extent of the settlement? *(percentage of surface area)*	5 – 10 %
i) Is it localized or continuous?	Localized
ii) How deep is it?	≤ 0.3 m
c) Where is the settlement occurring? Southern half of the top of the SSDF (see Figure A-1, Appendix A).	
d) Explanation: The area of minor settlement observed in 2008 is less obvious but has enlarged somewhat to occupy most of the width of the southern half of the SSDF (Figure A-1,Appendix A), giving the top a general downward slope toward the south. Settling is minor, and not much deeper than in 2008. There is no evidence of significant infiltration, although minor erosion and very slight settlement appears on top in many locations (e.g. Photo 14). No ponding was observed on top of the SSDF.	

3. Frost Action	Answer
a) Is there frost action/damage to the landfill?	No
i) Is there exposed debris due to uplift?	No

ii) Is there tension cracking along the berms?	No
iii) Is there sorting of granular fill?	Yes
b) What is the extent of the frost action? *(percentage of surface area)*	---
i) Is it localized or continuous?	---
c) Where is the heaving/cracking occurring? Major cracking not observed.	
d) Explanation: No apparent frost damage. Sorting of granular fill is obvious, especially on south facing slope.	
4. Monitoring Instruments	
a) What is the condition of the monitoring wells and thermistor strings? Minor upwelling and cracking of the internal bentonite seal was observed within the casing of MW06-04 and MW06-05 (Photo 15); this was also noted for well MW06-04 in 2008. The MW06-04 casing was slightly skewed to one side, possibly from frost (also as in 2008). There was also ponding around this well. There was a square area of recession (~ 5 cm) around monitoring well MW06-06. Thermistors and casings were in good condition. Locks were replaced at each well with Guard, 40 mm universal-key padlocks, No. 834 (key number 102). Thermistor batteries must be replaced in 2010.	
5. Sketch	
See Figure A-1, Appendix A	
6. General Comments	
The SSDF is in similar condition as in 2008. The same minor deviations in physical structure, such as settlement on the SSDF surface and small rivulets/erosion channels on the southern side, are apparent while no new, significant changes were observed. The structure therefore continues to function as designed.	

5.4 Thermal Monitoring Data

As described in the previous annual monitoring report (UMA, 2008), two thermistor strings (01-VT and 02-VT) are installed from the SSDF surface to the top of the key trench, while two strings (03-VT and 04-VT) are installed from 1.5 m below the surface to the middle of the key trench. To compensate for predictions made in the most recent (at the time of installation) global warming study, an additional one metre (1 m) of fill was placed on top of the landfill, raising the elevation of the thermistors accordingly. Despite the raised elevation of each of the thermistor strings from the original design, their current depths seem to provide sufficient information to evaluate the essential thermal conditions within the facility.

A complete memory transfer was successfully performed on each thermistor data logger. The position of the 0 ºC isotherm was calculated at each location from ground temperatures collected on August 24, 2009 and compared to the position as determined from the previous

year's data (Table 5-2). The maximum depth of the active layer – depth to the 0 ºC isotherm, or permafrost – was also interpolated from the deepest points during the year at which temperatures straddled the freezing point. Plots of depth versus temperature (at each thermistor bead) for a day at the end of each month over the previous year are presented in Figure A-3 through Figure A-6, Appendix A.

Table 5-2: Summary of SSDF Active Layer

Thermistor	**01-VT**	**02-VT**	**03-VT**	**04-VT**
Active layer depth (m) on Aug 24, 2008	1.7	2.2	2.4	2.0
Active layer depth (m) on Aug 24, 2009	1.8	2.2	2.3	2.2
Max active layer depth (m) between Sept 24, 2007 and Aug 31, 2008 (date established)	Permafrost not yet established.			
Max active layer depth (m) between Aug 31, 2008 and Aug 24, 2009 (date established)	1.8 (2009-08-22)	2.3 (2008-09-07)	2.5 (2008-09-07)	2.2 (2009-08-24)

Results presented in Table 5-2 do not indicate significant change over the past year. Temperature profile trends over the past two years, on the other hand, suggest conditions are getting colder within the SSDF (Figure A-7, Appendix A). In a temperature comparison at 1.8 mbg for the 2007-2008 and 2008-2009 winters, for example, the number of days spent at or below -10 ºC was 114 and 172, respectively, while the average temperature during this time interval was -15.1 and -16.3 ºC, respectively. Plots of depth below the top of the SSDF versus temperature, averaged over the period of January 1 to August 24, confirm significantly lower temperatures at depth despite apparently warmer surface conditions over this period (Figure A-8, Appendix A).

An inspection of the data from thermistor 04-VT (Figure A-6a, Appendix A) reveals anomalous values at the deepest of the 12 beads, where recorded temperatures do not follow the expected trend when compared to the other three thermistor strings and to general soil temperature profiles in similar environments. The same unexpected trend was also present in the 2007-2008 data set for the same thermistor. It is unlikely that this anomaly is attributable to any physical phenomenon. If it is assumed, however, that the wiring for thermistor beads 11 and 12 were mislabelled during installation, and their data interchanged accordingly, the resulting trend fits a smooth, expected curve (Figure A-6b, Appendix A). Although it cannot be proven that such a mix-up occurred at installation without an on-site verification of the thermistor string itself, the data strongly support this contention. It is therefore suggested that the second of these two graphs be considered correct. Regardless of the validity of the data at this thermistor bead, the above mentioned conclusions remain valid.

Although logged data appear valid for the remaining measurements, a small handful of readings on thermistor 02-VT failed an automatic, internal test; i.e. a value other than one (1) was recorded in the *Parallel Status* column. The number of failures is not that significant (fewer than 2% of values) and so corrupted temperatures were simply excluded from analysis. The logger manufacturer, Lakewood Systems, suggested that a weakening battery may cause problems in very cold weather, as the data gaps only appear during extreme cold weather events. Lower battery voltage can cause the multiplexors to switch from bank to bank (thus the "lost" data may actually be retrievable in some cases). Older batteries can start to fail when they get cold and then start working again when they warm back up. It is strongly recommended that the batteries be changed during the next sampling event in 2010. Because the battery voltages seemed quite reasonable, however, Lakewood Systems has also suggested that they could supply a replacement logger to swap for the 02-VT thermistor.

Additional details can be found the thermistor annual maintenance monitoring report (Table B-11, Appendix B).

5.5 Soil Sample Analytical Data

Soil samples were collected from five locations at two discrete intervals around the SSDF, as described in section 4.6, within a two to four metre radius of the monitoring wells and bench marks (Figure A-1, Appendix A). 2009 results for PHC, PCB and metals were again generally consistent with previous years' data. No significant changes occurred over this past year. Noticeable differences from 2008 include: 1) the registering of F3 hydrocarbons near MW06-04 (10 to 21 µg/g), which compare to what was observed in 2006 (11 µg/g); and 2) the decrease in F3 and F4 hydrocarbons near MW06-05, back to the reportable detection levels observed in 2006 and 2007. Samples were taken at the two bench marks in 2009 for the first time, and a very low, but measureable, value of F3 (25 µg/g) was recorded at the ground surface (0 to 10 cm) of BM1. Where no previous data exist, such as at BM1, the PHC parameter that was detected fell below the most stringent of applicable guideline values by more than an order of magnitude and the levels of metals detected were comparable to those found elsewhere on site. As seen previously, there does not appear to be any vertical gradient of any target contaminant.

The soil sample analytical data is presented in Table B-5, Table B-6 and Table B-7 and compared to previous years' data in Table B-10, Appendix B. The 2009 laboratory results are included in Appendix D.

Sampling locations near benchmarks BM1 and BM2 were prescribed in the CAM-F Long-Term Monitoring Plan, although probably not intentionally so. There are no groundwater monitoring wells at these locations and neither is there historical data. Chemical analysis, combined with visual and olfactory inspection, do not support continued, yearly monitoring. The only

prescribed soil samples, therefore, should be within the vicinity of the three existing groundwater wells.

Soil vapour screening, as described in section 4.7, was performed at the same locations as which all soil samples were collected. All screenings were negative, as were results of visual and olfactory inspections, and therefore no additional soil samples were warranted. Test pit logs can be found in Appendix C.

5.6 Ground Water Sample Analytical Data

Groundwater samples were collected at the three monitoring wells at the toe of the SSDF, as described in section 4.5. Wells were manually purged of as many well volumes as time and well recharge permitted (2 – 2.5 well volumes) using polyethylene tubing and foot valves at a rate not exceeding 100 mL/min, or as close to 100 mL/minute as was possible using Waterra tubing with foot valves. A Horiba U-22 water quality meter was calibrated and used to take field readings of pH, conductivity, turbidity, dissolved oxygen, temperature and oxidation-reduction potential; parameters were reasonably stable when readings were taken.

Groundwater results for 2009 were again generally consistent with previous years' data. Noticeable differences from 2008 include:

1. Total lead values, which were significantly higher in 2008, have dropped back to 2006-2007 values (in all three wells);
2. Total and dissolved zinc, which were also higher in 2008, have also decreased (especially at MW06-06) to levels comparable to those in 2006 and 2007;
3. Chromium values have dropped slightly; and
4. Colour readings are much lower.

Colour values in 2009 may have decreased due to increased purged volumes. The large colour values recorded in 2008, suggesting high suspended solids, may account for the higher metal readings last year. Colour was not recorded prior to 2008, however, and so it is difficult to link the low metal values in 2006 and 2007 with the same parameter. Conductivity values have also changed once again, but no clear pattern is evident over the last few years.

The groundwater sample analytical data is presented in Table B-1 through Table B-4 and compared to previous years' data in Table B-8 and Table B-9, Appendix B. The 2009 laboratory results are included as Appendix D.

5.7 Summary

All physical observations suggest that the SSDF is performing as designed and is containing the enclosed waste. Furthermore, temperature data suggest that the facility is growing increasingly cold at depths in which contaminated soil – located 3.3 mbgs – has been disposed. Given that

there are now two consecutive years worth of data, a tentative depth to permafrost can be identified somewhere around 2.5 mbgs, which suggests that the contaminated soil lies well within permanently frozen ground. Lastly, soil and groundwater chemistry data further support the conclusion that the landfill is functioning well.

6.0 NON-HAZARDOUS WASTE LANDFILL (NHWL)

6.1 Area Summary

The NHWL is located to the northwest of the SSDL. The monitoring of the landfill included visual inspection to assess its physical integrity, including evidence for erosion, ponding, frost action, settlement and lateral movement. It was not recommended that groundwater and soil samples be taken unless physical observation warranted a more detailed investigation. A plan view of the NHWL indicating photographic viewpoints can be seen in Figure A-2, Appendix A. The visual inspection report, including supporting photos and drawing, is presented in the following pages.

6.2 Photographic Record

The photographic record of the NHWL (and other areas of the site) has been completed as per the Terms of Reference. Those portions of the record referenced in the body of this document are included in Appendix F. The complete photographic record, of full-sized photographs, is contained in the Attached CD-ROM.

6.3 Visual Inspection Report

The visual inspection of the NHWL and surrounding area was conducted on August 25, 2009. The visual monitoring checklist provided in the CAM-F Long-Term Monitoring Plan has been completed and is included as Table 6-1 of this report.

Settlement

Settlement on the landfill top is similar to that described in 2008 (two small locations on the northwest sector). There is no obvious cause other than the subsurface material. It is presumed that surface water infiltrates through the cobbly and bouldery cover material and seeps along the frozen-thawed soil interface through the landfill body and side slopes, where sideslope seepage has never been observed but for which evidence exists (i.e. very small rills or erosional channels on the sideslopes). No ponding was observed.

Settlement areas were also observed beyond the toe off the NW corner and the SW side, where maximum depth of 0.3 to 0.4 m is reached. See Table 6-1 for photo details.

Erosion

Erosional evidence is also similar to that observed in 2008: there exists minor erosion on sideslopes of berms, likely due to downslope washing of fines between cobbles and boulders. Slight preferred drainage channels are observed on top and the southeast corner. The southeast corner toe is unaffected, and the slight erosion on top is not significant (i.e. it only reveals a few larger stones beneath the fine cover). There is no apparent downgradient erosion. See Table 6-1 for photo details.

Frost Action

No evidence of heaving or cracking was observed of the NHWL. Other than a slight sorting of granular fill on certain areas of landfill slope faces, there are no apparent signs of frost action.

Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

Staining

A small dark stain (radius roughly 0.3 m) was observed on the road between the cabin and the NHWL (Photo 17) but appears to be unrelated to the landfill. No additional evidence of staining was apparent.

Seepage Points

It is apparent from the small rills or erosional channels on the sideslopes that seepage has occurred on all sideslopes. No ponding within the vicinity of the NHWL was evident. The actual seepage flows appeared to be equal with what was observed in 2008.

Debris

An empty barrel (Photo 18) and a barbeque (Photo 19) were noticed roughly to the south of the cabin, distant from both the SSDF and the NHWL. A small amount of debris (one empty metal barrel, a wheel barrow and small amounts of plywood and cardboard) was also seen around the cabin (Photo 20). No other exposed debris was observed at the site.

Discussion

Based on the minimal or non-existent erosion, settlement, frost action, burrowing, staining and seepage observed, the performance of the NHWL, with respect to containment, was rated as satisfactory. The visual inspection report, including supporting photos and drawing, is presented in the following pages.

Table 6-1: CAM-F Sarcpa Lake – Landfill Visual Inspection

Date:	August 25, 2009
Landfill:	Non-Hazardous Waste Landfill (NHWL)

1. Erosion	**Answer**
a) Is erosion occurring on the surface or berms of the landfill?	Yes
i) Are there preferred drainage channels?	Yes
ii) Is there sloughing of material?	No
b) What is the extent of the erosion? *(percentage of surface area)*	10 %
i) Is it localized or continuous?	Localized
c) Where is the erosion occurring? Sideslopes of berms.	
d) Explanation: Similar status as 2008: minor erosion on sideslopes, likely due to downslope washing of fines between cobbles and boulders. No significant erosion apparent downgradient. Slight preferred drainage channels on top and southeast corner; SE corner toe unaffected. Slight erosion on top not significant – i.e. only revealing larger stone (Photo 21 and Photo 22).	

2. Settlement	**Answer**
a) Is there differential settlement occurring on the surface?	Yes
i) Are there low areas or depressions?	Yes
ii) Are voids forming?	No
b) What is the extent of the settlement? *(percentage of surface area)*	< 5%
i) Is it localized or continuous?	Localized
ii) How deep is it?	0.3 – 0.4 m
c) Where is the settlement occurring? On top (same as in 2008) with small areas beyond the toe off the NW corner and the SW side (Photo 23), where the maximum depth of 0.3 to 0.4 m is reached. See Figure A-2, Appendix A.	
d) Explanation: No obvious cause other than subsurface material; it is presumed that surface water infiltrates through the cobbly and bouldery cover material and seeps along the frozen-thawed soil interface through the landfill body and side slopes.	

3. Frost Action	**Answer**
a) Is there frost action/damage to the landfill?	No
i) Is there exposed debris due to uplift?	No
ii) Is there tension cracking along the berms?	No
iii) Is there sorting of granular fill?	No
b) What is the extent of the frost action? *(percentage of surface area)*	---
i) Is it localized or continuous?	---
c) Where is the heaving/cracking occurring? None visible.	
d) Explanation: No apparent signs of frost action other than slight sorting of granular fill on certain areas of landfill slope faces.	

4. Monitoring Instruments

a) What is the condition of the monitoring wells? The surface seal is deteriorating around all three wells (Photo 24) and some casing shift evident. Two wells (MW06-01 and -02) were missing wells caps. All three wells were missing padlocks; bring new ones during 2010 monitoring.
5. Sketch
See Figure A-2, Appendix A
6. General Comments
The NHWL is in similar condition as in 2008. The same minor deviations in physical structure, such as minor settlement on the landfill surface and minor erosion. No new, significant changes were observed. The structure is still acceptable and continues to function as designed. New locks should be installed on the monitoring wells.

6.4 Summary

All physical observations suggest that the NHWL is performing as designed and is containing the enclosed waste. Soil and groundwater chemistry were not sampled, as indicated in the Long-Term Monitoring Plan, but there were no observable signs (e.g. staining) that warranted sampling.

7.0 NATURAL ENVIRONMENT

Information regarding the natural environment was gathered both directly, through observation, and indirectly, through consultation with knowledgeable local persons in order to better understand the presence and temporal change of wildlife. The FOX-C Long-Term Monitoring Plan recommends monitoring the following parameters:

- Wildlife sightings
- Other evidence of recent presence of wildlife (e.g. droppings, tracks)
- Wildlife activity (e.g. nesting, migration)
- Qualitative assessment of relative numbers versus previous years
- Revegetation of disturbed areas versus previous years

Wildlife and Human Activity

From interviews with members of the Hall Beach Hunters and Trappers Association (HTA) it was discovered that the CAM-F site is used for hunting, possibly year-round. The cabin, built by Biogénie, is used frequently by hunters and travelers to and from Repulse. No changes in wildlife habits have been noted since site clean-up. Hunting on this site is mainly for caribou, and success is dependent on the season and long-term weather conditions. There were few caribou in spring, for example, due to high rainfall the previous year.

During the monitoring, Canada Geese as well as black birds (likely ravens) were observed on site. Numerous caribou tracks were also present around the SSDF (Photo 25).

Re-establishment of Vegetation

It is difficult to draw concrete conclusions from the photographic record, but little change is evident thus far. Based on the evidence of vegetation and roots in surficial soils surrounding the SSDF – as well as the regional setting of this landfill – it would seem that reestablishment of vegetation is not likely in the near future.

8.0 LIMITATIONS

This report has been prepared exclusively for Indian and Northern Affairs Canada. Any other person or entity may not rely upon the report without the express written consent from FRANZ Environmental Inc. and Indian and Northern Affairs Canada.

Any use, which a third party makes of this report, or any reliance on decisions made based on it, is the responsibility of such third parties. FRANZ Environmental Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Some of the information presented in this report was provided through existing documents and interviews. Although attempts were made, whenever possible, to obtain a minimum of two confirmatory sources of information, FRANZ Environmental Inc., in certain instances, has been required to assume that the information provided is accurate.

The conclusions presented represent the best judgment of the assessors based on current environmental standards and on the site conditions observed on August 24 and 25, 2009. Due to the nature of the investigation and the limited data available, the assessors cannot warrant against undiscovered environmental liabilities.

Should additional information become available, FRANZ Environmental Inc. requests that this information be brought to our attention so that we may re-assess the conclusions presented herein.

There is no warranty, expressed or implied that the work reported herein has uncovered all potential environmental liabilities, nor does the report preclude the possibility of contamination outside of the areas of investigation. The findings of this report were developed in a manner consistent with a level of care and skill normally exercised by members of the environmental science and engineering profession currently practicing under similar conditions in the area.

A potential remains for the presence of unknown, unidentified, or unforeseen surface and sub-surface contamination. Any evidence of such potential site contamination would require appropriate surface and sub-surface exploration and testing.

If new information is developed in future work (which may include excavations, borings, or other studies), FRANZ Environmental Inc. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

9.0 REFERENCES

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Zeiner, S*.T., Realistic Criteria for the Evaluation of Field Duplicate Sample Results,* Proceedings of Superfund XV, November 29-December 1, 1994, Sheraton Washington Hotel, Washington, D.C.

10.0 CLOSURE

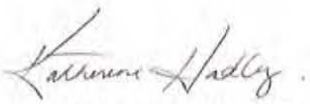
We trust that this information is satisfactory for your present requirements. Should you have any questions or require additional information, please do not hesitate to contact the undersigned.

Yours truly,

FRANZ Environmental Inc.

Andrew Henderson, B.A.Sc.
Field Assessor

Matthew Cyr, M.Sc.
Field Assessor



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Principal/Senior Reviewer

Distribution: Addressee (2 papers, 1 electronic)
FRANZ (2 papers)

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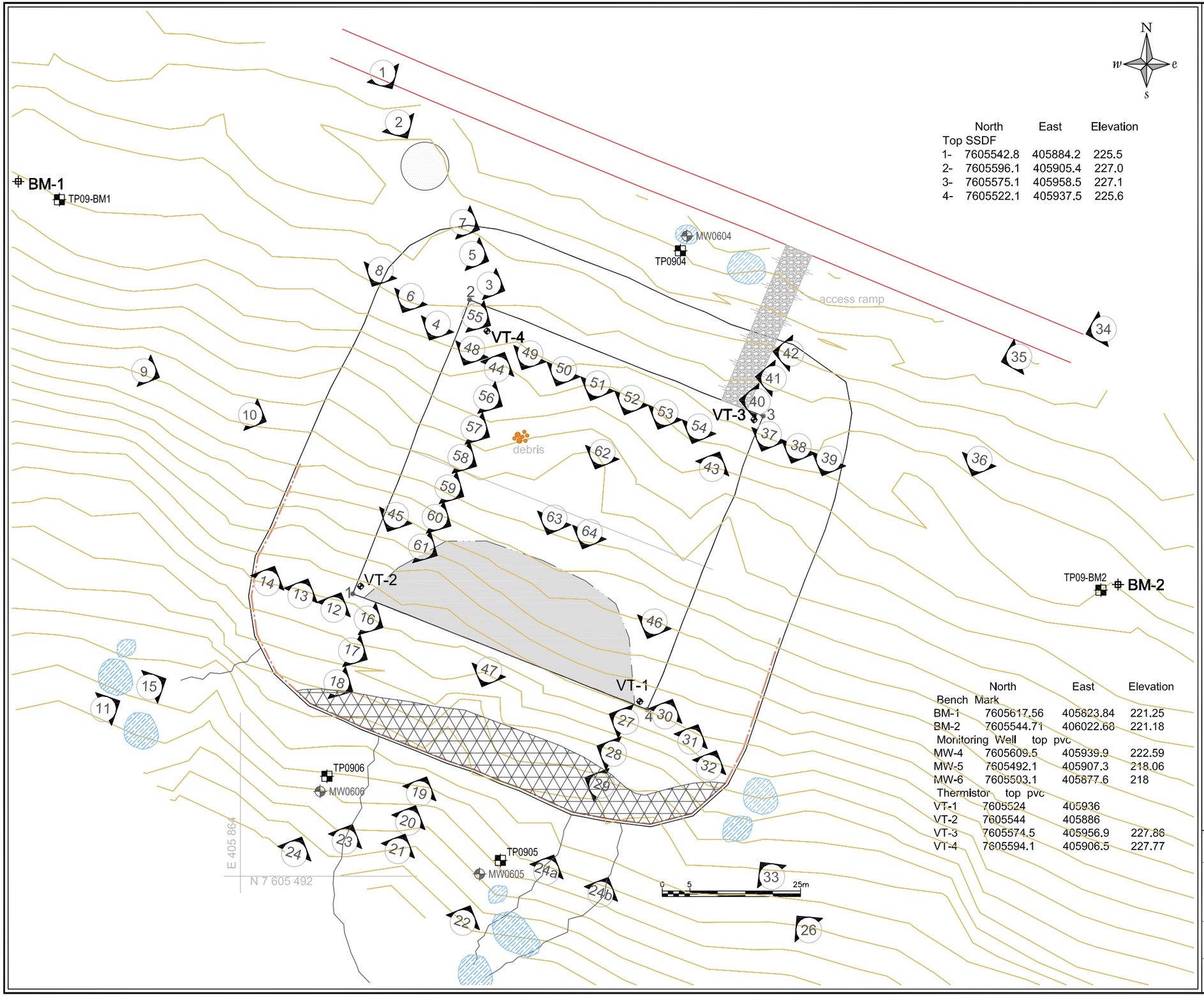
APPENDIX A

Figures



	North	East	Elevation
Top SSDF			
1-	7605542.8	405884.2	225.5
2-	7605596.1	405905.4	227.0
3-	7605575.1	405958.5	227.1
4-	7605522.1	405937.5	225.6

	North	East	Elevation
Bench Mark			
BM-1	7605617.56	405823.84	221.25
BM-2	7605544.71	406022.68	221.18
Monitoring Well top pvc			
MW-4	7605609.5	405939.9	222.59
MW-5	7605492.1	405907.3	218.06
MW-6	7605503.1	405877.6	218
Thermistor top pvc			
VT-1	7605524	405936	
VT-2	7605544	405886	
VT-3	7605574.5	405956.9	227.86
VT-4	7605594.1	405906.5	227.77

LEGEND

- TP — TEST PIT LOCATIONS
- MW — MONITORING WELL LOCATIONS
- BM-2 — BENCH MARK LOCATIONS
- 22 — PICTURE NUMBER VIEWPOINT
- EXPOSED RIPRAP
- PONDING
- EROSION CHANNEL
- SETTLEMENT
- AREA OF DEPRESSION
- VT-4 — VERTICAL THERMISTOR

Viewpoint #	Picture #	Viewpoint #	Picture #
1	P8250220	32	P8240095
2	P8240060	33	P8240096
3	P8240061	34	P8240097
4	P8240062	35	P8240098
5	P8240063	36	P8240099
6	P8240064	37	P8240100
7	P8240065	38	P8240101
8	P8240066	39	P8240102
9	P8240067	40	P8240103
10	P8240068	41	P8240104
11	P8240069	42	P8240105
12	P8240070	43	P8240106
13	P8240071	44	P8240107
14	P8240072	45	P8240108
15	P8240073	46	P8240109
16	P8240074	47	P8240110
17	P8240075	48	P8240111
18	P8240076	49	P8240112
19	P8240077	50	P8240113
20	P8240078	51	P8240114
21	P8240079	52	P8240115
22	P8240080	53	P8240116
23	P8240081	54	P8240117
24	P8240082	55	P8240118
24a	P8240086	56	P8240119
24b	P8240087	57	P8240120
25	---	58	P8240121
26	P8240089	59	P8240122
27	P8240090	60	P8240123
28	P8240091	61	P8240124
29	P8240092	62	P8240125
30	P8240093	63	P8240126
31	P8240094	64	P8240127

NOTE:
PICTURE NUMBERS REFER TO PHOTOGRAPH NAMES AS THEY APPEAR ON THE ATTACHED CD-ROM.

Title: SECURE SOIL DISPOSAL FACILITY

FRANZ ENVIRONMENTAL INC.
♦ CONSULTING ♦ ENGINEERING ♦ TECHNOLOGIES ♦

Project: CAM-F, SARCPA LAKE, NU 1697-0901

Date: NOVEMBER 2009

Client: INDIAN AND NORTHERN AFFAIRS CANADA

SCALE AS SHOWN

FIGURE A-1

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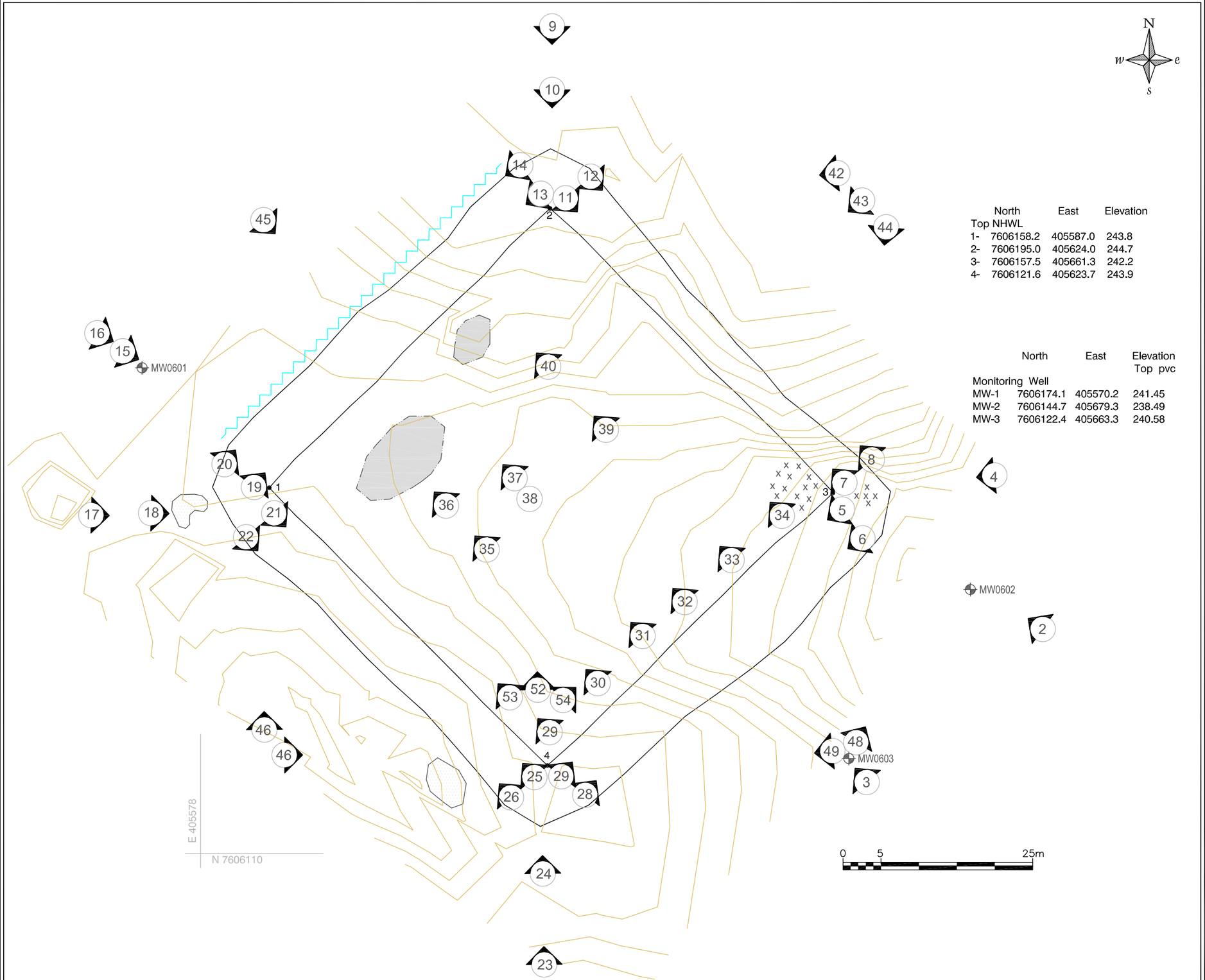

LEGEND

- MW — MONITORING WELL LOCATIONS
- 22 — PICTURE NUMBER VIEWPOINT
- SETTLEMENT
- AREA OF DEPRESSION
- POOR GRADING
- SMALL COLLECTION OF LARGE STONE AT TOE

	North	East	Elevation
Top NHWL			
1-	7606158.2	405587.0	243.8
2-	7606195.0	405624.0	244.7
3-	7606157.5	405661.3	242.2
4-	7606121.6	405623.7	243.9

	North	East	Elevation Top pvc
Monitoring Well			
MW-1	7606174.1	405570.2	241.45
MW-2	7606144.7	405679.3	238.49
MW-3	7606122.4	405663.3	240.58

Viewpoint #	Picture #	Viewpoint #	Picture #
1	---	28	P8250263
2	P8250237	29	P8250264
3	P8250238	30	P8250265
4	P8250239	31	P8250266
5	P8250240	32	P8250267
6	P8250241	33	P8250268
7	P8250242	34	P8250269
8	P8250243	35	P8250270
9	P8250244	36	P8250271
10	P8250245	37	P8250272
11	P8250246	38	P8250273
12	P8250247	39	P8250274
13	P8250248	40	P8250275
14	P8250249	41	---
15	P8250250	42	P8250276
16	P8250251	43	P8250277
17	P8250252	44	P8250278
18	P8250253	45	P8250279
19	P8250254	46	P8250280
20	P8250255	47	P8250281
21	P8250256	48	P8250282
22	P8250257	49	P8250283
23	P8250258	50	---
24	P8250259	51	---
25	P8250260	52	P8250285
26	P8250261	53	P8250286
27	P8250262	54	P8250287

NOTE:
PICTURE NUMBERS REFER TO PHOTOGRAPH NAMES AS THEY APPEAR ON THE ATTACHED CD-ROM.

Title: NON-HAZARDOUS WASTE LANDFILL

FRANZ ENVIRONMENTAL INC.
♦ CONSULTING ♦ ENGINEERING ♦ TECHNOLOGIES ♦

Project: CAM-F SARCPA LAKE, NU 1697-0901

Date: NOVEMBER 2009

Client: INDIAN AND NORTHERN AFFAIRS CANADA

SCALE AS SHOWN

FIGURE A-2

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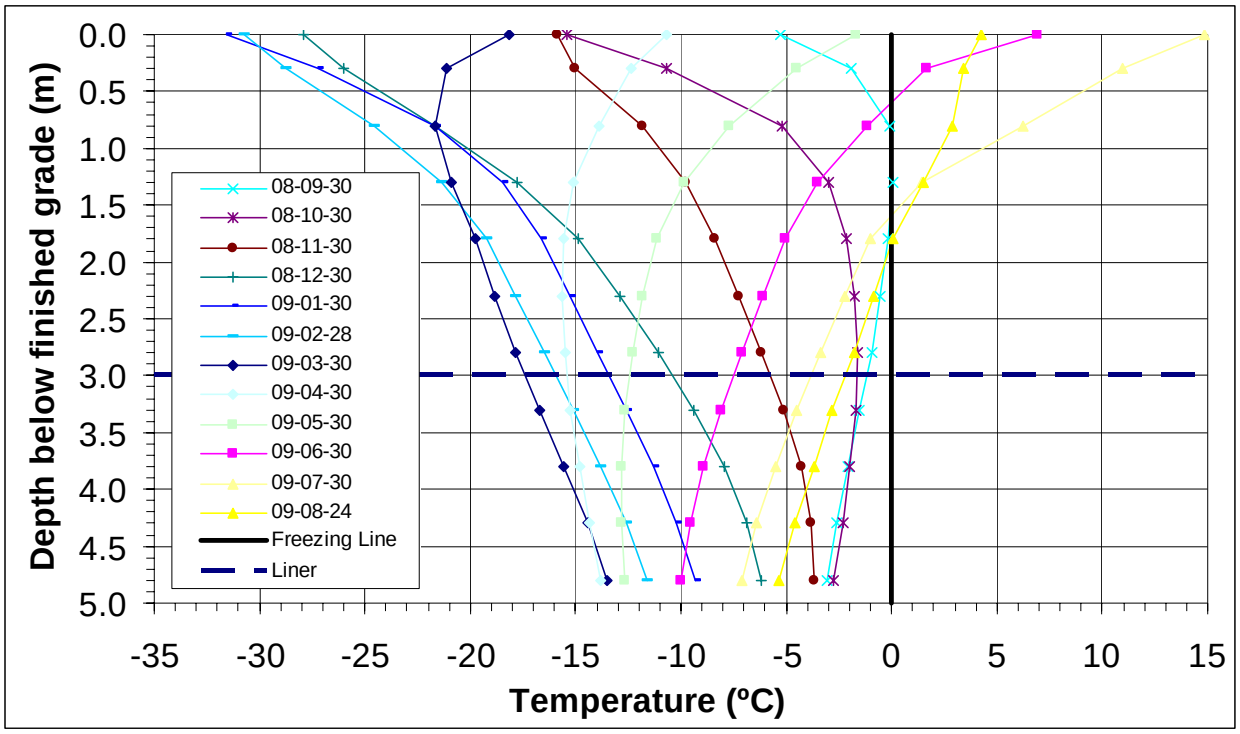


Figure A-3: Thermal monitoring data for thermistor VT01 (September 2008-August 2009).

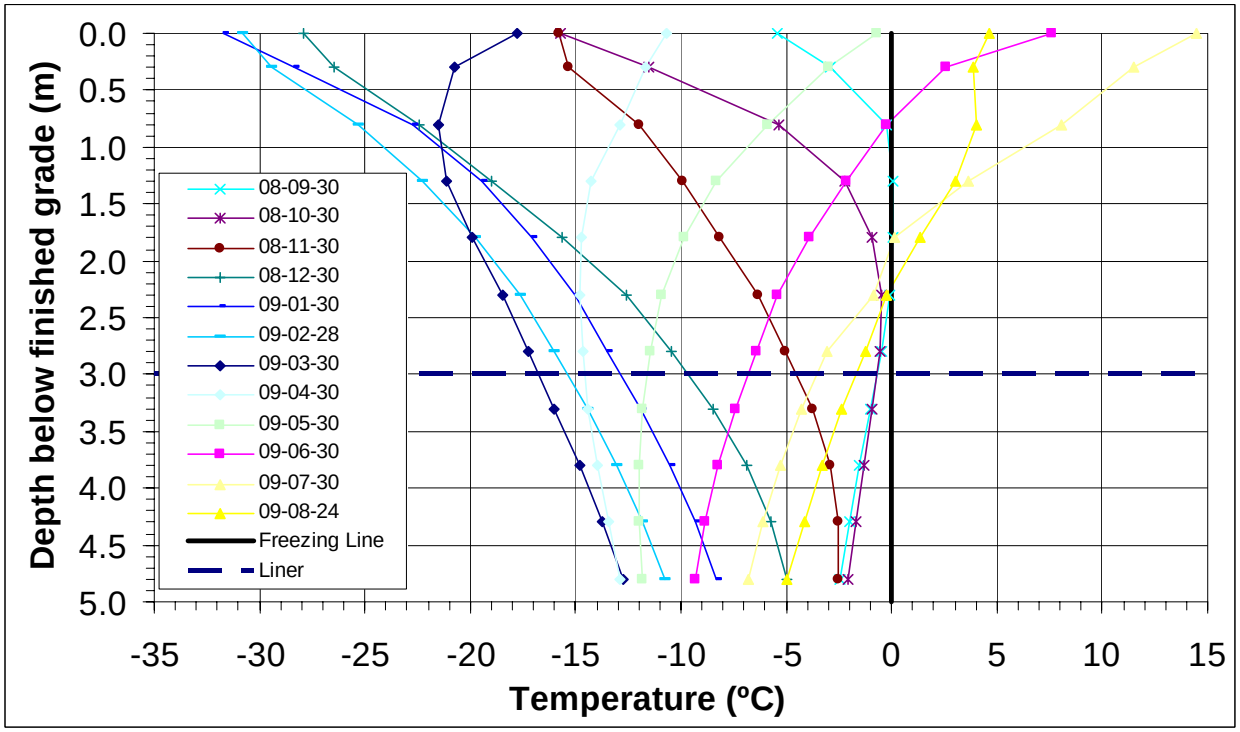


Figure A-4: Thermal monitoring data for thermistor VT02 (September 2008-August 2009).

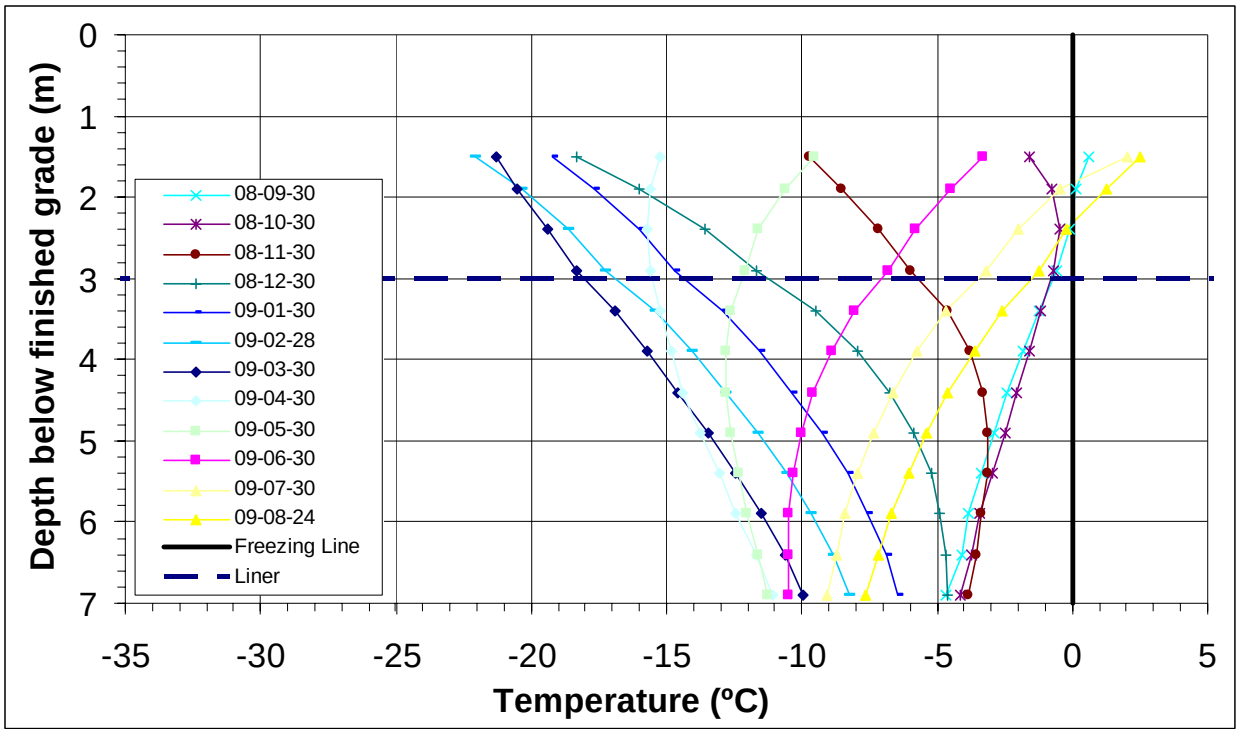
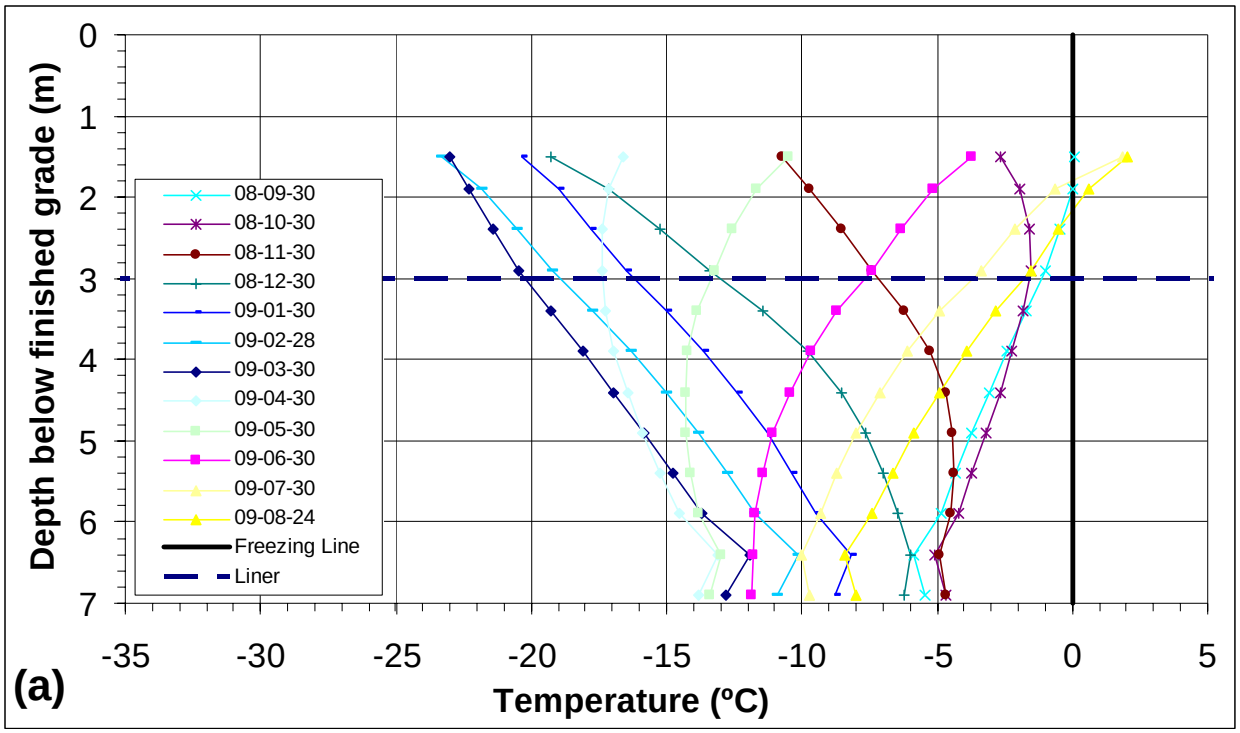


Figure A-5: Thermal monitoring data for thermistor VT03 (September 2008-August 2009).



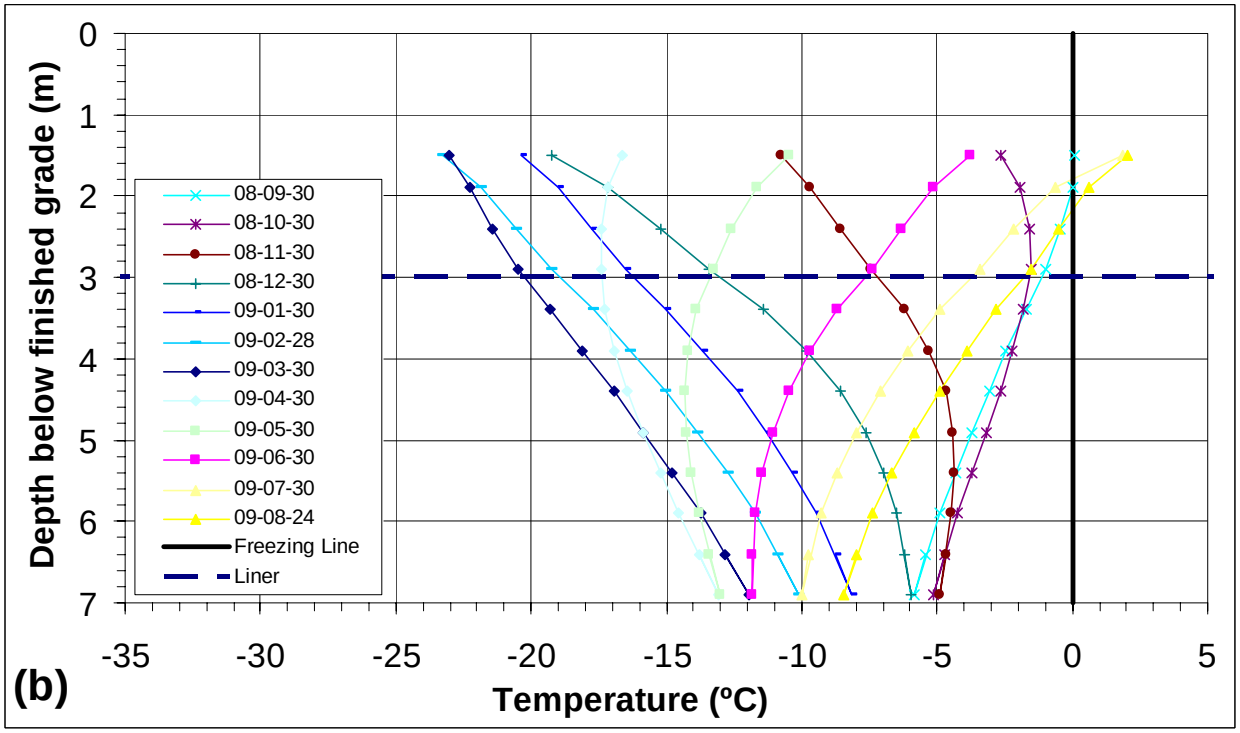


Figure A-6: Thermal monitoring data for thermistor VT04 (September 2008-August 2009). The two graphs are identical except that the data for the bottom two thermistor beads have been interchanged on figure (b).

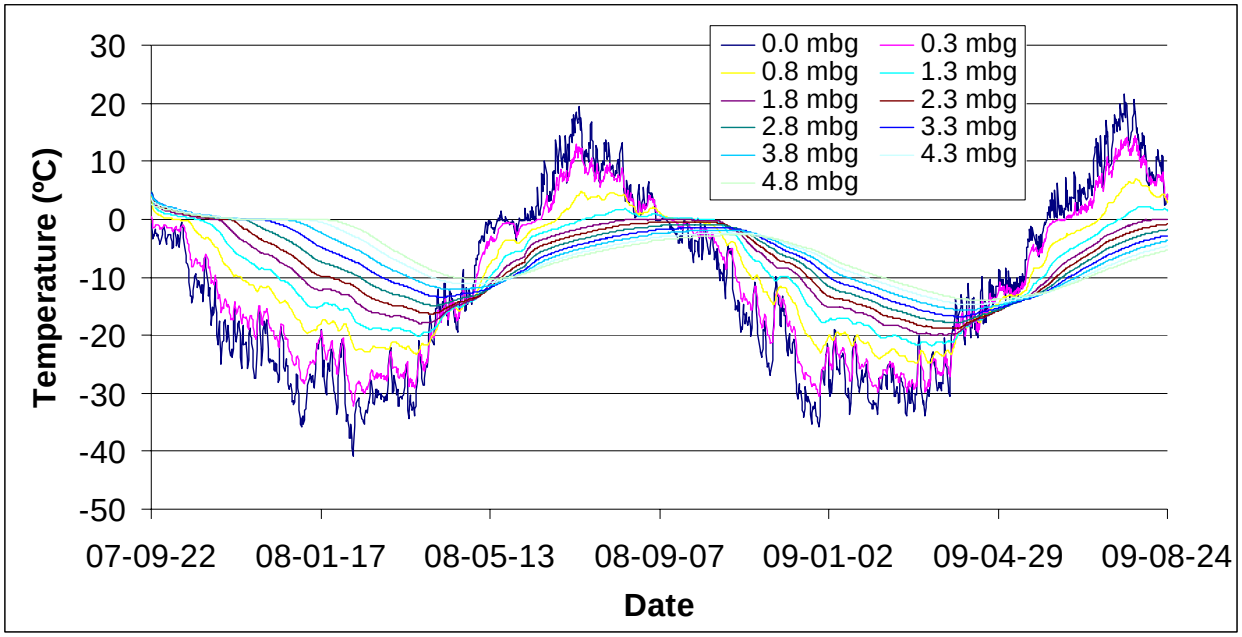


Figure A-7: Example of thermal monitoring data at the Secure Soil Disposal Facility (September 2007-August 2009) for Thermistor VT01

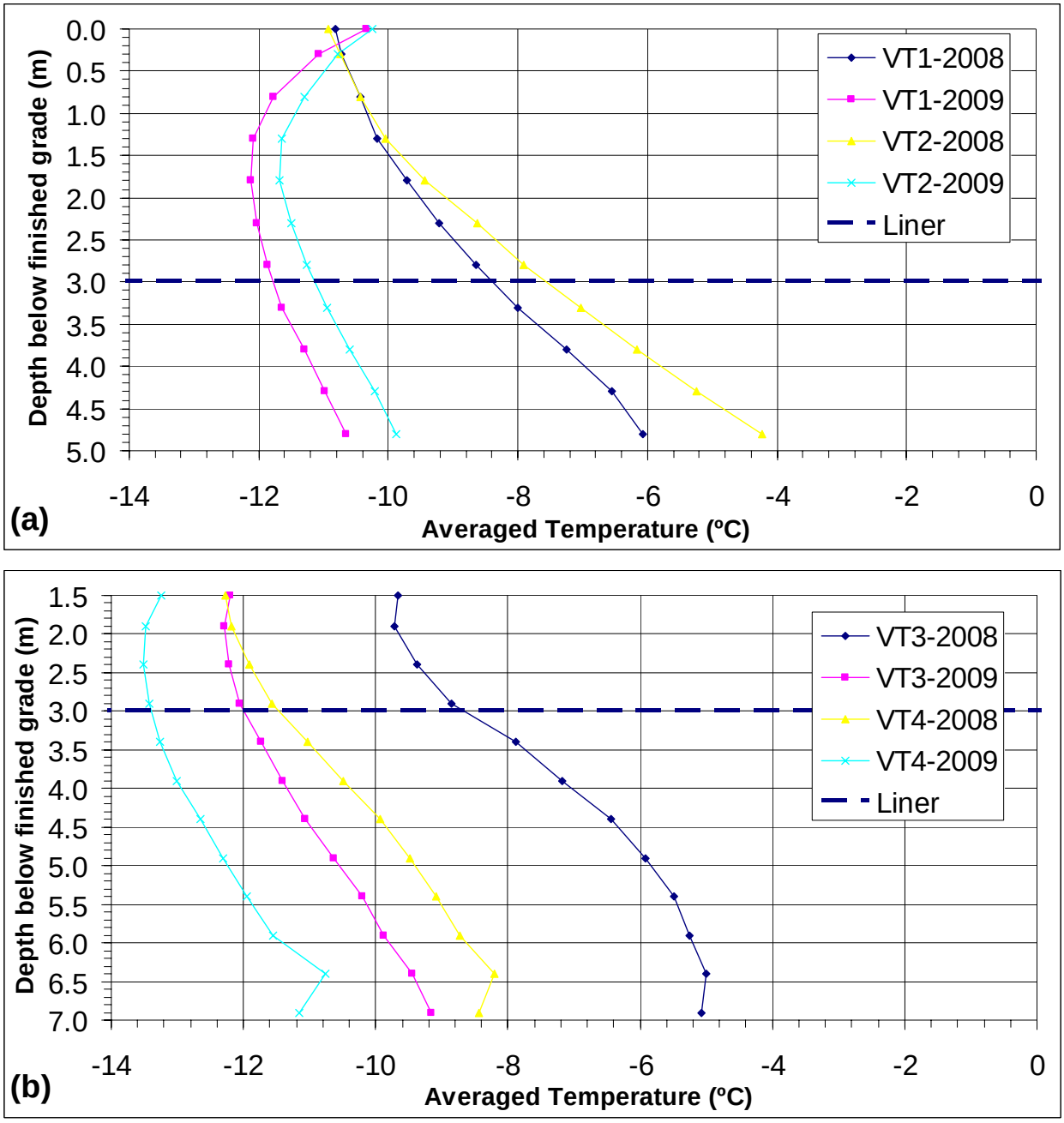


Figure A-8: Vertical profile of temperature (averaged over the period January 1 to August 24, 2009) with increasing depth below the top of the Secure Soil Disposal Facility using thermistor data from (a) 01-VT and 02-VT and (b) 03-VT and 04-VT.

APPENDIX B

Tables

Table B-1
Ground Water Chemical Concentrations - PHCs

PARAMETER	Groundwater Criteria Provincial		RDL					Duplicate Evaluation			
Sample ID	MOE Table 3[1] Non-Potable	MOE Table 2[2] Potable		MW0604-1	MW0605-1	MW0606-1	DUP-01				
Date				2009-08-25	2009-08-25	2009-08-25	2009-08-25	Scenario*	RPD (%)	Value (ug/L)	Acceptable
BTEX & F1 Hydrocarbons (ug/L)											
Benzene	**1900**	5	0.2	<0.2	<0.2	<0.2	<0.2	A	---	---	Y
Toluene	**5900**	24	0.2	<0.2	<0.2	<0.2	<0.2	A	---	---	Y
Ethy benzene	**28000**	2.4	0.2	<0.2	<0.2	<0.2	<0.2	A	---	---	Y
o-Xylene	NC	NC	0.2	<0.2	<0.2	<0.2	<0.2	A	---	---	Y
p+m-Xylene	NC	NC	0.4	<0.4	<0.4	<0.4	<0.4	A	---	---	Y
Total Xylenes	**5600**	300	0.4	<0.4	<0.4	<0.4	<0.4	A	---	---	Y
F1 (C6-C10)	NC	**1000**	100	<100	<100	<100	<100	A	---	---	Y
F1 (C6-C10) - BTEX	NC	**1000**	100	<100	<100	<100	<100	A	---	---	Y
F2-F4 Hydrocarbons (ug/L)											
F2 (C10-C16 Hydrocarbons)	NC	**1000**	100	<100	<100	<100	<100	A	---	---	Y
F3 (C16-C34 Hydrocarbons)	NC	**1000**	100	<100	<100	<100	<100	A	---	---	Y
F4 (C34-C50 Hydrocarbons)	NC	**1000**	100	<100	<100	<100	<100	A	---	---	Y
Reached Baseline at C50	NC	NC		Yes	Yes	Yes	Yes	NC	NC	NC	NC

Notes:

1 = MOE (2004) Ontario Ministry of the Environment, Soil, Ground Water and Sediment Standards,Table 3. Full Depth Generic Site Condition Standards in Non-Potable Ground Water Conditions, coarse-grained soils.

2 = MOE (2004) Ontario Ministry of the Environment, Soil, Ground Water and Sediment Standards,Table 2. Full Depth Generic Site Condition Standards in Potable Ground Water Conditions, coarse-grained soils.

* = See Quality Assurance and Quality Control section for scenario rationale.

NC = No Criteria

RDL= Reportable Detection Limit

20 = Guidelines used.

20 = Denotes exceedance.

Table B-2
Ground Water Chemical Concentrations - Metals

PARAMETER	Groundwater Criteria Provincial	Lowest RDL					Duplicate Evaluation			
Sample ID	MOE [1] Non-Potable		MW0604-1	MW0605-1	MW0606-1	DUP-01				
Date	Groundwater		2009-08-25	2009-08-25	2009-08-25	2009-08-25	Scenario*	RPD (%)	Value (ug/L)	Acceptable
Metals (ug/L)										
Mercury (Hg)	0.12	0.1	<0.1	<0.1	<0.1	<0.1	A	---	---	Y
Dissolved Arsenic (As)	480	1	<1	<1	<1	<1	A	---	---	Y
Total Arsenic (As)	480**	1	<1	<1	1	<1	B	---	0.500	Y
Dissolved Cadmium (Cd)	11	0.1	<0.1	<0.1	<0.1	<0.1	A	---	---	Y
Total Cadmium (Cd)	11**	0.1	<0.1	<0.1	0.1	<0.1	B	---	0.050	Y
Dissolved Chromium (Cr)	2000	5	<5	<5	<5	<5	A	---	---	Y
Total Chromium (Cr)	2000**	5	<5	<5	21	11	D	---	10.000	N
Dissolved Cobalt (Co)	100	0.5	2.1	1.2	0.5	0.6	D	---	0.100	Y
Total Cobalt (Co)	100**	0.5	2.5	1.5	2.3	2.3	D	---	0.000	Y
Dissolved Copper (Cu)	23	1	1	6	3	5	D	---	2.000	N
Total Copper (Cu)	23**	1	7	9	21	12	C	55	---	N
Dissolved Lead (Pb)	32	0.5	<0.5	<0.5	<0.5	<0.5	A	---	---	Y
Total Lead (Pb)	32**	0.5	1.1	<0.5	3.3	2.5	D	---	0.800	N
Dissolved Nickel (Ni)	1600	1	9 (1)	9	5	6	D	---	1.000	N
Total Nickel (Ni)	1600**	1	8 (1)	18	20	13	C	42	---	N
Dissolved Zinc (Zn)	1100	5	24	18	120	170	C	34	---	N
Total Zinc (Zn)	1100**	5	60	9	330	170	C	64	---	N

Notes:

1 = MOE (2004) Ontario Ministry of the Environment, Soil, Ground Water and Sediment Standards,Table 3. Full Depth Generic Site Condition Standards in Non-Potable Ground Water Conditions, coarse-grained soils.

* = See Quality Assurance and Quality Control section for scenario rationale.

** = Total value assumed same as dissolved value.

(1) = Detection Limit was raised due to matrix interferences.

NC = No Criteria

RDL= Reportable Detection Limit

20 = Denotes exceedance.

Table B-3
Ground Water Chemical Concentrations - PCBs

PARAMETER	Groundwater Criteria Provincial	RDL					Duplicate Evaluation			
Sample ID	MOE Table 3[1] Non-Potable		MW0604-1	MW0605-1	MW0606-1	DUP-01				
Date			2009-08-25	2009-08-25	2009-08-25	2009-08-25	Scenario*	RPD (%)	Value (ug/L)	Acceptable
PCBs (ug/L)										
Aroclor 1016	NC	0.05	<0.05	<0 05	<0.05	<0.05	A	---	---	Y
Aroclor 1221	NC	0.05	<0.05	<0 05	<0.05	<0.05	A	---	---	Y
Aroclor 1232	NC	0.05	<0.05	<0 05	<0.05	<0.05	A	---	---	Y
Aroclor 1242	NC	0.05	<0.05	<0 05	<0.05	<0.05	A	---	---	Y
Aroclor 1248	NC	0.05	<0.05	<0 05	<0.05	<0.05	A	---	---	Y
Aroclor 1254	NC	0.05	<0.05	<0 05	<0.05	<0.05	A	---	---	Y
Aroclor 1260	NC	0.05	<0.05	<0 05	<0.05	<0.05	A	---	---	Y
Aroclor 1262	NC	0.05	<0.05	<0 05	<0.05	<0.05	A	---	---	Y
Aroclor 1268	NC	0.05	<0.05	<0 05	<0.05	<0.05	A	---	---	Y
Total PCB	0.2	0.05	<0.05	<0 05	<0.05	<0.05	A	---	---	Y

Notes:

1= MOE (2004) Ontario Ministry of the Environment, Soil, Ground Water and Sediment Standards,Table 3. Full Depth Generic Site Condition Standards in Non-Potable Ground Water Conditions, coarse-grained soils.

* = See Quality Assurance and Quality Control section for scenario rationale.

NC = No Criteria

RDL= Reportable Detection Limit

20 = Denotes exceedance.

Table B-4
Ground Water Chemical Concentrations - Inorganics

PARAMETER		Groundwater Criteria Provincial	Lowest RDL					Duplicate Evaluation			
Sample ID		MOE [1] Non-Potable		MW0604-1	MW0605-1	MW0606-1	DUP-01				
Date		Groundwater		2009-08-25	2009-08-25	2009-08-25	2009-08-25	Scenario*	RPD (%)	Value (ug/L)	Acceptable
Inorganics	**Units**										
Hardness (CaCO3)	mg/L	NC	1	2400	780	880	820	C	7	---	Y
Colour	TCU	NC	2	4	3	3	5	D	---	2.000	N
Conductivity	umho/cm	NC	1	3740	1520	1530	1650	C	8	---	Y
Total Dissolved Solids	mg/L	NC	10	2410	932	1010	936	C	8	---	Y
Fluoride (F-)	mg/L	NC	0.1	0.5	0.6	0.7	0.9	C	25	---	N
Orthophosphate (P)	mg/L	NC	0.01	<0.01	<0.01	<0.01	<0.01	A	---	---	Y
pH	pH	6.5 - 8.5[a]	NC	7.8	7.8	8.1	7.9	C	2	---	Y
Total Suspended Solids	mg/L	NC	10	31	530	320	360	C	12	---	Y
Dissolved Sulphate (SO4)	mg/L	NC	5	2300	610	650	800	C	21	---	N
Dissolved Chloride (Cl)	mg/L	2300[b]	1	76	49	38	37	C	3	---	Y
Nitrite (N)	mg/L	2	0.01	0.02	<0.01	<0.01	<0.01	A	---	---	Y
Nitrate (N)	mg/L	NC	0.1	<0.1	0.2	0.2	0.1	D	---	0.100	N
Nitrate + Nitrite	mg/L	NC	0.1	0.1	0.2	0.2	0.1	D	---	0.100	N

Notes:

1 = MOE (2004) Ontario Ministry of the Environment, Soil, Ground Water and Sediment Standards,Table 3. Full Depth Generic Site Condition Standards in Non-Potable Ground Water Conditions, coarse-grained soils.

a = Canadian Council of Ministers of the Environment, Guidelines for Canadian Water Quality Summary Table (Table 4), 2006 Update; aesthetic objective only.

b = MOE (2008, unofficial release) Ontario Ministry of the Environment, Soil, Ground Water and Sediment Standards,Table 3. Full Depth Generic Site Condition Standards in Non-Potable Ground Water Conditions, coarse-grained soils.

* = See Quality Assurance and Quality Control section for scenario rationale.

NC = No Criteria

RDL= Reportable Detection Limit

20 = Denotes exceedance.

PARAMETER																					
Sample ID	Federal		RDL	TP0904-1	TP0904-2	TP0905-1	TP0905-2	DUP-02	Duplicate Evaluation				TP0906-01	DUP-01	Duplicate Evaluation				TP0906-02	TP-BM1-01	TP-BM1-02	TP-BM2-01	TP-BM2-02
Date	CCME [1] Residential/ Parkland	CWS for PHC in Soil (<1.5m)[2]		2009-08-25	2009-08-25	2009-08-25	2009-08-25	2009-08-25	Scenario*	RPD (%)	Value (ug/g)	Acceptable	2009-08-24	2009-08-24	Scenario*	RPD (%)	Value (ug/g)	Acceptable	2009-08-24	2009-08-25	2009-08-25	2009-08-25	2009-08-25
Depth (m)				0 to 0.1	0.4 to 0.5	0 to 0.1	0.4 to 0.5	0.4 to 0.5					0 to 0.1	0 to 0.1					0.4 to 0.5	0 to 0.1	0.4 to 0.5	0 to 0.1	0.4 to 0.5
BTEX & F1 Hydrocarbons (ug/g)																							
Benzene	**31**	NC	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	A	---	---	Y	<0.02	<0.02	A	---	---	Y	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	**75**	NC	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	A	---	---	Y	<0.02	<0.02	A	---	---	Y	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	**55**	NC	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	A	---	---	Y	<0.02	<0.02	A	---	---	Y	<0.02	<0.02	<0.02	<0.02	<0.02
o-Xylene	NC	NC	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	A	---	---	Y	<0.02	<0.02	A	---	---	Y	<0.02	<0.02	<0.02	<0.02	<0.02
p+m-Xylene	NC	NC	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	A	---	---	Y	<0.04	<0.04	A	---	---	Y	<0.04	<0.04	<0.04	<0.04	<0.04
Total Xylenes	**95**	NC	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	A	---	---	Y	<0.04	<0.04	A	---	---	Y	<0.04	<0.04	<0.04	<0.04	<0.04
F1 (C6-C10)	NC	NC	10	<10	<10	<10	<10	<10	A	---	---	Y	<10	<10	A	---	---	Y	<10	<10	<10	<10	<10
F1 (C6-C10) - BTEX	NC	**30** (210)	10	<10	<10	<10	<10	<10	A	---	---	Y	<10	<10	A	---	---	Y	<10	<10	<10	<10	<10
F2-F4 Hydrocarbons (ug/g)																							
F2 (C10-C16 Hydrocarbons)	NC	**150** (150)	10	<10	<10	<10	<10	<10	A	---	---	Y	<10	<10	A	---	---	Y	<10	<10	<10	<10	<10
F3 (C16-C34 Hydrocarbons)	NC	**300** (300)	10	21	<10	13	<10	<10	A	---	---	Y	<10	<10	A	---	---	Y	<10	25	<10	<10	<10
F4 (C34-C50 Hydrocarbons)	NC	**2800** (2800)	10	<10	<10	<10	<10	<10	A	---	---	Y	<10	<10	A	---	---	Y	<10	<10	<10	<10	<10
Reached Baseline at C50	N/A	N/A	N/A	Yes	Yes	Yes	Yes	Yes	NC	NC	NC	NC	Yes	Yes	NC	NC	NC	NC	Yes	Yes	Yes	Yes	Yes

Notes:

1 = CCME (2007), Canadian Soil Quality Guidelines, Update 7.0, Table 2. Canadian Soil Quality Guidelines, Residential / Parkland Use, coarse-grained soils.

2 = CCME (2008) Canadian-Wide Standards for Petroleum Hydrocarbons in Soil - Table 1, Tier 1 levels for PHCs, Residential / Parkland Use in coarse-grained surface soils. (Brackets) Protection of Eco Soil Contact from Table 1 - Technical Supplement.

*= See Quality Assurance and Quality Control section for scenario rationale.

N/A = Not applicable

NC = No Criteria

RDL= Reportable Detection Limit

20 = Guidelines used.

20 = Denotes exceedances.

Table B-6
Soil Chemical Concentrations - Metals

PARAMETER	Federal									Duplicate Evaluation							Duplicate Evaluation									
Sample ID	**CCME[1] Residential/ Parkland**	**CCME[2] Human Health Ingestion (H) / Eco Soil Contact (E)**	**INAC DEW Line Cleanup Criteria, Tier II**	**RDL**	**TP0904-1**	**TP0904-2**	**TP0905-1**	**TP0905-2**	**DUP-02**					**TP0906-01**	**DUP-01**					**TP0906-02**	**TP-BM1-01**	**TP-BM1-02**	**TP-BM2-01**	**TP-BM2-02**
Date					2009-08-25	2009-08-25	2009-08-25	2009-08-25	2009-08-25	Scenario*	RPD (%)	Value (ug/g)	Acceptable	2009-08-24	2009-08-24	Scenario*	RPD (%)	Value (ug/g)	Acceptable	2009-08-24	2009-08-25	2009-08-25	2009-08-25	2009-08-25
Depth (m)					0 to 0.1	0.4 to 0.5	0 to 0.1	0.4 to 0.5	0.4 to 0.5					0 to 0.1	0 to 0.1					0.4 to 0.5	0 to 0.1	0.4 to 0.5	0 to 0.1	0.4 to 0.5
Metals (ug/g)																								
Arsenic (As)	**12**	12H 17E	30	1	<1	<1	<1	<1	<1	A	---	---	Y	<1	<1	A	---	---	Y	<1	<1	<1	<1	<1
Cadmium (Cd)	10	NC	**5**	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	A	---	---	Y	<0.1	<0.1	A	---	---	Y	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium (Cr)	**64**	220H 64E	250	1	21	31	27	29	28	C	4	---	Y	25	27	C	8	---	Y	28	26	33	26	31
Cobalt (Co)	50**	NC	**50**	0.1	5.6	8.1	6.8	7.3	7.2	C	1	---	Y	6.7	6.7	C	0	---	Y	7.3	6.8	7.6	6.9	7.4
Copper (Cu)	**63**	1100H 63E	100	0.5	15	19	19	19	19	C	0	---	Y	35	17	C	69	---	N	19	20	19	16	20
Lead (Pb)	**140**	140H 300E	500	1	7	7	8	7	7	C	0	---	Y	6	7	C	15	---	Y	7	7	7	6	7
Nickel (Ni)	**50****	50E	100	0.5	15	20	19	19	19	C	0	---	Y	18	18	C	0	---	Y	19	19	22	17	20
Zinc (Zn)	**200**	200E	500	5	35	43	44	40	40	C	0	---	Y	40	40	C	0	---	Y	40	46	41	38	43
Mercury (Hg)	6.6	6.6H 12E	**2**	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	A	---	---	Y	<0.05	<0.05	A	---	---	Y	<0 05	<0.05	<0.05	<0.05	<0.05
Physical Properties																								
Moisture (%)	NC	NC	NC	0.2	11	8.8	19	9.4	9.1	C	3	---	Y	9.1	3.8	C	82	---	N	9.3	18	7.4	12	8.3

Notes:

1 = CCME (2007), Canadian Soil Quality Guidelines, Update 7.0, Table 1. Canadian Soil Quality Guidelines, Residential / Parkland Use, coarse-grained soils.

2 = CCME (2007), Canadian Soil Quality Guidelines, Update 7.0, Table 2. Human health soil ingestion and Eco Soil Contact.

* = See Quality Assurance and Quality Control section for scenario rationale.

** = CCME (2007), Canadian Soil Quality Guidelines, Update 7.0, Table 2. Interim remediation criteria for soil that have not yet been replaced by canadian soil quality guidelines.

N/A = Not applicable

NC = No Criteria

RDL= Reportable Detection Limit

20 = Guidelines used.

20 = Denotes exceedances for Residential/Parkland landuse.

PARAMETER		RDL																			
Sample ID	**Federal**		**TP0904-1**	**TP0904-2**	**TP0905-1**	**TP0905-2**	**DUP-02**	**Duplicate Evaluation**				**TP0906-01**	**DUP-01**	**Duplicate Evaluation**				**TP0906-02**	**TP-BM1-01**	**TP-BM1-02**	**TP-BM2-01**	**TP-BM2-02**
Date	**CCME[1] Residential/ Parkland**		2009-08-25	2009-08-25	2009-08-25	2009-08-25	2009-08-25	Scenario*	RPD (%)	Value (ug/g)	Acceptable	2009-08-24	2009-08-24	Scenario*	RPD (%)	Value (ug/g)	Acceptable	2009-08-24	2009-08-25	2009-08-25	2009-08-25	2009-08-25
Depth (m)			0 to 0.1	0.4 to 0.5	0 to 0.1	0.4 to 0.5	0.4 to 0.5					0 to 0.1	0 to 0.1					0.4 to 0.5	0 to 0.1	0.4 to 0.5	0 to 0.1	0.4 to 0.5
Polychlorinated Biphenyls (ug/g)																						
Aroclor 1262	NC	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor 1016	NC	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor 1221	NC	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor 1232	NC	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor 1242	NC	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor 1248	NC	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor 1254	NC	0.01	0.05	<0.01	<0.01	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor 1260	NC	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor 1268	NC	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	<0.01	<0.01	<0.01
Total PCB	1.3	0.01	0.05	<0.01	<0.01	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	A	---	---	Y	<0.01	<0.01	<0.01	<0.01	<0.01

Notes:

1 = CCME (2007), Canadian Soil Quality Guidelines, Update 7.0, Table 1. Canadian Soil Quality Guidelines, Residential / Parkland Use, coarse-grained soils.

*= See Quality Assurance and Quality Control section for scenario rationale.

NC = No Criteria

RDL= Reportable Detection Limit

20 = Denotes exceedances.

Table B-8
Ground water chemical concentrations – 2006 to 2009 (PHCs, PCBs, Inorganics)

Sample #	Location	Date	PCBs [ug/L]	TPH Identity				Conductivity [µmho/cm]	pH	Colour
				F1 [ug/L]	F2 [ug/L]	F3 [ug/L]	F4 [ug/L]			
Upgradient Groundwater Samples										
MW06-04	MW06-04	2006	<0.05					3110	7.9	
MW06-04	MW06-04	2008	<0.01	<100	<100	<100	<100	630	8.2	>70
MW0604-1	MW06-04	2009	<0.05	<100	<100	<100	<100	3740	7.8	4
Downgradient Groundwater Samples										
MW06-05	MW06-05	2006	<0.05					847	7.8	
MW06-05	MW06-05	2007	<0.10	<25000	<100	<100	<100			
MW06-05	MW06-05	2008	<0.01	<100	<100	<100	<100	1010	8.1	60
MW06-07	MW06-05	2008	<0.01	<100	<100	<100	<100	1000	8.1	60
MW0605-1	MW06-05	2009	<0.05	<100	<100	<100	<100	1520	7.8	3
MW06-06	MW06-06	2006	<0.05					2260	8.1	
MW06-06	MW06-06	2007	<0.10	<25000	<100	<100	<100			
MW06-06	MW06-06	2008	<0.01	200	200	200	200	1060	8.0	>70
MW0606-1	MW06-06	2009	<0.05	<100	<100	<100	<100	1530	8.1	3
DUP-01	MW06-06	2009	<0.05	<100	<100	<100	<100	1650	7.9	5
Statistics										
N Value			13	10	10	10	10	11	11.0	8
Average			<0.1	5644	111	111	111	1736	8.0	31
Minimum			<0.01	100	100	100	100	630	7.8	3
Maximum			<0.1	25000	200	200	200	3740	8.2	70

Sample duplicates underlined (primary sample listed above duplicate)

Table B-9
Ground water chemical concentrations – 2006 to 2009 (Metals)

Sample #	Location	Date	Cu [ug/l]	Diss. Cu [ug/l]	Ni [ug/l]	Diss. Ni [ug/l]	Co [ug/l]	Diss. Co [ug/l]	Cd [ug/l]	Diss. Cd [ug/l]	Pb [ug/l]	Diss. Pb [ug/l]	Zn [ug/l]	Diss. Zn [ug/l]	Cr [ug/l]	Diss. Cr [ug/l]	As [ug/l]	Diss. As [ug/l]	Hg [ug/l]	Diss. Hg [ug/l]
Upgradient Groundwater Samples																				
MW06-04	MW06-04	2006		2		4		1		<0.1		<0.5		<5		<5		<1		
MW06-04	MW06-04	2008	32	8	40	<3	3	1	0.163	<0.025	3710	<1	234	50	19	<1	1	<1	<0.025	<0.025
MW0604-1	MW06-04	2009	7	1	8	9	2.5	2.1	<0.1	<0.1	1.1	<0.5	60	24	<5	<5	<1	<1		<0.1
Downgradient Groundwater Samples																				
MW06-05	MW06-05	2006		8		15		1.7		0.1		<0.5		47		<5		1		
MW06-05	MW06-05	2007	6		9		2		<1		1		30		6		<1			
MW06-05	MW06-05	2008	12	12	20	6	3	2	0.261	<0.025	807	<1	43	347	11	<1	2	<1	<0.025	<0.025
MW06-07_	MW06-05	2008	16	10	20	6	2	2	0.307	<0.025	1100	<1	63	40	16	<1	2	<1	<0.025	<0.025
MW0605-1	MW06-05	2009	9	6	18	9	1.5	1.2	<0.1	<0.1	<0.5	<0.5	9	18	<5	<5	<1	<1		<0.1
MW06-06	MW06-06	2006		4		3		<0.5		<0.1		<0.5		9		<5		<1		
MW06-06	MW06-06	2007	13		22		2		<1		1		170		25		<1			
MW06-06	MW06-06	2008	46	13	30	8	6	1	0.453	<0.025	7390	<1	6210	6650	97	<1	2	<1	<0.025	<0.025
MW0606-1	MW06-06	2009	21	3	20	5	2.3	0.5	0.1	<0.1	3.3	<0.5	330	120	21	<5	1	<1		<0.1
DUP-01	MW06-06	2009	12	5	13	6	2.3	0.6	<0.1	<0.1	2.5	<0.5	170	170	11	<5	<1	<1		<0.1
Statistics																				
N Value			10	11	10	11	10	11	10	11	10	11	10	11	10	11	10	11	4	8
Average			18	6	20	7	3	1.2	0.364	0.078	1324	<1	806	744	22	<5	1	1	<0.025	<0.1
Minimum			6	1	8	3	1.5	0.5	0.100	0.025	0.5	<0.5	9	5	5	<1	1	1	<0.025	<0.025
Maximum			46	13	40	15	6	2.1	1.000	0.100	7390	<1	6210	6650	97	<5	2	1	<0.025	<0.1

Sample duplicates underlined (primary sample listed above duplicate)

Table B-10
Soil chemical concentrations – 2006 to 2009

Sample #	Location	Date	Depth (cm)	Cu [ug/g]	Ni [ug/g]	Co [ug/g]	Cd [ug/g]	Pb [ug/g]	Zn [ug/g]	Cr [ug/g]	As [ug/g]	Hg [ug/g]	PCBs [ug/g]	TPH Identity [ug/g]			
														F1	F2	F3	F4
Upgradient Groundwater Samples																	
MW06-04	MW06-04	2006		20	20	7.4	<0.3	6	42	30	1	<0.05	<0.01	<10	<10	11	<10
952	MW06-04	2007	0	10	12	4	<0.9	<10	28	17	<0.7		<0.1	<10	<20	<20	<20
953	MW06-04	2007	30	12	13	4	<0.9	<10	29	18	<0.7		<0.1	<10	<20	<20	<20
MW06-04	MW06-04	2008	0	16	19	6.4	0.5	9	39	29	0.8	<0.5	<0.005	<10	<10	<10	<10
MW06-04	MW06-04	2008	30	16	17	6	<0.5	13	38	27	0.7	<0.5	<0.005	<10	<10	<10	<10
TP0904-1	MW06-04	2009	0 to 10	15	15	5.6	<0.1	7	35	21	<1	<0.05	0.05	10	10	10	10
TP0904-2	MW06-04	2009	40 to 50	19	20	8.1	<0.1	7	43	31	<1	<0.05	<0.01	<10	<10	21	<10
TP-BM1-01	BM1	2009	0 to 10	20	19	6.8	<0.1	7	46	26	<1	<0.05	<0.01	<10	<10	25	<10
TP-BM1-02	BM1	2009	40 to 50	19	22	7.6	<0.1	7	41	33	<1	<0.05	<0.01	<10	<10	<10	<10
TP-BM2-01	BM2	2009	0 to 10	16	17	6.9	<0.1	6	38	26	<1	<0.05	<0.01	<10	<10	<10	<10
TP-BM2-02	BM2	2009	40 to 50	20	20	7.4	<0.1	7	43	31	<1	<0.05	<0.01	<10	<10	<10	<10
Downgradient Groundwater Samples																	
MW06-05	MW06-05	2006		23	20	7.6	<0.3	7	41	28	1	<0.05	<0.01	<10	<10	<10	<10
949	MW06-05	2007	0	12	13	4	<0.9	<10	33	19	<0.7		<0.1	<10	<20	<20	<20
950	MW06-05	2007	30	11	12	4	<0.9	<10	29	17	<0.7		<0.1	<10	<20	<20	<20
951	MW06-05	2007	30	13	13	4	<0.9	<10	31	18	<0.7		<0.1	<10	<20	<20	<20
MW06-05	MW06-05	2008	0	14	16	6	<0.5	9	41	26	0.6	<0.5	<0.005	<10	<10	61	22
MW06-07	MW06-05	2008	0	15	16	5.5	<0.5	8	37	25	0.6	<0.5	<0.005	<10	<10	18	<10
MW06-05	MW06-05	2008	30	17	14	5.2	<0.5	8	36	24	0.6	<0.5	<0.005	<10	<10	72	61
MW06-07	MW06-05	2008	30	15	15	5.2	<0.5	8	34	24	0.5	<0.5	<0.005	<10	<10	58	42
TP0905-1	MW06-05	2009	0 to 10	19	19	6.8	<0.1	8	44	27	<1	<0.05	<0.01	<10	<10	13	<10
TP0905-2	MW06-05	2009	40 to 50	19	19	7.3	<0.1	7	40	29	<1	<0.05	<0.01	<10	<10	<10	<10
DUP-02	MW06-05	2009	40 to 50	19	19	7.2	<0.1	7	40	28	<1	<0.05	<0.01	<10	<10	<10	<10
MW06-06	MW06-06	2006		18	20	8	<0.3	6	42	30	1	<0.05	<0.01	<10	<10	<10	<10
947	MW06-06	2007	0	9	11	4	<0.9	<10	29	17	<0.7		<0.1	<10	<20	<20	<20
948	MW06-06	2007	30	14	14	5	<0.9	<10	33	19	<0.7		<0.1	<10	<20	<20	<20
MW06-06	MW06-06	2008	0	17	20	6.8	<0.5	10	42	30	0.8	<0.5	<0.005	<10	<10	<10	<10
MW06-06	MW06-06	2008	30	26	19	6.4	0.5	9	38	29	0.8	<0.5	<0.005	<10	<10	<10	<10
TP0906-01	MW06-06	2009	0 to 10	35	18	6.7	<0.1	6	40	25	<1	<0.05	<0.01	<10	<10	<10	<10
DUP-01	MW06-06	2009	0 to 10	17	18	6.7	<0.1	7	40	27	<1	<0.05	<0.01	<10	<10	<10	<10
TP0906-02	MW06-06	2009	40 to 50	19	19	7.3	<0.1	7	40	28	<1	<0.05	<0.01	<10	<10	<10	<10
Statistics																	
	N Value			30	30	30	30	30	30	30	30	23	30	30	30	30	30
	Average			17	17	6.1	0.4	8	38	25	0.8	<0.5	0	10	12	19	16
	Minimum			9	11	4.0	0.1	6	28	17	0.5	<0.05	0.005	10	10	10	10
	Maximum			35	22	8.1	0.9	13	46	33	1.0	<0.5	0.1	10	20	72	61

Sample duplicates underlined (primary sample listed above duplicate)

Table B-11: Thermistor Annual Maintenance Report

Contractor name: FRANZ Environmental Inc.	**Inspection date:** 2009-09-24
Prepared by: Matthew D. Cyr	

Thermistor Information

Thermistor Number	CAMF 01-VT	CAMF 02-VT	CAMF 03-VT	CAMF 04-VT
Install date	2007-09-21	2007-09-23	2007-09-16	2007-09-17
Location	CAM-F (SSDF)	CAM-F (SSDF)	CAM-F (SSDF)	CAM-F (SSDF)
Inclination	Vertical	Vertical	Vertical	Vertical
Cable length (m)	7.8	7.8	8.4	8.4
Cable length (m) above ground	3	3	1.5	1.5
No. of beads	11	11	12	12
Coordinates (m)	N:7605524 E: 405936	N:7605544 E: 405886	N:7605574.5 E: 405956.9	N:7605594.1 E: 405906.5
Serial no.	07060039	05070003	05070006	05070020
Logger model	Lakewood Systems Ultralogger			

Thermistor inspection

Thermistor Number	CAMF 01-VT	CAMF 02-VT	CAMF 03-VT	CAMF 04-VT
Casing	Good condition	Good condition	Good condition	Good condition
Cover	Good condition	Good condition	Good condition	Good condition
Data logger	Good condition	Good condition	Good condition	Good condition
Cable	Good condition	Good condition	Good condition	Good condition
Beads	Operational	Operational	Operational	Operational
Battery installation date	2008-08-30	2008-08-30	2008-08-30	2008-08-30
Main battery (V)	11.34	11.34	11.34	11.34
Aux battery (V)	13.26	13.50	12.90	13.02

Observations and proposed maintenance

- New locks were installed on all four thermistor casings: Guard, 40 mm universal-key padlocks, No. 834 (key number 102).
- Data logger clocks reset/synchronized (due to drift): 01-VT was reset 24 min ahead; 02-VT was reset 30 min ahead; 03-VT was reset 60 min ahead; and 04-VT was reset 26 min ahead.
- Lakewood recommends replacing logger batteries every three years (although they may last up to five years, at voltages as low as 10 V). It is therefore recommended that batteries be replaced next year.
- Lakewood has also suggested that thermistor 02-VT logger might be exchanged for a new one, as a few anomalous readings are not necessarily a battery issue (although until Lakewood can inspect the logger, the cause of the – as yet insignificant – errors cannot be known).
- A Lakewood resistance meter and switchbox may be employed to compare manual and auto readings. If it is found that readings differ, however, only a new string or factory recalibration will suffice.
- Additional diagnostic and repair equipment may also be brought to the site (e.g. multimeter, soldering kit, shrink wrap, etc) although necessary repair is highly unlikely and will be useless if affected on areas around the thermistor beads (since repairs may alter string resistance, necessitating factory recalibration).

APPENDIX C

Test Pit Logs

Date: 25-Aug-09 Loggeg by: AH/MC Me hod: Shovel and trowel Location: CAM-F DEW Line, NU Work area: SSDF, north side, 3.2 m sou h of MW06-04	**Sample ID: TP0904**	OVM (ppm)	Analysis*
Depth (m)	Description		
0 0-0 3	Grey/brown clay and rock; imported material. Very wet. Brown silty material scattered.	< 30	PHC, PCB, metals
0 3-0 5	Grey/brown silty clay; slightly less rocky. Very wet. Brown silty material scattered.	< 30	PHC, PCB, metals
	EOH @ 0.5 m		

Date: 25-Aug-09 Loggeg by: AH/MC Me hod: Shovel and trowel Location: CAM-F DEW Line, NU Work area: SSDF, south side, 3.0 m nor heast of MW06-05	**Sample ID: TP0905**	OVM (ppm)	Analysis*
Depth (m)	Description		
0.0-0.15	Grey/brown silty clay with trace rich organic matter, including roots. Moist.	< 30	PHC, PCB, metals
0.15-0.5	Grey/brown clay with some rocks but fewer near bottom. Moist	< 30	PHC, PCB, metals
	EOH @ 0.6 m		

Date: 24-Aug-09 Loggeg by: AH/MC Me hod: Shovel and trowel Location: CAM-F DEW Line, NU Work area: SSDF, south side, 3.2 m nor h of MW06-06	**Sample ID: TP0906**	OVM (ppm)	Analysis*
Depth (m)	Description		
0.0-0.35	Brown silt with lots of rock. Dense, moist.	< 30	PHC, PCB, metals
0.35-0.5	Silty clay with fewer rocks. Dense, moist	< 30	PHC, PCB, metals
	EOH @ 0.5 m		

Date: 25-Aug-09 Loggeg by: AH/MC Me hod: Shovel and trowel Location: CAM-F DEW Line, NU Work area: 2.9 m east of BM1, on west side of SSDF.	**Sample ID: TP-BM1**	OVM (ppm)	Analysis*
Depth (m)	Description		
0 0-0.1	Fairly dry grey/brown silt and clay. Very rocky (~50%). No significant stratigraphy of interest. Some roots in first 10 cm.	< 30	PHC, PCB, metals
0.1-0 5	Same as above.	< 30	PHC, PCB, metals
	EOH @ 0.5 m		

Date: 25-Aug-09 Loggeg by: AH/MC Me hod: Shovel and trowel Location: CAM-F DEW Line, NU Work area: 3.0 m west of BM2, on east side of SSDF.	**Sample ID: TP-BM2**	OVM (ppm)	Analysis*
Depth (m)	Description		
0.0-0.15	Moist grey/brown silty clay with some dark brown organics mixed in, including roots. Fairly rocky.	< 30	PHC, PCB, metals
0.15-0.5	Moist grey/brown clay. Farily rocky.	< 30	PHC, PCB, metals
	EOH @ 0.5 m		

Note:
*Two discrete-depth soil samples were collected for laboratory analysis at each test pit, from 0.0 to 0.1 mbgs and 0.4 to 0.5 mbgs.

OVM= Organic Vapour Meter (RKI Eagle) reading as ppm equivalent hexane
EOH= End of hole (testpit depth)

APPENDIX D

Laboratory Reports and Chain of Custody Forms

Your P.O. #: 2049
Your Project #: 1697-0901
Your C.O.C. #: 15887501, 158875-0

Attention: Matthew Cyr
Franz Environmental Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2009/09/30
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A9B3160
Received: 2009/08/28, 18:00

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Chloride by Automated Colourimetry	4	N/A	2009/09/08	CAM SOP-00463	SM 4500 Cl E
Colour	4	N/A	2009/09/08	CAM SOP-00412	APHA 2120
Conductivity	2	N/A	2009/09/04	CAM SOP-00448	SM 2510
Conductivity	2	N/A	2009/09/08	CAM SOP-00448	SM 2510
Petroleum Hydro. CCME F1 & BTEX in Water (1)	4	N/A	2009/09/03	CAM SOP-00315	CCME CWS
Petroleum Hydrocarbons F2-F4 in Water (1)	3	2009/08/31	2009/09/01	CAM SOP-00316	CCME Hydrocarbons
Petroleum Hydrocarbons F2-F4 in Water (1)	1	2009/08/31	2009/09/02	CAM SOP-00316	CCME Hydrocarbons
Fluoride	2	2009/09/04	2009/09/04	CAM SOP-00456	APHA 4500FC
Fluoride	2	2009/09/04	2009/09/08	CAM SOP-00456	APHA 4500FC
Hardness (calculated as CaCO3)	4	N/A	2009/09/05	CAM SOP 0102	SM 2340 B
Mercury	4	2009/09/08	2009/09/08	CAM SOP-00453	EPA 7470
Dissolved Metals by ICPMS	4	N/A	2009/09/05	CAM SOP-00447	EPA 6020
Total Metals Analysis by ICPMS	4	N/A	2009/09/08	CAM SOP-00447	EPA 6020
Nitrate (NO3) and Nitrite (NO2) in Water (2)	4	N/A	2009/09/08	CAM SOP-00440	SM 4500 NO3I/NO2B
Polychlorinated Biphenyl in Water	4	2009/09/01	2009/09/02	CAM SOP-00309	SW846 8082
pH	2	N/A	2009/09/04	CAM SOP-00448	SM 4500H
pH	2	N/A	2009/09/08	CAM SOP-00448	SM 4500H
Orthophosphate	4	N/A	2009/09/09	CAM SOP-00461	SM 4500 P-F
Sulphate by Automated Colourimetry	3	N/A	2009/09/08	CAM SOP-00464	EPA 375.4
Sulphate by Automated Colourimetry	1	N/A	2009/09/09	CAM SOP-00464	EPA 375.4
Total Dissolved Solids	4	N/A	2009/09/03	CAM SOP-00428	APHA 2540C
Total Suspended Solids	4	N/A	2009/09/02	CAM SOP-00428	SM 2540D

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) This test was performed by Maxxam Ottawa
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

../2

Maxxam Job #: A9B3160
Report Date: 2009/09/30

Franz Environmental Inc
Client Project #: 1697-0901

Your P.O. #: 2049

Encryption Key

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

MELISSA MORRISON, Project Manager
Email: Melissa.Morrison@maxxamanalytics.com
Phone# (613) 274-0573

==========

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. SCC and CALA have approved this reporting process and electronic report format.

For Service Group specific validation please refer to the Validation Signature Page

Total cover pages: 2

Maxxam Job #: A9B3160
Report Date: 2009/09/30

Franz Environmental Inc
Client Project #: 1697-0901

Your P.O. #: 2049

O'REG 153 PETROLEUM HYDROCARBONS (WATER)

Maxxam ID		DN8711	DN8712	DN8713	DN8714		
Sampling Date		2009/08/25 13:00	2009/08/25 15:00	2009/08/25 13:30	2009/08/25 10:45		
	Units	**MW0606-1**	**MW0605-1**	**DUP-01**	**MW0604-1**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons							
Benzene	ug/L	<0.2	<0.2	<0.2	<0.2	0.2	1927382
Toluene	ug/L	<0.2	<0.2	<0.2	<0.2	0.2	1927382
Ethylbenzene	ug/L	<0.2	<0.2	<0.2	<0.2	0.2	1927382
o-Xylene	ug/L	<0.2	<0.2	<0.2	<0.2	0.2	1927382
p+m-Xylene	ug/L	<0.4	<0.4	<0.4	<0.4	0.4	1927382
Total Xylenes	ug/L	<0.4	<0.4	<0.4	<0.4	0.4	1927382
F1 (C6-C10)	ug/L	<100	<100	<100	<100	100	1927382
F1 (C6-C10) - BTEX	ug/L	<100	<100	<100	<100	100	1927382
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	100	1924206
F3 (C16-C34 Hydrocarbons)	ug/L	<100	<100	<100	<100	100	1924206
F4 (C34-C50 Hydrocarbons)	ug/L	<100	<100	<100	<100	100	1924206
Reached Baseline at C50	ug/L	YES	YES	YES	YES		1924206
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	95	94	94	97		1927382
4-Bromofluorobenzene	%	115	113	114	114		1927382
D10-Ethylbenzene	%	89	89	84	86		1927382
D4-1,2-Dichloroethane	%	82	81	82	82		1927382
o-Terphenyl	%	80	74	77	86		1924206

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: A9B3160
Report Date: 2009/09/30

Franz Environmental Inc
Client Project #: 1697-0901

Your P.O. #: 2049

RESULTS OF ANALYSES OF WATER

Maxxam ID		DN8711		DN8712		DN8713			DN8714		
Sampling Date		2009/08/25 13:00		2009/08/25 15:00		2009/08/25 13:30			2009/08/25 10:45		
	Units	**MW0606-1**	**QC Batch**	**MW0605-1**	**QC Batch**	**DUP-01**	**RDL**	**QC Batch**	**MW0604-1**	**RDL**	**QC Batch**
Calculated Parameters											
Hardness (CaCO3)	mg/L	880	1923926	780	1923926	820	1	1923926	2400	1	1923926
Inorganics											
Colour	TCU	3	1930391	3	1930391	5	2	1930391	4	2	1930391
Conductivity	umho/cm	1530	1929726	1520	1930283	1650	1	1930283	3740	1	1929726
Total Dissolved Solids	mg/L	1010	1927211	932	1924968	936	10	1924968	2410	10	1924968
Fluoride (F-)	mg/L	0.7	1929731	0.6	1930285	0.9	0.1	1930285	0.5	0.1	1929731
Orthophosphate (P)	mg/L	<0.01	1930180	<0.01	1930180	<0.01	0.01	1930198	<0.01	0.01	1930180
pH	pH	8.1	1929735	7.8	1930284	7.9		1930284	7.8		1929735
Total Suspended Solids	mg/L	320	1926183	530	1926183	360	10	1926183	31	10	1926183
Dissolved Sulphate (SO4)	mg/L	650	1930178	610	1930178	800	5	1930203	2300	10	1930178
Dissolved Chloride (Cl)	mg/L	38	1930175	49	1930175	37	1	1930195	76	1	1930175
Nitrite (N)	mg/L	<0.01	1930117	<0.01	1930095	<0.01	0.01	1930095	0.02	0.01	1930212
Nitrate (N)	mg/L	0.2	1930117	0.2	1930095	0.1	0.1	1930095	<0.1	0.1	1930212
Nitrate + Nitrite	mg/L	0.2	1930117	0.2	1930095	0.1	0.1	1930095	0.1	0.1	1930212

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A9B3160
Report Date: 2009/09/30

Franz Environmental Inc
Client Project #: 1697-0901

Your P.O. #: 2049

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		DN8711		DN8712		DN8713		DN8714		
Sampling Date		2009/08/25 13:00		2009/08/25 15:00		2009/08/25 13:30		2009/08/25 10:45		
	Units	**MW0606-1**	**QC Batch**	**MW0605-1**	**QC Batch**	**DUP-01**	**RDL**	**MW0604-1**	**RDL**	**QC Batch**
Metals										
Mercury (Hg)	ug/L	<0.1	1931246	<0.1	1931246	<0.1	0.1	<0.1	0.1	1931246
Dissolved Arsenic (As)	ug/L	<1	1929946	<1	1929946	<1	1	<1	1	1929946
Total Arsenic (As)	ug/L	1	1931768	<1	1931307	<1	1	<1	1	1931768
Dissolved Cadmium (Cd)	ug/L	<0.1	1929946	<0.1	1929946	<0.1	0.1	<0.1	0.1	1929946
Total Cadmium (Cd)	ug/L	0.1	1931768	<0.1	1931307	<0.1	0.1	<0.1	0.1	1931768
Dissolved Chromium (Cr)	ug/L	<5	1929946	<5	1929946	<5	5	<5	5	1929946
Total Chromium (Cr)	ug/L	21	1931768	<5	1931307	11	5	<5	5	1931768
Dissolved Cobalt (Co)	ug/L	0.5	1929946	1.2	1929946	0.6	0.5	2.1	0.5	1929946
Total Cobalt (Co)	ug/L	2.3	1931768	1.5	1931307	2.3	0.5	2.5	0.5	1931768
Dissolved Copper (Cu)	ug/L	3	1929946	6	1929946	5	1	1	1	1929946
Total Copper (Cu)	ug/L	21	1931768	9	1931307	12	1	7	1	1931768
Dissolved Lead (Pb)	ug/L	<0.5	1929946	<0.5	1929946	<0.5	0.5	<0.5	0.5	1929946
Total Lead (Pb)	ug/L	3.3	1931768	<0.5	1931307	2.5	0.5	1.1	0.5	1931768
Dissolved Nickel (Ni)	ug/L	5	1929946	9	1929946	6	1	9(1)	5	1929946
Total Nickel (Ni)	ug/L	20	1931768	18	1931307	13	1	8(1)	5	1931768
Dissolved Zinc (Zn)	ug/L	120	1929946	18	1929946	170	5	24	5	1929946
Total Zinc (Zn)	ug/L	330	1931768	9	1931307	170	5	60	5	1931768

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Detection Limit was raised due to matrix interferences.

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Maxxam Job #: A9B3160
Report Date: 2009/09/30

Franz Environmental Inc
Client Project #: 1697-0901

Your P.O. #: 2049

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		DN8711	DN8712	DN8713	DN8714		
Sampling Date		2009/08/25 13:00	2009/08/25 15:00	2009/08/25 13:30	2009/08/25 10:45		
	Units	**MW0606-1**	**MW0605-1**	**DUP-01**	**MW0604-1**	**RDL**	**QC Batch**
PCBs							
Aroclor 1016	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	1926065
Aroclor 1221	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	1926065
Aroclor 1232	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	1926065
Aroclor 1242	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	1926065
Aroclor 1248	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	1926065
Aroclor 1254	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	1926065
Aroclor 1260	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	1926065
Aroclor 1262	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	1926065
Aroclor 1268	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	1926065
Total PCB	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	1926065
Surrogate Recovery (%)							
2,4,5,6-Tetrachloro-m-xylene	%	54	65	56	56		1926065
Decachlorobiphenyl	%	84	85	87	82		1926065

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A9B3160
Report Date: 2009/09/30

Franz Environmental Inc
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Package 1	6.7°C

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

GENERAL COMMENTS

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: A9B3160
Report Date: 2009/09/30

Franz Environmental Inc
Client Project #: 1697-0901

Your P.O. #: 2049

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
1924206	o-Terphenyl	2009/09/01	89	30 - 130	80	30 - 130	74	%				
1924206	F2 (C10-C16 Hydrocarbons)	2009/09/01	74	60 - 130	65	60 - 130	<100	ug/L	NC	50		
1924206	F3 (C16-C34 Hydrocarbons)	2009/09/01	74	60 - 130	65	60 - 130	<100	ug/L	NC	50		
1924206	F4 (C34-C50 Hydrocarbons)	2009/09/01	74	60 - 130	65	60 - 130	<100	ug/L	NC	50		
1924968	Total Dissolved Solids	2009/09/03					<10	mg/L	NC	25	102	85 - 115
1926065	2,4,5,6-Tetrachloro-m-xylene	2009/09/02	63	40 - 130	69	40 - 130	69	%				
1926065	Decachlorobiphenyl	2009/09/02	82	40 - 130	83	40 - 130	87	%				
1926065	Aroclor 1260	2009/09/02	84	30 - 130	97	30 - 130	<0.05	ug/L	NC	40		
1926065	Total PCB	2009/09/02	84	30 - 130	97	30 - 130	<0.05	ug/L	NC	40		
1926065	Aroclor 1016	2009/09/02					<0.05	ug/L	NC	40		
1926065	Aroclor 1221	2009/09/02					<0.05	ug/L	NC	40		
1926065	Aroclor 1232	2009/09/02					<0.05	ug/L	NC	40		
1926065	Aroclor 1242	2009/09/02					<0.05	ug/L	NC	40		
1926065	Aroclor 1248	2009/09/02					<0.05	ug/L	NC	40		
1926065	Aroclor 1254	2009/09/02					<0.05	ug/L	NC	40		
1926065	Aroclor 1262	2009/09/02					<0.05	ug/L	NC	40		
1926065	Aroclor 1268	2009/09/02					<0.05	ug/L	NC	40		
1926183	Total Suspended Solids	2009/09/02					<10	mg/L	0	25	99	85 - 115
1927211	Total Dissolved Solids	2009/09/03					<10	mg/L	0.7	25	99	85 - 115
1927382	1,4-Difluorobenzene	2009/09/03	99	70 - 130	84	70 - 130	91	%				
1927382	4-Bromofluorobenzene	2009/09/03	115	70 - 130	115	70 - 130	114	%				
1927382	D10-Ethylbenzene	2009/09/03	83	70 - 130	84	70 - 130	91	%				
1927382	D4-1,2-Dichloroethane	2009/09/03	79	70 - 130	80	70 - 130	81	%				
1927382	Benzene	2009/09/03	114	70 - 130	121	70 - 130	<0.2	ug/L	NC	40		
1927382	Toluene	2009/09/03	108	70 - 130	107	70 - 130	<0.2	ug/L	NC	40		
1927382	E hylbenzene	2009/09/03	111	70 - 130	110	70 - 130	<0.2	ug/L	NC	40		
1927382	o-Xylene	2009/09/03	113	70 - 130	113	70 - 130	<0.2	ug/L	NC	40		
1927382	p+m-Xylene	2009/09/03	121	70 - 130	122	70 - 130	<0.4	ug/L	NC	40		
1927382	F1 (C6-C10)	2009/09/03	91	70 - 130	92	70 - 130	<100	ug/L	NC	40		
1927382	Total Xylenes	2009/09/03					<0.4	ug/L	NC	40		
1927382	F1 (C6-C10) - BTEX	2009/09/03					<100	ug/L	NC	40		
1929726	Conductivity	2009/09/04					<1	umho/cm	0	25	97	85 - 115
1929731	Fluoride (F-)	2009/09/04	105	80 - 120	98	80 - 120	<0.1	mg/L	NC	25		
1929946	Dissolved Arsenic (As)	2009/09/05	105	80 - 120	101	90 - 110	<1	ug/L				
1929946	Dissolved Cadmium (Cd)	2009/09/05	101	80 - 120	100	90 - 110	<0.1	ug/L				
1929946	Dissolved Chromium (Cr)	2009/09/05	101	80 - 120	99	90 - 110	<5	ug/L				
1929946	Dissolved Cobalt (Co)	2009/09/05	101	80 - 120	99	90 - 110	<0.5	ug/L				
1929946	Dissolved Copper (Cu)	2009/09/05	98	80 - 120	98	90 - 110	<1	ug/L				
1929946	Dissolved Lead (Pb)	2009/09/05	98	80 - 120	100	90 - 110	<0.5	ug/L	NC	25		

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Maxxam Job #: A9B3160
Report Date: 2009/09/30

Franz Environmental Inc
Client Project #: 1697-0901

Your P.O. #: 2049

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
1929946	Dissolved Nickel (Ni)	2009/09/05	99	80 - 120	98	90 - 110	<1	ug/L				
1929946	Dissolved Zinc (Zn)	2009/09/05	97	80 - 120	99	90 - 110	<5	ug/L				
1930095	Nitrite (N)	2009/09/08	102	75 - 125	105	80 - 120	<0.01	mg/L	NC	25		
1930095	Nitrate (N)	2009/09/08	96	75 - 125	97	80 - 120	<0.1	mg/L	NC	25		
1930095	Nitrate + Nitrite	2009/09/08					<0.1	mg/L	NC	25		
1930117	Nitrite (N)	2009/09/08	104	75 - 125	105	80 - 120	<0.01	mg/L	NC	25		
1930117	Nitrate (N)	2009/09/08	96	75 - 125	97	80 - 120	<0.1	mg/L	NC	25		
1930117	Nitrate + Nitrite	2009/09/08					<0.1	mg/L	NC	25		
1930175	Dissolved Chloride (Cl)	2009/09/08	NC	75 - 125	101	80 - 120	<1	mg/L	3.9	20		
1930178	Dissolved Sulphate (SO4)	2009/09/08	NC	75 - 125	101	80 - 120	<1	mg/L	7.7	25		
1930180	Orthophosphate (P)	2009/09/09	99	75 - 125	108	80 - 120	<0.01	mg/L	NC	25		
1930195	Dissolved Chloride (Cl)	2009/09/08	NC	75 - 125	104	80 - 120	<1	mg/L	1.7	20		
1930198	Orthophosphate (P)	2009/09/09	100	75 - 125	106	80 - 120	0.01, RDL=0.01	mg/L	NC	25		
1930203	Dissolved Sulphate (SO4)	2009/09/09	NC	75 - 125	93	80 - 120	<1	mg/L	3.2	25		
1930212	Nitrite (N)	2009/09/08	NC	75 - 125	109	80 - 120	<0.01	mg/L	2.1	25		
1930212	Nitrate (N)	2009/09/08	NC	75 - 125	102	80 - 120	<0.1	mg/L	1.2	25		
1930212	Nitrate + Nitrite	2009/09/08					<0.1	mg/L	1	25		
1930283	Conductivity	2009/09/08					<1	umho/cm	0	25	100	85 - 115
1930285	Fluoride (F-)	2009/09/08	100	80 - 120	100	80 - 120	<0.1	mg/L	NC	25		
1930391	Colour	2009/09/08			99	75 - 125	<2	TCU	NC	25		
1931246	Mercury (Hg)	2009/09/08	114	75 - 125	108	84 - 113	<0.1	ug/L	NC	25		
1931307	Total Arsenic (As)	2009/09/08	106	80 - 120	104	86 - 119	<1	ug/L				
1931307	Total Cadmium (Cd)	2009/09/08	108	80 - 120	102	85 - 116	<0.1	ug/L	NC	25		
1931307	Total Chromium (Cr)	2009/09/08	108	80 - 120	102	80 - 120	<5	ug/L	NC	25		
1931307	Total Cobalt (Co)	2009/09/08	106	80 - 120	103	82 - 117	<0.5	ug/L	NC	25		
1931307	Total Copper (Cu)	2009/09/08	101	80 - 120	99	80 - 117	<1	ug/L	NC	25		
1931307	Total Lead (Pb)	2009/09/08	104	80 - 120	101	80 - 120	<0.5	ug/L	NC	25		
1931307	Total Nickel (Ni)	2009/09/08	102	80 - 120	101	81 - 117	<1	ug/L	NC	25		
1931307	Total Zinc (Zn)	2009/09/08	103	80 - 120	101	80 - 120	<5	ug/L	NC	25		
1931768	Total Arsenic (As)	2009/09/08	102	80 - 120	98	86 - 119	<1	ug/L				
1931768	Total Cadmium (Cd)	2009/09/08	103	80 - 120	98	85 - 116	<0.1	ug/L				
1931768	Total Chromium (Cr)	2009/09/08	101	80 - 120	96	80 - 120	<5	ug/L				
1931768	Total Cobalt (Co)	2009/09/08	100	80 - 120	97	82 - 117	<0.5	ug/L				
1931768	Total Copper (Cu)	2009/09/08	97	80 - 120	95	80 - 117	<1	ug/L				
1931768	Total Lead (Pb)	2009/09/08	100	80 - 120	96	80 - 120	<0.5	ug/L	NC	25		

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Maxxam Job #: A9B3160
Report Date: 2009/09/30

Franz Environmental Inc
Client Project #: 1697-0901

Your P.O. #: 2049

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
1931768	Total Nickel (Ni)	2009/09/08	98	80 - 120	95	81 - 117	<1	ug/L				
1931768	Total Zinc (Zn)	2009/09/08	97	80 - 120	96	80 - 120	<5	ug/L				

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 contamina ion.
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 sufficien ly significant to permit a reliable calculation.

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Validation Signature Page

Maxxam Job #: A9B3160

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

CHARLES ANCKER, B.Sc., M.Sc., C.Chem, Senior Analyst

CRISTINA CARRIERE, Scientific Services

STEVE ROBERTS, Lab Supervisor, Ottawa

==========

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. SCC and CALA have approved this reporting process and electronic report format.

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Your P.O. #: 2049
Your Project #: 1697-0901
Site: CAM-F, NU
Your C.O.C. #: 00574543

Attention: Andrew Henderson
Franz Environmental Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2009/10/05
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A9B2784
Received: 2009/08/28, 18:00

Sample Matrix: Soil
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Petroleum Hydro. CCME F1 & BTEX in Soil (1)	2	2009/08/31	2009/08/31	CAM SOP-00315	CCME CWS
Petroleum Hydro. CCME F1 & BTEX in Soil (1)	10	2009/08/31	2009/09/01	CAM SOP-00315	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil (1)	11	2009/08/31	2009/08/31	CAM SOP-00316	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil (1)	1	2009/08/31	2009/09/01	CAM SOP-00316	CCME CWS
Acid Extr. Metals (aqua regia) by ICPMS	12	2009/09/04	2009/09/04	CAM SOP-00447	EPA 6020
MOISTURE (1)	12	N/A	2009/09/01	CAM SOP-00445	MOE HANDBOOK(1983)
Polychlorinated Biphenyl in Soil	8	2009/09/01	2009/09/03	CAM SOP-00309	SW846 8082
Polychlorinated Biphenyl in Soil	4	2009/09/02	2009/09/02	CAM SOP-00309	SW846 8082

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) This test was performed by Maxxam Ottawa

Encryption Key

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

MELISSA MORRISON, Project Manager
Email: Melissa.Morrison@maxxamanalytics.com
Phone# (613) 274-0573

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For Service Group specific validation please refer to the Validation Signature Page

Total cover pages: 1

Maxxam Job #: A9B2784
Report Date: 2009/10/05

Franz Environmental Inc
Client Project #: 1697-0901
Project name: CAM-F, NU
Your P.O. #: 2049
Sampler Initials: AH

O'REG 153 PETROLEUM HYDROCARBONS (SOIL)

Maxxam ID		DN6049	DN6050	DN6051	DN6052	DN6053	DN6054		
Sampling Date		2009/08/24 17:10	2009/08/24 17:12	2009/08/24 17:15	2009/08/25 11:00	2009/08/25 10:45	2009/08/25 14:00		
	Units	**TP0906-01**	**TP0906-02**	**DUP-01**	**TP0904-1**	**TP0904-2**	**TP0905-1**	**RDL**	**QC Batch**
Inorganics									
Moisture	%	9.1	9.3	3.8	11	8.8	19	0.2	1923509
BTEX & F1 Hydrocarbons									
Benzene	ug/g	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	1923506
Toluene	ug/g	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	1923506
Ethylbenzene	ug/g	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	1923506
o-Xylene	ug/g	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	1923506
p+m-Xylene	ug/g	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	1923506
Total Xylenes	ug/g	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	1923506
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	<10	10	1923506
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	<10	10	1923506
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	<10	10	1924172
F3 (C16-C34 Hydrocarbons)	ug/g	<10	<10	<10	21	<10	13	10	1924172
F4 (C34-C50 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	<10	10	1924172
Reached Baseline at C50	ug/g	YES	YES	YES	YES	YES	YES		1924172
Surrogate Recovery (%)									
1,4-Difluorobenzene	%	94	88	94	89	93	89		1923506
4-Bromofluorobenzene	%	114	115	116	115	114	115		1923506
D10-Ethy benzene	%	77	81	77	76	78	79		1923506
D4-1,2-Dichloroethane	%	86	84	86	85	87	85		1923506
o-Terphenyl	%	76	87	79	83	84	87		1924172

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A9B2784
Report Date: 2009/10/05

Franz Environmental Inc
Client Project #: 1697-0901
Project name: CAM-F, NU
Your P.O. #: 2049
Sampler Initials: AH

O'REG 153 PETROLEUM HYDROCARBONS (SOIL)

Maxxam ID		DN6055	DN6056	DN6057	DN6058	DN6059	DN6060		
Sampling Date		2009/08/25 13:48	2009/08/25 15:45	2009/08/25 15:50	2009/08/25 17:10	2009/08/25 17:20	2009/08/25 13:50		
	Units	**TP0905-2**	**TP-BM1-01**	**TP-BM1-02**	**TP-BM2-01**	**TP-BM2-02**	**DUP-02**	**RDL**	**QC Batch**
Inorganics									
Moisture	%	9.4	18	7.4	12	8.3	9.1	0.2	1923509
BTEX & F1 Hydrocarbons									
Benzene	ug/g	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	1923506
Toluene	ug/g	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	1923506
Ethy benzene	ug/g	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	1923506
o-Xylene	ug/g	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	1923506
p+m-Xylene	ug/g	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	1923506
Total Xylenes	ug/g	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	1923506
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	<10	10	1923506
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	<10	10	1923506
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	<10	10	1924172
F3 (C16-C34 Hydrocarbons)	ug/g	<10	25	<10	<10	<10	<10	10	1924172
F4 (C34-C50 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	<10	10	1924172
Reached Baseline at C50	ug/g	YES	YES	YES	YES	YES	YES		1924172
Surrogate Recovery (%)									
1,4-Difluorobenzene	%	89	86	82	97	85	85		1923506
4-Bromofluorobenzene	%	116	115	116	115	116	116		1923506
D10-Ethylbenzene	%	78	71	69	78	74	72		1923506
D4-1,2-Dichloroethane	%	86	84	85	85	84	85		1923506
o-Terphenyl	%	84	84	87	77	95	92		1924172

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		DN6049	DN6050	DN6051	DN6052	DN6053	DN6054		
Sampling Date		2009/08/24 17:10	2009/08/24 17:12	2009/08/24 17:15	2009/08/25 11:00	2009/08/25 10:45	2009/08/25 14:00		
	Units	**TP0906-01**	**TP0906-02**	**DUP-01**	**TP0904-1**	**TP0904-2**	**TP0905-1**	**RDL**	**QC Batch**
Metals									
Acid Extractable Arsenic (As)	ug/g	<1	<1	<1	<1	<1	<1	1	1929446
Acid Extractable Cadmium (Cd)	ug/g	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	1929446
Acid Extractable Chromium (Cr)	ug/g	25	28	27	21	31	27	1	1929446
Acid Extractable Cobalt (Co)	ug/g	6.7	7.3	6.7	5.6	8.1	6.8	0.1	1929446
Acid Extractable Copper (Cu)	ug/g	35	19	17	15	19	19	0.5	1929446
Acid Extractable Lead (Pb)	ug/g	6	7	7	7	7	8	1	1929446
Acid Extractable Nickel (Ni)	ug/g	18	19	18	15	20	19	0.5	1929446
Acid Extractable Zinc (Zn)	ug/g	40	40	40	35	43	44	5	1929446
Acid Extractable Mercury (Hg)	ug/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	1929446

Maxxam ID		DN6055	DN6056	DN6057	DN6058	DN6059	DN6060		
Sampling Date		2009/08/25 13:48	2009/08/25 15:45	2009/08/25 15:50	2009/08/25 17:10	2009/08/25 17:20	2009/08/25 13:50		
	Units	**TP0905-2**	**TP-BM1-01**	**TP-BM1-02**	**TP-BM2-01**	**TP-BM2-02**	**DUP-02**	**RDL**	**QC Batch**
Metals									
Acid Extractable Arsenic (As)	ug/g	<1	<1	<1	<1	<1	<1	1	1929446
Acid Extractable Cadmium (Cd)	ug/g	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	1929446
Acid Extractable Chromium (Cr)	ug/g	29	26	33	26	31	28	1	1929446
Acid Extractable Cobalt (Co)	ug/g	7.3	6.8	7.6	6.9	7.4	7.2	0.1	1929446
Acid Extractable Copper (Cu)	ug/g	19	20	19	16	20	19	0.5	1929446
Acid Extractable Lead (Pb)	ug/g	7	7	7	6	7	7	1	1929446
Acid Extractable Nickel (Ni)	ug/g	19	19	22	17	20	19	0.5	1929446
Acid Extractable Zinc (Zn)	ug/g	40	46	41	38	43	40	5	1929446
Acid Extractable Mercury (Hg)	ug/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	1929446

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		DN6049	DN6050	DN6051	DN6052	DN6053	DN6054	DN6055		
Sampling Date		2009/08/24 17:10	2009/08/24 17:12	2009/08/24 17:15	2009/08/25 11:00	2009/08/25 10:45	2009/08/25 14:00	2009/08/25 13:48		
	Units	**TP0906-01**	**TP0906-02**	**DUP-01**	**TP0904-1**	**TP0904-2**	**TP0905-1**	**TP0905-2**	**RDL**	**QC Batch**
PCBs										
Aroclor 1262	ug/g	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1926299
Aroclor 1016	ug/g	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1926299
Aroclor 1221	ug/g	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1926299
Aroclor 1232	ug/g	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1926299
Aroclor 1242	ug/g	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1926299
Aroclor 1248	ug/g	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1926299
Aroclor 1254	ug/g	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	0.01	1926299
Aroclor 1260	ug/g	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1926299
Aroclor 1268	ug/g	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1926299
Total PCB	ug/g	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	0.01	1926299
Surrogate Recovery (%)										
2,4,5,6-Tetrachloro-m-xylene	%	99	92	98	95	101	100	82		1926299
Decachlorobiphenyl	%	111	106	108	101	113	108	95		1926299

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		DN6056	DN6057	DN6058	DN6059		DN6060		
Sampling Date		2009/08/25 15:45	2009/08/25 15:50	2009/08/25 17:10	2009/08/25 17:20		2009/08/25 13:50		
	Units	**TP-BM1-01**	**TP-BM1-02**	**TP-BM2-01**	**TP-BM2-02**	**QC Batch**	**DUP-02**	**RDL**	**QC Batch**
PCBs									
Aroclor 1262	ug/g	<0.01	<0.01	<0.01	<0.01	1926878	<0.01	0.01	1926299
Aroclor 1016	ug/g	<0.01	<0.01	<0.01	<0.01	1926878	<0.01	0.01	1926299
Aroclor 1221	ug/g	<0.01	<0.01	<0.01	<0.01	1926878	<0.01	0.01	1926299
Aroclor 1232	ug/g	<0.01	<0.01	<0.01	<0.01	1926878	<0.01	0.01	1926299
Aroclor 1242	ug/g	<0.01	<0.01	<0.01	<0.01	1926878	<0.01	0.01	1926299
Aroclor 1248	ug/g	<0.01	<0.01	<0.01	<0.01	1926878	<0.01	0.01	1926299
Aroclor 1254	ug/g	<0.01	<0.01	<0.01	<0.01	1926878	<0.01	0.01	1926299
Aroclor 1260	ug/g	<0.01	<0.01	<0.01	<0.01	1926878	<0.01	0.01	1926299
Aroclor 1268	ug/g	<0.01	<0.01	<0.01	<0.01	1926878	<0.01	0.01	1926299
Total PCB	ug/g	<0.01	<0.01	<0.01	<0.01	1926878	<0.01	0.01	1926299
Surrogate Recovery (%)									
2,4,5,6-Tetrachloro-m-xylene	%	76	51	75	15(1)	1926878	89		1926299
Decachlorobiphenyl	%	92	88	95	90	1926878	105		1926299

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Surrogate recovery was below the lower control limit. This may represent a low bias in some results.

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Package 1	8.7°C

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

GENERAL COMMENTS

Sample DN6051-01: F1/BTEX Analysis:
Due to the volatility of the analysed compounds, results from a sample containing headspace are likely biased. Analysis performed on the submitted samples will only accurately represent the values within the container at the time of testing. These values will not represent the actual concentrations within the sample source at the time of collection.

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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
1923506	1,4-Difluorobenzene	2009/08/31	97	60 - 140	83	60 - 140	87	%				
1923506	4-Bromofluorobenzene	2009/08/31	114	60 - 140	115	60 - 140	117	%				
1923506	D10-Ethylbenzene	2009/08/31	85	30 - 130	88	30 - 130	85	%				
1923506	D4-1,2-Dichloroethane	2009/08/31	67	60 - 140	85	60 - 140	83	%				
1923506	Benzene	2009/08/31	97	60 - 140	95	60 - 140	<0.02	ug/g	NC	50		
1923506	Toluene	2009/08/31	86	60 - 140	86	60 - 140	<0.02	ug/g	NC	50		
1923506	Ethylbenzene	2009/08/31	89	60 - 140	89	60 - 140	<0.02	ug/g	NC	50		
1923506	o-Xylene	2009/08/31	91	60 - 140	92	60 - 140	<0.02	ug/g	NC	50		
1923506	p+m-Xylene	2009/08/31	97	60 - 140	98	60 - 140	<0.04	ug/g	NC	50		
1923506	F1 (C6-C10)	2009/08/31	92	60 - 140	94	60 - 140	<10	ug/g	NC	50		
1923506	Total Xylenes	2009/08/31					<0.04	ug/g	NC	50		
1923506	F1 (C6-C10) - BTEX	2009/08/31					<10	ug/g	NC	50		
1923509	Moisture	2009/09/01							0	50		
1924172	o-Terphenyl	2009/08/31	82	30 - 130	80	30 - 130	85	%				
1924172	F2 (C10-C16 Hydrocarbons)	2009/08/31	74	60 - 130	71	60 - 130	<10	ug/g	NC	50		
1924172	F3 (C16-C34 Hydrocarbons)	2009/08/31	74	60 - 130	71	60 - 130	<10	ug/g	NC	50		
1924172	F4 (C34-C50 Hydrocarbons)	2009/08/31	74	60 - 130	71	60 - 130	<10	ug/g	NC	50		
1926299	2,4,5,6-Tetrachloro-m-xylene	2009/09/03	91	40 - 130	81	40 - 130	84	%				
1926299	Decachlorobiphenyl	2009/09/03	99	40 - 130	92	40 - 130	92	%				
1926299	Aroclor 1260	2009/09/03	104	30 - 130	93	30 - 130	<0.01	ug/g	NC	50		
1926299	Total PCB	2009/09/03	104	30 - 130	93	30 - 130	<0.01	ug/g	NC	50		
1926299	Aroclor 1262	2009/09/03					<0.01	ug/g	NC	50		
1926299	Aroclor 1016	2009/09/03					<0.01	ug/g	NC	50		
1926299	Aroclor 1221	2009/09/03					<0.01	ug/g	NC	50		
1926299	Aroclor 1232	2009/09/03					<0.01	ug/g	NC	50		
1926299	Aroclor 1242	2009/09/03					<0.01	ug/g	NC	50		
1926299	Aroclor 1248	2009/09/03					<0.01	ug/g	NC	50		
1926299	Aroclor 1254	2009/09/03					<0.01	ug/g	NC	50		
1926299	Aroclor 1268	2009/09/03					<0.01	ug/g	NC	50		
1926878	2,4,5,6-Tetrachloro-m-xylene	2009/09/02	67	40 - 130	80	40 - 130	75	%				
1926878	Decachlorobiphenyl	2009/09/02	92	40 - 130	94	40 - 130	90	%				
1926878	Aroclor 1260	2009/09/03	116	30 - 130	100	30 - 130	<0.01	ug/g	13.3	50		
1926878	Total PCB	2009/09/03	116	30 - 130	100	30 - 130	<0.01	ug/g	13.3	50		
1926878	Aroclor 1262	2009/09/03					<0.01	ug/g	NC	50		
1926878	Aroclor 1016	2009/09/03					<0.01	ug/g	NC	50		
1926878	Aroclor 1221	2009/09/03					<0.01	ug/g	NC	50		
1926878	Aroclor 1232	2009/09/03					<0.01	ug/g	NC	50		
1926878	Aroclor 1242	2009/09/03					<0.01	ug/g	NC	50		
1926878	Aroclor 1248	2009/09/03					<0.01	ug/g	NC	50		

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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
1926878	Aroclor 1254	2009/09/03					<0.01	ug/g	NC	50		
1926878	Aroclor 1268	2009/09/03					<0.01	ug/g	NC	50		
1929446	Acid Extractable Arsenic (As)	2009/09/04	93	75 - 125			<1	ug/g	NC	35	95	75 - 125
1929446	Acid Extractable Cadmium (Cd)	2009/09/04	96	75 - 125			<0.1	ug/g	NC	35	90	75 - 125
1929446	Acid Extractable Chromium (Cr)	2009/09/04	NC	75 - 125			<1	ug/g	5.9	35	89	75 - 125
1929446	Acid Extractable Cobalt (Co)	2009/09/04	96	75 - 125			<0.1	ug/g	3.4	35	88	75 - 125
1929446	Acid Extractable Copper (Cu)	2009/09/04	92	75 - 125			<0.5	ug/g	4.5	35	96	75 - 125
1929446	Acid Extractable Lead (Pb)	2009/09/04	95	75 - 125			<1	ug/g	9.4	35	94	75 - 125
1929446	Acid Extractable Nickel (Ni)	2009/09/04	95	75 - 125			<0.5	ug/g	3.4	35	89	75 - 125
1929446	Acid Extractable Zinc (Zn)	2009/09/04	NC	75 - 125			<5	ug/g	6.4	35	89	75 - 125
1929446	Acid Extractable Mercury (Hg)	2009/09/04	98	75 - 125			<0.05	ug/g			151(1, 2)	75 - 125

N/A = Not Applicable
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 contamina ion.
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 sufficien ly significant to permit a reliable calculation.
(1) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.
(2) - The recovery was above the upper control limit. This may represent a high bias in some results for flagged analytes. For results that were not detected (ND), this potential bias has no impact.

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Validation Signature Page

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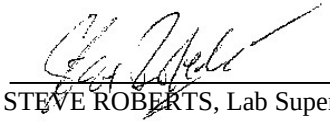
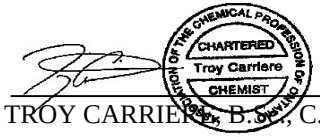
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

CHARLES ANCKER, B.Sc., M.Sc., C.Chem, Senior Analyst



STEVE ROBERTS, Lab Supervisor, Ottawa



TROY CARRIERE, B.Sc., C.Chem, Scientific Specialist

==========

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. SCC and CALA have approved this reporting process and electronic report format.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your P.O. #: 2049
Your Project #: 1697-0901
Site: CAM-F, UN
Your C.O.C. #: N/A

Attention: Andrew Henderson
Franz Environmental Inc
329 Churchill Ave N
Suite 200
Ottawa, ON
K1Z 5B8

Report Date: 2009/10/07

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A9D0180
Received: 2009/09/30, 19:08

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Sieve, 75um (1)	1	N/A	2009/10/07	CAM SOP-00467	

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) The Sieve test has been validated in accordance with ISO Guide 17025 requirements. SCC accreditation pending.

Encryption Key

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

MELISSA MORRISON, Project Manager
Email: Melissa.Morrison@maxxamanalytics.com
Phone# (613) 274-0573

==========

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. SCC and CALA have approved this reporting process and electronic report format.

For Service Group specific validation please refer to the Validation Signature Page

Total cover pages: 1

Maxxam Job #: A9D0180
Report Date: 2009/10/07

Franz Environmental Inc
Client Project #: 1697-0901
Project name: CAM-F, UN
Your P.O. #: 2049

RESULTS OF ANALYSES OF SOIL

Maxxam ID		DW6235		
Sampling Date		2009/08/25 11:00		
	Units	**TP0904-01**	**RDL**	**QC Batch**
Miscellaneous Parameters				
Grain Size	%	COARSE	N/A	1963575
Sieve - #200 (<0.075mm)	%	36	N/A	1963575
Sieve - #200 (>0.075mm)	%	64	N/A	1963575

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A9D0180
Report Date: 2009/10/07

Franz Environmental Inc
Client Project #: 1697-0901
Project name: CAM-F, UN
Your P.O. #: 2049

GENERAL COMMENTS

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: A9D0180
Report Date: 2009/10/07

Franz Environmental Inc
Client Project #: 1697-0901
Project name: CAM-F, UN
Your P.O. #: 2049

QUALITY ASSURANCE REPORT

			RPD	
QC Batch	**Parameter**	**Date**	**Value (%)**	**QC Limits**
1963575	Grain Size	2009/10/07	NC	20
1963575	Sieve - #200 (<0.075mm)	2009/10/07	1.3	20
1963575	Sieve - #200 (>0.075mm)	2009/10/07	17.4	20

RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficien ly significant to permit a reliable calculation.

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Validation Signature Page

Maxxam Job #: A9D0180

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

Cristina Carriere

CRISTINA CARRIERE, Scientific Services

==========

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. SCC and CALA have approved this reporting process and electronic report format.

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CHAIN OF CUSTODY RECORD

Page of

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 Franz Environmental Inc	Company Name:		Quotation #:	A95172	MAXXAM JOB #:	BOTTLE ORDER #:
Contact Name:	Lillian Ellis	Contact Name:	Matthew Cyr	P.O. #:			158875
Address:	329 Churchill Ave N Suite 200	Address:		Project #:	1697-0901	CHAIN OF CUSTODY #:	PROJECT MANAGER:
	Ottawa ON K1Z 5B8			Project Name:		C#158875-01-01	MELISSA MORRISON
Phone:	(613)721-0555 Fax: (613)721-0029	Phone:	Fax:	Site Location:			
Email:	lellis@franzenvironmental.com	Email:	mcyr@franzenvironmental.com	Sampled By:			

REGULATORY CRITERIA:
- ☐ MISA — Reg. 153/04 — Sewer Use: ☐ Sanitary ☐ Storm ☐ Combined
- ☐ PWQO — ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table 6 — ☐ Residential/Parkland ☐ Industrial/Commercial ☐ Medium/Fine ☐ Coarse — Municipality: _____
- ☐ Reg. 558
- Other (specify): _____ Report Criteria on C of A ? ☐

SPECIAL INSTRUCTIONS

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

SAMPLES MUST BE KEPT COOL (< 10ºC) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: [X]
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number: _____ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	O'Reg 153 Petroleum Hydrocarbons	Polychlorinated Biphenyl in Water	Dissolved Metals by ICPMS + Hg	Total Metals by ICPMS + Hg	pH	Colour	Conductivity	Chloride by Automated Colourimetry	Fluoride	Nitrate (NO3) and Nitrite (NO2) in Water	# of Bottles	Comments
1		MW06-06-1	25/8/09	1300	WT	N	Y*	X	X	X	X	X	X	X	X	X	X	11	* note total metals is NOT preserved — please analyze from general bottle!
2		MW06-05-1	↓	1550	WT	N	Y*	X	X	X	X	X	X	X	X	X	X	11	
3		DUP-01	↓	1330	WT	N	Y*	X	X	X	X	X	X	X	X	X	X	11	↓
4		MW06-04-01	25/8/09	1045	WT	N	*	X	X	X	X	X	X	X	X	X	X	11	ACCOMPANIES IN SOIL COOLER
5					WT														
6					WT														REC'D IN OTTAWA
7					WT														
8					WT														
9					WT														
10					WT														

28-Aug-09 18:00
MELISSA MORRISON
A9B3160
JOE OTT-001

SIF : Sample Inspection
Resolved ☐ By: _____
Date: _____

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	# Jars Used and Not Submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Andrew Henderson	26/8/09	1600	S. Kich	09/08/28	18:00		X	6/6/8	☐ Yes ☐ No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

Maxxam Analytics

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CHAIN OF CUSTODY RECORD

Page of

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#10988 Franz Environmental Inc	Company Name:		Quotation #:	A95172	MAXXAM JOB #:	BOTTLE ORDER #: 158875
Contact Name:	Lillian Ellis	*Contact Name:	Matthew Cyr	P.O. #:			
Address:	329 Churchill Ave N Suite 200 Ottawa ON K1Z 5B8	Address:		Project #:	1697-0901		
				Project Name:	CAM-F MONITORING	CHAIN OF CUSTODY #:	PROJECT MANAGER:
Phone:	(613)721-0555 Fax: (613)721-0029	Phone:	Fax:	Site Location:	CAM-F, NC	C#158875-01-02	MELISSA MORRISON
Email:	lellis@franzenvironmental.com	Email:	mcyr@franzenvironmental.com	Sampled By:	AH, MC		

REGULATORY CRITERIA:
☐ MISA Reg. 153/04 Sewer Use ☐ Sanitary ☐ Storm ☐ Combined
☐ PWQO ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table 6 ☐ Residential/Parkland ☐ Industrial/Commercial ☐ Medium/Fine ☐ Coarse
☐ Reg. 558 Municipality _____
Other (specify) _____ Report Criteria on C of A? ☐

SPECIAL INSTRUCTIONS

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

ANALYSIS REQUESTED (Please be specific):

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT:
(will be applied if Rush TAT is not specified): ☐
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	Orthophosphate	Sulphate by Automated Colourimetry	Hardness (calculated as CaCO3)	Total Dissolved Solids	Total Suspended Solids					# of Bottles	Comments
1		MW0606-1	25/8/09	1300	WT	N	Y*	X	X	X	X	X						* see notes on prev page
2		MW0605-1	↓	1500	WT	N	Y*	X	X	X	X	X						* Chain
3		DUP-01	↓	1330	WT	N	Y*	X	X	X	X	X						*
4		MW0604-01	↓	1045	WT	N	*	X	X	X	X	X						*
5					WT													
6					WT													
7					WT													
8					WT													
9					WT													
10					WT													

REC'D IN OTTAWA

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	# Jars Used and Not Submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Andrew Hedges	26/8/09	1600	S. Rish	09/08/28	18:00		X	6/6/8	☐ Yes ☐ No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

CHAIN OF CUSTODY RECORD

Maxxam Analytics Inc
6740 Campobello Road, Mississauga, ON, L5N 2L8
Phone: 905-817-5700 Fax: 905-817-5778 Toll Free: (800) 563-6266

Page ____ of ____

INVOICE INFORMATION	REPORT INFORMATION (if differs from invoice)	PROJECT INFORMATION	MAXXAM JOB NUMBER
Company Name: Franz Environmental	Company Name: CS Invoice	Quotation #:	
Contact Name: Andrew Henderson	Contact Name:	P.O. #:	CHAIN OF CUSTODY #
Address: 329 Churchill Ave N ste 200, Ottawa, ON	Address:	Project #: 16T3-0901	00574543
Phone: 613 721 0555 Fax:	Phone: Fax:	Project Name: CAMF	
Email: ahenderson@franzenvironmental.com	Email:	Location: CAMF, NU	
		Sampled By: AH, MS.	

REGULATORY CRITERIA

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form.

- ☐ MISA
- ☐ PWQO
- ☐ Reg. 558
- Reg. 153: ☐ Table 1 ☐ Table 2 ☐ Table 3
- Sewer Use: ☐ Sanitary ☐ Storm Region: ____
- ☐ Other ____ specify
- Report Criteria on C of A? ☐

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM.

ANALYSIS REQUESTED (Please be specific)

	Sample Identification	Date Sampled	Time Sampled	Matrix (GW, SW, Soil, etc.)	Regulated Drinking Water? (Y / N)	Metals Field Filtered? (Y / N)	TPH	Metals	PCBs	# of Cont.
1	TP0906-01	24/8/09	1110	Soil	N	N	X	X	X	5
2	TP0906-02	↓	1112	↓						↓
3	DUP-01	↓	1115	↓						
4	TP0904-1	25/8/09	1100	Soil						
5	TP0904-2		1045							
6	TP0905-1		1400							
7	TP0905-2		1348							↓
8	TP-BM1-01		1545							3
9	TP-BM1-02		1550							↓
10	TP-BM2-01		1710							
11	TP-BM2-02		1720							↓
12	DUP-02	↓	1350	↓	↓	↓	↓	↓	↓	5

REC'D IN OTTAWA

TURNAROUND TIME (TAT) REQUIRED

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS.

Regular (Standard) TAT:
☐ 5 to 7 Working Days

Rush TAT: Rush Confirmation #: ____ (call Lab for #)
☐ 1 day ☐ 2 days ☐ 3 days

DATE Required: ____

TIME Required: ____

Please note that TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

COMMENTS / TAT COMMENTS

SIF : Sample Inspection
Resolved ☐ By: ____
Date: ____

28-Aug-09 18:00
MELISSA MORRISON
A9B2784
JOE OTT-014

RELINQUISHED BY (Signature/Print)	RECEIVED BY (Signature/Print)	Date	Time
Andrew Henderson	Jennifer Wright	26/8/09 28 Aug 09	1600 6pm

Laboratory Use Only

Temperature (°C) on Receipt	Condition of Sample on Receipt
10/9/7°C	☐ OK ☐ SIF

*MANDATORY SECTIONS IN GREY MUST BE FILLED OUT. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

ENVCOC-ONT-05/06

White: Maxxam Yellow: Mail Pink: Client