



LION 2D MARINE SEISMIC SURVEY ENVIRONMENT PLAN: PUBLIC SUMMARY

This summary of the Lion 2D marine seismic survey Environment Plan (EP) has been submitted to the Western Australia Department of Industry and Resources (DoIR) to comply with Regulations 11(7) and 11(8) of the Petroleum (Submerged Lands) (Management of Environment) Regulations 1999.

INTRODUCTION

Chevron Australia Pty Ltd (Chevron) proposes to conduct a 2D marine seismic survey in deep water within and adjacent to Exploration Permit WA-383-P. The survey area is located on the North West Shelf in Commonwealth marine waters approximately 140 km from the mainland of Western Australia.

COORDINATES OF THE PETROLEUM ACTIVITY

The seismic survey will take place in Commonwealth marine waters within and adjacent to Exploration Permit WA-383-P (Figure 1). The survey area is bounded by the coordinates listed in Table 1.

Table 1: Coordinates of the Proposed Survey Area

Point ID (See Figure 1)	Longitude (East)		Latitude (South)	
	degrees	minutes	degrees	minutes
A	112	52	19	28
B	113	38	19	28
C	113	38	20	36
D	112	52	20	36

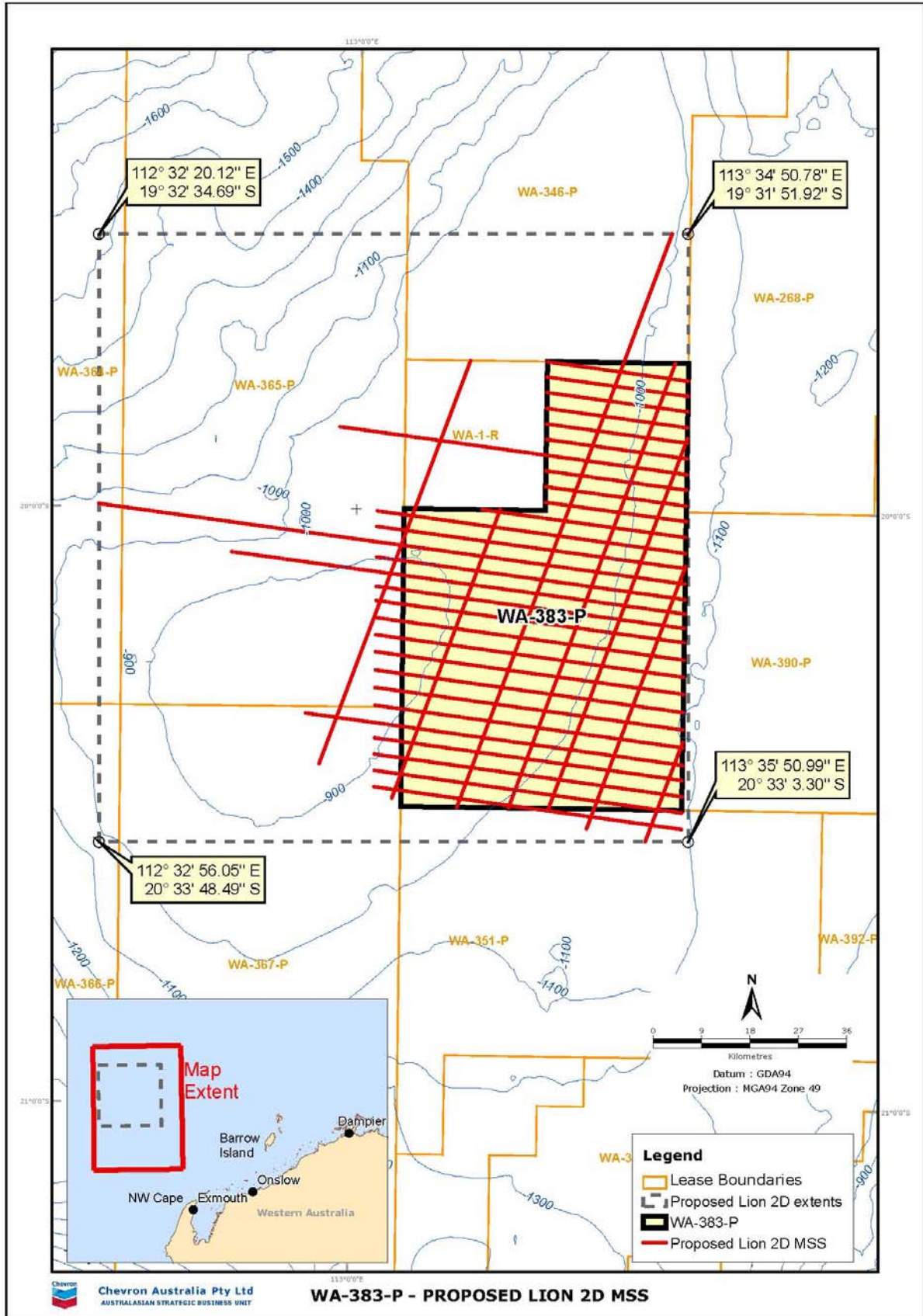


Figure 1: Overview of the Lion 2D Survey Area

DESCRIPTION OF THE ACTION

The seismic survey will map sub-surface geology to ascertain the potential sub-surface oil and gas deposits of the survey area via the acquisition of two dimensional (2D) seismic data.

The survey will be conducted by CGG Veritas (CGGV), a specialist geophysical contractor, using the 'M/V Veritas Voyager', a purpose built seismic survey vessel. The seismic energy source will be provided by a dual-airgun array, towed astern of the vessel at a depth of approximately 5 m and discharged at 25 m shot point intervals. Seismic reflections from subsurface layers will be detected by hydrophones mounted inside a single solid streamer of up to 6 km in length.

The seismic survey is scheduled to commence sometime between late August and September 2008 and take approximately 21 days to complete from the start date. Seismic operations will occur 24 hours per day.

DESCRIPTION OF THE RECEIVING ENVIRONMENT

Physical Environment

The survey area is located on the continental slope of north-western Australia, over 140 km north of the North West Cape. Water depths in the area range from 900 to 1400 m. There are no islands, emergent land or shallow seabed features in the survey area, the nearest landfall being the North West Cape and Muiron Islands, some 140 km south to south-east.

The substrate over the survey area is expected to comprise loose, silty carbonate sands with occasional exposed hard substrate and is likely to be broadly homogenous over extensive areas of similar water depth and distance offshore along the continental slope of the North West Shelf.

Biological Environment

Some marine migratory species with broad distributions such as cetaceans, fish, sharks, sea turtles and seabirds may traverse the survey area, at least on occasion. The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) lists six threatened/migratory and four other migratory species that could occur in the area. These species are discussed in the following. The survey area does not contain recognised critical habitat for any threatened or migratory species.

Cetaceans

Several species of whale and dolphin are known to frequent the waters of the North West Shelf, including the blue whale (*Balaenoptera musculus*) listed as endangered and the humpback whale (*Megaptera novaeangliae*) listed as vulnerable under the EPBC Act.

The humpback is the most common whale species in the region, and migrates annually between its summer feeding grounds in the cold waters of Antarctica to its winter breeding and calving grounds in the sub-tropical and tropical inshore waters of north-western Australia. The peak of the northbound migration passes Barrow and Montebello Islands (175 km to the south-east of the survey area) around the end of July, the southbound peak occurs between late August and early September, although the exact timing of migration may vary by up to three weeks.

The survey area is outside (seaward) of the main humpback migration routes and distant (>140 km) from known feeding, breeding and resting areas. The likelihood of encountering significant numbers of humpback whales during the survey is therefore low.

Blue whale migration patterns are similar to the humpback, with the species feeding in mid to high latitudes (south of Australia) during the summer months and mating and breeding in temperate/tropical waters for the winter. Blue whales tend to be more widely dispersed and rarely present in large numbers outside aggregation areas. The survey area does not include any recognised blue whale migratory routes or known feeding, breeding or resting areas, hence the likelihood of encountering significant numbers of blue whales during the survey is low.

Four other whale species listed as migratory species under the EPBC Act may occur in the survey area on occasion; the Antarctic minke (*Balaenoptera bonaerensis*), Bryde's (*Balaenoptera edeni*), killer (*Orcinus orca*) and the sperm whale (*Physeter macrocephalus*). Given their widespread distributions and the absence of particular bathymetric features in the area, the survey area is unlikely to represent an important habitat for any of these species.

Marine turtles

Five species of sea turtle may occur in the survey area; green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), hawksbill (*Eretmochelys imbricata*), flatback (*Natator depressus*) and loggerhead (*Caretta caretta*), all of which are listed as threatened and migratory under the EPBC Act.

Sea turtles, particularly green turtles, undertake extensive migrations and low numbers of individuals may transit the survey area. Migration and nesting activity generally occurs between September and April. The survey area does not contain any emergent land or shallow subtidal (reef) features and the nearest areas of known turtle breeding or feeding importance are located 175 km to the south-east. Given the distance from emergent land, it is expected that only very low numbers of marine turtles may occur in the area during the survey.

Birds

The southern giant petrel (*Macronectes giganteus*) is listed as Endangered under the EPBC Act and may be found in the survey area. The southern giant petrel breeds in sub-Antarctic waters during the summer, while in winter most disperse north from 50°S to the Tropic of Capricorn and sometimes beyond. The Tropic of Capricorn is located some 300 km south of the survey area, hence the southern giant petrel is not expected to be present in significant numbers during any time of the year.

Benthic Habitats

The biological productivity of the benthic environment is expected to be limited due to low nutrient availability and limited extent of exposed hard substrates. The water depths preclude photosynthetic benthic habitats that might have significance as fauna habitat, such as coral reefs or seagrass/algae communities.

The seafloor is likely to comprise predominantly unconsolidated soft sediments inhabited by sparse communities of relatively larger benthic species (urchins, seastars and crustaceans). Infaunal communities are likely to be comprised of smaller burrowing invertebrates. Any areas of exposed hard substrate that occur may support more diverse assemblages, including deep water filter feeding organisms, such as hydroids and sponges.

The deep offshore environment of the survey area is typical of wide expanses of the continental slope and is not expected to represent habitat of particular significance for any macrofauna.

Socio-Economic Environment

The North West Shelf region is subject to extensive petroleum exploration and production activities, shipping, and low levels of commercial fishing.

Consultation with Commonwealth and State fishing authorities and commercial operators indicate that fishing activity in the survey area is likely to be low. No tourism, recreational or game fishing is known for the area.

Low levels of commercial shipping is known to traverse the survey area, however, there are no bathymetric features or other navigational hazards in the area that will restrict ships avoiding the seismic vessel.

The nearest conservation reserves include the Barrow Island Marine Management Area, Muiron Islands Nature Reserve and the Ningaloo Marine Park, which are over 155 km south to south-east of the survey area. These areas are not likely to be affected by the proposed action.

MAJOR ENVIRONMENTAL HAZARDS AND CONTROLS

Risk analysis has been used to characterise risk likelihood and severity and to evaluate the environmental risks and effects, as summarised for key aspects in Table 2.

Given the water depth and absence of shallow bathymetric features, distance from shore, separation from recognised cetacean migratory routes, and the management requirements for all environmental aspects of operations, the risk of significant adverse environmental effects from the seismic survey is low.

Table 2: Summary of Environmental Risks and Management Approach for Key Aspects of the Survey

Hazard/ Incident	Potential Hazard Consequence	Risk and Management Approach
Acoustic impulse from air-guns during seismic operations.	Physiological damage or disruption to behaviour patterns of sensitive marine fauna.	Low risk. Short duration of survey. Implementation of DEWR (now DEWHA) Guidelines for Interactions Between Offshore Seismic Exploration and Whales.
Diesel fuel loss during transfer	Potential acute/chronic toxic effects on marine organisms from hydrocarbon loss.	Low risk. Refuelling is not expected during the survey. Strict adherence to Vessel refuelling guidelines and procedures. Approved Oil Spill Contingency Plan.
Chemical spill runoff to sea	Potential localised and temporary acute toxic effects.	Low risk. All materials stored and handled in accordance with relevant procedures and MSDS. Absorbent materials available onboard.
Discharge of oily bilge water	Potential localised and temporary acute toxic effects.	Low risk. All bilge water passes through an oil/water separator prior to discharge at <15 ppm.
Diesel loss through rupture of vessel fuel tanks	Acute/ chronic toxic effect on marine organisms from hydrocarbon loss.	Low risk. Refuelling is not expected during the survey. Strict adherence to Vessel refuelling guidelines and procedures. Approved Oil Spill Contingency Plan.
Quarantine-Introduction of exotic marine species	Alteration to community composition and function – competition with indigenous species.	All vessels will comply with Australian quarantine laws. Ballast exchanges conducted outside the Australian 12 nm limit.

MANAGEMENT APPROACH

The Lion 2D marine seismic survey will be conducted in accordance with all legislative and regulatory requirements, to the satisfaction of the DoIR. Chevron's overall environmental objective for the programme is to avoid or minimise environmental risks to as low as reasonably practicable (ALARP). The environmental management approaches relevant to key aspects of the seismic acquisition programme are summarised in Table 2.

CONSULTATIONS

Consultations regarding exploration activity in and around Permit area WA-383-P have been undertaken with relevant stakeholders, including:

- Australian Fisheries Management Authority (AFMA)
- Western Australian Department of Fisheries, (DoF)
- Western Australian Northern Trawl Owners Association (WANTOA)
- Northern Fishing Companies Association
- Commonwealth Fisheries Association (CFA)
- Western Tuna and Billfish Fishery (WTBF)
- Southern Bluefin Tuna Fishery (SBF)
- Western Deepwater Trawl Fishery (WDT)
- Western Skipjack Fishery
- Western Australian Fishing Industry Council (WAFIC)
- Australian Maritime Safety Authority (AMSA)
- Austral Fisheries Pty Ltd
- Australian Southern Bluefin Tuna Industry Association
- TunaWest
- RecFishWest
- A Raptis and Sons

These consultations have indicated that conflicts with other users of the area are unlikely as commercial and recreational fishing activity in the area is absent or at low levels, no commercial tourism activity occurs in the vicinity of the survey area and no sensitive environmental resources are known for the survey area.

FURTHER DETAILS

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