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February 28, 2013

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Sent via email to DHicks@cnlopb.nl.ca

Re: Technical Review of the Husky White Rose Extension Project Environmental Impact Statement.

Please find attached Natural Resources Canada's (NRCan's) technical review comments on Husky White Rose Extension Project Environmental Impact Statement (December 2012). NRCan is participating as a federal authority in the screening level environmental assessment (EA) for this project, providing specialist and expert information and knowledge within the meaning of s. 12(3) of the *Canadian Environmental Assessment Act, 1992* (CEAA 1992). While CEAA 1992 has been repealed, this screening was designated by the Minister of Environment to continue, pursuant to s. 124(1) of CEAA 2012.

NRCan's geoscience expertise includes marine and coastal geology and geohazards for this project.

If you have questions or require clarification on our comments please feel free to contact Kate Cavallaro at (613) 996-0055 or Kathleen.Cavallaro@nrcan.gc.ca.

Sincerely,

Original Signed by

John Clarke
Director
Environmental Assessment Division

cc:
Mark Pearson
Linda Richard

Natural Resources Canada's Technical Review of the White Rose Extension Project's Environmental Impact Statement

NRCan is providing geoscience expertise in areas related to coastal and marine geology and geohazards for the technical review of the Husky White Rose Extension project. NRCan's review focused on chapters 2, 3, 4, 14 and 16 of the Environmental Impact Statement (EIS).

Coastal and Marine Geology:

Proponent's Conclusions:

As indicated in the Husky White Rose Extension Environmental Assessment document (December 2012) the White Rose field and satellite extensions are located in the Jeanne d'Arc Basin, 350km east of Newfoundland and Labrador. Section 4.2.5 of the Environmental Assessment (EA) document summarizes the geological setting of the project. It indicated that the wellhead platform (WHP) will occur on the Argentia Peninsula, in Palentia Bay on the southern Avalon Peninsula. It characterizes Palentia Bay as having well-defined channels and as being a glacially modified basin that has a complex glacial history affected by ice draining from both the Burin and Avalon Peninsulas (Brushett et al. 2007). In order to characterize the project site the proponent relied on a number of data sets derived from multibeam bathymetry, an acoustic sub-bottom reflection profile, sediment core and grab samples and colour seabed photographs, which provided information on the relief, seabed features and sediment composition of the project site.

NRCan's Conclusions:

The proponent has properly referenced and described both nearshore and offshore Grand Bank geology (surface and shallow subsurface). The Final design criteria for the potential gravity-based structure will be based on a detailed geotechnical investigation and proper engineering design and installation details are not provided in the EA document. NRCan does not have expertise to advise on those aspects.

NRCan has not identified any issues or information gaps on aspects related to coastal and marine geology.

Seismicity:

Proponent's Conclusion:

Information related to seismicity was included in section 4.3.8 of the EA document. The proponent has summarized that while literature reveals the region around the White Rose field to have relatively low seismicity based on the existing regional seismic catalogue. However, large magnitude (M7 and above) earthquakes have occurred in the region. The stresses driving these events are not well understood and the probably locations of future large earthquakes cannot be robustly forecast. While Husky Oil (2001) presented a peak ground acceleration (PGA) of 0.03 for a return period of 200 years (based on findings of Foo and Crouse -1986), independent seismic hazard analyses recently conducted for the region (URS 2006 – model B; GSC 2010 – model A) indicate higher PGAs. The PGAs calculated for a 2500 year return were 0.213 (model A) and 0.323 (model B) respectively, and the PGAs calculated for a 200 year return were 0.069 (model A) and 0.03 (taken from Foo and Crouse – 1986 – calculated for the Hibernia Operating Level Earthquake).

NRCan's Conclusion:

Based on NRCan's review of section 4.3.8, the seismicity and seismic hazard review analysis is reasonably comprehensive. The proposed 1/2500 year hazard values appear to be considerably higher than previous industry assessments and, if they are used in the design process, should be adequate.

Using the average of the values from Model A and B is a little un-conservative relative to using a model that gives each a 50% weight. NRCan confirms that the estimated "GSC model" entries in Table 4-83 are approximately the same as when NRCan's Geological Survey of Canada (GSC) runs its NBCC2005 model for the White Rose site. The GSC values are median values, but it is uncertain whether the URS seismic hazard values in Table 4-83 of the EA document are mean or median values and should be clarified before they are used in design. The GSC is currently working on a revised model for NBCC2015 that gives lesser weight to "Model 2". Indications are that the mean hazard that the full model gives at the White Rose site will not exceed the "URS" values in Table 4-83. Note that the NBCC seismic source models are national in scope and of necessity very general for specific locations, so the values from the model are only suitable for screening purposes. Site-specific studies are recommended where safety or cost implications justify them.

NRCan Recommendation:

The proponent should clarify whether the URS seismic hazard values in Table 4-83 (chapter 4) are mean or median values before they are used in design.