

**CANADA-NEWFOUNDLAND and LABRADOR OFFSHORE  
PETROLEUM BOARD  
CEAA SCREENING REPORT**

---

**Part A: General Information**

<b>Screening Date</b>	<b>April 19, 2007</b>
<b>EA Title</b>	Husky White Rose Development Project: New Drill Centre Construction and Operations Program Environmental Assessment
<b>Proponent</b>	Husky Oil Operations Limited St. John's NL A1C 1B6
<b>Contact</b>	Mr. Don Williams Manager, HSEQ
<b>C-NLOPB File No.</b>	7705-H64
<b>CEAR No.</b>	06-01-17410
<b>Referral Date</b>	<b>January 13, 2006</b>
<b>EA Start Date</b>	January 31, 2006
<b>Location</b>	Northeastern Grand Banks

**Part B: Project Information**

In January 2006, Husky Energy submitted a project description "*Husky White Rose Development Project New Drill Centre Construction & Operations Program Project Description*" (Husky Oil Operations Limited 2006) to the C-NLOPB, in support of its application to undertake development of four new drill centres located in three areas adjacent to the currently active Northern, Central and Southern drill centres over a five year period. The "*Husky White Rose Development Project: New Drill Centre Construction and Operations Program Environmental Assessment*" (LGL Limited 2006) (herein referred to as the 2006 EA Report) provided an environmental assessment of the development of up to four new drill centres over a five year period. In order to address deficiencies in the EA report Husky submitted an EA addendum on January 17, 2007. The "*Husky White Rose Development Project: New Drill Centre Construction and Operations Program Environmental Assessment Addendum*" (LGL Limited 2007) (herein referred to the 2007 EA Addendum) describes the development of up to five new drill centres and addresses regulatory review comments on the 2006 EA Report.

In completing this Screening Report, information from the 2006 EA Report and the 2007 EA Addendum, and the 04 April 2007 letter from Husky Energy (Husky 2007), was summarized and is included in the following sections.

## **1. Description of Project**

Husky Energy proposes to drill up to five new drill centres in three areas adjacent to the three drill centres currently active in the White Rose Field. All proposed activities will occur within the defined project areas, North, West and South White Rose Extension Drill Centres and the North Amethyst Drill Centre. The South White Rose Extension (SWRX) and North Amethyst each would require a new drill centre and a maximum of 16 wells each. The West White Rose Extension (WWRX) could potentially support up to two new drill centres and a maximum of 18 wells. The North White Rose Extension (NWRX) would support one new drill centre and a maximum of 4 wells. There are a total of 54 wells proposed for the five drill centres.

Development of up to these wells will occur in five phases: drill centre construction and temporary guide base (TGB) installation; drilling; subsea equipment installation; production operations; and, abandonment. The viability of any or all of the other proposed new drill centres is contingent on successful delineation drilling results during the next three to seven years.

Glory holes will be dredged using a trailing suction hopper dredging (TSHD) vessel. This type of dredge is a self-propelled ship that fills its hold or hopper during dredging while following a pre-set track. Material is lifted through the trailing pipes by one or more pumps and discharged into a hopper contained within the hull of the dredge. When the hoppers are full, the TSHD sails to a disposal area and either dumps the material through doors in the hull or pumps the material out of the hoppers. The glory hole(s) will be excavated to a maximum of 11 m below existing seabed level. Each glory hole will have a maximum floor dimension of approximately 65m by 50m with graded sloped sides of either 1:5 or 1:3. At the seafloor, each drill centre will be approximately 20 300m<sup>2</sup>. Approximately 225,500 m<sup>3</sup> of seabed sediment per glory hole will be moved and dumped at a previously used dumpsite located approximately three kilometres south-southeast of the current southern glory hole.

The Project includes all activities associated with the five phases outlined above, and involves the use of mobile operating drilling units, construction and diving vessels, marine support vessels, helicopter support and existing shore based facilities in St. John's Harbour. The new drill centres will either be tied-back to the FPSO either through new production flowlines, or directly to the FPSO. Jack-up drilling units are not proposed for any phase of this project and have not been considered in this Screening Report. . Geohazard/well site surveys and vertical seismic profiling (VSP) using an airgun array may be required on an as-needed basis at any time of the year. Production operations associated with these five new drill centres would occur between 2009 and 2020.

Glory holes and drill centres will occur in water depths ranging from 120 to 125 m. Water based muds (WBM) will be used where possible, usually during the first sections of each well. Synthetic-based muds (SBM) will be used to drill the majority of each well.

It is proposed that initial construction operations will start with glory hole excavation at North Amethyst during the 2007 construction season; construction of the SWRX may occur in 2008. Drilling, subsea construction operations and tie-ins from these two drill centres to the SeaRose

FPSO will occur during the 2007-2015 period. It is likely that the glory hole construction, installation and tie back operations will see occur from May to September in any one year. Drilling activities will occur year round. Subsea production equipment installation and flowline installation and tie-ins may occur from May to October. Production operations will be continuous up to 2020. Abandonment may occur at any time of the year.

## **2. Description of Environment**

### **2.1 Physical Environment**

The 2006 EA Report and the 2007 EA Addendum provides a detailed description of the physical environment. Physical environment information can also be found in the White Rose Oilfield Comprehensive Study documents (Husky 2000 and 2001).

The Project Area is located on the Grand Banks, offshore Newfoundland, approximately 350 km east-southeast of St. John's in water depths ranging from 120 to 125 m. Physical environmental conditions considered in the environmental assessment include wind, wave and currents; air and sea temperatures; visibility (fog); and, sea ice and icebergs.

#### **2.1.1 Wind, Waves and Currents**

On average, winter winds are from the west to west-southwest in the project area. A prevailing southwest wind occurs in the summer months. Wind speeds are higher in the winter months, with maximum wind speeds measured at 30 m/s in February.

Wave data presented in the 2006 EA Addendum (LGL 2007) show that the highest sea states occur in the Project Area during storm events, which typically occur from October to March. The lowest significant wave height in the area ranges from 1.7 m (monthly mean) in July to 3.9 m (monthly mean) in December and January. The maximum monthly mean significant wave heights measured are 6 m in July to 13 m in December/January/February.

Current data at various wellsites in the White Rose field show that the maximum near-surface current measured 89.9 cm/sec (1999) and a mean range of 10 to 27 cm/sec (1999). At mid-depth the highest current was 43.7 cm/sec (1985) with a mean range of 9 to 12 cm/sec (1999). At bottom, the maximum current measured 50.6 cm/sec (1985), with a mean range of 6 to 11 cm/sec (1988).

#### **2.1.2 Air and Sea Temperatures**

Monthly average air temperatures are typically just below 0°C (-0.5°C) at the coldest time of the winter (i.e. February) and approximately 13.5°C at the warmest time of summer (i.e. August). The range of sea surface temperatures is similar to air temperatures. In winter (i.e. February), the average sea surface temperature is 0°C and in the summer (i.e. August) the average sea surface temperature is 13.3°C.

#### **2.1.3 Visibility**

Reduced visibility on the Grand Banks occur primarily by mist and fog in the warmer months, whereas snow or snow showers reduces visibility in the winter months. On average, July reports

the highest number of low visibility days with poor visibility reported in 55.3% of reports, primarily due to mist and fog. October has the highest number of reported good visibility at 77.1%.

#### **2.1.4 Sea Ice and Icebergs**

Data for the ice environment surrounding the White Rose Field drilling and exploration site was recorded over the last 10 years.

Between 1997 and 2006, sea ice was present approximately 15 km from the White Rose field during three of the ten years between March 12<sup>th</sup> and April 30<sup>th</sup> (LGL Limited 2007). The duration of coverage ranged from one to five weeks and the mean concentration of the sea ice was 4.3 (on a scale of 10).

Between 1997 and 2006, a total of 1,324 icebergs reached the Grand Banks. Three hundred and eighty-eight icebergs were within the vicinity of the White Rose Field with the 10-year average number of icebergs observed in the White Rose area as 38. Icebergs were sighted between the months of March and June.

#### **2.1.5 Seabed Characteristics**

Six sediment samples were collected by Husky Energy in 2004 at the SWRX drill centre. Particle size analysis indicates homogeneous nature of the seafloor. The substrate is predominately sand, ranging from 96-98.6% of the sample volume with a mixture of silt clay and gravel. Results from chemical analyses indicate all samples are below the lower level of the National Action List in the Disposal at Sea Regulations (CEPA 1999). Four sediment samples were analysed for toxicity and the results demonstrate that all samples are non-toxic, according to the amphipod survival and bacterial luminescence (Microtox<sup>®</sup>) tests (Husky Energy Disposal at Sea Permit Application, 2007).

## **2.2 Biological Environment**

The information presented in the 2006 EA Report is presented below, and updated where additional information has been provided in the 2007 EA Addendum.

### **2.2.1 Plankton**

Plankton are found in the Study Area. Phytoplanktons generally undergo explosions in populations, commonly referred to as blooms. These usually occur in the spring (April/May) and, for some species, again in the fall-early winter (October/January) of the year. There may be areas of enhanced production in the Study Area, similar to other slope areas that have been studied.

Copepods are the dominant zooplankton species in the waters of Newfoundland; they feed on phytoplankton, but are prey for larger zooplankton, fish, seabirds, and marine mammals (LGL Limited 2006).

### **2.2.2 Benthos**

The benthic community is very diverse and includes a number of invertebrate species such as

polychaete worms, molluscs and crustaceans, and certain fish species (e.g. flatfish). Substrate type and water depth determine the composition of the benthic community. Epibenthic invertebrate species caught during the White Rose baseline characterization program in 2000 included snow crab, Iceland scallop, toad crab, various echinoderms and sponges (Husky 2000 in LGL Limited 2006).

The sediment samples collected during the environmental effects monitoring program in 2004 and 2005 at White Rose, as reported in the 2006 EA Report, indicated that polychaetes accounted for about 75% of the invertebrates in the samples. Bivalves also accounted for a large proportion of the total number of invertebrates. LGL (2006) reports that 200 grab samples collected during a three-year trawling impact study (1993 to 1995) near the White Rose area was dominated by polychaetes, crustaceans, echinoderms, and molluscs.

### **2.2.3 Fish and Invertebrates**

Proposed activities in the Project Area will occur in the North Atlantic Fisheries Organization (NAFO) unit areas 3Li and 3Lt. Within this area and the larger Study Area UAs 3Mc, 3Md, 3Nb, 3Nf and portions of UAs 3Lh, 3Lr, 3Ma, 3Mb, 3Na and 3Nf UA, there are a number of fish species that are commercially harvested. A detailed description of these species was provided in the 2006 EA Report and the 2007 EA Addendum.

Fish and invertebrate species in the drill centre Study Area include: snow crab (*Chionoecetes opilio*), Stimpson's surf clam (*Mactromeris polynyma*), northern propeller clam (*Cyrtodaria siliqua*), northern shrimp (*Pandalus borealis*), American plaice (*Hippoglossides platessoides*), yellowtail flounder (*Limanda ferruginea*), Atlantic cod (*Gadus morhua*), Greenland halibut (turbot) (*Reinhardtius hippoglossoides*), Atlantic halibut (*Hippoglossus hippoglossus*), wolffish (*Anarhichas* spp.), swordfish (*Xiphias gladius*), tuna (*Thunnus* spp.), porbeagle shark (*Lamna nasus*), white shark (*Carcharodon carcharias*), shortfin mako (*Isurus oxyrinchus*), blue shark (*Prionace glauca*), and cusk (*Brosme brosme*). The 2003 to 2005 fishery was dominated by snow crab, northern shrimp, and Stimpson surf clam.

Snow Crab prefer water temperatures ranging from -1°C to 4°C. Soft bottom substrates and water depths between 70 m and 280 m are primarily habitat for larger snow crabs. Smaller crabs prefer hard substrates. Mating occurs in early spring with the females carrying the fertilized eggs for two years. Hatching occurs in late spring to early summer, with larvae remaining in the water column for up to 15 weeks before settling on the bottom. Snow crab feed on fish clams, polychaete worms, brittle stars, shrimp, and crustaceans, including smaller snow crab. LGL Limited (2006) reports that the exploitable biomass and recruitment in NAFO Divisions 2J3KLNO is declining.

Northern shrimp occur primarily in areas where the substrate is soft mud and bottom water temperatures range from 2° to 6°C typically in waters offshore of Newfoundland and Labrador where depths range between 150 and 600 m. They spawn in the shallower inshore waters in the late summer and fall. Eggs remain attached to the female for one year. Since the fall of 2002, fall and spring research surveys in NAFO Divisions 3LNO have indicated that the greatest occurrences of shrimp along the eastern and northern edges of the Grand Banks have been along

the 3L slope region between 185 m and 550 m (LGL Limited 2006).

Stimpson's surf clam are found along the western Atlantic coast. External fertilization results in pelagic larvae that remain in the upper water column for a few weeks prior to settling in suitable habitat (medium to coarse sand). Spawning typically occurs during the late summer/fall months.

#### **2.2.4 Commercial Fisheries**

NAFO Unit Areas 3Li and 3Lt include the Study Area for the proposed drilling program. Within 3Li and 3Lt, the 2006 EA Report indicate that commercial fishing activity during 2003 to 2005 was dominated by snow crab, northern shrimp, and Stimpson surf clam. Within the Project Area, the crab fishery was the dominant fishery in the 2004 harvest (LGL Limited 2006). Snow crab is harvested with crab pots, a fixed gear. Within the Study Area, the crab fishery is concentrated along the eastern side of 200 mi EEZ. It typically occurs from April to August, with harvesting activity peaking in May and June.

#### **2.2.5 Marine Mammals and Sea Turtles**

There are 21 species of marine mammals that may occur in the Study Area, including 18 species of cetaceans and three species of seals that are known to occur in the area (LGL 2005). Baleen whales most likely to be found in the Study area include the blue (*Balaenoptera musculus*), fin (*B. physalus*), sei (*B. borealis*), humpback (*Megaptera novaeangliae*), minke (*B. acutorostrata*) and North Atlantic right whale (*Eubalaena glacialis*). Toothed whales include the sperm (*Physeter macrocephalus*), northern bottlenose (*Hyperoodon ampullatus*), Sowerby's beaked (*Mesoplodon bidens*), killer (*Orcinus orca*), long-finned pilot (*Globicephala melaena*) whales, the bottlenose (*Tursiops truncatus*), common (*Delphinus delphis*), Atlantic White-sided (*Lagenorhynchus acutus*), white-beaked (*Lagenorhynchus acutus*), Risso's (*Grampus griseus*), striped (*Stenella coeruleoalba*) dolphins, and the harbour porpoise (*Phocoena phocoena*). Seal species that are likely to occur in the area are the grey (*Halichoerus grypus*), harp (*Phoca groenlandica*) and hooded (*Cystophora cristata*) seals.

There are three species of sea turtles known to occur in the Project area. These include the Leatherback turtle (*Dermochelys coriacea*), the loggerhead turtle (*Caretta caretta*), and the Kemp's Ridley turtle (*Lepidochelys kempii*). The Leatherback turtle is listed as Endangered under Schedule 1 of the *Species at Risk Act* and the most likely to occur in the Study Area.

Primary sources of new information on marine mammal distribution and abundance in and near the Study Area include the results of environmental monitoring programs conducted in Jeanne d'Arc Basin and north of the Study Area in the Orphan Basin. Results are summarized in the 2006 EA Report and the 2007 EA Addendum. The data indicated that the most common odontocete in and near the Study Area is the long-finned pilot whale which likely occurs year-round. Common, Atlantic white-sided, and white-beaked dolphins also occur regularly in the Study Area mostly during summer months. Five species of mysticetes or baleen whales that are known or suspected to occur in the Study Area include the blue, fin, sei, humpback and minke whale. It is possible, but highly unlikely, that a North Atlantic right whale may occur in the Project. Harp seals are likely the most common phocid in the Study Area.

### 2.2.6 Marine Birds

The Grand Banks of Newfoundland have been identified as important habitat for many species of marine birds (LGL Limited 2006). Over 27 marine birds have been identified as occurring in the Study Area. These include species of *Alcidae* (Dovekie, Murres – Common and Thick-billed, Razorbill and Atlantic puffin), *Laridae* (Skuas – Great and South polar; Jaegers – Pomarine, Parasitic, and Long-tailed; Gulls – Herring, Iceland, Glaucous, Great Black-backed, and Ivory; Black-legged Kittiwake and Arctic Tern), *Sulidae* (Northern Gannet), *Hydrobatidae* (Wilson and Leach's Storm Petrels); *Phalaropodinae* (Phalarope – Red and Red-necked), and *Procellariidae* (Northern Fulmar, Cory's, Greater, Sooty and Manx Shearwaters). Information specifics can be found in the 2006 EA Report and 2007 EA Addendum.

The abundance and distribution of marine birds varies depending on the season. There is a pattern of increased bird numbers along the Continental Shelf edge on the northern and northeastern Grand Banks in the July to September and October to December period (2007 EA Addendum). For instance, the Northern Fulmar (*Fulmaris glacialis*) is common throughout the year, whereas the Greater Shearwater (*Puffinus gravis*) is common from May to October, and absent from December to April. Leach's storm petrels are common from April to October, whereas the Black-legged Kittiwake is most abundant from October to May. Dovekies are uncommon in the winter and absent in the summer. In its review of the 2006 EA Report, Environment Canada provided a list of updated scientific references for the operator to consult in preparing the 2007 EA Addendum. Husky Energy reviewed the literature and provided an update on the status of a number of species for the Study Area. They are presented in the 2007 EA Addendum.

### 2.2.7 Species at Risk

There are a number of Species at Risk, as defined under Schedule 1 of the *Species at Risk Act* (SARA) that are likely to be in the Project Area. The following table identifies the species likely to be present and their SARA and COSEWIC listing. SARA listed species are described below.

**Table 1 – Listing of SARA Species in Project Area**

Species	SARA Status	COSEWIC Status (Last Examination)
Blue Whale ( <i>Balaenoptera musculus</i> )	Schedule 1 - Endangered	
North Atlantic Right Whale ( <i>Eubalaena glacialis</i> )	Schedule 1 - Endangered	
Leatherback sea turtle ( <i>Dermochelys coriacea</i> )	Schedule 1 - Endangered	
Northern Wolffish ( <i>Anarhichas denticulatus</i> )	Schedule 1 – Threatened	
Spotted Wolffish ( <i>Anarhichas minor</i> )	Schedule 1 - Threatened	
Atlantic (Striped) Wolffish ( <i>Anarhichas lupus</i> )	Schedule 1 – Special Concern	
Ivory Gull ( <i>Pagophila</i> )	Schedule 1 – Special Concern	Endangered (May 2006)

Species	SARA Status	COSEWIC Status (Last Examination)
<i>eburnea</i> )		
Sowerby's beaked whale ( <i>Mesoplodon bidens</i> )	Schedule 3 – Special Concern (Pending public consultation for addition to Schedule 1)	
Atlantic Cod ( <i>Gadus morhua</i> ) (Newfoundland and Labrador population)		Endangered (May 2003)
Porbeagle Shark ( <i>Lamna nasus</i> )		Endangered (May 2004)
White Shark ( <i>Carcharodon carcharias</i> )		Endangered (April 2006)
Shortfin Mako ( <i>Isurus oxyrinchus</i> )		Threatened (April 2006)
Cusk ( <i>Brosme brosme</i> )		Threatened (May 2003)
Blue Shark ( <i>Prionace glauca</i> )		Special Concern (April 2006)
Harbour porpoise ( <i>Phocoena phocoena</i> ) (Northwest Atlantic population)	(Pending public consultation for addition to Schedule 1)	Special Concern (April 2006)
Fin Whale ( <i>Balaenoptera physalus</i> )	Schedule 1 – Special Concern	

LGL Limited (2006) reports that there is insufficient data to determine population trends of the Blue whale in the northwest Atlantic. In the north Atlantic, the population of the Blue whale may range from 600 to 1500 individuals. One known area of blue whale concentration, as reported by LGL (2006), is the Gulf of St. Lawrence where 350 individuals have been photographically catalogued. In the waters off Newfoundland, very little is known regarding their presence or distribution. LGL (2006) reports that there have been no confirmed sightings of blue whales in or near the Project Area based upon available data provided by DFO. There was, however, a sighting in the Study Area made in June 1993, approximately 270 km south of the Project Area. A Recovery Strategy is being developed under SARA.

The North Atlantic right whale is the most endangered species in the northwest Atlantic. The 1996 population estimates indicate that there are approximately 284 individuals.

Population estimates of Leatherback turtles are between 26,000 and 43,000 species worldwide (LGL 2006). Adult leatherback turtles are commonly sighted in the waters off Newfoundland from June to November, with peak abundance in August. Leatherback turtles have been caught incidentally during commercial fish harvesting in Newfoundland waters. Most of the captures occur near the 200 m isobath from June to November. It is possible that leatherbacks may occur in the Project Area, however to date, no sea turtles have been reported in or near the Terra Nova Development by observers on various platforms and during seismic monitoring programs in the area (LGL 2006). A proposed Recovery Strategy was released in June 2006.

It is assumed that wolffish occur in the Study Area. Northern wolffish is the deepest residing



species and Atlantic wolffish is the shallowest residing species. Based on DFO trawl surveys in Newfoundland and Labrador waters between 1971 and 2003 (2007 EA Addendum), northern wolffish were most concentrated during December to May in areas where depths ranged from 500 to 1,000 m, shifting to slightly shallower areas from June to November. Northern wolffish spawn in September, and the fish remain near their eggs to guard them. Spotted wolffish concentrations were highest in areas with water depths ranging from 200 to 750 m at all times of the year, peaking in 300 m areas from June to November. Spotted wolffish spawn during late summer and early autumn. Atlantic wolffish were most concentrated in areas with depths approximately 250 m at all times of the year.

The Ivory Gull, listed as Special Concern, may appear in low numbers in the Study Area. They are typically found on the edge of pack ice on the northern Grand Banks in late winter. LGL (2006) report that the global population of the Ivory Gull is less than 14,000 breeding pairs. Recent surveys in 2002 2003, 2004 and 2005 of historic breeding sites in the Canadian Arctic showed an 80% decline in the numbers of nesting Ivory Gulls.

The Study Area lies within the known range of the Sowerby's beaked whale. It occurs mainly in areas where water depth is 1000 m or more. None were observed during the 2004 monitoring program in the Orphan Basin and during the 2005 seismic monitoring program in the Jeanne d'Arc Basin. There was, however, one sighting of four Sowerby's beaked whale in September in 2500 m of water.

Husky Energy has indicated that they acknowledge the rarity of the species-at-risk and will continue to exercise due caution to minimize impacts on them and that due caution will also be extended to any other species added to Schedule 1 during the life of the Project.

### **2.3 Research Surveys, Vessel Traffic, Recreation and Tourism**

Vessel traffic with respect to fishing vessels is discussed in terms of amount of commercial fishing activity (see Section 2.2.4). DFO conducts scheduled fishery research surveys on the Grand Banks. The schedule for 2007 was not available at the time of completing the Screening Report. Based on 2006 survey season data it can be assumed that multi-species surveys will be undertaken in the 3LNO and 2J 3KLMNO areas in 2007. Prior to the commencement of construction activity, in any given year, Husky Energy will be required to communicate with DFO to avoid any potential conflict with research surveys that may be operating in the area.

## **Part C: Environmental Assessment Process**

### **3. Procedures**

In January 2006, Husky Energy submitted a project description "*Husky White Rose Development Project New Drill Centre Construction & Operations Program Project Description*" (Husky Oil Operations Limited 2006) to the C-NLOPB. This was in support of its application to undertake development of four new drill centres in the Jeanne d'Arc Basin over a five year period. The Project will require authorizations pursuant to Section 138 (1)(b) of the *Canada-Newfoundland Atlantic Accord Implementation Act* and Section 134(1)(a) of the *Canada-Newfoundland and*

*Labrador Atlantic Accord Implementation Newfoundland and Labrador Act*. The C-NLOPB, as Responsible Authority (RA), forwarded the 2006 EA Report on 15 September 2006 to the DFO, Environment Canada (EC), National Defence, Natural Resources Canada, provincial Departments of Environment and Conservation, Fisheries and Aquaculture, and Natural Resources.

Environment Canada responded on 14 March 2006 that the proposed project will require an ocean disposal permit pursuant to the *Canadian Environmental Protection Act* for the disposal of spoils associated with the construction of the drill centres. In addition, the Department of Fisheries and Oceans responded on 14 March and indicated that an authorization pursuant to Section 35(2) of the *Fisheries Act* will be required. Glory hole excavation activities will result in the harmful alteration, disruption or destruction of fish habitat (HADD), which is prohibited unless authorized by Fisheries and Oceans Canada pursuant to subsection 35(2) of the *Fisheries Act*. Authorizations are issued under the condition that acceptable measures for any habitat loss are developed and implemented. Therefore, the C-NLOPB, DFO and EC are RAs for the environmental assessment. The C-NLOPB is the Federal Environmental Assessment Coordinator for this Screening.

Pursuant to Section 5(1)(d) of the *Canadian Environmental Assessment Act* (CEA Act), the C-NLOPB, Environment Canada and Fisheries and Oceans are Responsible Authorities (RAs) and must undertake an environmental assessment of the Project. The project as proposed is described in the *Inclusion List Regulations* and therefore is subject to a screening level of assessment under the CEA Act.

In September 2006, Husky submitted the “*Husky White Rose Development Project: New Drill Centre Construction and Operations Program Environmental Assessment*” (LGL Limited 2006). The report provides an environmental assessment of the development of up to four new drill centres over a five year period. However, in order to address deficiencies in the EA report, and to address modifications to the project description Husky Energy was required to submit an environmental assessment addendum.

Comments on the EA Report were received from Environment Canada, DFO, Natural Resources Canada, Department of Fisheries and Aquaculture, Department of Natural Resources, Fish Food and Allied Workers Union, and One Ocean.

The EA Addendum was submitted on January 17, 2007. The “*Husky White Rose Development Project: New Drill Centre Construction and Operations Program Environmental Assessment Addendum*” (LGL Limited 2007) describes the development of up to five drill centres and addresses regulatory review comments on the 2006 EA report. Husky Energy is now proposing to drill up to five new drill centres from 2007 through to 2015. Drilling will occur from 2007 to 2015. Production operations associated with these five new drill centres would occur between 2009 and 2020.

The C-NLOPB forwarded the 2007 EA Addendum on 18 January 2007 to the DFO, EC, and the

provincial Department of Fisheries and Aquaculture. Comments were received from DFO and EC.

It is the obligation of the RAs to consider which physical works and undertakings in relation to the proposed project fall within the scope of the Project. First, there are no physical works that should be included in the scope of the Project. Second, if the Project were to proceed, as set out in the application and supporting EA report and addendum, it would constitute a single project for the purposes of section 15(2) of CEA Act. For the purposes of subsection 15(3) of CEA Act, the scoping exercise is complete because an assessment was conducted in respect of every construction, operation, modification, decommissioning, abandonment, or other undertaking proposed by Husky Energy that is likely to be carried out in relation to their proposed Project.

### **3.1 Scope of Project**

The operator, Husky Energy proposes to drill up to five new drill centres in three areas adjacent to the three drill centres currently active in the White Rose Field. Production operations associated with these five new drill centres would occur between 2009 and 2020. The temporal scope of the project is from 2007 through to the end of 2020. The timing of the various project phases is as follows: drill centre construction and TGB Installation from May to September; drilling and completions from January to December; subsea and flowline equipment installation and tie-ins from May to October; production operations year round; and abandonment as required. Concurrent drilling with existing drilling operations may occur.

Glory holes will be dredged using a TSHD vessel. Approximately 225,500 m<sup>3</sup> of seabed sediment per glory hole will be moved and disposed of at a previously designated disposal area located 3 km south-southeast of the current southern glory hole. No jack up drilling platform will be used. Husky Energy is proposing that initial construction operations will start with glory hole excavation at North Amethyst from May to September 2007. Construction of the SWRX drill centre is likely to commence in 2008 with drilling and subsea construction operations and tie-ins from these two drill centres to the SeaRose FPSO occurring over the 2007-2015 period. The number of wells that will be drilled in each of the five glory holes has yet to be determined and will depend on the results of delineation drilling. However, Husky has provided an estimate of 54 wells to be drilled within the five drill centres. The SWRX and NA drill centres will each support up to 16 wells, WWRX up to 18 wells and NWRX up to 4 wells.

The Project includes all ancillary activities in support of a construction and operation of drill centres, drilling activities, production operations and abandonment: a TSHD vessel, a MODU, marine support supply vessels, helicopter support, operation of shore-based facilities, and the undertaking of geotechnical, vertical seismic profiling, and geohazard/wellsite survey programs.

At the time of application for subsequent program authorizations or permits in the Study Area, Husky Energy will be required to provide information to the Responsible Authorities that outlines the proposed activities, confirms that the proposed program activities falls within the scope of the previously assessed program, and indicates if with this information, the EA predictions remain valid. In addition, Husky Energy will be required to provide information

regarding the adaptive management of requirements of the *Species at Risk Act* (SARA) into program activities (e.g., introduction of new species or critical habitat to Schedule 1; additional mitigations; implementation of recovery strategies and/or monitoring plans). If there are any changes in the scope of project, or information becomes available which may alter the EA conclusions, then a revised EA will be required at the time of authorization renewal. The Canadian Environmental Assessment Registry will be updated as required. In addition, there may be information requirements to satisfy permitting requirements related to project activities.

### 3.2 Boundaries

The boundaries of the Project as defined in the 2006 EA Report and 2007 EA Addendum are as follows and are acceptable to the C-NLOPB.

<b>Boundary</b>	<b>Description</b>
<b>Temporal</b>	Year-round from 2007 to 2015 for construction, drilling and pre-production activities. Year-round from 2009 to 2020 for production operations. After 2020 for abandonment activities.
<b>Project Area</b>	Where project activities will occur in any given year within SWRX (SDLs 1043 and 1044; EL 1045), North Amethyst (SDLs 1043 and 1044; EL 1045), WWRX (SDLs 1024, 1025, 1028; PL 1006), and NWRX (SDL 1028) (See Figure 1.2, LGL 2007)
<b>Study Area</b>	Based on the oil spill trajectory modeling conducted for the White Rose Oilfield Comprehensive Study (Husky 2000), and as defined in Figure 1.1 of the EA addendum (LGL 2007)..

For seismic programs (VSPs, geohazard/well surveys) undertaken, there would also be an area of influence from the sound array. However, depending on the marine species present, this area of influence will vary in size. Hearing thresholds have been determined for a number of species (seals and odontocetes), but the threshold is not known for others (baleen whales). The sound that is actually received by the marine species depends on the energy released from the source and its propagation (and loss) through the water column. Therefore, the hearing ability of the species and background noise will affect the amount of noise from an airgun array detected.

### 3.3 Scope of Assessment

For the purpose of meeting the requirements of the CEA Act the factors that were considered to be within the scope of an environmental assessment are those set out in subsection 16(1) of the CEAA and those listed in the “*White Rose Drill Centre Construction/Operation Program Scoping Document*” (C-NLOPB 2006).

## 4. Consultation

### 4.1 Consultation carried out by Husky Energy

Husky Energy, as reported in the 2006 EA Report and EA Addendum, contacted the following: Department of Fisheries and Oceans, Environment Canada, the provincial Dept. of Fisheries and Aquaculture and Dept. of Environment and Conservation, One Ocean, Fish, Food, and Allied

Workers Union (FFAW), Natural History Society, the Association for Seafood Producers, Fishery Products International, Groundfish Enterprise Allocation Council, Clearwater Seafoods Limited Partnership, and Icewater Harvesting. All consultations were held to inform the stakeholders about the proposed new drill centre development program and to identify issues or concerns that should be considered in the EA. The 2007 EA Report and EA Addendum state that none of the agencies, interest groups or fisheries industry officials contacted raised any major concerns or issues related to the proposed Project.

The RAs are satisfied that the consultations carried out by Husky Energy and reported on in the EA Report and Addendum, during the preparation of the environmental assessment included all elements of the Project. The RAs are not aware of any public concerns with respect to the environmental effects of the project, and does not require that further consultations be undertaken.

## **4.2 Consultations with other Federal Authorities and Other Government Departments**

In accordance with the CEA Act and the *Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements* and the C-NLOPB's environmental assessment procedures, various federal and provincial government departments were notified on 15 September 2006 regarding Husky Energy's proposed program. Regulatory Authorities and Federal Authorities were provided the 2006 EA Report for review and comment. The following agencies were notified:

Department of Fisheries and Oceans (DFO),  
Environment Canada,  
National Defence,  
Natural Resources Canada  
Newfoundland and Labrador Department of Environment and Conservation,  
Newfoundland and Labrador Department of Fisheries and Aquaculture, and  
Newfoundland and Labrador Department of Natural Resources.

DFO provided comments on 07 November 2006. DFO questioned the discussion provided in the EA Report regarding species at risk, physical environmental data, and project effects on marine mammals and sea turtles.

Environment Canada responded on 03 November 2006. Environment Canada provided several comments regarding Husky Energy's discussion on: pollution prevention and control, atmospheric emissions, effects on migratory birds, wind speed and wave height, ice and icebergs, and the effects of the environment on the project.

NR Can responded on 26 October 2006. They stated that approaches and issues for this project are similar to the original project and comments were provided at that time.

The Department of Fisheries and Aquaculture sent comments on 27 October 2006. They

questioned whether modelling for the zone of influence from glory hole excavation had been undertaken. They also requested clarification on reversible effects on fish species.

The FFAW responded on 27 October 2006. They requested further information on the Northern Cod and the effects of the environment on the project.

For the other agencies contacted, either no response was received, or they responded that they did not have any environmental assessment requirements for the proposed drilling program.

The C-NLOPB provided comments to Husky Energy on 17 November 2006 and asked for an addendum to address the comments.

The 2007 EA Addendum was provided to the C-NLOPB on 17 January 2007 and sent to the DFO, EC, and the Department of Fisheries and Aquaculture for review and comment. The Department of Fisheries and Aquaculture did not provide additional comments on the EA Addendum. However, the RAs required further clarification the following issues: discrepancies between the Development Application Amendment and the EA report, area of excavation per drill centre, Husky's chemical screening process, greenhouse gas emissions, and potential impacts to wolffish species, a Species at Risk.

Husky Energy submitted a response to the outstanding comments on April 4, 2007. Based on a review of this information the C-NLOPB, DFO and EC have completed their review of the environmental assessment report and have sufficient information to complete the screening report.

## **5. Environmental Effects Analysis**

### **5.1 Methodology**

The RAs (CNLOPB, EC, DFO) reviewed the environmental effects analysis presented by Husky Energy in the 2006 EA Report and the 2007 EA Addendum. The environmental assessment methodology and approach used by the Proponent are acceptable to the RAs. The following environmental effects analysis uses the information presented by the Proponent (in LGL Limited 2006 and LGL Limited 2007) and takes into consideration mitigation proposed by the Proponent and those required by the RAs, to assess the potential for residual environmental effects.

The potential adverse environmental effects, including cumulative effects, were assessed with respect to:

- magnitude of impact
- scale of impact (geographic extent);
- duration and frequency;
- reversibility; and
- ecological, socio-cultural and economic context, and

after taking mitigation measures into account,

- significance of residual effect.

The potential effect significance of residual effects, including cumulative effect, for each VEC is rated in this environmental screening report as follows.

- 0 = No Detectable Adverse Effect*
- 1 = Detectable Effect, Not Significant*
- 2 = Detectable Effect, Significant*
- 3 = Detectable Effect, Unknown*

Upon review of the information of the effects assessment presented by Husky Energy in the 2006 EA Report and 2007 EA Addendum, including proposed mitigations, the effects assessment follows.

## **5.2 Effects of the Environment on the Project**

The variable and sometimes harsh climate on the Grand Banks and the potential for sea ice and icebergs during the winter and spring months can pose significant challenges to drilling operations. Effects of the environment on the Project include those caused by geohazards, wind, ice, waves, currents and biofouling, particularly extreme events. The physical variables were described in the 2006 EA Report (LGL Limited 2006), the 2007 EA Addendum (LGL Limited 2007), and in the “*Climate of the Husky New Drill Centre*” report (Oceans 2006). Effects of the environment will be mitigated by state-of-the-art weather and ice prediction, timing, selection of suitable rigs, vessels, equipment and personnel. As part of its monitoring program, Husky will have marine weather observers on board the rig, observing weather on a 24 hour basis. Husky Energy has an active ice management plan for ongoing production activities and a similar plan will be submitted in fulfillment of requirements for the Board’s Drilling Program Authorization process. The ice management plan includes mitigations to prevent impacts from sea ice and icebergs during drilling activities. All these should ensure that effects from the environment can be minimized. Therefore the effects of the environment on the project will be **not significant**.

## **5.3 Presence of Structures**

Surface structures will include the dredging vessel and drill rig(s). Subsea structures will include diving vessels, glory holes, and subsea infrastructure (e.g. flow lines, umbilicals, subsea manifolds with control system components). The White Rose safety zone will require an increase in size. Presently, the White Rose safety zone is 49.2 km<sup>2</sup>. The safety zone will be modified as each drill centre is constructed. Therefore the final size of the safety zone cannot be determined until all five drill centres are completed.

### **5.3.1 Fish and Fish Habitat**

**1**

The presence of the structures and a safety zone may alter the local abundance and distribution of fish in the area. Alternatively, the safety zone and presence of the rig could have a potential positive effect on juvenile and adult fish by excluding other users from the area, including commercial fishers. It may also create a reef effect, whereby local populations of fish and benthos are attracted to the structures and become concentrated, thereby providing increased food and shelter for a more diverse assemblage of marine organisms. Safety zones would provide some protection against damage to the seabed by trawlers and shellfish dredges and

perhaps lower fish mortality from commercial fisheries. Increased predation by fish, which are attracted to the structures, and by invertebrate predators (such as starfish), which are attracted by the presence of epifaunal prey, may also cause changes in the benthic communities.

The reef effect, the exclusion zone and the temporary alteration of habitat would have a duration greater than 72 months, a low magnitude and medium (11-100 km<sup>2</sup>) geographic extent effect on fish populations with an overall effect on fish and fish habitat as **not significant**.

The cumulative effects of the new drill centre project and all other drilling activities on the Grand Banks is deemed to be **not significant** given the potential for recovery (Husky Energy 2006. Benthic Invertebrate Communities at the White Rose Sediment Disposal Site).

### 5.3.2 Marine Birds

1

The effect due to presence of structures on marine birds is most likely associated with lights and flares. The reef effect, as noted above, will likely see an increase in marine birds in the area due to an increase in prey abundance. See Section 5.4.2 for a discussion on the effects of lights and flares on marine birds. Environmental/Ice Observers are present on the drilling rigs and will conduct seabird and marine mammal observations on a daily basis in accordance with established protocols.

### 5.3.3 Marine Mammals and Sea Turtles

1

The physical presence of structures in the marine environment will have a negligible and **not significant** effect on marine mammals and sea turtles. However, noise related to the physical presence of structures, such as from the dredging vessel, drill unit, supply boats and VSP surveys might have an effect. See Section 5.7.3 for a discussion of the effects of noise on marine mammals and sea turtles.

### 5.3.4 Commercial Fisheries

1

The presence of structures and the corresponding safety zone during all five phases of the Project would prohibit commercial fishing activities in the project area. The exclusion zone around each well is very small compared to the entire fishing area of 3Li and 3Lt. As indicated in the EA, crab is the primary species harvested, with harvesting typically executed from May to July. Based on the information presented in the EA, there appears to be no large fishing aggregations in the Project Area. Husky Energy has indicated that all reasonable efforts will be made to accommodate fishing in the licence areas when activities are not occurring.

Husky Energy predicts that the effect of presence of structures on commercial fisheries will be of low magnitude, low geographic extent (1-10 km<sup>2</sup>) and of a duration >72 months. Overall, taking mitigation measures into consideration, Husky predicts the effects will be **not significant**.

Cumulative effects on fisheries could occur from operations at Hibernia, Terra Nova and White Rose, but the safety zones of the three projects will still not overlap and their additive cumulative effect will not exceed the *not significant* rating. Hibernia and Terra Nova have safety zones of 5.2 km<sup>2</sup> and 13.8 km<sup>2</sup>, respectively. The area of the current safety zone at White Rose is 49.2 km<sup>2</sup>, and will have to be increased to accommodate the new drill centres as they are developed.



In addition, since the zones will be located in areas where commercial fishing does not typically occur, it is not expected to have an effect on fish harvesters. Husky Energy predicts there would be no cumulative effect on commercial fisheries.

### 5.3.5 Species at Risk

1

There are a number of Species at Risk, as defined under Schedule 1 of the *Species at Risk Act* (SARA) that are likely to be in the project area. However, the presence of additional structures is unlikely to pose a risk to fish, marine mammals or sea turtles protected under SARA or listed by COSEWIC. Therefore, the impact on fish, marine mammal and sea turtle species at risk is considered to be **not significant**.

## 5.4 Lights and Flares

The dredging vessel, drill rig, FPSO, and supply and standby vessels will all be equipped with navigation and warning lights. Working areas will be illuminated with floodlights and drill rigs may conduct flaring for short periods during testing. Flaring during production operations can occur up to a maximum of 144 months over the 12 year period.

### 5.4.1 Fish and Fish Habitat

0

Fish may be attracted to illuminated surface waters, due to the use of floodlights and flaring in working areas. The effect would be negligible and **not significant** due to the small area affected. The magnitude, geographic extent and duration of the potential effects on fish are negligible, 1-10 km<sup>2</sup>, and >72 months (2009-2020). Lights will be used during all five-project phases and there is potential for temporal overlap of this activity in different phases. However, they will not be large enough to change the overall effects rating and therefore there will be no cumulative effect.

### 5.4.2 Marine Birds

1

The illumination of rigs and supply vessels on the Grand Banks may attract night migrating and other night-active marine birds to the structures. In particular, nocturnal seabirds, such as Leach's Storm-petrels, may be at risk of attraction to offshore lights, particularly during their fall migration to offshore wintering grounds. The attraction of birds may result in some strandings on the rig. There is potential for flaring to interact with marine birds during the drilling and production operation phases of the Project. While this activity is relatively infrequent and of short duration on a per event basis during the drilling phase, flaring during the production operation phases is continuous. However, the heat and noise generated by the flare may deter marine birds from the immediate area.

In terms of stranded birds, Husky has committed to a recovery and release program for the rig and supply boats, consistent with the requirements of the Canadian Wildlife Service. Husky has indicated that the environmental officer on board the rig will also be responsible for monitoring and observing seabirds and marine mammals in the area, using established protocols. Recent seismic monitoring studies in the Jeanne d'Arc and Orphan Basins have shown that Leach's Storm-Petrels regularly strand on seismic ships and appear to be attracted to the ship's lighting (LGL Limited 2006). However, with proper mitigation measures in place, most petrels were released in good condition.

Lights are expected to interact with marine birds during all five phases of the new drill centre project. Flaring is expected to interact with marine birds during the drilling and production phases of the Project. The effect on birds from lights and flaring is low and likely. However, given the mitigation of recovery and release, the effects on seabirds will be low in magnitude, with a 10-100 km<sup>2</sup> in geographic extent for lights and a 1-10 km<sup>2</sup> for flaring, and >72 months in duration resulting in a **not significant** effect.

Cumulative effects are not expected to exceed those expected for individual oil development sites. Once the new drill centres are developed, there will be no additional lighting over what is currently at White Rose. The effects on seabirds regarding lights and flares for Terra Nova and White Rose production facilities were determined to be not significant in each of the projects environmental assessments. The implementation of mitigations at Terra Nova and White Rose facilities, as well as on seismic vessels operating to the north would reduce any cumulative effects associated with strandings. Cumulative effects therefore are **not significant**.

#### **5.4.3 Marine Mammals and Sea Turtles**

**0**

It is possible that lights and flares associated with vessels and rigs may attract prey for marine mammals. However, given the small areas where this may happen (<1 km<sup>2</sup>), the effects on marine mammal and sea turtles are negligible and therefore, the effects of lights and flaring on marine mammals and sea turtles are considered to be **not significant**.

#### **5.4.4 Commercial Fisheries**

**0**

There should be no impact on commercial fisheries due to lights and flares.

#### **5.4.5 Species at Risk**

**0**

As in the case of populations of marine mammals and sea turtles, the effect of light from structures and flaring is predicted to be minimal for individual fish, marine mammals, and marine bird species at risk. Therefore, the effects are considered to be **not significant**.

### **5.5 Construction of Drill Centres**

The glory hole(s) needed to support establishment of the drill centres will be excavated to a maximum of 11m below existing seabed level in order to protect the subsea wellheads and templates from iceberg scour. For the North Amethyst drill centre the maximum dimension will be 65m x 50m with four graded sloped sides (either 1:3 or 1:5) for a total area of 20,300 m<sup>2</sup>. The final size of subsequent glory holes will be determined at the final design stages for each drill centre. Approximately 225,500 m<sup>3</sup> of seabed sediment per glory hole will be moved and dumped at a previously used dumpsite located approximately three kilometres south-southeast of the current southern glory hole. The removal of sediment from one Glory Hole represents <0.0002% of the Project Area. Concrete mattresses or impact resistant plastic sleeves at flow exits from the glory holes will protect the flow lines from drill rig anchor chains. It is not planned to bury flow lines in the seabed.

#### **5.5.1 Fish and Fish Habitat**

**1**

The area of each glory hole is relatively small (equivalent to <0.0002% of the Project Area).

The spoil area used for the original project will be used again for sediment deposition and the sandy nature of the sediment will minimize the amount and duration of sediment suspension in the water column. The magnitude, geographic extent and duration of the potential effects of sediment excavation on fish and fish habitat are low, <1 km<sup>2</sup> and 1-12 months (2 months per glory hole; 10 months maximum). DFO has concluded that the glory hole excavation activities will result in the harmful alteration, disruption or destruction of 101,500 m<sup>2</sup> of fish habitat (HADD). Fish habitat compensation was identified as an option to mitigate the loss of productive habitat associated with the undertaking. As a result, in consultation with DFO, the proponent has developed a compensation strategy and resultant compensation plan, to mitigate the loss of habitat. As part of any finalized compensation requirements, the proponent will also be responsible for providing a detailed monitoring plan to assess the success of the compensation measures. The submission of the compensation plan, including monitoring requirements, is a requirement prior to issuing a subsection 35 (2) Fisheries Act Authorization. Following such mitigation, the potential residual effects of the construction of drill centres on fish and fish habitat are considered to be **not significant**.

Cumulative effects of drill centre construction would be **negligible** for fish and fish habitat due to the fact that no overlap of glory hole excavations is expected to occur during the new drill centre Project.

#### **5.5.2 Marine Birds**

**0**

There should be no effect on marine birds due to the construction of drill centres. Therefore, cumulative effects from construction of drill centres on marine birds are predicted to be **not significant**.

#### **5.5.3 Marine Mammals and Sea Turtles**

**0**

The effects from the construction of drill centres on marine mammals and sea turtles would be negligible to low in magnitude, <1 km<sup>2</sup> in geographic extent and 1-12 months in duration. The predicted effect would be **not significant**. Cumulative effects with respect to other activities on the Grand Banks are considered negligible.

#### **5.5.4 Commercial Fisheries**

**0**

The effects on the commercial fishery will be low in magnitude, <1 km<sup>2</sup> in geographic extent and 1-12 months (2 months per glory hole (10 months maximum) in duration. The effect would be negligible and not significant due to the small area affected.

Cumulative effects from construction of drill centres on commercial fisheries are predicted to be **not significant**.

#### **5.5.5 Species at Risk**

**1**

If due caution is exercised and mitigations as proposed are followed, then effects from the construction of drill centres on fish, marine mammals, sea turtles and marine birds protected under SARA or listed by COSEWIC are considered to be **not significant**.

## 5.6 Subsea Infrastructure, Installation and Tieback to FPSO

Development of the new drill centres may entail tying back to the FPSO through existing drill centres via new production flowlines or the new drill centres may be tied back directly to the SeaRose FPSO. In the event that new drill centres are tied back through existing drill centres, it will be necessary to disconnect valves and sections of pipework from the subsurface manifolds in the existing drill centres. Prior to disconnecting the existing manifold pipework, the complete drill centre production flowline system will be depressurized and all production fluids (i.e., oil and gas) will be flushed from the manifold and flowline system. To assist in the removal of oil emulsions from the surface of the flowlines and manifold pipework, a dilute surfactant may be added to the water during the flushing operation. Despite the flushing operations, small amounts of oil may remain trapped in the flowline carcass and manifold piping cavities. As a result, a small amount of oily residue may be released to the environment. The pipework will be open for approximately two to four hours until the replacement pipe spools are connected to the exposed manifold flanges. The amount of oily residue released is not anticipated to exceed  $0.3 \text{ m}^3$ . The flowline will be flushed in order to minimize the oily discharge. Once tie-in is complete, the system will be brought back into service through the existing infrastructure at the FPSO.

If it determined modifications or upgrades to the FPSO are required, all work will be undertaken at an existing shore-based fabrication facility.

### 5.6.1 Fish and Fish Habitat

0

Considering the relatively small amount of oily residue discharged ( $0.3 \text{ m}^3$ ), mitigation such as flushing flowlines, and the infrequency of discharge, the effects of oily residue discharge on fish habitat would be negligible in magnitude,  $<1 \text{ km}^2$  in geographic extent and  $>72$  months in duration with a **not significant** effect on fish and fish habitat.

The cumulative effects of the subsea infrastructure installation and tieback to FPSO and all other activities on the Grand Banks is deemed to be **not significant** considering the small amount of oily residue that will be discharged.

### 5.6.2 Marine Birds

1

Considering the relatively small amount of oily residue discharged ( $<0.3 \text{ m}^3$ ), the short period of release and the near-bottom release, the effects of discharges on marine birds are expected to be negligible in magnitude,  $<1 \text{ km}^2$  in geographic extent, and  $>72$  months in duration with a **not significant** effect.

The combined discharge of oily residue from all offshore oil development sites on the Grand Banks will have the same potential effects rankings as those predicted for the project alone and result in negligible cumulative effects.

### 5.6.3 Marine Mammals and Sea Turtles

0

There should be no interaction between marine mammals and sea turtles and the subsea infrastructure installation and tieback to FPSO.

#### 5.6.4 Commercial Fisheries

0

As indicated above, there will be no significant effect on fish populations. Therefore, the magnitude of effects on commercial fisheries will be **not significant** with a low magnitude, a <1 km<sup>2</sup> geographic extent, and a duration of <1 month. Cumulative effects will be **not significant** given the lack of harvesting recorded in areas close to most project activities.

#### 5.6.5 Species at Risk

0

The subsea infrastructure installation and tieback to FPSO is predicted to be not significant for populations of fish, marine mammals, sea turtles and marine birds. The effect on individual fish, marine mammal, sea turtle and marine bird species at risk is also considered to be **not significant**.

### 5.7 Noise

Underwater noise may be caused by supply/support boats, drilling rig machinery and thrusters, dredging vessel, echo sounders, seismic energy associated with the conduct of VSP surveys and wellhead severance using chemical explosives. Air-borne noise is normally associated with helicopters servicing the drill rig.

#### 5.7.1 Fish and Fish Habitat

1

Noise will occur during all five phases of the project and can potentially affect all life stages of fish. Fish vary widely in their ability to hear sounds. In general, most fish show avoidance reaction to underwater noise and the avoidance reaction varies depending on the species, life history stage, behaviour, time of day, whether the fish have eaten, and the water's sound propagation characteristics (LGL Limited 2006). Husky Energy predicts the effects will be low in magnitude, with a geographic extent of 1-10 to 11-100 km<sup>2</sup> and duration of 72 months and therefore **not significant**.

Noise will be generated during geotechnical surveying for Glory Hole excavation. Due to the short timeframe of this activity, Husky Energy predicts the effect will be **not significant**.

Noise is produced by all activities occurring on the Grand Banks. Cumulative impacts of noise on fish will be **negligible** given the fact that most fish are able to move away from any noise source before any chance of a physical effect. While eggs and larvae do not have the same capability of avoiding a noise source, it seems that exposure to very high sound energy levels is required before damage is done to these early life stages (LGL Limited 2006).

#### 5.7.2 Marine Birds

0

Personnel and supplies will be transported to and from offshore structures via helicopter with flights occurring approximately six times per week. However, the addition of extra glory holes will not increase helicopter travel during normal production and drilling. The presence of helicopters would occur in all five phases of the project. There is concern of aircraft flying over colonies of seabirds, which may cause a panic response and result in eggs and flightless young being pushed off cliff edges. Helicopters, stationed in St. John's, will fly a direct path from the airport in St. John's to the project area, and generally will not come in contact with seabird colonies. As mitigation, aircraft will be directed to avoid colonies of seabirds, and will be

instructed to avoid repeated overflights of concentrations of birds and their habitat. During all flights, the helicopters and aircraft will fly at minimum altitudes of 600 m whenever possible. In addition, aircraft will not come within eight km seaward and 3 km landward of major seabird colonies from April 1 to November 1. As well, supply vessels will maintain adequate distances (two km) from any seabird colonies. Therefore, effects of noise from helicopters and supply vessels will be negligible and **not significant**.

Birds, which spend time underwater foraging, may be affected if they dive within a few metres of the airgun. Murres and shearwaters may be potentially the most sensitive group due to their time spent underwater diving for food, and can reach great depths (up to 100 m below water). Noise produced by VSP is primarily a concern for biota occurring below the water's surface. Ramp up of the VSP array would likely scare birds from the area. Effects of seismic activity on marine birds are predicted to be of low magnitude, with a small geographic extent of 11-100 km<sup>2</sup>, and >72 months in duration. Therefore, the environmental effect is not likely and **not significant**.

Cumulative effects from sound produced from these sources on marine birds are predicted to be **not significant**.

### 5.7.3 Marine Mammals and Sea Turtles

1

There is a concern with the noise produced by supply ships, boats, helicopters, and dredging and drilling activities on marine mammals and sea turtles, as they depend on the underwater acoustic environment to communicate and to gain information about their surroundings. Sediment excavation via a suction-hopper dredge will occur only during the glory hole excavation/TGB installation phase of the project. Drilling noise will be present throughout the drilling phase of the project for a maximum duration of 48 months. Support vessels will be present for all phases of the project as well as regular supply boat trips per week (e.g., 18 trips per well during the drilling phase) to the project site. Helicopters will be used regularly during all project phases except abandonment but mostly during production operations (144 months). This will be the same level of activity at the current operating White Rose project. The VSP (and geohazard) activities are typically less than those associated with typical, full-scale seismic surveys. The duration of VSP activities will be two days per well. In addition, the effects of the 3-D seismic surveys in the Jeanne d'Arc Basin were assessed as being not significant.

The passage of marine vessels may also affect marine mammals and sea turtles. For the duration of the drilling program, the effects from ships are likely to be negligible to low, of a duration of >72 months, and within an area of 1-10 km<sup>2</sup>. Effects may be reduced by supply boats maintaining a steady course and speed, and avoiding areas with large numbers of whales. Overall, the effects are **not significant**.

Low flying aircraft could cause low magnitude effects on marine mammals and sea turtles in the water. Helicopters will fly at an altitude of 600 m and are prohibited from flying over wildlife for passengers to view. These effects are predicted to be negligible to low, with a duration of >72 months, in an area of 1-10 km<sup>2</sup> and therefore **not significant**.

For seismic surveys, it is predicted that the overall effect on marine mammals and sea turtles will be less than that from a typical 2D or 3D seismic survey, given the smaller array, reduced duration, and area covered. The Lewis Hill EA provides references for a number of reports that predict that there would not be significant impact of seismic surveys on marine mammals or sea turtles. In order to further reduce effects to marine mammals and sea turtles, Husky will implement the following mitigation measures during the conduct of VSPs:

- ramp up of airguns over a 20-40 minute period prior to conduct of survey;
- trained observers will be used aboard the rig or supply vessel to monitor for marine mammals and sea turtles 30 minutes prior to ramp-up;
- if marine mammals/sea turtles are spotted within 500 m of the array, ramp-up will not commence until the animal has moved outside the 1000 m zone;
- the observer will monitor for marine mammals and turtles when the source is active and note location and behaviour; and
- the airgun(s) will be shut down if a SARA listed endangered marine mammal or sea turtle is sighted within 500 m of the airgun(s).

In addition, during the conduct of VSP surveys, the Board will require that the Operator implement the mitigations outlined in the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (2004) and implement a 500 m monitoring zone. Based on the information presented above, and the mitigations proposed, effects are predicted to be negligible to low, for a limited duration (1-12 months), and in an area of 1-10 km<sup>2</sup> to 11-100 km<sup>2</sup>. Therefore, the effects on marine mammals or sea turtles will be **not significant**.

Oil and gas activities ongoing on the Grand Banks include production operations at Hibernia, Terra Nova, and White Rose. Supply vessels transiting from St. John's to the production and drilling facilities offshore (300 trips per year). There are approximately 156 trips by oil tankers from the production facilities. In 2007 there will likely be 2-3 drill rigs operating in the Jeanne d'Arc Basin area, and 1 seismic operation. In addition there will be seismic program ongoing in waters to the north of the Project Area. Commercial traffic (tankers, cargo ships, bulk carriers, and container ships) in Newfoundland waters account for approximately 3300 transits per year. Fishing vessel trips to NAFO area 3L account for approximately 20,000 transits per year. Locally, there may be an incremental increase in noise levels but the cumulative effects will be **not significant**.

#### 5.7.4 Commercial Fisheries

0

As indicated above, there will be no significant effect on fish populations. Therefore, the magnitude of effects on commercial fisheries will be **not significant** with a low magnitude, a 1-10 to 11-100 km<sup>2</sup> geographic extent, and a duration of >72 months. Cumulative effects will be **not significant** given the lack of harvesting recorded in areas close to most project activities.

#### 5.7.5 Species at Risk

1

If due caution is exercised and mitigations as proposed are followed as presented for populations of mammals and sea turtles, particularly for seismic and VSP activities, then effects of noise on

individual fish, marine mammals, sea turtles and marine birds protected under SARA or listed by COSEWIC will be reduced and thus considered to be **not significant**.

## 5.8 Atmospheric Emissions

Air emissions will occur during all phases of the project. The potential emissions from offshore drilling include

- burning of well fluids during production tests and clean-ups
- engine, generator and heating exhausts from the dredging vessel, drilling rig, helicopters and supply vessels
- mud, degassing and other mudroom exhausts; and
- fugitive emissions

The air emissions of offshore drilling activities are within the range of those of fishing vessels, tanker traffic, and military vessels that routinely transit eastern Canadian waters. The offshore environment is windy and air emissions disperse quickly from the installations. Equipment will be similar in emissions to other industrial equipment in routine use, will be within the range of what is occurring now offshore, and mitigations will be employed. Fugitive emissions will be minimized through implementation of best management practices and preventative maintenance measures.

The quantity of air emissions from the existing White Rose area is calculated and provided annual to the C-NLOPB as per the OWTG (2002) and to the National Pollutant Release Inventory. The 2006 emissions estimates, provided by Husky Energy, for the Criteria Air Contaminants associated with the existing project are provided in the following table.

**Table 2 - Criteria Air Contaminant (CAC) estimates for 2006 (based on NPRI reporting requirements)**

CAC	Quantity	Unit
Sulphur Oxides (SO <sub>2</sub> )	below reportable thresholds	tonnes
Nitrogen Oxides (NO <sub>X</sub> )	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 <sub>10</sub> )	702.10	tonnes
Particulate Matter ≤ 2.5 microns (PM <sub>2.5</sub> )	702.10	tonnes

In addition, the proponent has categorized the 2006 emissions by source (see Table 3) and will consider this information in its efforts to minimize releases through application of appropriate best management practices. Husky Energy, for planning purposes for the EA review, provided the 2007 emissions estimates (see Husky 2007).

**Table 3 – 2006 Emission Estimates by Source (Husky 2007).**



Source	NO <sub>x</sub> (tonnes)	CO (tonnes)	VOC (tonnes)	TPM (tonnes)	PM <sub>2.5</sub> (tonnes)	PM <sub>10</sub> (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

### 5.8.1 Fish and Fish Habitat

0

In general, emissions of potentially harmful materials will be small and of short duration and will rapidly disperse once released to undetectable levels. Effects on fish and fish habitat from atmospheric emissions will be low, with a geographic extent 1-10 km<sup>2</sup>, and a duration >72 months and therefore **not significant**. Cumulative effects will be negligible.

### 5.8.2 Marine Birds

0

The effects would likely be minimal because emissions of potentially harmful materials will be small and rapidly disperse to undetectable levels. Effects on marine birds from atmospheric emissions are predicted to be negligible in magnitude, 1-10 km<sup>2</sup> in geographic extent, and >72 months in duration resulting in a **not significant** effect.

Potential cumulative effects of atmospheric emissions released from the three oil development sites and their supply ships, seismic vessels, fishing vessels, and other ships in the study area will be **negligible** for marine birds. Emissions are not expected to be detectable beyond the immediate area of discharge, as they will rapidly disperse due to their volatility, temperature of emission and the exposed and often windy nature of the Grand Banks.

### 5.8.3 Marine Mammals and Sea Turtles

0

There should be no interaction between marine mammals and sea turtles and atmospheric emissions.

### 5.8.4 Commercial Fisheries

0

There should be no interaction between commercial fisheries and atmospheric emissions.

### 5.8.5 Species at Risk

0

There should be no interaction between atmospheric emissions and fish, marine mammals and sea turtles considered at risk. Therefore, the effect on species at risk is considered to be **not significant**.

## 5.9 Discharge of Drilling Muds and Cuttings

The discharge of drilling muds and cuttings will occur during the drilling phase of the project. Husky Energy is proposing to use water based (WBM) and synthetic based muds (SBM) for its drilling program. WBM, comprised primarily of water, bentonite (clay) and barite, will be directly discharged to the seafloor when drilling the initial sections of the hole, after that cuttings

will be discharged from the rig at surface. When SBMs are used, all cuttings are treated in accordance with the *Offshore Waste Treatment Guidelines* (NEB 2002) prior to discharge. The muds are recycled and returned to shore for on-land disposal. The total quantity of mud and cuttings that would be deposited on the seabed would be on the order of 230 m<sup>3</sup> per well. This will cover an area of the seabed of about 0.8 km<sup>2</sup> to a thickness of one cm or greater.

Fifty-four wells will be drilled during the 60-month period in different glory holes. 500 m is assumed to be the radius of each well's biological zone of influence (ZOI) (i.e. potential smothering due to a minimum of one-centimetre thickness of deposited cuttings and mud). Given that the overall dimensions of each glory hole will be estimated to be 175m x 116m, there will be 100% overlap of the ZOIs of adjacent wells within a single glory hole. Therefore, the ZOI associated with each glory hole would have an area of approximately 20 km<sup>2</sup>. Including the ZOIs of the 19 existing wells in the three existing glory holes increases the total ZOI area to 6.24 km<sup>2</sup>, equivalent to <1.6% of the area of the project area. Since the wells will be drilled on the floor portion of each glory hole, which is approximately 11 m below the surface of the ocean substrate, it is likely that much of the mud and cuttings deposition will occur within the glory holes (175 m x 116 m including sloped ramps). Deposition from adjacent wells in any single glory hole will accumulate vertically (i.e., overlap of individual well biological ZOIs). Given the almost complete overlap of well ZOIs in each glory hole, the occasional occurrence of concurrent drilling is insignificant in terms of cumulative effects.

#### **5.9.1 Fish and Fish Habitat**

##### **1**

The primary effects associated with the discharge of muds and cuttings is the smothering of benthos, toxicity (based on chemical constituents of the mud) and bioaccumulation. In modelling exercises conducted by Husky for the White Rose Comprehensive Study, whereby the fate of cuttings and muds were estimated from a discharge point at the center of the drill location, for cuttings the area covered would be approximately 0.2 km<sup>2</sup>. The maximum thickness of deposition would be approximately 10 mm within a 200 m radius of the well. The 2006 EA Report indicates that smothering of benthos will occur if the thickness of the deposition layer is greater than 1 cm. Literature cited in the EA report indicates that within months to years, benthos would recover once drilling stopped.

Water based muds are generally non-toxic. The primary additives are bentonite, barite and potassium chloride, with seawater as the main component. Chemicals, such as caustic soda, viscosifiers and shale inhibitors, are added to control mud properties. Husky reports that many of the metals present in WBM are not in a bioavailable form and there have been few, if any, biological effects associated with the metals from these discharges.

The SBMs to be used by Husky Energy are non-toxic, and they have the potential to biodegrade rapidly (LGL Limited 2006). SBMs typically require less mud for the same distance drilled and the discharged cuttings tend to clump together, resulting in less dispersion from the drill hole. All SBM cuttings will be treated in accordance to the OWTG prior to discharge.

It is predicted that the area of impact from SBM and cuttings depositions would be less than 1

km<sup>2</sup> for a multi-well program from a single drill centre, based on analysis used during the White Rose Comprehensive Review. The 2005 White Rose EEM results (Husky 2006) show an estimated zone of influence from the nearest drill centre between 6 and 7 km, with the greatest concentration up to 750 m from the drill centre.

Through its Offshore Chemical Management System, Husky Energy has indicated that it will ensure compliance with the most recent guidance published under the *CEPA*, including information gathering requested under EC's New Chemical Management Plan (e.g., the EC Challenge program). At this stage, the Proponent has confirmed that it is not using any of the 15 substances identified to date under the EC Challenge program. The Proponent will continue to monitor the challenge initiative and adopt chemical-specific risk management measures resulting from the initiative as applicable, including adoption of recommended best management practices. Information on the program, and updates, are accessible at [http://www.ec.gc.ca/CEPARRegistry/subs\\_list/dsl/s1.cfm](http://www.ec.gc.ca/CEPARRegistry/subs_list/dsl/s1.cfm). The proponent has indicated that it will ensure all chemical contractors comply with the EC Challenge program and resulting risk management measures through their Contractor Management System, which includes regular scheduled audits.

Based on mitigations indicated in the EA (e.g., cuttings treatment, chemical screening, compliance with 2002 OWTG) and the predicted recolonization of benthic species in the cuttings deposition area, the predicted effects of drilling muds and cuttings on fish and fish habitat will be a low magnitude, with a geographic extent <50 km<sup>2</sup>, and a duration between 37-72 months. Therefore, the effects will be **not significant**.

Currently there are three oil fields in production on the northeast Grand Banks. Drilling activities are ongoing in association with these programs. However, given the relatively small area potentially affected by each well relative to the total Grand Banks area and the apparent short duration of the smothering effect and the potential for recovery, cumulative effects are predicted to be **not significant**.

### 5.9.2 Marine Birds

0

There is concern that the discharge of cuttings will produce a sheen on the water, thereby creating the potential for oiling of marine birds. The drilling program is using WBM and SBM, where required. Sheens are not likely associated with the discharge of WBM. For SBM, if they are used, mitigations such as treatment prior to release, and release of cuttings below surface, will reduce likelihood of sheens on the water surface. Therefore, the discharge of drill muds and cuttings are expected to be low in magnitude, <1 km<sup>2</sup> in geographic extent and 37-72 months in duration resulting in a **not significant** effect on marine birds.

Cumulative effects, associated with other offshore facilities, will be negligible and **not significant**. There is little chance seabirds will interact with muds and cuttings; there is no likely pathway for significant exposure, and little chance that heavy metals will bioaccumulate to harmful levels.

### 5.9.3 Marine Mammals and Sea Turtles

0

The deposition of muds and cuttings on the seafloor are unlikely to produce concentrations of heavy metals. LGL (2006) state that none of the marine mammals that regularly occur in the project area are known to feed on benthos in the area. Therefore, effects from deposition of drill muds and cuttings will be negligible, over a duration of 37-72 months, in an area  $<1 \text{ km}^2$  and therefore **not significant**. Given the relatively small area potentially affected by each drill centre relative to the total Grand Banks area, and the apparent short duration of smothering effect on benthos (LGL 2006), cumulative effects will be **not significant**.

### 5.9.4 Commercial Fisheries

0

As indicated above, the effect of fish and fish habitat from drill cuttings deposition is not significant, therefore the effect on commercial fisheries will be **not significant**. There will be no cumulative impact.

### 5.9.5 Species at Risk

0

The discharge of drill cuttings is predicted to be not significant for populations of fish, marine mammals, sea turtles, and marine birds. The effect on individual fish, marine mammal, sea turtle, and marine bird species at risk is also considered to be **not significant**.

## 5.10 Operational Discharges

Discharges associated with drilling include cement slurry and blowout preventer (BOP) fluid. Wastes and discharges from the rig include deck drainage, cooling water, sanitary and domestic waste, garbage and other solid waste, ballast water, bilge water, and produced fluids. All wastes will be treated in accordance with the OWTG prior to discharge. Solid wastes, such as garbage, will be shipped to shore for proper disposal or recycling. Combustible materials such as oily rags and paint cans will be placed in separate hazardous materials containers and transferred ashore. Husky indicated in the EA that it will implement an offshore chemical management system (OCMS) to screen all chemicals intended for use on the rig.

Produced water will be released during production operations. The current estimate of the amount of produced water to be discharged is  $22,000 \text{ m}^3/\text{day}$ . The total amount of produced water previously assessed in the White Rose Comprehensive Study was  $30,000 \text{ m}^3/\text{day}$ . The total daily limit for the Project will not exceed this amount. Maintaining less than  $30,000 \text{ m}^3/\text{day}$  will be achieved by new wells coming on stream producing little or no water for the first few years and older wells that are producing larger volumes of water reaching the end of their productive life. All produced water will be treated to less than  $30 \text{ mg/L}$  and discharged as per the OWTG.

### 5.10.1 Fish and Fish Habitat

0

It is predicted that for each well, approximately  $26.4 \text{ m}^3$  of excess cement will be released to the marine environment. The discharge will result in the local smothering of benthos, but according to the EA, literature suggests that the cement will act as an artificial reef, and may be colonized by epifaunal animals and attract fish. The effect, while negative, is negligible in magnitude,  $<1 \text{ km}^2$  in geographic extent and  $>72$  months in duration resulting in a **not significant** effect.

The blowout preventer is required to undergo periodic testing, during which approximately 1 m<sup>3</sup> of BOP fluid is released. Husky indicated that glycol-water mixes, with low toxicity will be used. The release of the BOP fluid will be negligible in magnitude, <1 km<sup>2</sup> in geographic extent and 37-72 months in duration resulting in a **not significant** effect.

Cooling water will be released after being treated with chlorine for anti-fouling purposes. Deck drainage and bilge water would be collected and treated to 15 mg/L or less and discharged as per the OWTG. Ballast water is stored in dedicated tanks however if oil is suspected then it would be tested and, if necessary, treated so that oil concentrations in the discharge do not exceed 15mg/L, as required by the current OWTG. Sanitary waste will be macerated to a particle size of 6 mm or less as per the OWTG. Food waste will be compacted and shipped ashore in containers. The effects would be negligible in magnitude, <1 km<sup>2</sup> in geographic extent and >72 months in duration resulting in a **not significant** effect.

Produced water discharges up to a maximum of 30,000 m<sup>3</sup>/day were assessed in the White Rose Comprehensive Study and determined to have no significant effect. Discharges of produced water will not exceed this maximum amount therefore the effect will be **not significant**.

As indicated above, all chemicals will be screened through Husky's OCMS, and all discharges will be treated in accordance with the 2002 OWTG prior to discharge. Therefore, overall, the effect on fish and fish habitat will be **not significant**.

#### 5.10.2 Marine Birds

1

In compliance with the OWTG, sanitary waste from the rig will be macerated to 6 mm and will be released at a depth of about 14.5 m at normal operating ballast. There is concern that seabirds, particularly gulls, will be attracted to the particles. Husky indicated that the small amount discharged below surface over a limited period of time will be unlikely to increase the gull population offshore. Associated with an increase in gull population is the possibility of an increase in gull predation on Leach's Storm Petrels. However, as indicated, there should not be an increase in offshore gull populations; therefore the impact on Leach's Storm Petrels should be minimal.

Husky predicts that the effects of discharge of sanitary waste will be low and of short duration. The effects from other operational discharges are negligible (LGL 2005). Other discharges, particularly oily waste and bilge water may cause sheening on the water surface. However, as indicated previously, all discharges are treated prior to release and discharged at-depth, thereby reducing potential for sheening. The overall effect of operational discharges on seabirds will be negligible in magnitude, <1 km<sup>2</sup> in geographic extent, and >72 months in duration with a **not significant** effect.

All rigs, production platforms, supply vessels and seismic vessels, treat operational discharges prior to discharge in compliance with regulations and guidelines. The combined discharge of the fluids and solids from all offshore oil development sites on the Grand Banks will have the same

potential effects rankings as those predicted for the Project alone. The treatment of discharges will result in negligible cumulative effects on seabirds and will be **not significant**.

### 5.10.3 Marine Mammals and Sea Turtles

0

Operational discharges from the rig should have a negligible and **not significant** effect on marine mammals and sea turtles. Cooling water discharges will be chlorinated to a level of 1-2 mg/L chlorine and discharged at 30°C above ambient. A low volume of water will be discharged and the area of thermal effects will be small. Therefore, cooling water discharge effects will be negligible in magnitude, <1 km<sup>2</sup> in geographic extent and >72 months in duration with a **not significant** effect. Treatment of all discharges for all production facilities and rigs operating on the Grand Banks will result in a **not significant** cumulative effect on marine mammals and sea turtles.

### 5.10.4 Commercial Fisheries

0

As indicated above, any effects on fish and fish habitat will be of short duration, and low magnitude, therefore not significant. Subsequently effects on commercial fisheries will be negligible and **not significant**.

### 5.10.5 Species at Risk

0

If due caution is exercised and mitigations as proposed are followed for operational discharges from drilling activities, then effects on individual fish, marine mammals, sea turtles and marine birds protected under SARA or listed by COSEWIC will be reduced and thus considered to be **not significant**.

## 5.11 Well Abandonment

Upon completion of its drilling program, it is Husky's intent to abandon and remove all wells, in accordance with the C-NLOPB regulations, using mechanical separation. In the event that mechanical separation fails, Husky will use directed chemical charges to sever the wellhead. In the event that chemical explosives are required for well abandonment, the C-NLOPB will require Husky Energy to undertake a marine mammal observation program during the abandonment program. An authorization will also be required.

### 5.11.1 Fish and Fish Habitat

1

The effects of using directed chemical charges underwater are dependent on the magnitude and timing of the explosion. In previous EAs reviewed by the C-NLOPB, it is noted that fish and invertebrates nearest the explosion will be affected. For fish, those nearest the blast center might sustain damage to their sensory epithelia. In a study cited in the previous EAs, surface observations of killed fish were noted in three of 15 blasts, in a wellhead severance program in the North Sea. In the event chemical explosives are required in the well abandonment program, the C-NLOPB will implement a monitoring program and investigate, in consultation with Husky Energy, possible mitigations to reduce impacts to fish and fish habitat. The effects on fish and fish habitat, will be of short duration, low magnitude and low frequency, and therefore **not significant**.

### 5.11.2 Marine Birds

0

There should be no interaction between marine birds and well abandonment (mechanical or directed charges), and therefore no environmental effect.

### 5.11.3 Marine Mammals and Sea Turtles

1

Mechanical severance using chemical explosives may result in injury to marine mammals present in the area. Explosives have rapid rise times, which are related to the extent of biological injury. Previous EAs report that a 2 kg TNT charge has a source level of 271 dB re 1 $\mu$ Pa-m<sub>0-peak</sub> and that a 20 kg charges has an equivalent source level of 279 dB re 1 $\mu$ Pa-m<sub>0-peak</sub> in water depths of 60 m. There is little information available regarding the effects of underwater explosions on marine mammals. If chemical wellhead severance is required, mitigation measures such as marine mammal observations within a set radius around the rig installation prior to wellhead severance will be required. With the implementation of mitigations, well severance using chemical explosives will have a **not significant** effect on marine mammals and sea turtles.

### 5.11.4 Commercial Fisheries

0

There should be no impact on commercial fisheries associated with well abandonment. As indicated above, impacts on fish and fish habitat are predicted to be not significant, therefore, it can be expected that effects on commercial fisheries would be negligible and **not significant**.

### 5.11.5 Species at Risk

0

If due caution is exercised and mitigations as proposed are followed for abandonment activities, then effects of activity and noise on individual fish, marine mammals, sea turtles and marine birds protected under SARA or listed by COSEWIC will be reduced and thus considered to be **not significant**.

## 5.12 Accidental Events

During all five project phases, blowouts and batch spills are the possible accidental events that may effects the environment. Based on 54 development wells being drilled over a five year period, the spill frequencies estimated for the Drilling Phase of the development of new drill centres is estimated to be 1 in 696 for spills greater than 150,000 bbl, 1 in 347 for spills greater than 10,000 bbls and 1 in 370 for spills greater than 1000 bbl (LGL Limited 2007). The calculated blowout frequency is approximately one-in-four chance of a blowout occurring over the 54-well drilling phase. However, the chances of having an oil discharge associated with the blowout are extremely low (1.1%) with a probability of one-in-370 during the 54-well drilling phase.

The characteristics of White Rose crude show that the crude is very waxy and if spilled in water, it would form near-solid particles and may persist for weeks, up to months on the surface. Data from spill trajectory modeling conducted for the White Rose Comprehensive Study (as reported in LGL Limited 2006, show that of the 14,600 trajectories modeled, there was no contact with the shoreline. While the trajectory analysis predicts the track of oil, it cannot predict the state of the oil (e.g. consistency, particle size, patch). Estimates for the geographic extent of a batch spill are presented in the 2006 EA report (LGL Limited 2006). In summer months, it was estimated

that the slick would travel approximately 700 km, whereas in winter it would travel 933 km from the rig.

#### 5.12.1 Fish and Fish Habitat

1

Juvenile and adult fish can and probably will avoid any crude oil by swimming from the blowout/spill region. Effects of oil spills on adult and juvenile fish are predicted to be negligible. Fish eggs and larvae are more likely to be affected by oil spills. Eggs and larvae present in the area will be exposed to hydrocarbons from spill events. In the White Rose comprehensive study, Husky evaluated the impact of the eggs and larvae of eight species (some of which are the same as above) and determined that the effects of an oil spill would be *adverse* due to the potential lethal and sublethal effects to the sensitive life stages. The environmental assessments for the Hibernia, Terra Nova, and White Rose production projects and the exploratory drilling programs all predicted not significant effects from accidental events. For this project, therefore, the effects would be negligible to low magnitude, <1 to >10,000 km<sup>2</sup> geographic extent and 1-12 month duration. Mitigation measures such as spill prevention and remediation would reduce overall impacts. Therefore, impact on fish and fish habitat would be **not significant**.

#### 5.12.2 Marine Birds

2

Oil on water is a threat and potential impact to marine birds. Significant numbers and concentration of birds occur on the Grand Banks. Any oil spill could cause bird mortality. As indicated above, the waxy nature of the White Rose crude slows evaporation and dispersion. As a result, the oil maintains its volume and persists on the water's surface, and may last for months at a time. While spilled oil may reach land, it is unlikely, based on the spill trajectory predictions that oil will affect seabird colonies. However, birds in the area of the rig would be at risk.

Depending on the time of the year, location of seabirds with the Study Area, and the extent of the spill, the magnitude of the effects will range from negligible to high. Blowouts will have a larger geographic extent (>10,000 km<sup>2</sup>) than batch spills (1,001 to 10,000 km<sup>2</sup>) with a duration from one to 12 months. While the likelihood of an event occurring is **low** (less than one event per year) the effects would be **significant and adverse**. Countermeasures such as bird scaring devices would reduce some birds from oiling. However, overall, oil spill countermeasures would more than likely be ineffective at reducing the effect. Note, however, that even though there would be a significant effect on birds, the likelihood of a spill is very small, as there are mitigations in place to prevent spills from occurring.

Husky Energy is currently revising its oil spill response plan (OSRP) including the Spill Environmental Effects Monitoring Procedure. Husky Energy will meet with the Canadian Wildlife Service to review and amend the portions of the procedure that directly address or affect seabirds.

#### 5.12.3 Marine Mammals and Sea Turtles

1

Marine mammals and sea turtles exposed to oil from a spill could suffer sublethal effects, through oiling of mucus membranes, but would be reversible. However, whales are present in



the area in low numbers and only at certain times of the year. Seals are not normally present in large numbers during the months when drilling is planned. Depending on the time of year, location of whales and seals in the study area, and volume of oil spilled, effects could range from negligible to low magnitude, extend between 1001 to 10,000 km<sup>2</sup> for batch spills, and >10,000 km<sup>2</sup> for blowouts, with a duration of 1-12 months. However, even though there could be an effect, the likelihood of a spill is very small, there are mitigations in place to prevent spills from occurring and oil spill countermeasures should reduce the number of marine mammals exposed to oil. Therefore, the conclusion is that effects are likely **not significant**.

#### 5.12.4 Commercial Fisheries

1

Commercial fisheries could be impacted if there is an effect on eggs and larvae. In the event of a large spill (greater than 10,000 bbls), an oil spill would not cause not significant effects on fish or result in fish taint. Gear may be damaged, but compensation to fishers would reduce that impact. However, the marketability and the perceived commercial value of the fish may be impacted. Such an impact would be considered significant in economic terms. However, compensation to the fishers could lessen the significance. As with the results of the White Rose Comprehensive Study, the effects on commercial fisheries are **not significant**.

#### 5.12.5 Species at Risk

1

An accidental event is predicted overall to be not significant for populations of fish, marine mammals, sea turtles, and marine birds. Although an accidental event could have a greater significance for individual species at risk, for which population numbers are low, the likelihood of a spill is very small, mitigations are in place to prevent spills from occurring and oil spill countermeasures should reduce the number of species exposed to oil. Therefore, the conclusion is that effects are likely **not significant**.

### 5.13 Follow-up Monitoring

Required

Yes ☒

No ☐

The C-NLOPB, DFO and EC will require Husky Energy to undertake follow-up monitoring, as defined in the CEA Act.

DFO will require monitoring of the stability/movement of glory hole dredge spoil piles using post-construction seabed surveys in order to determine whether the disposal of material from the new glory hole(s) remains contained within the area where HADD has been previously authorized. DFO will also require Husky to carry out compensation and monitoring measures as outlined in any Fish Habitat Compensation Agreement related to the project.

The C-NLOPB will require Husky Energy to undertake environmental effects monitoring of its development drilling and production activities associated with the new drill centres. The environmental effects monitoring is to confirm or validate environmental assessment predictions and to ascertain environmental effects from offshore petroleum production activities. Therefore, Husky Energy will be required to modify its existing EEM program to incorporate drilling and production activities of the Project.

## **6. Other Considerations**

Mitigations presented by Husky in its environmental assessment for the Husky White Rose Development Project: New Drill Centre Construction and Operations Program (LGL Limited 2006) and Husky White Rose Development Project: New Drill Centre Construction and Operations Program Addendum (LGL Limited 2007) are sufficient to prevent or reduce environmental impacts. If chemical explosives are required during wellhead abandonment, a biological observation program will be required. Specific details of the monitoring program will be discussed with Husky at the time of application for the well abandonment program. Depending on the timing of the well abandonment program, additional mitigations or monitoring protocols may be required.

The RAs are satisfied with the environmental information provided by Husky Energy regarding the potential adverse environmental effects which may result from the proposed drilling program, and are satisfied with the operator's proposed monitoring and mitigative measures.

The RAs are of the view that the environmental effects from the Project, in combination with other projects or activities that have been or will be carried out, are not likely to cause significant adverse cumulative environmental effects.

The RAs are of the view that if the proposed environmental mitigative measures outlined in the 2006 EA Report and 2007 EA Addendum, and those listed below are implemented, the Project is not likely to cause significant adverse environmental effects.

### **6.1 Recommended Conditions and/or Mitigations**

For authorizations issued by the C-NLOPB, it is recommended that the following conditions be appended, if the Project is approved.

For any authorizations issued by the C-NLOPB

- *Husky Energy shall implement, or cause to be implemented, all the policies, practices, recommendations and procedures for the protection of the environment included in or referred to in the "Husky White Rose Development Project: New Drill Centre Construction and Operations Program Environmental Assessment" (LGL Limited 2006) and the "Husky White Rose Development Project: New Drill Centre Construction and Operations Program Environmental Assessment Addendum" (LGL Limited 2007).*

#### **For Drilling (including Geotechnical Programs) and Production Operations**

- *Husky Energy will be required to submit to the Chief Conservation Officer an amended EEM design that incorporates drilling and production activities associated with the five new drill centres, and tie-back to the FPSO. The amended EEM Plan should be consistent with the strategy in the White Rose Development EEM Design Report (Husky Energy 2004), discuss any changes that may be required to existing sampling stations, and consider the necessity for collection of baseline data at any or all of the new drill*

*centre locations. Drilling or production operations at an individual drill centre will not be authorized until an acceptably amended EEM plan in respect of that location is in place.*

- *A marine mammal monitoring protocol shall be developed in consultation with the C-NLOPB at the time of application for approval to terminate the well(s) with the use of chemical explosives.*

#### **For VSP and/or Wellsite Surveys**

- *Husky Energy shall implement or cause to be implemented the mitigation measures outlined in Appendix 2 of the Geophysical, Geological, Environmental and Geotechnical Program Guidelines (C-NLOPB 2004), respecting VSP and wellsite surveys.*
- *Monitoring for marine mammals and sea turtles shall be consistent with the approach outlined in the Geophysical, Geological, Environmental and Geotechnical Program Guidelines (C-NLOPB 2004) respecting VSP and wellsite surveys, and includes monitoring during ramp-up and at all times when the airgun(s) are active.*
- *The “safety zone” defined for marine mammal protection respecting VSP and/or wellsite surveys is designated to be 500 m.*
- *During ramp-up, and/or when the airgun array is active, the airgun(s) shall be shut down, if a marine mammal or sea turtle, listed as **Endangered** or **Threatened** (as per Schedule 1 of SARA), including the North Atlantic right whale, Blue whale, and leatherback turtle, is observed within 500 m of the airgun array.*
- *During line changes, the seismic airgun array shall be reduced to a single airgun and the airgun shall remain active during the line change. If for any reason, the airgun is shut down for a period greater than 30 minutes, then ramp-up procedures shall be implemented as per the Geophysical, Geological, Environmental and Geotechnical Program Guidelines.*

For authorizations issued by the Department of Fisheries and Oceans, it is recommended that the following conditions be appended, if the Project is approved.

#### **For Glory Hole Construction/Subsea Equipment Installation**

- *Husky Energy shall implement, or cause to be implemented, all the policies, practices, recommendations and procedures for the protection of the environment included in or referred to in the “Husky White Rose Development Project: New Drill Centre Construction and Operations Program Environmental Assessment” (LGL Limited 2006) and the “Husky White Rose Development Project: New Drill Centre Construction and Operations Program Environmental Assessment Addendum” (LGL Limited 2007).*

- *To compensate for the loss of productive fish habitat associated with the excavation of glory holes and deposition of glory hole dredge spoils associated with the proposed expansion and operation of the White Rose offshore oil development on the Grand Banks, Husky Energy will agree to terms as presented in its subsection 35(2) Fisheries Act Authorization as well as carry out compensation and monitoring measures as outlined in any Fish Habitat Compensation Agreement related to the project.*

For permits issued by Environment Canada, it is recommended that the following conditions be appended, if the Project is approved.

- *Husky Energy shall implement, or cause to be implemented, all the policies, practices, recommendations and procedures for the protection of the environment included in or referred to in the “Husky White Rose Development Project: New Drill Centre Construction and Operations Program Environmental Assessment” (LGL Limited 2006) and the “Husky White Rose Development Project: New Drill Centre Construction and Operations Program Environmental Assessment Addendum” (LGL Limited 2007).*

## **Part D: Screening Decision**

### **7. Decision/Decision Date**

The Canada-Newfoundland and Labrador Offshore Petroleum Board, Fisheries and Oceans and Environment Canada are of the opinion that, taking into account the implementation of proposed mitigation measures set out in the conditions above and those committed to by Husky Energy, the Project **is not likely to cause significant adverse environmental effects**. This represents a decision pursuant to Section 20(1) (a) of the CEA Act.

Responsible Officer      *Original Signed by K. Coady*      Date: **April 19, 2007**  
Kimberly A. Coady  
Environmental Assessment Officer  
C-NLOPB

Responsible Officer      *Original Signed by B. Power*      Date: **April 19, 2007**  
Brian Power  
Provincial Manager, Newfoundland and Labrador  
Environmental Protection Operations Division  
Environment Canada

Responsible Officer      *Original Signed by M. Roberge*      Date: **May 3, 2007**  
Michelle Roberge  
A/Regional Manager  
Habitat Management & Sustainable Development  
Fisheries and Oceans

**References:**

- C-NLOPB. 2006. White Rose Drill Centre Construction/Operation Program Scoping Document. 12 pp.
- LGL Limited. 2006. Husky Energy White Rose Development Project: New Drill Centre Construction & Operations Program Environmental Assessment. LGL Rep. SA883. Rep. by LGL Limited, St. John's, NL, for Husky Energy Inc., Calgary, AB. 299 p. + App.
- LGL Limited. 2007. Husky Energy White Rose Development Project: New Drill Centre Construction & Operations Program Environmental Assessment Addendum. LGL Rep. SA883a. Rep. by LGL Limited, St. John's, NL, for Husky Energy Inc., Calgary, AB. 126 p. + App.
- Husky Energy. 2000. White Rose Oilfield Comprehensive Study. Submitted by Husky Oil Operations Limited, St. John's, NL.
- Husky Energy. 2001. White Rose Oilfield Comprehensive Study Supplemental Report. Submitted by Husky Oil Operations Limited, St. John's, NL. 265 p. + App.
- Husky Energy. 2006. White Rose Environmental Effects Monitoring Program (2006) Volume 1. 211 p.
- Husky Energy. 2006. Husky White Rose Development Project New Drill Centre Construction & Operations Program Project Description. 11 pp.
- Husky Energy. 2007. Response to review comments on the EA addendum.
- Oceans Ltd. 2006. Climate of the Husky New Drill Centre. Appendix 3 in "Husky White Rose Development Project: New Drill Centre Construction and Operations Program Environmental Assessment Addendum. 50 pp.