

**Environmental Assessment  
of Seitel's East Coast Offshore  
Seismic Program, 2016-2025  
Addendum**

**Prepared by**



**Prepared for**



**August 2016  
LGL Project No. FA0071**



**Environmental Assessment  
of Seitel's East Coast Offshore  
Seismic Program, 2016-2025  
Addendum**

**Prepared by**

**LGL Limited**  
**environmental research associates**  
P.O. Box 13248, Stn. A  
St. John's, NL A1B 4A5  
Tel: 709-754-1992  
jchristian@lgl.com

**for**

**Seitel Canada Ltd.**  
1000, 550-6th Avenue SW  
Calgary, AB T2P 0S2  
Canada

**August 2016**  
**LGL Project No. FA0071**

**Suggested format for citation:**

LGL Limited. 2016. Environmental Assessment of Seitel's East Coast Offshore Seismic Program, 2016-2025 Addendum.  
LGL Rep. FA0071. Prepared by LGL Limited, St. John's, NL for Seitel Canada Ltd., Calgary, AB.  
23 p. + appendix.

# Table of Contents

	Page
Table of Contents.....	ii
List of Figures.....	iii
Introduction.....	1
General Comments.....	1
Fish, Food and Allied Workers (FFAW/Unifor).....	1
Nunatsiavut Government (NG).....	1
Specific Comments.....	5
Canada – Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB).....	5
Fisheries and Oceans Canada (DFO).....	8
Nunatsiavut Government (NG).....	15
Fish, Food and Allied Workers (FFAW/Unifor).....	17
Literature Cited.....	19
Appendix 1 Labrador Consultations Report.....	A-1

## List of Figures

Page

Figure 1. Locations of Sensitive Areas that Overlap the Seitel Study Area. ....	11
---	----

# INTRODUCTION

This Addendum document contains responses to comments provided by reviewers of the Environmental Assessment of Seitel's East Coast Offshore Seismic Program, 2016-2025.

## GENERAL COMMENTS

### **Fish, Food and Allied Workers (FFAW/Unifor)**

**General Comment #1:** The timing of the activity coincides with the highest harvesting activity of our Membership.

*Response:* Seitel concurs with the FFAW/Unifor that the timing of Seitel's proposed geophysical activities coincides with the time of highest harvesting activity by the FFAW/Unifor membership.

**General Comment #2:** The correct convention for the areas would be NAFO Divisions 3KLMNOPs and 4Vs, not 3K, 3L, 3M, 3N, 3O, 3Ps and 4Vs. There are multiple cases of this error in Section 4.3 Fisheries.

*Response:* Seitel notes the correct convention for naming NAFO Divisions.

### **Nunatsiavut Government (NG)**

The Nunatsiavut Government fundamentally disagrees with the length of the environmental assessment. The 10-year EA presents many problems which require clarification from the proponent.

**General Comment #1:** Within the 10-year authorization what are the opportunities for adaptive mitigation based on new information and technology? What reporting requirements exist in order to ensure adaptive and effective mitigation over the 10-year time period with regards to fisheries impacts, marine mammal impacts, and impacts to Inuit subsistence activities? What power does the C-NLOPB or its stakeholders have to encourage the use of new techniques that are developed during the length of the program? For example, the Pacific and Western Arctic jurisdictions of Canada have used Section 13 of the Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment (Statement of Practice) to establish mitigations based on received levels of sound within the marine environment. This action was instituted because the minimum 500 m was modelled and found to be insufficient to prevent harm to marine mammals in certain project areas.

*Response:* There will be full opportunity for adaptive mitigation during the 10-year program. Seitel will be required to prepare an EA Update document prior to commencing activities in any given year. The Update document will include new relevant information that was unavailable during preparation of the previous program document(s). If there are any new techniques developed during the 10-year period that may help to further mitigate environmental effects, they will be investigated and incorporated into the program if deemed useful.

**General Comment #2:** The cumulative effects impact assessment does not incorporate climate change and the subsequent impacts to the marine environment and associated VECs. As this is a 10-year environmental assessment, the impacts of climate change should be included in the assessment. In 2010, the Canadian Environmental Assessment Agency published a guidance document called Incorporating Climate Change

Considerations in Environmental Assessment: General Guidance for Practitioners (<https://www.ceaa-acee.gc.ca/default.asp?lang=En&n=A41F45C5-1&offset=1&toc=show>). This guidance document clearly outlines the importance of incorporating possible climate change impacts into the cumulative effects assessment. As a designated responsible authority under the Canada Environmental Assessment Act, the C-NLOPB is responsible to ensure proponents are following best practices not only in their operations but also in their environmental assessment practices.

**Response:** Seitel agrees that climate change is indeed a potential contributing factor to cumulative effects. From the perspective of greenhouse gases, atmospheric emission levels from the marine vessels and other relevant equipment that would be used during Seitel's exploration program are considerably less than those associated with drilling operations. Regardless of this fact, there will be atmospheric emissions produced during the Seitel program. The Canadian Environmental Assessment Agency's guidance document regarding the incorporation of climate change considerations in environmental assessment is of limited value in this case, primarily because a utile method of conducting assessment of cumulative effects has not yet been devised. Duinker et al. (2012), in their review of work to date on the scientific dimensions of cumulative effects assessment (CEA), concluded that it is particularly difficult to properly implement CEA in project-specific EAs. They made several recommendations regarding revisions to guidance materials for science in CEA, including the following:

- A much richer and nuanced conceptual framework for a cumulative effect is required in order to describe how effects become cumulative;
- Clearer guidance regarding CEA analytical methods is required; and
- Better definitions of thresholds, without which it is really impossible to judge the significance of cumulative effects.

Duinker et al. (2012) concluded by saying that lack of competent CEA impairs our ability to determine the degree to which particular activities jeopardize the sustainability of Valued Environmental Components (VECs), and that improvements in CEA practice are desperately needed.

**General Comment #3:** Paragraph 19(1)(a) of CEAA 2012 specifies that a project EA must take into account environmental effects, including cumulative environmental effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out. This environmental assessment does not clearly state the proponent's scenario with which they are assessing their own cumulative effects of a 10-year program. The proponent states that the maximum possible combinations within each year are 2D and 2D or 2D and 3D; therefore section 5.8 should detail a scenario that includes one of these combinations each year for 10 years to assess cumulative effects.

**Response:** As indicated in § 5.8 of the EA, the EA has assessed cumulative effects within the Project and the residual effects described in § 5.0 include any potential cumulative effects resulting from the Seitel activities. The cumulative effects discussed in the EA that consider other activities outside of Seitel's activities pertain to 2016 only. It isn't possible to realistically consider cumulative effects for the entire 10-year period. The annual EA Updates will consider the cumulative effects in subsequent years. As indicated in the response to the NG General Comment #2, improvements in CEA practice are desperately needed.



**General Comment #4:** The maintenance of adequate separation of seismic projects is insufficient to reach a conclusion of “not significant” impacts to VECs. The concept of avoiding overlapping sound does not assess the impacts of diverted migration patterns or movements from multiple seismic projects, nor does it assess the impacts of multiple exposure events to VECs. Section 5.8.3 should detail the references and studies used to conclude that “any cumulative effects... will be additive (not multiplicative or synergistic) and predicted to be not significant.”

**Response:** According to Appendix 2: Types of Cumulative Effects of CEAA’s Technical Guidance for Assessing Cumulative Environmental Effects under the *Canadian Environmental Assessment Act (CEAA)*, although the cumulative effects of habitat loss, for example, can be considered to be additive, the cumulative effects on the species using the habitat may be synergistic (CEAA website; accessed May 2016). Therefore, the last sentence of the first paragraph on page 194 in § 5.8.3 of the EA should be changed from “Any cumulative effects (i.e., disturbance), if they occur, will be additive (not multiplicative or synergistic) and predicted to be not significant” to “Any cumulative effects are predicted to be not significant”.

**General Comment #5:** In addition, a 10-year environmental assessment should assess the impacts to the marine environment over 10 years. Section 5.8.3 of the environmental assessment has only assessed the potential for “cumulative effects with other seismic programs proposed for 2016 (e.g., WesternGeco, MKI, Statoil, GXT). If the proponent is applying for a 10-year project, the environmental assessment should be able to properly assess cumulative effects over that time span by assessing the certain and probable projects over that time period – otherwise each project should reduce the scope to an assessable timeframe; likely resulting in each seismic project being treated as an annual or bi-annual project with separate environmental assessments.

**Response:** It isn’t possible to assess cumulative effects for the entire 10-year period. The annual EA Updates will consider the cumulative effects in their respective years. As indicated in the response to the NG General Comment #2, improvements in CEA practice are desperately needed.

**General Comment #6:** The Nunatsiavut Government also takes issue with the referencing of previous EA studies to validate or defend a position. Rather than providing evidence to support conclusions, the proponent has instead asked the reviewer to refer to past EAs that are not included in the document. This practice is done throughout the document (ex. 4.5.11, 5.5, 5.7.4.1, 5.7 etc.). This is poor EA practice and should be discouraged by the regulator.

**Response:** The use of this approach is based on directives in the C-NLOPB’s Final Scoping Document provided to the proponent on 21 December 2015.

**General Comment #7:** A major gap within the EA is the absence of a defined monitoring plan. A monitoring plan needs to be in place if they wish to provide new plans for each year. Clarification and details on the plan is requested from the proponent.

**Response:** A stand-alone monitoring plan per se is not typically required for environmental assessments of proposed geophysical programs. Types of monitoring that are typically included in geophysical program EAs are the employment of marine mammal/seabird observers (MMOs/SBOs) to monitor marine mammals and seabirds in the general vicinity of operations, and employment of Fisheries Liaison Officers (FLOs) to monitor commercial fishing/fishing gear/fishing vessels in the general vicinity of operations. Field reports are prepared and submitted

for all of these monitoring activities. Seitel also commits to maintaining open dialogue with the NG and to have a NG MMO on the vessel.

**General Comment #8:** The Nunatsiavut Government recommends that sound source verification be conducted in advance of project commencement (within a week prior to project start date), as is common practice in other Canadian jurisdiction. Verified sound propagation and modeling would ensure that seismic sound stays contained within the project area, including outside of the ‘the Zone’, and ensures that it does not exceed disturbance levels. Results of verification should be sent to regulators and relevant stakeholders immediately.

**Response:** The requirement of underwater sound propagation modelling was not indicated in the Final Scoping Document provided to the proponent by the C-NLOPB on 21 December 2015.

**General Comment #9:** The EA states that DFO has not adopted any noise exposure criteria. With regards to the issue of preventing temporary threshold shift (TTS) and behavioral disturbance, the Western Arctic and Pacific Regions of DFO Canada have recommended precautionary noise exposure criteria within their advice provided to the National Energy Board. In the Western Arctic, criteria are based on 180 dB to avoid temporary threshold shift. It should be noted that seismic operations were successful in gaining their data when applying the mitigation recommended by DFO Western Arctic. In the Pacific Region, a safety zone is required to be modelled to correspond to 160 decibels is established to avoid behavioural disturbance (CSAS, 2014). This approach is based on Section 13 of the Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment that allows for incorporation of new mitigation measures based on sound variation in the environment as well as cumulative effects.

**Response:** While some case-by-case recommendations have been made by DFO for noise exposure criteria, currently there are no nationally-adopted noise exposure criteria. The EA proposes to use the protocols currently approved for use in offshore Newfoundland and Labrador. It should also be noted that the 180 dB re 1  $\mu\text{Pa}_{\text{rms}}$  criterion to avoid temporary threshold shift (TTS) was established before there was any available information regarding the minimum received levels of sounds necessary to cause TTS in marine mammals.

**General Comment #10:** Considering the high number of potential projects in the area over the 10-year span of this EA, a precautionary approach to seismic mitigation for cetaceans and sea turtles is recommended. 500 m is stated as a minimum in Section 2.2 of this environmental assessment. It is recommended that sound propagation modelling should be done to assess the potential impacts to marine life throughout the project area. It should be noted that the Statement of Practice is based on a 2004 CSAS document that outlines the large data gaps and potential consequences in seismic mitigation. It states that “risks of these consequences are poorly quantified, often unknown, and likely to be variable with both conditions of the environment and of the organisms exposed to the sounds.”

**Response:** The requirement of underwater sound propagation modelling was not indicated in the Final Scoping Document (C-NLOPB 2015) provided to the proponent by the C-NLOPB on 21 December 2015.

**General Comment #11:** With regards to the consultations in the appendices, please explain why specific recommendations regarding scallops and bivalves were not specifically included in mitigation and monitoring measures as encouraged by Ocean Choice International.