



Husky Energy

Canada-Newfoundland & Labrador Onshore
Petroleum Board

REPORT

REPORT TITLE

**Environmental Assessment of
Husky's Jeanne d'Arc Basin / Flemish Pass
Regional Seismic Program, 2012-2020
Addendum**

SUBMITTED TO

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**Environmental Assessment of Husky's
Jeanne d'Arc Basin/Flemish Pass
Regional Seismic Program, 2012-2020
Addendum**

Prepared by



for



**May 2012
LGL Project No. SA1144**

Environmental Assessment of Husky's
Jeanne d'Arc Basin Field Development
Regional Strategic Program 2012-2020
Addendum

Prepared by



for

Husky Energy

June 2012
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**Environmental Assessment of Husky's
Jeanne d'Arc Basin/Flemish Pass
Regional Seismic Program, 2012-2020
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Preface

This addendum contains Husky's responses to reviewer comments on the "Environmental Assessment of Husky's Jeanne d'Arc Basin/Flemish Pass Regional Seismic Program, 2012-2020." Comments and responses are organized by the regulatory agencies and groups that submitted comments. Comments are provided in italic font and responses in normal font.

Fisheries and Oceans Canada (DFO)

General Comments

Please be advised that the "Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment" (SOCP) specifies the mitigation requirements that must be met during the planning and conduct of marine seismic surveys, in order to minimize impacts on life in the oceans. These requirements are set out as minimum standards to be implemented during the planning and conduct of seismic programs. As such it is advised that the proponent adhere to all relevant minimum mitigations outlined in the SOCP including the Planning Seismic Surveys, Safety Zone and Start-up, Shut-down of Air Source Array(s), Line Changes and Maintenance Shut-downs, Operations in Low Visibility and Additional Mitigative Measures and Modifications sections of the SOCP.

The report indicates that surveys may occur at anytime from March to November from 2012-20, with surveys ranging in duration from 30-120 days. While the proponent does acknowledge that Species at Risk Act (SARA) requirements could change over this timeframe and that they will reassess accordingly, DFO would like to note that changes to the SARA could include additions to species on Schedule 1 of SARA, changes in species status, new recovery strategies, action plans and/or management plans and identification of critical habitat. Please continue to refer to the Species at Risk Public Registry (www.sararegistry.gc.ca) to get the most up to date information.

In Section 4.3 Commercial Fisheries the author avails of commercial fishing statistical information from 3 different sources. The text of the report is not entirely clear as to the source for various sections. For future reports it would be useful if the source is referenced more clearly in the text. Also it would be useful if the potential level of interaction between harvesters and gear could be indicated.

As is common practice sightings data for marine mammals and sea turtles should be forwarded to DFO.

Response:

Husky Energy will adhere to all relevant minimum mitigations outlined in the SOCP including the Planning Seismic Surveys, Safety Zone and Start-up, Shut-down of Air Source Array(s), Line Changes and Maintenance Shut-downs, Operations in Low Visibility and Additional Mitigative Measures and Modifications sections of the SOCP.

Husky Energy will reassess *Species at Risk Act (SARA)* requirements during the 2012-2020 timeframe of the seismic program, acknowledging that changes to the *SARA* could include additions to species on Schedule 1 of *SARA*, changes in species status, new recovery strategies, action plans and/or management plans and identification of critical habitat. Husky will continue to refer to the Species at Risk Public Registry (www.sararegistry.gc.ca) to obtain the most up to date information.

Husky Energy notes that the sources of the commercial fishing statistical information for the various subsections of Subsection 4.3 were not clear to the reviewers. Two sources of fisheries data were used in Subsection 4.3; the NAFO STATLANT 21A dataset and the DFO commercial fishery landings data set. In future, the data sources will be more clearly indicated.

Husky Energy acknowledges that sightings data for marine mammals and sea turtles will be forwarded to DFO.

Specific Comments

Comment DFO-1

Section 3.3 Physical Oceanography, pg 61– Additional information on physical oceanography can be found in Han et al., *Journal of Physical Research*, 2008) achieved by DFO Newfoundland and Labrador Region and Maritimes Region under the Program of Energy Research and Development (PERD).

Response DFO-1

Husky Energy acknowledges that additional information on physical oceanography in the vicinity of the EA Study Area can be found in Han et al. (2008). Han et al. (2008) has been added to the reference list at the end of this addendum.

Comment DFO-2

Section 4.2 Fish and Fish Habitat, pg 98 – Sandlance is an important species in the study area and a description should be included in this section.

Response DFO-2

Husky Energy adds the following text to Subsection 4.2, Fish and Fish Habitat.

Sand Lance

The northern sand lance (*Ammodytes dubius*) is a small planktivorous fish usually found on the shallow portions of the Grand Banks in areas where bottom depths are less than 100 m and the substrate is mostly sandy. The American sand lance (*Ammodytes americanus*) also occurs in Newfoundland and Labrador waters but is typically considered an inshore species. Sand lance is a pelagic species that forms varying sized dense schools feeding throughout the water column, but also spend a portion of each day buried in sand. They are found in the North Atlantic from Greenland to the Gulf of St. Lawrence (Scott and Scott 1988).

All species of *Ammodytes* spawn demersally either inshore or on offshore banks (e.g., the Grand Bank off Newfoundland) at depths down to 100 m. Spawning appears to occur within sandy habitat that is occupied year-round but spawning migrations have not been documented (Robards et al. 1999). There is little information available regarding the time of spawning in the Study Area. Most sand lance species are reported to spawn in fall or winter, although some populations apparently spawn in spring or summer (Robards et al. 1999). Winters (1983) noted that the main spawning season of northern sand lance on the Grand Bank of Newfoundland occurs from November through January; however, the presence of spent fish in April and May suggests that minor peaks in spawning may also occur in late winter or early spring. This species is not commercially fished, but is an important part of the marine food-web as it is a food source for marine mammals and several species of fish including cod.

Comment DFO-3

Section 4.2.3.1 Deep-water Corals and Sponges, pg 100 – Please see additional references for Deep water Corals and Sponges.

Kenchington, E., Lirette, C., Cogswell, A., Archambault, D., Archambault, P., Benoit, H., Bernier, D., Brodie, B., Fuller, S., Wilkinson, K., Lévesque, M., Power, D., Siferd, T., Treble, M., and Wareham, V. 2010. Delineating Coral and Sponge Concentrations in the Biogeographic Regions of the East Coast of Canada Using Spatial Analyses. DFO Can. Sci. Advis. Sec. Res. Doc. 2010/041. vi + 202 pp.

Kenchington, E., Power, D. and Koen-Alonso, M. 2010. Associations of Demersal Fish with Sponge Grounds in the Northwest Atlantic Fisheries Organizations Regulatory Area and Adjacent Canadian Waters. DFO Can. Sci. Advis. Sec. Res. Doc. 2010/039. vi + 27 p.

Also see attached documents scs08-24 and scs09-06.

Response DFO-3

Husky Energy acknowledges the additional coral and sponge references recommended by DFO. These four references (NAFO 2008, 2009; Kenchington et al. 2010a,b) are included in the references listed at the end of this addendum. Murillo et al. (2011), which was cited in the EA, discussed the distribution of deep-water corals of the Flemish Cap, Flemish Pass and Grand Banks, information that is contained in the two NAFO documents suggested by DFO (NAFO 2008, 2009).

Comment DFO-4

Section 4.3.4.1 Northern Shrimp, pg 137 – Catch data for Northern Shrimp in this section does not match Table 4.7.

Response DFO-4

Husky Energy notes that in Subsection 4.3.4.1 of the EA, the text should state that northern shrimp accounted for an annual average of 5,595 mt of harvest (50.5% of average annual total harvest) in the Study Area during May to November, 2005-2010. The values in Table 4.7 of the EA are correct.

Comment DFO-5

Section 4.5.1.4 Toothed Whales (Odontocetes), pg 166 – (Editorial) The reference to “DFO 2011j” should be corrected to the proper reference “DFO 2011i”

Response DFO-5

This correction is noted by Husky Energy.

Comment DFO-6

Section 4.6 Species at Risk, Table 4.14, p. 173 - In the table under the COSEWIC column it should be noted that Humpback Whale was assessed by COSEWIC as "not at risk".

Response DFO-6

Husky Energy acknowledges that the humpback whale (*Megaptera novaeangliae*) is currently assessed by COSEWIC as 'not at risk'.

Comment DFO-7

Section 4.7.2 Coral Areas, Figure 4.34, pg 180 - Coral/Sponge Closure Area #5 has been revised. Please see attached. (Proposal for a Resolution concerning the extension of Closed Area 5).

Response DFO-7

Replace the original Figure 4.34 in Subsection 4.7.2 of the EA with the following revised figure.

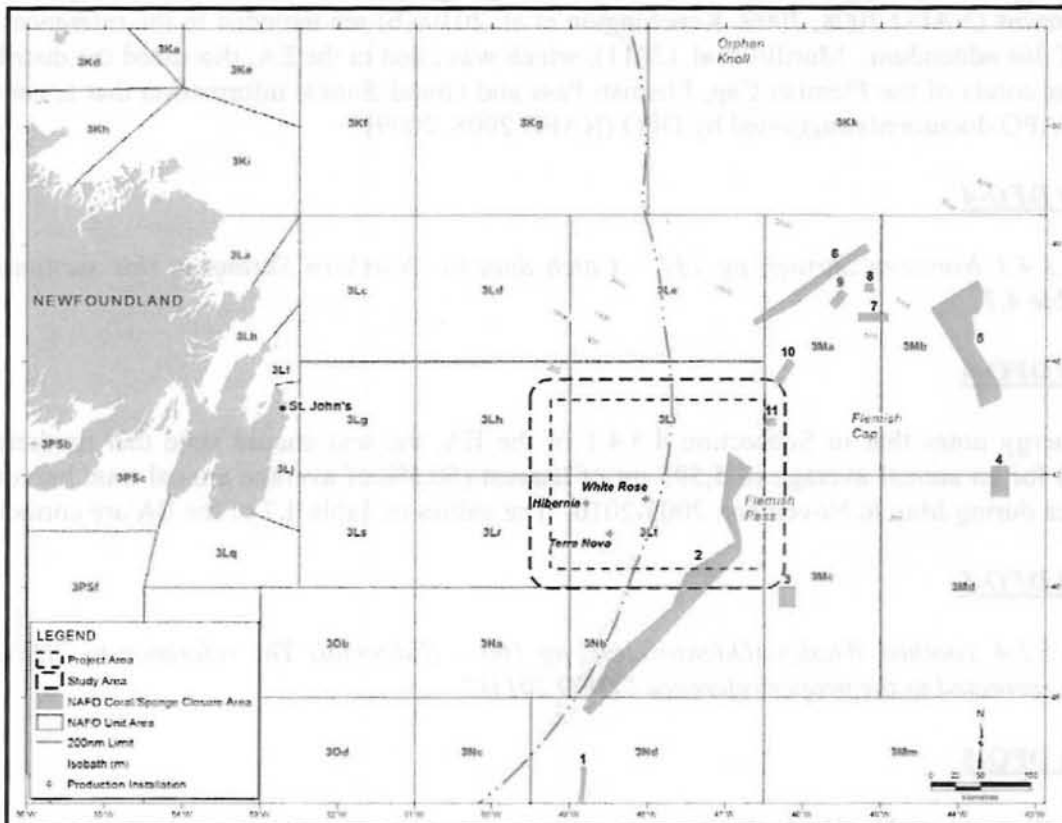


Figure 4.34. Locations of NAFO Coral/Sponge Closure Areas Relative to Husky's Proposed Study and Project Areas.

Comment DFO-8

Section 5.4.4.2 Geographic Extent, pg 188 – Geographic Extent rating criteria is defined as”, the 5 = >1,000-10,000 km² should be = >1,000-10,000 km².

Response DFO-8

This correction is noted by Husky Energy.

Comment DFO-9

Section 5.6.4.1 Sound, pg 224 - In addition to habituation, repeated exposures could also cause “sensitization” where the response increases upon repeated exposures (i.e., the disturbance effects do more than just “persist”.

Response DFO-9

Husky Energy acknowledges that in addition to habituation, repeated exposures to air gun sound could also cause sensitization, thereby resulting in increased response.

Comment DFO-10

Section 5.8 Mitigations and Follow-up, pg 276 – The use of a picket vessel manned by the marine mammal observer in advance of the seismic vessel may be a better place to detect and avoid marine mammals.

Response DFO-10

Husky Energy disagrees with the idea that it would be better if the marine mammal observer manned the picket vessel rather than the seismic vessel. The picket vessel is often sailing kilometers ahead of the seismic vessel and not always in the seismic survey track, especially if it is investigating fishing gear. The SOCP states that a circular safety zone be established with a radius of 500m from the centre of the source and that the marine mammal observer continuously observe the safety zone. It is therefore crucial that marine mammal observations be made from the seismic vessel to provide better information on marine mammal occurrences in the vicinity of the operating air guns.

Department of National Defence (DND)

General Comments

DND is likely to be operating in the vicinity of the study area in a non-interference manner during the project timeframe.

A search of unexploded ordnates (UXOs) records was conducted to determine the possible presence of UXO within the proponent's project area. Given their understanding of the survey activities to be conducted, the associated UXO risk is negligible. Nonetheless, due to the inherent dangers associated with UXO and the fact that the Atlantic Ocean was exposed to many naval engagements during WWII, should any suspected UXO be encountered during the course of the proponent's operations it should not be disturbed/manipulated. The proponent should mark the location and immediately inform the Coast Guard. Additional information is available in the 2012 Annual Edition – Notices to Mariners, Section F, No. 37.

In the event of activities which may have contact with the seabed (such as drilling or mooring), it is strongly advised that operational aids, such as remote operated vehicles, be used to conduct seabed surveys in order to prevent unintentional contact with harmful UXO items that may have gone unreported or undetected. General information regarding UXO is available at www.uxocanada.forces.gc.ca

Response:

Husky Energy notes that DND will likely to be operating in the vicinity of the Study Area in a non-interference manner during the Project timeframe.

Husky Energy agrees that in the case of any encounter with suspected UXO, the location would be marked and the Coast Guard immediately informed. Husky Energy does not foresee any contact between the survey equipment and the seabed during the seismic program.

Environment Canada (EC)

Specific Comments

Comment EC-1

Section 5.6.5 Species at Risk, pg 270 - Use of the Chardine protocol should be limited to stranded Leach's Storm-Petrel. Stranded Ivory Gulls would be an exceedingly rare occurrence, and would likely be related to an injury on the animal. EC-CWS should be immediately contacted should a stranded Ivory Gull be found.

Response EC-1

Husky Energy notes that the Chardine protocol should be limited to stranded Leach's Storm-Petrel, and, in the case of a stranded Ivory Gull, EC-CWS would be contacted immediately.

Comment EC-2

Section 5.8 Mitigations and Follow-up, pg 276 - The CWS protocol for collecting data on seabirds at sea is "Gjerdrum et al.", rather than "Wilhelm et al.". This protocol can be cited as follows:

Gjerdrum, C., D.A. Fifield, and S.I. Wilhelm. 2011. Eastern Canada Seabirds at Sea (ECSAS) standardized protocol for pelagic seabird surveys from moving and stationary platforms. Canadian Wildlife Service Technical Report Series No. 515. Atlantic Region. vi + 36 pp.

Response EC-2

Husky Energy notes that CWS protocol for collecting data on seabirds at sea is as per Gjerdrum et al. (2011), not Wilhelm et al. (n.d.). Gjerdrum et al. (2011) has been added to the reference list at the end of this addendum.

Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB)

Specific Comments

Comment C-NLOPB-1

Section 1.1 Relevant Legislation and Regulatory Approvals, pg 1 – The Geophysical, Geological, Environmental and Geotechnical Program Guidelines (C-NLOPB) were revised in 2012.

Response C-NLOPB-1

Husky Energy notes that the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* have been recently revised and should be cited as C-NLOPB (2012).

Comment C-NLOPB-2

Section 2.1 Spatial and Temporal Boundaries, pg 5 – Please provide the total area of the Project Area and the Primary 2012 Activity Area. Also, the coordinates for all three areas (i.e. Study Area, Project Area, Primary 2012 Activity Area) should be provided.

Response C-NLOPB-2

The following table should be added to Subsection 2.1-Spatial and Temporal Boundaries:

Spatial Boundary	Delineation Coordinates	Area (km ²)
Study Area	47.84655°N, 49.51635°W 47.84655°N, 46.23400°W 45.98673°N, 46.23400°W 45.98673°N, 49.51635°W	51,258
Project Area	47.66667°N, 49.25000°W 47.66667°N, 46.50000°W 46.16667°N, 46.50000°W 46.16667°N, 49.25000°W	34,948
Primary 2012 Activity Area	47.09504°N, 48.28848°W 47.09053°N, 47.77335°W 46.45026°N, 47.78393°W 46.45485°N, 48.07230°W 46.61682°N, 48.07092°W 46.61661°N, 48.29319°W	2,479

Comment C-NLOPB-3

Sections 2.3 to 2.6, pgs 11 – 16 – These sections do not appear to be part of the “Project Description” and seem out of place given that all of this is discussed in much greater detail in the report. It appears that they have just been copied from the 22 November 2011 Project Description. The text should be reviewed to ensure that statements made are consistent with those stated in later sections of the report.

Response C-NLOPB-3

Husky Energy believes that the topics addressed in Subsections 2.3 to 2.6 are indeed aspects of the Project Description and should be introduced to the reader in Section 2.0.

Comment C-NLOPB-4

Section 2.4.2 Physical Environment and Effects on the Project, line 8, pg 11 – “The scheduling of 2D/3D seismic surveys...the environment on the Project.” The survey is scheduled to begin in March. This is still winter when conditions are as you say “not typically good.”

Response C-NLOPB-4

Husky Energy suggests the following rewording:

“The scheduling of 2D/3D seismic surveys during March to November period when NW Atlantic operating conditions are generally relatively good compared to December to February period should lessen effects of the environment on the Project.”

Comment C-NLOPB-5

Section 4.3.4.2 Snow Crab, pg 138 – This section appears again on page 141 of the report.

Response C-NLOPB-5

Husky Energy notes the redundant text. The three paragraphs related to snow crab on page 138 should be removed.

Comment C-NLOPB-6

Section 5.5 Effects of the Environment on the Project, pg 191 – This section should contain an integrative discussion of the intersection of the physical environment and the project aspects. It is not appropriate in the first sentence to point to the physical environmental data in Section 3.0 and ask the reader to make any inferences about the operability of the proposed equipment in that environment. As per Section 5.2.1 of the Scoping Document, the EA shall provide a brief summary description of the meteorological and oceanographic characteristics, including extreme conditions, and any change to the Project that may be caused by the environment. The discussion of the operability of vessels, seismic arrays, support craft and other equipment in the environment likely to be encountered could focus on:

- *Wave height vs vessel operational capability (seismic vessel, chase vessel, service vessel, and seismic array within the program temporal window);*
- *Wind speed vs vessel operational capability (seismic vessel, chase vessel, service vessel, and seismic array within the program temporal window);*
- *Pack ice presence vs operability (seismic vessel, chase vessel, service vessel, and seismic array within the program temporal window); and*
- *Iceberg presence vs operability (seismic vessel, chase vessel, service vessel, and seismic array within the program temporal window).*

Response C-NLOPB-6

Husky Energy generally subscribes to the following guidelines. If either the sea state exceeds 3 m or winds exceed 40 kt, then continuation/termination of seismic surveying will be evaluated. The absolute operating limits are 3.5 m combined sea significant wave height and 45 kt winds.

As for ice, Husky Energy would either not commence or would terminate seismic operations if encounters with any pack ice or icebergs were expected.

Comment C-NLOPB-7

Section 5.5 Effects of the Environment on the Project, 2nd para., line 1, pg 191 – It is stated that the Project time frame is “May to November”. The temporal scope has previously been stated as March to November for seismic operations. Please confirm the temporal scope.

Response C-NLOPB-7

Husky Energy notes that Subsection 5.5 should reflect a Project timeframe of March to November, not May to November.

Comment C-NLOPB-8

Section 5.5 Effects of the Environment on the Project, 2nd para., line 10, pg 191 –It is stated that surveys will be suspended once wind and wave conditions reach certain levels. What are these levels?

Response C-NLOPB-8

As noted above, if either the sea state exceeds 3 m or winds exceed 40 kt, then continuation/termination of seismic surveying will be evaluated. The absolute operating limits are 3.5 m combined sea significant wave height and 45 kt winds.

Comment C-NLOPB-9

Section 5.6.2 Fishery VEC, 3rd para., pg 210 – As previously stated, the Geophysical, Geological, Environmental and Geotechnical Program Guidelines were revised in 2012. The mitigation outlined should be reviewed against the revised guidelines to ensure it is still applicable (e.g. Section 4.2 is now 5.2).

Response C-NLOPB-9

Husky Energy acknowledges that the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* have been recently revised and should be cited in Subsection 5.6.2 as C-NLOPB (2012). In addition, Section 5.2 rather than Section 4.2 should be cited in relation to gear contact incident reporting. The text from Appendix 2 of C-NLOPB (2011) included in Subsection 5.6.2 of the EA remains applicable.

Comment C-NLOPB-10

Section 5.7 Cumulative Effects, last para., line 4, pg 275 – “It will be in the interests of the different parties...acoustic interference”. Will Husky participate in this coordination?

Response C-NLOPB-10

Husky Energy will participate in a coordinated effort to provide sufficient spatial buffers between seismic vessels operating concurrently in the northern Grand Banks area.

Comment C-NLOPB-11

Section 5.8 Mitigations and Follow-up, 2nd para., line 5, pg 276 – “within 24 h of the contact”. The Guidelines state that it should be reported immediately.

Response C-NLOPB-11

Husky Energy notes that any incidents of contact between the survey vessel/equipment and fishing gear should be reported immediately as per the Emergency Notification Process outlined in *C-NLOPB / CNSOPB Guideline for the Reporting and Investigation of Incidents*, not within 24 h of contact as indicated in Subsection 5.8 of the EA.

Fish, Food and Allied Workers Union (FFAW)

The following comments from the FFAW were included in a letter sent to the C-NLOPB from the FFAW on 7 May 2012. The letter is included in Appendix 1 of this addendum.

Comment FFAW-1

Subsection 5.1.1., Consultations, p. 182-183; Appendix 3, Consultations Report, p A81-A83 - It should be noted that the harvesters are as equally concerned about the impact of seismic surveys on the snow crab resource as they are on the northern shrimp resource. Only concerns related to the impacts of seismic surveys on the shrimp resource were mentioned in the EA. This is an important point as the 2012 plans for Husky involve seismic on/near important crab fishing grounds for 3L fish harvesters. Harvesters specifically requested at the consultation meetings in December 2011 and March 2012 that seismic not be conducted until after the snow crab season in the area has closed (Approximately 10 August 2012).

Response FFAW-1

Husky Energy notes that the snow crab resource and the northern shrimp resource are of equal importance to the harvesters, and all appropriate efforts will be made to minimize the potential for interaction between the seismic survey activity and fishers.

Comment FFAW-2

Subsection 5.6.2., Fishery VEC, p. 210 - If seismic work is conducted on/near crab fishing grounds while the area is being heavily fished, there is significant potential for gear conflict. As stated in the EA, "the chief means of mitigating potential impacts of fishery activities is to avoid fishing areas, particularly fixed gear zones". The loss of fishing time, catch and/or gear that may be associated with gear entanglement in this area may be significant during this prime period so all efforts to mitigate conflicts should be used.

Response FFAW-2

Husky Energy will make all appropriate efforts to mitigate interaction between the seismic survey activities and fishing activity. Following consultation with One Ocean and the FFAW, the use of a Fisheries Liaison Officer (FLO) during 2D and 3D seismic programs may be warranted. An FLO serves to liaise with fishers directly as well as provide crucial information such as vessel monitoring system (VMS) data and current fishing activity which will augment the planning and execution of the seismic survey.

Effective communication and information exchange between the two industries during the planning and execution phases is important, and the ability of the FFAW to provide near real-time information regarding fishing activity will assist Husky in establishing its mitigative measures.

Comment FFAW-3

Subsection 4.3.3.3., Harvesting Locations, p. 134 – The overall study area for this EA is quite large but there is considerable fishing activity in the area. While historical fishing patterns have been detailed in the document, fishing activity can change from year to year and during the season as well. It is very important that Husky maintain regular communication with the FFAW to keep apprised of ongoing developments with fisheries in the project area throughout the duration of this Environmental Assessment (2012-2020).

Response FFAW-3

Husky Energy will prepare documents that update the original EA and any subsequent update documents whenever seismic program activities are planned for any particular year during the 2012-2020 period. Husky Energy will also communicate with One Ocean and the FFAW during this period in order to remain up-to-date on commercial harvesting in the Study Area.

References

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Appendix 1. FFAW Letter of Comment on the Husky Seismic Program EA



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DAVID DECKER
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Monday, May 7, 2012

Darren Hicks
Environmental Analyst
Canada-Newfoundland and Labrador Offshore Petroleum Board
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Dear Darren,

Thank you for providing the Fish, Food and Allied Workers' Union (FFAW/CAW) with the opportunity to comment on the Environmental Assessment of Husky's Jeanne d'Arc Basin/Flemish Pass Regional Seismic Program, 2012-2020. I'd like to comment on a few aspects of the study that are representative of issues and concerns from the fishing industry, namely the members of the FFAW/CAW.


A consultation was held with fish harvesters during the development of this Environmental Assessment in December 2011. It should have been noted in the EA that harvesters are equally concerned about the impact of seismic surveys on the snow crab resource. (Only concerns related to the impacts of seismic surveys on the shrimp resource were mentioned in the EA, pages 183, A-81-83). This is an important point as the 2012 plans for Husky involve seismic on/near important crab fishing grounds for 3L fish harvesters. Harvesters specifically requested at the consultation in December that seismic not be conducted until after the snow crab season in the area has closed (approximately August 10th). A follow-up meeting in March 2012 was held with the operator once they knew their area of interest for 2012 and concerns related to the snow crab resource were stated again by harvesters at that time.

Further to this, if seismic work is conducted on/near crab fishing grounds while the area is being heavily fished there is significant potential for gear conflict. As stated in the EA, "the chief means of mitigating potential impacts on fishery activities is to avoid active fishing areas, particularly fixed gear zones" (page 210). The loss of fishing time, catch and/or gear that may be associated with gear entanglement in this area may be significant during this prime period so all efforts to mitigate conflicts should be used.

The overall study area for this EA is quite large but there is considerable fishing activity in the area. While historical fishing patterns have been detailed in the document (page 134) fishing activity can change from year to year and during the season as well. It is very important that Husky maintain regular communication with the FFAW to keep apprised of ongoing developments with fisheries in the project area throughout the duration of this Environmental Assessment (2012-2020).

I thank you for providing an opportunity for the FFAW/CAW to comment on this EA. If you have any questions or comments please feel free to contact me.

Kind regards,


Robyn Saunders Lee
Petroleum Industry Liaison