

# **ENVIRONMENTAL SCREENING REPORT**

**COHASSET PHASE II DECOMMISSIONING**

**ENCANA CORPORATION**

**PREPARED BY**

**CANADA-NOVA SCOTIA OFFSHORE PETROLEUM BOARD  
FISHERIES AND OCEANS CANADA  
ENVIRONMENT CANADA**

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## LIST OF ABBREVIATIONS

|         |  |
|---------|--|
| CALM    | Catenary Anchored Leg Mooring                            |
| CEAA    | <i>Canadian Environmental Assessment Act</i>             |
| CEPA    | <i>Canadian Environmental Protection Act</i>             |
| CMM     | Confederacy of Mainland Mi'kmaq                          |
| CNSOPB  | Canada – Nova Scotia Offshore Petroleum Board            |
| COSEWIC | Committee on the Status of Endangered Wildlife in Canada |
| DFO     | Fisheries and Oceans Canada                              |
| DPA     | Development Plan Application                             |
| EA      | Environmental Assessment                                 |
| EC      | Environment Canada                                       |
| EEM     | Environmental Effects Monitoring                         |
| EnCana  | EnCana Corporation                                       |
| EPA     | Environmental Protection Agency                          |
| HADD    | Harmful Alteration, Disruption or Destruction            |
| IBOF    | Inner Bay of Fundy                                       |
| IMO     | International Maritime Organization                      |
| IUCN    | The World Conservation Union                             |
| LTMO    | Low Toxicity Mineral Oil                                 |
| MPA     | Marine Protected Area                                    |
| NAFO    | Northwest Atlantic Fisheries Organization                |
| NORM    | Naturally Occurring Radioactive Material                 |
| OCSG    | CNSOPB Offshore Chemical Selection Guidelines            |
| OIW     | Oil in Water content                                     |
| OSPAR   | Oslo-Paris Convention                                    |
| PLEM    | Pipeline End Manifold                                    |
| RAs     | Responsible Authorities                                  |
| RG III  | Rowan Gorilla III  |
| ROV     | Remotely Operated Vehicle                                |
| SAR     | Species at Risk  |
| SARA    | <i>Species at Risk Act</i>                               |
| TOC     | Total Organic Carbon                                     |
| TPH     | Total Petroleum Hydrocarbon                              |
| UNSI    | Union of Nova Scotia Indians                             |
| VEC     | Valued Ecosystem Component                               |

## **FOREWORD**

Sections of the following documents may have been reproduced in whole or in part during the preparation of this report:

Jacques Whitford Environment Limited (JWEL). 2004. CEEA Screening Environmental Assessment: Cohasset Project Phase II Decommissioning. EnCana Corporation, Halifax, NS.

CNSOPB. 2004. EnCana Corporation Cohasset/Panuke Phase II Decommissioning Description of the Factors and the Scope of Those Factors.

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## 1.0 GENERAL INFORMATION

**Project Name:** Cohasset Project Phase II Decommissioning

**Project Location:** Approximately 256 km southeast of Halifax and approximately 41 km from Sable Island.

The coordinates of the Panuke platform are:  
Latitude: 43 degrees 48.66 minutes; Longitude: 60 degrees 43.95 minutes.

The coordinates of the Cohasset platform are:  
Latitude: 43 degrees 50.94 minutes; Longitude: 60 degrees 37.62 minutes.

Water depth in the Project area is approximately 45 meters.

**Purpose of Project:** Phase II decommissioning of Cohasset offshore oil development facilities

**Project Proponent:** EnCana Corporation

**Responsible Authorities:** Canada-Nova Scotia Offshore Petroleum Board (CNSOPB), Fisheries and Oceans Canada (DFO), and Environment Canada (EC),

**Environmental Assessment Triggers:** Law list triggers include:

- Development Plan Amendment under *Canada Nova Scotia Offshore Petroleum Resources Accord Implementation Act* (CNSOPB)
- Work authorization pursuant to *Canada Nova Scotia Offshore Petroleum Resources Accord Implementation Act* (CNSOPB)
- Habitat Alteration, Disruption or Destruction authorization pursuant to the *Fisheries Act* (DFO)
- Disposal at Sea permit pursuant to *Canadian Environmental Protection Act* (EC)

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**Canadian Environmental Assessment Registry Number:** 03-01-102

**CNSOPB File Number:** 30,008.8

## 1.1 INTRODUCTION

The Cohasset project was approved in 1990 and was Canada's first offshore oil development when it began production in 1992. Production continued until 1999, by which time 7.1 million cubic meters (44.5 million barrels) of oil had been produced. While originally owned and operated by Lasmo Nova Scotia Limited, the operator was changed to PanCanadian in 1995. PanCanadian became EnCana Corporation in 2002.

Decommissioning of the Cohasset Project has been separated into two phases. The first phase of decommissioning, which consisted of the following activities, was approved by the CNSOPB in 2000:

- well abandonment
- flushing and cleaning of process and utility systems
- ensuring all platforms, installations, vessels and pipeworks were gas and oil free
- preserving fixed components for future use or removal
- removing the CALM Buoy
- demobilizing and removing mobile components
- depressurizing and de-energizing platforms and subsea facilities

After completion of Phase I, the proponent was authorized by the CNSOPB to suspend the remainder of decommissioning, until such time that it determined whether jackets and topsides could be re-used for the proposed Deep Panuke project. In January 2002, EnCana determined it would not re-use existing facilities and the Board requested a plan for the second and final phase of decommissioning.

Phase II of decommissioning began in the summer of 2003 after the Board authorized EnCana to prepare platforms for removal and complete well abandonment. Two options, the *Partial Removal Option* and the *Total Removal Option*, are now under consideration for the completion of Phase II decommissioning. Both options would involve the removal and re-use, recycling or disposal of platforms on-land, but differ in their treatment of subsea equipment. The *Partial Removal Option*, which is preferred by the proponent, would treat, and abandon in situ, offshore subsea equipment not posing a snagging hazard. The *Total Removal Option* would involve the removal and on-land management of all subsea equipment. The latter option is consistent with commitments made by the proponent in the 1990 Development Plan Application and the subsequent Cohasset – Panuke Project Development Plan Decision Report. A change to the Development Plan (i.e., the *Partial Removal Option*) would require approval from the CNSOPB. It is also noted that prior authorization from the CNSOPB will be required for all offshore work for both options.

## **2.0 PURPOSE OF THE SCREENING**

The purpose of this screening and the proponent's EA is to assess the environmental effects of both the *Partial* and *Total Removal Options* under consideration for Phase II decommissioning of the Cohasset Project. This screening report is not intended to make a final determination of whether to approve the proposed amendment to the Development Plan sought by EnCana and, accordingly, may not determine which decommissioning option will ultimately be approved. The CNSOPB will make that determination after considering the results of the screening together with other regulatory factors.

The screening report has been prepared jointly by the three responsible authorities (RAs) for the project: the CNSOPB, DFO, and EC. It is based on outcomes of the proponent's Environmental Assessment (EA) and associated review, as well as information requests, specialist or expert advice, and public comments prepared since submission of a project description in November 2003. The screening will be used in making a final determination with respect to the significance of potential environmental effects of Phase II decommissioning activities.

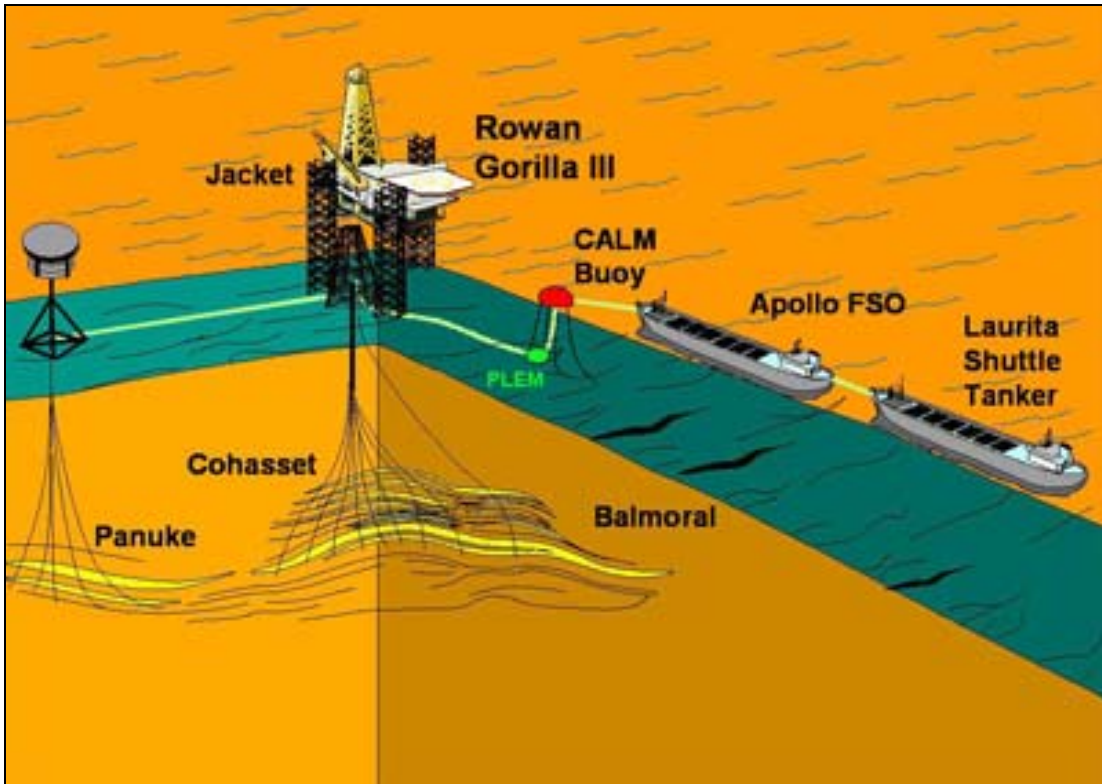
## **3.0 PROJECT DESCRIPTION**

The Cohasset Project involved the development of the Cohasset, Panuke and Balmoral fields, located approximately 256 km southeast of Halifax and approximately 41 km from Sable Island. Figure 1 is a schematic of the project during its operational phase. Figure 2 illustrates the Cohasset and Panuke field layout. While Phase I decommissioning was completed in 2000, two options for the second phase of decommissioning are now under consideration.

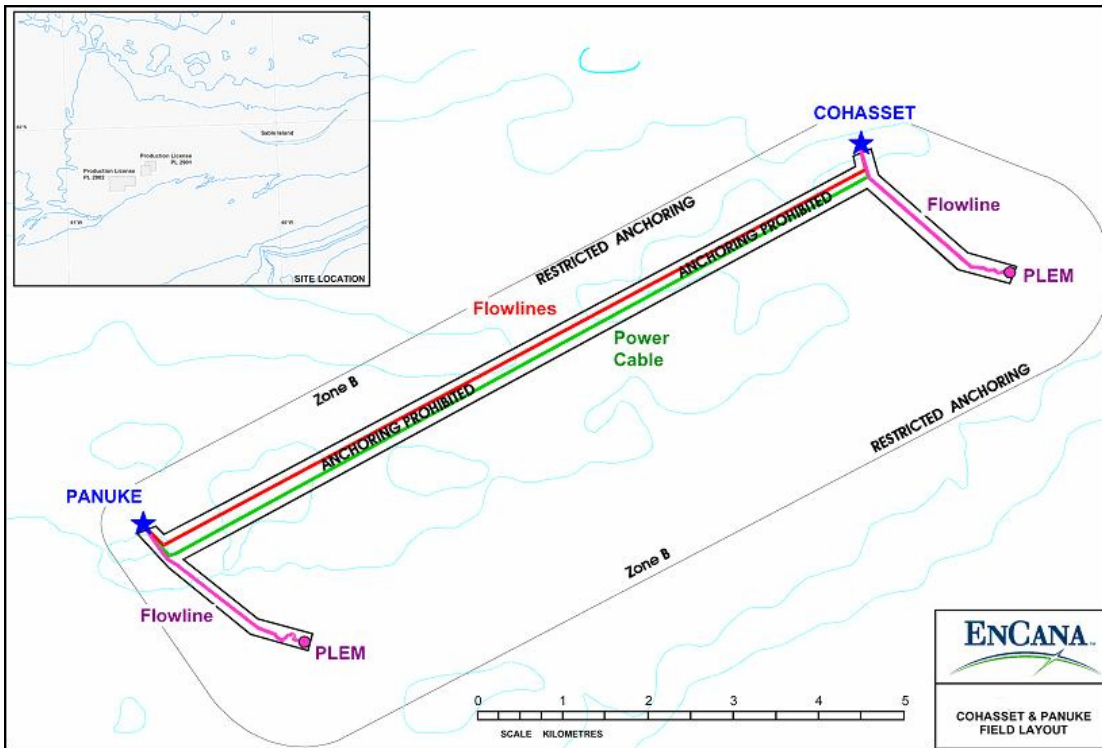
Both options would involve the removal and re-use, recycling or disposal of platforms on-land, but differ in their treatment of subsea equipment. The *Total Removal Option* involves the removal and on-land management of all subsea equipment, while the *Partial Removal Option* consists of the removal of subsea equipment posing a snagging hazard, but securing and abandoning the remaining subsea equipment in situ.

Table 1 provides a summary of the type of subsea equipment, the description, the status, and the management options.

**FIGURE 1. SCHEMATIC OF THE PROJECT DURING ITS OPERATIONAL PHASE**



**FIGURE 2. COHASSET-PANUKE FIELD LAYOUT**



**TABLE 1 SUBSEA EQUIPMENT TYPE, DESCRIPTION, STATUS AND MANAGEMENT OPTIONS**

| Equipment Type                  | Description  | Status   | Management Options   |
|---------------------------------|--|--|--|
| Interfield production flowlines | <p>8" inner diameter flexible flowline used for transferring unprocessed production fluids between the two platforms. Approximately 10 km long. Flange-connected to rigid risers at each of the platforms, and held in place on the sea floor by stabilization mattresses.</p> <p>Contain 31 anodes (84 kg each or total of 2604 kg). Anodes are composed primarily (&gt;99.995%) of zinc, but contain small amounts of other metals such as aluminum, cadmium, copper, iron, lead, and silicon.</p> | <p>Purged with seawater, gel pigged with a surfactant and caustic\degreaser, and filled with corrosion inhibited seawater during Phase I.</p> <p>Water samples were collected in August 2003 from the risers and confirmed that the Oil in Water (OIW) content is less than 5 mg/L.</p> <p>The proponent has indicated in a September 2004 survey that these flowlines are buried except for 2.5% of their total length with an average depth of 35 cm. The proponent's EA predicts that self-burial process expected to continue, but acknowledges that flowlines may become uncovered during storm events</p> <p>According to the proponent's EA, all metals that comprise the anodes are released at a very slow dissolution rate such that amounts released into the environment would be within background levels and would not be considered harmful to marine life.</p> | <p>The proponent indicates that flowlines are not expected to be re-useable as they have surpassed the 10 year design life; recycling is not practical as it would entail dissection of layers, including melted thermoplastic layers; if reuse and recycling opportunities are not available, flowlines would be disposed of in an onshore landfill.</p> <p>Reuse opportunities for anodes were not explored by the proponent, however, anodes are likely recyclable if they can be separated from flowlines.</p> |

| Equipment Type                      | Description   | Status   | Management Options  |
|-------------------------------------|---|--|---|
| Interfield water injection flowline | <p>6" inner diameter flexible flowline, approximately 10 km long.</p> <p>Contains 34 anodes (63 kg each or total of 1242 kg). See above Interfield Production Flowlines re: anodes</p>  | <p>This flowline was damaged during commissioning and it was never successfully pressure tested; it is not connected to the risers at Cohasset or Panuke; it is effectively abandoned on the seafloor.</p> <p>See Interfield Production Flowlines, re: September 2004 survey.</p> <p>See Interfield Production Flowlines re: anodes.</p>   | <p>See Interfield Production Flowlines re: design life and re-use</p> <p>See Interfield Production Flowlines re: anodes.</p>  |
| Export flowlines                    | <p>The Cohasset export flowline is a 6" ID, approximately 2.3 km flexible line used to transfer crude oil from the production facilities on the rig to the tanker. It is flange connected to the rigid pipe riser at the Cohasset platform and the PLEM. A similar arrangement is installed at the Panuke platform.</p> <p>Contain four anodes (63 kg each for a total of 252 kg). See Interfield Production Flowlines re: anodes .</p> | <p>Both flowlines were flushed and suspended with corrosion-inhibiting solution. Respective PLEM valves were closed.</p> <p>OIW content in the Panuke export flowline is less than 5 mg/L in the Panuke riser. Riser fluid sampling from the Cohasset export flowline indicated there was a break in the line and that the fluid had probably already dispersed to the ocean.</p> <p>See Interfield Production Flowlines, re: September 2004 survey</p> <p>See Interfield Production Flowlines, re: anodes</p> | <p>See Interfield Production Flowlines re: design life and re-use.</p> <p>See Interfield Production Flowlines, re: anodes</p> |

| Equipment Type                               | Description  | Status   | Management Options   |
|--|--|--|--|
| Interfield Pirelli Power Communication cable | 3" outer diameter, 110 km, 3.8 KV power cable, laid alongside the two interfield flowlines. Provided electrical power and communications to either platform. Includes fibre-optics control umbilical that allowed remote control of the wellheads and manifold.  | <p>The cable was isolated at both ends and disconnected from the transformers. It remains connected to both platforms through the J-tubes.</p> <p>The September 2004 survey indicates the power cable is buried except for 1% of its total length with an average depth of 31 cm. The proponent's EA predicts that the self-burial process is expected to continue, but acknowledges that subsea equipment may become uncovered during storm events.</p>   | The proponent's EA states that the cable has passed its design life. |
| <b>PLEMs</b>                                 | <p>The PLEMs are located approximately 2.5 km from the respective platforms, and consist of steel structures that house the manifold end of the export flowline. The Panuke PLEM is the largest of the two, measuring 6.2m x 6.2m x 1.3m.</p> <p>Two anodes on each PLEM (322kg each or a total of 1288kg). Anodes are composed primarily (&gt;99.5%) of zinc, but contain small amounts of other metals such as aluminum, cadmium, copper, iron, lead, and silicon.</p> | <p>The Cohasset PLEM was decommissioned in 1997 by closing the isolation valves and the PLEM riser was removed. The Panuke PLEM was shutdown shortly after the cessation of production and isolated by closing the valves. The PLEM riser was removed by severing just above the valve. Both PLEMS remain flange connected to their respective flowlines.</p> <p>The September 2004 survey indicates the Cohasset PLEM is essentially buried and the Panuke PLEM is covered to its base "Top of Steel" elevation. The proponent's EA predicts the burial process will continue, but acknowledges that subsea equipment may become uncovered during storm events.</p> | Mostly recyclable.   |

| Equipment Type           | Description   | Status  | Management Options   |
|--------------------------|---|---|--|
| Stabilization mattresses | <p>Vary in design, size and weight and are composed of concrete sections connected by polypropylene rope. The purpose is to ensure the subsea equipment is not moved or shifted from its location by waves or currents.</p> <p>There are 512 mattresses giving a total weight of approximately 1735 tonnes.</p> | The September 2004 survey indicates all mattresses are sufficiently buried with the exception of the mattress around the Panuke PLEM which is only buried around the edges. | The proponent indicates that potential means of re-use (e.g., harbour walls, coastal structure, road surfaces) will be investigated once a contractor has been selected. |

### 3.1 DESCRIPTION OF EQUIPMENT AND PHASE II DECOMMISSIONING OPTIONS

The Cohasset Project consists of two platforms and subsea equipment as described below:

#### PLATFORMS

The Panuke wellhead jacket weighs approximately 1,600 tonnes and is a steel tripod type structure with a four meter diameter central column, which houses five 24-inch conductors, two risers and two J-tubes. There are a total of three skirt piles, which are 60 inches in diameter, and two docking piles. The deck structure weighs approximately 750 tonnes and has four levels (i.e., lower, mezzanine, top deck, and helideck).

The Cohasset wellhead jacket weighs approximately 1,900 tonnes and is a steel four-legged structure that housed ten 24 inch conductors (now removed), four risers and two J-tubes. There are a total of four skirt piles that are 72 inches in diameter. The deck structure weighs approximately 350 tonnes and has three levels (i.e., lower, mezzanine, and top decks).

All platform-associated material described above would be removed and taken ashore as part of both decommissioning options under consideration. The Panuke platform will be removed, piles will be cut at least two meters below the seafloor, well conductor stubs will be removed at least four meters below the seafloor, and the two docking piles will be removed. For the Cohasset platform, it is proposed that piles will be cut at least two meters below the seafloor and the platform removed (note: conductors associated with the Cohasset platform have already been removed). Explosives will not be used in the removal of infrastructure. Piles will be cut using abrasive cutting techniques.

#### SUBSEA EQUIPMENT

Subsea materials include:

- two approximately 10 km long subsea interfield flowlines that once connected the Panuke and Cohasset platforms;
- two pipeline end manifolds (PLEMs);
- a power cable approximately 10 km long;
- two approximately 2.5 km long export flowlines from each of the jackets to each of the PLEMs; and
- 510 stabilizing concrete mattresses.

For the *Partial Removal Option* either the PLEMs or PLEM topsides would be removed to prevent snagging hazards to fishing equipment. Flowlines and power cables would be disconnected, the ends secured, and abandoned on the sea floor at the site. Stabilization mattresses would also be abandoned. It is noted that flexible flowlines were employed in project activities to facilitate future removal.

All subsea equipment would be removed for the *Total Removal Option*.

### **3.2 MANAGEMENT OF EQUIPMENT**

Approximately 4,700 tonnes of platform materials will be handled, recycled and/or disposed as part of the *Partial Removal Option*, while an additional 3,200 tonnes of subsea equipment will require management as part of the *Total Removal Option*. Platform material is anticipated to consist primarily of steel and marine growth. Subsea equipment consists of a variety of materials. For example, mattresses are constructed primarily of concrete, PLEMs of steel, and flowlines of a selection of materials. Recovered materials will be delivered to a third-party contractor for re-use, recycling or disposal onshore in compliance with applicable legislation and standards.

### **3.3 OPERATING SCHEDULE**

Fieldwork and the removal of materials have been estimated to take approximately four weeks for the *Partial Removal Option* and between eight and 15 weeks for the *Total Removal Option*.

The project has been assessed for the period of 2004-2009 inclusive. This timeframe includes a subsea survey of the field to verify that the work program has met its stated objectives.

## **4.0 ROLE OF THE FEDERAL AUTHORITIES**

In November 2003, EnCana submitted a project description to initiate an EA under the *Canadian Environmental Assessment Act* (CEAA) for Phase II decommissioning activities. The CNSOPB declared itself a Responsible Authority for the project in accordance with Sections 5 (1) (d) and 11 (1) of the CEAA. The Project will require authorization pursuant to sections 142 (1) (b) of the *Canada Nova Scotia Offshore Petroleum Resources Accord Implementation Act*. The need to approve an amendment to the Development Plan also must be met pursuant to sections 143(4)(a) and 143(5) of the *Canada Nova Scotia Offshore Petroleum Resources Accord Implementation Act*. A screening level assessment was deemed appropriate for the issuance of this authorization in accordance with section 18 (1) of the CEAA.

In accordance with the CEAA and *Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements*, the CNSOPB notified federal government departments about the project and associated EA in November 2003. Based on the information contained in the project description, DFO and EC determined they were in possession of specialist knowledge and information to support the EA process.

An application to amend the Development Plan for the *Partial Removal Option* was submitted to the CNSOPB by EnCana in December 2003.

While the project description submitted by EnCana considered the *Partial Removal Option* for decommissioning, the CNSOPB expanded the scope of the project to include an assessment of the *Total Removal Option*. It determined that the EA of both options would be important in informing the Board's decision of whether to approve the amendment to the Development Plan.

In April 2004, the CNSOPB finalized the scope of the EA and delegated the preparation of the EA report to the proponent.

EnCana submitted an EA in April 2004. This document was reviewed by federal authorities who submitted comments in July 2004. Based on the expanded scope of the project, DFO determined in March 2004 that it would also have a responsibility for the EA, based on the potential requirement for an authorization for Habitat Alteration, Disruption or Destruction (HADD) under the *Fisheries Act* [35(2)].

Based on the information in the proponent's EA, EC determined in July 2004 that it would have a responsibility for the EA, based on the potential requirement for a Disposal at Sea permit pursuant to the *Canadian Environmental Protection Act* (CEPA). This permit is required for the deliberate disposal of sediment, which could be associated with project activities. In addition, in accordance with section 79(1) of the *Species at Risk Act* (SARA), EC notified DFO that species at risk were likely to be affected by the proposed project. Table 2 summarizes the roles of Federal Authorities in the EA.

**TABLE 2 SUMMARY OF FEDERAL AUTHORITIES' ROLES**

| Agency or Department                 | Responsible Authority | Expert Advice | No Role |
|--------------------------------------|-----------------------|---------------|---------|
| CNSOPB                               | X                     |               |         |
| Environment Canada (EC)              | X*                    |               |         |
| Fisheries and Oceans Canada (DFO)    | X*                    |               |         |
| Health Canada                        |                       |               | X       |
| National Energy Board (NEB)          |                       |               | X       |
| Industry Canada                      |                       |               | X       |
| Department of National Defense (DND) |                       |               | X       |
| Transport Canada                     |                       |               | X       |

\*Based on the information included in the project description, EC and DFO declared themselves to have advice with respect to the project, in accordance with Section 12(3) of CEAA. Both departments later changed their determination to having a responsibility for the EA based on a change in the project description and the submission of additional information.

Public comments were sought and received on the proponent's EA (see Section 6.0, Consultation) and, in July 2004, EnCana was requested by the CNSOPB to respond to public and government comments on the EA. The proponent provided these responses in July 2004. Based on the information received, EC requested and received supplementary information from EnCana in August 2004. DFO provided additional comment on the undertaking in September 2004.

Documents prepared by the proponent and associated comments by federal authorities and the public are available from the CNSOPB public registry for the project at [www.cnsopb.ns.ca](http://www.cnsopb.ns.ca) in the Environment section under Public Registry or from the CNSOPB offices.

#### **4.1 REGULATORY RESPONSIBILITIES**

In addition to the responsibilities related to the need for an environmental assessment under the CEAA (described above), the RAs administer legislation and policies of general application to project activities. A brief description of some these mandates follows.

#### **4.1.1 ENVIRONMENT CANADA**

Environment Canada (EC) administers several statutes including the *Canadian Environmental Protection Act (CEPA)*, *Species at Risk Act*, *Department of Environment Act*, *Fisheries Act* (Section 36), and *Migratory Birds Convention Act*. EC is also the lead federal department in promoting a variety of policies and programs concerning the environment including: the *Toxic Substances Management Policy* and *Pollution Prevention – A Federal Strategy for Action*. Through the Meteorological Service of Canada, EC has expertise related to weather, climatology, and atmospheric science.

#### **4.1.2 FISHERIES AND OCEANS CANADA**

Fisheries and Ocean Canada (DFO) administers a number of statutes including the *Fisheries Act* and *Oceans Act*. Section 35 of the *Fisheries Act* protects fish habitat from harmful alteration, disruption or destruction from works or undertakings. However, the act does allow for harmful alteration, disruption or destruction, if it has been authorized by the Minister of Fisheries. Marine mammals are protected under the Marine Mammal Regulations of the Fisheries Act.

The *Oceans Act* gives DFO a mandate for integrated management, marine environmental quality and establishment of marine protected areas. *The Gully Marine Protected Area Regulations* under the *Oceans Act* were enacted in May 2004.

DFO also has responsibilities for aquatic species (including marine mammals, fish and turtles) under the *Species at Risk Act* (see section 8.8).

#### **4.1.3 CANADA – NOVA SCOTIA OFFSHORE PETROLEUM BOARD**

The Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) is an independent joint agency of the governments of Canada and Nova Scotia. It was established in 1990 following proclamation of the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act*, S.C. 1988, c.28 by the federal government and the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation (Nova Scotia) Act*, S.N.S. 1987, c.3 by the provincial government. The Board's responsibilities include:

- the enhancement of safe working conditions for offshore operations,
- protection of the environment during offshore petroleum activities,
- management and conservation of offshore petroleum resources,
- ensuring compliance with the provisions of the *Accord Implementation Acts*, that deal with Canada-Nova Scotia employment and industrial benefits,
- rights issuance and management,

- resource evaluation, and
- data collection, duration and distribution.

## 5.0 SCOPE OF THE PROJECT AND ASSESSMENT

Based on the information contained in the project description, and consideration of the *Total Removal Option*, the CNSOPB prepared a scoping document entitled “EnCana Corporation Cohasset/Panuke Phase II Decommissioning: Description of the Factors and Scope of Those Factors” (April 16, 2004). The scoping document directs the preparation of a screening to determine whether or not the project is likely to cause significant adverse environmental effects. In developing the scoping document, the CNSOPB consulted with regulators and fisheries groups.

The scope of the assessment includes a consideration of factors set out under Section 16(1) of CEAA for a screening level assessment with respect to both the *Partial* and *Total Removal Options*. The scope of the project was determined to include the following components:

1. Disconnecting the flowlines and cable from the Cohasset and Panuke platforms;
2. Total removal of the flowlines and cables AND removal of the PLEM; OR
3. Securing the flowline ends and leaving the flowlines and cable on the seabed AND removal of the PLEM or PLEM topsides;
4. Removal of both platforms and associated jackets and piles;
5. General intent of disposal of all recoverable materials.

The proponent was directed to consider the potential effects of the project on Valued Ecosystem Components (VECs) within appropriate spatial and temporal boundaries, which were to be defined and rationalized. Potential issues specifically referenced in the scoping document include the need to consider marine resources, marine use, discharges and emissions, the effects of the environment on the project, accidental events, and follow-up and monitoring.

The scoping document is available on the CNSOPB website ([www.cnsopb.ns.ca](http://www.cnsopb.ns.ca)) under the Environment section in the Public Registry or from the CNSOPB offices.

## 6.0 CONSULTATION

The CNSOPB actively sought written public comment throughout the screening process. The CNSOPB indicated on the Canadian Environmental Assessment Agency registry that public participation was being requested. In addition to consultation with federal authorities in accordance with the federal coordination regulations, the CNSOPB posted electronic copies the following documents on its Public Registry ([www.cnsopb.ns.ca](http://www.cnsopb.ns.ca)):

- Cohasset Project Phase II Decommissioning – CEAA Project Description
- EnCana Corporation Cohasset/Panuke Phase II Decommissioning: Description of the Factors and Scope of Those Factors (April 16, 2004).

- CEAA Screening Environmental Assessment Cohasset Phase II Decommissioning
- comments from the public, RAs and EnCana on the project description, scoping document and the EA.
- Environmental Screening Report

All public comments will also be considered by the Board during the Development Plan decision process.

## **6.1 SCOPING DOCUMENT**

The CNSOPB prepared the scoping document entitled, “EnCana Corporation Cohasset/Panuke Phase II Decommissioning: Description of the Factors and Scope of Those Factors” (April 16, 2004) between February and March 2004. In developing this document, the CNSOPB consulted with regulators and circulated a draft for comment to the CNSOPB’s Fisheries Advisory Committee. Written comments on the scoping document and project description were received from the Eastern Shore Fishermen’s Protection Association and the Native Council of Nova Scotia.

## **6.2 PROPONENT’S ENVIRONMENTAL ASSESSMENT**

The CNSOPB received the EA from the proponent at the end of April 2004 and on May 11<sup>th</sup> posted it to the electronic registry and released it for written public comment. A news release was distributed and picked up by media around the province. Advertisements were placed in 10 provincial, community and French newspapers seeking written public comment on the EA and providing the public with approximately 45 days to make a submission. The advertisements appeared in the following publications:

The Cape Breton Post - Saturday, May 15<sup>th</sup>  
 The Halifax Chronicle-Herald - Saturday, May 15<sup>th</sup>  
 The Halifax Daily News - Saturday, May 15<sup>th</sup>  
 The Inverness Oran - Wednesday, May 19<sup>th</sup>  
 The Kentville Advertiser - Friday, May 14<sup>th</sup>  
 Le Courrier - Friday, May 21<sup>st</sup>  
 The New Glasgow Evening News - Saturday, May 15<sup>th</sup>  
 The Port Hawkesbury Reporter - Friday, May 14<sup>th</sup>  
 The Shelburne Coast Guard - Tuesday, May 18<sup>th</sup>  
 The Yarmouth Vanguard - Friday, May 14<sup>th</sup>

The CNSOPB also requested comment from its Fisheries Advisory Committee.

All public comments received by the CNSOPB on the proponent’s EA were distributed to the RAs, to EnCana, and posted on the public registry.

There were five written submissions from the public. Comments were received from the Area 19 Snow Crab Fishermen’s Association, the Netukulimkewe’l Commission, Clearwater Seafoods, the Seafood Producers Association of Nova Scotia, and a concerned member of the public. The CNSOPB responded in

writing to acknowledge the receipt of all comments and the comments were considered as the RA's reviewed the EA. Table 3 summarizes the public comments, EnCana's response, and the RA's response. All public comments favoured the *Total Removal Option*. Public comments were sought on (1) the EA and the potential for environmental effects to be associated with decommissioning activities and (2) the proposed amendment to the Development Plan. Public comments on the EA are considered in this screening. Comments that relate to the Development Plan amendment are identified and will be considered by the CNSOPB in the Development Plan decision process.

EC and the DFO forwarded EA information on the project to the Confederacy of Mainland Mi'kmaq (CMM) and Union of Nova Scotia Indians (UNSI) on August 17<sup>th</sup>, 2004, providing the opportunity for these organizations to comment on the proposed undertaking with respect to (1) the current use of lands and resources for traditional purposes by Aboriginal persons, (2) physical and cultural heritage, and (3) sites of historical or archaeological significance. While it was requested that both organizations respond with any comments or concerns by early September (i.e., so that these could be considered in the screening), there has been no response to date.

**TABLE 3 SUMMARY OF PUBLIC COMMENTS, ENCANNA'S RESPONSE AND THE RA'S RESPONSE TO THOSE COMMENTS**

| <b>Written Public Comments<br/>(summary)</b>   | <b>EnCana's Response</b>   | <b>RA's Response</b>   |
|--|--|--|
| <p>EnCana should keep its legal agreement.</p> <p>The original Cohasset Panuke DPA included a commitment for the removal of all equipment upon completion of the project. It is unacceptable for EnCana to now say that new circumstances warrant abandoning equipment on the seafloor.</p> <p>EnCana's full commitment should be completed, otherwise an initial project review process is meaningless.</p> <p>Partial removal will open the door to future projects following suit.</p> <p>One can only imagine what the ocean bottom will look like in years to come.</p> | <p>The original DPA was approved 15 years ago and EnCana has since re-evaluated its decommissioning plan and determined that partial removal is the best option from both an environmental and safety perspective.</p> | <p>The purpose of the EA is to assess the environmental effects of the decommissioning options. It is not intended to make a final determination of whether to approve the proposed Development Plan amendment sought by EnCana and, accordingly, may not determine which decommissioning option will ultimately be approved. The CNSOPB will make that determination after considering the results of the screening together with other regulatory factors.</p> <p>Comments relate to the Development Plan amendment and will be considered by the CNSOPB in the Development Plan decision process.</p> |

| <b>Written Public Comments<br/>(summary)</b>  | <b>EnCana's Response</b>  | <b>RA's Response</b>  |
|---|---|---|
| The CNSOPB should hold EnCana to its original commitment and return the ocean floor to the same condition it was before the Project was initiated. Failure to do so could result in the seabed being littered with obstructions in the future. (This comment was repeated several times.) | EnCana will comply with the CNSOPB's decision   | See above response; this is a decision of the CNSOPB following its consideration of all regulatory requirements   |
| To what time and level of legally binding long-term liability and compensation is EnCana or its legal successors prepared to commit to the CNSOPB Management Board, Nova Scotia, Canada and share users of the ocean environment?   | EnCana will honour whatever obligations, authorized by the applicable offshore legislation and regulations, are imposed upon it by the CNSOPB.  | See Section 10.1.1 Required Mitigation and Follow-up  |
| Does the CNSOPB have the authority or mandate to derogate or abrogate from the spirit, intent, and articles of an international convention ratified by Canada?  | EnCana believes that the proposed partial removal is not inconsistent with international conventions regarding decommissioning of oil and gas facilities.   | The RAs have considered international experience with decommissioning in the preparation of this screening report. See Section 7.0 International Experience.  |
| There is no guarantee that flowlines and other equipment will not be a hazard to fishing soon or at some time in the future. It is insufficient that EnCana propose to compensate for gear damage when the equipment can easily be removed.   | EnCana will adhere to the CNSOPB <i>Compensation Guidelines Respecting Damages Related to Offshore Petroleum Activity</i> (March 2002).   | The RAs recognize the concern regarding damage to fishing gear and note the concerns related to leaving equipment on the seabed. The technical issues related to the removal of equipment will be considered in the CNSOPB's Development Plan decision. |
| Does the proponent have adequate funds for both removal options?  | Prior to the production start up date the operators provided evidence of financial responsibility totaling \$35 million. The applicant continues to renew this financial responsibility on an annual basis. | This comment is outside the scope of the environmental impact analysis.   |
| The Cohasset debris (subsea equipment) could have the same type of negative effect on fisheries as reported to the Fact Finding mission by the North Sea operators.   | No comments provided  | The RAs recognize the concerns related to leaving equipment on the seabed, including access to fishing grounds and cumulative effects. See section 9.9 Commercial Fisheries.  |

| Written Public Comments<br>(summary)   | EnCana's Response   | RA's Response  |
|--|---|--|
| A significant quahaug resource has been identified on the Sable Island Bank and is moving toward commercialization. The resource in the Project area will remain inaccessible to the commercial fishery unless the structures on the seafloor are removed. | The charted Cohasset and Panuke exclusion zone represents a very small portion of the entire area available for harvesting quahogs on the eastern Sable Island Bank. "No dredging areas" could serve as refugia or de-facto conservation zones. EnCana proposes that, if collision with decommissioned equipment were to occur, EnCana will adhere to the CNSOPB <i>Compensation Guidelines Respecting Damages Related to Offshore Petroleum Activity</i> (March 2002). | DFO science has estimated, based on survey catch rates, that the biomass of quahogs is 16-26 tonnes in the approximately 42 km square area of the restricted anchoring zone around the flowlines. This biomass is a small portion of the estimated 1.4 million metric tonnes of quahaug resource available on the Sable Island Bank. |
| What is the depth of sand cover of the Cohasset inter-field flowlines, power cable and PLEMs? What is the depth of sand cover over the Panuke export flowlines?  | EnCana conducted an ROV survey in the fall of 2004 to confirm the state of burial for decommissioning operations. Specific depth of burial is not expected to affect the conclusions with regard to potential for significant environmental effects. (Further detail is provided in the EnCana's response to comments).   | The RAs have reviewed the most up to date information provided on the state of burial. The results of the September 2004 survey are presented in Table 1.  |

### 6.3 SCREENING REPORT

A copy of this screening report will be made public in November 2004 and the public will be invited to submit written comments on the screening. Public comments will be considered by the RAs prior to making their respective regulatory decisions.

### 7.0 INTERNATIONAL EXPERIENCE

Given that this is the proposed project is the first decommissioning of an offshore oil facility in Canada, international experience with decommissioning, primarily from the North Sea and the United States, was reviewed by RAs. Key international decommissioning practices pertinent to the proposed project are summarized below.

Norway:

- All platforms are required to be removed except those over 10,000 tonnes may be considered for in-situ disposal. Preferred option is to abandon pipelines and associated materials in-situ provided they do not impede other users of the sea (Norwegian Petroleum Directorate, 2003).

United Kingdom:

- All platforms are required to be removed except those over 10,000 tonnes may be considered for in-situ disposal.

- Pipelines are addressed case by case. Major pipelines are candidates for abandonment in-situ. Small diameter flowlines that are neither trenched nor buried should normally be removed (Department of Trade and Industry, 2000).

United States:

- All platforms are required to be removed.
- Pipelines and associated materials can be abandoned in-situ provided they do not constitute a hazard to navigation or commercial fishing (MMS, 2002).

The International Maritime Organization (IMO) 1989 guidelines and standards specify that the decision to allow an offshore installation, structure, or parts thereof, to remain on the sea-bed should be based on a case-by-case evaluation. Matters to evaluate include, but are not limited to potential effects on the marine environment, on navigation or other users of the sea, and potential future effects relating to deterioration of materials. The factors have been considered as part of the EA of the Cohasset Phase II Decommissioning Project. Other factors such as costs and risk of injury to personnel have not received detailed consideration as part of the EA but will receive additional consideration by the CNSOPB as part of its regulatory responsibility.

The IMO guidelines and standards require monitoring the accumulation and deterioration of material left on the sea-bed to ensure there is no subsequent adverse impact on navigation, other uses of the sea, or the marine environment. This requirement is reflected in the EA by the requirement for a monitoring program at the site.

Among the standards in the IMO document is the requirement for the entire removal of abandoned or disused installations or structures standing in less than 75 m of water and weighing less than 4,000 tonnes. The decommissioning plan under consideration includes removal of standing structures and is thus consistent with the IMO standard. Parts of an installation can be left in place provided there is no unjustifiable interference with other uses of the sea. The proponent's EA has considered what materials may be left in place as part of the decommissioning plan and has reached conclusions relating to potential interference with other users (see Section 9.9 in particular). Consistent with the guidelines and standards: the water column in the project area will be unobstructed and nautical charting requirements for any remaining materials will be met; the EA process has been used to ensure removal activities are performed in such a way as to cause no significant adverse effects upon the marine environment; self-burial processes evident at the decommissioning site will ensure any of the materials that may be abandoned in place will not move under the influence of waves, tides, currents, or storms.

EnCana is of the opinion that the proposed partial removal is not inconsistent with international conventions regarding decommissioning of oil and gas facilities. The RAs agree that the EA is consistent with the IMO guidelines and standards and the CNSOPB will ensure that the final regulatory decision is consistent with the same.

## 8.0 DESCRIPTION OF THE ENVIRONMENT

### 8.1 DESCRIPTION OF THE PHYSICAL ENVIRONMENT

The Cohasset Project includes the Cohasset, Panuke and Balmoral offshore oil fields, which are located on the outer zone of the Scotian Shelf. The site is approximately 256 km southeast of Halifax, approximately 41 km southwest of Sable Island, and in an area with water depths of 35 to 40 metres.

The percentage of occurrence of sea ice and the probability of occurrence of icebergs at the project site are low. The largest currents are generated in winter when storms are most intense. Tropical storms threaten the project area in late summer and fall. Non-tropical storms are more common in winter than in summer and are the predominant cause of extreme winds. Freezing precipitation is less common in the outer shelf than in areas closer to shore. Saltwater icing of ships and structures is probable from November through April. Air pollutant concentrations in the project area are near the background levels measured in remote northern areas. (MacLaren Plansearch Limited, 1996).

The project location is near the outer limit of measurable effects of land-based sources of marine pollution but also near the Continental Shelf-Break, often the site of significant biological productivity. Water quality in the project area will reflect primarily inputs produced by natural biological processes together with limited land-based influences, both natural and anthropogenic (MacLaren Plansearch Limited, 1996).

The seabed in the project area is characterized by well-sorted sand with periodic disturbances brought on by storms. Gravel, silt and clay are present in trace amounts. The sand particles are fine to medium and there is a regular occurrence of mega-ripples<sup>1</sup>.

During the production phase of the Cohasset Project, there were discharges of drill cuttings that have the potential to impact the environment, and sediment quality in particular. In 1991 and 1992 there were eight wells drilled at the Panuke site using water-based drilling fluid. Between 1993 and 1997, 17 wells (including sidetracks) were drilled using a low toxicity mineral oil (LTMO) based drilling fluid at the Cohasset field and the cuttings discharged overboard. Approximately 1100 tonnes of LTMO drilling fluid (approximately 14% by weight oil on cuttings) and 8000 tonnes of cuttings associated with the LTMO were discharged into the marine environment. After 1998, the cuttings and drilling fluids from all wells were re-injected into geological formations in dedicated injection wells. Over the life of the Project a total of 17 wells were drilled at the Cohasset platform and 10 wells were drilled at the Panuke platform.

The EA document notes that, based on 1997 and 2003 video surveys, piles of drill cuttings on the seafloor are not visually evident. The proponent's position is

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<sup>1</sup> Mega ripples are formed on sandy bottoms of shallow seas by current and wave action and are typically 0.06 to 1.5 meters high and 0.6 to 30 meters in length (Morelissen et al. 2001).

that the cutting piles are no longer evident due to re-working by currents and storms. Relying on sediment quality data from a previous survey and using barium as a tracer, EnCana has found chemical evidence of drill cuttings up to 100 metres from the Cohasset platform and up to 50 metres from the Panuke platform. Elevated concentrations of total petroleum hydrocarbons were found to correspond to elevated barium concentrations. The prevailing current (northeast) has influenced the distribution of contaminants. EnCana has noted that the trail of remnant cuttings is removed from the majority of the proposed decommissioning activities, thus it will not be disturbed by project activities.

Although there is evidence of elevated contaminant concentrations EnCana has concluded that no biological impact is expected from current concentrations and that follow-up sediment monitoring would show a gradual reduction in surface sediment contaminant concentrations.

## 8.2 MARINE BENTHOS

Information on marine benthos was collected by ROV surveys in 2000 and 2001. According to the proponent's EA, the epifaunal communities at the Cohasset and Panuke fields are sparse. The predominant epifaunal organisms found near the Cohasset site at those stations surveyed are the Ocean Quahaug (*Arctica islandica*) and Surf Clam (*Spisula polynyma*). Other common epifauna include Moon Snails (*Lunatia heros*), starfish (*Asterias vulgaris*), sea anemones (*Cerianthus borealis*), Orange-footed Sea Cucumber (*Cucumaria frondosa*), Sand Dollar (*Echinarachinus parma*), Jonah crabs (*Cancer borealis*), Hermit crabs (*Pagurus* spp.), sculpins, and flounders. Infaunal species include amphipods, polychaetes, small bivalves and gastropods.

The proponent's EA indicated that there is limited seasonal variation in the diversity of marine benthos, except after a storm. Most larvae are planktonic and may remain in the water column for several months prior to settlement. Filter feeders and detritus feeders dominate the benthic fauna on Sable Island Bank.

Based on the 2000 and 2001 surveys, the proponent's EA indicates that the exposed portions of both PLEMs, the 15.24 cm (6 inch) and 20.32 cm (8 inch) pipelines, and the mattresses exhibit growth of marine organisms that includes marine algae, hydroids, sponges, anemones and other epilithic organisms. American Lobster (*Homarus americanus*) was observed on or near mattresses and where the pipeline became exposed from underneath the sediment. The proponent's EA stated that 16 lobsters were observed in one video survey undertaken in 1998. In 2004, an additional ROV survey indicated that the self-burial process is essentially complete; however, the effect of the burial on the remaining marine life has not yet been determined.

Values for biomass of attached biota were obtained from data collected on the Rowan Gorilla I for a period spanning July through to November 1985. The proponent's EA references an average standing stock value of 2,158 g/m<sup>2</sup> of marine growth on the subsea structures from Dobrocky Seatech Ltd. (1986). According to the proponent's EA, the annual benthic production in the Sable Island Bank area is stated in the report to be presumed to fall within the range of

132-536 kJm<sup>-2</sup>yr<sup>-1</sup>. The biomass on the Sable Island Bank in May ranged from 3.0 to 282.8 g/m<sup>2</sup> and in December, the biomass ranged from 2.6 to 55.7 g/m<sup>2</sup>.

There are no marine benthos species that are designated as species at risk under SARA in the Project area.

### 8.3 MARINE FISH

Marine fish can be divided into two categories based on their life habits. Demersal fish live near the seafloor for the majority of their lives. Pelagic fish are those species that spend the majority of life at the surface or in the water column. The eggs and larvae of most demersal and pelagic fish species are found near the surface or through the water column. Sable Island Bank is a spawning and nursery area for many fish species. A relatively persistent gyre allows for retention of eggs and larvae over the banks where conditions are favourable for their development. Some species spawn more or less year-round on Sable Island Bank and over most of the Scotian Slope.

Historically, demersal fish supported the largest fisheries in the Northwest Atlantic. Atlantic Cod (*Gadus morhua*), though common throughout the Scotian Shelf in the past, has declined to historic lows on the Eastern Scotian Shelf and continues to decline even in the absence of directed commercial fishing. The Scotian Shelf population is listed as a species of *special concern* (COSEWIC 2003). Cusk (*Brosme brosme*), a large slow-growing species, was recently listed as *threatened*, because the rate of decline has been more than 90% over three generations (COSEWIC 2003). The International Union for Conservation of Nature and Natural Resources (IUCN) evaluated the status of Haddock (*Melanogrammus aeglefinus*) as *vulnerable*. Table 4 lists the marine fish species at risk and species of special status that occur in the study area. The Sable Island/Western Bank complex is particularly important for juvenile Atlantic Cod and Haddock (Frank *et al.* 1997). The banks and their edges are also spawning areas for Atlantic Cod, Silver Hake (*Merluccius bilinearis*), White Hake (*Urophycis tenuis*), and Haddock (Davis *et al.* 1998).

Yellowtail Flounder (*Limanda ferruginea*), evaluated as vulnerable by ICUN, spawn on Banquereau, Sable Island, Western, and Browns Banks and the west side of Emerald Bank. Witch Flounder (*Glyptocephalus cynoglossus*) spawn in a widely scattered area from the northeastern Shelf to Banquereau and on the western edge of Sable Island and Western Banks. American Plaice (*Hippoglossoides platessoides*) spawn on Sable Island Bank and some slope areas. Atlantic Halibut (*Hippoglossus hippoglossus*), evaluated by ICUN as *endangered*, is thought to spawn in slope areas.

Sand lances are a very abundant on the Scotian Shelf, with the highest concentrations usually found in depths of 50m or less (Breeze *et al.* 2002). They are not commercially important, but play a vital ecological role as forage fish for other marine animals (Scott and Scott 1988).

Little Skate (*Raja erinacea*), Winter Skate (*Raja ocellata*), Smooth Skate (*Raja senta*), Barndoor Skate (*Raja laevis*) and Thorny Skate (*Raja radiata*) are found in the study area (Scott and Scott 1988). Little is known about the spawning

habits of these skate species. The IUCN evaluated the status of the Barndoor Skate as *endangered* (IUCN 2003).

Pelagic fish are highly migratory and pelagic zones are often homogenous over large areas. There is limited information on pelagic fish assemblages on the Scotian Shelf and Slope (Breeze *et al.* 2002). Most of these species are typically present on the Scotian Shelf and Slope during the summer and fall. Both Atlantic Herring (*Clupea harengus*) and Atlantic Mackerel (*Scomber scombrus*) spawn on Sable Island Bank during the summer months.

**TABLE 4 MARINE FISH SPECIES AT RISK AND SPECIES OF SPECIAL STATUS THAT MAY OCCUR IN THE STUDY AREA**

| <b>Marine Fish Species</b>                            | <b>Status</b>                               |
|---|---|
| Atlantic Cod ( <i>Gadus morhua</i> )                  | <i>Special Concern</i> (COSEWIC 2003; SARA) |
| Atlantic Halibut ( <i>Hippoglossus hippoglossus</i> ) | <i>Endangered</i> (IUCN 2003)               |
| Yellowtail Flounder ( <i>Limanda ferruginea</i> )     | <i>Vulnerable</i> (IUCN 2003)               |
| Barndoor Skate ( <i>Dipturus laevis</i> )             | <i>Vulnerable</i> (IUCN 2003)               |
| Haddock ( <i>Melanogrammus aeglefinus</i> )           | <i>Vulnerable</i> (IUCN 2003)               |
| Cusk ( <i>Brosme brosme</i> )                         | <i>Threatened</i> (COSEWIC 2003)            |
| Porbeagle Shark ( <i>Lamna nasus</i> )                | <i>Endangered</i> (COSEWIC 2004)            |
| Atlantic Salmon ( <i>Salmo salar</i> )                | <i>Endangered</i> (COSEWIC 2001; SARA)      |
| Spotted Wolffish ( <i>Anarhichas minor</i> )          | <i>Threatened</i> (COSEWIC 2001; SARA)      |
| Northern Wolffish ( <i>Anarhichas denticulatus</i> )  | <i>Threatened</i> (COSEWIC 2001; SARA)      |
| Atlantic Wolffish ( <i>Anarhichas lupus</i> )         | <i>Special Concern</i> (COSEWIC 2000; SARA) |

#### **8.4 MARINE MAMMALS**

The analysis in the proponent's EA report considers both cetaceans (whales) and pinnipeds (seals) that may live and/or migrate through the study area. Little or no data is available on the size or status of whale stocks. Seal stocks are considered abundant, and routine surveys of populations are conducted on Sable Island.

The proponent's EA study identifies 14 cetacean species that are regular or occasional residents on the Scotian Shelf and have been recorded in the study area. These are listed in Table 4.7 of the EA document.

According to the proponent's EA report, small odontocete cetaceans (toothed whales) such as Pilot Whales (*Globicephala melaena*) and Atlantic White-sided Dolphins (*Lagenorhynchus acutus*) are more common in the nearshore areas of Sable Island. The shallow waters around the island restrict the passage of large Rorqual Whales. Other toothed whale species likely to occur include Common Dolphin (*Delphinus delphis*) and bottlenose Dolphin (*Tursiops truncatus*). Observer information indicates that pilot whales are the most common species on the Scotian Slope.

The Fin Whale (*Balaenoptera physalus*) occurs year-round on the Scotian Shelf. The number of Humpback Whales (*Megaptera novaeangliae*) migrating through the Scotian Slope and Shelf to nearshore areas peaks in the study area between July to September. Sei Whales (*Balaenoptera borealis*) occur both along the

Scotian Slope and Shelf migrating north in June and July and returning south from September to November. The solitary Minke Whale (*Balaenoptera acutorostrata*) is the smallest of the baleen whales. They occur over the entire Scotian Shelf; however, their seasonal distribution and migration patterns are not well defined.

Blue Whales (*Balaenoptera musculus*) are widely distributed in the world but they prefer the edge of the continental shelf. Both the North Atlantic Right Whale (*Eubalaena glacialis*) and the Northern Bottlenose Whale (*Hyperoodon ampulatus*) are found on the Scotian Shelf. Critical areas for the North Atlantic right whale include Roseway Basin and part of the Bay of Fundy. The Scotian Shelf population of the northern bottlenose whale is found primary in the Gully and other underwater canyon features. The Harbour Porpoise (*Phocoena phocoena*), is a coastal species rarely found in water deeper than 125m (Gaskin 1992).

Four seal species are present near Sable Island, the Grey Seal (*Halichoerus grypus*), Harp Seal (*Phoca groenlandica*), Harbour Seal (*Phoca vitulina*) and Hooded Seal (*Cystophora cristata*). The Grey Seal is of particular importance to Sable Island in terms of numbers. The Harbour Seal which had been present in the hundreds, is decreasing in numbers, possibly due to predation by sharks in the vicinity, as well as the population expansion of the socially aggressive Grey Seal. Harbour seals whelp on the beaches of Sable Island in May, followed by breeding in June. Large numbers of grey seals haul out on Sable Island in May to moult. Hooded and Harp Seals are occasionally present in the area.

There are seasonal variations in the diversity and abundance of marine mammals on the Scotian Shelf and Slope and thus the study area. From a low in winter months, diversity and abundance increases in the spring as species which have over-wintered further south arrive. Some whale species move closer inshore or over the banks to feed on Herring or other fish. Whales are most abundant during summer months and Harbour and Grey seals are present near Sable Island. The number and diversity of whales decreases in the fall, as migrations to the south occur.

**TABLE 5 CETACEAN SPECIES AT RISK AND SPECIES OF SPECIAL STATUS THAT MAY OCCUR IN THE STUDY AREA**

| <b>Cetacean Species</b>                                    | <b>Status</b>                               |
|--|---|
| Blue Whale ( <i>Balaenoptera musculus</i> )                | <i>Endangered</i> (COSEWIC 2003; SARA)      |
| Fin Whale ( <i>Balaenoptera physalus</i> )                 | <i>Special Concern</i> (COSEWIC 2003; SARA) |
| Sei Whale ( <i>Balaenoptera borealis</i> )                 | <i>Data Deficient</i> (COSEWIC 2003)        |
| North Atlantic Right Whale ( <i>Eubalaena glacialis</i> )  | <i>Endangered</i> (COSEWIC 2003; SARA)      |
| Harbour Porpoise ( <i>Phocoena phocoena</i> )              | <i>Special Concern</i> (COSEWIC 2003; SARA) |
| Northern Bottlenose Whale ( <i>Hyperoodon ampullatus</i> ) | <i>Endangered</i> (COSEWIC 2003; SARA)      |
| Humpback Whale ( <i>Megaptera novaeangliae</i> )           | <i>Special Concern</i> (SARA)               |
| Sowerby's Beaked Whale ( <i>Mesoplodon bidens</i> )        | <i>Special Concern</i> (COSEWIC 1989; SARA) |

## 8.5 MARINE BIRDS

The proponent's EA states that over 25 seabird species may be observed on the Scotian Shelf. Migrating birds begin to appear in large numbers in the vicinity of Sable Island in May, remaining abundant until August. During the summer months, the offshore seabird community consists primarily of shearwaters (*Puffinus* spp.), storm-petrels (*Oceanodroma leucorrhea*; *Oceanites oceanicus*), jaegers (*Stercorarius* spp), and gulls (*Larus* spp), whose populations are believed to be generally stable. Endangered Roseate Terns (*Sterna dougallii*) breed on Sable Island from mid-May to mid-August in colonies of Arctic Terns (*Sterna paradisaea*) and Common Terns (*Sterna hirundo*). These latter two species have been designated Sensitive (yellow rating)<sup>2</sup> by the Nova Scotia Department of Natural Resources. Sable Island is also the only major breeding location for the Ipswich Sparrow (*Passerculus sandwichensis princeps*), classified as a species of *Special Concern* (COSEWIC 2003). The great majority of the world population of this species breeds on Sable Island.

The proponent's EA states that Alcids [e.g., Razorbills (*Alca torda*), Black Guillemot (*Cepphus grille*), Murres (e.g., *Uria lomvia*, *U. aalge*), dovekies (*Alle alle*)], Black-legged Kittiwakes (*Rissa tridactyla*) and Northern Fulmars (*Fulmarus glaciaris*) are common on the Sable Bank during the winter (JWEL 2002). Alcids are pelagic, typically staying offshore, except during the breeding season. However, some species such as Thick-billed Murres will forage inshore on small fishes and euphasids. Of the alcids, Dovekies and murres are the most abundant species near Sable Island because these Arctic breeding birds over-winter in the area. Although widely distributed in the North Atlantic, factors that affect populations of alcids, shearwaters and gulls include oil pollution, by-catch in fishing gear, disturbance at breeding colonies, and hunting.

Other avian species at risk in the Atlantic coastal region include Barrow's Goldeneye (*Bucephala islnadica*), the Harlequin Duck (*Histrionicus histrionicus*) and the Ivory Gull (*Pagophila eburnean*). However, it is believed that the probability of these species occurring in the project area is low, given that the Barrow's Goldeneye and Harlequin Duck are coastal species and the Ivory Gull only rarely occurs in the Nova Scotian offshore.

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<sup>2</sup> *Sensitive* species are given a yellow rating: "Species that are not believed to be at risk of immediate extirpation or extinction, but which may require special attention or protection to prevent them from becoming at risk".

**TABLE 6 MARINE BIRD SPECIES AT RISK AND SPECIES OF SPECIAL STATUS THAT MAY OCCUR IN THE STUDY AREA**

| <b>Marine Birds</b>   | <b>Status</b>  |
|---|--|
| Roseate Tern ( <i>Sterna dougallii</i> )                      | <i>Red listed</i> (NSDNR 2003); <i>Endangered</i> (COSEWIC 2003; SARA)   |
| Arctic Tern ( <i>Sterna paradisaea</i> )                      | <i>Yellow listed</i> (NSDNR 2003)  |
| Common Tern ( <i>Sterna hirundo</i> )                         | <i>Yellow listed</i> (NSDNR 2003)  |
| Ipswich Sparrow ( <i>Passerculus sandwichensis princeps</i> ) | <i>Yellow listed</i> (NSDNR 2003); <i>Special Concern</i> (COSEWIC 2003) |
| Ivory Gull ( <i>Pagophila eburnean</i> )                      | <i>Special Concern</i> (COSEWIC, SARA)                                   |
| Barrow's Goldeneye ( <i>Bucephala Islandica</i> )             | <i>Special Concern</i> (COSEWIC 2003; SARA)                              |
| Harlequin Duck ( <i>Histrionicus histrionicus</i> )           | <i>Special Concern</i> (COSEWIC 2003; SARA)                              |

## 8.6 SPECIAL AREAS

The proponent's EA report indicates that the only special area potentially affected by the Project is Sable Island, which is located 41 km from the project site. Sable Island is a federally protected area and a designated Migratory Bird Sanctuary. The island is 42 km in length and the only emergent part of Sable Island Bank. The main body of the Island is defined by two well-developed systems of sand dunes paralleling the north and south beaches. These dunes are the main barrier, preventing the ocean from inundating the low heath communities and freshwater ponds in the island's interior. Approximately 35 percent of Sable Island is covered by vegetation, while the remaining 65 percent is essentially unvegetated sand.

The island's unique sand/dune vegetation habitat supports flora and fauna, including numerous bird species, feral horses, and Harbour and Grey seals. Sable Island is virtually the only breeding ground of the rare Ipswich Sparrow (*Passerculus sandwichensis princeps*), which is listed as a species of Special Concern by COSEWIC (2003). The island is also periodically home to small breeding numbers of the *endangered* Roseate Tern (*Sterna dougallii*). The seven main plant communities include Sandwort, Marram-Forb, Marram-Sparse Grassland, Marram-Fescue, Shrub Heath, Cranberry Heath, and Pond Edge herbaceous plant communities. Six rare plant taxa have been recorded on Sable Island, and two plant species are endemic to and common on Sable Island.

## 8.7 COMMERCIAL FISHERIES

The proponent's EA states that the spatial boundary of the interaction with commercial fisheries primarily includes the exclusion area surrounding the project work site. It focuses on Canadian commercial fishing activities. There is no subsistence, recreational, or aboriginal fishery in the vicinity of the decommissioning sites. The assessment area for the fisheries VEC is defined as that part of the Scotian Shelf known as NAFO Unit Area 4Wf.

Landings of commercial species in NAFO Unit Area 4Wf for 1992 and 1999 to 2002 are summarized in Table 4.14 in the proponent's EA. The average monthly catch for species or species groups for NAFO Unit Area 4Wf, 1998-2002, is found in Table 4.15 of the EA. Based on these landings, the most significant

fisheries from 1999 to 2002 were for snow crab and sea scallop. Other species caught in significant quantities in 2002 were Cusk (which is now listed as *threatened* by COSEWIC 2003), Atlantic halibut, Skate and Northern shrimp.

Stocks of cod, haddock, White Hake, and Cusk remain at very low levels. From 1999 to 2002, very little groundfish was landed from Area 4Wf. Prospects for groundfish fishing on the eastern Scotian Shelf have not improved in recent years. The proportion of groundfish caught within the study area is likely to remain small. Fishing for groundfish in the last five years has concentrated primarily in the basins and along the Shelf edge.

Pelagic fish were landed in small quantities within NAFO Unit Area 4Wf from 1999 through 2002. The most substantial of these was a landing of 11.3 tonnes of Herring in 2001 and of 2.4 tonnes of Swordfish in 1999. Herring and Mackerel are the principle small pelagic species fished on and around Sable Island Bank. Herring are the only species fished near Sable Island Bank by larger vessels that report fishing locations. They are fished primarily in the spring. Concentrated areas of swordfish, tuna and shark fishing occur along the Shelf edge, the Scotian Slope and further offshore. These fisheries occur almost exclusively in waters deeper than 100m.

At this time, the principle invertebrate fishery on Sable Island Bank is for deep-sea scallop (see Table 4.14, Figure 4.4 and Appendix F of the proponent's EA). Scallops are fished mainly between June and October, although they may be harvested at any time of the year. Harvests of sea scallop were substantial within 4Wf in 1999 (840 tonnes) and 2000 (500 tonnes). The catch fell off considerably in 2001 (52 tonnes), but 2002 has seen some recovery (141 tonnes). There were substantial Snow Crab catches in 2000 and 2001 (1,060 tonnes and 1,180 tonnes respectively). These have decreased by about 40% in 2002. Other species, such as Jonah Crab, are fished along the edge of the Scotian Shelf to the south.

A joint industry/DFO survey undertaken in 2003 indicates a 1.4 million tonnes of quahaug biomass on Sable Island Bank, some of which is found within the project area. A biomass of 16-26 tonnes is estimated to exist within the approximately 42 square kilometer area of the anchoring restriction zone around the flow lines, mattresses and pipeline manifolds. Development of a commercial fishery for quahaug is anticipated based on research survey results. Clearwater Fine Foods Inc. holds an exploratory licence for quahaugs on Sable Island Bank and is constructing a new vessel for the harvest.

## **8.8 SPECIES AT RISK**

The *Species at Risk Act* (SARA) requires that the potential effects of decommissioning on species at risk be assessed. SARA protects listed species by prohibiting activities that may harm or kill individuals, damage or destroy their residence or their critical habitat. Relevant prohibitions that came into effect on June 1, 2004 are listed in Table 7

**TABLE 7 SARA PROHIBITIONS PROTECTING INDIVIDUALS, RESIDENCES AND CRITICAL HABITAT**

|  |
|--|
| 32(1): No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species.   |
| 33: No person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened species, or that is listed as an extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada.   |
| 58(1): Subject to this section, no person shall destroy any part of the critical habitat of any listed endangered species or of any listed threatened species -- or of any listed extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada -- if<br>(a) the critical habitat is on federal land, in the exclusive economic zone of Canada or on the continental shelf of Canada;<br>(b) the listed species is an aquatic species; or<br>(c) the listed species is a species of migratory birds protected by the <i>Migratory Birds Convention Act, 1994</i> . |

The prohibitions listed in Table 7 apply only to species listed as endangered or threatened in Schedule 1 of SARA, although a species may be designated at risk by COSEWIC and be found in Schedule 2 or 3 of SARA, the prohibitions do not apply until they become listed in Schedule 1.

SARA requires that the adverse effects of the project on the listed wildlife species and its critical habitat must be identified. If the project is carried out, measures must be taken to avoid or lessen those effects and to monitor them. The measures must be taken in a way that is consistent with any applicable recovery strategy and action plans. SARA does allow DFO to issue Incidental Harm Permits if the following conditions are met:

- Affecting the species is incidental to the activity being carried out,
- All reasonable alternatives to the activity that would reduce the impact to the species have been considered,
- All feasible measures to minimize the impact of the activity on the species, its residences or critical habitat have been taken,
- The activity must not jeopardize the survival or recovery of the species.

Species at risk were not considered as a stand alone VEC in the proponent's EA. However, each VEC included a summary of species of special status, which included those listed under SARA. An assessment of species at risk is included in Appendix 3 of EnCana's response to regulatory comments (July 26, 2004).

The table in Appendix 3 of EnCana's response document lists the species at risk that may occur in the study area, their status, the reason for designation and critical periods for that species. Seven species of marine fish, eight species of marine mammals, one species of sea turtle and four species of marine birds are included in the table. Table 8 lists the COSEWIC designations for Species at

Risk (SAR) that could potentially occur in the study area as well as their status under SARA.

There are two species of marine fish listed by COSEWIC as endangered that may be found within the project area, the Porbeagle Shark (*Lamna nasus*) and the Inner Bay of Fundy (IBOF) Salmon (*Salmo salar*). The Porbeagle Shark is not yet SARA-listed but could be included in Schedule 1 as early as March 2006.

The IBOF Salmon is anadromous, spawning in fresh water but spending much of its life at sea. It is currently SARA-listed. Although the species could occur in the area during the months of December to February, there is no indication that the project area is of any particular importance. A growing body of evidence suggests that the rapid decline in numbers of IBOF Salmon is due to low marine survival rather than an inability to spawn and live successfully in freshwater rivers and streams. Ecological changes in the Bay of Fundy may be at least partly responsible for the low marine survival rates.

Porbeagle Shark migrate north along the Scotian Shelf in early spring and south in late fall. Recent research indicates that Porbeagle Shark mate in the late summer or early fall off the Grand Banks, southern Newfoundland and the entrance to the Gulf of Saint Lawrence, and they give birth to live young in late winter to early spring. Late stage embryos have been observed on the Scotian Shelf and Gulf of Maine (Campana et al. 2003). The late maturity and low fecundity of this species render it particularly vulnerable to impacts. The project area is not known to be of critical importance to the Porbeagle Shark.

Spotted Wolffish (*Anarhichas minor*), Northern Wolffish (*Anarhichas denticulatus*) and Cusk (*Brosme brosme*) are listed as threatened by COSEWIC and listed on Schedule 1 of SARA (Cusk may be listed as early as March 2005).

Northern and Spotted Wolffish both grow and mature slowly. They spawn in the summer months, and eggs are laid in large masses on the ocean floor. Both species of wolffish are found more commonly in deeper water than is located in the project area, and there is no indication that the project area is of critical importance.

Cusk are a relatively slow-growing and late-maturing species. Spawning usually occurs in May to August on the Scotian Shelf. This fish seems to prefer water depths greater than 200 metres. There is no indication that the project area is of critical importance for this species.

The Atlantic Wolffish (*Anarhichas lupus*) and Maritimes population of Atlantic Cod (*Gadus morhua*) are designated as species of special concern by COSEWIC. The Atlantic Wolffish is listed in Schedule 1 of SARA and the Maritimes cod population could be SARA listed as early as October 2005. Although Atlantic Cod spawn throughout most of the year, there are spawning peaks in November and May/June. Adult cod concentrate on Sable Island Bank in summer. The Atlantic Wolffish is more commonly found in deeper waters than are located in the project area.

The Blue Whale (*Balaenoptera musculus*), the North Atlantic Right Whale (*Eubalaena glacialis*) and the Northern Bottlenose Whale (*Hyperoodon ampullatus*) are all listed as endangered by COSEWIC and could be found in the project area. All are being considered for listing under SARA.

Whaling reduced the original Blue Whale population and it is believed there are now fewer than 250 mature individuals off Atlantic Canada. Currently the biggest threats to this species are ship strikes, disturbance from whale watching activities, entanglement in fishing gear and pollution. Blue Whales are transitory in the project area.

The numbers of North Atlantic Right Whale were heavily reduced by whaling and it is estimated the total population currently numbers about 322 animals. Their numbers have decreased in the past decade due to a high mortality from ship strikes and fishing gear entanglements. The project area is not recognized as being of critical importance to this species.

The Scotian Shelf population of the Northern Bottlenose Whale is found primarily in the Gully and other underwater canyon features, though they have been observed on other parts of the Scotian Shelf. The Gully population is estimated to number 130 individuals and appears to be stable at present. The project area is not recognized as being of critical importance to this species.

Three marine mammals currently listed by COSEWIC as species of special concern and potentially found in the study area are the Fin Whale (*Balaenoptera physalus*), the Harbour Porpoise (*Phocoena phocoena*) and Sowerby's Beaked Whale (*Mesoplodon bidens*). The Fin Whale, occurs year-round on the Scotian Shelf, the Harbour Porpoise is a coastal species, and the Sowerby's Beaked Whale prefers deep offshore waters. Although these species could be found in the project area, it is not known to be of critical importance to them.

The Leatherback Sea Turtle (*Dermochelys coriacea*) is listed as endangered under Schedule 1 of SARA. They have been sighted on the Scotian Shelf from May to early October pursuing prey. The major threats to leatherback turtles in our waters include entanglement in fishing gear and other debris, and starvation due to consumption of plastics.

Endangered Roseate Terns (*Sterna dougallii*) breed on Sable Island from mid-May to mid-August in colonies of Arctic Terns (*Sterna paradisea*) and Common Terns (*Sterna hirundo*). Sable Island is also the major breeding location for the Ipswich Sparrow (*Passerculus sandwichensis princeps*), classified as a species of *Special Concern* (COSEWIC 2003). Other avian species at risk in the Atlantic coastal region include Barrow's Goldeneye (*Bucephala islandica*); Harlequin Duck (*Histrionicus histrionicus*) and the Ivory Gull (*Pagophila eburnea*). However, it is believed that the probability of these species occurring in the project area is low, given that the Barrow's Goldeneye and Harlequin Duck are coastal species and the Ivory Gull only rarely occurs in the Nova Scotian offshore.

**TABLE 8 SUMMARY OF SPECIES AT RISK AND SPECIES OF SPECIAL STATUS THAT MAY OCCUR IN THE STUDY AREA**

| <b>Species</b>  | <b>COSEWIC Status</b>       | <b>SARA Status</b>                                    |
|---|-----------------------------|---|
| <b>Marine Fish</b>  |                             |   |
| Maritimes population of Atlantic Cod ( <i>Gadus morhua</i> )  | <i>Special Concern</i> 2003 | <i>Schedule 3 – Special Concern</i>                   |
| Cusk ( <i>Brosme brosme</i> )                                 | <i>Threatened</i> 2003      |   |
| Porbeagle Shark ( <i>Lamna nasus</i> )                        | <i>Endangered</i> 2004      |   |
| Atlantic Salmon ( <i>Salmo salar</i> )                        | <i>Endangered</i> 2001      | <i>Schedule 1 listed as Endangered June 2003</i>      |
| Spotted Wolffish ( <i>Anarhichas minor</i> )                  | <i>Threatened</i> 2001      | <i>Schedule 1 listed as threatened June 2003</i>      |
| Northern Wolffish ( <i>Anarhichas denticulatus</i> )          | <i>Threatened</i> 2001      | <i>Schedule 1 listed as threatened June 2003</i>      |
| Atlantic Wolffish ( <i>Anarhichas lupus</i> )                 | <i>Special Concern</i> 2000 | <i>Schedule 1 listed as special concern June 2003</i> |
| <b>Cetaceans</b>  |                             |   |
| Blue Whale ( <i>Balaenoptera musculus</i> )                   | <i>Endangered</i> 2003      | <i>Schedule 3 – Endangered</i>                        |
| Fin Whale ( <i>Balaenoptera physalus</i> )                    | <i>Special Concern</i> 2003 | <i>Schedule 3 – Special Concern</i>                   |
| North Atlantic Right Whale ( <i>Eubalaena glacialis</i> )     | <i>Endangered</i> 2003      | <i>Schedule 2 – Endangered</i>                        |
| Harbour Porpoise ( <i>Phocoena phocoena</i> )                 | <i>Special Concern</i> 2003 | <i>Schedule 2 – Special Concern</i>                   |
| Northern Bottlenose Whale ( <i>Hyperoodon ampullatus</i> )    | <i>Endangered</i> 2003      | <i>Schedule 3 – Endangered</i>                        |
| Sowerby's Beaked Whale ( <i>Mesoplodon bidens</i> )           | <i>Special Concern</i> 1989 | <i>Schedule 3 – Special Concern</i>                   |
| <b>Marine Birds</b>   |                             |   |
| Roseate Tern ( <i>Sterna dougallii</i> )                      | <i>Endangered</i> 1999      | <i>Schedule 1 – Endangered</i>                        |
| Ipswich Sparrow ( <i>Passerculus sandwichensis princeps</i> ) | <i>Special Concern</i> 2000 | <i>Schedule 1 - Special Concern</i>                   |
| Barrow's Goldeneye ( <i>Bucephala islandica</i> )             | <i>Special Concern</i> 2000 | <i>Schedule 1 – Special Concern</i>                   |
| Harlequin Duck ( <i>Histrionicus histrionicus</i> )           | <i>Special Concern</i> 2001 | <i>Schedule 1 – Special Concern</i>                   |
| Ivory Gull ( <i>Pagophila eburnean</i> )                      | <i>Special Concern</i> 2001 | <i>Schedule 1 - Special Concern</i>                   |
| <b>Sea Turtles</b>  |                             |   |
| Leatherback Sea Turtle ( <i>Dermochelys coriacea</i> )        | <i>Endangered</i> 2001      | <i>Schedule 1 listed as Endangered June 2003</i>      |

## 9.0 IMPACT ANALYSIS

This section considers potential impacts and necessary mitigation and follow-up measures. It reflects a summary of the analysis conducted for each VEC by the proponent and the supplementary analysis conducted by the Responsible Authorities. The supplementary analysis is focused on considerations related to air quality, water quality, marine sediment quality, species at risk, malfunctions and accidental events,

effects of the environment on the project, human health, traditional use and materials management.

## 9.1 AIR QUALITY

### ENCANA'S ASSESSMENT

EnCana has stated that the principal sources of direct emissions will be power requirements of vessels.

### PUBLIC COMMENT

No public comments were received on air quality.

### VIEWS OF THE RAS

There are limited emissions sources and receptors in the project area. Major sources of emissions in the offshore include the Sable Offshore Energy Project, and vessel-related emissions. In addition, air quality may be affected by the long range transport of air pollution (e.g., ozone, particulate matter).

The following estimates of vessel power requirements have been employed for the purposes of the screening:

- mid-sized construction vessel - 7000 hp (assumed to be mostly in maneuvering mode)
- heavy lift barge -15,000 hp (assumed operating capacity 10%)
- anchor handling tugboat - 1500 hp (assumed to be mostly in maneuvering mode)
- transportation vessel - 12,000 hp (assumed to be mostly in maneuvering mode)

The United States Environmental Protection Agency (EPA) methods<sup>3</sup> were followed by Environment Canada in developing worst case emissions estimates for the project. For the purpose of the screening, it was assumed that all four vessels will be operating constantly for a maximum of 15 weeks. Although the probability of this level of vessel activity is low (i.e., four vessels operating constantly in the same place), it is appropriate to rely on this relatively crude but conservative estimate in conducting the impact assessment. Emissions estimates, based on these assumptions and methods are presented in Table 9.

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<sup>3</sup> *Analysis of Commercial Marine Vessels Emissions and Fuel Consumption Data*. EPA 420-R-00-002. February 2002.

**TABLE 9. EMISSIONS ASSOCIATED WITH A MAXIMUM LEVEL OF ACTIVITY**

| <b>Emission</b> | <b>Project Emissions (tonnes)</b> | <b>Daily Emissions (tonnes/day)</b> |
|-----------------|-----------------------------------|-------------------------------------|
| PM              | 14                                | 0.1                                 |
| NO <sub>x</sub> | 499                               | 5                                   |
| SO <sub>2</sub> | 58                                | 0.6                                 |
| VOC             | 31                                | 0.3                                 |
| CO <sub>2</sub> | 37,000                            | 350                                 |

For perspective, the daily emissions of the proposed project are expected to be less than emissions from vessels operating in Halifax Harbour or most large industrial emissions sources. Project emissions are expected to be similar to emissions from an institutional boiler (e.g., hospital, university). Based on previous experience and given the limited emission sources in the area, project emissions are not expected to cause an exceedance of applicable air quality standards or guidelines, such as the CEPA Ambient Air Quality Guidelines and the *Nova Scotia Air Quality Regulations*<sup>4</sup>.

Based on the impact analysis, the RAs are satisfied that project emissions are not likely to result in significant adverse environmental effects.

#### MITIGATION/FOLLOW-UP

Upon completion of project activities, the proponent shall verify project-associated emission estimates of PM, NO<sub>x</sub>, SO<sub>2</sub>, VOC CO<sub>2</sub> based on actual vessel operations and US EPA methods. This emission data will support an accounting of cumulative offshore emissions and contribute to a reasonable information base for future environmental assessments and continuous improvement initiatives.

## **9.2 WATER QUALITY**

#### ENCANA'S ASSESSMENT

Project-related discharges to the marine environment are considered in the proponent's EA in terms of predicted quantities and general characteristics, as well as applicable standards.

#### PUBLIC COMMENT

No public comments were received with respect to water quality.

#### VIEWS OF THE RAS

##### *Risers and Flowlines*

During the Phase I Decommissioning, EnCana removed a 0.46 meter oil column from the Panuke export flowline. The proponent states that other risers did not

<sup>4</sup> Note: While the receptors to air pollution are relatively limited in the offshore, these documents can provide guidance with respect to acceptable emissions limits.

have similar oil columns. The oil in water concentration was tested for flowlines and risers and determined to be less than 5 mg/L of oil in water in all cases. This concentration is within the standard for permitted oil in water content of 15 mg/L<sup>5</sup>. If additional oil is found during Phase II decommissioning, it will be removed by the proponent prior to releasing riser and flowline water to the marine environment.

During Phase I decommissioning, flowlines were filled with corrosion-inhibited seawater also referred to as a 'preservation fluid'. EnCana has proposed that this seawater be released to the environment as part of Phase II decommissioning. In response to EC concerns, EnCana provided additional information on the corrosion-inhibited seawater. The additional information confirms that the corrosion inhibitors in the flowlines are consistent with application of the CNSOPB's Offshore Chemical Selection Guidelines. The proposed release of seawater containing these inhibitors would also be consistent with international practices. The submitted information does not suggest that compliance with section 36 of the *Fisheries Act* (i.e., prohibition against the deposit of a deleterious substance) can not be achieved, and it appears unlikely that such a release would result in a significant adverse environmental effect.

The abandonment of project components on the seafloor for the Partial Removal Option will result in leaching of metals or other substances into the water. Leaching of metals from subsea anodes is expected to occur over an extended period of time, with no measurable effect on water quality.

#### *Naturally Occurring Radioactive Material*

The proponent's EA states that EnCana conducted a Naturally Occurring Radioactive Material (NORM) survey of the platform in August of 2003 and found no contamination. Potential NORM contaminated fluid in the flowlines is unlikely because NORM contaminated fluid would have had to flow through the platforms and these were found to be NORM-free.

#### *Spills*

The potential for accidental spills is primarily related to the operation of the heavy-lift barge, and support vessels. On-board the vessels and barge are small amounts of marine diesel fuel and lube oil that could be accidentally released. Mitigation to prevent spills and contingency plans that would be implemented in the event of a spill is discussed in further detail in Section 9.11, Malfunctions and Accidental Events.

Based on the impact analysis the RAs are satisfied that significant adverse environmental effects to water quality are not likely to result from the project activities taking in to account mitigation and follow-up identified in the proponent's EA and that identified by the RAs.

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<sup>5</sup> In accordance with *Oil Pollution Prevention Regulations of the Canada Shipping Act*

#### MITIGATION/FOLLOW-UP

EnCana shall remove any oil found in the top of risers or flowlines prior to releasing riser or flowline water into the marine environment.

Mitigation with respect to potential spill events is discussed in Section 9.11. Malfunctions and Accidental Events.

### **9.3 MARINE SEDIMENT QUALITY**

#### ENCANA'S ASSESSMENT

As noted in Section 8.1, although there is evidence of elevated contaminant concentrations the proponent has concluded that no biological impact is expected from current concentrations and that follow-up sediment monitoring would show a gradual reduction in surface sediment contaminant concentrations.

#### PUBLIC COMMENT

No public comments were received on marine sediment quality.

#### VIEWS OF THE RAS

The proponent did not identify potentially adverse impacts to sediment quality resulting from either Partial or Total Removal Options. It did identify disturbance of hydrocarbon contaminated sediments as a mitigation measure promoting biodegradation.

While the RAs agree with the conclusion that elevated sediment contaminant concentrations in the project area may not lead to biological impact, the excavation, airlifting, and jetting of seabed sediments are activities that will likely require authorization under the Disposal at Sea provisions of the Canadian Environmental Protection Act. Those provisions impose pollution prevention requirements on Disposal at Sea activities and allow material to be disposed of in the marine environment only after a characterization of the physical, chemical, and biological properties. Seabed sediments failing to meet chemical and biological testing requirements cannot normally be returned to the sea or disposed of elsewhere at sea.

The information provided by the proponent indicates that sediment to be disposed of at sea under the Partial Removal Option is unlikely to be contaminated. In this case, the available data will support an adequate sediment characterization and the RAs believe that the environmental assessment provides sufficient information to begin the Disposal at Sea permit application process.

For the Total Removal Option, based on available data, EC has concluded that most of the sediment to be disposed of at sea is unlikely to be contaminated and therefore not likely to cause significant adverse environmental effects. For the sediment lying in close proximity to the two platforms, EC has concluded that

contaminant concentrations are likely less than the relevant Disposal at Sea chemical screening criteria. However, due to a degree of uncertainty and regulatory requirements, that conclusion will need to be further evaluated in advance of a Disposal at Sea permit application. The evaluation will be based on EnCana providing additional sediment quality information and/or the results of a site sampling and analysis program.

#### MITIGATION/FOLLOW-UP

The excavation, airlifting, and jetting of seabed sediments are activities that will require authorization under Disposal at Sea provisions of the Canadian Environmental Protection Act. Should the Total Removal Option be selected, the proponent shall provide, if available, additional sediment quality information. If unavailable, or if the additional information is inadequate, the proponent shall design and implement a sampling and analysis program for sediments in close proximity to the two platforms. The plan shall be reviewed by EC in advance of implementation and the results shall be submitted as part of a Disposal at Permit application.

### **9.4 MARINE BENTHOS**

#### ENCANA'S ASSESSMENT

The proponent's EA states that the volume of re-suspended sediment at each of the platform sites may produce a thin veneer of sediment with a similar consistency to the sediment on the seafloor in areas previously impacted by the platforms. The displaced sediment will be left to infill the voids created by the removal of jacket and skirt piles. The re-suspended sediments are not likely to be contaminated and are of insufficient quantity to adversely affect benthos. The benthic environment at the site is comprised of common invertebrate species with low density and abundance, and bottom areas that receive re-suspended sediments will recolonize rapidly over time. Residual environmental effects associated with an accidental spill are not likely to be significant as slicks will disperse and evaporate rapidly.

The proponent's EA states that the removal of all subsea structures would result in a reduction of biodiversity in immediate areas, including the direct loss of colonizing animals and loss or redistribution of those non-sessile organisms that rely upon the mattress community. Eventually the benthic environment would recover and return to its pre-Project state. The residual environmental effects of total removal are predicted to be greater than partial decommissioning; however, they are not likely to be significant at the population level.

Due to the reversibility, limited duration, low magnitude, and localized geographic extent of the potential environmental effects associated with decommissioning activities, the residual environmental effects are considered not likely to be significant for marine benthos.

## PUBLIC COMMENT

Public comments were provided on the quahaug fishery (see Section 9.9, Commercial Fisheries).

## VIEWS OF THE RAS

The Sable Island Bank is characterized by sandy sediments that have a high level of natural disturbance. The benthic community is expected to recover from the disturbance associated with the full removal of subsea structures. The size and dimensions of structures to be removed is such that they are expected to become alternately covered and uncovered over time. The long-term habitat value of these structures is likely to be low under these conditions.

Disturbance of the benthic community may cause a HADD which would require an authorization under section 35(2) of the *Fisheries Act*. The benthic community is expected to recover from the disturbance and it is unlikely to result in significant adverse effects.

The abandonment of project components on the seafloor for the Partial Removal Option could result in leaching of metals or other substances into the water. The materials to be left in situ are considered to be fairly inert, and are not expected to lead to significant levels of contamination during decomposition.

Heavy lift vessels may be mobilized from either Europe or the Gulf of Mexico. The ballasting and de-ballasting of ships can introduce harmful aquatic organisms and pathogens to marine ecosystems. This has the potential to negatively impact marine benthos in the area. It can also contribute to the introduction of other types of ship-source contaminants. The primary method used to reduce the risk of invasive species introductions is the open ocean exchange of ballast water (i.e., at depths greater than 200 metres).

The RA views on the potential impacts to the quahaug fishery are addressed under Section 9.9, Commercial Fisheries.

The RAs have determined that both removal options are not likely to cause significant adverse effects on marine benthos provided that the mitigation and follow-up measures proposed by the proponent, as well as those recommended by the RAs, are implemented.

## MITIGATION/FOLLOW-UP

All vessels used in the removal that have been mobilized from foreign waters shall be required to follow the Transport Canada Guidelines for Ballast Water Exchange in Canadian Waters. Transport Canada is now proceeding with *Ballast Water Regulations*, finalization and enactment anticipated during 2004/05. Upon enactment, vessels shall be required to adhere to the ballast water regulations.

Harmful Alteration Disruption or Destruction (HADD) of fish habitat may result from the *Total Removal Option*, as the removal of subsea structures may result in the loss of the artificial reef community. Should a HADD authorization be

required, EnCana shall submit to DFO a compensation plan that adequately satisfies the requirements of the “No Net Loss” principle of DFO’s Policy for the Management of Fish Habitat.

## 9.5 MARINE FISH

### ENCANA’S ASSESSMENT

According to the proponent’s EA, there are 256 different species of marine fish that might be present within the study area. Summaries of preferred habitat and spawning activities for some of these species are provided in Appendix D of the EA. The proponent’s EA indicates that the fish species present in the project area are ubiquitous to the entire Scotian Shelf. No areas within the project area are recognized as being of critical value for spawning activities.

Although the release of residual water from export flowlines could potentially affect marine fish, the proponent’s EA states that any chemicals that may be discharged from the flowlines were approved for discharge and ranked within the less hazardous CNSOPB *Offshore Chemical Selection Guidelines* (OCSG) to pose little or no risk.

The health of fish, eggs and larvae could be affected by accidental spills. However, EnCana states that the likelihood of an accidental spill would be low because vessels involved in the project will be complying with IMO Standards and Standard Vessel Operation Procedures.

The abandonment of project components on the seafloor for the Partial Removal Option could result in leaching of metals or other substances into the water. The proponent’s EA states that leaching of metals from subsea anodes is expected to be localized and in trace concentrations.

The proponent’s EA states that sediment disturbance, which could result from a number of project activities, is expected to be short-term and localized, and any plumes generated would likely deposit a thin veneer of sandy sediment within a small area. Sediment disturbance for the *Total Removal Option* would occur over a larger area than for the *Partial Removal Option*,

The total removal option could result in a loss of habitat as any artificial reef community established on Subsea components would be removed. The proponent’s EA predicts that this will not have a significant influence on marine fish.

Due to the reversibility and limited duration, magnitude, and geographic extent of the potential adverse environmental effects associated with decommissioning activities for either removal option, the proponent’s EA predicts that the residual environmental effects are not likely to be significant for marine fish at a population level.

## PUBLIC COMMENT

No public comments were received concerning marine fish (excluding those comments received on the fisheries in particular; see Section 9.9, Commercial Fisheries).

## VIEWS OF THE RAS

Potential impacts on marine fish from project activities can result from a change in water quality, sediment disturbance and loss of habitat. Noise levels associated with project activities are not expected to result in significant harm to fish.

As discussed in Section 9.2, water quality issues include the release of residual water from the export flowlines; leaching of metals or other substances over time from abandoned components, spills from the barge or support vessels or from vessels colliding. Corrosion inhibitors in the flowlines are consistent with application of the *CNSOPB's Offshore Chemical Selection Guidelines* and with international practices. Leaching of metals from subsea anodes is expected to be localized and in trace concentrations. If mitigation proposed by the proponent is followed, the likelihood of an accidental spill should be low, and would be responded to quickly. Impacts on fish resulting from changes in water quality are predicted to be short-term and localized.

Sediment in the water can abrade fish membranes and decrease visibility affecting fish that feed by sight. As it settles it can smother benthic eggs and larvae. The Sable Island Bank is characterized by sandy sediments with high levels of natural disturbance, and because effects are predicted to be short-term and localized, marine fish populations would be expected to recover quickly from any disturbance. The RAs agree that that sediment disturbance would be greater for the *Total Removal Option*, but it is still not expected to have significant effects for marine fish.

The 2000 and 2001 surveys show colonization of the exposed mattresses by a variety of benthic organisms and associated fish. The burial process has continued since then as evidenced by the results of the September 2004 survey. Up to date information on the degree of colonization is required to assess the potential loss to marine fish. Disturbance of the benthic community and the resulting loss to marine fish may cause a HADD which would require an authorization under section 35(2) of the *Fisheries Act*. The benthic community is expected to recover from the disturbance and it is unlikely to result in significant adverse effects.

The RAs have determined that both removal options are not likely to cause significant adverse effects to marine fish provided that the mitigation and follow-up measures proposed by the proponent are implemented.

## MITIGATION/FOLLOW-UP

No specific mitigation required in addition to commitments made by the proponent.

## 9.6 MARINE MAMMALS

### ENCANA'S ASSESSMENT

The proponent's EA states that the Project area does not occur within critical marine mammal habitat.

The proponent's EA states that the likelihood of vessels colliding and resulting in a large spill of diesel fuel is low as they will comply with IMO standards and Standard Vessel Operating Procedures. These standards will also minimize the potential of small accidental spills of hydrocarbons. The proponent will have in place a spill response plan which contains detailed measures for preparing for and responding to spills, including the use of equipment, training of personnel, lines of communication and organizational requirement.

Reported ship collisions with whales are infrequent (Laist et al. 2000). According to the proponent's EA, the volume of traffic due to the Project is expected to be a small percentage of total vessel traffic in the area. The proponent has committed to having an environmental observer on board to monitor interactions with marine mammals. The monitoring information collected will be provided to the CNSOPB, DFO and EC and will contribute to existing data on marine mammal distribution and their behavioural responses to oil and gas activities.

The proponent's EA states that potential noises associated with project activities are anticipated to be much lower than seismic sounds and will likely be attenuated to ambient levels within the exclusion zone. Since noise associated with project activities such as cutting, airlifting or jetting work will be intermittent and short in duration, communication masking is not considered to be significant. The document also states that marine mammals will tend to avoid an area of excessive noise.

The proponent's EA states that leaching of metals from subsea anodes into water is expected to be very localized in trace concentrations.

Under these conditions, the proponent's EA predicts that residual adverse environmental effects on marine mammals are not likely to be significant.

### PUBLIC COMMENT

No public comments were received concerning marine mammals.

### VIEWS OF THE RAS

Sable Bank is an important foraging area for seals and other marine mammals. While the project area does not overlap with any marine mammal conservation areas [e.g. right whale sanctuaries or the Gully Marine Protected Area(MPA)], marine mammals are expected to be present.

Potential impacts from project activities on marine mammals include oiling from spills, vessel collisions, and disturbance from noise and other waste emissions.

Compliance with IMO standards and Standard Vessel Operating Procedures is an important component in the prevention of spills; however, a contingency plan should outline measures that will be used to handle marine mammals impacted by a spill, should it occur.

While the proponent has committed to having an environmental observer on board to monitor interactions with marine mammals, no protocol has yet been developed to describe steps that would be taken if interaction with marine mammals were to occur. Of particular concern is any interaction with SAR marine mammals (see Section 9.8).

While the noise related to decommissioning activities may be attenuated to background levels within the project's exclusion zone, there are no measures to protect marine mammals that may be within the exclusion zone, i.e. the exclusion zone relates to other human activities and does not represent an exclusion zone for marine mammals. It should be recognized that marine mammals may be present when activities commence. Measures to ensure marine mammals are not exposed to harmful impacts within the exclusion zone should be considered.

The RAs agree that changes to water quality as a result of decommissioning activities are unlikely to have a significant impact on marine mammals.

Views of the RAs on potential for interaction with marine mammal species at risk are included in section 9.10.

The RAs have determined that both removal options are not likely to cause significant adverse environmental effects to marine mammals provided that the mitigation and follow-up measures proposed by the proponent, as well as those recommended by DFO, are implemented.

#### MITIGATION/FOLLOW-UP

EnCana has committed to having an environmental observer to monitor any interaction with marine mammals, marine birds and species at risk. Reports shall be submitted to the CNSOPB for review by the RAs.

In addition, EnCana shall prepare and submit a protocol to the CNSOPB for review by the RAs, prior to the onset of project activities, which outlines the steps to be taken should interaction occur with marine mammal or turtle species at risk.

EnCana shall prepare and submit to the CNSOPB for review by the RAs, a plan that describes measures that will be taken to protect marine mammals (and other environmental components) in the event of a spill.

## **9.7 MARINE BIRDS**

### ENCANA'S ASSESSMENT

The proponent lists (1) the effects of noise from short-term, localized sources, (2) collisions with vessels and (3) pollution from potential accidental spills as the main issues related to marine birds. According to its EA, riser water containing

residual hydrocarbons will be released, but the oil-in-water content in risers is less than 5 ppm and below standards for permitted oil in water content<sup>6</sup>. The proponent recognizes that oiling could occur in the unlikely event of an accidental spill, however, precautionary measures will be taken to prevent these from occurring.

While the proponent's EA states that the *Total Removal Option* presents a higher potential for impacts due to the longer duration of decommissioning activities, it concludes that neither project option is likely to result in significant adverse effects. This is based on the short duration of project activities, the low frequency of potential effects, the localized geographical extent of effects in comparison to overall distribution patterns, and the low magnitude of effects.

#### PUBLIC COMMENT

No public comments were received concerning marine birds

#### VIEWS OF THE RAS

Potential impacts from project activities include oiling from spills, disturbance or displacement from noise and by vessels or helicopters, and attraction to the project area by lights or discharge of food waste. The impacts of oiling can be considered with respect to murres because this species is common in the project area, susceptible to oiling, and faced by existing cumulative stresses. In its comments dated 5 July 2004, EC recommended that a protocol be developed to protect birds in the case of spills. This protocol should consider:

- equipment that would be available to contain spills and maximum response time;
- measures that would be taken in the case that birds were affected by a spill (e.g., would birds be scared away?); and
- measures that would be taken in the case that birds were oiled (e.g., would the operators do nothing, capture and kills the birds, clean the birds?).

The attraction of birds to Project activities may result from lighting or the discharge of food waste from vessels. Night-flying seabirds, such as storm-petrels, are most at risk of attraction to light, particularly during the summer months. In the winter months, Dovekies may be attracted to lights under certain environmental conditions. Many species of land birds undertaking an over-sea migration are known to be attracted to lights. This attraction could lead to collisions with project vessels, predation by other species (e.g., gulls) and use of energy reserves. In its letter dated 5 July 2004, EC recommended that the proponent follow the Williams and Chardine protocol entitled "The Leach's Storm Petrel: General Information and Handling Instructions" in the case that birds become stranded on project vessels. Although the proponent indicated in its responses dated 26 July 2004 that it believes that this protocol is more relevant for permanent fixed platforms, EC maintains that it is important to adhere to the protocol.

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<sup>6</sup> In accordance with *Oil Pollution Prevention Regulations of the Canada Shipping Act*

Migratory birds on and around Sable Island (e.g., Roseate Tern, Ipswich Sparrow) could be disturbed by vessel and helicopter activity associated with the undertaking. However, the proponent's EA and Code of Practice state that it will not come within 2 km of the island except for the purposes of safety. In addition, the proponent has committed to monitoring seabirds, including species at risk. EC recommends that vessels/helicopters remain as far as possible from Sable Island.

While the proponent's EA predicts that impacts to marine birds associated with both project options are not significant, it states that the *Total Removal Option* presents a higher potential for impacts due to the longer duration of decommissioning activities. It is noted, however, that if the *Partial Removal Option* requires the monitoring of abandoned equipment, and it will result in a longer duration of project activities.

Based on the impact analysis, the RAs are satisfied that significant adverse environmental effects on marine birds are unlikely to result from project activities taking into account mitigation measures and follow-up as identified by the proponent and RAs.

Additional consideration of the potential for impacts to avian species at risk is included in Section 9.11: Species at Risk.

#### MITIGATION/FOLLOW-UP

EnCana shall prepare and submit to the CNSOPB, for review by the RAs, a plan that describes measures that will be taken to protect environmental components (e.g. birds, Sable Island, and whales) in the event of a spill. All vessels working on the Project shall have a spill response kit onboard with sufficient capacity to deal with small spills.

Should storm-petrels or other species become stranded on vessels, the proponent is expected to adhere to the protocol described in Williams and Chardine's brochure entitled, "The Leach's Storm Petrel: General Information and Handling Instructions". A permit is required from the Canadian Wildlife Service of EC to implement this protocol. In the interest of insuring compliance with the *Migratory Birds Convention Act*, it is important that this permit be obtained prior to the beginning of decommissioning activities.

The proponent has committed to monitoring seabird species at risk. The results of seabird observations shall be provided to the CNSOPB for review by the RAs. EnCana will be required to follow its Code of Practice for Sable Island. If vessels or helicopters approach within two km of Sable Island, the circumstances under which this occurred shall be reported to the CNSOPB.

## **9.8 SPECIAL AREAS**

### ENCANA'S ASSESSMENT

The proponent commits to following its Code of Practice for Sable Island and thus not coming within two kilometers of Sable Island under normal operating conditions. The proponent's EA states potential impacts of the project to Sable Island include disturbance from an emergency helicopter landing on the Island and effects to intertidal habitat and vegetation as a result of an accidental spill. However, it also maintains that the potential for an emergency landing on the island is unlikely given routine maintenance and preventative measures. In the unlikely event of a spill, the proponent indicates that the affected area would be localized and spills are not predicted to reach Sable Island even if winds are blowing toward the island.

### PUBLIC COMMENT

No public comments were received concerning Sable Island.

### VIEWS OF THE RAS

Based on the information provided in the EA, the RAs are satisfied that both decommissioning options are not likely to result in significant adverse effects to Sable Island, providing adherence to mitigation proposed by the proponent as well as that described below. The potential for impacts to the Island is minimized given the distance between the project site and Sable Island (i.e. 41 km). In minimizing the potential for interactions with the transiting vessels/helicopters, it is recommended that these remain as far as possible from the island

### MITIGATION/FOLLOW-UP

EnCana will be required to follow its Code of Practice for Sable Island. If vessels or helicopters approach within two km of Sable Island, the circumstances under which this occurred should be reported to the CNSOPB.

EnCana shall also prepare and submit to the CNSOPB, for review by the RAs, a plan that describes measures that will be taken to protect environmental components (e.g. birds, Sable Island, and whales) in the event of a spill. All vessels working on the Project shall have a spill response kit onboard with sufficient capacity to deal with small spills.

## **9.9 COMMERCIAL FISHERIES**

### ENCANA'S ASSESSMENT

The proponent's EA states that an exclusion zone already in place around the Cohasset and Panuke facilities will minimize effects on commercial fisheries during the planned decommissioning activities. They have committed to ongoing communications with fishery groups, and to notify any fishing groups operating in the area prior to commencement of decommissioning activities.

As discussed in Section 9.6, Marine Fish, the likelihood of an accidental release of hydrocarbons is very low and the proponent's EA states that its impact on fish, and thus the fisheries, would not be significant.

Under the *Partial Removal Option*, some infrastructure would remain on the sea floor. According to the proponent's EA, structures presenting a snagging hazard (PLEM topsides) will be removed. The remaining components are mainly covered with sand, and are held in place by concrete mattresses at various locations thus minimizing the potential of damage to fishing gear.

EnCana has committed to:

- cutting pilings to >2m below the seafloor and well conductors to >4 m below the seafloor
- removing PLEMs or PLEM topsides to prevent snagging hazards
- submitting locations of infrastructure left on the seafloor and/or removed to update hydrographic charts

In EnCana's response to regulatory comments (July 26, 2004) the proponent acknowledges that there is a high potential for clam dredges to become damaged or lost if dragged in areas where flowlines and associated mattresses have been abandoned. It further states that the Cohasset and Panuke exclusion zone is only a small portion of the area available for clam harvesting and the area could serve as a refugia or de facto conservation zone if avoided by harvesters. The proponent proposes that if interaction with fishing gear were to occur, it will adhere to the CNSOPB *Compensation Guidelines Respecting Damages Related to Offshore Petroleum Activity* (March 2002) to address claims for damage.

The proponent's EA states that there are not likely to be any significant adverse effects to commercial fisheries from either removal option.

#### PUBLIC COMMENT

EnCana's consultations with stakeholders identified a number of concerns including the following: snagging potential of abandoned subsea components, ability to safely operate a clam dredge in the vicinity of the abandoned components, potential interaction with fishing vessels during decommissioning, loss of access to fishing grounds, and the potential for contamination of fish as a result of chemical leaching from abandoned flowlines.

Written public comment expressed concerns that the ocean bottom would not be returned to its pre-project state and that if project materials were left behind, it could lead to an impediment to fisheries in general. Of particular interest was the significant quahaug resource which was recently delineated on Sable Bank and which is moving towards commercialization. The primary concern is that this resource will remain inaccessible unless the structures on the seafloor are removed.

The RAs acknowledge these comments and the CNSOPB will take them into consideration, in consultation with DFO, in the Development Plan decision.

## VIEWS OF THE RAS

Potential impacts from the *Partial Removal Option* include snagging hazards for commercial fisheries gear, interference with fishing vessels and interruption of fishing activity during project activities, and possible loss of fishing grounds. Potential impacts from the *Total Removal Option* would include interference with fishing vessels and interruption of fishing activity during project activities.

The proponent bases much of its analysis for the *Partial Removal Option* on claims that the flowlines will be self-burying and that although they may become unburied during punctual events such as severe storms, they are expected to bury again after such events. The results of the September 2004 subsea survey inspection indicate that the self burial process predicted in their earlier submissions is now essentially complete. Since uncertainty remains as to the rate at which covering and uncovering of the subsea equipment occurs and the effect of severe storms on the process, a monitoring and reporting program will be necessary. Compensation for any damage to fishing gear will also be required.

The RAs agree that interference with fishing vessels and interruption of fishing activity during will be minimized by EnCana's commitment to ongoing communication with fisheries groups.

The RAs acknowledge that the *Partial Removal Option* has the potential to negatively impact any potential quahaug fishery in the Project area. There are an estimated 16 to 26 tonnes within the approximately 42km square of anchoring restriction zone. However, this biomass is a small portion of the estimated 1.4 million metric tonnes of quahaug resource available on the Sable Island Bank.

The RAs agree that both removal options are not likely to have significant adverse environmental effects on commercial fisheries provided that the mitigation and follow-up measures proposed by the proponent, as well as those provided below, are implemented.

## MITIGATION/FOLLOW-UP

If the *Partial Removal Option* is chosen, EnCana shall prepare and submit a monitoring program, including the appropriate mitigation, to the CNSOPB for review by the RAs to monitor the state of burial of equipment following decommissioning.

If interference with fishing equipment occurs, EnCana shall adhere to the CNSOPB *Compensation Guidelines Respecting Damages Related to Offshore Petroleum Activity* (March 2002).

## **9.10 SPECIES AT RISK**

### ENCANA'S ASSESSMENT

Although SAR were not considered a stand-alone VEC in the proponent's EA, each VEC (fish, marine mammals and birds) included a summary of species of

special status. In EnCana's response to regulatory comments (July 26, 2004) it states that the assessment for a SARA-listed VEC would be similar to a non-listed VEC in terms of potential issues and concerns, available literature on effects of project activities and the geographical extent and magnitude of the effects. Each SARA species has been described further in Appendix 3 of that document.

Sea turtles were not identified as a VEC in the proponent's EA, but have been included in Appendix 3 of EnCana's response to regulatory comments (July 26, 2004).

In EnCana's response to regulatory comments (July 26, 2004), it states that no harm to listed species or their critical habitat is anticipated to occur as a result of the project at any time of the year. It also states all available information regarding species at risk will be reviewed prior to commencing the Project to ensure that the effects predication and recommended mitigation and monitoring are still appropriate and effective. A qualified environmental observer will be present during the field program to monitor marine mammal, bird and turtle species at risk. Monitoring information will be provided to the CNSOPB, DFO and EC, and will contribute to existing data on the distribution of these species, as well as their behavioral responses to oil and gas activities.

#### PUBLIC COMMENT

No public comments were received concerning species at risk

#### VIEWS OF THE RAS

The potential impacts from project activities could be the same for COSEWIC-listed species as for those that are not listed; however, the threshold at which an effect is considered significant could be much lower. For example, an impact on one individual of a species at risk, especially if that species is listed as endangered, may be considered a significant effect if it jeopardizes the species' survival or recovery

Potential impacts on SAR from project activities may result from changes in water quality, sediment disturbance, noise emissions, loss of habitat and accidental events, including collisions and spills.

Potential project effects on marine fish SAR include disturbance from noise, changes in water quality, sedimentation and loss of habitat. Of particular concern would be any impacts on the reproductive success of these species. Atlantic Cod and Cusk may spawn in the study area. Porbeagle Shark give birth to live young in late winter or spring and may be present in the study area at this time; however, the exact timing and location of birthing is not known. Location of wolffish (Atlantic, Northern and Spotted) spawning is also uncertain; these species are typically found in waters deeper than those of the project area. IBOF salmon do not spawn in the marine environment. Given the limited duration, magnitude and geographic extent of proposed activities, project effects are not expected to be significant for current fish species at risk. However, since the

project may not occur for several years, it will be important to reassess the potential impacts of the project and mitigation at that time.

Potential project effects on marine mammal and turtle SAR include noise disturbance and accidental events such as spills and collisions. There is a potential for endangered SARA species such as the Blue Whale, North Atlantic Right Whale, Northern Bottlenose Whale and Leatherback Turtle to be in the project area when activities commence. Measures to ensure these animals are not exposed to harmful impacts within the exclusion zone should be developed.

The potential for a ship to collide with a species at risk is low and the proponent has committed to an observer monitoring program; however, it is not clear what steps would be taken if a collision with a marine mammal or turtle SAR were to occur. The likelihood of an accidental spill of hydrocarbons is also expected to be low because vessels will comply with standard operating procedures designed to minimize such events. The proponent's spill response plan will contain detailed measures for preparing for and responding to spills, including the use of equipment, training of personnel, lines of communication and organizational requirement. Although it is predicted that any spill would be localized and would dissipate rapidly, the proponent should develop a spill response protocol to deal with marine mammals and turtles affected by a spill, if it were to occur.

Given the distance of the proposed project from Sable Island (i.e., 41 km), it is unlikely that project activities will result in impacts to avian species at risk which may occur on the Island (e.g., Ipswich Sparrow, Roseate Tern). Similarly, it is unlikely that coastal species at risk will be impacted by decommissioning activities, given the offshore location of the project. Nonetheless, it is important that the proponent adhere to mitigation outlined in Section 9.7: Marine Birds. In addition, the proponent should monitor marine birds, including species at risk, during decommissioning activities as proposed and review updated recovery strategies and action plans prior to the onset of project activities.

According to the proponent, the *Total Removal Option* presents a higher potential for impact due to the longer duration of decommissioning activities. It should be noted, however, that the *Partial Removal Option* requires the monitoring of abandoned equipment and will result in a longer duration of project activities.

The project has the potential to interact with species at risk, however, with appropriate mitigation the RAs have determined that both removal options are not likely to cause significant adverse environmental effects.

#### MITIGATION/FOLLOW-UP

EnCana has committed to having an environmental observer to monitor any interaction with marine mammals, marine birds and species at risk. Reports shall be submitted to the CNSOPB, for review by the RAs.

EnCana shall, prior to the onset of project activities, prepare and submit a protocol to the CNSOPB, for review by the RAs, which outlines the steps to be taken should any harmful interaction occur with marine mammal or turtle species at risk.

EnCana shall prepare and submit to the CNSOPB, for review by the RAs, a plan that describes measures that will be taken to protect environmental components in the event of a spill.

It is possible that new species at risk may be listed over the duration of the Project or recovery strategies or action plans may come into effect. Therefore, EnCana shall submit an updated review of species at risk information and any changes to its mitigation to the CNSOPB, for review by the RAs, once the timing of the project is better known. At that time, EnCana shall reassess proposed mitigation and submit a plan, approved by the RAs, to protect species at risk.

## **9.11 MALFUNCTIONS AND ACCIDENTAL EVENTS**

### ENCANA'S ASSESSMENT

The proponent's EA indicates that there are several unplanned situations that might be encountered during decommissioning, including small spills, collisions and extreme weather conditions. The potential for accidental spills is primarily related to the operation of the heavy-lift barge, and support vessels, which will have on board small amounts of marine diesel fuel and lube oil that could be spilled.

The proponent's EA indicates that it will ensure that policies, plans, and procedures are in place to prevent malfunctions and accidents. Diesel spills of any magnitude are highly unlikely during the Project. In the case that spills do occur, the proponent indicates that modeling has demonstrated that spills would disperse prior to reaching Sable Island, even if winds blow directly toward the island. The proponent's EA states that vessel collisions are also highly unlikely due to standard vessel operating procedures and protocols. In the event of a collision, EnCana's Alert Emergency Response Contingency Plan and Nova Scotia Spill Response Plan will be followed and spills will be reported to the CNSOPB and Canadian Coast Guard Emergency Response.

While the proponent's EA states that decommissioning activities will be carefully planned to ensure that they coincide with appropriate weather conditions, it also states that extreme weather conditions will require appropriate action.

### PUBLIC COMMENTS

No public comments were received concerning accidents or malfunctions.

### VIEWS OF THE RAS

The proponent is reminded that pollution prevention measures are important in ensuring that malfunctions and accidental events are minimized. As such, additional effort should be taken in developing these measures as part of emergency response plans. In addition, it should be clarified that natural dispersion is not necessarily an appropriate solution for managing spills, should they occur.

Providing the mitigation/follow-up proposed by the proponent and described below is implemented, the RAs agree that spills are not likely to have significant adverse environmental effects.

#### MITIGATION/FOLLOW-UP

EnCana's spill response plan shall describe measures that will be taken to protect environmental resources in event of a spill, as outlined in Section 9.6, Marine Mammals; Section 9.7 Marine Birds; and Section 9.8 Special Areas. Should spills or collision occur, EnCana is expected to adhere to its Alert Emergency Response Contingency Plan and Nova Scotia Spill Response Plan. All vessels working on the Project shall have a spill response kit onboard with sufficient capacity to deal with small spills. EnCana should adhere to the reporting strategy outlined in the EA.

### **9.12 EFFECTS OF THE ENVIRONMENT ON THE PROJECT**

#### ENCANA'S ASSESSMENT

The proponent's EA states that EnCana and its contractors have gained a good understanding of weather conditions at the project site. As the proposed work programs are short-term (*i.e.*, maximum of 15 weeks), appropriate weather windows will be identified.

Project activities will require the use of divers and a heavy-lift barge. The proponent's EA states that these types of operations will not be conducted under extreme weather conditions.

#### PUBLIC COMMENTS

No public comments were received concerning the effects of the physical environment on the Project.

#### VIEWS OF THE RAS

Extreme winds and waves, thunderstorms and fog can occur at any time of year, while ice accretion and even sea ice can occur in season at the project site. In addition to creating a safety risk, these conditions can lead to accidents or spills which can cause environmental damage. It is therefore important that sensitive activities not take place during extreme weather conditions. Forecasts should be monitored throughout the operation to allow sufficient time to suspend activities should the need arise.

It is predicted that with appropriate planning, monitoring, training, and experience, extreme weather conditions and superstructure icing are not likely to have a significant effect on the proposed project or create high risk to human health and safety or the environment.

#### MITIGATION/FOLLOW-UP

EnCana shall monitor weather forecasts throughout operations to allow sufficient time to suspend activities should weather conditions dictate.

### **9.13 HUMAN HEALTH**

#### ENCANA'S ASSESSMENT

The proponent described health and safety protection procedures as a component of the project in its EA. It did not select human health as a valued ecosystem component.

#### PUBLIC COMMENT

No public comments were received concerning human health.

#### VIEWS OF THE RAS

Due to the location and nature of the project the potential for project related changes to the environment resulting in effects on human health is minimal. The RAs agree with the proponent's decision not to identify human health as a valued ecosystem component. It is noted that occupational health and safety matters concerning workers will be addressed separately by the CNSOPB.

#### MITIGATION/FOLLOW-UP

No mitigation or follow-up is required from an environmental perspective.

### **9.14 USE OF RESOURCES BY ABORIGINAL PERSONS**

#### ENCANA'S ASSESSMENT

The proponent's EA report states that there are no subsistence or First Nation fisheries in the vicinity of the decommissioning sites. In its analysis of potential post-project effects on commercial fisheries, the EA report recognizes Aboriginal fishing effort and includes Aboriginal fishing effort in its data evaluation. That evaluation led to the conclusion that there are not likely to be any significant adverse effects to commercial fisheries (See Section 9.9).

#### ABORIGINAL COMMENT

The Netuklimkewe'l Commission provided written comments to the CNSOPB on the proponent's EA document. The commission identifies what it believes to be a fundamental issue and concern; consistency with international decommissioning practices, and with decommissioning and abandonment plans for offshore developments in the Atlantic Region. It also poses a number of questions concluding with "Are we considering the future and our living environment?" It did not directly address use of resources by aboriginals.

## VIEWS OF THE RAS

The RAs accept the findings of the EA report on current use of resources by Aboriginal persons. With respect to post-project effects on commercial fisheries, the RAs have determined that both removal options are not likely to have significant adverse environmental effects on commercial fisheries, post-project included, provided that the mitigation and follow-up measures proposed by the proponent and RAs are implemented.

Section 7.0 addresses decommissioning and international guidelines and standards.

## MITIGATION/FOLLOW-UP

No mitigation or follow-up measures are required outside of those already identified for commercial fisheries

### **9.15 MATERIALS MANAGEMENT**

#### ENCANA'S ASSESSMENT

The proponent has determined that platform materials consist primarily of steel and marine growth. The recovered steel is expected to be recyclable and the marine growth is to be disposed of on shore. Subsea mattresses consist primarily of concrete. The proponent states that potential means of mattress re-use (e.g., harbour walls, coastal structure, road surfaces) will be investigated once a contractor has been selected. The proponent's EA states that subsea flowlines and the cable have passed their design life. In addition, some flowlines are already damaged and there is a high probability of additional damage during recovery. Recycling the flowlines is not practical because it would require a dissection of the various layers and extruded thermoplastic layers have melted into other layers. The proponent concludes that flowlines would likely require disposal in an onshore landfill. The recovery of anodes on flowlines would require them to be located and unburied. PLEMs are constructed primarily of steel and are likely recyclable.

The proponent indicates that a detailed assessment of materials management will be conducted once a contractor has been selected at which time a waste management plan will be developed for all recovered materials. Waste management practices will follow industry fundamentals, including the Waste Management Hierarchy.

The proponent's EA states that Phase I rendered platforms and installations hydrocarbon and chemical free. While the proponent has not confirmed that any hazardous materials or CEPA toxic substances in use during the operation of the Cohasset project have been removed, it indicates that it will consult with EC, the Nova Scotia Department of Environment and Labour, and the Nova Scotia Department of Transportation and Public Works to ensure that any hazardous wastes are properly disposed of in compliance with provincial, federal and international regulations. .

## PUBLIC COMMENTS

No public comments on materials management were received.

## VIEWS OF THE RAS

RAs are satisfied that the general intent of waste management has been considered in the EA, with the understanding that further consideration is required once a contractor has been selected and a waste management plan prepared. EC believes that land-based disposal of marine growth may not be the most appropriate management option. Use of the material for composting or other purposes should be explored. If uses cannot be found, disposal at sea may be the preferred disposal option. In addition, the proponent will be expected to adhere to the follow-up described below.

## MITIGATION/FOLLOW-UP

EnCana shall prepare and submit a Waste Management Plan to the CNSOPB, for review by the RAs, prior to the onset of project activities. The plan shall consider all materials associated with decommissioning and take into account those elements included in EC comments dated 5 July 2004 (Appendix II, Developing a Waste Management Plan).

EnCana shall consult with EC, the Nova Scotia Department of Environment and Labour, and the Nova Scotia Department of Transportation and Public Works to ensure that hazardous wastes are properly disposed of in compliance with applicable regulations. If hazardous wastes are to be disposed of in provinces other than Nova Scotia or outside of Canada, the proponent will ensure adherence to the *Interprovincial Movement of Hazardous Waste Regulations* and the *Export and Import of Hazardous Wastes Regulations*.

## **9.16 CUMULATIVE EFFECTS**

### ENCANA'S ASSESSMENT

EnCana's assessment considers cumulative environmental effects (environmental effects from individual projects that can accumulate and interact) for each VEC as required by CEAA. The proponent's EA identified a number of past, present and future activities where there was a potential for the effects to interact cumulatively with those of the project. These activities included offshore oil and gas projects (e.g. Sable Offshore Energy Project, Deep Panuke Offshore Gas Development and Blue Atlantic Transmission System), seismic exploration, research surveys, shipping, commercial fisheries, commercial whaling, tourism military exercises and telecommunication cables.

According to the proponent's EA, the VECs selected for effects assessment through the scoping process were considered appropriate and inclusive for consideration of the potential cumulative effects. The significance of these cumulative effects was evaluated in accordance with the significance definitions developed for each VEC.

EnCana concluded that because the implementation of mitigative measures contained in their environmental assessment and adherence to applicable legislation and guidelines reduce the potential for adverse environmental effects associated with the Project for both the partial and total removal methods, and temporal and special overlap with other projects is limited, cumulative interaction with other projects is unlikely to have significant adverse effects.

#### PUBLIC COMMENTS

Written public comment was received expressing concerns that the ocean floor should be returned to its pre-project state since failure to do so could result in the seabed becoming littered with obstructions in the future.

The RAs recognize the concerns related to leaving equipment on the seabed, including cumulative effects. Comments related to the development plan amendment will be considered by the CNSOPB, in consultation with other RAs, in the development plan decision process.

#### VIEWS OF THE RAS

The RAs acknowledge the potential for effects of other projects to interact cumulatively with those of the Project. Because of the limited duration and geographical extent of the Total Removal Option, the Project is unlikely to interact cumulatively with other projects (past, present or likely future).

Under the Partial Removal Option, components that are left in situ have the potential to interact cumulatively with other projects over a much greater time frame. For example, should similar decommissioning options be chosen for other projects, there is a potential for the accumulation of man-made structures on the ocean bottom having a negative impact on commercial fisheries. However, since the footprint of the components to be left in place is very small compared to the total area fished, the Total Removal Option is unlikely to interact cumulatively with other projects to cause significant adverse effects. The RAs have determined that both removal options are not likely to cause significant adverse effects provided that the mitigation and follow-up measures proposed by the proponent, as well as those recommended by the RAs, are implemented.

#### MITIGATION/FOLLOW-UP

No specific mitigation, beyond that which is proposed in the proponent's EA and those required by the RAs under section 9 of this document, would be required.

## 10.0 DETERMINATION OF ENVIRONMENTAL EFFECTS SIGNIFICANCE

The purpose of the screening is to assess the potential environmental effects of both the *Partial* and *Total Removal Options* under consideration for Phase II Decommissioning of the Cohasset Project. As required under the *Canadian Environmental Assessment Act*, the screening is focused on establishing whether significant adverse environmental effects are likely to result from decommissioning activities taking into account the identified mitigation measures.

The screening will be used in support of decision-making by the CNSOPB on whether to approve the proposed amendment to the Development Plan sought by EnCana. The CNSOPB will only make that determination after considering the results of the screening together with other regulatory factors. In terms of EC and DFO, the screening will be used to support their respective decision-making responsibilities related to the Disposal at Sea Permit and authorization for Harmful Alteration and Destruction of Fish Habitat that may be required.

The RAs reviewed the environmental effects analysis presented by EnCana in the EA Report. A valued ecosystem component based assessment on the interaction of project activities on these VECs was used in assessing environmental effects. The environmental assessment methodology and approach used by the proponent is acceptable to the RAs, however the RAs did conduct additional analysis beyond those VECs identified by the proponent. The RAs are satisfied with the environmental information provided by EnCana regarding the potential adverse effects on the VECs.

In accordance with sub-section 16(1)(b) of the *Canadian Environmental Assessment Act*, the Canada-Nova Scotia Offshore Petroleum Board, Environment Canada and Fisheries and Ocean Canada have considered the significance of the environmental effects of the Project and have determined that, taking into account the implementation of the following mitigation measures and those committed to by EnCana in its EA and supporting documents, **the Project (either removal option) is not likely to result in significant adverse environmental effects.**

### 10.1 REQUIRED MITIGATION AND FOLLOW-UP

The following is a list of the proposed conditions to be imposed on the proponent for mitigation and follow-up:

#### 10.1.1 SUMMARY OF MITIGATION

##### TOTAL AND PARTIAL REMOVAL:

- a) EnCana shall adhere to its own mitigation commitments outlined in the EA and supporting documents.
- b) EnCana has committed to having an environmental observer to monitor any interaction with marine mammals, marine birds and species at risk. Reports shall be submitted to the CNSOPB, for review by the RAs.

- c) EnCana shall prepare and submit a protocol to the CNSOPB, for review by the RAs, prior to the onset of project activities, which outlines the steps to be taken should any harmful interaction occur with marine mammal or turtle species at risk.
- d) EnCana shall remove any oil found in the top of risers or flowlines prior to releasing riser water into the marine environment.
- e) EnCana shall be required to follow its Code of Practice for Sable Island throughout the Project activities. If vessels or helicopters approach within 2 km of Sable Island, the circumstances under which this occurred shall be reported to the CNSOPB.
- f) EnCana shall monitor weather forecasts throughout operations to allow sufficient time to suspend activities should weather conditions dictate.
- g) EnCana shall prepare and submit to the CNSOPB for review by the RAs, a plan that describes measures that will be taken to protect environmental components (e.g. birds, Sable Island, and whales) in the event of a spill. All vessels working on the Project shall have a spill response kit onboard with sufficient capacity to deal with small spills.
- h) Should storm-petrels or other species become stranded on vessels, the proponent is expected to adhere to the protocol described in Williams and Chardine's brochure entitled, "The Leach's Storm Petrel: General Information and Handling Instructions." A permit is required from the Canadian Wildlife Service of EC to implement this protocol.
- i) EnCana shall prepare and submit a Waste Management Plan to the CNSOPB, for review by the RAs, prior to the onset of project activities. The plan shall consider all materials associated with decommissioning and take into account those elements included in EC comments dated 5 July 2004 (Appendix II, Developing a Waste Management Plan).

EnCana shall consult with EC, the Nova Scotia Department of Environment and Labour, and the Nova Scotia Department of Transportation and Public Works to ensure that hazardous wastes are properly disposed of in compliance with applicable regulations. If hazardous wastes are to be disposed of in provinces other than Nova Scotia or outside of Canada, the proponent will ensure adherence to the *Interprovincial Movement of Hazardous Waste Regulations* and the *Export and Import of Hazardous Wastes Regulations*.

- j) All vessels used in the removal that have been mobilized from foreign waters will be required to follow the Transport Canada Guidelines for Ballast Water Exchange in Canadian Waters. Transport Canada is now proceeding with Ballast Water Regulations, finalization and

enactment anticipated during 2004/05. Upon enactment, vessels will be required to adhere to the ballast water regulations.

- k) EnCana shall submit an updated review of species at risk information, and any changes to its mitigation, to the CNSOPB for review by the RAs once the timing of the project is better known. At this time, EnCana shall reassess proposed mitigation and submit a plan, to be approved by the RAs, to protect species at risk.

TOTAL REMOVAL ONLY:

- l) Should the Total Removal Option be selected, the proponent shall provide, if available, additional sediment quality information. If unavailable, or if the additional information is inadequate, the proponent shall design and implement a sampling and analysis program for sediments in close proximity to the two platforms. The plan shall be reviewed by EC in advance of implementation and the results shall be submitted as part of a Disposal at Permit application.
- m) Should a HADD authorization be required, EnCana shall submit to DFO a compensation plan that adequately satisfies the requirements of the “No Net Loss” principle of DFO’s Policy for the Management of Fish Habitat.

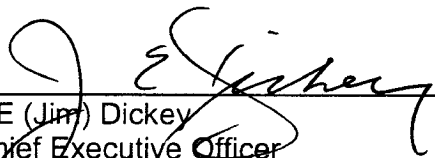
**10.1.2 SUMMARY OF FOLLOW-UP AND MONITORING**

TOTAL AND PARTIAL REMOVAL:

- a) Upon completion of project activities, the proponent shall verify project-associated emission estimates of PM, NO<sub>x</sub>, SO<sub>2</sub>, VOC, CO<sub>2</sub> based on actual vessel operations and US EPA methods. This emission data will support an accounting of cumulative offshore emissions and contribute to a reasonable information base for future environmental assessments and continuous improvement initiatives.


PARTIAL REMOVAL ONLY:

- b) If the *Partial Removal Option* is chosen, EnCana shall prepare and submit a monitoring program, including the appropriate mitigation, to the CNSOPB for review by the RAs to monitor the state of burial of equipment following decommissioning.
- c) If interference with fishing equipment occurs, EnCana shall adhere to the CNSOPB *Compensation Guidelines Respecting Damages Related to Offshore Petroleum Activity* (March 2002).



J.E. (Jim) Dickey  
Chief Executive Officer  
Canada-Nova Scotia Offshore Petroleum Board

Nov. 4/04  
Date



K.G. (Ken) Hamilton  
Regional Director, Environmental Protection Branch  
Atlantic Region  
Environment Canada

Nov 8/04  
Date



Carol-Ann Rose  
A/Director, Oceans Branch  
Maritime Region  
Fisheries and Oceans Canada

5 Nov 2004  
Date

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