

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

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**PART A: General Information**

<b>Screening Date</b>	<b><u>December 10, 2007</u></b>
<b>Project Title</b>	ConocoPhillips Laurentian Sub-basin Exploration Drilling Program
<b>Physical Activity</b>	Exploration Drilling
<b>Proponent</b>	ConocoPhillips Canada Resources Corporation P.O. Box 130 401 - 9th Avenue S.W. Calgary, AB T2P 2H7
<b>Contact</b>	Scott Grindal Environmental Coordinator Health, Safety, Environment & Sustainable Development
<b>C-NLOPB File No</b>	7705 C62
<b>CEAR No.</b>	05-01-16537
<b>Location</b>	Laurentian Subbasin, Newfoundland and Labrador Offshore Area
<b>Referral Date</b>	December 07, 2005
<b>EA Start Date</b>	December 16, 2005
<b>CEAA Law List Trigger</b>	Section 134(1)(b) <i>Canada Newfoundland Atlantic Accord Implementation Act</i> (Accord Act)

**Part B: Project Information**

In December 2005, ConocoPhillips submitted a project description to the C-NLOPB for a proposed exploration drilling program in the Laurentian Sub-basin. The program will be conducted in the offshore area under the jurisdiction of the Canada-Newfoundland and Labrador Offshore Petroleum Board. The proposed program is within exploration licences 1081, 1082, 1085, 1086, and 1087 held by ConocoPhillips. The information in this screening report has been summarized from the following reports submitted by ConocoPhillips in support of their application: “*Laurentian Sub-Basin Exploration Drilling Program Environmental Assessment*”

(Buchanan *et al.* 2006) (the EA Report) and the “*Laurentian Sub-basin Exploration Drilling Program Environmental Assessment Addendum*” (Buchanan *et al.*, 2007) (the EA Addendum).

## **1. Description of Project**

ConocoPhillips, the project proponent, is proposing to conduct exploration/appraisal drilling in the Laurentian Sub-basin area. The proposed drilling area is located near the mouth of the Laurentian Channel at the offshore entrance to the Gulf of St. Lawrence, about 250 km southwest of St. John’s, Newfoundland. The first well is tentatively planned for the second quarter of 2009 on EL1087. A second well may be drilled on EL 1081. Depending on results and seismic data interpretation, additional exploration and appraisal wells may be drilled in ELs 1082, 1085 and 1086. Drilling may occur year round up to the period of expiration for these licences. It is anticipated that from one to four wells per year could be drilled. Each well will take from 50 to 100 days to complete. Drilling will be conducted by a drill rig (jack-up, anchored or dynamically-positioned drill ship or semi-submersible), depending on water depth. Activities will be supported by supply vessels and offshore helicopters. Vertical seismic profiling (VSP) and well site shallow geohazard survey activities may also be conducted in conjunction with the drilling.

## **2. Description of Environment**

The EA Report describes the Valued Ecosystem Components (VECs) that have a potential to be affected by drilling activities as commercial fisheries, fish species, marine mammals and sea turtles, marine birds and species at risk. The following sections provide a summary of the environmental factors described in the EA report and addendum. A complete description of the biological and physical environment can be found in the EA report and addendum.

### **2.1. Physical Environment**

A detailed description of the physical environment is presented in the EA Report and EA Addendum. The exploration drilling activities will be carried out in water depths ranging from 200 m to 3,000 m along the Laurentian Slope, and will include the Laurentian shelf, slope and abyssal plain.

### **2.2. Biological Environment**

#### **2.2.1. Fish and Commercial Fisheries**

The EA Report provides a general description of habitat requirements and areas of occurrence for the following species – Atlantic cod, redfish, white hake, monkfish, Greenland halibut, snow crab, Atlantic halibut, Pollock, thorny skate, smooth skate, and swordfish. Activities are proposed in North Atlantic Fishery Organization (NAFO) Subareas 3 and 4 and subdivisions 3PSf, 3PSg, 3PSh, 4VSb, and 4VSc.

The EA report notes that of the species listed above, the groundfish fisheries accounted for over 86% of the landed catch between 2003 to 2005. Atlantic cod and redfish species made up more than half of the overall harvest, while skates, white hake and monkfish constituted approximately 25% of the total. Halibut catches were also important within the Study Area. Of the non-groundfish species, the snow crab harvest made up the largest catch by quantity. The EA Report indicates that harvesting occurs year round for most of the fisheries.

There are three species of redfish that occur in the Northwest Atlantic, however Golden redfish (*Sebastes marinus*) is less likely to be found in the project area than the other two species Acadian redfish (*Sebastes fasciatus*) and beaked redfish (*Sebastes mentella*). The most common species on the southern Grand Banks is the Acadian redfish at depths of 0-600 m. The beaked redfish ranges from 350-1100m. The EA report indicates that mating occurs in the fall with females releasing the larvae from April to July. Peak spawning occurs from April to June and appears to be concentrated in 3Ps and 4Vn, particularly along the slope regions of St. Pierre Bank, southern Green Bank and the southern Halibut Channel. Redfish harvesting represents the 22% - 36% of the harvest during 2003 to 2005 within the Study and Project Areas. The most concentrated redfish harvesting include the southern end of the Laurentian Channel in Unit Area 4Vsc, the Laurentian Channel at the eastern end of Unit Area 4Vsb, the southern slope region of St. Pierre Bank in Unit Areas 3Psg, and the slope region at the southern end of Halibut Channel in Unit Area 3Psh. Fish are harvested using the bottom (stern) otter trawl with a smaller proportion harvested by mid-water trawl.

During 2003 through to 2005, Atlantic cod (*Gadus morhua*) was one of the main species harvested in the Study Area with 29% of the total harvest by quantity. There is a directed fishery in the 3Ps area. There has been no directed fishery since 1993 in the 4VS area. Commercial harvesting concentrates within 3Ps on and near the shelf edge and St. Pierre Bank, and occurs primarily between December and February. Harvesting (63% over the past three years) in the Study Area occurs primarily with mobile otter trawls. The remainder was harvested with fixed gear (set gillnets and longlines).

White hake (*Urophycis tenuis*) are most abundant in the Study Area along the southern edge of the St. Pierre Bank and the eastern edge of the Laurentian Channel. Spawning occurs on the southwestern slope of the St. Pierre Bank between June and August. As reported in the EA Report, harvesting for the species is concentrated in the deeper waters of the Laurentian Channel, along the slope regions at the mouth of the Channel and the southern tip of the St. Pierre Bank, the St. Pierre Bank (north-central portion of the Project Area) and along the 3Psf/3Psh boundary. They are harvested as a by-catch of the longline, gillnet and trawl fisheries for halibut, redfish, cod and pollock.

Two species of skate can be found in the Study Area. The most common thorny skate (*Amblyraja radiata*) and the smooth skate (*Raja senta*). Thorny skate are most common in water depths ranging from 90 to 200 m in the Laurentian Channel and the St. Pierre Bank slopes. Smooth skate is found on the St. Pierre Bank and its eastern slope at depths ranging between 45 and 91 m. Timing of smooth skate spawning is unknown but is thought to occur over the entire range. Harvesting occurs in April on the slope region from the southern tip of St. Pierre Bank to the eastern boundary of the Study Area. The majority of the harvest has been with mobile (bottom stern otter trawl) gear with some fixed gillnets and longlines.

Monkfish (*Lophius americanus*) occur in the deeper waters at depths of 650 m along the southwest slope of the St. Pierre Bank and the Laurentian Channel. Summer spawning in the slope areas produces floating egg masses up to 12 m long (LGL 2006). Harvesting appears to be

concentrated along the upper slope region at the southern end of Halibut Channel and eastwards (Unit Area 3Psh), at the southern slope of St. Pierre Bank and on the western side of the mouth of the Laurentian Channel.

Atlantic halibut (*Hippoglossus Hippoglossus*) can be found along the slope of the St. Pierre Bank and in the Laurentian Channel. Spawning is likely within the Study Area and may occur on the slope between the St. Pierre Bank and Laurentian Channel from February to April. Harvesting occurs using fixed gear (halibut longlines) concentrating along the shelf edge and upper slope within 3Psh in the Study Area. Greenland halibut (*Reinhardtius hippoglossoides*) also known as turbot inhabits deeper parts of the slope of the St. Pierre Bank and the Laurentian Channel (LGL2006). Spawning is believed to occur in waters near the southern Esquiman Channel and the Laurentian Channel during the winter. Most reported catches occur in deep water areas, including all slope areas in the Laurentian and Halibut Channels.

Swordfish (*Xiphias gladius*) can be found in the Study Area from June to November. Commercial harvesting of this species within the Project Area occurs along the upper slope region from Banquereau Bank to the eastern boundary of the Study Area, along the edges of the shelf, in the thermocline near the 200 m contour. Fixed gear (longlines up to 50 miles in length) are used.

Snow crab (*Chionoecetes opilio*) can be found in the northernmost part of the Halibut Channel (southern 3Psf and northern 3Psh). Mating occurs in early spring with the females carrying the fertilized eggs for up to two years. The larvae hatch in late spring or early summer. The snow crab harvested within the Study Area has accounted for 12% of the total harvest over the past three years. The snow crab fishery uses fixed gear crab pots.

### **2.2.2. Marine Mammals and Sea Turtles**

The 2006 EA Report listed 22 species of marine mammals that were known or likely to occur in the Project Area. Observations were recorded during the 2005 seismic survey conducted from 14 June to 29 September 2005 with 1,483 hours of observations along 13,484 km of ship trackline. During the 2005 survey program, 14 of these 22 species were observed in or near the project area. The sightings included: blue whale (49 sightings of 53 individuals); minke whale (2 sightings of 2 whales); humpback whales (5 sightings of 6 individuals); sei whale (3 sightings of 3 individuals); fin whale (30 sightings of 37 individuals); sperm whale (29 sightings of 33 individuals); long-finned pilot whale (183 sightings of 1,940 individuals); northern bottlenose whale (2 sightings of 2 individuals); bottlenose dolphins (7 sightings from six to 30 individuals); striped dolphin (5 sightings); short-beaked common dolphin (43 sightings from one to 80 individuals); Atlantic white-sided dolphin (47 sightings from one to 150 individuals); white-beaked dolphin (1 sighting of six individuals); and Risso's dolphin (5 sightings of 41 individuals). ConocoPhillips will continue with its marine mammal observation program.

The leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*) and Kemp's ridley (*Lepidochelys kempii*) turtles may all be found on the Grand Banks. The EA Report indicates that both loggerheads and leatherbacks can be found in Atlantic Canada waters during the summer and fall. Less is known about the distribution of Kemp's ridley turtles in eastern

Canada. Their distribution is largely determined by water temperatures. Loggerheads have been regularly caught in the pelagic longline fishery along the edge of the Newfoundland and Scotian Shelves. During the 2005 seismic survey in the Project Area a sea turtle of unknown species and a deceased leatherback turtle were sighted.

**2.2.3. Marine Birds**

A list of the marine birds commonly found in the Project Area and information regarding their distribution and foraging strategies can be found in the EA Report. There is limited data specific to seabird distributions in the Project Area. The observations taken from 16 June to 29 September during the 2005 seismic program and those on-board the Canadian Coast Guard ship Hudson operating in the area from 18 – 20 June 2004 provide additional information regarding the occurrence of the species listed in the 2006 EA Report in the Project Area.

The main species likely to occur include fulmars, shearwaters, storm petrels, gannets, skua, jaeger, gulls, terns, murre, Dovekies and puffins. Bird concentrations can be expected in the area of the shelf edge where water depths quickly change from 400 to 1000 m. The 2006 EA report indicates that the Leach’s Storm-Petrel was the most numerous species in the Laurentian Sub-basin Study Area during the 2005 seismic monitoring program and that the numbers of Cory’s Shearwaters recorded during the 2005 seismic monitoring were the highest recorded for Newfoundland waters. Additional data regarding observed species can be found in the 2006 EA Report.

There are several Important Bird Areas (IBAs) along the south coast of Newfoundland including: Cape St. Mary’s, Green Island, St. Pierre, Grand Columbier, Middle Lawn Island, and Corbin Island.

**2.2.4. Species at Risk**

There are several species at risk (SAR) listed under the *Species at Risk Act* (SARA) that may occur in the Project Areas. These include:

Species	SARA Status
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
Atlantic Salmon ( <i>Salmo salar</i> ) (Inner Bay of Fundy Population)	Schedule 1 - Endangered
Beluga Whales ( <i>Delphinapterus leucas</i> ) (St. Lawrence Estuary population)	Schedule 1 - Endangered
Northern Bottlenose Whale ( <i>Hyperoodon ampulatus</i> ) (Scotian Shelf population)	Schedule 1 – Endangered
Northern Wolffish ( <i>Anarhichas denticulatus</i> )	Schedule 1 – Threatened
Spotted Wolffish ( <i>Anarhichas minor</i> )	Schedule 1 - Threatened

Species	SARA Status
Atlantic Wolffish ( <i>Anarhichas lupus</i> )	Schedule 1 – Special Concern
Ivory Gull ( <i>Pagophila eburnean</i> )	Schedule 1 – Special Concern
Fin Whale ( <i>Balaenoptera physalus</i> )	Schedule 1 – Special Concern
Harbour Porpoise ( <i>Phocoena phocoena</i> ) (Northwest Atlantic population)	Schedule 2 - Threatened
Sowerby's Beaked Whale ( <i>Mesoplodon bidens</i> )	Schedule 3 – Special Concern

The EA Report indicates that during the 2005 2D seismic program, there were 49 sightings of 53 individual blue whales in the survey area. These sightings made up more than half of the baleen whale sightings in the Laurentian Sub-basin during the seismic survey. Sighting rates were highest during August and in water depths of 2,000-2,500 m. Most sightings were in the Eastern block of the seismic survey area. Based on this information, blue whales are likely to occur in the Project Area during summer.

The EA Report indicates that the North Atlantic right whale could occur in the Project Area from late spring to early fall but is unlikely. North Atlantic right whales were not sighted during the 2005 seismic survey.

Leatherback sea turtles are likely to be a part of the marine fauna in the Project Area but uncommon. No critical habitat areas for leatherbacks have been identified in the Study Area. Only one decomposing leatherback was observed during the 2005 seismic survey. The final recovery strategy is available for Leatherback Sea Turtles (Atlantic population).

The Inner Bay of Fundy Atlantic salmon probably does not migrate through the Project Area (2006 EA Report). Annual Department of Fisheries and Oceans (DFO) research surveys have shown Atlantic salmon in the 3Ps area, but the complete data has not been extracted from the research survey data. Information regarding the migration route and timing is unknown.

The Beluga whale is occasionally sighted off Newfoundland or Nova Scotia outside its usual habitat.

In the western North Atlantic, there are two areas of abundance of northern bottlenose whales, one off northern Labrador and the other in The Gully on the Scotian Shelf (2006 EA Report). Only two individuals of this species were sighted during the ConocoPhillips seismic survey of the Laurentian Sub-basin. One was sighted in 849 m of water in the Western block, and the other in 1,450 m of water in the Eastern Block. Northern bottlenose whales are likely to be uncommon in the Project Area.

The 2006 EA Report indicates that northern wolffish can be found in the Laurentian Channel and along the slope of the St. Pierre Bank at depths between 90- 200 m, with some fish found at depths up to 600m. Spotted wolffish occur in the deeper waters of the Laurentian Channel and Hermitage Channel at depths up to 475 m (LGL et al. 2004). Atlantic wolffish can be found at

depths of 90-200 m along the slope of the St. Pierre Bank and in the Laurentian Channel in the spring. The 2006 EA Report indicates that the Atlantic wolffish is the most abundant of the three species in the study area. It is not known if any of these species spawn in the Study Area, however, as LGL et al. (2006) report, given the limited spatial migration of these species, spawning in this area is likely. Spawning would probably occur on the slope of the St. Pierre Bank during the late fall and the fish remain near their eggs to guard them.

The occurrence of the Ivory Gull is nearly always directly related to sea ice. Sea ice does not reach the Laurentian sub-basin every year. Considering the known range of the Ivory Gull, the overall low numbers of individuals in the Northwest Atlantic and the paucity of sea ice on the Laurentian Sub-basin, Ivory Gull is likely a very rare occurrence on the Laurentian Sub-basin (2006 EA Report).

Fin whales occur in coastal and shelf waters, as well as in oceanic waters. A total of 30 fin whale sightings (37 individuals) were recorded during the 2005 seismic survey of the Project Area. Sighting rates were highest during July and August and in water less than 1,000 m deep. Twelve sightings occurred in water more than 1,500 m deep. The 2006 EA report states that fin whales may be regular visitors to the Project Area and their presence there is likely to be common during the spring to fall period.

### **2.2.5 Special Places**

There is a marine munitions dumpsite within the Project Area, on the eastern border (JWEL 2003). Information regarding the type or munitions present or its present day condition cannot be provided. The Department of National Defence (DND) will be investigating a number of munitions dumpsites including the one located in the Project Area. The intent of the investigations is to determine what is present at these sites, their conditions, and if further action (remediation) is warranted.

### **2.2.6. Research Surveys, Vessel Traffic, Recreation and Tourism**

The EA report does not provide information regarding recreation use or tourism. Vessel traffic with respect to fishing vessels is discussed in terms of amount of commercial fishing activity. Information regarding DFO vessel research surveys is provided in the EA Report. For the 2009 survey season, research surveys may be held in the DFO Maritimes Region and Newfoundland Region, but are dependent on vessel time. There may be temporal and spatial overlap of the drilling activities with the 2009 Groundfish Enterprise Allocation Council (GEAC) Unit 2 redfish survey and the 4VWX halibut survey. ConocoPhillips has indicated that contact with DFO will be maintained to determine research vessel locations and times throughout the drilling program activities.

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

### **3. Procedures**

In December 2005, ConocoPhillips submitted a project description “*Laurentian Sub-basin Exploration Drilling Program Project Description*” (LGL 2005) to the C-NLOPB, in support of its application to conduct an exploration drilling program. Pursuant to Section 12.2(2) of the CEA Act, and the *Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements*, the C-NLOPB assumed the role of the

Federal Environmental Assessment Coordinator (FEAC) for the Screening. Input was sought from federal and provincial regulatory agencies and interested stakeholders respecting the scope of project and environmental assessment review.

A Federal Coordination Regulations (FCR) notification was sent on December 16, 2005 regarding ConocoPhillip's proposed program. Environment Canada (EC), DFO, Natural Resource Canada, and DND responded that they would participate as FAs in the EA review. The Fish, Food and Allied Workers Union (FFAWU) indicated that they would participate in the EA review.

On March 2, 2006, the C-NLOPB notified ConocoPhillips that a screening level of assessment was required and the proponent was provided with a Scoping Document.

ConocoPhillips submitted the 2006 EA Report to the C-NLOPB on October 25, 2006. The C-NLOPB, as Responsible Authority (RA), forwarded the 2006 EA on November 09, 2006 to the DFO, DFO Maritimes Region, EC, DND, Natural Resources Canada, and the provincial Departments of Environment & Conservation, Fisheries & Aquaculture, and Natural Resources. The FFAWU and One Ocean were provided a copy of the EA report to review. Comments were received from DFO, DFO Maritimes Region, EC, DND, and Natural Resources Canada.

On February 21, 2007, the C-NLOPB requested additional information from ConocoPhillips in order to satisfy the requirements of the CEAA and to complete the Screening Report. ConocoPhillips provided a response to this request on May 29, 2007.

The C-NLOPB forwarded the "*Laurentian Sub-basin Exploration Drilling Program Environmental Assessment Addendum*" (LGL 2007) to the DFO, DFO Maritimes Region, DND, Natural Resources Canada and EC on May 30, 2007. Comments were received from DFO, EC and Natural Resources Canada.

It is the obligation of the C-NLOPB 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 proposed 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 subsection 15(2) of CEAA. For the purposes of subsection 15(3) of CEAA, the C-NLOPB's scoping exercise is complete because an assessment was conducted in respect of every construction, operation, modification, decommissioning, abandonment, or other undertaking proposed by ConocoPhillips that is likely to be carried out in relation to their proposed Project.

#### **4. Environmental Assessment Review**

Comments on the EA report were received from DFO, DFO Maritimes Region, EC, DND, and Natural Resources Canada.

DND commented on November 27, 2006 requesting that they be contacted prior to any seismic/drilling activities to determine location/scheduling of Canadian Naval exercises/operations.



DFO Maritimes provided comments on December 21, 2006 requesting that sensitive/special areas adjacent to and downstream of the Study Area be addressed in the potential effects of accidental spills. They also made several comments on SARA and how they should be addressed in the environmental assessment.

Natural Resources Canada provided comments on December 22, 2006 on the seismic issues and on the marine geology/hazards assessments of the exploration and drilling program of the project.

DFO provided comments on 03 January 2007. DFO requested a more thorough coverage of Species at Risk and an evaluation of the Proponents effects assessment. Some of the comments from DFO focussed on clarification of information provided in the EA, and identified more recent data sources to be used in the assessment.

Environment Canada responded on 25 January 2007. Some of the comments were editorial however, the majority of comments focused on the physical environment description and discussion in the EA report.

Comments were provided to the ConocoPhillips on 21 February 2007 to be addressed in an addendum before a Screening Report could be completed.

The response was provided by ConocoPhillips on 29 May 2007. This was forwarded to DFO – St. John’s and Maritimes, DND, EC and Natural Resources Canada. DFO-Newfoundland responded that their comments had been satisfactorily addressed but did stress that a higher degree of precaution should be applied for SARA and that proposed mitigation measures be applied rigorously. Environment Canada stated that the EA addendum didn’t address their comments on greenhouse gases and questioned how a not significant effect could have been reached for well abandonment on seabirds and effects of the environment on the project given the information provided in the EA report and EA addendum. Natural Resources Canada reviewed the EA addendum and suggested actions for resolution of seismic hazard aspects of the project.

## **5. Scope of Project**

ConocoPhillips is proposing an exploration/appraisal drilling program within exploration licences EL 1081, 1082, 1085, 1086 and 1087. The proposed drilling sites are situated in the Laurentian Sub-basin, approximately 250 km southwest of St. John’s at water depths ranging from 100 to 2,300 m. Drilling operations are scheduled to commence in the second quarter of 2009 and the project may extend for the life of the licenses (2013). It is anticipated that from one to four wells per year could be drilled. The initial exploratory well will likely be in either EL 1081 or 1087 and subsequent drilling would be dependent upon additional data analyses and results of the initial well. Up to seven exploration/appraisal wells may be drilled in ELs 1087, 1081, 1082, 1085 and/or 1086. Each well will take from 50 to 100 days to complete. A drill rig (jack-up, anchored or dynamically-positioned drill ship or semi-submersible) will conduct drilling. Drilling activities will be supported by a number of supply vessels and offshore

helicopters. Vertical seismic profiling (VSP) and well site shallow geohazard survey activities may also be conducted in conjunction with the drilling. Following completion of drilling and well testing activities, three scenarios may occur for well abandonment: plug and leave well head in place; plug and remove mechanically; or remove with shaped charges. The method selected for each well will depend on site-specific conditions (e.g. water depth), risk analyses, and C-NLOPB requirements.

At the time of application for drilling activities to be undertaken beyond 2007 in the Project Area, the Operator will be required to provide information to the C-NLOPB which 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, the Operator will be required to provide information regarding the adaptive management of requirements of the 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 or information 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.

## 5.1 Boundaries

The boundaries of the Project are defined in the 2006 EA Report and 2007 EA Addendum as follows and are acceptable to the RA:

<b><i>Boundary</i></b>	<b>Description</b>
<i>Temporal</i>	2009 to the end of licenses (2013).
<i>Project Area</i>	The five exploration licenses EL 1081 (534,535E 4936538N $\pm$ 15 km) EL 1087 (647,287E 4958250N $\pm$ 10 km) ELs 1082, 1085, 1086 (To be defined based on drilling activity)
<i>Study Area</i>	The Project Area and 10 km to the west, 40 km to the north and east, and 60 km to the south and southwest, to account for potential environmental effects on VECs.
<i>Affected Area</i>	The geographic area of specific effects on a species, species group, or their habitats. It varies according to the timing and type of Project activity and the sensitivities of the species/habitat being assessed .
<i>Regional Area</i>	Varies with the physical and environmental components being discussed.

There may also be an area of influence from the sound array (VSP, geohazard surveys). 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.

## **6. Consultation carried out by ConocoPhillips**

ConocoPhillips consulted in person, via telephone or email with representatives of the following organizations: Association of Seafood Producers; One Ocean; the Natural History Society; the Groundfish Enterprise Allocation Council; Nova Scotia Swordfish Association; Clearwater Seafoods Limited Partnership; Icewater Harvesting Ltd.; Fishery Products International; Seafood Producers of Nova Scotia; Fish, Food and Allied Workers Union (FFAWU); W.T. Grover Fisheries Ltd.; and the Alder Institute. Consultations were held with DFO (NL and Maritimes Regions) and Environment Canada. All consultations were held to inform the stakeholders about the survey and to identify issues or concerns, which should be considered in the EA. The results of those consultation sessions, and issues identified are documented in the EA Report. Concerns were raised regarding conflict with drill rigs and marine mammal deep-water sensors deployed by DFO. Questions were raised by the FFAWU about the size of the safety zone for drilling activities and whether it would be deemed a no fishing zone. All concerns raised and documented are addressed within the EA report.

The RA is satisfied that the consultations carried out by ConocoPhillips and reported on in the EA Report included all elements of the Project. The RA 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 for the 2009 field season.

## **7. Environmental Effects Analysis**

### **7.1 Scope of Assessment**

For the purpose of meeting the requirements of the CEAA, the factors that were considered to be within the scope of the environmental assessment are those set out in subsection 16(1) of the CEAA, and those listed in the “*ConocoPhillips Canada Laurentian Subbasin Exploratory Drilling Program Scoping Document*” (C-NLOPB 2006).

### **7.2 Methodology**

The C-NLOPB reviewed the environmental effects analysis presented by ConocoPhillips in the 2006 EA Report. A VEC based assessment based on the interaction of project activities on these VECs was used in assessing environmental effects, including cumulative effects and accidental events. The environmental assessment methodology and approach used by the Proponent is acceptable to the RAs. The following environmental effects analysis uses the information presented by the operator and takes into consideration mitigation proposed by the Proponent to assess the potential for residual environmental effects.

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

- magnitude of impact;
- geographic extent;

- duration and frequency;
- reversibility; and
- ecological, socio-cultural and economic context;

after taking mitigation measures into account,

- significance of residual impact.

The potential effect significance of residual effects, including cumulative effects, 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*

These ratings, along with the likelihood of the effect are considered in determining overall significance of residual effects.

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

The effects of the physical environment on the Project include those caused by wind, ice, waves, temperatures and currents. As described in the 2006 EA report and 2007 EA addendum, iceberg densities are considerably lower in the Laurentian Sub-basin compared to the Grand Banks. Freezing precipitation in the Newfoundland and Labrador area is most likely to occur from March to April however, icing conditions in the Laurentian Sub-basin may not be as severe as on the northern Grand Banks. As part of its monitoring program, ConocoPhillips will have marine weather observers on board the rig, observing weather on a 24 hour basis. An ice management plan has to be submitted to the C-NLOPB as part of the DPA process and includes mitigations to prevent impacts from sea ice and icebergs during drilling activities. Icebergs will be managed by surveillance, an early warning system, and by towing. The risk associated with freezing precipitation will be managed through forecasting, close monitoring of conditions, and adherence to safety procedures. There is a possibility that drilling activities may occur in areas associated with munitions dump sites. Once drilling locations are identified, ConocoPhillips will consult with the Department of National Defence to determine if they may be present. If the well site is considered to be in a risk area for munitions, a screening survey will be conducted using sonar methodology and possibly a magnetometer. It is ConocoPhillips first priority to prevent or avoid the presence of a hazard, if at all possible, and conduct a formal structured risk assessment process. This risk assessment has to be submitted to the C-NLOPB as part of the DPA process. All of these actions should ensure that impacts from the environment could be minimized. Therefore, the effects of the environment on the project will be **not significant**.

### **7.4. Presence of Structures**

The drill rig will be the only surface structure. A safety exclusion zone would extend approximately 500 m from a drill rig with an exclusion zone of 0.8 km<sup>2</sup> in total area.

#### **7.4.1 Marine Fish and Fish Habitat**

**1**

The presence of the structure and a 0.8 km<sup>2</sup> temporary fishery exclusion zone may alter the local abundance and distribution of fish in the area; however, it will be for a short duration (generally 80-100 days). This zone and the presence of the rig may create an artificial reef effect, whereby

local populations of fish and benthos are attracted to the rig lights and flaring and become concentrated. This would produce a small positive effect on fish populations (2006 EA report). For jack-up rigs, there is also the covering of the seafloor associated with the spud cans for an 80 day duration. The EA does not address the temporary loss of habitat associated with the spud cans.

The reef effect, attraction to lights and flaring, the exclusion zone, and the temporary alteration of habitat would have an overall short term duration (1 – 12 months), low magnitude and small (<1 -10 km<sup>2</sup>) geographic extent effect on fish populations. Therefore, the overall effect on fish and fish habitat is **not significant**.

#### **7.4.2 Marine Mammals and Sea Turtles** **1**

The presence of the drilling rig may create an artificial reef effect that could alter the local abundance and distribution of fish, thus concentrating a food source that may attract marine mammals and sea turtles to platforms. Noise, however from the drill unit and supply boats may have an effect. See Section 7.6.2 for a discussion of the effects of noise on marine mammals and sea turtles.

The physical presence of structures in the marine environment will have a negligible and **not significant** effect on marine mammals and sea turtles.

#### **7.4.3 Marine Birds** **0**

The presence of structures would create an artificial reef effect that could alter the local abundance and distribution of fish, thus concentrating a food source that may attract marine birds to the rig. Another effect on marine birds is most likely associated with lights and flares. See Section 7.5.3 for a discussion on the effects of lights and flares on marine birds.

The presence of the drill rig is expected to have negligible effects on marine birds that may be attracted to the Project area. It is likely that fishing boats would present a greater attraction for marine birds because of the availability of fish offal. There is an increased risk of predation on smaller birds such as storm petrels but it is not expected that there will be any increase in regional bird populations given the short duration of the project. The physical presence of structures in the marine environment will be continuous but negligible and **not significant** effect on marine birds.

#### **7.4.4 Commercial Fisheries** **1**

The presence of structures and the corresponding commercial fish exclusion zone (approximately 1-5 km<sup>2</sup> depending on the type of rig) would prohibit commercial fishing activities in the drilling area. The exclusion zone around each well is very small compared to the activities in the drilling area. The potential effects on fisheries will vary by location within the Project Area, depending on where exploratory drilling occurs. There are many areas within the Project Area where there is little recorded fishing activity (2006 EA report). Most fish activity with a good level of consistency from year to year occurs within fairly well-defined zones along the shelf break, in the Laurentian Channel within the southern part of the western Project Area, and in the northernmost part of the eastern Area. The physical areas occupied by drilling and VSP/shallow geohazard infrastructure is quite limited and the potential “footprint” of Project components with

respect to the commercial fisheries small. Based on the information presented in the EA, for the proposed drilling sites, the eastern area has had no recorded fishing activity during the past three years.

Therefore, the effect of the presence of structures on commercial fisheries will be of low magnitude, low geographic extent (1-10 km<sup>2</sup>) and of short duration (1-12 months). Overall, taking mitigation measures into consideration, the effects will be negligible and **not significant**.

#### 7.4.5 Species at Risk

0

As indicated above, the presence of structures is predicted to be not significant for birds, fish, marine mammals, and sea turtles. With application of mitigation such as: minimizing of lighting; recycling of drilling mud; treatment and discharge of cuttings; recycling and/or treatment of other waste fluids and solids; avoidance of marine mammals and sea turtles by supply vessels; maintenance of minimum flying altitude by helicopters; and ramp up/delay of ramp up/shutdown of seismic array; the effects on marine birds, marine fish, marine mammals and sea turtles species at risk will be **not significant**.

### 7.5 Lights and Flares

There may be some short-duration flaring by the drill rig during testing, if it occurs.

#### 7.5.1 Marine Fish and Fish Habitat

0

Fish may be attracted to illuminated surface waters, due to the use of floodlights in working areas on the drill rig and supply vessels. The effect would be negligible and **not significant** due to the small area affected and the short duration of the project.

#### 7.5.2 Marine Mammals and Sea Turtles

0

It is possible that lights associated with the drilling platform and associated supply vessels may attract prey for marine mammals and sea turtles. However, given the small areas where this may happen, any effects would be negligible. Therefore, impacts from lights and flares from the drilling platform and associated vessels on marine mammals and sea turtles would be **not significant**.

#### 7.5.3 Marine Birds

1

Lights on sea-going vessels regularly attract seabirds at night. Leach's Storm-Petrel is particularly prone to being attracted to lights at night. Leach's Storm-Petrels breed in large numbers in Newfoundland and was the most numerous species of seabird on the Laurentian Sub-basin seabird surveys during the 2005 seismic program. The drill rig and support vessels are to be checked early in the morning on a daily basis. Birds are to be released as per the Canadian Wildlife Service guidelines. Lights would have a continuous effect during nighttime hours but no effect in daylight.

Flaring may occur if petroleum hydrocarbons are encountered. The bright light on the flare reflects off the water droplets in fog creating a bright reflective light, which is thought to attract a greater number of Leach's Storm-petrels. The noise and heat should steer birds away from the flare under most night-time conditions. The added light of a flare may draw more Leach's Storm-petrels to the drill rig causing stranding on the deck. The frequency of occurrence is

unknown but could be as high as 11-50 events in the drilling season. The concern that birds will fly into a potential flare is presently considered low based on current knowledge. The geographic extent affected would be 1-10 km<sup>2</sup>.

The presence of lights on the drill vessel and support vessels and flaring would have a low and likely effect within a 1-10 km<sup>2</sup> area during the drilling period. However, given the mitigation of recovery and release, the short period of flare operation, and the short time frame for a drilling operation, effects on marine birds will be **not significant**.

#### **7.5.4 Commercial Fisheries** **0**

There should be no interaction between lights and flares and commercial fisheries. Therefore, there should be no effect on commercial fisheries due to lights and flares and therefore **not significant**.

#### **7.5.5 Species at Risk** **0**

As indicated above, the light from structures is predicted to be not significant for birds, fish, marine mammals, and sea turtles. Therefore, the effect on marine birds, marine fish, marine mammals and sea turtles species at risk will be **not significant**.

### **7.6 Noise**

Underwater noise may be caused by supply boats, drilling operations, and wellhead severance. Chemical explosives may be required for wellhead severance. Air-borne noise is normally associated with helicopters servicing the drill rig.

#### **7.6.1 Marine Fish and Fish Habitat** **1**

Sources of noise associated with the project include drilling activities, noise from marine traffic, noise associated with VSP activities, and noise associated with decommissioning and abandonment of the wells. Sounds emitted by a drilling rig are lower in magnitude, but more continuous than those from supply boats or seismic exploration. The fact that fish are well-known to be attracted to offshore drilling and production platforms indicates that fish adapt well to sounds associated with offshore oil exploration (2006 EA report). Effects of sound from the passage of supply vessels will be transitory and no greater than that of passage of fishing vessels (2006 EA report). The potential effects of VSP are less than those associated with commercial exploratory seismic surveys.

The physical effects on fish will only occur if fish are very close (<10 m) to a sound source. Thus, physical effects from the project are not likely. The more probable effect on fish is likely to be behavioural effects associated with the avoidance of sound. Due to the temporary nature of the Project, effects of noise will be low magnitude, not extensive geographically, and short to medium duration. This results in a negligible to minor, **not significant** adverse effect on fish and fish habitat.

#### **7.6.2 Marine Mammals and Sea Turtles** **1**

There is a concern with the noise produced by drilling activities on marine mammals and sea turtles, as they depend on the underwater acoustic environment. The drill rig(s) could be a semi-submersible drill rig (either dynamically positioned (DP) or anchored), jack-up, or drillship. In

general, drillships are noisier than jack-up rigs and semi-submersibles as noise from the ship's equipment is coupled very well to the water owing to the vessel's large surface area (2006 EA report). The drilling rig will be supported by three vessels of 12-15,000 HP. There will be, on average, two trips per week between the base and the platform. Personnel and light supplies will be transported to and from the drilling rig via twin-engine, offshore-rated helicopters. Flights would occur approximately six times per week. VSP arrays are typically smaller and have lower source sound pressure levels than 2-D or 3-D seismic surveys. They are typically conducted in a small area relative to a full 2-D or 3-D seismic survey and are conducted over shorter periods (i.e., 8 to 36 hours).

Marine mammals and sea turtles would most likely avoid the immediate area around the drilling rig or drillship due to underwater sound generated by the rig or drillship and attendant vessels. Helicopters normally fly at a minimum altitude of 600 m whenever possible and thus, little, if any effects on marine mammals' behaviour are likely. Based on source levels of VSP, the short duration of the operation, and use of mitigation measures, it is unlikely that marine mammals, including endangered species, would incur temporary or permanent changes in their hearing sensitivities.

Disturbance effects on marine mammals and sea turtles from drilling activities, aircraft and VSP activities are predicted to be negligible to low, over a duration of <1-12 months, in an area of 1-10 km<sup>2</sup>. Therefore, the effect on marine mammals and sea turtles will be **not significant**.

### 7.6.3 Marine Birds

0

There is concern of aircraft flying over nesting colonies of seabirds, which may cause a panic response and result in eggs and flightless young being pushed off cliff edges or being exposed to harsh weather conditions or predations when adults flush. As mitigation, aircraft will be directed to fly at a minimum of 600 m above sea surface whenever possible, avoid colonies of seabirds, and avoid repeated overflights of concentrations of birds and their habitat. In addition, guidelines established by the CWS require aircraft to remain at least eight km to the seaward side and 3 km on the landward side away from major seabird colonies from April 1 to November 1. Birds are mobile and can easily avoid the sounds created by drill rigs and supply vessels by flying or diving. Energy expended during these events would be minimal and have no physiological effect on the birds.

The effects of sound from the drill rig, support helicopter and supply vessel on marine birds are predicted to be negligible and therefore **not significant**.

### 7.6.4 Commercial Fisheries

0

As indicated above, there will be no significant effect on fish populations; therefore the effect on commercial fisheries will be **not significant**.

### 7.6.5 Species at Risk

0

As indicated above, the effects of noise from drilling operations is predicted to be not significant for fish, birds, marine mammals and sea turtles. Therefore, the effect of noise on marine birds, marine fish, marine mammals, and sea turtles species at risk will be **not significant**.



## 7.7 Atmospheric Emissions

The potential emissions from offshore drilling include: burning of well fluids during production tests and clean-up; engine, generator and heating exhausts from the rig, helicopters and supply vessels; med, degassing and other mudroom exhausts; and fugitive emissions.

### 7.7.1 Marine Fish and Fish Habitat

0

Emissions of potentially harmful materials will be small and of short duration and will rapidly disperse to undetectable levels. Effects on fish and fish habitat from atmospheric emissions will be negligible and **not significant**.

### 7.7.2 Marine Mammals and Sea Turtles

0

There should be no interaction between marine mammals and sea turtles and atmospheric emissions. Effect of atmospheric emissions on marine mammals and sea turtles will be **not significant**.

### 7.7.3 Marine Birds

0

Atmospheric emissions will originate from the drill rig, supply vessels, and helicopters from engines, generators and machinery. Diesel will be the primary fuel. However, all equipment is designed to meet regulatory requirements for emissions and regular maintenance plans ensure equipment operates as efficiently as possible. As a result, emissions of potentially harmful materials will be small and will rapidly disperse to undetectable levels. Effects of atmospheric emissions on marine birds will be negligible and **not significant**.

### 7.7.4 Commercial Fisheries

0

There should be no interaction between commercial fisheries and atmospheric emissions. Effect of atmospheric emissions on commercial fisheries will be **not significant**.

### 7.7.5 Species at Risk

0

As indicated above, emissions from drilling operations is predicted to be not significant for marine birds, marine fish, marine mammals and sea turtles. Therefore, the effect on marine birds, marine fish, marine mammals and sea turtles species at risk will be **not significant**.

## 7.8 Discharge of Drilling Muds and Cuttings

ConocoPhillips is proposing to use Water Based Mud (WBM) with a Synthetic Based Mud (SBM) necessary for a portion of its drilling program. WBM 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* (OWTG) (NEB 2002) prior to discharge. The muds are recycled and returned to shore for on-land disposal. During the modeling exercise for the well drilled at a water depth of 2,300 m over a 58 day period, a combined total of 754.4 m<sup>3</sup> of cuttings and mud were discharged during 47 drilling days. The modeling exercise for the well drilled at a water depth of 750 m over a 125 day period, a combined total of 754.4 m<sup>3</sup> of cuttings and mud were discharged during 95 drilling days.

### 7.8.1 Marine 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. However, the main effects from these discharges are likely smothering and alteration of benthic communities adjacent to the well. The modeling exercises conducted by ConocoPhillips for the 2006 EA Report, whereby the fate of cuttings and muds are estimated from a discharge point at the center of the drill location, showed that seafloor return WBM cuttings (1-mm layer) will be deposited over an area  $<0.002 \text{ km}^2$  for the deep water well location and  $<0.1 \text{ km}^2$  for the “shallow” location. Therefore, based on model predictions,  $<0.1 \text{ km}^2$  of seabed could be physically affected by a thin cuttings layer by each Laurentian Sub-basin well. Zones of effects on benthic organisms likely vary with quantity and type of drilling fluids and cuttings, water depth, physical conditions (e.g., bottom topography, sediments, currents, natural suspended material), species, life stage, season, and other factors (2006 EA report). The area of biological effects will be species/life stage dependent but in total can be expected to be less than the area of physical effects because many benthic species are mobile (2006 EA Report).

Portions of the southwest Grand Banks have been identified as exhibiting peak areas of coral abundance and diversity. The World Wildlife Fund-Canada (Edinger et al., 2007) has recommended that protective measures should be established. Areas of coral concentration appear to be located on the southwest Grand Banks shelf edge and continental slope near the southeast corner of the Study Area. An area of concentration of deepwater corals also is located at the Stone Fence, well outside the Project Area but just outside the Study Area. The ConocoPhillips geohazard and/or munition survey data will be examined for concentrations of corals. The discharge of drill cuttings and muds could also potentially increase sedimentation and cause toxic conditions for sensitive corals. ConocoPhillips has committed to avoiding areas with coral concentrations.

For a single well (one well drilled per location) exploration program, the predicted effect should be less as the risk of fish and fish habitat contamination is determined to be minimal. The discharge of muds and cuttings on fish and fish habitat will be negligible to low in magnitude,  $<1 \text{ km}^2$  geographic extent, with a 1-12 month duration. Based on mitigations indicated in the 2006 EA Report (e.g., use of WBMs wherever possible and low toxicity Blowout Preventer (BOP) fluid, cuttings treatment, chemical screening, compliance with 2002 OWTG); the predicted recolonization of benthic species in the cuttings deposition area; and the short duration of the program, the effects of drilling muds and cuttings on fish and fish habitat will be **not significant**.

### **7.8.2 Marine Mammals and Sea Turtles**

**0**

The deposition of muds and cuttings on the seafloor may have increased concentrations of heavy metals. However, drill cuttings are unlikely to affect marine mammals and sea turtles because the species that may occur in the Project Area do not typically feed on benthos (which would be the pathway of drill cuttings chemical components to marine mammals). Therefore, effects from deposition of drill muds and cuttings will be negligible and **not significant**.

### **7.8.3 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, where required, SBM. These materials are discharged below the surface and fall to the seafloor. 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 the likelihood of sheens on the water surface. Therefore, the discharge of drill muds and cuttings will have a negligible and **not significant** effect on marine birds.

#### **7.8.4 Commercial Fisheries** **0**

As indicated above, the effect on fish and fish habitat from drill cuttings deposition is not significant, therefore the effect on commercial fisheries will be **not significant**.

#### **7.8.5 Species at Risk** **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**.

### **7.9 Operational Discharges**

Discharges associated with drilling include cement slurry and blowout preventer (BOP) fluid. However, BOP fluid is not discharged from a jack-up rig. With a semi-submersible drilling platform, approximately 1 m<sup>3</sup> BOP fluid (glycol-based compound) would be released during up to six BOP function tests (three pressure and three function tests are typically conducted over a 40-day drilling program). Wastes and discharges from the rig include deck drainage, cooling water (semi-submersible only), sanitary and domestic waste (approximately 50 and 25 m<sup>3</sup>/day of grey and black water, respectively), garbage and other solid waste, ballast water, bilge water, and produced fluids. All discharges will comply with the OWTG. Black water or sewage will be macerated to 6 mm particle size or less and discharged as per the OWTG. Garbage, which includes organic waste from galleys, non-hazardous materials and hazardous materials, will be segregated as required for transport back to shore from disposal at approved facilities. The drilling platform will have a recycling program. ConocoPhillips indicated in the 2006 EA report that any unused portion of any chemical used during the exploration drilling program will be stored and returned to shore for disposal at an approved facility.

In exploration drilling programs, produced water would only be discharged once the well is tested for production. However, if any produced water is encountered during the well test, it is likely that it will be atomized and flared during testing. If the flare capacity were exceeded, small amounts of treated produced water would be brought ashore for disposal or discharged in accordance with the OWTG. Any cooling water associated with the drilling program (from a semi-submersible only) would be discharged as per the OWTG.

#### **7.9.1 Marine Fish and Fish Habitat** **0**

All solid and food waste will be brought ashore. Combustible materials such as oily rags and paint cans will be placed in separate hazardous materials containers and transferred ashore. All wastewater discharges will be treated and tested for compliance in accordance with the 2002 OWTG prior to discharge. In compliance with the OWTG, sanitary waste from the rig will be macerated to a particle size of 6 mm or less. Ballast water on floating drill rigs and supply boats is stored in dedicated ballast tanks. Effects of operational discharges will be negligible in magnitude, with a 1 – 12 month duration, and <1 km<sup>2</sup> geographic extent. Therefore, overall the effect on fish and fish habitat will be **not significant**.

### **7.9.2 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. There will be no release of BOP fluids or cooling water fluids during drilling with a jack-up rig. Other fluids include oily water from other drilling fluids, deck drainage and bilge and ballast water. Any discharged oily water will comply with the OWTG as will any other regulated liquid or solid discharged from the drilling platform.

The discharge of BOP fluid, cooling water, deck drainage, bilge water, sanitary and domestic waste, is predicted to have negligible effects on marine mammals and sea turtles. Therefore, the effects on marine mammals and sea turtles from proposed drilling discharges will be **not significant**.

### **7.9.3 Marine Birds** **1**

Domestic garbage will be transported to shore and will not interact with marine birds. In compliance with the OWTG, sanitary waste from the rig will be macerated to a particle size of 6 mm or less. All discharges are treated prior to releases and discharged at-depth, thereby reducing the potential for sheening. The overall effect of operational discharges on marine birds will be **not significant**.

The effects of operational discharges on marine birds will be negligible and therefore **not significant**.

### **7.9.4 Commercial Fisheries** **0**

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

### **7.9.5 Species at Risk** **0**

As indicated above, operational discharges from drilling activities are predicted to be not significant for marine fish, marine birds, marine mammals, and sea turtles. Therefore, the effect on marine fish, marine birds, marine mammals, and sea turtles species at risk will be **not significant**.

## **7.10 Well Abandonment**

There are three scenarios for well abandonment: plug and leave well head in place; plug and remove mechanically; or remove with shaped charges. The method selected for each well will depend on site-specific conditions (e.g., water depth), risk analyses, and C-NLOPB requirements. Upon completion of its drilling program, it is ConocoPhillips intent to abandon and remove all wells, in accordance with the C-NLOPB regulations, using mechanical separation. In the event that mechanical separation fails, ConocoPhillips 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 ConocoPhillips to undertake a marine mammal observation program during the abandonment program.

### **7.10.1 Marine Fish and Fish Habitat** **1**

Well abandonment would include using mechanical devices or cement mixture plugs to isolate

the wellbore and mechanical cutters to remove the wellhead and any associated equipment (such as casing strings and the high and low pressure wellhead housings) from the seabed. The well casing is typically cut just below the surface of the seal. In the unlikely event that the mechanical casing/wellhead cutting device fails, shaped charges may be required to cut the wellhead. The effects of using directed chemical charges underwater are dependent on the magnitude and timing of the explosion. Explosive removal would only be done as a last option and will conform to C-NLOPB requirements and industry standards. The explosive energy will be dampened by burying charges but some fish in the immediate vicinity may suffer damage. Mitigations to prevent damage to marine mammals will include selective use of buried charges, a 1,000 m safety zone, and an environmental observer to monitor the safety zone. With mitigations in place and a small geographic extent, magnitude, and duration, the effects will be **not significant**.

#### **7.10.2 Marine Mammals and Sea Turtles** **1**

Standing in place or mechanical removal can be considered to have no effect on marine mammals or sea turtles. Mechanical severance using chemical explosives will only be done if not other option and will conform to C-NLOPB requirements and industry standards. Mitigations to prevent damage to marine mammals will include selective use of buried charges, a 1,000 m safety zone, and an environmental observer. Effects are predicted to be **not significant**.

#### **7.10.3 Marine Birds** **0**

There should be no interaction between marine birds and well abandonment (mechanical or directed charges), and therefore a **not significant** effect.

#### **7.10.4 Commercial Fisheries** **0**

There should be no effects on commercial fisheries associated with well abandonment. Well heads would only be considered to be left in place in water depths or locations where no fishery is expected to occur. As indicated above, effects 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**.

#### **7.10.5 Species at Risk** **0**

Explosive removal would only be done as a last option and would conform to C-NLOPB requirements and industry standards. Mitigations to prevent damage to SARA species will include selective use of buried charges, a 1,000 m safety zone, and an environmental observer. The effect on marine fish, marine birds, marine mammals, and sea turtles species at risk resulting from well abandonment operations will be **not significant**.

### **7.11 Accidental Events**

During exploration drilling programs, the possible accidental events, which may impact the environment, include blowouts and batch spills. For the proposed drilling program, the probability of a blowout during the drilling of an exploration well is estimated to be 1 in 19,500 for spills greater than 150,000 bbl, 1 in 6,500 for spills greater than 10,000 bbl, and 1 in 4,875 for spills greater than 1,000 bbl (LGL 2006). The frequency of platform based spills have been estimated to range from 0.0014 to 3.4 spills per year, for spills less than 999 bbls.

Modeling was completed to predict the behaviour and fate of condensate from subsea and surface blowouts at the exploration platforms and diesel fuel discharges in the vicinity of the drilling platform. A gas flow rate of 570 MMSCFD and a condensate flow of 10 barrels per MMSCF of gas was selected for use in the surface blowout modeling exercises. Subsea blowouts were assumed to have gas flows of 850 MMSCFD and a condensate flow of 10 barrels per MMSCF of gas. The geology was assumed to be consistent with Sable Island which was primarily gas with a small amount of liquid condensate. The fate of 10 and 100 barrel batch spills of diesel fuel was also modeled. It is predicted that no condensate or oil spilled in the Project Area will reach shore. The expected hydrocarbons (if present) will be primarily gas with the result that condensate slicks will be relatively small and short-lived as the slicks quickly dispersed by wind and waves. Results of the modeling exercise are described in the 2006 EA report.

### 7.11.1 Marine Fish and Fish Habitat

1

Fish eggs and larvae are more likely to be affected by oil spills. However, the effects would be negligible to low magnitude with a geographic extent range from <1 km<sup>2</sup> to 1,001-10,000 km<sup>2</sup>. Frequency and duration of these accidental spills are <11 events/yr and <1 month, respectively. Mitigation measures such as spill prevention and remediation would reduce overall impacts. Given these criteria and that, all residual impacts are also predicted to be reversible, impacts on fish and fish habitat would be **not significant**.

### 7.11.2 Marine Mammals and Sea Turtles

1

Marine mammals and sea turtles exposed to oil from a spill could suffer sublethal effects, though oiling of mucus membranes would be reversible. Marine mammals and sea turtles have been observed avoiding or attempting to avoid spills (2006 EA report). Some species are likely present in the Laurentian Sub-basin area year round, but most species probably just occur there during summer months. For marine mammals, it is probable that only small proportion of populations are at risk at any one time. Based on the marine mammal monitoring program in the Laurentian Sub-basin in the summer of 2005, there is some evidence to suggest that blue whales frequent the slope of the Study Area. Blue whales were the most abundant baleen whale observed during monitoring with the highest sighting rate in August and in deep water (2006 EA report). It will be important to implement appropriate monitoring and mitigation measures in the unlikely event of a large gas/condensate blowout or a spill. Depending on the time of year, location of toothed and baleen whales within the affected area, and the type of oil spill or blowout, the effects of an offshore oil release on marine mammals and sea turtles is predicted to range from a negligible to low magnitude over varying geographic extent. For all spill scenarios considered for the EA report, the duration is predicted to be 1 – 12 months and effects are considered reversible. Therefore, the effects of accidental spills on marine mammals and sea turtles will be **not significant**.

### 7.11.3 Marine Birds

2

Oil on water is a threat and potential effect to marine birds. Significant numbers and concentration of birds occur on the Grand Banks. The northwest section of the Study Area is on the Grand Banks. Any oil spill could cause bird mortality. It is unlikely, based on the spill trajectory predictions (2006 EA report), that oil will reach land and affect seabird colonies. However, birds in the area of the rig would be at risk. Thick-billed murre, common murre and

dovekies are the species most sensitive to oiling on the Grand Banks (2006 EA report). All of the spills modeled had the potential to negatively affect marine birds. However, given that the expected hydrocarbons are primarily gas, the condensate slicks will be relatively small and short-lived, as the slicks will be quickly dispersed by wind and wave. The effects of the modeled spills were not significant. Even though there could be a significant effect on birds, the likelihood of a spill is very small due to mitigation in place to prevent spills from occurring. Therefore, this will result in a negligible to low magnitude, 1 -12 month duration, and geographic extent >10,000 km<sup>2</sup> with a **not significant** effect.

#### 7.11.4 Commercial Fisheries

1

Fate and behaviour modeling indicates that the maximum distance from the source of a spill where hydrocarbon concentrations are at least 0.1 ppm is 75 km (2006 EA report). Depending on where the drilling site is located within the Project Area, this could be well away from fishing activities. Based on surface wind and current conditions, the hydrocarbons will be carried offshore to the south away from most fishing activities. Also, the area where hydrocarbon levels are high enough to foul gear or cause tainting is much smaller than the area out to 0.1 ppm. Most of the fisheries activities in or near the Study Area in recent years are pursued with bottom trawl (groundfish), gillnets (groundfish), and crab pots. If there were damage to fishing gear, there would likely be some disruption of fisheries activities. Such economic effects (caused by loss of access, gear damage or changes in market demand) could be considered significant to the commercial fisheries. However, with the mitigation of appropriate economic compensation, the effect would be reduced to **not significant**.

#### 7.11.5 Species at Risk

1

It is predicted that accidental events will not have significant effects on marine fish, marine birds, marine mammals, or sea turtles. Therefore, for marine fish, marine birds, marine mammals, and sea turtles species at risk likely to be present in the area, the effects from accidental events will be **not significant**.

### 7.12 Cumulative Environmental Effects

Potential cumulative effects external to the Project include marine transportation (e.g., tankers, freighters, naval vessels, private yachts), DFO and industry research surveys, commercial fishing, oil and gas exploration drilling activity, seismic activity, and existing oil development projects (Hibernia, White Rose and Terra Nova). There may also be a munitions dumpsite in the Project Area.

The DND will be consulted to identify munitions dump sites or hazardous shipwrecks. A risk assessment will be undertaken and the report provided to the C-NLOPB with the Drilling Program Authorization (DPA) application.

Considering the small areas occupied by Project drilling-related activities, displacement of DFO/industry research surveys would need only implement a diversion of a km or less to avoid drilling activities.

For site profiling or geohazard surveys (which would be short in duration and limited in extent), communication and coordination with DFO and the fishing industry would be implemented, as is

typically done for 2-D and 3-D seismic surveys. Four seismic programs (one each in Labrador, Orphan Basin, the Laurentian Sub-basin, and the Grand Banks) were conducted in Newfoundland and Labrador waters in 2005. For the Newfoundland and Labrador Offshore area, it is probably reasonable to assume two programs per year over the next few years.

Mitigation measures, including treatment of fluids, muds and cuttings will minimize the potential for significant effects on seabirds within the Study Area. Any other rigs will be beyond the sight capabilities of seabirds and thus there is no potential for overlapping effects from light attraction.

It is predicted that the Project will not cause any marine mammal mortalities and thus there will be no cumulative effects on marine mammals in terms of direct mortalities. Effects on their prey (e.g., zooplankton, squid, and fish) have all been predicted to be negligible and not significant. Given the amount of commercial shipping and fishing activity that is present on and near the Laurentian Sub-basin and surrounding areas, it is safe to conclude that the underwater environment is noisy. The incremental sound from exploratory drilling activities may increase overall sound levels, but increases are probably low considering the distance between operations on the Laurentian Sub-basin and those at Hibernia, White Rose, and Terra Nova.

In 2009, the activities that may overlap in time and space with the exploration program are likely to be commercial fishing, DFO/Industry research surveys, and marine transportation. However, the exploration program will be scheduled to such an extent to avoid spatial overlap in areas of concentrated fishing and to reduce interference with research surveys. The cumulative effects may be additive, however with mitigation outlined above and from other existing project, the effects will be adverse but of low magnitude, limited geographic extent and short duration. The cumulative effects are therefore considered **not significant**.

**7.13 Follow-up Monitoring**                      **Required**      **Yes**                      **No**

The RA does not require follow-up monitoring, as defined in the CEA Act and supporting guidance material, to be carried out for the Project.

**8. Other Considerations**

The C-NLOPB is satisfied with the environmental information provided by ConocoPhillips regarding the potential adverse environmental effects, which may result from the proposed Project for exploration drilling activities in 2009, and are satisfied with the operator's proposed monitoring and mitigative measures.

The C-NLOPB is 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 C-NLOPB is of the view that if the proposed environmental mitigative measures outlined in the EA Report and supporting documents and those listed below are implemented, the Project is not likely to cause significant adverse environmental effects.



## **9. Recommended Conditions and/or Mitigations**

The C-NLOPB recommends that the following conditions be included in the authorization if the Project is approved.

- *ConocoPhillips 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 “Laurentian Sub-Basin Exploration Drilling Program Environmental Assessment” (Buchanan et al. 2006) and the “Laurentian Sub-basin Exploration Drilling Program Environmental Assessment Addendum” (Buchanan et al. 2007).*
- *The “safety zone” defined for marine mammal protection is designated to be 500 m.*
- *ConocoPhillips and its contractors shall shut down the seismic array if a marine mammal listed as **endangered** (as per SARA – Schedule 1) including the northern right whale, Blue whale, and leatherback turtle, is observed within 500 m of the airgun array during ramp-up procedures and when the array is active.*
- *A report respecting any formal risk assessment process necessary because of the proximity of any well location to known munitions dump sites, as mentioned in Section 5.2.4.3 of the “Laurentian Sub-basin Exploration Drilling Program Environmental Assessment” (LGL 2006) shall be provided to the C-NLOPB with the submission of the application for Drilling Program Authorization (DPA). The DPA application, and the report, should be submitted at least three to four months prior to the anticipated spud date of the first well in the drilling program.*
- *Drilling shall not occur within 200 m of coral colonies without the prior approval of the Chief Conservation Officer. A coral colony is defined as*
  - a *Lophelia pertusa* reef complex; or
  - 5 or more larger corals (larger than 30 centimeters in height or width) within a 100 square metre area.

## **Part D: Screening Decision**

### **10. Decision/Decision Date**

The Canada-Newfoundland and Labrador Offshore Petroleum Board is of the opinion that, taking into account the implementation of proposed mitigation measures set out in the conditions above and those committed to by ConocoPhillips, 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  
Kimberly A. Coady  
Environmental Assessment Officer

Date: December 10, 2007

C-NLOPB

## References:

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- Buchanan, R.A., J.R. Christian, V.D. Moulton, B. Mactavish, R. Pitt, J. Bobbitt, S. Canning, R. Belore, P. Rudkin, D. Dunbar, and M. Wawrzkow. 2007. Laurentian Sub-basin Exploration Drilling Program Environmental Assessment Addendum. LGL Rep. SA934. Rep. by LGL Limited with Oceans Limited, Canning & Pitt Association, Inc., Provincial Airlines Limited, SL Ross environmental Research Ltd., Calixte Environmental Management and PAL Environmental Services, St. John's, NL. For ConocoPhillips Canada Resources Corporation, Calgary, Alberta. 80 p. + appendix.
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