Indian and Northern Affairs Canada
Affaires indiennes et du Nord Canada

Contaminants and Remediation Directorate
PO Box 1500,
Yellowknife NT X1A 2R3

July 11, 2008

Your file Votre référence

Our file Notre référence

Northwest Territories Water Board
5114- 49th St CJCD Building
PO Box 1326
Yellowknife, NT
X1A 2N9

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BOARD	4
CHAIR	—
E.A.	—
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Dear Sir/Madam:

Subject: Water Licence N7L1-1824 Submittals - Johnson Point Remediation Project

Further to the electronic submission of submittals today, please find attached hard copies of the following submittals associated with the Johnson Point Water Licence N7L1-1824 held by the Contaminants and Remediation Directorate (CARD) of INAC:

- Quality Assurance/Quality Control Plan (QA/QC Plan) as per SNP Part B Item 7. Note that this plan has already been submitted to the analyst for approval.
- Spill Contingency Plan as per Part F Item 1
- Further details on the greywater treatment system from the remediation contractor E. Gruben's Transport

If there are any questions or concerns regarding this supplementary information, please contact me at (867)669-2756 or pikee@inac-ainc.gc.ca or Joel Gowman at (867) 669-2423.

Sincerely,

Emma Pike
Project Manager

NORTHWEST TERRITORIES WATER BOARD
JUL 14 2008
YELLOWKNIFE, NWT

Canada

Quality Assurance and Quality Control
For
Water & Soil Sampling at Johnson Point Staging Area
Northwest Territories

1.0 INTRODUCTION

As the custodian of most federal lands in the north, Indian and Northern Affairs Canada (INAC) has responsibility, through the Northern Contaminated Sites Program (CSP), to manage a number of contaminated properties that are no longer maintained by the original occupant. The Johnson Point Staging Area, Northwest Territories is one of these sites.

This site will require activities to remediate on-site and/ or remove contaminants for disposal off site. Soil sampling and analysis based on the CCME Hydrocarbons in Soil – F1 through F4 will be conducted to confirm adequate soil excavation and treatment as specified in the Johnson Point Remedial Action Plan (RAP). Water sampling will be conducted throughout the remediation process to ensure the following wastewater complies with discharge criteria and conditions outlined in the Water License issued for this site:

1. Grey water produced by the camp operations
2. Water ponded in contaminated soil excavations and bermed contaminated soil piles
3. Wastewater derived from sludge consolidation
4. To maintain a contractors camp at site with drinking water and waste facilities.

In accordance with the water licence issued by the Northwest Territories Water Board to the Contaminants and Remediation Directorate (CARD), the purpose of this document is to provide a quality assurance and quality control program for water sampling required during the remediation of Johnson Point Staging Area, located on the east coast of Banks Island, approximately 270 km northeast of Sachs Harbour in the Northwest Territories. The program will be in affect for the duration of the site cleanup activities on site, which is expected to last from July 2008 until mid August 2010.

2.0 SAMPLE COLLECTION

Soil and water samples will be collected during various activities. The following indicates the waste water streams and soil to be sampled and the frequency of sampling. A spreadsheet can be found in Appendix A that details the sampling protocol, frequency and parameters.

2.1 Site Camp

A contractor's camp will be set up at the site to provide services and support for the remediation activities. The camp is scheduled to be on site for a period of three seasons with the duration of the construction season from June until mid September.

2.1.1 Sewage / Blackwater

The camp sewage treatment system consists of Pacto toilets situated throughout the camp buildings. These toilets completely encapsulate sewage waste to allow for periodic disposal by on-site incineration. No sewage / blackwater will be discharged during camp operations so there is no requirement for testing.

2.1.2 Grey Water

Grey water generated from camp operations (primarily kitchen and laundry facilities along with sinks and showers) will be stored and treated on site. Grey water will be stored on-site and samples will be taken from the top of the storage facility, about 30 cm below the surface of the water, using new, unpreserved sample containers. Samples may be taken at various points along the treatment process to determine the effectiveness of treatment.

2.1.3 Drinking Water

The source of potable drinking water for on-site construction personnel will be Unnamed River. Water from Unnamed River will be considered non-potable until treatment and testing prove otherwise. Bottled water will be provided for potable water until testing on the water from Unnamed River is completed.

Drinking water at the site from Unnamed River will be sampled on a weekly basis to ensure the water quality meets the Health Canada Guidelines for Canadian Drinking Water Guidelines. The sampling and analyses will be provided at the water supply source and at the distribution source prior to consumption. Bottled distilled drinking water will be supplied at the camp should exceedances be noted in the water sampling analysis.

2.1.4 Hydrocarbon Contaminated Soils

Samples will be taken to confirm the effectiveness of the treatment process and to assess whether complete excavation of contaminated soils has occurred. Samples will be collected in unused sample containers. Sampling implements will be cleaned with a soil wash between samples and with soap and water and a solvent at the beginning of each sampling day. The soil being sampled will be homogenized prior to sampling.

2.2 Remediation Activities

The following remediation activities may generate wastewater that will require sampling and testing:

1) Excavation of contaminants and materials causing ponding of site ground and surface water;
2) Stockpiling of contaminated soils; and.
3) Rinsing of tanks.

All contaminated soils that are to be remediated on-site will be stored to eliminate or minimize run off to existing water bodies or water courses. Hydrocarbon contaminated soils designated for on-site treatment are to be stored on a bermed impermeable liner.

All potentially contaminated aqueous materials (residual product or melt water in tanks and rinsate water) will be sampled and either discharged to land, incinerated on site or transported off-site for disposal. The disposal option chosen will depend on the results of the laboratory analysis and the criteria set out in the Water licence, Land Use permit and/or INAC remediation protocols. Temporary bermed and lined storage will be provided for all these materials to ensure run off does not enter the surrounding environment.

3.0 SAMPLING EQUIPMENT AND METHODOLOGY

Water sampling will be conducted by IEG Consultants Ltd. (IEG) to confirm that wastewater generated or encountered on site meets discharge criteria outlined in the water licence. Soil treatment monitoring of the hydrocarbon soils will also be conducted by IEG. Additional sampling conducted on behalf of the Crown/CARD by the departmental representative will follow the procedures identified in this plan.

Sampling equipment to be used at site will be dependent on the parameters and materials to be sampled. The following is a breakdown of the sampling equipment required for the site activities as well as the associated methodology. The *CCME Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites* will be complied with.

During all sampling activities there is the requirement for the use of new disposable nitrile gloves for each individual sample collected to avoid the potential for cross-contamination of samples. Also, dedicated water sampling equipment will be used to avoid cross-contamination within samples. Reused soil sampling implements will be soil washed between every sample and will be washed with soap and water and rinsed with water at the beginning of each day. All sample containers required for the sampling events will be new; none will be reused and will be provided by the laboratory. Sample container cleaning will not be required.

Duplicate, trip and field blanks will be required for applicable parameters as detailed in the spreadsheet in Appendix A. A duplicate sample is a repeat

analysis of a sample within the same batch including all steps of the testing method, and is used as a control to assess the precision of the test method for the sample matrix. Duplicates will be provided "blind" to the laboratory. A trip blank is a sealed sample bottle containing an inert matrix that is carried to the field and returned unopened to the laboratory. Field blanks, consisting of distilled water, will be containerized in the field using the same handling procedures as the samples. A field blank is then re-sealed and shipped to the laboratory for analysis with the other samples. This control is used to assess possible sample contamination due to field sampling procedures.

Sampling frequency for duplicates, trip blanks and field blanks for each parameter can be found in Appendix A. A full list of sample containers, preservation methods, holding times and laboratory analytical methods can be found in Appendix B.

3.1 Grey water (Waste Water)

The grey water generated from the camp operations will be sampled on an ongoing basis during the field season from the grey water storage and treatment system. The location of sampling will be the final holding cell. Samples will be taken prior to discharge.

The sample contents will be placed in appropriate analytical bottles as identified by the accredited laboratory used for specific chemical analysis.

Table 3-1: Grey water analytical tests.

Contaminant	Container	Storage	Sample Preparation	Holding Time	DL
TSS	500 mL plastic	Cool	none	7 days	1 mg/L
Residual Chlorine	500 mL plastic	Cool	none	ASAP	0.1 mg/L
Mineral Oil and Grease	1L amber glass	Cool	2 mL 50% H2SO4	14 days	2 mg/L

3.2 Drinking Water

Bottled water shipped to site will not be analysed. All sampling and analyses of the drinking water at the construction camp supply source must satisfy the Health Canada Guidelines for Canadian Drinking Water Quality.

The sampling and analysis will be provided at the water source and at the distribution source prior to consumption and continued thereafter on a biweekly basis. Sampling will include the use of new bottles and the water collected will be stored in the laboratory identified bottles. A blank sample will be required every 1 in 12.

Drinking water will be analysed for the following parameters:

Table 3-2: Drinking Water Analytical Tests

Contaminant	Container	Storage	Sample Preparation	Holding Time
Dissolved Metals	250 mL plastic	Cool	Field filtered, 2 mL 50% HNO_3	6 months
Total Metals	250 mL plastic	Cool	2 mL 50% HNO3	6 months
Mercury	250 mL plastic	Cool	2 mL 50% HNO3	28 days
pH, TSS	500 mL plastic	Cool	none	7 days
Nitrate, Nitrite	500 mL plastic	Cool	none	7 days
Faecal Coliforms	100 mL plastic sterilized	Cool	$NA_2S_2O_3$	48 hours

Although these parameters do not fall under the Water Licence, the same QA/QC procedures will be followed.

3.3 Tank Residue/Sludge Consolidation

Tank and any residual drum contents will be sampled using disposable sampling implements. Depending on the contents of the tank, either glass barrel thieves or PVC bailers will be used. The contents of the thieves will then be deposited into the proper container for each parameter required. Based on the results of the testing, the tank contents will be incinerated on site or discharged to land following suitable treatment and applicable testing. All residuals not slated for discharge or incineration will be stored in water tight containers and disposed of as hazardous materials off site.

Used sampling implements will be disposed of off-site.

Table 3-3: Tank residue analytical tests.

Contaminant	Container	Storage	Sample Preparation	Holding Time	DL
Total As, Cr, Hg, Zn	250 mL Plastic	Cool	2 mL 50% Nitric Acid	6 months	0.001, 0.001, 0.00005, 0.003 mg/L
Dissolved Cd, Co, Cu, Pb, Ni	250 mL Plastic	Cool	Field filtered, 2 mL 50% Nitric Acid	6 months	0.0002, 0.0003, 0.0002, 0.0002, 0.0005 mg/L
PCB	1 L amber glass	Cool	none	7 days	0.00005 mg/L
TVH	3-40 mL vials & 2-250 mL Amber Glass-no headspace	Cool	Sodium Bisulphate	14 days	0.1 mg/L
TEH	3-40 mL vials & 2-250 mL Amber Glass-no headspace	Cool	Sodium Bisulphate	14 days	0.1 mg/L

3.4 Waste Processing and Rinsing

All rinsate from tank cleaning activities will be stored, sampled and tested.

Rinsate water that meets the discharge criteria will be discharged through a hydrocarbon absorbent material at a location a minimum of 30 metres from natural drainage courses and 100 metres from fish bearing waters.

If analytical results do not meet the discharge criteria, the rinsate will be shipped off-site and disposed of at an approved facility.

The water treatment process for Johnson Point was not finalized by the time this Plan was written. A copy of the plan will be submitted once the treatment process has been finalized.

Table 3-4: Waste processing analytical tests.

Contaminant	Container	Storage	Sample Preparation	Holding Time	DL
TVH	3-40 mL vials & 2-250 mL Amber Glass-no headspace	Cool	Sodium Bisulphate	14 days	0.1 mg/L
TEH	3-40 mL vials & 2-250 mL Amber Glass-no headspace	Cool	Sodium Bisulphate	14 days	0.1 mg/L
pH	500 mL plastic	Cool	none	7 days	-

3.5 Water Ponded in Contaminated Soil Excavation

Water ponded in contaminated soil excavations will be sampled, tested and discharged to land if it is tested to meet the Wastewater Discharge Criteria outlined in the Water Use License and are listed below.

Table 3-5: Water Ponded in Soil Excavations analytical tests.

Contaminant	Container	Storage	Sample Preparation	Holding Time	DL
TVH	3-40 mL vials & 2-250 mL Amber Glass-no headspace	Cool	Sodium Bisulphate	14 days	0.1 mg/L
TEH	3-40 mL vials & 2-250 mL Amber Glass-no headspace	Cool	Sodium Bisulphate	14 days	0.1 mg/L
pH	500 mL plastic	Cool	none	7 days	-

Hydrocarbon Soil Excavations

Confirmatory sampling will be analysed for CCME hydrocarbon fractions F1-F4 listed below.

Contaminant	Container	Storage	Sample Preparation	Holding Time	DL
F1	125 mL jar-no headspace	cool	none	14 days	12 mg/kg
F2-F4	125 mL jar-no headspace	cool	none	14 days	10 mg/kg

4.0 SAMPLE HANDLING

All samples are to be sent to a CAEAL accredited laboratory for chemical analyses and will be stored in coolers with ice to maintain the temperature below 4°C. Those samples requiring preservation will be completed as per procedures outlined by the laboratory.

4.1 Sample Identification

To allow for unbiased analysis, samples will be given a sample number that provides no information to the laboratory as to the location or nature of the sample. Sample numbers and their corresponding locations will be recorded in a tracking spreadsheet and in a field notebook by the departmental representative. The sampling date will also be included. Samples will be labelled with only a sample number and a date sampled when sent to the laboratory. Samples will be labelled with provided laboratory labels and water resistant markers. Proper chain of custody procedures will be followed to prevent sample tampering.

Confirmatory soil sample locations will be marked with a tag and a number that will be recorded in a tracking spreadsheet. Water sample locations will be recorded using a GPS.

4.2 Transportation

Samples will be transported in an ice chilled cooler to keep the temperature of the samples at or below 4°C. Each chemical analysis will have holding times that they can not exceed. Transportation of the samples will be provided by air to the accredited laboratory for chemical analysis. Sample coolers will be identified with "fragile" and "keep cool" stickers. Testing results will be considered valid only if samples are analysed within the applicable holding time appropriate to the chemical analysis. The contractor will be responsible for shipping all samples from site to Edmonton. Laboratory personnel will transport the samples from the airport to the lab for analysis.

5.0 REPORTING REQUIREMENTS

Reports for the Water License parameters will be submitted monthly during site operations and will consist of a comparison of laboratory and field duplicates (as a relative percent difference) and an analysis of trip and field blanks, to assess the accuracy and precision of the laboratory results.

6.0 FIELD EQUIPMENT CALIBRATION

Field analytical equipment for hydrocarbon testing (PetroFlag kits and PID monitor) will be calibrated daily with records kept of calibration results. Soil samples will be sent to the laboratory for analysis to confirm the results obtained from field test methods.

7.0 LABORATORY ANALYSES

All chemical analyses will be conducted by Maxxam Analytics in Edmonton which is a laboratory accredited by the Canadian Association of Environmental Analytical Laboratories (CAEAL). Verification of accreditation can be provided upon request.

Detection limits are predetermined by the laboratory based on the testing procedure for the specific analysis and will be selected relative to the appropriate criteria. Analytical methodology is included in Appendix B.

APPENDIX A
SAMPLE FREQUENCY SPREADSHEET

Table 1
Sampling Frequency

Material	Sampling Frequency and Location	Duplicate Frequency	Trip blank Frequency	Field blank Frequency
F1-F4 Hydrocarbon Soils				
F1-F4 Hydrocarbons	As required	1/10	NA	NA
Grey water				
Mineral Oil & Grease	Prior to discharge	1/12	1/12	1/12
TSS	Prior to discharge	1/12	n/a	1/12
Residual Chlorine	Prior to discharge	1/12	1/12	1/12
Wastewater Derived from Sludge Consolidation				
pH	Prior to discharge	1/12	n/a	1/12
Mineral Oil & Grease	Prior to discharge	1/12	1/12	1/12
Total As, Cr, Hg, Zn	Prior to discharge	1/12	1/12	1/12
Dissolved Cd, Co, Cu, Pb, Ni	Prior to discharge	1/12	1/12	1/12
TVH	Prior to discharge	1/12	1/12	1/12
TEH	Prior to discharge	1/12	1/12	1/12
PCBs	Prior to discharge	1/12	1/12	1/12
Ponded water resulting from excavation activities and tank cleaning				
pH	Prior to discharge	1/12	n/a	1/12
TVH	Prior to discharge	1/12	1/12	1/12
TEH	Prior to discharge	1/12	1/12	1/12
Drinking water				
Copper	weekly	1/12	1/12	1/12
Iron	weekly	1/12	1/12	1/12
Lead	weekly	1/12	1/12	1/12
Manganese	weekly	1/12	1/12	1/12
Mercury	weekly	1/12	1/12	1/12
Cadmium	weekly	1/12	1/12	1/12
Chromium	weekly	1/12	1/12	1/12
Zinc	weekly	1/12	1/12	1/12
pH	weekly	1/12	1/12	1/12
Total Suspended Solids	weekly	1/12	NA	NA
Nitrate	weekly	1/12	1/12	1/12
Nitrite	weekly	1/12	1/12	1/12
Faecal Coliforms	weekly	NA	NA	NA

Glossary

Duplicate	Repeat analysis of a sample within the same batch; including all steps of the testing method. This control is used to assess the precision of the test method for the sample matrix.
Trip blank	A trip blank is a sealed sample bottle containing an inert matrix. It is carried to the field and returned to the laboratory for analysis. Those bottles are sealed in the laboratory prior to the field trip and are returned un-opened to the laboratory. This control helps to identify any possible sample contamination during shipping and handling from the laboratory to the field and back to the laboratory.
Field Blank	A field blank is a sealed sample bottle containing an inert matrix. It is carried to the field and opened under the same condition and for the same length of time as regular sample during sampling. It is then re-sealed and shipped to the laboratory with other samples for analysis. This control is used to assess possible sample contamination due to the sampling procedure used in the field.
Frequency	Controls are analyzed in a fixed frequency. This frequency is expressed as 1/n for one control for every n samples.
Trip	For the purpuse of quality control, a trip is defined as a sampling event. A sampling event can last as little as one day and as long as months.
NA = Not applicable	

Appendix B
Sample Preparation, Holding Time, Detection Limit and Analytical Method

Test	Sample Container	Sample preservation	**Holding time	Detection limit	Analytical method
* TSS	500ml Plastic	none	7 days	1mg/L	SM 2540 D
* Total residual chlorine	500ml Plastic-No Headspace	none	Preferably within 1 hr. Should not exceed 6 hours	0.02mg/L	HACH 8167
Mineral O&G	1L Amber glass	2ml 50% H2SO4	14 days	2mg/L	SM 5520 B
Dissolved metals (ICPMS)	250ml Plastic	Filter then add 2mL 50% HNO3	6 months		EPA SW-846 6020A
Cd				0.0002mg/L	
Co				0.0003mg/L	
Cu				0.0002mg/L	
Pb				0.0002mg/L	
Ni				0.0005mg/L	
Total Metals	250ml Plastic	2mL 50% HNO3	6 months		EPA SW-846 6020A
As				0.001mg/L	
Cr				0.001mg/L	
Zn				0.003mg/L	
Hg	240ml Plastic	2mL 50% HNO3	28 days	0.05ug/L	EPA 245.1
* pH	500ml Plastic	none	7 days	n/a	SM 4500-H B
* NO2,NO3	500ml Plastic	none	7 days	0.003mg/L	SM 4110-B
Faecal colifoms	100mL sterilized plastic	Sodium Thiosulfate (precharged in bottle)	48 hours	1 mpn/100mL	SM 9223 A,B
PCB (aroclor)	1L Amber Glass	none	7 days	0.05 ug/L	EPA 8081 modified
BTEX F1 (C6-C10)	3 x 44ml Vials-No Headspace	Sodium Bisulfate (precharged in vials)	14 days		EPA 8260C/CCME
Benzene				0.4ug/L	
Toluene				0.4ug/L	
Ethylbenzene				0.4ug/L	
o-Xylene				0.4ug/L	
m & p-Xylene				0.8ug/L	
Xylenes (Total)				0.8ug/L	
F1 (C6-C10)-Btex				100ug/L	
F2 (C10-C16)	2 x 250mL Amber glass-No Headspace	Sodium Bisulfate (precharged in bottles)	14 days	0.1mg/L	EPA 8015D/3510C
F1 (SOIL)	125mL Jar-No Headspace	none	14 days	12mg/kg	EPA 8260C/CCME
F2-F4 (SOIL)	125mL Jar-No Headspace	none	14 days	10mg/kg	CWS PHCS Tier 1

Can come out of the same bottle

**Hold time is based on the proper bottle/preservation.