

# **Laurentian Sub-basin Exploration Drilling Program Project Description**

**Prepared by**



**Prepared for**



**1 December 2005  
LGL File SA832**



**Laurentian Sub-basin  
Exploration Drilling Program  
Project Description**

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# Table of Contents

	Page
Table of Contents .....	ii
List of Figures .....	iv
List of Tables .....	iv
1.0 Introduction .....	1
1.1. Relevant Legislation and Regulatory Approvals .....	3
1.2. Canada-Newfoundland and Labrador Benefits .....	4
2.0 Proposed Project .....	5
2.1. Name and Location .....	5
2.2. The Operator .....	5
2.3. Project Overview .....	8
2.4. Alternatives to Project/Alternative Means within Project .....	8
2.5. Project Scheduling .....	8
2.6. Site Plans .....	9
2.7. Personnel .....	9
2.8. Geophysical Survey Equipment .....	9
2.9. Project Logistics .....	9
2.9.1. Marine Support Vessels .....	9
2.9.2. Helicopter Support .....	10
2.9.3. Shore-base Facilities .....	10
2.10. Drilling .....	10
2.10.1. Mobile Offshore Drilling Units (MODU) .....	10
2.10.2. Well Abandonment .....	11
2.11. Emissions and Waste Discharges .....	12
2.11.1. Drill Muds and Cuttings .....	12
2.11.2. Well Testing .....	12
2.11.3. Grey/Black Water .....	13
2.11.4. Machinery Space Discharges .....	13
2.11.5. Bilge Water .....	13
2.11.6. Deck Drainage .....	13
2.11.7. Ballast Water .....	13
2.11.8. Cooling Water .....	14
2.11.9. Solid Waste .....	14
2.11.10. Air Emissions .....	14
2.11.11. Miscellaneous .....	14
2.12. Waste Management Plan .....	15
2.13. Project Site Information .....	15
2.13.1. Environmental Features .....	15
2.13.2. Physical Environment .....	15

2.13.3.	Multiple Ocean Uses.....	15
2.13.4.	Navigable Waters.....	16
2.13.5.	2.13.5 Fish and Fish Habitat .....	16
2.13.6.	Species Listed under the Species at Risk Act .....	16
2.14.	Effects of the Environment on the Project.....	17
2.15.	Effects of the Project on the Environment.....	17
2.16.	Environmental Monitoring.....	17
2.17.	Information on Consultations .....	18
3.0	References Cited .....	19

## List of Figures

	Page
Figure 1.1. Laurentian Sub-basin Project Area. ....	2
Figure 2.1. Laurentian Sub-basin Proposed Year 1 Drill Sites and Previous Drill Sites in the Area. ...	6

## List of Tables

	Page
Table 2.1. Locations of Potential Wells. ....	5
Table 2.2. Description of Typical Drill Hole and Casings. ....	11





# 1.0 Introduction

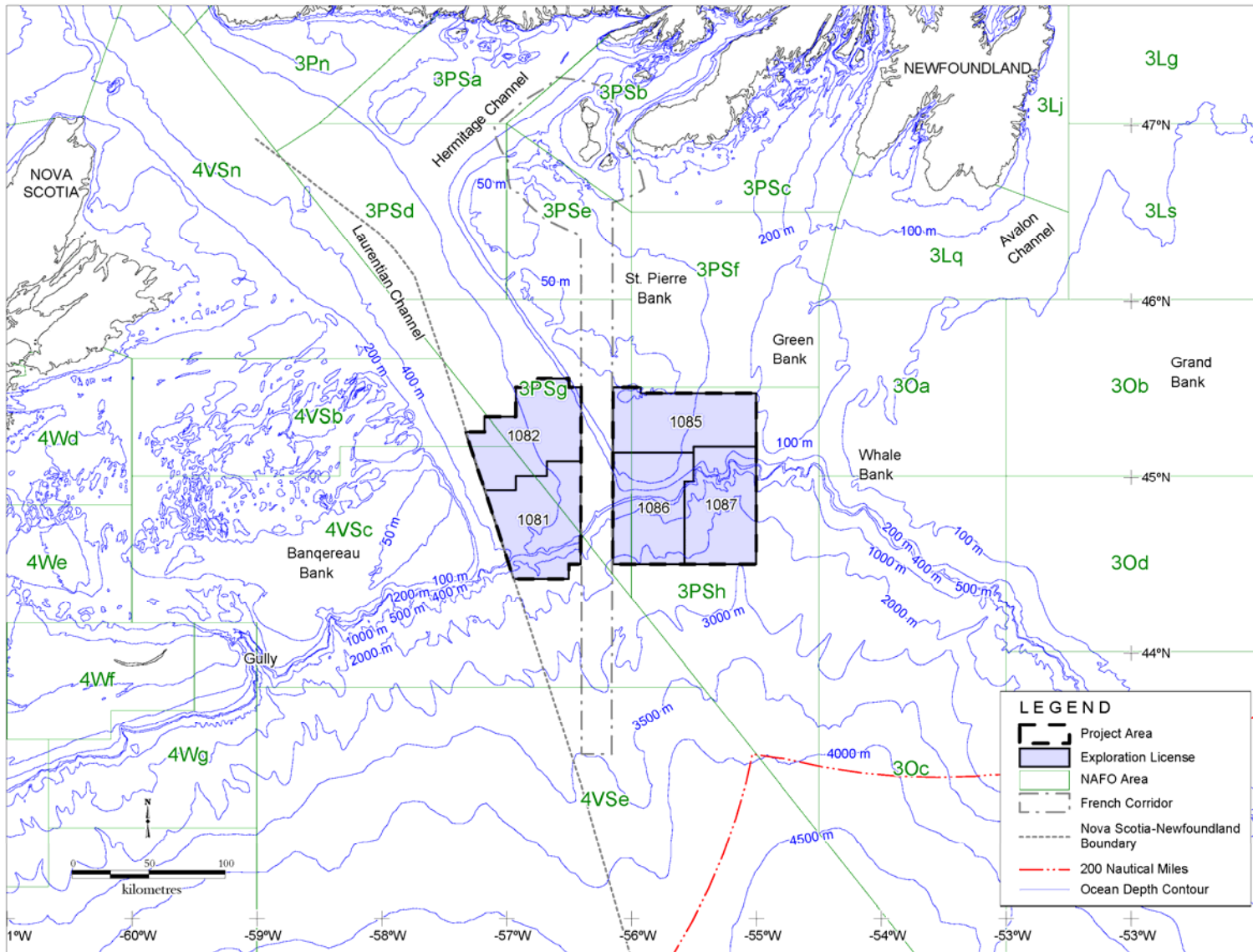
This document is submitted to the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) as a Project Description for the Laurentian Sub-basin Exploration Drilling Program (“the Project”). ConocoPhillips Canada Resources Corporation (the “Operator”) and partners Murphy Oil Corporation and BHP Billiton Limited are proposing an exploration/appraisal drilling program within Exploration Licenses EL1081, 1082, 1085, 1086 and 1087 (Figure 1.1). The proposed drilling sites are situated in the Laurentian Sub-basin over 250-km southwest of St. John’s, Newfoundland and Labrador at water depths ranging from 100 to 2,300-m. Depending on regulatory approval and rig availability, drilling operations may commence in late 2006. However, it is more likely that operations will commence in the second quarter of 2007.

Previous environmental assessments (EAs) for the Laurentian Sub-basin include a strategic environmental assessment (SEA) conducted for the C-NLOPB and the Canada-Nova Scotia Offshore Petroleum Board (C-NSOPB) (JWEL 2003), and two seismic exploration screening level EAs conducted for ConocoPhillips (Buchanan et al. 2004; Christian et al. 2005).

This Project Description is based upon information available at the time of writing. Not all Project details are presently known because not all contractors and suppliers have been selected and the specific numbers and locations of wells will depend upon ongoing analyses of 3-D seismic data and the success (or lack thereof) of initial wells. Nonetheless, this Project Description is an accurate reflection of the Proponents’ present level of knowledge. The Project Description will be refined as the Project progresses.

This Project Description is organized as follows.

- Introduction
  - Relevant Legislation and Regulatory Approvals
  - Canada-Newfoundland and Labrador Benefits
- Proposed Project
  - Name and Location
  - The Operator
  - Project Overview
  - Alternatives to Project/Alternative Means within Project
  - Project Scheduling
  - Site Plans
  - Personnel
  - Geophysical Survey Equipment
  - Project Logistics
  - Drilling
  - Emissions and Waste Discharges
  - Waste Management Plan



**Figure 1.1. Laurentian Sub-basin Project Area.**

- Project Site Information
- Effects of the Environment on the Project
- Effects of the Project on the Environment
- Environmental Monitoring
- Information Monitoring
- Information on Consultations
- References Cited

## 1.1. Relevant Legislation and Regulatory Approvals

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*. Subject to Section 5 (1) (d) of the *Canadian Environmental Assessment Act (CEAA)*, the C-NLOPB, also referred to as “the Board”, is a responsible authority (RA) and must undertake an EA of the Project.

Legislation that is relevant to the environmental aspects of this Project include

- *Canada-Newfoundland Atlantic Accord Implementation Acts*
- *Canadian Environmental Assessment Act*
- *Oceans Act*
- *Fisheries Act*
- *Navigable Waters Protection Act*
- *Canada Shipping Act*
- *Species at Risk Act*
- *Migratory Birds Convention Act*
- *Canadian Environmental Protection Act*

There is no federal funding for this Project. Federal lands are involved and they are administered by the C-NLOPB, a federal-provincial agency operating under the Accord Acts. A Drilling Program Authorization (DPA) and one or more Approvals to Drill a Well (ADW) are required to operate a drilling program in the offshore.

The EA will be coordinated among the C-NLOPB, and federal departments including Fisheries and Oceans (DFO), Environment Canada, Transport Canada, Natural Resources Canada, the Department of National Defense and the Canadian Environmental Assessment Agency (CEA Agency).

The exploration drilling and appraisal program has been determined to be one project as the ELs are in the same basin, because similar activities will occur at the same time, and one company (ConocoPhillips Canada Resources, also referred to as CPC) is the lead company for the purposes of the environmental assessment.

## 1.2. Canada-Newfoundland and Labrador Benefits

Consistent with the legislative requirements of the *Canada Newfoundland Atlantic Accord Implementation Acts*, CPC and its partners are committed to enhancing the business opportunities for Canada and Newfoundland and Labrador as described in their Benefits Plan.

No direct long-term employment opportunities are anticipated as a result of this limited duration work program. Most of the local employment opportunities associated with the drilling program will be indirect and provided by the drilling contractor. CPC, its partners and its contractors are committed to full and fair opportunity with first consideration given to qualified individuals resident in Newfoundland.

The guiding principal for the tendering and contract award process will be based upon “Best Value”. The procurement strategies are designed to achieve “full and fair opportunity” for Newfoundlanders and Labradorians and Canadians in terms of industrial and employment benefits.

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## 2.0 Proposed Project

### 2.1. Name and Location

The official name of the Project is the Laurentian Sub-basin Exploration Drilling Program. It 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 and Labrador (Figure 2.1). Bathymetry is complex with water depths ranging from about 100 to 2,300-m depth over shelf, slope and basin areas. Offshore drilling has previously occurred at five locations within 50-km of the Project Area (Figure 2.1).

Initially, CPC intends to drill two exploratory wells in ELs 1081 and 1087. Depending on results and seismic data interpretation, an additional two appraisal wells may be drilled in those license areas, as well as up to three additional wells in ELs 1082, 1085 and 1086 (Table 2.1). Additional information will be provided as it becomes available.

The Project Area as defined in Figure 2.1 is similar to the previous seismic EAs conducted by ConocoPhillips and includes all of the license areas within which ConocoPhillips is intending to drill.

**Table 2.1. Locations of Potential Wells.**

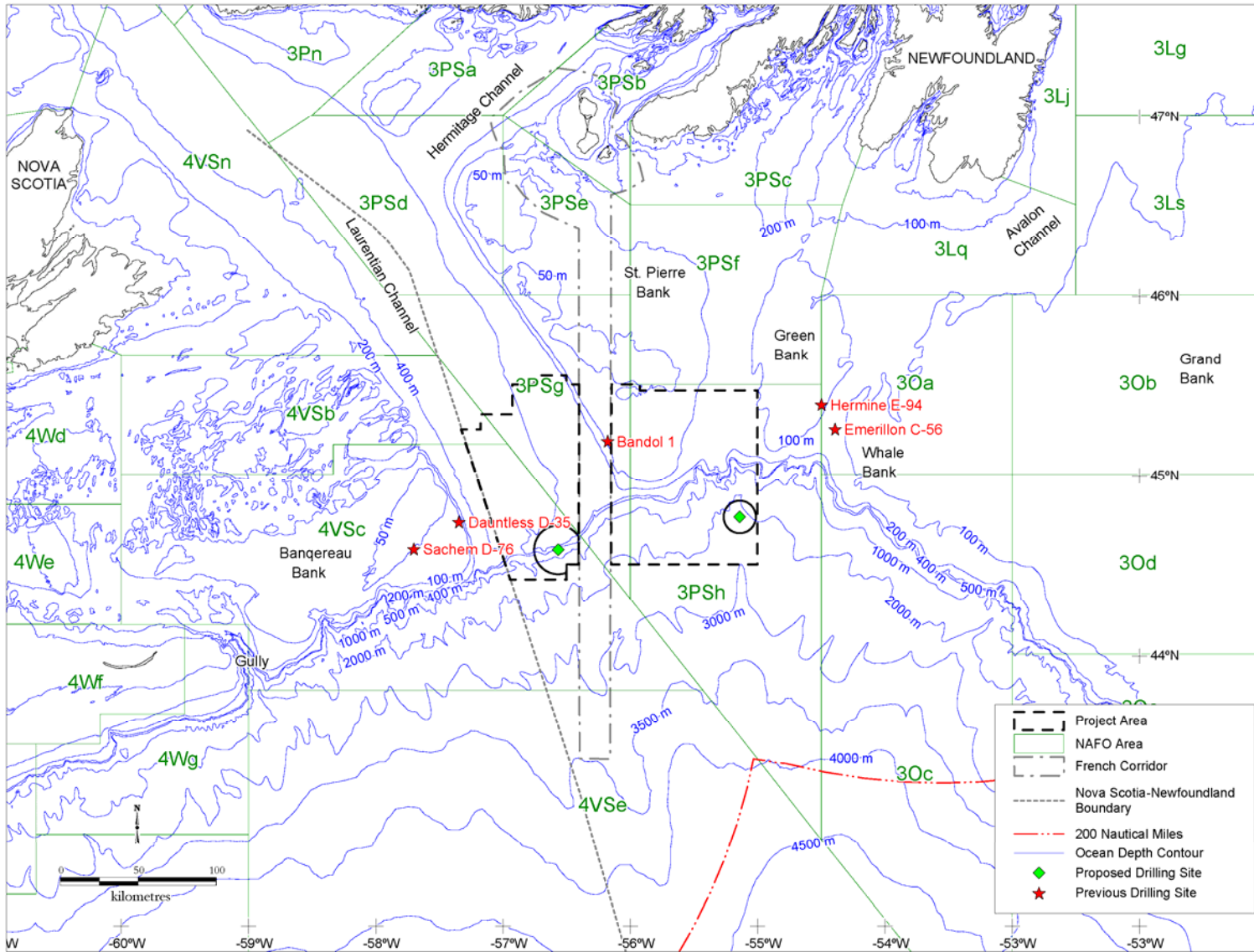
Year (Tentative)	Block	Exploratory/Appraisal	Water Depth (m)	Coordinates (UTM Zone 21)
2007	1087	Exploratory	2,300 approx.	647,287E 4,958,250N ±10km
2007	1081	Exploratory	750 approx.	534,535E 4936538N ±15km
2008/9	1087	Appraisal	N/A*	N/A
2008/9	1081	Appraisal	N/A	N/A
2009	1086	Exploratory	N/A	N/A
2010	1085	Exploratory	N/A	N/A
2010	1082	Exploratory	N/A	N/A

\*Not available at this time

Source: ConocoPhillips

### 2.2. The Operator

The Operator, ConocoPhillips Canada (CPC), is headquartered in Calgary, Alberta and has approximately 1,100 employees. The company is a wholly owned subsidiary of Houston-based ConocoPhillips and was formed in 2002 following the merger of Conoco Inc. and Phillips Petroleum. A fully integrated energy company, ConocoPhillips is globally involved in every aspect of the oil and natural gas industry. The company operates in over 40 countries, has more than 35,000 employees around the globe, and US\$93 billion of assets. ConocoPhillips stock is listed on the New York Stock Exchange under the symbol "COP."



**Figure 2.1. Laurentian Sub-basin Proposed Year 1 Drill Sites and Previous Drill Sites in the Area.**

CPC's diverse mix of oil and gas exploration and development opportunities stretch from Western Canada to the Frontier regions of the Far North and offshore Atlantic Canada. Alberta's oil sands resources are also a significant part of the company's portfolio, with interests in Syncrude and the Surmont Project, located near the town of Fort McMurray.

In Western Canada, the company holds conventional oil and gas interests in Alberta, northeast British Columbia and southwest Saskatchewan. ConocoPhillips operates about 75 per cent of assets based on production and has working interest in over 10 million net acres in Western Canada.

The company's legacy projects include:

- Far North, with a 75% interest in the Parsons Lake field
- Surmont Oil Sands Project, as operator and 50% owner
- Offshore Atlantic Canada, with a majority interest in 6.1 million acres in the Laurentian Basin.

CPC's ongoing commitment to its stakeholders is supported through the principle of sustainable development and its SPIRIT values (safety, people, integrity, responsibility, innovation and teamwork). This is the foundation upon which they build relationships with communities where they operate, managing the social, economic and environmental elements of everything they do.

ConocoPhillips has established a clear goal to conduct its business in a way that promotes economic growth, a healthy environment and vibrant communities, now and in the future. The company is committed to:

- increasing the availability of ever-cleaner energy;
- being transparent and accountable by measuring and reporting both financial and non-financial performance;
- operating to the highest safety standard;
- positively impacting communities wherever it operates;
- minimizing the environmental impact of operations;
- investing in the well-being and development of its employees;
- constantly improving the energy and material efficiency of operations;
- practicing and upholding the highest ethical standard; and,
- ensuring the long-term financial viability of the company.

To achieve these commitments, CPC strives to incorporate sustainable development into all of its planning and decision-making.

## **2.3. Project Overview**

Initially, CPC and its partners plan to drill up to seven exploration/appraisal wells. Depending on the results of seismic data analyses, CPC expects to drill two initial exploratory wells in ELs 1087 and 1081. Again, depending upon additional data analyses and results of the initial drilling, an appraisal well may be drilled in each of those ELs, and an additional three exploration wells may be drilled in the adjacent license areas (EL 1082, 1085, 1086). 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 upon water depth), 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.

The Operators' drilling contractors will maintain a marine shore base(s) in Atlantic Canada during the proposed drilling campaign. The re-supply of drilling equipment and materials will be performed from this location. The transport of personnel to and from the shore base and the Project Area will be conducted mainly by helicopter, but in isolated situations, supply boats may be used. The Project Area as defined in this EA encompasses all of the Operator's land holdings in the Laurentian Sub-basin, offshore Newfoundland. No new shore-based facilities will be constructed for this operation.

## **2.4. Alternatives to Project/Alternative Means within Project**

A potential alternative to the Project is to not drill any wells in these locations but to seek oil and gas elsewhere in order to satisfy market demand. However, CPC and its partners have been awarded rights to explore in these areas through a regulated competitive bidding process and are now seeking to fulfill commitments made as part of this process. As such there is no alternative to the Project.

Alternative means to complete the Project may be considered in selecting the rig, drilling program/fluid, supply base, waste/emissions management, and program timing. Selection of these alternatives will be guided by a consideration of economic, environmental, community, safety and technical factors.

## **2.5. Project Scheduling**

Execution and scheduling of subsequent wells will largely be dependent on exploration success encountered by the initial wells. The EA will contain a project schedule in as much detail as known at time of writing. The first well is tentatively planned for the second quarter of 2007 and the Project may extend for the life of the licenses (up to July 2013). [However, drilling could potentially occur as early as late 2006.] It is anticipated that from one to four wells per year could be drilled.



## **2.6. Site Plans**

Site locations are presented in Figure 2.1 and Table 2.1. More specific locations are yet to be determined but will be included within the EA for initial wells.

## **2.7. Personnel**

The overall Project will be managed by CPC from an office located in Newfoundland and Labrador. The managers have the authority to effectively manage the overall operational aspects of the Project on an ongoing basis. Day-to-day drilling operations will be directed by the Operators' drilling superintendents.

Offshore, the management team consists of the Senior Drilling Supervisors (Operator's offshore representative), the designated Offshore Installation Managers, and Supply Vessel Masters.

## **2.8. Geophysical Survey Equipment**

Vertical seismic profiling (VSP) using an airgun array may be conducted as part of the drilling activities. The VSP is used to assist in further defining a petroleum resource. The array is similar to that employed by 2-D or 3-D seismic surveys but is usually smaller and deployed in a small area for a limited amount of time (several days to several weeks).

Shallow geohazard surveys may be conducted at each location prior to drilling in order to assess seabed stability and potential for shallow gas. The specific equipment will be determined based on location, but typically use multi-beam sonar, side scan sonar, a towed array, and bottom sampling and/or ROV video. For deep water wells, 3-D seismic data may be sufficient to assess geohazards.

The Operator will adhere to the C-NLOPB's *Geophysical, Geological, Environmental and Geotechnical Program Guidelines, April 2004*.

## **2.9. Project Logistics**

### **2.9.1. Marine Support Vessels**

Supply/standby vessels will meet Canadian standards and will be managed from the Contractors' offices in Atlantic Canada. Letters of Compliance for each chartered standby vessel will be in place prior to work commencing. The vessels will be comparable to those presently operating on the Grand Banks in terms of power and capabilities. The vessels will be used for re-supply, safety stand-by, and iceberg surveillance and control.

## **2.9.2. Helicopter Support**

Contract helicopter support will be provided by several twin-engine, offshore-rated helicopters (about six trips per week per rig). The helicopter contractor will also provide all auxiliary flight services for First Response Equipment and technicians, alternate landing sites complete with weather station, aviation fuel, helicopter passenger transportation suits and an aircraft maintenance and passenger loading terminal located in Atlantic Canada.

## **2.9.3. Shore-base Facilities**

The Project will be managed and operational decisions will be made from the Operators' offices in Atlantic Canada. The existing infrastructure and activity in Atlantic Canada harbours enables the industry to optimize the utilization of supply vessels and other logistic assets. The existing facilities are capable of servicing multiple operations with the existing infrastructure including office space, crane support, bulk storage and consumable (fuel, water) storage and delivery capability. Warehouse facilities will be provided by Project contractors as required and will consist primarily of storage for tubular goods, and the equipment belonging to the drill rigs which can be stored onshore.

Operation and co-ordination service of all aeronautical and marine voice and data communication services will be provided from a central facility (contractor to be selected) in Atlantic Canada. The primary communications link between the drill rigs and the Project Operations offices will be via a dedicated satellite service. Independent backup communications systems will be provided by high quality HF radio service, available through the coastal radio station. Details on communications systems are outlined in the Alert and Emergency Response Plans to be filed with the C-NLOPB.

## **2.10. Drilling**

### **2.10.1. Mobile Offshore Drilling Units (MODU)**

Drilling will be conducted by a bottom-founded jack-up rig, anchored semi-submersible or dynamically positioned (DP) drill ship or semi-submersible rig. The key difference between DP units and other drill rigs typical on the Grand Banks is that the DP vessels are not anchored to the bottom but maintain position using a system of thrusters. In the case of a DP rig, the drill stem and riser are the only connections with the seafloor. Although generally noisier than anchored rigs, DP vessel position maintaining activities do not disturb the seabed. The DP rigs are often used in water depths exceeding 500-m. They are virtually the same as anchored rigs in terms of drilling and discharge treatment equipment. A jack-up rig may be used in water less than 150-m deep.

Examples of typical (and very approximate) well setting depths and hole/casing sizes for the proposed location are shown in Table 2.2. This scenario assumes no abnormal geopressures or shallow hazards. The well is started with a structural hole drilled to reach a depth typically 100-m below the mudline (BML). On occasion the structural pipe may be jetted in. This would be followed by the conductor hole to approximately 750-mBML, the surface hole to 2,500-mBML, the intermediate hole to 4,200-mBML and the production hole to 5,000-mBML. Typically, the structural and conductor holes are drilled, the drill string is pulled out and steel pipe called casing is inserted and cemented in place in order to prevent the wall of the hole from caving in, prevent seepage of mud and other fluids, and provide a foundation for subsequent casing strings. A conductor casing lines the upper section of the well and provides formation integrity to facilitate well control while drilling the surface hole.

**Table 2.2. Description of Typical Drill Hole and Casings.**

Possible Casing Plan and Drill Hole Characteristics					
Hole Section	Hole Size (mm)	Casing Size (mm)	Section Depth (m Below mudline)	Drilling Fluid Type	Point of Drilling Fluid Return
Structural	1066	914	100	WBM*	Seafloor
Conductor	660	508	750	WBM	Seafloor
Surface	445	346	3000	SBM**	Drilling Unit
Intermediate	311	251 liner	4500	SBM	Drilling Unit
Main hole	216	178 liner	5000	SBM	Drilling Unit

Source: ConocoPhillips (\*Water-based mud, \*\*Synthetic-based mud)

The next casing string is the surface casing, which ensures adequate pressure integrity to reach subsequent casing setting depths. Intermediate casings may also be required; the size, depth and number of which will vary according to expected formation depths and pressures.

If significant quantities of hydrocarbons are found, production casing may be installed or the initial well may be abandoned without casing the open hole to provide sidetrack utility from the wellbore. It is intended to gather all data possible from the well and then temporarily or permanently abandon the well. If insignificant hydrocarbons are found the well will be secured and abandoned according to the C-NLOPB's regulations (see below).

## 2.10.2. Well Abandonment

Following completion of drilling and well testing activities many exploration wells are permanently abandoned. The well abandonment procedures follow industry standard practices and are in accordance with the *Newfoundland Offshore Petroleum Drilling Regulations*. Abandonment procedures are designed to prevent hydrocarbons from flowing out of the well. Well log information is used to determine how the hole should be plugged to ensure isolation of the formations that may contain hydrocarbons.

Offshore wells are typically abandoned in two stages. During the first stage, the wellbore is isolated using mechanical and cement plugs in accordance with existing regulations. During the second stage the wellhead and any associated equipment items are removed from the seabed. Removal of the wellhead will routinely involve the use of mechanical cutters. In some circumstances, however, subsurface cutting using shaped charges may be required. Wellheads may be left in place, subject to approval from the Board, if it is determined that they do not create an obstruction on the seafloor.

## **2.11. Emissions and Waste Discharges**

Waste discharges will include drill muds and cuttings, produced water, grey and black water, ballast water, bilge water, deck drainage, discharges from machinery spaces, cement, blowout preventer (BOP) fluid, and air emissions. All chemicals in use offshore with potential to be discharged into the marine environment are screened through the *Offshore Chemical Selection Guidelines* (NEB et al. 1999). All discharges will be in compliance with the *Offshore Waste Treatment Guidelines (OWTG)* developed jointly by the National Energy Board (NEB), the C-NSOPB, and the C-NLOPB (NEB et al. 2002). Any waste that does not meet *OWTG* after treatment will be hauled to an appropriate shore-based facility for disposal.

### **2.11.1. Drill Muds and Cuttings**

The exploration wells covered under this assessment will likely be drilled using a combination of both water-based muds (WBM) and synthetic-based muds (SBM), depending on the hole section. The discharge of drilling fluids will be in compliance with the *OWTG*. The *OWTG* allow for the discharge of whole WBM and WBM-associated cuttings (treated if they contain petroleum hydrocarbons) and SBM-associated cuttings (<6.9% wet-weight drilling fluid on cuttings).

At this stage of the planning process, the specific drilling fluid program has not been selected. Once a candidate drilling fluid has been selected, a “generic mud composition” will be identified for each section of the hole which will undergo toxicity testing as per C-NLOPB requirements.

Additional detail will not be available until a well plan is developed. A table in the EA will present the volume of muds and cuttings that may be discharged for each individual well as estimated for a typical well within the Project Area. Actual quantities of muds/cuttings requiring disposal at sea may vary.

### **2.11.2. Well Testing**

Deep water exploratory wells are not usually tested; however, appraisal wells may be tested. Once a well has been drilled to total depth and the initial geological evaluation has been completed, a decision on whether to test the well will be made. The decision to test a well is dependent on the quality, quantity and content of the hydrocarbon-bearing formations encountered. If well testing is deemed necessary, the

Operator would return to the location at a later date with a suitably equipped drilling unit. During typical well testing operations test tools are installed in the cased well bore and are used to perforate the casing, cement and formation at the specified zone of interest. Once the well has been perforated, formation fluids are allowed to flow to the drilling deck surface test facility in a controlled manner.

These fluids may contain hydrocarbons (oil and gas) and/or formation water. The produced hydrocarbons are separated from the produced water in the test unit. Hydrocarbons and small amounts of produced (formation) water are flared using high efficiency igniters to ensure relatively complete combustion of hydrocarbons and minimize emissions. If not flared, produced water, if it occurs, will be treated in accordance with the *OWTG* prior to ocean discharge.

### **2.11.3. Grey/Black Water**

The rigs will accommodate up to 150 personnel, depending upon the rig. Each rig will discharge up to approximately 50-m<sup>3</sup> of grey water per day. Black water or sewage will be macerated to 6-mm particle size or less and discharged as per the *OWTG*. Estimated amounts of black water are up to 25-m<sup>3</sup> per day per rig.

### **2.11.4. Machinery Space Discharges**

Machinery space drainage will be through a closed system and treated to 15-mg/L of oil or less.

### **2.11.5. Bilge Water**

Bilge water will be treated to *OWTG* standards (15-mg/L of oil or less).

### **2.11.6. Deck Drainage**

Any deck drainage such as the rotary table floor and machinery spaces will undergo treatment as per the *OWTG*.

### **2.11.7. Ballast Water**

Water used for stability purposes in both supply boats and drilling rigs is stored in dedicated tanks and thus does not normally contain any oil. If oil is suspected in the ballast water it will be tested and if necessary treated to *OWTG* standards.

### **2.11.8. Cooling Water**

Top drives and draw-works on rigs are cooled by pumping water through a set of heat exchangers; the water is then discharged overboard in accordance with the *OWTG*. Other equipment is cooled through a closed loop system which may use chlorine as a biocide. Water from closed systems will be tested prior to discharge and will comply with the *OWTG*. Any proposals for alternate biocides will be submitted to C-NLOPB for consideration prior to use.

### **2.11.9. Solid Waste**

All trash and garbage, including organic waste from galleys, will be containerized and transported to shore for disposal in approved landfills. Combustible waste such as oil rags and paint cans will be incinerated in high efficiency burners (if available on the specific rig) or placed in hazardous materials containers for transport to shore. The rig will have a recycling program.

Any hazardous waste will be properly containerized, sealed, labelled and its disposition on shore at an approved facility will be the responsibility of a certified waste handler. All third-party waste management facilities will be assessed by CPC to ensure they meet CPC waste management standards.

### **2.11.10. Air Emissions**

The Project will produce emissions from fugitive emissions (e.g., from fuel storage tanks) and from helicopter, supply vessel, and drill rig engines, generators, and machinery. Flaring may also occur if petroleum hydrocarbons are encountered. The specific amounts and types of emissions are not known at this time because vessel and rig contractors have not yet been selected. However, marine diesel will be the primary fuel and operational discharges will be similar to other marine operations using vessels of this size and power.

### **2.11.11. Miscellaneous**

With semi-submersible rigs, BOP test fluid (glycol/water) is released at intervals (typically three pressure and three function tests per 40-day drilling). About 1.0 m<sup>3</sup> is released per test (Husky 2000). Chemicals potentially discharged offshore will be screened using the *Offshore Chemical Selection Guidelines*. Excess chemicals or chemicals in damaged containers will not be discharged into the sea but returned to shore on supply boat. Any spent or excess acids will be neutralized as approved by C-NLOPB and discharged.

Substances not discussed above or covered in the *OWTG* will not be discharged without prior notification and approval of the C-NLOPB. Additional information on discharges and treatment will be contained in the EA.

## **2.12. Waste Management Plan**

The waste streams will be managed according to the Operator's Waste Management Plan. The purpose of the Waste Management Plan is to provide guidance on effectively dealing with waste from the facility and avoiding environmental pollution. A Waste Management Plan will be submitted to the C-NLOPB as part of the DPA requirements. Wherever possible, waste streams will be kept independent of one another so as not to create the additional problem of expensive decontamination or separation onshore.

## **2.13. Project Site Information**

### **2.13.1. Environmental Features**

The Project has the potential to affect air, water, plankton, fish and fish habitat, fisheries, marine birds, turtles and mammals through emissions and discharges, both routine and accidental. There are no known special or unique resources in the Project Area although several species listed on Schedule I of the *Species at Risk Act* may occur there (e.g., blue whale, leatherback turtle, Ivory Gull, Atlantic wolffish). Potential interactions and effects will be discussed in detail in the EA.

### **2.13.2. Physical Environment**

The physical environment including geology, climate, oceanography and ice influences the biological environment and also has the potential to affect the Project. A detailed description of the physical environment for the Laurentian Sub-basin will be contained in the EA to follow.

### **2.13.3. Multiple Ocean Uses**

Current and past uses of the area include marine shipping, oil and gas activity, defense-related ship traffic, and commercial fisheries. There also may have been marine dumping in the area in the past. Hunting of murre, waterfowl, and seals has occurred for many years farther inshore from the Project Area.

There are no known sources of contamination in the Project Area although there is a continuing problem on the Grand Banks and the approaches to the Gulf of St. Lawrence in general with illegal oily discharges from shipping. Previous disturbance of the seabed may have occurred from bottom trawling or dredging activity associated with commercial fisheries.

The closest conservation area (Laurentian Channel Coral Conservation Area, the "Stone Fence") is near the southwest border of the Project Area and the closest major seabird colony (Cape St. Mary's) is about 160-km to the northeast from the northeast corner of the Project Area. The closest urban centre is St. John's, about 250-km to the northeast of the northeast corner of the Project Area (Figure 2.1).

## 2.13.4. Navigable Waters

The physical presence of the rig and supply boats affects navigable waters at the entrance to the Laurentian Channel to a small degree. The Project Area is close to major North Atlantic shipping lanes entering Canadian waters and may receive ship traffic from fishing vessels, tankers, freighters, naval vessels, private yachts and others. The detailed physical characteristics of the waterway will be provided in EA.

## 2.13.5. 2.13.5 Fish and Fish Habitat

The Project Area lies to the east of Banqereau Bank, south of St. Pierre Bank, Halibut Channel and Green Bank, and west of the SW Grand Banks, regions known to support large and diverse commercial fisheries. However, at least half of the Project Area is beyond the 1,000-m depth contour which is beyond the depth limit of most fisheries. Important commercial species in the vicinity of the Project Area include redfish, Atlantic cod, white hake, monkfish, Pollock, skates, turbot, snow crab, Atlantic halibut, swordfish, and others. Fish and fish habitat, and fisheries will be covered in detail in the EA.

## 2.13.6. Species Listed under the Species at Risk Act

Schedule 1 is the official list of wildlife species at risk in Canada. Once listed, the measures to protect and recover a listed species are implemented. Species that are legally protected under SARA (i.e., Schedule 1 “threatened” or “endangered”) and which may occur in the Project Area include:

- Blue whale (*Balaenoptera musculus*)—endangered
- Beluga whale (*Delphinapterus leucas*) (St. Lawrence Estuary population)—threatened
- North Atlantic right whale (*Eubalaena glacialis*)—endangered
- Leatherback sea turtle (*Dermochelys coriacea*)—endangered
- Atlantic salmon (*Salmo salar*)—endangered (Inner Bay of Fundy population)
- Northern wolffish (*Anarhichas denticulatus*)—threatened
- Spotted wolffish (*Anarhichas minor*)—threatened

Atlantic wolffish (*Anarhichas lupus*) and Ivory Gull (*Pagophila eburnea*) are listed as “special concern” on Schedule 1. Schedules 2 and 3 of SARA identify species that were designated “at risk” by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) prior to October 1999 and must be reassessed using revised criteria before they can be considered for addition to Schedule 1. Species considered at risk in the Project Area but which have not received specific legal protection (i.e., proscribed penalties and legal requirement for recovery strategies and plans) under SARA include:

- Harbour porpoise (*Phocoena phocoena*) (Northwest Atlantic population) (Schedule 2—threatened)
- Fin whale (*Balaenoptera physalus*) (Schedule 3—special concern)



- Sowerby's beaked whale (*Mesoplodon bidens*) (Schedule 3—special concern)
- Northern bottlenose whale (*Hyperoodon ampullatus*) (Scotian Shelf population) (Schedule 3—special concern)
- Atlantic cod (*Gadus morhua*) (Schedule 3—special concern)

Under *SARA*, a 'recovery strategy' and corresponding 'action plan' must be prepared for endangered, threatened, and extirpated species. A management plan must be prepared for species listed as special concern. Currently, there are no recovery strategies, action plans, or management plans in place for species listed as endangered or threatened under Schedule 1 and which are known to occur in the Project Area. It is possible that a Recovery Strategy will be in place for blue whales in the near future (J. Lawson, DFO, pers. comm.).

Other species may be added in the future and the Operator will comply with all relevant provisions of *SARA*.

## **2.14. Effects of the Environment on the Project**

Effects of the physical environment on the Project include those caused by wind, ice, waves, and currents. A description of these components, including extreme events, will be contained in the EA.

Effects of the biological environment on the Project are primarily those related to biofouling. Biofouling may affect rig stability and corrosion and may also affect the interior of pipes as well as water intakes and outlets.

## **2.15. Effects of the Project on the Environment**

The predicted effects of the Project on the environment will be detailed and discussed in the EA. The scope of the EA, the issues and factors to be considered, the spatial and temporal boundaries, and the determination of significance are contained in the Scoping Document which has been submitted under separate cover.

## **2.16. Environmental Monitoring**

An onsite Environmental Observer will be onboard the Drilling Units to record and report 24-hour weather, oceanographic and ice data. During potential ice-infested water periods, two Environmental/Ice Observers will be stationed on the Drilling Units to assist the Drilling Operations personnel in strategic and tactical planning along with the recording and reporting the weather and oceanographic duties. As part of these duties these personnel will also assist in vessel monitoring under the Project Collision Avoidance Procedures to be outlined in the Alert and Emergency Response Plan.

Environmental Observers will also conduct seabird and marine mammal observations on a daily basis in accordance with established protocols. The data compiled from these observations will be provided to the Canadian Wildlife Service, and Fisheries and Oceans Marine Mammals Section.

Mitigations such as ramp-ups and safety zones will be instituted and monitored during operation of seismic arrays.

In addition, an Oceanographic Monitoring Program will be conducted in accordance with the C-NLOPB *Guidelines Respecting Physical Environment Programs*.

## **2.17. Information on Consultations**

For the Laurentian Sub-basin program, the following organizations, as a minimum, will be consulted during the preparation of the EA:

- Natural History Society of Newfoundland and Labrador
- Environment Canada
- Fisheries and Oceans
- One Ocean (inclusive of Fish, Food and Allied Workers, FFAW)
- Fishery Products International (FPI)
- Association of Seafood Producers (ASP)
- Swordfish Association of Nova Scotia
- Atlantic Shark Association
- Clearwater Ltd. Partnership
- Icewater Harvesting
- W. T. Grover Fisheries Ltd.

### 3.0 References Cited

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