
# Environmental Protection Plan

## Cambridge Bay Soil and Water Treatment Facility

**July 2018**

## Summary

This Plan outlines what Nunavut Excavation will do to protect the environment during operation of the soil and water treatment facility (SWTF). Before starting operations, NE will assess baseline conditions as required, and will collect samples of soil and groundwater in the footprint of the treatment facility to measure existing conditions. If the conditions facilitate, monitoring wells will be installed to monitor shallow groundwater during operations. While the SWTF is in operation, groundwater will be sampled once annually to ensure that no impacts are present. When it is time to close the facility, NE will sample the soil again to confirm there are no ongoing impacts to soil quality, along with final groundwater monitoring and sampling.

# Table of Contents

# 1. Introduction

## a. Company Name, Project Location & EffectiveDate

Nunavut Excavating 2007 INC
1825 Federal Road
P.O. Box 1984,
Iqaluit, Nunavut
X0A 0H0

Project location:

69$^{o}$ 07’ 40.56”N 105$^{o}$ 02’ 54.08”W

Cambridge Bay, NU

Project management includes:

Glen Molloy
Manager, Nunavut Excavating Ltd.
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Operations Supervisor, Nunavut Excavating Ltd.
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Nunavut Excavating Ltd. (NE) is proposing to develop and operate a soil and water treatment facility (the Facility) in Cambridge Bay, NU. The proposed Facility will be located adjacent to the Hamlet of Cambridge Bay sewage lagoon. NE will provide the expertise to manage the facility design, comply with the Nunavut Water Board (NWB) approval requirements, keep the facility in compliance and manage treatment operations. NE will provide the Facility land and contracting services to construct as well as provide necessary equipment to treat contaminated soil and water. Coordinates for the Facility are:

69$^{o}$ 07’ 40.56”N 105$^{o}$ 02’ 54.08”W

The site is accessible by road, from an access road off of Natik Street. The effective date for this *Environmental Protection Plan* (the Plan) is the start of construction of the facility, anticipated to be in summer of 2018. The Plan will be effective for the duration of the lease and the life of the facility, a period of five (5) years.

## 2. Environmental Policy

Our commitment to the protection of the environment needs to be demonstrated in how we conduct our day-to-day business operations. The highest standards of care are to be taken by all employees to minimize the environmental impact of all operations. The company management team has the responsibility to take a leadership role and develop policies and procedures that minimize environmental effects. Employees have the responsibility to bring to the attention of their immediate supervisor those procedures and incidents which may impair the environment. Our policy is to:

1) Comply with all applicable government regulations.
2) Consider the environmental effects of ouroperations.
3) Provide staff with all the necessary information, training and equipment.
4) Develop processes, policies and procedures that minimize the occurrence and consequences of environmental incidents.

Our corporate environmental goal is to minimize the environmental impact of our operations.

## 3. Purpose & Scope

The purpose of this Plan is to describe environmental baseline conditions and outline monitoring activities that will occur to ensure that impacts to the aquatic and terrestrial environment associated with Facility operation are avoided. The scope of this Plan includes operation and maintenance of the Facility.

NE will manage the program operations responsibly and will comply with all licenses, permits and applicable territorial and federal laws and regulations related to waste management specific to Facility operation.

### a. Project Description

The purpose of this project is to construct and operate a permanent SWTF in Cambridge Bay, NU. The site of the proposed facility is located at 69$^{o}$ 07’ 40.56”N 105$^{o}$ 02’ 54.08”Wand is currently vacant. The proposed permanent facility will include construction of an engineered cell to receive petroleum hydrocarbon-contaminated snow and water. Water will be treated on site by a package treatment plant. Treated water will be stored in a tank until it is confirmed that the water meets discharge criteria, after which it will be reused on site or released to the environment. The proposed discharge location is the small watercourse located approximately 40 m east of the proposed treatment facility, south of the existing road. Discharge water will be conveyed to the small watercourse through a discharge pipe connected to the treated water storage tank. The proposed discharge location is illustrated on Figure A.1 in the Baseline Conditions Assessment, Environmental Monitoring and Post-Closure Plan.

Following bioremediation, treated soil meeting license criteria will beneficially reused off site at the Hamlet landfill or as otherwise permitted. Soil and water not meeting discharge/reuse criteria will be

transported off site for disposal at a suitable facility. The facility will also include an area of the treatment pad designated for storage of hazardous wastes awaiting transportation to authorized facilities, *(the likely source of the hazardous waste is end of life vehicles, mainly used motor oil, grease, and spill cleanup materials)* . The permanent facility, as illustrated in Appendix A, will include one engineered cell consisting of three sub-cells: one cell 50 m x 40 m, for receipt, storage and treatment of petroleum hydrocarbon- contaminated soil; one cell designed for storage of up to 170 $m^3$ of petroleum hydrocarbon- contaminated snow and water; one cell 19m x 14m designed for storage of hazardous waste, *(the likely source of the hazardous waste is end of life vehicles, mainly used motor oil, grease, and spill cleanup materials)*, awaiting shipment; one small package treatment plant to treat petroleum hydrocarbon-contaminated water; one or two above ground storage tank(s) (AST) for treated water storage; one small shed for storage of supplies, documentation and health and safety equipment.

The proposed permanent facility is intended to operate for a duration of five (5) years commencing in summer of 2018, after which it is anticipated that the agreement with the Hamlet will be reviewed.

# 4. Environmental Setting

Cambridge Bay, including the Facility, is situated within the Northern Arctic ecozone (NAE 2008). In this ecoregion, the landscape predominantly consists of low rolling plains covered with soil and rock debris left by glaciers. Many coastlines are characterized by wide flat plains with perennially frozen ground (permafrost). Mean annual temperatures range from -30 to -35°C in winter and from 5°C to 10°C in summer.Meanannualprecipitationis100-200mm, with snow potentially falling during any month. Much of the region is devoid of plants, with the exception of some coastal low lands and nutrient rich sheltered valleys. Muskox, Caribou, Arctic Fox and Polar Bear are the three dominant large mammals in the area, with the Collared Lemming being the only small mammal. Birds including Snowy Owl, Snow Geese, Canada Geese, and Horned Larks are also common to the region.

# 5. Environmental Effects

## a. Heritage Resources

The Facility is proposed for construction and operation in an existing industrial area. No land clearing will occur nor will any new disturbance to the surrounding lands. The Facility is expected to have no impacts on heritage resources in the project area.

## b. Terrestrial Environment

The Facility is proposed for construction and operation in an existing industrial area. No land clearing will occur nor will any disturbance to the surrounding lands. Any waste generated on site will be managed in accordance with the *Cambridge Bay Soil and Water Treatment Facility Waste Management Plan* (NE 2018), including appropriate containment and disposal, thus minimizing the potential to attract wildlife. Accordingly, the Facility is expected to have no impacts on vegetation or terrestrial wildlife in the vicinity of the project area.

Baseline soil and groundwater sampling program is planned to occur prior to Facility operation to document existing surficial material quality. The planned facility will possess an engineered liner. Routine Liner and facility inspections, and in the event of a tear, immediate liner repair, will occur. At the time of closure or lease transfer, soil sampling will occur to document surficial material quality and to confirm that there are no existing or ongoing impacts from the Facility on soil quality. Accordingly, impacts to soil quality in the project area are considered to be negligible.

### c. Aquatic Environment

Treated effluent from the water treatment plant which meets discharge criteria (refer to *Cambridge Bay Treatment Facility Operations and Management Plan* (NE 2018) for criteria) will be discharged to the environment, following exhaustion of effluent reuse opportunities. Treated effluent will be batch discharged to the small watercourse located approximately 40 m east of the proposed treatment facility, south of the existing road. Discharge water will be conveyed to the small watercourse through a discharge pipe connected to the treated water storage tank. The proposed discharge location is illustrated on Figure A.1 in the Baseline Conditions Assessment, Environmental Monitoring and Post-Closure Plan.

Prior to beginning operations, shallow groundwater wells will be installed to monitor quantity and quality of groundwater in the area of the planned SWTF. During operations, groundwater will be sampled once annually to ensure no changes occur to groundwater quality. Locations of groundwater wells will be determined prior to construction of the SWTF.

### d. Air and Noise

Operation of the bioremediation pad such that remediation is efficient and effective involves maintaining a certain degree of soil moisture during the frost-free portion of the year. Maintaining this moisture content in the soil also serves to suppress dust and avoid migration of soil off site as dust. Accordingly, impacts to air quality as well as impacts to terrestrial vegetation adjacent to the site resulting from dust deposition are considered negligible.

The Facility is proposed for construction and operation in an existing industrial area. The main activities occurring at the site, bioremediation, are largely passive. Any activities that may generate noise such as tilling soil and pumping effluent will be periodic during summer months, of short duration, will occur during daytime hours and will be lower in volume and frequency than other activities that concurrently occur in the industrial area. The Facility is expected to have negligible impacts on ambient noise levels in the project area.

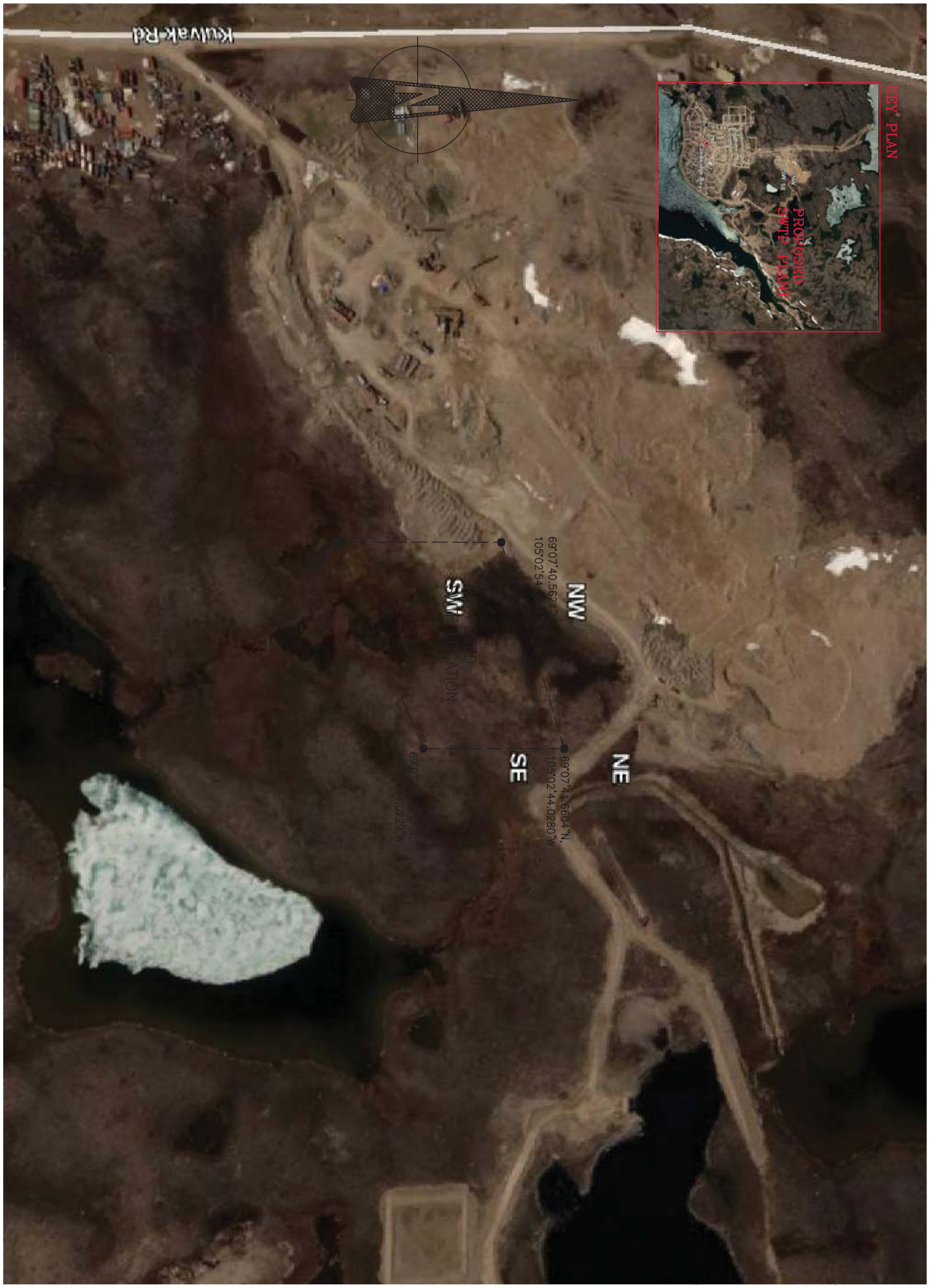
## 6. Documentation and Reporting

If required, an annual report will be submitted to GN Department of Environment (DOE) in accordance with the terms and conditions of the license approval and permits assigned to the Facility. In conjunction with annual reporting, this Plan is to be reviewed annually and updated as needed to maintain compliance. Analytical test results, as required under the anticipated water license, are submitted to DOE. A copy of all licenses and permits will be maintained on site.

# Appendix A

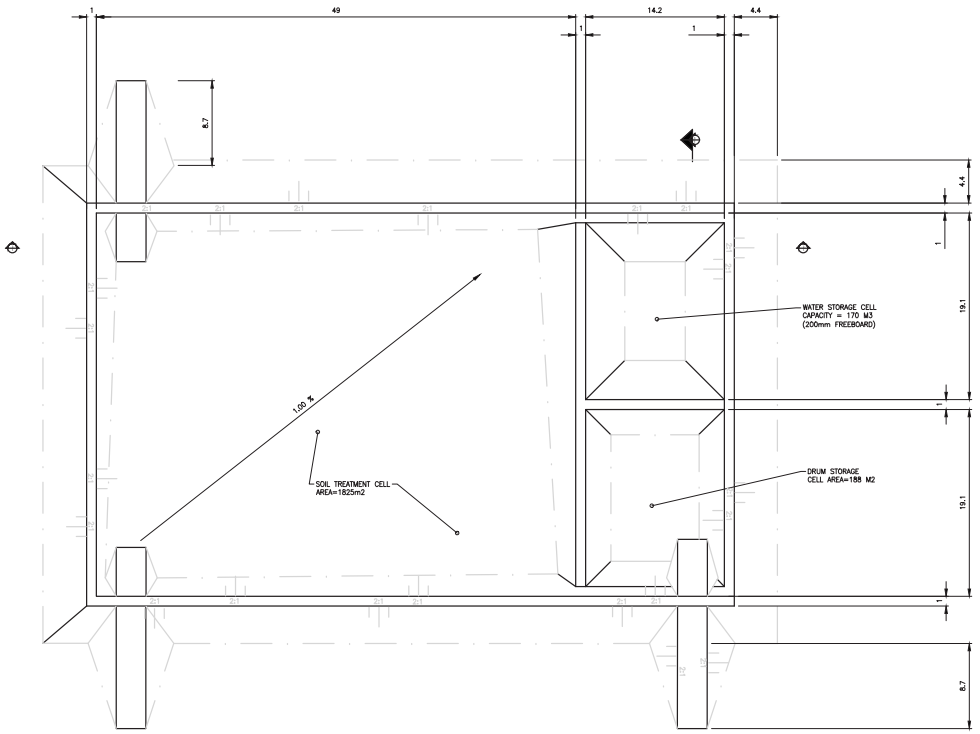
# Site Plan and

# Section




SITE PLAN

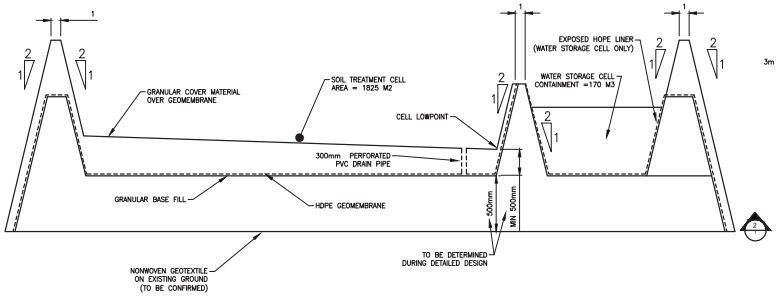
| | | |
|---|---|---|
| SOIL TREATMENT FACILITY<br>SITE PLAN<br>CAMBRIDGE BAY, NUNAVUT | NUNAVUT EXCAVATING<br>CAMBRIDGE BAY, NUNAVUT | DRW'N BY: D.B.<br>DATE: JUNE 2018<br>SCALE: N.T.S<br>DWG NO. |



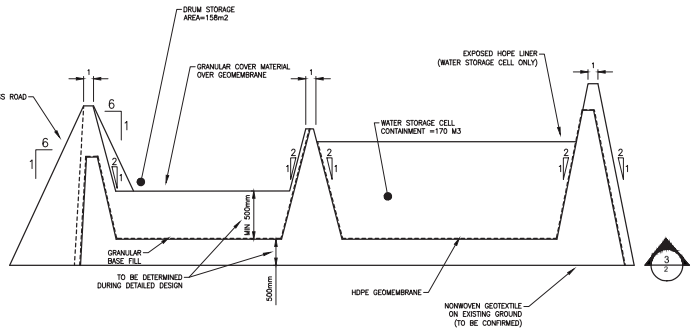

PLAN

NOTES:

1. FIGURE IS IN SUPPORT OF NUNAVUT EXCAVATION'S APPLICATION FOR A DEVELOPMENT PLAN FOR A SOIL TREATMENT FACILITY IN CAMBRIDGE BAY, NU.
2. FIGURES PRESENT GENERAL LAYOUTS AND CONCEPTUAL DESIGNS. FINAL DESIGNS AND CONSTRUCTION WILL DEPEND ON FIELD CONDITIONS AND LOCALLY AVAILABLE CONSTRUCTION MATERIALS.
3. SCALES AND DIMENSIONS ARE APPROXIMATE.
4. EXISTING GRADE IS ASSUMED TO BE FLAT AND LEVEL. ACTUAL CONFIGURATION WILL MAKE USE OF ADVANTAGEOUS NATURAL SLOPE ORIENTATIONS.
5. BERM HEIGHT MAY BE INCREASED TO ACCOMMODATE FIELD CONDITIONS.
6. GEOMEMBRANE INSTALLATION QUALITY CONTROL AND QUALITY ASSURANCE SHALL BE CONDUCTED THROUGHOUT INSTALLATION ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. BERMS AND BASE SHALL BE COMPACTED TO 98% STANDARD PROCTOR DENSITY IN LIFTS UP TO 300 MILLIMETERS.
8. PERMAFROST INSULATION LAYER AND GRADING FILL IS TO BE GRADED AND PROOF ROLLED WITH SMOOTH DRUM ROLLER OR SMOOTH PLATE PRIOR TO PLACEMENT OF GEOTEXTILE AND GEOMEMBRANE.
9. BERM SLOPES TO BE CONFIRMED DURING DETAILED DESIGN.
10. MINIMUM DEPTH OF BASE FILL ABOVE EXITING GROUND TO BE CONFIRMED DURING DETAILED DESIGN.




SECTION




SECTION

SITE PLAN AND SECTION

DRW'N BY: D.B.
DATE: JUNE 2018
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NUNAVUT EXCAVATING
CAMBRIDGE BAY, NUNAVUT

SOIL TREATMENT FACILITY
CONCEPTUAL DESIGN
CAMBRIDGE BAY, NUNAVUT