

Chevron Australia Pty Ltd Wheatstone 3D MAZ Marine Seismic Survey - North West Shelf, Western Australia

Environment Plan: Public Summary

Introduction

This document is a summary of the Environment Plan (EP) in support of a three dimensional (3D) marine seismic survey proposed by Chevron Australia Pty Ltd (Chevron), located within and around Retention Leases WA-39-R, WA-17-R and WA-16-R, in Commonwealth waters of north-west Western Australia (WA) (Figure 1). The public summary is submitted to the Western Australian Department for Mines and Petroleum (WA DMP), as required by Regulations 11(7) and 11(8) of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 and the Commonwealth *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGGS Act).

Description of the Activity

The seismic survey is a multi-azimuth survey, to be undertaken in two line directions (60°/240° and 120°/300°). Multi-azimuth 3D seismic survey uses more than one seismic line direction to improve target illumination and data resolution (PGS 2005).

Chevron's seismic survey will be undertaken in Commonwealth marine waters of the continental slope, in depths ranging between 70 and 1,100 metres (m) (chart datum).

The seismic survey is scheduled to be undertaken between October 2011 and January 2012 and will take approximately 75 days to complete. The seismic survey will be conducted 24 hours per day.

The survey area is bound by the coordinates provided in Table 1 and Figure 1. Seismic data will be acquired over a survey area of approximately 1,074 km² for each line direction.

Table 1: Coordinates of the Seismic Survey Area (GDA94)

Point ID (See Figure 1)	Longitude (East)			Latitude (South)		
	degrees	minutes	seconds	degrees	minutes	seconds
1	19	39	2.492	115	12	44.379
2	19	37	6.020	115	16	22.457
3	19	37	8.588	115	22	6.828
4	19	39	51.882	115	26	54.925
5	19	58	30.106	115	26	59.571
6	20	3	25.041	115	17	46.761
7	20	0	29.392	115	12	45.788

The seismic survey will be operated by Petroleum Geo-Services Australia Pty Ltd (PGS) and conducted using a specialised survey vessel, the *Ramform Explorer*. The seismic energy source will be provided by a dual Bolt 1900 LLXT airgun array, totaling 4,130 cubic inches and operating at 2000 psi.

The vessel will be towing seismic equipment in a predetermined pattern within the survey area. The airgun array will be towed at a depth of approximately 6 m and discharged at intervals of approximately eight seconds, resulting in a spatial interval of seismic pulses of approximately 18.75 metres. Seismic reflections from subsurface layers will be detected by a series of hydrophones in 10 solid streamers. The

streamers will be 6,000 m in length and will be towed behind the survey vessel at a depth of approximately 15 m. The depths and lateral spread of the streamers are measured and automatically controlled by devices installed along the streamer.

Description of the Receiving Environment

Physical Environment

The survey area is located approximately 60 km north of Barrow Island and approximately 115 km north-west of the mainland, in water ranging from 70 – 1,100 m deep. The area is void of significant or shallow seabed features.

Geophysical site surveys within the survey area found the sediments to comprise uniformly clayey, silty, medium sand. In the central region of the survey area, there were occasional, small areas of rock or reef outcrops with relief generally greater than 0.5 m (Chevron Australia 2005). No seabed features of significance were identified in the geophysical surveys.

The region is characterised by two seasons: a wet 'summer' between September and April, and dry 'winter' between May and August. The climate in winter is dominated by intense anti-cyclonic belts generating strong winds, predominantly from the east to south-east, and infrequent rain. Summer winds are more variable, with south-westerly winds being the most common. Tropical cyclones typically occur in the region three to four times per year, bringing strong winds, heavy rain and high seas. These cyclones are unpredictable in occurrence, intensity and behaviour, but are most common between December and March.

Biological Environment

A benthic habitat survey conducted within the survey area in water depths of 70 – 250 m found that the majority of the survey area is comprised of soft substrate, with limited areas of hard substrate, which supported sparse (1-2%) to occasional (2-10%) coverage of benthic sessile invertebrates, including soft corals, sponges and gorgonians (Chevron Australia 2005). These substrates were not thought to support any ecologically isolated, sensitive, unique or significant habitats. Benthic biological activity was found to be limited due to the low light availability at depth and limited exposed hard substrates with low coverage of benthic sessile invertebrates (Chevron Australia 2005). Beyond these depths, benthic fauna are likely to be sparse and limited to burrowing infauna and sparse epifauna.

Some marine migratory species with broad distributions such as cetaceans, fish, sharks, marine turtles and seabirds may traverse the survey area, at least on occasion. *The Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Database lists 14 Migratory and eight Threatened species that could occur in the area.

These include:

- One bird species
- Seven cetacean species
- Five turtle species
- Three shark species

The Threatened and Migratory species listed above are considered to be widespread throughout the region. The survey area does not contain recognised critical habitat for any Threatened or Migratory cetaceans, marine turtles, fish, sharks or birds. The seismic survey has been scheduled to avoid the peak humpback whale migration period (late August and early September) and the annual whale shark aggregation (between March and July) at Ningaloo Marine Park, approximately 210 km to the south of the survey area. Due to the timing of the seismic survey, the depths of the survey area and its distance from

recognised areas of importance (migration, feeding, breeding and resting) for cetacean species and whale sharks, impacts are not anticipated.

Migration and nesting activity of all species of marine turtles in WA generally occurs between September and April. The survey area does not contain any emergent land or shallow subtidal features, which is a requirement for turtle nesting and feeding. The nearest sites of known turtle breeding or feeding importance are located approximately 40 km to the south-east of the survey area at the Montebello Islands and 70 km south at Barrow Island. It is therefore expected that only a few individuals may occur in the survey area during the period of operations.

Socio-Economic Environment

The offshore region of the NWS supports petroleum exploration and production, shipping, and low levels of commercial fishing. Recreational or game fishing is also known to occur within the region.

Petroleum

The petroleum exploration and production industry is a significant stakeholder in the region. The petroleum industry has developed major production facilities on Thevenard Island, Airlie Island, Barrow Island and Varanus Island. The nearest land-based production facility is on Barrow Island, 70 km south of the survey area.

There are a number of petroleum exploration and development activities in the area. These include the Pluto gas field, located adjacent to the survey area in WA-43-L, and the Pluto-A Riser Platform, located within the survey area and subject to a standard 500 m exclusion zone. The Pluto pipeline also passes through the southern extent of the survey area, at water depths of approximately 80 m to 200 m. The North West Shelf Venture, Australia's largest resource project, includes production from five major oil and gas fields and a number of smaller fields, the nearest approximately 30 km to the east of the survey area.

Fisheries

Consultation with the Australian Fisheries Management Authority (AFMA) indicated that several Commonwealth managed fisheries are also permitted to fish in or adjacent to the survey area, including:

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

Consultation with AFMA indicated that although the above fisheries are permitted in the survey area, actual fishing activity in the vicinity of the survey area has only been reported from Commonwealth licensed operators for the North West Slope Trawl Fishery (NWSTF) for the period 2008-2010. There are currently seven fishing permits in this fishery. Due to the very large area in which this fishery operates, and the small number of fishing permits, it is unlikely that interactions between fishing vessels the seismic operations will be significant during the survey period.

AFMA also confirmed that the managed Southern Bluefin Tuna Fishery (SBTF) does not occur in the survey area. However, SBT spawning occurs to the north of the survey area. The spawning region spans between 7°S and 20°S, occurring from September to April, with peak spawning occurring from December through to March. SBT are highly migratory and widely distributed throughout waters of the southern oceans. Migrating adult SBT and juveniles transported with the Leeuwin Current may pass through survey area during the period of operations; however due to the mobility of this species and the transitory nature of the seismic survey, impacts to the fishery are not anticipated.

The State managed West Coast Deep Sea Crab Fishery is permitted to operate in waters within and adjacent to the survey area. The West Coast Sea Crab Fishery operates in depths of 150–1,200 m with the only allowable method for capture being baited pots (traps). There are currently seven permits operating in the fishery. Due to the remote location of the survey area, the very large area in which this fishery operates, and the small number of fishing permits, it is expected that fishing effort within the survey area is extremely low.

The Onslow Prawn Managed Fishery extends in all WA waters eastward of 114°39.9'E on the landward side of the 200 m isobath. However, areas trawled in 2009 are confined to nearshore areas (<50 km from the shoreline) (Fletcher and Santoro 2010), distant from the survey area.

The North Coast Demersal Fishery includes the Pilbara Trap Managed Fishery and the Pilbara Line Fishery. The Pilbara Trap Managed Fishery lies north of latitude 21°44'S and between 114°9.6'E and 120°E on the landward side of the 200 m isobath and seaward of the 30 m isobath. The primary target species are red emperor and goldband snapper. There are 6 licences in the fishery, consolidated onto 2 vessels. The Pilbara Line Fishery allows boat licensees to operate anywhere within Pilbara waters (west of the North West Cape and north to longitude 120°E). Licence holders are permitted to fish for any 5 months period within the year. Fishing effort in the survey area for these fisheries is expected to be low.

The survey area lies within the Mackerel Managed Fishery in the Pilbara (Area 2), between 114°E and 121°E. Fishing methods are restricted to trolling and handlining. There are 22 permits issued for Area 2, operating on 7 boats. The majority of the catch for the mackerel fishery is taken in the Kimberley region (Fletcher and Santoro 2010), with operations generally located around reefs, shoals and headlands. As a result, fishing effort in the vicinity of the survey area is likely to be low (J. Lloyd, Department of Fisheries, pers. comm., 29 June 2011).

Marine Protected Areas

There are no marine protected areas within the survey area. The nearest marine protected areas are the Montebello Islands Marine Park and the Barrow Island Marine Park, located within the Montebello/Barrow Island Marine Conservation Reserve approximately 35 km to the south-east of the survey area.

The closest World Heritage Site is the Ningaloo Coast World Heritage Area, approximately 200 km south-west of the survey area. The closest National Heritage Place is the Dampier Archipelago, located approximately 130 km south-east of the survey area.

Shipping

Shipping traffic occurs in the region, with vessels transiting between WA and the Ombai Strait; however traffic along this route is very low (J. Bond, AMSA Officer, pers. comm. 4 July 2011). Traffic density analysis mapping for the period March to July 2011 carried out by AMSA 2011 concluded that areas of relatively high traffic are associated with existing oil and gas facilities around the survey area, such as the Pluto-A Riser Platform and recent exploration well Xeres-1 in an adjacent permit, with otherwise low shipping densities in the rest of the survey area. There are no bathymetric features or other navigational hazards in the area that would restrict ships avoiding the seismic vessel.

Major Environmental Hazards and Controls

A risk analysis was undertaken for all aspects of the seismic survey, in accordance with the procedures outlined in the Australian and New Zealand Standards (AS/NZS ISO 31000:2009) (Risk Management) and HB 203:2006 (Environmental Risk Management), and based on the Chevron Integrated Risk Prioritization Matrix. The risk analysis has enabled to determine likelihood and severity of risks associated with the seismic survey and to evaluate the resultant environmental risks and effects (Table 2).

The risk analysis indicates that the risk of significant adverse environmental impacts from the seismic survey is low and likely effects are limited to:

- temporary and localised increase in ambient underwater noise levels as a result of acoustic discharges and associated effects on the behaviour of sensitive marine fauna
- temporary and localised changes in water quality from routine discharges of grey water, sewage and putrescible wastes during the seismic survey
- collision with a turtle or cetacean
- disruption of other users of the marine environment, particularly support vessels associated with the Pluto-A Riser Platform.

These sources of potential impacts to the marine environment are limited due to the duration, scale and intensity of the seismic survey. The ecological, social and economical consequences of the seismic survey are expected to be negligible. Furthermore, the Standard Management Procedures contained in EPBC Act Policy Statement 2.1 - Guidelines for Interactions between Offshore Seismic Exploration and Whales (DEWHA 2008), will be implemented throughout the seismic survey.

Management Approach

The environmental management approaches relevant to key aspects of the seismic survey and the residual risk after management implementation are summarised in Table 2. The seismic survey will be conducted in accordance with all legislative and regulatory requirements. Chevron's overall environmental objective for the program is to avoid or minimise environmental risks to as low as reasonably practicable (ALARP).

Table 2: Summary of Potential Major Environmental Risks and Management Approach

Hazard/ Incident	Potential Environmental Effect	Risk and Management Approach
Underwater noise as a result of acoustic discharges.	Physiological damage or disruption to behaviour patterns of sensitive marine fauna.	Low risk. Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) EPBC Act Policy Statement 2.1 Standard Management Procedures (DEWHA 2008) implemented throughout seismic survey.
Routine discharges of grey water, sewage and putrescible wastes.	Temporary and localised changes in water quality (e.g. nutrient enrichment). Adverse effects on marine life. Localised reduction in benthic productivity.	Low risk. Adhere to vessel specific waste management procedures and MARPOL 73/78. Maceration of waste to <25 mm prior to discharge. Offshore discharge only when >12 nautical miles from shore. Approved onboard sewage treatment plant. Biodegradable detergents only.
Collision or entanglement with a turtle or cetacean.	Injury or death of a Threatened species (turtle, cetacean or whale shark).	Low risk. DSEWPaC EPBC Act Policy Statement 2.1 Standard Management Procedures (DEWHA 2008) implemented throughout seismic survey. Death or injury of a listed species reported to the Secretary within seven days.
Displacement of other users of the marine environment.	Potential disruption of commercial fishing/shipping activity.	Low risk. Notice to Mariners Issued. Risk of disruption to fishing and shipping activities reduced by stakeholder liaison. Simultaneous Operations (SIMPOS) Plan will be developed to ensure that interactions are minimised.

Consultation

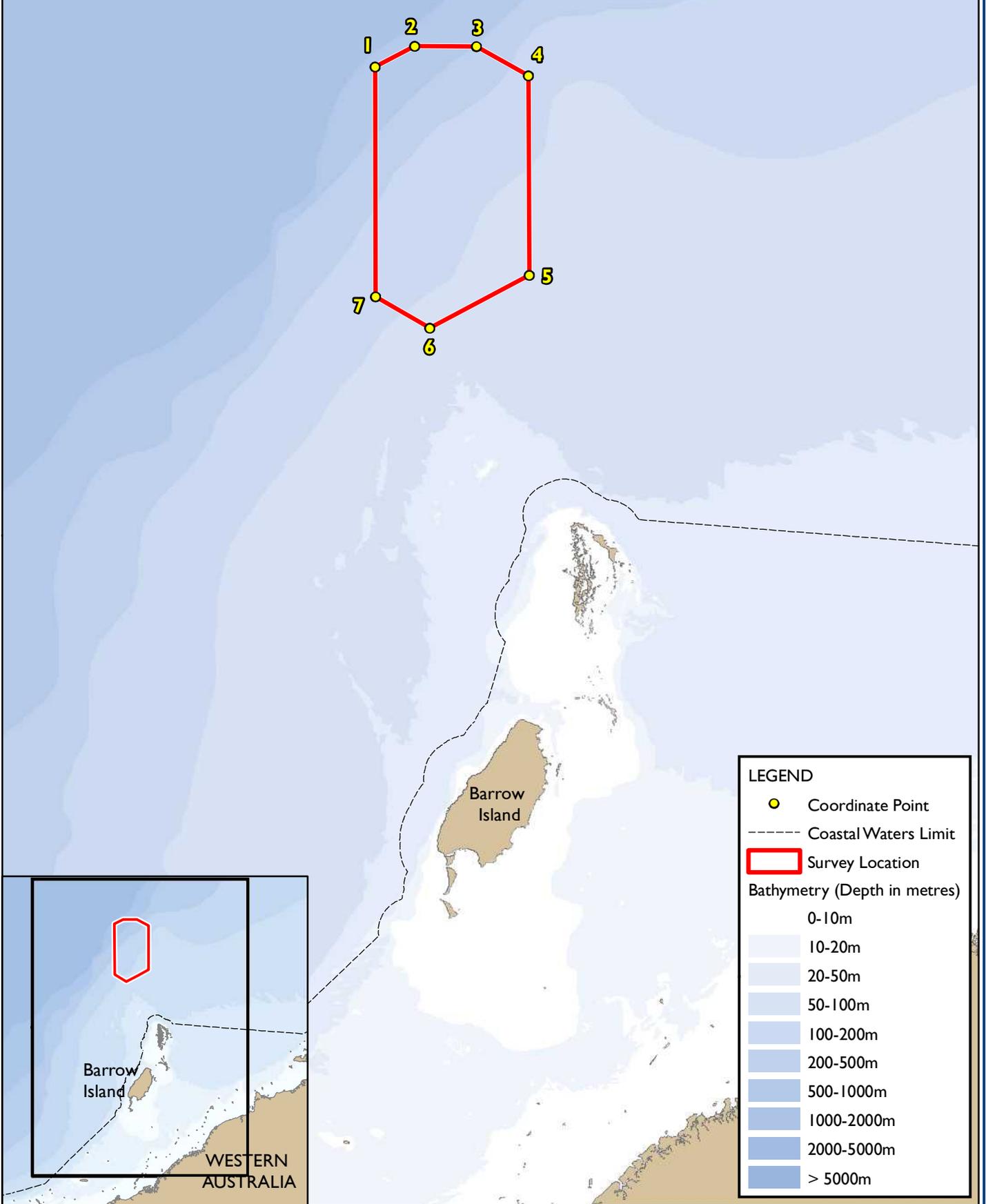
Consultations regarding the seismic survey have been undertaken with relevant stakeholders, including:

- Australian Fisheries Management Authority (AFMA).
- Australian Maritime Safety Authority (AMSA).
- Commonwealth Department of Defence.
- Commonwealth Fisheries Association (CFA).
- Australian Southern Bluefin Tuna Industry Association (ASBTIA).
- Western Australia Department of Fisheries (DoF).
- Western Australian Fishing Industry Council (WAFIC).
- A. Raptis and Sons.
- JAMAACLAN Marine Services.
- Recfishwest.
- TunaWest.
- Western Australia Seafoods.
- Northern Fishing Companies Association.

Contact Details

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Point	Latitude (DMS)	Longitude (DMS)	Easting	Northing
1	19° 39' 2.492" S	115° 12' 44.379" E	312567	7826189
2	19° 37' 6.020" S	115° 16' 22.457" E	318884	7829836
3	19° 37' 8.588" S	115° 22' 6.828" E	328918	7829856
4	19° 39' 51.882" S	115° 26' 54.925" E	337358	7824913
5	19° 58' 30.106" S	115° 26' 59.571" E	337809	7790532
6	20° 3' 25.041" S	115° 17' 46.761" E	321830	7781307
7	20° 0' 29.392" S	115° 12' 45.788" E	313027	7786617



LEGEND

- Coordinate Point
- Coastal Waters Limit
- Survey Location

Bathymetry (Depth in metres)

- 0-10m
- 10-20m
- 20-50m
- 50-100m
- 100-200m
- 200-500m
- 500-1000m
- 1000-2000m
- 2000-5000m
- > 5000m