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VERMILION OIL & GAS AUSTRALIA

WANDOO WELL CONSTRUCTION ENVIRONMENT PLAN SUMMARY

WNB-1000-RH-0008

Revision	Date	Description	Originator	Checker	Approver
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[Appendix A. Environmental impacts and risks](#)

Abbreviations and definitions

AFMA	Australian Fisheries Management Authority
AHTS	Anchor Handling Transport Supply (vessel)
ALARP	As Low as Reasonably Practicable
AMOSC	Australian Marine Oil Spill Centre
AMSA	Australian Maritime Safety Authority
CALM Buoy	Catenary Anchor Leg Mooring Buoy
DER	Department of Environmental Regulation
DMP	Department of Mines and Petroleum
DoF	Department of Fisheries
DoT	Department of Transport
DPaW	Department of Parks and Wildlife
EP	Environment Plan
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ENVID	Environmental Hazard Workshop
HSE MS	Health, Safety and Environmental Management System
KEF	Key Ecological Feature
MOC	Management of Change
MODU	Mobile Offshore Drilling Unit
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NWS	North West Shelf
OPGGG(E)R	Offshore Petroleum Greenhouse Gas Storage (Environment) Regulations 2009
OSCP	Oil Spill Contingency Plan
PPA	Pearl Producers Association
VOGA	Vermilion Oil and Gas Australia Pty Ltd
WA	Western Australia
WAFIC	Western Australian Fishing Industry Council
WCEP	Well Construction Environment Plan
WHA	World Heritage Area
ZPI	Zone of Potential Impact

VERMILION OIL & GAS AUSTRALIA

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1 Introduction

Vermilion Oil and Gas Australia Pty Ltd (VOGA) periodically conducts well construction operations in Permit Area WA-14-L using a Mobile Offshore Drilling Unit (MODU). Well construction operations planned over the next five years involve the drilling and, possibly, completing of new wells, or the re-entering, side-tracking and recompleting of existing wells.

The frequency of campaigns vary depending on a range of operational and commercial factors, however, VOGA would expect to undertake a campaign in 2015 with an additional two or three campaigns proposed in the next five years. Each of these will take up to 100 days to complete.

The Wandoo Well Construction Environment Plan (WCEP) [WPA-7000-YH-0001] has been prepared in accordance with requirements of the Offshore Petroleum Greenhouse Gas Storage (Environment) Regulations 2009 (OPGGs(E)R).

Support activities during well construction campaigns are similar to those provided to the Wandoo Production Facilities during routine activities including helicopter transfer of personnel and Anchor Handling Transport Supply (AHTS) vessels.

2 Location

The Permit Area (WA-14-L) is located in Commonwealth waters in the Carnarvon Basin off the northwest coast of Western Australia (WA), approximately 80km northwest of Dampier and 110km northeast of Barrow Island (Figure 2-1). The Wandoo facilities, including the Wandoo A Monopod, Wandoo B Platform, Catenary Anchor Leg Mooring (CALM) buoy (single point mooring tanker mooring and offloading facility) and anchorage are located within the Permit Area in water depths of approximately 54m (Figure 2-1).

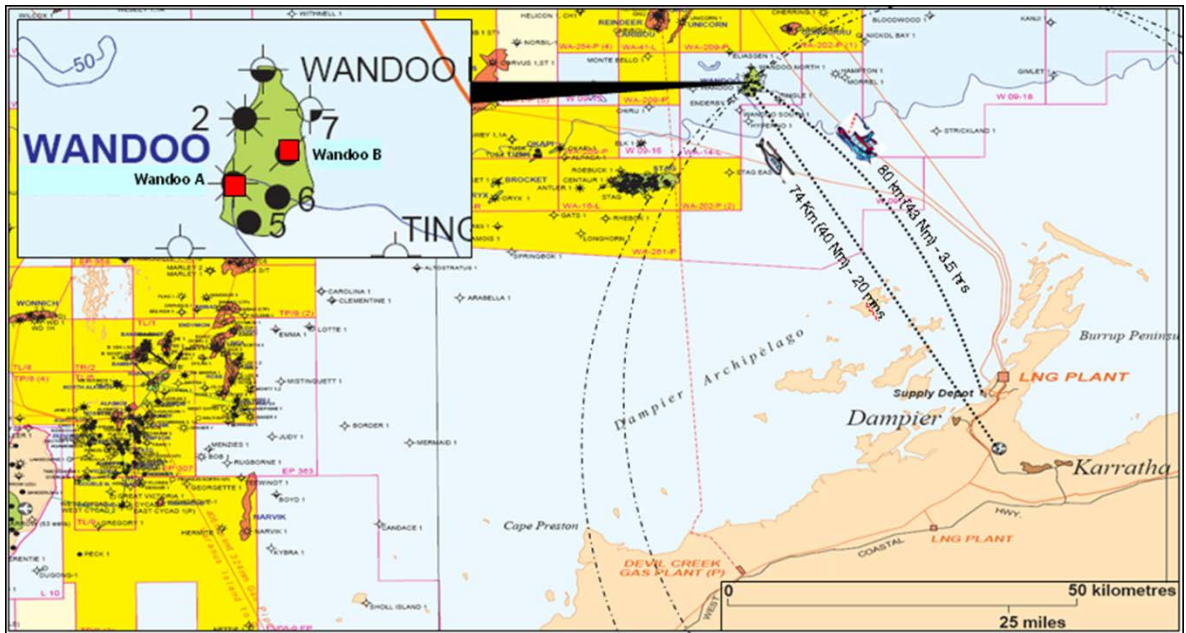


Figure 2-1: Location of the WA-14-L Permit Area and Wandoo Production Facility

Geographical coordinates of Wandoo production’s various facilities are provided in Table 2-1.

Table 2-1: Coordinates of Wandoo Production Facilities

Facility	Latitude	Longitude
Wandoo A	20°08' 20" S	116°25' 17.5" E
Wandoo B	20°07' 43" S	116°26' 04" E
Anchorage	20°05' 00" S	116°23' 48" E
CALM Buoy	20°07' 02" S	116°26' 02" E



3 Description of the environment

This section describes the environmental conditions in and around the Permit Area, as well as within the wider Zone of Potential Impact (ZPI).

The ZPI is based on a 1% probability of sea-surface exposure (reported to 1 μ m) from a 60-day spill based on the unlikely event of a loss of well control (and subsequent oil spill) during well construction activities. The 1 μ m threshold is conservative in terms of environmental effects on seabirds, however is more indicative of the perceived area of a spill that may trigger socio-economic impacts as a precautionary measure (Asia-Pacific Applied Science Associates, 2013). The ZPI is based on the trajectory modelling of a spill of Wandoo crude oil during summer, transitional period and winter wind and current conditions, as these represent the worst-case scenario for an oil spill event in terms of the average and/or maximum volume of oil likely to reach a shoreline. The greatest proportion of environmentally sensitive areas is located at the shoreline and in near-shore/coastal waters.

3.1 Physical environment

The Permit Area is situated in the middle/outer shelf waters of the North West Shelf (NWS). Circulation of seawater in the Permit Area is influenced by the Indonesian Throughflow from the western Pacific and Leeuwin Current which continues the transport of warm water further south. Sediments in the Permit Area are typically comprised of unconsolidated fine to coarse sands dominated by carbonates. Areas closer to shore may have a larger component of terrigenous sediments, particularly around inputs such as rivers and creeks. Sediment quality and water quality in the region is generally considered to be high, with low levels of metals and other contaminants (Fandry *et al.*, 2006).

Currents in the continental shelf region around the Permit Area, and much of the offshore ZPI, are typically tidal currents influenced by wind-driven surface currents. Water movement is predominantly south-easterly during flood tides and north-westerly during ebb tides. Winter swells are typically in the range of 1 to 2m, but occasionally reach 3m in the presence of severe cold fronts. In summer the swell is smaller, more variable and tends to be westerly in direction. However, the swells generated by tropical cyclones in summer and the transitional periods (between December to April) may range between 8 and 10m.

During winter months (June to August), the winds are typically more variable, but mostly from the east. Therefore, winter winds will tend to push the spill trajectories offshore and towards the northwest. During summer, the wind is expected to push surface oil towards the northeast, which is almost parallel to the coastline.

3.2 Biological environment

Benthic habitats within the area over which ZPI comprises soft sediments and associated benthic fauna. The infaunal community of these soft sediments is essentially similar to that found at other locations throughout the region with low numbers of species and low abundance, with no particular areas of significant value.

Coral reefs, seagrasses, mangroves and macroalgae are widespread throughout the shallower areas of the ZPI. Significant areas of these in the ZPI include the waters of the Dampier Archipelago, around offshore island groups such as the Montebello Island Group and the Barrow and Thevenard Islands. These habitats are recognised as an important resource for a diverse range of species including breeding, calving, feeding and migratory areas.

An *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search (Department of Sustainability, Environment, Water, Population and Communities, 2013) of the ZPI, identified a total of 72 fauna species listed as migratory and/or threatened under the EPBC Act, including 39 bird, 14 mammal, eight reptile and 11 shark/ray species. Fourteen marine mammals are listed as threatened or migratory under the EPBC Act, including 12 cetaceans, one dugong, and one pinniped, may potentially occur in the ZPI.

Listed species may seasonally visit or transit the Permit Area. However, no critical habitat has been identified within the Permit Area. Several areas within the ZPI have, however, been recognised as critical habitats for marine mammals. These include the humpback whale calving area in Camden Sound and resting areas in Shark Bay and Exmouth Gulf, and the dugong feeding grounds in Shark Bay, Exmouth Gulf and coastal waters near Broome. Roebuck Bay and Camden Sound are recognised as an important area for Australian snubfin dolphins, and Jurien Bay and the Abrolhos Islands are important breeding and foraging areas for Australian sea lions.

3.3 Social and economic environment

3.3.1 National Heritage and shipwrecks

There are no Commonwealth or National Heritage sites in the Permit Area, although the following natural, indigenous and historic sites are located within the ZPI. These are:

- The Ningaloo Coast;
- Shark Bay;
- The West Kimberley;
- Barrow Island and the Montebello Islands Marine Conservation Reserve;
- Beekeepers-Lesueur-Coomallo Area and Nambung National Park;
- Dampier Archipelago (including the Burrup Peninsula);
- Dirk Hartog Landing Site 1616 – Cape Inscription Area;
- HMAS Sydney II and HSK Kormoran Shipwreck Sites; and
- Batavia Shipwreck Site and Survivor Camps 1629 – Houtman Abrolhos.

Historic shipwrecks of National and State heritage value are legally protected. There are no known shipwrecks within the Permit Area, however there are numerous shipwrecks within the broader ZPI region.

3.3.2 Fisheries and aquaculture

Several Commonwealth and State managed fisheries occur in the ZPI, some of which overlap the Permit Area. Commercial fishing activity is unlikely to occur within the Permit Area because of the

existence of safety exclusion zones around the Wandoo Facilities, and the fact that most fisheries operate in deeper water seaward of the Permit Area (e.g. scalefish fisheries) or in shallow waters landward of the Permit Area (e.g. pearl oyster fisheries). A range of Commonwealth and State managed commercial fisheries potentially active within the ZPI, in addition to considerable commercial aquaculture activities, these are listed in Table 3-1.

Table 3-1: Commonwealth and State fisheries identified as potentially occurring in the ZPI

Commonwealth Fisheries	State Fisheries
Western Tuna and Billfish Fishery	North Coast Prawn Fishery
Southern Bluefin Tuna Fishery	North Coast Near-shore and Estuarine Fishery
Western Deepwater Trawl Fishery	North Coast Demersal Scalefish Fishery
North West Slope Trawl Fishery	Exmouth Gulf Prawn Fishery
Western Skipjack Fishery	Gascoyne Demersal Scalefish Fishery
	Mackerel Fishery
	Pearl Oyster Fishery
	Beche-de-mer Fishery
	Northern Shark Fishery
	West Coast Rock Lobster Managed Fishery
	Shark Bay Crab Interim Managed Fishery
	Shark Bay Scallop Fishery
	Shark Bay Prawn Fishery
	Abrolhos Islands and Mid West Trawl Limited Entry Fishery
	West Coast Demersal Scalefish Interim Managed Fishery

Recreational fishing within the ZPI is managed by the DoF and mainly occurs at near shore locations such as the Dampier Archipelago and the Montebello Islands and in State waters adjacent to populated coastal areas (DoF, 2011).

3.3.3 Shipping, defence and tourism

The region supports significant commercial shipping activity, the majority of which is associated with the WA oil and gas and mining industries, with a high density of vessel traffic in waters surrounding the Permit Area. There are no military related uses within the Permit Area; however the ZPI encompasses the military installations near Exmouth, including a pier facility.

No tourist activities take place within the Permit Area, although tourist activities do occur within the ZPI and tourism plays a significant role in the region. Tourism related activities include fishing and diving charters, shore-based activities and seasonal whale/whale shark watching, with activity often associated with marine protected areas or other coastal nature reserves. Major tourism precincts within the ZPI include the Ningaloo Coast, the Exmouth Gulf and Broome.

3.4 Areas of environmental significance

There are two World Heritage Areas (WHA) within the ZPI; the Ningaloo Coast and the Shark Bay WHA. The Ningaloo Coast WHA has a high diversity of marine habitats, including coastal mangrove systems, lagoons, reef, open ocean, continental slope and the continental shelf and



includes both the Commonwealth and State marine parks (CALM, 2005). It is a very important nesting habitat for four species of marine turtle that are found in WA and it is estimated that between 300 and 500 whale sharks visit the area each year between March and June, coinciding with mass coral spawning events. Shark Bay has the largest and richest seagrass beds in the world, covering an area of 4,800km², supporting an important dugong population. In addition, the Shark Bay WHA hosts some of the oldest forms of life on earth – stromatolites – which are colonies of algae that form hard dome-shaped deposits (UNESCO, 2013).

There are two gazetted and 10 proposed Commonwealth Marine Protected Areas (MPAs) within (or partially within) the ZPI. The gazetted Commonwealth MPAs located within the ZPI include the Ningaloo Marine Park and the Mermaid Reef Marine National Reserve (approximately 250km and 450km from the Permit Area respectively). The Mermaid Reef Marine National Nature Reserve is recognised for its spectacular coral assemblages and diverse marine fauna. A number of the species found there are at the limit of their distribution, with some found nowhere else in WA (DotE, 2014) and, as mentioned above, one of the key features of the Ningaloo Marine Park is the annual aggregation of whale sharks.

There are seven gazetted State MPAs within (or partially within) the ZPI. These include:

- Montebello/Barrow Islands Marine Conservation Reserves (approximately 80km from Permit Area);
- Ningaloo Marine Park and Muiron Islands Management Area (approximately 250km from Permit Area);
- Eighty Mile Beach Marine Park (approximately 310km from Permit Area);
- Rowley Shoals Marine Park (approximately 320km from Permit Area);
- Camden Sound Marine Park (approximately 930km from Permit Area);
- Shark Bay Marine Park (approximately 580km from Permit Area); and
- Jurien Bay Marine Park (approximately 1,120km from Permit Area).

These MPAs provide important habitats, including foraging, nesting, calving and resting areas for a number of protected species. These areas are particularly important for turtles (green, hawksbill, flatback and loggerhead), humpback whales, whale sharks, dugong, Australian sea lions and migratory birds.

Key Ecological Features (KEFs) have been identified through the marine bioregional planning process and are described as those parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of a Commonwealth Marine Area (DEWHA, 2008). Within the ZPI, 19 KEFs have been identified including:

- Ancient coastline at 125m contour;
- Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula;
- Commonwealth Waters adjacent to Ningaloo Reef;
- Continental slope demersal fish communities;
- Western demersal slope and associated fish communities;
- Exmouth Plateau;

-
- Glomar Shoals;
 - Mermaid Reef and Commonwealth waters surrounding Rowley Shoals;
 - Wallaby Saddle;
 - Ancient coast line at 90m to 120m depth;
 - Commonwealth marine environment surrounding Houtman Abrolhos Islands; and
 - Perth Canyon and adjacent shelf break and other west coast canyons.

4 Description of the activity

The exploration/appraisal wells covered under the scope of the WCEP will be drilled in Permit Area WA-14L within a 2km radius of the Wandoo Facility. The formations targeted will be the same as those producing at Wandoo. They will have similar reservoir characteristics and reservoir fluid properties and, as a result, will have similar environmental risk profiles.

The scope of the well construction operations planned for the Wandoo Field over the next five years includes:

- well interventions, re-enter, side-track and complete;
- construction of new wells; and
- abandonment of existing well bores.

It is possible that well construction activities could occur at any time during the calendar year. Timing is dependent on the activities of the operators that have contracted the MODU ahead of Vermilion. The length of each campaign will be heavily dependent on the number of wells to be drilled and completed, with each new well taking approximately 20 days to complete. The ongoing Wandoo Field development process requires two to five new producing intervals to be added every two to three years, with each campaign taking 50 to 100 days.

All activities will be undertaken from a jack-up MODU, with support from AHTS vessels. The MODU will be towed onto location within the Permit Area and off again by AHTS vessels.

The planned well construction activities will use standard technical methods and procedures. The drilling and completions fluids used at Wandoo are selected for their environmental and drilling performance properties. VOGA will only use water based drilling and completion fluids for the planned wells. The MODU's closed drilling fluid circulation and solids control system will enable the fluids circulated from the well and treated before being returned to the fluid tanks for re-use. This process allows drilled or milled solids to be removed from the fluids and discharged with a minimal amount of wasted fluid.

5 Environmental hazards and controls

VOGA held an environmental hazard workshop (ENVID) to identify and then evaluate the potential environmental risks associated with the contemplated well construction activities. This process enabled the development of elimination, mitigation and contingency strategies to ensure that, for those risks not eliminated, the residual risk is reduced to as low as reasonably practicable (ALARP). The assessment was undertaken in accordance with Australian/New Zealand Standard AS NZS ISO 31000-2009 Risk Management – Principles and Guidelines and the VOGA Risk Management Manual VOG-2000-MN-0001 and the VOGA risk assessment procedure. The VOGA risk assessment level and action guide shown below (Table 5-1) were used, taking into account the consequence and probability of 16 identified sources of potential environmental impact.

Table 5-1: Risk level and action guide

HR	High Risk:	Intolerable – Stop activities unless risk controls that will reduce the risk are implemented
UM	Upper Range Medium Risk:	Tolerable (higher region) on demonstration of ALARP
LM	Lower Range Medium Risk:	Tolerable on demonstration of ALARP
L	Low Risk:	Acceptable

The risk assessment workshop found that there were no high or upper-medium risks, four lower-medium risks and 12 low risks. A summary of the risks and their scores is provided below in Table 5-2.

Table 5-2: Environmental risks from well construction activities and their residual risk ranking

VOGA EP risk no.	Hazard	Residual risk ranking
EP-WC-R01	Liquid hydrocarbon release from wells	LM
EP-WC-R02	Liquid hydrocarbon release from the platform, export equipment or pipeline(s)	LM
EP-WC-R03	Diesel spill to sea	LM
EP-WC-R04	Oil spill response strategy hazards	LM
EP-WC-R05	Noise	L
EP-WC-R06	Atmospheric emissions	L
EP-WC-R07	Artificial light	L
EP-WC-R08	Discharge of cooling water/reject water	L
EP-WC-R09	Deck drainage and bilge water discharge	L
EP-WC-R10	Non-hazardous and hazardous was	L
EP-WC-R11	Discharge of drill cuttings, cement, steel shavings and well drilling and completions fluids	L
EP-WC-R12	Discharge of sewage, grey water and putrescible wastes	L
EP-WC-R13	Ancillary hydrocarbons or chemical spills	L
EP-WC-R14	Physical presence of MODU and AHTS vessels	L
EP-WC-R15	Seabed disturbance	L
EP-WC-R16	Introduction of invasive marine species	L

To ensure that the potential environmental impacts identified through the risk assessment process are managed appropriately, VOGA has a range of performance standards (risk mitigation controls) that will be implemented during well construction campaigns.

Following the identification of risk mitigation controls, VOGA reviewed the residual risk and assessed whether there were any further measures required to reduce the residual risk to ALARP. For well construction activities and well intervention projects, risks were considered to have been reduced to ALARP if the risks are within the tolerable region of the VOGA Risk Matrix and have been subject to a detailed assessment process that has concluded that there are no further reasonably practicable measures were available to further reduce the level of risk. For those risks with a separate ALARP and acceptability assessment, an 'acceptable' risk is one where the likelihood and consequence of the risk has been assessed as falling within or below the tolerable range on the VOGA Risk Matrix.

The environmental hazards listed in Table 5-2 are summarised in Appendix A along with details on the environmental impacts and associated prevention and mitigation controls.

6 Ongoing monitoring of environmental performance

6.1 Overview

The VOGA well construction campaigns will be managed in compliance with the WCEP, under the OPGGS(E)R. The implementation strategy outlined in the WCEP details how VOGA will manage the well construction activities such that environmental risks and impacts are continually being managed to ALARP. VOGA uses systems and procedures to ensure that risks associated with well construction activities are identified; hazards controls are implemented; activities are monitored against performance outcomes; and appropriate standards and relevant legislative requirements are met.

The implementation strategy includes:

- systems and procedures to be implemented;
- key roles and responsibilities;
- training and competencies;
- contractor management;
- hazard identification and evaluation;
- monitoring, auditing and non-conformance review;
- incident response, including the Wandoo Field Oil Spill Contingency Plan (OSCP) [WAN-2000-RD-0001];
- record keeping; and
- stakeholder consultation.

The VOGA Health, Safety and Environmental Management System (HSE MS) provides the procedures and practices that will be followed to ensure that the environmental risks associated with its activities are reduced to ALARP. The HSE MS is structured into 12 elements; each element has been developed within the overall three-phase HSE MS process (Plan-Implement-Check and Correct). As such, each element connects to one or more of the other elements within the overall continual improvement cycle.

At a high level, monitoring of environmental performance is evaluated through:

- internal audits and inspections and third party audits and verification;
- emissions and discharges monitoring data; and
- end of well environmental performance reports submitted to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment to confirm compliance with the environmental performance objectives, standards and measurement criteria outlined in the WCEP.

6.2 Environment Plan revision

A formal revision of the WCEP will be undertaken in accordance with the requirements outlined in Regulation 17, Regulation 18, or Regulation 19 of the OPGG(E)R. VOGA will submit a proposed revision of the WCEP to NOPSEMA including as a result of the following:

- When any significant modification or new stage of the activity that is not provided for in the EP is proposed;
- Before, or as soon as practicable after, the occurrence of any significant new or significant increase in environmental risk or impact not provided for in the EP prompted through VOGA's Management of Change (MoC) process;
- At least 14 days before the end of each period of five years commencing on the day in which the original and subsequent revisions of the EP is accepted under Regulation 19 of the OPGG(E)R; and
- As requested by NOPSEMA.



7 Response arrangements

The OSCP, which also covers well construction activities, details the arrangements in place for dealing with any potential spills and minimising the potential effects of a spill on the environment. The OSCP details the roles and responsibilities of all personnel involved in managing a response and includes interfaces with third parties who may be affected by, or involved in, responding to a spill, for example, by supplying response equipment, such as the Australian Marine Oil Spill Centre (AMOSOC).

The OSCP has been developed in consultation with State and Commonwealth Statutory Agencies including the WA Department of Transport (DoT) and Australian Maritime Safety Authority (AMSA). The OSCP outlines:

- VOGA's incident response structure and function and interfaces with external response agencies;
- the incident notification requirements for the relevant State and Federal agencies;
- the potential spill scenarios, trajectory modelling and zones of potential impact;
- the response options, including net environmental benefit analysis, response constraints and logistics arrangements; and
- the testing and monitoring arrangements to ensure the performance standards for the plan and equipment are maintained.

In the event of a spill, immediate notifications will be made as detailed in the Wandoo Field OSCP [WAN-2000-RD-0001]. All resources relevant for the spill category will be activated as per the OSCP. In the event of a spill, the incident action planning process formally documents and communicates the:

- incident objectives;
- effectiveness of the response strategies;
- status of assets;
- operational period objectives; and
- response strategies defined by the Incident Commander during response planning.

The Incident Command Team will evaluate the response strategies provided in the OSCP based on the actual circumstances of the spill to ensure the response is appropriate to the nature and scale of the risks and to demonstrate that the risks are reduced to ALARP. The Incident Command Team will use monitoring and evaluation data to understand the behaviour and likely trajectory of the oil spill to evaluate the appropriate spill response strategy. To ensure the spill strategy is achieving the desired environmental outcomes, performance measures are established to support the assessment of the response strategy. If the review process determines that a strategy is not 'effective', the incident action planning process provides the flexibility to adjust the response strategy or reallocate resources if necessary.

Feasible oil spill response strategies include:

- source control;

-
- monitoring and evaluation;
 - chemical dispersion;
 - containment and recovery;
 - mechanical dispersion;
 - protection and deflection; and
 - shoreline clean-up.

The potential impacts of each spill response strategy have been assessed to demonstrate the strategies are acceptable and will reduce the consequences of a spill to ALARP. Equipment and capability requirements are also defined and reviewed to ensure that spill response resources enable the management of the spill risks to ALARP. The results are documented in the Oil Spill Capability Review [VOG-2000-RY-0037] and a summary of the capability is provided in the form of a resource list in the OSCP.

8 Consultation

The key objectives of VOGA’s stakeholder consultation process are to:

- initiate and maintain open communications between stakeholders and VOGA;
- ensure stakeholders are kept informed of VOGA’s activities;
- provide stakeholders with an opportunity to provide feedback on VOGA’s activities;
- establish an open and transparent process for input;
- manage any concerns raised by stakeholders regarding VOGA’s activities; and
- provide a means for recording all communication and/or consultation, issues raised and responses.

8.1 Consultation undertaken

During the period November 2013 to June 2014, VOGA engaged with the key stakeholders by telephone and email, and held briefing meetings (when necessary) to present an overview of its current and planned operations, the OSCP and the oil spill model, and sought feedback and comment on VOGA’s plans. A list of all past and future stakeholders consulted regarding the WCEP are listed in Table 8-1.

Table 8-1: Summary of stakeholders

Group	Stakeholders
Relevant Government Regulators/Agencies	Australian Fisheries Management Authority (AFMA)
	AMSA
	AMOSC
	Dampier Port Authority
	Department of Mines and Petroleum (DMP) (WA)
	DoT (WA)
	DoF (WA)
	Department of Parks and Wildlife (DPaW)
	City of Karratha (formerly Shire of Roebourne)
	State Emergency Service - Karratha
	Department of Environmental Regulation (WA)
Interested Agencies	WA Fishing Industry Council (WAFIC)
	Australian Petroleum Production and Exploration Association
Interested Fisheries	Recfishwest
	Mackerel Managed Fishery
	Onslow Prawn Managed Fishery
	Pilbara Trawl/Trap/Line Managed Fisheries
	Pearl Oyster Managed Fishery
	Beche-de-mer Fishery
	Marine Aquarium Managed Fishery
Specimen Shell Managed Fishery	

Group	Stakeholders
	Pearl Oyster Managed Fishery
	Pearl Producers Association (PPA)

In summary, no significant change to the planned activity was identified during the consultation process. No objections relating to the proposed well construction activities were raised, however some key issues were identified and have subsequently been addressed by VOGA. A summary of the key issues raised are listed in Table 8-2.

Table 8-2: Summary of stakeholder key issues

Stakeholders	Key issues raised in consultation to-date	VOGA response to feedback
AFMA	AFMA recommended engaging directly with fishers ahead of drilling.	Letters were issued to fishing licence holders in the vicinity of the Wandoo facility and to the WA Pearl Producers Association, which distributed the letter to its members. VOGA will engage directly with fishers as appropriate ahead of drilling.
DPaW	<p>DPaW sought confidence that VOGA has undertaken investigations and has access to information on baseline ecological condition of sensitive receptors within the ZPI.</p> <p>DPaW recommended that VOGA develops and maintains a baseline understanding of shallow water (<2m) and intertidal benthic habitat, sediment and water characteristics, turtle and seabird nesting and roosting sites within a suitable radius of any future activities (as determined in consultation with DPaW). In the absence of current baseline data for any areas affected by future incidental hydrocarbon release, DPaW would assume the baseline state of affected marine and coastal onshore and offshore areas to be pristine and would expect VOGA to return affected areas to their natural state within a period acceptable to regulators and the community.</p> <p>DPaW advised that implementation of its oiled wildlife response must be mandated by regulatory decision makers as part of whole-of-government response.</p> <p>DPaW advised that in the event of an oil spill occurring in State waters, the Department of Environmental Regulation (DER) Environmental Hazard Branch should be notified as soon as practicable in accordance</p>	<p>VOGA has undertaken a gap analysis of baseline data within the worst-case ZPI (Astron 2014). A key function of the review was to link the most reliable and relevant baseline data collection with their methodological approaches so that post spill data collection is carried out with the highest likelihood of effectively informing management decisions. Additionally, VOGA has committed to further marine monitoring within the Wandoo Field in the Wandoo Field EP [WPA-7000-YH-0007]. In the absence of required data, the OSMP has identified methodologies for obtaining relevant baseline data at the time of a spill.</p> <p>During the development of the gap analysis, DPaW was identified as having established marine monitoring programs for sediment quality at Shark Bay, Montebello Islands and Barrow Island, as well as water quality monitoring at various locations. VOGA has contacted the DPaW Environmental Management Branch to determine whether this data contains hydrocarbon analysis, as well as how this data could be accessed in the event of a spill. No feedback from DPaW has been received to date.</p> <p>VOGA advised DPaW of the process for implementation of the Oiled Wildlife Response Measures, which are detailed in the EP, and acknowledged DPaW’s valuable input to the development of these measures.</p> <p>Within the Wandoo Field OSCP [WAN-2000-RD-0001], VOGA has identified that DPaW will be invited to participate in the VOGA Incident Command Team during a spill to ensure that the response is reasonable and proportionate</p>

Stakeholders	Key issues raised in consultation to-date	VOGA response to feedback
	<p>with the requirements of the <i>Environmental Protection Act 1986</i>. If a site within State jurisdiction is potentially contaminated VOGA must report the area to the DER Contaminated Sites Branch in accordance with the requirements of the <i>Contaminated Sites Act 2003</i>.</p> <p>DPaW advised that the EP must consider the method of disposal of oily waste within State sea or land areas.</p>	<p>and to ensure that resources that may assist DPaW to undertake its function are supplied.</p> <p>Within the Wandoo Field OSCP [WAN-2000-RD-0001] the VOGA waste management plan identifies companies and resources necessary for the offshore/shoreline temporary storage, marine transport, onshore final disposal, and auditing requirements, to ensure acceptable cradle-to-grave disposal practices are in place for all oily wastes.</p>
DoF	<p>DoF recommended VOGA consult with WAFIC, Recfishwest and commercial fishers directly with regard to proposed well construction activities.</p> <p>DoF requested that VOGA collect baseline marine data to compare against any post-spill monitoring to determine the nature and extent of any impacts, and specific strategies are developed in EP and/or OSCP to mitigate the risks of spills on fish spawning areas.</p> <p>DoF requested that the risk of translocating pests and diseases via immersible equipment be minimised.</p>	<p>VOGA sent letters to WAFIC, Recfishwest and commercial fisheries on 4 July 2014 outlining the proposed activities. No feedback has been received to date. VOGA will engage directly with WAFIC, Recfishwest and commercial fisheries as appropriate ahead of drilling.</p> <p>VOGA has undertaken a gap analysis of baseline data within the worst-case ZPI (see DPaW response). Strategies to mitigate the impact of a hydrocarbon spill on sensitive environmental receptors, including impacts on fish and fisheries, have been detailed in the Wandoo Field OSCP [WAN-2000-RD-0001].</p> <p>VOGA has identified and risk assessed the potential for introducing invasive marine species and developed appropriate controls. These controls include vessels obtaining AQIS clearance prior before entering Australian waters and current International Anti-fouling System Certificate for all support vessels.</p>
PPA	<p>PPA requested an improved map to include the water depth contours of the operational area.</p> <p>PPA requested clarification on whether seismic survey activity formed part of the proposed operational activities.</p>	<p>VOGA provided updated maps to PPA, including depth contours via email on 27 August 2014.</p> <p>VOGA confirmed with PPA via email on 21 August 2014 that no seismic survey activity is contained within the proposed operational activities.</p>
DMP	<p>DMP requested additional information on:</p> <ul style="list-style-type: none"> • the activities particularly drilling that is planned; • the potential impacts of the activity; • spill modelling data; and • potential for any impacts to State Waters/coast? 	<p>VOGA provided the DMP with details on the planned activity; spill modelling data; and the potential impacts of the activities to State Waters and the WA coast.</p> <p>DMP reviewed the notification and in their response did not require any further information.</p>

8.2 Ongoing consultation

Regulation 14(9) of the OPGGS(E)R defines a requirement for the implementation strategy to provide for appropriate consultation with authorities, persons and organisations. As appropriate to the nature and the scale of the activities, VOGA has planned for ongoing consultation. Details of ongoing consultation required for proposed well construction activities are outlined in Table 8-3.

Table 8-3: Ongoing stakeholder consultation requirements

Stakeholder	When	Ongoing stakeholder consultation requirements
Australian Hydrographic Service (AHS) – Department of Defence.	When on well location.	MODU to email location so AHS can issue Notice to Mariners.
WA Fishing Industry Council Recfishwest Mackerel Managed Fishery Onslow Prawn Managed Fishery Pilbara Trawl/Trap/Line Managed Fisheries Pearl Oyster Managed Fishery Beche-de-mer Fishery Marine Aquarium Managed Fishery Specimen Shell Managed Fishery	Two months prior to commencing well construction campaigns.	Provide specific start and end dates of activity and spatial extent of proposed activities including exclusion zones.
Vessel operators associated with well construction activities.	Two months prior to commencing well construction campaigns.	Provide details of DoF biosecurity policy.

Should any significant change to the potential or actual environmental impacts detailed in the EP for any well construction activity be identified, VOGA will inform all relevant stakeholders of the change and seek feedback via a consultative process.

VOGA has provided all stakeholders with contact details, and the company can be contacted directly regarding any aspect of our activity. Each enquiry will be carefully considered with responses provided in a timely manner.

9 Contact details

Further information about the WCEP can be obtained from:

Mr Namek Jivan

Health, Safety, Environment and Security Advisor

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APPENDIX

Appendix A: Environmental impacts and risks

Table 0-1: Summary of environmental hazards, potential impacts and preventative and mitigation measures

Source of Risk (Hazard)	Potential Environmental Impact	Preventative Control Measures	Mitigation Control Measures
Liquid hydrocarbon release from wells	Temporary decrease in marine water quality. Increased toxicity of, and bioaccumulation in, marine organisms from the ingestion of hydrocarbons. Injury or death of exposed marine fauna (e.g. oiling of seabirds). Habitat impacts where the spill reaches sensitive marine areas such as coral reefs or the shoreline.	VOGA require third party Quality Assurance (QA) inspections on equipment prior to shipping offshore.	Wandoo Emergency Response Plan [VOG-2000-RD-0017]/Wandoo Field OSCP [WAN-2000-RD-0001].
		Well casing, completion and wellhead components are manufactured to relevant API specifications.	
		The well intervention contractor used on a campaign has been through VOGA's contractor evaluation process or equivalent.	Platform status complies with requirements of the Wandoo Field Safety Case Revision and the MODU Safety Case Revision prior to a MODU obtaining permission to approach platform during rig move.
		Well Construction Program outlines the intended work scope and well barriers to be in place during the campaign.	
		VOGA Drilling Supervisors, Completions Supervisors and Drilling Superintendents hold current well control certification as required.	
		Relevant MODU personnel hold current well control certification as required.	
		BOPs are tested a regular intervals in accordance with API standard 53 in accordance with VOGA requirements.	
		Well Construction Program includes directional drilling plans for new wells and trajectories are checked for wellbore collision risk.	
		Well Construction Program specifies wells to be shut in prior to drilling in close proximity.	
		Lifting equipment utilise equipment that is certified in accordance with the VOGA Lifting Equipment Manual or MODU Safety Case requirements.	
Permit to Work issued for all heavy lifts onto or over platform infrastructure.			
Liquid hydrocarbon release from the platform, export equipment or pipeline(s)	Temporary decrease in marine water quality. Increased toxicity of, and bioaccumulation in, marine	Platform location published in Notice to Mariners and Marine Charts.	Wandoo Emergency Response Plan [VOG-2000-RD-0017]/Wandoo Field OSCP [WAN-2000-RD-0001].
		Navigational lights on all AHTS vessels and MODU.	
		Vessel contract specifies Dynamic Positioning capable AHTS vessels or multi-point mooring capable vessels.	
		AHTS vessels contracted by VOGA have competent masters.	

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Source of Risk (Hazard)	Potential Environmental Impact	Preventative Control Measures	Mitigation Control Measures
	organisms from the ingestion of hydrocarbons. Injury or death of exposed marine fauna (e.g. oiling of seabirds). Habitat impacts where the spill reaches sensitive marine areas such as coral reefs or the shoreline.	AHTS vessels obtain permission to enter petroleum safety zone. AHTS vessels contracted by VOGA have systems to assist with tracking and identifying vessels in the general area. Detailed Simultaneous Operations (SIMOPS) Plan (including wells shut in and external conductors bled down during move onto location).	
Diesel spill to sea	Temporary decline in marine water quality. Injury or death of exposed marine fauna. Potential impacts where the spill reaches sensitive marine areas such as coral reefs or sandy/rocky shorelines.	Notification of intent to move MODU to or from Field is notified in advance to Australian Maritime Safety Authority. Navigational lights on all AHTS vessels and MODU. Vessel contract specifies Dynamic Positioning capable AHTS vessels or multi-point mooring capable vessels. AHTS vessels obtain permission to enter MODU exclusion zone. SIMOPS matrix defines controls to be implemented when multiple vessels are in field. AHTS vessels contracted by VOGA have certified masters. Breakaway coupling on refuelling hose to prevent spill due to vessel loss of position. MODU bunkering conducted under a Permit to Work.	Shipboard Oil Pollution Emergency Plan (SOPEP) for vessels addresses potential spill response. Wandoo Emergency Response Plan [VOG-2000-RD-0017]/Wandoo Field OSCP [WAN-2000-RD-0001].
Oil spill response strategy hazards	Increased entrained fraction of hydrocarbons in the water column after adding dispersants. Toxicity effects on marine fauna from dispersant. Disturbance to benthic habitat, adjacent vegetation and other environmentally sensitive areas. Scouring of sediments.	Undertake monitor and evaluate response activities to maintain situational awareness and adequately identify receptors at risk. Dispersant application to be selected and implemented in accordance with the Wandoo Field OSCP [WAN-2000-RD-0001]. Mechanical dispersant activities shall be undertaken within the minimum standard timeframes as per spill category requirements once initiated. Containment and recovery to be selected and implemented in accordance with the Wandoo Field OSCP [WAN-2000-RD-0001] Protection and deflection activities shall be undertaken within the minimum standard timeframes as per spill category requirements once initiated.	Environmental monitoring of impact of the spill and response strategies.

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Source of Risk (Hazard)	Potential Environmental Impact	Preventative Control Measures	Mitigation Control Measures
	Waste generation, disposal and management.	Protection and deflection booms to be installed in consultation with the Department of Transport. The shoreline predicted to be impacted will be surveyed prior to commencement of clean-up activities and key sensitivities identified. Shoreline clean-up activities shall be undertaken within the minimum standard timeframes as per spill category requirements once initiated. Wastes shall be stored in appropriate containers and segregated on-site prior on-shore disposal at an approved location. Induction and training covers requirement to avoid disruption to environment and contact with flora and fauna. Oiled wildlife activities undertaken shall align with the strategies detailed in the WA Oiled Wildlife Response Plan (WAOWRP). All external communications occurring through the Incident Command Team, including government, industry and community stakeholders are documented.	
Noise	Injury to hearing or other organs of marine fauna. Masking or interfering with biologically important sounds. Disturbance leading to behavioural changes or displacement of fauna.	MODU and AHTS vessel engines and power generation equipment maintained in accordance with contractor’s preventative maintenance systems. AHTS vessels operating in the Permit Area will adhere to Part 8 of EPBC Regulation 2000.	No practicable controls identified.
Atmospheric emissions	A localised and temporary reduction in air quality due to particulate matter from diesel combustion. Contribution to global greenhouse gases.	The sulphur content of fuel complies with Regulation 14 of MARPOL 73/78 Annex IV and AMSA Marine Order 97. MODU and AHTS Vessels have current IAPP certificates as required under MARPOL 73/78 Annex VI, and AMSA Marine Orders Part 97. MODU and AHTS vessel engines and power generation equipment maintained in accordance with contractor’s preventative maintenance systems. Contractor PMS in place to maintain helicopter engines.	No practicable controls identified.

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Source of Risk (Hazard)	Potential Environmental Impact	Preventative Control Measures	Mitigation Control Measures
Artificial light	Disorientation, attraction or repulsion of marine fauna and birds. Altered foraging and breeding behaviours including increased predation risk.	No controls identified as vessel lighting is specified for safe working practices.	No practicable controls identified.
Discharge of cooling water/reject water	Thermal impacts to marine organisms. Reduced dissolved oxygen concentrations and dilute hypochlorite content, leading to localised impacts on pelagic fauna.	Engines on board the MODU and AHTS vessels will be maintained in accordance with manufacturer's specifications.	No practicable controls identified.
Deck drainage and bilge water discharge	Reduction in water quality. Toxicity effects to marine organisms in the immediate vicinity of the discharge.	Biodegradable detergents will be used during wash-down activities on the MODU and AHTS vessels.	MODU and AHTS vessels have SOPEP procedures to manage small spills on their facilities.
		MODU and AHTS vessel are required to have oily water filtering equipment of a design approved by the Administration, as per MARPOL 73/78 Annex I.	MODU and AHTS vessels have equipment to manage small spills on their facilities.
		Deck drainage and bilge water will be treated in an oil water separator and discharged in accordance with MARPOL Annex I (Regulation 15) and AMSA Marine Order 91.	
Non-hazardous and hazardous waste	Marine pollution (litter). Injury and entanglement of marine fauna and seabirds. Potential toxicity effects to marine fauna. Land and groundwater contamination.	MODU and AHTS vessels procedures which are compliant with MARPOL Convention Annex V, Prevention of Pollution by Garbage from Ships and Marine Orders 95 (Marine Pollution Prevention – Garbage).	No practicable controls identified.
		Non-hazardous and hazardous wastes are managed in accordance with contractor's Waste Management Plan.	
Discharge of drill cuttings, cement, steel shavings and	Burial and smothering of benthic habitat and fauna;	Drilling and completion fluids and cement components are selected using the chemical assessment process outlined in the VOGA chemical selection procedure, in Section 6.10 of the EP.	No practicable controls identified.

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Source of Risk (Hazard)	Potential Environmental Impact	Preventative Control Measures	Mitigation Control Measures
well drilling and completions fluids	Increased water turbidity and localised changes to water quality; and Potential toxicity effects to marine fauna.	Solids control system used.	
Discharge of sewage, grey water and putrescible wastes	Nutrient enrichment and increased biological demand of surrounding waters. Low level contamination of organisms caused by ingestion of waste materials. Increase in scavenging behaviour of marine fauna and seabirds.	Putrescible waste from MODU and AHTS vessels is macerated and discharged in accordance with MARPOL 73/78 Annex V.	No practicable controls identified.
		Sewage discharge from AHTS vessels and MODU is treated in accordance with MARPOL 73/78 Annex IV and AMSA Marine Order 96.	
		In the event of sewage treatment plant failure untreated sewage will be stored on-board in suitable holding tanks and disposed of onshore at a reception facility or to a carrier licensed to receive the waste, or discharged at a distance of more than 12nm from the nearest land.	
		Biodegradable, low phosphate detergents will be used in the laundry.	
Ancillary hydrocarbons or chemical spills	Reduction in water quality. Toxic effects on marine biota.	Intermediate Bulk Containers, cranes and lifting equipment are certified.	MODU and AHTS vessels have SOPEP procedures to manage small spills on their facilities.
		All MODU and vessel equipment including lifting equipment and cranes is covered by the MODU contractor's PMS.	
		Chemical storage on MODU compliant with MODU contractor's storage requirements.	MODU and AHTS vessels have equipment to manage small spills on their facilities.
		Crane operators to be certified for offshore tower crane operations.	
Physical presence of MODU and AHTS vessels	Disturbance marine fauna including marine mammals, reptiles and birds. Interaction with commercial and recreational fishing and shipping.	Consultation with relevant stakeholders.	No practicable controls identified.
		Functional communication equipment on board MODU and AHTS vessels to communicate with commercial and recreational shipping vessels in the vicinity of the Facility.	
		Notification of intent to move MODU to or from field is notified in advance to AMSA.	
		MODU has exclusion zone of 500m for unauthorised vessels.	
		AHTS vessel speed within MODU 500m exclusion zone required to be 5 knots or less.	

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Source of Risk (Hazard)	Potential Environmental Impact	Preventative Control Measures	Mitigation Control Measures
		VOGA contracted vessels operating in the Permit Area will adhere to Part 8 of EPBC Regulation 2000.	
		For potential impact of provision of an artificial habitat for benthic and pelagic organisms, no controls are required as no negative impact has been identified.	
		For potential impact of changes to visual amenity, no control measures were identified due to distance from shore.	
Seabed disturbance	Seafloor scour. Increase in turbidity of the water column/reduction light penetration. Localised smothering of benthos. Localised reduction in benthic productivity.	Rig move plan will be prepared in general accordance with Drilling Contractor's Marine Operations Manual. AHTS vessels required to anchor outside the platform exclusion zone. Anchor zone is nominated as clear of subsea infrastructure and environmentally sensitive seabed environments. At the vessel masters discretion, AHTS vessels are expected to recover anchors and sail slowly if the weather is such that there is a risk of dragging an anchor.	Objects are very infrequently dropped from the MODU during the work process. At the completion of the well construction campaign, a video record is made of the seabed around the MODU location and any dropped objects are recovered or plans are made for recovery in the future.
Introduction of invasive marine species	Changes to habitat structure. Predation of native species. Potential introduction of invasive marine species.	If it becomes necessary to use a MODU or AHTS vessel from outside Australian waters the MODU or AHTS vessel is contractually obliged to meet Australian Quarantine Inspection Services (AQIS) Guidelines. If a MODU or AHTS vessel has not been operating in Australian waters within six months prior to moving to the Permit Area they will comply with the Annex 1 of the International Convention on the Control of Harmful Anti-Fouling Systems on Ships.	Bio-fouling on vessels will be managed in accordance with the National Bio-fouling Management Guidance (2009).