PROJECT DESCRIPTION

Multiklient Invest

Labrador Offshore Seismic Program, 2026–2030

Prepared for TGS

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July 2025

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Multiklient Invest Labrador Offshore Seismic Program, 2026–2030

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1 Introduction

Multiklient Invest AS (MKI) is proposing to conduct two-dimensional (2D), three-dimensional (3D), and/or four-dimensional (4D) seismic surveys offshore Labrador. MKI is planning to conduct seismic surveys during one or more years within the 2026–2030 timeframe. This document is the Project Description (PD), the first step in the Canada-Newfoundland and Labrador Offshore Energy Regulator's (C-NLOER) environmental assessment (EA) process. This PD, combined with the technical and scoping advice received from the C-NLOER, other federal agencies, and stakeholders consulted by MKI, will guide the preparation of an EA. The Project Area is identified in Figure 1.1.

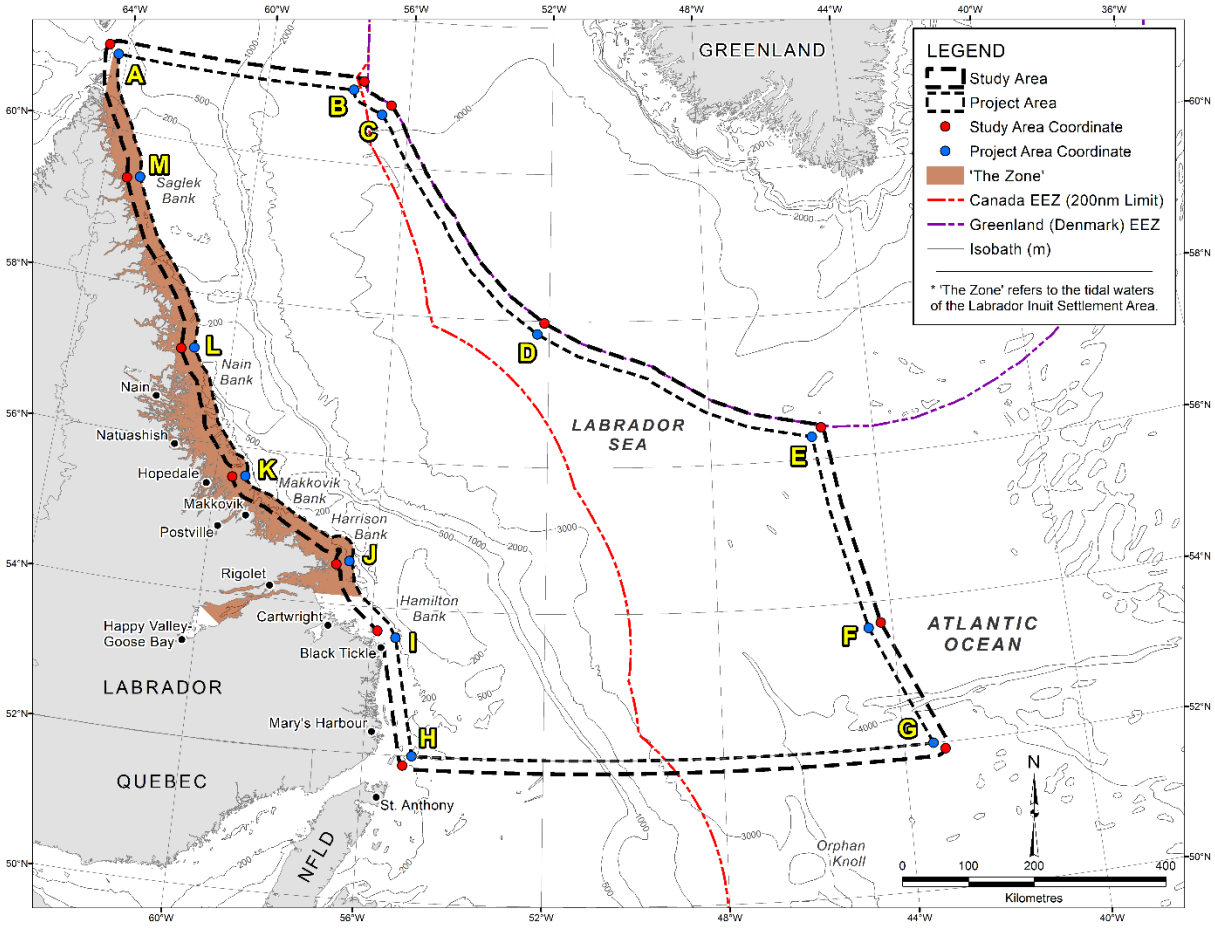

Figure 1.1. Locations of Project Area and Study Area for MKI's proposed offshore Labrador seismic program, 2026–2030.

1.1 Relevant Legislation and Regulatory Approvals

An Authorization to Conduct a Geophysical Program will be required from the C-NLOER. The C-NLOER is mandated in this matter by the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act* (Section 138(1)(b)) and the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act* (Section 134(1)(b)). Pursuant to the Accord Acts, the C-NLOER is responsible for seeking to identify the federal departments or agencies that may have the expertise required in the completion of the assessment. Because seismic survey activities have the potential to affect fish and fish habitat, fisheries, marine mammals, sea turtles, and marine associated birds, Fisheries and Oceans Canada (DFO) and Environment and Climate Change Canada (ECCC) are the government agencies most involved in the EA process.

Other legislation that is relevant to the environmental aspects of this Project is as follows:

- *Species at Risk Act* (SARA)
- *Oceans Act*
- *Fisheries Act*
- *Navigable Waters Protection Act*
- *Canada Shipping Act*
- *Migratory Birds Convention Act*

1.2 The Operator

The Operator, MKI, is a wholly owned subsidiary of TGS.

1.3 Canada-Newfoundland and Labrador Benefits

In full appreciation of the requirements of the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland Labrador Act* and the *Canada-Newfoundland Atlantic Accord Implementation Act*, MKI are committed to providing maximum benefits associated with East Coast operations to Canadians, and in particular, to Newfoundland and Labrador individuals and companies where they are commercially competitive in accordance with MKI's requirements.

MKI will manage the seismic operations from St. John's, Newfoundland and Labrador. MKI agrees that first consideration will be given to personnel, support and other services that can be provided from within Newfoundland and Labrador, and to goods manufactured in Newfoundland and Labrador as long as the goods and services can be delivered at a high standard of Health, Safety and Environmental competency, are of high quality, and are competitive in terms of fair market price. All contractors and subcontractors working for MKI in Newfoundland and Labrador must also apply these principles in their operations.

1.4 Contacts

Contact information for MKI personnel overseeing the Project is provided below (Table 1.1).

Table 1.1. MKI contact information.

Name	Position	Address	Company	Phone	Email
Executive Contact					
Mr. Jason Norman	Project Manager	10451 Clay Road Houston, Texas 77041	TGS	1-709-749-6046	Jason.Norman@tgs.com
Mr. Steve Whidden	Project Development Manager, Offshore North America Arctic	2100, 250-5th Street S.W. Calgary, Alberta T2P 0R4	TGS	1-403-852-6115	Steve.Whidden@tgs.com
Environment Contact					
Mr. Chris Wilkes	Director, HSEQ Project Management	10451 Clay Road Houston, Texas 77041	TGS	1-832-217-8875	Chris.Wilkes@tgs.com

2 Project Description

The official name of the Project is Multiklient Invest Labrador Offshore Seismic Program, 2026–2030. MKI is proposing to conduct 2D, 3D and/or 4D seismic surveys within its proposed Project Area (see Figure 1.1) between 2026 and 2030, starting as early as May 2026. The EA will consider a maximum of three simultaneous seismic surveys within a given year: two 3D/4D surveys and one 2D survey. However, in most survey years, there would typically be no more than two simultaneous seismic surveys. The timing of the seismic surveys is subject to MKI priorities and circumstances, weather conditions, contractor availability, and regulatory approvals.

2.1 Spatial and Temporal Boundaries

The Study Area includes the Project Area plus a 20 km buffer around the Project Area to account for the propagation of seismic survey sound that could potentially affect marine biota (see Figure 1.1; Table 2.1). The proposed Project Area includes space to account for ship turning and streamer deployment. The areal extents of the Project Area and the Study Area are 654,060 km^2 and 731,955 km^2, respectively. As indicated in Figure 1.1 the eastern portion of the Project Area and Study Area extends outside of Canada's Exclusive Economic Zone (EEZ) (~38% of the total area). Water depths within the Project Area range from approximately 100 m to 4000 m.

Table 2.1. Geographic coordinates (decimal degrees, WGS84 Datum) delineating the Project and Study areas.

Coordinate Point [a]	Project Area		Study Area	
	Latitude	Longitude	Latitude	Longitude
A	61.000	64.253	61.108	64.546
B	61.003	57.587	61.128	57.321
C	60.700	56.743	60.835	56.501
D	57.818	52.301	57.970	52.121
E	56.307	45.504	56.426	45.262
F	53.644	44.547	53.703	44.260
G	52.000	43.348	51.909	43.098
H	52.000	54.913	51.865	55.105
I	53.601	55.428	53.681	55.852
J	54.601	56.623	54.543	56.919
K	55.614	59.281	55.584	59.593
L	57.254	60.938	57.220	61.262
M	59.421	63.041	59.380	63.382

[a] See Figure 1.1 for location of coordinate points.

The temporal boundaries of the Project are 1 May to 30 November during 2026–2030. The duration of individual seismic surveys will vary from year to year but will typically occur within the May to November timeframe. The approximate durations of proposed 3D/4D and 2D seismic surveying in any given year are 90–150 days and 150 days, respectively.

2.2 Project Overview

The ship-borne geophysical program may include as much as 15,000 km^2 of 3D seismic survey and 10,000 km of 2D seismic survey lines in a given year. Specific data acquisition plans for 2D, 3D and/or 4D surveys during 2026–2030 are not yet determined. The specific seismic survey vessel(s) and supporting vessels to be used during 2D/3D/4D surveys are currently unknown but will be approved for operation in Canadian waters and will be typical of the worldwide fleet. Information on representative seismic and support vessels are provided in Sections 2.2.5. It is possible that MKI will use Ocean Bottom Nodes (OBNs; Section 2.2.7) and as an option may utilize the Gemini sound

source (Section 2.2.6). MKI will adhere to required and established mitigation measures and monitoring for marine mammals, sea turtles, and seabirds required for seismic surveys (see Section 2.3 for further details). A Fisheries Liaison Officer (FLO) will be on board the seismic vessel(s) to ensure implementation of communication procedures intended to minimize conflict with the commercial fishery.

2.2.1 Objectives and Rationale

The primary objective of a seismic survey is to determine the presence and likely locations of geological structures that might contain hydrocarbon deposits. Existing seismic data in the area do not provide sufficient detail or coverage to serve the needs of the energy companies in their exploration, development and production activities. Furthermore, MKI's advanced OBN systems (detailed below) provide much deeper, and more precisely defined features, identifying source rocks, migration pathways, and play types. These data will enhance the understanding of the Labrador's offshore hydrocarbon potential, and aid future exploration and development activities, delivering – for instance – better information for those deciding on future exploration drilling locations, reducing the need for additional drill sites.

2.2.2 Project Scheduling

As indicated in Section 2.1, the seismic surveys will be conducted between 1 May and 30 November of any given year from 2026–2030. In 2026, it is anticipated that seismic surveys would occur from mid-May through September.

2.2.3 Site Plans

In any given year from 2026–2030, it is possible that there will be ~15,000 km^2 of 3D and 4D seismic survey lines and 10,000 km of 2D seismic survey lines. The specific location, orientation, length, and spacing of seismic survey lines will be determined prior to each survey year. For 3D and 4D seismic surveys a racetrack survey design is used and for 2D seismic surveys, lines can be separated by approximately 5–50 km with variable lengths. In 2026, it is anticipated that MKI will acquire approximately 4,000–6,000 km^2 of seismic data.

2.2.4 Personnel

A typical seismic vessel can accommodate ~55–75 personnel. Personnel on a seismic vessel include ship's officers and marine crew as well as technical and scientific personnel. The seismic vessel will also have Marine Mammal Observers (MMOs), Passive Acoustic Monitoring (PAM) Operators, and a FLO on board.

All project personnel will have the required certifications (safety, medical) as specified by the relevant Canadian legislation and the C-NLOER.

2.2.5 Seismic Vessel

The MV *Ramform Atlas* or a similar vessel(s) will be used for the 3D and 4D seismic surveying, and the MV *Sanco Swift* or a similar vessel for 2D surveying. Seismic vessels will typically travel at a speed of ~8.2–9 km/h (4.4- 4.9 knots) while conducting 3D, 4D, and 2D seismic surveying.

The MV *Ramform Atlas* was built in 2013 and is flagged in Norway (Figure 2.1). It is 104.2 m long, with a beam of 70 m and a draft of about 6.4 m. The *Ramform Atlas* has six diesel electric engines that have 20,400 kW of total power. The *Ramform Atlas* and its sister ships (*Ramform Titan, Ramform Tethys*) have previously been used by MKI for 3D seismic surveying in the NL offshore.

Figure 2.1. A representative 3D/4D seismic vessel: MV *Ramform Atlas*.

For 2D seismic surveying, the MV *Sanco Swift* or similar vessel will be used (Figure 2.2). The MV *Sanco Swift* was built in 2013 and is flagged in Gibraltar. It is 96.15 m long, with a beam of 23 m and a draft of about 7 m. The *Sanco Swift* has four 4000 kW diesel engines.

Figure 2.2. A representative 2D seismic vessel: MV *Sanco Swift*.

For seismic surveys during 2026-2030, vessel specifics will be provided once the vessel(s) has been identified.

2.2.6 Seismic Energy Source Parameters

For surveying, the typical sound sources for the proposed 2D/3D/4D survey program will consist of one, two or three airgun arrays. For any sound source that consists of either two or three airgun arrays, the arrays will be discharged alternately (i.e., multiple airgun arrays will not be discharged simultaneously). The total volume of an airgun array will range from 3000–6000 in^3. The airgun array(s) will be deployed at depths ranging from 6–15 m. The airguns will be operated with compressed air at pressures ranging from of 2000–2500 psi and a source level of ~260–266 dB re 1 µPa· m $_{pk-pk}$. A typical shotpoint interval will be one array pulse every 12.5 m, 18.75 m or 25 m. Detailed specifications of the airgun array for the 2026 seismic program will be provided once the project design is completed and parameters are selected.

In one or more years, MKI may optionally use a two-airgun configuration called “Gemini” (Figure 2.3). Two 4000 in^3 airguns are configured in a barbell-type arrangement and deployed at similar depths to a multi-airgun array (i.e.,6- 15 m). The two airguns activate simultaneously (8,000 in^3 total), operate at 2000 psi and have an estimated source level of ~248.7 dB re 1µPa· m $_{pk-pk}$ (Grooms et al. 2019). The Gemini configuration enhances the low frequency broadband portion of the sound spectrum (1–4 Hz), which produces higher-quality seismic images than other

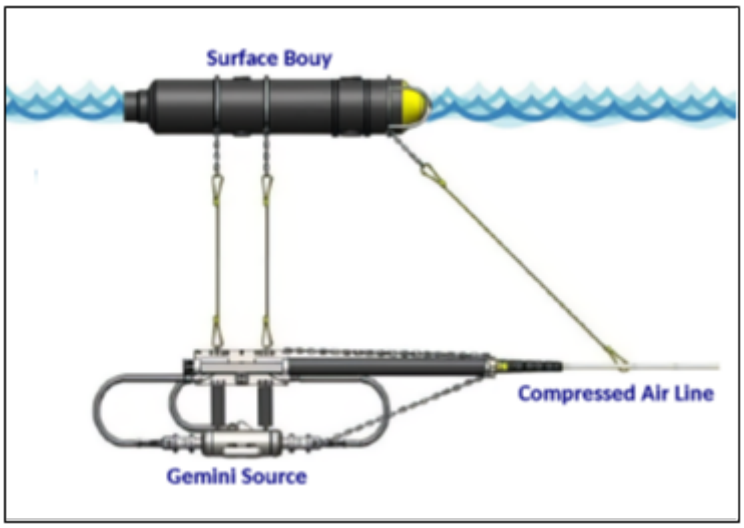

Figure 2.3. Schematic of Gemini sound source.

configurations. This is also expected to result in lower sound pressure levels relative to a conventional, multi-airgun array of the same total volume (Grooms et al. 2020). As with a conventional airgun array, a typical shotpoint interval will be one array pulse every 12.5 m, 18.75 m or 25 m. Further details will be provided in the EA.

2.2.7 Seismic Streamers and Ocean Bottom Nodes

For 3D and 4D seismic surveys, vessels will tow as many as 16 solid streamers, ranging in length from 6–14 km at depths ranging from 9–25 m. The streamers are typically spaced 100 m apart. For 2D seismic surveys, vessels will tow one solid streamer that may range from 8–12 km in length.

MKI may use OBNs in conjunction with streamers to acquire seismic data. OBN acquisition produces very detailed imaging of complex subsurface structures and strata types. It is used mainly in locations where towed-streamer data is difficult to collect (e.g., close to existing marine structures) or where other methods cannot provide the data quality needed. These types of data can be used for many purposes, such as determining best drilling locations, or quantifying reservoir size and behaviour over time. In an OBN survey, the nodes are placed on the seafloor in an orderly grid enabling recording of cleaner, high-fidelity data without gaps in coverage. OBN surveys also improve repeatability in 4D seismic surveying. Each OBN will have a footprint of about 0.1 m^2 and will contain a hydrophone and geophones (Figures 2.4 and 2.5). The OBNs are deployed over an area using a node installation vessel and then recovered and re-deployed again in new area within the larger survey area. A Remotely Operated Vehicle (ROV) will be used for OBN deployment and recovery. The OBN spacing is typically 300–500 m on the ocean floor, and approximately 1000–3000 OBNs may be used in total depending on the size of the seismic survey. These units are completely autonomous to operate on the seabed until retrieved and can be left unattended for up to 100–150 days. OBNs can operate in water depths down to 3500 m.

Detailed specifications of the streamers (and potential OBNs) for the 2026 seismic program will be provided once the project design is completed and parameters are selected.

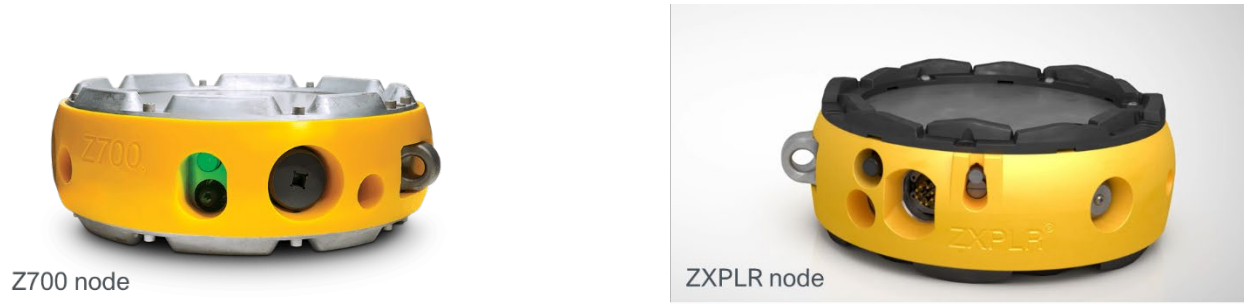

Figure 2.4. Typical Ocean Bottom Nodes (models Z700 and ZXPLR) used by MKI.

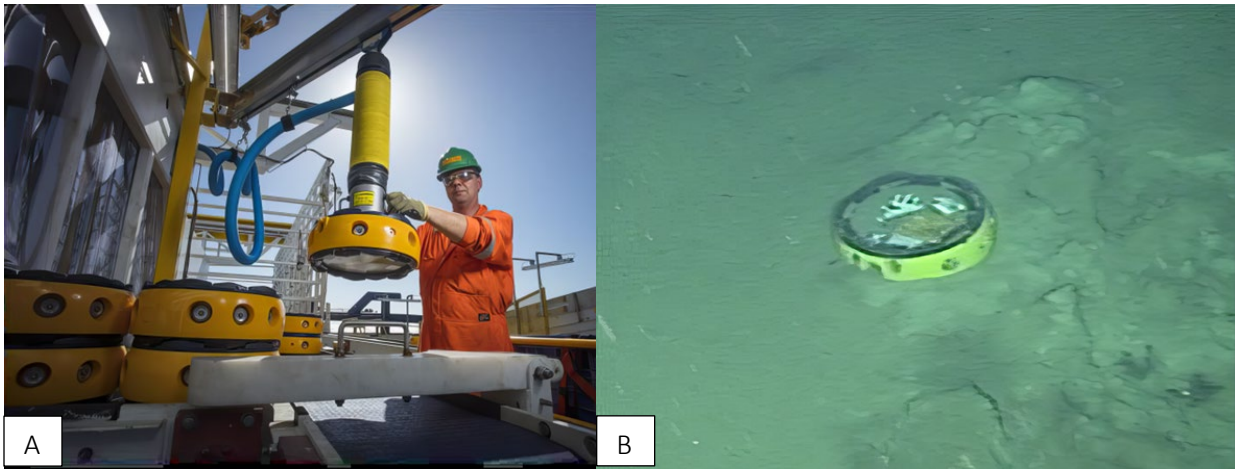

Figure 2.5. Node handling on a vessel (A) and node on the seafloor (B).

2.2.8 Logistics/Support

2.2.8.1 Vessels

MKI's primary support and supply will be provided by either the TGS vessel MV *Thor Magni* or a similar vessel. The operational objective is to have one escort vessel available with each seismic vessel. When necessary, escort vessels will be used to scout ahead of the seismic vessels for fishing vessels and gear, as well as for hazards such as ice and floating debris. Resupply will be provided by *Thor Magni* or a similar vessel.

It is anticipated that a node installation vessel will be used to deploy and retrieve OBNs. Vessel specifics will be provided once the vessel has been identified.

2.2.8.2 Crew Changes

Crew changes for the seismic vessels will be conducted by either ship-to-ship transfer or ship-to-shore transfer.

2.2.8.3 Shore Base, Support and Staging

MKI will have a project manager based in St. John's for the duration of the seismic program. No new shore base facilities will be established as part of the Project.

2.2.9 Waste Management

Waste management will be consistent with industry best practices in offshore Newfoundland and Labrador. MKI follows MARPOL 73/78 Annex IV: *Pollution by Sewage from Ships*, and Annex V: *Pollution by Garbage from Ships*.

2.2.10 Air Emissions

Air emissions will be those associated with standard operations for marine vessels, including the seismic vessel and support vessel(s). MKI follows MARPOL 73/78 Annex VI: *Regulations for the Prevention of Air Pollution from Ships*.

2.2.11 Accidental Events

In the unlikely event of the accidental release of hydrocarbons during the Project, the measures outlined in MKI's oil spill response plan will be implemented. The oil spill response plan will be filed with the C-NLOER. In addition, MKI will have an emergency response plan in place.

2.3 Mitigation and Monitoring for Marine Mammals, Sea Turtles and Seabirds

Project mitigation measures will be detailed in the EA. DFO's *Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment* will be used as the basis for the marine mammal and sea turtle monitoring and mitigation program for the seismic surveys. MMOs will monitor for marine mammals and sea turtles and implement mitigation measures as appropriate. PAM Operators will also monitor for marine mammals. The airgun array will be ramped up, and ramp ups will be delayed if a marine mammal or sea turtle is detected within the appropriate safety zone (minimum of 500 m as noted in the *Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment*). The airgun array will be shut down any time an *endangered* or *threatened* (as listed on Schedule 1 of SARA) marine mammal or sea turtle (as well as a beaked whale) is detected within the safety zone. These measures are designed to minimize the potential for effects (e.g., auditory, disturbance) on marine life, particularly marine mammals and species considered at risk under the SARA. Relevant components of the *Guideline for Framework Regulations* will also be followed (CNSOPB and C-NLOPB 2024)

In addition, the MMOs will conduct a monitoring and release program for seabirds which may strand on Project vessels. Seabird monitoring will include systematic counts based on protocols issued by the Environment and Climate Change Canada-Canadian Wildlife Service (ECCC-CWS). Likewise, mitigation measures and monitoring for stranded birds will follow established ECCC-CWS procedures.

3 Environmental Assessment

The EA will closely follow previous assessments of seismic programs in the Newfoundland and Labrador offshore (e.g., LGL 2018). The primary issue of concern relates to the potential effects of underwater noise from the airgun arrays on marine fauna and the effects of the seismic survey on fisheries.

3.1 Physical and Biological Environment

The Labrador Shelf Offshore Area Strategic Environmental Assessment (SEA; C-NLOPB 2008) and Labrador SEA Update (C-NLOPB 2021), provide descriptions of the biophysical environment in much of the Study Area. A description of the physical and biological environments will be provided in the EA for this Project. Background information will be provided for the anticipated Valued Components (VCs): fish and fish habitat, fisheries and other ocean users, marine birds, marine mammals, sea turtles, species at risk and sensitive areas using the most recent literature and data sources.

3.2 Effects of the Environment on the Project

A discussion of expected effects of the physical environment on the Project, based partly on information in the relevant SEAs and Regional Assessment (C-NLOPB 2008, 2021), will be included in the EA. This information will be supplemented with more recent literature and data sources available for the Study Area.

3.3 Effects of the Project on VCs

The effects of Project activities on VCs, most notably the underwater sound from airgun arrays, will be assessed in detail. Information on the known effects of Project activities on the VCs, with emphasis on the effects of underwater sound on marine fauna, will be reviewed and used to predict residual effects on VCs. The EA will also examine potential effects of OBNs on benthic habitat. Input received during consultations will be considered when determining the mitigation and monitoring procedures that will be included in the EA.

Accidental events associated with Project activities, such as an unplanned hydrocarbon release, will also be assessed in the EA. The EA will also include an analysis of cumulative environmental effects.

3.4 Consultations

As part of the EA process, MKI will consult with stakeholders who have an interest in the Project. This will assist in scoping the effects assessment and monitoring and mitigation plan. The results of the consultations (i.e., issues of concern) will be presented and addressed in the EA.

MKI will undertake a consultation program with various municipal, provincial, and federal agencies, fisheries groups, and other stakeholders, including but not limited to:

- DFO;
- ECCC;
- Department of National Defense (DND);
- One Ocean;
- Fish, Food and Allied Workers (FFAW)-Unifor;
- Study Area fishers;
- Indigenous groups;
- Nunatsiavut Government;
- Nunatukavut Community Council;
- Nunavik Marine Region Impact Review Board (NMRIRB);
- Nature Newfoundland and Labrador (NNL);
- Transport Canada (TC);
- Various fish processors; and
- Other identified Newfoundland and Labrador fisheries industry stakeholders.

In-person consultations will be held in Labrador and St. John's. MKI will distribute an annual Newsletter describing the seismic survey plans for a given year to an established list of stakeholders (see Appendix B in LGL 2020).

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