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Your File Votre référence

Our File Notre référence  
BAB 3970-175

March 21, 2011

Ms. Elizabeth Young  
Environmental Assessment Officer  
Canada-Newfoundland and Labrador Offshore Petroleum Board  
5th Floor TD Place 140 Water St.  
St. John's NL A1C 6H6

Dear Ms. Young:

Re: ExxonMobil Canada Properties – Hebron Project Draft Comprehensive Study Report:  
Response to Review Comments, Parts 1 & 2

In response to your request dated February 25, 2011, Fisheries and Oceans Canada (DFO) has reviewed the “*Comprehensive Study Report: Response to Review Comments, Parts 1 & 2*”, “*Comprehensive Study Report: Bull Arm Nearshore Spill Trajectory Modelling Report*”, “*Comprehensive Study Report: Offshore Spill Trajectory Modelling Report*” and “*Comprehensive Study Report: Section 14.2 and 14.3 (revised)*” dated February 2011 for the ExxonMobil Canada Properties Hebron Project.

Outlined below for your consideration are DFO's comments on ExxonMobil's responses provided in the document “*Comprehensive Study Report: Response to Review Comments, Part 2*”.

**Comment 179-DFO F6)**

This response is considered adequate.

**Comment 179-DFO G)**

This response is considered adequate, provided the following comments are addressed:

As new information becomes available on the events in the Gulf of Mexico, it is important that ExxonMobil commits to taking this information into consideration during future plans concerning the protection of fish and fish habitat, as appropriate.

**Comment 179-DFO G2)**

This response is considered adequate.

At this time DFO would also like to provide comments on the adequacy of ExxonMobil's responses provided in the document, "*Comprehensive Study Report: Response to Review Comments, Part I*" as these responses could not be assessed until the Nearshore Bull Arm Spill Trajectory Modelling Report was received and reviewed by the department, which has now been completed:

**Comment 138: DFO 32**

This response is considered adequate, provided the following comments are addressed:

Based on the new information provided in the Bull Arm Nearshore Spill Trajectory Modelling Report, Table 7-14 (Page 7-18 of the "*Hebron Project Comprehensive Study Report*", dated June 2010) appears to have some inaccuracies. Under "*Nearshore Spill*", both the magnitude and geographic extent appear to be understated. Many of the spill trajectory outcomes provided in the new report consisted of hundreds of kilometres of shoreline, which included shallow nursery habitats. The spill model also includes trajectories which appear to encompass several significant habitat areas in some of the stochastic scenarios. The ratings for magnitude and geographic extent should be re-evaluated and revised based on information provided in the new spill model.

ExxonMobil's response states that, "*The fish species that are likely to be present in the eelgrass include juvenile and adult cunner, juvenile lumpfish, juvenile lobster and pelagic juvenile Atlantic cod and herring spawn in eelgrass.*" Although it is correct that pelagic juvenile Atlantic cod could be present between June and October, it is the recently post-settled demersal juvenile life stage that would be of greatest concern for this species. Please make the appropriate revisions based on this information.

**Comment 139: DFO 33**

This response is considered adequate.

In addition to the abovementioned comments, DFO would like to provide the following comments on the documents, "*Hebron Project Comprehensive Study Report: Nearshore Bull Arm Spill Trajectory Modelling Report*" and "*Hebron Project Comprehensive Study Report: Offshore Spill Trajectory Modelling Report*":

# Hebron Project Comprehensive Study Report: Nearshore Bull Arm Spill Trajectory Modelling Report

## General Comments

The assumptions used during the modeling of ocean circulation in the area causes concern regarding validity of the results for retention of an oil spill in Trinity Bay. For instance, there is no reference to any *in situ* oceanographic measurements taken to validate or justify the modeling approach in HYDROMAP. Furthermore, there are numerous important features regarding regional oceanographic circulation that are not mentioned in the document, and therefore it is assumed that they were not incorporated in the circulation modeling. These features include:

- Realistic water column temperature and salinity stratifications in Trinity Bay and Conception Bay during winter and summer. (This affects the strength of circulation at the surface of the water column);
- Non-linear terms in the equations of motion, specifically advection of momentum. (This can create gyre circulation features in Trinity Bay that would affect residency times of oil within the bay. They also enhance upwelling and downwelling effects due to wind forcing by displacing surface water);
- Surface wind generated waves that induce Stokes drift. (This could move oil particles to shorelines quickly);
- Realistic wind scenarios, including strong summer southwesterly wind events; and
- Inertial oscillations caused by variable winds.

Inclusion of these features may alter the modeling results. Please provide a rationale as to why these features were not incorporated and why the modeling approach was not validated with observations.

## Specific Comments

### **Section 2.4: Wind Data**

Although downscaling methodology for wind from MSC50 grids to the Bull Arm location is reasonable, there is no mention of the MSC50 winds being used in model simulations. Please provide clarification.

### **Figure 2.4-2**

Please provide the location of M6012874 on a map.

### **Appendix C: Figure C5**

The main figure and the accompanying inset map do not appear to match up. Please correct this error.

# Hebron Project Comprehensive Study Report: Offshore Spill Trajectory Modelling Report

## General Comments

Although the Spill Trajectory Model used in the offshore may have been validated in other regions, it has not been validated for the Newfoundland Shelf and adjacent deep ocean. The report does not provide any validation of the model ocean currents for the study area or how winter ice was dealt with in the circulation model. Furthermore, insufficient detail is provided on how the model output was used and which HYCOM model data was used.

## Specific Comments

DFO would like to request the following information:

- The frequency and resolution of the HYCOM ocean model run output used, (i.e. full model resolution and daily averaged output or hourly output);
- More detail regarding how the runs were implemented. This is needed before DFO is able to comment on the acceptability of the approach used for these oil spill fate models;
- Justification as to why MSC50 winds were used as opposed to the original HYCOM wind forcing. Using the original HYCOM wind forcing would have made for a more consistent approach.
- More detail on the model drift runs, specifically with regards to:
  - The number of simulations run;
  - How the HYCOM system was used, (i.e. static currents or variable currents);
  - If a wind driven ocean component of drift was added to the HYCOM model output;
  - What defines the characteristics of a SIMAP model run in winter and summer;
  - Define how runs were set up in detail; and
  - How ice was incorporated in the SIMAP model runs.

### **Figure 2.6.1**

It appears that this figure includes information for the Gulf of St. Lawrence, a portion of SW Newfoundland Shelf, Scotian Shelf and Gulf of Maine only, therefore it cannot represent the situation for the entire east coast.

Should you have any questions, please do not hesitate to contact me at (709) 772-8889 or [jason.kelly@dfo-mpo.gc.ca](mailto:jason.kelly@dfo-mpo.gc.ca).

Sincerely yours,

*Original signed by*

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Jason Kelly  
A/Regional Manager  
Environmental Assessment & Major Projects

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