

Amendment Report

**ENVIRONMENTAL ASSESSMENT NORTHEAST
NEWFOUNDLAND SLOPE 2-D SEISMIC SURVEY**

Client:

Multi Klient Invest AS

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Survey Dates:

2012 - 2017

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1 Introduction

This document is an Amendment to the Environmental Assessment (EA) report originally submitted to the Canada-Newfoundland Labrador Offshore Petroleum Board (C-NLOPB) by Multi Klient Invest AS (MKI) (YOLO Environmental Inc. 2012) to conduct marine 2D seismic reflection surveys offshore in the region of the Northeast Newfoundland Slope. MKI obtained a letter of Determination of Significance dated September 4, 2012.

On April 30, 2015, the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB), in consultation with the Board's fishery and environmental review agencies, reviewed the environmental assessment (EA) amendment reports "*Amendment to the MKI NE NL Slope Seismic Survey EA*" (RPS Energy Canada February 13, 2015 & March 23, 2015) and Multi Klient Invest's (MKI's) March 23 and April 14, 2015 response to review comments. MKI amended the *Environmental Assessment Northeast Newfoundland Slope 2-D Seismic Survey Program, 2012-2017* (RPS Energy Canada April 2012) to include three-dimensional seismic activities in their Northeast Newfoundland Slope Seismic Program.

The C-NLOPB determined that the EA Amendment Report provided a satisfactory assessment of environmental effects associated with this activity. The C-NLOPB concluded that, taking into account the implementation of mitigation measures committed to by MKI during the environmental assessment, the project is not likely to cause significant adverse environmental effects.

MKI now wish to submit a further amendment to this EA to allow for concurrent 2D and 3D surveys to take place in the Project Area. The amendment requires approval through the C-NLOPB.

This amendment evaluates potential effects on the valued ecosystem components (VECs) from the 3D surveys.

The Project temporal and spatial scopes for the 3D surveys will remain the same as in the original EA. (Figure 1).

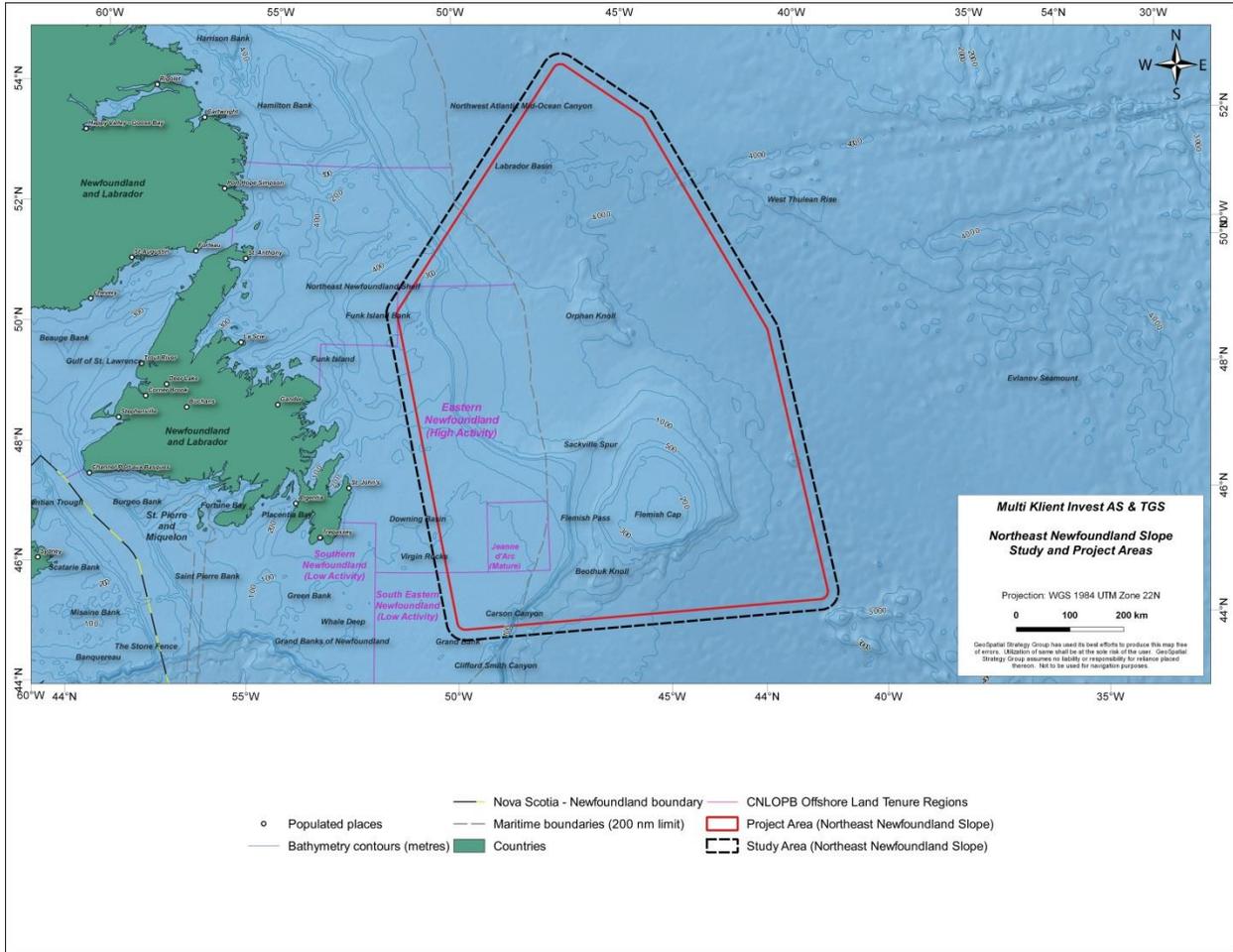


Figure 1 - Project Area and Study Area

1.1 Proponent Contact Information

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2 Project Description

MKI is proposing to conduct two 3D seismic surveys concurrently in the Northeast Newfoundland Slope during the 2015 season and further 3D surveys may take place during 2016 & 2017.

2.1 Project Components

2.1.1 Project Activity Area

The activity area for the 3D surveys will occur within the same approved Project Area. In 2015 MKI is planning to conduct two 3D surveys concurrently in the assessed area. The first survey is located in the southern part of the Flemish Pass Basin and the second survey is located some 300 kilometres to the north in the Orphan Basin. Specific survey locations for activities in future years have yet to be decided but will be provided to the C-NLOPB and shared with other stakeholders as future updates.

2.1.2 Schedule

The duration of a 3D survey is estimated at 100 to 150 days in a given year. A survey would typically commence at the beginning of the summer but the exact dates will depend on the location and weather conditions.

3 Potential Effects Assessment and Mitigation

In the original EA and responses to information requests, MKI committed to planning and best practice mitigation measures to reduce each of the potential adverse environmental effects that were identified in Sections 4.2.1 and 6.0, and potential interactions in Section 4.2.4. Section 6 provides the effects analysis and mitigation for seismic operations.

Mitigation measures implemented for monitoring and management of sea space around the vessels and towed equipment will be consistent as for the ongoing 2D surveys and 3D surveys. The Statement Of Canadian Practice mitigations of a safety zone; ramp up, ramp up delay and shutdown procedures; reduced and continuous vessel speed; use of a guard vessel; presence of Environmental Observers and Fisheries Liaison Officers; Notice to Mariners, and weekly communications with commercial fisheries and the Department of Fisheries, as committed to in the original EA, provide several layers of mitigation measures. The purpose of the “ramp up” procedure is to provide an acoustic warning for marine mammals, fish and sea turtles to minimize their exposure to the array sound source that may cause impairment by motivating them to move away from the sound source. With the 10 - 15km spacing between sequential data acquisition lines, the sound exposure levels will be well below the sound range considered to cause behavioural or physical effects, as discussed in detail for each marine biological VEC in Section 6 of the original EA report.

As described in the original EA, there has never been a record of a cetacean entanglement offshore Atlantic Canada over the several decades of seismic surveys with 2D or 3D equipment. The “ramp up” procedure, along with delay and shutdown mitigations is established, in part, to avoid marine mammal and gear entanglement. Similarly, there has been no record of sea turtle entrapment offshore Atlantic Canada. There will be turtle guards fixed to each tail buoy.

The potential of space user conflict with fishers and fishing gear from an increased number of towed streamers in a focussed survey area will be mitigated. This will be mitigated by the presence of a Fisheries Liaison Officer and the effective communication and planning procedures established by MKI since commencing seismic surveys in this region in 2012.

Table 1 provides a summary review of the VECs, the interaction with Project activities, a review of potential effects and applied mitigation established in the original EA that are directly applicable to the 3D survey.

Table 1 - Summary of Project Activity Interactions, Potential Effects and Mitigation Measures

VEC	Interaction	Potential Effects	Mitigation
Marine and Migratory Birds/Species at Risk/Critical Habitats	Vessel Presence	Disturbance from increased vessel traffic causing localized avoidance or attraction	Waste management implemented to control food waste discharges, maintaining compliance with OWTG (NEB et al 2010)
	Vessel lighting	Attraction to lights causing injury or mortality from hitting ship or becoming stranded or entangled in equipment	A dedicated observer will be on board the seismic vessel to record marine birds and incidents of collisions and stranding.
	Noise produced by air source array	Hearing damage	Implement ramp up procedure of air source array
	Accidental hydrocarbon spill	Oiling of birds	Vessel compliant with audit prior to survey. Maintenance of equipment and responsible management of such equipment. Compliance with OWTG (NEB et al. 2010) and MARPOL for all discharges. A dedicated observer will be on board the seismic vessel to record marine birds and incidents of oiling and stranding.
Marine Mammals/ Species at Risk/Critical Habitats	Vessel Presence	Strikes Temporary behavioral (aversion or attraction) effects to vessels	Strike avoidance practices, including constant speed and course maintained by seismic vessels.
	Noise from increased vessel traffic	Behavioral changes Physiological changes Masking of sound Hearing impairment	Vessels would maintain a constant speed of about 4.5 knots while surveying. Implement ramp up procedure of air source array
	Sound produced from air source array	Communication masking; behavioral effects associated with seismic noise (e.g., avoidance, changes in migration, reproductive and feeding behaviors); and direct physical effects associated with seismic noise from air gun during 3D programs, (e.g. TTS, PTS, mortality).	Adherence to the Statement of Canadian Practice on the Mitigation of Seismic Noise in the Marine Environment. A 500-m safety zone from the air source array and monitoring program for whale species at risk during survey data acquisition will be implemented. Ramp-up, ramp up delay, and shutdown procedures

			<p>implemented.</p> <p>Dedicated Marine Mammal Observers will be onboard the seismic vessel.</p> <p>If a concentration of marine mammals is observed in a particular area, the survey can shift to another part of the Study Area until the concentration has moved away.</p>
Sea Turtles/Critical Habitat	Vessel Presence	<p>Collision with seismic vessel</p> <p>Entrapment in towed streamers</p>	<p>Vessels would maintain a constant speed of about 4.5 knots while surveying.</p> <p>Implement ramp up procedure of air source array.</p> <p>Environmental Observers onboard.</p> <p>Use of turtle guards.</p>
	Sound produced from air source array	<p>Auditory damage and behavioural effects (e.g., avoidance behaviour, increased swimming speeds).</p>	<p>Adherence to the Statement of Canadian Practice on the Mitigation of Seismic Noise in the Marine Environment.</p> <p>A 500-m safety zone from the air source array and monitoring program for sea turtles during survey data acquisition will be implemented.</p> <p>Ramp-up, ramp up delay, and shutdown procedures implemented.</p> <p>Dedicated Marine Mammal Observers will be onboard the seismic vessel.</p>
Marine Fish and Shellfish/Species at Risk/Critical Habitats	Sound produced by air source array	<p>Hearing and sound sensory damage</p> <p>Auditory and communication masking</p> <p>Avoidance behavior causing horizontal and or vertical distribution shift</p> <p>Physical and anatomical effects</p>	<p>Ramp-up and Shutdown procedures implemented.</p> <p>Operations will not take place within the EBSAs until after July.</p>
	Noise from increase vessel traffic	<p>Localized avoidance</p>	<p>Operations will not take place within the EBSAs until after July</p>
Traditional and	Seismic survey has	Potential loss of income to	Tracking of other area vessels

Commercial Fisheries Fisheries Research Surveys	the potential to affect the behavior and movement of commercial fish species	resource users due to change in fish behavior and spatial distribution.	through VMS A Notice to Mariners on the location and scheduling of seismic activities will be issued. Communication mechanisms will be developed with the fishing industry and DFO research surveys. Fisheries observers on the seismic vessel will monitor fishing activity and serve as a liaison between the fishing and seismic vessels; A Notice to Shipping and notification on the CBC Fisheries Broadcast on the location and scheduling of seismic activities will be issued.
	Fishing gear damage	Potential loss of income if gear is damaged by vessels and or towed array	Vessel tracking and communications as described above. MKI will comply with C-NLOPB's compensation guidelines.
Accidents/Malfunction	Accidents and spills would have the potential to release hydrocarbons into the marine environment through fuel loss.	Adverse changes to ecosystem process and marine life presence due to spills, depending upon the spill or accident characteristics.	All vessels will adhere to approved procedures, MARPOL and SOPEP Manuals Only solid streamers will be used
Effects of the Environment on the Project	Interaction with pack ice Extreme storms	The project schedule may be altered due to weather shutdowns	Weather forecasting service will be obtained Review of ice monitoring reports

4 Cumulative Effects Assessment

The assessment of cumulative effects entails the consideration of projects and activities that have been or will likely be carried out that have or would have residual effects that may act in a cumulative manner with the residual effects of the proposed Project on the environment.

4.1 Residual Effects from the Project

Potential adverse effects from the Project and mitigation measures are identified in Table 2. Those effects that were considered highly localized or negligible in magnitude were not considered in this assessment of cumulative effects, as it was determined they would not have potential to interact with residual effects of other projects in any measureable manner. This is summarized in the table below which also shows a level of confidence in the assessment.

Table 2 - Residual Effects Rating

VEC	Residual Adverse Environmental Effect Rating	Probability of Occurrence (Likelihood)	Level of Confidence
Marine and Migratory Birds	Not Significant	na	High
Marine Fish and Shellfish	Not Significant	na	High
Marine Mammals	Not Significant	na	Medium
Sea Turtles	Not Significant	na	High
Species at Risk	Not Significant	na	High
Sensitive Areas	Not Significant	na	High
Commercial Fisheries	Not Significant	na	High
na = likelihood is only indicated for those Environmental Components that have a significant residual adverse environmental effect rating.			
Residual Effects Rating: S=Significant Adverse Environmental Effect; N=Non-significant Adverse Environmental Effect; P=Positive Environmental Effect Probability of Occurrence: Based on professional judgment; 1 = Low; 2 = Medium; 3 = High; N/A = Not applicable (effect is not predicted to be significant) Scientific Uncertainty: Based on scientific information and statistical analysis or professional judgment;			

In consideration of MKI’s planned mitigation the following residual effects from the Project have potential to interact cumulatively:

- Temporary displacement of marine mammals due to exposure to anthropogenic sound input and vessel traffic; and
- Temporary displacement of fish due to exposure to anthropogenic sound input.
- Potential impacts on the commercial fishing, fishing effort is diverse and shifting in response to stock locations.
- Possible displacement of seabirds; routine discharges from marine vessels could influence avifauna, and vessel traffic.

4.2 Identification of Other Projects and Activities

Other approved activities that would likely be carried out in the Project area over the same time period are identified in Table 3.

Table 3 - Summary of Offshore Activities, Project Interactions and Mitigation Project

Activity	Interaction with Project	Mitigation Measures
Offshore Petroleum Production Exxon Mobil’s HMDC, production until 2036. Suncor – Terra Nova production until 2027 Husky – White Rose production until 2020	The active production platform located in study area.	Avoidance mitigation as per C-NLOPB requirements for a safety zone around platforms/facilities
Offshore Petroleum Drilling Exxon Mobil Hebron Project commence offshore 2016-ongoing Husky exploration drilling 2008-2017 Suncor exploration drilling 2009-2017 Statoil exploration drilling 2008-2016	Four drilling rigs planned to operate on the Grand Banks presently and in the future. No spatial overlap anticipated due to distance between projects. Temporal overlap may occur.	Avoidance mitigation as per C-NLOPB requirements for a safety zone around platforms/facilities
Geophysical Exploration Husky 2D, 3D, 4D + geophysical surveys, in 2013 – 2020, March to November, Statoil 3D, 2D + geophysical surveys in 2011-2019, April to October	Nine programs in the same region with high potential for overlap. Possible for future temporal and spatial overlaps.	Notice to Shipping Notice to Mariners VMS tracking of all area vessels Internal MKI planning between 2D and 3D crews (SIMOPS)

Activity	Interaction with Project	Mitigation Measures
Chevron 2D, 3D + geophysical in 2012-2017, May to November, 30 to 120 days Suncor 2D, 3D, 4D, 2014-2024 GXT 2D grav/mag, 2014-2018 ExxonMobil 3D/4D May to Dec 2015 MKI and TGS NOPEC 2D & 3D survey, 2012-2017 Bridgeport Aerial Gravity Survey 2015-2019		
Commercial Marine Traffic Heavy domestic and international marine traffic over the Grand Banks.	Project is not transiting any shipping channels	Notice to Shipping VMS tracking of all area vessels
Commercial Fishing Fishing effort is diverse and shifting in response to stock locations	Temporal and spatial overlaps may occur.	Establish advance and ongoing communication with fishing industry representatives and DFO Avoidance of fishing gear through communication tools Notice to Shipping CBC Fishermen's Broadcast Notice to Mariners on the location and scheduling of seismic activities Dedicated FLO onboard VMS tracking of all area vessels Single Point of Contact
Scientific Research Surveys Spring and fall bottom trawl surveys, fall post-season crab trap survey	Temporal and spatial overlaps may occur	Establish advance and ongoing communication with fishing industry representatives, and DFO Avoidance of fishing gear through communication tools; Notice to Shipping, CBC Fishermen's Broadcast Notice to Mariners on the location and scheduling of seismic activities Dedicated FLO onboard VMS tracking of all area vessels Single Point of Contact

The distance between MKI's 2D and 3D seismic vessels, other vessels and offshore drilling and production facilities in the Project area would minimize the potential for cumulative effects to occur. There is considerable effort from operators to discuss the temporal and spatial relationship of their

activities in order to minimize space conflicts and effects to each other's activities as well as those of other stakeholders. These discussions, operations planning and other mitigation procedures will reduce or eliminate the likelihood that the sound levels from two surveys will be additive in a particular area and reduce the potential for cumulative effects.

Any potential cumulative environmental effects would be minimal due to the mitigation measures that reduce exposure of marine mammals to simultaneous and overlapping noise sources. Displacement of marine mammals and fish would be temporary and reversible. Therefore, it is not likely that there would be any significant cumulative environmental effects resulting from this project.

5 Conclusions

The Project Area is not known to be an important feeding, rearing or mating area for any of the listed species at risk that could occur in the area. Ecological processes will not be disturbed outside natural variability, and ecosystem structure and function will not be critically affected. All effects are reversible, of limited duration, magnitude, and geographic extent. With the application of appropriate mitigation, all Project effects have been rated as not adversely significant. Most of the species that could occur in the Project Area are more vulnerable to direct and indirect fishing activities; entanglement in fishing gear; collisions with ships; and/or pollution.

As described in the original EA Report, all appropriate mitigation measures and response planning will be in place to limit any potential pollution as a result of the Project; vessel activity will be restricted to the Project Area; and noise levels associated with the Project are not predicted to result in physical harm to marine mammals, marine fish, seabirds or sea turtles. Based on the above, no harm to listed species or their critical habitat is anticipated to occur as a result of the Project at any time of year. Previous 2D, 3D seismic surveys, well site geohazard and VSP surveys conducted in this area have not resulted in claims that significant adverse effects to biological or socio-economic VECs of the area. Therefore, there is high confidence that the mitigation in place of avoidance is effective to ensure that no harm to listed species, critical habitats or fisheries harvesting is anticipated to occur as a result of the Project.

The significance of residual environmental effects (i.e., after mitigation has been applied), including cumulative effects, is predicted not likely to be significantly adverse for all VECs. In conclusion, this amendment to the environmental assessment predicts that MKI's proposed 2D and 3D seismic programs can be conducted with no likely significant adverse effects on the biological and socio-economic resources of the Northeast Newfoundland Slope.

6 Consultation

MKI has held previous communication with Stakeholders on the 3D Amendment. The FFAW is familiar with our plans.

7 Literature Cited

National Energy Board, Canada Nova Scotia Offshore Petroleum Board, Canada-Newfoundland and Labrador Offshore Petroleum Board. 2010. Offshore Waste Treatment Guidelines.

YOLO Environmental Inc. 2012. Environmental Assessment of MKI INVEST AS's Northeast Newfoundland Slope 2-D Seismic Survey Program 2012-2017. Prepared for RPS Energy (Canada) and MKI AS and TGS NOPEC Geophysical Company ASA.

Amendment to the MKI NE NL Slope Seismic Survey EA, (RPS Energy Canada February 13, 2015 & March 23, 2015) and Multi Klient Invest's (MKI's) March 23 and April 14, 2015 response to review comments.