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Building *Nunavut* Together  
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Bâtir le *Nunavut* ensemble

Petroleum Products Division,  
Department of Community & Government Services,  
Government of Nunavut

## **New Baker Lake Landfarm – Supplementary Information Guide** **Construction, Operation and Maintenance Plan**

**Date of Application** – March 28, 2022

**Name and mailing address of Applicant** - Petroleum Products Division,  
Department of Community and Government Services,  
Government of Nunavut, PO Box 590, Rankin Inlet, NU X0C 0G0

**Contact Information including phone number(s) and email address –**

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**Name of Facility operator** – PPD Tank Farm Baker Lake, NU

**Number of years requesting for license** – Five (5) years (March 2022 till March 2027)

**Location GPS** - (Lat./Long) = Latitude 64.315, Longitude -96.020912

(UTM) Zone 15 (Lot 1, Block 55, Plan 3512)

## **OBJECTIVE/INTRODUCTION**

The community of Baker Lake is located within the Kivalliq Region, Nunavut. The community is in a zone of continuous permafrost, which has an active layer of approximately one metre.

The Baker Lake Fuel Facility had major fuel spill of 10000 litres of gasoline which threatened the environment in March 2021. In response to this contamination, PPD require a landfarm to aid impacted soil remediation with approximately capacity 5,000 cubic metres of hydrocarbon-contaminated soils which must be remediated summer 2022 which aim to protect the Hamlet of Baker Lake against soil hydrocarbon degradation.

Contaminated soils will be remediated in a lined engineered landfarm. The landfarm will be located at the back of the existing Tank farm in Baker Lake. It will be accessed from the main road. PPD-GN in consultation with the Hamlet of Baker Lake selected the site.

## **DETAILED DESCRIPTION OF FACILITY**

The proposed site for the landfarm is in Latitude 64.315, Longitude -96.020912 and (UTM) Zone 15 (Lot 1, Block 55, Plan 3512) at the back of PPD existing Oil Facility, away from the Hamlet of Baker Lake environmental pollution.

The landfarm will be designed to hold 5000 CU.M. of contaminated soil for a maximum period of 4 years and decommission thereafter within the five years period allotted.

## **OPERATION AND MAINTENANCE PLAN**

- ✓ All soil will be screened prior to deposit inside the landfarm and all rocks will be separated from soil.
- ✓ Soil is always deposited no deeper than 2 meters.
- ✓ When depositing contaminated soil trucks do not drive over existing contaminated soil to reduce contaminants out of the berm.
- ✓ When equipment leaves the landfarm care should be taken not to track excess material out of the berm.
- ✓ Contaminated soils are turned once a month during snow free seasons. Care is always 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 or treated the water treatment plant on site.
- ✓ Only Type B contaminated soil shall be stored within the landfarm. No Heavy Metals, glycols and or heavy oils is be placed in the landfarm.

## **RUNOFF MANAGEMENT**

Our landfarm will be designed to manage runoff and eliminate surface and subsurface contamination.

Surface water that appears outside the containment area are being routed around the berms and will have no chance to penetrate the contaminated soils.

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

The landfarm will be built in an area where evaporation exceeds precipitation. Any water that does collect in the sump is not discharged but rather pumped back over the contaminated soil to maximize remediation and evaporation. Water monitoring wells have been designed into landfarm plan. These wells monitored to ensure no contamination of the local groundwater.

## **SPILL CONTINGENCY PLAN/MITIGATION MEASURES TO PREVENT SEEPAGE**

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

This will accomplish two objectives.

- Protect the liner from contacting the native ground that could have sharp edges, which in turn could cause wear and tearing of the liner.
- 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.

Water monitoring wells have been designed into landfarm plan. These wells will be monitored to ensure no contamination of the local groundwater.

Spill Contingency Plan identifies lines of authority and responsibility, established proper reporting and communication procedures and described an action plan to be implemented in the event of a spill. All the information necessary to effectively control and clean up a spill.

### Action Plan

- Potential spill sizes and sources for each hazardous material on site.
- Potential environmental impacts of spill (include worst case scenario)
- Procedures (include alternative action in case of impending environmental conditions):
  - A. Procedures for initial actions
  - B. Spill reporting procedures
  - C. Procedures for containing and controlling the spill e.g., on land, water, snow, ice using Spill kits, Spill absorbent, booms and earth moving equipment to contain spill.
  - D. Procedures for transferring, storing, and managing spill-related wastes.
  - E. Procedures for restoring affected areas.

## **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.

## **SITE MONITORING PROGRAM**

Soil and Water samples are taken yearly, before the snow season, immediately after the contaminated soil is turned. This is a good indicator of the progress of the remediation. All samples are taken on a 10 by 10-meter grid. Piezometers will be checked yearly until freeze up. Any water collected in any piezometer are tested for:

- PHC
- BTEX, F1 to F4
- Total Metals

During construction of the landfarm, background groundwater parameters were collected and tested for reference. QA/QC programs will be implemented soon as part of our monitoring program.

**MAPS**



**Baker Lake Proposed landfarm location in XXXXXXXXXX above**

## **HEALTH AND SAFETY CONSIDERATIONS**

Baker Lake Landfarm requires the appropriate safeguards for the protection of human health and fence will be built around it. The potential for uncontrolled emissions, such as volatile organic compounds (VOCs), leachates and odours and any other adverse effects from treatment, needs to be considered on a site-specific basis according to the nature of the contamination and the conditions of the site.

The landfarm will be located 2.5km from the Hamlet of Baker Lake, therefore no emissions reaching the general population. All operational procedures including Personal Protective Equipment (PPE) and methodology are outlined within the Operation and Maintenance Plan associated with this landfarm. If properly operated every year, the risk of emissions affecting the general population or landfarm personnel is significantly decreased (EPA 2014).

PPD will not allow contaminated materials into the landfarm that pose an extreme health risk to the personnel at the landfarm. Unfortunately, those materials will need to be shipped south to an approved facility. The contamination levels can be determined by effective soil sampling.

## **ENVIRONMENTAL CONSIDERATIONS**

PPD have a working water treatment plant on site of Baker Lake and all impacted water generated from the contaminated area around the landfarm will be treated and proper discharge criteria before release to the environment.

Materials are in place to appropriately contain all contaminated water from leaching the landfarm which include the diversion of water and leachate to a suitable lined retention pond where it can be recycled over the landfarm materials to maintain moisture content. It should be noted that PPD initiated this control system during summer operations.

### **Prepared by:**

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