

**EXMOUTH PLATEAU/GREATER GORGON DEEPWATER DRILLING PROGRAM—*ENSCO 7500* ENVIRONMENT PLAN: PUBLIC SUMMARY**

**First Update with Well Locations – 09 October 2009**

This summary of the Chevron Australia Pty Ltd (Chevron) Exmouth Plateau/Greater Gorgon Deep Water Drilling Program—*ENSCO 7500* Environment Plan has been submitted to the Western Australian Department of Mines and Petroleum (DMP) to comply with Regulations 11(7) and 11(8) of the Petroleum (Submerged Lands) (Management of Environment) Regulations 1999.

**INTRODUCTION**

Chevron proposes to drill up to 20 offshore exploration wells over a two year period from February 2009 to investigate potential gas reserves within the nominally titled Exmouth Plateau and Greater Gorgon areas on the North West Shelf. The Exmouth Plateau area encompasses Petroleum Exploration Permits WA-364-P and WA-365-P and is located approximately 195 km north-west of the North West Cape. The Greater Gorgon drilling area includes Petroleum Exploration Permits WA-268-P R1, WA-374-P, WA 392-P and WA-205-P R3 and Retention Leases WA-18-R, WA-19-R, WA-20-R, WA-22-R, WA-24-R, WA-25-R and WA-26-R, and is situated approximately 70 km north-north-west of Barrow Island.

Drilling will be undertaken by the Dynamically Positioning (DP) drill rig *ENSCO 7500*, which is currently drilling in Australia after being towed from the Gulf of Mexico.

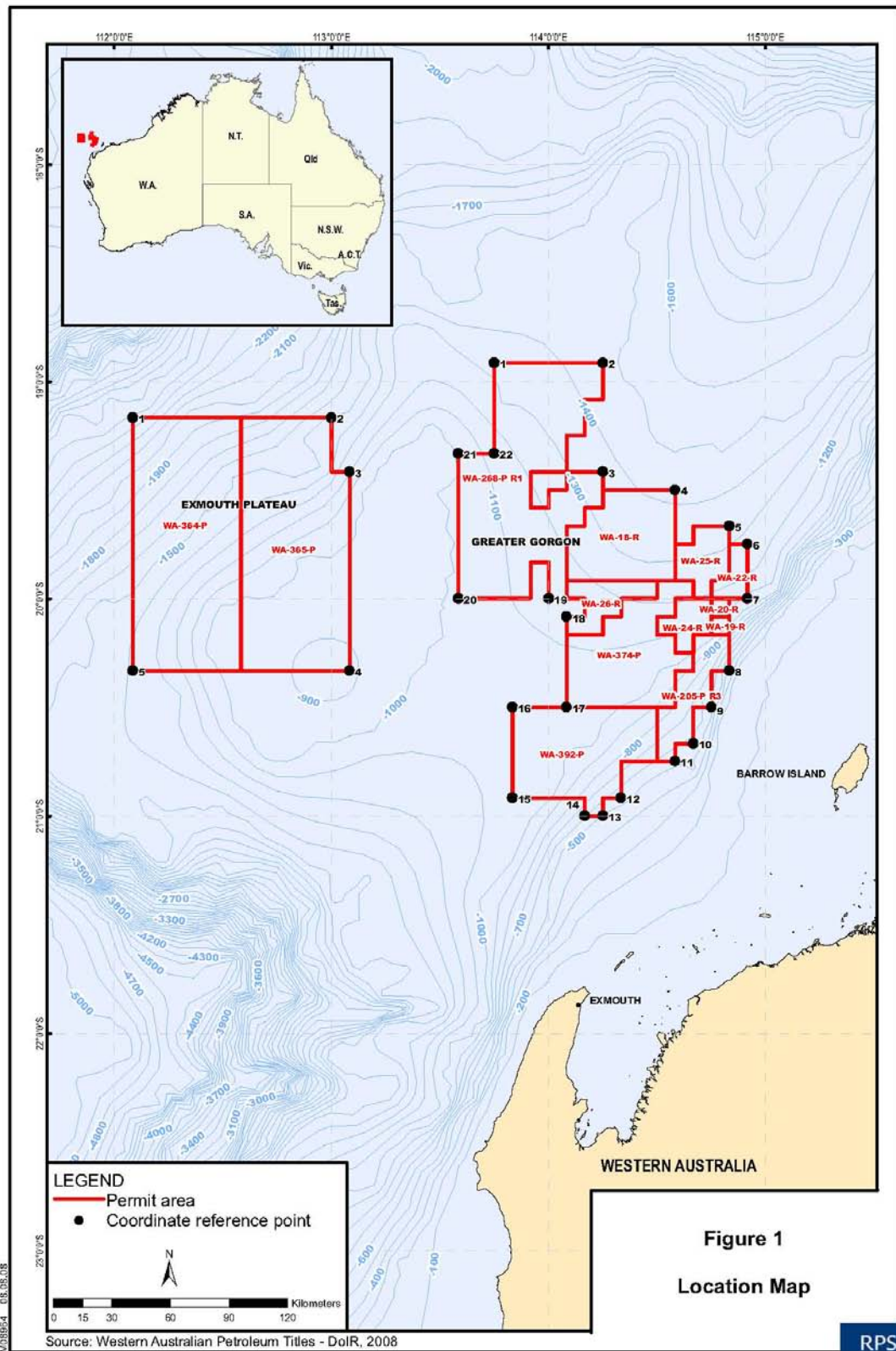
**COORDINATES OF THE PETROLEUM ACTIVITY**

The boundary coordinates for the Exmouth Plateau and Greater Gorgon drilling areas are shown in Table 1 and Figure 1.

Table 1: Boundary coordinates for the proposed drilling areas

Location point	Latitude (south)			Longitude (east)		
	degrees	minutes	seconds	degrees	minutes	seconds
<b>Exmouth Plateau area</b>						
1	19	9	55.497	112	5	5.053
2	19	9	55.468	113	0	5.036
3	19	24	55.472	113	5	5.053
4	20	19	55.480	113	5	5.082
5	20	19	55.509	112	5	5.092
6	19	9	55.497	112	5	5.053
<b>Greater Gorgon area</b>						
1	18	54	55.436	113	45	5.018
2	18	54	55.429	114	15	5.014
3	19	24	55.436	114	15	5.029
4	19	29	55.424	114	35	5.038
5	19	39	55.422	114	50	5.042
6	19	44	55.417	114	55	5.023
7	19	59	55.420	114	55	5.034
8	20	19	55.426	114	50	5.064
9	20	29	55.435	114	45	5.061
10	20	39	55.443	114	40	5.059
11	20	44	55.446	114	35	5.082
12	20	54	55.461	114	20	5.089
13	20	59	55.460	114	15	5.086
14	20	59	55.464	114	10	5.077
15	20	54	55.476	113	50	5.096

Location point	Latitude (south)			Longitude (east)		
	degrees	minutes	seconds	degrees	minutes	seconds
16	20	29	55.464	113	50	5.082
17	20	29	55.456	114	5	5.078
18	20	4	55.444	114	5	5.064
19	19	59	55.449	114	0	5.054
20	19	59	55.464	113	35	5.067
21	19	19	55.452	113	35	5.046
22	19	19	55.441	113	45	5.032



Preliminary drilling locations have been identified for five of the (approximately) 20 wells (Table 2); the locations for the remaining wells are dependant on further geological interpretation.

Table 2: Well locations (first 5 wells)

Well	Latitude (south)			Longitude (east)		
	degrees	minutes	seconds	degrees	minutes	seconds
Achilles-1 (previously Argonaut-1)	20	12	54.830	114	82	13.706
Satyr-1	20	25	51.235	114	20	33.866
Yellowglen-1	19	41	37.22524	113	55	04.88325
Chandon-2	19	32	59.085	114	07	47.787
Geryon-2	19	57	12.438	114	52	43.64

## DESCRIPTION OF THE ACTION

Chevron proposes to drill up to 20 offshore exploration wells during 2009 and 2010 to investigate potential gas reserves within the nominally titled Exmouth Plateau and Greater Gorgon areas (see above). Drilling will be undertaken by the DP drill rig *ENSCO 7500*, which arrived in Australia from the Gulf of Mexico in March 2009. It is anticipated that each well will take between 30 and 40 days to complete, including relocation between sites.

At the completion of drilling, the wells will be abandoned in accordance with the requirements of the *Petroleum (Submerged Lands) Act 1967* and industry best practice.

## DESCRIPTION OF THE RECEIVING ENVIRONMENT

### Physical Environment

The Exmouth Plateau and Greater Gorgon areas are located on the continental slope of north-western Australia in water depths ranging from 300 to 1500 m. The Exmouth Plateau area is approximately 195 km north-west of the North West Cape and the Greater Gorgon area is approximately 70 km north-north-west of Barrow Island; there are no islands, emergent land or shallow seabed features in the areas.

The substrate over the areas is expected to comprise loose, silty carbonate sands and soft muds 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 shelf of Western Australia.

### BIOLOGICAL ENVIRONMENT

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

Some marine migratory species with broad distributions, such as cetaceans, fish, sharks, marine turtles and seabirds, may traverse the areas, at least on occasion. Seven species listed as Threatened and Migratory and four other listed Migratory species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) could occur in the area (DEWHA, 2008). However, the Permit areas do not contain recognised critical habitat for any Threatened or Migratory fish, sharks, marine turtles, cetaceans or seabirds.

Further detail regarding the main fauna groups that might occur in the area is provided in the following.

### Fish

A number of sharks and pelagic finfish, including mackerels, tunas and billfishes, occur in the waters of the North West Shelf and would be expected to occur in the area of the drilling. The deep offshore environment of the Permit areas is typical of the continental slope of north-western Australia and is not expected to represent habitat of particular significance to sharks and finfish.

### Marine Turtles

Three species of marine turtle may occur in the Permit areas, these being the green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*) and flatback (*Natator depressus*) turtles, all of which are listed as Vulnerable under the EPBC Act.

Significant numbers of any turtle species are not expected at any given drilling location during operations.

### Cetaceans

Several species of whale are known to frequent the waters of the North West Shelf, including the blue whale (*Balaenoptera musculus*), which is listed as Endangered, and the Humpback whale (*Megaptera novaeangliae*) which is listed as Vulnerable under the EPBC Act. The southern right whale (*Eubalaena australis*) is also listed as Endangered under the EPBC Act and was identified in EPBC Act Protected Matters database (DEWHA, 2008) for the area.

The humpback whale, which is the most common whale species in the region, migrates between Antarctic waters and the Kimberley each winter to mate and breed. The northbound migration passes Barrow Island and the Montebello Islands (70 km south-east of Permit area WA-205-P) from June to mid August and the southbound migration occurs between mid September until the end of November, although the exact timing of migration may vary by up to three weeks (Jenner *et al.*, 2001). The northbound migration tends to be on or within the 200 m bathymetric contour, with southbound whales more dispersed (Jenner *et al.*, 2001) and a significant component, including most cow-calf pairs, remaining closer to the coast.

The Permit areas are mostly outside (seaward) of the main migration routes and are more than 50 km distant from the nearest known whale aggregation area, located in Exmouth Gulf. A small portion of the south-eastern corner of one of the proposed drilling areas overlaps the recognised humpback whale migration route through the region. However, none of the drilling sites within the area are expected to fall along the migration route. Water depths in this area (i.e. along the 200 m bathymetric contour) are shallower (i.e. <500 m) than those in which the *ENSCO 7500* will operate.

Blue whale migration patterns are similar to the humpback, with the species feeding in mid-high latitudes (south of Australia) during the summer months and migrating to temperate/tropical waters in the winter for mating and breeding. However, the blue whale tends to be more widely dispersed in its migration and rarely presents in large numbers outside aggregation areas, the nearest of which is located approximately 1,200 km to the south at the Perth Canyon (DEH, 2005). The Permit areas do not include any recognised blue whale migratory routes or known feeding, breeding or resting area, hence significant numbers of blue whales are not expected to be present during drilling operations.

Four whales listed as Migratory under the EPBC Act may occur in the proposed drilling area on occasion. These include the Antarctic minke whale (*Balaenoptera bonaerensis*), Bryde's

whale (*Balaenoptera edeni*), killer whale (*Orcinus orca*) and the sperm whale (*Physeter macrocephalus*). Other whale species that have widespread or tropical deep water distributions and may occur in the area include the minke (*Balaenoptera acutorostrata*), melon-headed (*Peponocephala electra*), dwarf sperm (*Kogia simus*) and false killer (*Pseudorca crassidens*) whale. Given their widespread distributions (Reeves *et al.*, 2002) and the absence of particular bathymetric features in the areas to be drilled, the Permit areas are unlikely to represent important habitat for any of these species.

Dolphin species known to occur on the edge and seaward of the continental shelf are the striped (*Stenella coeruleoalba*), Risso's (*Grampus griseus*) and rough-toothed (*Steno bredanensis*) dolphins, although a number of other dolphins (e.g. common, spotted, long-snouted, Fraser's, bottlenose) also occur in the region and could be encountered during the program. None of these species are considered threatened or likely to occur in significant numbers in the Permit areas.

### Birds

The southern giant petrel (*Macronectes giganteus*) is listed as Endangered under the EPBC Act and may be found in the drilling areas. 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 (Environment Australia, 2001). The Tropic of Capricorn is located some 230 km south of the proposed drilling areas and the southern giant petrel is not expected to be present in significant numbers during any time of the year.

There are no important feeding grounds known from the waters of the drilling operations area and given the distance from land, foraging activity in the drilling areas is likely to be low.

### Benthic Assemblages

There is limited information concerning the benthic communities of the proposed drilling areas, due primarily to the remoteness and water depths of the areas. However, the biological productivity of the benthic environment is expected to be limited due to low light availability at depth, low nutrient availability and limited extent of exposed hard substrates.

The seafloor is likely to comprise predominantly unconsolidated soft sediments inhabited by sparse communities of relatively large benthic species (crustaceans, molluscs and sponges). Infaunal communities are likely to be comprised of smaller burrowing invertebrates (Woodside, 2005; Woodside, 2006). Any areas of exposed hard substrate that occur may support more diverse assemblages, including deep water filter feeding organisms, such as hydroids and sponges.

## **Socio-Economic Environment**

The North West Shelf supports extensive petroleum exploration and production activities, however, only limited activity occurs as far offshore as the proposed drilling program. The petroleum industry has developed major production operations on Thevenard, Airlie, Barrow and Varanus Islands. The nearest land based production facility is situated on Barrow Island, approximately 70 km south-east of Permit area WA-205-P.

Consultation with Commonwealth and State fishing authorities and commercial operators indicated that fishing activity in the Permit areas is likely to be low. No tourism or recreational fishing is known for the area.

Commercial shipping is known to traverse the area, however there are no bathymetric features or other navigational hazards in the area that will restrict ships avoiding the drill rig and support vessels.

There are no marine protected areas within the Permit areas. The nearest marine protected areas are the Barrow Island Marine Management Area located approximately 70 km to the south-east and Muiron Islands Marine Management Area, approximately 65 km south of Permit area WA-392-P. These areas are not likely to be affected by the proposed drilling program.

## **MAJOR ENVIRONMENTAL HAZARDS AND CONTROLS**

Risk analysis has been used to determine risk likelihood and severity and to evaluate environmental risks and effects, as summarised in Table 5.

The risk analysis indicates that because of the short term nature of the drilling for each well, coupled with the low volumes of discharges, remote location, water depths and expected high dispersion of cuttings in this water depth, drilling at the well locations is unlikely to have any discernible effect on the environment beyond a small area beneath and adjacent to the drilling rig. The localised nature of the impact and the uniformity of the seafloor and associated biota over broad expanses in the vicinity of the wells suggest that any impacts associated with the drilling program will be insignificant on a regional scale.

**Table 3 Environmental risks and risk management measures**

Aspect (Stressor)	Event/Incident	Potential Environmental Impact	Standard Management/Regulatory Requirements	Risk Level
<b>PLANNED OPERATIONS</b>				
<b>Physical disturbance of seabed</b>	Discharge of cuttings	Smothering of sensitive or ecologically important benthic communities	Cuttings discharge near the surface to maximise dispersion  ROV surveys show that size of cuttings piles near the wellheads are each <450 m <sup>3</sup>	Very Low
	Drilling of wells	Loss of sensitive or ecologically important benthic communities		Very Low
<b>Waste discharges</b>	Discharge of whole drilling fluid	Acute/chronic toxicity effects to marine life  Reduction in water quality leading to adverse effects on marine life	Recycling or return of recovered SBM to shore based storage, no discharge of whole SBM to sea	Very Low
	Discharge of cuttings with adhered drilling fluid	Acute/chronic toxicity effects to benthic communities	Use of cuttings drier to assist with in-water dispersion  <10 % by dry weight of base fluid on discharged cuttings (averaged over each hole section)  Selection of drilling fluids with acceptable toxicity and biodegradation characteristics, as approved by the DMP	Very Low



Aspect (Stressor)	Event/Incident	Potential Environmental Impact	Standard Management/Regulatory Requirements	Risk Level
	Discharge of soapy SBM tank wash	Acute/chronic toxicity effects to benthic communities  Reduction in water quality leading to adverse effects on marine life	Cleaning of SBM tanks with squeegee and vacuum pump to ensure minimal loss of SBM  Selection of drilling fluids with acceptable toxicity and biodegradation characteristics, as approved by the DMP  Recycling water and separation through rig systems where possible	Very Low
	Discharge of hydrate management fluid (glycol and possibly methanol)	Acute/chronic toxicity effects to benthic communities  Reduction in water quality leading to adverse effects on marine life	If required, only very small volumes will be used.	Very Low
	Disposal of domestic (grey water/ sewage/ putrescible galley) wastes	Reduction in water quality leading to adverse effects on marine life	Treat onboard in accordance with P(SL)A Schedule Clause 222 and MARPOL 73/78 prior to discharge	Very Low
	Disposal of solid wastes (garbage)	Reduction in habitat/ water quality from incorrect disposal	Mainland recycling or disposal of wastes in accordance with the Waste Management Plan and MARPOL 73/78	Very Low
	Discharge of cooling water	Effects to marine life from elevation in sea temperature	Rig design	Very Low
	Discharge of oily water	Acute/chronic toxicity effects to marine life	MARPOL 73/78 standard for oily water discharge	Very Low

<b>Aspect (Stressor)</b>	<b>Event/Incident</b>	<b>Potential Environmental Impact</b>	<b>Standard Management/Regulatory Requirements</b>	<b>Risk Level</b>
<b>Physical Interaction</b>	Movement of rig/ support vessels/ helicopter	Disturbance/casualty to sensitive fauna from collision	Rig Move Plan	Very Low
<b>Light spill</b>	Artificial lighting from rig and support vessels	Attraction/deterrence of sensitive marine fauna due to artificial lighting	Lighting as required for safe operational requirements and safety regulations	Very Low
<b>Noise and vibration emissions</b>	Noise from drilling	Disruption to behaviour patterns (attraction/deterrence) of sensitive marine fauna		Very Low
	Noise from rig/ support vessel movements/ positioning	Disruption to behaviour patterns of sensitive marine fauna	Power requirements to maintain station keeping	Very Low
	Noise from helicopter	Behavioural disturbance to sensitive bird species	EPBC Regulation 8.07	Very Low

Aspect (Stressor)	Event/Incident	Potential Environmental Impact	Standard Management/Regulatory Requirements	Risk Level
	Noise from VSP	Disruption to behaviour patterns of sensitive marine fauna	No VSP operations start if cetaceans observed within 3 km of rig within 2 hours prior to soft-start  Soft-start procedures implemented over 20 min  Seismic operations stop if a whale is seen within 500 m of acoustic source  Day-time start for VSP where possible  Night-time VSP (if unavoidable) must be preceded by 2 hours of 'cetacean free' observations during daylight	Very Low
		Physiological damage to sensitive marine fauna	No VSP operations start if cetaceans observed within 3 km of rig  Soft-start procedures implemented over 20 min  Seismic operations stop if a whale is seen within 500 m of acoustic source  Day-time start for VSP where possible  Night-time VSP (if unavoidable) must be preceded by 2 hours of 'cetacean free' observations during daylight	Very Low
<b>Atmospheric emissions</b>	Flaring of hydrocarbons	Reduction in air quality	Use of 'green' type burners and flaring procedures to optimise combustion and minimise potential for fallout	Very Low

Aspect (Stressor)	Event/Incident	Potential Environmental Impact	Standard Management/Regulatory Requirements	Risk Level
	Emissions from engines	Reduction in air quality	Engines maintained in accordance with manufacturer specifications	Very Low
<b>Quarantine</b>	Movement of rig into Australian waters	Introduction of exotic marine species	AQIS (Australian Quarantine Inspection Service) Australian Ballast Water Management Requirements 2001	Low
<b>UNPLANNED OPERATIONS</b>				
<b>Physical disturbance of the seabed</b>	Failure in drilling fluid control system	Smothering of sensitive benthic communities	DoIR (2006)	Very Low
<b>Leaks and spills</b>	Spill of chemical to sea	Acute toxic effects to marine fauna	Procedures and spill contingency. Chemical selection to minimise impact and relatively small volumes.	Very Low
	Failure in drilling fluid control system	Acute toxic effects to marine fauna	DoIR (2006)	Very Low
	Loss of drilling fluid during transfer	Acute toxic effects to marine fauna/reduction in water quality	Restrict procedure to daylight wherever possible  All transfers in accordance with procedures  Reinforced hoses with dry break couplings and safety break away couplings  Continuous monitoring of pressures and flow rates	Very Low

Aspect (Stressor)	Event/Incident	Potential Environmental Impact	Standard Management/Regulatory Requirements	Risk Level
	Loss of diesel during refuelling	Acute toxic effects to marine fauna/reduction in water quality	Strict adherence to rig's refuelling procedure  Operation restricted to daylight wherever possible  Approved OSCP (Oil Spill Contingency Plan)  AMOSC oil spill resources available offsite  Reinforced hoses with dry break couplings and safety break away couplings  Continuous monitoring of pressures and flow rates	Very Low
	Loss of diesel through rupture of support vessel or rig fuel tanks	Acute toxic effects to marine fauna/habitat/reduction in water quality	Approved OSCP  AMOSC (Australian Marine Oil Spill Centre) oil spill resources available offsite  Rig brightly lit and all vessels use navigation lighting at night  Notice to Mariners  Refuelling operations conducted in strict accordance with refuelling procedure  Rig fuel tanks located in-board of ballast tanks and at height that precludes impact from support vessel	Very Low

Aspect (Stressor)	Event/Incident	Potential Environmental Impact	Standard Management/Regulatory Requirements	Risk Level
	Loss of hydrocarbon to sea during flaring	Acute toxic effects to marine fauna/reduction in water quality	Approved OSCP AMOSC oil spill resources available offsite	Very Low
	Loss of well control	Acute toxic effects to marine fauna/reduction in water quality	<i>Offshore Petroleum Act 2006</i> requirement for adequately rated and tested BOPs Approved OSCP AMOSC oil spill resources available offsite	Very Low

## MANAGEMENT APPROACH

The drilling program has been planned and will be implemented in accordance with Chevron's Health, Environment and Safety (HES) management framework for the North West Shelf. This framework ensures a systematic approach to environmental management, with the environmental aspects of each project addressed from project conception, throughout project planning and as an integral component of implementation.

All Chevron operations are managed in accordance with the Chevron Operational Excellence Management System (OEMS), which describes performance standards for each element of operations.

## CONSULTATIONS

Consultations and/or notifications regarding the proposed drilling program have been undertaken with all relevant stakeholders, including:

- Raptis and Sons (commercial fishing company)
- Australian Fisheries Management Authority (AFMA)
- Australian Maritime Safety Authority (AMSA)
- Australian Southern Bluefin Tuna Industry Association
- Commonwealth Fisheries Association (CFA)
- Department of Fisheries, Western Australia
- Department of Defence (Royal Australian Navy)
- Department of Defence (Royal Australian Air Force)
- Recfishwest
- TunaWest
- Western Australian Department of Mines and Petroleum (DMP, formerly Department of Industry and Resources (DoIR))
- Western Australian Fishing Industry Council (WAFIC)
- Western Australian Northern Trawl Owners Association

The consultations have confirmed that:

- Commercial and recreational fishing activity in the area is absent or at very low levels.
- Part of the proposed drilling area overlaps with the main international shipping route between Indonesian and central to southern Western Australian waters; any drilling activity within the shipping route will be conducted in accordance with standard risk reduction measures.

## FURTHER DETAILS

For further information about the exploration drilling program, please contact:

Mr Steve Hassman  
Drilling Manager  
Chevron Australia Pty Ltd  
QV1 Level 37  
250 St Georges Terrace  
Perth WA 6000

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