



2012–2013 Exmouth Plateau/Greater Gorgon Deepwater Drilling Program – Atwood OSPREY

Environment Plan: Summary October 2012

This summary of the 2012–2013 Exmouth Plateau/Greater Gorgon Deepwater Drilling Program – Atwood Osprey Environment Plan ABU120400712 Rev.2 has been submitted to comply with Regulation 11(7) of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009.

1.0 Introduction

Chevron Australia Pty Ltd (Chevron) has been conducting the Exmouth Plateau / Greater Gorgon Deepwater Drilling Program (drilling program) since April 2011. Chevron proposes to extend the current drilling program to include four wells to be drilled in 2012 and 2013 by the semi-submersible drill rig Atwood Osprey. Three wells are proposed to be drilled within the Exmouth Plateau Exploration Permit areas; WA-364-P, WA-365-P and WA-383-P and one well within the Greater Gorgon permit area; WA-268-P (Figure 1.1).

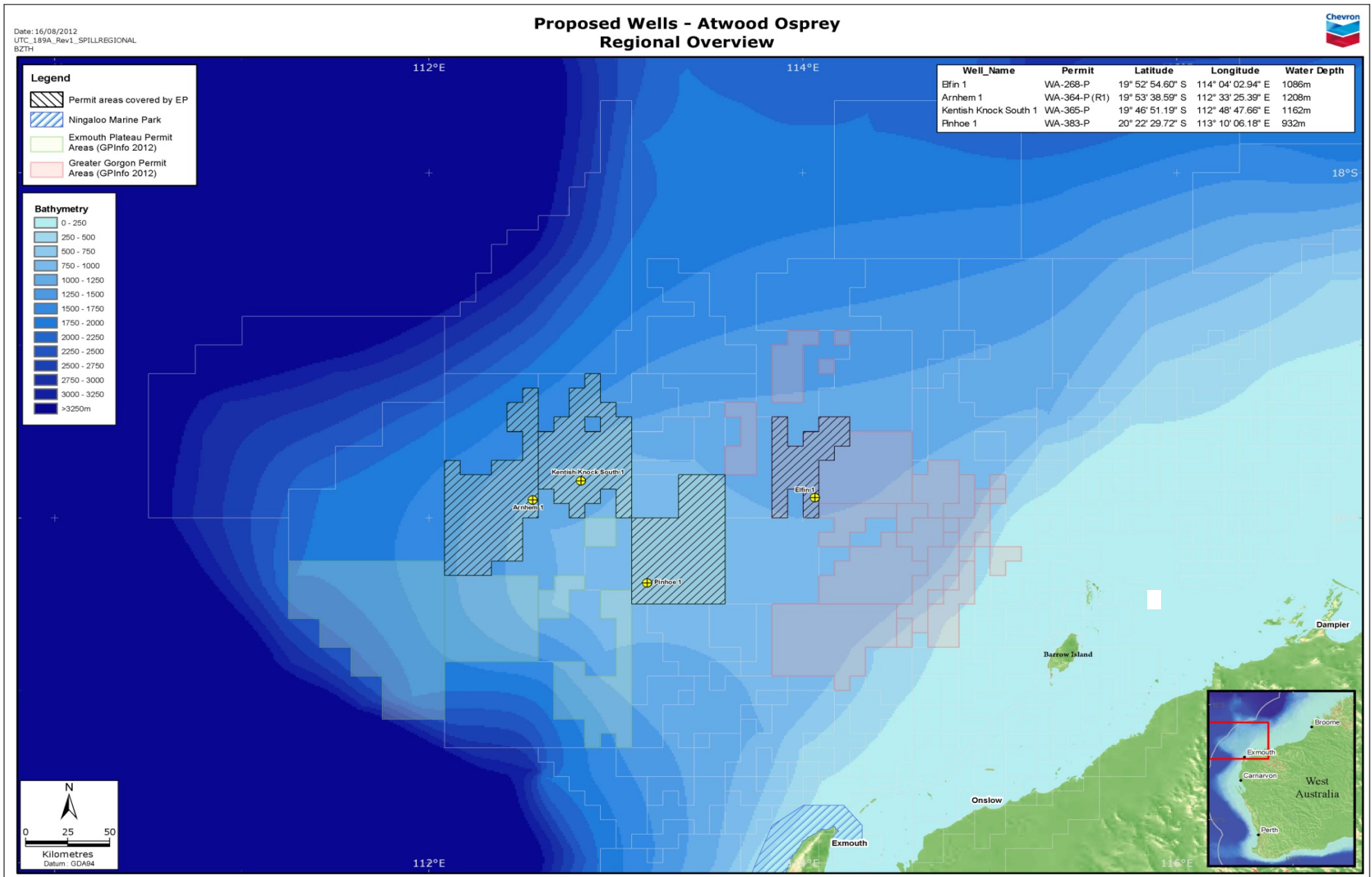
The Exploration Permit and well locations are shown on Figure 1.1 and Table 1.1 provides the coordinates for the following wells:

- Kentish Knock South-1 within Exploration Permit area WA-365-P
- Arnhem-1 within Exploration Permit area WA-364-P
- Pinhoe-1 within Exploration Permit area WA-383-P
- Elfin-1 within Exploration Permit area WA-268-P

Table 1.1: Co-ordinates of well locations

Well	Latitude (south)			Longitude (east)			Water Depth
	Degrees	minutes	seconds	degrees	minutes	seconds	
Elfin-1	19	52	54.60	114	04	02.94	1086 m
Arnhem-1	19	53	38.60	112	33	25.39	1208 m
Kentish Knock Sth-1	19	46	51.19	112	48	47.66	1162 m
Pinhoe-1	20	22	29.72	113	10	06.18	932 m

Figure 1.1: Location of Exploration Permit and Proposed Well Locations



2.0 Activity Description

Drilling will be undertaken using a semi-submersible, moored drilling rig - Atwood Osprey. The rig is supported by two dedicated Anchor Handling, Tug and Supply Vessels.

The four wells will be of a single design, determined primarily by the final well depth and predicted pore pressures. The wells have been designed in accordance with Chevron Standards and accepted industry practices. The wells are to be drilled according to the standards defined in the Well Operations Management Plan (WOMP) currently in place for the exploration program.

The indicative well design to be applied to the wells is described in Table 2.1. The upper sections of the wells (42" and 17 ½" hole sections) will be drilled riserless, using seawater with high viscosity gel sweeps / water based mud (WBM). The lower sections (12¼" and 8 ½" hole sections section) will be drilled with non-aqueous drilling fluid (NADF). The proposed NADF is classed as being low toxicity, is readily biodegradable, and has been previously used for drilling of exploration drilling undertaken by Chevron.

Table 2.1: Well Design, Depth and Drilling Fluid

Hole size		Casing size		Depth below seabed	Length of Hole Section	Volume of cuttings		Drilling Fluid
Inches	mm	Inches	mm	m	m	bbl	m3	
42	1067	36	914	60	60	337	54	Sea water with high viscosity gel sweeps / Water Based Mud
17½	444	13¾	340	1000	940	917	146	Sea water with high viscosity gel sweeps / Water Based Mud
12¼	311	9¾	244	1700	700	335	53	Non-aqueous drilling fluid
8 ½	216			2800	1100	253	40	Non-aqueous drilling fluid
Total				2800	2800	1842	293	

During top hole drilling the cuttings and entrained drill fluid will be returned at the sea floor. On completion of the top hole sections, steel pipe casing will be inserted and the gap between the casing and the hole will be sealed with cement. Cementing fluids are not routinely discharged to the environment during this operation, although very small amounts will be unavoidably released when the cement mixture is circulated to the seabed during grouting of the surface casing strings, during cementing operations. Following connection of the riser, drill cuttings will be returned to the drill rig and drilling fluid recovered for use. After separation from the drilling fluid, cuttings will be discharged overboard after passing through a cuttings drier.

At the completion of drilling, the well will be plugged and abandoned in accordance with the requirements of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Act 2006 and industry best practice.

2.1 Timing

The drilling program is scheduled to commence in October 2012 and extend into 2013. It is anticipated that the wells will take from 35 to 67 days to complete, including relocation of the drill rig between sites, drilling to total depth, wireline logging and plug and abandonment. However, to take into account delays and changes to project priorities this EP will cover a year period from October 2012 to October 2013 and the impact assessment of activities has been undertaken to cover this time period. Drilling operations will be conducted on a 24-hr basis.

3.0 Description of the Receiving Environment

3.1 Physical Environment

The wells are located within the North-west Province bioregion. The North-west Province Bioregion is comprised of the offshore waters between Exmouth and Port Hedland and is located on the continental slope. This region is generally characterised by two seasons; winter (May–August) and summer (September–April) which also includes a transitional period where the climate can be a mixture of both seasons.

3.2 Biological Environment

3.2.1 Benthic Habitat

There is limited information concerning benthic communities due primarily to the remoteness and water depths. 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. Substrate is expected to comprise loose, silty carbonate sands and soft muds with occasional exposed hard substrate.

3.2.2 Macrofauna

The deep offshore environment associated with the well locations is typical of the continental slope of North-Western Australia and is not expected to represent habitat of particular significance to macrofauna.

A search for matters of National Environmental Significance (NES) under the Environmental Protection and Biodiversity Conservation Act 1999 identified eight threatened species and eight migratory species that may potentially occur at the well locations and associated permit areas. These species have been included in Table 3.1.

Table 3.1: Matters of National Environmental Significance (NES) Identified that have the potential to occur at the well locations.

	Scientific Name	Common Name	Likelihood of occurrence at well locations
Birds	<i>Macronectes giganteus</i>	Southern giant petrel	The Southern Giant Petrel breeds in the sub-Antarctic waters during the summer, while in winter most disperse north from 50oS to the tropic of Capricorn and sometimes beyond. The Tropic of Capricorn is located some 400 km south of the permit area; therefore the Southern Giant Petrel is not expected to be present in significant numbers during any time of the year.
Mammals	<i>Balaenoptera musculus</i>	Blue whale	The permit area is outside (seaward) of the main humpback and blue whale migration routes and is distant from the nearest known whale aggregation areas.
	<i>Megaptera novaeangliae</i>	Humpback whale	
	<i>Balaenoptera edeni</i>	Bryde's whale	A widespread distribution and absence of particular bathymetric features within close proximity to the well location and permit area suggests that the environment within the permit area is unlikely to represent important habitat for any of these species.
	<i>Orcinus orca</i>	Killer whale	
	<i>Physeter macrocephalus</i>	Sperm whale	
	<i>Balaenoptera bonaerensis</i>	Antarctic minke whale	
Reptiles	<i>Chelonia mydas</i>	Green turtle	The permit area does not contain any emergent land or shallow sub-tidal features, which is a requirement for nesting and feeding. The nearest known breeding or feeding site of importance to turtles is located 160 km southeast of the closest well location at Barrow Island. It is therefore unlikely that significant numbers of turtles will occur within the permit areas.
	<i>Eretmochelys imbricata</i>	Hawksbill turtle	
	<i>Caretta caretta</i>	Loggerhead turtle	
	<i>Dermochelys coriacea</i>	Leatherback turtle	
	<i>Natator depressus</i>	Flatback turtle	
Fish	<i>Isurus paucus</i>	Longfin mako	The shortfin and longfin mako occur within a wide-ranging habitat and have a highly transient nature. Although these sharks may pass through the permit areas, no bathymetric features or aggregation areas of importance for these species are known within the permit areas.
	<i>Isurus oxyrinchus</i>	Shortfin mako	

3.3 Socio-Economic Environment

3.3.1 Petroleum Activities

The North-west Province bioregion supports extensive petroleum exploration and production activities, however, to date only exploration activities have been undertaken within the proposed permit areas. 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 155 km south-east of Exploration Permit WA-268-P.

3.3.2 Fisheries

The well locations and associated permit boundaries overlap several authorised commercial fishing zones including:

- North West Slope Trawl Fishery
- Southern Bluefin Tuna Fishery
- Western Deepwater Trawl Fishery
- Western Tuna and Billfish Fishery
- Western Skipjack Tuna Fishery

In addition, state managed fisheries permitted to operate in these areas are:

- Pilbara Trap Managed Fishery
- West Coast Deep Sea Crustacean (Interim) Managed Fishery
- Mackerel Managed Fishery

3.3.3 Shipping

In consultation with AMSA an assessment of the shipping traffic identified that blue water cargo and several other commercial vessels traverse the waters within the permit boundaries. The vessel traffic is predominantly associated with movements between Indonesia and central-to-southern Western Australian waters.

3.3.4 Recreational and Tourism Activities

Consultation with Recfishwest indicated that no recreational fishing or charter vessel activity is likely to occur within close proximity to the well locations due to their deep waters and distance offshore.

3.3.5 Defence Practice Areas

The Learmonth military restricted airspace area overlaps the well locations and associated permit areas. Stakeholder consultation with the Department of Defence (DoD) confirmed that the proposed operational activities would not impact Defence activities.

3.3.6 Cultural Heritage

A search of the Australian Heritage Database, the Australia National Shipwreck Database and the Department of Indigenous Affairs Aboriginal Heritage Inquiry Database did not identify any indigenous or European heritage sites at the well location or within the associated permit areas.

4.0 Major Environmental Hazards

All aspects of the project have been subjected to a comprehensive impact and risk assessment. The risk assessment was undertaken in accordance with the procedures outlined in AS/NZS ISO 31000:2009 Risk Management and HB 203:2006 Environmental Risk Management. This process allows higher risk activities to be identified and addressed. The main environmental hazards and associated operational activities and unplanned events are detailed in Table 4.1.

Table 4.1: Summary of Key Hazards and Associated Operational Activities and Unplanned Events.

Aspect / Hazard	Operational Activities	Unplanned Events
Benthic Habitat Disturbance	<ul style="list-style-type: none"> • Rig positioning • Drilling Riserless • NADF and Cutting Handling and Disposal • Cementing Operations 	
Navigation	<ul style="list-style-type: none"> • Rig Positioning 	
Localised reduction in water quality	<ul style="list-style-type: none"> • Drilling Riserless • NADF and Cutting Handling and Disposal • Cleaning of NADF Holding Tanks • Cementing Operations • Function Testing and Hydrate Management • Chemical and Hydrocarbon Storage • Bulk Transfers • Treated Waste Discharge • Cooling Water Discharge • Solid Waste Management 	<ul style="list-style-type: none"> • Single Point Failures Overboard • Loss of Containment during Transfer • Vessel Collision • Escape of Shallow Gas • Loss of Well Control
Disturbance to fauna behavior patterns	<ul style="list-style-type: none"> • Drilling Riserless • Drilling with Returns • Logging • Transport via Helicopter / Support Vessel 	<ul style="list-style-type: none"> • Vessel Collision • Loss of Well Control
Fauna Injury / Casualty	<ul style="list-style-type: none"> • Transport via Helicopter / Support Vessel 	<ul style="list-style-type: none"> • Vessel Collision • Loss of Well Control
Reduction in Air Quality	<ul style="list-style-type: none"> • Power Generation 	<ul style="list-style-type: none"> • Escape of Shallow Gas • Loss of Well Control

To ensure the potential environmental hazards identified through the risk assessment are managed appropriately, Chevron has developed a range of management strategies that will be implemented throughout the course of the project. A summary of the main strategies associated with operational activities are detailed in Table 4.2.

Table 4.2: Summary of Key Management Strategies for Operational Activities.

Description potential Hazards	Management Strategies.
Benthic Habitat Disturbance	Benthic disturbance will be managed by: <ul style="list-style-type: none"> • Deploying a well specific anchor plan. • Discharging treated drill cuttings at surface whilst drilling with NADF.
Navigation	Navigational hazards will be managed by: <ul style="list-style-type: none"> • Submitting a Rig Move Notice to AMSA prior to each rig move.
Localised Reduction in Water Quality	Localised reduction in water quality will be managed by: <ul style="list-style-type: none"> • Using low toxicity drill fluids. • Minimising residual synthetic on cuttings discharged overboard. • Using a blow out preventer hydraulic fluid that has been assessed as water soluble and having low toxicity. • Ensuring hazardous chemicals are contained within appropriately bunded areas. • Undertaking regular servicing of bulk chemical transfer equipment. • Ensuring bulk chemical transfer procedures are implemented. • Ensuring cooling water is discharged at surface. • Minimising volumes of BOP hydraulic fluid discharged to sea during BOP function testing. • Minimising volumes of hydrate management fluid discharged to sea whilst BOP is connected or during wellhead disconnect. • Ensuring no disposal of non-putrescible solid and hazardous wastes to sea. • Ensuring sewage waste is treated prior to discharge. • Ensuring putrescible food waste is macerated prior to discharge. • Ensuring bilge and deck drainage water is treated prior to discharge.
Disturbance to Fauna Behavior Patterns	Disturbance to fauna behavior patterns will be managed by: <ul style="list-style-type: none"> • Implementing the EPBC Act Policy Statement 2.1 during logging. • Implementing the EPBC Regulations 2000 Division 8.1 and Division 8.07 requirements in relation to the interaction of vessels, aircraft and cetaceans.
Fauna Injury / Casualty	Disturbance to fauna injury / casualty will be managed by: <ul style="list-style-type: none"> • Implementing the EPBC Regulations 2000 Division 8.1 and Division 8.07 requirements in relation to the interaction of vessels, aircraft and cetaceans.
Reduction in Air Quality	Reduction in air quality will be managed by: <ul style="list-style-type: none"> • Implementing a maintenance schedule as per Manufacturer’s specifications for equipment with potential to release greenhouse gas. • Recording volumes of fuel used for power generation.

A summary of the main strategies associated with unplanned events are detailed in Table 4.3. Oil spill response associated with unplanned events will be managed in accordance with the oil spill contingency plan for the activity.

Table 4.3: Summary of Key Management Strategies for Unplanned Events.

Unplanned Events	
Single Point Failures Overboard	Single point failures overboard will be managed by: <ul style="list-style-type: none"> • Ensuring hazardous chemicals are contained within appropriately banded areas. • Undertaking regular servicing of bulk chemical transfer equipment.
Loss of Containment During Transfer	Loss of containment during transfer will be managed by: <ul style="list-style-type: none"> • Implementing bulk chemical transfer procedures. • Undertaking regular servicing of bulk chemical transfer equipment.
Vessel Collision	Vessel collision will be managed by: <ul style="list-style-type: none"> • Ensuring the Vessel Master is appropriately accredited. • Ensuring the minimum required navigation lighting is operational aboard rig and support vessels. • Submitting a Rig Move Notice to AMSA prior to each rig move.
Escape of Shallow Gas	Escape of shallow gas will be managed by: <ul style="list-style-type: none"> • Undertaking a shallow hazards survey. • Designing each well in accordance with the Australian Business Unit Well Integrity and Well Control procedure.
Loss of Well Control	Loss of well control will be managed by: <ul style="list-style-type: none"> • Undertaking a formation evaluation. • Designing each well in accordance with the Australian Business Unit Well Integrity and Well Control procedure. • Implementing function and pressure testing of BOP for duration of drilling program whilst BOP installed.

5.0 Management Approach

The implementation strategy as documented within the 2012–2013 Exmouth Plateau/Greater Gorgon Deepwater Drilling Program – Atwood OSPREY EP will be enacted in accordance with Chevron Australia’s Operational Excellence Management System (OEMS). Chevron’s OEMS is aligned to ISO 14001:2004 and key components of the management system that will be implemented are included in Table 5.1.

Table 5.1: Summary of Key Implementation Measures.

Key Implementation Measures	Brief description
Roles & Responsibilities	Accountabilities and responsibilities are defined for personnel involved in the projects implementation for both planned activities and unplanned events.
Training and Competency	Detailed inductions are provided to educate personnel of specific environmental risks. These inductions will include: <ul style="list-style-type: none"> • Program induction • Environmental roles and responsibilities training • Spill response training • Marine Fauna Observer training.
Routine Monitoring and Reporting	Chevron Australia has a number of internal and external environmental reporting requirements. Routine reporting provides information regarding Chevron’s environmental performance.
Incident Reporting	Chevron Australia has a number of processes dedicated to incident investigation and reporting. Incident reporting ensures that the appropriate regulator is notified in the event of an incident.
Compliance Assurance	Auditing and inspections are undertaken to identify gaps in management of risk and assign corrective actions to responsible personnel.
Documents and Records	Chevron Australia have prescribed storage and maintenance periods for records and documents.
Environmental Plan Review	Chevron Australia has processes in place to ensure the review of an Environmental Plan in accordance with relevant legislation.

6.0 Consultation

Consultations have been undertaken with the following stakeholders:

- Australian Fisheries Management Authority (AFMA)
- Australian Hydrographic Service (AHS)
- Australian Maritime Safety Authority (AMSA)
- Australian Department of Defence (DoD)
- Commonwealth Fisheries Association (CFA)
- Department of Environment and Conservation, Western Australia (DEC)
- Department of Fisheries (DoF), Western Australia
- Recfishwest
- JAMA CLAN Marine Services
- NOPSEMA
- Western Australian Fishing Industry Council (WAFIC)

Chevron will maintain communications with these stakeholders as required ensuring that they are informed of any aspects of the drilling program that may affect other users of the area.

7.0 Contact Details

The proponent is Chevron Australia Pty Ltd.

Contact details for the drilling operations are:

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