VERSION 1.0 FEBRUARY 13, 2018

Nordlys

ENVIRONMENTAL ASSESSMENT REGISTRATION

CONSTRUCTION AND OPERATION OF A SOIL BIOREMEDIATION FACILITY

HAPPY VALLEY-GOOSE BAY, NL

ENVIRONMENTAL ASSESSMENT REGISTRATION

NAME OF UNDERTAKING

Construction and Operation of a Temporary Soil Bioremediation Facility, Happy Valley-Goose Bay, NL Environmental Assessment Division File Ref No. 200.20.2628

PROPONENT

i. Name of Corporate Body

Nordlys Environmental Limited Partnership, 3223845 Nova Scotia Limited, Corporation #62979, Incorporated July 26, 2010

ii. Address

10422 Highway 19, Southwest Mabou, Nova Scotia, Canada BOE 1X0

iii. Company Owners

J&T Van Zutphen Construction Inc. and ECC Canada, LLC

iv. Company Officers

a. Vincent Van Zutphen, President

Address: 10442 Route 19, Southwest Mabou, Nova Scotia B0E1X0

Telephone No.: (902) 945-2300

b. Lorrain Van Zutphen, Secretary

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Telephone No.: (902) 945-2300

c. Manjiv S. Vohra, Chairman

Address: 1240 Bayshore Highway, Burlingame, CA 94010, USA

Telephone No.: (650) 347-1555

v. Company Directors

- a. John Van Zutphen
- b. Ted Van Zutphen
- c. Manjiv S. Vohra
- d. August Ochabauer
- vi. Principal Contact Person for Purposes of Environmental Assessment
 - a. Tara Oak, Consultant
 PO Box 28053, Dartmouth, Nova Scotia, B2W3E0
 902-266-3157

2/13/2018 Environmental Assessment Registration

THE UNDERTAKING

i. Name of the Undertaking

Construction and Operation of a Temporary Soil Bioremediation Facility, Happy Valley-Goose Bay, NL

ii. Purpose/Rationale/Need for the Undertaking

Canadian Forces Base (CFB) 5 Wing Goose Bay (the Base) has been an active military base since 1941, serving as an aircraft refuelling base for Europe-bound aircraft during World War II. By 1943, Goose Bay was the largest airport in the world, peaking at 12,000 personnel and handling more than 24,000 aircraft in the 12-month period ending September 1945. The US military was actively involved through the 1960s, with all US operations ceasing in 1991. The Base continues to support low-level flight training.

Given its remote location, most of the waste generated at the Base from 1940 to 1990 was disposed of on site, as was considered acceptable at the time. These activities, in combination with normal operations and various unplanned releases of contaminants, have resulted in substantial environmental contamination at the property. After investigating, mitigating and risk managing these issues, the Department of National Defence (DND) has been actively remediating numerous contaminated sites through the Base as part of the Federal Contaminated Sites Action Plan (FCSAP) Program.

Survival Tank Farm (STF) consisted of nine aboveground storage tanks, fuel stands and associated piping, and was part of the Base's petroleum supply storage system. Nordlys has been actively involved in soil remediation at the STF site, removing free-phase liquid petroleum hydrocarbon (LPH) from designated plumes, and remediating the excavated LPH-impacted soil (see Appendix A – Photos).

The FCSAP Program is nearing completion, and the STF site must be fully restored and monitoring implemented prior to 2020. Nordlys has been treating the excavated soil ex-situ at an approved treatment area on Base property, however some soils may require additional biodegradation. The offsite temporary bioremediation facility is being proposed as it may be necessary to relocate a portion of the contaminated soils (which have been undergoing treatment over the past 5 years) to remediate residual contamination.

DESCRIPTION OF THE UNDERTAKING

i. Geographic Location

The proposed bioremediation facility site is on the South Branch Road off Highway 520, approximately 10 km northwest of the community of Happy Valley-Goose Bay, Labrador (National Topographic Survey Square 013F08) (see Appendix B – Figures 1 and 2). The UTM coordinates of the site corners are noted on Figures 3-1 and 3-2 (Appendix B). The proposed access route from the STF to the bioremediation facility is illustrated on Figure 4 (Appendix B).

ii. Physical Features

The main infrastructure consists of a bermed 40-mil high-density polyethylene (HDPE) pad (~60 m X 120 m). Other equipment includes an office trailer (~3.6 m X 18 m) with general single phase electrical hook-up, two 20-foot marine containers for storage, and one 15,000-gal HDPE leachate / water holding tank (sized to accommodate storage of excess water during a major precipitation event).

A short gravel road currently provides site access, and the site will be encircled by a perimeter access route.

The site is approximately 240 m wide by 120 m deep and is bounded by the South Branch Road to the northeast and by trees to the northwest, southwest and southeast. The property is part of the Municipal Planning Area of Happy Valley-Goose Bay and is zoned for Industrial Use.

There are no residential buildings within 1 km of the proposed bioremediation facility. The following industrial sites are located within 1 km of the proposed facility (distances and directions noted in relation to the facility property boundary):

- Former saw mill site immediately across the South Branch Road
- Universal Environmental Services' soil bioremediation facility 200 m west
- Municipal landfill 750 m west
- Sand and gravel quarries 200 m southwest; 300 m and 700 m northwest; 300 m south; and 800 m east
- Peat moss production facility 1 km southwest

The topographic contour of the proposed Project area is relatively flat, with slight grading to the southwest toward Terrington Basin. The east-northeast area of the property is upgradient, and the property slopes generally downgradient to the south-southwest. The property requires minimal grading, as the treatment pad will be installed such that the gentle sloping facilitates gravity feed to a collection basin sump. Toe berms will be installed for containment and construction of the lined pad.

The site was previously cleared, possibly as a staging area for the former saw mill. Existing vegetation consists of low-lying brush, and there are no wetlands or waterbodies on the site. The surrounding area is generally wooded with coniferous and deciduous trees. Wildlife likely to be present at or near the site include a variety of bird species, mammals (e.g., red foxes, wolves, black bears, otters, various rodents), and amphibians (frogs, toads and salamanders).

The nearest waterbody is the Northwest River, located 200 m northeast of the site's eastern corner, which is an offshoot of the Goose River. The Goose River, located approximately 600 m northwest of the site, flows to the east and discharges into the Hamilton Inlet. Approximately 500 m southwest of the proposed facility is a wetland that drains east into a stream, which eventually flows into Terrington Basin.

iii. Construction

Construction activities include minimal clearing of the site of low-lying brush, grading the existing access road, establishing the perimeter access route and site trailer, erecting a partial fence with associated access gate, developing a bermed area for containment, and installing the lined HDPE treatment pad.

Site clearing activities are proposed to occur prior to spring melt, scheduled to avoid the migratory bird nesting season.

Planned construction start dates and durations are as follows:

Activity	Commencement	Duration
Site clearing	April 20, 2018	1 week
Construction	June 15, 2018	4 weeks

Potential sources of pollutants during the construction period are as follows:

- Airborne emissions:
 - Particulate matter (i.e., dust) from heavy equipment use and vehicle traffic on unpaved roads and site
 - Fumes and noise from operation and idling of heavy equipment and vehicles
- Liquid effluents:
 - No planned liquid effluent releases
 - Possible site runoff during significant precipitation events
- Solid waste materials:
 - No hazardous waste materials
 - Construction waste (e.g., silt fencing, excess HDPE liner)

Construction waste will be recycled or disposed of at an approved facility, as applicable.

The below table identifies construction-related Project activities with the potential to cause resource conflicts, potential associated environmental effects, and corresponding mitigation measures to be implemented.

Activity	Potential Effects	Mitigation
Site clearing	Inadvertent destruction of active nests and/or disturbance to nesting birds	Vegetation clearing will occur prior to the nesting bird season (see "Schedule" below).
Heavy equipment operation and vehicle traffic	Decrease in air quality due to emissions of dust, fumes and noise	Dust, fumes and noise emissions will be localized and temporary (over the 5-week construction period), in an industrial area zoned for such use. Idling of equipment and vehicles will be minimized.
Exposed soils	Suspended sediment in site runoff and receiving waterbodies during significant precipitation events	Silt fencing will be used during construction to minimize the potential for fines to migrate offsite, and earth-moving activities will not be conducted during significant precipitation events.

Construction activities will occur on a previously-cleared site, in an area zoned for industrial uses. Implementation of the identified mitigation measures will minimize any potential construction-related effects to air and water quality, and any such effects will be highly localized and temporary (5-week construction period).

iv. Operation

Equipment employed during operation will include excavators with screening buckets and skid-steers. A minimum of four tandem or semi-dump trucks will be used to transport contaminated soil from the STF to the bioremediation facility, along the access route identified on Figure 4 (Appendix B). During peak operations (October to December 2018), the estimated facility-related traffic is estimated at approximately 40 truckloads per day.

Tracking sheets will be used to record soil entering and exiting the facility. Prior to transport to the facility, contaminated soil will be fully characterized through laboratory analyses, including the origin of the soil, the type of contaminants, and the level of contamination. Historical data analysis and years of

characterization have indicated that the analytes of concern are BTEX and TPH, and that the soil does not contain any PAHs or metals above applicable standards. The Nordlys Construction Supervisor will monitor the third-party trucking operations, to verify that the trucking company is employing best management practices for the safeguard and transport of soils.

Soils will be placed on the constructed, lined treatment pad in bio-piles or mounds to a height not exceeding 3 m, and TPH degradation amendments (e.g., nitrogen, phosphates) will be added. Once homogenized, the soils will be sampled and analyzed to determine the operational treatment parameters, then relocated to the appropriate area for processing on the treatment pad.

Amendments will be applied seasonally to adjust pH and moisture, and the soil will be turned with a screener / bucket mounted on an excavator. Piles will be sampled, analyzed and compared against provincial municipal landfill criteria for general daily cover, and ultimate disposal will be based on the analytical data. Additional reuses of material could be anticipated with proper regulatory or provincial approvals.

A collection catch basin sump, installed at the low point of pad, will receive water by gravity. The catch basin will be equipped with a float-activated submersible pump, and a check valve at the discharge. Recovered water will be reused and sprayed back onto the pile for hydration. Fines that accumulate in the sump will be reintroduced back into the biopiles for continued treatment.

Nordlys anticipates treating up to 20,000 m³ of soil at the temporary facility, over a period not exceeding two years. Delivery of the first truckload of contaminated soil is planned for October 2018; depending on the quantity of residual soil at the STF, trucking could continue until early December 2018. All soil will be remediated and disposed of at municipal landfill by November 2020, and the site will be fully decommissioned by December 2020.

Planned operation start dates and durations are as follows:

Activity	Commencement	Duration
Soil transported to facility	October 2018	2 months
Bioremediation of soils	October 2018	2 years
Remediated soils disposed of at municipal landfill and facility decommissioned	June 2019	18 months

The soil treatment facility will be decommissioned and revegetated where appropriate for erosion control. Following decommissioning, closure samples will be collected from the soil beneath and surrounding the former treatment facility and from the groundwater monitoring wells. Soil and groundwater samples will be submitted for laboratory analysis of contaminants of concern. Should any contamination have occurred during facility construction or operation, remediation will occur as part of the closure process.

Potential sources of pollutants during the period of operation are as follows:

- Airborne emissions:
 - Particulate matter (i.e., dust) from heavy equipment use and vehicle traffic on unpaved roads and site
 - Fumes and noise from operation and idling of heavy equipment and vehicles
 - Volatile organic compounds (VOCs) and CO₂ emitted from the biopiles

- Liquid effluents:
 - No planned releases of liquid effluents
 - Leachate extracted from the biopiles
- Solid waste materials:
 - No hazardous waste materials
 - Fines and sludge from tank bottom
 - Remediated soil

Material to be transported to the facility is well degraded and is not anticipated to result in any soil vapour concerns. Air monitoring will be conducted on an as-needed basis. Based on the soil characterization, emitted gases will be odourless, and composed primarily of water vapour and CO₂.

Leachate extracted from the biopiles may contain oily water, which will be reinjected into the biopiles for further treatment. Based on the degraded nature of this material, it is not anticipated that any oil product will be recovered, as it will be consumed in the remediation process, however if any oil is recovered, it will be transferred into UN standardized 200 L steel drums and disposed of at an approved waste disposal facility. Fines and sludge from the tank bottom will be integrated in the biopiles and remediated with the contaminated soil. Remediated soils will be transported to the municipal landfill and reused as waste cover material.

The below table identifies Project activities during the operation period with the potential to cause resource conflicts, potential effects of these activities, and corresponding mitigation measures to be implemented.

Activity	Potential Effects	Mitigation
Heavy equipment operation and vehicle traffic	Decrease in air quality due to emissions of dust, fumes and noise	Dust, fumes and noise emissions will be localized and temporary (two treatment seasons). Activities will occur in an industrial area, zoned for such use. During dry periods, water will be sprayed on unpaved areas on site to minimize dust emissions. Equipment and vehicles will be inspected and maintained, and idling will be minimized.
Transportation of contaminated soils from STF to remediation facility	Nuisance to residents, traffic delays	Few residences are present along the route from the STF to the bioremediation facility. Given the existing industrial traffic, the incremental increase due to the Project will be negligible and is not anticipated to result in any traffic delays.
Operation of air blowers (as needed)	Increase in noise	Blowers will be isolated inside containers, and the sound will be further attenuated by the natural tree buffer that will remain intact on three sides of the site. Activities will occur in a non-residential area, zoned for industrial use.

Operation-related activities will occur in an industrial area, zoned for such uses. Implementation of the identified mitigation measures will minimize any potential construction-related effects, and any such effects will be localized and temporary (two treatment seasons).

Nordlys will operate the facility in accordance with the Guidelines for Construction and Operation of Facilities Using Ex-Situ Bioremediation for Treatment of Petroleum Contaminated Soil.

In addition to the mitigation measures described above, Nordlys is aware of and will comply with the requirements of the following Acts and Regulations, as applicable:

Provincial Legislation

- Dangerous Goods Transportation Act and Regulations
- Newfoundland Fire Prevention Act and Regulations
- Environmental Protection Act
- Air Pollution Control Regulations
- Storage and Handling of Gasoline and Associated Products Regulations
- Used Oil Control Regulations
- Water Resources Act
- Environmental Control Water and Sewage Regulations

Federal Legislation

- Canadian Environmental Protection Act and Regulations
- Transportation of Dangerous Goods Act and Regulations
- Fisheries Act
- Species at Risk Act
- National Fire Code

v. Occupations

The following table provides an estimate of the number of employees required for Project construction (5 weeks) and operation (24 months).

Number	Occupation	Direct hire / contract	National occupation classification 2011
Constructio	n phase		
3	Technician	Direct hire	2231
1	Civil Engineer	Direct hire	2131
2	Heavy Equipment Operator	Direct hire	7521
2	Labourers	Direct hire	7611
2	Geomembrane Technician	Direct hire	2231
1	Electrician	Contract	7241
Operations phase			
1	Office Clerk	Direct hire	1241
1	Civil Engineer	Direct hire	7521
3	Heavy Equipment Operator	Direct hire	7611
1	Technician – Site Supervisor	Direct hire	2231

Nordlys employs proactive employment equity practices to ensure that their recruiting and hiring processes are fair and equitable, and that applicants are treated equitably with regards to age, gender, and other potential factors. Striving to increase the representation of women, visible minorities, persons with disabilities, and Indigenous Peoples, Nordlys employs best practices for planning for, recruiting, hiring and retaining a diverse workforce. Nordlys uses inclusive, unbiased and ungendered language in advertisements, employs standardized interview questions, and focuses on candidate qualifications in hiring decisions.

vi. Project Related Documents

The Crown Lands Grant application (see below) is the sole Project document that has been generated to date by or for the proponent.

The application for Certificate of Approval for a Waste Management System is under development for submission to the regulator (see below).

A site-specific Environmental Health and Safety Emergency Response Plan is being developed, to include the following:

- Role of employees in response to an incident
- Notification and alerting procedures
- Responsibilities of the on-site commander
- Spill control and clean-up procedures
- Restoration of any spill site
- Information on the disposal of residual material and contaminants
- Resource inventory

A decommissioning plan for remediating the site at the end of operations (equal to or better than its original condition) is also being prepared, for inclusion with the Certificate of Approval application.

APPROVAL OF THE UNDERTAKING

The following table identifies authorizations to which the Project is subject, including the pertinent act, and the responsible department and division.

Permit/Authorization	Governing Act	Department	Division
Environmental Assessment	NL Environmental	Municipal Affairs and	Environmental
Registration/Release	Protection Act	Environment	Assessment
Crown Lands Grant	NL Lands Act	Fisheries and Land Resources	Crown Lands Administration
Certificate of Approval for a	NL Environmental	Municipal Affairs and	Pollution Prevention
Waste Management System	Protection Act	Environment	

i. Environmental Assessment Registration

The NL Environmental Assessment Division issued a letter on September 19, 2017 indicating that the Project is an undertaking requiring environmental review. This Registration Document constitutes

project registration pursuant to the *Environmental Protection Act*, SNL 2002, cE-14.2. The Project cannot proceed until it is released from the environmental assessment process.

ii. Crown Lands Grant

As the proposed Project site is located on Crown land, an Application for Crown Lands was submitted to the Labrador Regional Lands Office on July 6, 2017. The Lands Office provided the application to, and requested comments and recommendations from, the following referral agencies:

- Service NL
- Land Use Planning Section
- Labrador and Aboriginal Affairs Office
- Environmental Assessment Division
- Provincial Archaeology Office
- Department of Natural Resources Agrifoods
- Town of Happy Valley-Goose Bay
- Wildlife Division
- Nalcor Energy

Aside from the Environmental Assessment Division, all referral agencies have provided the Regional Lands Office with confirmation that no further information is needed, and no concerns were expressed about the Project (Lynn Durno, Lands Officer, pers. comm., December 20, 2017).

The Crown Lands Grant will not be issued prior to the Project being released from the environmental assessment process.

iii. Certificate of Approval for a Waste Management System

A Certificate of Approval for a Waste Management System must be acquired prior to initiating Project construction. Nordlys has consulted with the Pollution Prevention Division of NL Municipal Affairs and Environment and is preparing the application for submission in accordance with requirements. The Certificate of Approval will not be issued prior to the Project being released from the environmental assessment process.

SCHEDULE

Site clearing activities are proposed to occur between April 20 and 27, 2018, timed prior to spring melt and to avoid the nesting season. The regional nesting period for the project site (Nesting Zone D6) is from early May to mid-August.¹

Following site clearing, other construction activities would not commence until between June 15, 2018 (at the earliest) and August 15, 2018 (at the latest).

¹ <u>https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html#_03</u>

Given the FCSAP deadline for site restoration and monitoring, the facility must be prepared to begin operations and start accepting soil by October 1, 2018.

FUNDING

No grants or loans of capital funds from a government agency (federal, provincial or otherwise) have been requested for the undertaking.

The capital costs for the undertaking are approximately CAD\$150,000.

2018-02-14

Signature of Chief Executive Officer

Date

APPENDIX A – PHOTOS



PHOTO 1. SURVIVAL TANK FARM AERIAL



PHOTO 2. CONTAMINATED WATER SUMP (TYPICAL), SURVIVAL TANK FARM



PHOTO 3. REMOVAL OF CONTAMINATED SOIL, SURVIVAL TANK FARM



PHOTO 4. BERMING/ENGINEERING CONTROLS, SURVIVAL TANK FARM

APPENDIX B – FIGURES









