ᓄᓇᑦᑕᐅ ᐊᕐᓂᑎᓪᓗᓂᒃ ᑎᒥᖅᓯᓂ
NUNATTA ENVIRONMENTAL SERVICES INC.

ᓇᓗᓇᐃᒪᓕᖅ ᐅᑭᐅᖅᑕᕐᓂᒃ ᐊᐅᓚᑦᑎᐊᓂ
PROTECTING OUR ARCTIC ENVIRONMENT

Abandonment and Restoration Plan

Revised 2025

NWB #1BR-NUN1828

Prepared for

Nunavut Water Board
Po Box 119
Gjoa Haven
Nunavut
X0B-1J0

ᐃᖃᓗᐃᑦ ᓄᓇᕗᑦ **IQALUIT, NU X0A 3H0** ᐃᓕᓴᕐᓂᒃ **1575 Sivumugiaq St.** ☎**(867) 979-1488**
nunatta@northwestel.net

February 27 2025

Reclamation Objectives

1. Remediate cell contents to CCME standards for Industrial Land.
2. Remove all soil not required to correct property grade.
3. Deconstruct cells, dispose of liners to appropriate disposal facilities.
4. Grade and level land to pre landfarm development.
5. Maintain monitoring wells for 2 years, post deconstruction.
6. Retain the Quonset Building which houses offices, bathroom, maintenance shop and storage mezzanine, sealift containers, lumber, building supplies and perimeter fencing will remain.

Equipment used at the landfarm

(Plan is to leave this equipment deeded to the landfarm until Landfarm deconstructed at which time will be sold off)
The equipment is kept in very good operating condition with low operating hours.
Roto-screen was purchased in 2010.
Volvo Loader purchased new in 2019

Fuel type	Horse power	Brand	Type	Model #	Capacity
Diesel	165 Hp	John Deere	Excavator	892 D	2 yard machine
Diesel	75 Hp	Volvo	Loader	L35G	1 yard loader
Diesel	145 Hp	Case	Loader	621-C	2.5 yard machine
Diesel/electric	65Hp	Hewitt Robins	Elliptical Shaker		200 ton per hour
Diesel	65Hp	AR Laprade	Trommel	R-450	150 ton per hour
Hydraulic		AR Laprade	Belt stacker	C-50	150 ton per hour
Gasoline	11Hp	Honda	Hydraulic pump		
Gasoline		Honda	Water pump	WB20XK 2C	30,000 L/hour

Infrastructure

The Landfarm has a modern quonset structure which measures 70'x 44' (ft)
The front portion of the building contains three furnished offices complete with internet and multiple phone lines and washroom and a mezzanine above for storage.
The back portion is the repair shop. The shop has a cement floor with no drains that ensures any spilled products will not reach the environment. Access is via remote control power operated overhead door.
Washroom and safety features such as medical kits, eye wash station, these are located in the building.

Seasonal Shut down and Temporary Closures

The landfarm is monitored all year as staff is on site performing maintenance on equipment or performing office duties. At no time is the land farm left for more than a long weekend and even then someone comes on site to check the heat is on and everything is good.

The land farm does not shut down seasonally. General maintenance is done on all equipment over winter and reports are written and submitted.
In the event of a temporary closure, an inspection of the containment facility will take place by the General Manager to ensure compliance. All equipment will be winterized and placed within the cells or shop area.

ᐃᖃᓗᐃᑦ ᓄᓇᕗᑦ IQALUIT, NU X0A 3H0 ᐃᓗᖕᒪ 1575 Sivumugiaq St. ☎(867) 979-1488
nunatta@northwestel.net

Schedule for Reclamation and implementation

The timing for completion of reclamation of the landfarm is open to many factors. At present there will be no plans to close down this business. Many innovative ideas have come about in the past few years and these new approaches to remediation are working very well for Nunatta. We have started to work at the Rankin Landfarm and if results there are as positive as in Iqaluit we plan to share our findings with operators of other landfarms throughout Nunavut and other northern communities.

Nunatta has had permission to remove soils from our landfarm on many occasions since 2011 renewal. Most have been for dump cover in Iqaluit. We were asked by a local business for soil to level out their lot. Approval for removal was granted by the Government of Nunavut, Department of Environment.

Rocks removed during remediation are left to weather off. These rocks are then crushed to make gravel.

Since all the soils in the landfarm will not be removed at one time, remediation practices will change as soils are removed from the cells. We estimate this remediation and deconstruction should be done in as little as 4 years but have allowed 6 years because the people doing the reclamation will not know Nunatta's proprietary methods.

Soil and Rock Treatment

The soils in the cells require breaking up to allow microorganisms to break down hydrocarbons into harmless components. This requires addition of fertilizers, moisture and good aeration. This is best achieved when soils are put through a screening plant and stacked in long windrows. This process should be repeated as often as weather permits. Experience has shown 2 rotations a summer will reduce containment time to approx 3 years for Diesel (P50) contaminated soils.

ᐃᖃᓗᐃᑦ ᓄᓇᕗᑦ IQALUIT, NU X0A 3H0 ᐃᓗᖕᒐᑕ 1575 Sivumugiaq St. ☎(867) 979-1488
nunatta@northwestel.net

Soil aeration starts as soon as soils have thawed and continues until the freezing takes place. When weather conditions permit cell #3 will be turned over 3 times a year, other cells as time and weather permit. The frequency of soil aeration depends on factors such as temperature and weather and other work taking place at the land farm.

Impacted soils enter the landfarm into Cell #1 where custom blended fertilizer is added and large rocks are removed by a screening plant down to 3 inch or 75mm. Then soil is moved into cell #4 where it stays over the winter. The next year soil is screened down to ¾ inch or 19mm and moved to cell #3 where it winter's over in much smaller piles this gives greater surface area. From here it is turned to thaw it out and blended then put into larger piles and tested until it meets CCME standards.

Cell Info:

Cell One 60 meters X 30 meters, wall height 1.5 meters:

This is where soils entering the land farm are dumped and piled to await the screening process to remove construction debris and large rocks. There is ample room between soil and walls to allow collection of melt waters. Water pump out points are located on the SW corner.

Cell Two Is now used for storage of Quilliq consumables (oil, anti freeze and waste) The protective layer remains

Cell Three 90 meters X 30 meters, wall height is 1.5 meters:

This is the final or finishing cell. Here all large stones and debris have been removed and all fresh hydrocarbons reduced to weathered status. Fertilizers have been added and soils are piled in windrows.

This cell will undergo more frequent aeration and soils will leave the land farm from this cell, when the remediation process is complete. Laboratory sampling is used to verify when the process is complete

Cell Four 60 meters X 25 meters, wall height is 1.5 meters:
Waste received from clients is stored in this cell until spring. Soils will be piled in here when they are cleaned of cobbles and rocks and the treatment process will begin. Plan is to allow as much room as possible for surface runoff water storage. When soil is piled in this cell, holes are dug to allow us to fill with water. Ponds of water are ideal for evaporation of surplus water.

Once all the worked soil is removed from the cells there will be a protective layer remaining. This is the protective layer and its purpose is to keep the liner from being damaged by equipment and by rocks punching a hole through the liner due to weight from above. This layer will be contaminated from leaching and will contain very weathered hydrocarbons. This layer of undisturbed soil will have to be removed in order to get the liner out of the bottom. This layer will be treated, screened down to ¾ inch and mixed with some of the remediated soil (in order to introduce the bacteria needed to break down hydrocarbons). With aeration (mixing of soils) happening a couple times a year we expect this soil will clean up very quickly and can be removed in an estimated 3 years.

When the breakdown of contaminants is complete the liner which covers the bottom of the cells will be removed and cut into pieces and disposed of at an appropriate disposal facility. The area under the liners will be tested for contaminants and any soil which does not pass CCME standards will be dug up and placed into a single existing cell. When all soil has been cleared to be removed, any remaining contaminated soil will be containerized and shipped to an approved disposal facility.
Disturbed areas remaining from cell construction will be levelled and returned to grade.

Water samples will be sent to a Laboratory for analysis and results forwarded to Nunavut Water Board for review. Any test results which exceed CCME standards will be reviewed with regulatory organizations to determine the best approach.

Total estimated time to return this land to commercial standards with current degradation rates is 7 years. If remediation was done by Nunatta we believe we could clean up whole landfarm in as little as 4-5 years but since everything is being calculated as being done 3rd party we will leave estimate at 7 years

Without some of this specialised equipment the remediation time will be longer. The main piece of equipment is the Roto-screen 450 Trommel screening plant. It was bought new and shipped here in 2010. It is equipped with the proper accessories to make the remediation of soils very fast and very precise. This large controlled feed, stacking screening plant has a capacity in excess of 100 cubic meters an hour. Extra screens are in stock as well as spare parts.

Detailed Cost estimates for the Reclamation and Abandonment

Appendix I: for Yearly costs of turning soil and adding fertilizers.
Total allowed per year for private contractors supplying equipment and manpower but not the screening plant or additives (these will be on site) is $40,000 and we figure it will take a total of 4 years. We believe 2 years is soil in cells now and the next 2 years is the protective layer soil. Prices have been exaggerated to cover inflation over the next 4 years. We have reduced the amount of soil in our landfarm since last file in 2017

The total costs of third party decommissioning of Nunatta landfarm. The total cost has gone down since 2017 due to much less soil being stored in the landfarm. This is due to improved remediation practices by Nunatta.

The total cost for remediation of landfarm with 2024 year end volumes is $334,625.00
Breakdown of cost shown in Attachment #1

ᐃᖃᓗᐃᑦ ᓄᓇᕗᑦ IQALUIT, NU X0A 3H0 ᐃᓗᖓᑕ 1575 Sivumugiaq St. ☎(867) 979-1488
nunatta@northwestel.net

When this project has been completed the supplies and equipment used in the operation of the landfarm will be offered up for sale.

Equipment Values:

$20,000 for loader

$10,000 for Excavator

$30,000 for elliptical screening plant and generator (40KVA 3 phase diesel generator)

$75,000 for Trommel screening plant

$5000 for hoses, pumps, generators, hand tools

$10,000 for clean up supplies (carbon, clay, absorbent pads other materials)

Total recoverable revenue $150,000 (this does not include computers and other office equipment or other assets of company such as trucks)