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# 1 INTRODUCTION

ExxonMobil Canada Properties (EMCP), as Operator, on behalf of the Hebron Project Proponents, ExxonMobil Canada Ltd., Chevron Canada Limited (Chevron), Petro-Canada Hebron Partnership through its managing partner Suncor Energy Inc. (Suncor), Statoil Canada Ltd. (Statoil) and Nalcor Energy - Oil and Gas Inc. (Nalcor), is leading the development of the Hebron Project. The Hebron Project includes offshore surveys, engineering, procurement, construction, installation, commissioning, development drilling, production, operations and maintenance and decommissioning of an offshore oil / gas production system and associated facilities.

## 1.1 Hebron Project Area

The Hebron Project is divided into two Project Areas for the purposes of environmental assessment: a nearshore construction area at Bull Arm, Trinity Bay for the Gravity Base Structure (GBS) construction, Topsides assembly, installation and commissioning; and an offshore area located on the Grand Banks where the completed Hebron Platform will be installed and production of crude oil will occur for at least 30 years.

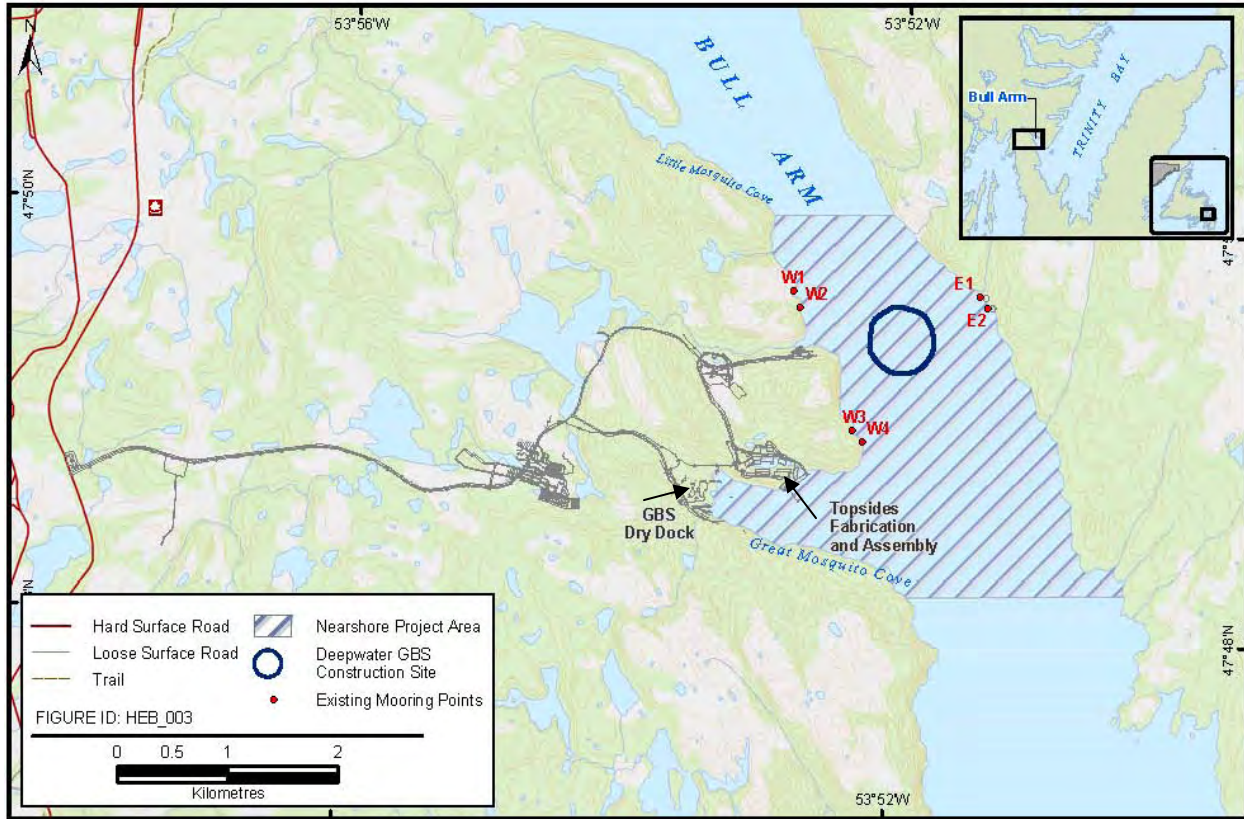
### 1.1.1 Nearshore Project Area

The Bull Arm Site is located 150 km northwest of St. John's, Newfoundland and Labrador. The site is owned and operated by Nalcor Energy-Bull Arm Fabrication. The site was originally built for the construction of the Hibernia GBS and is an ideal location for the construction of the Hebron GBS. The Nearshore Project Area is the marine environment within the Bull Arm site property boundary as illustrated in Figure 1-1.

The Bull Arm Site is a self-contained facility with capabilities for steel and concrete construction and fabrication, outfitting, installation, at-shore hook-up and commissioning. The site is connected to the Province's main highway (Trans-Canada Highway) and has more than 16 km of paved roads.

The GBS drydock site is situated in Great Mosquito Cove. The cove is 1.5 km long and has an average width of 500 m. The GBS drydock area is approximately 16.5 m deep and has a diameter of 180 m. To re-establish a drydock, the inner cove will be enclosed by a bund wall, which may include a row(s) of sheet piles, and will be dewatered. The partially constructed GBS will be floated out of the drydock and towed to the deepwater site, where it will be moored for final construction.

The deepwater GBS construction site is located in Bull Arm with a water depth of 180 m; it is equipped with six mooring points. The water depth in Bull Arm increases towards the mouth of the arm, where it reaches approximately 250 m, as it enters Trinity Bay.



**Figure 1-1 Nearshore Project Area**

The Topsides fabrication and assembly area is located on the north side of Great Mosquito Cove. Selected Topsides components will be fabricated at the Bull Arm Site; others will be fabricated offsite and will be transported to the Bull Arm Site. All modules and components will be integrated at the pier. Hook-up and commissioning activities with the fully integrated Topsides will begin at the pier prior to float out and mating with the GBS at the deepwater site and continue after mating.

**1.1.2 Offshore Project Area**

The Hebron Offshore Project Area is located in the Jeanne d’Arc Basin (centred at approximately 46°32.64344’ N; 48°29.88379’ W), 340 km offshore of St. John’s, Newfoundland and Labrador, approximately 9 km north of the Terra Nova Field and 32 km southeast of the Hibernia development. The water depth ranges from 88 to 102 m.

The Hebron Unit currently contains three discovered fields (the Hebron Field; the West Ben Nevis Field and the Ben Nevis Field) and incorporates four Significant Discovery Licenses (SDLs) (SDL 1006, SDL 1007, SDL 1009 and SDL 1010) (Figure 1-2), with ownership varying in each SDL. These four SDLs contain the most likely extent of the oil for the delineated pools within the Hebron Unit. The Hebron Unit could be expanded if additional studies, seismic surveys or, exploration and/or delineation drilling prove that economically recoverable oil pool accumulations extend beyond the currently envisioned boundaries of the Hebron Unit.

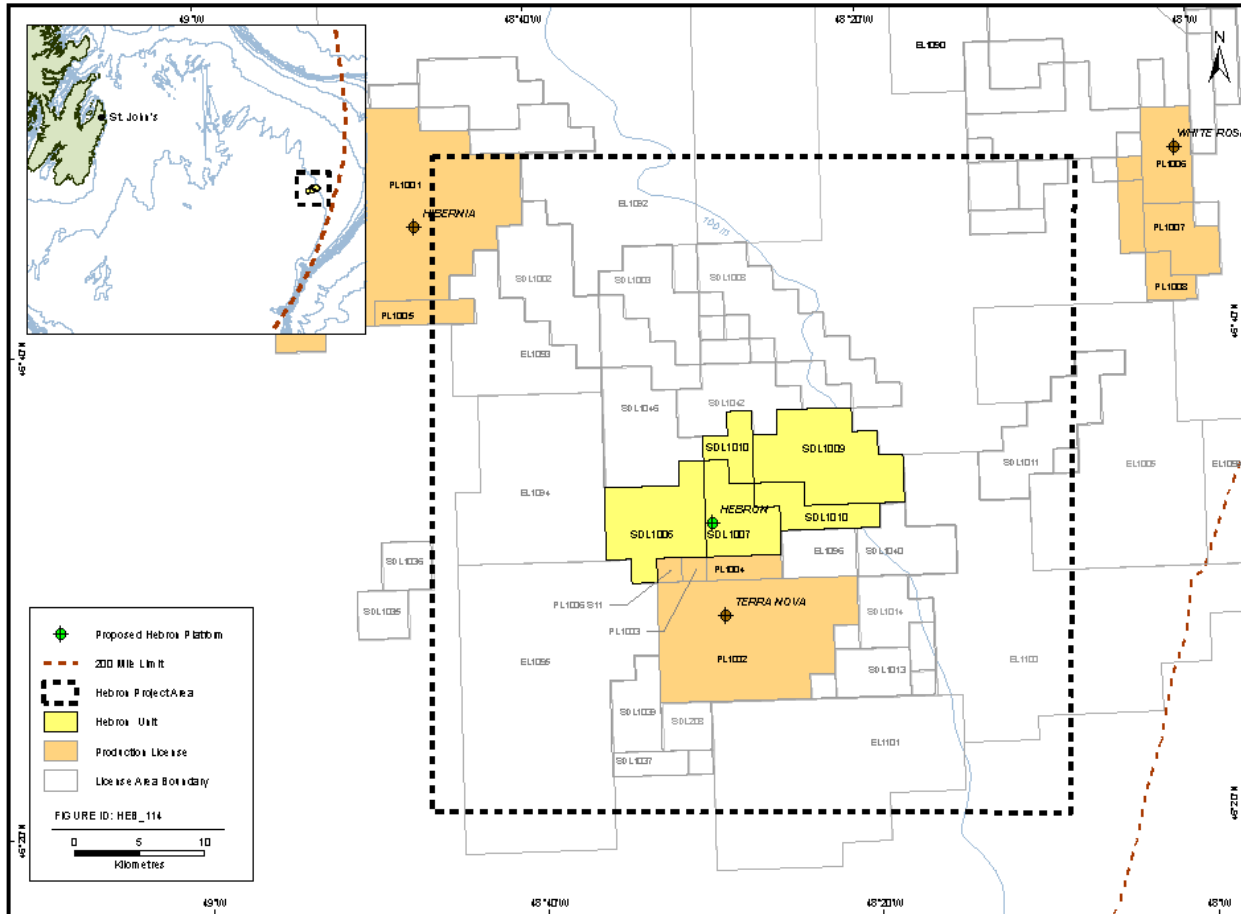


Figure 1-2 Offshore Project Area

Some Project activities (e.g., ice studies, geotechnical, geophysical, geological, and/or environmental surveys, vessel support) may occur within and outside the Hebron Unit. Therefore, the Hebron Offshore Project Area, as defined in this document, encompasses the area surrounding the Hebron Unit, as shown in Figure 1-2.

## 1.2 Project Proponents

The Hebron Project Proponents have varying participating interests in the four SDLs comprising the Hebron Unit. The Project owners and their respective share in the Hebron Project are identified in Table 1-1.

Table 1-1 Owners' Participating Interest

Owners	Share (%)
ExxonMobil Canada Properties	36.0
Chevron Canada Limited	26.7
Petro-Canada Hebron Partnership	22.7
Statoil Canada Ltd.	9.7
Nalcor Energy – Oil and Gas Inc.	4.9

Contacts to obtain additional information regarding the Hebron Project are indicated below:

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### 1.3 Regulatory Context

Offshore oil and gas exploration and development activities in the Newfoundland and Labrador offshore area are regulated under the *Canada-Newfoundland Atlantic Accord Implementation Act* (S.C. 1987, c.3) and the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act* (R.S.N.L. 1990, c. C-2) (Atlantic Accord Acts). Pursuant to *Canadian Environmental Assessment Act* (CEAA), the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) and other Responsible Authorities (RAs) are required to conduct an environmental assessment of a proposed project before the requisite authorizations, permits and licenses can be issued. Under section 5 of CEAA, an environmental assessment is required in relation to this project because the C-NLOPB may issue a permit or license under paragraph 139(4)(a) of the *Canada-Newfoundland Atlantic Accord Implementation Act* and may issue a permit or license under paragraph 138(1)(b) of the *Canada-Newfoundland Atlantic Accord Implementation Act*; Environment Canada may issue a permit or license under subsection 127(1) of the *Canadian Environmental Protection Act*; Fisheries and Oceans Canada (DFO) may issue a permit or license under subsection 35(2) of the *Fisheries Act*; Industry Canada may issue a permit or license under paragraph 5(1)(f) of the *Radiocommunication Act* and Transport Canada may issue an approval under Part 1, Section 5 of the *Navigable Waters Protection Act*.

The *Comprehensive Study List Regulations* under CEAA prescribe a comprehensive study-level of environmental assessment for an offshore oil and gas development project. Pursuant to the Atlantic Accord Acts, proponents of offshore oil development projects are required to submit a Development Application. An Environmental Impact Statement (EIS) is required as a component of this Application. The Comprehensive Study Report (CSR) fulfils the requirement of the EIS supporting document for approval. Therefore, this environmental assessment of the Hebron Project will address the requirements of CEAA and the Atlantic Accord Acts.

The C-NLOPB and the Canadian Environmental Assessment Agency (CEA Agency) have established a single harmonized process for addressing the environmental assessment requirements for offshore oil and gas development projects. The environmental assessment process for the Hebron Project will be assessed under this harmonized process.

The C-NLOPB and the following federal departments and agencies have identified an interest in the Project, and will participate in the federal review in relation to the proposed Project as follows:

- ◆ The C-NLOPB has regulatory and statutory responsibilities under the *Canada-Newfoundland Atlantic Accord Implementation Act* and, pursuant to CEAA, is a RA. The C-NLOPB may be in possession of specialist or expert information or knowledge with respect to the Project and, on request, shall make available that information or knowledge to RAs
- ◆ DFO has regulatory and statutory responsibilities under the *Fisheries Act* and, pursuant to CEAA, is an RA. DFO may be in possession of specialist or expert information or knowledge with respect to the Project and, on request, shall make available that information or knowledge to RAs
- ◆ TC has regulatory and statutory responsibilities under the *Navigable Waters Protection Act* and, pursuant to CEAA, is an RA. Transport Canada may be in possession of specialist or expert information or knowledge with respect to the Project and, on request, shall make available that information or knowledge to RAs
- ◆ Environment Canada has regulatory and statutory responsibilities under the *Canadian Environmental Protection Act, 1999* (CEPA 1999) and, pursuant to CEAA, is an RA. Environment Canada may be in possession of specialist or expert information or knowledge with respect to the Project and, on request, shall make available that information or knowledge to RAs
- ◆ Industry Canada has regulatory and statutory responsibilities under the *Radiocommunication Act* and, pursuant to CEAA, is an RA
- ◆ Natural Resources Canada and Health Canada are federal authorities pursuant to CEAA and may be in possession of specialist or expert information with respect to the Project (expert Federal Authority ) and, upon request, shall make available that information or knowledge to RAs

The CEA Agency has administrative and advisory responsibilities pursuant to CEAA in support of the environmental assessment. The CEA Agency will act as the Environmental Assessment Manager, the Crown Consultation Coordinator for the environmental assessment in relation to the Project, and will coordinate input into the review that is being undertaken pursuant to the Atlantic Accord Acts, to the extent possible.

The Major Projects Management Office has administrative and advisory responsibilities under the Cabinet Directive on Improving the Performance of the Regulatory System for Major Resource Projects and the associated Memorandum of Understanding. The Major Projects Management Office will provide oversight and advice throughout the entire federal review in relation to the Project to ensure adherence to the service standards and roles and

responsibilities of all Parties. Additionally, the Major Projects Management Office will provide selective intervention to help address identified challenges and, in collaboration with the Parties, will play an oversight role throughout the federal review in regard to Aboriginal engagement and consultation.

The Newfoundland and Labrador Department of Environment and Conservation (NLDEC) will require an Environmental Protection Plan (EPP) for the Bull Arm Site. This EPP will be submitted by EMCP to the NLDEC for approval in 2010.

The CEA Agency administers a Participant Funding Program that supports individuals and non-profit organizations interested in participating in certain types of federal environmental assessment. The CEA Agency will provide up to a total of \$30,000 in participant funding, should this particular environmental assessment proceed as a comprehensive study. Notification of the availability of participant funding was provided by the Agency in conjunction with the RAs' advertisement of the Scoping Document comment period. The closing date for applications was May 22, 2009. No applications were received.

The RAs must also recommend to the Minister of the Environment whether the environmental assessment should continue by means of a comprehensive study or whether the project should be referred to a mediator or review panel. This report, known as the Environmental Assessment Track Report, was jointly issued on June 18, 2009. The RAs, in consultation with the CEA Agency and expert Federal Authorities and taking into consideration public comments received, concluded that a Comprehensive Study can effectively address issues related to the proposed Project and recommended that the environmental assessment process should continue as a Comprehensive Study.

After considering the subsection 21(2) report and recommendation, the Minister of the Environment is required to decide whether to refer the project back to the RAs to continue with the comprehensive study process, or refer the project to a mediator or review panel. If the Minister of the Environment decides that the project should continue as a comprehensive study, then the project cannot be referred to either a mediator or review panel at a later date. On July 22, 2009, the Minister of the Environment announced his decision that this Project would proceed as a comprehensive study. Based on this decision by the Minister, the environmental assessment process has continued as a comprehensive study with the RAs coordinating to prepare a single CSR. For this Project, the RAs have delegated preparation of the CSR (this report) to the Proponent. The public has been and will be given an opportunity to participate during the comprehensive study process.

Consultations conducted to date during the preparation of the comprehensive study are detailed in Chapter 5. EMCP will continue open dialogue with any stakeholders with questions or concerns. Ongoing meetings are planned with the fishing industry and non-governmental organizations.

## 1.4 Purpose of the Comprehensive Study Report

This CSR was prepared in the context of the *Hebron Development Project Canadian Environmental Assessment Act Scoping Document* (dated June 2009), and in fulfillment of regulatory requirements to assess the significance of potential environmental effects and reduce adverse environmental effects resulting from the Project under CEAA and the Atlantic Accord Acts. This report addresses the requirements for a comprehensive study level of assessment pursuant to CEAA and the EIS for the C-NLOPB *Development Plan Guidelines* (C-NLOPB 2006).

## 1.5 Scope of the Project

The scope of the project is defined as the components of a proposed undertaking relating to a physical work, or a proposed physical activity not relating to a physical work, that are determined to be part of the project for the purposes of the environmental assessment (CEA Agency 2006).

The scope of the Project includes a combination of works and activities that will take place in the Nearshore and Offshore Areas, necessary for the construction and operation of an offshore oil production system and associated facilities. In accordance with Section 15 of CEAA, the RAs have therefore agreed that the scope of the proposed Project, for purposes of preparation of this CSR, includes the following Project components.

### 1.5.1 Project Components - Nearshore Project Area

Project activities within or affecting the marine environment in the nearshore area may include:

- a) Dredging and construction of a marine bund wall for the drydock in Great Mosquito Cove (associated activities may include: sheet pile / driving, dredging, blasting, grouting, dewatering of the drydock, ocean disposal of bund wall material)
- b) Construction of the GBS in the drydock
- c) Construction of additional and/or strengthened mooring points at the deepwater site (activities may include chain laying and connection)
- d) Decommissioning of the bund wall and tow-out of GBS to deepwater site
- e) Completion of GBS construction at the deepwater site and mating of the GBS with topside components and ancillary activities (may include solid ballasting)
- f) Hook-up and commissioning of topside modules with GBS at deepwater site in Bull Arm
- g) Tow-out of the platform to its offshore location through Trinity Bay (dredging activities may be required before tow-out)
- h) Operation of support craft associated with the above activities, including but not limited to heavy lift vessels, construction vessels, supply vessels, helicopters, tow vessels, barges



- i) Associated surveys for all above activities, including: remotely-operated vehicle (ROV) surveys, diving programs, geotechnical programs, geophysical programs, geological programs, environmental surveys

### 1.5.2 Project Components - Offshore Project Area

Project activities within or affecting the marine environment in the offshore area may include:

- a) Tow-out of platform to offshore site
- b) Offshore site and clearance surveys
- c) Installation of the platform at its offshore location (may include site preparation activities such as clearance dredging, seafloor levelling, underbase grouting, offshore solid ballasting, piles and mooring points, and placement of rock scour on the seafloor)
- d) Platform commissioning
- e) Operation, production, maintenance, modifications, decommissioning of the platform petroleum production facility
- f) Drilling operations (exploration and development drilling), from the GBS of up to 52 wells, including well testing, well completions and workovers and data logging
- g) Construction, installation, operation, maintenance of an offshore loading system (OLS) (may include dredging activities, pile driving, installation and insulation of riser and OLS (rock dumping, concrete mattress pads)
- h) Supporting activities, including diving programs, and operation of support craft associated with the above activities, including but not limited to dredging vessels, shuttle tankers, shuttle tankers connecting / disconnecting to OLS, mobile offshore drilling units (MODUs), platform supply and standby vessels and helicopters
- i) Associated surveys for all above activities, including: ROV surveys, diving programs, geotechnical programs, geophysical programs (e.g., 2D/3D/4D seismic, Vertical Seismic Profiles (VSPs), geohazard/wellsite surveys), geological programs, environmental surveys (including iceberg surveys)

### 1.5.3 Potential Expansion Opportunities

- a) Construction and abandonment/decommissioning of up to four excavated drill centres within the Hebron Field; may include the disposal of dredged material at one or more offshore locations
- b) Installation, operation and maintenance, an abandonment / decommissioning of subsea infrastructure within excavated drill centres
- c) Construction (including trenching, excavation, covering and/or spoil deposition), installation, maintenance, protection and abandonment / decommissioning of subsea flowlines and tieback to the GBS
- d) Drilling operations from one or more MODUs
- e) Supporting activities, including diving programs, ROV surveys and operation of support craft associated with the above activities, including but not limited to dredging vessels, MODUs, platform supply and standby vessels and helicopters

- f) Seismic programs (2D/3D/4D surveys) and other geotechnical and/or geophysical activities (VSP surveys, geohazard/well site surveys)

## 1.6 Document Organization

This CSR is organized into the following chapters.

- ◆ Chapter 1 - Introduction: Provides a description of the Nearshore and Offshore Project Areas, identifies the Project proponents, indicates the regulatory context and the purpose of this environmental assessment, details the scope of the Project and the nearshore and offshore Project Components and describes the organization of this CSR
- ◆ Chapter 2 - Project Description: Provides the justification and need for the Project, discusses the alternatives to the Project, discusses and evaluates the alternatives within the project and discusses in detail the preferred concept for the Project in terms of construction in the Nearshore and Offshore Project Areas and operation and maintenance and decommissioning and abandonment in the Offshore Project Area discusses potential future development
- ◆ Chapter 3 - Physical Environment Setting: Describes the nearshore and offshore physical environment setting, including the atmospheric environment, oceanic environment, wind and wave extremes, sea ice and icebergs, geotechnical and geological conditions and climate change
- ◆ Chapter 4 - Environmental Assessment Methods: Details the scope of the environmental assessment and the scope of the factors to be considered in the environmental assessment; provides the nine-step method used in conducting the environmental effects assessment of the Project on identified Valued Ecosystem Components
- ◆ Chapter 5 - Consultations: Provides details on the consultations conducted in support of the CSR, including consultation with the public, meetings with government departments and agencies, other consultations methods used, media briefings and tracking, and the use of the Project website and telecommunications
- ◆ Chapter 6 - Air Quality: Describes the existing environment, potential interactions, proposed mitigation measures and assesses the potential environmental effects of the Project (including cumulative environmental effects and accidents and malfunctions) on Air Quality
- ◆ Chapter 7 - Fish and Fish Habitat: Describes the existing environment, potential interactions, proposed mitigation measures and assesses the potential environmental effects of the Project (including cumulative environmental effects and accidents and malfunctions) on Fish and Fish Habitat
- ◆ Chapter 8 - Commercial Fisheries: Describes the existing environment, potential interactions, proposed mitigation measures and assesses the potential environmental effects of the Project (including cumulative environmental effects and accidents and malfunctions) on Commercial Fisheries

- ◆ Chapter 9 - Marine Birds: Describes the existing environment, potential interactions, proposed mitigation measures and assesses the potential environmental effects of the Project (including cumulative environmental effects and accidents and malfunctions) on Marine Birds
- ◆ Chapter 10 - Marine Mammals and Sea Turtles: Describes the existing environment, potential interactions, proposed mitigation measures and assesses the potential environmental effects of the Project (including cumulative environmental effects and accidents and malfunctions) on Marine Mammals and Sea Turtles
- ◆ Chapter 11 - Species at Risk: Describes the existing environment, potential interactions, proposed mitigation measures and assesses the potential environmental effects of the Project (including cumulative environmental effects and accidents and malfunctions) on Species at Risk
- ◆ Chapter 12 - Sensitive or Special Areas: Describes the existing environment, potential interactions, proposed mitigation measures and assesses the potential environmental effects of the Project (including cumulative environmental effects and accidents and malfunctions) on Sensitive Areas
- ◆ Chapter 13 - Effects of the Environment on the Project: Describes the potential effects of the environment on the Project in both the nearshore and offshore, including bathymetry, wind, waves and currents, tsunamis, tides, water levels and storm surge, sea temperature, geohazards, and climate change and the mitigation measures that will be applied
- ◆ Chapter 14 - Accidental Hydrocarbon Spill Events: Provides oil spill probabilities and nearshore and offshore oil spill trajectory modelling results, as well as contingency plans in the event of an oil spill (or other accidental event)
- ◆ Chapter 15 – Follow-up and Monitoring: Provides the framework for the follow-up programs (including environmental effects monitoring) and environmental compliance that will be conducted for this Project, as well as environmental assessment validation
- ◆ Chapter 16 - Environmental Management: Details the environmental management procedures that EMCP will apply to the Hebron Project
- ◆ Chapter 17 – Summary and Conclusions: Provides the conclusions of the effect of the Project resulting from the environmental effects assessment
- ◆ Chapter 18 - References: Provides the personal communications and literature cited used to prepare the CSR
- ◆ Chapter 19 - Glossary, Acronyms and Abbreviations: Provides definitions of key words, acronyms and abbreviations