

Northern Jeanne d'Arc Basin Seismic Program Draft Project Description

Prepared by



Prepared for



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Box 6525, Station "D"
Calgary, AB
T2P 3G7

11 January 2005
Project No. SA836

Northern Jeanne d'Arc Basin Seismic Program Draft Project Description

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1.0 Introduction

Husky Oil Operations Limited (Husky) proposes to undertake a 3-D seismic and follow-up geohazard survey on Husky's exploration acreage in the Northern Jeanne d'Arc Basin (see Figure 1). Husky foresees initiating the 3-D seismic survey in the summer of 2005 while other surveys may occur in 2006 and 2007.

This document provides a Project Description to allow the Canada-Newfoundland Offshore Petroleum Board (C-NOPB) to fulfill its responsibilities under the *Canadian Environmental Assessment Act* *Federal Coordination Regulations*. This Project Description together with the technical and scope advice received from the C-NOPB and other Federal Agencies through the *Federal Coordination Regulations* and from other stakeholders consulted by Husky will guide the preparation of a Screening Level Environmental Assessment.

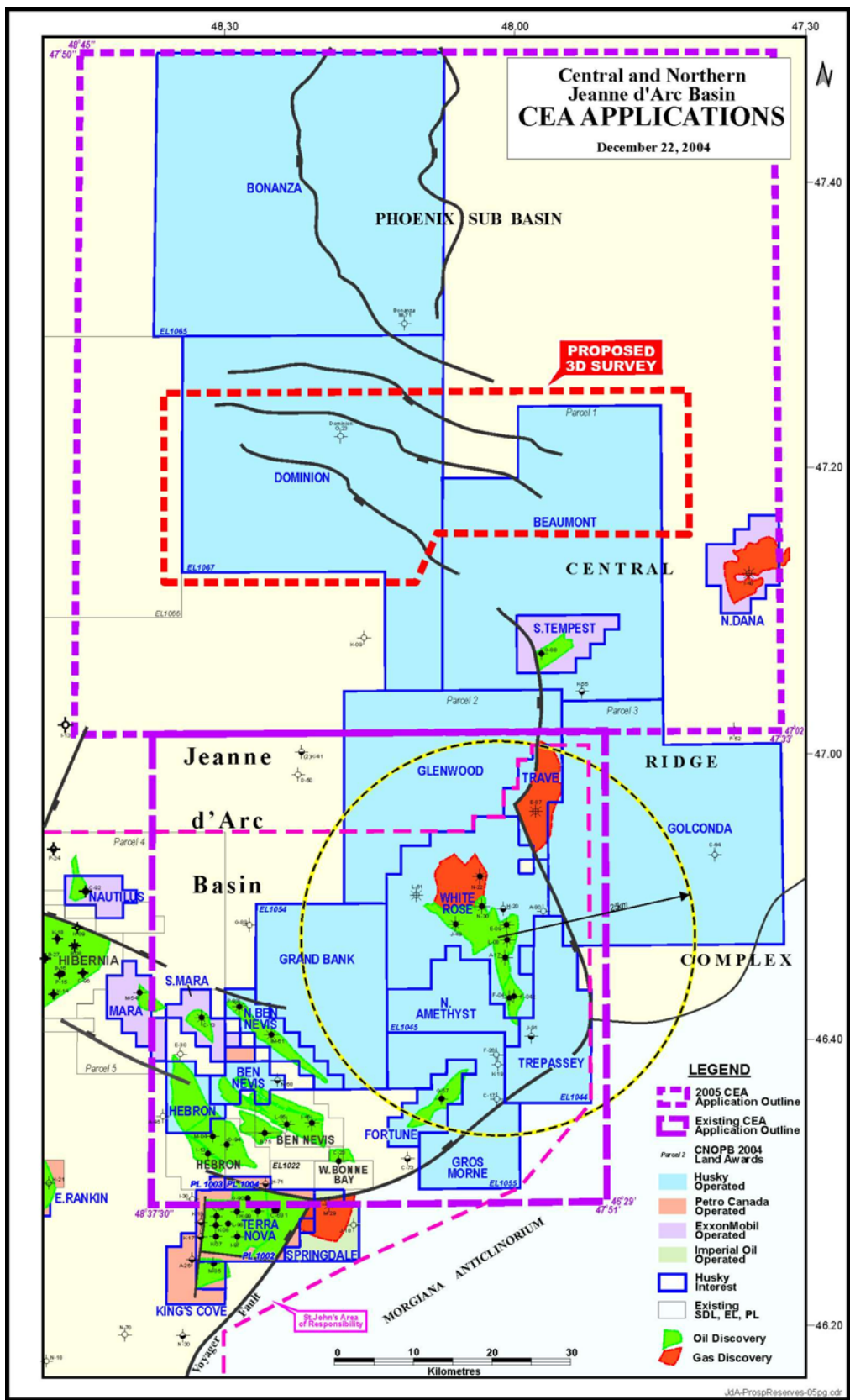


Figure 1. Location of Proposed Seismic Program.

2.0 Relevant Legislation and Regulatory Approvals

An *Authorization to Conduct a Geophysical Program* will be required from the Canada-Newfoundland Offshore Petroleum Board (C-NOPB or “Board”). The C-NOPB is mandated by the *Atlantic Accord Implementation Acts*. Offshore geophysical surveys (including geohazard surveys) on federal lands are subject to screening under the *Canadian Environmental Assessment Act (CEA Act)*. The Board acts as the federal environmental assessment coordinator or FEAC. Because seismic survey activities have the potential to affect seabirds, marine mammals, and fish and fisheries, the Fisheries and Oceans and Environment Canada are the primarily interested agencies. Legislation that is relevant to the environmental aspects of this Project includes:

- *Canada-Newfoundland Atlantic Accord Implementation Acts*
- *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Acts*
- *Canadian Environmental Assessment Act*
- *Oceans Act*
- *Fisheries Act*
- *Navigable Waters Act*
- *Canada Shipping Act*
- *Migratory Bird Act*
- *Species at Risk Act*

2.1. Canada Newfoundland 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 actively seeks to enhance the participation of Canadian, and Newfoundland and Labrador, individuals and organizations in offshore oil and gas activity on the East Coast. Husky's commitment to delivering benefits to the Province and to Canada is outlined in the White Rose Development Application Volume One: Canada-Newfoundland Benefits Plan.

Husky manages East Coast operations from its St. John's office. Canadian, and in particular Newfoundland Labrador, individuals and organizations are provided with *full and fair opportunity* to participate in Husky's activities on the East Coast. Husky 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 Subcontractors working for Husky 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

- Mr. Ruud Zoon, General Manager, Husky East Coast Operations
Husky Oil Operations Limited
Suite 801, Scotia Centre
235 Water Street
St. John's, NL
A1C 1B6

2.2.2. Geophysical Contact

- Mr. Garry Bilous, Geophysical Manager, Husky Oil Operations Limited
Husky Energy Inc.
707-8th Avenue SW
Box 6525, Station "D"
Calgary, AB
T2P 3G7

2.2.3. Environmental Contact

- Mr. Ken Dyer, HSEQ Manager, Husky East Coast Operations
Husky Oil Operations Limited
Suite 801, Scotia Centre
235 Water Street
St. John's, NL
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3.0 Proposed Project

3.1. Name and Location

The Northern Jeanne d'Arc Seismic Program application covers the C-NOPB exploration licenses 1065, 1067 and Parcel 1 from the 2004 land sale (EL number to be provided by C-NOPB in early January). The x,y coordinates of the application area in NAD 83 Zone 22 coordinates are:

Top Left Corner - Lat 47° 50' Long 48° 45' 668183 E 5306842 N

Bottom Right Corner - Lat 47° 33' Long 47° 02' 723209 E 5270552 N

Within this application it is Husky's intention to acquire a 3-D seismic survey on EL 1067 and Parcel 1. The maximum area under consideration for this survey (Year 1) is indicated on Figure 1. The exact dimensions would be determined early in 2005 as a function of vessel availability and cost. The coordinates for this proposed 3-D survey in NAD 83 Zone 22 are:

Lat 47° 12' 39.7" Long 48° 36' 35.8" 680985 E 5231387 N

Lat 47° 12' 35.4" Long 48° 10' 29.0" 713945 E 5232356 N

Lat 47° 16' 02.4" Long 48° 08' 16.8" 716491 E 5238847 N

Lat 47° 15' 47.0" Long 47° 42' 07.4" 749485 E 5239672 N

Lat 47° 25' 56.9" Long 47° 42' 05.2" 748732 E 5258500 N

Lat 47° 25' 59.1" Long 48° 36' 35.5" 680233 E 5256061 N

Lat 47° 12' 39.7" Long 48° 36' 35.7" 680986 E 5231387 N

At present, the defined area includes a nine (9) km east-west buffer around the 3-D seismic survey to accommodate seismic vessel turning radius.

Subsequent Geohazard surveys may be conducted anywhere on Husky's Exploration licenses within the CEAA boundaries (Figure 1), depending on the final geophysical interpretation using the acquired 3-D survey and the existing 2D seismic in the application area.

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.

The Operator is the management and operating company for the Operator's six Significant Discovery Areas (SDA) and ten Exploration Licenses, offshore Newfoundland. The White Rose field, the largest of the Operator's SDA's, is estimated to contain approximately 230-250 million barrels of recoverable reserves.

3.2. Project Overview

The proposed Project is a shipborne geophysical program consisting of approximately 1500 km² of 3-D survey (Year 1) and a yet-to-be-determined area of 3-D and/or geohazard survey in Years 1 and 2. Surveys will be within Husky ELs 1065 (Bonanza), 1067 (Dominion), and Parcel 1 (Beaumont). Some adjacent lands are also included as part of the overall Project Area in order to ensure inclusion of N. Dana, ship turning and holding areas, and any associated potential environmental effects (Figure 1).

The surveys will be conducted by a "piggy-back" charter on a seismic vessel or vessels that will be operating in Newfoundland and Labrador waters during 2005-2007. These vessels have previously been assessed as part of other operators' seismic programs and will be assessed again for the coming seasons. The vessels will be approved for operation in Canadian waters and are typical of the worldwide fleet. The specific vessel has not yet been selected through the bidding process.

The 3-D seismic survey ship will tow a sound source (airgun array) and streamer (s) composed of receiving hydrophones. Survey lines will run east-west and be spaced between 200 and 400-m apart. The geohazard 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 will include dedicated marine mammal observer (MMO) (s) and "soft-starts" or "ramp-ups" of the 3-D array in order to avoid disturbance to marine life, particularly marine mammals, and a fisheries liaison officer (FLO) and communication procedures to avoid conflicts with the fishery.

3.2.1. Alternatives to Project, Alternatives within Project

The existing 2-D seismic on EL 1067 and Parcel 1 indicates two structures that may contain significant volumes of producible hydrocarbons. Unfortunately this existing seismic is insufficient in determining exact structural size and internal complexity. Acquisition of new 3-D seismic is required to determine if exploration drilling is warranted.

Husky has exploration commitments on the ELs. The 3-D seismic survey is now a standard precursor to offshore exploratory drilling. It lessens the chances of expending resources “drilling dry holes” and increases safety. As such, there is no alternative to the 3-D Project other than to incur financial penalties and explore for oil and gas elsewhere.

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

3.2.2. Project Phases

The Project can be considered as three phases: (1) Year 1 (3-D survey of area defined in Figure 1), (2) Year 2 (3-D survey of any other areas that may be identified through additional analyses of existing 2-D data, and geohazard surveys in preparation for a potential drilling program), and (3) Year 3 (additional 3-D and/or geohazard data collection in anticipation of a potential drilling program).

3.2.3. Project Scheduling

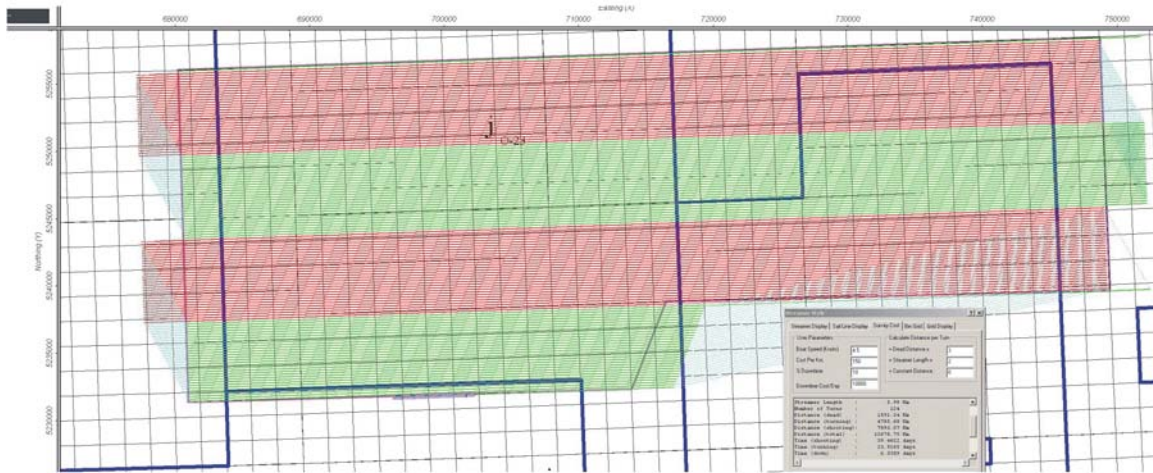
The surveys may occur between 1 April and 31 October of any given year. The duration of the Year 1 3-D survey is estimated at 40-100 days and the duration of a geohazard survey in support of a potential drilling program is about 4 days.

3.2.4. Site Plans

Site maps showing the Project Area and proposed survey area and lines for Year 1 are provided in Figures 1 and 2.

Sail lines for 2 Array Configurations

4 X 6km Array, 200 m spacing



8 X 6km Array, 400 m spacing



Figure 2. Proposed Sail Lines at 200-m and 400-m Separation. Actual separation distance will be dependent upon contractor selection.

The largest seismic vessels under consideration could potentially accommodate up to 140 personnel. Personnel on seismic vessels typically include individuals from the Operator (i.e., Husky), the vessel owner/operator (ship's officers and crew), and the various technical and scientific personnel from a variety of contractors and subcontractors.

3.2.5. Seismic Vessels

Vessels presently approved and operating on the East Coast on other programs will be utilized. 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. 3-D

As described above, Husky will utilize a seismic vessel already operational in East Coast waters. The 3-D survey sound source will consist of two airgun arrays, 3,000 to 5,000 cubic inches (in³) in total volume spaced 50-m apart, and towed at depths about six to seven metres. The airguns will be operated with compressed air at pressures of 2,000 to 2,500 psi, and producing peak-to-peak pressures on the order of 140 bar-m. There will be four to eight towed streamers (strings of hydrophone sound receivers), 5,000 to 6,000-m in length that will be towed behind the vessel at depths about four-eight m. Sail lines will run east-west with spacings dependent upon the number of streamers and will be between 200 and 400-m. Streamer flotation 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/Geohazard

Once a potential drilling site is located it is standard offshore industry procedure, and a requirement of the C-NOPB, that a well site/geohazard 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 is collected over closer lines (250-m), using smaller equipment and lower pressures, over a shorter time period (e.g., several days) compared to 3-D seismic programs.

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 truthing 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 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 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

Husky and 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 ports, presumably on the Avalon Peninsula because of proximity to the Project Area. 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's East Coast Waste Management Plan and the contracted vessels policies and procedures that will be reviewed against the Husky Plan. Husky's East Coast Waste Management Plan is currently on file with the C-NOPB.

3.3. Project Site Information

Project location is on the northern Grand Banks, just north of existing projects such as Hibernia, Terra Nova and White Rose (the closest) (Figure 1).

3.3.1. Environmental Features

The physical and biological environment of the northeastern Grand Banks has been described in previous large scale EAs such as the Hibernia EIS (Mobil et al. 1985), Terra Nova EA (Petro-Canada 1996), the White Rose Comprehensive Study and associated documents (Husky 2000, 2001), the Jeanne d’Arc Basin Screening EA for Drilling (Husky 2002), the Orphan Basin Strategic Environmental Assessment (LGL 2003), and the Orphan Basin 3-D Seismic EA (Buchanan et al. 2004).

3.3.2. Physical Environment and Effects on the Project

The physical environment of the northeastern Grand Banks has been described in previous large scale EAs. The physical environmental conditions that will be encountered within the Project Area will be within the range of conditions as described in those EAs. A brief summary of expected conditions is contained in the EA (to follow).

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

The fish species that inhabit the Project Area and the other species and habitats that support them are expected to be typical of the Grand Banks for equivalent depths, substrates, and physical oceanographic conditions. These components of the ecosystem have been described in the previous EAs and will be summarized in the EA to follow.

3.3.4. Species at Risk

The Project Area is not known to contain any sensitive areas for species listed on Schedule 1 of the *Species at Risk Act (SARA)* but this issue will be examined in the EA to follow.

3.4. Other Users

3.4.1. Fisheries

The area of the Grand Banks that contains the Project Area supports a variety of commercial fisheries to be described in the following EA based on latest available DFO data. The most important fisheries, in terms of landed value, in and adjacent to the Project Area, are northern shrimp (mobile trawl fishery) and snow crab (fixed gear fishery).

A mitigation plan will be developed to avoid or at least lessen any potential effects on the commercial fishery. The plan will include such as elements as good communications (e.g., fishery broadcast notifications, FLO (Fisheries Liaison Officer), etc.), avoidance of areas and times of heavy fixed gear use, a fishing gear compensation program, and so forth. Consultations with the fishing industry will be undertaken through the established ONE OCEAN committee and directly with relevant fishing interests as necessary.

There are no recreational or aboriginal fisheries in or adjacent to the Project Area.

3.4.2. Navigable Waters

Other users of the navigable waters on the Grand Banks in addition to fishery vessels, include other oil industry-related vessels, transport and military vessels and the occasional private yacht.

3.4.3. Consultations

During the course of the assessment, Husky will consult with stakeholders with an interest in the project. Those consulted and the results of those consultations will be in the environmental assessment report.

In order to assist in scoping the effects assessment and mitigation plan and to aid in addressing any issues of concern, Husky and consultants will undertake a consultation program with the following interested parties:

- Fisheries and Oceans
- Environment Canada
- ONE OCEAN
- Newfoundland and Labrador Natural History Society
- Fish, Food and Allied Workers (FFAW)
- Fishery Products International (FPI)
- Other relevant parties as identified

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 is not expected to produce any adverse significant effects on the marine environment in or adjacent to the Project Area. Nonetheless, potential effects will be examined in detail with focus on the fishery, SARA species, marine mammals, and cumulative effects with other users of the area, particularly other seismic programs.

3.5.1. Spatial Boundaries

The regional scale study area boundaries will take into consideration those established for previous project assessments e.g., Hibernia, Terra Nova and White Rose Developments and Husky's Jeanne d'Arc 2002 exploration program. The CEA Study Area boundary is defined in Figure 1. The Project Area boundary for Year 1 is also shown in Figure 1. Project Area boundaries for Year 2 and 3 are unknown at this time but will be well within the CEA Study Area boundaries and will be no greater in area than that shown for Year 1.

3.5.2. Temporal Boundaries

The temporal boundaries for the Project are 2005 to 2007 inclusive, with timing of activities between 1 April and 31 October 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, Fish and Fish Habitat, Commercial Fisheries, Marine Mammals and Sea Turtles. In response to recent legislative developments, identification and evaluation of "species at risk" will form part of the assessment as a valued ecosystem component.

3.5.4. Environmental Monitoring

An environmental observer (s) will be on board the vessels to properly identify marine mammal species for mitigation purposes and to collect opportunistic data on marine mammal behaviour and distribution with and without airguns operating.

3.6. References Cited

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