



REPORT TITLE

2009 – 2018 Seismic Survey Program for the Sydney Basin Offshore Area - Project Description

SUBMITTED TO

Canada-Newfoundland and Labrador Offshore Petroleum Board
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Table with 7 columns: Date (August 6, 2009), HDMS No. (004074369), Report No. (EC-HSE-GM-0004), Version No. (01).

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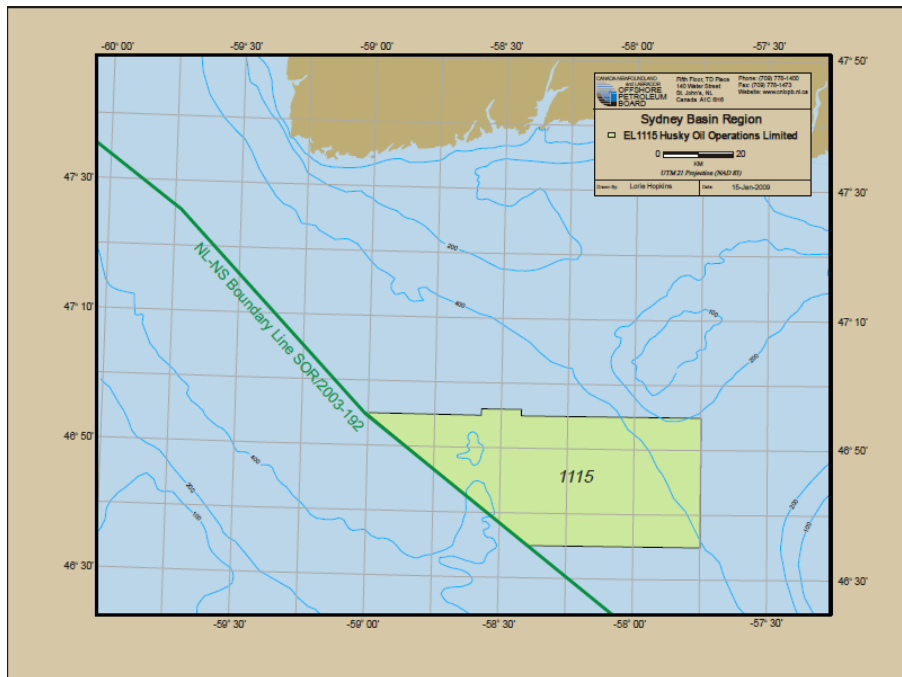
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## 1.0 Introduction

Husky Energy proposes to undertake 2-D and 3-D seismic and follow-up geo-hazard surveys on its recently acquired exploration acreage on the south coast of the Island of Newfoundland (Figure 1–1). In 2010 Husky Energy plans to undertake a 2-D seismic survey while other surveys – 2-D, 3-D or geo-hazard – may occur at various times between 2010 and 2018 - the life of the exploration lease.

It is important to note that for at least the initial and potentially for later seismic surveys the survey lines will extend across the jurisdictional boundary between the Canada-Newfoundland and Labrador and the Canada – Nova Scotia Offshore Petroleum Boards. Preliminary consultations with both Offshore Boards determined that both jurisdictions must issue Work Authorizations pursuant to their legislation and hence both have responsibilities under the Canadian Environmental Assessment (CEA) Act.

This document provides a Project Description to allow both the Canada-Newfoundland and Labrador and the Canada-Nova Scotia Offshore Petroleum Boards (C-NLOPB and C-NSOPB) hereinafter referred to as the Boards to fulfill their responsibilities under the Federal Coordination Regulations pursuant to the CEA Act. This Project Description together with the technical and scoping advice to be received from the C-NLOPB and other Federal Agencies and from other stakeholders consulted by Husky Energy will guide the preparation of a screening level Environmental Assessment.



**Figure 1–1 - General Location of Exploration Lease EL 1115 on the south coast of Newfoundland to be subject to Seismic Surveys**

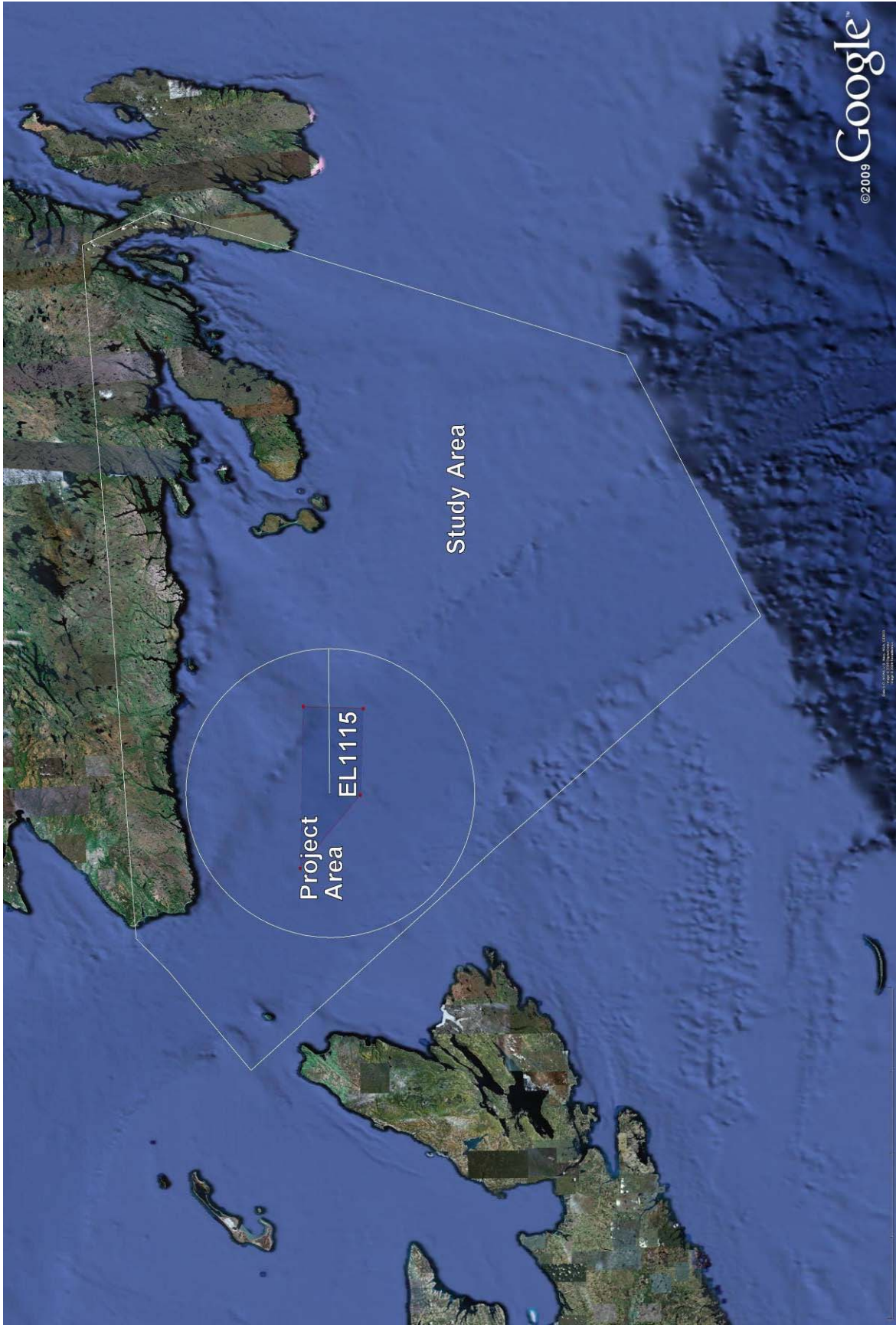


Figure 1-2 - Provisional Study and Project areas for proposed 2-D and 3-D seismic surveys over exploration lease EL1115 off the south coast of Newfoundland

## 2.0 Relevant Legislation and Regulatory Approvals

Authorizations to Conduct a Geophysical Program will be required from the C-NLOPB and the C-NSOPB as noted previously. These Offshore Petroleum Boards are mandated in this matter by their respective versions of the “Atlantic Accord Implementation Act”. Furthermore, offshore geophysical surveys (including geo-hazard surveys) on federal lands are subject to screening under the Canadian Environmental Assessment Act (CEA Act). In this case both Boards will act as Responsible Authorities under the CEA Act with the C-NLOPB taking the lead as the Federal Environmental Assessment Coordinator (FEAC). Because seismic survey activities have the potential to affect species such as seabirds, marine mammals, and fish and also commercial fisheries, the Departments of Fisheries and Oceans (DFO) and Environment Canada are the federal agencies primarily interested and involved as Federal Authorities under the CEA Act. Legislation that is relevant to the environmental aspects of this Project includes:

- Canada-Newfoundland & Labrador and Canada-Nova Scotia Atlantic Accord Implementation Acts;
- Canadian Environmental Assessment (CEA) Act;
- Oceans Act;
- Fisheries Act;
- Navigable Waters Act;
- Canada Shipping Act;
- Migratory Bird Convention Act, and
- Species at Risk Act (SARA).

One of the specific Guidelines, issued jointly by both Offshore Boards, the Geophysical, Geological, Environmental and Geotechnical Program Guidelines (May 2008) is directly relevant to this undertaking.

### 2.1 Canada Newfoundland and Labrador Benefits

Husky Energy is committed to bringing maximum benefits associated with East Coast operations to Canada and in particular Newfoundland and Labrador, where commercially achievable in accordance with our operating philosophy and legislative requirements. In the spirit of the Atlantic Accord, Husky Energy actively seeks to enhance the participation of Newfoundland and Labrador, and Canadians and organizations in offshore oil and gas activity on the East Coast. Husky Energy's commitment to delivering benefits to the Province and to Canada is outlined in the White Rose Development Application Volume One: Canada-Newfoundland and Labrador Benefits Plan.

Husky Energy manages its East Coast operations from St. John's, Newfoundland and Labrador. Canadians, and in particular Newfoundland and Labradoreans, and organizations are provided with full and fair opportunity to participate in Husky Energy's

activities on the East Coast. Husky Energy also supports the principle that first consideration be given to personnel, support and other services that can be provided by Newfoundland and Labrador, and to goods manufactured in Newfoundland and Labrador, where such goods and services are competitive in terms of fair market price, quality and delivery. Contractors and sub-contractors working for Husky Energy on its East Coast Operations must also subscribe to and apply these principles in their own operations.

## **2.2 Contacts**

### **2.2.1 Executive Contact Information**

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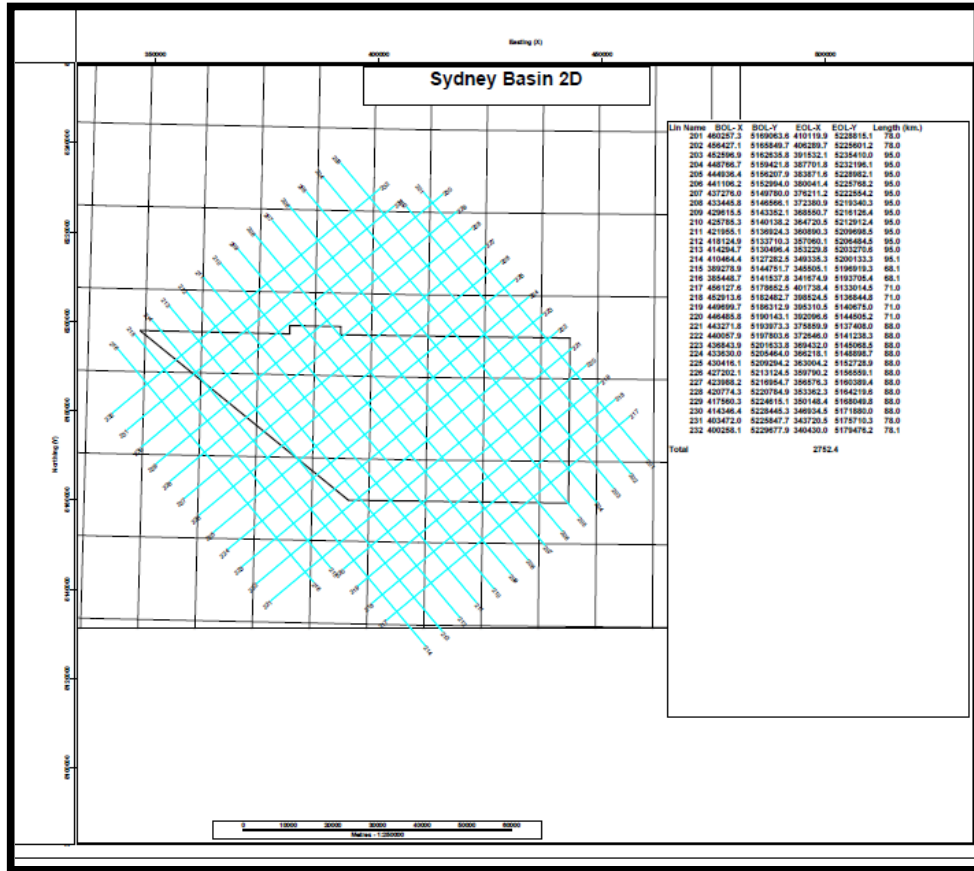
St. John's, NL A1C 1B6

## **3.0 Proposed Project**

### **3.1 Name and Location**

The Husky Energy Newfoundland South Coast Seismic Survey Program application encompasses C-NLOPB exploration license EL 1115. Figure 3–1 provides a of the preliminary plot plan for the area to be surveyed in 2010. It is Husky Energy's intention to acquire a 2-D seismic survey over the area exploration leases listed above in 2010, or as soon thereafter as possible. The exact dimensions of the 2010 survey area will be confirmed in early 2010 taking into consideration of vessel availability and cost.





**Figure 3-1 - Preliminary Plot of 2-D Seismic Survey Lines for 2010 Survey**

The proposed Project Area for the environmental assessment is defined in Figure 1-2 and includes a thirty (30) km buffer around the exploration lease(s) to accommodate both streamer deployment and seismic vessel turning radius.

3-D seismic surveys may also be carried out in later years, within the term of the exploration license(s) dependent on the results of 2-D work and/or the availability of survey vessels. Buffer zones and streamer deployment areas similar to those for a 2-D survey would be required and implemented.

Subsequent geo-hazard surveys to support specific drilling operations may be conducted anywhere on Husky Energy’s exploration licenses within the Project Area boundaries (Figure 1-2), depending on the final geophysical interpretation using the 2-D/3-D seismic acquired in the application area. Drilling operations will be subject to a separate environmental assessment at sometime in the future should promising drilling targets be discovered during the interpretation of the seismic survey information.

**3.1.1 The Operator**

Headquartered in Calgary, Alberta, Husky Oil Operations Limited (the Operator) is a Canadian-based integrated energy company serving global customers, committed to maximizing returns to its shareholders in an ethical and socially responsible way, through the dedicated effort of its people. It is involved in:

- Exploration and development of crude oil and natural gas,
- Production, purchase, transportation, refining and marketing of crude oil, natural gas and natural gas liquids and sulfur, and
- Transportation and marketing of refined products.

### **3.2 Project Overview**

The proposed Project is a ship-borne geophysical program to be carried out at various times from 2009 to 2018. Initially in 2010 or as soon thereafter as possible approximately 2,000 to 3,000 km of 2-D seismic survey will be acquired. In the subsequent years of the lease period, yet-to-be determined areas of 3-D and/or geo-hazard surveys will be acquired. Adjacent lands to the current leasehold, EL 1115, are included in the Project Area to ensure inclusion of ship turning, holding and streamer deployment areas and to allow the surveys to encompass an area outside the immediate lease area to better define any potential oil and gas reservoir structures that may be discovered.

The seismic survey vessel(s) will be approved for operation in Canadian waters and will be typical of the worldwide fleet. Specific vessel(s) has not yet been selected through the bidding process.

The 2-D seismic survey ship will tow a sound source (air gun array) and a single streamer up to several kilometers long composed of receiving hydrophones. The geo-hazard surveys will be conducted over a much shorter time frame using a smaller vessel and a combination of smaller scale seismic equipment, sonars, sparkers and boomers.

Mitigation procedures, consistent with the C-NLOPB's guidelines for this activity will include dedicated marine mammal observers (MMOs) and "soft-starts" or "ramp-ups" of the 2-D array and when possible maintenance of single air gun operation during end of line turns to help minimize disturbance to marine life, particularly marine mammals and species at risk. In addition, a fisheries liaison officer (FLO) will be on board to ensure that communication procedures to avoid conflicts with the commercial fishery are implemented.

#### **3.2.1 Alternatives to Project and Alternatives within Project**

Husky Energy has licensed all of the available vintage 2D in the Sydney Basin that was acquired by Texaco between 1969 and 1974. While these surveys were adequate to evaluate the NL08-03 lease sale, the quality of the data, i.e. line spacing, is not adequate to properly evaluate the prospectivity of EL 1115. Husky requires a consistent grid of data acquired and processed with the most modern techniques, to fully evaluate the block in order to justify acquiring a 3D survey or drilling.

Husky Energy has exploration commitments on exploration license 1115. A 2-D seismic survey is a precursor to investment in 3-D seismic surveys which are a standard precursor to investment in offshore exploratory drilling. Acquisition of good seismic survey information lessens the chances of expending resources "drilling dry holes" and increases safety. As such, there is no alternative to the initial 2-D survey project and potential future 3-D surveys in the Sydney Basin.



Geohazard surveys are an immediate precursor to site specific drilling operations and are a regulatory requirement and needed to ensure drilling safety and hence have no alternatives.

Viable alternatives within the scope of the Project are essentially the choices between different contractors' ships and survey equipment which are presently being evaluated through the bid evaluation process.

The seismic survey will be planned in order to:

- Use the minimum amount of energy necessary to achieve geological objectives;
- Minimize the proportion of the energy that propagates horizontally; and
- Minimize the amount of energy at frequencies above those necessary for the purpose of the survey objectives.

### 3.2.2 Project Phases

The Project will proceed in three phases once activities begin. The actual timing of these activities within the temporal scope will be dependent on economic feasibility, vessel availability and the results of interpretation of survey work from preceding phases.

- **Phase 1** (Year 1) will be a 2-D survey in the area defined in Figure 3–1;
- **Phase 2** foresees a 3-D survey of any areas that may be identified through analyses of existing and acquired 2-D data, and geo-hazard surveys in preparation for a potential drilling program; and,
- **Phase 3** will see collection of additional 3-D and/or geo-hazard data in anticipation of a potential drilling program(s).

### 3.2.3 Project Scheduling

The surveys may occur March 1<sup>st</sup> through November 30<sup>th</sup> of any given year. The duration of the initial 2-D survey is estimated at 40 to 60 days and the duration of typical a geo-hazard survey in support of a drilling program is approximately 4 days. The estimated duration of a 3-D program, depending on the area to be covered is approximately 30 to 75 days.

### 3.2.4 Site Plans

Site maps showing the exploration lease and the draft Study and Project Areas and the proposed survey area for 2010 are provided in Figure 1–1, Figure 1–2 and Figure 3–1 respectively.

### 3.2.5 Seismic Vessels

Vessel specifics will be provided once the contractors are selected. Most, if not all likely survey vessels have diesel-electric propulsion systems (main and thrusters) and operate on marine diesel.

### 3.2.6 2-D Surveys

As described above, the 2-D survey sound source will consist of one air gun array, 4,000 to 7,000 cubic inches (in<sup>3</sup>) in total volume, and towed at depths about of approximately 6 to 15 m. The air guns will be operated with compressed air at pressures of 2,000 to 2,500 psi, and producing peak-to-peak pressures of approximately 140 to 165 bar-m. There will be one towed streamers (strings of hydrophone sound receivers), 6,000 to 10,000 m in length which will be towed behind the vessel at depths of approximately 8 to 30 m. Streamer floatation will be either solid or liquid (Isopar), depending upon availability from specific contractors.

Detailed specifications will be provided when the contractor is selected.

### 3.2.7 Well Site Geo-hazard Surveys

Once a potential drilling site is located, it is standard offshore industry procedure, and a requirement of the C-NLOPB, that a well site/geo-hazard survey be conducted. The purpose of the survey is to identify, and thus avoid, any potential drilling hazards such as steep and/or unstable substrates or pockets of “shallow gas”. It involves acquisition of high resolution seismic, side scan sonar, sub-bottom profile, and bathymetric data over the proposed drilling area(s). Typically the seismic data for well site surveys are collected over closer lines (250-m), using smaller equipment and lower pressures, over a shorter time period (e.g., several days) compared to 2-D and 3-D surveys.

Surficial data are collected using a broad band (e.g., 500-Hz to 6-kHz) sparker or boomer as a sound source which provides data as deep as 100-m into the substrate. A single or multi-beam echo sounder is used for bathymetry and a dual frequency side scan sonar system is used to obtain seabed imagery. Seabed video and/or grab samples are used to provide ground-truth information on the character of the seabed and sediments.

Detailed specifications will be provided when the contractor is selected.

### 3.2.8 Logistics/Support

#### 3.2.8.1 Vessels

As noted above, primary support will be provided by a chartered seismic survey vessel. In order to mitigate any potentially adverse effects on marine animals, the commercial fisheries, and other vessel traffic, a mitigation plan will be developed as part of the Project. A standby or picket vessel may be required as mitigation. This vessel would be used as an additional method of obtaining information on commercial fishing activity in the area and in warning off other vessels in order to avoid gear losses for all parties.

#### 3.2.8.2 Helicopters

The larger seismic vessels are usually equipped with a helicopter platform and helicopters are often used for crew changes and light re-supply. In some cases, survey contractors may prefer to come to shore for crew changes and re-supply.

### **3.2.8.3 Shore Base, Support and Staging**

Husky Energy and its contractors maintain offices and shore facilities in St. John's. However, some seismic contractors may prefer to crew change or re-supply in other existing Newfoundland and Labrador ports. No new shore base facilities will be established as part of this project.

### **3.2.9 Waste Management**

Waste management aboard the seismic vessel will be implemented in a manner consistent with Husky Energy's East Coast Waste Management Plan and the contracted vessels policies and procedures that will be reviewed against this plan. Husky Energy's East Coast Waste Management Plan is currently on file with the C-NLOPB.

## **3.3 Project Site Information**

Project location is off the south coast of Newfoundland (c.f., Figure 1–1 and Figure 1–2).

### **3.3.1 Environmental Features**

The physical and biological environment of the Sydney Basin area within which EL 1115 is located has been described in the C-NLOPB Strategic Environmental Assessment for the Sydney Basin Offshore Area.

### **3.3.2 Physical Environment and Effects on the Project**

The physical environment of the south coast of Newfoundland has been described C-NLOPB Strategic Environmental Assessment (SEA) for the Sydney Basin Offshore Area. The physical environmental conditions that will be encountered within the Project Area will be within the range of conditions as described in the C-NLOPB SEA. A brief summary of expected conditions is contained in the Environmental Assessment Report.

The effects of the physical environment on the Project will be described and include those caused by wind, ice, waves, and currents.

### **3.3.3 Fish and Fish Habitat and Fisheries**

The fish species that inhabit the Project Area and the other species and habitats that support them are not unique to the Newfoundland and Labrador area. A recent description of the biophysical environment describing the species and habitat information known about the area exists in the Sydney Basin SEA (Jacques Whitford 2007) that is currently being updated. The mix of principal species fished differs to some extent from, the Jean d'Arc Basin area, and includes Atlantic Cod, Redfish, Herring, Monkfish, White Hake, Scallop spp., Whelk and Snow Crab. The latest information on fish, fish habitats and fisheries and the ecosystem that supports them will be summarized in the Environmental Assessment Report.

### **3.3.4 Species at Risk**

The Project Area specifically, is not known to contain any designated critical habitats for species listed on Schedule 1 of the Species at Risk Act (SARA) but this issue will be

examined within the Environmental Assessment Report. It is recognized, however, that the Study Area may encompass habitat for a species for which “critical habitat” areas may be designated in the future - e.g., piping plover (*melodus* subsp.). In addition, the list of endangered and threatened species in the area includes two species of Wolffish (Spotted and Northern); Blue, North Atlantic Right and Beluga whales; and Leather Back Turtle.

Notwithstanding the above the potential environmental effects on species currently under assessment by the Committee on the Status of Endangered Species in Canada (COSEWIC) that occur in within the Project Area will also be included in the Environmental Assessment Report.

### **3.4 Other Users**

#### **3.4.1 Commercial Fisheries**

The Newfoundland South Coast supports a variety of commercial fisheries (c.f., Section 3.3.3) to be described in the Environmental Assessment Report based on latest available DFO data. Recent information suggests that Atlantic Cod, Redfish and Scallop account for at least 75 % of the catch the fisheries statistical districts in the Sydney Basin Strategic Environmental Assessment Area (Jacques Whitford 2007). It is noted however that emerging fisheries, e.g., Significant and high value catches of Whelk along the South Coast of Newfoundland and Labrador generally (One Ocean, Pers. Comm.).

Operational planning and communications will be developed in order to avoid or minimize any potential effects on the commercial fishery. These communication elements include but are not limited to notices to shipping, fishery broadcast notifications, dedicated fisheries liaison officers (FLO) on seismic vessels, and a fishing gear damage compensation program. Consultations with the fishing industry will be undertaken in Newfoundland and Labrador through the established ONE OCEAN mechanism and the Fish, Food and Allied Workers (FFAW) and directly with relevant fishing interests along the Newfoundland South Coast and within as necessary. In Nova Scotia consultations will be undertaken with the advice of C-NSOPB’s Fisheries Advisory Committee and will include relevant fishing interests in Nova Scotia (see also Section 3.4.3)

The presence of any recreational or Aboriginal fisheries in or adjacent to the Project Area will be investigated in the Environmental Assessment Report and consultations held with Aboriginal fishing interests where those are identified during the preparation of the report.

#### **3.4.2 Navigable Waters**

The waters between Newfoundland and Nova Scotia also know as the Cabot Strait plays host to a considerable volume of vessel traffic. Users of these navigable waters in addition to fishery vessels include cargo and passenger vessels both private and commercial, other oil industry-related vessels, and military vessels and the occasional private yacht. The route of the year round ferry service that operates daily between Port-aux-Basques and North Sydney is traverses the Study Area for this project.

### 3.4.3 Consultations

During the course of the assessment, Husky Energy will consult stakeholders with an interest in the Project. The results of the consultations will be compiled in the EA report.

In order to assist in scoping the effects assessment and mitigation plan and to aid in addressing any issues of concern, Husky Energy and its consultants will undertake a consultation program with interested parties including but not limited to:

- Fisheries and Oceans Canada in Newfoundland and Labrador and Maritime Regions
- Environment Canada Atlantic Region Newfoundland and Labrador and Nova Scotia offices
- ONE OCEAN in Newfoundland & Labrador
- Fish Food and Allied Workers Union in Newfoundland and Labrador
- Fishermen's Associations in Nova Scotia as recommended by the C-NSOPB's Fisheries Advisory Committee
- Newfoundland and Labrador Natural History Society;
- Fish processors in Newfoundland and Labrador and Nova Scotia and
- Other relevant parties as identified during the course of the assessment process

### 3.5 Effects of the Project on the Environment

The proposed geophysical Project will be well within the range of other programs routinely conducted on the Grand Banks and elsewhere and is not expected to produce any adverse significant environmental effects on the marine environment in or adjacent to the Project Area. Nonetheless, potential environmental effects will be examined in detail with focus on the commercial fishery, SARA species, marine mammals, and cumulative environmental effects with other users of the area, particularly other seismic programs.

#### 3.5.1 Spatial Boundaries

A provisional study area boundary is provided in Figure 1-2 subject to confirmation as the environmental assessment progresses taking into account consideration the information compiled in the C-NLOPB's Strategic Environmental Assessment for the Sydney Basin Offshore Area (Jacques Whitford 2007). Husky recognizes that the C-NLOPB is updating this Strategic Environmental Assessment and will ensure that new information arising as a result of this update is considered in the development of the Environmental Assessment Report.

A provisional Project Area boundary is also provided in Figure 1-2 to allow for the collection of data across the administrative boundary between the two offshore boards (c.f. Section 1) and the turning radii of the seismic survey vessel.

### 3.5.2 Temporal Boundaries

The temporal boundaries for the Project are 2009 to 2018 inclusive, with the timing of actual survey activities between March 1<sup>st</sup> and November 30<sup>th</sup> within any particular year.

### 3.5.3 Valued Ecosystem Components

The valued ecosystem components (VECs) will encompass, but may not be limited to, Marine Birds, Marine Fish and Fish Habitat, Commercial Fisheries, Marine Mammals) and Sea Turtles and species at Risk (both those listed under the SARA Schedule 1 and under consideration by COSEWIC.

Accidental events (such as an unplanned hydrocarbon release) associated with Project activities will also be assessed in the EA (to follow). In addition, the EA (to follow) will also include an analysis of cumulative environmental effects.

### 3.5.4 Environmental Monitoring

As noted previously MMO(s) will be on board the vessel(s) to provide proper identification of marine mammals and species at risk for mitigation purposes and to collect opportunistic data on marine mammal behaviours and distribution with and without air guns operating. Seabird observations will also be collected.

In addition, a Fisheries Liaison Officer will be retained to help ensure proper communications and coordination with fisheries interests and avoidance of conflicts with fishing activities and fixed gear.

## 4.0 References

Canada-Newfoundland and Labrador Offshore Petroleum Board, 2007, ***Strategic Environmental Assessment, Sydney Basin Offshore Area***. Prepared by Jacques-Whitford. January 2007.