Osprey 3D MSS

Environment Plan - Summary

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Environment Plan
Osprey 3D Marine Seismic Survey

Document Information

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1.0 Introduction

This document is a summary of the Environment Plan (EP) for the Osprey three dimensional (3D) Marine Seismic Survey in Exploration Permits WA-455-P and WA-456-P (referred to thereafter as 'the survey'). The EP has been prepared in accordance with the Offshore Petroleum and Greenhouse Gas Storage Act (2006) (OPGGS Act) and has been submitted to NOPSEMA as required by Regulations 11(7) and 11(8) of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (OPGGS (E) Regulations).

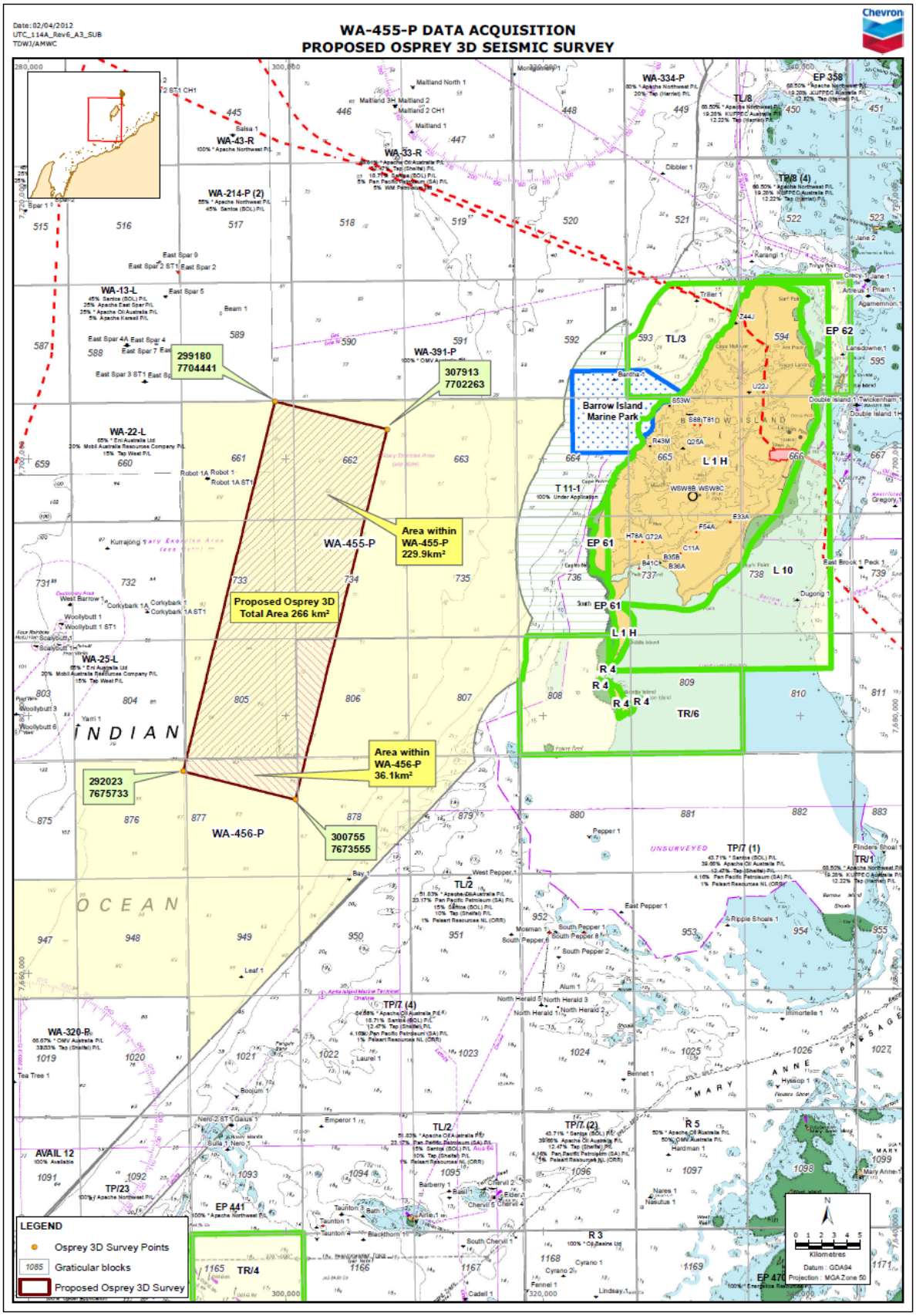
2.0 Coordinates of the Activity

The survey will be conducted in Commonwealth marine waters of the North West Shelf, Western Australia (WA), west of the Barrow/Lowendal/Montebello region, approximately 20 km west of Barrow Island and approximately 65 km north-west of the mainland at its closest point (Figure 1). The survey will take place within Exploration Permits WA-455-P, WA-456-P, with three-dimensional (3D) seismic acquisition covering an area of approximately 270 km^2. The coordinates of the survey area are shown in Table 1.

Table 1:
Coordinates of the 3D Survey Area (Datum: GDA 94)

Point ID (See Figure 1)	Longitude (East)			Latitude (South)		
	degrees	minutes	seconds	degrees	minutes	seconds
1	20	44	56.23	115	04	13.65
2	20	46	17.75	115	09	18.06
3	21	01	37.79	115	04	56.59
4	21	00	26.96	114	59	55.56

Figure 1 – Survey Location Map - Osprey 3D MSS



3.0 Description of the Receiving Environment

The survey area is located on the continental shelf in water depths ranging from approximately 70 to 95m). The seafloor is gently sloping west, increasing to approximately 95 m at the western boundary of the survey area. The nearest emergent land is Barrow Island, located approximately 20 km east of the survey area. Surveys conducted in similar water depths along the Gorgon feed gas pipeline route and in the vicinity of the existing East Spar facilities found the substrate in this area to be mostly comprised of unconsolidated, bio-turbated, bare, sandy sediments.

A benthic survey conducted in the vicinity of the East Spar facilities in similar water depths to the survey area found the seabed to consist of bioturbated bare sand, with occasional benthic invertebrates.

Some marine species with broad distributions such as cetaceans, fish, sharks, marine turtles and seabirds may traverse the survey area.

The EPBC Protected Matters Database lists 11 Threatened/Migratory species and seven other Migratory species that could occur within the survey area (Table 2). However, the survey area does not contain recognised critical habitat for any Threatened or Migratory fauna.

Table 2:
Threatened and Migratory Species that May Occur within the Survey Area

Scientific Name	Common Name	Status
Birds		
Macronectes giganteus	Southern giant-petrel	Endangered, Migratory
Mammals		
Balaenoptera musculus	Blue whale	Endangered, Migratory
Eubalaena australis	Southern right whale	Endangered, Migratory
Megaptera novaeangliae	Humpback whale	Vulnerable, Migratory
Balaenoptera edeni	Bryde's whale	Migratory
Orcinus orca	Killer whale	Migratory
Sousa chinensis	Indo-Pacific humpback dolphin	Migratory
Tursiops aduncus	Spotted bottlenose dolphin (Arafura/Timor Sea populations)	Migratory
Dugong dugon	Dugong	Migratory
Reptiles		
Chelonia mydas	Green turtle	Vulnerable, Migratory
Dermochelys coriacea	Leatherback turtle	Endangered, Migratory
Eretmochelys imbricata	Hawksbill turtle	Vulnerable, Migratory
Natator depressus	Flatback turtle	Vulnerable, Migratory
Caretta caretta	Loggerhead turtle	Endangered, Migratory
Sharks and Rays		
Rhincodon typus	Whale shark	Vulnerable, Migratory

Scientific Name	Common Name	Status
Isurus oxyrinchus	Shortfin mako	Migratory
Isurus paucus	Longfin mako	Migratory

A number of sharks and pelagic finfish, including Spanish mackerel, tuna and billfish, are found in the nearby waters of the Montebello/Barrow Islands Marine Conservation Reserves and may occur in the survey area. The benthic habitats of the survey area are typical of those found throughout the region and are not expected to represent habitat of particular significance to sharks and finfish.

Due to the distance of the survey area from Ningaloo Marine Park (approximately 80 km), and the timing of the survey, it is very unlikely that significant numbers of whale sharks will be present in the vicinity of the survey area. However, individuals migrating south to the Ningaloo coast may be encountered in the survey area during operations.

Five species of marine turtle are known to occur in the Montebello/Lowendal/Barrow Island region to the east of the survey area, and thus may occur within the survey area: green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), hawksbill (*Eretmochelys imbricata*), flatback (*Natator depressu*s) and loggerhead (*Caretta caretta*), all of which are listed as Threatened and Migratory under the EPBC Act. The flatback turtle is restricted to the tropical areas of the continental shelf of Australia, southern Irian Jaya and southern Papua New Guinea. Green, loggerhead, hawksbill and leatherback turtles have global distributions in tropical, subtropical and temperate seas (Environment Australia 2003).

Several whale and dolphin species are known to occur in the region, including the humpback whale (*Megaptera novaeangliae*) which is listed as Vulnerable under the EPBC Act, the blue whale (*Balaenoptera musculus*) and the southern right whale (*Eubalaena australis*), both listed as Endangered. Humpback, blue and southern right whales migrate annually from the Antarctic to temperate/tropical waters during the Australian winter.

Four cetacean species listed as Migratory under the EPBC Act may occur in the survey area on occasion: Bryde's whale (*Balaenoptera edeni*), killer whale (*Orcinus orca*), Indo-Pacific humpback dolphin (*Sousa chinensis)* and the spotted bottlenose dolphin (*Tursiops aduncus*).

Dugongs are known to occur around the islands of the North West Shelf, although not in the same concentrations seen further south in Exmouth Gulf and Shark Bay (Prince 1986). The nearest known habitats of dugongs are Varanus Island, Barrow Shoals (RPS BBG 2005b), and off the east coast of Barrow Island (Prince 2001). Dugongs are likely to feed on the sparse seagrass around Barrow Island, however given the large food reserves to the south and water depths of the survey area, it is unlikely that dugongs will be encountered in the survey area.

The southern giant-petrel is classified as Threatened under the EPBC Act and may be present in the survey area. The southern giant-petrel ranges widely throughout the southern oceans. Due to the widespread distribution of the southern giant-petrel, numbers at any given location are likely to be low.

The petroleum exploration and production industry is a significant stakeholder in the region. Chevron operates crude oil production facilities on Barrow Island and Thevenard Island. Barrow Island is Australia's largest onshore oil field, and has been in production since 1967. Barrow Island is also the site of the onshore component of the Gorgon Development, which includes an LNG facility and domestic gas plant. Thevenard Island, located approximately 50 km south of the survey area, also provides a base for the processing and storage of hydrocarbons from surrounding fields.

In addition to the land-based production and processing facilities on the nearby islands, there are a number of petroleum exploration and development activities in the area. The Woolybutt Floating Production, Storage and Offloading (FPSO) facility is located approximately 10 km west of the survey area. Vessel movements associated with the FPSO may pass through the survey area. The East Spar to Varanus Island pipeline is also located approximately 5 km north of the survey area.

The survey area overlaps with fishing zones for the following Commonwealth managed fisheries:

- Western Tuna and Billfish Fishery
- Western Skipjack Fishery
- Southern Bluefin Tuna Fishery.

4.0 Description of the Activity

Seismic data will be used to map the subsurface geology of the region to ascertain potential subsurface petroleum deposits. Seismic acquisition will be undertaken by a specialist geophysical contractor, Petroleum Geo-Services Australia Pty Ltd (PGS), using the Ramform Explorer, a purpose built seismic survey vessel. The vessel is 82.6 m in length and has a beam of 39.6 m.

The seismic survey is approximately 270km^2 in area and will take about 9 days to acquire in early-mid April 2012.

The *Ramform Explorer* will tow seismic equipment consisting of a seismic energy source array of Bolt 1900 LLXT airguns, with a total capacity of approximately 4130 in^2 with an operating pressure of 2000 psi. The seismic array will be towed astern of the vessel at a depth of approximately 6 m. Seismic pulses will be produced at 18.75 m shot point intervals during 3D acquisition. This will be achieved by alternating two seismic sources. Seismic reflections from subsurface layers will be detected by hydrophones inside a receiver array of 10 streamers approximately 6,000 m in length, towed behind the survey vessel approximately 100 m apart at a depth of approximately 15 m.

Two support/scout vessels, the *Nautika Pride* and *No Limit,* will be used for logistical, safety and equipment management support.

5.0 Environmental Hazards and Controls

Hazard	Controls
Acoustic impulses	Seismic operations will be conducted in accordance with the standard management procedures for minimising acoustic disturbance to cetaceans, as described in the EPBC Act Policy Statement 2.1 (DEWHA 2008).
Artificial Lighting	To control impacts from light generation during the survey, external lighting of vessels will be minimised to the minimum required for navigation, vessel safety and safety of deck operations, except in the case of an emergency.
Vessel Wastes	All wastes generated on the seismic vessel will be managed in accordance with the vessel's Waste Disposal Procedure and MARPOL 73/78 regulations. Each discharge or incineration will be recorded in the Garbage Record Book.
Domestic wastes	No domestic wastes will be discharged within 12 nautical miles of any land. Sewage and grey water will be treated in an onboard treatment plant and putrescibles wastes macerated prior to overboard discharge. Only biodegradable detergents shall be used on the vessel. Records shall be kept onboard of the survey and support vessels detailing the quantities of macerated sewage discharged overboard and the distance of the vessel from the nearest land at the time of discharge. These records will be logged in the Garbage Record Book.
Bilge Water	In the event that it is necessary to release bilge water, the discharged water shall be treated in an oil-water separator to contain less than 15 ppm hydrocarbons (in accordance with MARPOL 73/78 Annex I requirements). Following separation, the oil-free water will be discharged overboard and the recovered oil will be stored for transfer to shore for appropriate disposal/recycling.
Solid and Hazardous Wastes	All solid and hazardous wastes will be managed in strict accordance with the vessel's Waste Disposal Procedure, and no disposal of these wastes to the ocean will occur. All solid wastes which cannot be incinerated onboard the vessel will be transferred to the mainland, via supply vessel, for onshore disposal at an appropriately licensed waste facility. Records will be kept onboard the seismic survey and support vessels detailing quantities of wastes generated and transferred to shore for disposal.
Quarantine and Ballast Water Exchange	The Ramform Explorer and support vessels have been subject to an AQIS hull inspection and certification prior to entry into Australian waters.
Collision with a cetacean or turtle	The survey timing is planned to avoid the whale migration season and no cetaceans are expected to be in the area during the survey period. Furthermore, the vessel will follow the EPBC Policy Statement 2.1 covering the interaction of seismic exploration and whales. This includes; – the shut-down of seismic source if a whale is sighted within 500 m of the source. – power-down of seismic source if whale and/or whale shark is sighted within 2 km of the source. – observation of marine fauna within a 3 km radius of the source.
Accidental hydrocarbon spill as a result of	The vessel has a Shipboard Oil Pollution Emergency Plan (SOPEP) consistent with Chevron's MOPP, MARPOL 73/78 Annex I Regulations

ruptured fuel tanks due to collision	for the Prevention of Pollution by Oil and AMSA Act. Furthermore, an oil spill contingency plan (OSCP) has been prepared for this activity which includes modeling of a credible spill scenario and draws on the provision of oil spill management services available through the Australian Marine Oil Spill Centre (AMOSC), AMSA and Chevron's Barrow Island Emergency Management Coordinator.
Accidental hydrocarbon spill during refueling operations	No refueling is planned during the survey as the vessel has adequate fuel storage capacity to complete the 9-10 day survey without the need for refueling. The vessel uses dry-break couplings for refueling operations if and when needed and these prevent any fuel loss if the fuel transfer hose is subject to excessive tension during any fuel transfer operation.

6.0 Management Measures

The Implementation Strategy for the survey will ensure a systematic approach to optimising environmental performance and ensuring that Chevron's environmental objectives and management standards are achieved. All operations will be conducted in accordance with Chevron's OEMS.

Seismic operations will be conducted in accordance with the standard management procedures for minimising acoustic disturbance to cetaceans, as described in the EPBC Act Policy Statement 2.1 (DEWHA 2008). This includes the following measures:

Chevron will review the Environment Plan after the survey is completed and assess environmental performance. The results of the review and any recommended improvements, including feedback from NOPSEMA, will be incorporated into the EP for future operations.

Chevron will apply a systematic approach to optimising the environmental performance of the survey and ensuring that environmental objectives and management standards are achieved. The environmental (as well as health and safety) risks associated with the program will be identified and prioritised through the Risk Analysis to reduce risks to ALARP.

The management controls, monitoring and review processes that will be implemented for the survey and the documents and/or systems that support them are detailed in the Environment Plan.

Chevron has developed a tiered series of Systems, Plans, Procedures and Work Instructions to ensure that appropriate management measures are implemented as required to minimise the risk of environmental disturbance from operations. These environmental practices and procedures are documented in the corporate management manuals developed by Chevron and by the survey vessel operators and in project specific documents outlined below.

- Operational Excellence Management System (OEMS). The ABU OEMS prescribes the standards expected for HES in all Chevron-controlled operations
- ABU Emergency Management Process
- Marine Oil Pollution Plan
- HSE Manual
- Emergency and Vessel Procedures
- Shipboard Oil Pollution Emergency Plan
- Waste Disposal Procedures
- Bridging Document
- Survey Vessel Project Plan
- Environment Plan
- Oil Spill Contingency Plan.

All Chevron and survey vessel personnel will attend an induction as part of the start-up meeting for new operations. The induction will:

- Highlight the Chevron Corporate HES Policy.
- Discuss the specific environmental sensitivities of the survey area.
- Introduce the project Environment Plan, and outline the information presented in the Plan, particularly in regard to the aspects and risks identified as requiring management.

- Identify the environmental objectives for the survey and the management strategies and procedures in place to achieve those aims.
- Highlight individual responsibilities of survey personnel in regard to management procedures.

One of the purposes of the induction is to encourage environmental responsibility among all personnel. The induction will ensure that, prior to the commencement of operations, personnel are made fully aware of the procedures, regulations and management measures required to minimise the potential impact of the survey on the marine environment.

Personnel with responsibilities in specific environmental practices will be trained to ensure effective implementation of the Work Instructions and Procedures for which they have responsibilities. These include:

- waste management
- emergency response, including response to accidental oil spillage
- cetacean observation.

7.0 Consultation

Consultation with the following stakeholders has been undertaken;

- Australian Fisheries Management Authority (AFMA)
- Australian Marine Safety Authority (AMSA)
- Department of Defence
- Commonwealth Fisheries Association (CFA)
- Australian Bluefin Tuna industry Association
- WA Fishing Industry Council (WAFIC)
- WA Northern Trawl Owners Association (WANTOA)
- Northern Fishing Companies Association
- WestMore Seafoods
- A Raptis and Sons
- Border Protection Command
- Air Force Headquarters
- Royal Australian Navy
- Australian Hydrographic Office

These stakeholders have been advised of the survey start and vessel contact details, and will be advised once the survey operations are complete.

8.0 Operator's Nominated Liaison Personnel for the Activity

Operator (person):	David Moffat	Chevron Australia (WA-455-P) Pty Ltd	
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