Responses to Information Requirements and Clarifications – Round 1 (Part 1)

For

Eastern Newfoundland Offshore Exploration Drilling Project
(CEAR 80132)

pursuant to the *Canadian Environmental Assessment Act, 2012*

ExxonMobil Canada Ltd.

May, 2018

Responses to Information Requirements and Clarifications – Round 1 (Part 1)

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INFORMATION REQUIREMENTS

EXXONMOBIL

INFORMATION REQUIREMENT – IR-66

(N/A)

Project Effects Link to CEAA 2012: All - project description relevant to all section 5 effects.

Reference to EIS Guidelines: Part 2, Section 3, Project Description.

Reference to EIS: Section 2.1 Project Scope (Eastern Newfoundland Offshore Exploration Drilling Project)

Context and Rationale

The EIS states that up to 35 exploration and delineation/appraisal wells could be drilled. It is not clear from the description how many exploration (versus appraisal/ delineation) wells specifically are anticipated and in which ELs they may be located.

Specific Question or Information Requirement

Clarify the following:

- how many exploration wells could be drilled within ExxonMobil-operated ELs 1135 and 1137;
- how many delineation/appraisal wells could be drilled within ELs 1135 and 1137 in relation to proposed exploration wells on those same licences; and
- how many (if any) delineation and appraisal wells could be drilled within ELs 1135 and 1137 in relation to exploration wells on other ExxonMobil-held licences.

Describe whether there are differences between the activities associated with exploration and delineation drilling and the associated environmental effects.

Response

The number of exploration wells that could be drilled within ExxonMobil Canada Ltd (ExxonMobil) Exploration Licenses (ELs) 1135 and 1137 may be up to five on each EL. Specific detail, including exploration well counts, will be outlined in the *Operations Authorization* (OA) Application that will be submitted to the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) for review and approval. Specific locations of wells will be submitted to the C-NLOPB via the Application to Drill a Well.

The number of delineation/appraisal wells that could be drilled within ExxonMobil ELs 1135 and 1137 are not known as delineation/appraisal wells would only be required if the exploration drilling well was successful in identifying potential hydrocarbons. The number of appraisal wells will depend on geological conditions, particularly faulting/segmentation and fluid contacts (oil/water) for the discovery. If delineation/appraisal wells are required, the specific details, including number of delineation/appraisal wells, will be outlined in the OA Application that will be submitted to the C-NLOPB for review and approval. Appraisal well objectives and location would be specified in the Application to Drill a Well, which is submitted to the C-NLOPB.

It is also not currently known how many delineation/appraisal wells could be drilled within ExxonMobil ELs 1135 and 1137 in relation to exploration wells on other ExxonMobil-held license for similar reasons discussed in the paragraph above.

The methods and equipment required to drill an exploration well and a delineation/appraisal well are the same, therefore there are no additional environmental effects to consider in the EIS. The key difference is the time their data is retained confidential by the C-NLOPB prior to public release; 2 years for an exploration well and 90 days for a delineation assuming the related exploration well is released (C-NLOPB 2011).

References

C-NLOPB (Canada-Newfoundland and Labrador Offshore Petroleum Board). 2011. Data Acquisition and Reporting Guidelines. Available online: http://www.cnlopb.ca/pdfs/guidelines/data_aq_guide.pdf?lbisphpreq=1. Accessed April 2018.

INFORMATION REQUIREMENT – IR-67

(KMKNO-19)

Project Effects Link to CEAA 2012: 5(1)(a)(i) Fish and Fish Habitat.

Reference to EIS Guidelines: Part 2, Section 6.3.1 Fish and Fish Habitat and 6.6.3 Cumulative Effects Assessment.

Reference to EIS: Section 2.9.5.2 Sound Emissions, 10.3.1 Approach and Methods, 10.3.3 Presence and Operation of Drilling Installation, 10.3.7 Project Related Surveys, Appendix C.

Context and Rationale

The EIS Guidelines require a description, assessment, and determination of the significance of potential effects from underwater noise on fish and marine mammals (Part 2, Section 6.3.1 and Section 6.6.3).

The EIS states that the acoustic modeling conducted for the Scotian Basin Exploration Drilling Project (in Nova Scotia) was used to support the effects assessment for the Project given similarities in project components and activities, locations, and relevancy of recent data, and directs the reader to Appendix C for more information on comparability of the projects (Section 10.3.1).

It is noted that the Scotian Basin model was conducted in relation to operation of a single drilling unit, while two drilling units may be operating simultaneously for the Project. The effects of noise from two drilling units operating simultaneously is not addressed in Appendix C, nor carried through the effects assessment.

Although Exxon may be drilling in relatively shallow water, the Scotian Basin model was based on drilling in deep water (e.g. 2790 m and 2100 m). Appendix C states that for shallow sites, differences in sound propagation would result in longer distances to thresholds than predicted in the Scotian Basin model for high sound levels, and shorter distances to thresholds for lower sound level. It is not clear how these differences have been applied to the effects analysis. The shorter distance to threshold is mentioned in both Sections 10.3.3 and 10.3.7, but the implications of longer distances to thresholds for higher sound levels is not carried through the effects analysis.

Specific Question or Information Requirement

Assess the effects of noise from operating multiple drilling units simultaneously, as proposed for the Project.

Given that the Scotian Basin model was based on deep water (e.g. 2790 m and 2100 m), update the effects assessment for shallow water sites with consideration that noise is predicted to travel longer distances to thresholds for higher sound levels.

Update the effects assessment, as applicable.

Response

Multiple Drilling Units

As noted by the reviewer, the description of the Project provided in the Environmental Impact Statement (EIS), and thus the scope of the Project for environmental assessment (EA) purposes, includes the potential for multiple drilling installations to be actively engaged in drilling activities in the Project Area at any one time over the life of the Project. It should be noted, however, that there is low potential for two drilling installations to be active at the same time as part of the Project, as discussed in Information Requirement (IR) IR-01. This is due primarily to commercial and logistical factors, including the availability of drilling equipment, as well as the typical sequencing of exploration drilling activity in any particular Exploration Licence (EL), where an initial well is drilled and its results are analysed and evaluated as part of an operator's decision-making about whether, when, and where to drill any additional exploration or delineation wells in that area. There is therefore very little possibility that two drilling installations would operate at the same time in proximity to one another as part of the Project, drilling installations could be up to 500 km apart from each other. The environmental effects assessment has, however, considered this potential occurrence, in order to be conservative and fully inclusive of all such possible scenarios, including the potential for "overlapping" or combined environmental effects to a valued component (VC) resulting from multiple, concurrent drilling campaigns occurring as part of the Project. In addition, the cumulative effects assessment presented in Chapter 14 of the EIS is largely focussed on assessing the potential for the environmental zones of influence of individual Project-related activities and those of other projects and activities in the Regional Study Area (RSA) to overlap in space and time to result in combined effects on any VC. However, these concepts are also applicable to potential "within Project" effects resulting from multiple, concurrent Project activities as well. Furthermore, each of the mitigation measures outlined in the EIS would be applicable to and implemented for each individual drilling campaign, whether concurrent or consecutive in nature.

In assessing the potential effects of underwater noise on marine species, the EIS relied on literature source levels, the results of acoustic modelling for other projects, and field measurements during comparable drilling operations (EIS Appendices C and D). To summarize the soundscapes around the Eastern Newfoundland Exploration Drilling Project Area, JASCO analyzed sound pressure levels from a data collection program conducted in 2015-2016. Hydrophone Station 18 was 35 km from the Hibernia platform in the existing Jeanne d'Arc Basin development area in 80 m of water, and sound pressure levels here were recorded as 110–120 dB re 1 µPa continuously. Field measurements taken at this hydrophone station reflect the combined sound levels of three producing platforms and the support vessel traffic associated with their activities. Conclusions reached in the EIS factored in results for the Scotian Basin Exploration Drilling Project modelling, which predicted that sound levels from an operating drilling installation would attenuate to below National Oceanic and Atmospheric Administration's marine mammal behavioural disturbance thresholds (120 dB re 1 µPa RMS sound pressure levels [SPL]) at distances from the source ranging from 23 km (in summer) to approximately 150 km (winter). The measured sound levels at Station 18, which reflect cumulative sounds produced by three operating developments fall well within this range. The results of the environmental effects assessment presented in the EIS are therefore fully inclusive of, and thus reflect, the potential use of multiple drilling installations at any one time during the Project.

Shallow Water Sites

Appendix C of the EIS presents a professional acoustic review of the comparability of the source levels and sound propagation parameters associated with the Scotian Basin Exploration Drilling Project EIS (BP 2016; Zykov 2016) against the source levels and sound propagation parameters expected for this Project. The conclusion of this review was that the Scotian Basin modelling work provides a good reference for the sound levels expected from the Project, particularly at deep water sites. Based on a comparison of sound speed profiles between the Scotian Basin and the Project Area, Martin et al. (2017, EIS Appendix C) concluded that sound propagation extents for the Project will fall somewhere between those predicted for summer and winter in the Scotian Basin modelling study (Zykov 2016), with less overall variation across the year. For operation in shallow water, distances to thresholds corresponding to high levels (e.g., SPL thresholds of 180–190 dB re 1 µPa) are expected to be longer than those modelled for the Scotian Basin Exploration Drilling Project, while the opposite would be expected for lower sound level thresholds (e.g., SPL of 120 dB re 1 µPa). Therefore, with respect to sound propagation in potential shallow water sections of the Project Area, distances to thresholds for behavioural disturbance are likely to be lower than predicted for the Scotian Basin, while distances to thresholds for auditory injury are likely to be higher (Appendix C). As such, use of the threshold distances from the Scotian Basin modelling work in the EIS is considered conservative for all scenarios except the assessment of auditory injury when drilling in shallow waters. Results from the Scotian Basin's modelled operating drilling installations predicted that cumulative sound exposure levels (SELs) (over 24 hours) would decrease to below threshold values for potential marine mammal auditory injury at distances between 120 and 470 m from the source (depending on the species group and environmental conditions) (Zykov 2016). This means that marine mammals would need to remain within less than 500 m of the operating drilling installation over the course of 24 hours in order to experience auditory injury. Similarly, peak SPLs were predicted to decrease to below threshold values for permanent threshold shifts at 10 m from the operating drilling installation. As such, exposure to underwater noise at levels capable of causing marine mammal auditory injury (using either the SPL or SEL metric) was deemed unlikely for the Scotian Basin modelling (Zykov 2016). Even during shallow water drilling scenarios, where distances to thresholds might be somewhat greater than those cited here, based on literature source levels, the results of acoustic modelling for other projects, field measurements during comparable drilling operations (Appendix D of the EIS) and despite potential minor differences in Project parameters, it is still considered unlikely that marine mammals will approach and remain within the distances required to be exposed to sound levels capable of causing auditory injury during presence and operation of the drilling installation.

The results of the environmental effects assessment presented in the EIS are therefore considered fully inclusive of the potential effects of underwater noise resulting from Project activities in shallow water locations and no modifications to the conclusions presented therein are deemed necessary. Therefore, the effects assessment is not required to be updated.

References

BP. 2016. Scotian Basin Exploration Drilling Project. Environmental Impact Statement. Available online: http://ceaa.gc.ca/050/evaluations/document/116118. Accessed May 2018.

Zykov, M.M. 2016. Modelling Underwater Sound Associated with Scotian Basin Exploration Drilling Project: Acoustic Modelling Report. JASCO Document 01112, Version 2.0. Technical report by JASCO Applied Sciences for Stantec Consulting Ltd. February 2010.

INFORMATION REQUIREMENT – IR-68

(N/A)

Project Effects Link to CEAA 2012: Multiple VCs- Accidents and Malfunctions.

Reference to EIS Guidelines: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions.

Reference to EIS: Section 15.1.2.1.1 Accidents and Malfunctions, Source Control.

Context and Rationale

ExxonMobil anticipates that the capping stack would be sourced from Norway and that it could be mobilized and installed within 30 days of the incident occurring. Weather conditions and logistical considerations of the specific incident would be factored in the overall time required to secure the well, but for the purposes of the spill trajectory modelling, 30 days was assumed. A secondary capping stack location was not identified.

The EIS anticipates that the capping stack would be sourced from Norway, but indicates that the OSRL maintains capping stack systems, containment and subsea intervention equipment at four strategic locations around the world.

Specific Question or Information Requirement

Explain whether 30 days for ExxonMobil is intended to be an average or a worst-case timeline for capping a well, taking into consideration weather and logistical considerations. If 30 days is not a worst-case scenario, provide a worst-case scenario for capping a blowout in ELs 1135 and 1137.

Confirm the timeline associated with the mobilization of the capping stack, in particular if mobilization would occur immediately following a blowout or at a later time.

Clarify whether consideration has been given to mobilizing a secondary capping stack from a second location as part of the Eastern Newfoundland Offshore Exploration Drilling Project or justify why Norway is the only location under consideration. If applicable, confirm the timeline for the mobilization of the secondary capping stack (i.e. would it be immediately after a blowout or at a later time?).

Explain whether it is possible that a capping stack in Norway would be unavailable and what contingencies would be in place to address this scenario.

Response

The 30-day estimate is intended to be a worst case scenario, inclusive of weather and logistical constraints.

In the unlikely event the Capping Stack System (CSS) was deemed necessary for the emergency scenario, notification and mobilization would occur immediately. The process for mobilization of the CSS to site is anticipated to take between 14-21 days (worst case). In the unlikely event the CSS was deemed necessary, a secondary system could be mobilized if deemed appropriate, as the member agreement with Oil Spill Response Limited (OSRL) provides access to up to two CSS

systems. OSRL have four CSS globally (two 15ksi rated, two 10ksi rated). Based on transit times, the Norway system is expected to arrive ahead of any other systems located elsewhere globally. As per OSRL processes, all members are notified when / if the CSS system is unavailable. In the unlikely event that the Norway CSS was not available for an emergency scenario, CSS equipment would be mobilized from one of the other locations globally where OSRL maintains CSS equipment.

The capping stack and response scenarios will be described in the ExxonMobil Canada Ltd. (ExxonMobil) Oil Spill Response Plans (OSRP), which is required to be submitted to the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) for their review and approval as part of the *Operations Authorization* (OA) process.

References

N/A

INFORMATION REQUIREMENT – IR-69

(C-NLOPB-9)

Project Effects Link to CEAA 2012: Multiple VCs- Accidents and Malfunctions.

Reference to EIS Guidelines: Part 2, Section 6.4. Mitigation Measures.

Reference to EIS: Section 15.3 Spill Risk and Probabilities.

Context and Rationale

The water depths at which a potential blowout on EL 1135 and EL 1137 are modelled at are 362 m and 89 m, respectively. However, the water depths within these ELs range from 70 m to 1130 m.

The CNLOPB has advised that modelling at 362 m is not considered to be representative of a deep water well.

Specific Question or Information Requirement

If drilling could occur in deeper water (>500 m), provide modelling to support this activity along with an analysis of potential environmental effects and proposed mitigation. Alternatively, provide a rationale as to how the shallow water (i.e. <500 m) blowout modeling or other modelling to which the proponent has access represents a worst-case scenario and why associated effects analysis can be applied to water depths of up to 1130 m.

Response

The oil spill modelling conducted for Exploration License (EL) 1135 was considered appropriate based on the tentative well location planned for that EL. Following submission of the Environmental Impact Statement (EIS), ExxonMobil Canada Ltd. (ExxonMobil) has acquired operatorship of EL 1134, which is to the south of EL 1135 and in deeper water. ExxonMobil is currently preparing an oil spill model for a location of 1175 m water depth which is representative of a well in EL 1134, as well as the deeper water depths in EL 1135. The model will be provided as an addendum to the existing EIS.

References

N/A

INFORMATION REQUIREMENT – IR-70

(C-NLOPB-conformity)

Project Effects Link to CEAA 2012: Multiple VCs- Accidents and Malfunctions.

Reference to EIS Guidelines: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions.

Reference to EIS: Section 2.5.2.3 Offshore Well Drilling; 15.0 Accidental Events.

Context and Rationale

The EIS Guidelines require a discussion on the use and feasibility of a capping stack to stop a blowout and resultant spills. It is understood that ExxonMobil's ELs (1135 and 1137) occur in water depths between 70 m and 1130 m. The C-NLOPB has advised that the use of a regular capping stack in shallow water depths may not be possible because a vessel may not be able to operate over the well.

Statoil's Appendix H states that in shallow waters (less than 600 m) an offset installation tool may be required, which is available from Italy. The tool enables capping stack installation in situations where extreme jet forces from the incident well do not allow vertical access to the well bore by the vessel.

Specific Question or Information Requirement

Provide additional information on the technology available to cap a shallow-water well, including information available to support the effectiveness of the technology.

Discuss limitations associated with the use of a capping stack in shallow environments, including any differences in the steps taken to affix a capping stack in shallow water that may not be required when capping a deep water well (e.g. use of dispersants to reduce flow rate). Explain how the limitations of the technology would affect the length of time it may take to cap the well.

If applicable, update the effects analysis to reflect these additional considerations.

Response

Effective in 2018, our member agreement with Oil Spill Response Limited (OSRL) provides access to Offset Installation Equipment (OIE), which facilitates installation of the Capping Stack System (CSS) in the event vertical well access by vessel is not possible. The equipment can be deployed up to 400 to 500 metres (m) from the well site and is suitable for use in water depths ranging from 75 to 600m. More information about the OIE system can be found on the OSRL website (OSRL 2018). The worst-case scenario included in the Environmental Impact Statement (EIS) includes time for potential use of the OIE system to safely cap the well. It is also noted that ExxonMobil Canada Ltd. (ExxonMobil) and regulatory representatives were invited to tour the OSRL facility and observe the OIE equipment in early 2018.

References

OSRL (Oil Spill Response Limited). 2018. Offset Installation Equipment – Bringing an industry first to our members. Available online: https://www.oilspillresponse.com/services/subsea-well-intervention-services/offset-installation/. Accessed April 2018.

CLARIFICATIONS

EXXONMOBIL

CLARIFICATION – CL-21

(ECCC-15)

Project Effects Link to CEAA 2012: Multiple VCs – Accidents and Malfunctions

Reference to EIS Guidelines: Part 2, Section 6.6.1, Effects of Potential Accidents or Malfunctions

Reference to EIS: Section 15.0 Accidental Events

Context and Rationale

It is important to understand the logistical and operational constraints involved with drilling a relief well so that well control timeframes can be fully appreciated and the magnitude of environmental effects resulting from such delays can be properly determined and characterized to the greatest extent possible so as to help inform a determination of significance of any residual effects.

Required Clarification

Explain why mutual aid assistance from other operators in the region (such as drill rig assistance for the emergency drilling of a relief well) would be limited to "(u)nder the agreement, each party agrees to use reasonable effort to make available designated resources in the event of an emergency. Resources provided to requesting party is only to the extent that the donor party's operation is not jeopardized or its personnel or facility put at risk" (Appendix H, page 4).

Provide information specific to potential drill rig assistance to other mutual aid agreement operators in the region that may require the emergency drilling of a relief well.

Response

As mentioned in Information Requirement (IR) IR-44, ExxonMobil Canada Ltd. (ExxonMobil) is a participating party to the Grand Banks Operators Mutual Emergency Assistance Agreement (herein referred to as the Agreement). The Agreement came into effect on 01-Dec-2017 and the purpose is for various operators in the Grand Banks to provide assistance to each other in the event of an emergency. The current parties in the Agreement include:

- Hibernia Management and Development Company Ltd.;
- Suncor Energy;
- Husky Energy;
- ExxonMobil; and
- Statoil Canada Ltd.

Assistance provided by other operators will depend on the situation, however, it may include the following:

- Providing current, or forecasted, ice, weather and/or oceanographic information;
- Providing MedEvac support from an offshore location; and

- Providing personnel, vessels, equipment, facilities, and other company or contracted resources to assist during the emergency response operation.

To utilize other operators in the event of an emergency, a notice and informal request is required to be made, which is typically by telephone. Formal written confirmation is also completed by the operator Incident Commander. Under the Agreement each operator agrees to use reasonable effort to make the available designated resources available, however, resources will only be provided to the extent that the responding operator's operation is not jeopardized or its personnel or facilities are put at risk.

The type of drilling installation required to drill a relief well is identified in advance of any drilling operations occurring. ExxonMobil also has the ability to utilize other rigs that are contracted globally.

Other operators have met with the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) on a regular basis during past exploration drilling activities to discuss various emergency response aspects. Operators are always monitoring rig availability in their region for the purposes of drilling a relief well.

References

N/A