Environment Canada | Environnement Canada

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Our file Notre référénce 4703 003 025
Your file Votre référénce 1BR-RAN0914/TR/E6

April 30, 2009

Richard Dwyer
License Administrator
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0B 1J0

Via Email at licensingadmin@nunavutwaterboard.org

Dear Richard Dwyer,

Re: NWB 1BR-RAN0914/TR/E6 – Government of Nunavut, Community and Government Services – Submission of Landfarm Operation and Maintenance Plan

Environment Canada (EC) has reviewed the information submitted with the above-mentioned application. The following requested specialist advice has been provided pursuant to EC's mandated responsibilities arising from the *Canadian Environmental Protection Act* (CEPA), Section 36(3) of the *Fisheries Act*, and the the *Migratory Birds Convention Act*.

It is our understanding that the Government of Nunavut, Community and Government Services, as a requirement of Part F, under Section III, General Considerations of the water license 1BR-RAN0914 (Nunavut Water Board, January 30, 2009) (herein known as 'the water license'), submitted the report entitled "Landfarm Operation and Maintenance Plan" (FSC Architects and Engineers, March 2009) (herein known as 'the plan'). This condition is in place to ensure that the landfarm is being operated in a way that is consistent with the requirements of the water license. The Nunavut Water Board (NWB) imposed the requirement on the water license that the plan be submitted within sixty (60) days of the issuance of the water license and that it shall include the requirements under Part E, Item 6 of the water license.

The community of Rankin Inlet is located within the Kivalliq Region of Nunavut. The site is home to a Fuel Facility that is being upgraded. As part of the upgrade, approximately 5,000 cubic meters 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 new Rankin Inlet Municipal Solid Waste Site (Page 4 of the plan).

EC offers the following comments and recommendations:

Description of Facility (Section 1.1)

1. EC recommends that section 1.1 of the plan be updated to include the capacity of the landfarm facility.

Operation and Maintenance Protocols (Section 1.2)

2. The proponent has identified that a berm and an impermeable liner (section 1.4 of the plan) will be used to restrict leachate, as well as a means of collecting and holding contaminated runoff water and leachate (section 1.3 of the plan). EC agrees that these measures should be in place, but also has the additional following recommendations with respect to the general operation of landfarms. Please note that these recommendations are not intended to serve as a comprehensive set of design and operational specifications.

   Design plans and specifications should incorporate the following requirements:
   - Inspection and maintenance of the landfarm to ensure its effectiveness;
   - Methodology for sampling, treating, and releasing leachate and/or pond water from the landfarm;
   - Procedure for snow removal /treatment prior to spring melt;
   - A means of controlling dust from and precipitation infiltration into the land treatment facility;
   - Access to the site should be restricted through fencing or other suitable means and signs warning of the potential hazard;
   - Prior to the placement of 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 (CSQG) (please refer to point 5);
   - A detailed set of operations 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, i.e. water, air, lime, nutrients, or inoculum which may be required; and
   - A health and safety plan should be developed which addresses both the site workers and, where applicable, nearby inhabitants.

Mitigation Measures to Prevent Seepage (Section 1.4)

3. The proponent should consider installing a geofabric overtop of the liner material as extra protection from tears and punctures from rocks, branches, and equipment. This approach has been undertaken recently in Nunavut at other landfarm operations and would provide extra insurance that no contaminants would seep beneath the liner.

Soil Quality Remediation Objectives (Section 1.5)

4. The proponent indicates that the soils will be remediated to meet CCME and the Government of the Northwest Territories Commercial/Industrial Standards. The NWB is advised that this cleanup criteria renders the soil inappropriate for any future residential or parkland use; the soil's eventual fate should be closely monitored. EC recommends that a condition of the license be that the soil will only be used for commercial/industrial

uses after remediation unless confirmatory sampling indicates that the soil is remediated to residential or parkland criteria.

Monitoring Program (Section 1.6)

5. The soil to be remediated is contaminated with hydrocarbons, but the proponent is advised that depending on the original source of contamination there may be co-contaminants in the soil which may impact the remediation objective. Hydrocarbon contamination from jet fuels for example can contain lead, and gasoline and diesel fuels may result in other heavy metal contamination. EC recommends analyzing the soil for Total Petroleum Hydrocarbon (TPH), BTEX, the CCME fraction F1-F4 hydrocarbon content, and total heavy metals.

   Table 1 below describes contaminants of potential concern (COPCs) related to contaminant sources/activities.

Table 1: Recommended Analyses Based on Suspected Soil Contamination

Contaminant Source	Parameters Analyzed								
	CWS – PHC Fractions	BTEX	TPH (calculated)	Lead	Total Heavy Metals	Chromium/ Cadmium	PCBs	Phenols	PAHs
Unleaded Gasoline	■	■	■		■				
Leaded Gasoline, Aviation Gasoline	■	■	■	■	■				
Fuel Oil, Diesel, Kerosene, Jet Fuel, Mineral Oil/Spirits, Motor Oil	■	■	■		■				■
Petroleum Solvents	■		■				■		
Crude Oils, Hydraulic Fluids	■		■	■	■				■
Waste Petroleum Products	■	■	■	■	■	■	■	■	■

6. EC recommends that all of the groundwater monitoring wells be sampled no less frequently than twice per year. One sampling should occur during spring freshet, and the other during mid summer (which could coincide with the water retention cell testing). These wells should be analyzed for indicators of TPH, BTEX, the CCME fraction F1-F4 hydrocarbon content, total heavy metals and any COPCs as identified in table 1. Should analytical results indicate groundwater contamination associated with

the land treatment facility, corrective action should be taken as soon as possible (please refer to point 8).

7. Accurate records should be maintained by the owner/operator which contain the following information:
    - A detailed description of the size and location of the land treatment facility;
    - Quantitative and qualitative data on the soil treated at the site;
    - Monitoring data as set forth above;
    - The final destination of the treated soil and its intended use.

Water Quality – *Fisheries Act* Section 36(3)

8. Meeting the requirements of the *Fisheries Act* is mandatory, irrespective of any other regulatory or permitting system. Section 36(3) of the *Fisheries Act* specifies that unless authorized by federal regulation, no person shall deposit or permit the deposit of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water. The legal definition of deleterious substance provided in section 34(1) of the *Fisheries Act*, in conjunction with court rulings, provides a very broad interpretation of deleterious and includes any substance with a potentially harmful chemical, physical or biological effect on fish or fish habitat.

CEPA – Spill Prevention, Preparedness and Response

9. Please note that any spill of fuel or hazardous / deleterious materials, adjacent to or into a water body, **regardless of quantity**, shall be reported immediately to the NWT/NU 24-hour Spill Line, **(867) 920-8130**
10. EC recommends that a secondary containment or a surface liner (drip pans, fold-a-tanks, etc) be placed under all container or vehicle fuel tank inlet and outlet points, hose connections and hose ends during fuel or hazardous substance transfers. This containment should be of adequate size and volume to contain and hold fluids for the purpose of preventing spills (the worst case scenario).
11. EC recommends that the appropriate spill response equipment and clean-up materials (absorbents, containment devices, etc.) be on hand during any transfer of fuel or hazardous substances and at vehicle maintenance areas.

CEPA – Hazardous substances

12. The proponent shall ensure that all hazardous wastes, including waste oil, receive proper treatment and disposal at an approved facility. Furthermore, Spill Contingency Plans should include locations of disposal sites approved to accept wastes and means of storage prior to disposal.
13. If any contaminated and/or hazardous material is to be removed from the site, EC recommends that the proponent provide the information regarding disposal and transportation methods.

Wildlife / Species at Risk

14. Section 5.1 of the *Migratory Birds Convention Act* prohibits persons from depositing substances harmful to migratory birds in waters or areas frequented by migratory birds or in a place from which the substance may enter such waters or such an area.

If there are any changes in the proposed plan, EC should be notified, as further review may be necessary. Please do not hesitate to contact me at (867) 669-4748 or Stacey.Lambert@EC.gc.ca with any questions concerning the above points.

Yours truly,

Original signed by

Stacey Lambert
Environmental Assessment Coordinator, EPO

cc: Carey Ogilvie (Head, Environmental Assessment North, EPO)
Lisa Perry (Environmental Assessment Coordinator, EPO)
Jody Klassen (Contaminated Sites, EPO)