

Crude Efficiency and Flexibility Project Environmental Assessment Registration

REGISTRATION PURSUANT TO
SECTION 40(1) AND 45 (1) OF THE ENVIRONMENTAL ASSESSMENT
REGULATIONS, 2003
UNDER THE
ENVIRONMENTAL PROTECTION ACT (SNL 2002 CE-14.2)
FOR THE PROPOSED
NARL REFINING LIMITED
CRUDE FLEXIBILITY AND EFFICIENCY PROJECT
JULY 2019

Submitted to:

Minister of Municipal Affairs and Environment
P. O Box 8700
St. John's NF A1B 4J6
Attention: Director of Environmental Assessment

Submitted by:

NARL Refining Limited ("NARL")
P.O. Box 40
Come By Chance, NL
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Crude Efficiency and Flexibility Project

Executive Summary

This document provides the Project Registration for a crude efficiency and flexibility project. The project includes the installation and operation of several preheat exchangers and a pre-fractionation column within the crude unit as well as several piping modifications also within the crude unit.

Effective January 1, 2020, the International Maritime Organization (IMO) will implement a global cap of 0.5% sulfur on fuel oil used by all ocean-going vessels. As a result, existing markets for residual fuel higher than 0.5% sulfur are predicted to experience significant decline. While NARL is exploring Coker construction options, a more immediate solution is necessary. The proposed project will allow NARL to process higher volumes of lighter, lower sulfur crude thereby reducing the volume and sulfur content of its heavy fuel oil production. Added benefits of this project include reduced SO₂ emissions, and reduced carbon emission intensity. Our top quality fuels will also have a reduced lifecycle carbon intensity as a result of this project.

The project will incorporate state-of-the-art methods with Best Available Control Technology (subject to availability) for the limitation of environmental impact including process and design, comprehensive waste management practices and safeguards against the atmospheric, terrestrial and marine pollution to ensure meeting all applicable regulatory requirements. The project will be carried out in an environmentally-responsible manner, with minimal adverse impact on environment, human health and safety.

NARL will be meeting with community groups in the surrounding area and will work with them to identify their concerns and to develop a path forward.

Highlights of the project include:

- A total of \$25 million CAD in physical plant investment for a new distillation column, plus 2 new heat exchangers, the upsizing of 4 existing exchangers, piping, valves, and control systems
- Reduce crude unit energy consumption by more than 20% (on an intensity basis) for the crude unit alone and 8% for the entire refinery (also on an intensity basis)
- Reduction of approximately 40% Sulfur Dioxide emissions by switching fuel oil to fuel gas for stationary combustion
- Supporting the long term viability of NARL and employment in the regional Newfoundland economy
- Improved crude oil processing flexibility to efficiently manage exposure to the commodity market in the future
- An increase in crude throughput rate

NARL is committed to executing this project in a manner consistent with all applicable Safety, Health and Environmental regulations and industry best practices.

NAME OF UNDERTAKING: Crude Efficiency and Flexibility Project

PROPONENT:

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1.0 THE UNDERTAKING

1.1 Introduction

NARL Refining Limited (“NARL”) is the owner and operator of the Refinery located at Come By Chance, in the Province of Newfoundland and Labrador. NARL is beginning the environmental assessment process for the installation and operation of equipment to allow for the processing of light sweet crude as part of its mission to produce a low-sulfur residual fuel oil product per the new guidelines being provided by the International Maritime Organization from the phase-out in 2020 of high sulfur marine residual bunker fuels.

This document provides a Project Registration of the proposed upgrades based on the requirements defined under the Newfoundland and Labrador Environmental Protection Act. The Project Registration is submitted to the Department of Municipal Affairs and Environment in order to initiate the provincial environmental assessment process.

1.2 NARL Refining Limited (“NARL”)

NARL Refining Limited is a privately owned company.

1.3 Nature of the Undertaking

NARL plans to install upgrades to its Crude Unit to allow for processing of light, sweet crudes. The project will yield improved energy efficiency and environmental performance, improved cut-points and increased crude throughput rates. Installation and operation will take place on the existing refinery footprint.

The stated goals of the project are:

- Produce a 0.5% Low Sulfur Marine Bunker Fuel Oil to comply with the International Maritime Organization’s 2020 Low Sulfur Fuel regulations
- Process lighter gravity crude oils without incurring energy or yield penalty
- Reduce crude unit energy consumption by more than 20% (on an intensity basis) for the crude unit alone and 8% for the entire refinery (also on an intensity basis)

- Reduce, and potentially eliminate, all residual fuel oil firing in the refinery's heaters, thus reducing the GHG emissions footprint by up to 10% (on an absolute basis) and also reducing SO₂ in the refinery heaters' flue gas emissions
- Reduce flaring during the summer months by providing more pathways for volatile non-condensable gases to be routed to the refinery fuel system instead of the flare system. These gases in turn will directly offset the need to burn residual fuel oil

The upgrades will require a pre-fractionation column to allow for separation of lighter hydrocarbons from the crude stream before it reaches the crude oil charge heater and the atmospheric crude tower. NARL will install four expanded-capacity heat exchangers, a new overhead drum system with integrated de-salting, two overhead condensers, and an economizing pre-heat exchanger for the existing debutanizer column which will capture waste heat and use it to bring debutanizer feed close to the tower's operating temperature.

The project is budgeted at \$25 million CAD for construction, installation and commissioning. Investment will consist of privately provided funds.

The Project construction will begin in the third quarter 2019 and should be completed by the end of the second quarter of 2020.

1.4 Rationale for the Undertaking

January 14, 2020 has been set as the implementation date for a significant reduction in the sulfur content of fuel oil used by ships. The existing global limit of 3.5% will be reduced to 0.5%, as decided by the International Maritime Organization. The subsequent reduction in sulfur dioxide emissions are expected to have a significant benefit to the environment and on human health. The economic impacts of this change are many. Demand and price of heavy fuel oil will experience a direct decline, impacting the NARL refinery's nearly 5 million barrels of annual heavy fuel oil production.

The proposed project will allow NARL to meet the new maximum sulfur specification of 0.5%. It will also allow for the optimization of cutpoints and an increase in crude oil processing capacity. The project design has the added benefit of reducing SO₂ emissions and greenhouse gas emission intensity.

Should market conditions be such that light crudes are unavailable or uneconomical to process, medium crude processing may continue. In such cases, environmental benefits and rate increases may be less than projected.

1.5 Regulatory and Public Consultation

NARL plans to meet with local community groups, trades unions and other interest groups, as well as provincial and federal regulators, to identify and address any potential issues and concerns. Early and sustained communication with people in the area that may be affected by a development is a priority of NARL.

This project is not expected to be subject to Federal Environmental Assessment as there is no Federal involvement related to implementation, financial assistance or land. Also, capacity increase will be less than 35% and therefore does not meet the minimum threshold to trigger a Federal Environmental Assessment.

2.0 DESCRIPTION OF THE UNDERTAKING

NARL will install a pre-fractionation column within its crude oil preheat train to remove approximately 15% of the mass of the total feed prior to approaching the crude oil charge heater. The pre-fractionation column will allow for mass to be routed out of the preheat train before the final 6-heat exchangers and the crude oil charge heater. This means that 15% of mass will no longer be wastefully heated to 660 degrees (or hotter).

The overhead gases from the pre-fractionation column will be routed to two heat exchangers which will use cold crude oil from tank as the cooling medium. This will improve NARL's heat integration by using a low-temperature stream to exchange heat into the feedstock, saving energy. Also, this improved overhead condenser system will allow for the capture and efficient use of non-condensable gases, some of which escape to the flare system in our current operation.

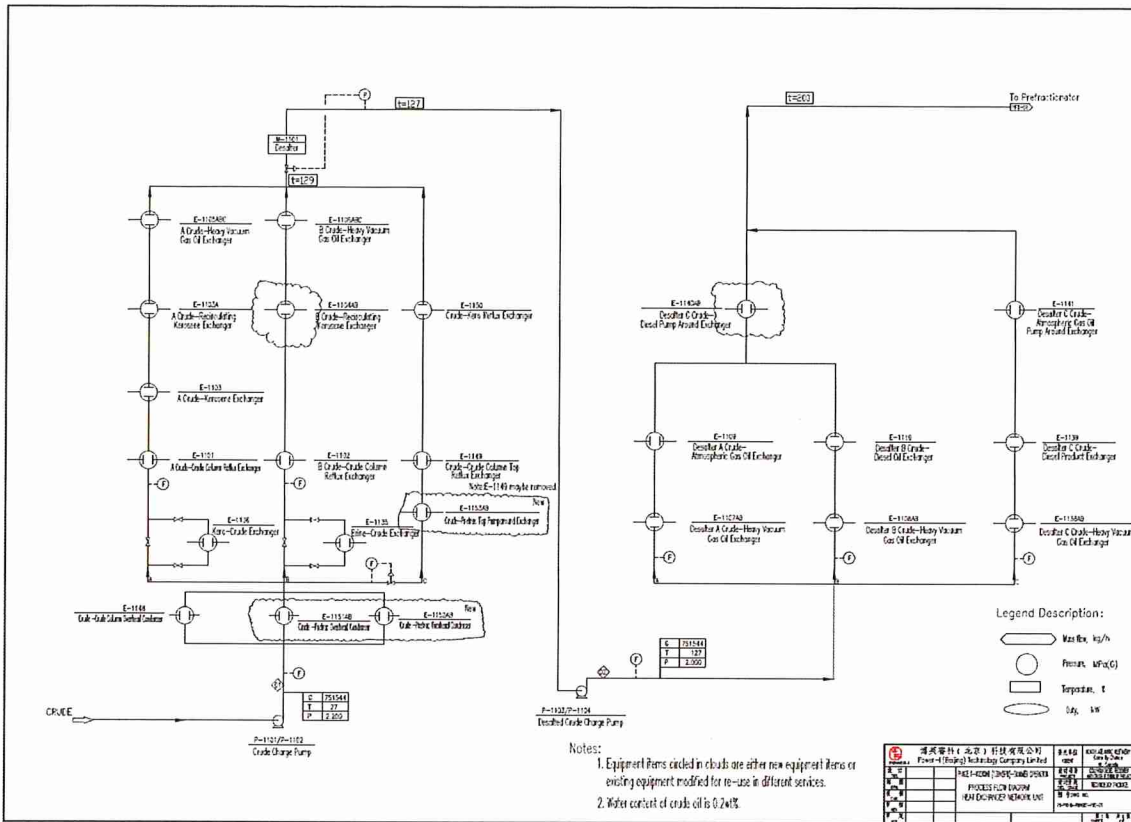


Figure 2: Preheat Exchanger Modifications

In addition, the routing of naphtha through the existing debutanizer column and naphtha splitter columns will be changed so that each product is sent to the most efficient column for separation. This will further reduce energy load.

Because the crude unit is hydraulically balance top operate with 130,000 barrels per day of feedstock through the crude oil charge heater and the vacuum tower, the pre-fractionation of 15% of the mass (corresponding to 18-20% of the volume) will allow the refinery to process more crude oil feedstock to maintain an efficient operation.

2.1 Geographical Location

NARL's operation is located in the town of come By Chance in Placentia Bay. Figure 3 is a topographic map of the region showing the location of the refinery operations in relation to Placentia Bay and the Avalon Peninsula. Figure 4 is an Aerial Photograph of the

refinery. Other nearby industrial facilities include the Municipal Construction asphalt storage facility and the Whiffen Head Transshipment facility.

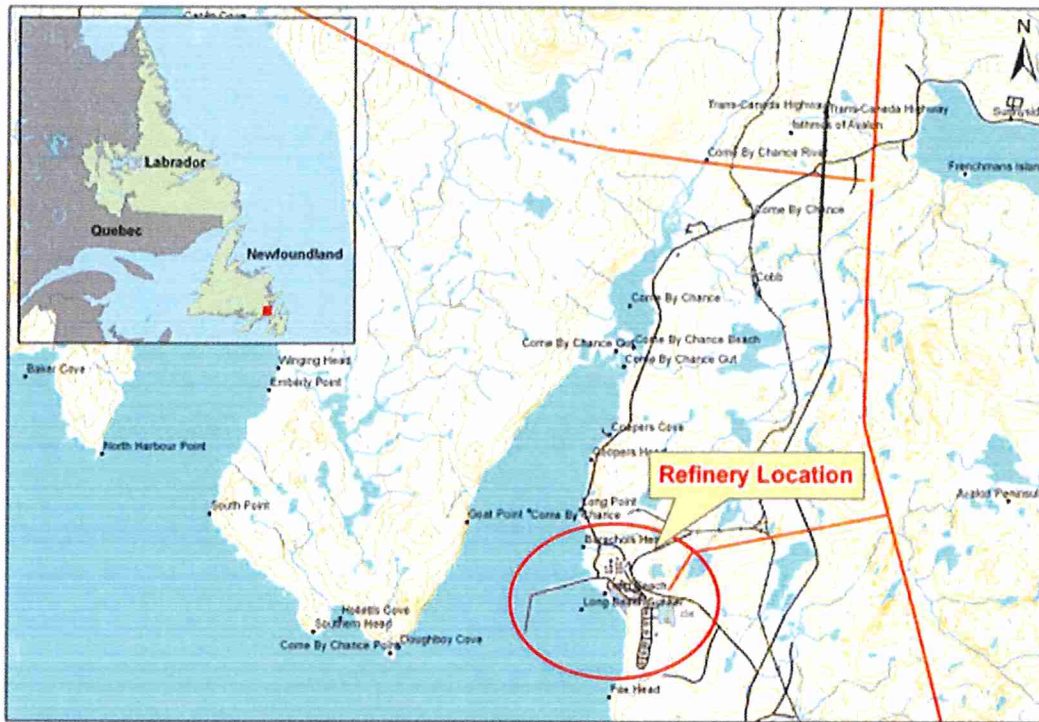


Figure 3: Refinery Location



Figure 4: Aerial Photograph of Refinery

2.2 Physical Features

The proposed project site is within the existing operating refinery and as such is a brown field site and there will be very little new land disturbance. Impacted units are located within the existing layout and infrastructure, with no change to the plot plan. A new parcel is land, north of the refinery will be required as a laydown, staging area.

An overview of the surrounding environment including Climate and Geology, Aquatic Environment, Terrestrial Environment and Socioeconomic Environment is given in *Proposed Butane Storage Facility, Environmental Assessment Registration, North Atlantic Refinery Limited, May 21, 2002*. Some minor changes in the text are made to reflect the current project.

Climate and Geology

The project area is located on the northwestern portion of the Island of Newfoundland's Avalon Peninsula (Figure 1). The area is located within the South and Southeast Coasts

and Immediate Hinterlands climatic zone, as defined by Banfield (1981). The area's climate exhibits a strong maritime influence with mild winters, cool summers, frequent fog, high precipitation and strong, predominantly southwest, winds (1995). Canadian climate normal data for the period 1951-1980 (AES 1982) are available for the Come By Chance area. Daily maximum and minimum temperatures at Come By Chance during that period averaged 0.2° C to -7.1°C in February and 18.5° C to 12.9°C in August. Annual rainfall averaged 968 mm, and the average snowfall was 160 cm. Wind data are available only from nearby Arnold's Cove, but are likely indicative of wind conditions in the general area (SGE 1995). The average annual wind speed during this period was 21.2 km/h, with the prevailing wind direction being southwest (AES 1982).

Bedrock geology in the Come By Chance area is comprised of late Precambrian sedimentary and volcanic rocks, and Cambrian-Ordovician quartzite and sedimentary rocks. Surficial deposits consist primarily of continuous and discontinuous ground moraine, with lesser amounts of bog, outwash and modern stream deposits (King 1989 and Henderson 1982, cited in SGE 1995).

Aquatic Environment

There are no major rivers adjacent to the proposed project site. The nearest water bodies consist of two ponds. These ponds are part of a small watershed comprised of several small ponds, wetlands and stream sections that enter Placentia Bay. Past samplings of small ponds and streams in the general area have produced catches of brook trout (*Salvelinus fontinalis*) and three spine stickleback (*Gasterosteus aculeatus*). Deeper ponds such as Little Mosquito Pond (Bull Arm) contain landlocked Arctic char (*Salvelinus alpinus*) and larger streams in the broader region contain Atlantic salmon (*Salmo salar*) (i.e., Come By Chance Brook and Arnold's Cove Brook) (JWEL 1990). Other fish that may be present in the watershed include American eel (*Anguilla rostrata*).

Drainage from the project is away from identified water bodies, and therefore, they will not be affected by this project.

Terrestrial Environment

The Come By Chance area is located within the Southeastern Barrens Sub region of the Island of Newfoundland's Maritime Barrens Ecoregion (Damman 1983). This ecoregion is characterized by extensive barren areas of heath, bog and fen with forested valleys. The main forest vegetation is balsam fir (*Abies balsamea*) associated with black spruce (*Picea mariana*) and lesser amounts of white spruce (*Picea glauca*), white birch (*Betula papyrifera*) and larch (*Larix laricina*). Scrub forest is common. Rock and soil barrens characterize heath areas. Rock barren vegetation is low and tundra-like. The dominant plant species are *Kalmia angustifolia*, *Ledum groenlandicum*, *Rhododendron canadense* and *Chamaedaphne calyculata*.

In the Southeastern Barrens Subregion, the landscape is dominated by heath lands and the forest occurs only in small acreages which have escaped fire. The dominant heath shrub on uplands is *Empetrum nigrum*, with *Kalmia angustifolia* forming a dense cover only in protected valleys (Meades 1990). No rare or endangered plant species have been identified in this area by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2002).

Wildlife species using the general region are likely those which are typically found in predominantly barren ground habitats on the island of Newfoundland. This may include red fox (*Vulpes vulpes*), moose (*Alces alces*) and willow ptarmigan (*Lagopus lagopus*). Raptors such as bald eagle (*Haliaeetus leucocephalus*), sharp-shinned hawk (*Accipiter striatus*), northern harrier (*Circus cyaneus*) and short eared owl (*Asio flammeus*) may also hunt in the general area. The short-eared owl is listed as a species of special concern by COSEWIC.

Socioeconomic Environment

The Town of Come By Chance is located approximately 5 km north of the proposed site. The project area is located within that community's municipal boundary. Other communities in the general area include Arnold's Cove (approximately 5 km to the south), Sunnyside (approximately 8 km to the northeast) and Southern Harbour (located approximately 10 km to the south).

There are no known archaeological sites within the project area (PAO 2002).

2.3 Construction

Construction and commissioning is expected to take roughly eight months starting with the installation of the foundations for the pre-fractionation column and its support equipment. This will be followed by the setting of the column on its foundation. Next will be the installation of the heat exchangers and their connective piping, valves, and instruments. This equipment will be installed starting in the third quarter of 2019 and commissioned before the end of the second quarter of 2020. Construction and commissioning will be completed with all process unit either remaining online or with a small planned outage of 3-5 days.

2.3.1 Project Activities and Work Breakdown Structures

The construction phases of this project will be managed the same as for previous NARL turnarounds and capital projects. This project will result in only minimal changes to the existing refinery footprint. Most project components are proprietary purchases to be delivered and assembled during the project. These components will be brought to site both by road and by sea transport.

Construction activities will include:

- Construct/extend new concrete foundations where needed
- Installation of associated infrastructures of selected units
- Installation/modification of piping and cabling in support of selected units
- Building/connecting new electrical substations

2.3.2 Potential Sources of Pollution from Construction

The potential sources of pollution for this project are similar to those of the normal refinery operations. There may be some increases in the volumes of some waste streams which will be addressed by NARL's Waste management Plan. The plan provides detailed procedures for the handling of all typical and non-typical waste materials. As part of the

plan, contractors are required to have their own Environment Plans for their work scope. In addition, North Atlantic Refining Limited has a contract in place with a waste management company to transport material requiring off-site disposal.

Potential sources of pollution during the Construction stage may include:

Noise

The nearest communities to the site are Come By Chance and Arnold's Cove, both approximately 5 km away. Noise is not expected to be a concern for residents of these communities or wildlife in the area. Noise within the project area will be that of an industrial site and mitigated with personal protective and safety devices as required.

Air Emissions

All company and contractor vehicles and equipment are required to be in good and safe operating conditions.

Dust and Sediments

Excavation is not required for this project. Road access to the site is paved; however some parking lots are not. As necessary, dust will continue be controlled by the application of water to the road.

Fuel and Lubricants

Construction activity poses a risk for the release of fuel and lubricants from construction equipment. NARL will require that all contractors and company equipment are properly maintained and inspected to avoid leaks of oil, fuel and hydraulic fluids.

Sewage

Sewage will be handled through existing sewage treatment facilities with portable facilities as required.

Waste and Garbage

All waste will be handled as required by the existing Waste Management Plan.

2.3.3 Potential Resource conflicts

This project will occur completely within a well-developed and operational industrial site. No resource conflicts are expected.

2.4 Operation

2.4.1 Crude Unit

The Crude Fractionation Unit efficiency, distillation performance and emissions performance will be improved through the addition of a pre-fractionation column. This will also allow for increased total throughput. Additional preheat capacity will be installed to reduce lifecycle carbon intensity. This will optimize the separation of light ends from the crude before it enters the main fractionation unit. The following changes and benefits are expected from these modifications:

- increased production capacity from 130,000 bpd to 162,000 bpd
- reduced lifecycle carbon intensity of products
- improved heat recovery and heat integration
- improved yield of diesel, gasoil and gasoline blend components

2.4.2 Shipping

Crude will continue to be delivered to the NARL Jetty via tankers carrying 500,000 to 1,000,000 barrels at a frequency of approximately once per month. The change in vessel traffic is calculated to be 2 to 3 additional crude vessels per month and 5 to 6 product vessels per month.

2.4.3 Tanks

No new tankage will be required.

2.4.4 Energy

This project will allow NARL to reduce energy intensity. It will also allow for a change in energy source from a combination of fuel gas and fuel oil to predominately fuel gas through:

- The additional throughput of crude oil which will provide more total gases to be available,

- Better capture of non-condensable gases through 2 additional overhead condensing heat exchangers which will allow gases currently flowing into the flare to be redirected to the plant fuel system
- The efficient processing of a lighter crude oil feedstock slate which contains more gases overall

Our preliminary process engineering indicates that the atmospheric distillation unit and vacuum distillation units will be able to operate with about 68% of the current energy intensity of the current operation – all while yielding improved product fractionation performance. In 2018, the atmospheric distillation and vacuum distillation units consumed 27% of the total energy consumed in the refinery. Hence a reduction in intensity of 32% in these units is expected to result in a total energy intensity reduction of 8% per barrel of oil processed. It is likely that this number can be improved upon further due to the economies of scale in operating a refinery.

It is important to note that the energy efficiency and GHG/emissions improvements are predicated upon the refinery processing higher volumes of feedstock.

2.4.5 Wastewater

The existing wastewater treatment plant consistently meets and exceeded the requirements of the federal *Petroleum Refinery Liquid Effluent Regulations* and the provincial *Water and Sewer Regulations*. In addition, the Environmental Effects Monitoring (EEM) Program carried out under these regulations has not indicated any impact of the discharge from the plant on the marine environment.

While there may be a slight increase in the flow to the Sour Water Stripper and the wastewater plant as a result of this project, the existing wastewater plant has sufficient hydraulic capacity to handle this increase. The volume increase is expected to be less than 20% overall at this point. Also, NARL is exploring ways to economize by recycling certain sour-water streams within the plant.

2.4.6 Hydrogen Sulfide Treatment

Gaseous steams containing high amounts of Hydrogen sulfide will continue to be treated in the amine unit. There is no significant increase to the volume of H₂S treatment despite the increase in rate due to intended strategy of processing lower sulfur crudes. All sour water will continue to be treated by the Sour Water Stripper.

2.4.7 Water Supply

Raw, Fire and Treated Water Systems will not require any change. Capacity exists to meet the proposed changes.

2.4.8 Flare

This proposed project is expected to reduce flaring due to the improved ability to process light ends that may otherwise be flared. Overall hydrocarbon flaring volumes are projected to be 30% to 40% lower than the current operation. Due to a fixed sweep gas minimum, very little flare improvement beyond this reduction can be accomplished due to safety requirements of maintaining a positive flow through the flare header.

2.5 Emissions

The refinery is currently rated at 130,000 bpd of crude. The proposed modifications will allow for a processing rate of 162,000 bpd with no new product or waste streams created by this change. There will be no installation of high emitting sources such as heaters, boilers, or Vacuum towers. The project will incorporate state-of-the-art methods with Best Available Control Technology (subject to availability) to ensure minimal environmental impact.

2.5.1 Greenhouse Gas Emissions

An important part of this project is the reduction of Greenhouse Gas (GHG) intensity. This project will allow NARL to reduce the fuel required to produce a barrel of product, thereby reducing the lifecycle carbon intensity of the fuel.

2.5.2 Critical Air Contaminants

This project is expected to have a positive effect on Criteria Air Contaminants (CACs). SO₂ is the CAC of most concern to the refinery's operation. Current estimates indicate that there will be an approximately 40% reduction in SO₂ emissions from normal operations as a consequence of this project. Estimates of expected reductions in other CACs such as NO_x and particulates are expected to be similar to that of SO₂ given they share the same reduction at source.

2.6 Decommissioning

NARL has a decommissioning plan which has been submitted to the Department of Municipal Affairs and Environment.

2.7 Occupations

2.7.1 Construction and Operation

The workforce will consist primarily of NARL's 390 full-time, permanent employees. During the construction phase of the project, an additional 149 temporary employees are estimated. Estimates of occupation breakdowns for the project, along with the number of personnel required for each category and the appropriate National Occupational Classification (NOC) codes are listed in Table 3 below. The number of workers is an estimate of the maximum of each type that can be expected at any time.

Table 3: Occupations Breakdown

Occupation	NOC Code	Number of Workers
Direct Field		
Laborer	7611	10
Millwright	7311	4
Rigger	7611	5
Light vehicle driver	7414	0

Occupation	NOC Code	Number of Workers
Heavy vehicle driver	7411	0
Oiler	7612	0
Mechanic	7321	6
Light equipment operator	7421	2
Medium equipment operator	7421	2
Heavy equipment operator	7421	2
Pipefitter	7252	8
Pipe welder	7265	8
Cement finisher	7282	10
Carpenter	7271	5
Ironworker – rebar	7264	5
Ironworker – structural	7264	5
Welder – structural	7265	10
Boilermaker	7262	15
Instrument fitter	7612	5
Electrician – line	7244	5
Electrician – wiring	7242	5
Sheet metal worker	7261	0
Insulator	7293	8
Painter	7294	0
Foreman	7302	5
Project construction superintendent	0711	1
Area superintendents	7302	1
Indirect Field		
Field Superintendents		
Piping	7213	1
Instrumentation	7212	1
Electrical	7212	1
Civil	7217	1
Mechanical	7214	1
QC&A, Inspection	2141	2
Administration		
Cost engineering	2141	1
Field engineering	2131/2132	5
Planning & scheduling	2141	2
Safety & medical	2263	3
Timekeeping & accounting	1432	1
Material controls supervisor	1474	1
Drafting	2253	2
Total		149

2.7.2 Employment and Gender Equity

Hiring of the additional temporary employees will be in accordance with NARL's existing hiring policies. NARL believes that all employees should be treated fairly. NARL promotes employment equity in the workplace to ensure that women, aboriginal peoples, persons with disabilities and visible minorities are fully represented at all levels of the organization. NARL is developing an employment equity program ensures that ensures hiring and promotion practices are based on qualifications and ability.

3.0 APPROVAL OF THE UNDERTAKING

This proposed undertaking will require provincial, federal and municipal authorizations. To ensure permitting compliance, a permitting registry has been developed to record and track permitting activities.

Permits and authorizations which may be required in relation to this proposed undertaking are listed below in Table 4.

Table 4 Approvals and Authorizations

Activity	Approval/Certificate/ License/Permit/Inspection	Legislation	Regulating Agency
Government of Newfoundland and Labrador			
Project Construction/ Commencement	Release from the Newfoundland and Labrador <i>Environmental Protection Act</i> , Part X, Environmental Assessment	Newfoundland and Labrador <i>Environmental Protection Act</i> , SNL 2002 c.E-14.2, Part X, Environmental Assessment	Environmental Assessment Division, NLDEC
	Certificate of Approval to Operate	Newfoundland and Labrador <i>Environmental Protection Act</i> , SNL 2002	Pollution Prevention Division, NLDEC
Site Construction	Statutory Declaration for Registration of Boiler and Pressure Vessels Fittings Fabricated in	<i>Boiler Pressure Vessels and Compressed Gas Regulation</i> under the <i>NL Public Safety Act</i>	NLDGS

Activity	Approval/Certificate/ License/Permit/Inspection	Legislation	Regulating Agency
	Newfoundland and Labrador		
	Certificate of Plant Registration for Power, Heat, Refrigeration Compressed Gas or Combined Plant	<i>Boiler Pressure Vessels and Compressed Gas Regulation</i> under the <i>NL Public Safety Act</i>	NLDGS
	Contractor's Licence – Pressure Piping System	<i>Boiler Pressure Vessels and Compressed Gas Regulations</i> under the <i>NL Public Safety Act</i>	NLDGS
	Examination and Certification of Welders and Blazers	<i>Boiler Pressure Vessels and Compressed Gas Regulations</i> under the <i>NL Public Safety Act</i>	NLDGS
	Compliance Standard -	Fisheries Act, Sec. 36 (3) Deleterious Substances	Environment Canada
Waste Management Related to Construction Activities	Waste Oil – Handling and Disposal	Newfoundland and Labrador <i>Environmental Protection Act</i> , SNL 2002 c.E-14.2, <i>Used Oil Control Regulations</i>	NLDEC
Garbage Disposal/Waste Management	Waste Management System, Certificate of Approval	Newfoundland and Labrador <i>Environmental Protection Act</i> , SNL 2002 c.E-14.2, Waste Disposal and Litter	NLDEC
Access Roads	Culvert Installation, Certificate of Approval, Application for Environmental Permit to Alter a Body of Water	Newfoundland and Labrador <i>Water Resources Act</i> , SNL 2002, c.W-4.01, Section 48	NLDEC
	Certificate of Approval for Stream Fording, Application for Environmental Permit to Alter a Body of Water	Newfoundland and Labrador <i>Water Resources Act</i> , SNL	NLDEC

Activity	Approval/Certificate/ License/Permit/Inspection	Legislation	Regulating Agency
		2002, c.W-4.01, Section 48	
	Permit for Access off any Highway	Newfoundland and Labrador <i>Urban and Rural Planning Act</i> , SNL 2000, c.0-8, Highway Sign Regulations	NLDMA
	Construction (Site Drainage) Certificate of Approval	Newfoundland and Labrador <i>Water Resources Act</i> , SNL 2002, c.W-4.01, Section 48	NLDEC
Stream Crossings/ Fording	Water Resources – Water Course Crossings, Certificate of Environmental Approval	Newfoundland and Labrador <i>Water Resources Act</i> , SNL 2002, c.W-4.01, Section 48	NLDEC
Fuel Storage	Fuel Storage & Handling – Temporary Storage Remote Locations	Newfoundland and Labrador <i>Environmental Protection Act</i> , SNL 2002, c.E-14.2, Storage and Handling of Gasoline and Associated Products Regulations, 2003	NLDEC
	Fuel Storage & Handling – A Permit Flammable & Liquid Storage & Dispensing (above or below ground) & for Bulk Storage (above ground only)	Newfoundland and Labrador <i>Environmental Protection Act</i> , SNL 2002, c.E-14.2, Storage and Handling of Gasoline and Associated Products Regulations, 2003, and <i>Fire Prevention Act</i> , SNL 1991, c.34	NLDEC and NLDMA (Office of the Fire Commissioner)
Borrow Pits and Rock Quarries	Quarry Development Permit – A permit is required to dig for, excavate, remove and dispose of any crown quarry material	Newfoundland and Labrador <i>Quarry Minerals Act</i> , SNL 1999, c.Q-1.1	NLDNR, Mines Division

Activity	Approval/Certificate/ License/Permit/Inspection	Legislation	Regulating Agency
Handling and Transportation of Dangerous Goods	Permit to Transport	<i>Transport of Dangerous Goods Act</i>	Transport Canada
Accidental Hazardous Material Spill	Report Mechanism/Response	Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances, and/or Marine Pollutants. TP9834E. under the <i>Canada Shipping Act</i>	DFO – Canadian Coast Guard
Communications	Application for License to Install and Operate a Radio Station in Canada	<i>Radiocommunication Act</i>	Industry Canada Communications
In stream Activities	Fish Habitat Authorization for Works or Undertakings Affecting Fish Habitat	<i>Fisheries Act</i>	DFO
	Application for a Water Lease	<i>Fisheries Act</i>	Transport Canada

Municipal Government

Project Approval	Compliance Standard/ Development Plan		City of St. Johns
Waste Disposal	Approval to dispose waste in municipal landfill		Relevant municipality

Guidelines

In addition, the Project will also need to comply with or consider the following guidelines:

- DFO's Guidelines for Protections of Freshwater Fish Habitat in Newfoundland and Labrador (Gosse et al 1998)
- DFO's Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky 1998)
- Newfoundland and Labrador Department of Natural Resources' Environmental Guidelines for Construction and Mineral Exploration Companies
- Newfoundland and Labrador Department of Environment and Conservation's Environmental Guidelines for General Construction Practices
- Newfoundland and Labrador Department of Environment and Conservation's Guidelines for Culverts
- Newfoundland and Labrador Department of Environment and Conservation's Guidelines for Diversions, New Channels, Major Alterations (1992)
- Newfoundland and Labrador Department of Environment and Conservation's Environmental Guidelines for Water Course Crossings (1992)

4.0 SCHEDULE

Pending final approvals and completed engineering and design, work will commence in the third quarter of 2019 and will finish in the second quarter of 2020.

5.0 FUNDING

The project will be privately funded by company owner-provided equity.

Date

July 29, 2019

Signature of Chief Executive Officer

Thomas J. [Signature]

6.0 REFERENCES

AES (Atmospheric Environment Service). 1982. Canadian Climate Normals, Volumes 1-5. Environment Canada, Ottawa, ON.

Banfield, C. C. 1981. The climatic environment of Newfoundland. In: The Natural Environment of Newfoundland – Past and Present. A.G. Macpherson and J.B. Macpherson (eds.). Department of Geography, Memorial University of Newfoundland, St. John's, NF.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2002. Species Database. http://www.cosewic.gc.ca/eng/sct1/searchform_e.cfm

Damman, A.W.H. 1983. An ecological subdivision of the Island of Newfoundland. In: Biogeography and Ecology of the Island of Newfoundland. G.R. South (ed.). Dr. W. Junk Publishers, The Hague.

JWEL (Jacques Whitford Environment Limited (LeDrew, Fudge and Associates Limited)). 1990. Hibernia Development Project Field Survey Freshwater Resources Habitat and Water Quality. Prepared for Mobil Oil Canada Properties, St. John's, NF.

Meades, S.J. 1990. Natural Regions of Newfoundland and Labrador. Report prepared for the Protected Areas Association, St. John's, NF.

PAO (Provincial Archaeology Office). 2002. Archaeological Site Inventory, Culture and Heritage Division, Department of Tourism, Culture and Recreation, St. John's, NF.

SGE (Sheppard Green Engineering and Associates Limited). 1995. North Atlantic Refining Limited Terrestrial Effects Monitoring Program. Report prepared in association with G.R. Ringius and Associates for North Atlantic Refining Limited, Come By Chance, NF.

Source Test Report for the 205 Delayed Coking Unit Drum 205-1201 and Drum 205-1202 Depressurization Vents, 2011, URS Corporation, Austin, TX.