Operation & Maintenance Plan for Chesterfield Inlet Landfarm

Version 1.0

Created May 2012

Effective till October 2017

Stantec Project # 144901145

GN Project # 10-3018

Prepared for:

Government of Nunavut
Community and Government Services,
Box 490, Oomilik Building
Rankin Inlet, NU,
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11, May, 2012

File: 144901145

Phyllis Beaulieu
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0

Attn: Phyllis Beaulieu

Re: Proposed Landfarm Operation & Maintenance Plan

Dear Phyllis,

Please find enclosed the Operation & Maintenance Plan as required for the proposed Water Licence Application submitted on behalf of the Government of Nunavut, Community and Government Services. This Plan is intended to be a stand alone document and meets all requirements for an Operation and Maintenance Plan for the proposed landfarm.

If you have any questions regarding this plan please don't hesitate to contact us

Sincerely,

Stantec Architecture Ltd.,

Arlen Foster, EIT

Civil / Environmental Engineering

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1 Introduction

1.1 INFORMATION OF THE LICENSEE

Government of Nunavut
Community and Government Services
Box 490, Oomilik Building
Rankin Inlet NU,
X0C 0G0
(867) 645-8100

1.2 INFORMATION OF 24 HOUR CONTACT

Department of Community & Government Services
Petroleum Products Division
Regional Director CGS Kivalliq Region
(867) 645-8153
(867) 645-3625

1.2.1 Effective Dates & Revisions

Operation and Maintenance Plan Effective Date:

1. May 11, 2012

Operation and Maintenance Plan Revision Date:

1. None

1.3 COMMUNITY INFORMATION

The Hamlet of Chesterfield Inlet, or Igluligaarjuk, Nunavut with a population of 332 people is located at latitude 63 degrees 20 minute north and longitude 90 degrees 42 minutes west. It lies on the south shore of Chesterfield Inlet and on the west shore of Hudson Bay. In relation to other communities, Chesterfield Inlet is 101 Km northeast of Rankin Inlet.

Chesterfield Inlet's topography consists of sand to gravel landscape with low granite outcrops and inland lakes. It is located on a low and narrow coastal strip at elevation of 10 meters. Vegetation is typical arctic tundra and consists of mosses, lichens and grasses. The elevation at Chesterfield Inlet, at the airstrip is approximately 25m above sea level. Chesterfield's average annual precipitation consists of 14.6 cm of rainfall and 112 cm of snowfall. Mean high in July is 13.1 degrees with a mean low of 4.6 degrees. In January, mean high is -27.8 degrees and a mean low of -35.2 degrees.

The Chesterfield Inlet Fuel Facility is being upgraded. As part of the upgrade, approximately 150 cubic metres of hydrocarbon-contaminated soils must be removed from the site and remediated. Contaminated soils will be remediated in a lined engineered landfarm.

The landfarm will be located adjacent to the existing Solid Waste Site. It will be accessed from the same road. The Government of Nunavut in consultation with the Hamlet of Rankin Inlet selected the site.

1.4 GENERAL DESCRIPTION OF PROPERTY

The site for the landfarm is located in the area of:

(Lat/Long) 63º 20' 46" N, 90º 45' 10" W

(UTM) Easting 612,460m, Northing 7,026,122m

(Map sheet number 55O7) near the Hamlet of Chesterfield Inlet's Solid Waste Site.

See Appendix A for drawings and site maps.

1.5 PURPOSE AND SCOPE

This Plan consists of Operation and Maintenance Procedures for the Landfarm Facility. The Plan is developed to ensure the operation and maintenance of the Landfarm meets the mandatory requirements as per the applied Water Licence from the Nunavut Water Board (NWB). The Board's mandate is to regulate the use of land and waters and the disposal of waste to provide for the conservation, development and utilization of land and water resources. The Plan is developed to manage the waste deposited at the Landfarm in such a way that adverse impacts to public health & safety and the environment are minimized.

Therefore, all aspects of the lagoon facilities operation and maintenance must not be contravention of the requirements stated in the NWB Water Licence.

1.6 EMERGENCY PLANNING & CONTACT

In the event of accidental/unauthorized discharge of waste occurs or if such a discharge is foreseeable, the Landfarm Spill Contingency Plan shall be employed.

1. The first contact shall be to the Regional Director, GN-CGS (867) 645-8153;
2. The incident shall be reported to the 24-Hour Spill Report at (867) 920-8130; and
3. A report regarding the incident shall be submitted to the Aboriginal Affairs and Northern Development Canada (AANDC) Inspector within 30 days of reporting the incident.

2 Landfarm Fundamentals

2.1 OPERATION AND MAINTENANCE PROTOCOLS

- Generally, soil is to be deposited no deeper than 1 meter.
- When depositing contaminated soil trucks should not drive over existing contaminated soil as to not track contaminates out of the berm.
- When equipment is leaving the landfarm care should be taken not to track excess material out of the berm.
- Contaminated soil should be turned once a month during snow free seasons. Care should be taken not to rip the liner as this could cause contaminate leakage.
- No effluent discharge of contaminated material is permitted. Contaminated liquid collected within the treatment area will be dispersed within the containment area over the contaminated soil.
- Only Type B contaminates shall be stored within the landfarm. No Heavy Metals, glycols and or heavy oils will be placed in the landfarm.

2.2 RUNOFF MANAGEMENT

The landfarm is designed to manage runoff and eliminate surface and subsurface contamination.

Surface water that appears outside the containment area will be routed around the berms and will have no chance to penetrate the contaminated soils. Water outside the landfarm will not be in contact with contaminated soils thus will have no chance to affect any surrounding water bodies.

Water that collects inside the containment area will have no chance to contaminate local groundwater sources because of the berm and the 60 mil HDPE textured impervious membrane.

The landfarm is built in an area where evaporation exceeds precipitation. Any water that does collect in the sump will not be discharged but rather pumped back over the contaminated soil to maximize remediation and evaporation.

2.3 MITIGATION MEASURES TO PREVENT SEEPAGE

The landform is designed to prevent seepage. The berm will have a 2 to 1 slope and will be lined with an impervious HDPE 60 mil textured membrane. On either side of the liner will be an 80mm lift of sand. This will accomplish two objectives.

1. Protect the liner from contacting the native ground that could have sharp edges, which in turn could cause wear and tearing of the liner.
2. Protect the equipment from contacting the liner. Over the lift of sand will be a geo-textile membrane with further gravel on top of that. This layer system will ensure containment of the contaminates.

A trained equipment operator will be an asset in the prevention of preventing seepage. A trained operator will minimize excessive equipment operation. The operator will also make sure the equipment will damage the liner and will leave a barrier of soil between the equipment and liner.

Surface water will be sampled annually during warm months to insure no contamination or seepage from the landfarm.

2.4 SOIL QUALITY REMEDIATION OBJECTIVES

The objective of our sample procedure is to obtain commercial levels of petroleum hydrocarbons in soil as a minimum. Based on the GN and CCME Guidelines.

GNWT COMMERCIAL STANDARDS FOR PETROLEUM HYDROCARBONS (PHCs) IN SOILS (mg/kg soil)									
	Particle Size	Benzene	Toluene	Ethyl-benzene	Xylene	F1 (C_6-C_{10})	F2 (C_{10}-C_{16})	F3 (C_{16}-C_{34})	F4 (>C_{34})
Under building <1.5m	Coarse	5.0	20	0.8	17	310	1700	NA	NA
	Fine	5.0	20	0.8	17	4600	25000	NA	NA
Under building >1.5m	Coarse	5.0	20	0.8	17	340	1800	NA	NA
	Fine	5.0	20	0.8	17	4800	26000	NA	NA
Eco-soil <1.5m	Coarse	5.0	20	0.8	17	330	760	1700	3300
	Fine	5.0	20	0.8	17	660	1500	2500	6600
Eco-soil >1.5m	Coarse	5.0	20	0.8	17	700	2000	3500	10000
	Fine	5.0	20	0.8	17	1000	3000	5000	10000

2.5 MONITORING PROGRAM

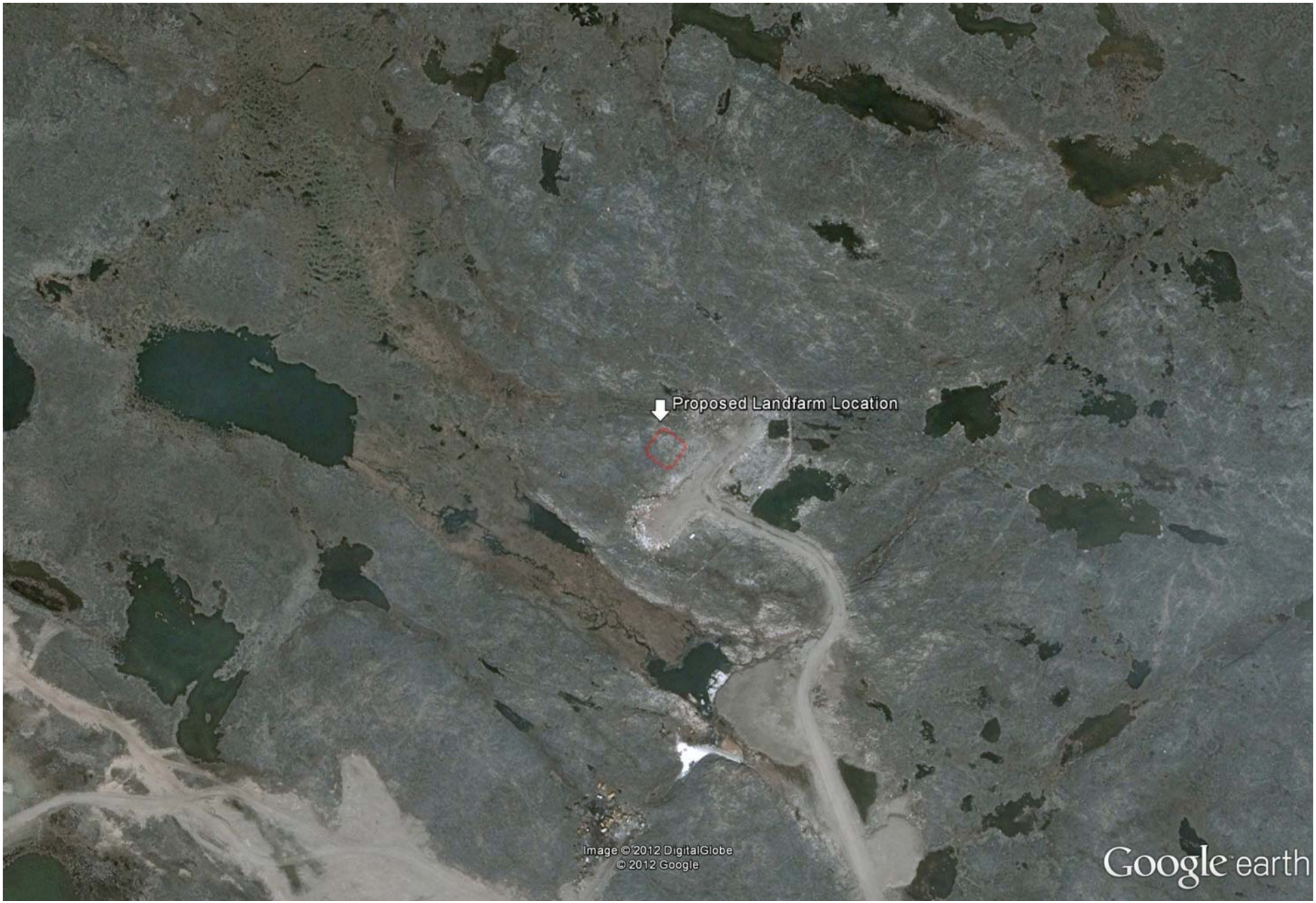
Field testing will be completed on samples taken once a month, during the snow free season, immediately after the contaminated soil is turned. This will be a good indicator of the progress of the remediation.

Samples will be taken on a 10 by 10 meter grid.

Any surface water near the site will be checked monthly until freeze up. If any sheen on the water is apparent, samples will be collected and tested for:

1. PHC
2. BTEX; and
3. Total Metals

Appendix A: Map



Google Earth Pro

feet 2000
meters 600

Appendix B: Spill Report Form

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR	REPORT TIME	☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER ____-_____
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME		

C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS

F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION	
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION	
H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
I	SPILL SOURCE	SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS		

L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			