Transport Canada
Iqaluit Airport Land Farm

QA/QC Plan

for

Nunavut Water Board
License #1BR-LTU1013

February 2012

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1.0 Introduction

Transport Canada obtained a Water License (#1BR-LTU1013) from the Nunavut Water Board to operate a land farm at the Iqaluit Airport. The land farm contains petroleum hydrocarbon (PHC) contaminated soil from various locations on the airport property.

The Water License requires Transport Canada to develop a QA/QC Plan for the Land Farm. The Water License requires Transport Canada to submit the QA/QC Plan to the accredited lab (who has performed the laboratory analysis for this site) to confirm acceptance of the Plan as per Part J Section 10 of the license. The Plan shall include up to date sampling methods to all applicable standards, acceptable to an accredited lab. Therefore, Transport Canada requests a letter from Exova Accutest confirming the acceptance of this Plan.

Prior to July 1, 1995 Iqaluit Airport was owned by the Government of Canada and operated by the Quebec Region of the Department of Transport. From July 1, 1995 until April 1, 1999 the airport was owned by the Government of Northwest Territories and operated by the Arctic Airports Division of the Department of Transportation. Since April 1, 1999 the airport has been owned by the Government of Nunavut and operated by the Nunavut Airports Division of the Nunavut Department of Community Government, Housing and Transportation.

As a condition of the Arctic A Airport transfer agreement (July 1995) between GNWT and Transport Canada, the environmental issues, which existed prior to the airport transfer, are to be remediated as well as any items identified by the GN within six years of the transfer date. Works identified under this document address some of the issues identified in the Transfer agreement as well as post transfer issues.

Transport Canada is obligated to remediate all hazardous substances that are the department's responsibility that do not comply with the applicable environmental laws.

2.0 Sampling Program

All soil and water samples must be sent to an accredited lab according to ISO/IEC Standard 17025. The contractor taking the samples must adhere to the CCME Guidance Manual on Sampling, Analysis, and Data Management for Contaminated Sites, 1993. The QA/QC Sampling program is as follows:

The first objective is to conduct a comprehensive soil sampling program at the beginning of each field season to identify the levels of PHC contamination in the soil. Due to the long winter season at this location, TC anticipates initially sampling the LTU in the beginning of June depending on weather conditions. The soil criteria used for this site will be under the CCME Canada Wide Standards for Petroleum Hydrocarbon Contaminated Soils Tier 1, coarse grain soil, Industrial site. This criteria is used due to the location of the facility between Runway 18-35 and Apron I. To access the site airport

security clearance is required. The location will not be used for commercial development due to the location adjacent to the runway and Apron.

1a) The sampling program will require eight (8) composite soil samples and a sample from each monitoring well from the LTU for submission to a laboratory for analysis. The sampling protocol for the LTU will require a random grid pattern covering the entire area. All sampling procedures will be in accordance with the standards contained in the CCME Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites Volume I &II. Quality assurance/quality control will be observed while conducting the sampling program and include at a minimum the following:

- Use of trip, field and equipment blanks;
- Use of duplicate and spiked samples;
- Proper sample containment, preservation, chain of custody; and
- Due regard for necessary health and safety precautions.

1b) All samples should be analyzed for the following parameters:

- BTEX;
- Total Extractable Hydrocarbons (TEH);
- CCME Canada Wide Standards for Petroleum Hydrocarbons in Soil for Fractions #1 to #4 for the Tier 1 criteria, coarse grain soil for Industrial Sites.
- Polycyclic Aromatic Hydrocarbons (PAH);
- Total Heavy Metals (Al, As, Cd, Co, Cu, Fe, Pb, Mo, Ni, Se, Ag, Ti, Zn).

Summary of Tier 1 Levels (mg/kg) for surface soil CCME.*

Land Use	Soil Texture	F 1	F 2	F 3	F 4
Agriculture	Coarse grain soil Fine grain soil	30b 210 (170a)	150 150	300 1300	2800 5600
Residential/Parkland	Coarse grain soil Fine grain soil	30b 210(170a)	150 150	300 1300	2800 5600
Commercial	Coarse grain soil Fine grain soil	320(240a) 320(170a)	260 260(230a)	1700 2500	3300 6600
Industrial	Coarse grain soil Fine grain soil	320 (240a) 320 (170a)	260 260 (230a)	1700 2500	3300 6600

* Additional Tier 1 levels are presented in Technical Supplement.
a= Where applicable, for protection of potable groundwater.
b= assumes contamination near residence

2a) The use of a gas Photo Ionization Detector (PID) or similar equipment to monitor hydrocarbon vapours will be required to field screen the soil sample taken. The use of field screening the soil will provide an immediate representation of the conditions and levels of the PHC in the soil. This process does not replace laboratory results, however it does give a good sense of the conditions.

The results of the laboratory analysis are to be compared to the Nunavut Environmental Guidelines for Site Remediation (most current edition), CCME Canada Wide Standards Petroleum Hydrocarbon Guidelines (most current edition) and the CCME Interim Canadian Environmental Quality Criteria for Contaminated Sites (most current edition) remediation criteria for industrial zoned sites. The selected laboratory must provide quality assurance (QA) and quality control (QC) procedures. All samples are to be procured through approved methods and procedures and are to be submitted to a Certified Laboratory (CAEAL/ Standards Council of Canada - ISO/IEC Standard 17025) for formal analysis.

3.0 Nutrient Amendments and Tilling

Biodegradation requires micro-organisms are meeting nutritional requirements. The optimal range of carbon:nitrogen:phosphorus (C:N:P) is 100:10:1 to 100:1:0.5. Soil amendments in the form of commercially used solid fertilizers will be applied in sufficient amounts as recommended by the manufacturer to achieve this target ratio for the specified volume and PHC concentration of soil in the LTU.

Once the nutrients have been added to the LTU the soil will be turned over with the use of a backhoe. This will expose the soil to oxygen and for micro-organisms as well as distributes nutrients and moisture in the soil, thereby aiding in biodegradation. Care must be taken by the backhoe operator not to tear the liner and report any cracks, blisters or punctures to the liner.

4.0 Leachate Management

The LTU is constructed with a 1% slope which allows any leachate to collect in the sump area. Visual monitoring of the sump ensures that water is collecting in the sump area indicates the liner is not damaged. Leachate may be recirculated over the LTU soil surface as a means of irrigation to maintain optimal biodegradation rates. Discharge of the leachate may be required if the sump collection area rises to within 1 foot of the top of the berm. This is not likely to happen due to the height of the engineered berms taking into consideration the amount of precipitation and evaporation rates at this location. If the leachate is required to be discharged it must first meet the discharge levels within CCME EQGs and the Water License 1BR-LTU1013 agreement for LTU wastewater discharge criteria:

Parameter	Maximum Allowable Concentration (ug/l)
Oil & Grease	**5000**
Lead	**1**
Benzyene	**370**
Toluene	**2**
Ethylbenzene	**90**

The area designated for leachate disposal is located adjacent to the LTU in the open field between Apron I and the runway. This area is located greater then 1 km away from any water body and potable water source.

The LTU will continue to be monitored each field season to ensure the facility is operating as it has been designed. Additional soil sampling will be conducted in the fall of each year to determine the effectiveness of the previous amendments in the spring. A soil sampling program will be conducted in August or September as described earlier including monitoring wells. The following outlines when the samples and activities will be conducted:

Activity	Time of Year	Time of Year
Soil Sample	**June**	**September**
Monitoring Well Sample	**June**	**September**
Tilling/Fertilizer	**June**	**If Required Aug - Sept**

5.0 Monitoring Well Sampling

TC will undertake sampling the monitoring wells and the sump inside the LTU as described in the Water License No. 1BR-LTU1013. The first step with groundwater monitoring involves obtaining a Photo Ionization Detector (PID) reading of the interior of the well. Prior to sampling from the well, each well is developed using a Wattera™ inertial pump with HDPE tubing. While purging the well, the equivalent of 3 static level well volumes of water is removed.

Groundwater monitoring activities include:

- The collection of volatile organic compounds (VOC's) using the PID. VOC's are taken from inside each well casing by placing the PID nozzle approximately 15 to 30 cm below the top of the casing and recording the peak reading on the PID. The PID is calibrated prior to use.
- Measurements of the groundwater depth is taken using an electronic oil/water Waterra HS-1 interface probe. Prior to each use in each well, the interface probe is cleaned using a lab-grade phosphate-free detergent and water solution and

rinsed with distilled water to minimize the potential for cross-contamination. Depth measurements are taken from the top of the casing.

All groundwater samples are collected using a dedicated disposable bailer. Conductivity, PH and temperature of the groundwater is measured in the field while samples are being collected. All field data is recorded on groundwater monitoring logs for each monitoring well.

All samples are kept in laboratory-provided coolers, shipped and submitted under chain-of-custody procedures.

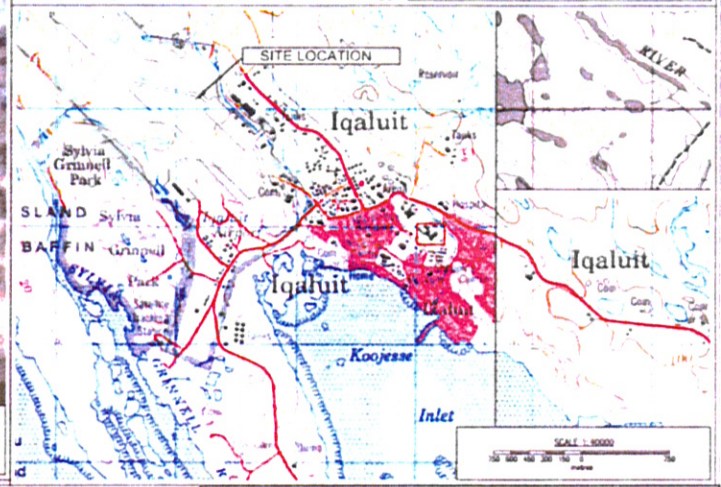
The frequency and time of year are outlined in the above table. The sump will be tested prior to any required discharge and tested prior to the decommissioning of the facility. The parameters for testing the monitoring wells are as follows:

Station	Location	Parameter	Frequency
LTU -1	**Sump**	**PTH, BTEX, HM,PAH**	**Discharge**
LTU – MW1	**Upgradient - LTU**	**PTH, BTEX, HM,PAH**	**Twice/year**
LTU – MW2	**Downgradient - LTU**	**PTH, BTEX, HM,PAH**	**Twice/year**
LTU – MW3	**Downgradient - LTU**	**PTH, BTEX, HM,PAH**	**Twice/year**

- Franz Environmental was contracted in September 2009 to inspect the LTU facility and monitoring wells. All wells are working properly and the LTU cells are also working as designed. Please as the "As Built Drawings" for the report and more details included.
- No PCBs present in facility. PCB contaminated soil is not allowed in the LTU.
- All samples must be sent to an accredited lab according to ISO/IEC Standard 17025. The contractor taking the samples must adhere to the CCME Guidance Manual on Sampling, Analysis, and Data Management for Contaminated Sites, 1993.

Appendix I

Site Location
Site Photos



References:

(above) Google Earth satellite image, 2008.

(upper right) *"Canada Road Map"*, MapArt Publishing, 2003

(lower right, composite) Natural Resources Canada NTS Sheet: 25-N/9 Burton Bay, Nunavut, Edition 3, NAD 83, Series A 713, 2001.
Natural Resources Canada NTS Sheet: 25-N/10 Hill Island, Nunavut, Edition 2, NAD 83, Series A 713, 2001.
Natural Resources Canada NTS Sheet: 25-N/15 Iqaluit, Nunavut, Edition 2, NAD 83, Series A 713, 2001.
Natural Resources Canada NTS Sheet: 25-N/16 (No Title) Nunavut, Edition 2, NAD 83, Series A 701, 2001.

Title: SITE LOCATION

FRANZ ENVIRONMENTAL INC.
CONSULTING • ENGINEERING • TECHNOLOGIES

Project: LTU AS-BUILT REPORT
IQALUIT AIRPORT
IQALUIT, NT

Date: JUNE 2010

Client: TRANSPORT CANADA

SCALES AS SHOWN

FIGURE 1

Z:\Projects\2009\1584-0902 TC Iqaluit Airport LTUs\figures

Appendix II

Water License #1BR-LTU1013

P.O. Box 119
Gjoa Haven, NU X0B 1J0
Tel: (867) 360-6338
Fax: (867) 360-6369

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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

File No.: **1BR-LTU1013**

February 13, 2010

Michael Molinski, Environment Officer
Environmental Affairs
Transport Canada
P.O. Box 8550
3rd Floor – 344 Edmonton St.
Winnipeg, MB R3C 0P6
Email: Michael.molinski@tc.gc.ca

RE: NWB Licence No. 1BR-LTU1013

Dear Mr. Molinski,

Please find attached Licence No. **1BR-LTU1013** issued to Transport Canada – Environmental Affairs, Programs by the Nunavut Water Board (NWB) pursuant to its authority under Article 13 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada.* The terms and conditions of the attached Licence related to water use and waste disposal are an integral part of this approval.

If the Licensee contemplates the renewal of this Licence, it is the responsibility of the Licensee to apply to the NWB for its renewal. The past performance of the Licensee, new documentation and information, and issues raised during a public hearing, if the NWB is required to hold one, will be used to determine the terms and conditions of the Licence renewal. Note that if the Licence expires before the NWB issues a new one, then water use and waste disposal must cease, or the Licensee will be in contravention of the *Nunavut Land Claims Agreement* (NLCA) and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA). However, the expiry or cancellation of a licence does not relieve the holder from any obligations imposed by the licence. The NWB recommends that an application for the renewal of this Licence be filed at least three months prior to the Licence expiry date.

If the Licensee contemplates or requires an amendment to this licence, the NWB may decide, in the public interest, to hold a public hearing. The Licensee should submit applications for amendment as soon as possible to give the NWB sufficient time to go through the amendment process. The process and timing may vary depending on the scope of the amendment, however a minimum of sixty (60) days is required from time of acceptance by the NWB. It is the responsibility of the Licensee to ensure that all application materials have been received and acknowledged by the Manager of Licensing.

The NWB strongly recommends that the Licensee consult the comments received by interested persons on issues identified. This information is attached for your consideration.[1]

Following the public comment period, on June 26, 2009 a Spill Contingency Plan entitled "NWB Water Licence Number: 1BR-LTU0608 was received by the NWB. After an internal review, this Plan has been found deficient and a revised Spill Contingency Plan is required. Additional information in this requirement is detailed under Part H, Item 1.

Sincerely,

Thomas Kabloona
Nunavut Water Board
Chair

TK/dc/pb

Enclosure: Licence No. **1BR-LTU1013**
Comments
Consolidation of Spill Contingency Planning and Reporting Regulations R-068-93

cc: Distribution – Qikiqtani

1 Government of Nunavut Department of Culture, Language, Elders and Youth (GN-CLEY), April 15, 2009; Indian and Northern Affairs Canada (INAC), April 21, 2009; Government of Nunavut Department of Environment (GN-DoE), May 5, 2009 and Environment Canada (EC), May 7, 2009

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DECISION

LICENCE NUMBER: 1BR-LTU1013

This is the decision of the Nunavut Water Board (NWB) with respect to an application dated January 5, 2009 for a renewal of a Water Licence made by:

TRANSPORT CANADA – ENVIRONMENTAL AFFAIRS, PROGRAMS

to allow for the disposal of waste during remediation activities at the Iqaluit Airport Project located at Iqaluit within the Qikiqtani Region, Nunavut generally located at the geographical coordinates as follows:

Latitude: 63° 45' 26"N Longitude: 68° 33' 01"W

DECISION

After having been satisfied that the application was for a location within an area in which there is no valid Land Use Plan and exempt from the requirement for screening by the Nunavut Impact Review Board in accordance with Schedule 12.1, Paragraph 5 of the *Nunavut Land Claim Agreement* (NLCA), the NWB decided that the application could proceed through the regulatory process. In accordance with S.55.1 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act (NWNSRTA)* and Article 13 of the *NLCA*, public notice of the application was given and interested persons were invited to make representations to the NWB.

After reviewing the submission of the Applicant and considering the representations made by interested persons, the NWB, having given due regard to the facts and circumstances, the merits of the submissions made to it and to the purpose, scope and intent of the *NLCA* and of the *NWNSRTA*, waived the requirement to hold a public hearing, and determined that:

Licence Number 1BR-LTU1013 be issued subject to the terms and conditions contained therein. (Motion #: 2009-18-L11)

SIGNED this 13th day of February 2010 at Gjoa Haven, NU.

Thomas Kabloona
Nunavut Water Board
Chair

TK/dc/pb

NUNAVUT WATER BOARD
WATER LICENCE

Pursuant to the Nunavut Waters and Nunavut Surface Rights Tribunal Act and the Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada, the Nunavut Water Board, hereinafter referred to as the Board, hereby grants to

TRANSPORT CANADA – ENVIRONMENTAL AFFAIRS, PROGRAMS
(Licensee)
3RD FLOOR – 344 EDMONTON ST., P.O. BOX 8550, WINNIPEG, MB R3C 0P6
(Mailing Address)

hereinafter called the Licensee, the right to alter, divert or otherwise use water or dispose of waste for a period subject to restrictions and conditions contained within this Licence:

Licence Number/Type:	1BR-LTU1013 TYPE "B"
Water Management Area:	NUNAVUT 05
Location:	IQALUIT AIRPORT PROJECT, IQALUIT QIKIQTANI REGION, NUNAVUT
Classification:	INDUSTRIAL UNDERTAKING
Purpose:	DEPOSIT OF WASTE
Quantity of Water use not to Exceed:	NO WATER USE AUTHORIZED UNDER THE LICENCE
Date of Licence Issuance:	FEBRUARY 13, 2010
Expiry of Licence:	DECEMBER 31, 2013

This Licence, issued and recorded at Gjoa Haven, Nunavut, includes and is subject to the annexed conditions.

Thomas Kabloona,
Nunavut Water Board
Chair

PART A: SCOPE, DEFINITIONS AND ENFORCEMENT

1. Scope

This Licence allows for the disposal of waste during an undertaking classified as Industrial as per Schedule II of the *Regulations* at the Iqaluit Airport Project, located in Iqaluit within the Qikiqtani Region, Nunavut.

a. This Licence is issued subject to the conditions contained herein with respect to the taking of water and the depositing of waste of any type in any waters or in any place under any conditions where such waste or any other waste that results from the deposits of such waste may enter any waters. Whenever new Regulations are made or existing *Regulations* are amended by the Governor in Council under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, or other statutes imposing more stringent conditions relating to the quantity or type of waste that may be so deposited or under which any such waste may be so deposited, this Licence shall be deemed, upon promulgation of such Regulations, to be subject to such requirements; and

b. Compliance with the terms and conditions of this Licence does not absolve the Licensee from responsibility for compliance with the requirements of all applicable Federal, Territorial and Municipal legislation.

2. Definitions

"**Act**" means the *Nunavut Waters and Nunavut Surface Rights Tribunal Act;*

"**Addendum**" means the supplemental text that is added to a full plan or report usually included at the end of the document and is not intended to require a full resubmission of the revised report.

"**Amendment**" means a change to original terms and conditions of this Licence requiring correction, addition or deletion of specific terms and conditions of the Licence; modifications inconsistent with the terms of the set terms and conditions of the Licence;

"**Appurtenant Undertaking**" means an undertaking in relation to which a use of water or a deposit of waste is permitted by a licence issued by the Board;

"**Board**" means the Nunavut Water Board established under the *Nunavut Land Claims Agreement* and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act;*

"**Effluent**" means treated or untreated liquid waste material that is discharged into the environment from a structure such as a settling pond or a treatment facility;

"**Engineer**" means a professional engineer registered to practice in Nunavut in

accordance with the Engineering, Geological and Geophysical Act (Nunavut) S.N.W.T. 1998, c.38, s.5;

"**Grab Sample**" means a single water or wastewater sample taken at a time and place representative of the total discharge;

"**Inspector**" means an Inspector designated by the Minister under Section 85 (1) of the *Act*;

"**Land Treatment Unit ("LTU")**" means the landfarm facility constructed under the previous licence as per drawing no. 06-1344-01 and described in "Transport Canada, Iqaluit, Nunavut Land Treatment Unit, Operation and Maintenance Plan" dated January 1, 2009;

"**Licensee**" means the holder of this Licence;

"**Modification**" means an alteration to a physical work that introduces a new structure or eliminates an existing structure and does not alter the purpose or function of the work, but does not include an expansion;

"**Nunavut Land Claims Agreement**" **(NLCA)** means the *"Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada"*, including its preamble and schedules, and any amendments to that agreement made pursuant to it;

"**Regulations**" means the *Northwest Territories Water Regulations sor/93-303 8th June, 1993*, omitting Section 5, Water Use or Waste Deposit Without a Licence;

"**Spill Contingency Plan**" means a Plan developed to deal with unforeseen petroleum and hazardous materials events that may occur during the operations conducted under the Licence;

"**Sump**" means an excavation in impermeable soil for the purpose of catching or storing water or waste;

"**Treatment Objective**" means the treatment objective for the Land Treatment Unit which is based on the Canadian Council of Ministers of the Environment (CCME), 2001 *Canada – Wide Standard for Petroleum Hydrocarbon in Soil*, revised January 2008; and as determined by the Government of Nunavut, Environmental Protection Service based on the 2002 *Environmental Guideline for Site Remediation*; See Table No. 1

"**Type B Soil**" means soil contaminated with hydrocarbons in which the primary petroleum product present in the soil as determined by laboratory analysis consists of fuel oil and /or diesel fuel and /or gasoline;

"**Waste**" means, as defined in S.4 of the *Act*, any substance that, by itself or in

combination with other substances found in water, would have the effect of altering the quality of any water to which the substance is added to an extent that is detrimental to its use by people or by any animal, fish or plant, or any water that would have that effect because of the quantity or concentration of the substances contained in it or because it has been treated or changed, by heat or other means.

3. **Enforcement**

a. Failure to comply with this Licence will be a violation of the *Act*, subjecting the Licensee to the enforcement measures and the penalties provided for in the *Act*;

b. All inspection and enforcement services regarding this Licence will be provided by Inspectors appointed under the *Act*; and

c. For the purpose of enforcing this Licence and with respect to the use of water and deposit or discharge of waste by the Licensee, Inspectors appointed under the *Act*, hold all powers, privileges and protections that are conferred upon them by the *Act* or by other applicable law.

PART B: GENERAL CONDITIONS

1. Water use fees are not required for this Licence as per S. 7 of the *Act*.

2. The Licensee shall file an Annual Report on the appurtenant undertaking with the Board no later than March 31st of the year following the calendar year being reported, containing the following information:

a. A summary report of water use and waste disposal activities;
b. A list of unauthorized discharges and a summary of follow-up actions taken;
c. Any revisions or addendums to approved Plans submitted under the Licence which may require Board approval;
d. A description of all progressive and or final reclamation work undertaken, including photographic records of site conditions before, during and after completion of operations;
e. A summary of all information requested and results of the Monitoring Program;
f. For the 2009 Annual Report, provide clarification on the presence or absence on site of oils containing PCB's and if present, provide the plans for removal/treatment and disposal of these oils as necessary;
g. Quantities and locations of remediated soil being deposited, as required by Part
h. For the 2009 Annual Report, provide further information, confirmation and documentation on the down gradient berm toe reinforcement referenced in the Technical and Project Team Proposal, along with confirmation that the berm is stable and functioning appropriately; and
i. Any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.

3. The Licensee shall notify the NWB of any changes in operating plans or conditions associated with this project at least thirty (30) days prior to any such change.

4. The Licensee shall, for all Plans submitted under this Licence, include a proposed timetable for implementation. Plans submitted, cannot be undertaken without subsequent written Board approval and direction. The Board may alter or modify a Plan if necessary to achieve the legislative objectives and will notify the Licensee in writing of acceptance, rejection or alteration of the Plan.

5. The Licensee shall, for all Plans submitted under this Licence, implement the Plan as approved by the Board in writing.

6. Every Plan to be carried out pursuant to the terms and conditions of this Licence shall become a part of this Licence, and any additional terms and conditions imposed upon approval of a Plan by the Board become part of this Licence. All terms and conditions of the Licence should be contemplated in the development of a Plan where appropriate.

7. The Licensee shall ensure a copy of this Licence is maintained at the site of operations at all times. Any communication with respect to this Licence shall be made in writing to the attention of:

(a) **Manager of Licensing:**
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0
Telephone: (867) 360-6338
Fax: (867) 360-6369
Email: licensing@nunavutwaterboard.org

(b) **Inspector Contact:**
Manager of Field Operations, INAC
Nunavut District, Nunavut Region
P.O. Box 100
Iqaluit, NU X0A 0H0
Telephone: (867) 975-4295
Fax: (867) 979-6445

8. The Licensee shall submit one paper copy and one electronic copy of all reports, studies, and plans to the Board. Reports or studies submitted to the Board by the Licensee shall include a detailed executive summary in Inuktitut.

9. The Licensee shall ensure that any document(s) or correspondence submitted by the Licensee to the Board is received and acknowledged by the Manager of Licensing.

10. This Licence is assignable as provided in Section 44 of the *Act*.

PART C: CONDITIONS APPLYING TO WATER USE

1. No water use is authorized under this Licence.

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall locate areas designated for waste disposal at a minimum distance of thirty one (31) metres from the ordinary high water mark of any water body such that the quality, quantity or flow of water is not impaired, unless otherwise approved by the Board in writing.

2. All waste generated under the Licence shall be removed from site and disposed of in an approved waste disposal facility.

3. The Licensee shall provide at least ten (10) days written notice to the Inspector prior to any planned discharges from the sump in the Land Treatment Unit. The notice shall include the volume proposed for discharge and results of monitoring under Part J, Item 3.

4. Any discharge from the sump in the Land Treatment Unit to the environment shall meet the following Effluent quality limits:

Parameter	Maximum Concentration of any Grab Sample (µg/L)
pH	6 to 9 (pH units)
Oil and Grease	5000
Arsenic (total)	100
Cadmium (dissolved)	10
Chromium (dissolved)	100
Cobalt (dissolved)	50
Copper (dissolved)	200
Lead (dissolved)	1
Mercury (total)	0.6
Nickel (dissolved)	200
PCB (total)	1000
Phenols	20
Zinc (total)	500
Benzene	370
Toluene	2
Ethylbenzene	90

5. If effluent does not meet the effluent quality limits of Part D. Item 4 above, it shall be considered hazardous waste and disposed off-site to an approved, licensed facility.

6. The discharge location for all treated effluents described in Part D Item 4 shall be located at a minimum of thirty one (31) metres from the ordinary high water mark of any water body and where direct or indirect flow into a water body is not possible and no additional impacts are created.

7. Licensee shall treat Type B Soil in the Landfarm Facility, to the Treatment Objective and, prior to the removal of any treated soil for future use, confirm with the Government of Nunavut, Environmental Protection Service that the soils have been treated to meet the required Treatment Objective, in a manner in accordance with the Operation and Maintenance (O&M) Plan dated January 1, 2007, and any subsequent revisions to the Plan approved by the Board in writing

8. The Licensee shall direct all treated soil that meets the Treatment Objective detailed in Table No. 1 to industrial or commercial land. Residential/parkland shall only be used as a disposal location if the Licensee demonstrates that the soil meets the additional criteria for such lands.

PART E: CONDITIONS FOR CONSRUCTION AND OPERATION

1. The Licensee shall within sixty (60) days of issuance of this Licence, submit to the Board for review, as-built drawings, stamped and signed by an Engineer for the Land Treatment Unit.

2. The NWB has approved the Operation and Maintenance (O&M) Manual entitled "Transport Canada, Iqaluit, Nunavut Land Treatment Unit, Operation and Maintenance Plan" dated January 1, 2009.

3. The Licensee shall within ninety (90) days, submit to the Board for review, an addendum to the approved O&M Manual. The revised O&M Manual shall include or address the following:

    a. A table of contents;
    b. Include the effective date for the Plan;
    c. Include Inspection and maintenance procedures for the Landfarm to ensure its effectiveness;
    d. Procedure for snow removal/treatment prior to spring melt;
    e. A means of controlling dust from, and precipitation infiltration into the land treatment facility;
    f. Access to the site should be restricted through fencing or other suitable means and signs warning of the potential hazard;
    g. Prior to the placement of any contaminated soil in the land treatment facility, the contaminated soil in question should be characterized with respect to the quality

and level of contamination and a treatability study carried out to determine the feasibility of remediating the contaminated soil to an acceptable level that meets the appropriate criteria as set forth in Canadian Councils of Ministers of the Environment (CCME) Canadian Soils Quality Guidelines (The proponent is requested to review the information in Appendix A of the letter dated June 30, 2006 for details regarding characterization of source soils, and further information on landfarming practices);

h. A detailed set of operational procedures should be prepared which identifies the recommended frequency and methods of tillage, microbial population density, moisture content of soil, depth of piles/windrows, and the type and application rate of any land treatment amendments, including water, air, lime, nutrients, or inoculums, which may be required;

i. Provide the planned frequency and timing of soil and ground water well monitoring;

j. Verify that monitoring wells are functioning as intended;

k. Confirm whether PCBs are present and if so, in what concentrations;

l. Include the approved Quality Assurance Quality Control Plan required under Part J, Item 10; and

m. Any further information based on relevant recommendations submitted by Environment Canada, including the January 31, 2007 submission to the NWB on the previous application.

4. The Licensee shall, during the excavation of soils to be treated within the LTU, implement measures prior to, during and following the excavation of soils, to prevent migration of sediments from the site that may impact water.

5. The Licensee shall not mix or blend PHC contaminated soils with non-contaminated soils for the expressed purpose of achieving the Treatment Objective.

PART F: CONDITIONS APPLYING TO DRILLING OPERATIONS

1. The Licensee is authorized to drill for the purpose of installing monitoring wells.

2. The Licensee shall not conduct any land based drilling within thirty one (31) metres of the ordinary high water mark of any water body, unless otherwise approved by the Board in writing.

3. The Licensee shall ensure that all drill waste, including chips, muds and salts ($CaCl_2$) in any quantity or concentration, from land-based drilling, shall be disposed of in a properly constructed sump or an appropriate natural depression located at a distance of at least thirty one (31) metres from the ordinary high water mark of any adjacent water body, where direct flow into a water body is not possible and no additional impacts are created.

4. If artesian flow is encountered, drill holes shall be immediately sealed and permanently

capped to prevent induced contamination of groundwater or salinization of surface waters. The Licensee shall report all artesian flow occurrences within the Annual Report, including the location (GPS coordinates) and dates.

PART G: CONDITIONS APPLYING TO MODIFICATIONS

1. The Licensee may, without written consent from the Board, carry out Modifications to the Water Supply Facilities and Waste Disposal Facilities provided that such Modifications are consistent with the terms of this Licence and the following requirements are met:

    a. the Licensee has notified the Board in writing of such proposed Modifications at least sixty (60) days prior to beginning the Modifications;
    b. such Modifications do not place the Licensee in contravention of the Licence or the *Act*;
    c. such Modifications are consistent with the NIRB Screening Decision
    d. the Board has not, during the sixty (60) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and
    e. the Board has not rejected the proposed Modifications.

2. Modifications for which all of the conditions referred to in Part G, Item 1 have not been met, can be carried out only with written approval from the Board.

3. The Licensee shall provide as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modification. These plans and drawings shall be stamped by an Engineer.

PART H: CONDITIONS APPLYING TO SPILL CONTINGENCY PLANNING

1. The Board acknowledges receipt of the Plan entitled "NWB Water License Number: 1BR-LTU0608, Part H: Spill Contingency Plan" undated and received on June 26, 2009. The Plan, although containing basic information, is lacking specific components of a plan acceptable to the Board. The Licensee shall therefore submit to the Board for approval, within sixty (60) days of issuance of the Licence, a revised Spill Contingency Plan, developed in the format set out by the Consolidation of Spill Contingency Planning and Reporting Regulations R-068-93, and address comments received during the application review process. In addition to addressing products to be stored, the procedures for the prevention, monitoring, detection, containment and cleanup of potential failures from the Land Treatment Unit containment structures shall also be included.

2. The Licensee shall review the Plan referred to in this Part as required by changes in operation and/or technology and modify the Plan accordingly. Revisions to the Plan are

to be submitted in the form of an Addendum to be included with the Annual Report.

3. The Licensee shall prevent any chemicals, petroleum products or wastes associated with the project do not enter water. All sumps and fuel caches shall be located at a distance of at least thirty one (31) metres from the ordinary high water mark of any adjacent water body and inspected on a regular basis.

4. The Licensee shall ensure that any equipment maintenance and servicing be conducted only in designated areas and shall implement special procedures (such as the use of drip pans) to manage motor fluids and other waste and contain potential spills.

5. If during the term of this Licence, an unauthorized discharge of waste occurs, or if such a discharge is foreseeable, the Licensee shall:

    1. Employ the Spill Contingency Plan;
    2. Report the spill immediately to the 24-Hour Spill Line at (867) 920-8130 and to the INAC Manager of Field Operations at (867) 975-4295; and
    3. For each spill occurrence, submit to the Inspector, no later than thirty (30) days after initially reporting the event, a detailed report that will include the amount and type of spilled product, the GPS location of the spill, and the measures taken to contain and clean up the spill site.

PART I: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION OR TEMPORARY CLOSING

1. The Licensee shall submit to the Board for approval in writing, within sixty (60) days of issuance of this Licence, a standalone Abandonment and Restoration Plan, for the licensed facilities and include or address the following:

    a. Pre-amble with effective period, project name, location description, reference to maps and regulatory instruments in place;
    b. Introduction with descriptions of the project area, scope of the plan and when seasonal or final abandonment will be implemented;
    c. Schedule with estimated time frame for carrying out the plan; and
    d. Project infrastructure including seasonal and final abandonment and restoration procedures for the project components.

2. The Licensee shall review the Plan referred to in this Part as required by changes in operation and/or technology and modify the Plan accordingly. Revisions to the Plan are to be submitted in the form of an Addendum to be included with the Annual Report.

3. The Licensee shall complete all restoration work prior to the expiry of this Licence.

4. The Licensee shall carry out progressive reclamation of any components of the project no longer required for the Licensee's operations.

5. The Licensee shall remove from the site, all infrastructure and site materials, including all fuel caches, drums, barrels, material and equipment prior to the expiry of this Licence.

6. In order to promote growth of vegetation and the needed microclimate for seed deposition, all disturbed surfaces shall be prepared by ripping, grading, or scarifying the surface to conform to the natural topography.

7. Areas that have been contaminated by hydrocarbons from normal fuel transfer procedures shall be reclaimed to meet objectives as outlined in the Government of Nunavut's Environmental Guideline for Site Remediation, January 2002. The use of reclaimed soils for the purpose of back fill or general site grading may be carried out only upon consultation and approval by the Government of Nunavut, Department of Environment and an Inspector.

8. All disturbed areas shall be contoured and stabilized upon completion of work and restored to a pre-disturbed state.

PART J: CONDITIONS APPLYING TO THE MONITORING PROGRAM

1. The Licensee shall measure and record the volume of all soil from all locations entering the Land Treatment Unit.

2. The Licensee shall assess and record the concentration of F1 – F4 fractions in petroleum hydrocarbon contaminated soil, according to the CCME *Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil*, that is entering the Land Treatment Unit from all sources and excavations.

3. The Licensee shall maintain Monitoring Program Stations, sampling and analyses as described below at the following locations:

Station	Location	Parameters[2]	Frequency
LTU-1	Discharge from the sump	See Part D, Item 7	Representative sample prior to each discharge
LTU-MW1	Monitoring well upgradient of the Land Treatment Unit	TPH BTEX HM PAH	Twice per year (after freshet and at the end of the treatment season)
LTU-MW2	Monitoring well	TPH	Twice per year (after

2 Parameters: TPH (Total Petroleum Hydrocarbons)
BTEX (Benzene, Toluene, Ethybenzene, Xylene)
HM (Heavy Metals including Al, As, Cd, Co, Cu, Fe, Pb, Mo, Ni, Se, Ag, Ti, Zn)
PAH (Polycyclic Aromatic Hydrocarbons)

	downgradient of the Land Treatment Unit	BTEX HM PAH	freshet and at the end of the treatment season)
LTU-MW3	Monitoring well downgradient of the Land Treatment Unit	TPH BTEX HM PAH	Twice per year (after freshet and at the end of the treatment season)

4. The Licensee shall determine the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where remediated soil is deposited.

5. The Licensee shall keep accurate records of the date, amounts and final destination of all treated soil removed from the LTU under Part D, Item 11, and provide to an Inspector upon request.

6. The Licensee shall sample prior to discharge at Monitoring Program Station LTU-1, to verify compliance with the effluent quality limits under Part D, Item 4.

7. The Licensee shall sample at Monitoring Program Stations LTU-MW1, MWLTU-2 and LTU-MW3 once annually in the summer, giving consideration to adequate ground thaw and obtaining a representative groundwater sample. Samples shall be analyzed for the following parameters:

Total Suspended Solids	pH
Total Hardness	Total Alkalinity
Conductivity	Nitrate-Nitrite
Ammonia Nitrogen	Chloride
Oil and Grease	Total Phenols
Sulphate	
Calcium	Magnesium
Sodium	Potassium
Total Aluminium	Total Cadmium
Total Chromium	Total Cobalt
Total Copper	Total Iron
Total Lead	Total Manganese
Total Molybdenum	Total Nickel
Total Selenium	Total Silver
Total Titanium	Total Zinc
Total Mercury	Total Arsenic

PCB (Polychlorinated Biphenyls)
TPH (Total Petroleum Hydrocarbons)
PAH (Polycyclic Aromatic Hydrocarbons)
BTEX (Benzene, Toluene, Ethylbenzene, Xylene)

8. All sampling, sample preservation and analyses shall be conducted in accordance with methods prescribed in the current edition of *Standard Methods for the Examination of Water and Wastewater*, or by such other methods approved by the Board in writing.

9. All analyses shall be performed in a laboratory accredited according to ISO/IEC Standard 17025. The accreditation shall be current and in good standing.

10. The Licensee shall submit a Quality Assurance/Quality Control (QA/QC) Plan to the Board for inclusion with the O&M Manual, required under Part E, Item 4. The Plan shall include up to date sampling methods to all applicable standards, acceptable to an accredited laboratory as required by Part J, Item 8 and Part J, Item 9. The Plan shall include a covering letter from the accredited laboratory, confirming acceptance of the Plan for analyses to be performed under this Licence.

11. The Licensee shall annually review the Quality Assurance/Quality Control Plan in Part J, Item 10 and modify it as necessary. Proposed modifications shall be submitted to the accredited laboratory for approval.

12. Additional monitoring requirements may be requested by the Inspector

13. The Licensee shall include in the Annual Report required under Part B, Item 2 all data, monitoring results and information required by this Part.

Table No. 1
Remediation Requirements

		Agricultural	Residential/Parkland	Commercial	Industrial
Fraction 1	Coarse	30[b]	150	300	2800
	Fine	210 (170[a])	150	1300	5600
Fraction 2	Coarse	30[b]	150	300	2800
	Fine	210 (170[a])	150	1300	5600
Fraction 3	Coarse	320 (240[a])	260	1700	3300
	Fine	320 (170[a])	260 (230[a])	2500	6600
Fraction 4	Coarse	320 (240[a])	260	1700	3300
	Fine	320 (170[a])	260 (230[a])	2500	6600
Benzene		0.05	0.5	5	5
Toluene		0.1	0.8	0.8	0.8
Ethylbenzene		0.1	1.2	20	20
Xylene		0.1	1	17	20
Total Petroleum Hydrocarbons		-	500	2500	2500
Lead		70	140	260	400
Polychlorinated biphenyl		0.5	5	50	50

Notes: All values are in parts per million (ppm).
a = Where applicable, for protection of potable groundwater.
b = Assumes contamination near residence

Data from CCME *Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil*, (2001) Revised January 2008 and the Government of Nunavut *Environmental Guideline for Site remediation*, (2002).