

Project Description

CGG's Newfoundland Offshore Seismic Program, 2016-2025

Prepared by



Prepared for



**14 October 2015
Project No. FA0067**

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Prepared by

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1.0 INTRODUCTION

CGG Services (Canada) Inc. (CGG) is proposing to conduct two dimensional (2D), three dimensional (3D), and/or four dimensional (4D) seismic surveys in the Newfoundland offshore (the Project). The Project Area identified in Figure 1 includes portions of the Northern and Southern Grand Banks, the Northeast Slope of Newfoundland, the Flemish Pass, and Orphan Basin. CGG is proposing to conduct seismic surveys in one or more years within the 2016-2025 timeframe.

This document is the Project Description (PD); the first step in the Canada-Newfoundland and Labrador Offshore Petroleum Board's (C-NLOPB) environmental assessment (EA) process. This PD, combined with the technical and scoping advice received from the C-NLOPB, other federal agencies, and stakeholders consulted by CGG, will guide the preparation of an EA.

1.1 Relevant Legislation and Regulatory Approvals

An Authorization to Conduct a Geophysical Program will be required from the C-NLOPB. The C-NLOPB is mandated in this matter by the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act* and the *Canada-Newfoundland Atlantic Accord Implementation Act*. The *Canadian Environmental Assessment Act, 2012* (CEAA, 2012) came into force on 6 July 2012. The "Regulations Designating Physical Activities" lists physical activities which fall under the new Act. Marine seismic surveys are not included on the list and therefore do not require an EA under the Canadian Environmental Assessment Agency (CEAA).

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*

One of the specific guidelines issued by the C-NLOPB, the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2012), is directly relevant to the proposed undertaking.

Authorizations for the kinds of activities described in this PD will be issued under the *Atlantic Accord Implementation Act* at the discretion of the C-NLOPB.

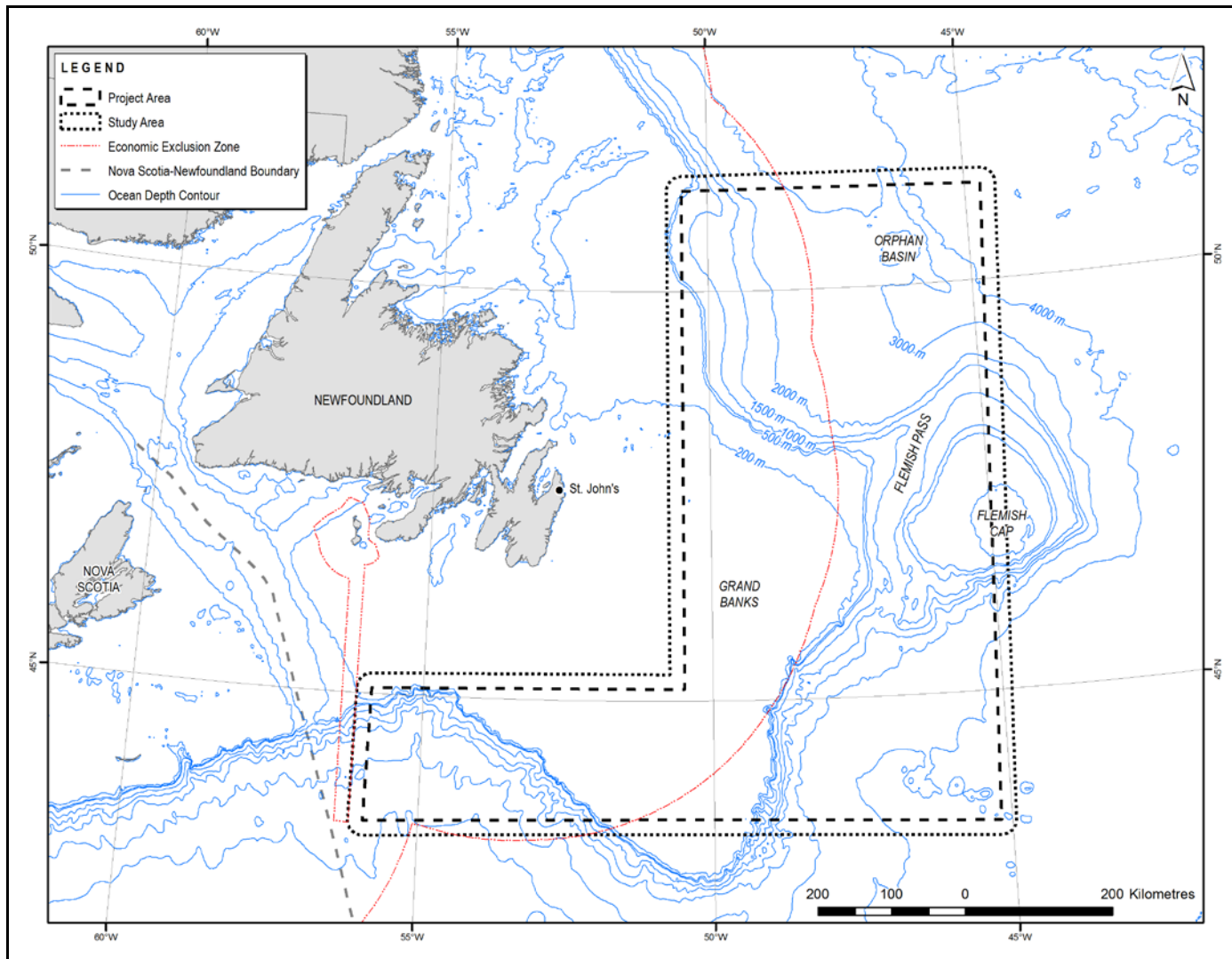


Figure 1. Locations of Project Area and Study Area for CGG’s Proposed Newfoundland Offshore Seismic Program, 2016-2025.

1.2 The Operator

CGG Services (Canada) Inc., a wholly owned subsidiary of CGG, is a fully integrated geoscience company providing leading geological, geophysical and reservoir capabilities to its broad base of customers primarily from the global oil and gas industry. CGG Services (Canada) Inc. is based in Calgary AB. Through its three complementary business divisions of Equipment, Acquisition, and Geology, and Geophysics & Reservoir (GGR), CGG brings value across all aspects of natural resource exploration and exploitation.

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*, CGG is 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 CGG's requirements.

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

1.4 Contacts

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2.0 PROJECT DESCRIPTION

The official name of the Project is the CGG Newfoundland Offshore Seismic Program, 2016-2025. CGG is proposing to conduct one or more 2D, 3D and/or 4D seismic surveys within its proposed Project Area (see Figure 1) between 2016 and 2025, starting as early as May 2016. There is the possibility that CGG will concurrently conduct two surveys in any given year. The timing of the surveys is subject to CGG 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). The proposed Project Area includes space to account for ship turning and streamer deployment. The area of the Project Area is 436,168 km². Just over half of the Project Area (51.7%) is located outside of Canada's Exclusive Economic Zone (EEZ; 200 nm limit). Water depth within the Project Area ranges from <100 m to > 4,000 m (see Figure 1).

The six “corner” coordinates (decimal degrees, WGS84 Datum) of the Project Area are as follow:

- 51.227°N, 50.503°W;
- 51.173°N, 44.690°W;
- 43.411°N, 45.188°W;
- 43.445°N, 55.923°W;
- 45.066°N, 55.896°W; and
- 45.145°N, 50.495°W.

The six “corner” coordinates (decimal degrees, WGS84 Datum) of the Study Area are as follow:

- 51.407°N, 50.789°W;
- 51.352°N, 44.405°W;
- 43.232°N, 44.942°W;
- 43.265°N, 56.170°W;
- 45.245°N, 56.150°W; and
- 45.327°N, 50.751°W.

The temporal boundaries of the Project are 1 May-30 November during 2016-2025. The typical duration of a seismic survey in any given year is 90-120 days.

2.2 Project Overview

The proposed Project is a ship-borne geophysical program that includes approximately 5,000 km² of 3D seismic survey lines in 2016. Specific data acquisition plans for 2D, 3D and/or 4D surveys during 2017-2025 are not yet determined.

For the proposed 3D survey in 2016, the seismic survey vessel will either be the *CGG Alize* (see Section 2.2.5 for more details) or a similar vessel. The seismic survey vessel(s) used during subsequent 2D/3D/4D surveys are currently unknown but will be approved for operation in Canadian waters and will be typical of the worldwide fleet. Details on airgun arrays and streamers are provided in Sections 2.2.6 and 2.2.7, respectively.

The C-NLOPB's *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2012) will be used as the basis for the marine mammal monitoring and mitigation program for the seismic surveys. Dedicated Marine Mammal Observers (MMOs) will monitor for marine mammals and sea turtles and implement mitigation measures as appropriate. 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 Fisheries and Oceans Canada *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 is detected within the safety zone. These measures are designed to minimize disturbance to marine life, particularly marine mammals and species considered at risk under the *SARA*. In addition, the MMOs will conduct a monitoring and release program for seabirds which may strand on board Project vessels. A Fisheries Liaison Officer (FLO) provided by the Fish, Food and Allied Workers Union (FFAW) will be on board the seismic vessel to ensure implementation of communication procedures intended to minimize conflict with the commercial fishery.

2.2.1 Objectives and Rationale

The primary objective of the Project 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 quality or coverage to serve the needs of the energy companies in their exploration, development and production activities. Acquisition of more 2D, 3D and/or 4D seismic data is required to provide images of higher resolution and quality that will reduce the possibility of unnecessary drilling activity.

2.2.2 Project Scheduling

As already indicated in Section 2.1, the seismic surveys will be conducted between 1 May and 30 November of any given year from 2016-2025. The approximate duration of the proposed 2016 survey is 90-120 days.

2.2.3 Site Plans

In 2016, it is planned that ~5,000 km² of 3D seismic data will be acquired. The 3D seismic survey lines will be primarily orientated north-south with an approximate 600 m separation between adjacent lines. The average survey line length is estimated to be 60 km.

2.2.4 Personnel

A typical seismic vessel can accommodate ~55-60 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 a FLO and MMOs on board. All project personnel will have the required certifications as specified by the relevant Canadian legislation and the C-NLOPB.

2.2.5 Seismic Vessel

In 2016, CGG will use either the *CGG Alize* or a similar vessel. The *CGG Alize* was rebuilt in France in 1999 and is also registered in France. The vessel is 101 m long, 29 m wide, and has a maximum draft of 7.5 m. The vessel is equipped with two Alstom 4200 Kw diesel electric motors and has a maximum cruising speed of 14 knots (25.9 km/h). Typical seismic surveying speed is 4.5-5 knots (8.3-9.3 km/h). For seismic surveys during 2017-2025, vessel specifics will be provided once the vessel has been identified.

2.2.6 Seismic Energy Source Parameters

In 2016, the proposed 2D/3D/4D survey sound source will consist of two airgun arrays in a flip-flop arrangement, each array consisting of three subarrays of 12 airguns each. The total volume of the proposed sound source (i.e., one airgun array) is 4,070 in³. The airgun arrays will be deployed at a depth of 8-10 m. The airguns will be operated with compressed air at pressures of 2000 psi. The peak-to-peak sound source level will be ~141.4 bar-m (~263 dB re 1 $\mu\text{Pa} \cdot \text{m}_{\text{pp}}$). Detailed specifications of the airgun array will be provided once the 2016 project design is completed and parameters are selected.

2.2.7 Seismic Streamers

In 2016, the 3D seismic survey vessel will tow 12 solid streamers, each 7,000-8,100 m long at a depth of 10-50 m. For subsequent 2D, 3D and/or 4D seismic surveys during 2017-2025, streamer equipment specifications will be provided once the program design is complete.

2.2.8 Logistics/Support

Vessels

Primary support and supply will be provided by CGG's own vessel, MV *Bourbon Grebe*. This vessel was built in Dubai in 2014 and is registered in Cyprus. The vessel is 54 m long, 13 m wide, and has a maximum draft of 4.8 m. It is anticipated that one local picket vessel will accompany the seismic vessel. The picket vessel will be used to scout ahead of the seismic vessel for fishing vessels and gear, as well as for hazards such as ice and floating debris.

Helicopters

The *CGG Alize* is equipped with a helicopter deck suitable for helicopters like the Sikorsky S-92. Crew changes will be either by helicopter or ship-to-ship.

Shore Base, Support and Staging

CGG will have a shore representative based in St. John's for the duration of each 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. CGG 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, the support vessel and the picket vessel. CGG 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 CGG's oil spill response plan will be implemented. The oil spill response plan will be filed with the C-NLOPB. In addition, CGG will have an emergency response plan in place.

2.3 Mitigation and Monitoring

Project mitigations will be detailed in the EA, some of which will follow the guidelines outlined in the *Statement of Canadian Practice with Respect to the Mitigation of Seismic Sound in the Marine Environment*. Mitigation procedures will include ramp-ups, implementation of ramp-up delays and airgun array shutdowns for designated marine mammal and sea turtle species, use of dedicated MMOs and FLOs, and a fisheries compensation program. 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 Canadian Wildlife Service.

3.0 ENVIRONMENTAL ASSESSMENT

The environmental assessment will closely follow previous assessments of seismic programs in the Newfoundland and Labrador offshore. The primary issues of concern are the effects of exposure to underwater airgun sound on marine fauna and fisheries.

3.1 Physical and Biological Environment

The Eastern Newfoundland Strategic Environmental Assessment (SEA; C-NLOPB 2014), Southern Newfoundland SEA (C-NLOPB 2010), and Labrador Shelf SEA (C-NLOPB 2008) provide descriptions of the physical and biological environments 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 Environmental Components (VECs): fish and fish habitat, fisheries, marine birds, marine mammals, sea turtles, species at risk and sensitive areas.

3.2 Effects of the Environment on the Project

A discussion of expected effects of the physical environment on the Project, based partially on information in the relevant SEAs (C-NLOPB 2008, 2010, 2014), will be included in the EA.

3.3 Effects of the Project on VECs

The effects of Project activities on VECs, most notably the underwater sound from airgun arrays, will be assessed in detail. Information on the known effects of Project activities on the VECs, with emphasis on the effects of underwater sound on marine fauna, will be reviewed and used to predict residual effects on VECs. 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, CGG will consult with stakeholders who have an interest in the Project. This will assist in scoping the effects assessment and mitigation plan. The results of the consultations (i.e., issues of concern) will be presented and addressed in the EA.

CGG will undertake a consultation program with various consultees that include:

- Fisheries and Oceans Canada (DFO);
- Environment Canada (EC);
- One Ocean;
- FFAW/Unifor;
- Study Area fishers;
- Nature Newfoundland and Labrador (formerly the Natural History Society);
- Various fish processors; and
- Other identified Newfoundland and Labrador fisheries industry stakeholders.

4.0 REFERENCES

- C-NLOPB (Canada-Newfoundland and Labrador Offshore Petroleum Board). 2014. Eastern Newfoundland Strategic Environmental Assessment. Report by AMEC Environment & Infrastructure, St. John's, NL for the C-NLOPB, St. John's, NL. 527 p. + appendices.
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- C-NLOPB (Canada-Newfoundland and Labrador Offshore Petroleum Board). 2010. Southern Newfoundland Strategic Environmental Assessment. Report by LGL Limited, St. John's, NL for the C-NLOPB, St. John's, NL. 333 p. + appendices.
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