Tilt Cove Exploration Drilling Program

Chapter 14: Commercial Fisheries and Other Ocean Users VC

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14.0 ASSESSMENT OF POTENTIAL EFFECTS ON COMMERCIAL FISHERIES AND OTHER OCEAN USERS

Commercial Fisheries and Other Ocean Users are included in this EIS due to the economic and cultural importance they hold for the province of NL as well as other jurisdictions that participate in these activities within the RAA (i.e., other NAFO nations and Saint Pierre and Miquelon). They are presented as a combined VC as the potential interaction with routine Project-related activities are similar.

In the following assessment, commercial fisheries refer to harvesting of fish species for commercial purposes by domestic and foreign fleets. Recreational fishing and aquaculture are also considered under the scope of commercial fisheries. There is very little commercial fishing activity within EL 1161 and the Project Area. However, the RAA encompasses important fishing grounds for commercially fished stocks managed by DFO and NAFO. Management regimes, quota sharing agreements, and the composition of important species / species groups that are commercially harvested and their spatial extent are presented in Chapter 7, Section 7.2.

Other ocean users that participate in activities offshore NL within the RAA include domestic and foreign vessels conducting marine research, military exercises, shipping or other offshore oil and gas activities. The presence of existing marine infrastructure (e.g., subsea cables, shipwrecks, and legacy sites) is also considered. Other ocean users and known schedules / activities are described in Chapter 7, Section 7.3. Post-season crab surveys and DFO RV trawls have historically occurred within EL 1161 and the Project Area. Marine shipping activity and activity related to offshore oil exploration and extraction are commonplace within offshore NL and activities overlap with EL 1161 and the Project Area. There are no known shipwrecks or legacy sites within the Project Area (see Section 7.4.3; Figure 7.37). Known subsea cables include fibre-optic lines from the Hibernia Canada Express cable to the Hibernia and Hebron platforms, the latter of which overlaps with EL 1161.

Portions of the assessment for commercial fisheries and other ocean users are indirectly related to three other VCs, as identified below, and more details on those components can be found within the respective chapters.

- Marine Fish and Fish Habitat (Chapter 9): Potential biological effects on fish and fish habitat from Project activities may influence commercial fishing success due to changes in fish health and quality.
- Special Areas (Chapter 12): Some special areas in the RAA are recognized as being important (e.g., nursery grounds) for species that are commercially fished and some special areas are designated as fisheries closures to protect fish and/or habitat from commercial fishing activities. Project activities may affect special areas that are important for commercially fished species and will introduce an additional fisheries exclusion zone (safety zone) which may influence commercial fishing success.
- Indigenous Peoples and Community Values (Chapter 13): Landings from Indigenous commercial communal licences, as issued by DFO, are represented in the domestic commercial fishing datasets.

14.1 Scope of Assessment

14.1.1 Regulatory and Policy Setting

Commercial Fisheries and Other Ocean Users have been identified by government departments, Indigenous communities, and stakeholder organizations as being important and requiring consideration in the EIS due to their presence in the region and the potential effects of the Project on these activities, as identified in Chapter 3. The assessment of potential effects on this VC is conducted in accordance with the EIS Guidelines issued by the CEA Agency in June 2019.

DFO and NAFO both oversee management of commercial fishing activity within the RAA. The most recent year for data available from DFO indicates there was domestic commercial fishing activity for snow crab in the southeast corner of the Project Area / LAA (Figure 14-1). Snow crab are also harvested along much of the transit route LAA (Figure 14-1). Since 2016, domestic commercial fishing activity for northern shrimp within NAFO Division 3L has been prohibited (Figure 14-2). This area overlaps directly with the Project Area and the main area for shrimp fishing, located along the Fogo Shelf, is located well away from Project activities. Groundfish species have historically been fished within the Project Area and are currently fished along the in-shore areas of the transit route LAA.

The recently amended *Fisheries Act* and its associated regulations provide protection for all fish and fish habitat. The amended *Fisheries Act* provides protection to fisheries through the management of fish resources and the habitats that support these activities. Sections 34 and 35 of the *Fisheries Act* focus on the protection of fish and fish habitat and include prohibition against harmful alteration, disruption, or destruction of fish habitat, and serious harm to or death of fish. The deposition of a deleterious substance into waters frequented by fish is prohibited by Section 36 of the *Fisheries Act*. The potential effects of the Project on commercial fishing and other ocean users are relevant to the provisions of the *Fisheries Act* and are considered in this section. Some species and their habitats may also have legislative protection under SARA or the NL ESA; these are discussed in Chapter 9.

Domestic fishery resources are protected from uncontrolled fishing activity though DFO and NAFO in accordance with the *Fisheries Act*, *Oceans Act* and the NAFO Conservation and Enforcement Measures (NAFO 2022a), and use one or more of the following management methods:

- Area closures (Figure 14-2)
- TAC and fishing quotas
- Temporal restrictions (i.e., opening and closing dates for fisheries)
- Gear and/or vessel restrictions

Integrated Fisheries Management Plans (DFO 2022) are developed by DFO, and NAFO produces stock advisory documents based on reports published in Scientific Council Research documents (NAFO 2022b) to help monitor and direct the recovery and management of various species throughout the NL region. These plans use scientific knowledge and industry data on capacity and harvesting methods, to create management strategies for the fishery.

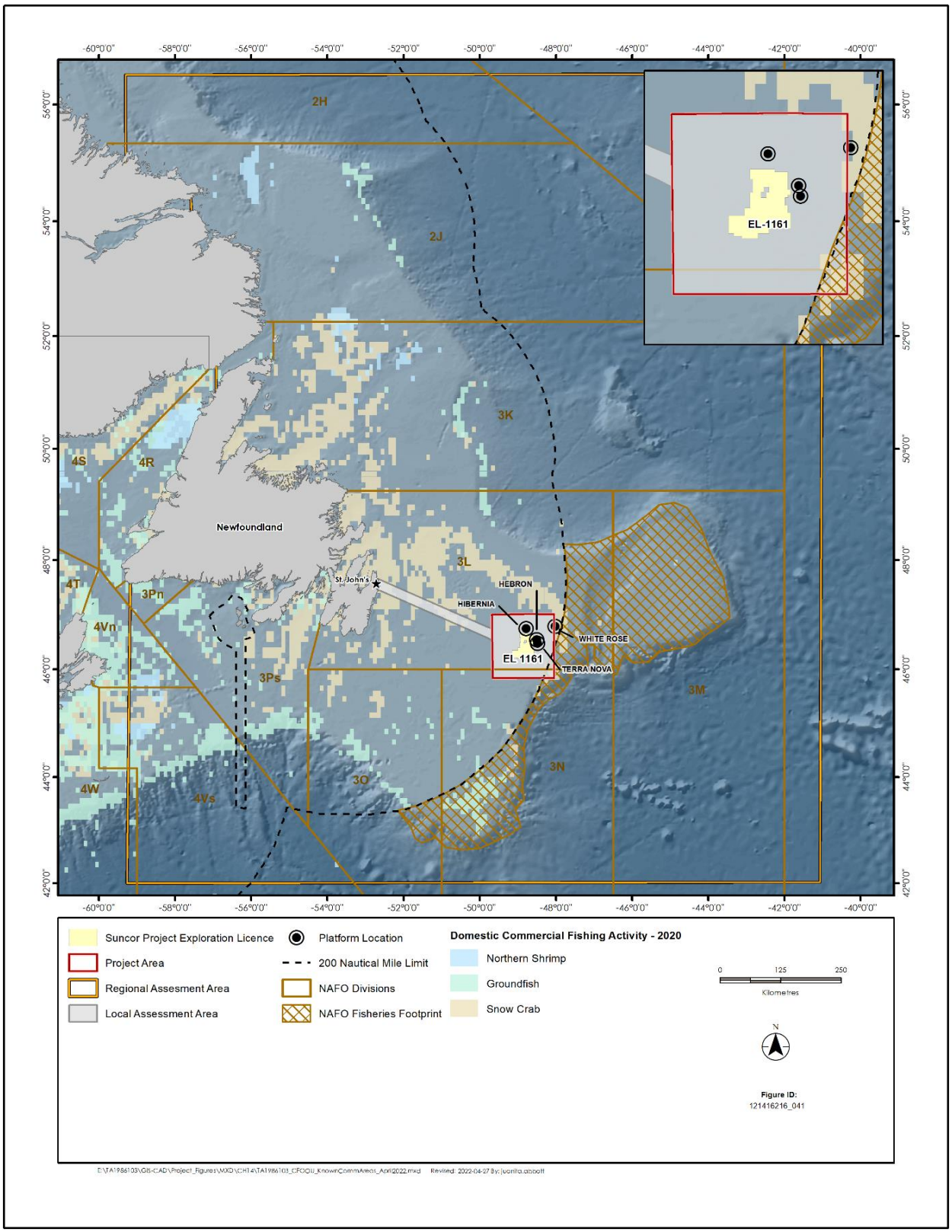

Figure 14-1 Known Commercial Fishing Areas for Key Species / Species Groups within the RAA in 2020

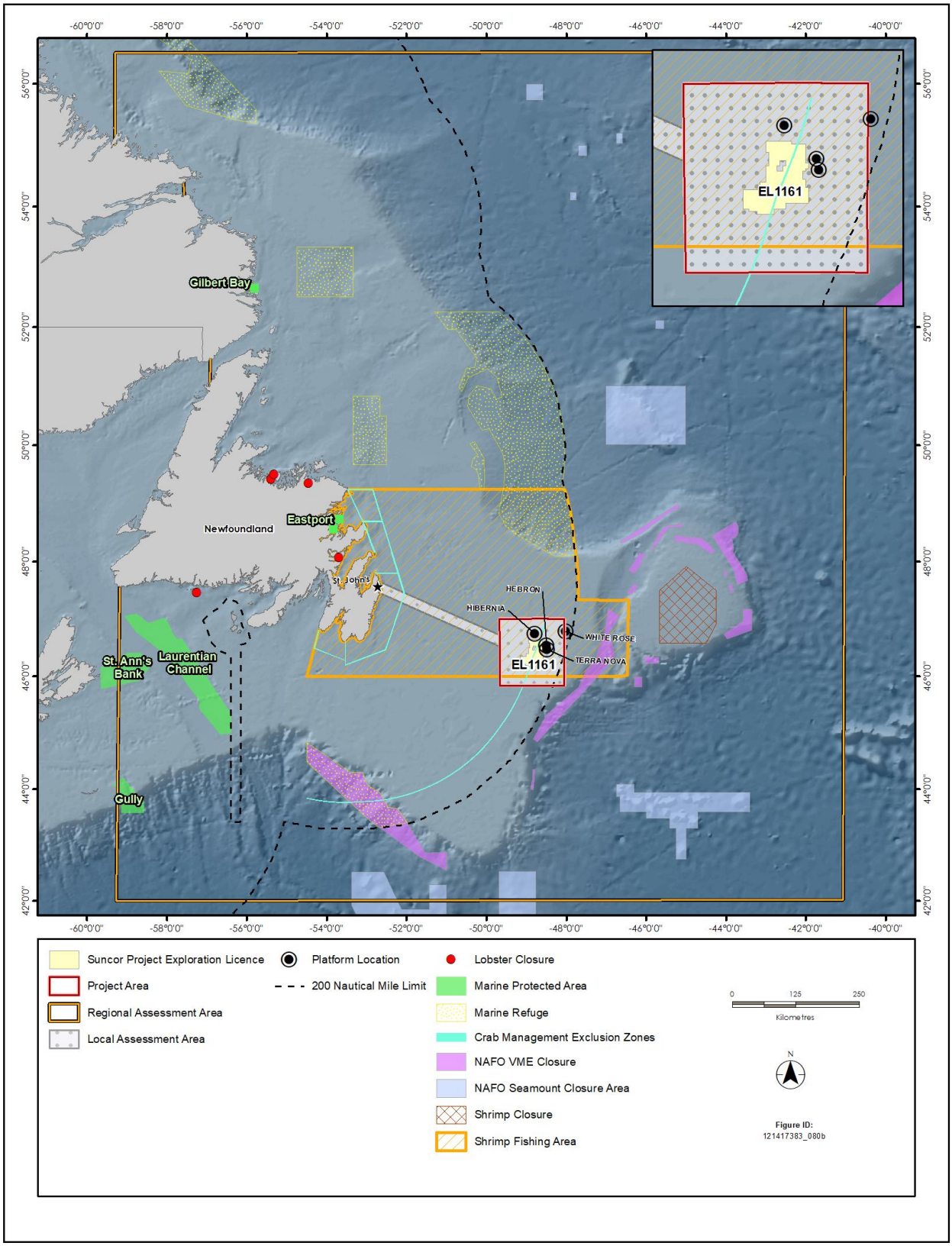

Figure 14-2 Fisheries Closures Areas in the RAA

14.1.2 The Influence of Consultation and Engagement on the Assessment

There are currently no documented FSC licences within or near the Project Area. However, Suncor acknowledges that species harvested for commercial or FSC purposes outside the Project Area may potentially interact with Project activities (planned or unplanned) during migration to traditional fishing grounds. These species include species at risk and/or of cultural importance to Indigenous groups (e.g., Atlantic salmon, American eel, swordfish, tuna, groundfish, lobster, crab, and sharks).

Suncor recognizes that there are several Indigenous organizations in Atlantic Canada that hold commercial-communal fishing licences for NAFO Divisions that overlap the Project Area. However, none of the Indigenous organizations that hold the licences have confirmed current fishing activity in the area.

Indigenous groups have concerns regarding effects of exploration drilling operations on the marine environment, including impacts from operations and potential incidents or spills that may result in adverse environmental effects on traditional, commercial and commercial-communal fisheries. With respect to FSC fisheries, many concerns and questions were raised regarding the potential for operations to impact behaviours of Atlantic salmon and other species in the area, such as related to underwater noise, light, vibration and changes to water quality. With respect to commercial-communal fisheries, engagement noted that the impacts on commercial-communal fisheries would be different than a “regular” commercial licence because the licences are “owned” by the Band (community) itself, they are not transferrable, cannot be sold, and the profits are often used to sustain employment, programs and services, and community infrastructure.

14.1.3 Potential Effects, Pathways, and Measurable Parameters

To date, there is minimal commercial fishing in the Project Area or LAA, although this does not necessarily mean there will be none in the future. Routine Project activities have the potential to interact directly with commercial fisheries and other ocean users. These interactions can include displacement from fishing grounds and loss or damage to gear (which would be compensated as per the Compensation Guidelines Respecting Damages Relating to Offshore Petroleum Activity (C-NLOPB and CNSOPB 2017). Indirect interactions include those that may result in physical or behavioural effects on commercially fished species, such as changes in fish health or quality, fish avoiding fishing grounds due to underwater sound, or changes in water quality (as discussed in Chapter 9). These direct and/or indirect effects have the potential to result in measurable changes for commercial fisheries. For other human components and activities, behavioural effects on fish could indirectly affect research activities, and Project activities may also limit certain areas for research or military exercises, which may result in changes in schedules, or relocation of vessels to alternate areas. Damage to vessels or research equipment may also occur.

As a result of these considerations, the assessment of Project-related effects on commercial fisheries and other ocean users is focused on the following potential effect:

- Change in access to or availability of resources

The measurable parameters used for the assessment of the environmental effect presented above, and the rationale for their selection, are provided in Table 14.1. Effects of accidental events are assessed separately in Section 16.5.X.

Table 14.1 Potential Effects, Effects Pathways, and Measurable Parameters for Commercial Fisheries and Other Ocean Users

Potential Environmental Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in availability of or access to resources	• Interactions between the extent, duration, or timing of Project activities that result in direct or indirect change in access to, or availability of, resources	• Change in access to areas used for commercial fisheries and other ocean activities (ha) • Change in catch rates (qualitative) • Change in quality of research • Delays in schedule for commercial fishing and other ocean activities • Mortality of commercially important species (qualitative)

14.1.4 Boundaries

Project components and activities and their potential effects are assessed based on the spatial and temporal boundaries presented below.

14.1.4.1 Spatial Boundaries

A number of spatial assessment boundaries have been defined for the environmental effects assessment of this VC, which reflect the varying ways and scales in which Project-related activities may influence commercial fisheries and other ocean uses. These include:

Project Area: The Project Area (Figure 14-1) encompasses the immediate area within which Project activities and components may occur, with a 40 km buffer around the perimeter of EL 1161. Specific well locations have not been identified but will occur within the Project Area.

Local Assessment Area (LAA): The LAA is the maximum area within which environmental effects from routine Project activities and components can be predicted or measured with a reasonable degree of accuracy and confidence. It consists of the Project Area and the transit routes to and from the Project Area.

Regional Assessment Area (RAA): The environmental effects assessment for this VC recognizes the potential for unplanned events (i.e., spills) to affect a broader geographic area outside the LAA and also recognizes the potential for Project-related effects to interact cumulatively with effects of fishing and other human activities occurring over a larger geographic region. Therefore, a broader spatial boundary is defined as the RAA. The RAA for this VC generally captures the marine waters offshore NL, and includes all of NAFO Divisions 2J and 3KL and portions of 2H, 3MNO, 3Ps, 3Pn, 4R, 4Vs, and 4Vn, including marine areas within the Saint Pierre and Miquelon EEZ and the NAFO Regulatory Area (Figure 14-1).

14.1.4.2 Temporal Boundaries

Suncor is proposing to drill up to 12 to 16 wells on EL 1161 over the term of the Project, with an initial well as early as Q2 2024, pending regulatory approval. The drilling of each well is expected to take up to 120 days and drilling activities may occur year-round. The temporal scope of the Project extends to end of 2029 to cover off activities that could carry over following the last year of the EL (e.g., well decommissioning, suspension and abandonment).

14.1.5 Residual Effects Characterization

Table 14.2 outlines the definitions used to characterize environmental effects as part of the assessment for commercial fisheries and other ocean users. These descriptions will be used throughout the chapter for characterization and evaluation of potential residual environmental effects on commercial fisheries and other ocean users from routine Project activities.

Table 14.2 Characterization of Residual Effects on Commercial Fisheries and Other Ocean Users

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long-term trend of the residual environmental effect relative to baseline	**Positive** – a residual environmental effect that moves measurable parameters in a direction beneficial to commercial fisheries and other ocean users relative to baseline **Adverse** – a residual environmental effect that moves measurable parameters in a direction detrimental to commercial fisheries and other ocean users relative to baseline
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	**Negligible** – no measurable change **Low** – a detectable change but within the range of natural variability **Moderate** – a detectable change beyond the range of natural variability, but with no associated adverse effect on the viability of the affected population or activity **High** – A detectable change that is beyond the range of natural variability, with an adverse effect on the viability of the affected population or activity
Geographic Extent	The geographic area in which a residual environmental effect occurs	**Project Area** – residual environmental effects are restricted to the Project Area **LAA** – residual environmental effects extend into the LAA **RAA** – residual environmental effects extend into the RAA
Frequency	Identifies how often the residual effect occurs and how often during the Project	**Unlikely event** – effect is unlikely to occur **Single event** – effect occurs once **Multiple irregular event** – effect occurs at no set schedule **Multiple regular event** – effect occurs at regular intervals **Continuous** – effect occurs continuously
Duration	The period required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	**Short term** - for duration of the activity, or for duration of accidental event **Medium term** - beyond duration of activity up to end of Project, or for duration of threshold exceedance of accidental event – weeks or months **Long term** - beyond Project duration of activity, or beyond the duration of threshold exceedance for accidental events - years **Permanent** - recovery to baseline conditions unlikely

Table 14.2 Characterization of Residual Effects on Commercial Fisheries and Other Ocean Users

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Reversibility	Pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	**Reversible** – will recover to baseline conditions before or after Project completion **Irreversible** – permanent
Ecological and Socio-economic Context	Existing condition and trends in the area where residual effects occur	**Undisturbed** – The VC is relatively undisturbed in the Project Area, not adversely affected by human activity, or is likely able to assimilate the additional change **Disturbed** – The VC has been previously or continues to be substantially disturbed or the VC is likely not able to assimilate the additional change

14.1.6 Significance Definition

In consideration of the descriptors listed above, the following threshold has been established to define a significant adverse residual environmental effect on commercial fisheries and other ocean users. For the purposes of this effects assessment, a significant adverse residual effect on commercial fisheries and other ocean users is defined as a Project-related environmental effect that results in one or more of the following:

- Local fishers being displaced or unable to use substantial portions of the currently fished area for all or most of a fishing season
- Other ocean users being displaced or unable to use substantial portions of currently used areas for one or more years
- Local fishers experiencing a change in the availability of fisheries resources (e.g., fish mortality and/or dispersion of stocks) such that resources cannot continue to be used at current levels within the RAA for more than one fishing season
- Unmitigated damage to fishing gear and/or equipment

14.2 Project Interactions with Commercial Fisheries and Other Ocean Users

Project-related activities that may interact with commercial fisheries and other ocean users resulting in an identified environmental effect are shown in Table 14.3. The interactions are indicated by a checkmark and are discussed in detail in Section 14.3.

Table 14.3 Potential Interactions of Project-related Activities with Commercial Fisheries and Other Ocean Users

Physical Activity	Environmental Effects
	Change in Availability of or Access to Resources
Presence and Operation of a MODU	✓
Geophysical (including VSP), Geological, Geotechnical, and Environmental Surveys	✓
Discharges (e.g., drill muds / cuttings, liquid discharges)	✓
Well Testing and Flaring (including air emissions)	–
Well Decommissioning, Suspension and Abandonment	✓
Supply and Servicing (including helicopter transportation and Project supply vessel operations)	✓
Notes: ✓ = Potential interaction – = No interaction	

Well testing and flaring is not expected to result in environmental effects on commercial fisheries and other ocean users as there is no interaction with the marine environment.

14.3 Assessment of Residual Environmental Effects on Commercial Fisheries and Other Ocean Users

The following section assesses the environmental effects on commercial fisheries and other ocean users as identified though potential interactions noted in Table 14.2. Given the similarities in Project description and proximity of activities at Orphan Basin and Flemish Pass, this EIS draws on recent information from previous EA documents for similar exploration drilling projects in Atlantic Canada, including comments received during stakeholder and Indigenous review processes.

14.3.1 Change in Availability of or Access to Resources

14.3.1.1 Project Pathways

Commercial fishing activity involves setting and retrieving gear in designated fishing grounds, as well as travel to and from those fishing grounds. Effects on commercial fishing activity identified by Andrews et al. (2021) include:

- Decline in the quality of landed fish species
- Increase in mortality for targeted species
- Loss of access to target species due to displacement of target species from formerly suitable habitats
- Change in the probability of capture

Other ocean uses can include shipping and planned military activities, ocean research activities, and the presence of existing infrastructure on the seabed.

Project pathways that might interrupt or prevent these activities include:

- Presence of the marine safety zone around the MODU, which will impose temporary access restriction in areas that may overlap with known fishing grounds
- Sound emissions from the MODU, survey and supply vessels, which may temporarily cause commercially fished species to avoid the area around the MODU, thus changing their availability as a resource
- Presence of a suspension cap or abandoned wellhead on the sea floor, which may cause fishers to avoid fishing in certain areas due to fear of damage to or loss of gear

14.3.1.2 Mitigation

Key mitigation measures that will be implemented in relation to the Project to help avoid or reduce potential environmental effects on commercial fisheries and other ocean users include.

- A Fisheries Communication Plan will be implemented to facilitate coordinated communication with fishers (commercial fishers and Indigenous groups). Suncor will share Project details, as applicable, and determine the need for a fisheries liaison officer during mobilization and demobilization of the MODU. This engagement will be coordinated through One Ocean for the following Fish, Food and Allied Workers-Unifor, Ocean Choice International, Association of Seafood Producers, and Atlantic Groundfish Council. Indigenous groups will also be included in the development of the Fisheries Communication Plan (Section 14.3.2.2).
- Suncor will maintain ongoing communications with the NAFO Secretariat, through DFO as the Canadian representative, regarding planned Project activities, including timely communication of drilling locations, safety zone, and well decommissioning, suspension and abandonment.
- Suncor will establish a safety (exclusion) zone in accordance with the *Newfoundland Offshore Petroleum Drilling and Production Regulations* and will provide details of the safety zone to the Marine Communication and Traffic Services for broadcasting and publishing in the NAVWARN and NOTMAR systems. Details of the safety zone will also be communicated during ongoing engagement with commercial and Indigenous fishers.
- Suncor will develop and implement a compensation program for damages to gear and/or equipment resulting from Project activities. This compensation program will be developed in consideration of the Compensation Guidelines Respecting Damages Relating to Offshore Petroleum Activities (C-NLOPB and CNSOPB 2017).
- Suncor will prepare a well decommissioning, suspension and abandonment plan, including a wellhead abandonment strategy and submit it to the C-NLOPB for acceptance at least 30 days prior to abandonment of each well. If it is proposed that a wellhead be abandoned on the seafloor in a manner that could potentially interfere with commercial fishing, the strategy will be developed in consultation with Indigenous groups and commercial fishers, and DFO.
- Suncor will communicate locations of suspended and/or abandoned wellsite locations in a timely manner to the appropriate authorities for inclusion on nautical charts for use by fishers and other mariners.
- During transit to / from the Project Area, supply vessels will use existing / common travel routes for Project-related supply vessels and helicopters.
- During transit to / from the Project Area, supply vessels will travel at vessel speeds not exceeding 22 km/hour (12 knots).

- Suncor will contact DFO regarding timing and locations of planned DFO research (spring and fall RV surveys, longline halibut survey, and post-season crab survey).
- Suncor will contact DND regarding timing of planned offshore military exercises.
- Suncor will conduct a pre-drill survey at each wellsite to confirm the presence / absence of potential hazardous subsea infrastructure (e.g., cables, unexploded ordnance, shipwrecks), and also to confirm the presence / absence of any corals and sponges.
- Obstruction lights, navigation lights, and foghorns will be kept in working condition on board the MODU and supply vessels. Radio communication systems will be in place and in working order for contacting other marine vessels as necessary.

Routine Project operations that have the potential to cause environmental effects are discussed in the following section. Only those with direct interactions, as indicated in Table 14.2, are discussed for each environmental effect. Indirect environmental effects are addressed though implementation of mitigation listed in Section 9.3.1.2 for Fish and Fish Habitat related to providing the results of the seabed investigation survey, selection of chemicals, disposal of spent synthetic-based muds, and the discharge of waste from the MODU.

14.3.1.3 Characterization of Residual Project-related Environmental Effects

14.3.1.3.1 Presence and Operation of a MODU

Mobilization and operation of the MODU can affect the availability of or access to resources for commercial fisheries and other ocean uses by direct interference through the establishment a safety zone (which will restrict access to certain areas for commercial fisheries and other ocean activities) and through effects from underwater sound on fish species which could affect their distribution.

The safety zone is put in place to avoid collisions between the MODU and other vessels (e.g., fishing vessels, research vessels, cargo vessels) operating in or transiting through the area. This safety zone will be established around the MODU during initial mobilization activities and drilling operations, including well evaluation and abandonment processes. Given the relatively shallow waters in EL 1161 (less than 100 m), the MODU will use both anchors and dynamic-positioning to keep it on-station during drilling. In cases where the MODU is anchored, Transport Canada states that the safety zone will be 500 m in all directions from the MODU and 50 m beyond the boundaries of the anchor pattern (Government of Canada 2019). For example, an anchor may extend out from the MODU to 1,500 m, thus the maximum safety zone would have a radius of 1,550 m. The exclusion zone could be up to 7.5 km², depending on anchor arrangement. The MODU (and corresponding safety zone) will be in place at the wellsite for approximately between 45 to 120 days for each well drilled.

Mobilization and operation of the MODU may also interact with other ocean users by requiring them to reroute, relocate or reschedule their activities due to transit operations and/or establishment of the safety zone.

Given the lack of commercial fishing in the Project Area / LAA, and in consideration of the mitigation measures (primarily with implementation of communication protocols), residual environmental effects on commercial fisheries and ocean users resulting from the mobilization and operation of the MODU will the

low in magnitude, short-term, localized to the Project Area, occurring irregularly as there is no set drilling schedule, and reversible.

14.3.1.3.2 Geophysical (including VSP), Geological, Geotechnical and Environmental Surveys

VSP surveys use air gun arrays; however, the associated size and volume of the array are much smaller than used for a traditional seismic survey and the length of time for a VSP survey is much shorter. VSP surveys will occur over a one-day period (per well) and since the VSP is focused around a wellbore, the extent of the towed gear (typically one streamer), and the seismic energy and associated underwater sound is much more localized compared to that generated during 2D and 3D seismic surveys. More specific information on underwater sound emissions from VSP surveys can be found in Section 2.8.4 and Appendix D, in the Underwater Sound Model undertaken for this Project.

Underwater sound associated with a VSP survey could disturb fish, causing them to temporarily avoid the affected area. This may lead to a reduction in landings for certain commercially fished species, particularly groundfish species, as underwater sound has been found to cause behavioural responses to air gun source array exposure. Studies have shown effects on fisheries catch rates of groundfish species were short term in nature and no effect was noted after seismic surveys ceased (Engås et al. 1996; Løkkeborg et al. 2012; Streever al. 2016). Studies conducted on shrimp and crab indicate that invertebrate species do not exhibit the same avoidance response as groundfish species and that natural spatial and temporal influence are more important factors in determining the catch rate (Christian et al. 2003; Morris et al. 2018). Geological, geotechnical and environmental surveys would have less of an effect than VSP surveys as the primary source of noise is the survey vessel. With no sound source arrays, the spatial extent would be localized to the physical vessel within the Project Area.

There is limited potential for direct interactions with commercial fishing gear for geological, geotechnical and environmental surveys that do not used towed gear. While the survey vessels may result in a temporary restriction in the survey area (restricted to EL 1161), the surveys are relatively non-intrusive, localized, short-term, and infrequent.

For other surveys that do not use towed gear, such as geological, geotechnical and environmental surveys, there is limited potential for direct interactions with communal-commercial fishing gear. These surveys are conducted from survey-specific vessels within the Project Area potentially at all times of year over the course of the Project. They are transitory in nature with a short term presence at any one location, and is generally consistent with the overall marine traffic that has occurred throughout the region for years. The effects are similar to those discussed in supply and servicing. Mitigation measures outlined in Section 14.3.1.2 will be in place during Project operations.

As illustrated in Figure 14-1 for the most recent year of domestic commercial fishing data available (2020), there were no catches for groundfish or shrimp in the Project Area, and a small amount of commercial fishing activity for snow crab occurs in the southeast corner of the Project Area. No commercial fishing occurs within EL 1161.

Given the short term and localized nature of geophysical (including VSP), geological, geotechnical and environmental surveys and other surveys and limited interaction with commercial fishing activities, residual effects associated with geophysical (including VSP), geological, geotechnical and environmental survey

operations on a change in availability of or access to fisheries resources is predicted to be low in magnitude, within the Project Area, short-term in duration, occurring at irregular intervals, and reversible following completion of the geophysical (including VSP), geological, geotechnical and environmental surveys.

14.3.1.3.3 Discharges

Sediment and seawater quality could be affected by discharges from the MODU (including drill muds and cuttings) and supply vessels, by indirectly affecting the quality (or perceived quality) of commercial fish species, as well as the potential conditions during research activities. As per the assessment of discharges on marine fish and fish habitat (Sections 9.3.1.3 and 9.3.2.3), the effects from discharges (including grey or black water, bilge water, deck drainage, BOP fluid, and cement) are expected to be low in magnitude and localized to the Project Area.

Drill muds and cuttings can result in a change in sediment and water quality of the surrounding area; however, these are very localized around the drilling location. The maximum thickness during the summer simulations was predicted to be 7.28 mm, which is below the 10 mm thickness threshold that was also assessed. The maximum thickness predicted during the fall simulations was 2.64 mm, well below the thresholds of 6.5 and 10 mm, which were never reached. The thinnest depositional thicknesses at or above 0.1 mm were predicted to extend to the southeast up to 1.79 km (summer) and 2.43 km (fall) and cover an area up to 1.45 km² (summer) and 2.14 km² (fall) as shown in the Drilling Cuttings Model in Appendix C). This is just beyond the potential exclusion zone of 2 km².

EEM programs have been conducted for the production platforms operating on the Grand Banks, including Terra Nova, and negligible effects have been noted on commercial species such as American plaice (DeBlois et al. 2014). The most recent results from the Terra Nova EEM show that there continues to be no significant body burden (chemical) differences in plaice fillets collected in the Terra Nova field and reference areas, and no significant differences were noted in the taste between field and reference areas in panel tests (Suncor Energy 2019). Other EEMs programs on the Grand Banks also indicate no significant body burden (chemical) differences and no significant taste differences (Hibernia Management and Development Company 2021, Husky Energy 2022). Any changes in sediments and benthic community from drill cuttings (as measured during the EEM programs) have not resulted in adverse effects for commercial fisheries.

Residual effects associated with discharges or a change in availability of fisheries resources is predicted to be low in magnitude, within the Project Area, short-term in duration, occurring irregularly as there is no set drilling schedule, and reversible following Project completion. Marine discharges are not predicted to have an effect for other ocean users.

14.3.1.3.4 Well Decommissioning, Suspension and Abandonment

All wells drilled during the Project life span will be plugged and abandoned upon completion of well evaluation activities, although the abandonment program has not yet been defined. Abandonment activities will be conducted according to Suncor's practices and requirements set by the C-NLOPB. Suncor's wellhead removal strategy considers water depth and the likelihood of potential interactions with fishing activities. As discussed in Section 2.4.4, two possible scenarios exist to decommission an exploratory well: suspension or abandonment. Suncor is required to provide detailed plans to the C-NLOPB for monitoring

suspended wells and is also required to provide information regarding the specific proposed methods of suspension of each well. For a suspended well, a suspension cap is installed to protect the wellhead connector. The suspension cap will protrude above the seabed.

An exposed suspension cap may cause temporary disturbance to the area immediately surrounding the well but is not expected to have a substantial effect on fish populations (Chapter 9). If the wellhead is left in place after well decommissioning and abandonment, it would result in a permanent piece of infrastructure on the seafloor, which would have to potential to affect access to commercial fisheries resources (i.e., vessels may have to deviate from a straight line transit to avoid charted wellheads). It is estimated that there would not be a large amount of interaction with commercial fishing activities within EL 1161 , as most harvesting takes place along the shelf edge at shallower depths. It is unlikely that wellhead abandonment will result in an interaction with commercial fishing as there is limited fishing activity in EL 1161 and offshore research activity in a way that would result in a substantial change to availability of resource.

As part of its mitigation measures, Suncor will provide the locations for each suspended and/or abandoned well to fishers and the Canadian Hydrographic Service for communication via a Notice to Mariners.

Residual effects associated with well decommissioning, suspension and abandonment resulting in a change of access to a resource is predicted to be low in magnitude, localized to the Project Area, short to long-term (if wellhead is left in place) and irregular (i.e., abandonment will occur once per well but the effect could occur none or several times depending on how many vessels change course to avoid a charted wellhead). If the wellhead is left in place, the effects will be permanent and irreversible.

14.3.1.3.5 Supply and Servicing

An existing supply base facility in the St. John’s region will likely be used to support the majority of logistical requirements for offshore operations. Supply base activities will be conducted by a third-party contractor and are outside the scope of this EIS.

The addition of supply vessel traffic to and from the area will provide a small increase to existing marine traffic levels. Commercial fishers are aware of supply vessels moving throughout offshore NL and are accustomed to operating around supply vessels. The implementation of standard industry measures and operation of vessels will reduce the likelihood of an interaction. Supply vessels will follow established vessel traffic routes and communication protocols when transiting to and from the Project Area. Once near the Project Area, the supply vessel will select the route most appropriate for reaching the MODU. Supply vessels will adhere to standard at-sea protocol and procedures, reducing potential conflicts with commercial fisheries and other ocean users.

Helicopter transportation is predicted to have no effect on fisheries or other ocean users given the lack of interaction with the marine environment (including fish).

Residual effects associated with supply and servicing on a change in availability of or access to resources is predicted to be low in magnitude, within the vessel transit LAA, short-term in duration, occurring regularly, and reversible following Project completion.

14.3.2 Summary of Project Residual Environmental Effects

Table 14.4 summarizes the environmental effects assessment and prediction for the residual environmental effects resulting from interactions between Project activities and commercial fisheries and other ocean users. The Project may result in residual adverse effects through a change in availability of or access to resources (including resources that may be used for commercial fishing activity, offshore marine research, and military training exercises). The designated safety zone (500 m radius from the well location or 50 m beyond an anchor point, whichever is larger) is established around the MODU in accordance with the *Newfoundland Offshore Petroleum Drilling and Production Regulations* to prevent collisions between the MODU and other vessels. It will result in an area of approximately 7.5 km² being inaccessible to fishing and other vessels for a period of between 45 to 120 days per well. The residual environmental effects are assessed in consideration of the implementation of applicable mitigation measures described in Section 14.3.2, and adherence to industry standards and best practices for offshore oil and gas activities. The residual adverse environmental effects or a change in availability of or access to resources are predicted to be low in magnitude, located within the Project Area and/or LAA (along transit route), short-term to permanent (if wellhead left in place) in duration, occurring at irregular intervals to continuous (for duration of drilling period), reversible to irreversible (if wellhead let in place).

Table 14.4 Summary of Residual Environmental Effects on Commercial Fisheries and Other Ocean Users

Residual Effect	Residual Environmental Effects Characterization						
	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context
Change in Availability of or Access to Resources							
Presence and Operation of a MODU	A	L	PA	ST	IR	R	D
Discharges	A	L	PA	ST	IR	R	D
Geophysical (including VSP) Surveys	A	L	PA	ST	IR	R	D
Geological, Geotechnical and Environmental Surveys	A	L	PA	ST	IR	R	D
Well Testing and Flaring (including air emissions)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well Decommissioning, Suspension and Abandonment	A	L	PA	ST-P	IR	R-I	D
Supply and Servicing	A	L	LAA	ST	R	R	D

Table 14.4 Summary of Residual Environmental Effects on Commercial Fisheries and Other Ocean Users

Residual Effect	Residual Environmental Effects Characterization						
	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context

KEY:
See Table 14.2 for detailed definitions
N/A: Not Applicable

Direction:
P: Positive
A: Adverse
N: Neutral

Magnitude:
N: Negligible
L: Low
M: Moderate
H: High

Geographic Extent:
PA: Project Area
LAA: Local Assessment Area
RAA: Regional Assessment Area

Duration:
ST: Short-term
MT: Medium-term
LT: Long-term
P: Permanent

Frequency:
UL: Unlikely
S: Single event
IR: Irregular event
R: Regular event
C: Continuous

Reversibility:
R: Reversible
I: Irreversible

Ecological / Socio-economic Context:
D: Disturbed
U: Undisturbed

14.4 Determination of Significance

Residual adverse effects from routine Project activities on commercial fisheries are not anticipated to result in local fishers being displaced or unable to use portions of the areas currently used for fishing for all or most of the season. It is not expected that local fishers will experience a change in availability of fishing resources such that they cannot be used at current levels within the LAA and RAA for more than one fishing season. Likewise, for other ocean users, it is not expected they will be displaced or unable to use substantial portions of the areas currently used for fisheries.

Given the irregular schedule and short-term duration of drilling activities, the localized nature of Project interactions with commercial fishing activity, and the implementation of mitigation, such as communication with commercial fishers and other ocean users, and environmental protection measures, residual adverse environmental effects on commercial fisheries and other ocean users are predicted to be not significant.

14.5 Prediction Confidence

This prediction of significance has been determined with a high level of confidence based on the current knowledge of the offshore environment and interactions between oil and gas and other industries offshore (including existing One Ocean protocols and the to be developed Fisheries Communication Plan) and analysis of current fishing activity within the Project Area, where there is a relatively low likelihood of interaction.

14.6 Follow-up and Monitoring

Given the high level of confidence for a prediction of no significant adverse environmental effects on commercial fisheries and other ocean users, and the implementation of standard mitigation, including ongoing engagement with fisheries stakeholders and other ocean users and the implementation of a Fisheries Communication Plan, no follow-up and monitoring are proposed for routine Project activities.

14.7 References

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