Environmental Assessment Update (2018) of Multiklient Invest Newfoundland Offshore Seismic Program, 2018–2023

Prepared by

LGL LIMITED
environmental research associates

for

Multiklient Invest AS

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TGS-NOPEC Geophysical Company ASA

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1.0 Introduction

This document is an Update of the Environmental Assessment (EA) of the Multiklient Invest AS (MKI) Newfoundland Offshore Seismic Program, 2018–2023 (LGL 2018a) and the associated Addendum (LGL 2018b). In 2018, MKI is proposing to conduct only 3D seismic surveying in the Newfoundland Offshore Project Area (Figure 1.1). The EA Update document addresses the validity of the EA (Table 1.1) as it pertains to MKI's proposed seismic survey activities in 2018. The EA Update is intended to assist the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) in its regulatory review process by demonstrating that both the scope of the assessment and the mitigation measures to which MKI previously committed remain technically valid for proposed seismic survey operations in 2018.

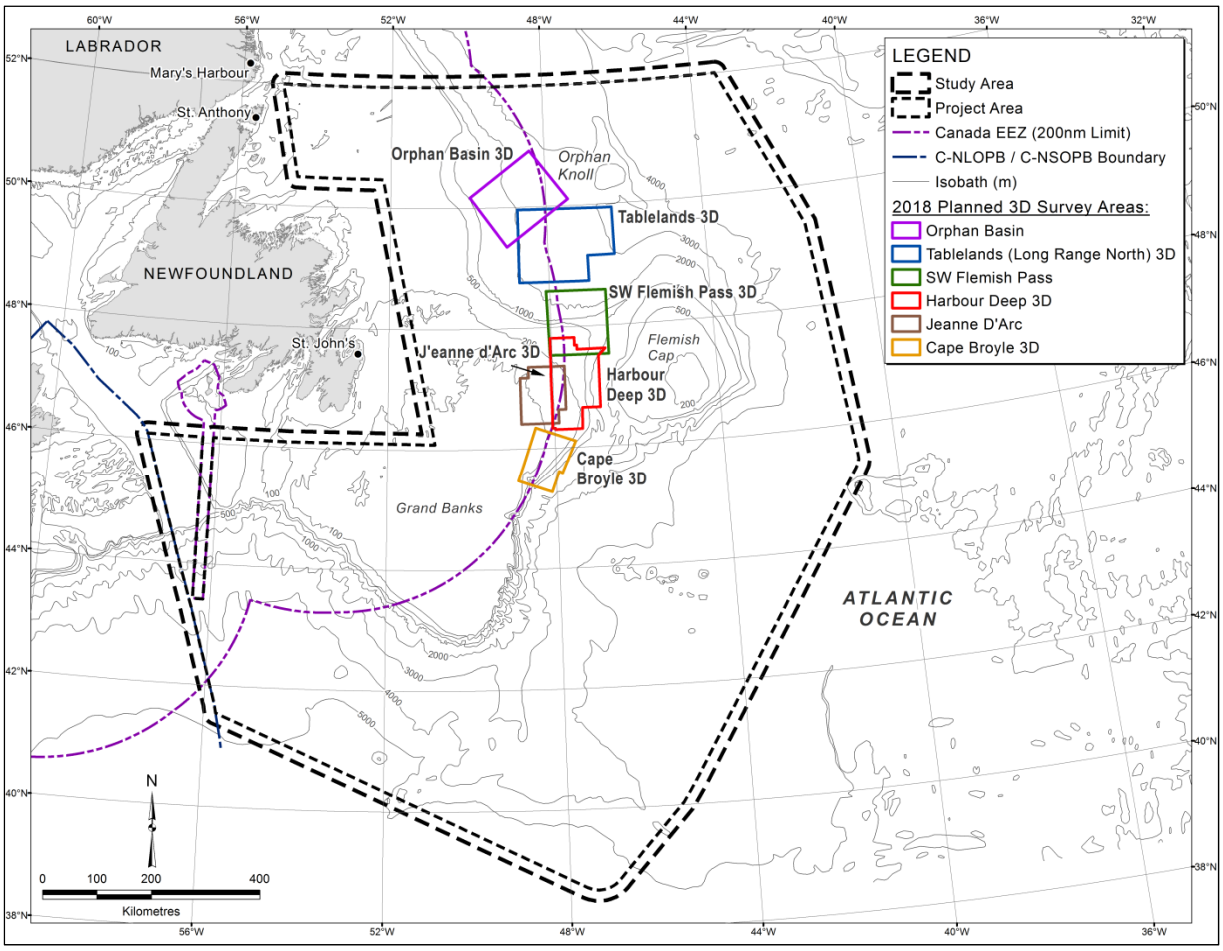

FIGURE 1.1. Locations of the Project Area, Study Area and 2018 3D Survey Areas for MKI's Newfoundland Offshore Seismic Program, 2018–2023.

TABLE 1.1. Active Environmental Assessment documents for the MKI Newfoundland Offshore Seismic Program, 2018–2023.

Screening Determination Reference	Temporal Scope	EA Document
C-NLOPB File No. 45006-020-005	May 1 to November 30, 2018–2023	Environmental Assessment of Multiklient Invest Newfoundland Offshore Seismic Program, 2018–2023 and EA Addendum (LGL 2018a,b)[a]

[a] On 15 May 2018, the C-NLOPB made a positive determination on this EA and EA Addendum.

The following sections provide the information necessary to confirm the validity of the EA (see Table 1.1). This EA Update includes new relevant information not included in the EA, specific only to the Project Description. The EA and the associated Addendum (2018a,b) were posted to the C-NLOPB website on 6 March 2018 and 18 April 2018, respectively. Since submission of the EA Addendum, there is no new information to present for either the physical or biological existing environments.

2.0 Project Description

2.1 Vessels and Equipment

The EA assessed a project that includes three vessels conducting simultaneous 2D and 3D seismic surveying programs within the Project Area. For 2018, MKI will now conduct 3D seismic surveying only, utilizing as many as three vessels. All survey specifics described in the EA are applicable to MKI's 2018 activities.

2.2 Spatial Scope

The Project and Study areas defined in the EA (LGL 2018a) remain unchanged (see Figure 1.1).

2.3 Temporal Scope

The temporal scope defined in the EA (LGL 2018a) as 1 May–30 November during each year of the 2018–2023 period remains unchanged.

2.4 Seismic Survey Activities Planned for 2018

In 2018, MKI plans to conduct only 3D seismic surveying in the Project Area. A maximum of three vessels will be used in 2018. MKI is proposing to conduct about 24,400 km^2 of 3D seismic surveying in the Project Area in 2018 (see Figure 1.1). There are six potential 3D survey areas identified in the Project Area for 2018 (see Figure 1.1).

In 2018, MKI will use the MV *Ramform Hyperion* and *Ramform Sterling* for the 3D seismic surveying. The MV R*amform Hyperion* and *Ramform Sterling* are similar vessels, built in 2017 and 2009,

respectively, and flagged in the Bahamas (Figures 2.1 and Figure 2.2). The *Hyperion* is 104.2 m long, with a beam of 70 m and a draft of 6.4 m, and the *Sterling* is 102.2 m long, with a beam of 40 m and a draft of 7.3 m. The vessels will travel at a speed of ~9 km/h (4.9 knots) while conducting the 3D seismic surveying. The third vessel, if required, will be the *Ramform Tethys*.

All other project details presented in Section 2.0 of the EA remain applicable to MKI's seismic survey activities in 2018.

FIGURE 2.1. MV *Ramford Hyperion.*

FIGURE 2.2. MV *Ramform Sterling.*

2.5 Mitigation Measures

Mitigation measures to be implemented during seismic surveys carried out under this Project will follow those described in the EA (LGL 2018a,) and its Addendum (LGL 2018b), and defined in Appendix 2 of *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2017). These include ramp-up (i.e., soft start) of the airgun arrays, the use of qualified and experienced, dedicated Marine Mammal Observer(s) (MMOs) to monitor marine mammals and sea turtles and implement shut downs/ramp up delays of the airgun array when appropriate, and the use of a Fisheries Liaison Officer (FLO) and communication procedures to avoid conflicts with fisheries. Seabird observations and monitoring/mitigation for stranded birds will also be carried out by qualified experienced personnel (Seabird Observers, SBOs) according to established Canadian Wildlife Service (CWS) protocols aboard each of the seismic vessels.

As per a recent DFO request (C. Andrews, DFO Ecosystems Management Branch, Senior Biologist, pers. comm., 7 September 2017), MKI will continue to investigate Passive Acoustic Monitoring (PAM) options for future survey work. Currently, commercially available PAM equipment aboard seismic vessels is limited in its ability to determine the location of a received marine mammal vocalization and to detect low-frequency calls from baleen whales (including at-risk species that require shut downs). During the 2018 MKI 3D surveys, PAM will be used during pre-watch and during periods when visibility is <500 m in order to detect cetacean vocalizations (see Table 6.1).

3.0 Physical Environment

A summary of the physical environment was provided in Section 3.0 of the EA (LGL 2018a). There is no new relevant information available on the physical environment in the Study Area.

4.0 Biological Environment

The EA and associated Addendum (LGL 2018a,b) were submitted in March and April 2018, respectively. The Addendum addressed comments and data gaps identified by reviewers of the EA. There is no new relevant information on the existing biological environment in the Study Area since submission of the Addendum. The DFO 2016 commercial fisheries data is currently not available. There have been no changes to the SARA- and COSEWIC-listed marine species likely to occur within the Study Area. Also, the spatial configurations and occurrence of Sensitive Areas remains unchanged from that presented in the EA and its Addendum (LGL 2018a,b).

5.0 Consultations

There is no new information from face-to-face consultation meetings to report since the EA and associated Addendum (LGL 2018a,b) were submitted.

6.0 Environmental Assessment

6.1 Mitigation Measures

The mitigation measures described in the EA and EA Addendum (LGL 2018a,b) remain applicable to MKI's 3D seismic survey activities planned for 2018. A summary of mitigation measures and commitments made in EA documents for the Project is provided below along with commentary on the status of implementing the mitigation measures and commitments (Table 6.1). This summary serves as a tracking table as per § 5.1.4.1 of the C-NLOPB's *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2017).

TABLE 6.1. Summary of environmental commitments and mitigation measures and the current status of these commitments and measures.

VEC, Potential Effects	Primary Mitigations	Status (May 16, 2018)
Fisheries VEC: Interference with fishing vessels/mobile and fixed gear fisheries	• Pre-survey communications, liaison and planning to avoid fishing activity • Continuing communications throughout the program • FLOs • SPOC • Advisories and communications • VMS data • Avoidance of actively fished areas • Start-up meetings on ships that discuss fishing activity and communication protocol with fishers	• Upfront planning with FFAW, OCI, GEAC, and CAPP complete • Daily communications and weekly meetings when project commences • Contract in place • Contract in place • Planned upon commencement • Planned upon commencement • Confirmed • Completed
Fisheries VEC: Fishing gear damage	• Pre-survey communications, liaison and planning to avoid fishing gear • Use of escort vessel • SPOC • Advisories and communications • FLOs • Compensation program • Reporting and documentation • Start-up meetings on ships that discuss fishing activity, communication protocol with fishers, and protocol in the event of fishing gear damage	• Upfront planning with FFAW, OCI, GEAC, and CAPP complete • Contracts being put in place • Contract in place • Planned upon commencement • Contract in place • Document sent to FFAW • Upon commencement of program • Completed
Interference with shipping	• Advisories and at-sea communications • FLOs (fishing vessels) • Use of escort vessel • SPOC (fishing vessels) • VMS data	• Planned upon commencement • Contract in place • Contracts being put in place • Contract in place • Planned upon commencement
Fisheries VEC: Interference with DFO/FFAW research program	• Communications and scheduling • DFO does not indicate an official spatial and/or temporal buffer mitigation method for seismic operations in the vicinity of survey stations. MKI will work cooperatively with FFAW|Unifor and DFO	• Planned upon commencement • Meetings held with FFAW and DFO

VEC, Potential Effects	Primary Mitigations	Status (May 16, 2018)
	in an effort to avoid survey stations prior to their sampling to the best extent possible.	
Fish and Fish Habitat, Marine Mammal and Sea Turtle, and Marine-associated Bird VECs: Temporary or permanent hearing damage/disturbance to marine animals (marine mammals, sea turtles, seabirds, fish, invertebrates)	• "Pre-watch" (30 minute) of 500 m safety zone using visual and PAM • Delay start-up if any marine mammals or sea turtles are detected within 500 m with visual and PAM • Ramp-up of airguns • Use of experienced, qualified MMO(s) to monitor for marine mammals and sea turtles during all daylight periods when airguns are in use • Minimum separation distance of 30 km for simultaneous seismic surveys in the Project Area based on separation distances required in other jurisdictions (i.e., Gulf of Mexico [G. Morrow, PGS, Senior Contract Manager, pers. comm., June 2017] and Greenland [LGL 2012]).	• Confirmed • Confirmed • Confirmed • Confirmed • Confirmed
Species at Risk and Sensitive Areas VEC: Temporary or permanent hearing damage/ disturbance to Species at Risk or other key habitats	• "Pre-watch" (30 minute) of 500 m safety zone using visual and PAM • Delay start-up if any marine mammals or sea turtles are detected within 500 m with visual and PAM • Ramp-up of airguns • Shutdown of airgun arrays for endangered or threatened marine mammals and sea turtles within 500 m • Use of experienced, qualified MMO(s) to monitor for marine mammals and sea turtles during daylight seismic operations. • PAM will be used during pre-watch and during periods when visibility is <500 m in order to detect cetacean vocalizations • Minimum separation distance of 30 km for simultaneous seismic surveys in the Project Area based on separation distances required in other jurisdictions (see above).	• Confirmed • Confirmed • Confirmed • Confirmed • Confirmed • Confirmed • Confirmed
Marine-associated Bird VEC: Injury (mortality) to stranded seabirds	• Daily search of seismic and support vessels • Implementation of handling and release protocols • Minimize lighting if safe	• Confirmed • Confirmed • Confirmed
Marine-associated Bird VEC: Seabird oiling	• Adherence to MARPOL • Adherence to conditions of ECCC-CWS migratory bird permit • Spill contingency and response plans • Use of solid streamer	• Confirmed • Confirmed • Confirmed • Confirmed

6.2 Validity of Significance Determinations

Based on MKI's planned survey activities in 2018 and the lack of any new information related to the physical and biological existing environments, the determinations of significance of the residual effects of seismic survey activities on VECs presented in the EA (LGL 2018a) and its Addendum (LGL 2018b) remain valid for the seismic survey activities planned by MKI in 2018. This includes consideration of cumulative effects.

7.0 Concluding Statement

The 3D seismic survey activities proposed by MKI for 2018 have been reviewed and determined to be within the scope of the EA (LGL 2018a) and its Addendum (LGL 2018b). The EA assessed three simultaneous 2D and/or 3D seismic surveying programs using three vessels during May-November, 2018–2023. The 2018 program will includes at least two vessels, and possibly a third.

The environmental effects predicted in the EA and its associated Addendum remain valid. MKI reaffirms its commitment to implement the mitigation measures proposed in these assessment documents.

8.0 References

C-NLOPB. 2017. Geophysical, Geological, Environmental and Geotechnical Program Guidelines, September 2017. 44 p + appendices.

LGL (Limited). 2018a. Environmental Assessment of Multiklient Invest Newfoundland Offshore Seismic Program, 2018-2023. LGL Rep. FA0106A. Prepared by LGL Limited, St. John's, NL, for Multiklient Invest AS, Oslo, Norway, and TGS-NOPEC Geophysical Company ASA, Houston, Texas, USA. 233 p. + Appendix. Available at: http://www.cnlopb.ca/pdfs/mkiasseis/revea.pdf

LGL. 2018b. Addendum to the Environmental Assessment of Multiklient Invest Newfoundland Offshore Seismic Program, 2018-2023. LGL Rep. FA0106A-1. Prepared by LGL Limited, St. John's, NL, for Multiklient Invest AS, Oslo, Norway, and TGS-NOPEC Geophysical Company ASA, Houston, Texas, USA. 25 p. + Appendix. Available at: http://www.cnlopb.ca/pdfs/mkiasseis/eaadd.pdf

Personal Communication

C. Andrews. Senior Biologist, Ecosystems Management Branch, DFO. September 2017.