

CNOOC EP Summary

This summary of the CNOOC 3D 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

CNOOC Australia Exploration & Petroleum Pty Ltd (CNOOC) proposes to conduct a 3D marine seismic survey in deep water within and adjacent to Exploration Permit WA-406-P. The survey area is located on the continental shelf of north-western Australia in Commonwealth marine waters approximately 250 km from the mainland of Western Australia.

Coordinates of the Proposed Activity

The seismic survey will take place in Commonwealth marine waters within and adjacent to Exploration Permit WA-406-P (Figure 1). The survey area is bounded by the coordinates listed in Table 1 and will cover a total area of approximately 1000 km².

Table 1 Coordinates of the Proposed Survey Area (GDA 94)

| Location Point | Latitude (South) | | | Longitude (East) | | |
|----------------|------------------|---------|---------|------------------|---------|---------|
| | Degrees | Minutes | Seconds | Degrees | Minutes | Seconds |
| 1 | 11 | 7 | 8.004 | 126 | 7 | 53.328 |
| 2 | 11 | 7 | 13.656 | 125 | 58 | 40.656 |
| 3 | 10 | 53 | 58.848 | 125 | 51 | 43.776 |
| 4 | 10 | 53 | 42.612 | 126 | 15 | 49.752 |
| 5 | 11 | 15 | 13.392 | 126 | 29 | 0.564 |
| 6 | 11 | 15 | 26.64 | 126 | 12 | 15.516 |

Description of the Proposed Activity

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 three dimensional (3D) seismic data.

The survey will be conducted by Petroleum Geo-Services (PGS), a specialist geophysical contractor, using the 'M/V Orient Explorer', a purpose built seismic survey vessel. A support/scout vessel, operating out of Broome, will be employed for logistical, safety and equipment management support.

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 intervals of approximately 10 seconds. Seismic reflections from subsurface layers will be detected by hydrophones mounted in four solid streamers of up to 6 km in length.

The seismic survey is scheduled to commence in mid to late February 2008 and take approximately 60–90 days to complete. Seismic operations will occur 24 hours per day.

Description of the Receiving Environment

Physical Environment

The proposed survey area is located in the outer Joseph Bonaparte Gulf, on the continental shelf in water 30 to 250 m deep. The seabed shelves gently offshore and there are no significant or shallow seabed features apparent.

The climate in the Joseph Bonaparte is tropical monsoon, with a distinct wet summer season (November to April) and dry winter season (May to October). Cyclones are most likely to occur between December and April however most will pass to the north of the survey area, through the Timor Sea.

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 eight threatened and/or migratory species that could occur in the area:

- Blue and humpback whales
- Loggerhead, green, leatherback, hawksbill and flatback turtles
- Whale shark

The survey area does not contain recognised critical habitat for any of the above threatened or migratory species, and the open oceanic conditions are not associated with features such as feeding or breeding grounds that are likely to encourage marine mammals (whales, dolphins, dugong), reptiles (sea turtles or sea snakes) or seabirds to gather in the area.

Benthic Assemblages

The substrate over the survey area is likely to comprise of mainly gravel, sand and clay. The benthic flora and fauna is likely to be limited due to substrate type and light. Infaunal communities are likely to be comprised of smaller burrowing invertebrates, primarily arthropods and polychaete worms. Attached benthic organisms are expected to be sparse and are likely to comprise anemones, sea pens and hydroids.

It is unlikely that algal, sea grass or coral beds are present in the survey area due to the absence of hard substrate, generally high turbidity and the depth of water.

Socio-Economic Environment

The Joseph Bonaparte Gulf region supports low levels of petroleum exploration and development, but there is no existing infrastructure in the survey area.

Consultation with Commonwealth and State fishing authorities and commercial operators indicate that fishing activity in the survey area is low. Levels of tourism, recreational or game fishing is expected to be very low or absent in the area.

The survey area does not lie on any recognised shipping lane or recommended navigation track, but low levels of commercial shipping are expected.

The nearest marine protected areas are Cartier Island Marine Reserve and Ashmore Reef National Nature Reserve approximately 208 km and 320 km west south-west of the survey area respectively; neither area is likely to be affected by the survey.

Major Environmental Hazards and Controls

Risk analysis has been used to characterise risk likelihood and severity and to evaluate the potential environmental risks and effects, as summarised 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 Potential Major Environmental Risks and Management Approach

| 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. Survey scheduled to avoid peak whale migration periods. 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. 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. 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 nautical mile limit. |

Management Approach

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

Consultations

Consultations regarding exploration activity in and around Permit area WA-406-P have been undertaken with relevant stakeholders, including:

- Australian Maritime Safety Authority (AMSA)
- Australian Fisheries Management Authority (AFMA)
- Western Australia Department of Fisheries
- Western Australia Fishing Industry Council
- Commonwealth Fisheries Association
- Recfishwest

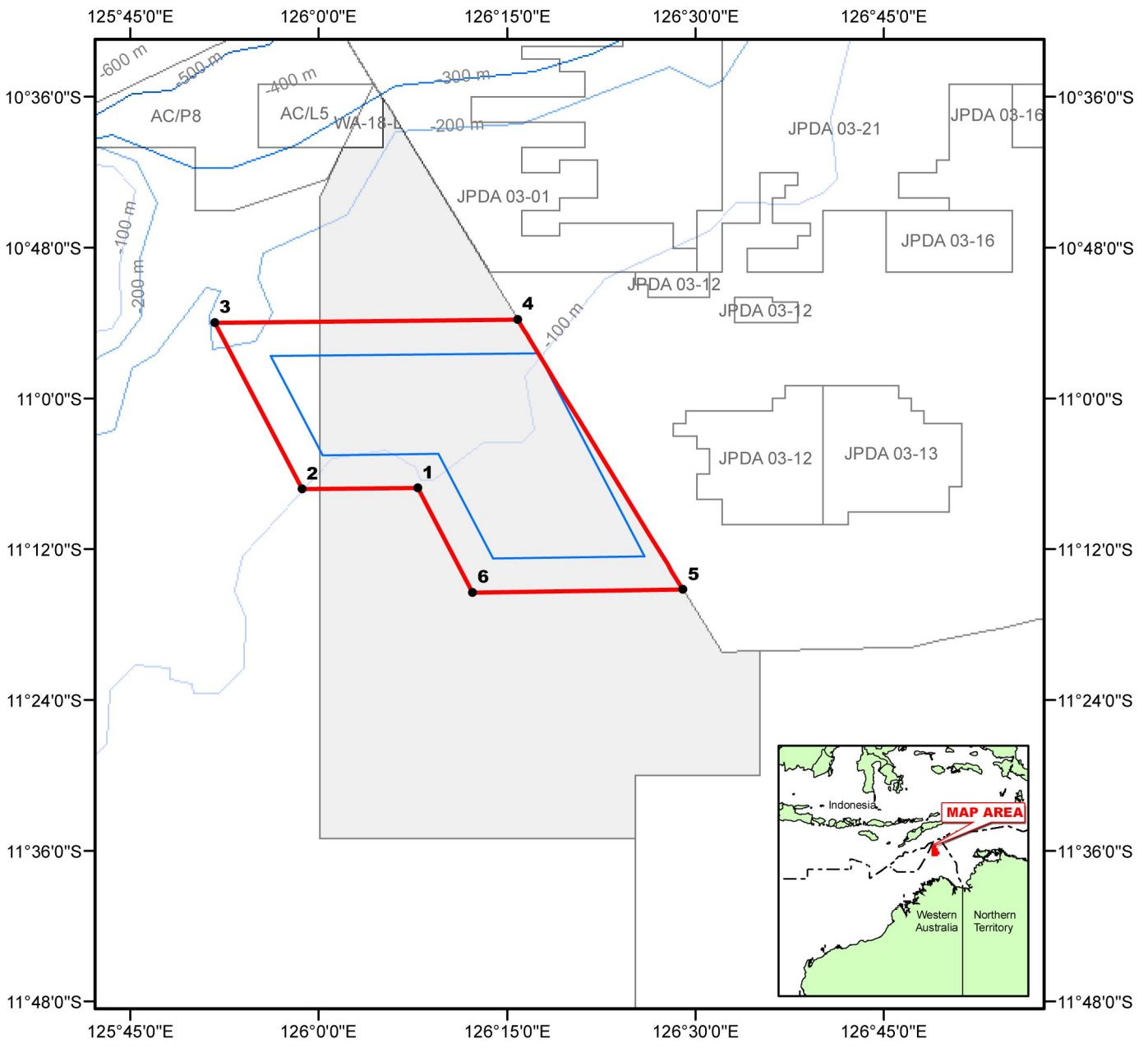
These consultations have indicated that conflicts with other users of the area are unlikely as commercial and recreational fishing activity in the area is absent or at low levels, no commercial tourism activity occurs in the vicinity of the survey area, no major shipping routes are in the vicinity and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

Further Details

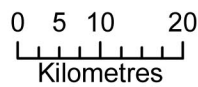
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Datum, GDA94



Legend

- Seismic Survey Area
- Survey Operations Area
- Exploration Permit WA-406-P
- Exploration Permits

Figure 1
Location Map