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Canada-Newfoundland and Labrador
Offshore Petroleum Board

May 22, 2007

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Ms. Kimberly Coady
Canada-Newfoundland & Labrador Offshore Petroleum Board
5th Floor, TD Place
140 Water Street
St. John's, Newfoundland
A1C 6H6

Dear Ms. Coady:

Subject: **Petro-Canada Jeanne d'Arc Basin 3-D Seismic Program Environmental Assessment**

Please find attached Petro-Canada's responses to your comments on the Environmental Assessment for Petro-Canada's 3-D Seismic Program planned for the Jeanne d'Arc Basin. As per your direction, we have addressed the eight key comments related to satisfy the requirements of the *Canadian Environment Assessment Act* and to complete the Board's Screening Report. We appreciate the commentary offered for planning purposes and these will be taken into consideration during the preparation of future environmental assessment reports.

Please feel free to contact me at your earliest convenience if you wish to discuss any of our responses in more detail.

Sincerely,

Urban Williams
Team Lead,
Environment, Emergency Response & Security

cc: B. Wilson
S. Strong
C. Horner
G. Janes

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vancouver 2010

NATIONAL PARTNER

Response to Reviewer Comments 1-8 on the "Petro-Canada Jeanne d'Arc Basin 3-D Seismic Program Environmental Assessment"

Comment No. 1:

The EA presents a very thorough review of the potential effects of seismic sounds on marine mammals and sea turtles. It is evident that the proponent is attempting to address comments previously put forward by DFO on this issue (such as separate consideration of sources of noise, consideration of sound impacts on different species, the uncertainty with respect to acoustic modelling and data gaps with respect to both species presence and behavioural effects). Evidence suggests that the likelihood of auditory system damage is low. However, the potential for calling and behavioural disturbance due to seismic activity is well presented and may exist. With the adjacency of petroleum industry activities in the Jeanne d"Arc Basin and surrounding areas, with the number of seismic programs in the area, with the annual occurrence of this activity and with the lack of certainty, the potential for behavioural disturbance and displacement of marine animals due to seismic activity (and discussed in the report) could be better addressed in the assessment of cumulative effects.

Response:

Although marine mammal responses to seismic exploration activities have been studied more than for other VECs, there has been little study of potential cumulative effects from exposure to more than one noise source, or from the same type of sources over time. However, the prediction of *no significant cumulative effects* on marine mammals (and sea turtles) was based primarily on the literature dealing with a single source of disturbance and the use of professional judgement to assess the additive effects of more than one source of disturbance.

In 2007, the following geophysical exploration activities may occur off the east coast of Newfoundland and Labrador, in addition to Petro-Canada's 3-D seismic program:

- Geohazard survey in the Project Area
- CSEM Survey in Orphan Basin
- 2-D seismic surveys off Labrador and Greenland

As explained in Section 5.7 of the EA, the geohazard survey proposed by Petro-Canada will not overlap in time with Petro-Canada's 3-D seismic survey; also, the limited scope (9-11 day duration; characteristics of sound sources) of the program is expected to have minimal effect on VECs (LGL Limited 2007) and thus, there is little potential for cumulative impacts from this activity. The electromagnetic source used in the CSEM survey in Orphan Basin is expected to have negligible effects on marine mammals (and turtles; see Buchanan et al. 2006), and the primary source of disturbance on these VECs from this program is likely ship noise, and not from the source. Given the geographic

separation between the CSEM survey area and Petro-Canada's 3-D seismic program (minimum of 116 km), there is little chance of cumulative effects between the two projects. The 2-D seismic surveys proposed by TGS-NOPEC (LaPierre et al. 2007) will occur well north of the Project Area, off the coast of northern Labrador and Greenland (and potentially from late June to November). Similarly, 2-D seismic surveys proposed by GSI for 2007 would occur well north of the Project, over the Labrador Shelf (Canning and Pitt 2007). Hence, given the geographic separation between the 2-D survey areas and Petro-Canada's 3-D seismic program, the potential for cumulative effects on marine mammals are limited.

In addition to the oil and gas activities listed above, there are production activities at Hibernia, Terra Nova, and White Rose, which at the closest points are 8.6 km, 17.2 km, and 31.4 km away from Petro-Canada's 3-D seismic survey area, respectively. Of most relevance would be the noise from the GBS, FPSOs and their attendant vessels (supply, standby). To the best of our knowledge sound levels have not been measured from the three oil developments (but source levels would be lower than those from a large seismic array). However, marine mammals have been observed in the Jeanne d'Arc Basin near the GBS and FPSOs on numerous occasions (Baillie et al. 2005), suggesting that marine mammals are known to occur in the area and presumably are not overly disturbed by them. Marine mammals (mostly baleen whales) were sighted on a regular basis during Husky's seismic program in northern Jeanne d'Arc Basin in 2005 (Lang et al. 2006) and 2006 (Abgrall et al. in prep.), at times when all three oil developments were operational and airgun arrays were active. These observations do not preclude the potential for disturbance of marine mammals; however, they suggest that if disturbance effects occurred, they may have been localized, and hence, the potential for cumulative effects

LaPierre, T., C. Hawkins, S. Bigg and B. Wheeler. 2007. Environmental impact assessment for marine 2D seismic reflection survey Baffin Bay / Davis Strait / Labrador Sea offshore Canada. Rep. for TGS-NOPEC Geophysical Company ASA. Rep. no. 06-256.1. 105 p. + appendices.

Lang, A.L., V.D. Moulton and R.A. Buchanan. 2006. Marine mammal and seabird monitoring of Husky Energy's 3-D seismic program in the Jeanne d'Arc Basin 2005. LGL Rep. SA887. Rep. by LGL Limited, St. John's, NL, for Husky Energy Inc., Calgary, AB. 63 p. + appendices.

LGL Limited. 2007. Addendum to the environmental assessment of Petro-Canada's Jeanne d'Arc Basin 3-D Seismic Program. LGL Rep. SA940-1. Rep. by LGL Limited, St. John's, NL, for Petro-Canada, St. John's, NL. 42 p. + appendices.

Comment No. 2:

Ramp-up procedures are only mentioned for the onset of the seismic survey. If for any reason airguns are shut down, ramp-up procedures should be followed prior to recommencing survey operations. Section 2.2.7 on page 8 states that "Petro-Canada will require that the seismic operator ramp up its airgun array after prolonged periods of shutdown." It is not understood what constitutes a "prolonged" period. A specific time period should be given, after which the ramp up process will be required.

Response:

Any time the airgun array has been inactive for a period greater than 30 minutes, the airgun array will be ramped up as per the Geophysical, Geological, Environmental and Geotechnical Program Guidelines.

Comment No. 3:

The list of mitigations should involve continuous firing of one gun during vessel turning for line change. The C-NLOPB will require the following during line changes: *the seismic airgun array shall be reduced to a single airgun and the airgun shall remain active during the line change. If for any reason, the airgun is shut down for a period greater than 30 minutes, then ramp-up procedures shall be implemented as per the Geophysical, Geological, Environmental and Geotechnical Program Guidelines.*

Response:

A single airgun (smallest volume) will be continuously activated during the vessel turning for the line change. If for any reason the single airgun is shut down for more than 30 minutes then ramp-up procedures shall be implemented as per the Geophysical, Geological, Environmental and Geotechnical Program Guidelines.

Comment No. 4:

It is understood that the project-specific starts dates are not included in the EA report, a clarification on when program areas will commence should be provided.

Response:

Section 2.2.3, Project Scheduling of the EA states "In 2007, it is anticipated that the seismic survey…is expected to start on or about 15 June". The anticipated sailing date from St. John's to commence the seismic program is June 16th with an anticipated completed date of July 14, 2007. The total program should be in the vicinity of 28 days in duration.

Comment No. 5:

The timing of the program may overlap with fishing activity and some species' spawning period (e.g. cod, crab, and flounder). Please clarify or confirm that spawning times of these species have been considered in the effects assessment.

Response:

Section 4.4.2 of the EA addresses the spawning times of fish and invertebrate species occurring in the Study Area/Project Area. The assessment includes the potential effects of exposure to seismic on ichthyoplankton.

Comment No. 6:

The EA Report states that through the consultation process, recommendations were made for communication to fishers through the "Union Forum" about project activities. Please clarify if these communications in the "Union Forum" were initiated.

Response:

Although consultations with FFAW and One Ocean representatives did not identify any major concerns or issues with respect to potential interactions between proposed survey activities and planned crab fishing activities in 2007, Petro-Canada will ensure that relevant information about the survey will be publicized using established communication mechanisms. Early discussions occurred with FFAW suggesting the inclusion of survey information in the *Union Forum*. However, the May edition of the *Union Forum* was published prior to finalization of the details of the seismic survey and future editions will likely not be issued because of funding problems. Petro-Canada will provide information on the survey through Notices to Shipping (Continuous Marine Broadcast and NavTex) and the CBC (Newfoundland) Radio's Fisheries Broadcast, as

well as direct communications between the survey vessel and fishing vessels via marine radio at sea. Petro-Canada will also discuss additional communication mechanisms with One Ocean and FFAW.

Comment No. 7:

The "Transit Route," including a transit route analysis that considers active fishing the area, from St. John's to the Study Area, as part of the project activities, should be provided to the C-NLOPB at least 5 days before commencement of survey activities. Also, please confirm that communication will be ongoing during this activity.

Response:

As discussed in Petro-Canada's EA, a route for the survey ship's transit from St. John's harbour to the survey prospect will be chosen based on avoiding fixed gear fishing activities. Petro-Canada will prepare a route analysis for this purpose when the survey start date is known with certainty. This analysis will be sent to the C-NLOPB at least five days before the commencement of the transit.

The route analysis will involve - i) mapping past (2004-2006) fixed gear fishing activities in relation to the selected route using DFO georeferenced datasets, ii) consulting with commercial fishing interests likely to be active in the general transit route area, iii) contacting FFAW and One Ocean, and iv) contacting DFO to ensure that no research vessel (RV) activities are planned along the route at that time.

Fishers who may be operating along the transit route, or within the general vicinity of the survey area, would also be identified and contacted. These would include St. John's and Avalon region based vessel operators such as Skipper Glen Winslow (754-4725) or Skipper Henry Thorne (685-1953/442-5271). In previous seismic vessel operations, both of these fishers have been very helpful in (a) identifying where offshore fish harvesting activities are taking place during the season and (b) providing the names of and contact information for other fishing vessel operators known to be in a particular area. Fish buyers and vessel dispatchers at Prosser's Rock in St. John's have also been very useful in identifying which vessels have recently departed the port or who are presently en route back to unload their catch. These Prosser's Rock contacts include such knowledgeable persons as Perry Noseworthy (685-1034) and Mike Cahill (685-9607).

Additional mitigations related to this activity will involve ongoing contact/ communications through the at-sea Fisheries Liaison Officer (FLO) to avoid fishing gear, notifications to fishers via Coast Guard radio Notices to Shipping, and response by the onshore Single Point of Contact (SPOC) if there are any fishing gear incidents. Financial compensation for lost or damaged fishing gear would constitute final mitigation of any effects in case of an accidental gear contact.

Comment No. 8:

Section 5.6.5.2 discusses the potential for leakage from streamers. Although it states that solid streamers are to be used in 2007, in future years when solid streamers may not be used, what contingency plans will be in place to respond to leakage from streamers?

Response:

Petro-Canada has an oil spill response plan in effect for its operations on the East Coast and this Plan will be implemented in the event of a spill from seismic operations where Petro-Canada is the Operator. Spills will be reported to the C-NLOPB and the Canadian Coast Guard.