EQUINOR CANADA LTD.

BAY DU NORD DEVELOPMENT PROJECT

Project Description

June 2018

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List of Acronyms and Abbreviations

2D	Two dimensional
3D	Three dimensional
4D	Four dimensional
AAROM	Indigenous Aquatic Resource and Oceans Management
ACSS	Atlantic Canada Shorebird Survey
AFS	Aboriginal Fisheries Strategy
AIP	Agreement in Principle
API	American Petroleum Institute
AUV	Autonomous Underwater Vehicle
BdN	Bay du Nord
BOP	Blowout Preventer
BOPD	Barrels of Oil Per Day
CEAA 2012	Canadian Environmental Assessment Act 2012
CEA Agency	Canadian Environmental Assessment Agency
C-NLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board
CO	Carbon monoxide
CO_2e	Carbon dioxide equivalent
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPAWS	Canadian Parks and Wilderness Society
CVP	Capital Value Process
DFO	Fisheries and Oceans Canada
DG	Decision Gate
EA	Environmental Assessment
EBSA	Ecologically and Biologically Significant Areas
ECSAS	Eastern Canadian Seabirds at Sea
EEZ	Exclusive Economic Zone
EIS	Environmental Impact Statement
EL	Exploration License
FEED	Front End Engineering and Design
FFAW-Unifor	Fish, Food and Allied Workers - Unifor
FSC	Food, social and ceremonial
GHG	Greenhouse Gases
HP	High Pressure
IMO	International Maritime Organization
IMR	Inspection, Maintenance and Repair
KMKNO	Kwilmu'kw Maw-klusuaqn Negotiation Office
LIL	Labrador Inuit Lands
LISA	Labrador Inuit Settlement Area

LP	Low pressure
MAMKA	Mi'kmaq Alsumk Mowimsikik Koqoey Association
MBES	Multibeam Echo Sounder
MMS	Mi’gmawei Mawiomi Secretariat
MODU	Mobile Operating Drilling Unit
MTI	Mi’gmawe’l Tplu’taqnn Inc
NAFO	North Atlantic Fisheries Organization
NCC	NunatuKavut Community Council
NCS	Norwegian Continental Shelf
NL	Newfoundland and Labrador
NL ESA	Newfoundland and Labrador Endangered Species Act
NOx	Nitrogen oxides
NRA	NAFO Regulatory Area
OA	Operation Authorization
OBIS	Ocean Biogeographic Information System
OWTG	Offshore Waste Treatment Guidelines
PL	Production License
ROV	Remotely Operated Vehicles
RV	Research Vessel
SARA	Species at Risk Act
SAS	Synthetic Aperture Sonar
SBM	Synthetic Based Mud
SBP	Subbottom Profiler
SCOP	Statement of Canadian Practice
SDL	Significant Discovery License
SEA	Strategic Environmental Assessment
Sm3/d	Standard cubic meters per day
SSAC	Species Status Advisory Committee
SSS	Side Scan Sonar
TSP	Total Suspended Particles
UNGA	United Nations General Assembly
UXO	Unexploded Ordance
VME	Vulnerable Marine Ecosystem
VOC	Volatile Organic Compounds
VSP	Vertical Seismic Profiling
WBM	Water Based Mud
WNNB	Wolastoqey Nation of New Brunswick
WWF	World Wildlife Federation

1 Introduction

Equinor Canada Ltd. (formerly Statoil Canada Ltd.), and its partner Husky Oil Operations Limited (Husky Energy), are proposing to develop the Bay du Nord field (which includes Bay du Nord, Bay de Verde and Bay de Verde East) and the Baccalieu discovery (collectively the Core Bay du Nord (BdN) Development) offshore eastern Newfoundland for the production of oil and gas.

The Core BdN Development includes offshore construction, installation, hook-up and commissioning, drilling, production operations, maintenance and decommissioning activities, as well as associated supporting surveys, field work, and supply and servicing activities. There are no land-based activities associated with this Project. In addition to the Core BdN Development, the Project may also include potential future development activities. Hence, the Project includes the Core BdN Development and potential future development. The location of the proposed Project is illustrated in Figure 1.1.

This Project Description has been planned and developed in accordance with the prescribed information set out in the *Prescribed Information for the Description of a Designated Project Regulations* under the *Canadian Environmental Assessment Act 2012* (CEAA 2012) and associated guidance (refer to Appendix B for a Table of Concordance between the Project Description and these regulatory requirements). It also addresses the environmental assessment (EA) requirements of the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) and is intended to initiate the EA review process under the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act* and the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act* (together, the Accord Acts).

1.1 Project Overview and Purpose

Equinor Canada, the Operator of the Core BdN Development, has been present and active in the Canada-Newfoundland and Labrador (NL) Offshore Area since 1996, when Norsk Hydro first acquired assets in the region. Norsk Hydro's Oil & Gas Division merged with Equinor Canada's parent corporation, Statoil ASA, in 2007. Since 2008, Equinor Canada has undertaken exploratory geophysical and drilling programs in the Flemish Pass and Jeanne d'Arc basins offshore Eastern Newfoundland. These exploration activities resulted in multiple oil discoveries, including Mizzen in 2009, Harpoon and BdN in 2013, and Bay de Verde and Baccalieu in 2015/16.

Through its operating and partner fields, Equinor Canada is making significant investments in Canada's offshore industry. Its goal is to build off its Canadian offshore exploration and international production experience to become a producing operator offshore east coast Canada.

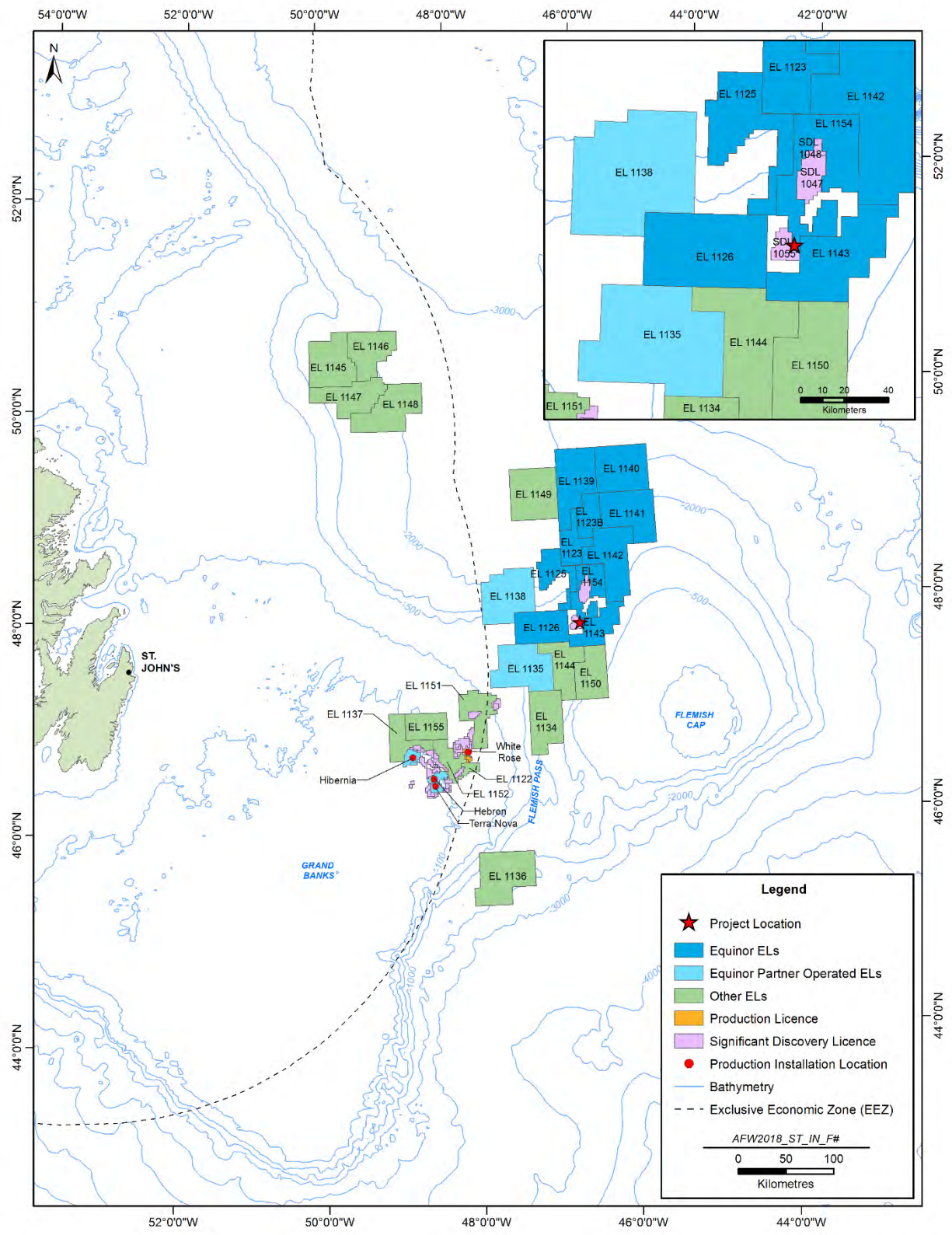


Figure 1.1 Proposed Project Location

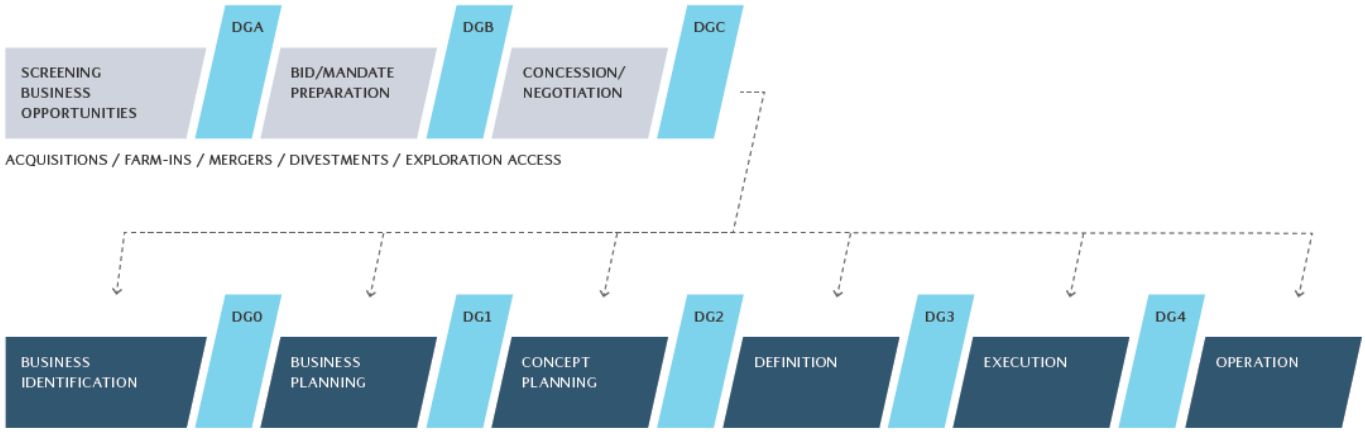


Figure 1.2 Equinor Capital Value Process

The global Equinor organization's (Equinor's) decision process for investment projects is called the Capital Value Process (CVP). Figure 1.2 illustrates the CVP. The CVP is a structured approach to developing a project from the first assessment of a new business opportunity to the start-up of an operation. As a project matures, it goes through a series of decision gates (DGs). The Core BdN Development is currently heading towards DG1. At DG1 it will move from the business planning stage to the concept planning stage. The concept planning stage is intended to establish a clear basis for the investment project, select a preferred commercial and technical development concept and mature the business case to the required level for DG2. DG2 is the main DG before significant external resources become involved, and is the approval to take a project into the definition phase. In the definition phase, the project is matured to the required level, including front-end engineering and design (FEED) for a final investment decision to be made. DG3 represents corporate sanction of a project. Upon sanction, a project enters the execution phase, where detailed engineering, design, fabrication, installation and commissioning occurs. DG4 occurs once the facilities are ready to commence operations.

Per Equinor's CVP, the Project has not yet received formal approval to proceed and is in the business planning phase. For the purposes of EA, the information presented in the Project Description assumes the Project is proceeding even though no final decision has been made. As part of the CVP, Equinor also evaluates the timing and certainty of the regulatory process and permitting requirements for the Project. The ability to execute the Project in accordance with certainty in timeline is a critical component of that evaluation.

If approved, the Project it will be the fifth oil and gas development offshore NL, and will be a major contributor to the provincial and national economies. It will provide important and substantial socioeconomic benefits and business opportunities for the provision of required goods and services across its various phases, as well as potential research and development and training opportunities. Throughout its operational phase, the Project will also contribute to overall energy diversity, supply and security, and contribute substantial revenues to the provincial and federal governments through taxes and royalty payments.

The Project could further extend the life of the offshore oil and gas industry in Newfoundland and Labrador. Opening up the Flemish Basin for development represents an important next step in the development of a strong and sustainable offshore oil and gas industry in the province.

1.2 Project Proponent

Equinor is a Norwegian-based energy organization with operations in more than 30 countries. Since 1972 Equinor has explored, developed and produced oil and gas on the Norwegian Continental Shelf (NCS), where it is a leading operator. From the early 1990s, Equinor has built a global business with strongholds in Europe, Africa, North America and Brazil. Equinor strives to be an industry leader on safety and is actively shaping its portfolio to deliver high value, with a low carbon footprint and aims to be the most carbon-efficient oil and gas producer, committed to creating lasting value for communities. Equinor employs over 20,000 individuals worldwide and is a values-based organization where empowered people collaborate to shape the future of energy. Equinor's ambition is to be the world's most carbon-efficient oil and gas producer, as well as a driver of innovation in offshore wind. Through its subsidiaries, Equinor is the operator of 42 assets in the North Sea, the Norwegian Sea and the Barents Sea with over 50 years of oil and gas exploration and production experience. Internationally, Equinor is the operator of assets in Brazil, the United Kingdom, and the United States, and has interests in countries such as Algeria, Tanzania, Angola, and Russia. Equinor is 67 percent owned by the Norwegian State and is listed on the Oslo and New York Stock Exchanges. It is headquartered in Stavanger, Norway. In 1996, Equinor established a Canadian headquarters in Calgary, Alberta, and a local office in St. John's, Newfoundland and Labrador. Equinor Canada currently holds interest rights in the Canada-NL Offshore Area as well as offshore Nova Scotia. As of April 2018, Equinor Canada is the operator of nine Exploration Licences (ELs) and five Significant Discovery Licences (SDLs), and is an interest holder in two ELs, 30 SDLs, and seven Production Licences (PLs) including Terra Nova, Hibernia, Hibernia South Extension, and Hebron production operations.

Equinor Canada holds a 65 percent interest in the BdN Development, and its partner, Husky Energy, holds a 35 percent interest. Equinor Canada is the Operator for the Project, and its offshore Newfoundland operations will be managed from its St. John's NL office.

Equinor's approach to sustainability is based on the following principles and themes:

- Aiming for outstanding resource efficiency
- Preventing harm to local environments
- Low carbon – reducing CO_2 footprint
- Creating local opportunities
- Respecting human and Indigenous rights
- Being open and transparent

1.2.1 Equinor's Offshore Experience

Equinor was founded in Norway in 1972 and has since become the largest operator on the NCS. Equinor applies its extensive offshore experience from work on the NCS to its operations offshore

Newfoundland, where the organization has been present since 1996. Equinor Canada undertook its first drilling and geophysical program activities offshore Newfoundland in 2008, and had its first offshore oil discovery in 2009 with Mizzen (SDL 1047/1048) in the Flemish Pass area. Following the Mizzen discovery, Equinor Canada continued its geophysical and exploration drilling activities. Additional geophysical surveys were undertaken offshore Newfoundland in 2011, 2012, and 2014. Further exploration drilling in the Flemish Pass area in 2013 resulted in the Harpoon (EL1112) and Bay du Nord (SDL 1055) discoveries. Equinor Canada continued its exploration and appraisal drilling program in the Flemish Pass area through a 19-month drilling program which began in the fall 2015, during which a total of nine exploration and/or appraisal wells were drilled. The 19-month drilling program resulted in two oil discoveries at the Bay de Verde (SDL 1055) and Baccalieu (EL1043) prospects. In 2017, Equinor Canada completed a two-well exploration drilling campaign offshore Newfoundland.

1.2.2 Equinor's Management System

Equinor Canada's offshore Newfoundland operations conform to the organization's corporate management system, which is the set of principles, policies, processes, and requirements that support the organization in fulfilling the tasks required to achieve its objectives. This management system has three main objectives:

1. Safe, reliable, and efficient operations and compliance with external and internal requirements
2. Incorporation of the Equinor values, people, and leadership principles in all Equinor activities
3. Excellent business performance through high-quality decision making, fast and precise execution, and continuous learning

The governing documentation in Equinor's management system is structured in three levels: (1) fundamentals, (2) requirements, and (3) recommendations.

Fundamentals are essential regulations for the organization and are valid throughout the entire Equinor organization. They describe what Equinor wants to achieve and include values, principles, commitments, and mandates.

Requirements are used to manage risks and to provide safe and efficient operations. They describe what the organization needs to comply with when performing tasks. Requirements are set out in various organization management and control documents, work processes, work requirement documents, technical requirement documents, system and operation documents, key control documents and emergency response plan documents.

Recommendations support people when performing tasks and enable compliance with fundamentals or requirements. They describe suggestions or proposals for the best course of action and are based on the collective learning and experience in the organization.

Equinor's management plan encompasses specific components including, but not limited to, pollution prevention policies and procedures, and plans for emergency response, spill response, waste management and environmental monitoring.

Compliance means to follow external and internal requirements to achieve set performance targets. The management system is used systematically in day-to-day work. Training in the use of the work processes is part of this systematic approach. When performing a specific activity, it is necessary to consider risks. A risk assessment may lead to a need for improvement or to evaluate an application for dispensation and/or regulatory equivalency from governing documentation. Leadership is also required in order to achieve compliance. This includes communicating about the management system, acting as a role model, and coaching the organization in the use of the management system. Equinor regularly tests how well its management system is working through an assurance process, which includes self-assessments, verifications, and audits.

Equinor complies with applicable laws, acts in an ethical, sustainable and socially responsible manner, practices good corporate governance, and respects internationally recognized human rights. Equinor maintains an open dialogue on ethical issues, both internally and externally. Open, honest, and accurate communication is essential to the organization integrity and business success.

Equinor uses a variety of tools that help to communicate required environmental commitments and mitigations identified for a project during its operations. Notwithstanding its internal processes and requirements for managing, monitoring, and reporting on its environmental performance, Equinor will also adhere to all the applicable legislative and regulatory requirements that pertain to the Project, including any terms and conditions imposed as conditions of an associated EA review and approval for the Project, and will monitor and report on these in accordance with applicable regulatory procedures or other relevant requirements.

1.2.3 Equinor Canada Contacts

Equinor Canada operates an office in St. John's NL where Equinor Canada's offshore NL activities are managed and key technical staff located.

The principal Equinor Canada contacts concerning the Project and its EA review are as follows:

Primary Contact for Environmental Assessment:

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Regulatory Lead
Equinor Canada Ltd.
2 Steers Cove, Level 2, St. John's, NL, A1C 6J5
Tel (709) 726-9091
Email: scurr@equinor.com

Primary Contacts for Bay du Nord Development and Offshore Newfoundland Operations:

Einar Erjford – BdN Project Director
Unni Fjaer - Vice-President, Offshore Newfoundland
Equinor Canada Ltd.
2 Steers Cove, Level 2, St. John's, NL, A1C 6J5
Tel (709) 726-9091

1.3 Regulatory Context

1.3.1 Canadian Environmental Assessment Act

Proposed oil and gas development activities in the Canada-NL Offshore Area are subject to EA review pursuant to the requirements of CEAA 2012 and its associated Regulations. The federal EA process under CEAA 2012 focuses on potential adverse environmental effects that are within areas of federal jurisdiction, including: fish and fish habitat, migratory birds, federal lands, and other changes to the environment that are directly linked to or incidental to federal decisions about a project.

The *Regulations Designating Physical Activities (the Regulations)* enacted under CEAA 2012 identify the physical activities that constitute a "designated project" that may require a federal EA. Section 11 of the Regulations specify that offshore oil and gas development activities are subject to federal EA review and are defined as:

> *The construction, installation and operation of a new offshore floating or fixed platform, vessel or artificial island used for the production of oil or gas.*

The Project, therefore constitutes a “designated project” under CEAA 2012, and requires the submission of this Project Description to commence the EA process. For clarity, there are no additional activities proposed that are classified as a “designated project” under the Regulations that may require a federal EA. This document will be reviewed by the Canadian Environmental Assessment (CEA) Agency and other relevant departments, agencies, organizations, Indigenous groups and the public to help inform a governmental decision regarding whether a federal EA review of the Project is required, and if so, the nature of that review.

It is Equinor Canada’s understanding that the Project will not take place on lands that have been subject to a regional study as described in Sections 73 to 77 of CEAA 2012.

1.3.2 The Accord Acts

Oil and gas activities offshore NL are regulated by the C-NLOPB, a joint federal-provincial agency that is responsible, on behalf of the Governments of Canada and NL, for petroleum resource management in the Canada–NL Offshore Area. The Accord Acts, administered by the C-NLOPB, govern all offshore oil and gas activities in the region.

As stated on the C-NLOPB’s website, their role, under the Accord Acts, is to regulate oil and gas exploration and development in the Canada-NL Offshore Area, overseeing compliance with regulatory requirements for worker safety, environmental protection and safety, conservation of the resource, land tenure, and Canada / NL benefits. These processes are administered under various legislation, regulations, guidelines and memoranda of understanding.

The C-NLOPB administers a scheduled land tenure system for the issuance and administration of petroleum exploration and production rights in the Canada-NL Offshore Area.

The C-NLOPB's regulatory responsibilities include issuing licences, authorizations and approvals pertaining to offshore oil and gas exploration and development activities in the Canada-NL Offshore Area. All petroleum-related work or activity in the Canada-NL Offshore Area requires an Operating Licence and an Operations Authorization (OA) issued by the C-NLOPB. In accordance with the Accord Acts and Section 6 of the *Newfoundland Offshore Petroleum Drilling and Production Regulations* prior to the issuance of an OA, the following information must be submitted by an Operator and approved by C-NLOPB:

- EA Report
- Canada-Newfoundland and Labrador Benefits Plan
- Safety Plan
- Environmental Protection Plan
- Emergency Response and Spill Contingency Plans
- Evidence of Financial Responsibility
- Certificate of Fitness for the proposed equipment / facilities used to carry out the planned activities

Other required C-NLOPB approvals may also include the approval of plans, procedures or other documents as specified by the relevant legislation or regulations. Additional oversight for environmental protection and safety of operations is provided guidelines issued by the C-NLOPB, and jointly with the Canada-Nova Scotia Offshore Petroleum Board and/or National Energy Board (NEB), and through regulations enacted under the various legislation governing offshore petroleum activities.

The Accord Acts establish the requirements that proponents of offshore petroleum development projects must fulfil in order to obtain approval for a Development Plan. The following reports are required as part of the Development Application

- Development Plan and Development Plan Summary
- Benefits Plan
- Environmental Impact Statement (EIS)
- Safety Analysis and Commitment
- Socio-economic Impact Statement and Sustainability Report.

Any EIS that may be required for the Project under CEAA 2012 will address the associated EA requirements of the C-NLOPB Development Application and/or OA processes.

1.3.3 Land Ownership and Licencing

The Canada-NL Offshore Area, as defined in the Accord Acts, includes those lands within Canada's 200-nautical mile Exclusive Economic Zone (EEZ) or to the edge of the continental margin, whichever is greater. As illustrated previously in Figure 1.1, the proposed Project is in marine areas (lands) that are located beyond Canada's EEZ on the outer continental shelf, whereas some other Project related activities (such as associated supply vessel traffic) will take place within the 200-nautical mile EEZ. In addition, CEAA 2012 defines "federal lands" as including "(i) the internal waters of Canada, in any area of the sea not within a province, (ii) the territorial sea of Canada, in any area of the sea not within a province, (iii) the exclusive economic

zone of Canada, and (iv) the continental shelf of Canada.". Therefore, pursuant to CEAA 2012, the Project will be carried out on federal lands.

As noted in the preceding section, offshore subsurface rights for petroleum-related activities are administered by the C-NLOPB on behalf of the Governments of Canada and NL. The C-NLOPB issues licences for land tenure that afford the holder of the licence exclusive rights to explore for or produce petroleum resources in that area, including ELs, SDLs and PLs. ELs are issued for a term of nine years covering two periods. A well must be drilled or diligently pursed by the end of Period I in order to obtain tenure to Period II. If an exploration drilling program results in a significant discovery and a declaration of significant discovery is made, an interest owner is entitled to apply for an SDL. A significant discovery is defined in the Accord Acts as:

> *A discovery indicated by the first well on a geological feature that demonstrates by flow testing the existence of hydrocarbons in that feature and, having regard to geological and engineering factors, suggests the existence of an accumulation of hydrocarbons that has potential for sustained production.*

An SDL is the document of title by which an interest owner can continue to hold rights to a discovery area while the extent of that discovery is determined and, if it has potential to be brought into commercial production in the future, until commercial development becomes viable. An SDL is effective from the application date and remains in force for so long as the relevant declaration of significant discovery is in force, or until a PL is issued for the relevant lands. A PL confers:

1. The right to explore for, and the exclusive right to drill and test for, petroleum;
2. The exclusive right to develop those portions of the offshore area in order to produce petroleum;
3. The exclusive right to produce petroleum from those portions of the offshore area; and
4. Title to the petroleum so produced.

A PL is effective from the date it is issued for a term of 25 years or for such period thereafter during which commercial production continues.

As an area is developed, when SDLs and / or PLs are issued by the C-NLOPB, the corresponding EL boundaries and numbering may be changed.

1.3.4 Federal Funding

No federal funding has been requested nor provided to the proponent from any federal authority to support the Project.

1.3.5 Other Regulatory Requirements and Interests

Depending on the nature and location of a proposed offshore oil and gas project, federal and provincial departments and agencies may have regulatory responsibilities and/or provide information pursuant to their relevant legislation and mandates. Various permits, authorizations or

approvals for the activities or works associated with this Project may be required, and may include:

- *Fisheries Act* Authorization: Department of Fisheries and Oceans
- Ocean Disposal Permit: Environment and Climate Change Canada
- Radio Licence: Industry Canada
- Seabird Handling and Salvage Permit: Canadian Wildlife Service, Environment and Climate Change Canada
- Species at Risk Permit: Environment and Climate Change Canada

In addition, there will be a number of licenses and certificates issued by Transport Canada or the Classification Society related to safety, security and pollution prevention. These certificates typically state how the vessel is equipped and what limitations there are, as opposed to a permit or an authorization for an activity. Examples of the types of licenses and certificates that may be issued include:

- *Certificate of Canadian Ship Registry*
- *International Tonnage Measurement Certificate*
- *International Air Pollution Prevention Certificate*
- *International Oil Pollution Prevention Certificate*
- *International Sewage Pollution Prevention Certificate*
- *International Civil Liability for Oil Pollution Damage Certificate*
- *International Load Line Certificate*
- *International Ship Security Certificate*
- *Ship Station Radio License*
- *Cargo Ship Safety Equipment Certificate*
- *Cargo Ship Safety Construction Certificate*
- *ISM Certificate*

Other federal legislations, and regulations thereunder, which may be applicable to the environmental aspects of the Project include, but are not limited to:

- *Oceans Act* (S.C. 1996, c. 31)
- *Fisheries Act* (R.S.C., 1985, c. F-14)
- *Canadian Environmental Protection Act* (S.C. 1999, c. 33)
- *Navigation Protection Act* (R.S.C., 1985, c. N-22)
- *Species at Risk Act* (S.C.2002, c. 29)
- *Migratory Birds Convention Act* (S.C. 1994, c. 22)
- *Canada Shipping Act* (S.C. 2001, c. 26)

Given the nature, scope and location of the Project, as described in Section 2, it is not anticipated that provincial EA review and approval under the NL *Environmental Protection Act* will be required. It is likewise not expected that provincial or municipal permits or authorizations will be required, or that associated land use plans or land zoning will be applicable.

Equinor Canada recognizes that should an EIS be required under CEAA 2012, the scope of the Project and its EIS will be established by the CEA Agency, based upon the results of the review

process, which could include input from participating governmental, Indigenous, stakeholder and public interest groups.

2 The Proposed Project

2.1 Location of Project

The Project is located in the Flemish Pass area of the Canada-NL Offshore Area, approximately 450 km east-northeast of St. John's (Figure 2.1). Water depths in the Core BdN Development Area range from approximately 1,000 m -1,200 m, whereas water depths in the broader Project Area range from approximately 340 m to 1,200 m. The Project Area includes all or portions of ELs 1125, 1126, 1143, and 1154 and SDLs 1047, 1048, 1055 and any SDLs that may be awarded within the foregoing ELs. The Core BdN Development will occur primarily on the area as currently defined by SDL 1055 and EL1143, within the Project Area. Equinor Canada recognizes that production activities are contingent on the requisite approvals and rights issuance granted by the C-NLOPB and/or governments (refer to Section 1.3.3).

Figure 2.1 illustrates a proposed Project Area, which is approximately 4,900 km^2 in size. The Core BdN Development Area is approximately 450 km^2. It is important to note that the footprint of the Project facilities on the seabed will, based on the current stage of design, only cover approximately 7 km^2. The Project Area coordinates are provided in Table 2.1 and coordinates for the Core BdN Development Area are provided in Table 2.2. The "geographic coordinates" for the proposed production installation are provided in Table 2.3. Note, final Project design is ongoing and these coordinates may change, but in the event it does, it will more than likely remain within the Core BdN Development Area and certainly within the broader Project Area described above.

Table 2.1 Proposed Project Area Coordinates

Corner Point	Coordinates – NAD 83 UTM ZONE 23N			
	Longitude (DMS)	Latitude (DMS)	Easting (m)	Northing (m)
A	46° 7' 2.400" W	48° 22' 42.619" N	417264	5358974
B	45° 56' 36.952" W	47° 58' 31.332" N	429579	5313994
C	46° 2' 55.932" W	47° 49' 59.642" N	421508	5298298
D	46° 2' 55.939" W	47° 43' 59.659" N	421357	5287184
E	47° 17' 48.813" W	47° 43' 55.569" N	327781	5289080
F	47° 17' 55.939" W	48° 4' 59.660" N	328795	5328108
G	46° 40' 25.909" W	48° 4' 59.682" N	375340	5326908
H	46° 15' 14.590" W	48° 24' 56.232" N	407208	5363256

Table 2.2 Proposed Core BdN Development Project Area Coordinates

Corner Point	Coordinates – NAD 83 UTM ZONE 23N			
	Longitude (DMS)	Latitude (DMS)	Easting (m)	Northing (m)
I	46° 7' 29.876" W	48° 1' 56.021" N	416135	5320494
J	46° 7' 38.691" W	47° 53' 36.363" N	415727	5305071
K	46° 31' 28.198" W	47° 53' 45.195" N	386052	5305854
L	46° 31' 23.225" W	48° 2' 5.004" N	386460	5321282

Table 2.3 Preliminary Location – Production Installation

Production Facility – Center Point Coordinates– NAD 83 UTM ZONE 22N			
Longitude (DMS)	Latitude (DMS)	Easting (m)	Northing (m)
46° 23' 0.887" W	47° 57' 49.647" N	396720	5313202

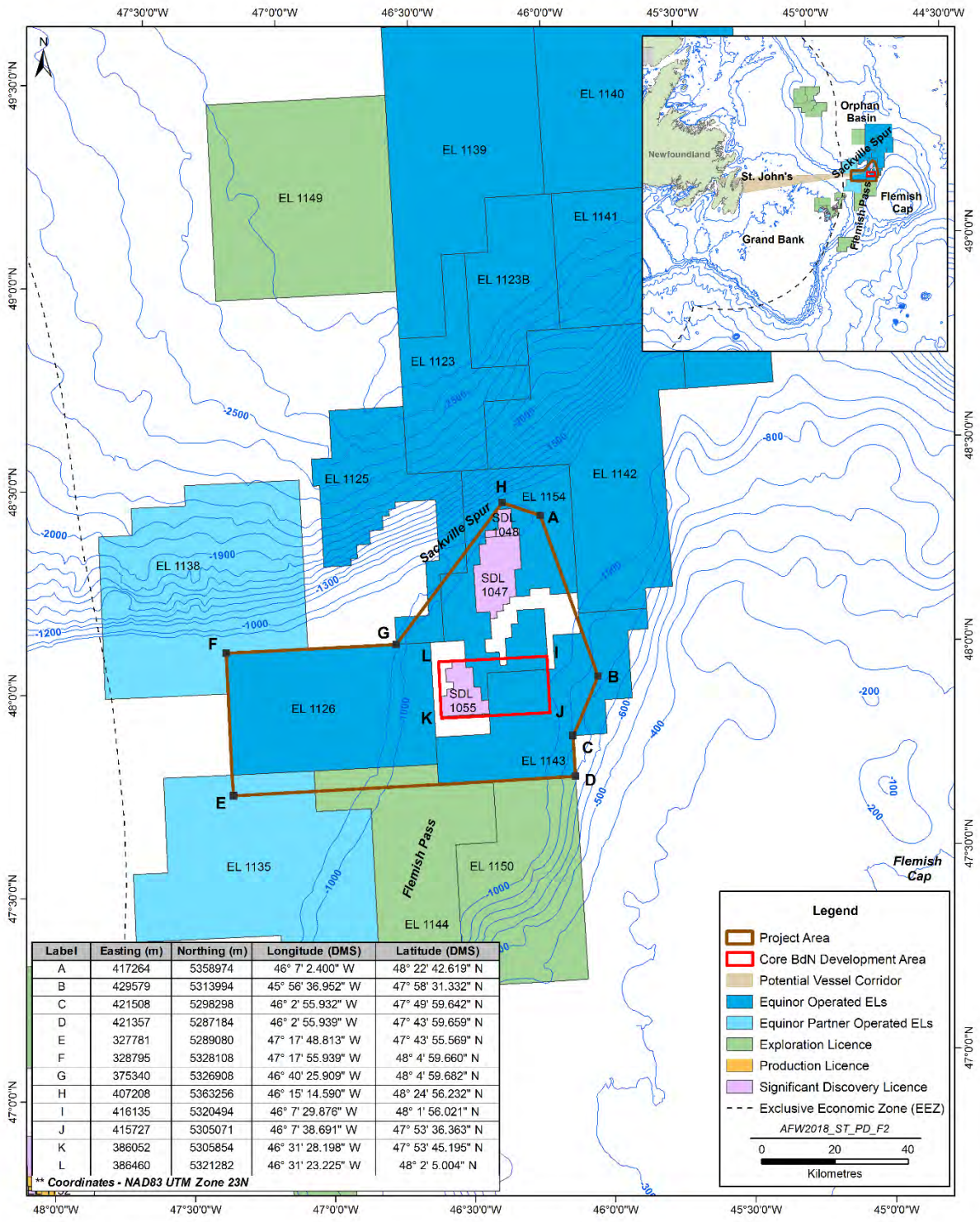
The Project Area considers ancillary and potential future activities that may be carried out over the life of the Project. For example, over the life of the Project, existing 3D seismic data may need to be augmented by additional data, as technology is refined. In addition, 4D seismic data may be required to accurately predict the changes in the reservoir as production continues. For 3D/4D seismic data collection, the Project Area includes a vessel turning radius.

The Project Area also includes lands adjacent to the Core BdN Development Area. Should future resource potential be discovered, these lands could be developed and produced from the BdN production facility through the addition of subsea tie-backs. Equinor Canada has majority interests in other ELs and SDLs in the area of the Project (Figure 2.1) with future tie-back opportunities. These lands may be included in future development opportunities and are therefore included in the Project Area.

The closest operating offshore oil and gas production facility is White Rose, which is approximately 240 km to the southwest of the proposed Project Area.

2.2 Project Overview

The Core BdN Development is comprised of the BdN field and Baccalieu discovery. The Core BdN Development has an estimated mean economically and technically recoverable resource of approximately 47.7 million cubic metres (approximately 300 million barrels) of crude oil. The crude oil in the Core BdN Development is a light crude with an approximate API (American Petroleum Institute) gravity of 36º and a low gas to oil ratio.



Label	Easting (m)	Northing (m)	Longitude (DMS)	Latitude (DMS)
A	417264	5358974	46° 7' 2.400" W	48° 22' 42.619" N
B	429579	5313994	45° 56' 36.952" W	47° 58' 31.332" N
C	421508	5298298	46° 2' 55.932" W	47° 49' 59.642" N
D	421357	5287184	46° 2' 55.939" W	47° 43' 59.659" N
E	327781	5289080	47° 17' 48.813" W	47° 43' 55.569" N
F	328795	5328108	47° 17' 55.939" W	48° 4' 59.660" N
G	375340	5326908	46° 40' 25.909" W	48° 4' 59.682" N
H	407208	5363256	46° 15' 14.590" W	48° 24' 56.232" N
I	416135	5320494	46° 7' 29.876" W	48° 1' 56.021" N
J	415727	5305071	46° 7' 38.691" W	47° 53' 36.363" N
K	386052	5305854	46° 31' 28.198" W	47° 53' 45.195" N
L	386460	5321282	46° 31' 23.225" W	48° 2' 5.004" N

** Coordinates - NAD83 UTM Zone 23N

Figure 2.1 Project Area

A drainage strategy for the Core BdN Development is currently under development. The goal of a drainage strategy is to provide a reasonable balance of conservation of resource, economic value and overall development flexibility to allow the reservoirs to be effectively managed over the life of the field. The drainage strategy is based on water and produced gas injection for pressure support. It is anticipated that core field production could be between 12-20 years. The proposed Core BdN Development is a subsea development which may include multiple templates and/or individual satellite wells (between five and 10 combined) tied back via flowlines to a ship-like floating production storage offloading installation. The total number of wells for the Core BdN Development is estimated to be between 10 and 30 wells. Figure 2.2 provides an illustration of a typical subsea development, and is representative of the Core BdN Development. The figure is for illustrative purposes only and is not meant to depict the final Core BdN Development layout, which is in the early stages of design. As stated above, while the water depth in the Core BdN Development Area ranges from approximately 1,000 to 1,200 m, it is relatively flat and with depth increasing near the eastern edge. In the Project Area, where future development may occur, the seabed is sloped (refer to Figure 2.3 for information on seabed bathymetry in the Project Area and Core BdN Development Area).

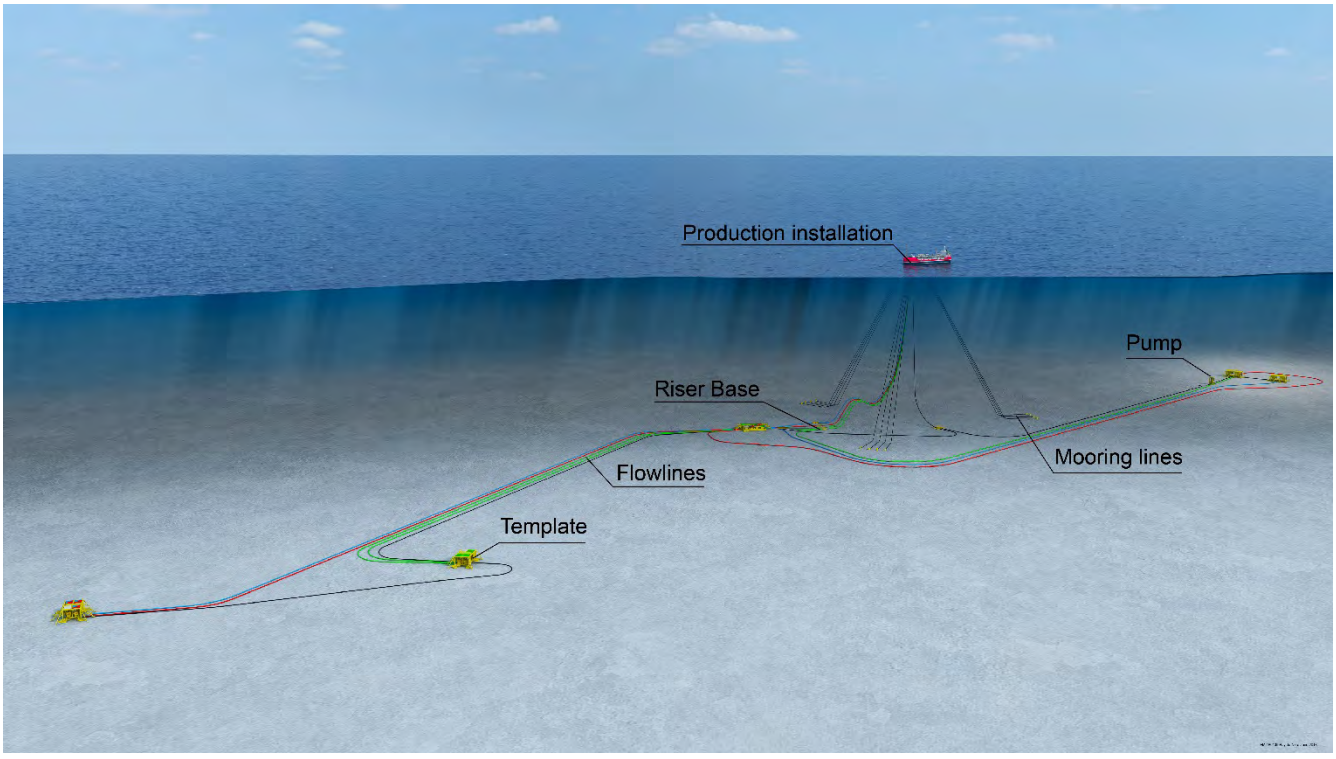


Figure 2.2 Illustration of a Typical Subsea Development - Representative of the Core BdN Development (Not to Scale)

Potential future development may be comprised of tie-backs of subsea templates to the existing production installation and/or subsea infrastructure. Future tie-backs would not increase the maximum production rates, but rather would serve to extend the life of the field and operations as the hydrocarbons in the Core BdN Development are produced and decline.

Figure 2.4 provides an illustration of a potential layout of the Core BdN Development. As noted previously, Project design is ongoing and the layout may change during detailed design and optimization. In the event that the layout changes, it is anticipated to remain within the Core BdN Development Area, within the ranges of wells (10 to 30) and templates/satellite wells (between five and 10) described below for the Core BdN Development

As described above, the Core BdN Development is currently at a conceptual stage of planning, which means that details regarding Project design, reservoir management and production operations are under consideration. The following overview is a conceptual plan, which will be refined as the design progresses.

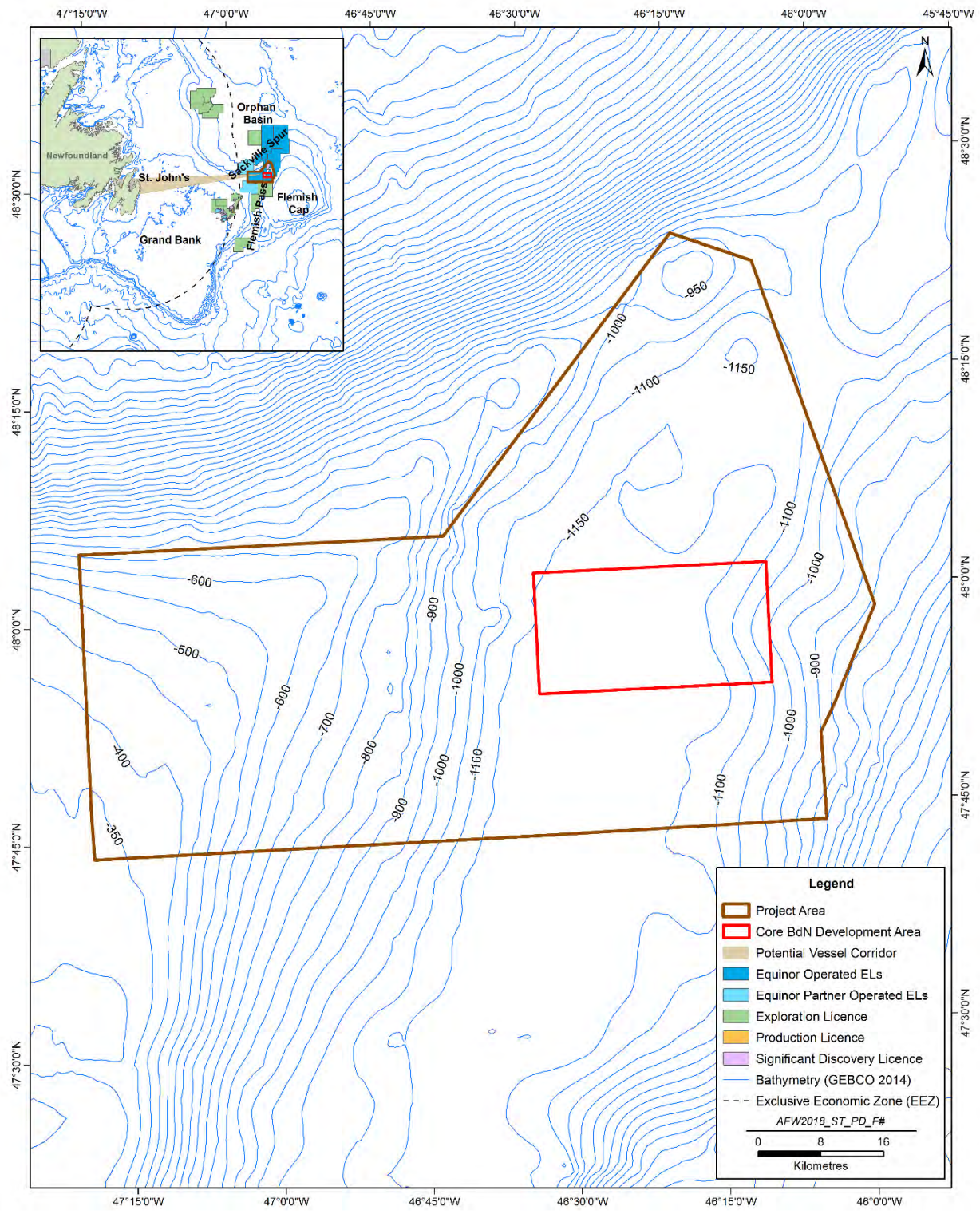


Figure 2.3 Bathymetry of Project Area

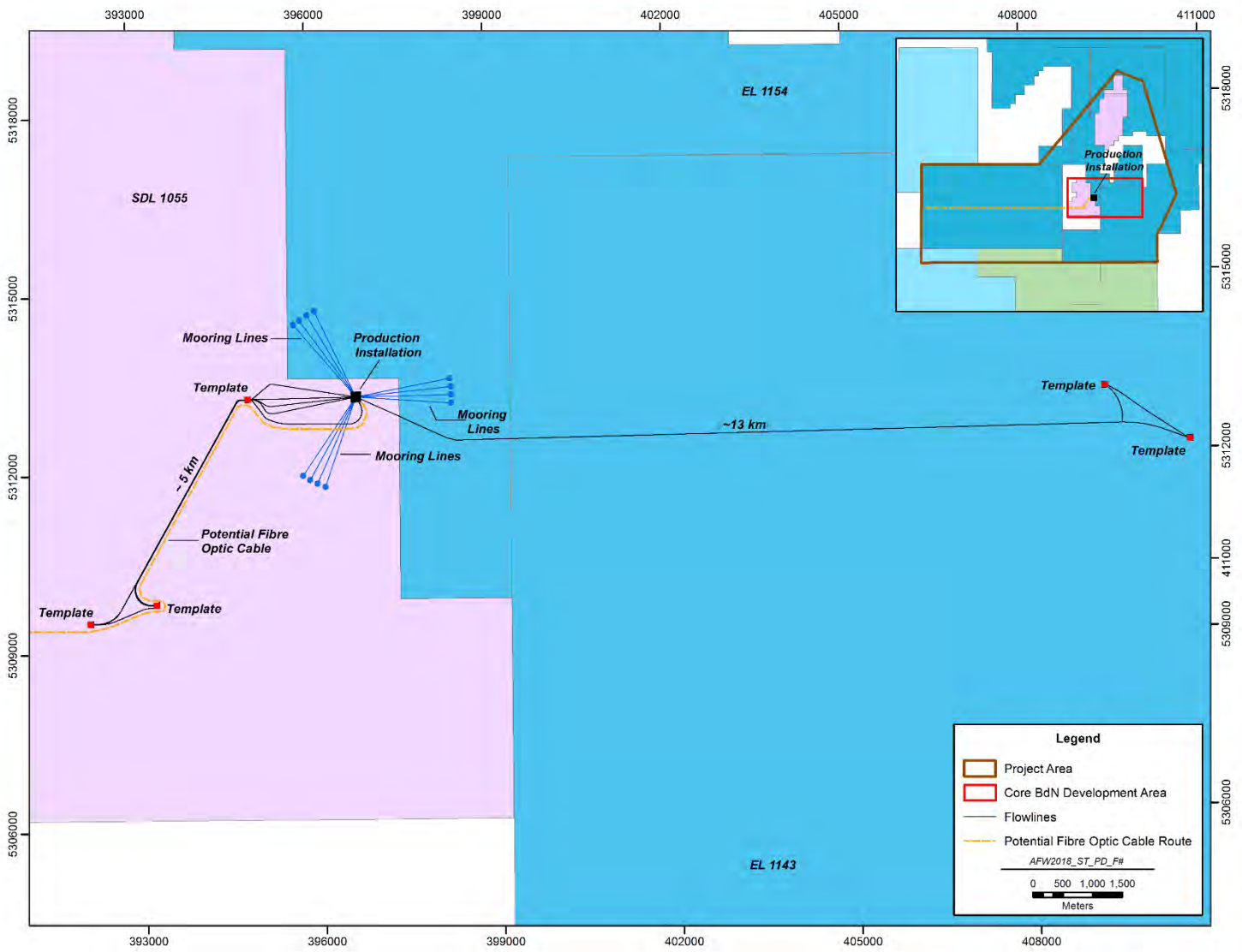


Figure 2.4 Illustration of Potential Layout of Core BdN Development

2.2.1 Project Components and Activities

The Core BdN Development includes the offshore construction, installation and hook-up and commissioning, drilling and life of field well support, operations and maintenance, and decommissioning of an oil and gas production installation. The Project includes all components and activities, including supporting activities, associated with offshore drilling and production facilities such as vertical seismic profiling (VSP) surveys, 3D/4D surveys, ice management operations, remotely operated vehicles (ROV) / autonomous underwater vehicle (AUV) / video surveys, and geophysical, environmental and geotechnical surveys. Detailed information on proposed Project activities are provided in the following subsections.

The Project may also include future development activities such as development drilling, geophysical surveys, geotechnical surveys, environmental surveys, and potential subsea tie-backs of templates to the existing production installation that may be required should future development opportunities arise.

As described above, the Project consists of the Core BdN Development and potential future development. Table 2.4 provides an overview of the key activities and temporal scope for these planned and potential Project phases.

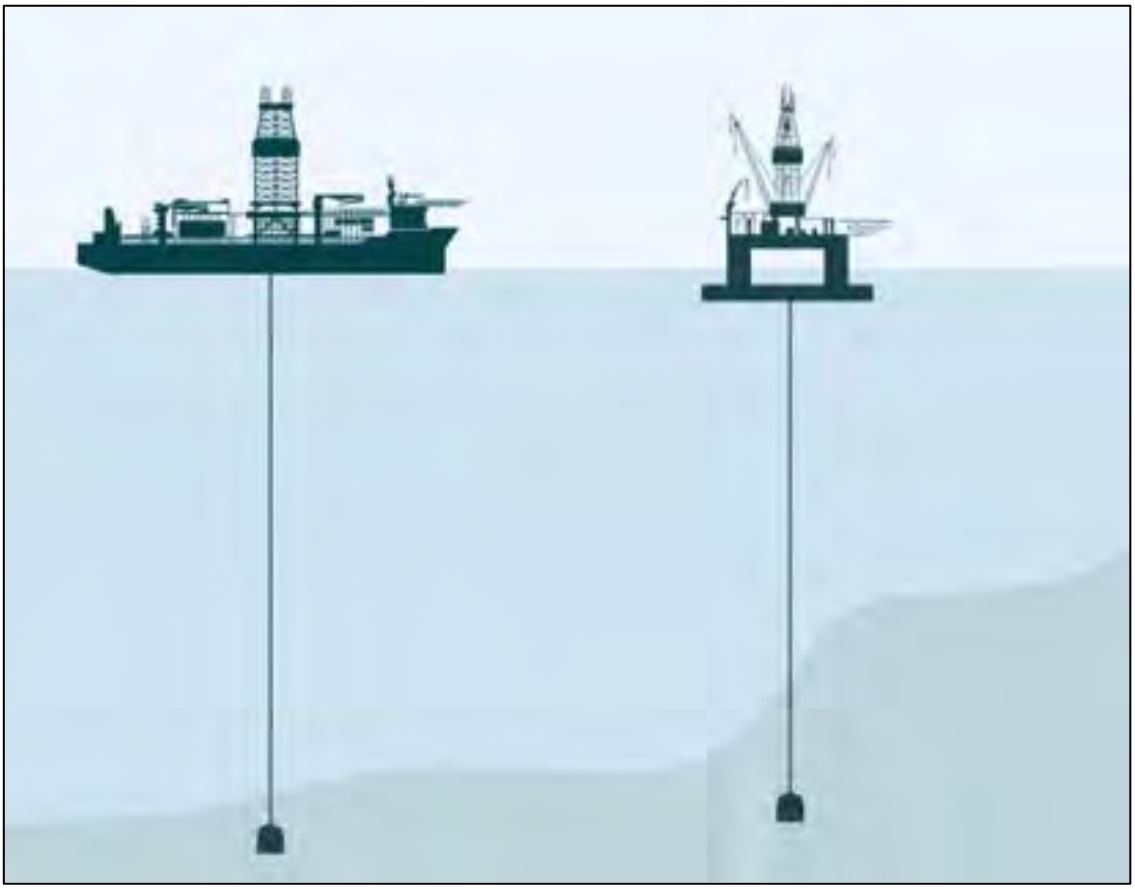
Table 2.4 Overview of Core BdN Development and Potential Future Development Activities

Component	Core BdN Development	Potential Future Development
Field life	12-20 years	Extension of core field life to maximum of 30 years
Drilling	Between 10 to 30 development wells	Up to an additional 20 development wells
Subsea templates, including individual satellite wells	5-10	1-5
Construction / installation / hook-up and commissioning	Seasonal over 3-5 years	As required depending on need for tie-backs
Production/maintenance activities	Life of field - 12 to 20 years	Would be extended with life of field extension
Supporting activities	As required year-round, throughout life of field	As required year-round throughout extended life of field
Production installation	New build	Tie back to existing installation or subsea infrastructure
Area	Core BdN Area, see Figure 2.1	Project Area, outside the Core BdN Area - see Figure 2.1
Production Rates	Maximum rates as described in Section 2.2.1.5 below	Maximum rates will be the same as Core BdN Development

2.2.1.1 Development Drilling

The Core BdN Development may involve the drilling of 10-30 wells, with a combination of production and injection wells. Wells will either be drilled using templates (multiple wells drilled in one location) or at individual well locations. Pre-drilling of wells may be carried out before the production installation is on site. It is planned that Core BdN Development wells will be drilled within an approximate three-year timeframe, once drilling commences. Well location planning to optimize resource recovery is ongoing, and therefore final well locations are not yet defined.

Drilling will be carried out by one or more mobile operating drilling units (MODUs), which may operate concurrently, suitable for drilling throughout the year and under the environmental conditions of the Project Area. Either a semi-submersible drilling unit or a drill ship could be used (Figure 2.5). Wells will be maintained throughout the life of the field using one or more MODUs, light well intervention vessel or Inspection, Maintenance and Repair (IMR) vessels. As drilling units are procured through a competitive bid process, the specific drilling unit that will be used is not known at this point. Drilling will occur year-round. Based on the water depths in the Core BdN Development Area, the drilling unit will maintain positioning using a dynamic positioning system, without the use of a mooring system.



Source: Adapted from Maersk (undated).

Figure 2.5 Schematic of a Drillship (Left) and a Semi-submersible (Right)

Wells are typically drilled in two phases: (1) drilling without a riser installed and (2) drilling with the riser installed. During riserless drilling, the surface and conductor sections, are typically drilled with seawater or water-based drilling mud (or fluid) (WBM) with the cuttings discharged at the seafloor, in accordance with the Offshore Waste Treatment Guidelines (OWTG) (NEB et al, 2010). Once the initial sections are drilled, a steel casing is cemented in place to prevent the wall of the wellbore from caving in and to prevent the seepage of muds and other fluids. The riser and blowout preventer (BOP) are then installed onto the wellhead. The riser is a large diameter pipe that acts as a conduit connecting the rig to the wellhead through the water column, and the wellhead provides structural integrity to house the BOP and pressure integrity for drilling operations. A BOP is a system of high pressure valves that prevent water or hydrocarbons from escaping into the environment in the event of an emergency or equipment failure. The remaining sections of the well are drilled to a predefined depth using either WBM or synthetic-based drilling muds (SBM). At intervals along the well, casing is cemented in place at set depths to reinforce the wellbore. Once development wells are drilled to depth, the BOP is removed and a 'Christmas tree' is installed on the wellhead. The tree is an assembly of valves, spools, and fittings used for an oil well, gas well, water injection well, gas injection well, and other types of wells. The primary function of a tree is to control the flow into or out of the well (see Figure 2.6 below).

Drilling activities may also include batch drilling, which is the process of consecutively drilling the top hole portions of a well for multiple wells, and then returning to complete each individual well. During batch drilling activities, the conductor hole section and surface hole section are drilled riserless using WBM and cuttings are discharged at the seabed. Batch drilling can be done with either a MODU or a vessel designed for riserless drilling. The number of top hole sections to be batch drilled at any one time is dependent on the number of wells proposed in any drilling campaign, and will be determined to optimize MODU and/or vessel efficiency and overall logistics.

Well interventions and workovers are possible throughout the life of field and are necessary to maintain the wells and optimize performance. Interventions and workovers could use a drilling unit or vessel (as listed above) to perform the required intervention/workover scope on the well(s). This type of work may occur three to five times during the life of the field or as required for safety reasons.

Typically for development drilling, well flow testing is not carried out and is, therefore, not considered to be within the scope of the Project. Equinor recognizes that should an EA be required under CEAA 2012, the scope of the Project will be set by the CEA Agency.

Section 2.4 below provides information on the anticipated discharges and emissions associated with drilling activities.

2.2.1.2 Subsea Infrastructure

Current design plans for subsea infrastructure consist of mooring lines and anchors, multiple wet tree wellheads (with Christmas trees), templates, flowlines (similar to a pipeline) and risers (i.e. vertical flowlines from seafloor to the production facility). Figure 2.2 (above) provides a general illustration of flowlines, risers and mooring lines. Figures 2.6 and 2.7 provide illustrations of well heads and templates typically used in offshore developments.

For the Core BdN Development, between five and 10 templates may be tied-back to the production installation. The templates may be either four-well slot or eight-well slot. The number and location of templates will be determined based on the reservoir management plan. Since the water depth in the Core BdN area is between 1,000 m and 1,200 m, there is no likelihood of iceberg scour. Therefore, there is no plan to use excavated drill centres, such as those that are used in the shallower Jeanne d'Arc Basin area, to house the subsea well equipment. The need for protection of the subsea installations from dropped objects or other interference will be assessed. Protection measures may include rock dumping over flowlines, installation of subsea wellhead protection equipment, trenching of flowlines, and/or concrete mattresses.



Figure 2.6 Typical Wet Tree Wellhead (with Tree)



8 slot template



4 slot template

Figure 2.7 Typical Template Design

2.2.1.3 Production Installation

The Core BdN Development will include a floating production installation with onboard storage for crude oil. With a water depth of approximately 1,200 m, the use of bottom-founded (seabed mounted) structures are not feasible for this Project. The production installation is moored offshore in a fixed location (refer to Figure 2.2).

The production installation will have the capacity to handle the requirements of crude oil production, storage and export, gas management, water injection, and the management of produced water and other wastes for a design life of 30 years. Crude production rates are estimated to be between 15,000 Sm^3/d to 30,000 Sm^3/d (approximately 94,000 to 188,000 BOPD). Crude storage capacity could be between 143,000 m^3 to 191,000 m^3 (0.9 million to 1.2 million barrels) of crude oil. The estimated produced water production rate ranges from 30,000 m^3/d to 50,000 m^3/d.

Figure 2.8 is a photograph of Husky Energy's White Rose Floating Production, Storage, and Offloading (FPSO) installation, an example of a typical floating production installation operating offshore Newfoundland.



Figure 2.8 Typical FPSO - Husky Energy White Rose FPSO

The Project Area is, like the rest of the marine environment off eastern Newfoundland, subject to seasonal incursions of icebergs (see Section 3.2.5). The production installation will have the capability to disconnect and transit as a marine vessel, in the event of a potential iceberg encroachment or if required for other purposes such as shore based maintenance. Ice management is part of normal offshore operations when sea ice is present offshore eastern Newfoundland. An Ice Management Plan will be developed for operations that provides details on the detection, monitoring and assessment and physical management of sea ice and icebergs.

As described in Section 1.3.5 the production installation and the subsea equipment will be constructed at existing fabrication yards either locally or internationally depending on capacity and fabrication requirements. Therefore, the activities associated with the construction/fabrication of the production installation and/or subsea equipment are not included in the scope of the Project. The Project scope does not include the establishment or operation of Project-specific construction or fabrication facilities. Equinor recognizes that should an EA be required under CEAA 2012, the scope of the Project will be set by the CEA Agency.

2.2.1.4 Offshore Construction, Installation and Hook-up and Commissioning

Offshore construction, installation, hook-up and commissioning refers to activities that will occur offshore at the Core BdN Development location. As stated above, the production installation and subsea infrastructure will be built at existing fabrication yards.

The offshore construction and installation phase includes the installation of subsea equipment including:

- Drilling templates
- Flowlines/pipelines and subsea infrastructure (including umbilicals), as well as hook-up thereof
- Risers
- Fibre optic cable in the Project Area

Hook-up includes tie-in and connection operations to connect flowlines/pipelines/umbilicals between drilling templates to risers and the production installation. Flowlines/pipelines will be flooded and leak-testing will be performed.

Offshore construction / installation and hook-up and commissioning will likely be carried out over three to five years, and likely limited to 'summer' seasons due to weather limitations associated with the construction field season. If required, subsea infrastructure protection measures may be installed.

Telecommunications will be provided either through fibre optic cable or satellite communications. Options for fibre optic cable include installing a dedicated system from shore or connecting to an existing offshore marine fibre optic cable system. The Project scope will include the potential installation of the fibre optic cable within the Core BdN Development Area. The routing of a potential fibre optic cable has not been determined. This is typically completed by specialized telecommunications installation companies and would be completed later in the project design stages. If a fibre optic cable is installed from the island of Newfoundland at the closest point, it would be approximately 450 km in length. Telecommunication fibre optic cables have historically been exempt from EA and Canadian permitting requirements. Underwater cables are listed as a work/activity in DFO exclusion list for minor works; similarly they are listed by Transport Canada in the *Navigable Waters Protection Act* minor works exclusion list. Activities associated with the installation of telecommunication cable in the Project Area may include, but not limited to the following:

- Ship-towed grapnel to clear cable path
- Cable laying vessel to install cable
- Hook-up of cable at sea floor (ROV) and to production installation

Activities associated with the above include, but are not limited to: pre-clearance surveys, site preparation, geotechnical, geophysical, environmental, and/or ROV/AUV surveys. Vessels engaged to carry out and/or support these activities are listed in Section 2.2.1.7 below and include helicopter support for the transport of personnel and/or cargo.

Equinor recognizes that should an EA be required under CEAA 2012, the scope of the Project will be set by the CEA Agency.

Section 2.4 below provides information on the anticipated discharges and emissions associated with offshore construction, installation, hook-up and commissioning activities.

2.2.1.5 *Production and Maintenance Operations*

Crude production rates are estimated to be between 15,000 Sm^3/d to 30,000 Sm^3/d (approximately 94,000 to 188,000 BOPD) and crude storage capacity could be between 143,000 m^3 to 191,000 m^3 (0.9 million to 1.2 million barrels) of crude oil. Produced water production rate is estimated to range from 30,000 m^3/d to 50,000 m^3/d. Options for management of produced water include re-injection into the reservoir or discharge overboard after treatment. Excess associated gas will be re-injected into the reservoir.

The following activities are typically carried out during normal production and maintenance operations:

- Power generation
- Operation of utilities system, including but not limited to heating, cooling, ventilation, power, corrosion protection systems if required
- Desalination of seawater for potable water
- Waste generation and disposal
- Operation of produced water treatment and management system (re-injection or overboard discharge)
- Operation of seawater systems (cooling, firewater, etc.)
- Provision of required water (potable, fire water, cooling, industrial water)
- Operation of oil storage and offloading
- Maintenance and inspection activities, including welding and x-ray inspection
- Flaring in connection with start-up, emergency and maintenance activities (vessel depressurization, etc.)
- Cargo/fuel/chemical handling

Power generation on the production installation will be provided by reciprocating dual fuel (gas/diesel) engines or dual-fuel turbines.

Maintenance of process and utility systems include regularly scheduled major shutdowns/turnarounds in line with established industry/company practice. In addition, marine systems and the hull will be maintained according to the class societies and flag state requirements.

Pressure and leak testing of the subsea systems including pipelines/flowlines will be carried out during commissioning. No testing is planned during the operational phase other than routine inspections such as checking for lack of cover, free-spans and evidence of interaction with fishing. The pipelines will be designed to accommodate “intelligent pigging“ inspection if necessary, whereby a remote sensing “pig“ will be conveyed through the pipeline to undertake checks on and confirmation of pipeline integrity and condition.

Ongoing Project design will investigate options to minimize flaring. It is anticipated that there will be no routine flaring of produced gas from the production installation. Excess produced gas (i.e., gas which is not used for power generation) will be reinjected into the reservoir. During start up and shutdown and during upset process conditions, depressurization of process segments may be required for safety reasons, and gas will be sent to the flare. A flare tower will be provided to assure the safe release and burning of the product. Current design options include a segregated

flare system that includes a high-pressure (HP) and a low-pressure (LP) system. Under normal operating conditions, no gas is flared via the HP flare. Primary sources of gas to the LP flare system would be produced water degassing and cargo tank blanketing. Options for the recovery of these sources of produced gas are being evaluated.

Potable water will be produced from a desalination plant onboard the production installation.

The Project is located approximately 450 km offshore from St. John's NL. Crude oil will be offloaded to shuttle tankers. Up to 8,000 m^3/hour of crude could be offloaded. Crude oil will be shipped via these shuttle tankers to an existing transhipment facility or directly to market using international shipping lanes. Once the shuttle tanker leaves the Project safety zone, it is under the responsibility of the third-party owners of the shuttle tankers, outside the care and control of Equinor Canada, Husky Energy and/or the Project. The shuttle tankers would be subject to international maritime requirements (i.e., International Maritime Organization (IMO)) and must adhere to the regulatory framework of the IMO as well as those of its flag state. Shuttle tankers will use existing international and Canadian shipping lanes. If travelling within Canada's EEZ, shuttle tankers are required to have arrangements with a Canadian marine response organization in the event of a spill. The Project includes the offloading of crude to shuttle tankers and their movement and hook-up/disconnect within the Project safety zone. The transhipment of crude is therefore not included in the scope of the Project. Equinor recognizes that should an EA be required under CEAA 2012, the scope of the Project will be set by the CEA Agency.

Potential discharges and emissions associated with the various production and maintenance operations outlined above are described in Section 2.4 below.

2.2.1.6 Other Supporting Activities

Activities and surveys in support of drilling and production operations, which may be carried out from time to time, include well intervention; 2D/3D/4D seismic surveys; VSP programs; geotechnical and/or geological surveys, wellsite / geohazard surveys, environmental surveys and ROV/AUV surveys. The Project also includes all the ancillary facilities and activities typically associated with an offshore oil and gas production operation. Vessels to support these activities are described in Section 2.2.1.7.

Geophysical / Geohazard / Wellsite and Seabed Surveys: These surveys are used to identify unstable areas beneath the seafloor (i.e., shallow gas deposits), hazards (large boulders, ocean debris, shipwrecks) so as to avoid these hazards when drilling, or corals. Surveys typically take between 5 to 21 days to complete but can be shorter (i.e., coral surveys) or longer, depending on the area to be surveyed and weather/operational delays. These can involve the mapping of the seabed through the use of seismic sound sources, multibeam echo sounder (MBES), side-scan or synthetic aperture sonar (SSS/SAS), sub-bottom profiler (SBP), video and other non-invasive equipment. The equipment is deployed either as hull-mounted equipment, on a towfish or on ROV / AUVs. Geohazard surveys may not be required for each well location; existing geophysical data may be used to analyze potential geohazards. These surveys may occur at any time of the year over the temporal scope of the Project.

2D/3D/4D Surveys: Over the life of the Project, seismic surveys may be undertaken to access and revalidate previous seismic data (Figure 2.9). Any required 2D/3D/4D surveys will take place within the Project Area. 2D seismic programs tend to cover relatively large geographical areas, in order to identify sites or zones that may warrant further investigation, and they are therefore of relatively short-term duration at any given location. These surveys typically use one sound source array and often employ a single streamer, with survey lines being widely spaced (usually several kilometres apart) and laid out in various directions. 3D surveys are typically more focussed and tend to cover smaller geographical areas than 2D surveys. Multiple sound source arrays are typically used and the vessel could tow between 8 and 16 streamers. 4D surveys, also known as 'time lapse seismic" simply means that successive 3D survey data sets for the same area are interpreted to define changes in the reservoir over time. A typical application of this technique is using previous 3D seismic data and comparing it with a recently acquired 3-D survey. Therefore, the activities associated with a 4D survey are similar to a 3D survey (multiple sound source arrays and streamers), and the data collected is then compared to previous 3D seismic data for the same area. In both 3D and 4D seismic surveys, hydrophones may be laid on the seafloor, rather than towed behind the vessel.

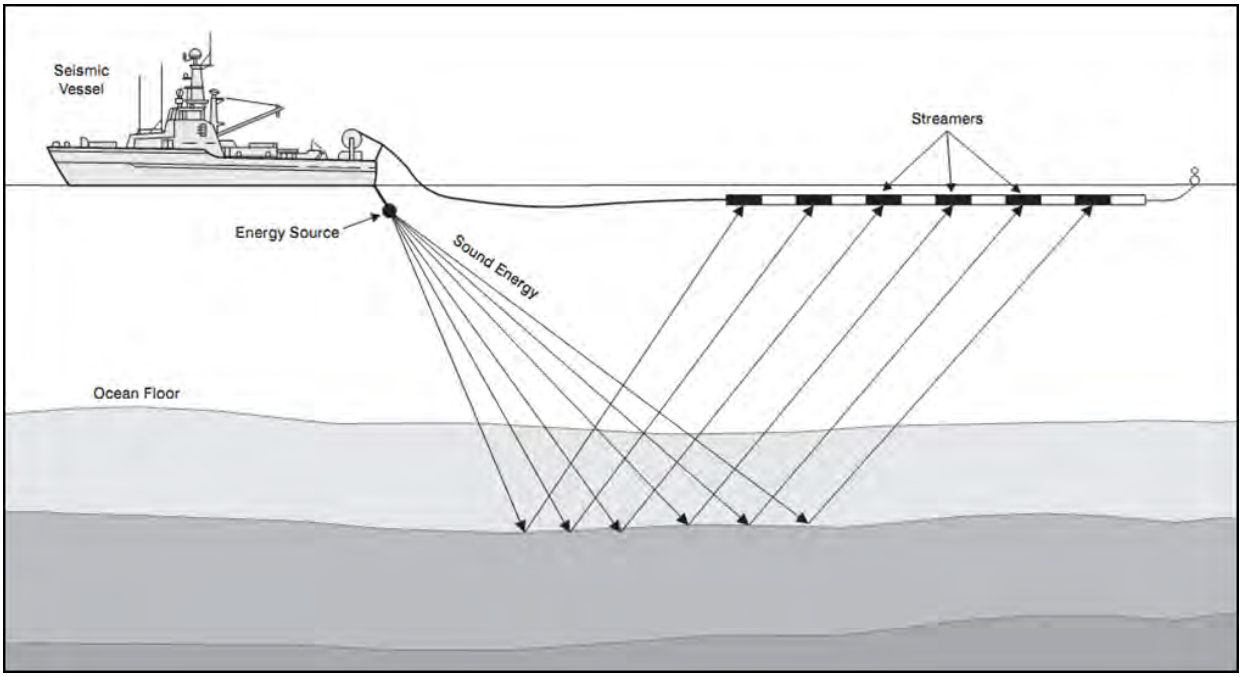


Figure 2.9 Conceptual Illustration of a Typical Offshore Seismic Survey

VSP Surveys: VSP is a tool used to further define the depth of geological features and potential petroleum reserves by obtaining high resolution images of the target. VSP surveys will be conducted as required throughout the Project life.

VSP surveys are similar to surface geophysical surveys in that a sound source and a receptor (or hydrophone) is required to measure the refraction and reflection of the sound waves, thereby providing data that can be interpreted to delineate geological features used to identify potential hydrocarbon deposits. VSP differs from surface geophysical surveys in that it is conducted in a

vertical wellbore using hydrophones inside the wellbore and a sound source near the surface at or near the well; a VSP is quieter and more localized than a surface geophysical survey, being smaller in size and volume. Up to 12 individual smaller sound sources may be used for VSP, each of which has a maximum volume of 250 cubic inches and is generally placed 5 to 10 m below the water surface. Additionally, a VSP is shorter in duration than surface geophysical surveys, with VSP operations usually taking less than 48 hours per well to complete the profiling.

During a VSP program, various VSP configurations are used depending on the objectives. For example, an offset VSP is the conventional configuration, in which the energy source is positioned directly above the hydrophone(s), typically close to the wellbore. A walkaway VSP occurs when the sound source is towed from a vessel and is moved progressively away from the hydrophones, generally resulting in higher resolution than surface data and providing more continuous coverage than an offset VSP. VSP surveys may be carried out at any time of the year.

Geophysical activities for the Project will be planned and conducted in consideration of the *Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environmen*t (SOCP, DFO 2007; and appended to the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2017)).

Environmental Surveys: These surveys are conducted to collect samples to analyze the physical, chemical, and biological aspects of the selected area. Sampling is typically carried out from a support / supply vessel or a dedicated vessel suitable to the survey. Environmental surveys may include oceanography, meteorology, and ice / iceberg surveys. They can also include biota, water, and sediment sample collection, and ROV-video or drop camera surveys. Environmental surveys may occur throughout Project life at any time of the year using vessels of opportunity associated with the Project, typically taking between five to 20 days to complete.

Geotechnical Surveys: These surveys measure the physical properties of the seabed and subsoil through the collection of sediment samples and in-situ testing. Methods to collect the samples typically include drilled boreholes or gravity coring. In-situ testing is done through cone penetration testing and pore pressure measurements. Installation of piezometers in boreholes to measure soil properties may also be carried out. Piezometers could be left in place to collect data for up to 12 months or longer. Geotechnical surveys may occur throughout the Project life at any time of the year, using dedicated vessels provided by marine geotechnical specialist suppliers.

ROV / AUV surveys: These surveys are used to conduct visual inspections (camera equipped) of facilities. ROV / AUV surveys may also be used during pre-drill surveys and before marine installations to determine presence / absence of physical objects on the seafloor. They may also be used during any or all of the surveys described above to support drilling operations. They will be conducted throughout the Project-life at any time of the year using vessels of opportunity associated with the Project.

2.2.1.7 Supply and Servicing

Offshore drilling and production activities are supported by various logistical activities, including existing onshore supply bases, offshore supply and support vessels, and helicopters.

A supply base provides temporary storage, re-fuelling, staging and loading of materials and supplies to support offshore drilling and production activities. Shore base facilities have operated on the island of Newfoundland since the 1970s when offshore exploration activity began. Shore base facilities are owned and operated by independent third-party service providers providing services to multiple clients, including ongoing oil and gas operations, and are subject to applicable regulatory requirements. These facilities operate with the required government permits and approvals and are certified as compliant port facilities under the *Marine Transportation Security Act*. Equinor Canada does not have care or control of operations or modification at these onshore supply bases. As this will be the fifth offshore development in NL, it is not anticipated that any significant construction or modifications would be required at contracted supply bases in support of the Project. Therefore, the supply base and associated activities are not considered within the scope of the Project. Equinor recognizes that should an EA be required under CEAA 2012, the scope of the Project will be set by the CEA Agency.

Offshore supply vessels will be engaged to support Project activities. Supply vessels will be contracted from third-party suppliers to provide support in transporting of equipment, supplies and personnel. Equinor Canada has yet to engage the services of support vessels for the Project. Supply vessels contracted for the Project will be required to have valid marine certification (i.e., certification of a supply vessel as a Passenger Vessel from Transport Canada) and meet regulatory requirements as set out by Canada and international organizations as well as meeting Equinor marine-vessel vetting requirements.

The following vessels are likely to be engaged during the Project life

- Offshore construction vessels
- Light intervention vessels
- IMR vessels
- Accommodation vessels
- Diving vessels
- Cable / pipe / flowline laying vessels
- Support/supply vessels
- Vessels for geotechnical, geophysical, seabed surveys, and/or environmental surveys
- 2D/3D/4D Seismic vessels
- Helicopter support
- Vessels for ROV/AUV surveys
- Ice management vessels
- Support/picket vessels for any of the above

Equinor Canada will not be establishing new fabrication or construction facilities for the Project; rather, it will engage, through a competitive procurement process, contractors to fabricate and/or procure the components of the Project. These services will be provided from third-party owned and operated existing fabrication and construction yards in either the province, Canada, or internationally. It is not anticipated that any significant construction or modifications would be required at any of the yards and facilities for the Project, or that substantively new types of

activities would be established at the yards and facilities. These facilities operate with the required government permits and approvals.

Equinor Canada will not have care and control of any potential modifications to, or the on-going broad operations of, fabrication yards and supply bases as they provide services for multiple customers. Therefore, the planned use of existing supply bases, fabrication facilities and their associated activities, are not considered to be within the scope of the Project. Equinor recognizes that should an EA be required under CEAA 2012, the scope of the Project will be set by the CEA Agency.

2.2.1.8 Decommissioning

The removal of the infrastructure, including plugging and securing of the wells, will be performed in accordance with the applicable rules and regulations in place at the time of abandonment. A detailed plan for the cessation activities will be developed at the time of decommissioning and will describe options for decommissioning.

Mandatory operational requirements for abandonment and decommissioning will be based on the C-NLOPB operational requirements as a minimum. In accordance with the Development Plan Guidelines (C-NLOPB 2009), the Development Plan Application is to include an overview of the decommissioning and abandonment program for the Project, including a description of measures to be undertaken to leave the site in a “fishable and navigable state”.

As a minimum, the process plant will be emptied and secured before removal of the production installation from the field. Pipelines will be shut down, cleaned and secured. Pipelines or subsea equipment that can represent a danger to future activities will be covered or removed from the seabed. Wells will be permanently abandoned as per Equinor and regulatory requirements.

Potential discharges and emissions associated with decommissioning are described in Section 2.4 below.

2.2.1.8.1 Well Decommissioning

Well suspension and abandonment will adhere to the requirements set out under the *Newfoundland Offshore Petroleum Drilling and Production Regulations* (SOR/2009-316), as promulgated under the Accord Acts. Suspension and abandonment involves the isolation of the well bore by placing cement and/or mechanical plugs at varying depths in the wellbore, thereby separating and isolating subsurface zones to prevent subsurface fluids from escaping. There may be instances when it is necessary to re-enter the wellbore. In such circumstances, the well would not be abandoned but suspended and the same safeguards, as for wellbore isolation would be implemented.

2.2.2 Potential Future Development Opportunities

Over the life of the Project, Equinor Canada may choose to undertake additional activities (e.g., development drilling, 2D, 3D/4D seismic) to search for and possibly develop economically recoverable reserves. These activities would be direct result of and/or caused by the operation of the production installation. Should additional economically and technically recoverable reserves be discovered within the Project Area, they could be processed on the production installation through the installation of additional subsea templates and flowlines (as described in Section 2.2.1.2). Between one and five subsea developments could be tied-back to the production installation, and may include the drilling of up to 20 additional wells. The number, timing and type of future development wells would depend on exploration results, reservoir properties / characteristics and the development strategy for any additional hydrocarbon reserves discovered. The timing of the drilling of up to 20 additional wells may occur at any time over the life of the Project. However, it is anticipated that this future development related drilling would most likely occur after approximately 10 years. Activities associated with potential future development would be the same as those described in Section 2.2.1. As described above the Core BdN Development has a field life of between 12-20 years. Should future development occur, the field life of the Project would be extended and maximum daily potential production rates would remain the same.

Tie-backs to the production installation may be feasible up to a distance of approximately 40 km from the installation location. Future development activities could therefore include development activities on Equinor Canada held lands within the Project area.

2.3 Project Schedule

As the Core BdN Development is in the early design phase, a detailed schedule of activities is not yet available. The following is an overview of the approximate timing of Project activities, and this preliminary schedule may change during Project design and construction.

The Core BdN Development is predicted to have a field life of 12-20 years. Project facilities (production installation, subsea equipment) are anticipated to have a design life up to 30 years, therefore the life of the Project is estimated to be 30 years. Offshore survey activities could begin as early as 2020.

Offshore construction and installation activities could commence as early as 2023, with hook-up and commissioning potentially occurring in 2024. First oil may be achieved by 2025. Decommissioning and abandonment would occur after field life. Project activities, as described herein, could occur at any time of the year.

Table 2.5 provides an overview of the estimated timeframe for each of the Project phases and associate activities, as defined by the Project scope, and Figure 2.10 provides a high-level schedule of proposed project activities.

Table 2.5 Anticipated Timing of Project Activities

Activities	Anticipated Timeframe
• Pre-installation surveys • Site preparation (if required) • Offshore construction / installation / hook-up and commissioning • Installation of subsea equipment • Installation of flowlines/pipelines insulation	• Commencing as early as 2020; offshore construction as early as 2023. • Activities would be carried out year-round.
• Drilling (including pre-drilling and/or development drilling)	• Commencement as early as 2023 • Drilling for Core BdN Development will occur year-round for approximately three to five years.
• Production/Operations/Maintenance	• Commencement anticipated in 2025 • Activities will be year-round and throughout life of Project (12-20 years for Core BdN Development).
• Geohazard surveys • Geotechnical surveys • Geological Surveys • Environmental Surveys • Seismic (2D/3D/4D)	• Activities could commence as early as 2020 and carried out year-round to end of Project
• Decommissioning	• Commencement at end of life of BdN field, activities could occur year-round until decommissioning is complete.
• Potential future development	• Any or all activities as described above, as required. • Activities may be carried out year-round depending on activity, to end of Project design life.

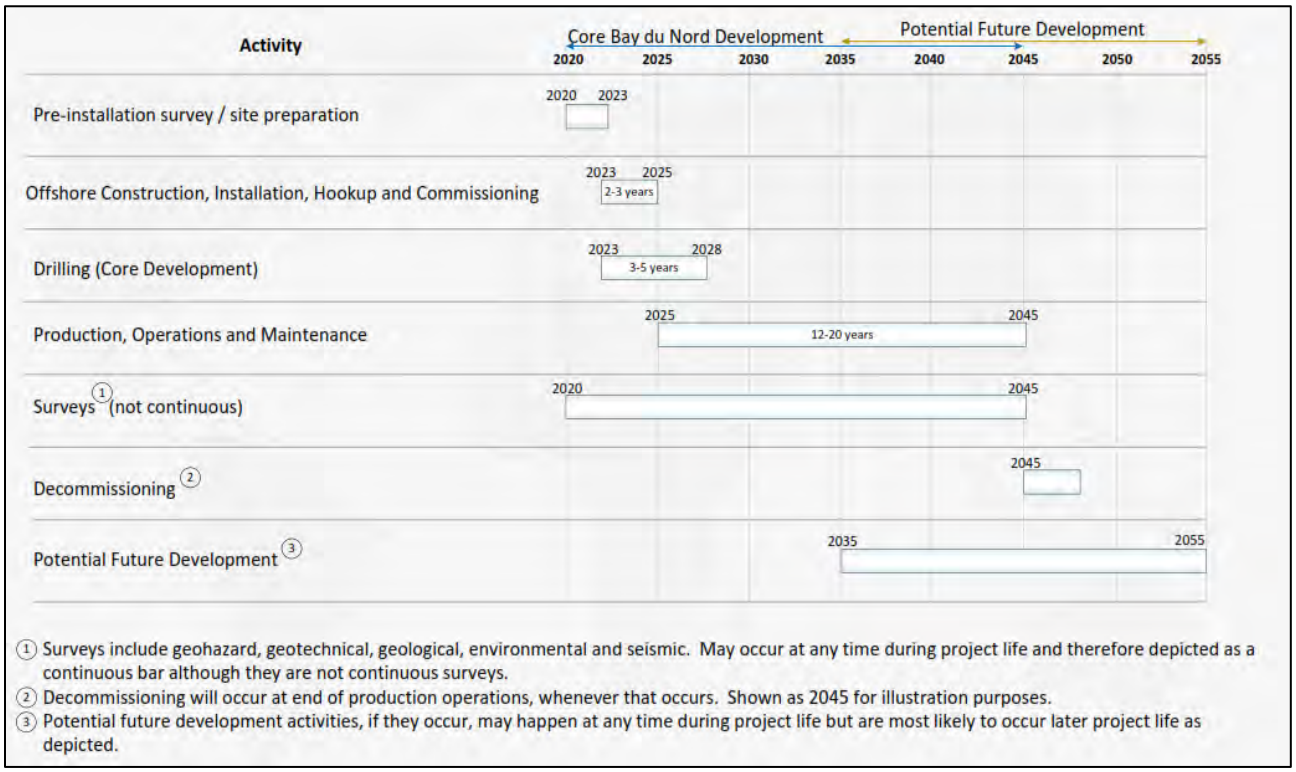


Figure 2.10 Preliminary Project Schedule

2.4 Discharges, Emissions and Waste and their Management

Potential environmental discharges that may be associated with the proposed Project include noise, light, atmospheric emissions, liquid discharges, drill cuttings discharges, and associated solid waste materials. The following sections provide a brief overview of these discharges, emissions and waste materials that may be generated during Project activities and how they will be managed.

2.4.1 Atmospheric Emissions

Atmospheric emissions during Project activities will include exhaust emissions from the production installation, drilling unit(s), vessels, and aircraft and emissions from occasional safety flaring during production activities and flaring during start up, production turn-around, and shutdown. These air emissions will include: carbon monoxide (CO), nitrogen oxides (NO_X), total particulate matter, volatile organic compounds (VOCs), sulphur dioxide, and greenhouse gases (GHGs). Specific emission types and volumes will depend on a variety of factors, including offshore installation and power generation design, types and numbers of support vessels, and timing and duration of activities. An estimate of, and analysis regarding, potential Project-related air emissions will be provided for in the EIS, as required. These air emissions will be in keeping with relevant regulatory requirements and standards, including the *Canadian Environmental Protection*

Act, National Ambient Air Quality Objectives and the Newfoundland and Labrador *Air Pollution Control Regulations* for specified criteria air contaminants, as well as relevant requirements under MARPOL.

It is estimated that there will be between 120,000 to 250,000 tonnes per year of carbon dioxide equivalent (CO_2e) emissions associated with the Core BdN Development, varying according to estimated production profile and uncertainties of estimates in this early planning phase. Annual CO_2e emissions from drilling are estimated to be between 70,000 to 85,000 tonnes. Total emissions from vessel traffic over the life of the field are estimated to be between 200,000 and 250,000 tonnes CO_2e. Assuming a Core BdN Development field life of between 12 and 20 years, total CO_2e emissions could be between 2.5 million and 4.5 million tonnes. The estimated annual emissions associated with the Core BdN Development would represent 1.2 to 2.4 percent of the total provincial reported GHG emissions for 2015 (10,300,000 tonnes CO_2e or 10.3 Mt CO_2e) and 0.01 to 0.03 percent of the total national emissions (722,000,000 tonnes CO_2e or 722 Mt CO_2e) (ECCC 2017).

2.4.2 Sound and Light Emissions

Sound emissions into the atmospheric environment associated with an offshore oil and gas development project include those associated with drilling, production, vessel and helicopter activities.

Artificial light emissions include installation and vessel lighting and flaring. Lighting will be kept to a minimum to the extent that it does not affect crew and vessel safety.

2.4.2.1 *Underwater Sound*

Underwater sound will be generated as a result of planned Project activities, which includes sound generated by the production installation (e.g., thrusters while station keeping, production activities), drilling units (station keeping and drilling activities) and vessel activity. Sound will also be generated during geophysical activities (VSP and/or 2D/3D/4D seismic surveys), and from supply and supporting vessels.

2.4.3 Drilling Wastes

Drilling muds are fluids which lubricate and cool the drill bit and hole, circulate cuttings and carry them back to the surface, and help maintain appropriate hydrostatic pressure in the well to overbalance formation pressure, providing the primary barrier for well control (BOP forms part of the secondary barrier). The initial “riserless” sections of the well bore are generally drilled using WBMs, the primary component of which is seawater, with other additives including bentonite (clay), barite, and potassium chloride. Other approved chemicals are also added as required to achieve and control the required mud properties. WBMs and WBM-associated drill cuttings are discharged at the seabed in accordance with the *Offshore Waste Treatment Guidelines* (NEB et al. 2010). Once the conductor and surface hole sections are completed and the riser and BOP are

installed, the deeper sections of the well bore are then typically drilled using SBMs, which are returned to the drilling unit via the riser. Once onboard the drilling unit, drilled (rock) cuttings are removed from the drilling mud in successive separation stages. The muds are reconditioned and reused, and spent SBM is returned to shore for disposal in an approved waste management facility. SBM-associated drill cuttings, treated in accordance with the *Offshore Waste Treatment Guidelines*, are discharged to the sea from the drilling unit. Total estimated volumes of cuttings that could be discharged, WBM and SBM cuttings combined, is estimated to range from 300 m^3 to 1,000 m^3 per well.

Cement constitutes a part of the well barrier envelope and is used during casing installation and plug and abandonment activities. For the initial riserless sections of the well, a spacer fluid is typically pumped ahead of the cement which is pumped down the drillstring and up the outside of the casing, with cement (and spacer fluid) returns to the seabed in riserless sections. For casing operations with the riser installed, cementing / drilling fluid interface is returned up the riser to the rig. For most casing cement jobs, the cement / spacer mud / mud interface will be left in the annulus; exceptions include lines and plugs, where cement may be circulated back to surface.

Drilled (hard) cement during the operation are discharged to seabed / sea when riserless. When drilling with the riser installed, drilled cement is processed by shakers and discharged overboard or captured in cutting skips and transported to shore.

Drilling associated with the Core BdN Development and, therefore, the generation of drilling waste, is expected to occur within the first three to five years as noted in Section 2.3. Drilling associated with any potential future development may occur at any time but is anticipated to most likely occur after 10 years up to the end of the Project.

2.4.4 Liquid Discharges

Liquid discharges generated by planned Project activities may include the following:

- Produced water
- Test fluids during commissioning and installation activities
- Cooling water (sea water to reduce temperature during processing)
- Bilge water (water that collects in the ships' bilge)
- Ballast water (water carried in ships' ballast tanks to improve stability and balance)
- Deck drainage (drains collect ocean and rainwater runoff)
- Gray and black water
- Fire water (seawater for firefighting purposes; tested intermittently)
- Well treatment fluids (required to maintain fluid properties in the well)
- Desalination brine (bi-product in the desalination of seawater for potable water)
- Discharges from subsea equipment (BOP, risers, flowlines, etc (intermittent discharges during testing of equipment)

The *Offshore Waste Treatment Guidelines* set performance standards for many of these discharges, and in some cases required sampling and analysis prior to ocean discharge. Liquid discharges that do not meet the standards set out in the *Offshore Waste Treatment Guidelines* for ocean disposal are transported back to shore for disposal at a licenced waste management

facility. The EIS, if required, will provide a description and estimate of volumes of these liquid discharges. Produced water discharges would account for the greatest volume of all liquid discharges. The volumes of other liquid discharges, as identified above, are likely to be minor in comparison.

The selection and use of chemicals used in drilling and production operations that may be discharged to the marine environment will be screened and selected for use in accordance with Equinor's chemical management system, which follows the requirements of the *Offshore Chemical Selection Guidelines for Drilling and Production Activities on Frontier Lands* (NEB et al., 2009). The Guidelines provide a procedure and criteria for offshore chemical selection. Its objective is to promote the selection of lower toxicity chemicals to reduce the potential environmental effects of a discharge where technically feasible.

Produced water discharge rates are expected to be very low in the initial stages of production and increase over time to an estimated peak rate in the range of approximately 30,000 m^3/d to 50,000 m^3/d. Other discharges are anticipated to generally remain at a steady rate throughout the Project life. The volumes of other liquid discharges (e.g., grey water, ballast water, bilge, drains, etc.) are not known at this stage of Project planning. The EIS will provide additional information on produced water and other liquid discharges, as required.

2.4.5 Hazardous and Non-Hazardous Solid Wastes

Hazardous and non-hazardous wastes will be generated during Project activities. Equinor is committed to the establishment of safe and environmentally responsible procedures for the generation, storage, handling, transportation, treatment and disposal of all waste materials generated during the Project.

Hazardous wastes may include oily waste (filters, rags, waste oil), waste chemicals and containers, batteries, biomedical waste, waste dangerous goods, and naturally occurring radioactive material. These wastes will be stored in designated areas in appropriate containers/containment for transport to shore in compliance with the *Transportation of Dangerous Goods Act* and its regulations. Non-hazardous wastes, including domestic waste, scrap metal, recyclables, and other miscellaneous non-hazardous wastes, will be stored in appropriate containers onboard and transported to shore. Once onshore, a third-party contractor will collect and dispose of the hazardous and/or non-hazardous wastes at an approved facility and in compliance with any federal and provincial regulations and requirements.

Waste food will be macerated to maximum particle size, and discharged overboard in accordance with the *Offshore Waste Treatment Guidelines*.

Vessels used to support Project activities will adhere to Canadian and international (*International Convention for the Prevention of Pollution from Ships* (MARPOL 73/78)) requirements, as appropriate for the handling and disposal of vessel waste material.

A waste management plan will be developed that outlines waste handling, storage and discharge criteria for the Project.

2.5 Potential Accidental Events

Equinor maintains a strong commitment to safe, secure and sustainable operations. Central to this commitment is a corporate Safety and Sustainability Management System. Equinor developed a management system to capitalize on the collective knowledge and best practice gained over many years. The Management System contains the information needed to set on the right path when performing work. It is also how safe, secure and sustainable activities are ensured and risks are effectively managed. Equinor's emergency response philosophy is to reduce the impact of an emergency on people, environment, and the integrity of Equinor, contractor, and third-party assets.

Equinor's objective in all its activities is to ensure safe and efficient operation. During drilling and production operations, control measures will be in place to prevent incidents from occurring. Potential accidental events that may occur during drilling and production activities include vessel collisions, loss of well control (e.g., blowout), batch spills (e.g., crude, diesel, SBM fluids), dropped objects, and other non-routine spills or releases from the drilling and production installations, subsea infrastructure and/or support vessels.

The EIS, if required, will include spill modelling of batch spills and loss of well control events to assess the risk of adverse environmental effects that may occur as a result of these accidental events. An overview of Equinor's emergency response plans, including spill prevention, preparedness and response measures, will be provided in any such EIS.

3 Environmental Setting

The following sections provide a brief description of the existing environmental setting that overlaps and may interact with the Project, including relevant components of the physical (geology, climate, oceanography, ice), biological (fish and fish habitat, marine and migratory birds, marine mammals, sea turtles) and human (fisheries, other human activities) environments that characterize the Project Area and surrounding region.

3.1 Previous Studies and Available Information: Eastern Newfoundland Offshore Area

Offshore oil and gas exploration and development activities have been occurring off Newfoundland and Labrador for several decades. Portions of the Canada-NL Offshore Area, including the Project Area, have been subject to previous environmental studies and assessments that are relevant to the Project and any EIS that may be required for it. The EAs and monitoring studies that have been carried out for offshore oil and gas activities provide important and valuable sources of information on the existing environmental setting in the region, as well as the potential environmental issues and interactions that may be associated with these activities. Furthermore, the potential effects and mitigation measures for the offshore are well known as a result of Equinor's global offshore expertise and previous assessments and monitoring in the NL Offshore.

Of particular relevance to this Project and its EA review, is the Strategic Environmental Assessment (SEA) for the Eastern Newfoundland Offshore Area (Amec 2014), completed by the C-NLOPB in 2014. The SEA presented regional environmental baseline information (physical, biological and socioeconomic) for offshore eastern NL and provided an overview of potential environmental issues, mitigation and planning approaches as input to future exploration licencing decisions by the C-NLOPB in this area. In addition, in late 2017 Equinor Canada prepared and submitted an EIS for exploration drilling, entitled the "Environmental Impact Statement for Flemish Pass Exploration Drilling Program" (Statoil 2017a) (the Drilling EIS). The Drilling EIS builds on the baseline information provided in the above referenced SEA and provides an analysis of potential effects from drilling in the Flemish Pass area. The core BdN Project is within the Drilling EIS defined project area. Together, these documents are key sources of regional environmental information for the BdN EIS.

Other project-specific EAs that have been completed or are ongoing within the vicinity of the Project include, but are not limited to:

- Flemish Pass Exploration Drilling Project (2018-2028) Environmental Impact Statement (Nexen Energy ULC, 2018)
- Eastern Newfoundland Offshore Exploration Drilling Project Environmental Impact Statement (ExxonMobil Canada Ltd. 2017)
- Suncor Energy's Eastern Newfoundland Offshore Area 2D / 3D / 4D Seismic Program, 2014-2024 (Suncor Energy 2013)

- Environmental Assessment East Canada CSEM Survey, 2014-2018 (LGL Limited 2014)
- White Rose Extension Project Environmental Assessment (Husky 2012)
- Environmental Assessment of Statoil's Geophysical Program for Jeanne d'Arc and Central Ridge / Flemish Pass Basins, 2011-2019 (LGL Limited 2011)
- Hebron Project Comprehensive Study Report (ExxonMobil Canada Properties 2011)
- Flemish Pass Drilling Environmental Assessment (Jacques Whitford Environment Limited 2002b)

Environmental effects monitoring (EEM) studies for existing development projects offshore NL have been ongoing since 1998. These data and results of these studies provide information regarding effects of development projects and will be useful reference the EIS, should one be required. Where data is available, the following EEM program reports will be incorporated into the EIS:

- Hibernia Production Phase Environmental Effects Monitoring Program (1998 to 2014)
- Terra Nova Environmental Effects Monitoring Program (2001 to 2014)
- White Rose Environmental Effects Monitoring Program (2004-2014)

Since 2008 Equinor Canada collected biological, physical sediment, meteorological, and oceanographic data during its drilling and seismic / geotechnical surveys in the Project and surrounding areas. Subject to approval from its licence partners, Equinor will include these data in the EIS. Such data may include the following:

- seabird and marine mammal observations
- side scan sonar data (seafloor mapping)
- core samples provide sediment grain size and sediment distribution
- ROV video data at well locations (visual data of seafloor regarding presence/absence of some benthic organisms and corals)
- met-ocean data

As indicated in Section 3.3.1 (below), Equinor Canada will be undertaking a seabed survey in the Core BdN Development Area in the summer of 2018. Coral and sponge mapping will be undertaken to provide information on the location of coral and sponge biota in this area. The existing information, as summarized above, combined with the 2018 survey data, provide a useful and informative description and understanding of the existing environmental in the Project Area and surrounding areas. The existing and available information provides a sound base of environmental baseline information for the Project Area for EA purposes. The information from the above reports, other relevant studies and the coral and sponge data to be collected provide sufficient data to characterize the existing environment in the Project and Study Areas and assess potential environmental effects associated with Project activities.

Equinor recognizes that should an EA be required under CEAA 2012, the scope of the Project and its EA, including any associated information requirements, will be set by the CEA Agency through the EIS Guidelines.

3.2 Physical Environment

3.2.1 Geology

The geology of the marine area off eastern Newfoundland is complex and dynamic. The current bedrock and surficial characteristics of the Project Area and surrounding regions have been shaped by various factors and processes over time. Located on the eastern continental shelf, this area was formed by extension during the breakup of Pangea and the opening of the Atlantic Ocean during the Late Triassic to early Tertiary and is underlain by pre-rift basement rocks (Fader et al 1989). Rifting, combined with salt tectonics in the area, created a complex series of Mesozoic rift basins that are separated by basement highs along the central to outer shelf. The resulting combination of stratigraphy, structure and timing have been conducive to hydrocarbon generation and entrapment (Bell and Campbell 1990). The main sedimentary basins off eastern Newfoundland include the Orphan, Flemish Pass, Jeanne d'Arc and Carson Basin (Fader et al 1989). The primary reservoirs are located in the shallow marine and fluvial sandstones deposited during the Late Jurassic and Early Cretaceous periods of the Mesozoic Era. The Late Jurassic Egret member of the Rankin Formation is a world-class source rock that is recognized as the primary source of the oil and gas discovered in the Jeanne d'Arc Basin, which is the only basin off eastern Newfoundland containing presently developed producing oil fields. This rock type has also proven to be widespread in the Flemish Pass Basin (G&G 2003).

The surficial geology of the region is highly variable, but generally in deeper water, such as the slope of the Flemish Pass, the seabed generally consists of Holocene silty mud. On parts of the floor of the Flemish Pass, winnowed sands are present (Murillo et al 2016a). The coarser-grained sediments are found through the centre and western side of the Flemish Pass while the finer-grained sediments are concentrated predominately on the eastern side of the Pass, including the terrace (Marshall et al. 2014). Quaternary sediments in the Flemish Pass include turbidite sands and muds and proglacial muds derived from the Grand Banks of Newfoundland, ice-rafted and proglacial plume deposits transported southward in the Labrador Current, and debris-flow deposits. These have been described as follows by Piper and Campbell (2005). In the northern Flemish Pass, deposits up to 120 m thick have been recognized and are interpreted as debris-flow deposits that are thought to be derived from sediment failures that have left scarps both on the southeast side of Sackville Spur and on the north-west side of the Flemish Cap. Sediments recovered from this area are generally lean silt to lean clay and are considered to be consolidated. The western slopes of the Flemish Pass are comprised mainly of muds with some coarse-grained ice-rafted detritus. Interbedded sandy turbidites are most abundant between 2 and 3.5 metres below sea floor. On the floor of the central part of the Flemish Pass, successions of silty muds with ice-rafted detritus, thin sand and mud turbidites overlie thick bedded sand turbidites. On the eastern slopes of the Flemish Pass, sediment consists primarily of mud with sparse ice-rafted detritus.

Canada's eastern continental margin is tectonically passive and seismicity is relatively quiet throughout much of the region. Natural Resources Canada (NRCan 2018a) estimates that approximately 450 earthquakes occur each year in Eastern Canada, with seismicity generally occurring randomly along the Grand Banks margin (NRCan 2018a, 2018b). The most recent

edition of the Seismic Hazard Map prepared by NRCan (2018b) indicates that the Project Area has been classified as having a relatively low seismic hazard. According to the National Earthquake Database (NRCan 2018c) there have been no seismic events recorded within the boundaries of the Project Area during the 1985-2018 period.

3.2.2 Bathymetry

The bathymetry of the Project Area and surrounding regions is generally well known (Figure 3.1). The Project Area is located over the Sackville Spur, northern portion of the Flemish Pass and Nose of the Grand Banks with depths in the central portion of the Project Area of about 1,100 m. The Sackville Spur extends the nose of the Grand Banks (to the southwest) where depths are about 500 m or less out to 1,000 m to the northeast.

3.2.3 Climatology

Available climatological information for the Project Area (as summarized in Statoil 2017a) indicate that the prevailing winds over this region are from the southwest to northwest (most frequently from the west) in winter and from the south through west (most frequently from the southwest) in summer. Mean hourly wind speeds range from about 7 m/s in summer to 12 m/s in winter. Maximum hourly wind speeds (at 10 m elevation) of 31 m/s (60 knots) can be expected in winter; a maximum wind speed of 38.6 m/s was measured in April 2015 at a Bay du Nord drilling location (107 m elevation) (Statoil 2017a). For the Core BdN Development area, 100-year extreme 1-h, 10 m elevation wind speed estimates are 39 m/s with 10-min values of 45.5 m/s (Statoil 2017b). Air temperatures in the region are coolest in February (minimum values of about -12°C) and warmest in August (maximum values of about 20°C).

Over the Project Area, regional observations indicate rain or drizzle are the most frequent type of precipitation occurring about 10 percent of the time annually (slightly higher from October through December). Snow occurs up to 15 percent of the time in winter. Mixed rain and snow, freezing rain, and hail, occur far less frequently. The monthly frequency of rain events is lowest in July and August. The snow occurrence frequency is at its peak in January and February. Maximum rain frequency occurs in October and November. Freezing rain and drizzle are relatively infrequent, occurring less than one percent of the time in any given month. There is a year-round potential for thunderstorms and hail, with the highest frequency of occurrence occurring in July (Statoil 2017a).

The Project Area has a high occurrence of marine fog, with visibility being poor (500 m to 1 km) or very poor (less than 500 m) 20 percent of the time annually. These conditions are most prevalent in summer with very poor visibility occurring 25 percent in June, 40 percent in July and 31 percent in August. Conditions are good (greater than 10 km) 61 percent of the time annually, with the best visibility occurring during winter when fair or good visibility occurs about 90 percent of the time.

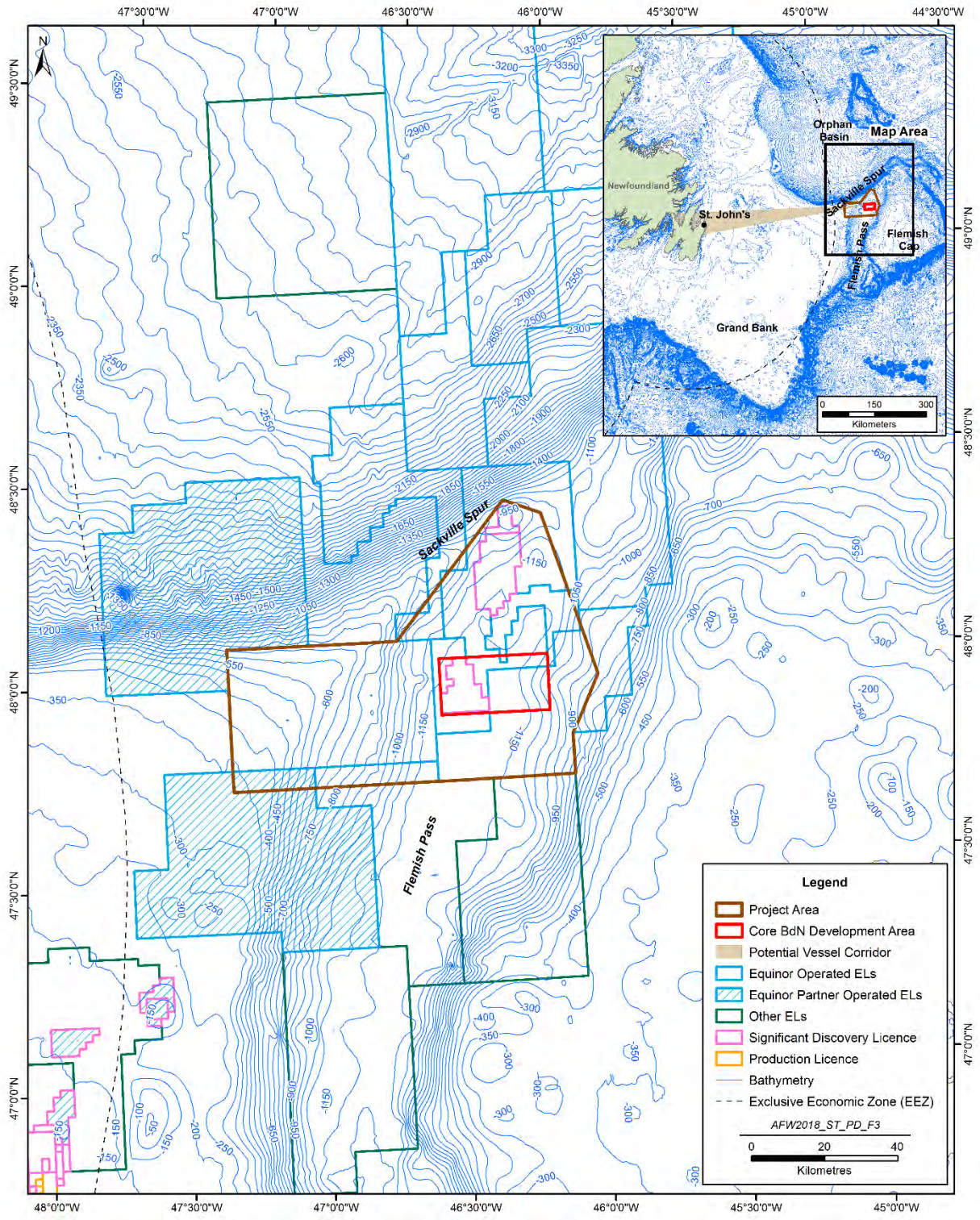


Figure 3.1 Bathymetry

3.2.4 Oceanography

A good, general indication of the wave climate over the Project Area is provided by the MSC50 (wind and wave) hindcast. Mean significant wave heights over the Project Area are expected to be on the order of 2 m in summer and 4.5 m in winter, with maximum significant wave heights of about 15 m in February and 7 m in June. The largest waves are from the southwest through northwest. Maximum significant wave heights measured during a 10-month 2014-2015 monitoring program in the region were 12.6 m (Statoil 2017a). For the Core BdN Development Area, 100-year extreme significant wave height estimates are 15.5 m (Statoil 2017a).

The cold Labrador Current dominates the general circulation of water off eastern Newfoundland. This current includes both an inshore branch that flows along the coast on the continental shelf and an offshore branch that flows along the outer edge of the Grand Banks, over the upper Continental Slope at depth, and through the relatively deep Flemish Pass. Near the Project Area, in the vicinity of the Flemish Pass, the Labrador Current divides into two near the Sackville Spur, with the main branch flowing southwards as slope water current and a side branch flowing clockwise around the Flemish Cap. The cores of the currents are located at an average depth of 100 m (Statoil 2017a). Mean current speeds typically range between about 5 and 20 cm/s, with maximum current speeds typically between about 30 and 70 cm/s, with maximum speeds up to about 100 cm/s. Average sea surface temperatures generally range from about 1.6°C in March to about 5°C in August and October (Statoil 2017a).

3.2.5 Ice Conditions

The Project Area is, like the rest of the marine environment off eastern Newfoundland, subject to seasonal intrusions of sea ice and icebergs, as well as vessel icing during particular meteorological conditions. Ice conditions may vary considerably each year and by location and are affected by both winds and temperatures. Icebergs are present offshore eastern Newfoundland traditionally from about January through August with occasional sightings into the fall. Over the Project Area, icebergs have been observed primarily from March through July (Statoil 2017a). Iceberg occurrence to the northeast is much less frequent. Based on iceberg-size observations in the region, approximately 18 percent growlers or bergy bits (length less than 15 m), 70 percent small or medium (15 to 100 m length), 11 percent large (length 100-200 m), and 1 percent very large (length greater than 200 m) (Statoil 2017a) may be expected in the Project Area. The estimated average iceberg drift speed is 0.43 m/s (Statoil 2017b).

Sea ice may be present in the Project Area between January and April with a much greater likelihood of occurrence in the western and southern portions, and conversely a lower likelihood in the northeast. Over the southwestern region near the Project Area the sea ice might be expected about every three years, twice as frequent as more northern or eastern regions. During January and the first half of February ice will be new and grey-white first year ice with thicknesses up to 30 cm. For the remainder of February and March thin and medium first year ice might be expected with thicknesses up to 120 cm. Greater thicknesses might be encountered during April (Statoil 2017a). Ice concentrations of 4 to 8/10 cover can be routinely expected. With the retreat of sea ice

over the entire Eastern Newfoundland offshore, conditions are likely to be ice free by the beginning of May (CIS 2011). The presence of icebergs in sea ice is estimated at approximately 67 percent when sea ice is present at Bay du Nord location (C-CORE 2017).

3.3 Biological Environment

Existing conditions in and near the Project Area for marine fish and fish habitat, marine and migratory birds, and marine mammals and sea turtles are summarized below. A list of species that are likely to occur, or may occur, in or near the Project Area is presented in Appendix A.

3.3.1 Marine Fish and Fish Habitat

Marine ecosystems are comprised of biological and physical elements that interact to form complex and variable patterns across a seascape. Biological ecosystem elements span primary producers such as phytoplankton to consumers such as zooplankton, invertebrates and fish. The Eastern Newfoundland SEA (Amec 2014) provides a detailed overview of marine fish and fish habitats that are known or considered likely to occur within the Project Area and surrounding environments, including plankton, benthos, deep-water corals and sponges, and fish (invertebrates and finfish), based on relevant, existing information and datasets.

The Project Area and surrounding areas are known to be inhabited by a variety of marine biota, within which the presence, abundance and distribution of specific fish species varies considerably based on habitat characteristics (both abiotic and biotic) and variability across this marine environment, which includes parts of the Flemish Pass and adjacent slope habitats (Figure 3.2). Within these areas and in the larger surrounding region and its associated habitat types, a variety of fish species and assemblages occur with “shallow water” groups (e.g., American plaice, witch flounder, Atlantic cod, redfish and wolffish) giving way to “slope” assemblages (e.g., Greenland halibut, roughhead grenadier, wolffish) and finally to “deep slope-abyssal assemblages” (e.g., Greenland halibut, grenadiers, blue hake, dogfish) (Amec 2014; Nogueira et al 2016). A list of marine fish species that do or may occur in the Project Area is provided in Appendix A. Within such depth zones, habitat complexity can also be a determining factor of species presence and prevalence. In addition to fish species that are resident in the Project Area, there are species that may pass through the region during feeding or spawning migrations (e.g., American eel, Atlantic salmon, tuna, swordfish).

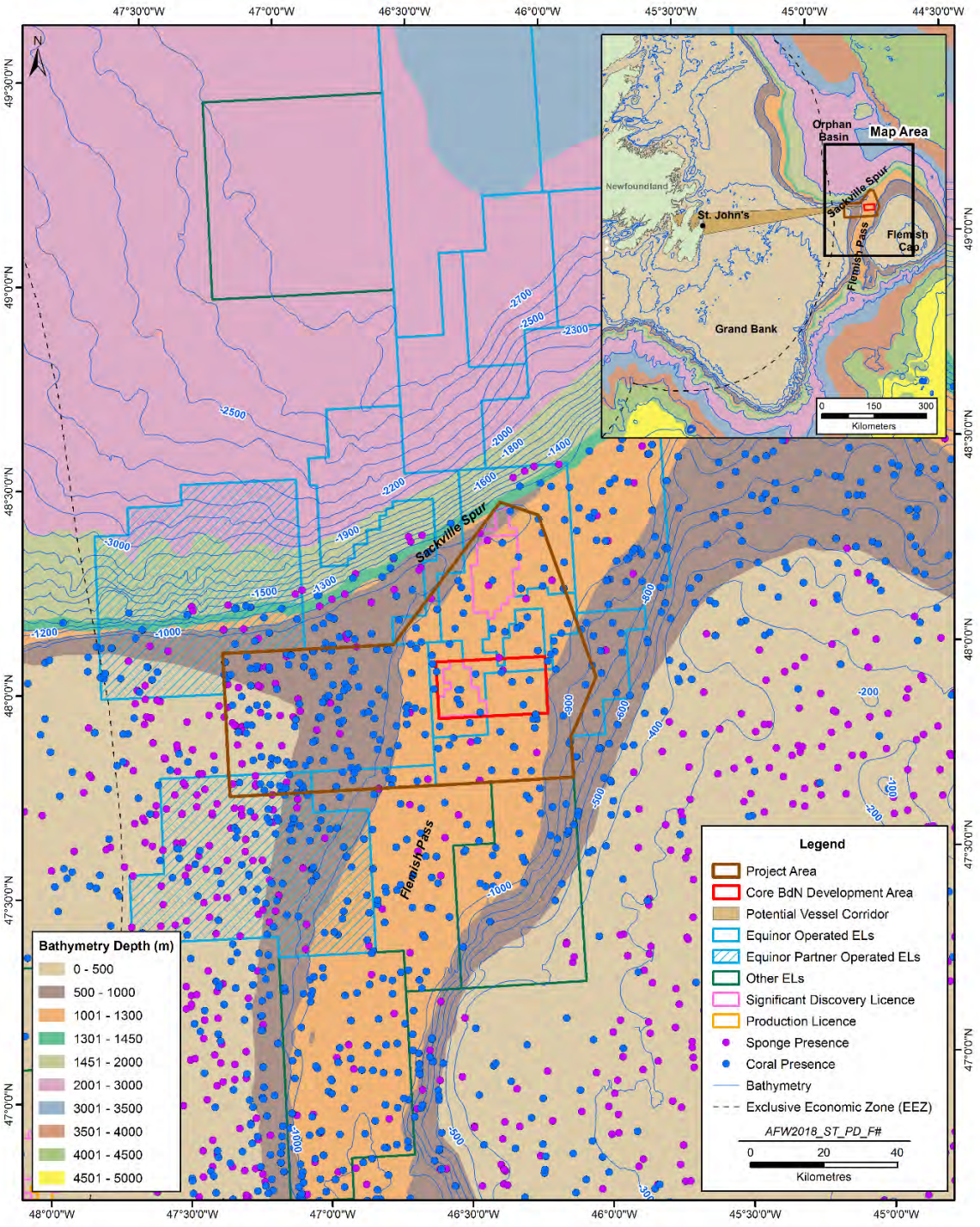


Figure 3.2 Primary Water Depth Zones of the Project Area and Surrounding Marine Environments and Corals / Sponge Distributions Based on Existing Datasets

Benthic community structure in the Flemish Pass and Flemish Cap have been surveyed through commercial bycatch logs and North Atlantic Fisheries Organization (NAFO) scientific trawling (Murillo et al 2012, 2016a, 2016b; Vàzquez et al 2013) and NEREIDA research survey program camera stations and scientific trawling (Barrio Frojàn et al 2012; Beazley et al 2013 Beazley and Kenchington 2015). Murillo et al (2016a) also modelled the substrate based on available box corer sediment sampling data from the area. The Flemish Cap is predominantly covered in sand and silty-sand with areas of gravel, becoming increasingly covered in silty-sand along the slopes (200-500 m). In deeper areas (500-2,000 m) of the Flemish Pass and Cap, the substrate is increasingly clay-silt or mud at greater depths (Murillo et al 2012; 2016a). Epifaunal communities of the Flemish Pass at sampling stations south of the Project Area were characterized by Beazley and Kenchington (2015) who identified 527 species from 400-1,400 m depths. Sponges and cnidarians represented the highest number of taxa followed by arthropods echinoderms, and molluscs. The highest diversity of benthic species on the adjacent Flemish Cap was observed between 500-1,000 m depths with corals and sponges as the most dominant trawl captured taxa followed by echinoderms, arthropods, and molluscs (Vàzquez et al 2013; Murillo et al 2016a).

Deep-sea corals and sponges are often of particular environmental interest due to the habitat-forming capacity aspects of these benthic invertebrates and their relative sensitivity to anthropogenic stressors. Bottom trawling and video surveys have identified over 50 species of corals and sea pens along the shelf of the Flemish Pass, Flemish Cap and northeast slope of the Grand Banks (Wareham 2009; Murillo et al 2011; Beazley et al 2013, Vázquez et al 2013; Baillon et al 2014a, 2014b; Beazley and Kenchington 2015). Modelling of coral distributions against environmental parameters indicated the association of coral species to specific depth ranges, particularly on shelf slopes (Guijarro et al 2016). Coral biomass is mainly distributed along the slopes of the Flemish Pass and Flemish Cap with fewer observations on the adjacent Grand Bank Shelf and on top of the Flemish Cap (Murillo et al 2011). In the Project Area, sea pens are the most well distributed corals between 900-1,200 m depths with moderate biomass (up to 0.517 kg / ha) (Murillo et al 2011). The most commonly observed sea pen species included *Anthoptilum grandiflorum*, *Funiculina quadrangularis*, *Pennatula aculeata*, and *Halipteris finmarchica* (Murillo et al 2011). Soft corals were also commonly observed with moderate biomass (up to 0.583 kg / ha) in the Project Area, but mainly on the slopes of the Grand Bank between 600-900 m depth (Murillo et al 2011). The most commonly observed soft corals included *Duva florida* and *Anthomastus* spp. (Murillo et al 2011). Other coral groups including cup corals, black wire corals and gorgonian corals have also been found to be present in and around the Project Area, but with a lower distribution or biomass (Murillo et al 2011).

Several dozen species of sponges have also been observed in and around the Project Area (Murillo et al 2012, 2016b; Beazley et al 2013; Knudby et al 2013; Beazley and Kenchington 2015). Of the identified species, many have wide depth ranges of 100-1,500 m indicating they can occupy slope and shelf areas in the region. Sponge surveys by Murillo et al (2012), for example, indicated that areas of high sponge biomass (>15 kg/ha) were located on the Flemish Cap, Flemish Pass and eastern slope of the Grand Banks. North of the Project Area, there are areas of high sponge presence on the north slope of the Flemish Cap and in the Sackville Spur area in relatively deep waters (1,000-1,500 m) (Murillo et al 2012; Beazley et al 2013). Areas of high sponge biomass have been associated with bottom salinity, depth, bottom temperature, and

bottom current speed (Knudby et al 2013). Within the Flemish Pass, in the Project Area, there is an identified sponge ground associated with a combination of silt, sand, and clay bottoms and large Astrophorid sponges (Murillo et al 2012, 2016; Knudby et al 2013). Astrophorid sponges, including *Geodia barretti*, *G. macandrewii*, and *G. phlegraei* were the most commonly observed species in trawl surveys in the Flemish Cap, Flemish Pass, and Tail of the Grand Banks (Murillo et al 2012).

Overall, a variety of available sources provide relevant and useful information related to marine fish and fish habitat in and around the Project Area and other portions of the marine environment off eastern Newfoundland. These include published and unpublished reports, available datasets and other sources, that were reviewed and are summarized in the SEA completed for this region (Amec 2014). Descriptions of the marine environment in the Project Area includes information and mapping describing the presence, distribution and abundance of fish species in the area from the recent Fisheries and Oceans Canada (DFO) Research Vessel (RV) surveys that cover part of the Project Area, as well as NAFO RV surveys that cover the Flemish Cap and Flemish Pass (Murua and de Cardenas 2005; Nogueira et al 2016, 2017, 2018; Murillo et al 2016a; Román et al 2017a, 2017b), and other literature that describes marine fish and habitats in other areas (often on a species-specific basis).

Regional information is also available on plankton (e.g., Dalley and Anderson 1998; Maillet et al 2004; Head and Sameoto 2007; Bradbury et al 2008). As discussed above, a variety of studies characterize invertebrate assemblages within and adjacent to the Project Area (Barrio Froján et al 2012, 2015; Beazley et al 2013; Altunai et al 2013; Beazley and Kenchington 2015; Murillo et al 2016a) through seabed sampling and video surveys. Environmental surveys, predictive habitat modelling and other analysis related to the presence and distribution of corals, sea pens and sponges have also been completed and are reported in the available literature (e.g., Edinger et al 2007; Wareham and Edinger 2007; WGEAFM 2008; Gilkinson and Edinger 2009; DFO 2010; Murillo et al 2011, 2012, 2016a, 2016b; NAFO 2011; Baker et al 2012; Beazley et al 2013; Knudby et al 2013; Guijarro et al 2016; Kenchington et al 2017). To augment existing information, Equinor Canada will be carrying out a coral and sponge survey of the Core BdN Development area during the summer of 2018. These surveys will characterize likely species and/or abundance and will be used in the design of the subsea infrastructure locations.

3.3.2 Marine and Migratory Birds

A variety of avifauna species occur within the Project Area and in adjacent marine and coastal regions, including seabirds and other marine-associated birds that inhabit the region at particular or extended periods for breeding, feeding, migration and other activities. A list of marine bird species that do or may occur in the Project Area is provided in Appendix A. A number of important habitats for birds have also been identified at locations along the coastline of eastern Newfoundland, well outside of the proposed Project Area.

As key components and indicators of ecosystem health, seabirds are often considered to be of high intrinsic ecological importance. Further, they are of socioeconomic importance in Newfoundland and Labrador both in terms of tourism and as a food source. Generally speaking,

seabirds are long-lived species with low fecundity, delayed recruitment and relatively low rates of population growth. A diverse assemblage of seabirds can be found in the marine waters off eastern Newfoundland at all times of year, including gannets, phalaropes, large gulls, kittiwakes, terns, alcids (auks), jaegers and skuas, fulmars, petrels and shearwaters (Amec 2014; Appendix A). The nutrient-rich Grand Banks and Flemish Cap regions off eastern Newfoundland serve as a major feeding area for dozens of marine bird species throughout the year, particularly during the summer months. Many seabird groups such as cormorants and terns tend to have a more coastal distribution, and would therefore seldom occur in the offshore waters of the Project Area. Similarly, waterfowl occur in large numbers in marine habitats off eastern Newfoundland, especially during the winter months, but they prefer open water in coastal areas and are thus not likely to frequent the offshore environments that characterize the Project Area itself (Amec 2014).

The eastern coast of Newfoundland is home to several major colonies supporting tens of millions of seabirds, which travel long distances offshore from their nest sites to forage for themselves and their chicks. The region also contains several designated Important Bird Areas (IBAs) which provide important habitat for nationally and/or globally significant numbers of birds and/or for avian species at risk, and there are various other sites of provincial and regional significance to birds. Although none of these areas or sites occurs within or near the Project Area itself, some of the bird species that make use of these designated habitats may spend some of their time in the Project Area.

A variety of existing information sources are available related to the characteristics, presence and distribution of marine / migratory birds within and around the proposed Project Area. The Eastern Newfoundland SEA (Amec 2014), for example, includes a detailed overview of the presence, life histories, and spatial and temporal distributions of marine avifauna within and around the region. Other existing and available sources such as the current Eastern Canadian Seabirds at Sea (ECSAS) dataset, records from the Atlantic Canada Shorebird Survey (ACSS), operator collected bird observational data, and other available literature and datasets provide additional information and insights on key species, times and locations for use in the EIS should one be required.

3.3.3 Marine Mammals and Sea Turtles

The waters off eastern Newfoundland support a diverse assemblage of marine fauna that includes some 20 marine mammals and several sea turtle species, many of which are considered to be at risk or otherwise of special conservation concern (see Section 3.3.4 below). The Eastern Newfoundland SEA (Amec 2014) summarizes the distribution and abundance of marine mammals and sea turtles in the region, and describes these species' relevant life history characteristics. The existing and available information indicates that marine mammal species that are known or considered likely to occur within the Eastern Newfoundland Offshore Area include a number of mysticetes (baleen whales), odontocetes (toothed whales and porpoises) and pinnipeds (seals). In addition, two sea turtle species have been regularly observed off eastern Newfoundland. A list of marine mammal and sea turtle species that do or may occur in the Project Area is provided in Appendix A.

These marine mammal and sea turtle species differ considerably in their likelihood of presence and in the particular locations and habitat types that they utilize and the times at which they occur in or pass through the region. Key feeding grounds such as the Grand Banks are of particular importance to marine mammals and turtles, and several Ecologically and Biologically Significant Areas (EBSAs) have been identified due in part to their known importance to a number of marine mammal species (Templeman 2007). Given that a number of these species have been designated as species at risk under Canadian legislation or are otherwise considered to be of conservation concern, they are typically a key consideration in the EA review process for projects and activities off eastern Newfoundland.

There are a number of existing and available information sources that provide information on the characteristics, presence and spatial and temporal distribution of marine mammals, sea turtles and seabirds in and around the Project Area. These are summarized in the Eastern Newfoundland SEA (Amec 2014), and include, for example, the current DFO marine mammals sightings database, data from the Ocean Biogeographic Information System (OBIS) (which incorporates data from a variety of sources across several decades), other available literature and available (published) marine mammals sightings data collected by operators working in the area.

3.3.4 Species at Risk

The Canadian *Species at Risk Act* (SARA) provides for the protection of species at the national level to prevent extinction and extirpation, facilitate the recovery of endangered and threatened species, and to promote the management of other species to prevent them from becoming at risk in the future. Designations under the Act follow the recommendations and advice provided by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

There are currently a number of schedules associated with the SARA. Species that have formal protection are listed on Schedule 1, which includes the following potential designations:

- *Extirpated*: A species that no longer exists in the wild in Canada, but exists elsewhere
- *Endangered*: A species that is facing imminent extirpation or extinction
- *Threatened*: A species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction
- *Special Concern*: A species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Schedule 1 of SARA is the official federal list of species at risk in Canada. Once a species is listed, measures to protect and recover a listed species are established and implemented, including the development of a Recovery Strategy. Action Plans summarize the activities required to meet recovery strategy objectives and goals, and Management Plans set goals and objectives for maintaining sustainable population levels of one or more species that are particularly sensitive to environmental factors.

At the provincial level, the Newfoundland and Labrador *Endangered Species Act* (NL ESA) provides protection for indigenous species, sub-species and populations considered to be endangered, threatened, or vulnerable within the province. These potential designations under the

legislation are defined as follows:

- *Endangered*: A species that is facing imminent extirpation or extinction
- *Threatened*: A species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction
- *Vulnerable*: A species that has characteristics which make it particularly sensitive to human activities or natural events.

Designations are based on recommendations from COSEWIC and/or the provincial Species Status Advisory Committee (SSAC). Habitat that is important to the recovery and survival of endangered or threatened species can also be designated as critical habitat or recovery habitat, and protected under the NL ESA.

Table 3.1 provides a listing of identified species at risk and species of conservation concern that are known or considered likely to occur offshore eastern Newfoundland and indicates their current designations under applicable legislation and/or by COSEWIC. There is currently no designated critical habitat for any of these species in or near the Project Area.

Comprehensive and up to date information on the protection and current designations of these species at risk and any associated Recovery Strategies, Action Plans and Management Plans (including any identified and designated critical habitat that may be identified in the future) is available from the relevant sources and will be included in any required EIS for this Project.

Table 3.1 Species at Risk or Otherwise of Special Conservation Concern (Current Designations) that May Occur in the Project Area

Family	Species		Federal		NL ESA
	Common Name	Scientific Name	SARA Status (Schedule 1)	COSEWIC Designation	
MARINE FISH					
Anarhichadidae	Atlantic wolffish	*Anarhichas lupus*	Special Concern	Special Concern	
Anarhichadidae	Northern wolffish	*Anarhichas denticulatus*	Threatened	Threatened	
Anarhichadidae	Spotted wolffish	*Anarhichas minor*	Threatened	Threatened	
Anguillidae	American eel	*Anguilla rostrata*		Threatened	Vulnerable
Cetorhinidae	Basking shark	*Cetorhinus maximus*		Special Concern	
Carcharhinidae	Blue shark	Prionace glauca		Special Concern	
Gadidae	Atlantic cod (Newfoundland and Labrador population)	*Gadus morhua*		Endangered	
Gadidae	Cusk	*Brosme brosme*		Endangered	
Lamnidae	Porbeagle	*Lamna nasus*		Endangered	
Lamnidae	Shortfin mako	*Isurus oxyrinchus*		Special Concern	

Family	Species		Federal		NL ESA
	Common Name	Scientific Name	SARA Status (Schedule 1)	COSEWIC Designation	
Lamnidae	White shark	*Carcharodon carcharias*	Endangered	Endangered	
Macrouridae	Roughhead grenadier	*Macrourus berglax*		Special Concern	
Macrouridae	Roundnose grenadier	*Coryphaenoides rupestris*		Endangered	
Phycidae	White hake (Atlantic and Northern Gulf of St. Lawrence population)	*Urophycis tenuis*		Threatened	
Pleuronectidae	American plaice (Newfoundland and Labrador population)	*Hippoglossoides platessoides*		Threatened	
Rajidae	Smooth skate (Funk Island Deep Population)	*Malacoraja senta*		Endangered	
Rajidae	Thorny skate	*Amblyraja radiata*		Special Concern	
Rajidae	Winter Skate (Eastern Scotian Shelf - Newfoundland)	*Leucoraja ocellata*		Endangered	
Salmonidae	Atlantic salmon (South Newfoundland Population; outer Bay of Fundy population)	*Salmo salar*		Threatened (South Newfoundland Population); Endangered (outer Bay of Fundy population)	
Scombridae	Atlantic bluefin tuna	*Thunnus thynnus*		Endangered	
Scorpaenidae	Acadian redfish (Atlantic population)	*Sebastes fasciatus*		Threatened	
Scorpaenidae	Deepwater redfish (Northern Population)	*Sebastes mentella*		Threatened	
Squalidae	Spiny dogfish	*Squalus acanthias*		Special Concern	
MARINE BIRDS					
Laridae	Ivory Gull	*Pagophila eburnea*	Endangered	Endangered	Endangered
Scolopacidae	Red-necked Phalarope	*Phalaropus lobatus*		Special Concern	

Family	Species		Federal		NL ESA
	Common Name	Scientific Name	SARA Status (Schedule 1)	COSEWIC Designation	
MARINE MAMMALS AND SEA TURTLES					
Balaenopteridae	Blue Whale - Atlantic Population	*Balaenoptera musculus*	Endangered	Endangered	
Balaenopteridae	Fin Whale - Atlantic Population	*Balaenoptera physalus*	Special Concern	Special Concern	
Balaenidae	North Atlantic Right Whale	*Eubalaena glacialis*	Endangered	Endangered	
Ziphiidae	Northern Bottlenose Whale - Davis Strait, Baffin Bay, Labrador Sea population; Scotian Shelf population	*Hyperoodon ampullatus*	Endangered (Scotian Shelf population)	Special Concern (Davis Strait, Baffin Bay, Labrador Sea population); Endangered (Scotian Shelf population)	
Ziphiidae	Sowerby's Beaked Whale	*Mesoplodon bidens*	Special Concern	Special Concern	
Delphinidae	Killer Whale (Northwest Atlantic / Eastern Arctic population)	*Orcinus orca*		Special Concern	
Phocoenidae	Harbour Porpoise (Northwest Atlantic population)	*Phocoena phocoena*		Special Concern	
Dermochelyidae	Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered	Endangered	
Cheloniidae	Loggerhead Sea Turtle	*Caretta caretta*	Endangered	Endangered	

3.3.5 Special Areas

A number of land-based, coastal and marine areas within and offshore eastern Newfoundland have been designated as protected under provincial, federal and/or other legislation and processes, or have been formally identified as being otherwise special or sensitive due to their ecological, historical and/or socio-cultural characteristics and importance.

Given its location approximately 450 km offshore, the Project Area will not overlap or interact directly with any of the existing provincial or federal protected areas on or around the Island of Newfoundland (Amec 2014). The Project Area likewise does not overlap with any of the Canadian Marine Refuges, fisheries closure areas, Ecologically and Biologically Significant Areas (EBSAs) or Preliminary Representative Marine Areas, or internationally identified areas such as Important Bird Areas or World Heritage Sites, that have been identified off eastern Newfoundland and within the Canadian EEZ (Figure 3.3). As illustrated in Figure 3.4, the Project Area overlaps with portions

of several internationally designated special areas off Eastern Newfoundland, including: a Convention on Biological Diversity EBSA (Slopes of the Flemish Cap and Grand Bank), a Vulnerable Marine Ecosystem (VME) (Sackville Spur) and one NAFO Fisheries Closure Area (Northwest Flemish Cap – 10), for which there are no known prohibitions of marine activities such as those being proposed as part of this Project.

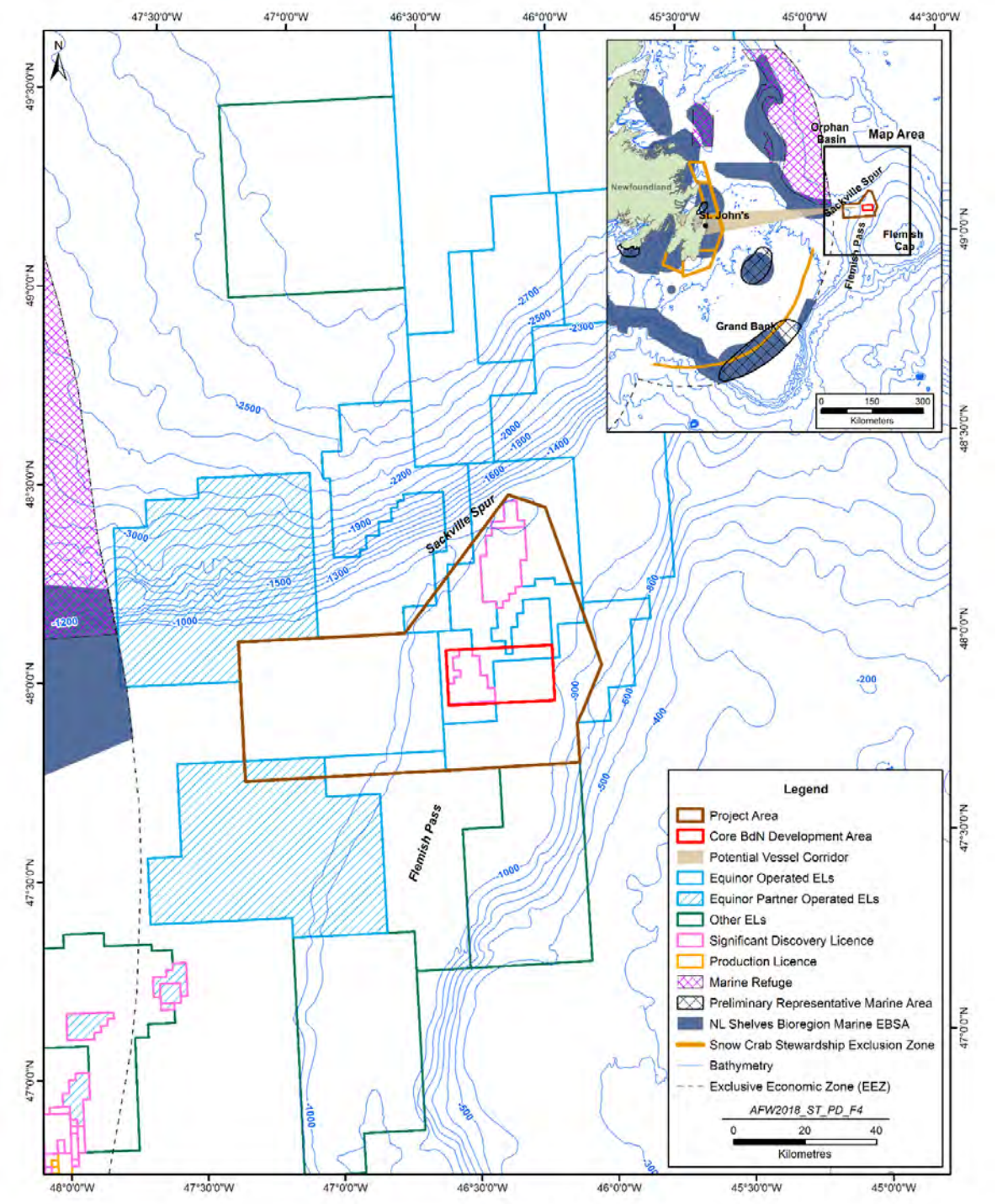


Figure 3.3 Identified Special Areas in Proximity to the Project Area (Canadian Designations)

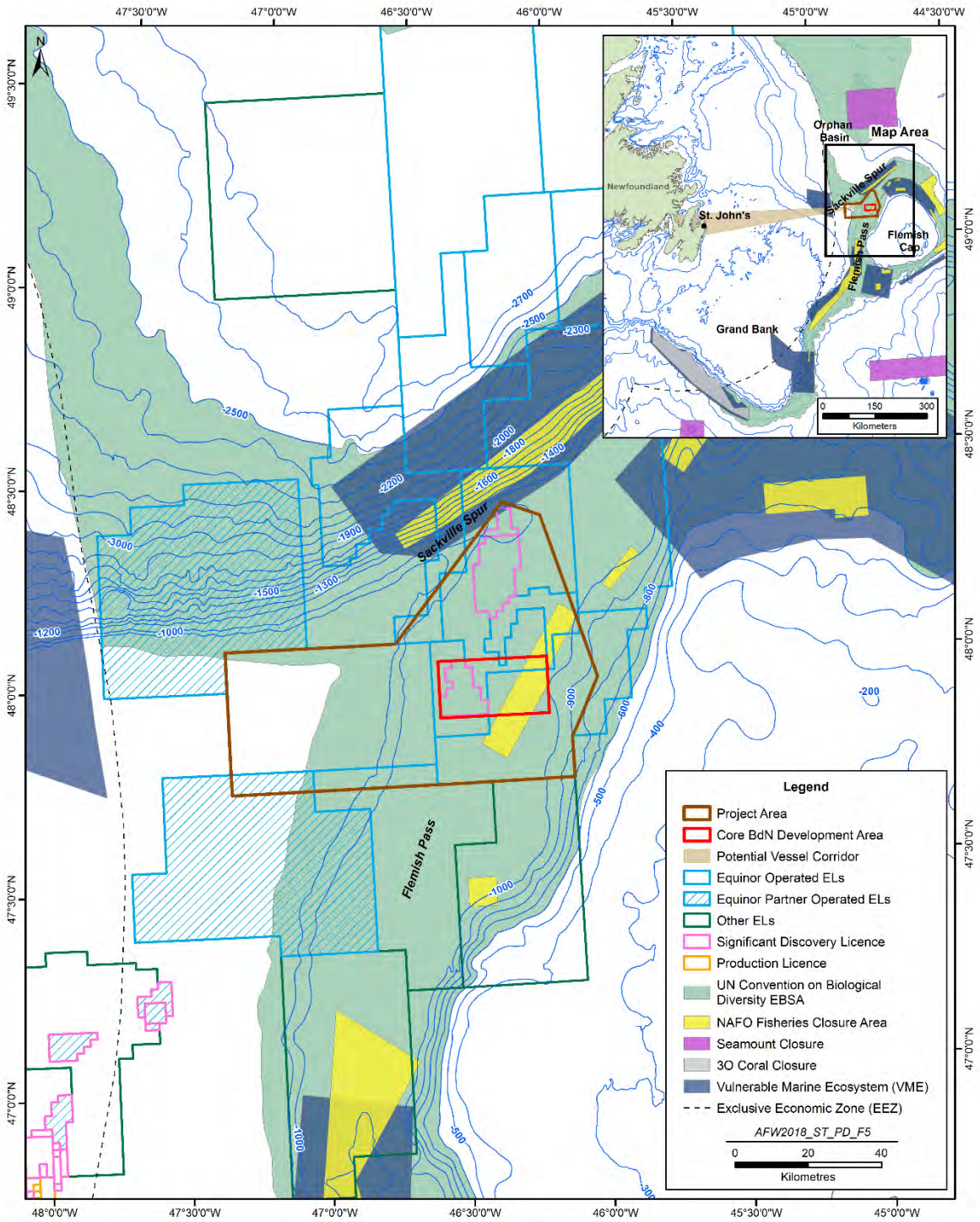


Figure 3.4 Identified Special Areas in Proximity to the Project Area (International Designations)

3.4 Human Environment

3.4.1 Commercial Fisheries

Fisheries are an important component of the socioeconomic environment of Newfoundland and Labrador and other parts of Canada, including the various communities that extend along the coastline of eastern Newfoundland. Commercial fisheries in this region are extensive and diverse, involving a range of species, gear types and other characteristics at various times of the year.

Commercial fisheries data are provided by DFO Statistical Services, including landings (weight and value) statistics and geospatial information illustrating the overall location and timing of fishing activity. The mapping information is provided by DFO as an aggregated data set which gives a general indication of fishing areas (by species, gear types and other pre-determined categories and data classes) for individual grid "cells" that are approximately 6 x 4 nautical miles in size. The DFO datasets record and report domestic and foreign fish harvests that are landed in Canada.

Figures 3.5 to 3.7 provide annual, locational summary information for commercial fishing activity in the Project Area and surrounding region for the 2010 to 2016 period, based on the above described DFO datasets up to and including the most recent year (2016) for which such geospatial data are available from DFO. The figures include relevant and representative maps showing overall fishing activity by year, as well as for the various categories of gear types (mobile and fixed gear). The available data indicate that key species that have been fished in and around the Project Area in recent years include, but are not limited to: Northern shrimp, turbot / Greenland halibut, redfish, Atlantic halibut, Atlantic cod, snow crab, roughhead grenadier, and greysole / witch flounder. Fishing activity occurs year-round in the region, but is concentrated primarily in the May-July period.

Various regulatory jurisdictions that apply to marine fish and fisheries management within and around the Project Area. The Government of Canada has jurisdiction over fish stocks and fishing activities within the 200-nautical mile EEZ and benthic invertebrates (such as crab) across the entire continental shelf. NAFO manages groundfish activities and other resources beyond that 200-nautical mile limit. The NAFO Regulatory Area (NRA) is some 2,707,895 km^2 in size (or 41 percent of the total NAFO Convention Area) and comprises that part of the Northwest Atlantic high seas located adjacent to Canada's EEZ. Fishing activity in the NRA targets a range of species, including cod, redfish, Greenland halibut, shrimp, skates, and other finfish, and has an approximate landed value of $200 million annually across all members (NAFO 2014, cited in Amec 2014). As a result of the 2007 United Nations General Assembly (UNGA Res. 61/105, paragraph 83) request that Regional Fisheries Management Organizations regulate bottom fisheries, NAFO undertook an exercise to identify bottom fishing areas in the NRA, and in doing so, to identify and map NAFO's bottom fishing footprint in the area. The NAFO bottom fisheries footprint is 120,048 km^2 in size, and its location and relationship to the current Project Area is illustrated in Figure 3.8.

Information on fishing activity by the NAFO members that fish in the NAFO Divisions that overlap with the Project Area and surrounding region are available from various sources, including the STATLANT21A Databases.

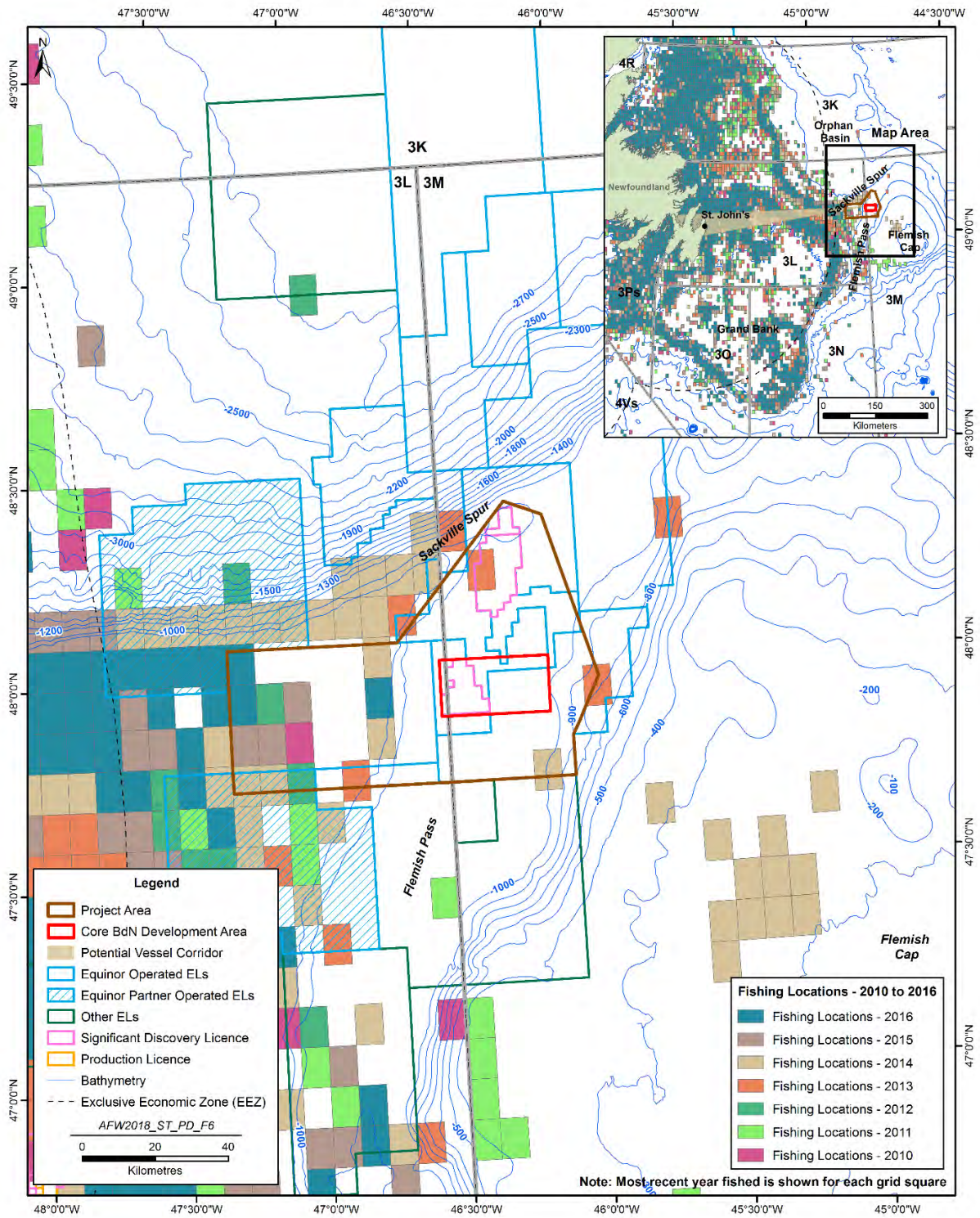


Figure 3.5 Commercial Fishing Locations, All Species (2010-2016)

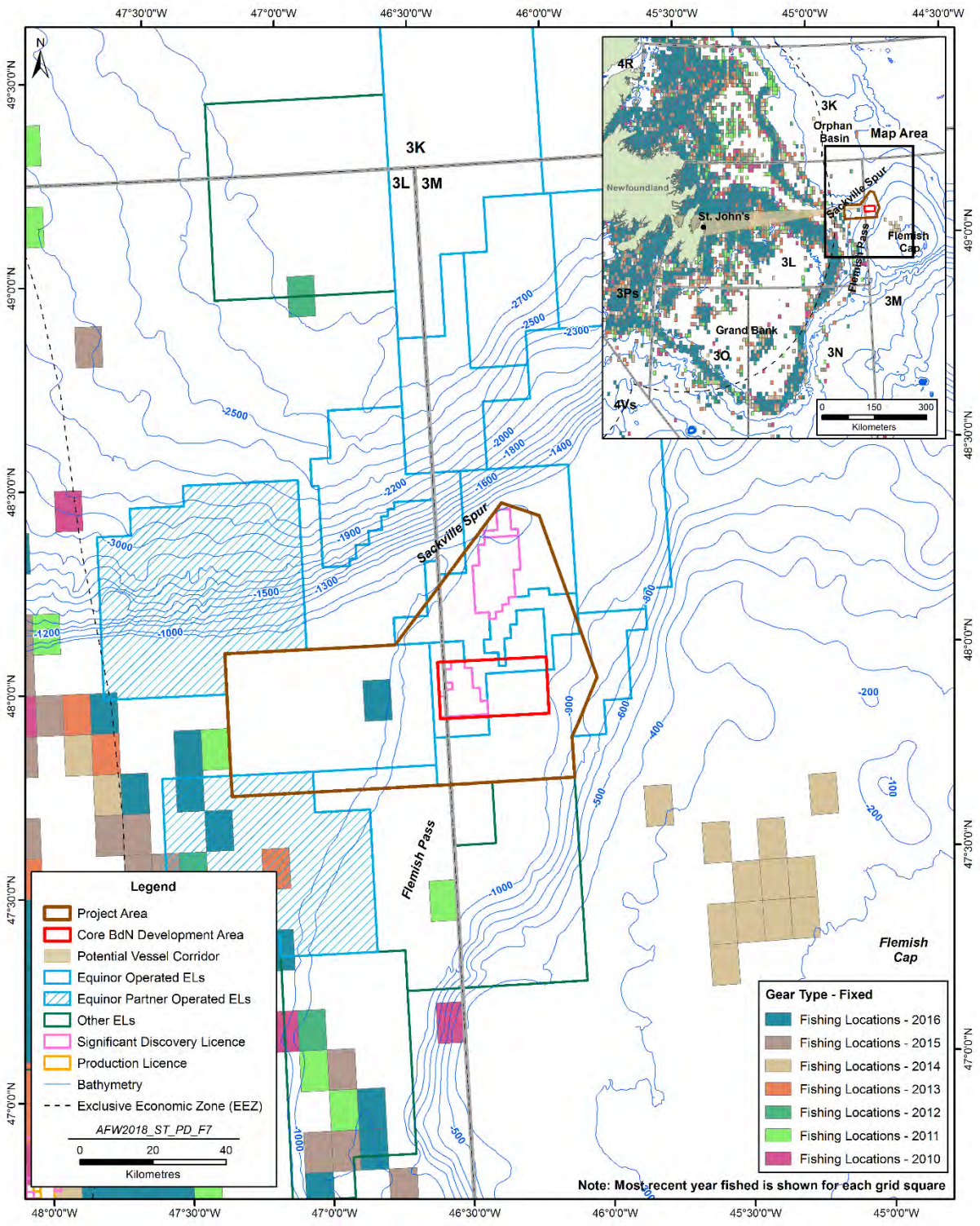


Figure 3.6 Commercial Fishing Locations, Fixed Gear (2010-2016)

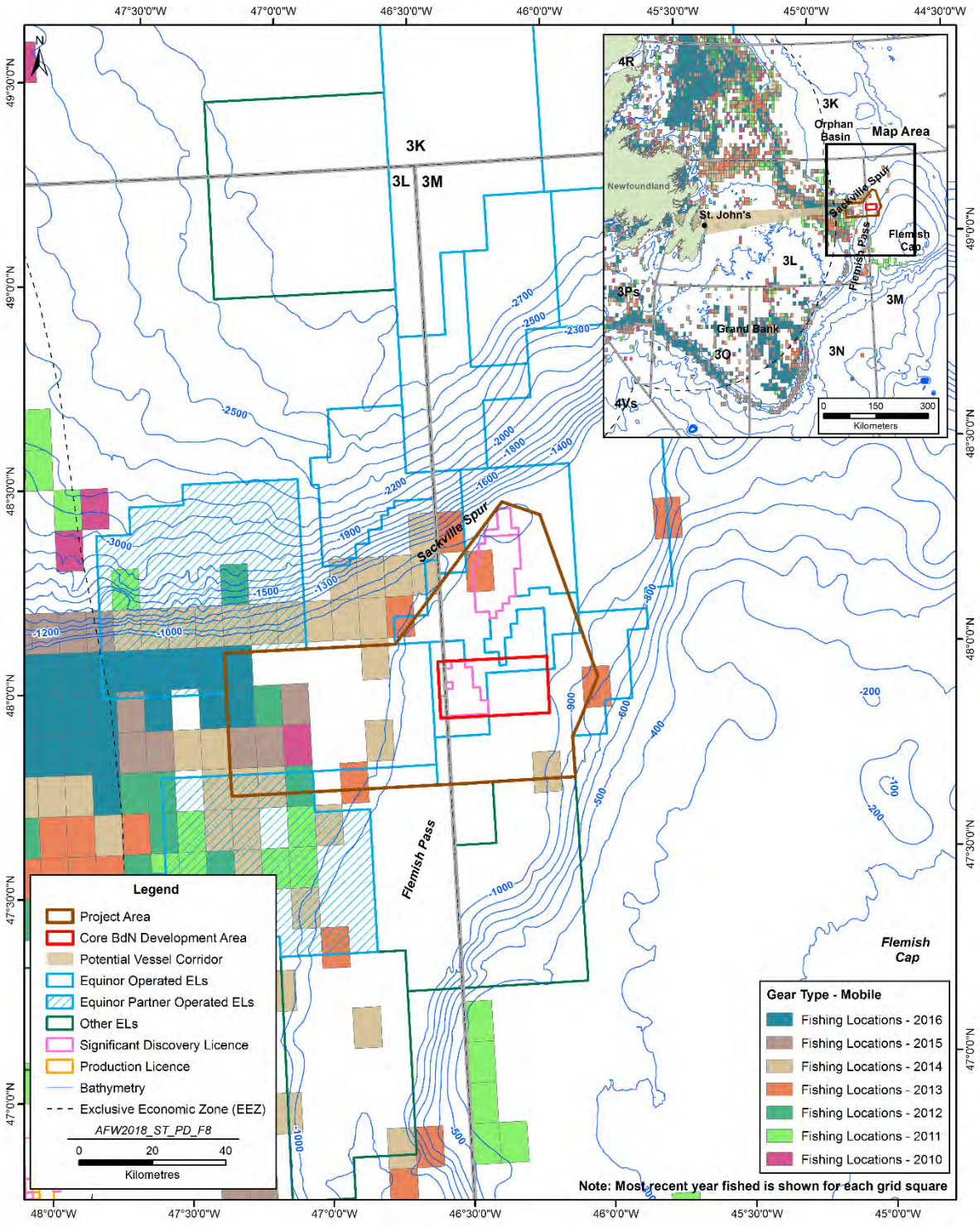


Figure 3.7 Commercial Fishing Locations, Mobile Gear (2010-2016)

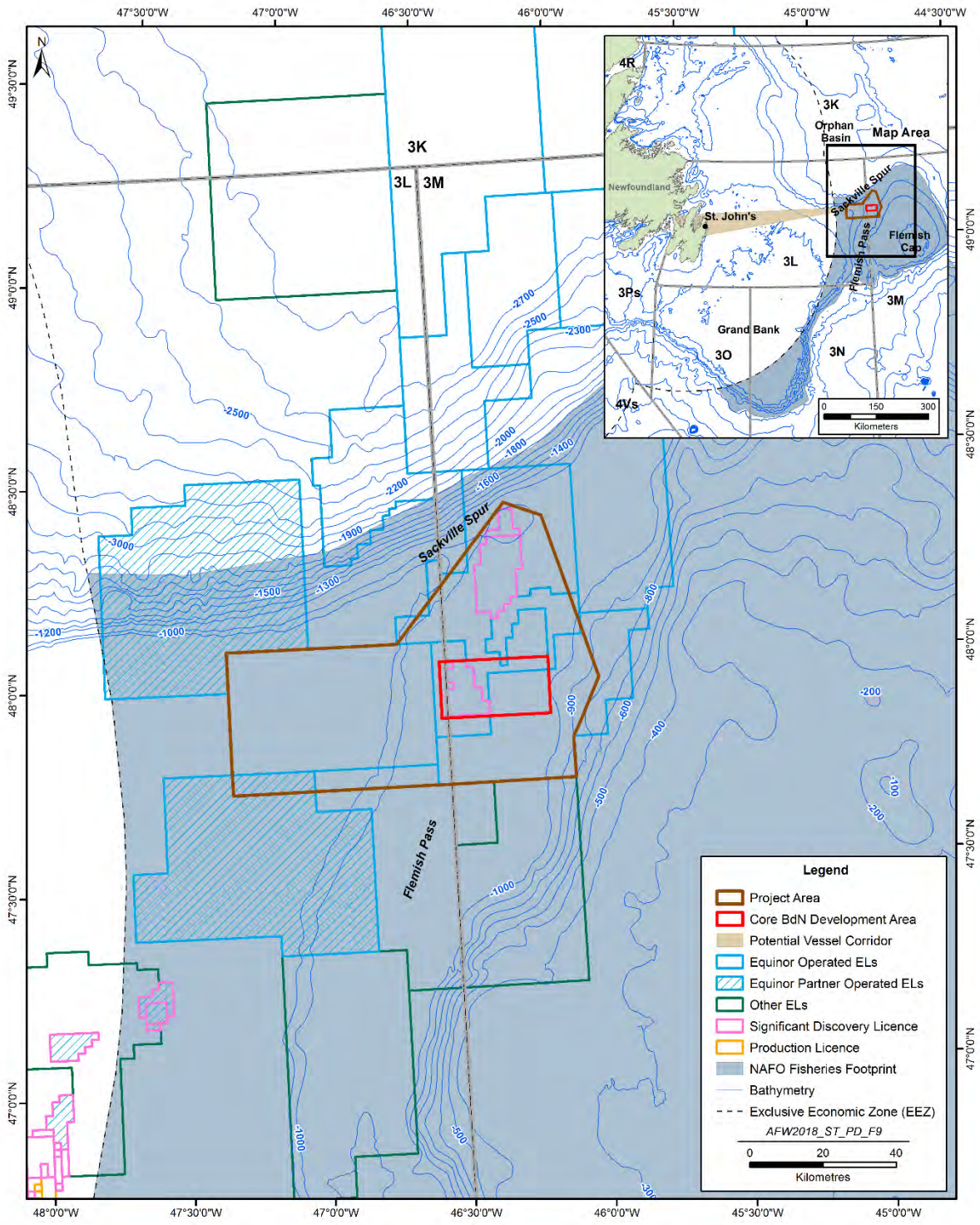


Figure 3.8 NAFO Fishing Zones and Foreign Fleet Bottom Fishing "Footprint"

3.4.2 Indigenous Commercial-Communal Fisheries

Several Indigenous groups in Newfoundland and Labrador hold commercial-communal fishing licences for NAFO Divisions offshore eastern Newfoundland. This includes licences permit access to a variety of species including groundfish and pelagic fish species, shrimp, tuna, swordfish, snow crab, and seal in various locations within Divisions 3KLMN0 (D Ball, pers comm) (Table 3.2).

Table 3.2 Commercial-Communal Fishing Licenses Issued to Newfoundland and Labrador Indigenous Groups off Eastern Newfoundland

Indigenous Group	Commercial Communal Fishing Licenses
Labrador Inuit (Nunatsiavut Government)	Inshore groundfish enterprises licensed to operate in 3KL, and seal licences in Seal Fishing Areas 4-33 (Atlantic-wide).
Labrador Innu (Innu Nation)	Mid-shore enterprise (65 to 100 feet) with a groundfish licence permitting access to a variety of areas (Atlantic-wide) including 3KLMN and an Area 6 (3K) shrimp licence; an inshore enterprise with a mobile gear and fixed gear groundfish licence for 3KL.
NunatuKavut Community Council	Multiple inshore enterprises with access to 3KL groundfish; Area 6 (3K) shrimp licences; seal licences allowing access in Seal Fishing Areas 4-33 (Atlantic-wide).
Miawpukek First Nation	Multiple enterprises and licences that give access to 3KL; tuna licences in 3LN; a seal licence for Seal Fishing Areas 4-33; a swordfish licence that includes 3KLMNO.
Qalipu Mi'kmaq First Nation Band	An inshore enterprise with a groundfish licence for 3K; a shrimp licence for Area 6 (3K); pelagic fishery access (herring, mackerel, and capelin) which occurs close to shore in 3KL; a snow crab licence for Area 4 (3K).

Several First Nations communities and councils in the DFO Maritimes and Gulf Regions hold commercial-communal licences for swordfish in NAFO Divisions 3, 4, and 5. However, DFO geospatial data (2010-2016) indicates no landings for swordfish in or around the Project Area over that period.

DFO created the Aboriginal Fisheries Strategy (AFS) in 1992 to provide a co-management framework for fishing by Indigenous groups, under which communal fishing licences for FSC purposes are issued. A component of the AFS is the Allocation Transfer Program, whereby commercial fisheries quotas are transferred to Indigenous groups. Following a review of the AFS, DFO created the Indigenous Aquatic Resource and Oceans Management (AAROM) program in 2003, which provides funding to Indigenous organizations to develop administrative, scientific and technical expertise for aquatic resource and oceans management (Charest et al. 2012). There are DFO-funded AAROM groups in Atlantic Canada that hold commercial-communal licences which may overlap the Project Area.

There are no documented food, social, or ceremonial licences within or near the Project Area. The closest Reserve to the Project is Conne River, located on the south coast of Newfoundland approximately 635 kilometres west of the Project Area.

Further information on Indigenous groups in Newfoundland and Labrador, the Maritime Provinces and Quebec is provided below in Section 3.4.4.

3.4.3 Fisheries Research

A number of fisheries survey programs are undertaken by government and/or industry in the Canada-NL offshore area. The DFO Multispecies RV Trawl Surveys include annual (spring and fall) standardized bottom-trawl surveys to collect information for managing and monitoring fish resources in the Newfoundland and Labrador Region. The annual Industry - DFO Collaborative Post-season Trap Survey for snow crab in NAFO Divisions 2J3KLOPs4R is conducted using commercial and modified snow crab traps at established trap stations starting in late August or early September after the commercial snow crab season has ended.

3.4.4 Indigenous Communities and Activities

This section provides an overview of various Indigenous groups in Newfoundland and Labrador, Nova Scotia, New Brunswick, Prince Edward Island and Québec, with a focus on those that are known to have interests related to offshore oil and gas activities off eastern Newfoundland and who have participated in recent and on-going EA reviews for such projects in the region under CEAA 2012 (see Section 4.2 for details on specific groups / communities and associated mapping).

Labrador Inuit

The Labrador Inuit, whose traditional territory extends from Cape Chidley in the north to south of Groswater Bay and west to the Labrador-Québec border, are descendants of the pre-historic Thule people. The Inuit of Labrador are currently resident primarily on the Labrador North Coast in the communities of Nain, Hopedale, Makkovik, Postville, and Rigolet, as well as in other Labrador communities and elsewhere.

The *Labrador Inuit Land Claims Agreement* was signed by the Labrador Inuit and the provincial and federal governments in January 2005 and came into effect on December 1st of that year. The Agreement is a modern comprehensive treaty, and sets out the details of land ownership, resource sharing and self-government in the area it covers in Northern Labrador. It also resulted in the establishment of the Nunatsiavut Government, which represents the approximately 7,000 beneficiaries of the Agreement. The treaty creates several categories of land, including: 1) the Labrador Inuit Settlement Area (LISA), and 2) Labrador Inuit Lands (LIL). The Settlement Area consists of 72,520 km^2 of land and 48,690 km^2 of ocean (referred to as “the Zone”), which encompass LIL and the five Inuit communities in Northern Labrador. Within the Settlement Area, the Inuit own the 15,800 km^2 of land referred to as LIL, and it is within this area that the Inuit have the most rights and benefits. The Agreement includes specific provisions and requirements related to resource harvesting, development projects and economic development, and other issues.

The pre-contact lifestyle of the Labrador Inuit included year-round harvesting and seasonal migration throughout Northern Labrador to follow the movements of fish, animals (especially whales and walrus), and other species they depended upon for food, clothing, shelter, and tools. Many Labrador Inuit still undertake traditional land and resource use activities, which include hunting, fishing, ice-fishing, and trapping for cultural, subsistence, and recreational purposes. Key food sources include Atlantic salmon, Arctic char, seals and marine and migratory birds and eggs. The Inuit also harvest various large game, small game, game birds, and berries. Traditional food has important value beyond market criteria, because its cultural, social, and nutritional qualities are an integral part of the Inuit lifestyle, in which sharing traditional foods with others in the community is of high importance (Egeland 2010; Felt et al. 2012)

The Nunatsiavut Government holds FSC fishing licences for salmon, trout, Arctic char, smelt and seal. As per the Land Claims Agreement, beneficiaries have the right to harvest at any time of the year throughout the LISA for any species or stock of fish or aquatic plant, up to the quantity needed for their food, social and ceremonial purposes. The Nunatsiavut Government also holds commercial-communal fishing licences for groundfish, Greenland halibut, seals, scallops, snow crab, northern shrimp, and Arctic char (D. Ball, pers comm 2018; Statoil 2017a).

Labrador Innu

The Innu of Labrador currently number about 2,500 and reside primarily in two communities - Sheshatshiu in Central Labrador and Natuashish on the North Coast. Some Innu also reside in Happy-Valley-Goose Bay, Labrador and elsewhere. The Sheshatshiu Innu and the Mushuau Innu of Natuashish comprise separate Bands, with each community currently a Reserve with an elected Chief and Council. Both communities are represented by Innu Nation in land claims negotiations and on other matters of common interest.

The Labrador Innu claim Aboriginal rights and title to much of Labrador. In September 2008, the Government of Newfoundland and Labrador and Innu Nation announced the signing of the *Tshash Petapen* (which translates as “New Dawn”) Agreement, which resolved key issues relating to matters between the Province and Innu Nation surrounding the Innu land claim, as well as impacts and benefits related to past and proposed hydroelectric developments in Western and Central Labrador. Since that time, the provincial and federal governments and Innu Nation have completed detailed agreements on these matters, including a tripartite *Labrador Innu Land Rights Agreement-in-Principle* (AIP) which was ratified by the Innu on June 30, 2011, and signed by the three parties on November 18, 2011. The AIP sets out jurisdictions, rights, benefits and limitations for the Labrador Innu in a variety of subject areas, which are tied directly to specific geographic areas, with various types of lands referenced in the AIP (IIAS 2018; INAC 2018). Negotiations towards a Final Land Claims Agreement are on-going.

The Innu were traditionally nomadic responding to the seasons and migrations of the animals they relied upon for food and clothing. The Innu travelled throughout their traditional territory of the Québec-Labrador Peninsula gathering in coastal areas in summer and spending winter in the interior. Caribou is the priority large animal for the Labrador Innu and caribou hunting holds high cultural importance. The Innu also harvest other large game, small game, and game birds for food and/or other resources such as fur. Marine and migratory birds harvested by the Innu include Canada geese, loons, ducks, scoters, and mergansers (Innu Nation 2010; Nalcor 2011).

Innu Nation holds FSC fishing licences for salmon, trout, and Arctic char in areas near Sheshatshiu and Natuashish. The Labrador Innu are also engaged in commercial-communal fishing enterprises. Innu Nation holds licences for groundfish, mackerel, capelin, shrimp, Greenland halibut, skate, white hake, Atlantic halibut, and haddock. Ueushuk Fisheries also holds a commercial-communal licence for shrimp (D. Ball, pers comm 2018; Statoil 2017a).

NunatuKavut Community Council

The NunatuKavut Community Council (NCC, formerly the Labrador Métis Nation) reports a membership of over 6,000 members who reside primarily in Southern and Central Labrador. Originally established as the Labrador Métis Association in 1985, the NCC has asserted a land claim that covers much of Central and Southeastern Labrador, but this has not to date been accepted for negotiation by the federal or provincial governments.

Members of the NCC place a high importance on traditional foods, both in terms of their nutritional attributes and their cultural value, and are known to undertake land and resource use activities including travel along overland and aquatic routes to gathering places and establishing seasonal habitation such as trapper tilts mainly in southern Labrador. Species consumed include various large game, small game, game birds, trout and berries. Marine species of interest include salmon, cod, seal, ducks, and geese (Nalcor 2010; Clark and Mitchell 2010; Nalcor 2011; Martin et al. 2012).

The NCC holds FSC fishing licences for salmon, trout, Arctic char, Atlantic cod, rock cod, herring, scallop, whelk, smelt, and seals. The Atlantic salmon fishery remains an integral part of the way of life. NCC members have been documented as fishing throughout central and southeastern Labrador. The NCC is also engaged in commercial-communal fishing with licences held by the NCC or Nunacor Development Corporation Fisheries Limited. The NCC holds commercial-communal licences for seals, groundfish, scallops, shrimp, whelk, northern shrimp, snow crab, capelin, herring, toad crab, and bait (AIOC 2012; D Ball, pers comm 2018; Statoil 2017a).

Miawpukek First Nation

The Samiajij Miawpukek Reserve is located at the mouth of the Conne River on the south coast of the Island of Newfoundland. The Miawpukek First Nation was recognized as a Band in 1984 and the Reserve was officially designated under the *Indian Act* in 1987. The registered First Nation population of the Miawpukek First Nation is more than 3,000 individuals. Approximately 27 percent were living on the Reserve in March 2018 (INAC 2018).

Miawpukek First Nation has identified a variety of medicinal plants (including parts of trees, roots, berries and other plants) harvested by its members. Other available information on species harvested by members is limited to that provided by DFO. The First Nation holds an FSC licence for scallop, lobster, mackerel, herring, rainbow trout, brook trout, Atlantic cod, eel, smelt, capelin, harp seals, grey seals, snow crab, and redfish. Miawpukek First Nation is also engaged in commercial-communal fishing through its own licences and those held by Mi'kmaq Alsumk Mowimsikik Koqoey Association (MAMKA), which is a joint fisheries initiative with Qalipu Mi'kmaq First Nation. Miawpukek First Nation holds commercial-communal licences for groundfish, bluefin tuna, other tuna, seals, sea cucumber, whelk, capelin, herring, mackerel, snow crab, squid, swordfish, scallops, and bait (D. Ball, pers comm 2018; Statoil 2017a).

Qalipu Mi'kmaq First Nation

The Qalipu First Nation Band was established in 2011, and in October 2017 the Band had a registered population of more than 24,000 members. Although Qalipu has no reserve land, its members are known to live in 66 communities throughout Newfoundland and in other areas. The Band's main administrative office is in Corner Brook and satellite offices are located in Glenwood, Grand Falls-Windsor and St. George's (Qalipu First Nation 2016).

Members of the Qalipu Mi'kmaq First Nation Band are known to hunt, trap, and fish for subsistence purposes, using extensive areas of land, sea, and inland waters where they reside, mostly in central and western Newfoundland. Important sources of traditional food include large game, small game, birds, trout, berries. salmon, eel, shellfish. Migratory birds, seals, and groundfish are harvested but generally of lesser importance. Nonetheless, harvesting of groundfish, pelagic fish, shellfish, and seals are of importance to the Mi'kmaq on the west coast of Newfoundland (Emera NL 2013; Qalipu First Nation 2016, 2017).

Qalipu First Nation, and its wholly owned Mi'kmaq Commercial Fisheries Inc., hold commercial-communal fishing licences. These include licences for groundfish, lobster, snow crab, mackerel, herring, squid, scallops, capelin, whelk, shrimp and bait. Qalipu First Nation also has licences for eel and smelt. The Qalipu, through its participation in MAMKA, holds commercial-communal licences for groundfish, whelk, snow crab, herring, capelin, scallops, lobster and bait (D Ball, pers comm 2018; Statoil 2017a; Qalipu First Nation 2017).

Mi'kmaq First Nations of the Maritime Provinces

There are 13 Nova Scotia Mi'kmaq First Nation communities, located throughout the province from Cape Breton to the Yarmouth area, two Mi'kmaq communities in Prince Edward Island and nine Mi'kmaq communities in New Brunswick. The Mi'kmaq generally lived in semi-permanent or permanent settlements at resource-rich locations with summer villages typically located by a navigable body of water (Mi'kma'ki All Points Services 2013). They believe that they have a spiritual connection to land, plants, animals, and water and in the interconnectivity of these resources to each other (GNB 2000). In the summer the Mi'kmaq harvest fish, shellfish, fowl and eggs and in the winter the Mi'kmaq did most of their game hunting moving inland from their summer camps (MGS 2016). Fish species generally harvested for FSC purposes include blue shark, herring, trout, catfish, cod, crab, eel, gaspereau, haddock, halibut, herring, lobster, mackerel, mussel, periwinkle, pollock, quahaug, rainbow trout, razor clams, scallop, seals, shad, smallmouth bass, smelt, soft-shell clams, squid, striped bass, and tomcod. Commercial-communal species include groundfish, lobster, crab, herring, mackerel, ocean quahaug, sea scallop, sea urchins, shrimp, squid, swordfish, and tuna (Statoil 2017a).

Wolastoqiyik of New Brunswick

The Wolastoqiyik Nation of New Brunswick is an Indigenous group of the Saint John River Valley and its tributaries. At the time of the first encounter with Europeans, the Wolastoqiyik were primarily an agricultural and forestry-based community, supplementing their diet with hunting, fishing, and gathering fruits, berries, and nuts (Madawaska Maliseet First Nation website undated). The Wolastoqiyik are known to occupy and use the land and waters around New

Brunswick including use for travel corridors, land hunting and harvesting, and fishing for traditional purposes. Fish species generally harvested for FSC purposes include catfish, clams, cod, eel, flounder, gaspereau, groundfish, halibut, herring, lobster, mackerel, mussels, oysters, quahaug, rock crab, salmon, scallops, seals, shad, smallmouth bass, smelts, striped bass, sturgeon, trout, white perch, whitefish, and yellow perch. Commercial-communal species include alewives/gaspereau, bar clams, crab, eel, groundfish, herring, lobster, mackerel, marine plant, mussels, ocean quahaug, oysters, sea scallop, sea urchins, seal, shark, shrimp, silverside, smelts, snow crab, soft shell clams, squid, swordfish, bluefin tuna, and whelks (Statoil 2017a).

Peskotomuhkati Nation (Passamaquoddy)

Peskotomuhkati Nation (Passamaquoddy) is located in St. Andrews where they assert title to territories along the Maine and New Brunswick border, with most of the members currently living on the American side of the border. The homeland of the Peskotomuhkati people is located along the Passamaquoddy Bay, with drainage area of the Schoodic (St. Croix) River and the Fundy Islands (RSF undated). Seasonal journeys within their traditional territory extended inland north along the Schoodic River to the Chipputnecook Lakes, and typically involved harvesting various natural resources at different times of the year. In the spring, many Peskotomuhkati people occupied a field at Salmon Falls on the Schoodic River, taking advantage of the runs up-river by salmon, eels, and alewives. Much of the harvest was processed/dried for the following winter. Passamaquoddy Bay was also important for its abundance of pollock (RSF undated). The Passamaquoddy are specifically named in the *Marshall Decision* based on the *Peace and Friendship Treaties* which provides them the Treaty right to fish. The Passamaquoddy have submitted a claim to the federal government which has currently been accepted for review. The CEA Agency identified Passamaquoddy as having an Aboriginal right to fish for Atlantic salmon for FSC purposes.

Mi’kmaq First Nations of Québec

The Mi’kmaq of Québec are known to occupy and use the land and waters around the Gaspé Peninsula for travel corridors, hunting and harvesting, and fishing for traditional purposes following seasonal patterns. Important traditional food sources of the Gaspé Mi’kmaq included winter flounder, smelt, alewife, sturgeon, salmon, eel, Atlantic tomcod, migratory sea-birds and eggs, oysters, scallops, quahogs, clams, American lobster, northern crab, walrus and seals. Eel harvesting is a traditional Mi’kmaq activity. Atlantic salmon was used for barter, spiritual/ceremonial practices, and salmon skin was used for bait and crafts. The Mi’kmaq of Québec, in general, currently harvest various traditional species including eel, trout, mackerel, salmon, crab, lobster, herring, cod, and waterfowl (CIE 2014; MMAFMA 2017).

The Micmacs de Gesgapegiag participate in communal fishing for FSC purposes and hold commercial-communal licences for mackerel, herring and bluefin tuna. The First Nation also has an agreement with the Government of Québec for communal fishing, which occurs principally in the Cascapédia River mouth but also in the Petite rivière Cascapédia and its mouth). The Listuguj Mi'kmaq participate in communal fishing for FSC purposes with licences to harvest salmon and lobster, and hold commercial-communal fishing licences for snow crab, shrimp, lobster, mussels, turbot and cod. The Micmacs de Gespeg participate in communal fishing for FSC purposes and

has an agreement with the Government of Québec for harvesting salmon on the Saint-Jean, Dartmouth and York Rivers. Most of the harvested salmon is distributed to Elders.

Innu First Nations of Québec

The Québec Innu were traditionally nomadic and depended on the products of hunting (mainly barren-ground caribou, moose and small game), fishing and gathering activities for their subsistence throughout the Québec-Labrador Peninsula. Innu culture and heritage is based on the relationship with game and fish and the seasonal migrations and locations of various species, particularly caribou and salmon. The Innu traditionally spent the winter months in the interior of the Labrador plateau and returned to coastal areas of the St. Lawrence River in spring. The Innu continue to harvest in the St. Lawrence and surrounding areas. Key land-based resources include large game, small game, trout, edible plants, and berries. In the marine environment, the Innu harvest Atlantic salmon, lobster, scallops, and herring as well as migratory birds, waterfowl, and eggs. Salmon is an important source of nutritious food for the Innu and salmon fishing is also highly valued for social and cultural reasons including sharing with others and respect for the resource, which is shown through conservation and avoiding waste (CAM 1983; HQP 2007; CDPDJ 2009; MRCN 2010; Charest et al. 2012; Verreault et al. 2013; CIE 2014; AMIK 2016a; MFFP 2017).

Ekuanitshit and Nutashkuan each have commercial fishing enterprises, but limited information is publicly available. Ekuanitshit co-manages Pêcheries Shipek with the Pakua Shipi Innu First Nation. Pêcheries Shipek commercially harvests scallops, crab, halibut, sea cucumber and whelk, and sells its products to three fish stores. Ekuanitshit operates six boats and its commercial fishing activities employ some 40 persons on a full- or part-time basis (AMIK 2016d). The Innu communities of Nutashkuan, Ekuanitshit, Pakua Shipi and Unamen Shipu are planning to develop a fish processing plant (AMIK 2016b, 2016c). Commercial salmon fishing in the North Shore rivers has been banned since 2000 (Charest et al. 2012). Nutashkuan fishers commercially fish crab, clams, lobster and groundfish and owns two fishing vessels (AMIK 2016b). Pêcheries Commerciales Nutashkuan, which was established by the Band Council in 1994, employs between six and 25 individuals.

3.4.5 Other Human Activities

There are other marine-based human activities occurring in or adjacent to the Project Area either a year-round or seasonal basis. General shipping traffic within and through the region includes marine tanker traffic and supply vessels associated with the existing offshore oil development and activities, as well as cargo ships, fishing vessel transits, and other vessel traffic. Naval training exercises also occur off Eastern Newfoundland and includes both surface vessels and submarines. There are also known and potential unexploded ordnance (UXO) sites in the Atlantic Ocean, which include shipwrecks and submarines as well as munitions dump sites off eastern Newfoundland (Amec 2014). A number of existing marine cable networks also cross through the region.

The Canada-NL offshore area is subject to ongoing oil and gas exploration and production activity, including geophysical surveys, drilling programs and oil and gas production activities

(Figure 3.9). To date, several thousands of kilometres of seismic data have been collected. As of March 2018, 231 development wells, 57 delineation wells and 171 exploration wells (C-NLOPB website) have been drilled offshore Newfoundland and Labrador. Offshore oil production activities have been ongoing since the 1990s with four active producing operations - Hibernia, Terra Nova, White Rose and Hebron. These offshore oil and gas exploration and development activities include ongoing ancillary and supporting activities.

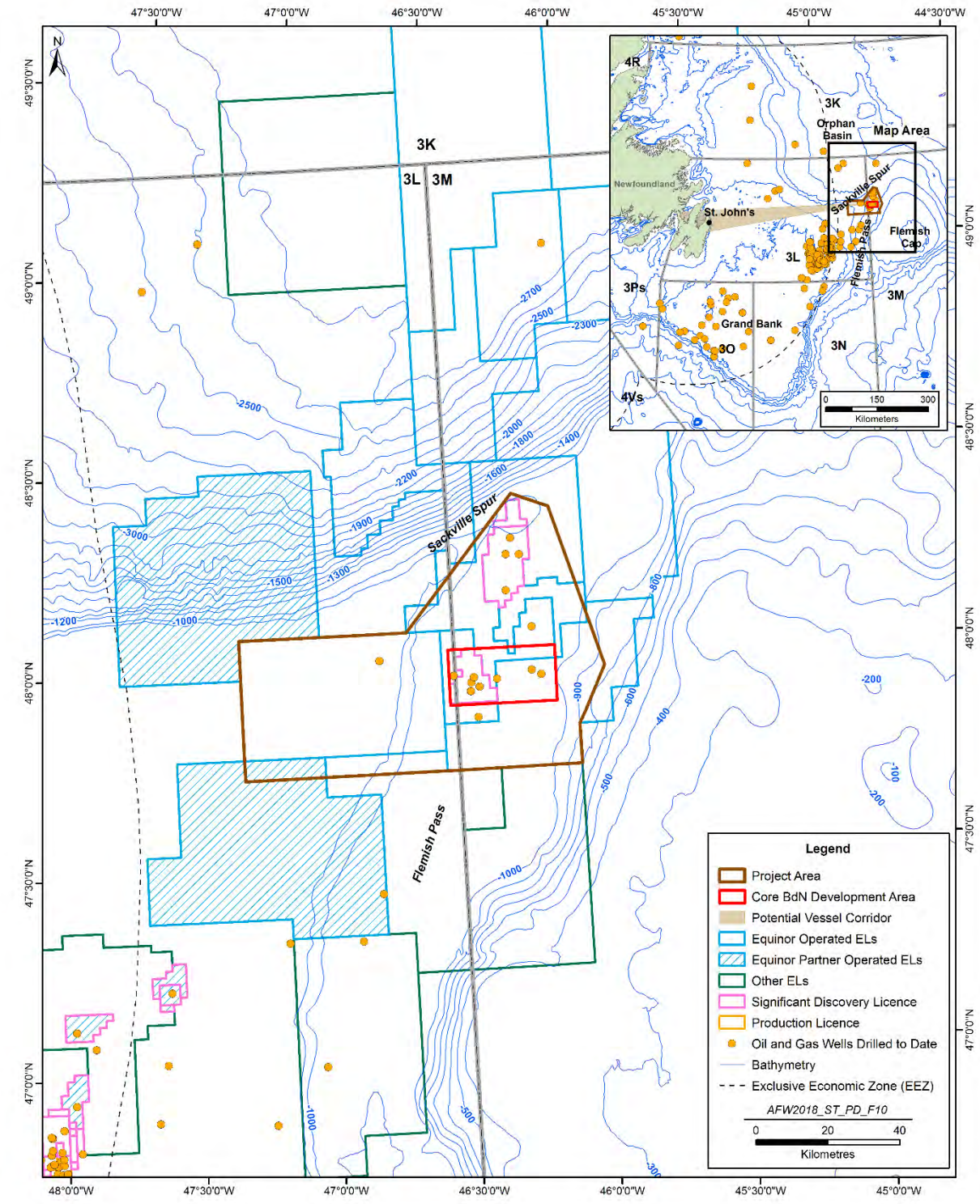


Figure 3.9 Previously Drilled Oil and Gas Wells (not inclusive of all wells drilled)

4 Engagement

Engagement is a key component of Equinor Canada's approach to the planning and implementation of its activities. A number of associated initiatives have been undertaken, are in progress, or are being planned in relation to the Project, including discussions with relevant government departments and agencies, Indigenous groups, stakeholder organizations and interested members of the public.

Should an EIS be required for the Project under CEAA 2012, Equinor Canada will design and implement an engagement program that will provide various mechanisms and opportunities for regulatory agencies, Indigenous groups and key stakeholders to receive and review information, and provide feedback on the Project regarding local and Indigenous knowledge related to the Project Area and any concerns and issues that may require consideration in the EIS and/or be addressed through associated mitigation. The following is an overview of ongoing and planned engagement activities for the Project.

4.1 Regulatory Engagement

As noted in Section 1.3, provincial and federal government departments and agencies may have regulatory responsibilities related to the Project and its potential environmental effects. As part of the planning and preparation of an EIS, Equinor Canada will meet with regulatory organizations to provide Project information and determine their level of regulatory interest for the Core BdN Development. The following is a list of federal and provincial agencies who will or may have an interest in the Project:

- CEA Agency
- C-NLOPB
- Fisheries and Oceans Canada (DFO)
- Environment and Climate Change Canada
- Transport Canada
- Department of National Defence
- Natural Resources Canada (NRCan)
- NL Department of Municipal Affairs and Environment
- NL Department of Fisheries and Land Resources
- NL Department of Natural Resources

The federal review of this Project Description will help to identify any important environmental questions and issues related to the Project for consideration by the CEA Agency in determining whether (and if so, what level of) EA is required and the scope and focus of that review. If further assessment is deemed necessary, relevant departments and agencies will also be involved in the development and finalization of EIS Guidelines, the review of the Project's EIS, and at other stages of the review process.

Equinor Canada will also continue to consult directly with relevant government departments and agencies as part of the planning and completion of any required EIS for the Project, as well as in

any post-EA environmental permitting and overall environmental management initiatives during its eventual implementation.

4.2 Indigenous Engagement

4.2.1 Background

Consistent with its corporate values (Courageous, Open, Collaborative and Caring) Equinor is committed to ensuring that all Indigenous groups affected by its operations are appropriately informed and provided meaningful opportunities for engagement regarding the company's on-going and planned activities.

The Project will be located in the Flemish Pass, approximately 450 km from St. John's, in the same area as Equinor Canada's Flemish Pass Exploration Drilling Program ("Exploration Drilling Program") (Statoil 2017a) which is currently undergoing EA review under CEAA 2012. Due to the proximity and similar nature of the two planned activities, Equinor Canada anticipates engagement with the same groups as are currently engaged in relation to the Exploration Drilling Program and further anticipates that issues raised in the context of Exploration Drilling will be equally relevant to the EA of the Project.

As part of the Exploration Drilling Program EIS, Equinor Canada has been engaged with 41 Indigenous groups as well as several representative Indigenous organizations in Newfoundland and Labrador, the Maritime Provinces and Quebec during the past two years (Table 4.1). Figures 4.1 and 4.2 identify the locations of these Indigenous communities in relation to the Project Area. Qalipu members reside in a range of communities across the island portion of Newfoundland. As noted on Figure 4.1, their Head Office is located in Corner Brook with additional offices in Grand Falls – Windsor, Glenwood and St. George's. Distances of the various Indigenous groups from the Project Area range from approximately 635 km (Miawpukek First Nation, NL), 1,000 km (Membertou, in Nova Scotia), and more than 1,500 km (Ekuanitshit, Nutashkuan, Quebec). Consultation will be tailored to ensure the opportunities for engagement are commensurate with the risk of potential impacts.

Table 4.1 Indigenous Groups Engaged by Equinor Canada to Date

Province	Indigenous Groups / Organizations
Newfoundland and Labrador	Labrador Inuit (Nunatsiavut Government)
	Labrador Innu (Innu Nation)
	NunatuKavut Community Council
	Miawpukek First Nation
	Qalipu Mi'kmaq First Nation Band
Nova Scotia	11 Mi'kmaq First Nation groups represented by Kwilmu'kw Maw-klusuaqn Negotiation Office (KMKNO):
	- Acadia First Nation
	- Annapolis Valley First Nation
	- Bear River First Nation

Province	Indigenous Groups / Organizations
	- Eskasoni First Nation
	- Glooscap First Nation
	- Membertou First Nation
	- Paqtnkek Mi'kmaw Nation
	- Pictou Landing First Nation
	- Potlotek First Nation
	- Wagmatcook First Nation
	- Waycobah First Nation
	Millbrook First Nation
	Sipekne'katik First Nation
New Brunswick	Eight Mi'gmaq First Nations groups represented by Mi'gmawe'l Tplu'taqnn Inc. (MTI)
	- Fort Folly First Nation
	- Eel Ground First Nation
	- Pabineau First Nation
	- Esgenoôpetitj First Nation
	- Buctouche First Nation
	- Indian Island First Nation
	- Eel River Bar First Nation
	- Metepnagiag Mi'kmaq First Nation
	Elsipogtog First Nation
	Five Maliseet First Nation groups represented by Wolastoqey Nation of New Brunswick (WNNB)
	- Kingsclear First Nation
	- Madawaska Maliseet First Nation
	- Oromocto First Nation
	- Saint Mary's First Nation
	- Tobique First Nation
	Woodstock First Nation
	Peskotomuhkati Nation at Skutik (Passamaquoddy)
Prince Edward Island	Two Mi'kmaq groups represented by Mi'kmaq Confederacy of PEI
	- Abegweit First Nation
	- Lennox Island First Nation
Quebec	Three Mi'gmaq First Nation groups represented by Mi'gmawei Mawiomi Secretariat (MMS):
	- Micmas of Gesgapegiag
	- La Nation Micmac de Gespeg
	- Listuguj Mi'gmaq Government
	Les Innus d'Ekuanitshit
	Innu First Nation of Nutashkuan

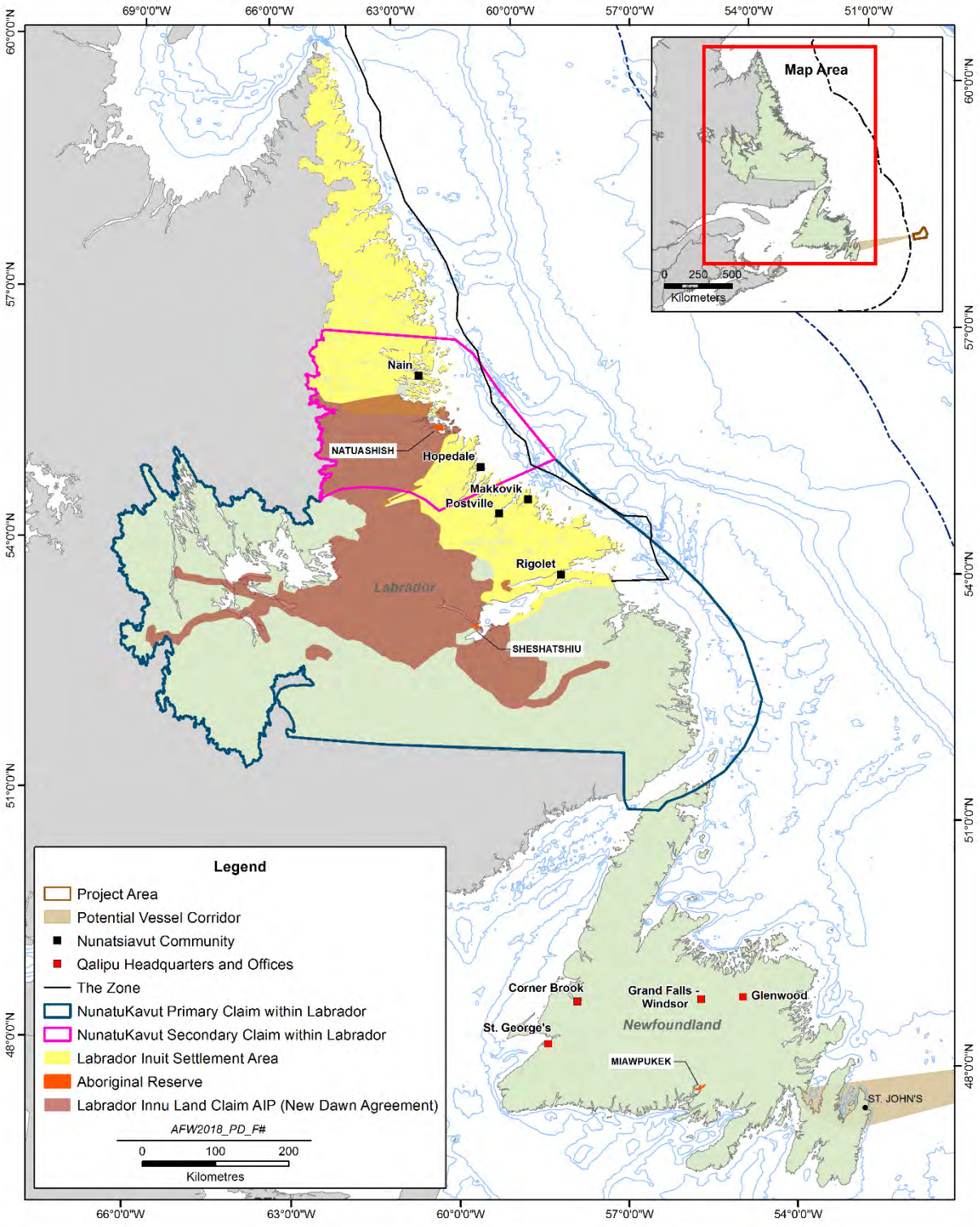


Figure 4.1 Indigenous Communities in Newfoundland and Labrador

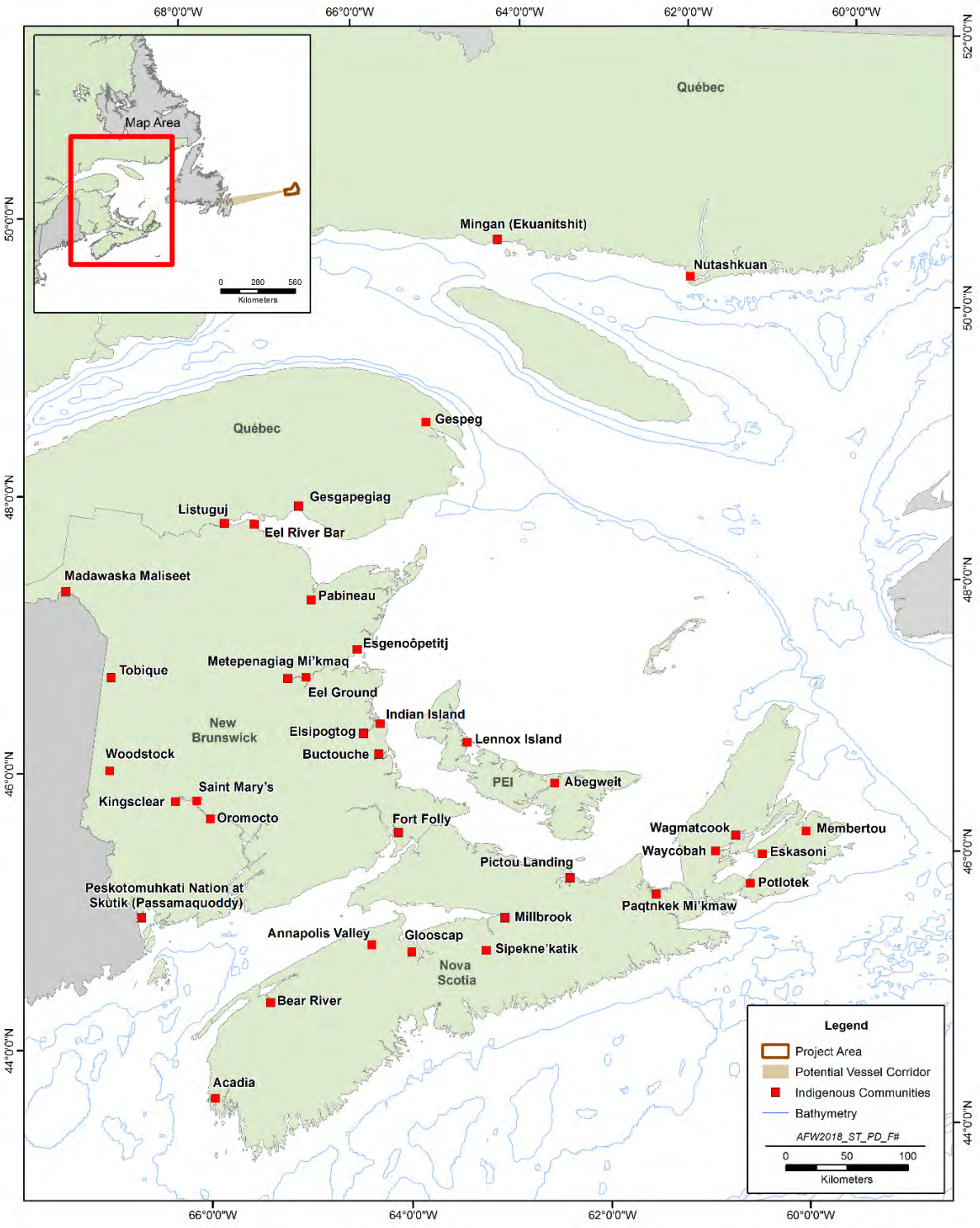


Figure 4.2 Indigenous Communities in the Maritime Provinces and Quebec

4.2.2 Approach to Engagement

A key objective of Equinor Canada's planned Project engagement is to promote communication and cooperation through ongoing dialogue with the named Indigenous groups as well as any others as directed by the CEA Agency.

In order to achieve this objective, Equinor Canada will build upon its ongoing engagement efforts to proactively address issues previously raised in the context of the Exploration Drilling Program as well as any new issues that may be identified with respect to the proposed Project. As part of its planned engagement, Equinor Canada will provide ongoing Project-related information in a timely and culturally appropriate manner to each group or representative organization as appropriate in order to enhance its understanding of how these groups may potentially be affected by Project activities, to listen and respond to questions and concerns raised by the groups and to work with groups to identify and develop potential mitigation measures and monitoring programs for the Project. Equinor Canada will also make reasonable efforts to integrate Indigenous knowledge into the environmental assessment of the Project where relevant.

Equinor Canada will keep detailed records of its engagement activities, recording all interactions with groups, documenting the issues raised by each group and detailing how the concerns raised were considered, addressed or responded to. Records will be shared with the CEA Agency.

4.2.3 EIS Preparation

Since it is likely that Equinor Canada will be required to engage with a wide range of Indigenous groups located throughout five provinces and characterized by distinct languages, histories and cultures, the approach to engagement, including the timing and nature of specific engagement activities, must be developed through discussion with the groups. However, while engagement will be tailored to the needs, interests and circumstances of the groups, including the requirements of any applicable consultation protocols, generally during the development of the EIS Equinor Canada will:

- provide the groups with relevant Project-related information on a timely basis through written correspondence, presentations, reports and fact sheets, translated as necessary
- make reasonable efforts to meet with the various groups at mutually convenient times and locations (in person, by phone, videoconferencing, or other mutually acceptable means)
- structure engagement processes to the extent possible to provide adequate time for Indigenous groups to review and comment on the relevant information

Groups will be encouraged to provide Equinor Canada with their views on:

- the effects of potential changes to the environment on their health and socio-economic conditions, physical and cultural heritage and current use of lands and resources for traditional purposes pursuant to paragraph 5(1)(c) of CEAA 2012
- the potential adverse impacts of the project on potential or established Section 35 rights

In addition, during this period, Equinor Canada will work with groups to collect relevant Indigenous knowledge and will take into account in the Project EIS that Indigenous knowledge to which it has access or that has been acquired through engagement.

Feedback obtained during this phase of engagement will be incorporated into the EIS as applicable and appropriate, and the EIS (if required under CEAA 2012) will document concerns and priorities raised and demonstrate how these have influenced Project planning and/or been considered in the EIS.

4.2.4 Post-EIS Submission

Equinor Canada is committed to establishing and maintaining relationships with Indigenous peoples that are based upon mutual respect and understanding and will continue to provide opportunities for information-sharing and exchange in the post-EIS submission period. Specific engagement activities will be determined through dialogue with Indigenous groups within this period and until the EA Decision, Equinor Canada will continue to provide opportunities for engagement with the various groups that want ongoing communication from the Project. Equinor Canada will provide ongoing Project-related updates, discuss any issues of concerns raised prior to the submission of the EIS or during the course of any information requests post-EIS submission, and provide information on proposed mitigation and monitoring measures. Engagement will be undertaken through written correspondence, conference calls or face-to-face meetings as necessary and appropriate. Engagement activities will continue to be documented and the CEA Agency will be provided with engagement records until the issuance of the EA decision.

Communication plans and strategies for subsequent phases (e.g. construction and operations) will be developed in conjunction with Indigenous groups.

4.2.5 Issues and Concerns

Equinor Canada has had the benefit of two years of engagement with the above named Indigenous groups in the context of the Exploration Drilling Program EIS (Statoil 2017a). Through this experience, Equinor Canada has acquired valuable information respecting each group's asserted or established Aboriginal or Treaty rights, the current use of lands and resources for traditional purposes and potential impacts of offshore operations upon Indigenous rights and interests.

Based on the results of its prior and ongoing engagement in the context of the Exploration Drilling Program, as well as Equinor Canada's review of and access to publicly available information, including information generated in the context of other offshore EAs, it is Equinor Canada's understanding that none of these groups holds, claims or otherwise asserts Aboriginal or Treaty rights within or near the Project Area. Equinor Canada further understands that none of these groups currently uses the lands or resources within the Project Area for traditional purposes. However, as described in Section 3.4.2, Equinor Canada is aware that fishing enterprises associated with several of these organizations do or may undertake commercial fishing activity

within NAFO Divisions that overlap parts of the Project Area and its surrounding areas, pursuant to the *Fisheries Act* and the associated *Aboriginal Communal Fishing Licences Regulations*, as well as other government policies and strategies that are designed to involve Indigenous people and communities in commercial-communal fisheries in Canada.

As a result of its ongoing Indigenous engagement activities, Equinor Canada has also been made aware of the following concerns associated with offshore drilling activities:

- Fish and Fish Habitat: Potential effects on migrating marine fish and mammal species of traditional and cultural importance to Indigenous communities (i.e., Atlantic salmon, swordfish, Bluefin tuna and American eel) that may travel through or near the Project Area before reaching traditional territories (potential effects upon fish and fish habitat, population distribution and food sources)
- Migratory Birds: potential increase in mortality events associated with flaring
- Waste discharges: effects on fish and marine mammals
- Increased vessel activity: Effects on marine mammals and fishers (vessel strikes, loss or damage to fishing gear)
- Cumulative effects: The possible proliferation (existing and planned) of offshore activities and effects on fish, fish habitat, marine mammals, migratory birds
- Unplanned Project activities: Effects of spills and blow-outs and resulting contamination (either direct or through the food chain) of species of cultural significance as well as destruction of habitat of corals, sponges, marine mammals and fish.

These issues and concerns are captured in the potential Project-related interactions, as described in Sections 5.1 and 5.2.

4.3 Stakeholder Engagement

As part of its on-going exploration activities Equinor regularly engages with fisheries and environmental groups that have traditionally been engaged in or had an interest in offshore oil and gas operations off Newfoundland and Labrador.

Fish harvesters and processors are a key stakeholder, with which Equinor Canada has ongoing communication and engagement to keep them apprised of offshore oil and gas activity in their fishing areas and to address any concerns they may have. Fish harvesters engaged in fishing offshore Newfoundland are represented by the Fish Food and Allied Workers-Unifor (FFAW-Unifor). Fish processors and their representative organizations include Ocean Choice International, the Association of Seafood Producers, and the Groundfish Enterprise Allocation Council. One Ocean is the liaison organization established by and for the fishing and petroleum industries of Newfoundland and Labrador. Its objective is to assist the fishing and petroleum industries in understanding each sector's operational activities. Members of the One Ocean Board and working group include representatives from FFAW-Unifor, fish processors, and offshore oil and gas operators.

Environmental groups, which have been actively engaged regarding offshore oil and gas activities offshore NL include: Nature Newfoundland and Labrador, the World Wildlife Federation (WWF),

the Canadian Parks and Wilderness Society (CPAWS), the Protected Areas Association of Newfoundland, and the Sierra Club (NL Chapter).

Equinor Canada will build upon the results of its prior and continuing engagement with these key stakeholders as the EIS (if required under CEAA 2012) is prepared to provide information on the Project and address concerns or issues that may be raised by these or other stakeholders.

5 Potential Project-Related Environmental Interactions

Project activities have the potential to interact with, and may result in associated changes to, the receiving environment. Pursuant to CEAA 2012, the Project Description is required to describe potential changes to fish and fish habitat, aquatic species and migratory birds that may be affected by carrying out the Project. The Project Description must also describe any potential interaction or changes to federal or transboundary lands, and potential interactions with or changes to Indigenous groups.

Potential environmental effects may occur as a result of planned Project activities, as well as any unplanned events such as an accident or malfunction.

5.1 Planned Project Components and Activities

Potential planned activities that may result in changes to the environment are described in detail in Chapter 2. The following is summary list of those activities:

- Drilling
- Offshore Construction, Installation and Hook-up and Commissioning
- Production and Maintenance
- Ancillary and Supporting Activities
- Supply and Servicing
- Decommissioning
- Potential Future Development Opportunities

An overview of the potential environmental interactions and/or changes to the environment resulting from planned Project activities, as specified under CEAA 2012, are outlined in Table 5.1. Should an EIS be required, these potential interactions and associated effects assessment will be addressed in the EIS.

Table 5.1 Environmental Components / Issues and Potential Environmental Interactions Relevant to CEAA 2012 – Planned Project Components and Activities

Environmental Component / Issue	Relevant Section(s) of *CEAA 2012*	Potential Environmental Interactions / Changes
Fish, Fish Habitat, and Aquatic Species	5(1)(a)(i) 5(1)(a)(ii)	• Potential changes to water quality and degradation and disturbance to marine benthic habitats due to physical disturbance of the substrate (e.g., installation and presence of subsea infrastructure, discharge of drill cuttings), and discharge of liquid wastes. • Sound and light disturbances associated with presence and operation of the production and drilling installations, vessels, and geophysical surveys, resulting in possible avoidance or attraction by marine biota (fish, mammals, turtles). • Associated direct (injury or mortality) or indirect (alterations of key life history activities and

Environmental Component / Issue	Relevant Section(s) of *CEAA 2012*	Potential Environmental Interactions / Changes
		requirements, such as migration, reproduction, communication, availability and quality of food sources) effects on marine biota.
Migratory Birds	5(1)(a)(iii)	• Attraction and disturbance / disorientation or stranding, potential injury or mortality • Possible health effects due to contamination of individuals and/or their habitats • Potential effects on prey species / food sources
Project Activities Occurring on Federal Lands	5(1)(b)(i)	• The proposed Project Area includes marine areas (lands) that are located beyond Canada's EEZ on the outer continental shelf, whereas some other Project related activities (such as associated supply vessel traffic) will take place within the Canada's EEZ. • Where planned Project components and activities occur on or near such federal lands, any resulting environmental effect described in this Project Description may affect existing environmental conditions on these lands.
Transboundary Issues	5(1)(b)(ii) 5(1)(b)(iii)	• Planned project activities within areas of Canadian jurisdiction are not anticipated to result in changes to the environment outside Newfoundland and Labrador, or outside the marine waters under the jurisdiction of Canada. • Although the direct environmental zone of influence of any Project components and activities occurring within the Canada's jurisdiction are not expected to extend to other jurisdictions, the Project may affect environmental components (such as migratory fish, aquatic species, or birds and air and water quality) that extend to and/or move both within and outside the areas under the jurisdiction of Canada.
Health and Socio-Economic Conditions for Indigenous Peoples	5(1)(c)(i)	• Potential socioeconomic effects on Indigenous fisheries (landings and values) and other marine activities due to biophysical changes (resource availability, distributions, quality), access / interference, damage to equipment or other direct or indirect interactions. • Potential interactions with protected or special marine areas and possible associated effects on their human use and value. • Planned Project activities are not expected to result in any changes to the environment that would have an effect on the health of Indigenous peoples.
Health and Socio-Economic Conditions	5(2)(b)(i)	• Potential socioeconomic effects on fisheries (landings and values) and other marine activities due to biophysical changes (resource availability, distributions, quality), access / interference,

Environmental Component / Issue	Relevant Section(s) of *CEAA 2012*	Potential Environmental Interactions / Changes
		damage to equipment or other direct or indirect interactions. • Potential interactions with protected or special marine areas and possible associated effects on their human use and value. • Planned Project activities are not expected to result in any changes to the environment that would affect health conditions
Physical and Cultural Heritage, or Resources of Historical, Archaeological, Paleontological, or Architectural Significance	5(1)(c)(ii) 5(1)(c)(iv) 5(2)(b)(ii) 5(2)(b)(iii)	• There are no interactions or anticipated changes to these resources as a result of planned Project activities in the Project Area, which is located several hundred kilometers offshore.
Current Use of Lands and Resources for Traditional Purposes by Aboriginal Groups	5(1)(c)(iii)	• Planned project activities are not anticipated to result in any changes to the environment that would have an effect on the current use of land and resources for traditional purposes by Indigenous peoples other than commercial-communal fisheries and associated socioeconomic interactions (discussed above) given the Project Area's water depth and distance from the nearest Indigenous community. • There are no documented food, social, or ceremonial licences within or near the Project Area.
Other Changes to the Environment Directly Related or Necessarily Incidental to a Federal Authority's Exercise of a Power or Performance of a Duty or Function in Support of the Project	5(2)(a)	• Planned Project activities authorized by the C-NLOPB and other federal authorities (see Section 1.3) have the potential to result in changes to the atmospheric environment due to the release of air emissions and generation of noise associated with drilling and production operations.

Relevant environmental planning, management and mitigation measures will be identified and considered integrally in the environmental effects analyses provided as part of the EIS, if required, for the Project.

5.2 Potential Unplanned Events

While unlikely, non-routine activities, or unplanned events that could occur during offshore petroleum development activities include well control events (subsea blowouts), batch spills (e.g., crude, hydraulic fluid, drilling mud, diesel), vessel collisions, and dropped objects. Spill trajectory modelling will be carried out as part of any required EIS to predict areas that could be potentially affected by a blowout and batch spills. Potential environmental interactions or changes may occur within the defined spill area or as a result of migratory species travelling through the affected area.

Equinor's objective in its operations is to ensure safe and efficient operations; spill prevention is the primary focus in all operations. An overview of Equinor Canada's emergency response plans, including spill prevention, preparedness and response measures, will be provided in the EIS, if required.

Table 5.2 provides an overview of the potential environmental interactions that may be associated with unplanned Project components and activities to the environmental components and issues that are specified under CEAA 2012.

Table 5.2 Environmental Components / Issues and Potential Environmental Interactions Relevant to CEAA 2012 – Unplanned Project Components and Activities

Environmental Component / Issue	Relevant Section(s) of *CEAA 2012*	Potential Environmental Interactions / Changes
Fish, Fish Habitat, and Aquatic Species	5(1)(a)(i) 5(1)(a)(ii)	• Changes in the presence, abundance, distribution and/or health of marine fish / other aquatic species, as a result of exposure to accidental spills (including injury or mortality through physical exposure, ingestion, or effects on prey and habitats / water quality).
Migratory Birds	5(1)(a)(iii)	• Changes in the presence, abundance, distribution and/or health of marine birds as a result of exposure to accidental spills (including injury or mortality through physical exposure, ingestion, or effects on prey and important habitats).
Project Activities Occurring on Federal Lands	5(1)(b)(i)	• The proposed Project Area includes marine areas (lands) that are located beyond Canada's EEZ on the outer continental shelf, whereas some other Project related activities (such as associated supply vessel traffic) will take place within Canada's EEZ. • Where Project components and activities and any associated unplanned events (such as an oil spill) occur on or near such federal lands, any associated environmental effects as described in this Project Description may affect existing environmental conditions on these lands.
Transboundary Issues	5(1)(b)(ii) 5(1)(b)(iii)	• An accidental event has the potential to result in transboundary effects (e.g., fish and fish habitat, aquatic species, migratory birds, air quality, water quality) outside the marine waters under the jurisdiction of Canada; no land masses are anticipated to be affected. • Spill trajectory modelling and analyses will assess the nature and geographic extent of any such accidental event and its potential effects.
Health and Socio-Economic Conditions for Indigenous Peoples	5(1)(c)(i) 5(2)(b)(i)	• Potential effects of offshore spills on commercial-communal fishing activities, including closure of commercial-communal fishing areas, reduced catchability, gear damage and reduced market value

Environmental Component / Issue	Relevant Section(s) of *CEAA 2012*	Potential Environmental Interactions / Changes
		• Potential taint/quality and/or contamination of fish species • Potential interactions with protected or special marine areas and associated effects on their human use and value.
Health and Socio-Economic Conditions	5(2)(b)(i)	• Potential effects of offshore spills on commercial fishing activities, including closure of commercial fishing areas, reduced catchability, gear damage and reduced market value • Potential taint/quality and/or contamination of fish species • Potential interactions with protected or special marine areas and associated effects on their human use and value.
Physical and Cultural Heritage, or Resources of Historical, Archaeological, Paleontological, or Architectural Significance	5(1)(c)(ii) 5(1)(c)(iv) 5(2)(b)(ii) 5(2)(b)(iii)	• No interactions or adverse effects are anticipated as a result of unplanned Project activities in this marine environment, which is located several hundred kilometers offshore. • Oil spill modelling and analyses will assess the nature and geographic extent of any such accidental event and its potential effects.
Current Use of Lands and Resources for Traditional Purposes by Aboriginal Groups	5(1)(c)(iii)	• Accidental events may result in changes to the environment that may affect traditional and or cultural use of migratory species, including: o Contamination-related restrictions on traditional fish harvesting activities o Change in the distribution, population size, behavior and/or health of fish and or migratory birds o These changes could potentially occur within the predicted spill trajectory area or as a result of migratory species transiting through the affected area. • Oil spill modelling and analyses will assess the nature and geographic extent of any such accidental event and its potential effects.
Other Changes to the Environment Directly Related or Necessarily Incidental to a Federal Authority's Exercise of a Power or Performance of a Duty or Function in Support of the Project	5(2)(a)	• Accidental events occurring as a result of activities authorized by the C-NLOPB and other federal authorities (see Section 1.3) have the potential to result in temporary and localized changes to the marine environment and air quality.

5.3 Environmental Assessment Scoping Considerations

Based on the initial information and analysis provided above, and in keeping with most recent EAs for similar projects of Newfoundland and Labrador and elsewhere, a preliminary list of potential Valued Components (VCs) upon which any eventual EIS will be focused is provided below:

a) Atmospheric Environment

b) Marine Fish and Fish Habitat (including Species at Risk)

c) Marine and Migratory Birds (including Species at Risk)

d) Marine Mammals and Sea Turtles (including Species at Risk)

e) Special Areas

f) Indigenous Communities and Activities

g) Fisheries and Other Ocean Uses.

Onshore activities, such as supply and servicing and construction and fabrication, will occur at existing facilities which are subject to independent permitting and regulatory requirements.

Equinor Canada recognizes that the scope and focus of any EIS that may be required under CEAA 2012, including the final selection of VCs upon which it will focus, will be informed by and based upon the results of the review processes described previously, including associated input from participating governmental, Indigenous, stakeholder and public interests, and again will be set by the CEA Agency.

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Appendices

App A List of Species That are Likely to Occur or May Occur in the Project Area

Common Name	Scientific Name
Fish / Shellfish	
Acadian redfish	*Sebastes fasciatus*
Albacore tuna	*Thunnus alalunga*
American eel	*Anguilla rostrata*
American plaice	*Hippoglossoides platessoides*
Armed grenadier	*Coryphaenoides armatus*
Atlantic bluefin tuna	*Thunnus thynnus*
Atlantic cod	*Gadus morhua*
Atlantic halibut	*Hippoglossus hippoglossus*
Atlantic herring	*Clupea harengus*
Atlantic mackerel	*Scomber scombrus*
Atlantic salmon	*Salmo salar*
Atlantic wolffish	*Anarhichas lupus*
Barndoor skate	*Dipturus laevis*
Barracudina	Paralepididae
Basking shark	*Cetorhinus maximus*
Bigeye tuna	*Thunnus obesus*
Black dogfish	*Centoscyllium fabricii*
Blacksmelts	*Bathylagus sp.*
Blue hake	*Antimora rostrata*
Blue shark	*Prionace glauca*
Butterfish	Stomiatidae
Capelin	*Mallotus villosus*
Common grenadier	*Nezumia bairdii*
Cup coral	*Flabellum alabastrum*
Cusk	*Brosme brosme*
Deep-sea catshark	*Apristurus* spp.
Deepwater redfish	*Sebastes mentella*
Demosponge	*Iphon piceum*
Dragonfish	*Stomias boa ferox*
Chimera / Smalleyed rabbitfish	*Hydrolagus affinis*
Eelpout	*Lycodes sp.*
Golden redfish	*Sebastes norvegicus*
Greenland halibut	*Reinharditus hippoglossoides*
Greenland shark	*Somniosus microcephalus*
Haddock	*Melanogrammus aeglefinus*
Hookear sculpin	*Artediellus sp*
Icelandic scallop	*Chlamys islandica*
Lanternfish	Myctophidae
Large gorgonian corals	Various species
Large scale tapirfish	*Notacanthus chemnitzii*
Longnose eel	*Synaphobranchus kaupii*
Longfin hake	*Physis chesteri*
Marlin-spike	*Nezumia bairdi*
Monkfish	*Lophius americanus*
Northern sandlance	*Ammodytes dubius*
Northern shrimp	*Panadalus borealis*
Northern wolffish	*Anarhichas denticulatus*
Ogrefish	Melamphaidae

Common Name	Scientific Name
Pollock	*Pollachius virens*
Porbeagle shark	*Lamna nasus*
Roughhead grenadier	*Macrourus berglax*
Roundnose grenadier	*Coryphaenoides rupestris*
Sculpin	*Triglops sp.*
Sea pen	Various species
Short-finned squid	*Illex illecebrosus*
Shortfin mako shark	*Isurus oxyrinchus*
Shortnose snipe eel	*Serrivomer beanii*
Shortspine taprifish	*Polyacanthonotus rissoanus*
Sloane's viperfish	*Chauliodus sloani*
Small gorgonian coral	*Acanella arbuscula*
Smooth skate	*Malacoraja senta*
Snow crab	*Chionoecetes opilio*
Soft coral	*Gersemia sp.; Heteropolypus sol*
Spotted wolffish	*Anarhichas minor*
Spiny dogfish	*Squalus acanthias*
Stony coral	Various species
Swordfish	*Xiphias gladius*
Thorny skate	*Amblyraja radiata*
Threebeard Rockling	*Gaidropsarus ensis*
Vahl's eelpout	*Lycodes vahlii*
Viperfish	*Chauliodus sloani*
White shark	*Carcharodon carcharias*
White hake	*Urophycis tenuis*
Winter skate	*Leucoraja ocellata*
Witch flounder	*Glyptocephalus cynoglossus*
Yellowtail flounder	*Limanda ferruginea*
Marine Mammals	
Atlantic spotted dolphin	*Stenella frontalis*
Atlantic white-sided dolphin	*Lagenorhynchus acutus*
Beluga whale (St. Lawrence Estuary population)	*Delphinapterus leucas*
Blue whale	*Balaenoptera musculus*
Bowhead whale (Eastern Canada-West Greenland population)	*Balaena mysticetus*
Common bottlenose dolphin	*Tursiops truncatus*
False killer whale	*Pseudorca crassidens*
Fin whale	*Balaenoptera physalus*
Harbour porpoise	*Phocoena phocoena*
Humpback whale	*Megaptera novaengliae*
Killer whale	*Orcinus orca*
Long-finned pilot whale	*Globicephala melas*
Minke whale	*Balaenoptera acutorostrata*
North Atlantic right whale	*Eubalaena glacialis*
Northern bottlenose whale	*Phocoena phocoena*
Risso's Dolphin	*Grampus griseus*
Sei whale	*Balaenoptera borealis*
Short-beaked common dolphin	*Delphinus delphis*
Sowerby's beaked whale	*Mesoplodon bidens*
Sperm whale	*Physeter macrocephalus*
Spinner Dolphin	*Stenella longirostris longirostris*
Striped dolphin	*Stenella coeruleoalba*

Common Name	Scientific Name
White-beaked Dolphin	*Lagenorhynchus albirostris*
Seals	
Grey seal	*Halichoerus grypus*
Harbour Seal (Atlantic subspecies)	*Phoca vitulina ssp. concolor*
Harp seal	*Pagophilus groenlandicus*
Hooded seal	*Cystophora cristata*
Sea Turtles	
Kemp's ridley sea turtle	*Lepidochelys kempii*
Green sea turtle	*Chelonia mydas*
Leatherback sea turtle	*Dermochelys coriacea*
Loggerhead sea turtle	*Caretta caretta*
Seabirds	
Arctic Tern	*Sterna paradisaea*
Atlantic Puffin	*Fratercula arctica*
Black Guillemot	*Cepphus grylle*
Black-headed Gull	*Chroicocephalus ridibundus*
Black-legged Kittiwake	*Rissa tridactyla*
Caspian Tern	*Hydroprogne caspia*
Common Murre	*Uria aalge*
Common Tern	*Sterna hirundo*
Cory's Shearwater	*Calonectris borealis*
Double-crested Cormorant	*Phalacrocorax auritus*
Dovekie	*Alle alle*
Glaucous Gull	*Larus hyperboreus*
Great Black-backed Gull	*Larus marinus*
Great Cormorant	*Phalacrocorax carbo*
Great Skua	*Stercorarius skua*
Great Shearwater	*Ardenna gravis*
Herring Gull	*Larus argentatus*
Iceland Gull	*Larus glaucoides*
Ivory Gull	*Pagophila eburnea*
Leach's Storm-petrel	*Oceanodroma leucorhoa*
Long-tailed Jaeger	*Stercorarius longicaudus*
Manx Shearwater	*Puffinus puffinus*
Northern Fulmar	*Fulmarus glacialis*
Northern Gannet	*Morus bassanus*
Pomarine Jaeger	*Stercorarius pomarinus*
Parasitic Jaeger	*Stercorarius parasiticus*
Razorbill	*Alca torda*
Red Phalarope	*Phalaropus fulicarius*
Red-necked Phalarope	*Phalaropus lobatus*
Red Phalarope	*Phalaropus fulicarius*
Ring-billed Gull	*Larus delawarensis*
Sabine's Gull	*Xema sabini*
Sooty Shearwater	*Ardenna grisea*
South Polar Skua	*Stercorarius maccormicki*
Thick-billed Murre	*Uria lomvia*
Wilson's Storm-petrel	*Oceanites oceanicus*

App B Table of Concordance with the Prescribed Information for the Description of a Designated Project Regulations under CEAA 2012

Prescribed Information for the Description of a Designated Project Regulations		Guide to Preparing a Description of a Designated Project under CEAA 2012		Where Addressed in the Project Description
General Information / General Information and Contacts				
1	The project's name, nature and proposed location.	1.1	Describe the nature of the designated project, and proposed location	Section 1.1
2	The proponent's name and contact information and the name and contact information of their primary representative for the purpose of the description of the project.	1.2	Proponent information 1.Name of the designated project. 2.Name of the proponent. 3. Address of the proponent. 4.Chief Executive Officer or equivalent (include name, official title, email address and telephone number). 5.Principal contact person for purposes of the project description (include name, official title, email address and telephone number).	Section 1.2.3
3	A description of and the results of any consultations undertaken with any jurisdictions and other parties including Aboriginal peoples and the public.	1.3	Provide a list of any jurisdictions and other parties including Aboriginal groups and the public that were consulted during the preparation of the project description. (A description of the result of any consultations undertaken is to be provided in sections 6 and 7).	Section 4
4	The environmental assessment and regulatory requirements of other jurisdictions	1.4	Provide information on whether the designated project is subject to the environmental assessment and/or regulatory requirements of another jurisdiction(s).	Section 1.3
4.1	A description of any environmental study that is being or has been conducted of the region where the project is to be carried out	1.5	Provide information on whether the designated project will be taking place in a region that has been the subject of an environmental study.	Section 1.3
Project Information				
5	A description of the project's context and objectives	2.1	Provide a general description of the project, including the context and objectives of the project. Indicate whether the designated project is a component of a larger project that is not listed in the Regulations Designating Physical Activities	Section 1.1
6	The provisions in the schedule to the *Regulations Designating Physical Activities* describing the project in whole or in part.	2.2	Indicate the provisions in the schedule to the *Regulations Designating Physical Activities* that describe the designated physical activities that are proposed to be carried out as part of the designated project	Section 1.3.1

7	A description of the physical works that are related to the project including their purpose, size and capacity	2.3	Provide a description of the components associated with the designated project, including: 1.The physical works associated with the designated project (e.g., large buildings, other structures, such as bridges, culverts, dams, marine transport facilities, mines, pipelines, power plants, railways, roads, and transmission lines) including their purpose, approximate dimensions, and capacity. Include existing structures or related activities that will form part of or are required to accommodate or support the designated project.	Section 2.2
8	The anticipated production capacity of the project and a description of the production processes to be used, the associated infrastructure and any permanent or temporary structures	2.3	2.Anticipated size or production capacity of the designated project, with reference to thresholds set out in the Regulations Designating Physical Activities, including a description of the production processes to be used, the associated infrastructure, and any permanent or temporary structures. The production capacity does not refer to the planned production capacity of a project but the maximum production capacity based on the project's design and operating conditions. 3.If the designated project or one component of the designated project is an expansion, describe the size and nature of the expansion with reference to the thresholds set out in the Regulations Designating Physical Activities	Sections 2.2.1, 2.2.2
9	A description of all activities to be performed in relation to the project	2.3	4.A description of the physical activities that are incidental to the designated project. In determining such activities, the following criteria shall be taken into account: • nature of the proposed activities and whether they are subordinate or complementary to the designated project; • whether the activity is within the care and control of the proponent; • if the activity is to be undertaken by a third party, the nature of the relationship between the proponent and the third party and whether the proponent has the ability to "direct or influence" the carrying out of the activity; • whether the activity is solely for the benefit of the proponent or is available for other proponents as well; and, • the federal and/or provincial regulatory requirements for the activity.	Sections 2.2.1, 2.2.2
10	A description of any waste that is likely to be generated during any phase of the project and of a plan to manage that waste	2.4	Emissions, discharges and waste Provide a description of any waste that is likely to be generated during any phase of the designated project and plans to manage that waste, including the following: 1.Sources of atmospheric contaminant emissions during the designated project phases (focusing on criteria air contaminants and greenhouse gases, or other non-criteria contaminants that are of potential concern) and location of emissions. 2.Sources and location of liquid discharges.	Section 2.4

			3.Types of wastes and plans for their disposal (e.g., landfill, licenced waste management facility, marine waters, or tailings containment facility).	
11	A description of the anticipated phases of and the schedule for the project's construction, operation, decommissioning and abandonment	2.5	5.Construction, operation, decommissioning and abandonment phases and scheduling. Provide a description of the timeframe in which the development is to occur and the key project phases, including the following: 1. Anticipated scheduling, duration and staging of key project phases, including preparation of the site, construction, operation, decommissioning and abandonment. 2.Main activities in each phase of the designated project that are expected to be required to carry out the proposed development (e.g., activities during site preparation or construction might include, but are not limited to, land clearing, excavating, grading, de-watering, directional drilling, dredging and disposal of dredged sediments, infilling, and installing structures).	Sections 2.2, 2.3
Project Location Information				
12	A description of the Project's location, including	3.0	Provide a description of the designated project's location, including:	Section 2.1
(a)	Its geographic coordinates	3.1	1.Coordinates (i.e. longitude/latitude using international standard representation in degrees, minutes, seconds) for the centre of the facility or, for a linear project, provide the beginning and end points.	Section 2.1
(b)	Site maps produced at an appropriate scale in order to determine the project's overall location and the spatial relationship of project components	3.1	2. Site map/plan(s) depicting location of the designated project components and activities. The map/plan(s) should be at an appropriate scale to help determine the relative size of the proposed components and activities. 3.Map(s) at an appropriate scale showing the location of the designated project components and activities relative to existing features, including but not limited to: • watercourses and waterbodies with names where they are known; • linear and other transportation components (e.g., airports, ports, railways, roads, electrical power transmission lines and pipelines); • other features of existing or past land use (e.g., archaeological sites, commercial development, houses, industrial facilities, residential areas and any waterborne structures); • location of Aboriginal groups, settlement land (under a land claim agreement) and, if available, traditional territory; • federal lands[3] including, but not limited to National parks, National historic sites, and reserve lands; • nearby communities; • permanent, seasonal or temporary residences;	Figures 1.1, 2.1, 2.2, 2.3, 2.4, 3.1 to 3.9, 4.1, 4.2

			• fisheries and fishing areas (i.e., Aboriginal, commercial and recreational); • environmentally sensitive areas (e.g., wetlands, and protected areas, including migratory bird sanctuary reserves, marine protected areas, National Wildlife areas, and priority ecosystems as defined by Environment Canada); and, • provincial and international boundaries.	
(c)	The legal description of land to be used for the project, including the title, deed or document and any authorization relating to a water lot			Section 1.3.3
		3.1	4. Photographs of work locations to the extent possible	n/a
(d)	The project's proximity to any permanent, seasonal or temporary residences	3.1	5. Proximity of the designated project to: • any permanent, seasonal or temporary residences; • traditional territories, settlement land (under a land claim agreement) as well as lands and resources currently used for traditional purposes by Aboriginal peoples; and, • any federal lands.	Section 2.1, 3.4.2
(e)	The project's proximity to reserves, traditional territories as well as lands and resources currently used for traditional purposes by Aboriginal peoples			Sections 3.3.2, 3.3.4
(f)	The project's proximity to any federal lands			Section 1.3.3
		3.2	Land and Water Use To the extent that is known at this time, describe the ownership and zoning of land and water that may be affected by the project, including the following. 1.Zoning designations. 2.Legal description of land to be used (including information on sub-surface rights) for the designated project, including the title, deed or document and any authorization relating to a water lot. 3.Any applicable land use, water use (including ground water), resource management or conservation plans applicable to or near the project site. Include information on whether such plans were subject to public consultation. 4.Describe whether the designated project is going to require access to, use or occupation of, or the exploration, development and production of lands and resources currently used for traditional purposes by Aboriginal peoples.	Sections 1.3.3, 3.3, 3.4, 4.2, and 4.3
Federal Involvement				
13	A description of any financial support that federal authorities are, or may be, providing to the project	4.1	Describe if there is any proposed or anticipated federal financial support that federal authorities are, or may be, providing to support the carrying out of the designated project.	Section 1.3.4
14	A description of any federal land that may be used for the purpose of carrying out the project	4.2	Describe any federal lands that may be used for the purpose of carrying out the designated project. This is to include any information on any granting of interest in federal land (i.e., easement, right of way, or transfer of ownership).	Section 1.3.3

15	A list of permits, licences or other authorizations that may be required under any Act of Parliament to carry out the project	4.3	Provide a list of any federal permits, licences or other authorizations that may be required to carry out of the project.	Section 1.3.5
Environmental Effects				
16	A description of the physical and biological setting	5.1	Using existing knowledge and available information provide an overview of the following: 1.A description of the physical and biological setting, including the physical and biological components in the area that may be adversely affected by the project (e.g., air, fish, terrain, vegetation, water, wildlife, including migratory birds, and known habitat use).	Sections 3.3, 3.3
17	A description of any changes that may be caused, as a result of carrying out the project, to	5.2	A description of any changes that may be caused as a result of carrying out the designated project to:	
(a)	fish and fish habitat as defined in subsection 2(1) of the *Fisheries Act;*	(a)	Fish and fish habitat, as defined in the *Fisheries Act*	Sections 5.1, 5.2
(b)	aquatic species, as defined in subsection 2(1) of the *Species at Risk Act*; and			Sections 5.1, 5.2
		(b)	marine plants, as defined in the *Fisheries Act*; and	Sections 5.1, 5.2
(c)	migratory birds, as defined in subsection 2(1) of the *Migratory Birds Convention Act, 1994*	(c)	migratory birds, as defined in the *Migratory Birds Convention Act*, 1994	Sections 5.1, 5.2
18	A description of any changes to the environment that may occur, as a result of carrying out the project, on federal lands, in a province other than the province in which the project is proposed to be carried out or outside of Canada.	5.3	A description of any changes to the environment that may occur, as a result of carrying out the designated project, on federal lands, in a province other than the province in which the project is proposed to be carried out, or outside of Canada	Sections 5.1, 5.2
19	Information on the effects on Aboriginal peoples of any changes to the environment that may be caused as a result of carrying out the project, including effects on health and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes or on any structure, site or thing that is of historical,	5.4	A description of the effects on Aboriginal peoples of any changes to the environment that may be caused as a result of carrying out the designated project, including effects on health and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes, or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.	Sections 5.1, 5.2

	archaeological, paleontological or architectural significance.			
Proponent Engagement and Consultation with Aboriginal Groups				
		6.0	Provide the following information to the extent that it is available or applicable:	
		6.1	A list of Aboriginal groups that may be interested in, or potentially affected by, the designated project.	Section, 3.4.2, 3.4.4, 4.2
		6.2	2.A description of the engagement or consultation activities carried out to date with Aboriginal groups, including: • names of Aboriginal groups engaged or consulted to date with regard to the designated project; • date(s) each Aboriginal group was engaged or consulted; and, • means of engagement or consultation (e.g., community meetings, mail or telephone).	Section 4.2
		6.3	An overview of key comments and concerns expressed by Aboriginal groups identified or engaged to date, including any responses provided to these groups.	Section 4.2
		6.4	A consultation and information-gathering plan that outlines the ongoing and proposed Aboriginal engagement or consultation activities, the general schedule for these activities and the type of information to be exchanged and collected (or, alternatively, an indication of why such engagement or consultation is not required).	Section 4.2
Consultation with the Public and Other Parties (other than Aboriginal consultation included above)				
		7.0	Provide the following information to the extent that it is available or applicable	
		7.1	An overview of key comments and concerns expressed to date by stakeholders and any responses that have been provided.	Section 4
		7.2	An overview of any ongoing or proposed stakeholder consultation activities	Section 4
		7.3	A description of any consultations that have occurred with other jurisdictions that have environmental assessment or regulatory decisions to make with respect to the project.	Section 4.1
Summary				
20	A summary of the information required under sections 1 to 19	8.0	Proponents are to include as part of the project description a standalone section that summarizes the information identified in Sections 1 to 7 of this Guide	Provided under separate cover