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BAB 3970-665

February 22, 2009

Ms. Kimberly A. Coady
Environmental Assessment Officer
Canada-Newfoundland Offshore Petroleum Board
5th Floor, TD Place
140 Water Street
St. John's NL A1C 1B6

Dear Ms. Coady:

**RE: Hibernia Management and Development Company Ltd. (HMDC)
Hibernia Drill Centers Construction and Operations Program Screening Report**

As requested, Fisheries and Oceans Canada (DFO), has reviewed the document entitled, "*Hibernia Drill Centres Construction and Operations Program Screening Report*", dated December 16, 2008. This document describes the proposed construction, installation, operation, maintenance, modification, decommissioning and abandonment of up to six drill centers within glory holes at various locations within the Jeanne d'Arc Basin over a 27-year period. The following comments are provided for your review and consideration.

General Comments:

In general, the biological/environmental risk issues have been covered and the conclusions are mostly in agreement with available literature, including past monitoring programs which have been carried out on the Grand Banks, several major reviews as well as specific studies dealing with exploration drilling on the Banks. Despite this however, the department feels the document is lacking in a number of areas and does not adequately address the issues outlined in the scoping document, particularly with respect to identification, characterization, quantification and modeling of discharges.

It is noted that the existing EEM program will be amended to incorporate monitoring of the drill centers as appropriate both spatially and temporally, including consideration of possible inter-center cumulative effects. That being said, the requirement for baseline data is neither included nor discussed. Given the proposed project timelines, it is essential that this be addressed in a timely fashion, well in advance of the start of any new project activities.

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Caution must be taken when making assumptions about the magnitude of acoustic effects as this depends on the sound propagation characteristics of the environment as well as the activity. A number of recent studies have shown that even the best multivariate acoustic models do not always provide adequate prediction of sound propagation. Consideration should be given to carrying out field measurements of sound propagation prior to and during the activities of concern to confirm the results of a *priori* modeling efforts and as a means to mitigate potential impacts. Possible changes to the current seismic code of practice may necessitate such activities in the future.

Hibernia has been re-injecting drill cuttings at the GBS since 2002 which has proven to be a measurably effective means of reducing the environmental footprint of drilling activities. Why is this mitigation not being considered for the proposed expansion?

The proponent suggests that since there will be no increase in the overall rate of produced water discharge from the GBS, it does not need to be discussed in this assessment. Although rates of discharge may not change, which is not demonstrated in the document by the way, the total amount of produced water discharged will be increased significantly. Therefore, the effects of this discharge should in fact be assessed in this document.

According to CEAA, the effects of climate change on the project and its potential environmental effects should be included in the assessment, which has not been addressed.

The cumulative effects assessment provided assumes that if there is no direct overlap of physical effects on fish habitat, then there are no cumulative effects, which is incorrect as it is the overall reduction in habitat that should be assessed. Additionally, the proponent assumes that if an individual activity has an effect that is below current detection limits or of short duration, then there will be no cumulative effects.

Specific Comments:

Page v. The following statement "*Whales are opportunistic feeders and have adapted to the variability in prey abundance, so usually are not reliant on any single location for food*" is not entirely correct. There is evidence that some whale stocks (e.g., blue whales in the Gulf of St. Lawrence, possibly humpback and fin whales on the SE Grand Banks in winter) return year-after-year to predictable aggregations of prey. Alteration of such an aggregation could have significant impacts, particularly for a SARA-listed species.

Page vi. Abandonment could be a greater source of disturbance and injury for mammals and leatherbacks than vessel operations if explosive well severance methods are used.

Page vi. The statement that leatherback sea turtles will not likely be significantly affected by an oil-spill is not accurate, as leatherback turtles could potentially be affected if they eat contaminated jellyfish.

Page 11, 2.1.3. The new Federal monitoring and mitigation guidelines may specify a mammal monitoring distance greater than 500 m, and the seismic and VSP operating methods will have to reflect this. Since visibility falls to less than 1 km almost half of the time in July, this could prove problematic.

Page 57, 3.2.1. The Labrador Current has strong inter-annual variability, related to the North Atlantic Oscillation (see: Han, G and C.L. Tang 2001: Interannual Variations of Volume Transport in the Western Labrador Sea Based on TOPEX/Poseidon and WOCE Data. *J. Phys. Oceano.* **31(1)**: 199-211; Häkkinen, S and P.B. Rhines 2004: Decline of Subpolar North Atlantic Circulation During the 1990s. *Science* **304(5670)**: 555 – 559). Some discussion from the climatic perspective would be useful.

Page 64, Fig. 3.17 (and Fig. 3.18). The units for temperature and salinity should be provided.

Page 67, Para.1. The word “*seasonal*” is confusing. Does the sentence actually mean ice seasons were different from year to year? If so “*interannual*” would be more appropriate.

Page 70, Para.1. What is the reference for the duration of sand waves in this environment? The mobile and transient nature of sandy substrates in this environment is particularly relevant for evaluating the extent and duration of benthic habitat impacts. This issue should be explicitly addressed both in the description of the environment and in the assessment of potential project specific and cumulative environmental effects.

Page 78, 4.1.4. The text refers to Stimpson’s surf clam and Greenland cockle being fished in the area, yet they are not included in the species profiles. Please revisit and discuss.

Page 84, 4.1.6. A figure illustrating the proximity of the Bonavista ‘Cod Box’ to the Project Area would be informative.

- Other marine conservation measures could be included under international initiatives. For example, the NAFO Ecosystem Working Group has proposed a number of Vulnerable Marine Ecosystems (VME) that include many of the canyons along the shelf edge of the Grand Banks, including the SE Shoal where many fish and marine mammals feed in the summer and apparently overwinter.

Page 85, 4.2 (and 6.3.2). The list of NAFO unit areas encompassed by the Study Area should also include 3Mc.

Page 91. The Proponent states that DFO has not yet provided the 2008 shrimp quotas. This must be a typo (2009 not 2008) as shrimp quotas for 2008 would have been available at time of writing, particularly on the species quota report (SQR) available on-line. Furthermore, an Integrated Fisheries Management Plan (IFMP) would have been issued prior to the (2008) fishery.

Page 103, 4.3.2. This section should include a discussion on fin whales as a species likely to be encountered in the Project Area, more likely than sei whales anyway. This

would be supported by the discussion in Section 4.5.2.2.

Page 103, 4.3.2.1. Humpback whales have been sighted frequently in the eastern slopes of the southern Grand Banks during winter months, so it is likely that a portion of the Newfoundland and Labrador humpback population occupies the Grand Banks in and around the project area all year round.

Page 120, Table 4.10. For the marine mammal species, the last column suggests that the project area is not critical habitat. While this may be true, there is as yet no evidence to support this supposition so this statement should be omitted.

Page 140. While it is convenient at this stage to define “*project boundaries*” and “*affected areas*”, it should be noted that these boundaries will likely change once specific operations begin. That is, the affected area as it applies to baleen whales might be quite large for sound effects arising from seismic or VSP operations when sound propagation characteristics are good (for example, see: McQuinn, I.H., and D. Carrier 2005: Far-field measurements of seismic airgun array pulses in the Nova Scotia Gully Marine Protected Area. Can. Tech. Rep. Fish. Aquat. Sci. **2615**: v + 20 p). Furthermore, sound measurements and/or sound propagation modeling should be considered as mitigation measures for some activities when they are proposed.

Page 151, Para.3. The proponent confuses no change in rate of delivery of produced water with no change in amount. This confusion is continued throughout the document and leads to the incorrect conclusion that produced water effects do not need to be assessed in this screening.

Page 151, 6.1.3.1. The statement that metals do not accumulate in benthic species is incorrect. Mercury, arsenic, cadmium, copper and lead do have the potential to accumulate in benthic organisms and some (e.g. Hg) may even be biomagnified.

Page 152, Para.2. Please clarify whether the assumption that the wells will be drilled to a similar depth as those at White Rose is accurate. In addition, there is also an assumption that there is no cladding of the deposited material. What is the evidence for this from existing cuttings piles on the Grand Banks?

Page 152, Para.3. Other risks to the benthic habitat that should be discussed include: increased depth of the pile; cladding and permanent change of substrate characteristics; organic enrichment of the sediments; and shift in community composition.

Page 153, Para.5. This paragraph contains a number of inaccuracies and misapprehensions. Is the size of the turbidity plume really going to be large enough to affect phytoplankton? Phytoplankton will not “*drift*” out of the plume as reported. There is no evidence that all species of phytoplankton would go into a resting phase when they encounter an increase in suspended sediment. What about an increase in primary productivity due to a decrease in photo inhibition in the upper water column?

Page 155, 6.1.3.4. The potential for eutrophication from waste and wastewater discharges should be considered and discussed. The effects may be transient for individual activities or discharges, but may have longer term or cumulative effects.

Page 157, 6.1.4. Why is reinjection of cuttings not considered as a mitigation measure? It has proven very successful in this regard at the GBS.

Page 158, Para.2. There is no explanation to substantiate the claim that the drilling for this project will result in effects well below those projected for the White Rose project. Please re-visit and discuss.

Page 158, Para.3. How long does the WBM remain in the benthic boundary layer (BBL)? What are the references for the thickness of the BBL at this site? What are the consequences of storm mixing or other disturbance to the BBL for dispersal and eventual fate of the WBM?

Page 158, Para.5. The recovery time could also be affected by changes in grain size, organic matter content, redox, cladding, etc. These should also be considered in this assessment.

Page 160, 6.1.6.7. A statement that fish habitat considerations will be incorporated in the selection of decommissioning options should be included here.

Page 161, Table. 6.1. Mitigation: Cuttings reinjection is not listed as a mitigation option. Why?

- Duration: Mud and cuttings effects last longer than 128 days during which drilling takes place. The duration of the activity is not the same as the duration of the effect.

- Follow up: When will the current Hibernia EEM be modified and what are the plans for collection of baseline data? This needs to be completed prior to commencing any new drilling activities.

Page 164, 6.2.3. Why is produced water not included here? Again, the proponent uses a “*no change in rate*” argument to exclude it from consideration.

Page 168, Para. 3. Recent studies carried out by DFO indicate that there is potential for seismic effects on fish and shellfish beyond the tens of meters range as stated in this document.

Page 170, Para.5. What is the reference for the thickness of the BBL and the extent of spread of the WBM (200m diameter) in the BBL?

Page 183, Para.3. It could be argued that the existing marine mammal data, while reflective of the difficulties in collection, may not be “*sufficient to support the assessment.*” It would be better to conduct additional visual and acoustic surveys near the project area, particularly during the winter period when relatively little data has been collected.

Page 185, 6.4.3. The international NAFO candidate VMEs identified on and near the Grand Banks should also be considered here. A number of these candidate VMEs have been established based on the presence and activities of marine mammals.

Page 187, 6.4.3.2. (and 6.4.6.2). There have been reports of vessel strikes of large whales by supply vessels traversing the Grand Banks. In the cases reported, the fate of the animal is unknown. Monitoring and mitigation procedures should be considered during certain times and areas where marine mammals have an above-average expectation of being present and possibly struck by vessels. This could be in the form of reduced vessel speeds when whales are present, or posting of an observer specifically tasked with looking for whales, particularly in areas where there may be higher probabilities of encountering whales. At the very least, when a whale is sighted on shipping routes or near operations, its presence should be communicated to other vessels in the area.

Page 189, 6.4.3.6. On the Grand Banks, there have been reports of northern bottlenose whales entering and remaining in large vessels' thruster plumes, so it cannot be assumed that all marine mammals will move away from loud anthropogenic sound sources.

Page 189, 6.4.4. Note previous comment regarding vessel watches and notification procedures for large whales.

Page 190, 6.4.6.1. Based on the literature and several comments above, it is likely that not all marine mammals "*will avoid an area of noise.*" Given that some will not, appropriate monitoring and mitigation procedures should be adopted depending on the type of activity being conducted. These could fall within the Federal Codes of Practice for Seismic, for instance.

Page 190, Table 6.5 (and Table 6.8). Care should be taken when making assumptions regarding the propagation characteristics of an area without actual acoustic measurements. A number of studies have shown that propagation modeling does not always produce results reflective of the actual sound field. For very loud or prolonged activity, especially in areas where marine mammals of high concern or potential sensitivity are likely to be encountered, sound measurement studies should be considered as a monitoring and mitigation tool.

Page 191 (and 211, 219, 220). "*The Project Area offers no unique habitat or feeding areas for marine mammals or sea turtles*" and related statements. This conclusion is not supported by any existing data, and our knowledge of the life processes of marine mammals and leatherback turtles in this area has limitations with which to assess this. Leatherbacks can be attracted and feed wherever aggregations of jellyfish or other prey invertebrates might occur, including the project area.

Page 210, Para.3. Leatherback turtles are known to dive to great depths to feed on various gelatinous prey as well, and recent satellite tagging data showed that one turtle spent most of its time foraging near the seafloor of the Grand Banks for the weeks it spent off the Avalon Peninsula.

Page 210, 6.6.3.2. It is important to note that in some cases, the old NMFS sound exposure criteria are no longer considered conservative, but rather NMFS has proposed that sound energy exposure-based criteria be adopted for each mammal hearing type and human activity (see: Southall, B.L., Bowles, A.E., Ellison, W.T., Finneran, J.J., Gentry, R.L., Greene, C.R.J., Kastak, D., Ketten, D.R., Miller, J.H., Nachtigall, P.E., Richardson, W.J., Thomas, J.A., and P.L. Tyack 2007. Marine mammal noise exposure criteria: initial scientific recommendations. *Aquat. Mamm.* **33(4)**: 1-521). As these criteria are being considered for use in the United States, it is quite possible that Canada and other countries may adopt them as well.

Page 228, Para.3. This section addresses chemical change and the measurement of chemical signals, but does not address the physical habitat changes that may occur. How long will the cuttings piles last? Do they disperse? Is there a permanent alteration of habitat characteristics? If so, then the potential area of effect and cumulative effect may be much larger. As the proponent correctly states, sediment grain size is a determinant of benthic community structure. What is the long term effect of all these projects on sediment grain size in this part of the Grand Banks? A lot of data has already been collected and there are numerous existing wells drilled that can provide information regarding the duration of cuttings piles in the NL offshore. It may be timely to consider a research study (e.g. ESRF-funded) to investigate the fate and effects of cuttings piles in this area.

Page 229, Para.1. As a result of this project and other current or proposed projects, it appears that more than 50 km² of benthic habitat will be affected. While this may be small in the context of the entire Grand Banks it still represents significant habitat alteration.

Page 229, Para.2. According to the proponent cumulative effects only occur if the zones of influence (ZOI) overlap, which is not the case for habitat alteration. Actually, the cumulative loss of habitat will occur and be greater if the ZOI do not overlap.

Page 229, Para.5. The rate of discharge may affect the ability of the environment to accommodate some wastes, thus avoiding acute effects. However, it is the total amount of waste that determines cumulative effects. Even discharges that are within waste treatment/disposal guidelines may result in significant cumulative effects. Both drill cuttings and produced water disposal should be assessed from this perspective.

Page 232, Para.6. For the statement “...*all operators are required to comply with both...*” only one document (Statement of Canadian Practice) is listed. Please list the other document as well.

Page 236, Table 8.2. This table should be updated to incorporate more recent information; the data from 2005 should no longer be considered a forecast.

Page 241, Para.3. Although the U.S. Coast Guard (2005) reference sounds interesting, the website provided in the reference list is inaccessible. Care should be taken when developing the reference lists to ensure that all internet-based references are still current and available to the reader.

Page 267, Table 10.2. Baseline information is required for the follow up monitoring program.

Thank you for the opportunity to provide comments on this document. If you have any questions or comments regarding the above, please do not hesitate to contact Mr. James Meade by phone at 772-3521, or by e-mail (james.meade@dfo-mpo.gc.ca).

Yours truly,

original signed by

Carole Grant
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jm

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