

# **Technical Review of Equinor's Abridged EIS for the Central Ridge Exploration Drilling Project – Information Requests (IR)**

Prepared for

Wolastoqey Nation in New Brunswick

February 2020

Prepared by



207 Edgebrook Close NW  
Calgary, Alberta  
T3A 4W5 Canada  
Phone 403-241-8668  
Email: [shannon.gavin@mses.ca](mailto:shannon.gavin@mses.ca)

## List of Contributors

Fish and Fish Habitat

Dr. Derrick deK. Varent

Marine Mammals

Dr. Brian Kopach

Report Preparation & Project Management

Ms. Shannon Gavin, M.Sc., P. Biol.

## TABLE OF CONTENTS

	<b>PAGE</b>
<b>1.0 INTRODUCTION.....</b>	<b>1</b>
1.1 Background on the Proposed Project .....	1
1.2 Review Approach.....	1
1.3 Review Document Structure .....	3
<b>2.0 TECHNICAL REVIEW OF EQUINOR’S CENTRAL RIDGE EIS.....</b>	<b>3</b>
2.1 Fish and Fish Habitat Information Requests .....	3
2.1.1 General Comments.....	3
2.1.2 Information Requests.....	4
2.2 Marine Mammals and Sea Turtles Information Requests .....	8
2.2.1 Overarching Comments.....	8
2.2.2 Specific Information Requests.....	8

## FIGURES

Figure 1 – Project Exploration Licenses in blue within the Project Area .....	2
(reprinted from Central Ridge EIS 2020, Figure 1-1 pg 23)	

### **ACRONYM LIST**

the Agency	Canadian Environmental Assessment Agency
C-NLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board
EBSA	Ecologically and Biologically Significant Areas
EIS	Environmental Impact Statement
ELs	exploration licences
Equinor	Equinor Canada Limited
MSES	Management and Solutions in Environmental Science
The Project	Central Ridge Exploration Drilling Project
RSA	Regional Study Area
WNNB	Wolastoqey Nation in New Brunswick
ZOI	Zone of Influence

## **1.0 Introduction**

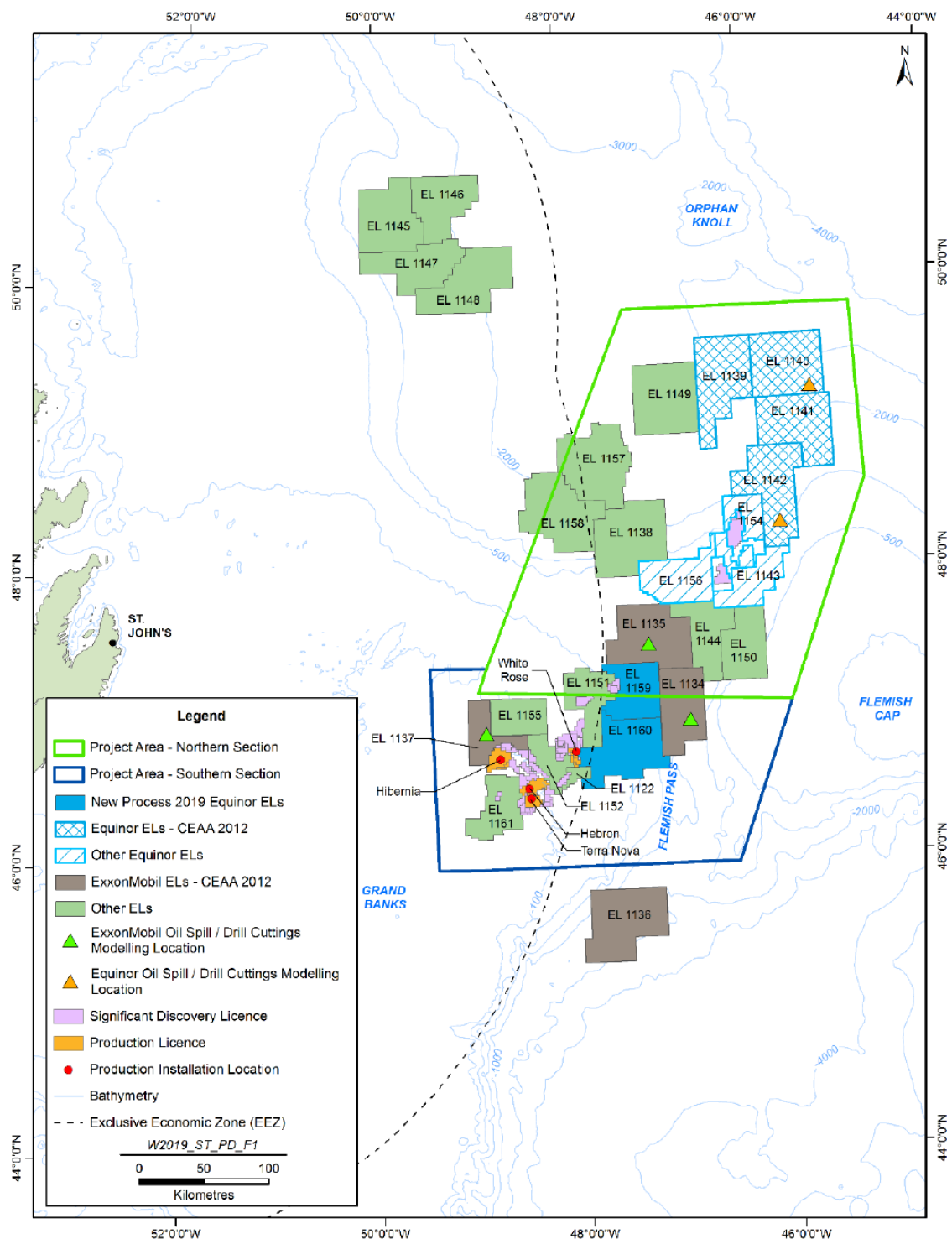
The Wolastoqey Nation in New Brunswick (WNNB) have requested that Management and Solutions in Environmental Science (MSES) conduct a third-party review of Equinor Canada Limited's (Equinor) Abridged Environmental Impact Statement (EIS) for the Central Ridge Exploration Drilling Program (the Project) that was submitted to the Canadian Environmental Assessment Agency (the Agency) in January 2020. In this technical review, MSES evaluated the Abridged EIS with the goal of assisting WNNB in understanding any gaps and deficiencies in the information provided by Equinor and to develop information requests and recommendations that would address those gaps and deficiencies. The review focused on the following disciplines: fish and fish habitat, and marine mammals.

### **1.1 Background on the Proposed Project**

Equinor, on behalf of its partners, Husky Oil Operations Limited and Suncor Energy Offshore Exploration Partnership, is proposing to construct and operate an exploration drilling program on Exploration Licenses (ELs) 1159 and 1160 in the Central Ridge Area, located approximately 375 km east of St. John's, Newfoundland (Figure 1). The proposed Project is located in an area that was previously assessed in Equinor's EIS for the Flemish Pass project. The Project Area is approximately 100,800 km<sup>2</sup> and is divided into the Northern Section that includes EL 1160 and a Southern section. EL 1159 is located within both sections. It was determined by the Agency that as the Central Ridge project is within ELs that were already assessed for environmental consequences in the Flemish Pass EIS (approved in April 2019), that an Abridged EIS would be sufficient for the Central Ridge application. The Project will entail the mobilization and operation of drilling installations, drilling activities, supporting ancillary activities to drilling programs, and well decommissioning or suspension.

### **1.2 Review Approach**

With a focus on fish and fish habitat, and marine mammals, MSES experts reviewed the adequacy of information presented in the Abridged EIS in terms of the baseline data presented by Equinor, and the quality of the assessment of potential environmental impacts and/or risks associated with the proposed Project. A key objective of the MSES review process was to identify and highlight any information gaps in the Abridged EIS that may impede WNNB's understanding of the potential impacts resulting from the proposed Project.



**Figure I – Project Exploration Licenses in blue within the Project Area**  
(reprinted from Central Ridge EIS 2020, Figure I-I pg 23)

## 1.3 Review Document Structure

This report is structured into Overarching Comments and Specific Information Requests for each discipline area. In the overarching comments, each expert provides a plain language summary of the overall findings of their review. The Specific Information Requests include the detailed technical analysis of the Abridged EIS and its' supporting documents in terms of the potential direct, indirect and cumulative impacts of the proposed Project, with a consideration of WNNB's traditional use practices. Text containing comments, requests or questions directed to Equinor appears in **bold**. Throughout the whole document, direct quotes from the EIS are in *italics* while quotes from other sources and literature remain in plain text.

## 2.0 Technical Review of Equinor's Central Ridge EIS

### 2.1 Fish and Fish Habitat Information Requests

#### 2.1.1 General Comments

The Central Ridge Exploration Drilling Program Abridged EIS by Equinor in 2020 relies heavily on the baseline data, analyses and arguments of the Flemish Pass Exploration Drilling Program EIS prepared by Statoil in 2017. Similarly, all recent EIS within the regional study area rely heavily on the Eastern Newfoundland Strategic Environmental Assessment prepared by AMEC Foster Wheeler in 2014 (e.g. the Flemish Pass Exploratory Drilling Project EIS prepared by Nexen in 2018). As such, there is an expected logic applied to many of the potentially adverse effects from exploratory, off-shore drilling, which generally minimizes the risks to Fish and Fish Habitat by either downplaying the probability of catastrophic events (i.e. large oil spills), promising further studies or monitoring (i.e. Atlantic Salmon migratory routes, or pre-drilling sponge surveys), or citing the same modelling studies to quantify impacts (e.g. JASCO sound propagation, and AMEC Drill Cutting Models). While a streamlined approach has benefits, in some cases there is a need for greater, more site-specific data, than is presented in this EIS. Further, the cumulative effects section does not seem to leverage this streamlined approach by presenting any quantifiable accumulation of potential effects (e.g. long distance noises from multiple drilling operations), and instead falls back on the standard approaches of describing in qualitative terms why impacts are too localized and in short duration to be of any influence on one another.

This review mainly focusses on one aspect of this EIS that could benefit from the presentation of more detail, which is the potential impacts on sponges and corals. These organisms provide a very important roles in sea-bed ecosystem structure and function and contribute to everything from the filtering of sea-water to providing nursery habitat for commercially important species (e.g. redfish). More detail is required to ensure this vital organism is properly protected from drilling activities.

## 2.1.2 Information Requests

<b>1. Issue: Drilling Waste Modelling Not Specific Enough</b>	
<b>Reference:</b>	Central Ridge Abridged EIS Summary, Section 6.1.3.2, Page 34
<b>Preamble:</b>	The discharge of drill cuttings on the sea floor is known to cause adverse effects on macrofauna (Bell et al 2015). The EIS has concluded that these effects will be low in magnitude based on the results of a modelling exercise of the dispersion of drill cuttings and waste across the sea floor that was presented in the 2017 EIS (Stat Oil 2017, Appendix G). The model included a hypothetical location roughly 10 kilometers north from the ELs border, which was called the Southern Project Area. While the average depths of the modelled area to the current project area may be similar, it is clear from other drill cuttings dispersion models in neighbouring ELs (e.g. EL-1144 and 1150, in the Nexen 2018 Flemish Pass EIS, Appendix D) that ocean currents can be spatially variable in this area due to the influence of the Flemish Pass. Given the importance of the area to sponges, more detailed modelling for the proposed ELs should be completed. Further, the drill waste modelling that was completed by Amec Foster Wheeler for both the Nexen 2018 EIS and the Statoil 2017 EIS did not include a suitable sensitivity analysis. As this model is paramount to assessing the footprint of the impacts of drilling, and the models are admittedly confounded by some assumptions (e.g. uniform bathymetry in Nexen 2018), there is a need to present a rigorous elasticity or sensitivity analysis so that the associated uncertainty of the model results can be understood.
<b>Request:</b>	<p><b>a) Please conduct a targeted dispersion model for two hypothetical drill locations within each of EL 1159 and EL 1160.</b></p> <p><b>b) Please include a proper sensitivity or elasticity analysis of the parameters within the model that hold potentially necessary, yet unrealistic assumptions.</b></p>
<b>Literature Cited:</b>	<p>Bell, J.J., McGrath, E., Biggerstaff, A., Bates, T., Bennett, H., Marlow, J. and M. Shaffer (2015). Sediment impacts on marine sponges. <i>Marine Pollution Bulletin</i>, 94(2015): 5-13.</p> <p>Equinor Canada Ltd. 2020. Central Ridge Exploration Drilling Program Abridged EIS Summary. pp 75.</p> <p>Nexen Energy ULC (2018) Flemish Pass Exploratory Drilling Project EIS (2018-2028). <i>Prepared by Amec Foster Wheeler</i>. St. John's, Canada, March 2018</p> <p>Statoil Canada (2017) Flemish Pass Exploration Drilling Program EIS <i>Prepared by Amec Foster Wheeler and Stantec Consulting</i>. St. John's, Canada, November 2017</p>
<b>2. Issue: Pre-drilling Coral Mapping Survey is Not Described Adequately</b>	
<b>Reference:</b>	Central Ridge Abridged EIS, Section 8.3.2, Page 335
<b>Preamble:</b>	The mitigation that is proposed to reduce the adverse impact of drilling operations on the macrofauna on the sea floor is to conduct pre-drilling surveys to create a coral map at the proposed drill site. The survey design will be submitted to Fisheries and Oceans Canada



	prior to its implementation, and as such, there is little detail in the Abridged EIS on this particular mitigation. However, given the high likelihood of observing sponges within the proposed areas (particularly in EL 1159), the known adverse effects of drill cutting wastes on macrofauna (Bell et al 2015), and the important role they play as an ecosystem driver (as identified in the Nexen 2018 Flemish Pass EIS), it is important that at least some aspects of the survey be outlined. It would at least be helpful to understand what Equinor considers a threshold for assigning significance to a coral or sponge aggregation. Would one sponge be enough? Or following common conventions, would a certain density be required close to the well site?
<b>Request:</b>	<b>Please provide more detail on the decision points of how a wellsite will be relocated in the event that a coral or sponge is observed in the pre-drilling survey. Please include:</b> <ol style="list-style-type: none"> <li><b>The threshold of sponge or coral density that is considered significant.</b></li> <li><b>The likely spatial dimensions of the survey relative to the drill site.</b></li> <li><b>Whether the full predicted radius of drill cutting depositions exceeding the predicted no effects threshold will be surveyed.</b></li> </ol>
<b>Literature Cited:</b>	Bell, J.J., McGrath, E., Biggerstaff, A., Bates, T., Bennett, H., Marlow, J. and M. Shaffer (2015). Sediment impacts on marine sponges. Marine Pollution Bulletin, 94(2015): 5-13.  Equinor Canada Ltd. 2020. Central Ridge Exploration Drilling Program Abridged EIS. pp 615.  Nexen Energy ULC (2018) Flemish Pass Exploratory Drilling Project EIS (2018-2028). Prepared by Amec Foster Wheeler. St. John's, Canada, March 2018

<b>3. Issue: No detail is provided on the subsea cuttings transport system</b>	
<b>Reference:</b>	Central Ridge Abridged EIS, Section 8.3.2, Page 335
<b>Preamble:</b>	The potential for drill cuttings to smother the sea floor is one of the few adverse effects of the project for which the volumes of drill cuttings and the area smothered can be quantified through a predictive model and observational studies of other projects. As mentioned, the mitigation for this action describes a pre-drilling assessment and further consultation with Fisheries and Oceans Canada to relocate well-sites or capturing drill cuttings before they settle with a subsea cutting transport system. The latter approach seems likely if high densities of sponges are found throughout the project area (which certainly seems likely in EL 1159) and as such, there is no appropriate location for a well site. If so, within this EIS there is no detail or references cited to support the efficacy of such a process or whether it had ever been attempted. Given the importance of sponge and coral aggregations to marine ecosystem function and structure, this information gap needs to be rectified to allow a thorough assessment of the risk to fish habitat from the project.
<b>Request:</b>	<b>a) Please provide more detail on the process, design, mechanics and efficacy of the subsea cuttings transport system. Also please provide examples of where it has been used and how successful it was in mitigating the smothering of benthic habitat.</b>
<b>Literature Cited:</b>	Equinor Canada Ltd. 2020. Central Ridge Exploration Drilling Program Abridged EIS. pp 615.

<b>4. Issue:</b> There is no fish habitat offsetting for the permanently smothered seabed	
<b>Reference:</b>	Central Ridge Abridged EIS, General
<b>Preamble:</b>	Under the <i>Fisheries Act</i> , the permanent loss or alteration of fish habitat following mitigation efforts requires that the proponent offset those losses through habitat compensation projects. The drill cuttings will smother fish habitat on the sea bed, and the over 30 wells from the six ELs will cumulatively cover a significant area. It is not known whether areas covered with drill cuttings ever recover, and there is indeed evidence that recovery can be slow or nonexistent (Smit et al 2006). As these impacts are much greater than a bridge pile footing for which the federal government often requires infrastructure developers to offset this area, there needs to be some explanation for why these losses to habitat are not compensated for.
<b>Request:</b>	<b>a) Please discuss why a fish habitat compensation project is not outlined in the EIS, or apparently required, for the loss of fish habitat on sea bed from drilling activities.</b>
<b>Literature Cited:</b>	Equinor Canada Ltd. 2020. Central Ridge Exploration Drilling Program Abridged EIS. pp 615.  Smit, M.G.D., J.E. Tamis, R.G. Jak, C.C. Harman, C. Kjelilen, H. Trannum and J. Neff. 2006. Threshold levels and risk functions for non-toxic sediment stressor; burial, grain size changes and hypoxia. Summary, Environmental Risk Management System, Report 9, THO 2006-BH0046/A Open, 2006.

<b>5. Issue:</b> It is not clear how White Rose's 95 km <sup>2</sup> safety zone does not overlap with EL I 160	
<b>Reference:</b>	Central Ridge Abridged EIS, Section 14.2, Page 458
<b>Preamble:</b>	An argument for the limited potential for cumulative effects on fish and fish habitat given on page 458 of the Abridged EIS is that the spacing between projects keeps the mostly localized effects of each individual drilling program from overlapping with another. However, after this argument the EIS acknowledges that White Rose is within 2 km of EL I 160. The EIS rectifies this proximity by mentioning a 95 km <sup>2</sup> safety zone around the White Rose production facility but does not describe any details on what the safety zone entails. If the safety zone was a circle centered the production facility, then its radius would be greater than 2 km.
<b>Request:</b>	<b>a) Please clarify what the safety zone around the White Rose production facility is in terms of shape and function.</b>
<b>Literature Cited:</b>	Equinor Canada Ltd. 2020. Central Ridge Exploration Drilling Program Abridged EIS. pp 615.

<b>6. Issue:</b> Cumulative effects does not address the combined footprint of all regional wells	
<b>Reference:</b>	Central Ridge Abridged EIS, Section 14.2
<b>Preamble:</b>	Pham and his co-authors recently published in Scientific Reports, a paper that estimates the value of sponges and corals to the Flemish Cap area in terms of the rates of seawater they filter and carbon they assimilate (Pham et al 2019). In this same article they are able to estimate the cumulative effects of bottom trawling on these same corals and sponges in

	terms of loss of biomass, but also loss of these rates of ecosystem functioning. The drilling of wells smother fish habitat on the sea bed for which the rates of recovery are uncertain (Smit et al 2006). As mentioned in the EIS, 470 wells have been drilled in the Canada-Newfoundland Offshore Area since March 4, 2019. As such, it should be possible, and also deeply insightful, for the cumulative footprint of all these wells be estimated, and the cumulative loss in coral and sponge ecosystem function be described. This would contribute a much more robust form of cumulative effects assessment than the mostly qualitative arguments presented throughout this section of the Abridged EIS.
<b>Request:</b>	<b>a) Please estimate the impact footprint, with error/uncertainty, of drilling operations in the Regional Study Area, on coral and sponge biomass following the approach of Pham et al. 2019.</b>
<b>Literature Cited:</b>	<p>Equinor Canada Ltd. 2020. Central Ridge Exploration Drilling Program Abridged EIS. pp 615.</p> <p>Pham, C.K., Murillo, F.J., Lirette, C. et al. (2019) Removal of deep-sea sponges by bottom trawling in the Flemish Cap area: conservation, ecology and economic assessment. Sci Rep 9, 15843 <a href="https://doi.org/10.1038/s41598-019-52250-1">https://doi.org/10.1038/s41598-019-52250-1</a></p> <p>Smit, M.G.D., J.E. Tamis, R.G. Jak, C.C. Harman, C. Kjelilen, H. Trannum and J. Neff. 2006. Threshold levels and risk functions for non-toxic sediment stressor; burial, grain size changes and hypoxia. Summary, Environmental Risk Management System, Report 9, THO 2006-BH0046/A Open, 2006.</p>

<b>7. Issue: Spill modelling does not include a relevant example</b>	
<b>Reference:</b>	Central Ridge Abridged EIS, Section 15.4, Page 472
<b>Preamble:</b>	<p>Large oil spills, and certainly sub-surface well blow-outs, would no doubt result in catastrophic impacts to the ecosystem functioning within the Regional Study Area. The EIS uses oil spill modelling on similar sites to demonstrate the extremely large impact area of a sub-surface blowout, as well as the minimal effects of small spills. Further, the EIS presents Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) statistics (current to 2018) to present the low probability of any single oil spill associated with drilling. These modelling exercises and probability-based analyses have great value, however, why did the EIS not present a relevant example from 2019? The Husky operations at the White Rose using the SeaRose released 250,000 L of oil into the sea on November 15, 2018 (Husky 2020). This oil spill is not identified in the EIS tables, even though it occurred in 2018, and would be the largest spill in their summary. Further, as mentioned in the EIS, the White Rose facility is within 2 km of the border of EL 1160 and so would provide a 'real world' example that would likely be comparable to conditions in this project. Lastly, the amount spilled is not as large as the modelled subsurface blowouts, but also not as low as a batch spill. As such, a description of the fate of this oil spill, would be useful for understanding the potential effects of a medium size spill in the project area.</p>
<b>Request:</b>	<b>a) Please describe the Nov 15, 2018 oil spill at the White Rose facility and explain what insights are relevant for the EL 1160 and EL 1159 drilling.</b>
<b>Literature Cited:</b>	Husky 2020 - <a href="https://huskyenergy.com/whiterose/whiterose-faqs.asp">https://huskyenergy.com/whiterose/whiterose-faqs.asp</a>

	Equinor Canada Ltd. 2020. Central Ridge Exploration Drilling Program Abridged EIS. pp 615.
--	--

## 2.2 Marine Mammals and Sea Turtles Information Requests

### 2.2.1 Overarching Comments

Marine mammals and sea turtles found in the Regional Study Area (RSA) include 23 species of cetaceans (whales, dolphins and porpoises), 4 species of seals and 4 species of sea turtles. Eleven of these are designated as at risk or special management concern.

The Abridged EIS has focused on the following potential environmental effects to marine mammals and seas turtles:

- Change in mortality or injury (underwater noise and vessel strikes)
- Change in habitat quality or use
- Change in food availability or quality
- Change in health (exposure to contaminants)

As is often the case in offshore EISs, the assessment of potential impacts on marine mammals is highly qualitative. In this Abridged EIS, it is stated that estimates of marine mammal and sea turtle species' densities, relative abundance and seasonal distribution are not available specific to the boundaries of the Project Area, local or regional study area (LSA or RSA), therefore, the assessment is based on an understanding of general species' presence and distribution in the region. Given the number of offshore projects and approval conditions that often require the implementation of environmental effects monitoring, it is unclear why Equinor could not utilize monitoring data for this area to better characterize baseline conditions. Furthermore, though sighting data is used to show where marine mammals are found in the RSA, descriptions of their habitat are extremely coarse and generally unsuitable for use as baseline information. Relating marine mammal occurrence to habitat characteristics and seasonal variation in prey availability would help explain the distribution of animals in the project LSA and RSA and would assist the proponent in understanding the likelihood of encountering marine mammals at different drilling locations. This type of assessment is commonly done in terrestrial environments but is rarely done for assessments in marine environments.

### 2.2.2 Specific Information Requests

<b>8. Issue: Lack of information on food availability and quality</b>	
<b>Reference:</b>	Central Ridge EIS, Section 10.2 Potential Environmental Changes, Effects and Associated Parameters, pg. 382
<b>Preamble:</b>	Change in Food Availability or Quality was one of the potential effects on marine mammals identified by Equinor in the Central Ridge EIS. However, we could find no information on marine mammal prey quality or quantity in the EIS, or in the previous assessments that were used to support the current EIS. The only information we could find was a high level, qualitative description of phytoplankton and zooplankton. Given the level of activity in the

	region it is surprising that monitoring data is not available that could be used to inform the EIS and its impact predictions. Without quantitative information on zooplankton there is no way to test impact predictions or measure cumulative effects.
<b>Request:</b>	<p>a) <b>Please provide a summary of quantitative information on the distribution and seasonal variation in abundance of zooplankton (e.g. krill) in the LSA and RSA in order to support the assessment of potential changes in food availability or quality for marine mammals.</b></p> <p>b) <b>Conduct a literature search of peer-reviewed and gray literature and provide a discussion as to prey quality in the region.</b></p>
<b>Literature Cited:</b>	Equinor Canada Ltd. 2020. Central Ridge Exploration Drilling Program Abridged EIS. pp 615.

<b>9. Issue: Qualitative description of marine mammal habitat</b>	
<b>Reference:</b>	Central Ridge EIS Section 6.0 Existing Biological Environment, Section 6.3 Marine Mammals and Sea Turtles
<b>Preamble:</b>	<p>The EIS presents numbers and maps of incidental sighting data of marine mammals within the RSA, but descriptions of their habitat are lacking. Rather only high-level statements such as this are provided: “While some species of baleen whales can be observed in the waters off Newfoundland year-round (blue, fin, humpback, and minke whales), most individuals of all species arrive in the late spring and early summer and remain until fall. Several species migrate to lower latitudes in the winter months, returning to the productive waters off Newfoundland in the spring to feed (AMEC 2014).” (pg 200).</p> <p>It would be more informative if Equinor linked these observations to habitat characteristics such as depth, water temperature, phytoplankton and zooplankton productivity. Relating marine mammal occurrence to habitat characteristics and seasonal variation in prey availability would help explain the distribution animals in the project local and regional study area and would assist the proponent in understanding the likelihood of encountering marine mammals at different drilling locations.</p>
<b>Request:</b>	a) <b>Please relate marine mammal sighting data to abiotic and biotic conditions to create a meaningful description of habitat for each species of interest that can inform impact predictions and increase the understanding of the likelihood that a given species will occur in the local study area during operations.</b>
<b>Literature Cited:</b>	Equinor Canada Ltd. 2020. Central Ridge Exploration Drilling Program Abridged EIS. pp 615.

<b>10. Issue: Empirical measurements of noise levels in the LSA</b>	
<b>Reference:</b>	Central Ridge EIS, Section 10.3.3 pg 383
<b>Preamble:</b>	The abridged EIS “relied on literature source levels, the results of acoustic modelling for other projects (Zykov 2016), and field measurements during comparable drilling operations (Maxner et al. 2017; Quijano et al. 2017)” (pg. 383). This suggests that no empirical data on baseline noise levels has been collected in the LSA. This is surprising given the apparent level of activity in the area. Rather the EIS presents results from the Scotian Basin Exploration Drilling Project underwater sound modelling and suggests the surface channel in this Project

	is not expected to be as conductive to sounds so it will likely yield shorter distances to thresholds compared to the Scotian Basin modelling (pg 384). Equinor concludes that the number of individuals that would be affected by noise from the Project is expected to be minimal relative to overall population sizes and of moderate duration. If predictions from previous assessments in the region are not being verified, then this uncertainty is being carried forward into the Central Ridge EIS.
<b>Request:</b>	<p>a) <b>Please explain why empirical monitoring of baseline and project-specific noise levels is not being gathered. If it is, please include it in the description of baseline conditions in the abridged EIS.</b></p> <p>b) <b>If no empirical data on noise levels is being gathered please explain how you plan to test impact predictions or estimate cumulative effects of noise on marine mammals.</b></p> <p>c) <b>As the Central Ridge EIS relies on the accuracy of modelling completed in other EISs, please discuss whether these models (e.g. Scotian Basin underwater sound modelling and others) have been verified. Discuss how Equinor will confirm the applicability of these models to this Project and substantiate their conclusions regarding the attenuation of sounds in this location.</b></p>
<b>Literature Cited:</b>	Equinor Canada Ltd. 2020. Central Ridge Exploration Drilling Program Abridged EIS. pp 615.

<b>11. Issue:</b> Drilling Activities Could Disrupt Cetacean Aggregations in Nearby Ecologically and Biologically Significant Areas (EBSA)	
<b>Reference:</b>	Central Ridge Abridged EIS, Section 10.3.3, Page 383
<b>Preamble:</b>	<p>The Abridged EIS relies on the literature sources, monitoring of nearby drilling operations, and acoustic modelling for other projects (Zykov 2016, Maxner et al 2017, Quijano et al 2017, all cited within the EIS) to predict that the ambient noise generated from the project will confer low to medium magnitude adverse effects to marine mammals, and be generally mitigated through ramping up the sounds and looking for nearby cetaceans or sea turtles. While it does seem unlikely that the magnitude of the noise levels will be acute enough to cause any mortalities, the probability of disrupting cetacean behaviour is much more likely. Whales are known to be well distributed among the Local and Regional Study Area, as described in the Abridged EIS. However, as whales are wide ranging species, and the surveys are mainly opportunistic whale sightings, it is generally not known whether there are any critical habitats within the Project Area. Instead, it is generally assumed that the whales will be able to avoid the localized disturbances within the project area, and return once the drilling is completed (in about a month or two for one well, but longer if wells operate simultaneously). This argument carries some merit, however, the Northeastern Shelf and Slope EBSA is located in the north west corner of EL 1159, and is known to be an important area for cetaceans to congregate (DFO 2016, Templeman 2007). It is therefore important for Equinor to conduct a more rigorous analysis of the extent and magnitude the noises from within ELs 1159 and 1160 will extend into the EBSA, and whether there is a need for additional seasonal mitigation in the drilling schedule to avoid important aspects of the cetaceans' seasonal behaviours.</p>



<b>Request:</b>	<b>a) Please conduct a targeted assessment of the potential of noises from the project operations within EL 1159 and EL 1160 to disrupt the behaviour of whales within the Northeastern Shelf and Slope EBSA.</b>
<b>Literature Cited:</b>	<p>Equinor Canada Ltd. 2020. Central Ridge Exploration Drilling Program Abridged EIS. pp 615.</p> <p>Fisheries and Oceans Canada (2016) Refinement Of Information Relating To Ecologically And Biologically Significant Areas (EBSA) Identified In The Newfoundland And Labrador (NL) Bioregion. Canadian Science Advisory Secretariat, Science Advisory Report 2016/032</p> <p>Templeman, N. 2007. Placentia Bay-Grand Banks Large Ocean Management Area Ecologically and Biologically Significant Areas. Canadian Science Advisory Secretariat, Research Document 2007/052.</p>

<b>12. Issue: Potential for mortality from vessel strikes</b>	
<b>Reference:</b>	Central Ridge EIS, Section 10.3.8 Supply and Servicing pg 387
<b>Preamble:</b>	<p>Equinor states that while vessel strikes have serious consequences for marine mammals and sea turtles, they conclude that “these events are rare on a per-vessel basis and only a small number of vessels relative to current vessel traffic volumes will be added to the RSA” (pg 387). Yet no further details as to the current vessel traffic for this area was provided but Equinor does state that vessel traffic will be approximately 8 to 10 trips per month to service one drilling installation. As well, no details on the number of vessel strikes reported each year for this area have been included. Rather Equinor seems to downplay this concern by indicating that they will monitor for marine mammal and sea turtles and reduce speeds if these species are observed within close proximity to the installation. Generally, the effectiveness of marine mammal observers visually detecting animals is reduced by weather conditions (e.g. sun glare, fog) and is restricted to daylight hours (Verfuss et al 2018) Animal behaviour such as diving and undemonstrative present at the sea surface has also been known to reduce detection probability (Verfuss et al 2018). Further support and evidence is needed regarding the efficacy of marine mammal monitoring program.</p>
<b>Request:</b>	<b>a) What is the current vessel traffic for the Project area and LAA?</b> <b>b) Provide data on the number of vessel strikes with marine mammals or sea turtles for this area across several years.</b>
<b>Literature Cited:</b>	<p>Equinor Canada Ltd. 2020. Central Ridge Exploration Drilling Program Abridged EIS. pp 615.</p> <p>Verfuss UK, D Gillespie, J Gordon, TA Marques, B Miller, R Plunkett, JA Theriault, DJ Tollit, DP Zitterbard, P Hubert and L Thomas. 2018. Comparing methods suitable for monitoring marine mammals in low visibility conditions during seismic surveys. Marine Pollution Bulletin. 126:1-18.</p>

<b>13. Issue: Limited cumulative effects analysis</b>	
<b>Reference:</b>	Central Ridge EIS, Section 14.4 Marine Mammals and Sea Turtles (including Species At Risk), pg 459

<b>Preamble:</b>	<p>Given the high level of current and proposed in the region, there is a high potential for impacts to marine mammals and sea turtles related to injury or disturbance from the movement and sound associated with the drilling installation and vessels. Yet Equinor concludes that safety zones that are required between offshore activities will reduce the potential for environmental Zone of Influence (ZOIs) from sound overlapping in space and time. They do note that underwater sound produced from these activities could extend beyond the safety zones but that the sound generated by exploration drilling and geophysical surveys is temporary and short-term. Yet, no data of baseline noise levels is presented, and no noise predictions associated with the proposed Project have been provided.</p> <p>Equinor also states that “As it is assumed that Hebron and the proposed Bay du Nord development project (located in the Project Area – Northern Section) will have similar ZOIs, there is a limited potential for cumulative effects to Marine Mammals and Sea Turtles from exploration drilling activities carried out on ELs 1159 and 1160 and these ongoing petroleum production projects.” (pg 459). It is unclear what is meant by this statement. A cumulative effects analysis considers the additive element of all projects, but it appears that Equinor is implying that these two projects will not be additive. Further justification and rationale is required to substantiate the conclusions in the cumulative effects analysis section.</p>
<b>Request:</b>	<ul style="list-style-type: none"> <li>a) <b>Provide evidence from peer-reviewed literature or monitoring data that would substantiate conclusions that the Project will not result in significant adverse cumulative environmental effects on marine mammals and sea turtles.</b></li> <li>b) <b>What is the predicted level of noise for the RAA when considering all the projects listed in Table 14.1?</b></li> <li>c) <b>Please clarify how having similar ZOIs for Hebron and Bay du Nord will result in limited potential for cumulative effects to marine mammals and sea turtles.</b></li> </ul>
<b>Literature Cited:</b>	Equinor Canada Ltd. 2020. Central Ridge Exploration Drilling Program Abridged EIS. pp 615.