Statoil Canada Ltd. - East Coast Operations
Newfoundland and Labrador Offshore Area
2017 Environmental Assessment Update

SC-CNO-0019-17

March 2017

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1 Introduction

Environmental assessments for offshore oil and gas exploration and production activities are scoped for multiple activities that are typically carried out over multiple years. The Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB), in its environmental assessment decisions requires that operators, when applying for an operations authorization submit information confirming that the proposed activities fall within the scope of the previously approved environmental assessment, indicate if the EA predictions remain valid, and provide an update on species at risk. The information provided herein provides the information to support the above requirements and notes any changes that need to be addressed.

In support of ongoing exploration activity in the Flemish Pass area, Statoil Canada Limited (SCL) proposes to continue its exploration/delineation and appraisal well drilling program in 2017. SCL is in the process of obtaining an Operations Authorization from the C-NLOPB to carry out its drilling activities. In support of drilling operations, wellsite and coral video surveys, and environmental sampling may be required.

The scope of the ongoing drilling operations and supporting surveys were assessed under the approved environmental assessments and associated amendments noted in Table 1. An amendment to the original EA is currently under review by the C-NLOPB which addresses the following proposed modifications to the project scope: change in the temporal scope, increase to number of wells drilled, addition of batch drilling, wellhead decommissioning, and environmental surveys.

This document provides the necessary update to the existing environmental assessments for the proposed ongoing exploration drilling operations and is intended to support the regulatory approval process for Statoil's 2017 activities by ensuring that the scope of the assessment and the mitigations committed to in the environmental assessments remain valid.

Table 1 - Existing Environmental Assessment Approvals for Statoil 2015 Survey Activities

EA Report Title	Temporal Scope	C-NLOPB EA reference no.
Environmental Assessment of StatoilHydro Canada Ltd. Exploration and Appraisal/Delineation Drilling Program for Offshore Newfoundland, 2008-2016, and associated EA amendments and updates (amendment in progress – dated June 2016)	Year-round, 2008-2016 inclusive (2016 amendment to extend temporal scope of 2019- in progress)	CEAR No. 07-01-32083
Revised Amendment to the Environmental Assessment of StatoilHydro Canada Ltd. Exploration & Appraisal/Delineation Drilling Program for Offshore Newfoundland, 2008-2016: 2015 Geotechnical Program. July 2015. Document # RE-PM539-00005	Summer/Fall of 2015 through end 2016	Approval Letter from C-NLOPB RE: Statoil Canada Limited Exploration / Appraisal / Delineation Drilling Program, 2008-2016 Environmental Assessment Amendment

2 Environmental Assessment Update

2.1 Project Description and Scope

This environmental assessment and associated amendments addressed the potential for drilling up to 40 delineation and/or exploration wells from semi-submersible or jack-up mobile drilling units or drill ships. At the end of 2016, 17 wells (including side-tracks) have been drilled within the Project Area. It also assessed the effects of geophysical (well site surveys) and geotechnical (borehole drilling and/or sediment sampling) and environmental surveys associated with the potential use of a jack-up drilling platform and remotely operated vehicle (ROV) surveys and vertical seismic profiles (VSP) surveys.

2.2 Geographic Scope

The Project Area, as defined in the original EA is illustrated in Figure 1. The coordinates of the Project Area from the original EA are as follows:

- 49° North & 49.5° West
- 49° North & 45.5° West
- 46° North & 49.5° West
- 46° North & 45.5° West

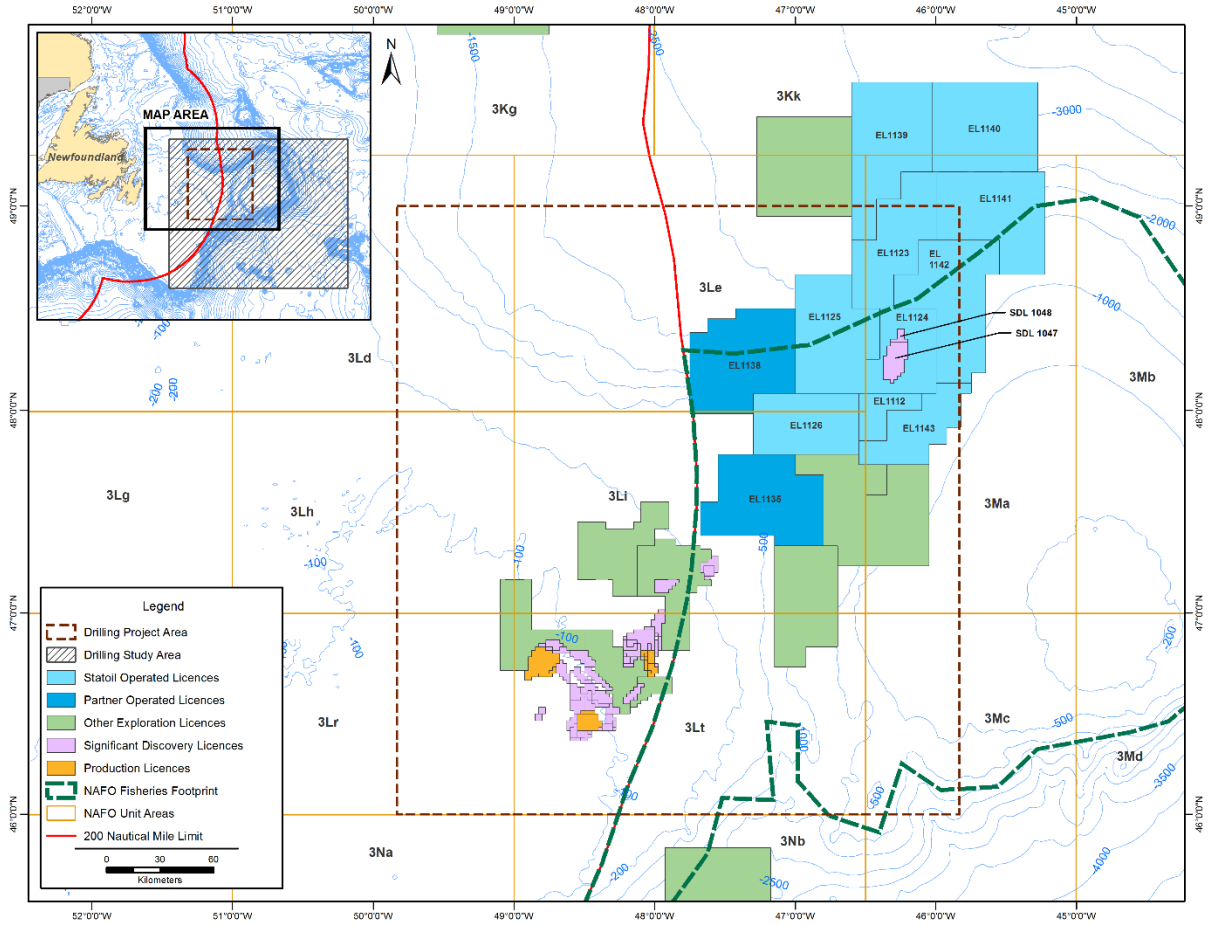

Figure 1: 2008 Drilling EA Project Area

2.3 Temporal Scope

All activities scoped in the original environmental assessment and associated amendments could be carried out year round from 2008 through to the end of 2016. An EA amendment to extend the temporal scope to 2019 is currently under review by the C-NLOPB.

2.4 Planned activities for 2017

For 2017, it is planned to drill two wells on EL 1143 and SDL 1047, with a potential to drill an appraisal well on SDL 1047. Sidetracks may also be drilled. Drilling locations for the first two wells are tentative and are shown on Figure 6.

The plans for these wells also include provision for Vertical Seismic Profile (VSP) surveys. SCL will also conduct an ROV surveys at any or all of these locations prior to spud for seabed obstructions and nearby presence of corals in accordance with the conditions of approval of the original environmental assessment. SCL may also conduct geo-hazard site surveys as necessary at these well site locations during this exploration drilling program in 2017. If required, environmental surveys may be carried out. In preparation for MODU arrival at each of the drilling locations, transponders will be laid on the seabed and metocean equipment will be deployed.

Wellhead decommissioning for the planned well will be carried out either at the end of each well or program with the MODU or at the end of the drilling campaign with a vessel capable of carrying out the activity. Wellhead decommissioning will follow the protocol outlined in the 2016 EA amendment, which is currently being considered by the C-NLOP, and as described here (Statoil 2016).

- In water depths less than 500 m, wellheads will be removed by cutting below the seafloor;
- In water depths between 500 m and 1,500 m, wellheads will be removed by cutting the wellhead externally, leaving a portion of the casing above the seafloor (maximum of 0.85 m); and
- In water depths greater than 1,500 m, the wellhead will remain in place and will not be removed.

For external cutting of the wellhead, this will involve the use of an offshore supply vessel using an exterior diamond wire cutting saw via ROV to cut and remove the wellheads above the sea floor. Cutting of the wellheads above the seafloor will be completed as close to the natural seabed as practicably and technically feasible. A pipe stub with a maximum height of approximately 0.85 m will remain above the seabed. For each wellhead that is decommissioned using this technique, it is anticipated that it may take up to two days to complete the removal.

3 Environmental Aspects

This section addresses the environmental aspects drilling programs and supporting surveys, as described above. As in previous updates this section considers commercial fisheries, species at risk and corals and sponges.

3.1 Commercial Fisheries

Figures 2-5 illustrate the pattern of fishing activity in 2015 for all commercial species, based on Canadian catch data as obtained from DFO with respect to the Study and Project Areas. Fishing activities in the Study Area have not changed significantly since the environmental assessment reports were accepted and the overall program approved.

The information portrayed in these figures is based on data derived from Fisheries and Oceans databases (up to and including 2015 Canadian catch data) including research vessel and underutilized species information. This pattern of activity is consistent with that documented in the original environmental assessments and subsequent updates and recent environmental assessments by other offshore operators that have geographic and temporal scopes for their operations that overlap SCL's.

SCL reviewed DFO's fishing activity information for commercial species of interest including Snow crab, northern shrimp, Greenland halibut (Figures 2-5), cod, redfish, and American plaice (Appendix 2). SCL is aware that Redfish will likely be fished by NAFO fishing vessels in the area of the Flemish Pass as part of their activities within the NAFO "footprint" outside Canada's 200 nautical mile Exclusive Economic Zone (EEZ). The "footprint" is an area outside the EEZ defined by the fishing activity of NAFO vessels over a 20-year period (NAFO 2009). That part of the "footprint" overlapping the area of SCL's proposed activities is shown in Figure 6.

The fisheries quota's allocated to NAFO vessels for 2017 are described in NAFO/FC Doc 17/01 (NAFO 2017). This document indicates total allowable catches of 10,966 T for Greenland halibut and 41,200 for redfish. The NAFO data cannot provide definitive information as to what extent these quotas will be taken in SCL's drilling EA Project Area, it does indicate that there will be a need to coordinate SCL's offshore operations with foreign fishing vessels in the Flemish Pass area using the measures committed to in the environmental assessments that govern its activities.

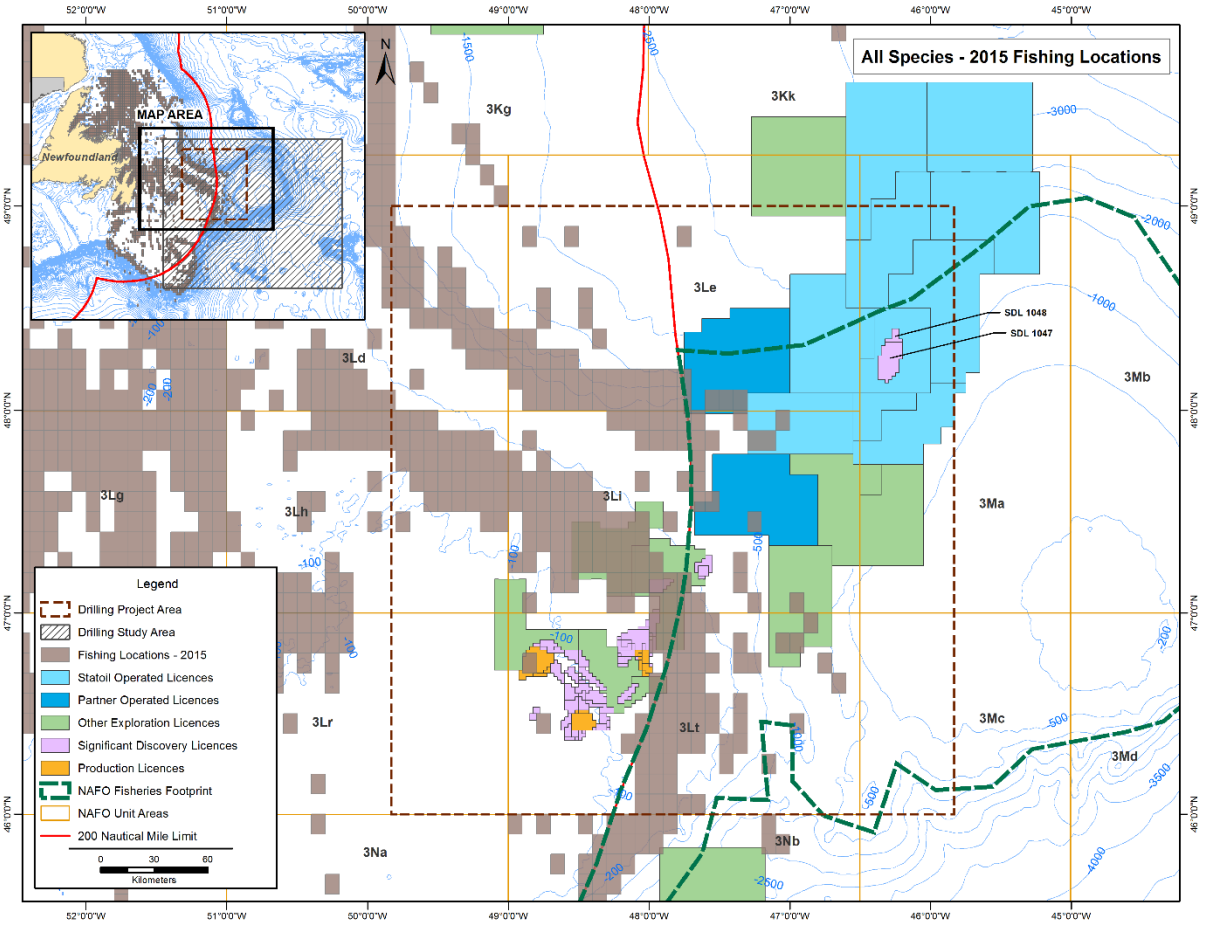

Figure 2: Pattern of Canadian fishing activity for 2015 for all commercial species in relation to the Drilling EA Project Area (Canadian data only)

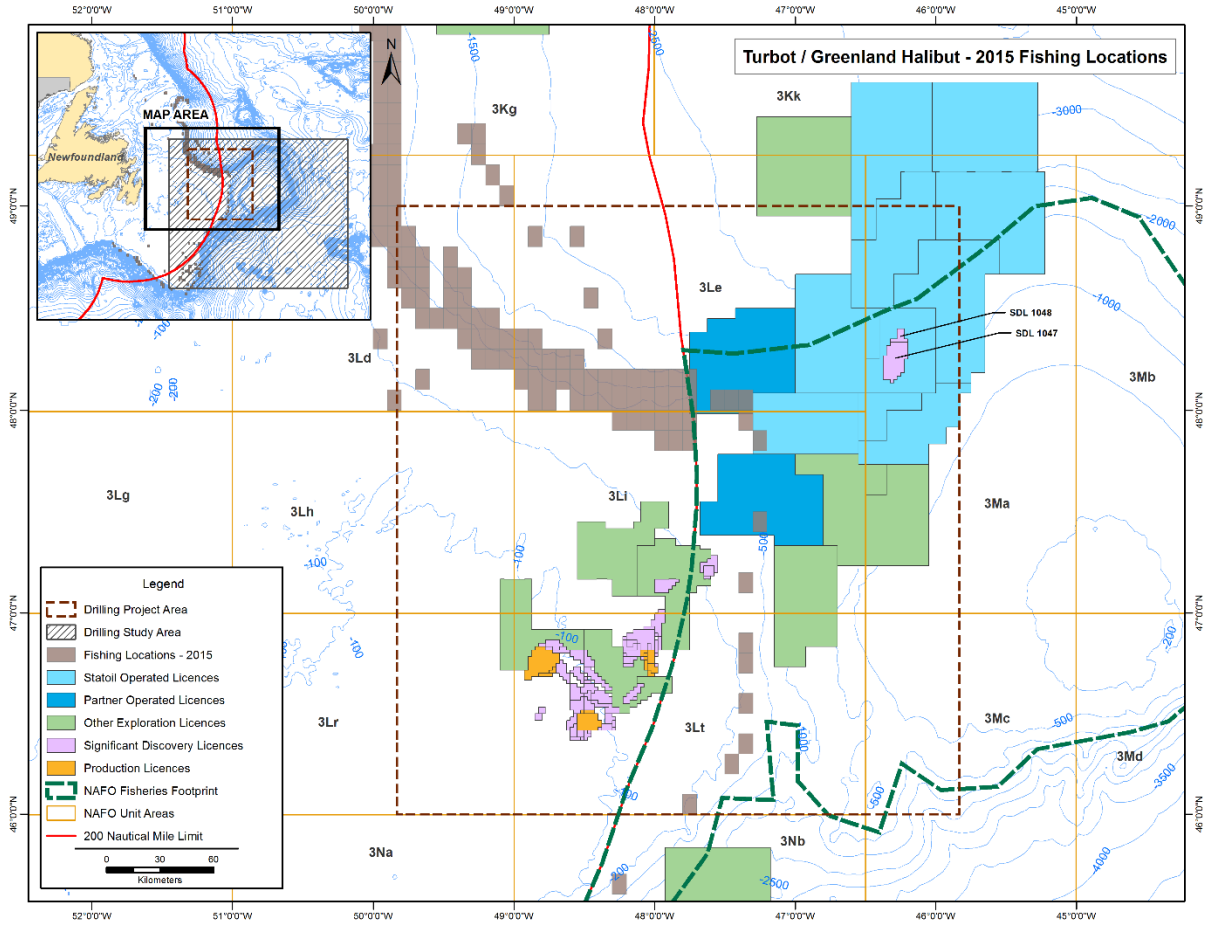

Figure 3: Pattern of Greenland Halibut Fishing Activity for 2015 (Canadian data only)

From the perspective of the current high value domestic fisheries – snow crab and shrimp – these species are harvested within the Project Area but not within Statoil licences. Figures 4 and 5 show the 2015 patterns of Canadian fishing activity for snow crab and northern shrimp. The pattern of activity shown for these species is showing a decline in fishing activity in the Project Area as compared to the original 2008 EA.

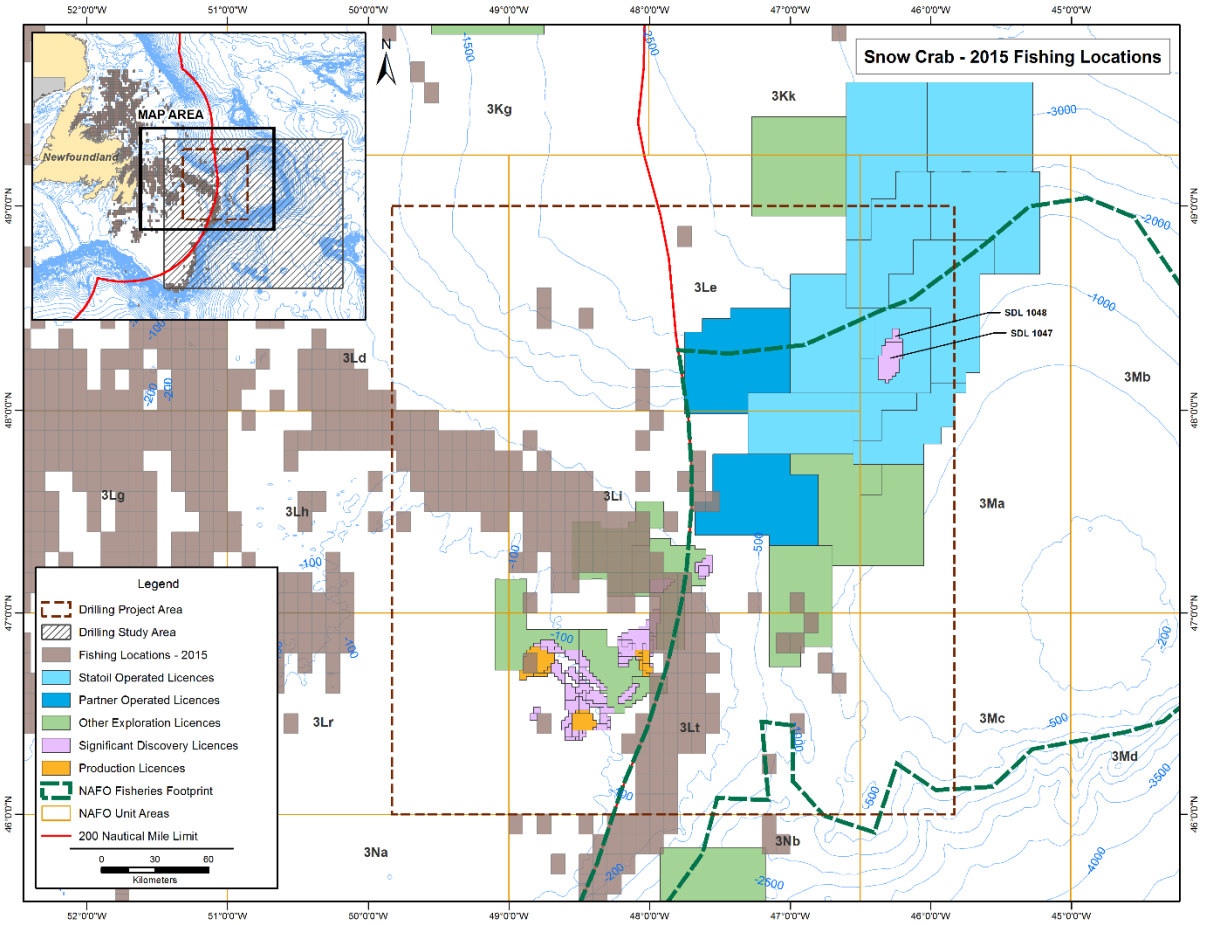

Figure 4: Pattern of Snow Crab Fishery in 2015 (Canadian data only)

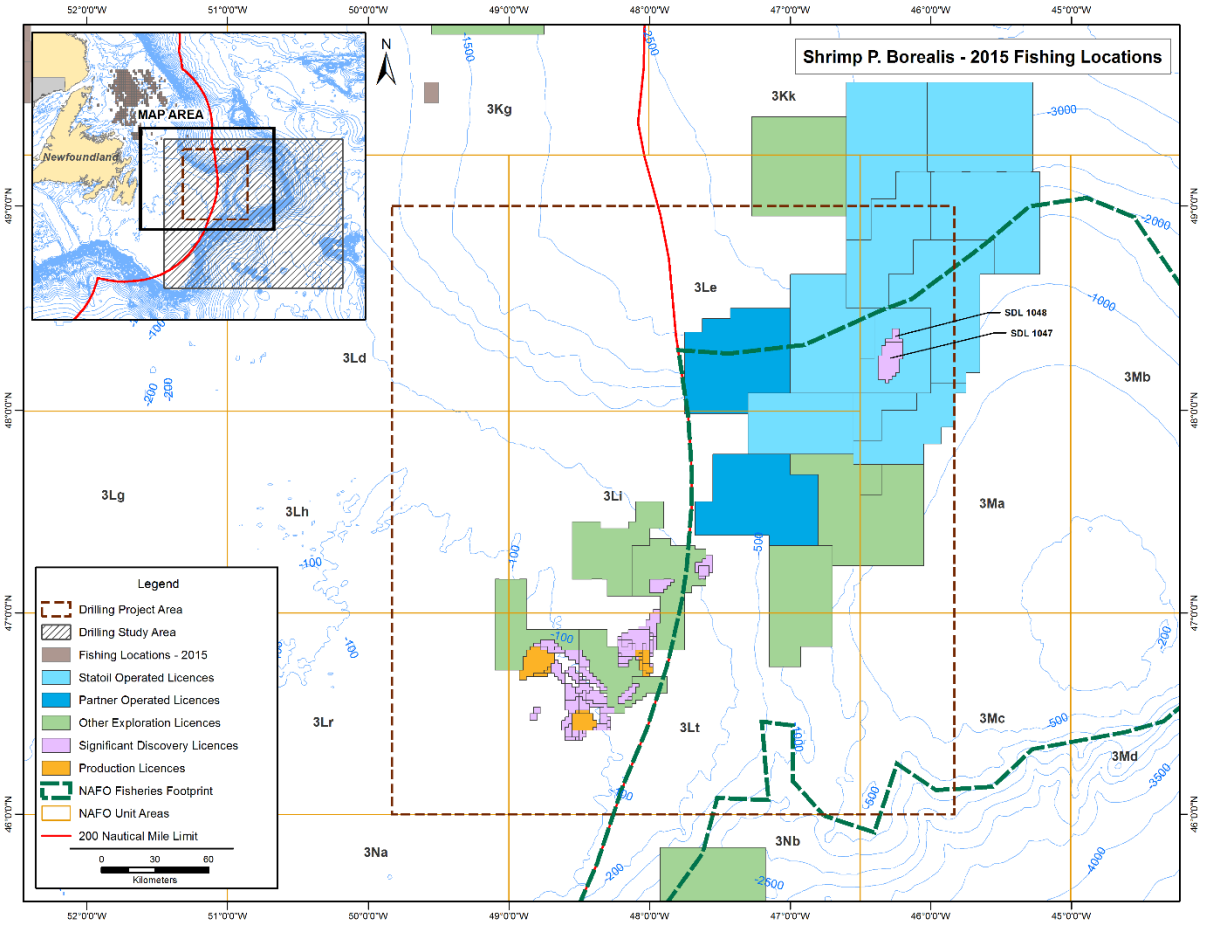

Figure 5: Pattern of Northern Shrimp Fishery in 2015 (Canadian data only).

3.2 Engagement

Information regarding planned 2017 drilling activities was provided to Fish Food and Allied Workers Union (FFAW-Unifor), the Association of Seafood Producers (ASP), Ocean Choice International (OCI), Groundfish Enterprise Allocation Council (GEAC) and One Ocean. There is also ongoing liaison with the fishing industry through the regular meetings of the One Ocean Technical Working Group that involves representatives from the various operating oil and gas companies and fishing interests.

SCL recognizes that other countries fish outside Canada's 200 nm Exclusive Economic Zone. In an attempt to minimize potential conflict, SCL will inform Canada's representative

on NAFO regarding 2017 activities and communicate all Notices to Shipping to the NAFO Secretariat in Halifax, Nova Scotia via Fisheries and Oceans Canada.

SCL also understands that it is important to recognize that harvesters fish a resource, and not fixed points from year to year. Fishing licenses are issued for large areas (e.g. NAFO subdivisions 3K or 3L) and fishing activity could take place anywhere within these areas and not just at the pattern of locations fished in recent years indicated by Fisheries and Oceans data. This means that that the operator should continue to consult with the fishing industry on a regular basis to keep up to date with trends in fishing from year to year through mechanisms noted above.

SCL will continue to keep fishing interests informed of these activities during the operational planning and execution phases. This will be done through the established One Ocean and FFAW contacts and others as deemed necessary or as advised.

SCL recognizes that communication and coordination between oil and gas industry activities and fishing interests are critical to avoid or minimize interference with either industries offshore operations. Key to achieving this from SCL's perspective is:

- Ongoing communications with all commercial fish harvesters in the Project area including FFAW-Unifor Fish Food and Allied Workers Union-Unifor (FFAW-Unifor), Ocean Choice International (OCI), Association of Seafood Producers (ASP), North Atlantic Fisheries Organization (NAFO) (through DFO), and One Ocean
- Ensuring clear protocols for reporting with respect to any fisheries issues that may arise to SCL, FFAW and the C-NLOPB as well as routine operational reporting
- Issuances of Notices to Shipping

3.3 Research Vessel Surveys by Fisheries and Oceans Canada

Fisheries and Oceans Canada (DFO) undertakes annual fisheries research surveys in the Newfoundland and Labrador Offshore area. Table 2 provides a tentative schedule for DFO research surveys for 2017 (D. Power, DFO - personal communication). SCL will coordinate with DFO on an ongoing basis to determine if overlaps in time and space are likely and what measures are required to manage any potential interactions.

Table 2: DFO Research Vessel (2017)

Vessel	Activity	NAFO Division	Tentative Start Date	Tentative End Date
CCGS Needler	NL Spring Survey	3P	March 31	April 11
		3P	April 12	April 25
		3P+3O	April 26	May 9
		3O+3N	May 9	May 23
		3L+3N	May 24	June 10
	Shellfish Survey	2J+4R	August 31	September 12
	NL Fall Survey	3O	September 13	September 26
		3O+3N	September 26	October 10
		3N+3L	October 11	October 24
		3L	October 24	November 7
		3K+3L	November 8	November 21
			November 21	December 2
CCGS Teleost	NL Spring AZMP[1]	3L	April 4	April 25
	Capelin Survey	3KL	May 2	May 23
	NL Summer AZMP[1]		July 8	July 29
	NL Fall Survey	2H	October 5	October 10
		2H+2J	October 11	October 24
		2J+3K	October 24	November 7
		3K	November 8	November 21
		3K+3L Deep	November 21	December 5
			December 6	December 20

[1] Atlantic Zone Monitoring Program
Source: D Power, DFO-NL (2017)

There is also an annual Industry - DFO Collaborative Post-Season Trap Survey for snow crab, which is conducted using commercial and modified snow crab traps at established trap stations. The survey typically starts in late August or early September after the commercial snow crab season has ended (see Appendix 3). Recent discussions with DFO representatives indicate that the plans for the 2017 surveys are not yet available (D Mullowney, DFO – NL, personal communication).

3.4 Corals and Sponges

Drilling will involve the use of water-based and synthetic based muds. Potential effects on corals and sponges associated with the deposition of drill cutting from the drilling activities were assessed in the original environmental assessment and subsequent amendments.

Information on these species was provided in the original assessment as well as in the C-NLOPB Strategic Environmental Assessment for the Eastern NL Shelf (CNLOPB 2014).

Figure 6 provides an illustration of the location of the NAFO closure areas for the protection of vulnerable marine ecosystems in relation to Statoil's exploration licences in the Project area. Tentative drilling locations for the proposed two wells are identified on the figure.

The mitigation measure specified in the C-NLOPB's acceptance of the original environmental assessment, which calls for a survey of the spud location for corals and a setback of the final spud location by 100 meters from any coral colonies defined as either a Lophelia pertusa reef complex or 5 or more corals larger than 30 centimetres in height or width, still applies.

Given the location of the coral and sponge habitat closure areas, nature of drill cuttings deposition and the mitigation measure noted above, the conclusions of the original environmental assessment on this issue remain valid.

3.5 Species at Risk

An updated listing of Species at Risk Act (SARA) and Committee on the Status of Endangered Wildlife in Canada (COSEWIC) listed species for the Grand Banks area of relevance to this assessment is provided in Appendix 1. Appendix 1 also provides a listing of COSEWIC candidate species under consideration. SARA listed species with final recovery strategies in place are noted.

The draft 2015 "Recovery Strategy for the Northern Wolffish and Spotted Wolffish and Management Plan for the Atlantic Wolffish" (Fisheries and Oceans 2015) identifies critical habitat for the Northern and Spotted Wolffish. The critical habitat identified falls within the EA Project Area but does not appear to overlap with SCL activities in the Flemish Pass area.

It is noted that the North Atlantic Right Whale does have a critical habitat statement pursuant to SARA. However, based on sightings to date, it is an infrequent visitor to the Study Area. Furthermore, the critical habitat designated for this species is located in the Grand Manan Basin in the Bay of Fundy. Similarly, the Leatherback Sea Turtle, which can occur in the Study Area, has had potential but not formally designated critical habitat areas identified in recent years (DFO, 2013). Again, these areas do not occur within the Study Area.

A review of the SARA species-specific recovery plans and the one critical habitat statement in place, as noted in Appendix 1, does not indicate that any new or modified mitigation measures are required beyond those already committed to by SCL for the scope of the operations addressed by the environmental assessments relevant to the activities described in this update.

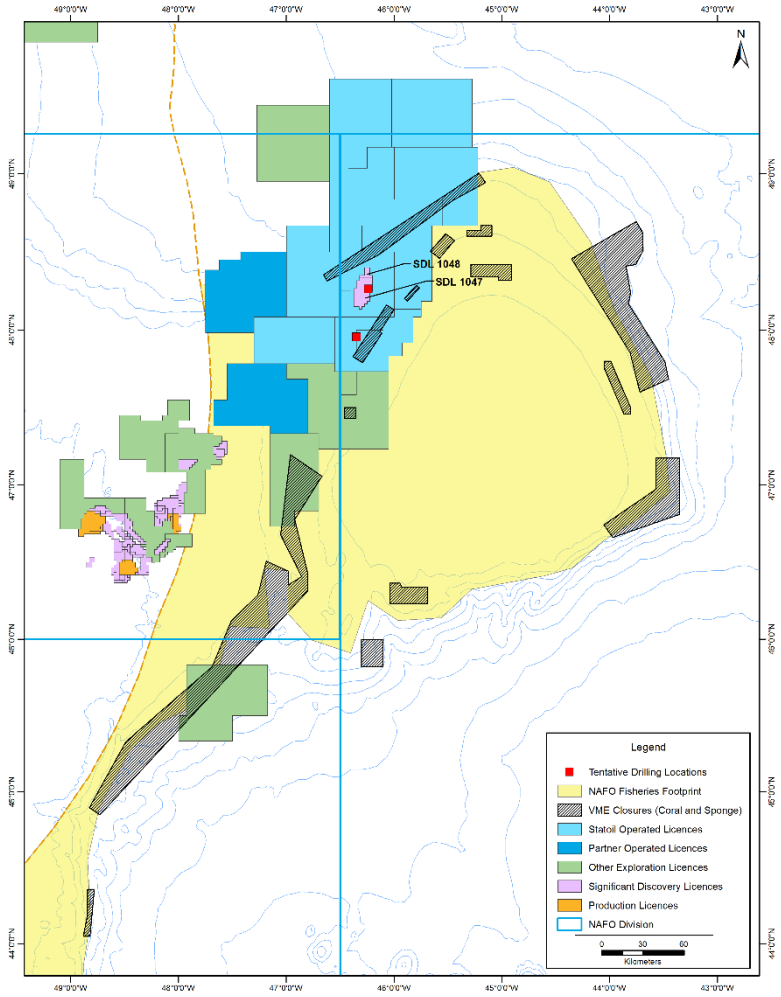

Figure 6: NAFO Bottom Fishing Closure Areas and Tentative Drilling Locations in Flemish Pass

3.6 Mitigations

Statoil regards the environmental predictions, consequent mitigations and subsequent significance determination as cited in the original 2008 environmental assessment and

approved amendments as valid and re-commits to implementing these mitigation measures for the activities to be carried out under the scope of this assessment this year.

Mitigations to be implemented, as stated in the original environmental assessments (and approved EA Amendments) include the following:

- Communication procedures with commercial fishers to avoid conflicts with fishery
- Marine mammal and seabird observations
- Gear and vessel compensation program
- Handling and release of stranded seabirds
- Notices to Shipping
- For geohazard/wellsite surveys, mitigations will follow those defined in Appendix 2 of Geophysical, Geological, Environmental and Geotechnical Program Guidelines (C-NLOPB 2016)

4 Concluding Statement

The activities SCL plans to carry out in 2017 have been reviewed and assessed to be within the scope environmental assessment currently in place to address those activities, specifically:

- The scope and nature of activities planned and addressed under the original EA and approved EA amendments have not changed
- The nature of the species at risk in the Project and Study areas have been validated and no new species has been added to Schedule 1 of SARA nor to COSEWIC listings
- As noted previously in this update, no critical habitats for any of these species defined pursuant to the Species at Risk legislation occur in the EA Study Area
- The nature and extent of the fishing activities being undertaken in the EA Project Area have been validated and have not changed such that project activities pose any potential effects not previously assessed
- The mitigation measures defined and committed to in the environmental assessment are still valid and will continue to be implemented

Statoil continues to consult with stakeholders directly affected by the activities planned under the approved environmental assessment.

The environmental effects predicted in the previously approved environmental assessments and subsequent amendments remain valid. Statoil reaffirms its commitment to implement the mitigation measures proposed in these assessments and in the Screening Decisions made by the C-NLOPB.

5 References

C-NLOPB. 2016. Geophysical, Geological, Environmental and Geotechnical Program Guidelines.

Fisheries and Oceans Canada. 2013. Report on the Progress of Recovery Strategy Implementation for the Leatherback Sea Turtle (Dermochelys coriacea) in Canada for the Period 2007-2012. Species at Risk Act Recovery Strategy Report Series. Fisheries and Oceans Canada, Ottawa.

Fisheries and Oceans. 2015. Draft Recovery Stratey for Northen Wolffish (Anarhicas denticulatus) and Spotted Wolffish (Anarhicas minor), and Management Plan for Atlantic Wolffish (Anarhicas lupus) in Canada [Draft]. Fisheries and Oceans Canada: Newfoundland and Labrador Region. St. John's NL viii +81 p.

LGL Limited. 2008. Environmental Assessment of StatoilHydro Canada Ltd. Exploration and Appraisal/Delineation Drilling Program for Offshore Newfoundland, 2008-2016. LGL Rep. SA947b. Rep. by LGL Limited, Canning & Pitt Associates Inc., and Oceans Ltd., St. John's, NL, for StatoilHydro Canada Ltd., St. John's, NL. 292 p. + appendices

NAFO 2017. Northwest Atlantic Fisheries Organization Conservation and Enforcement Measures NAFO/FC Doc. 17/01 Serial No. N6638

Statoil Canada Ltd. 2016. 2016 Amendment to the Environmental Assessment Statoil Canada Ltd. Exploration and Appraisal / Delineation Drilling Program for Offshore Newfoundland, 2008-2016. Revised February 2017.

APPENDICES

Appendix 1 - Listing of SARA[1] and COSEWIC Listed Species in the Statoil Project Area

Family	Species		Federal		Provincial
	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	
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*		Threatened	
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	*Malacoraja*		Endangered	

[1] *Green Shade means that Recovery Strategies, Action Plans and/or Management Plans have been issued for the species. Footnotes for each species will provide information regarding the status of these plans and strategies.*

Family	Species		Federal		Provincial
	Common Name	Scientific Name	SARA Status (Schedule 1)	COSEWIC Designation	
	(Funk Island Deep Population)	*senta*			
Rajidae	Thorny skate	*Amblyraja radiata*		Special Concern	
Rajidae	Winter Skate (Eastern Scotain 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	
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	*Hyperoodon ampullatus*	Endangered (Scotian Shelf population)	Special Concern (Davis Strait, Baffin Bay, Labrador Sea population); Endangered	

Family	Species		Federal		Provincial
	Common Name	**Scientific Name**	**SARA Status (Schedule 1)**	**COSEWIC Designation**	
	Shelf population			(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	

Appendix 2: Fishing Activity Maps for Cod, Redfish, American Plaice

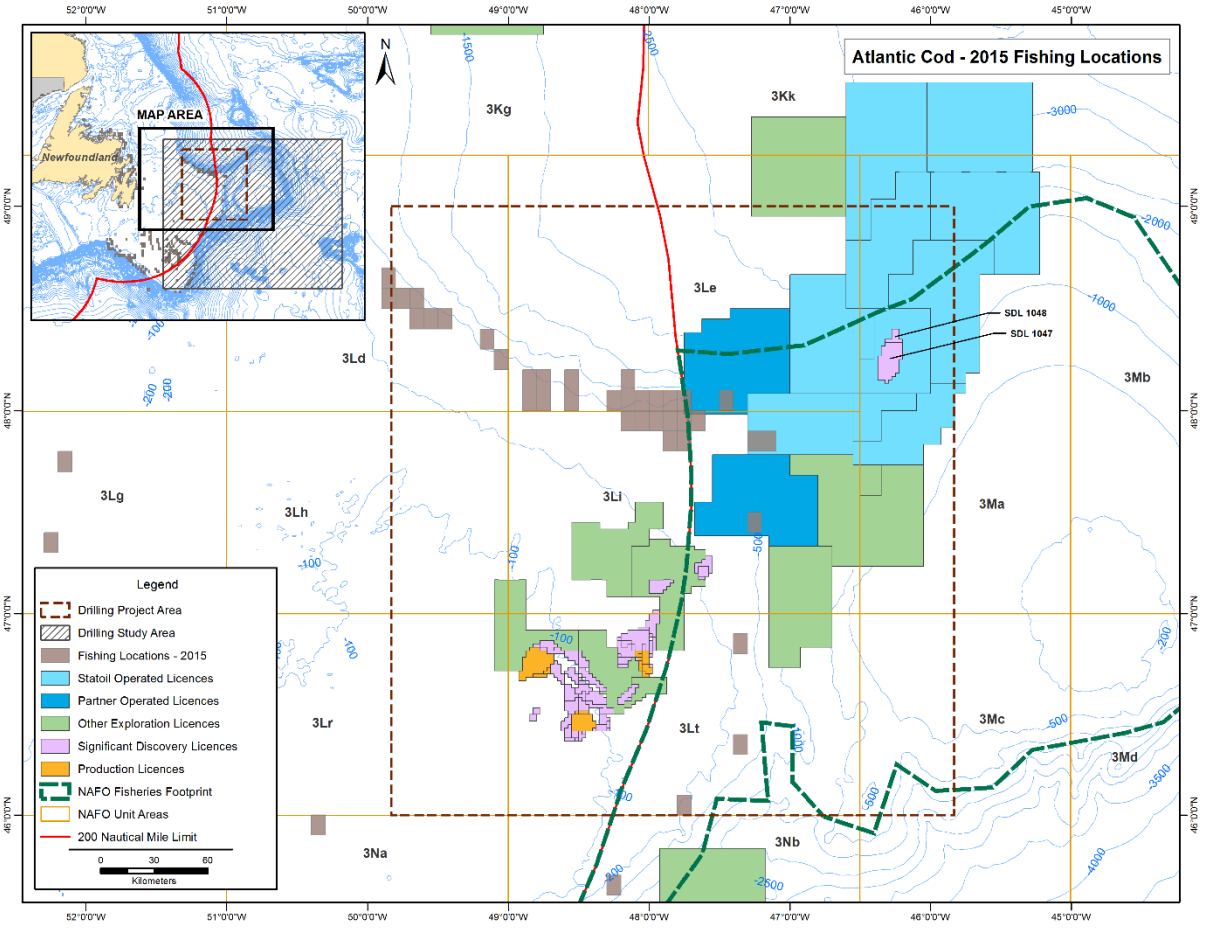

Figure A1: Canadian domestic fishing activity for Atlantic Cod in 2015 from DFO data

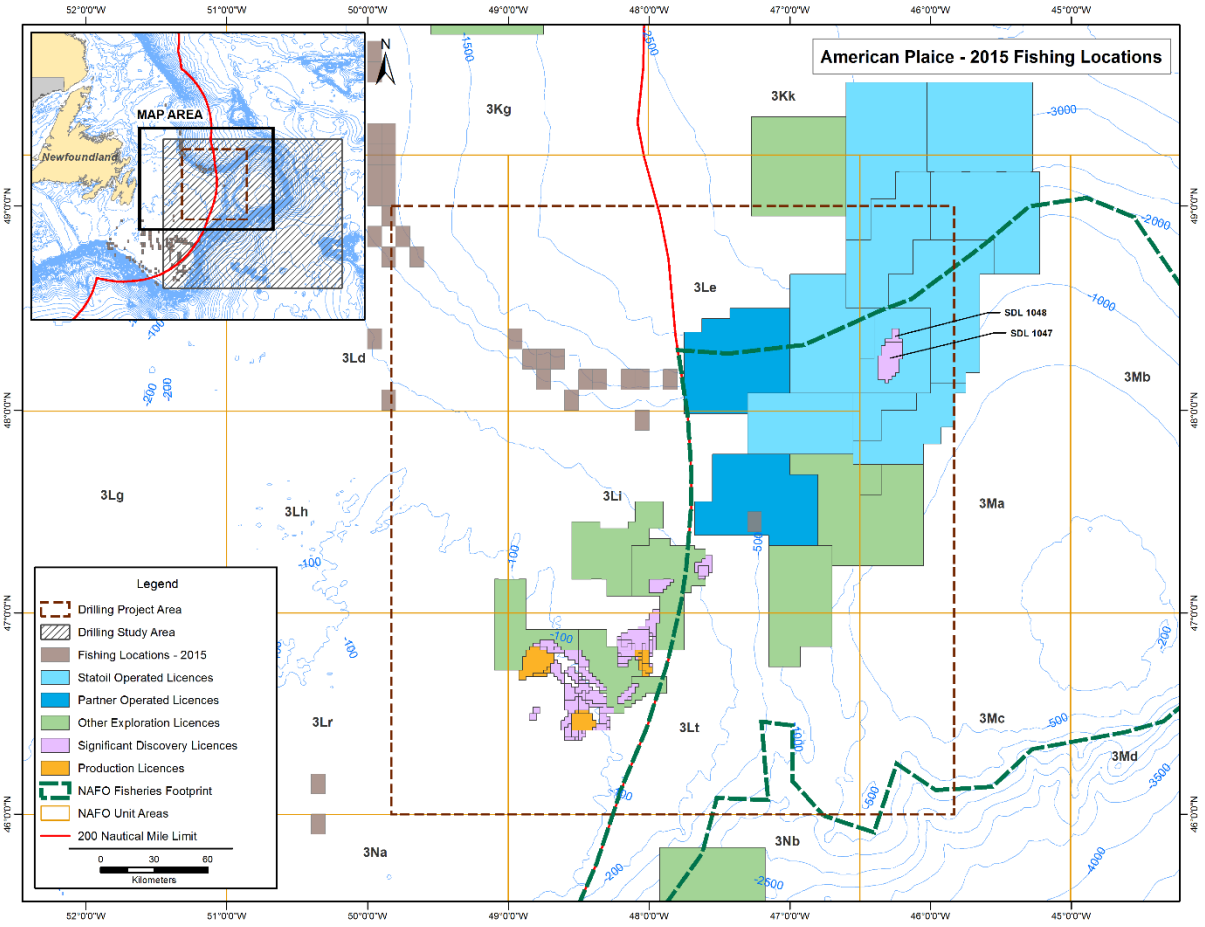

Figure A2: Canadian domestic fishing activity for American Plaice in 2015 from DFO data.

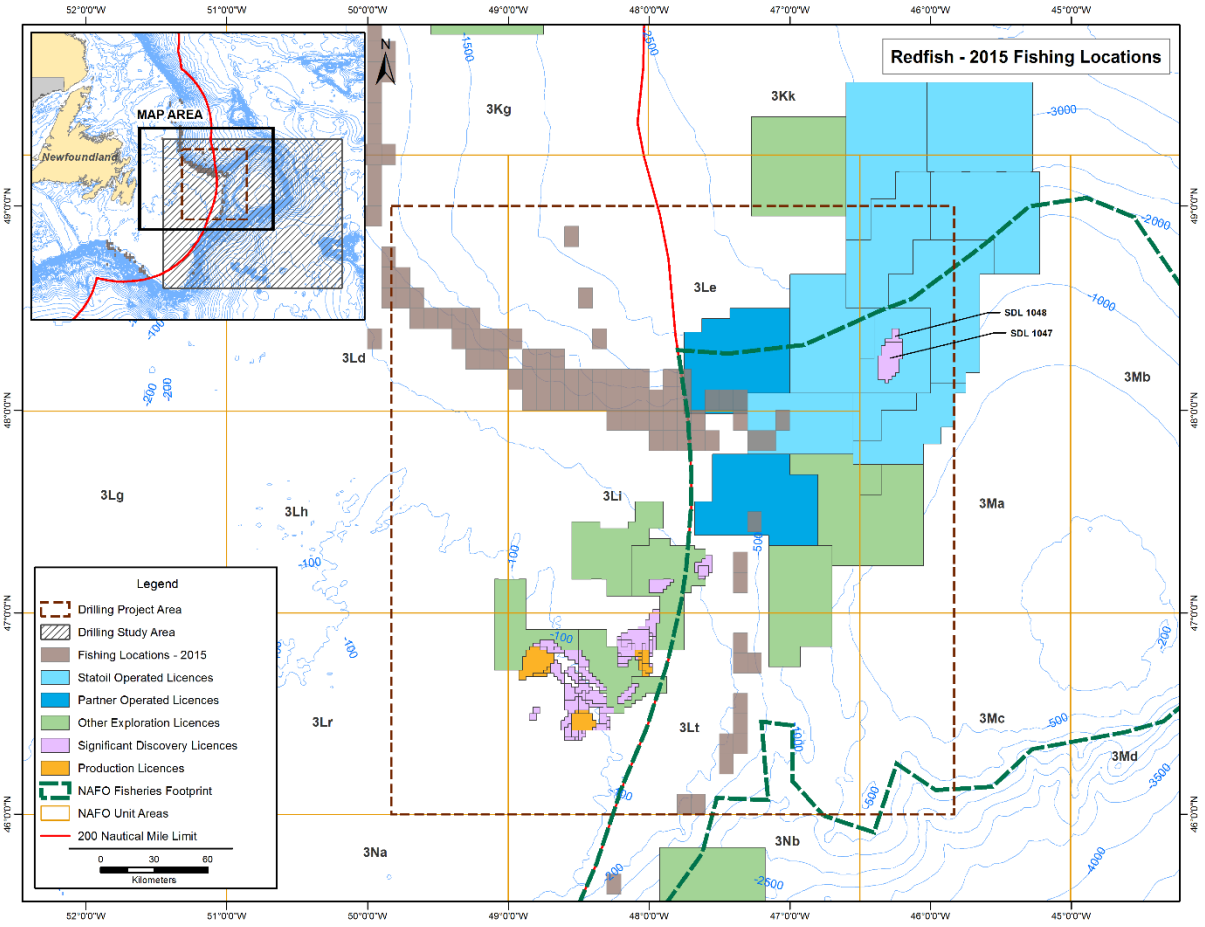

Figure A3: Canadian domestic fishing activity for Redfish in 2015 from DFO data

Appendix 3:

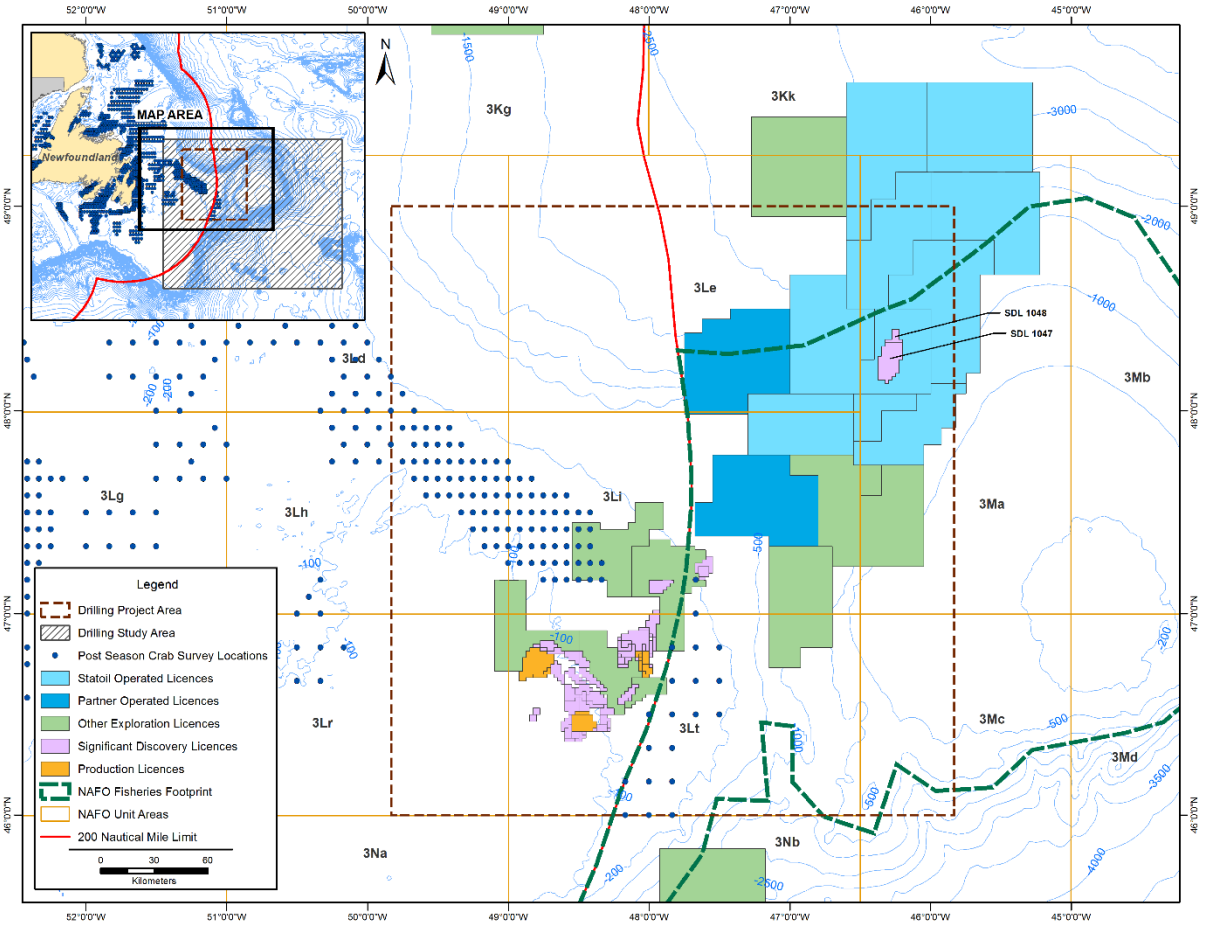

Figure A4: Locations of Industry-DFO Collaborative Post-Season Snow Crab Survey Stations