CANADA-NEWFOUNDLAND and LABRADOR OFFSHORE PETROLEUM BOARD DETERMINATION REPORT

PART A: GENERAL INFORMATION

Screening Date	**August 18, 2014**
EA Title	Environmental Assessment MKI Labrador Sea Seismic Program, 2014-2018
Proponent	Multi Klient Invest AS (MKI) Lilleakerveien 4C, P.O. Box 251 Lilleaker, 0216, Oslo, Norway
Contact	Mr. Jerry Witney Vice-President, North America MultiClient Petroleum Geo-Services (PGS) 15150 Memorial Drive Houston, Texas 77079
C-NLOPB File No.	45006-020-003
Location	Offshore Labrador and Northeast Newfoundland
Referral Date	**November 1, 2013**
EA Start Date	**November 5, 2013**
Law List Triggers	Paragraph 138(1) (b) *Canada-Newfoundland Atlantic Accord Implementation Act* (Accord Act)

Part B: PROJECT INFORMATION

On November 1, 2013, Multi Klient Invest AS (MKI) submitted a project description entitled, *Project Description Labrador Sea Seismic Program 2014-2018* (LGL Limited October 31, 2013) to the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB), describing its plans to conduct 2-Dimensional (2D) seismic surveys in the offshore region of the Labrador Sea in 2014 and possible 2D or 3-Dimensional surveys between 2015 and 2018. MKI submitted the *Environmental Assessment MKI Labrador Sea Seismic Program 2014-2018* (LGL Limited 2014a) on February 17, 2014. On April 14, 2014, the C-NLOPB requested additional information from MKI to respond to review comments on the February 17 submission. On May 2, 2014, MKI responded to the review comments, via the *Environmental Assessment MKI Labrador Sea Seismic Program, 2014-2018 Addendum* (LGL Limited 2014b).

1 Description of Project

The proposed Project is a ship-borne geophysical program to conduct a 2D single streamer or 3D multiple streamers marine geophysical survey that will collect seismic data. Seismic surveys are proposed between 1 May and 30 November in any given year between 2014 and 2018. A maximum acquisition of 10,000 line km will be acquired in 2014.

The proposed program will use a conventional seismic vessel to tow the sound source (airgun array) and a single seismic hydrophone streamer up to 10 km long for the 2D program and up to 16 streamers up to 10 km long for the 3D program.

2 Description of Environment

A complete description of the biological and physical environment can be found in the Environmental Assessment (EA) report (February 2014) and the subsequent EA addendum (May 2014). The following sections provide references to the appropriate sections of the EA Report and the EA Addendum.

2.1 Physical Environment

A description of meteorological and oceanographic characteristics, including extreme conditions, in the Study Area is provided in Section 3.0 of the EA Report (LGL Limited 2014a). Additional information was provided in the EA Addendum (LGL Limited 2014b). Specifically, information was provided on: bathymetry; geology; climatology; physical oceanography; and ice conditions.

2.2 Biological Environment

A detailed description of the biological environment may be found in Section 4.0 of the EA Report (LGL Limited 2014a) and EA Addendum (LGL Limited 2014b). Specifically, information on: fish and fish; fisheries, including commercial, traditional and Aboriginal, recreational; aquaculture; Fisheries and Oceans Canada (DFO) research vessel surveys; industry and DFO science surveys; seabirds and migratory birds; marine mammals and sea turtles; species at risk; and sensitive areas.

There are 13 Species at Risk, as defined under Schedule 1 of the *Species at Risk A*ct (SARA) that are likely to be within the Study Area. The following table identifies species likely to be present and their SARA listing and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status.

SPECIES	SARA Status	COSEWIC Status
Blue Whale (*Balenoptera musculus*)	Schedule 1 – Endangered (May 2012)	Endangered (May 2012)
Northern bottlenose whale (*Hyperoodon ampullatus*) Scotian Shelf population	Schedule 1 – Endangered (May 2011)	Endangered (May 2011)
Leatherback Sea Turtle (*Dermochelys coriacea*)	Schedule 1 – Endangered (May 2012)	Endangered (May 2012)
Ivory Gull (*Pagophilia eburnea*)	Schedule 1 – Endangered (April 2006)	Endangered (April 2006)
White shark (*Carcharodon carcharias*) Atlantic population	Schedule 1 – Endangered (April 2006)	Endangered (April 2006)
Northern Wolffish (*Anarhichas denticulatis*)	Schedule 1 – Threatened (November 2012)	Threatened (November 2012)
Spotted Wolffish (*Anarhichas minor*)	Schedule 1 – Threatened (November 2012)	Threatened (November 2012)
Atlantic Wolffish (*Anarhichas lupus*)	Schedule 1 – Special Concern (November 2012)	Special Concern (November 2012)
Fin Whale (*Balaenoptera physalus*) Atlantic population	Schedule 1 – Special Concern (May 2005)	Special Concern (May 2005)
Sowerby's beaked whale (M*esoplodon bidens*)	Schedule 1 – Special Concern (November 2006)	Special Concern (November 2006)

Polar bear (*Ursus maritimus*)	Schedule 1 – Special Concern (April 2008)	Special Concern (April 2008)
Harlequin Duck (*Histrionicus histrionicus*)	Schedule 1 – Special Concern (November 2013)	Special Concern (November 2013)
Barrow's Goldeneye (*Bucephala islandica*)	Schedule 1 – Special Concern (May 2011)	Special Concern (May 2011)

Part C: ENVIRONMENTAL ASSESSMENT PROCESS

3. Review Process

On November 1, 2013, MKI submitted a project description entitled, *Project Description Labrador Sea Seismic Program 2014-2018* (LGL Limited 2013) to the C-NLOPB, describing its plans to conduct a 2D seismic survey offshore Newfoundland in the offshore region of the Labrador Sea. The Project requires an authorization pursuant to Section 138(1) (b) of the *Canada-Newfoundland Atlantic Accord Implementation Act* and Section 134(1) (a) of the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act.* The C-NLOPB requested comments on the project description and identification of expertise on November 5, 2013 to: DFO; Environment Canada (EC); Department of National Defence (DND); Transport Canada (TC); Natural Resources Canada (NRCan); Health Canada; and the Newfoundland and Labrador Departments of Environment and Conservation (NLDEC), Fisheries and Aquaculture (NLDFA) and Natural Resources (NLDNR). The C-NLOPB requested comments on the project description from the Nunatsiavut Government (NG); One Ocean (OO) and the Fish, Food and Allied Workers Union (FFAW).

On November 21, 2013, the C-NLOPB notified MKI that an environmental assessment was required and the Scoping Document was provided.

MKI submitted the *Environmental Assessment MKI Labrador Sea Seismic Program, 2014-2018* (LGL Limited 2014a) on February 17, 2014. The C-NLOPB forwarded the EA Report on February 19, 2014 to DFO, EC, DND, NLDEC, NLDFA, NLDNR, NG, FFAW and OO for review.

Comments on the EA Report were received from DFO, EC, DND, NG and the FFAW. In order to address deficiencies in the EA Report, MKI was required to provide a response to the EA Report comments. On May 2, 2014, MKI responded to the review comments, via the *Environmental Assessment MKI Labrador Sea Seismic Program, 2014-2018 Addendum* (LGL Limited 2014b) and this was forwarded to reviewers for their consideration. Additional comments were provided from reviewers and these were forwarded to MKI on May 27, 2014. All comments were addressed satisfactorily by June 6, 2014 and a revised EA Addendum for administrative purposes was provided by MKI on July 14, 2014.

3.1 Scope of Project

The proposed 2D and 3D program will use a conventional seismic ship (as described in Section 2.2.6.1 of the EA Report) which will tow the sound source (airgun array) and a single streamer containing receiving hydrophones for the 2D program and up to 16 streamers for the 3D program. A support vessel will be used (as described in Section 2.2.6.2 of the EA Report). Helicopters may be used to ferry personnel and supplies to and from the seismic vessel.

The proposed 2D or 3D survey sound source will consist of one or more airgun arrays with a total discharge volume of 3,000 to 6,000 in^3, operating at tow depth of 6 to 15 m. The airgun arrays are comprised of individual airguns ranging in size from 22 to 250 in^3 each. The airguns will be operated with compressed air at pressures of 2,000–2,500 psi and produce approximate peak-to-peak pressures of 100 to 200 bar-m. A typical airgun array used for the 2D surveys consists of four sub-arrays with a total

volume of 4,808 in^3, operated at a pressure of 2,000 psi. This array is generally towed at a depth of 9 m and produces peak-to-peak pressures of 179 bar-m and the survey speed will be around 4.5 knots (8.3 km/h).

For 2D surveys, the seismic vessel will tow a single seismic hydrophone cable (streamer) up to 10 km long, deployed near the ocean surface, at a depth of approximately 15–25 m. The cable(s) will be a solid streamer, PGS GeoStreamer®. For 3D surveys, the seismic vessel will tow up to 16 solid streamers up to 10 km long and deployed at depths ranging from 15 to 25 m.

The seismic vessel will be equipped with a Furuno FE-700 echosounder. The downward-facing echosounder operates at a frequency of 50 kHz or 200 kHz and will be used to collect water depth information. Sound velocity profiles will also be acquired in the water column at various locations within the survey area. A small, passive device will be deployed by the support vessel and will measure pressure, temperature, and salinity.

Approximately 10,000 km of 2D seismic survey lines are planned for 2014. Additional seismic surveys may be conducted within the Project Area during 2015–2018 with a proposed maximum annual acquisition of 10,000 km. The Study Area includes the Project Area plus a 20 km buffer area around the Project Area to account for the propagation of seismic survey sound that could potentially affect marine biota.

Seismic surveys will occur within the period 1 May to 30 November from 2014 to 2018. The timing of the acquisition of specific lines within the Project Area in any year will depend on several factors, including commercial fish harvesting, the local weather, sea state, and ice conditions in specific locations. The estimated duration of the proposed 2014 survey is approximately 90 days.

3.2 Boundaries

The boundaries of the Project, defined in the EA Report and Addendum, are as follows.

Boundary	**Description**
Temporal	From 1 May to 30 November, 2014 to 2018.
Project Area	The Labrador Sea, with the "corner" coordinates (decimal degrees, WGS84 projection): • Northwest: 61.000°N, 64.253°W; • Northeast: 61.000°N, 57.587°W; • Southwest: 50.481°N, 54.424°W; • Southeast: 50.463°N, 48.130°W; and • Eastern extent: 55.144°N, 45.187°W. The Project Area includes the ships' turning radii.
Study/Affected Area	The Study Area includes the Project Area plus a 20 km buffer area for potential effects around the Project Area. The "corner" coordinates (decimal degrees, WGS84 projection) are: • Northwest: 61.112°N, 64.542°W; • Northeast: 61.129°N, 57.326°W; • Eastern extent: 50.001°N, 44.913°W; • Southeast: 50.338°N, 47.930°W; and • Southwest: 50.358°N, 54.630°W.
Regional Area	The area extending beyond the "Affected Area" boundary within the Labrador Shelf and Slope.

There may also be an area of influence from the sound array. However, depending on the marine species present, this area of influence will vary in size. Hearing thresholds have been determined for a number of species (seals and odontocetes), but the threshold is not known for others (baleen whales). The sound that is actually received by the marine species depends on the energy released from the source and its propagation (and loss) through the water column. Therefore, the hearing ability of the species and background noise will affect the amount of noise from an airgun array detected.

3.3 Scope of Assessment

For the purpose of meeting the requirements of the Accord Act, the factors that were considered to be within the scope of the environmental assessment are those set out in the *Multi Klient Invest AS Labrador Sea Seismic Program, 2014 to 2018 Scoping Document* (C-NLOPB 2013).

4. Consultation

4.1 Consultation carried out by MKI

Meetings were held in both Labrador and Newfoundland. The consultation meetings were conducted during 2-13 December 2013, and 12-17 January 2014. Stake holder meetings in St. John's took place between December 2nd and December 5th 2013. During the in-person meetings, PowerPoint presentations with details about the proponents and the proposed Project were given. The presentations included provisional maps of the proposed 2014 survey lines and the Project and Study Areas as well as several maps showing fish-harvesting locations (key species) in relation to those lines. Information about commercial fish harvesting details, including Traditional Environmental/Ecological Knowledge (TEK) related to the Project, was recorded and issues, concerns and advice about mitigations (particularly avoiding concurrent fisheries) and communications were noted.

Appendix 1 of the EA Report contains a table that provides details of the consultations, including stakeholder group name, names of contacts within that group, details of the engagement, comments/concerns/requests, and responses to these. The following were contacted.

- Cartwright Fishers Committee
- Labrador Fishermen's Union Shrimp Company
- Cartwright Town Council
- Torngat Secretariat
- Torngat Fish Producers Cooperative
- Town of Happy valley-Goose Bay
- Nunatsiavut Government: Department of Lands and Natural Resources, and the Department of Education and Economic Development
- Innu Nation
- Nunacor and NunatuKavut Department of Natural Resources and Environment
- Hopedale Inuit Community Government
- L'Anse au Loup Harbour Authority
- L'Anse au Loup Town Council
- Makkovik Inuit Community Government
- Nain Inuit Community Government
- Innu Nation and Mushuau Innu Band
- Town of Northwest River
- Sivunivut Inuit Community Corporation
- Postville Inuit Community Government
- Rigolet Inuit Community Government
- Transport Canada

- Environment Canada
- Fisheries and Oceans Canada
- Newfoundland and Labrador Department of Fisheries and Aquaculture
- City of St. John's
- St. John's Port Authority
- Nature Newfoundland and Labrador
- Fish, Food and Allied Workers Union (FFAW)/One Ocean
- Newfoundland Association of Seafood Producers
- Ocean Choice International (OCI)
- Gulf Shrimp Limited and Quinlan Brothers
- St. Anthony Port Authority
- St. Anthony Basin Resources Inc.
- St. Anthony Town Council.

The most consistent issue raised during the consultations related to potential conflict with the commercial fisheries – specifically ensuring that the survey does not interfere with or otherwise impact harvesting success. Other topics of discussion included potential effects on marine biota, employment opportunities, the importance of ongoing communication between the Operator and potentially affected groups.

MKI has committed to conduct follow-up discussions with all interested groups during and after the survey. This would include reporting on the progress of the survey, monitoring the effectiveness of the mitigations, determining if any survey-related issues had arisen, and presenting monitoring results.

The C-NLOPB is satisfied that the consultations carried out by MKI, and reported on in the EA Report, included all elements of the Project, and that MKI has addressed substantive concerns about the proposed Project.

4.2 Review of the March 2014 EA Report

The C-NLOPB forwarded the EA Report on February 19, 2014 to DFO, EC, DND, NLDEOC, NLDFA, NLDNR, NG, FFAW, and One Ocean for review.

EC provided comments on the EA Report on 02 April 2014. The key issues were: proper data numbers and concentrations of seabirds; clarification of recovery strategies and permits; assessment of sound; and a recommendation to use solid streamers. They reiterated that their comments on the draft scoping document (November 19, 2013) were still valid. EC provided a response on the EA Addendum on 21 May 2014 that they were satisfied with the response.

DFO provided comments on the EA Report on 08 April 2014. Their comments focused on: fisheries other than the commercial fishery; clarification of species at risk information presented; clarification of information presented on sensitive areas; adherence to the Standard of Canadian Practice; and the recovery strategy for multiple wolffish species. DFO provided comments on the EA Addendum on 27 May 2014 and were satisfied with MKI's response.

DND provided comments on the EA Report on 02 April, 2014 which stated that DND would likely be in the area in a non-interference manner, thus requesting it be informed of dates and locations of seismic activities. On May 27, 2014 DND replied that MKI's response in the EA Addendum to this comment was satisfactory.

The NG provided comments on the EA Report on 01 April 2014. Their comments included: impacts of seismic programs on catch rates for fisheries in the area; timing of the program to prevent overlap with

fisheries in the area; the hiring of Inuit observers; and an annual report submitted by January 31 of the following year on the benefits and impacts of the program; and continued communication and consultation. The NG provided a response on the EA Addendum on 27 May 2014 with no further comments.

The FFAW provided comments on the EA Report on 27 March 2014. The key issues were: clarification of results of fisheries surveys; the dynamic nature of the fisheries; timing of commercial fisheries; and avoidance of active fisheries and the DFO Post Season Trap Survey for Snow Crab. The FFAW provided comments on the EA Addendum 28 May, 2014. Comments included: the changing composition of commercially harvested species; and temporal and spatial avoidance of the post-season trap survey for snow crab. On June 6, 2014 the FFAW responded that they had no further comments.

The consolidated review comments were provided to MKI on April 14, 2014. MKI responded on May 2, 2014 in the form of an EA Addendum. MKI's May 2, 2014 response was forwarded to reviewers on May 5, 2015 for consideration. Additional comments were forwarded to MKI on May 27, 2014. All review comments and responses were consolidated and included in a revised EA Addendum and provided by MKI on July 14, 2014.

The C-NLOPB believes that all substantive comments within the scope of the EA have been satisfactorily addressed.

5. Environmental Effects Analysis

5.1 Methodology

The C-NLOPB reviewed the environmental effects analysis presented by MKI in its EA Report and Addendum. A Valued Ecosystem Component (VEC) based assessment, based on the interaction of project activities with VECs, was used in assessing environmental effects, including cumulative effects and effects due to accidental events. The environmental assessment methodology and approach used by the Proponent is acceptable to the C-NLOPB.

Potential adverse environmental effects, including cumulative effects, were assessed with respect to:

- magnitude of impact;
- geographic extent;
- duration, likelihood, and frequency;
- reversibility;
- ecological, socio-cultural and economic context; and
- significance of residual effects following implementation of mitigation measures.

The potential effect significance of residual effects, including cumulative effects, for each VEC was rated in this environmental screening report as follows:

0 = No Detectable Adverse Effect
1 = Detectable Effect, Not Significant
2 = Detectable Effect, Significant
3 = Detectable Effect, Unknown

These ratings, along with the likelihood of the effect, were considered in determining overall significance of residual effects.

In the EA Report, MKI presented information regarding the potential effects of the seismic survey program activities on fish and fish habitat, commercial fisheries, seabirds, marine mammals and sea turtles, species at risk, and sensitive areas. A summary of the effects assessment follows.

5.2 Valued Ecosystem Components/ Potential Environmental Effects

5.2.1 Fish and Fish Habitat 1

The seismic survey program will not result in any direct physical disturbance of the bottom substrate. During seismic surveys, survey equipment is not expected to come in contact with the seafloor and deep-water corals and sponges. The discussion of the potential effects of the proposed seismic project on fish and marine invertebrates may be found in Section 5.8.4 of the EA Report as well as in the EA Addendum. Therefore the negligible residual effects on fish habitat (i.e., water and sediment quality, phytoplankton, zooplankton, and benthos) are predicted to be **not significant**.

Mitigations consistent with those outlined in the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2012), will be implemented. Spatial and temporal avoidance of critical life history times (e.g., spawning aggregations) should mitigate the behavioural effects of exposure to airgun sound. The effects assessment concluded that physical effects on fish due to project activities will be: negligible to low in magnitude; over an area of less than 1 to 11-100 km^2; and for a duration of less than 1 month to 1 to 12 months. The likelihood of effects (behavioural and physical) is low and therefore **not significant**.

Any potential physical or behavioural impact to invertebrate species is considered to be: negligible to low in magnitude; over an area of less than 1 to 11-100 km^2; and for a duration of less than 1 month to 1 to 12 months. The likelihood of effects (behavioural and physical) is low and therefore **not significant**.

5.2.2 Commercial and Traditional Fisheries and DFO Research Surveys 1

The potential effects of the proposed seismic project on fisheries may be found in Section 5.8.5 of the EA Report as well as in the EA Addendum.

Given the application of mitigation measures, including the avoidance of fishery activity, it is predicted that the effects of seismic activity, including vessel movement, will be: negligible to low in magnitude; over an area of less than 1 to 11-100 km^2; and for a duration of less than 1 month to 1 to 12 months. The likelihood of effects (behavioural and physical) is low and therefore **not significant**.

To avoid potential conflict with DFO Research surveys, MKI will maintain communications with DFO personnel to keep up-to-date on the timing of planned research surveys. A temporal and spatial buffer zone will be implemented, in consultation with DFO, to reduce any potential interference with fish behavioural patterns. To avoid potential conflict with the execution of the Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab, MKI has committed to maintain regular communication with DFO, the FFAW, independent fishers, and managers of other key corporate fisheries in the area throughout the survey and that surveys will be scheduled, to the extent possible, to reduce potential for impact or interference with DFO science surveys or fishing activities. The impact of both noise and the seismic streamers on DFO research surveys will be negligible and **not significant**.

5.2.3 Marine Birds 1

The potential effects of the proposed seismic project on marine birds may be found in Section 5.8.6 of the EA Report as well as in the EA Addendum.

It is predicted that there will be **no significant effects** on seabirds from the sound because the magnitude of the effect (if it occurs) will be: negligible to low; over an area less than 1 to 10 km^2; and for a duration of 1-12 months.

The effect of vessel lighting on marine birds is predicted to be: of low magnitude; within an area 1-10 km, and over duration of less than one month. With the implementation of mitigation measures outlined in the EA Report and Addendum, the effect of vessel lighting on marine birds is deemed **not significant**.

5.2.4 Marine Mammals and Sea Turtles 1

The potential effects of the proposed seismic project on marine mammals and sea turtles may be found in the EA Report as well as in the EA Addendum.

The effects on marine mammals are predicted to be: negligible to low in magnitude; within an area less than 1 km to 1,000 km^2, and over a duration of 1-12 months. With the application of mitigation measures, the likelihood of effects occurring is low, and effects will be **not significant**.

The effects on sea turtles are predicted to be: negligible to low in magnitude; within an area less than 1 km to 100 km^2; and over duration of 1 to 12 months. With the application of mitigation measures, the overall likelihood of effects occurring is low, and effects will be **not significant.**

5.2.5 Species at Risk 1

The potential effects of the proposed project on species at risk may be found in the EA Report as well as in the EA Addendum.

There is a combined recovery strategy *(Kulka et al. 2007)* for northern and spotted wolffishes and management plan for Atlantic wolffish. The physical effects of the Project on the various life stages of wolffish and the white shark will range from: negligible to low; over a duration of 1-12 months' and within an area of <1 km^2. Behavioural effects may extend out to a larger area but are still predicted to be **not significant**. The mitigation measure of ramping up the airgun array (over a 30 min period) is expected to minimize the potential for impacts on wolffishes and the white shark.

The predicted effect of the Project on the Ivory Gull, Harlequin Duck, and Barrow's Goldeneye is **not significant.** These species are unlikely to occur in the Study Area, particularly during the summer when seismic surveys are likely to be conducted. In addition, the foraging behaviour (and location of foraging areas) would not likely expose them to underwater sound from the Project. Furthermore, these bird species are not known to be prone to stranding on vessels. An Ivory Gull recovery strategy has been prepared by Environment Canada (Environment Canada 2014). The mitigation measure of monitoring the seismic vessel and releasing stranded birds and ramping up the airgun array will minimize the potential for impacts on these species. MKI will obtain a live seabird handling permit for the release of stranded birds.

Based on available information, the blue whale, Sowerby's beaked whale and leatherback sea turtle are not expected to occur regularly in the Study Area. Northern bottlenose whales, (Scotian Shelf population), are expected to occur regularly in the Study Area during summer months and perhaps also at other times of the year. The polar bear also occurs in the Study Area primarily during the winter and spring. There are finalized recovery strategies for leatherback sea turtles (ALTRT 2006), blue whales in Atlantic Canada (Beauchamp et al. 2009), and the Scotian Shelf population of northern bottlenose whales (DFO 2010). Mitigation and monitoring designed to minimize potential effects of airgun array noise on *SARA*-listed marine mammals and sea turtles will be implemented. The effects are predicted to be: negligible to medium in magnitude (medium in the case of accidental releases), within an area less than 1 km to 1,000 km^2, and over a duration of 1-12 months. With the application of mitigation measures, the likelihood of effects occurring is low, and effects will be **not significant**.

5.2.6 Sensitive Areas 0

The potential effects of the proposed seismic project on sensitive areas may be found in Section 5.8.9 of the EA Report. Based on the previous conclusions on the effects of the project on the other VECs, the project is predicted to have **no significant effect** on sensitive habitat

5.2.7 Water Quality/Discharges **0**

Information on discharges may be found in Section 2.2.11 and Section 5.8.3 of the EA Report. Vessel discharges will not exceed those of standard vessel operations and will adhere to applicable regulations and standards. The effect of the seismic program operations on marine water quality should be undetectable and **not significant**.

5.3 Cumulative Environmental Effects **1**

A discussion of potential cumulative environmental effects may be found in Sections 5.5.5 and 6.0 of the EA Report, and the EA Addendum. With the implementation of mitigative measures, the limited temporal scope, and communication with other projects and activities, the cumulative environmental effect of the seismic program in conjunction with other projects and activities is predicted to be **not significant**.

5.4 Accidents and Malfunctions **0**

MKI will use a solid core streamer that eliminates the risk of leakage associated with cables filled with floatation fluid. In the unlikely event of an accidental release of hydrocarbons during the Project, MKI will implement the measures outlined in its oil spill response plan. In addition, MKI has an emergency response plan in place which bridges the emergency plans of all project entities and vessels to the local facilities and the Halifax Search and Rescue Region. MKI will have a representative onboard to represent MKI in all offshore Quality, Health, Safety and Environment activities and a Project Manager in St. John's. Effects due to accidental spills associated with the proposed operation, therefore, are considered, overall, to be detectable if they occur, but **neither significant nor likely**.

5.5 Follow-up Program **Required** **Yes**☐ **No**☒

The C-NLOPB does not require follow-up monitoring to be undertaken for this Project.

6. Other Considerations

The C-NLOPB is satisfied with the environmental information provided by MKI regarding the potential adverse environmental effects which may result from the proposed project, and are satisfied with the operator's proposed monitoring and mitigative measures.

The C-NLOPB is of the view that the environmental effects from the project, in combination with other projects or activities that have been or will be carried out, are **not likely** to cause significant adverse cumulative environmental effects.

7. Recommended Conditions and /or Mitigations

The C-NLOPB recommends that the following conditions be included in the authorization if the seismic survey program is approved:

- *The Operator shall implement or cause to be implemented, all the policies, practices, recommendations and procedures for the protection of the environment included in or referred to in the Application and in the "Environmental Assessment MKI Labrador Sea Seismic Program 2014-2018" (LGL Limited February 17, 2014) and "Environmental Assessment MKI Labrador Sea Seismic Program, 2014-2018 Addendum" (LGL Limited July 14, 2014).*

- *The Operator, or its contractors, shall shut down the seismic airgun array if a marine mammal or sea turtle listed as **Endangered or Threatened** (as per Schedule 1 of SARA) is observed in the safety zone during ramp- up procedures and when the array is active. The safety zone shall have a radius of at least 500 m, as measured from the centre of the air source array(s).*

- *No later than January 31, 2015, the Operator shall submit a report to the C-NLOPB describing the progress and potential environmental effects of its 2014 seismic program. It shall include, but not be limited to, copies of the Fisheries Liaison Officer (FLO) reports and the marine mammal observer (MMO) and seabird observer reports that were produced during the program.*

Part D: Determination Decision

8.1 C-NLOPB Decision

The C-NLOPB is of the opinion that, taking into account the implementation of the proposed mitigation measures set out in the conditions above and those committed to by Multi Klient Invest AS, the Project ***is not likely to cause significant adverse environmental effects****.*

Responsible Officer *Original signed by Elizabeth Young* D*ate: August 18, 2014*

Elizabeth Young
Environmental Assessment Officer
*Canada-Newfoundland and Labrador Offshore Pet*roleum Board

References:

ALTRT (Atlantic Leatherback Turtle Recovery Team). 2006. Recovery Strategy for Leatherback Turtle (*Dermochelys coriacea*) in Atlantic Canada. *Species at Risk Act* Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa, vi + 45 p.

Beauchamp, J., H. Bouchard, P. de Margerie, N. Otis and J.-Y. Savaria. 2009. Recovery Strategy for the blue whale (*Balaenoptera musculus*), Northwest Atlantic population, in Canada [FINAL]. *Species at Risk Act* Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa. 62 pp.

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Environment Canada. 2014. Recovery Strategy for the Ivory Gull (*Pagophila eburnea*) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. iv + 21 p.

Kulka, D., C. Hood, and J. Huntington. 2007. Recovery strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and management plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada. Fisheries and Oceans Canada: Newfoundland and Labrador Region. St. John's, NL. x + 103 p.

LGL Limited. 2013. *Labrador Sea Seismic Program 2014-2018 Project Description*. 17 pp.

LGL Limited. 2014a. Environmental Assessment MKI Labrador Sea Seismic Program, 2014-2018. LGL Rep. SA1245. Rep. by LGL Limited, St. John's, NL for Multi Klient Invest AS, Oslo, Norway, and TGS-NOPEC Geophysical Company ASA, Houston, TX. 241 p. + App.

LGL Limited. 2014b. Environmental Assessment MKI Labrador Sea Seismic Program, 2014–2018 Addendum. LGL Rep. SA1245-1. Rep. by LGL Limited, St. John's, NL, for Multi Klient Invest AS, Oslo, Norway, and TGS-NOPEC Geophysical Company ASA, Houston, TX. 26 p.