

# Hebron

## HEBRON PROJECT

Comprehensive Study Report Addendum

June 2013

ExxonMobil



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## 1 INTRODUCTION

ExxonMobil Canada Properties (EMCP), as Operator, on behalf of the Hebron Project Proponents, ExxonMobil Canada Ltd., Chevron Canada Limited, Petro-Canada Hebron Partnership through its managing partner Suncor Energy Inc., Statoil Canada Ltd. and Nalcor Energy - Oil and Gas Inc., is leading the development of the Hebron Project. The Hebron Project includes offshore surveys, engineering, procurement, construction, installation, commissioning, development drilling, production, operations and maintenance and decommissioning of an offshore oil / gas production system and associated facilities.

## 2 SCOPE OF ADDENDUM

The scope of this addendum includes three Project activities proposed for 2013 that have changed since completion of the Hebron Project Comprehensive Study Report (CSR) in 2011 (EMCP). The three activities are associated with a 3D seismic survey:

- ◆ Turning radius for a seismic vessel outside the original Offshore Project Area (see Figure 2-1)
- ◆ Use of up to 12 streamers in acoustic array versus 10, as described in the CSR and
- ◆ While turning, the potential firing of a single air source array in the area outside the original Offshore Project Area. The firing of the air source array is a mitigation measure to deter the presence of marine mammals near survey activities.

These activities are planned for 2013; however, future activities may occur during the life of the Project. This addendum, therefore, will serve to update those sections of the CSR associated with seismic surveys. The amended Offshore Project Area defined herein will replace the original Offshore Project Area in the Hebron Project CSR, for seismic surveys only; the Offshore Study Area (Figure 2-2) remains unchanged. Section 2.9.6.1 is amended to include the above referenced activities, and Section 4.3.2.1 is amended to include the additional area required for the seismic vessel turning radius.

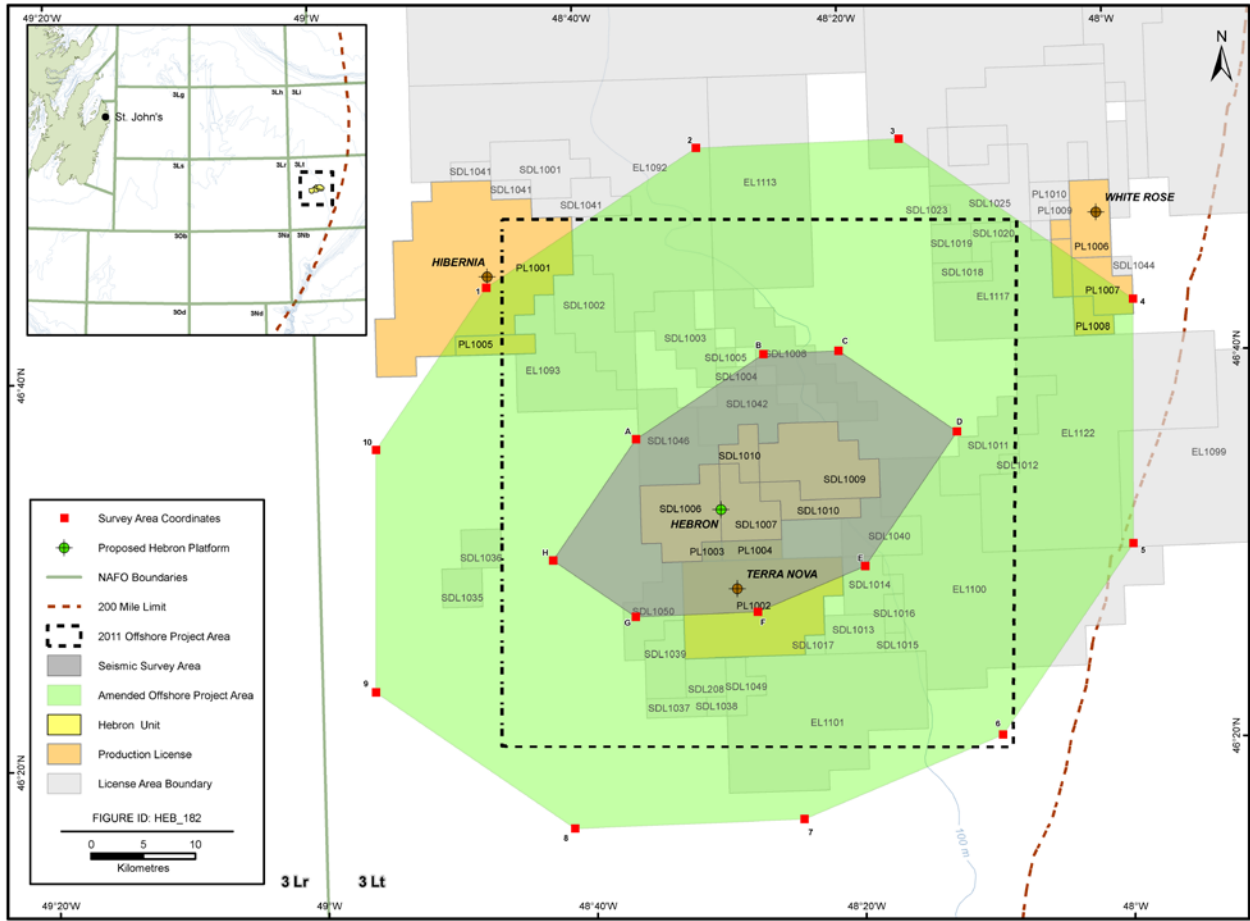


Figure 2-1 Amended Offshore Project Area

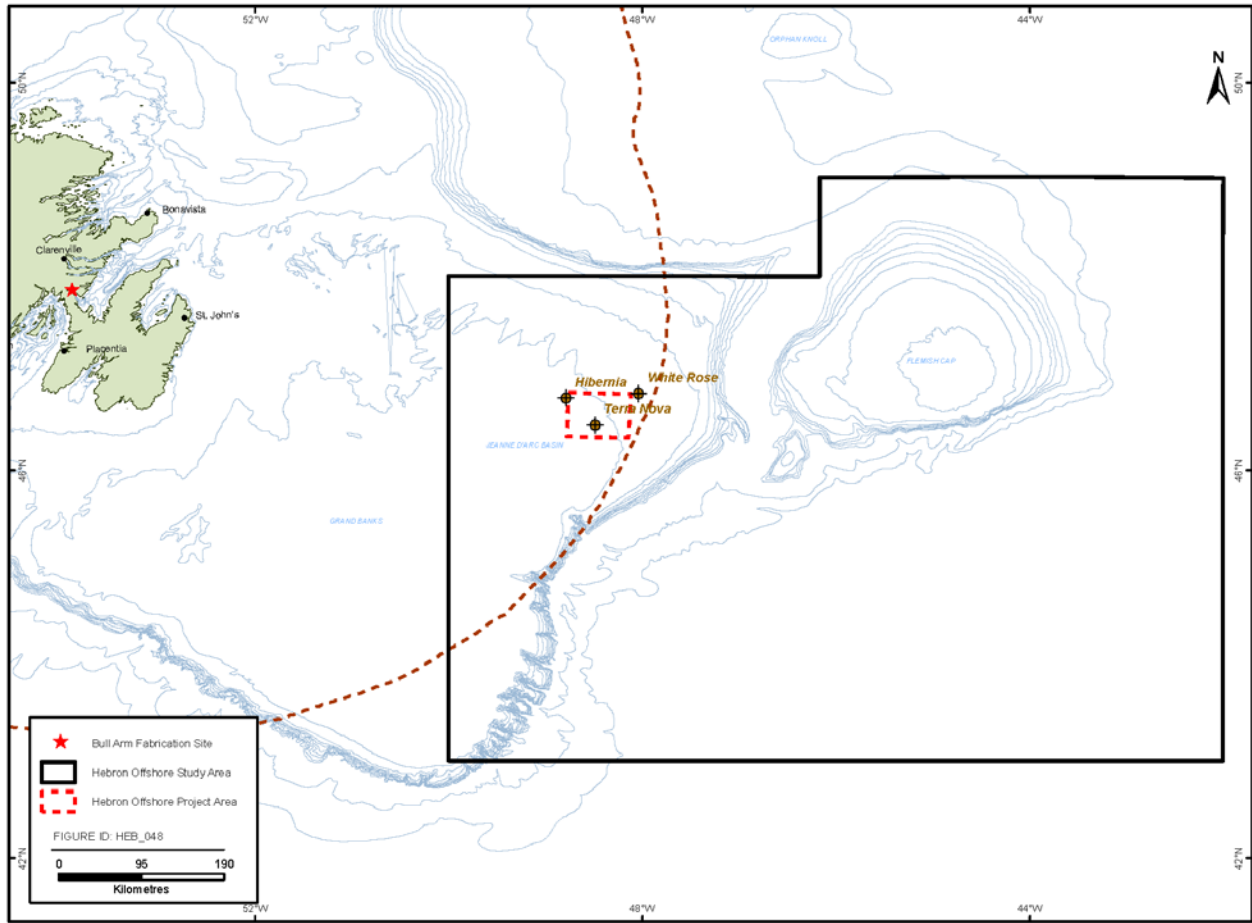


Figure 2-2 Offshore Study Area

### 3 SCHEDULE

The proposed program is scheduled to occur between June and November 2013, and is consistent with the timing of seismic activities addressed in the 2011 Hebron Project CSR (refer to Section 4.3.2.2 of the Hebron Project CSR). Specific timing of the program will depend on a variety of factors, including ice conditions, weather conditions, and timing and sensitivities associated with biological and socio-economic constraints.

### 4 CONSULTATION

EMCP met with the Fish, Food and Allied Workers (FFAW) Petroleum Industry Liaison, offshore fishers and One Ocean to provide an overview of the 2013 survey (planned geotechnical, geophysical, and 3D seismic) programs and to discuss any questions or concerns that these organizations may have with the upcoming program.

Key discussions included identification of crab fishing along the 60-fathom contour on the eastern side of the turn buffer. EMCP indicated that the lines would be run in a SSW-NNE direction, and the vessel will try to optimize a western turn in the northern portion of the amended Offshore Project Area,

when feasible, reducing potential for interaction with fishing gear. In addition, the timing of the 3D / 4D baseline seismic (beginning June 15 at the earliest) could mean the majority of the crab quota will likely already be harvested, further reducing the potential for interaction. There were no concerns voiced about either the geotechnical survey at the GBS location or the geohazard wellsite and pipeline survey (within the Hebron licenses).

EMCP has also contacted the Groundfish Enterprise Allocation Council, Association of Seafood Producers, Clearwater Seafoods, Ocean Choice International and Iceswater Seafoods to provide an overview of the planned survey programs and to discuss any questions or concerns and determine whether any fishing would be occurring within the vicinity of the survey. No specific concerns have been expressed by members of the Groundfish Enterprise Allocation Council (B. Chapman, pers. comm.). EMCP will notify processors of the survey start date, once determined.

## 5 MITIGATION

The potential interactions associated with the increased turning radius and additional streamers (10 verses 12) are noise effects on marine mammals / species at risk, interference with fishing activity and/or gear within the amended Offshore Project Area and overlap with DFO post-seasonal crab surveys. These activities were previously assessed in the Hebron Project CSR (refer to Sections 4.3.2.1, 8.5.1.2, 10.5.1, 10.5.2, 11.5.2.1, and 11.5.2.2) for the defined Offshore Study Area, and it was predicted that these activities would not have a significant effect. The mitigations proposed in the Hebron Project CSR (EMCP 2011) remain unchanged and include:

- ◆ Fisheries Liaison Officer
- ◆ Trained observer(s) for marine mammals and seabirds during seismic survey activities (reports to be provided to relevant regulatory agencies)
- ◆ Single point of contact
- ◆ Use of Vessel Movement System data available from DFO
- ◆ Ongoing communications with FFAW and fishers throughout seismic survey program
- ◆ For geophysical, geological and geotechnical activities specifically, the *Geophysical, Geological, Environmental and Geotechnical Guidelines* (C-NLOPB 2012) provide guidance aimed at minimizing, specifically, any impacts of well-site seismic surveys on commercial fish harvesting
- ◆ Smallest single element air source will continue producing pulses during the turn to ensure marine mammals remain at distance from the vessel during the turns
- ◆ Adhere to the *Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment*, as referenced in the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2012)
- ◆ Use of solid streamers

The following additional mitigations measures, as identified following consultations with fishers, will be implemented for the 2013 program, and may be implemented in future seismic surveys.

- ◆ Seismic vessel will try to optimize western turns in northern extent of survey area
- ◆ Avoid the eastern side of the turn buffer (from 60-fathom mark), to the extent practicable (specific to the 2013 survey).

With regard to DFO post-season crab surveys, the timing of annual surveys was not known at the time of preparing the Hebron Project CSR. During the preparation of the EA update (EMCP 2013), DFO advised that the 2012 post-season crab survey ran from August 29 to November 17. The 2013 post-season crab survey will collect samples from the same locations as the 2012 survey (see Figure 5-1). The timing of the 2013 survey will be similar to last year (EMCP 2013). EMCP will contact DFO prior to the survey start date to determine timing and location of 2013 post-season crab surveys. For activities that may occur in subsequent years, EMCP will contact DFO in advance to determine timing and location of research survey activities.

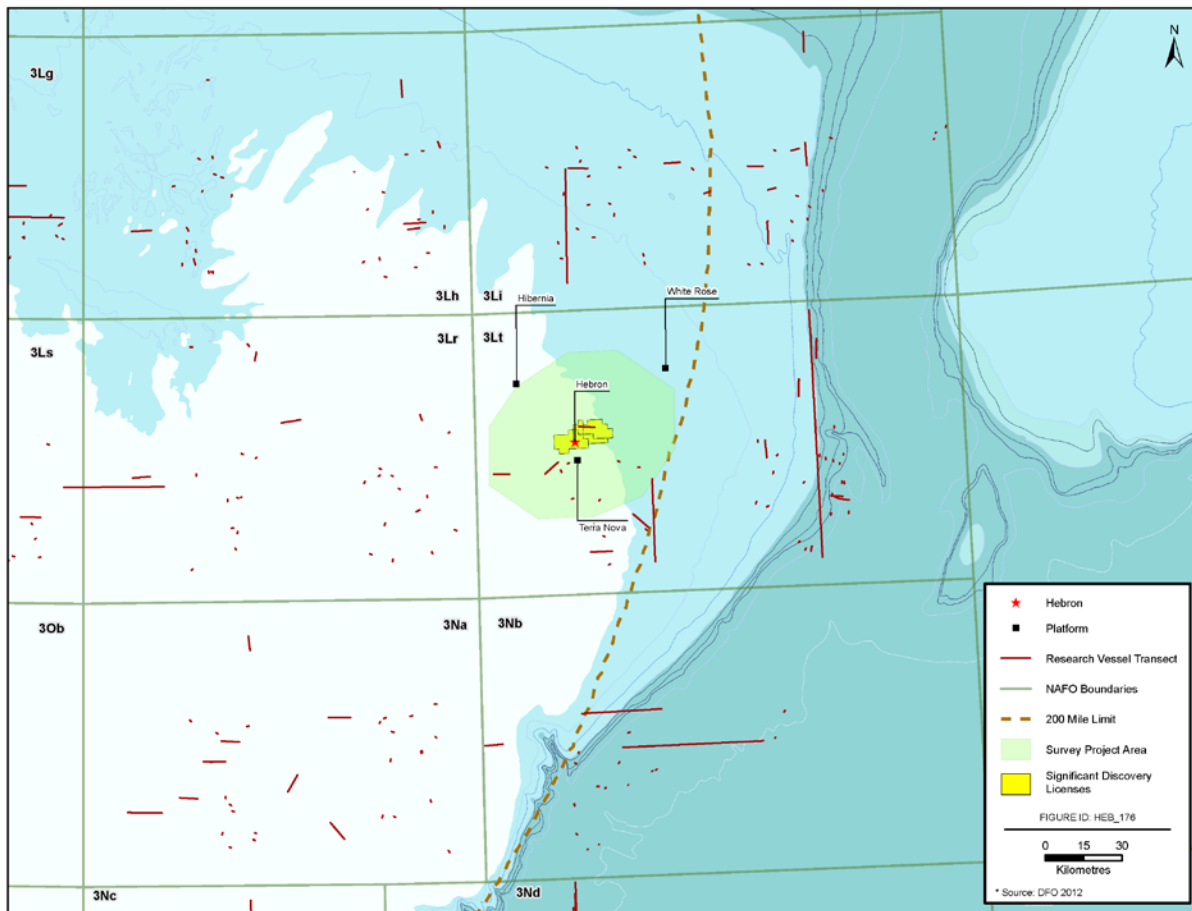


Figure 5-1 DFO Research Vessel Transects, 2012

## **6 ENVIRONMENTAL EFFECTS ASSESSMENT**

### **6.1 Potential Interactions**

The environmental effects assessment addresses an increase in the size of the original Offshore Project Area and the carrying out of the following activities within the amended Offshore Project Area that were not previously assessed in the Hebron Project CSR (EMCP 2011 :

- ◆ Potential interaction with fishing gear and/or DFO research surveys in the area outside the 2011 Offshore Project area (EMCP 2011) associated with the turning of seismic vessel
- ◆ Potential interaction with marine mammals and sea turtles, including marine mammal and sea turtle species at risk in the area outside the 2011 Offshore Project area (EMCP 2011) associated with the firing of a single air source (marine mammal mitigation consistent with the *Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment*) and
- ◆ Towing of up to 12 streamers (2011 CSR assessed the towing of up to 10 streamers) and potential interaction with fishing gear.

### **6.2 Existing Knowledge**

#### **6.2.1 Commercial Fisheries**

The issues pertaining to lost or damaged fishing gear, associated with seismic activity, including vessel turns and multiple streamers, in the amended Offshore Project Area are described in Section 8.4.1.2 of the Hebron CSR. The potential effects of the Project on lost or damaged fishing gear are described in Section 8.5.1.2 of the Hebron CSR. The potential interaction from activities occurring in the amended Offshore Project Area is the same as described in the above referenced sections of the CSR. With the addition of the mitigation measures described in the CSR and those listed above, these Project activities in the amended Offshore Project Area are predicted to have no significant effect on commercial fisheries (Table 6-1).



**Table 6-1 Environmental Effects Assessment: Operations and Maintenance – Commercial Fisheries**

Project Activity	Potential Environmental Effect	Mitigation	Evaluation Criteria for Assessing Residual Adverse Environmental Effects				
			Magnitude	Geographic Extent	Duration / Frequency	Reversibility	Ecological / Socio-economic Context
Surveys (e.g., geophysical, 2D / 3D / 4D seismic, VSP, geohazard, geological, geotechnical, environmental, ROV, diving)	<ul style="list-style-type: none"> <li>Loss of or Damage to Fishing Gear</li> </ul>	<ul style="list-style-type: none"> <li>Safety Zone, Fisheries Liaison Officer, Fishing Gear Compensation Program, Single Point of Contact, Notification and Communications</li> </ul>	1	3	3-2	R	2
<p><b>KEY</b></p> <p>Magnitude:                      = Low: does not have a measurable effect on commercial fishery net incomes                      = Medium: has a measurable effect on commercial fishery net incomes, but is temporary and/or is highly localized                      = High: has a measurable and sustained effect on commercial fishery net incomes</p> <p>Geographic Extent:                      1 = &lt;1 km<sup>2</sup>                      2 = 1-10 km<sup>2</sup>                      3 = 11-100 km<sup>2</sup>                      4 = 101-1,000 km<sup>2</sup>                      5 = 1,001-10,000 km<sup>2</sup>                      6 = &gt;10,000 km<sup>2</sup></p> <p>Duration:                      1 = &lt; 1 month                      2 = 1 to 12 months.                      3 = 13 to 36 months                      4 = 37 to 72 months                      5 = &gt;72 months</p> <p>Frequency:                      1 = &lt;10 events/year                      2 = 11 to 50 events/year                      3 = 51 to 100 events/year                      4 = 101 to 200 events/year                      5 = &gt;200 events/year                      6 = continuous</p> <p>Reversibility:                      R = Reversible                      I = Irreversible</p> <p>Ecological / Socio-economic Context:                      1 = Area is relatively pristine or not adversely affected by human activity.                      2 = Evidence of adverse environmental effects.</p>							

**6.2.2 Marine Mammals and Sea Turtles (including Species at Risk)**

Many of the issues of concern (including noise) with respect to environmental effects from seismic activities for species at risk, as well as mitigation measures and management strategies, are similar to those presented for non-listed marine species. On an ecosystem basis, the listed and non-listed species and their habitats are often highly integrated. The environmental effects of noise from seismic activities (physical / physiological) on marine mammals and sea turtles within the defined Offshore Study area are fully assessed in Section 10.5.1.2. All activities within the amended Offshore Project Area were assessed within the larger defined Offshore Study Area (EMCP 2011); therefore, the effects assessment presented in the Hebron Project CSR for seismic activities on this VEC remain valid for a single air source in the amended Offshore Project Area (Table 6-2).

**Table 6-2 Environmental Effects Assessment: Operations and Maintenance – Marine Mammals and Sea Turtles (including species at risk)**

Project Activity	Potential Environmental Effect	Mitigation	Evaluation Criteria for Assessing Residual Adverse Environmental Effects <sup>A</sup>				
			Magnitude	Geographic Extent	Duration / Frequency	Reversibility	Ecological / Socio-economic Context
Surveys (e.g., geophysical, 2D / 3D / 4D seismic, VSP, geohazard, geological, geotechnical, environmental, ROV, diving)	<ul style="list-style-type: none"> <li>Change in Habitat Use</li> <li>Change in Habitat Quality</li> </ul>	<ul style="list-style-type: none"> <li>Adherence to the <i>Statement of Canadian Practice on Mitigation of Seismic Noise in the Marine Environment</i> (C-NLOPB 2011)</li> </ul>	1	2	3/2	R	2
<p><b>KEY</b></p> <p>Magnitude:                      N = Negligible: There may be some environmental effect but it is not considered to be measurable                      1 = Low: &lt;10 percent of the population or habitat in the Study Area will be affected                      2 = Medium: 11 to 25 percent of the population or habitat in the Study Area will be affected                      3 = High: &gt;25 percent of the population or habitat in the Study Area will be affected</p> <p>Geographic Extent:                      1 = &lt;1 km<sup>2</sup>                      2 = 1-10 km<sup>2</sup>                      3 = 11-100 km<sup>2</sup>                      4 = 101-1,000 km<sup>2</sup>                      5 = 1,001-10,000 km<sup>2</sup>                      6 = &gt;10,000 km<sup>2</sup></p> <p>Frequency:                      1 = &lt;11 events/year                      2 = 11-50 events/year                      3 = 51-100 events/year                      4 = 101-200 events/year                      5 = &gt;200 events/year                      6 = continuous</p> <p>Duration:                      1 = &lt; 1 month                      2 = 1-12 months                      3 = 13-36 months                      4 = 37-72 months                      5 = &gt;72 months</p> <p>Reversibility:                      R = Reversible                      I = Irreversible</p> <p>Ecological / Socio-economic Context:                      1 = Area is relatively pristine or not adversely affected by human activity                      2 = Evidence of adverse environmental effects</p> <p>A Where there is more than one potential environmental effect, the evaluation criteria rating is assigned to the environmental effect with the greatest potential for harm</p>							

Given that Project activities are localized, of low magnitude, and reversible, there are not likely to be significant adverse environmental effects on marine mammals and sea turtles from seismic activities in the amended Offshore Project Area and any future seismic activities associated with the Project.

### 6.3 Significance Criteria

#### 6.3.1 Commercial Fisheries

The Hebron Project CSR uses the following definition of significance for the Commercial Fisheries assessment:

- ◆ Not Significant: does not have a measurable effect on commercial fishing incomes
- ◆ Significant: has a measurable and sustained adverse environmental effect on commercial fishing incomes

### **6.3.2 Marine Mammals and Sea Turtles (including species at risk)**

As stated in the Hebron Project CSR (EMCP 2011), a significant adverse residual environmental effect is one that affects marine mammals or sea turtles by causing a decline in abundance or change in distribution of a population(s) over more than one generation within the Offshore Study Area. Natural recruitment may not re-establish the population(s) to its original level within several generations or avoidance of the area becomes permanent.

An adverse environmental effect that does not meet the above criteria is evaluated as not significant.

A significant, adverse residual environmental effect on a marine mammal and sea turtle species at risk is one that, after application of feasible mitigation and consideration of reasonable Project alternatives:

- ◆ Will jeopardize the achievement of self-sustaining population objectives or recovery goals
- ◆ Is not consistent with applicable allowable harm assessments
- ◆ Will result in permanent loss of SAR critical habitat as defined in a recovery plan or an action strategy
- ◆ An incidental harm permit would not likely be issued

Due to the sensitive nature of SAR, residual adverse environmental effects on one individual may be considered significant.

A not-significant, adverse residual environmental effect on a marine mammal and sea turtle species at risk is one that, after application of feasible mitigation and consideration of reasonable Project alternatives:

- ◆ Results in effects to individuals, residences or SAR critical habitat of listed species that does not jeopardize the survival or recovery of the species
- ◆ Is consistent with applicable allowable harm assessments
- ◆ Does not result in permanent loss of SAR critical habitat
- ◆ An incidental harm permit would likely be issued

## **6.4 Determination of Significance**

### **6.4.1 Commercial Fisheries**

The mitigation measures identified above for commercial fisheries are the same as proposed in the Hebron Project CSR, and additional mitigation measures are proposed for the 2013 3D / 4D seismic survey. Fishers did not identify any concerns for the 2013 survey that were not addressed by the inclusion of additional mitigation measures. The adverse residual environmental effects of the Hebron Project on Commercial Fisheries from vessel turning and multiple streamers (up to 12) in the amended Offshore Project Area, are predicted to be not significant, as per the Hebron Project CSR (Table 8-17) (EMCP 2011).

#### **6.4.2 Marine Mammals and Sea Turtles (including species at risk)**

Mitigation measures identified for marine mammals and sea turtles are the same as proposed in both the Hebron CSR and the Hebron CSR 2013 Update for the amended Offshore Project Area, and overall Offshore Study Area. The identified mitigation measures to minimize the risk of injury from noise to marine mammals and sea turtles are considered applicable to species at risk as well as non-listed species.

As per the predictions of the Hebron CSR (Tables 10-14 and 11-14) (EMCP 2011), the adverse residual environmental effects of seismic surveys on marine mammals and sea turtles (including species at risk) are predicted to be not significant.

## **7 REFERENCES**

C-NLOPB (Canada-Newfoundland and Labrador Offshore Petroleum Board). 2012. *Geophysical, Geological, Environmental and Geotechnical Program Guidelines*. 38 pp. + Appendices.

EMCP (ExxonMobil Canada Properties). 2011. *Hebron Project Comprehensive Study Report*.

EMCP (ExxonMobil Canada Properties). 2011. 2013 Environmental Assessment Update: Hebron Project Comprehensive Study Report.