

April 3, 2007

Canada-Newfoundland and Labrador Offshore Petroleum Board
5th Floor, TD Place
140 Water Street
St. John's, NL
A1C 6H6

Ref. No.: HUS-CPB-SR-LTR-00002

Attention: Ms. Kim Coady

File No.: 6.2.21

Dear Ms. Coady:

**Subject: Husky White Rose Development Project: New Drill Centre
Construction and Operations Program Environmental Assessment
Responses**

Further to your letter of March 12, 2007 outlining comments on the Addendum submitted by Husky on January 17, 2007, please see the following responses to those comments:

Comment 1:

In the March 2, 2007 letter (M. Allan to J. Crocker) outlining Husky Energy's plans for the tie-back of the North Amethyst drill centre (NADC) to the FPSO, a brief explanation of the required upgrades to the FPSO to accommodate the NADC is provided. The letter indicates that no further environmental assessment should be required for the development application. However, it is stated in the EA report that there is no requirement for upgrades or modifications to the existing FPSO associated with the tie-back of the new drill centres. Based on the information provided in the March 2, 2007 letter, this statement is incorrect. FPSO upgrades or modifications that are required for the tie-back and operation of the drill centres assessed in the EA and EA addendum must be included in the scope of the project and an environmental assessment of these activities undertaken accordingly.

Husky's Response:

Agreed, section 3.8.4 of the EA made the statement, "Once tie-in is complete, this system will be brought back into service through the existing infrastructure at the Floating Production Storage and Offloading Vessel (FPSO)." To clarify, the vessel will be taken off location for modifications in 2010 and brought to an approved fabrication facility. The new production flowlines will be routed up through the turret, including two new pig launcher/receivers, and through the swivels to the topsides manifold. Some of the piping for the new flowlines was placed during the initial White

Rose Project as 'future' lines, and space was reserved for all of the new production flowlines. This is the existing infrastructure being referred to in the EA statement. After the manifold, the three-phase flow is commingled with the existing production, separation, produced water and gas re-injection systems. Therefore, there are no new sources of potential emissions, other than the marginal risk of accidental leaks from the new piping, all of which should be contained within the FPSO facility. The potential for these new accidental releases will be studied during detail design, but is expected to have a negligible impact on the overall FPSO risk profile.

Comment 2:

Once again, DFO would like to reiterate a concern which was raised in the last review, which is the conclusion of the effects on Species at Risk (SAR) as not significant, given with a high level of confidence. To expound this point, the report states that it is not known with certainty if northern or spotted wolffish spawn in the study area, although is probable given the limited migration of the species. It subsequently makes a determination of the effects of sediment excavation and deposition as not significant, given with a high level of confidence but with no attributed scientific certainty (Table 7.23). Even if the affected area is small compared to the known distribution of the species, there is still a possibility that some individuals could be affected. The absence of data for the affected areas does not equate to unlikely effect, therefore a precautionary and perhaps more pragmatic, assessment is necessary. Thus, it is recommended that the assessment tables should more closely reflect the data and more importantly, the data gaps presented throughout the text.

Husky's Response:

Husky concurs with DFO that it would be desirable to have additional data on wolffish, particularly on their movements and spawning areas. However, existing information was sufficient to justify the predictions provided in the EA.

The determination of *no significant effect* on wolffish is based on the following facts with some degree of deductive reasoning.

- Wolffish are very widely distributed both vertically (90 to >475 m water depth) and horizontally (on both sides of the N Atlantic; in the NW Atlantic from the Arctic to New Jersey).
- Of the huge habitat areas identified above, the three species are found over a variety of substrate types.
- Most spawning occurs in the fall over hard bottom and ledges, probably at the slope (i.e., probably outside the Project Area).
- According to the SARA Public Registry as viewed on 13 March 2007, there is no Wolffish Recovery Strategy or Plan, or Management Plan, and hence no critical habitat identified in the area.

- Furthermore, given that substrate in the White Rose Project Area is predominately sand (as shown from dredging activities and sediment sampling during EEM programs), it is unlikely that it contains any critical wolffish spawning habitat.
- The glory hole excavation will occur in summer, and will avoid peak wolffish spawning times. Any adults disturbed by excavation activity should move to adjacent areas.
- Any possible effects from the Project do not satisfy the criteria for significant effects as defined in other offshore EAs on the Grand Banks. In order to be significant the geographic extent would have to extend beyond 100 km².

In conclusion, we do not feel that reducing the degree of scientific certainty in the table would affect the overall *not significant* prediction or the outcome of the EA.

Comment 3:

Section 7.6.2.2, Sediment Excavation, Page 72: The glory hole dimension presented (70m x 70m) is not a true reflection of the amount of area to be affected as it does not include ramp area (an additional 130m x 70m). The total area to be affected should be as accurate as possible.

Husky's Response:

The proposed glory holes differ in structure to the existing three glory holes (North, Central and South). The reference to a ramp area in Comment 3 is pertinent to the existing glory holes at the White rose location, which were designed to be excavated using a clam dredge. They have steep sides and a low-sloped ramp extending beyond the rectangular perimeter. The purpose of the ramp is to allow for a more level entry/exit of flowlines and umbilicals. See Figure 3.1 (attached), "White Rose Field Central Drill Centre (Detail), glory hole layout superimposed over bathymetry."

The proposed glory holes will have the ramps incorporated into the sides, such that in plan view (i.e. seen in Figure 3.2 (attached),) the glory holes will remain rectangular. Figure 3.2 (attached) represents a concept drawing of the North Amethyst Glory Hole based on the pre-FEED¹ study. This newer design will better facilitate the use of a suction dredge and will allow for a better flushing action, which in turn will provide better visibility for the ROV. This has been given for illustrative purposes only because these specifications are subject to change and further revision during the FEED study.

Dimensions given in the habitat compensation plan were based on the early pre-FEED design in which the basal area was 70m x 70m and all four sides had a slope of 1:3 giving an overall area of 18900m². Recent revisions during the FEED study have modified the basal area to 65m x 50m, and at present the sides have a slope of either 1:3 or 1:5. This is an evolving process and the final dimensions have yet to be determined, however, the area to be compensated will be based on the final 'Approved for Construction' diagrams as soon as they become available.

¹ FEED: Front End Engineering and Design

The following calculations are based on the most recent data from Husky's Development and Project Engineering Groups. A glory hole must be a minimum of 10m deep. Instruments used during dredging to measure the depth have inherent measuring errors of $\pm 0.5\text{m}$, thus the depth will be dredged to 10.5m. For the purposes of area calculation we have rounded up to 11m therefore overestimating the intended area by over 5%. The sides slope upwards from the glory hole bottom to the seafloor at a slope of either 1:3 or 1:5. The 1:5 gentler slope serves as ramps for the umbilicals and flowlines entering/exiting the glory hole. The attached Figures 3.2 and 3.3 show the proposed glory hole structure and dimensions based on a 65m x 50m, 11m deep glory hole. The overall dimensions at seafloor level would be 175m x 116m for an overall conservative estimated area of 20300m².

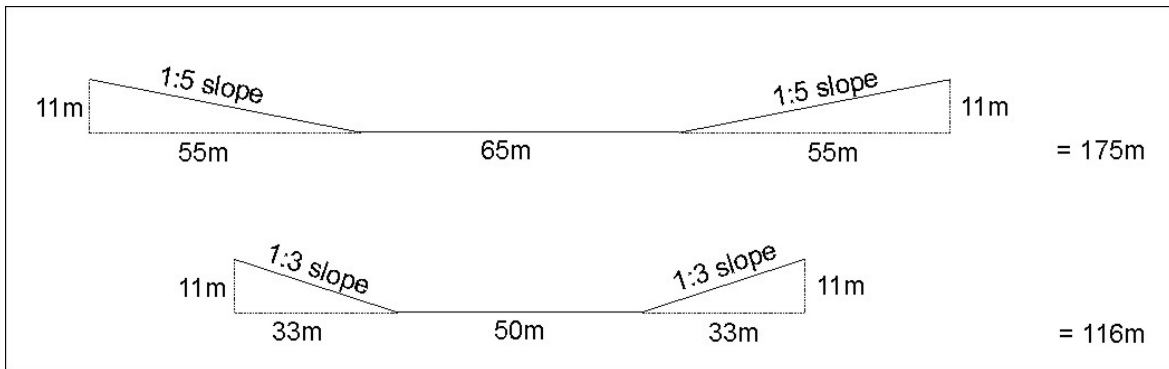


Figure 3.3 Cross-sectional view of conceptual glory hole.

Comment 4:

Table 7.22, Page 79. The determination of no significant residual effect is given when no mitigations for effects of excavation and deposition of sediment are presented.

Husky's Response:

The mitigation for excavation and deposition of sediment is habitat compensation and this should have been included in the table.

Comment 5:

Section 7.6.1.7, Atmospheric Emissions – The proponent's response is not completely adequate. For greater clarity and certainty, the proponent should provide emission estimates for SO₂, NO_x, H₂S, PM, PM_{2.5}, PM₁₀ and VOCs according to source.

Husky's Response:

The emissions that arise from SO₂, NO_x, H₂S, PM, PM_{2.5}, PM₁₀ and VOCs are the Criteria Air Contaminants (CAC's) must be reported to Environment Canada under the National Pollutant Release Inventory (NPRI) by June 4th annually for the SeaRose FPSO. All sources of emissions were taken into account; the main power generators, essential generators, flare, boilers, inert gas system, cargo tank venting and fugitive sources. Husky Energy reported to Environment Canada's NPRI for the 2005 reporting year on June 4,

2006. The results of the CAC reporting, also available on the [NPRI website](#)², are below in Table 1.

Table 1: NPRI Criteria Air Contaminant (CAC) reporting for 2005

CAC	Quantity	Unit
Sulphur Oxides (SO ₂)	0	tonnes
Nitrogen Oxides (NO _x)	83.37	tonnes
Carbon Monoxide (CO)	453.48	tonnes
Volatile Organic Compounds (VOC)	63.71	tonnes
Total Particulate Matter (TPM)	158.86	tonnes
Particulate Matter ≤ 10 microns (PM ₁₀)	158.86	tonnes
Particulate Matter ≤ 2.5 microns (PM _{2.5})	158.86	tonnes

The results reported in 2005, depicted above, are only representative for 2005, because the SeaRose FPSO only operated for November and December of 2005. The actual results for 2006 operating year will be reported by June 4, 2007 to the NPRI. Initial estimates for the 2006 year are depicted in Table 2 according to source. Husky Energy reserves the right to further refine these calculations for the NPRI June 4th, 2007 submission to Environment Canada. Emission estimates for the later part of 2005 and 2006 are consistent with a 'start up' year, which requires heightened flaring and generators running on diesel (until fuel gas becomes available). Table 3 depicts estimates for 2007, and is based on an assumption for an increase in daily production and increased power generation needs. The external combustion (flare) estimates are lower in 2007 than 2006 estimates due to a decrease in flaring, whereas the internal combustion (turbines and generators) estimates increase in 2007 as a result of the predicted production increase.

Table 2: NPRI Criteria Air Contaminant (CAC) estimates for 2006

CAC	Quantity	Unit
Sulphur Oxides (SO ₂)	0	tonnes
Nitrogen Oxides (NO _x)	2208.68	tonnes
Carbon Monoxide (CO)	2111.32	tonnes
Volatile Organic Compounds (VOC)	288.27	tonnes
Total Particulate Matter (TPM)	702.10	tonnes
Particulate Matter ≤ 10 microns (PM ₁₀)	702.10	tonnes
Particulate Matter ≤ 2.5 microns (PM _{2.5})	702.10	tonnes

Source	NO _x (tonnes)	CO (tonnes)	VOC (tonnes)	TPM (tonnes)	PM _{2.5} (tonnes)	PM ₁₀ (tonnes)
External Combustion	366.74	1,995.12	280.30	698.90	698.90	698.90
Internal Combustion	1,860.47	117.64	8.17	3.69	3.34	3.34
Venting	0.22	0	40.25	N/A	N/A	N/A

²

http://www.ec.gc.ca/pdb/queriesite/facility_substance_summary_e.cfm?opt_npri_id=0000008060&opt_report_year=2005

Table 3: NPRI Criteria Air Contaminant (CAC) estimates for 2007

CAC	Quantity	Unit
Sulphur Oxides (SO ₂)	0	tonnes
Nitrogen Oxides (NO _x)	2,905.70	tonnes
Carbon Monoxide (CO)	1,122.29	tonnes
Volatile Organic Compounds (VOC)	139.41	tonnes
Total Particulate Matter (TPM)	331.94	tonnes
Particulate Matter ≤ 10 microns (PM ₁₀)	331.94	tonnes
Particulate Matter ≤ 2.5 microns (PM _{2.5})	331.94	tonnes

Source	NO _x (tonnes)	CO (tonnes)	VOC (tonnes)	TPM (tonnes)	PM _{2.5} (tonnes)	PM ₁₀ (tonnes)
External Combustion	172.77	939.87	132.05	329.24	329.24	329.24
Internal Combustion	2,732.94	182.42	7.36	2.70	2.70	2.70
Total:	2,905.70	1,122.29	139.41	331.94	331.94	331.94

Comment 6:

The recently announced categorization process for chemical substances may result in specific risk management actions under CEPA (www.chemicalsubstanceshimiques.gc.ca). An online database is available at http://www.ec.gc.ca/CEPARegistry/subs_list/dsl/dslsearch.cfm to verify whether chemicals that would be in use at an expanded White Rose facility have been categorized. EC requests that Husky identify these chemicals and clarify how their current chemical management system will address any identified risk management actions resulting from the above referenced categorization system. In particular, how will chemical that are currently in use in the offshore be assessed if new chemical management objectives are required?

Husky Response:

Husky Energy, under its management system, keeps abreast of changes in regulations that are applicable to our industry. We have reviewed the gazette (February 3, 2007) that referenced the first release of technical information relevant to substances listed in the 'Challenge'. Mandated under the Canadian Environmental Protection Act (CEPA) 1999, ministers were required to categorize 23,000 substances on the Domestic Substances List (DSL) by September 14, 2006. This involved the systematic identification of the substances on the DSL that should be subject to screening assessments (Section 74, CEPA 1999).

Out of the 23,000 substances on the DSL, 4300 have been identified as requiring further work; 4000 met the categorization criteria and 300 warrants further attention for human health reasons. Out of the 4000, 500 high priority substances have been identified; these are substances that have been categorized as being persistent, bioaccumulative and inherently toxic to non-humans. Forty five have currently been assessed, whereas approximately 200 need further action. The Federal government is using a Challenge initiative to deal with these.

Husky Energy, as does industry as a whole, has a role to play in the challenge. We have confirmed that we are not currently using any of the 15 substances in the current Batch 1 substances that were identified under the Challenge. We will continue to monitor the progress and government's assessments of these chemicals as they are completed to steward to best practices for use. We will also continue to collect environmental release, exposure and product information as it applies to this process and the National Pollutant Release Inventory. It should be noted however, that under the Challenge, surveys are targeted towards importers and manufacturers. Husky will not be surveyed directly, but will ensure that all chemical contractors and suppliers are complying with the Challenge through our Contractor Management System which includes regularly scheduled audits.

The Chemical Management System is aligned with the Challenge program, in that it assesses chemicals based on the same tools for categorization that are used in the Challenge program. The Chemical management system evaluates persistence, bioaccumulation, and toxicity during the screening process. The OSPARCOM method used for the evaluation of chemicals looks at the bioaccumulation factor, the bioconcentration factor or the octanol-water partition coefficient, and tests for toxicity of the chemical on different species at various trophic levels of the food web. Husky's chemical Management System as well, documents if the chemical is on the CEPA – Toxic List. The Husky's Chemical system, though based on the Chemical Selection Guidelines from the Canada - Newfoundland and Labrador Offshore Petroleum Board, takes into account all other relevant legislation including the Hazardous Products Act, CEPA and the Transportation of Dangerous Goods.

Should you have questions or require further information on anything in the above letter, please contact Ms. Francine Wight at 724-3965, or Ms. Kathy Knox at 724-3994.

Yours sincerely,

HUSKY OIL OPERATIONS LIMITED

Don Williams
Manager, Health, Safety, Environment and Quality

fw/dw/pk

Attachments: Figure 3.1 and Figure 3.2

cc: Kathy Knox, Francine Wight, Margaret Allan – Husky Energy