



**DILLON**  
CONSULTING

ENVIROSOIL LIMITED

# EA Project Registration

Drill Mud Processing Facility, Conception Bay South, NL

December 19, 2019



Department of Municipal Affairs and Environment  
P. O. Box 8700  
St. John's, NL  
A1B 4J6

Attention: Ms. Joanna Sweeney  
Director of Environmental Assessment

*Drill Mud Processing Facility  
Environmental Assessment (EA) Registration Document*

Dear Ms. Sweeney:

For your review, enclosed is our Environmental Assessment Registration Document and associated documentation for the above noted project. If you have any questions or require clarification, please contact me.

Sincerely,

DILLON CONSULTING LIMITED

A handwritten signature in black ink, appearing to read "P. Koke", is positioned above the typed name.

Paul Koke, M.A., CISEC  
Project Manager

PEK:jes  
Enclosure(s): Six (6) copies of EA Registration Document

Our file: 19-1482-1000

137 Chain Lake Drive  
Suite 100  
Halifax, Nova Scotia  
Canada  
B3S 1B3  
Telephone  
902.450.4000  
Fax  
902.450.2008

Dillon Consulting  
Limited

# Table of Contents

<b>1.0</b>	<b>Name of Undertaking</b>	<b>1</b>
<b>2.0</b>	<b>Proponent</b>	<b>1</b>
2.1	General Information.....	1
2.2	Principal Contact for Purpose of Environmental Assessment .....	1
2.3	Corporate Leadership and Experience .....	2
2.4	Envirosoil's Commitment to Quality.....	3
2.5	Envirosoil's Commitment to Environmental Protection.....	3
<b>3.0</b>	<b>The Undertaking</b>	<b>4</b>
3.1	Name of the Undertaking .....	4
3.2	Rationale for the Undertaking .....	4
<b>4.0</b>	<b>Description of Undertaking</b>	<b>5</b>
4.1	Geographical Location .....	5
4.2	Physical Features.....	8
4.2.1	Project Structure/Infrastructure .....	8
4.2.2	Existing On-site Structures and Access.....	8
4.2.3	Adjoining and Nearby Properties .....	8
4.2.4	Project Area .....	9
4.2.5	Physical Environment .....	9
4.3	Construction Details .....	13
4.3.1	VDU Setup and Installation.....	13
4.3.2	Pelletizing Plant.....	14
4.3.3	Potential Environmental Impacts During Construction.....	15
4.3.4	Mitigation Measures During Construction .....	15
4.4	Operations .....	16
4.4.1	Background .....	16
4.4.2	Vacuum Assisted Recovery Unit.....	16
4.4.3	Safety and Compliance .....	19
4.4.4	Operator Training .....	19
4.4.5	Drilling Fluid Characteristics.....	22
4.4.6	Potential Environmental Impacts During Operations.....	23

4.4.7	Mitigation Measures During Operations .....	23
4.5	Occupations .....	26
4.6	Alternatives Considered .....	26
4.7	Project Related Documents .....	27
<b>5.0</b>	<b>Approval of the Undertaking</b> .....	<b>27</b>
5.1	Permits, Licenses and Approvals.....	27
<b>6.0</b>	<b>Project Schedule</b> .....	<b>28</b>
<b>7.0</b>	<b>Project Funding</b> .....	<b>28</b>
<b>8.0</b>	<b>Closing</b> .....	<b>28</b>

### Figures

Figure 1: Subject Property Location .....	6
Figure 2: Subject Property Aerial Image.....	7
Figure 3: Land Use.....	10
Figure 4: Typical Layout of VDU Pretreatment Unit (excluding the Pelletizing Plant component) .....	14
Figure 5: Integration of the VDU Pre-treatment Unit and Pelletizing Plant.....	21
Figure 6: Two Views of Envirosoil's VDU (excluding Pelletizing Plant).....	22
Figure 7: Typical Components of Drilling Fluid .....	22
Figure 8: Facility Operation Sound Levels .....	25

### Tables

Table 1: VDU Recovered Drilling Fluid vs. Virgin Drilling Fluid .....	17
---	----

### Appendices

A	Project Drawings
B	Site Photos (September/October 2019)
C	Certificate of Commitment to Employment Equity

## 1.0 Name of Undertaking

Drill Mud Processing Facility at 24-42 Hops Street, Conception Bay South (CBS), NL.

## 2.0 Proponent

### 2.1 General Information

Name of Corporate Body:  
Envirosoil Limited

Address:  
P. O. Box 48100  
Bedford, Nova Scotia  
B4A 3Z2

Director:  
Pat Rooney  
Director of Manufacturing  
Tel: (902) 222-7839  
Email: prooney@dexter.ca

Envirosoil Limited Project Lead:  
Jerry Scott, P.Eng.  
General Manager  
Tel: (902) 832-4192  
Cell: (902) 478-2731  
Fax: (902) 832-6390  
Email: jscott@dexter.ca

### 2.2 Principal Contact for Purpose of Environmental Assessment

Dillon Consulting Project Manager  
Paul Koke, M.A., CISEC  
Environmental Specialist  
137 Chain Lake Drive, Halifax, NS, B3S 1B3  
Tel: 902.450.4000  
Email: pkoke@dillon.ca

Dillon Consulting Technical Lead  
 Dan Morehouse  
 Senior Engineer  
 137 Chain Lake Drive, Halifax, NS, B3S 1B3  
 Tel: 902.450.4000  
 Email: dmorehouse@dillon.ca

### 2.3 Corporate Leadership and Experience

Envirosoil Limited (Envirosoil) is a wholly owned subsidiary of the Municipal Group of Companies and since 1992 has operated the largest soil remediation facility in Nova Scotia. The facility operates under an Approval from the Nova Scotia Department of Environment. For the first three years of operation, and with considerable effort and expense, Envirosoil utilized bioremediation technology for the treatment of hydrocarbon contaminated materials. In 1995, a state-of-the-art Low Temperature Thermal Desorption (LTTD) unit was purchased and commissioned at the facility to treat materials that could not be treated effectively, or treated in a timely manner, by bioremediation. Such material included those that were contaminated with high concentrations of hydrocarbons, high petroleum hydrocarbon fractions (C<sub>24</sub> - C<sub>56</sub>), polyaromatic hydrocarbons (PAHs), creosote, bunker, drilling cuttings/muds, etc. Since being commissioned, over 1 million tonnes of contaminated soil, sludge and drilling waste has been successfully treated to non-detectable levels by the LTTD unit.

Envirosoil's corporate philosophy is firmly rooted in the provision of value-added service that surpasses customer expectations and enhances the environment. This mandate encompasses recycling and restoring hydrocarbon contaminated materials/sites to environmentally healthy and productive levels.

As a member of the Municipal Group of Companies, Envirosoil is able to access more than 50 years of management and construction experience and a large fleet of construction and project equipment. This allows the company to assemble project teams with the highest qualifications and skills to successfully complete any task. Use of advanced technology ensures that equilibrium with environmental standards is assured. Envirosoil also has access to the latest technology and the most innovative heavy construction equipment. Through its association with the Municipal Group, Envirosoil is able to draw on the experience of over 1,000 industry personnel, many of who are top managers in their respective fields.

Envirosoil was acknowledged for its abilities by winning the 2000 Nova Scotia Export Achievement Award for its role in the remediation project of over 100,000 tonnes of contaminated sludge in Brunei, on the North East coast of Borneo in the South China Sea. This was a significant achievement and a tremendous success for Envirosoil and its technology.

More recently, Envirosoil, in conjunction with Astec Industries (based in Chattanooga, Tennessee), has developed a new technology for the treatment of waste drilling fluids. The patent pending technology, referred to as Vacuum Assisted Recovery (VAR), is based on the concept of vacuum distillation. Granted regulatory approval to operate by the Nova Scotia Department of Environment, Envirosoil has been operating a Vacuum Distillation Unit (VDU), in Bedford, NS since early 2019. This technology allows for the treatment of waste drilling muds and cuttings with the complete recovery of the valuable synthetic drilling fluid while generating almost no residual waste requiring landfilling or further treatment. During this time, the VDU has been fully commissioned, and has treated almost 800,000 litres of waste drilling fluids. Considerable operational experience has also been gained through this undertaking in Nova Scotia. It is anticipated that approximately 1.5 million litres of waste drilling fluids will be treated at the facility by June 2020.

#### 2.4 Envirosoil's Commitment to Quality

Envirosoil is a soil remediation company committed to the effective treatment of hydrocarbon contaminated materials (i.e., contaminated soil/sludge, oilfield drilling waste, etc.) to meet specified remedial criteria that results in the generation of a recycled product (i.e., remediated soils) that has a restored value. The value of these recovered materials is realized in the successful reuse of the treated materials for fill, roadbed construction materials, aggregate for asphalt or concrete production and in quarry restoration activities.

Envirosoil's policy is to provide a quality treatment process with excellent customer service at a reasonable cost. The company aims for continuous improvement in all aspects of its business that will result in benefits to the environment, customers, regulators, the community, and their employees. To achieve this goal, Envirosoil committed to maintaining a quality management system that incorporates all the required elements of ISO 9001. Personnel at all levels have the required training, resources and necessary empowerment to allow them to carry out their responsibilities in support of the quality policy. This ensures that each phase of its activities has well-defined controls, checks and associated responsibilities that are known, available and understood by all employees.

#### 2.5 Envirosoil's Commitment to Environmental Protection

Envirosoil is committed to the environment management standards of ISO 14001. Envirosoil is a company whose goal is to improve the environment through remediation of hydrocarbon contaminated materials. This is accomplished in a manner that safely and effectively reduces the potential for health and environmental hazards while promoting recycling. Envirosoil is committed to protecting the environment, combined with efforts of the community, regulators, scientists and industry. Operations are conducted in a manner designed to prevent negative environmental impacts. The company's work is executed with a spirit of cooperation to facilitate the enhancement of the environment with a goal to minimize potential risks.

Envirosoil is committed to continual improvement and pollution prevention. They accomplish this through process improvements, provision of resources and equipment, and through the environmental awareness of management and employees. Personnel at all levels have the required training, resources and necessary empowerment to allow them to carry out their responsibilities in support of the environmental policy and allow them to effectively treat contaminated materials. This ensures that each phase of their operations have well-defined controls, checks and associated responsibilities. Envirosoil is committed to the continuous monitoring of its operations and the implementation of appropriate corrective and preventive monitoring and action.

Envirosoil actively complies with all relevant environmental legislation and regulations governing its operations and with other requirements to which the organization subscribes, including ISO 14001.

## 3.0 The Undertaking

### 3.1 Name of the Undertaking

Drill Mud Processing Facility, 24-42 Hops Street, Conception Bay South, NL.

### 3.2 Rationale for the Undertaking

In an effort to improve environmental performance of oil and gas exploration and production activities, and due to an increasing need to drill through difficult geological formations, companies must employ advanced drilling techniques that utilize high performance drilling fluids. Drilling fluids, or muds, are slurries that are injected and circulated down the drill pipe during the drilling process. The fluid is pumped inside the drill string to lubricate and cool the drill bit, carry rock cuttings (small chips of rock) to the surface for disposal, and to help control the well pressure. In this process drilling fluid is reconditioned and re-used; however, as this process is repeated the drilling fluid reaches a stage where it cannot be reconditioned using standard solids control equipment and therefore becomes a waste (mainly due to high solids and water content). The waste drilling mud is typically a pumpable slurry comprised of water (50%), drilling fluid (30%) and fine solids (20%). Following their use in the offshore petroleum industry, waste drilling muds are loaded onto supply vessels and sent to land-based facilities for treatment and/or disposal.

These drilling fluids are typically comprised of low toxicity mineral oil (LTMO) that contains hydrocarbon molecules in the C<sub>10</sub> – C<sub>24</sub> range. These fluids are generally less toxic and are less persistent in the environment when compared to traditional diesel based drilling fluids. However, they are considerably more expensive. The recovery and reuse of the synthetic drilling fluid from waste materials such drilling mud and cuttings is critical for the environmental sustainability and economic feasibility of future oil and gas exploration activities in the province. Today, none of the most common methods for handling waste



drilling mud fully recycle the waste. At best, methods are limited to down-cycling, where the material is reduced to a lower quality and functionality than the original material.

Envirosoil proposes to install and operate a Vacuum Assisted Recovery Unit that allows for the treatment of waste drilling mud, fluids and cuttings with the purpose of recovering the valuable synthetic drilling fluid without thermally cracking or degrading the valuable LTMO drilling fluid. It will also minimize the generation of residual waste requiring additional treatment and/or disposal. The VAR Unit utilizes a two-stage process that consists of a (1) high vacuum distillation unit, and (2) a pelletizing process to produce a product that can be used as an alternative industrial fuel source.

The use of Envirosoil's proposed technology to treat contaminated drilling muds will provide Newfoundland and Labrador's offshore petroleum industry with a more cost effective option for the remediation of materials impacted with contaminants. It will allow for these contaminated materials to be treated year round, and allow for environmentally sustainable, faster and more cost effective options for Newfoundland and Labrador's offshore petroleum industry.

The proposed undertaking includes the implementation of the VDU, pelletizing plant and direct ancillary facilities at the site.

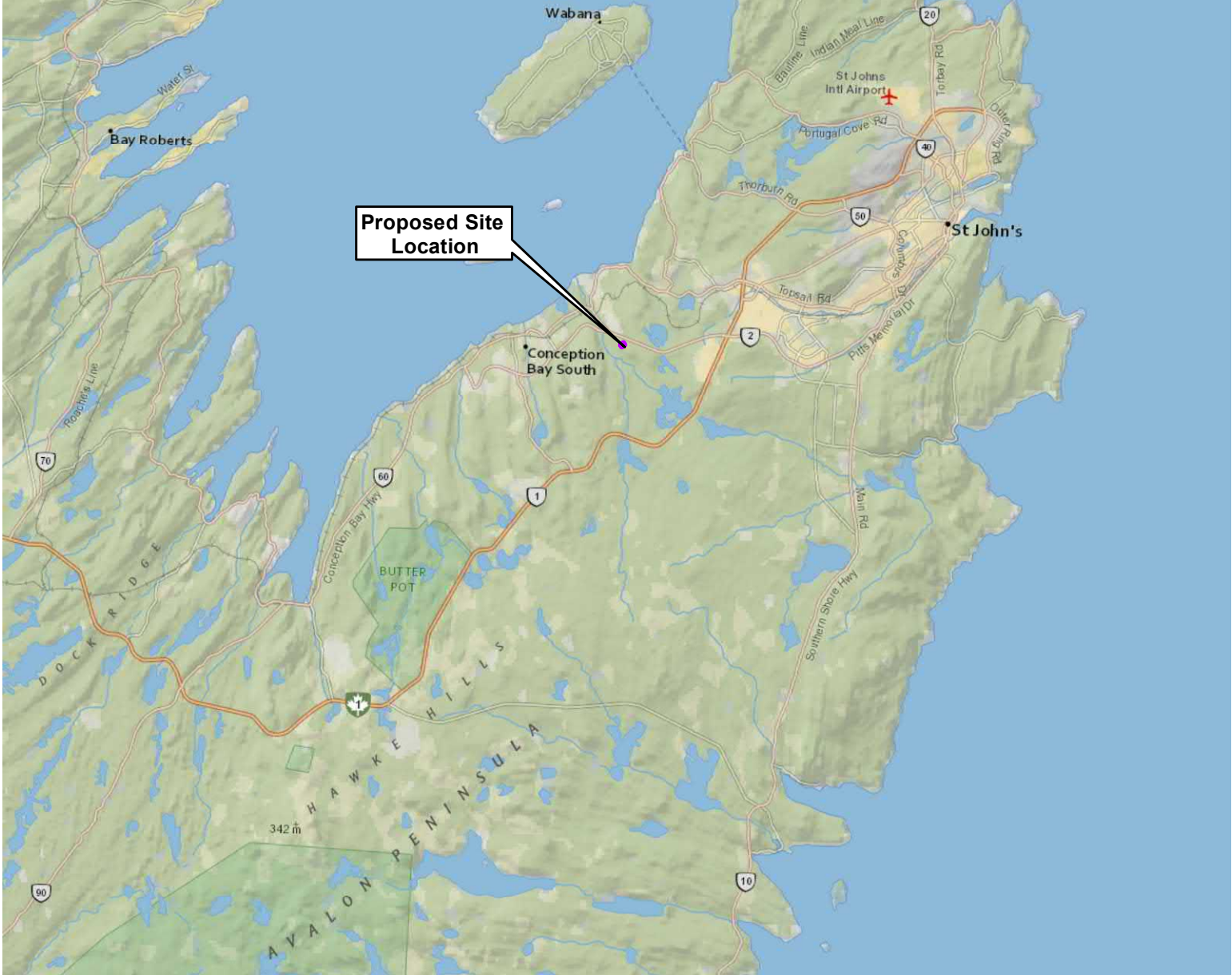
## 4.0 Description of Undertaking

The Vacuum Assisted Recovery Unit will operate from a permanent, fixed facility site at an existing cleared and vacant lot in a Commercial Light Industrial (CLI) Zone of Conception Bay South. Envirosoil will mobilize its VDU equipment to the property from its current location in Bedford, NS, construct an on-site pelletizing plant, and complete treatment and activities within the boundaries of the property.

It is anticipated that the vast majority of projects involving Envirosoil's VAR Unit will be associated with the treatment of used drilling muds associated with Newfoundland-based offshore oil exploration and production activities. Drilling muds used in the offshore drilling industry are generally classified as low-toxicity drilling muds, and consist of mineral based oils that have low health and safety risks. Alternatives to the undertaking are discussed in Section 4.6 below.

### 4.1 Geographical Location

The proposed project location is within the Conception Bay South Industrial Park, located at 24-42 Hops Street, off Highway 2 (Peacekeeper's Way) and Fowler's Road within the Town of Conception Bay South limits, and approximately 20 km from central areas of the City of St. John's, NL (NTS Map Sheet 01N10). Regional and local location figures are presented in Figures 1 and 2 below.



Envirosoil Limited  
Waste Drill Mud Treatment Facility

Site Location  
Figure 1

Site Location

---



---



---



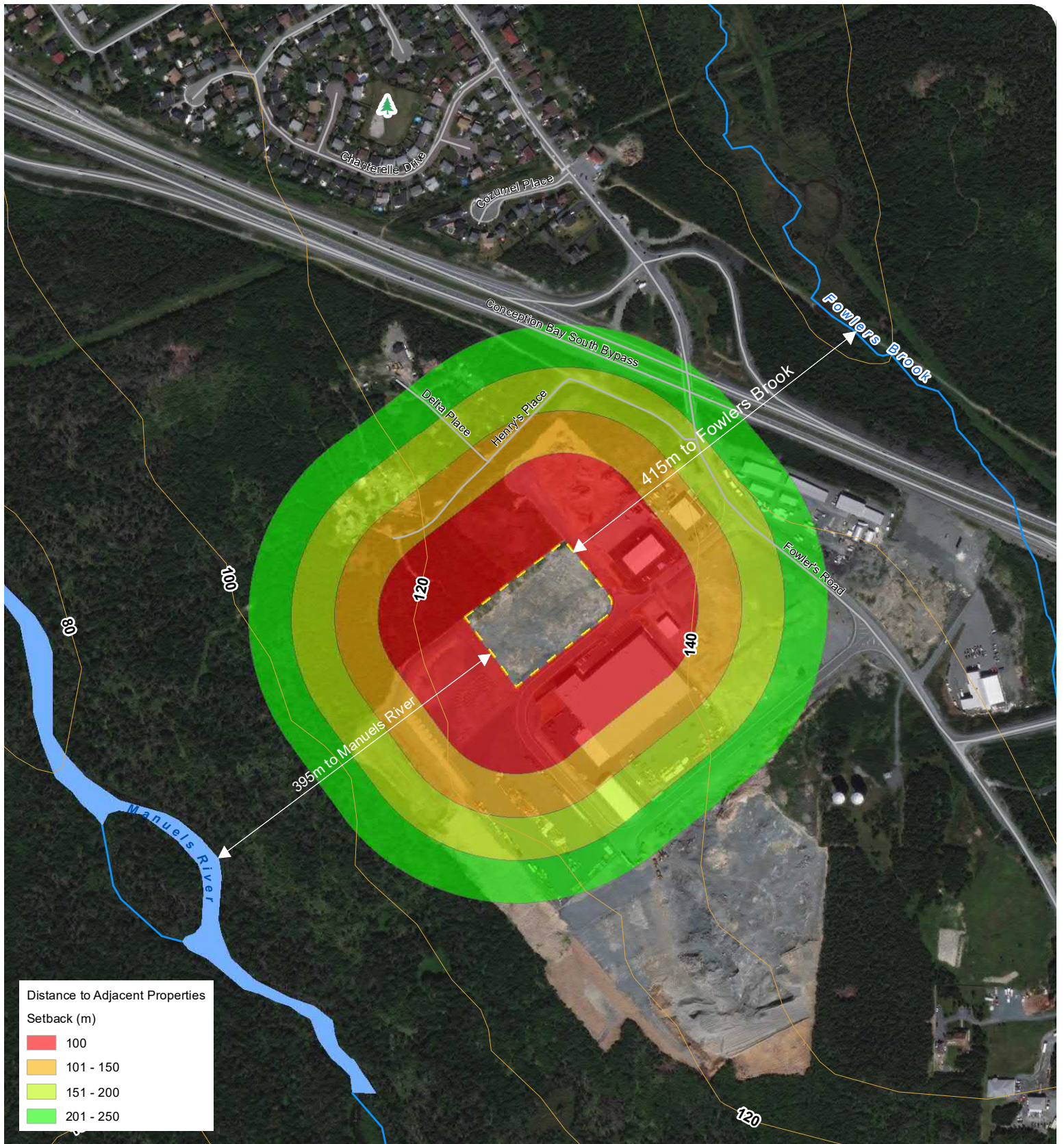
---



MAP DRAWING INFORMATION:  
DATA PROVIDED BY CanVec, ESRI

MAP CREATED BY: SCM  
MAP CHECKED BY: PEK  
MAP PROJECTION: NAD 1983 UTM Zone 22N





Envirosoil Limited  
Waste Drill Mud Treatment Facility

Site Plan  
Figure 2

Subject Property

MAP DRAWING INFORMATION:  
DATA PROVIDED BY CanVec, ESRI

MAP CREATED BY: SCM  
MAP CHECKED BY: PEK  
MAP PROJECTION: NAD 1983 UTM Zone 22N



0 25 50 100  
Metres

PROJECT: 19-1482 STATUS: FINAL Date: 2019-12-02



## 4.2 Physical Features

### 4.2.1 Project Structure/Infrastructure

Envirosoil will mobilize all of the necessary equipment to allow for the effective processing of drilling muds to be completed at the site. The following infrastructure components are expected to be required as part of its operations:

- Bulk Fuel Storage Tank (propane or liquid fuel) and associated secondary containment dike with jersey barricade dike walls, asphalt floor, and petroleum resistant liner;
- Operational pad for complete containment of drill mud processing and storage facility;
- Drill mud processing plant (VDU);
- Pelletizing plant;
- Pellet storage (fully contained);
- Control house;
- Three hot oil heaters;
- Nitrogen generator;
- Vacuum pump;
- Reinforced concrete unloading apron;
- Drill mud transfer pump;
- 15,000 litre double walled underground fibreglass reinforced plastic (FRP) oil water separator;
- Three site trailers, lunchrooms, washrooms, offices, decontamination facilities as required;
- Secondary asphalt containment curbs and dikes (paved with petroleum resistant liner); and
- 8 foot high chain link security fence surrounding entire property.

The proposed site plan/layout for the drill mud processing and storage facility at the property is presented in Appendix A.

### 4.2.2 Existing On-site Structures and Access

There are currently no structures present on the subject property. Access to the site will be directly from Hops Street.

### 4.2.3 Adjoining and Nearby Properties

Adjacent land use is a mix of undeveloped land, commercial/light industrial, and rural residential properties.

West – Undeveloped, gravelled lot, and storm water retention ponds servicing the industrial park.  
 South – Hops Street, and developed lot used for materials and equipment storage associated with the offshore petroleum industry. There is also a graded lot that was previously approved (Town of Conception Bay South Development Permit and NLMAE Environmental Assessment) for use as a concrete batch plant in 2015.

North – Forested buffer (mature), vacant industrial lot, seven rural residences, and the Conception Bay South Bypass (highway).

East – gravel road and commercial developments, consisting of BlueWater Group, automotive repair business, trailer repair shop, fitness businesses, etc.

Current land use at and adjacent the subject property is presented in Figure 3 below.

#### 4.2.4 Project Area

##### 4.2.4.1 Site Background

The subject property is rectangular in shape and approximately 1.3 hectares (3.2 acres) in total area. Based on a review of historical aerial imagery for the area, in anticipation of future commercial/ industrial development needs, the subject site was previously cleared of mature vegetation, filled and graded, and gravelled in late 2012/early 2013. Since this time, the property has remained vacant.

Located in an area zoned Commercial Light Industrial (CLI), the proposed undertaking is contained fully within an approved, planned industrial park. General industrial uses are listed as discretionary in this area (as defined in Section 10.7 of Town of Conception Bay South Development Regulations, 2011-2021).

#### 4.2.5 Physical Environment

The topography of the Site generally slopes downward to the west, consistent with the slope of the majority of the industrial park. Throughout the industrial park, surface drainage appears to be to the west. It is anticipated that groundwater also generally flows in this direction. The direction of shallow groundwater flow at the Site may be influenced by the presence of underground utility corridors and is not necessarily a reflection of regional or local groundwater flow.

Based on available surficial geology maps and previous site investigations, the native surficial soils at the property consist of glacial deposits, principally comprised of sand and gravel till overlying sedimentary bedrock. Based on bedrock geology mapping for the area, bedrock in the area of the property consists of granite of the Late Proterozoic to Cambrian era. Land surfaces at the property generally consist of coarse native materials (sand, gravel, and cobble). Stormwater drains by infiltration. No overland flow is expected at the property. There are no natural wetlands or watercourses at the property. Since the property was cleared within the past decade, vegetation is limited to early successional herbs and woody plants.

##### *Regional Background*

The site is located within the Maritime Barrens Eco-region, Southeastern Barrens Subregion (see [https://www.faa.gov.nl.ca/forestry/maps/mbarrens\\_eco.html](https://www.faa.gov.nl.ca/forestry/maps/mbarrens_eco.html)). This subregion covers the southern and central portions of the Avalon Peninsula, and most of the Burin Peninsula. It is characterized by cool



Envirosoil Limited  
Waste Drill Mud Treatment Facility

Site Plan  
Figure 3

Current Land Use

- |                        |                             |                            |
|------------------------|-----------------------------|----------------------------|
| Subject Property       | Commercial/Light Industrial | Open Space Conservation    |
| Contour Interval (20m) | Commercial Local            | Residential Medium Density |
| Highway Reserve        | Rural                       |                            |

MAP DRAWING INFORMATION:  
DATA PROVIDED BY CanVec, Town of Conception Bay South ESRI

MAP CREATED BY: SCM  
MAP CHECKED BY: PEK  
MAP PROJECTION: NAD 1983 UTM Zone 22N



0 25 50 100  
Metres

PROJECT: 19-1482 STATUS: FINAL Date: 2019-12-02



summers, with frequent fog and strong southerly winds, and short, moderate winters. The mean annual temperature in the area is approximately 5.5°C, with a mean summer temperature of 11.5°C and a mean winter temperature of 1°C. The mean annual precipitation in the area ranges from 1200 mm to 1600 mm.

#### *Surface Water Features*

There are no surface water features located at the subject property. The nearest watercourses include Fowlers Brook, located approximately 450 m to the east of the property, and Manuels River, located 395 m to the west.

There is an established, approximately 250 m wide environmental buffer (undeveloped, open space) located between the western edge of the industrial park and Manuels River to the west. There is also a storm water retention pond located downgradient and to the west of the subject property.

#### *Manuel's River Watershed*

The subject property is located within the Manuels River watershed area. This watershed area is approximately 80 km<sup>2</sup>. 55 km<sup>2</sup> of the watershed are located within the Northeastern Barrens Subregion of the Maritime Barrens, and the remaining 25 km<sup>2</sup> are located in the Southeastern Barrens Subregion.

The headwaters of Manuels River are formed by a series of ponds south of the river which drain pasture land, sod farms and a chicken farm. The ponds include Cochrane Pond, Northern Pond, Gear Pond, Loo Pond, Thomas Pond, Western Pond and Paddy's Pond. Wych Hazel Pond is also a major tributary that lies west of Manuel's River. Manuel's River flows in a northerly direction from its headwaters to its discharge into Conception Bay in the Manuels area of Conception Bay South. The river is approximately 10 km in length.

#### 4.2.5.1

#### Vegetation

Site reconnaissance and field studies were completed at the subject property in September and October 2019 to gather information to support this Environmental Assessment Registration. The subject property is currently unvegetated with the exception of a number of early successional herbs and woody plants scattered throughout the property. All woody plants identified were young saplings and generally less than 1 m in height.

Identified tree and shrub species at and adjacent the property included:

- Eastern larch (*Larix laricina*);
- Balsam fir (*Abies balsamea*);
- White birch (*Betula papyrifera*);
- Speckled alder (*Alnus incana*);

- Common red raspberry (*Rubus idaeus*); and
- A species of wild cherry (*Prunus* spp.).

Most of the herbaceous species present on site are considered common in disturbed, urban environments and included:

- Knapweed (*Centaurea nigra*);
- Grass-leaved goldenrod (*Euthamia graminifolia*);
- Rough-stemmed goldenrod (*Solidago rugosa*);
- Downy goldenrod (*Solidago puberula*);
- Purple toadflax (*Linaria purporea*);
- Pearly everlasting (*Anaphalis margaritacea*);
- Common plantain (*Plantago major*);
- New York aster (*Symphyotrichum novi-belgii*);
- Colts foot (*Tussilago farfara*);
- Common dandelion (*Taraxacum officinale*);
- Clammy groundsel (*Senecio viscosus*);
- Bristly sarsaparilla (*Aralia hispida*);
- Tussock grasses (*Deschampsia* spp.); and
- Fescues (*Festuca* spp.).

## 4.2.5.2

## Wildlife and Wildlife Habitat

Based on September and October 2019 field investigations, it was determined that impacts to priority wildlife species are not anticipated due to project activities proposed at the subject property. The property is currently cleared and partially graded, with minimal wildlife habitat potential. The property does not serve as a migratory corridor for mammal species, and holds only limited potential for foraging wildlife species (specifically, birds and small mammals).

Approximately 400 m to the west of the proposed facility, Manuels River and its riparian areas are locally known for being rich in vegetation and wildlife habitat, hosting a variety of aquatic plants, trees, shrubs and wildflowers. Some aquatic plants identified in the Manuels River area include sedges, rushes, and bladderworts. Small and large mammals also inhabit the watershed. Species include, but are not limited to, moose, red fox, beaver, muskrat, squirrels and hare.

Common avian species are also present along the river. The nearest Important Bird Areas (IBA), as determined through Canada's Important Bird and Biodiversity Areas Program ([www.ibacanada.com](http://www.ibacanada.com)), is over 20 km to the east of the subject property.

Due to the proximity of the subject property to Manuels River high water mark (located 395 m to the west), and that there is over 150 m of developed industrial park space (graded pad and storm water retention ponds) and an approximately 250 m wide mature forested buffer, between the western



border of the industrial park and the river, interactions between the project and wildlife and wildlife habitat are expected to be minimal.

It is also noted that surface water is directed to the existing storm sewer in the industrial park and will not be directed overland from the site to Manuels River or its tributaries.

### 4.3 Construction Details

Site preparation, including final grading activities, is expected to commence following release of the Project from the EA process from Newfoundland and Labrador Municipal Affairs and Environment (NLMAE). Envirosoil plans to begin physical site preparation activities in late winter to early spring 2020.

Components of the VDU and its direct ancillary facilities are generally pre-fabricated and will be delivered to the subject property from Bedford, NS. It is anticipated that assembly of parts and commissioning of the VDU would take up to 10 weeks. Mobilization of materials and equipment from suppliers is anticipated to occur within four months of the EA Registration submission date. To complete the VAR process, it is anticipated that the pelletizing plant will be added to the VDU in late 2020 to early 2021. Construction will also be subject to the approval of site plans from the Town of Conception Bay South.

No project features will be constructed within 395 m of any natural wetlands or watercourses. Some off-site support infrastructure (e.g., access road, power sourcing, buried utilities) currently existing within the industrial park will be required as part of the project.

#### 4.3.1 VDU Setup and Installation

It is anticipated that the VDU will be installed in late June to August 2020. The VDU will initially be setup as a standalone unit until the pelletizing plant component is added. Figure 4 below presents a typical layout of the VDU (excluding the pelletizing plant component). The Site Plan and General Arrangement at the Hops Street location is provided in Appendix A.

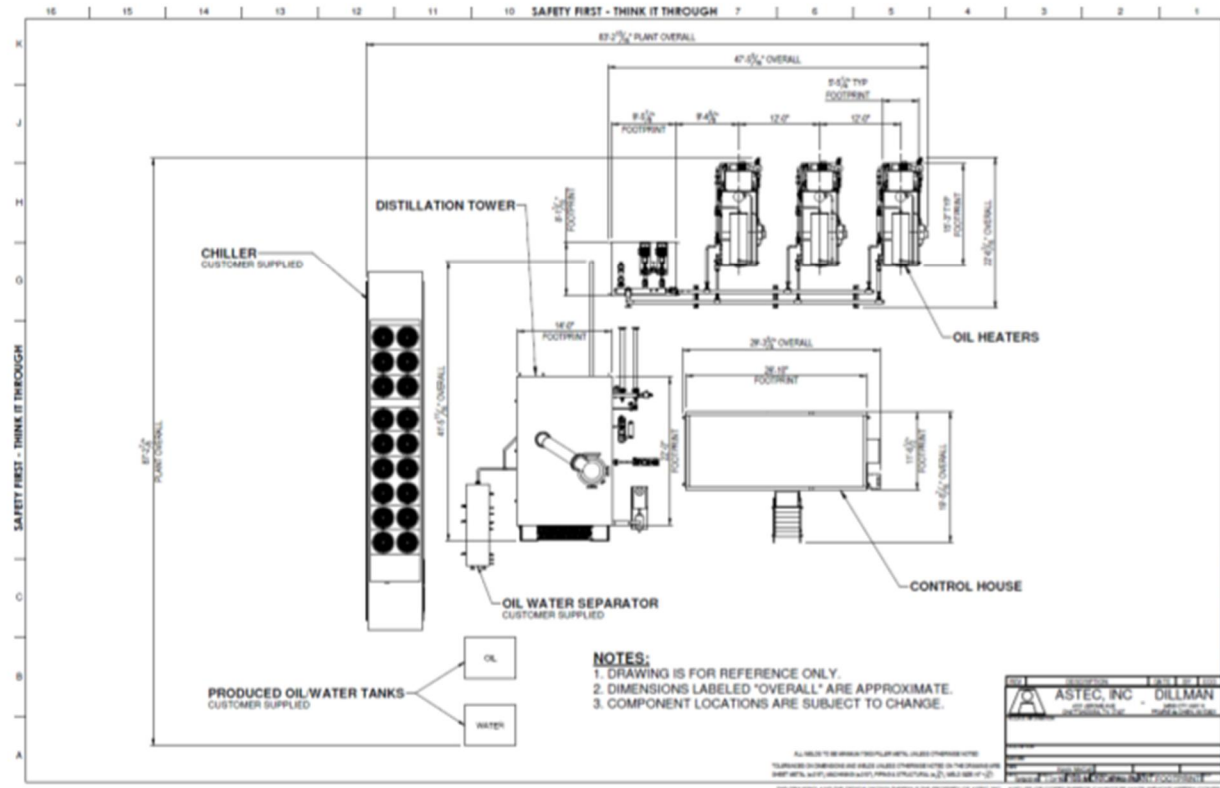
Installation of the VDU will be performed using experienced personnel and third party contractors under the direct supervision of Envirosoil. Safety will be a primary focus during the setup of the unit and all of Envirosoil's safety procedures will be strictly adhered to.

The VDU will be connected to the electrical system servicing the CBS Industrial Park by qualified electricians and all setup activities will be completed in accordance with regulatory and code requirements.

Prior to initiating any treatment activities the VDU unit will undergo a complete commissioning program to ensure that all safety, processing and monitoring systems are functioning as intended and that all systems/controls are fully functional. The VDU unit is already commercially operational in Nova Scotia

and will have treated approximately 1.5 million litres of waste drilling mud/cuttings prior to commissioning as part of this Project. The commissioning program will be completed by experienced Envirosoil personnel.

Figure 4: Typical Layout of VDU Pretreatment Unit (excluding the Pelletizing Plant component)



### 4.3.2 Pelletizing Plant

It is anticipated that the pelletizing plant will be added to the VDU in late 2020 to early 2021. Prior to completion of construction of the pelletizing plant, it is anticipated that any residual wastes generated from the VDU will be sent to a local bioremediation facility for treatment (e.g., Terrapure Environmental, Pardy's Waste Management and Industrial Services Ltd., or Universal Environmental Services Inc.). The Site Plan and General Arrangement provided in Appendix A, presents the location and approximate dimensions of the pelletizing plant. Construction of the pelletizing plant will be performed using experienced personnel and third party contractors under the direct supervision of Envirosoil.

The pelletizing plant will be connected to the electrical system servicing the property by qualified electricians and all setup activities will be completed in accordance with regulatory and code requirements. The plant will undergo a complete commissioning program to ensure that all safety, processing and monitoring systems are functioning as intended and that all systems/controls are fully functional. The commissioning program will be completed by experienced Envirosoil personnel.

### 4.3.3 Potential Environmental Impacts During Construction

The Project will be designed and constructed so as to minimize risk and potential environmental impacts, including sources of pollutants. Potential environmental impacts during construction that have been identified include:

- Dust;
- Risk of fuel, lubricant, and hydraulic fuel release;
- Airborne emissions from construction equipment;
- Noise pollution from construction activities (no blasting activities are anticipated); and
- Temporary increase in on-site and off-site traffic (during equipment mobilization).

Small volumes of non-hazardous solid waste materials (i.e., construction debris) may also be generated during assembly from materials and parts packaging. Materials will be recycled where possible, and general refuse will be collected and disposed of as per local regulations for commercial waste.

Negative environmental effects to the environment are anticipated to be minimal during the construction phase since activities are generally limited to the assembly of pre-fabricated components, and the site is generally cleared of vegetation and there are no surface water features. No project features will be constructed within 395 m of any natural wetlands or watercourses, and there is no natural vegetation on the property other than common weed species. Conflict with wildlife or other resources is not anticipated since the property will be fully enclosed by chain link fencing.

### 4.3.4 Mitigation Measures During Construction

Envirosoil will follow all specified permit conditions, safety codes, and construction best management practices during construction. Standard mitigation measures will be employed, as applicable, to reduce or eliminate adverse effects associated with construction. The following project specific mitigation measures will be implemented during construction so as to mitigate potential sources of pollutants from entering the environment:

- A site specific Environmental Management Plan (EMP) will be developed and followed;
- A site specific Erosion and Sediment Control Plan (ESCP) will be developed and followed;
- A project-specific Emergency Response and Contingency Plan (ERCP) for unplanned events will be prepared. This will include spill management and response procedures to prevent and respond to spills;
- An 8 foot high chain link perimeter security fence with a controlled access gate will be installed around the property to eliminate trespassers, as well as reduce the likelihood of interactions with wildlife;
- All debris and waste materials will be disposed of in accordance with the latest regulations respecting Solid Waste Resource Management issued by Newfoundland and Labrador Municipal Affairs and Environment. Non-hazardous construction debris will be either recycled or salvaged; items may include cardboard;

- On completion of the Project, all construction equipment, surplus materials and temporary works will be cleared away and removed from the site;
- If additional backfilling and/or grading are required, only new or reused, clean materials will be used. Material will be sourced from existing, approved pits or quarries;
- Dust mitigation measures will be implemented. Specific measures might include dust suppression activities such as wetting of the construction areas and sweeping and washing of paved road surfaces;
- All equipment used on site will be in good working order to reduce effects of noise;
- All construction activities will occur during working hours as defined in the permit; and
- Notice of construction activity will be appropriately communicated to potentially affected businesses and residents.

The proposed location of the facility will be surrounded by perimeter fencing, minimizing unauthorized access and wildlife conflicts.

## 4.4 Operations

### 4.4.1 Background

When an oil or gas well is drilled into a formation containing hydrocarbons, the drilling process generates drill cuttings which are washed back to the surface by the circulation of drilling mud in the well. The drill cuttings are usually contaminated by hydrocarbons from the reservoir and by the drilling mud that is pumped down the hole in order to wash the cuttings out of the well and aid in the drilling process. The contamination of the cuttings by the drilling mud and the reservoir hydrocarbons present challenges for the operator because environmental regulations require that the cuttings be treated to reduce the residual hydrocarbon content to acceptable levels before they can be safely disposed of. In addition, significant efficiency and cost savings can be achieved by recovering and recycling the used drilling mud for subsequent use in future drilling events/cycles.

### 4.4.2 Vacuum Assisted Recovery Unit

#### 4.4.2.1 VDU Technology Description

The VDU technology utilizes a process that consists of a high vacuum distillation unit that heats the material under a high vacuum to evaporate the oil and water fractions which are subsequently collected, condensed and separated into hydrocarbon and water products. The process allows for the removal, separation and recovery of hydrocarbons based on the boiling point of the specific hydrocarbon fractionation. In this manner the specific hydrocarbon compounds associated with the synthetic drilling fluid (typically C<sub>10</sub> – C<sub>24</sub>) can be separated and recovered from the general hydrocarbon mixture contained within the waste drilling mud/cuttings.

Inside the VDU the pressure is reduced to 10 – 30 mm Hg and heat from a thermic fluid heating system is transferred to the waste drilling mud/cuttings through a heat exchanger. The use of a high vacuum

within the vacuum chamber significantly lowers the temperatures required to evaporate/boil the hydrocarbons associated with the drilling fluid. This reduction in boiling point temperatures results in reduced energy consumption as well as guaranteeing that the operational temperature never reaches the levels required for thermal cracking or degradation of the synthetic oil. Once the synthetic drilling fluid has been recovered, the residual solids/sludge will still contain the high molecular weight hydrocarbons that came from the reservoir oil (i.e.,  $>C_{24}$ ). These solids/sludges are then typically sent to a facility for final treatment and/or disposal. There are several operating facilities located in eastern Newfoundland, including but not limited to, Terrapure Environmental and their indirect thermal desorption process at their Logy Bay Road location, as well as the centrifuge process at their Foxtrap area operations. Pardy's Waste Management and Industrial Services Limited, as well as Universal Environmental Services Inc. also operate permitted systems for processing drilling waste. However, it is noted in the VAR process, solids/sludges will be pelletized for use as an alternative fuel product (as described in Section 4.4.2.2 below).

The design and operation of the VDU technology results in recovered drilling fluids whose quality significantly exceeds that of any existing technology in the market today. As shown in Table 1, the chemical and physical properties of the recovered synthetic oil from the VDU technology is equivalent to those of virgin synthetic drilling fluid. The extremely high quality of recovered drilling fluid means that solids control companies and oil exploration companies can confidently reuse the fluid without compromising safety, quality or production.

Table 1: VDU Recovered Drilling Fluid vs. Virgin Drilling Fluid

Parameter	Recovered Drilling Fluid	Typical Synthetic Drilling Fluid
Flashpoint (°C)	94	94
Specific Gravity	0.80	0.80
% Water	0.01	0.0
% Solids	ND	NA
%Hydrocarbons	99.9	100
Aniline Point (°C)	81.9	82 max
Pour Point (°C)	<-51	-54
Kinematic Viscosity (cST) @ 40 °C	1.5	2.6 max
BTEX	0.013%	0.1% max
Aromatics	3.6%	5.0% max
Aliphatics	96.4%	NA
PAHs (total)	0.01%	0.35% max

In addition to the high quality of recovered drilling fluid generated by the VDU, the technology also generates recovered water. The quality of the recovered water is typically within the environmental criteria for discharge to storm sewer (note that different regulatory jurisdictions may have varying discharge criteria). Typically the recovered water contains less than 5 mg/L of Total Petroleum Hydrocarbons (TPH) and less than 25 mg/L of Total Suspended Solids (TSS).

Recovered water discharged to the storm sewer will comply with Schedule A guidelines of the *Environmental Control Water and Sewage Regulations, 2003* (available online at <https://www.assembly.nl.ca/legislation/sr/regulations/rc030065.htm#SchedA>). It is noted that the TPH (referenced as "Oils" in Schedule A) regulatory guideline is 15 mg/L and TSS guideline is 30 mg/L.

On average, it is anticipated that the proposed VDU will discharge between 30 to 70 m<sup>3</sup> of recovered water per week to the existing storm water system that services the Conception Bay South Industrial Park. In adherence to all anticipated Certificate of Approval conditions and provincial regulatory criteria, as well as Town of Conception Bay South approvals, all process water will be collected, stored, tested and/or treated prior to being discharged to the storm water system.

#### 4.4.2.2

#### Pelletizing Process

In addition to the high quality of recovered drilling fluid generated by the VDU, the Vacuum Assisted Recovery Unit will produce an alternative fuel pellet product.

Following recovery of the synthetic drilling fluid, residual solids/sludge will still contain the high molecular weight hydrocarbons that came from the reservoir oil (i.e., >C<sub>24</sub>). Traditionally, these residual solids/sludge have been sent for landfill disposal or sent to a low temperature thermal desorption unit where the hydrocarbons are destroyed. Neither of these traditional options allowed for the recycling of the hydrocarbons within the solids/sludge. Incorporating a pelletizing process will generate an alternative fuel (pellet) that can be utilized in cement plants, biomass plants, industrial boilers, etc.

The process of manufacturing the fuel pellets involves placing the residual solids/sludge, and several proprietary binders, into a specially manufactured pellet plant. Potential binding components may include, but not necessarily be limited to, starch, molasses, or clay. Any binders used will be non-hazardous in nature, and fully contained during storage. Inside the pelletizing plant, the mixture is homogenized and "fuses" together, forming a solid mass. This material is then extruded from the pelletizing plant in predetermined sizes and shapes.

The characteristics of the fuel pellets generated by the process can be tailored to the specific requirements of the end user. This tailoring involves adjusting the heating value, moisture content, ash content and pellet dimensions that is required for each end user (i.e., biomass plant, boilers, etc.). The energy content of the produced pellets is very similar to that of a traditional wood pellet (i.e., approximately 7000 Btu/lb). In Newfoundland, it is anticipated that end users may include

commercial/industrial users with large biomass plants (e.g., pulp and paper operation) or other industrial scale boiler systems. On island and off-island energy producers are also anticipated end users.

#### 4.4.3 Safety and Compliance

The design of the VDU system was completed by Envirosoil, Astec Industries, supported by CBCL Limited of Nova Scotia. CBCL was contracted for engineering services to complete the chemical analysis/design of the distillation tower and for a safety review, design review and code compliance review to ensure that the system was constructed in accordance with all applicable safety guidelines and regulatory requirements.

The VDU and ancillary facilities are equipped with the latest in safety and controls technology to ensure safe, efficient operations. The unit is equipped with a technologically advanced programmable logic controller (PLC) system with touch screen human-machine interface (HMI) and sophisticated safety and treatment algorithms. The system includes digital data logging of critical process parameters, Ethernet access to process data, communication with other Process Management Systems, and remote system access using wireless technology.

The facility also incorporates a sophisticated series of safety alarms, process alarms and emergency shutdown alarms. All of the safety interlocks, alarms and process components are tied to the main PLC control system that will monitor/control all devices (i.e., flow meters, high/low level monitors, temperatures, pressures, etc.). Some of the safety/emergency control systems include high temperature/pressure sensors, flow sensors, pressure relief valves, Nitrogen purge and “dump” system (i.e., the system is flooded with Nitrogen in the unlikely event of an emergency).

The design of the system is based on the most up to date advances in safety, environmental protection and industry standards. All components are designed to the applicable Canadian code and regulatory requirements for safety, electrical, piping, pressure vessel, etc. All equipment will have the necessary certifications (i.e., CSA, CRN, etc.) required to operate in Canada and Newfoundland and Labrador.

#### 4.4.4 Operator Training

The operation of the proposed facility will be performed by trained, experienced Envirosoil personnel. Personnel have experience in running Envirosoil’s VDU at the Bedford, Nova Scotia location since May of 2019, and are also experienced with other treatment processes and are intimately familiar with the handling of contaminated materials.

Any new operators will undergo a series of training led by experienced Envirosoil management and operators. Once the VDU equipment and pelletizing plant is setup and operational, all Envirosoil operators will undergo additional training during the commissioning of the VDU pre-treatment unit at the Hops Street location. This training will be performed by Envirosoil personnel. The training program will ensure that the operators have in-depth knowledge of all safety, controls and operational and

maintenance aspects of the equipment. The operators will also undergo training with regards to any requirements of the Certificate of Approval, issued by the Industrial Compliance section of NLMAE.

## 4.4.4.1

#### Environmental Sustainability and Drilling Fluid Reuse

In Newfoundland, the technology will be utilized for the long term treatment of waste drilling materials generated by oil and gas exploration offshore Newfoundland. It is anticipated that the system will treat 5,000 – 10,000 tonnes/year of drilling waste from offshore activities, and recover 0.8 to 1.9 million litres of valuable drilling fluid per year. The LTMO drilling fluid that will be recovered from the operation of the VAR Unit will be fully recycled, sold back to the petroleum industry, and reused by the oil production/exploration companies operating in the region.

The quantity of LTMO drilling fluid recovered/recycling as a result of the proposed VDU operations represents up to 50% of the total volume of LTMO drilling fluid currently used on an annual basis offshore Newfoundland. This 50% annual reduction in virgin LTMO drilling fluid usage represents a significant step in environmental sustainability for the offshore industry in Newfoundland and Labrador.

With the implementation of the VDU process and pelletizing plant, Envirosoil will be able to treat waste drilling muds/cuttings without having to use another traditional remediation option available in the province (e.g., LTTD, bioremediation, etc.). This will result in Envirosoil being able to achieve the following benefits:

- Recover/recycle valuable LTMO drilling fluid;
- Perform 100% recycling of the recovered LTMO drilling fluid (i.e., no “down-cycling”);
- Significantly reduce the handling and movement of waste material compared to conventional treatment systems;
- Reduce the risk of spills via material handling;
- Significantly reduce the use of carbon based fuels;
- Significantly reduce emissions to the atmosphere; and
- Achieve a significant reduction in fuel usage and CO<sub>2</sub> emissions.

Figure 5 presents a schematic of the integration of the VDU and pelletizing plant portion. Figure 6 presents a typical view of the VDU pre-treatment unit.



Figure 5: Integration of the VDU Pre-treatment Unit and Pelletizing Plant

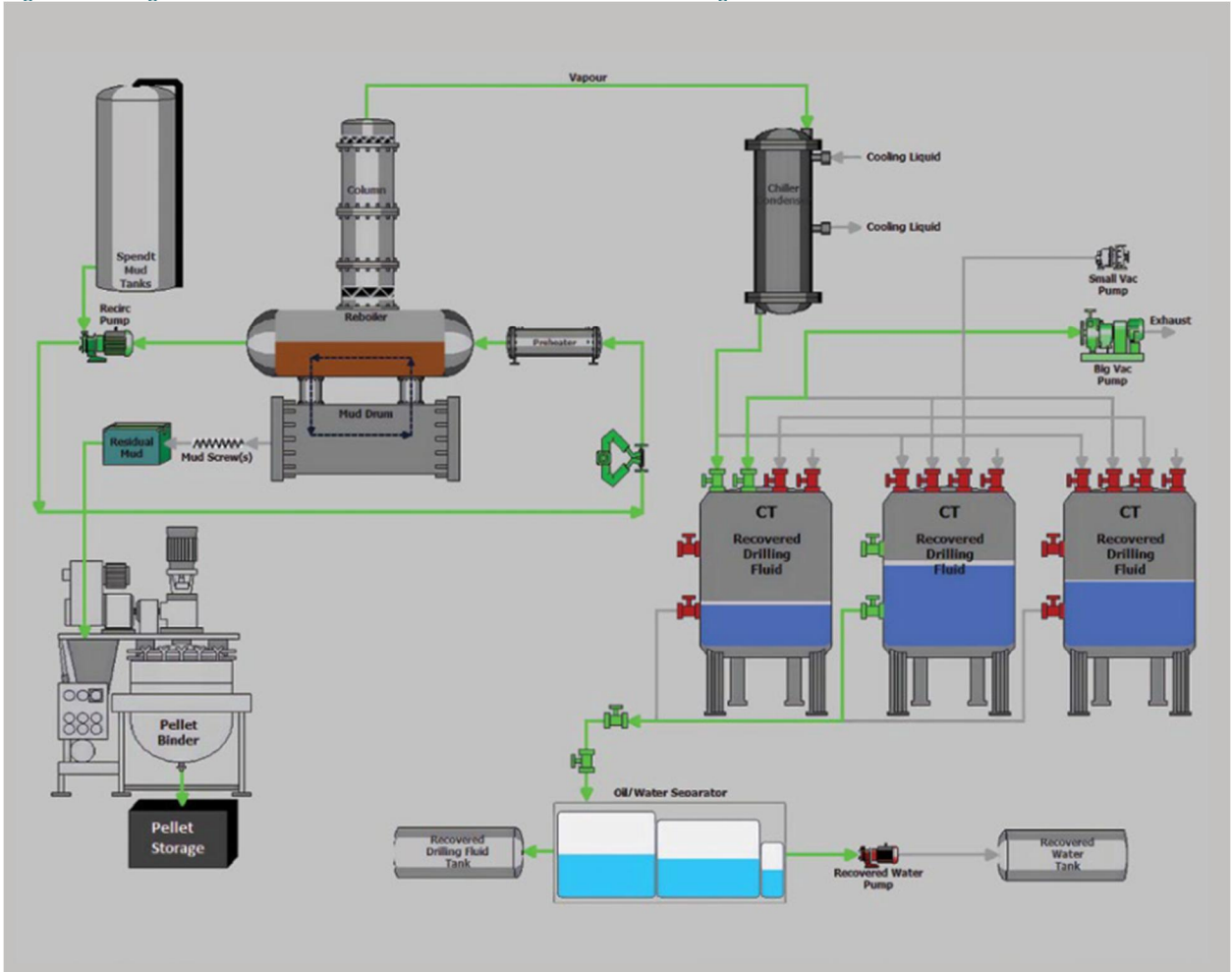
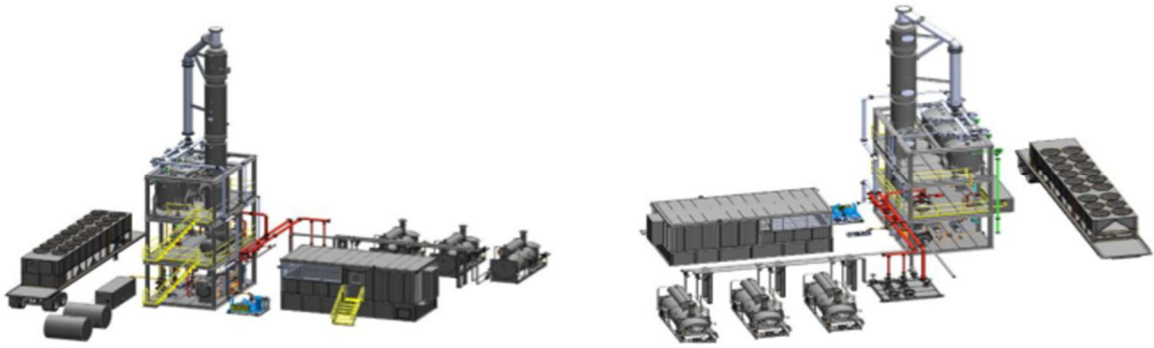


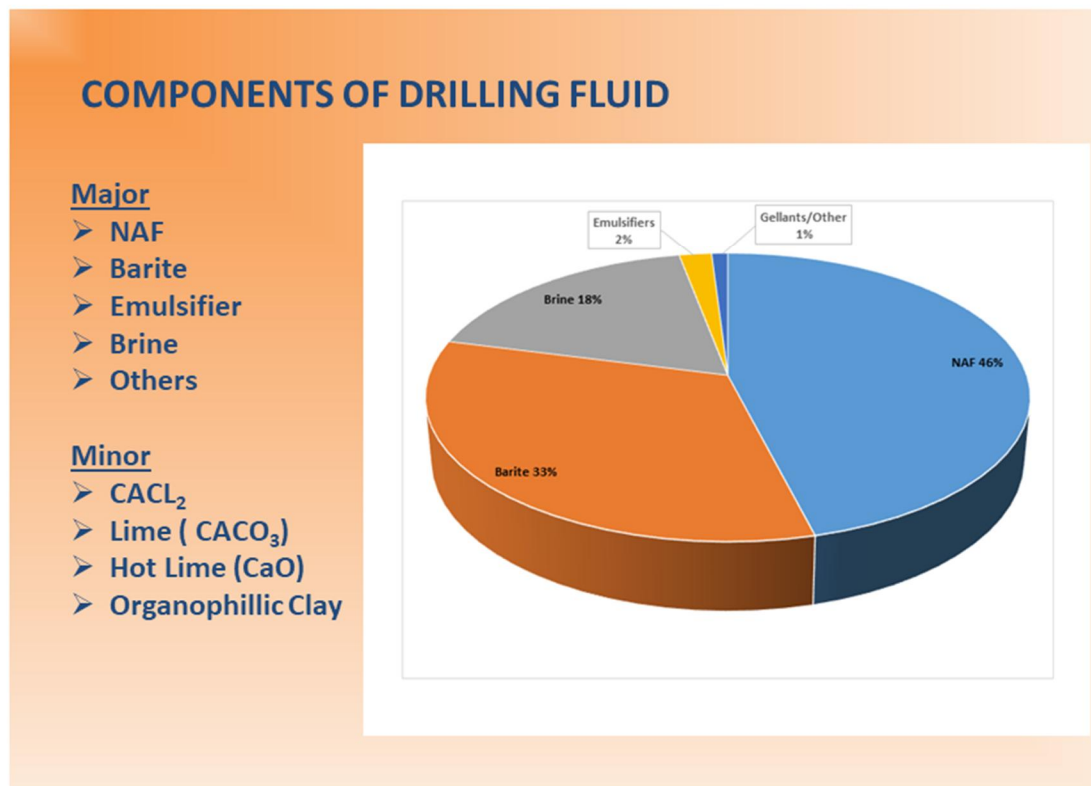
Figure 6: Two Views of Envirosoil's VDU (excluding Pelletizing Plant)



#### 4.4.5 Drilling Fluid Characteristics

Envirosoil's VDU is capable of treating various materials contaminated with a wide range of contaminants. The anticipated solids and additives are summarized in Figure 7 below:

Figure 7: Typical Components of Drilling Fluid



#### 4.4.6 Potential Environmental Impacts During Operations

The project will be operated so as to minimize risk and potential environmental impacts, including sources of pollutants. Potential impacts that have been identified for the purposes of assessment include:

- Noise pollution from operational activities;
- Airborne exhaust emissions from operational equipment;
- Dust;
- Odours; and
- Risk of fuel, lubricant, and hydraulic fuel release.

#### 4.4.7 Mitigation Measures During Operations

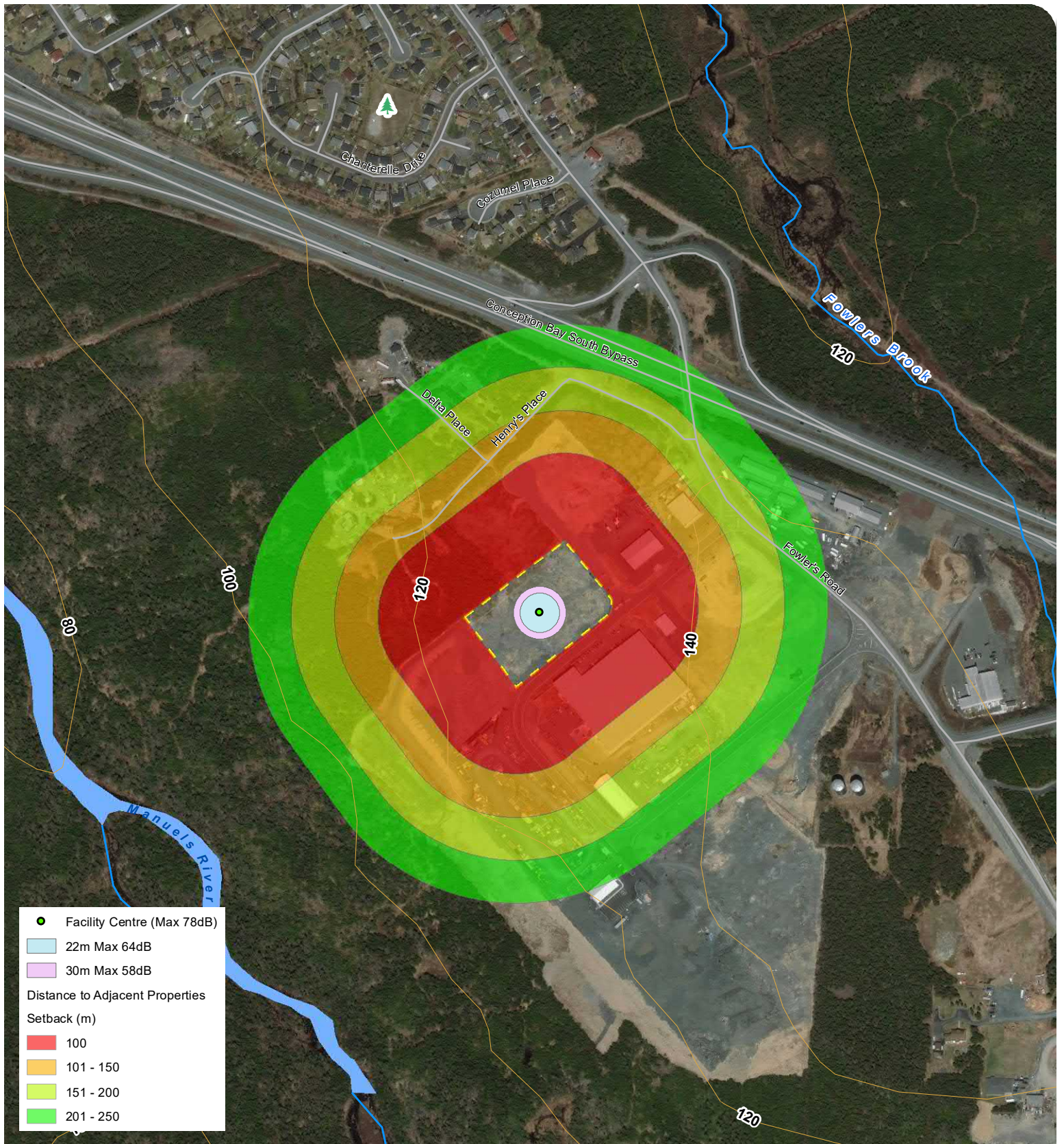
Envirosoil will follow all specified Certificate of Approval conditions and best management practices during operation. The following project specific mitigation measures will also be implemented during operations to mitigate potential environmental impacts during operations:

- A project-specific Emergency Response and Contingency Plan (ERCP) for unplanned events will be prepared. This will include spill management and response procedures to prevent and respond to spills;
- All fuels and lubricants used during construction will be stored in designated areas in certified bulk fuel tanks. Storage areas will be located at least 400 m from watercourses and wetlands, and secondary containment will be provided;
- Source noise levels from the VDU unit when operating at full capacity with all systems operating normally shall not contravene Town of Conception Bay South Noise and Nuisance Regulations. The equipment has a maximum decibel (dB) rating of 78, located near the centre of the VDU (see Figure 8 below and Sound Study drawing in Appendix A). Maximum decibel levels decrease significantly away from the centre of the VDU. As such, noise impacts are not anticipated at the perimeter of the property. The project location is situated over 150 m from the nearest residential receptor; therefore, the undertaking is not expected to impact everyday human activity;
- Circular truck route servicing facility is designed for forward flows only, and to mitigate potential noise from the use of truck back-up alarms;
- The VDU and ancillary facilities will be designed to minimize the production of odours (i.e., closed system). Specific engineered measures shall be in place to mitigate the propagation of odours. The proposed project location is in a commercial/industrial area in order to avoid the risk of odour nuisance to neighbouring properties. Drill mud/cuttings have been handled at facilities in eastern Newfoundland for over a decade with no known odour concerns;
- The pelletizing plant will operate in a closed system, which includes a dust collection system;
- All VDU equipment and process areas will be developed on new impermeable asphalt surfaces. The asphalt surface type is a proprietary design that has recently been tested and approved as equivalent to a high density polyethylene (HDPE) liner by Nova Scotia Department of Environment;
- Petroleum resistant liners will be installed under all storage and process areas;


- All petroleum storage will be located within approved secondary containment areas. Many areas at the site will have three levels of containment by design;
- All storage tanks will be ULC (Underwriters Laboratories of Canada) certified for aboveground and underground systems containing petroleum and allied petroleum products, and meet all applicable ASTM specifications;
- All general site runoff, predominantly stormwater, will be collected and processed in a ULC certified oil/water separator prior to discharge to the existing storm water system that services the industrial park. Detailed plans of the proposed oil/water separator are included in Appendix A;
- In adherence to all anticipated Certificate of Approval conditions, all process water will be collected, stored, tested and/or treated prior to being discharged to the local storm water system. All regulatory criteria will be met prior to discharge; and,
- To reduce traffic and vehicle noise at the site, deliveries of waste drilling mud will only be received at the facility from 8:00 am to 6:00 pm, Monday to Friday. It is anticipated that on average three to four loads of waste drilling mud will be received in a given day.

It is anticipated that air emissions and odours released from the treatment system will not pose an environmental concern, since drill muds will be indirectly heated in a closed system. Air emissions from operation are limited to fuel consumption to provide heat in the process chamber, similar to typical air emissions from an industrial boiler, and non-condensable gases from the vacuum pump, which goes through a carbon scrubber system. There will be no emissions from heavy equipment since no large equipment is required as part of operations.

Envirosoil systems are designed to contain potential spills within the confines of their system. No contamination of soils, surface water or groundwater is anticipated. Envirosoil staff on-site will be trained in oil spill emergency response protocols, and emergency response equipment and spill kits will be readily available at the facility. As indicated above, Envirosoil will develop a site-specific ERCP that outlines instructions intended to provide an immediate and coordinated response to any foreseeable emergencies associated with the handling and storage of untreated drill muds, and the operation of the treatment unit. The ERP will cover the reporting, containment, removal and cleanup of a spill or fire of any material stored on the property. The overall objective of the ERCP will be to ensure the safety of all employees, contractors and members of the public, establish an effective incident reporting system, and to minimize any potential damage to the natural environment.



Envirosoil Limited  
Waste Drill Mud Treatment Facility

 Subject Property

**Facility Operation Sound Levels**  
Figure 8

MAP DRAWING INFORMATION:  
DATA PROVIDED BY CanVec, ESRI

MAP CREATED BY: SCM  
MAP CHECKED BY: PEK  
MAP PROJECTION: NAD 1983 UTM Zone 22N



0 25 50 100  
Metres



## 4.5 Occupations

### Construction/Commissioning Phase Employment

It is anticipated that the assembly and commissioning of the VAR Unit will require six (6) personnel for up to ten (10) week duration. Site preparation activities (e.g., grading) will also require personnel and heavy equipment for approximately four (4) to six (6) weeks.

Anticipated occupations according to the National Occupational Classification (NOC) are identified below for the construction/commissioning phase:

- NOC0711: Superintendent
- NOC7611: Labourers
- NOC7271: Carpenters
- NOC7251: Plumber
- NOC7241: Electrician
- NOC 7521: Heavy Duty Equipment Operator

### Operational Phase Employment

It is anticipated that two to four full time direct employees will be required to operate the facility per shift. Operations will generally be carried out over two twelve-hour shifts daily. Processing will typically occur 24 hours per day, five to seven days per week. Operational hours may be reduced during the winter months.

It is also estimated that on average one to four transport trucks will be required for incoming waste drill muds each day from Monday to Friday. The number of trucks during any given time period is dependent on drilling activities offshore Newfoundland and Labrador.

Anticipated occupations according to the National Occupational Classification (NOC) are identified below for the operational phase:

- NOC0911: General Manager
- NOC 9232: Petroleum, Gas, and Chemical Process Operators

Envirosoil has a corporate employment equity policy that will be followed for any employment opportunities. Please refer to Appendix C.

## 4.6 Alternatives Considered

In developing the technology to be utilized for treatment, Envirosoil aimed to address a number of shortcomings of other current treatment technologies, including targeting:

- Low carbon footprint;
- Low equipment requirements;
- Low energy consumption;

- Reuse of the residual solids (i.e., no landfilling requirement);
- No degradation of the drilling fluids (by keeping temperature below 350°C); and
- Full recovery of the valuable drilling fluid (i.e., no down-cycling).

Most common methods for handling waste drilling mud is by one or more of the following, and they do not meet the aims identified above:

- Onsite or offsite landfill disposal (no recycling);
- Bioremediation (destruction only and no recycling);
- Low temperature thermal desorption (no recycling);
- Indirect low temperature thermal desorption (downcycling only); and
- Centrifuges and chemical treatment (downcycling only).

In partnership with Astec Industries, Envirosoil developed the VAR process and VDU proposed as part of this undertaking, to overcome the limitations of the alternative and current common methods for handling waste drilling mud identified above.

#### 4.7 Project Related Documents

See Appendices.

## 5.0 Approval of the Undertaking

### 5.1 Permits, Licenses and Approvals

Envirosoil has undertaken preliminary discussions with the Pollution Prevention Division (Waste Management Section) of the Department of Municipal Affairs and Environment to determine the requirements for a Certificate of Approval for the Project.

Envirosoil understands that Building Permit(s) and a Development Plan Approval are required from the Town of Conception Bay South prior to any site development. To date, Envirosoil has met with the Town Council for Conception Bay South, and with the support of the Town, has held a public information session presenting the proposed undertaking to interested members of the public (subject to Section 4.14 of the Conception Bay South Development Regulations). The public information session was advertised through the local newspaper (print version; The Shoreline), social media and the Town's website. All property owners within 400 m of the subject site were also directly notified.

A public notice was part of the consultation with the Town Council. The process included a two week public review and comment period to solicit information and identify concerns from stakeholders and interested members of the public in order to support project planning activities.

Applications for Tank Registrations as required in Section 13 of the Storage and Handling of Gasoline and Associated Products Regulations 2003, under the Environmental Protection Act will also be submitted to Service NL for the facility.

## 6.0 Project Schedule

Envirosoil has sourced all required equipment to construct the treatment unit and will be in a position to begin procurement upon approval. It is estimated that equipment required for the treatment system will be mobilized to site following site preparation, and within four (4) to six (6) months from the time that the undertaking is approved by NLMAE.

Upon receipt of all required approvals and authorizations, Envirosoil intends to begin site preparations and construction of the facility in early 2020, with an aim to be operational by the summer of 2020. The facility is permanent in nature, and therefore no operational end date is specified at this time.

## 7.0 Project Funding

Funding for Project will be provided entirely by Envirosoil, and construction is not dependent upon external grants or loans.

Since the VDU is an existing plant that will be relocated to the Project location, the estimated capital cost associated with the construction and commissioning of the Project is less than \$1.5 million.

## 8.0 Closing

Envirosoil has operated a soil treatment facility in Bedford, Nova Scotia since 1992 and has successfully operated soil treatment technologies since 1995. During this time Envirosoil has successfully treated over 1 million tonnes of contaminated materials without any environmental or regulatory issues.

More recently, following regulatory approval to operate by Nova Scotia Environment, Envirosoil has been operating a VDU, in Bedford, NS since early 2019. This technology has allowed for the treatment of waste drilling muds and cuttings with the complete recovery of the valuable synthetic drilling fluid while generating almost no residual waste requiring landfilling or further treatment. During this time, the VDU has been fully commissioned, and has treated almost 800,000 litres of waste drilling fluids. Considerable operational experience has been gained through this undertaking in Nova Scotia. By the time of the proposed initiation of operations at the Hops Street location, it is estimated that approximately 1.5 million litres of waste drilling fluids will have been treated. Based on this experience and the assessment



of the local conditions at the proposed project site, no significant impacts to the environment, air quality or water quality are expected from the operations of its technology for the treatment of drilling muds within Newfoundland and Labrador.

This Environmental Assessment Registration submission is a first and positive step in securing Envirosoil's long-term viability in Newfoundland and Labrador and in providing the region with an environmentally responsible, convenient, and cost effective option for treatment of drilling muds from the region's important offshore energy industry. This option provided by Envirosoil will help make drilling muds more technical and economically feasible within the province. Envirosoil commits to fully comply with all federal and provincial environmental acts and regulations during its operations, and believes that its technology can, and will, "raise the bar" on the treatment of drilling muds in Newfoundland and Labrador and looks forward to a constructive and productive future in the province.

# Appendix A

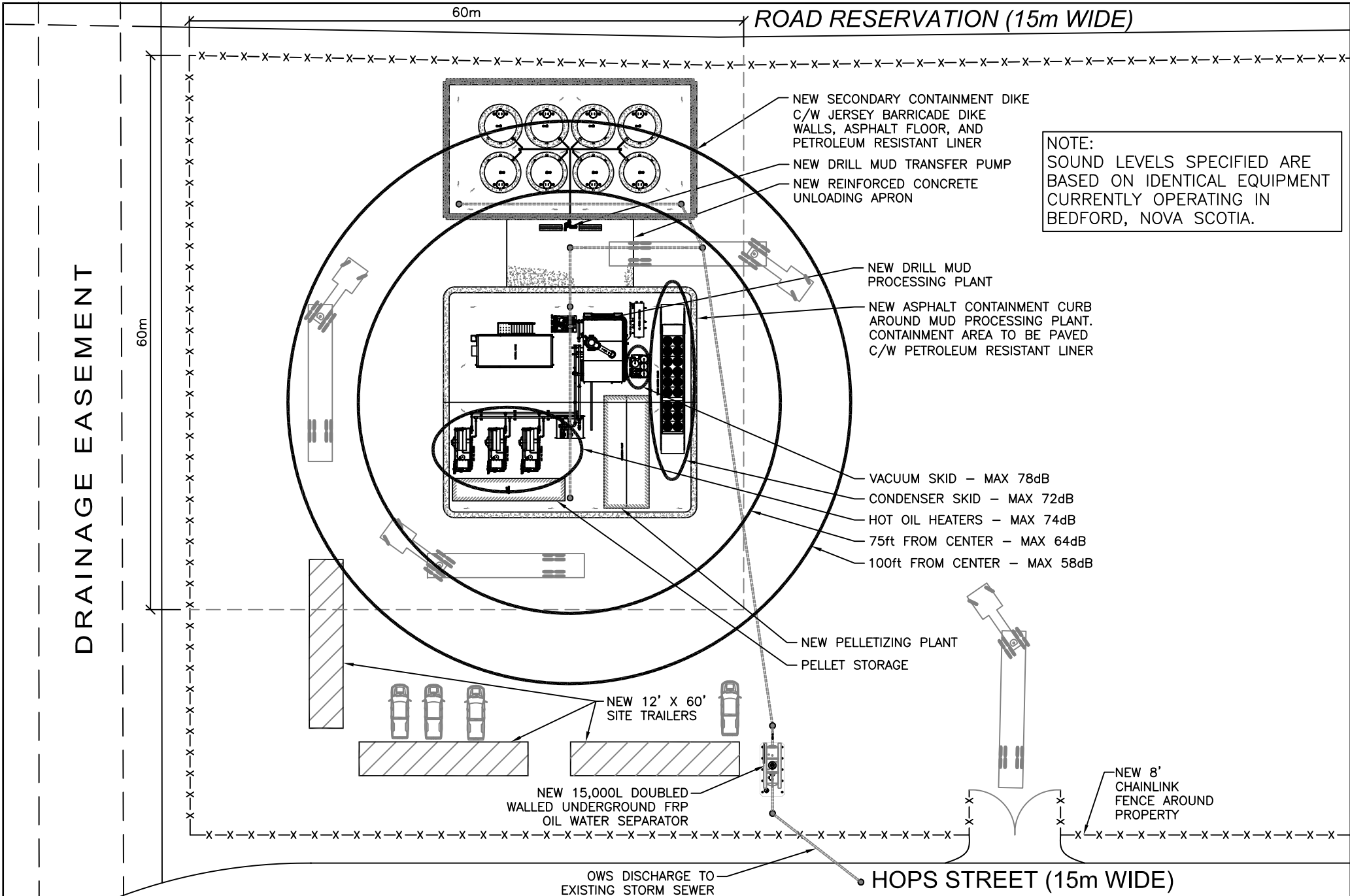
## *Project Drawings*











**NOTE:**  
SOUND LEVELS SPECIFIED ARE  
BASED ON IDENTICAL EQUIPMENT  
CURRENTLY OPERATING IN  
BEDFORD, NOVA SCOTIA.

DRAINAGE EASEMENT

ROAD RESERVATION (15m WIDE)

- NEW SECONDARY CONTAINMENT DIKE  
C/W JERSEY BARRICADE DIKE  
WALLS, ASPHALT FLOOR, AND  
PETROLEUM RESISTANT LINER
- NEW DRILL MUD TRANSFER PUMP
- NEW REINFORCED CONCRETE  
UNLOADING APRON

- NEW DRILL MUD  
PROCESSING PLANT
- NEW ASPHALT CONTAINMENT CURB  
AROUND MUD PROCESSING PLANT.  
CONTAINMENT AREA TO BE PAVED  
C/W PETROLEUM RESISTANT LINER

- VACUUM SKID - MAX 78dB
- CONDENSER SKID - MAX 72dB
- HOT OIL HEATERS - MAX 74dB
- 75ft FROM CENTER - MAX 64dB
- 100ft FROM CENTER - MAX 58dB

- NEW PELLETIZING PLANT
- PELLET STORAGE

NEW 12' X 60'  
SITE TRAILERS

NEW 15,000L DOUBLED  
WALLED UNDERGROUND FRP  
OIL WATER SEPARATOR

OWS DISCHARGE TO  
EXISTING STORM SEWER

HOPS STREET (15m WIDE)

NEW 8'  
CHAINLINK  
FENCE AROUND  
PROPERTY

**DEXTER CONSTRUCTION  
SOUND STUDY  
DRILL MUD FACILITY  
CONCEPTION BAY SOUTH, NL**



22 DOUGLAS DRIVE  
QUISPAMIS, NB  
E2G 1Y3  
PHONE: 506 849 4116  
FAX: 506 847 1070

THIS DRAWING IS THE PROPERTY OF  
GALLAGHER TECHNICAL SERVICES  
LOANED TO THE RECIPIENT WHO AGREES  
THAT IT SHALL NOT BE GIVEN OUT,  
COPIED OR DUPLICATED FOR THE USE OF  
ANOTHER BUT SHALL BE USED ONLY  
BY THE RECIPIENT FOR THE PURPOSE  
TO WHICH IT REFERS.

DATE:  
DECEMBER 2019

PROJECT:  
GTS-0000

SCALE:  
NTS

FIGURE:  
01

## Appendix B

*Site Photos (September/October 2019)*





Photo 1: Looking at the subject property from the western boundary, facing east (September 2019).



Photo 2: Looking at the subject property, facing north towards Hops Street and subject property in foreground, and forested area and residences in background (September 2019).



Photo 3: Looking west along subject property boundary towards adjacent undeveloped graded property and BlueWater Group building (September 2019).



Photo 4: Aggregate and debris stockpile area on adjacent property to the northeast of subject property (September 2019).



Photo 5: Hops Street in foreground and property and Manuels River valley in background. (September 2019).



Photo 6: Materials stockpile yard located approximately 100 m to the south of the subject property. Materials predominantly associated with offshore petroleum industry (September 2019).

## Appendix C

### *Certificate of Commitment to Employment Equity*

Envirosoil is committed to ensuring that no person is denied employment opportunities or benefits for reasons unrelated to ability and to achieving and maintaining a workforce that is representative of women, Aboriginal peoples, persons with disabilities and members of visible minorities.

Envirosoil seeks to identify and remove any discriminatory policies and practices found in the recruitment, selection, hiring, promotion, training, retention and termination of employees in all levels and categories of employment.

Employment equity is an ongoing planning process to eliminate barriers in the workplace that may prevent the full participation of all current and potential employees. It focuses on the employment situation of the four groups identified in the federal *Employment Equity Act*—women, Aboriginal peoples, persons with disabilities and visible minorities (referred to as the designated groups).

The goal of employment equity is to:

- Achieve full representation in line with availability;
- Identify and eliminate barriers in the organization's employment policies and practices;
- Remedy the effects of past discrimination;
- Foster a climate for equity; and
- Improve access and distribution throughout all occupations and at all levels for members of the designated groups.

## **Responsibilities**

It is the responsibility of Envirosoil to:

1. Recruit, hire, train and promote persons in all positions, without regard to race, colour, ethnic origin, and ancestry, national origin, religion, age, disability, sex or gender, sexual orientation, marital and/or family status, source of income, or political belief.
2. Base employment decisions in accordance with principles of equal opportunity by imposing only requirements it considers valid for employment opportunities;
3. Ensure that promotions are in accordance with principles of equal employment opportunity by imposing only requirements it considers valid for promotion opportunity, and;
4. Ensure that all employment areas such as compensation, benefits, transfers, layoffs, recalls, etc., will be administered without regard to race, colour, ethnic origin, and ancestry, national origin, religion, age, disability, sex or gender, sexual orientation, marital and/or family status, source of income, or political belief.
5. Provide a supportive work environment that will:
  - Encourage employees to self-identify as designated group members; and
  - Attract and retain designated group members;
6. Implement an employment equity program in accordance with the requirements of the Federal Contractors Program (FCP) of Human Resources and Skills Development Canada – Labour Program;
7. Communicate with employees by:
  - Distributing information about employment equity initiatives and progress regularly to all employees; and

- Using all available internal media and ensuring that media are accessible to all employees (including persons with disabilities);
- Co-operate with the Labour Program with respect to its compliance reviews; and
- Maintain all records as required by the *Employment Equity Act*, the Regulations and the FCP Requirements.

Envirosoil expects each supervisor and employee to comply with this policy of Employment Equity.

A handwritten signature in black ink, appearing to read "Jerry Scott", is written over a horizontal line.

Jerry Scott, M.Eng. P.Eng.  
General Manager

February 12, 2019

Date: