



Cliff Head Development HWU Installation and CH12 Workover Summary Environment Plan

AGR Asia Pacific Controlled Document

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ROC HSE Policy

Health, Safety and Environment - Vision, Goals, Policy and Guiding Principles



Vision & Goals

Our vision at ROC is to continually make measurable improvements in the Health, Safety and Environmental ("HSE") aspects of our business.

To realise this vision, we are committed to the following goals:

- Zero harm to our employees, contractors and the communities in which we operate;
- Conduct our business in a way that minimises the risks to the environment;
- Integrate HSE into all of our business activities; and
- Demonstrate industry leadership in HSE performance.

Policy

It is the policy of ROC to carry out its business activities in a manner consistent with sound HSE management practices and to comply with applicable HSE laws and regulations. This will be achieved by management, employees and contractors working together adopting ROC's HSE systems and standards. Performance will be monitored, reviewed and audited to achieve best practice.

ROC undertakes to regularly review this policy to take account of changes in legislation and ROC's activities.

Guiding Principles

We are committed to integrate the following "Guiding Principles" into all decisions affecting our Operations:

- **Safety Culture**
We will foster positive safety culture characterised by a shared commitment to safety and hazard prevention.
- **Leadership & Accountability**
We will establish HSE responsibility and accountability at every level of our organisation.
- **Environmental Stewardship**
We will ensure that potential impacts on the natural environment, including biodiversity, are minimised and water, energy and other natural resources are conserved where practicable.
- **Risk Management**
We will identify and assess HSE risks through a formal and structured process to facilitate effective risk reduction plans and action.
- **Asset Integrity**
We will ensure that systems are established, documented and maintained to ensure the ongoing integrity of plant and equipment.
- **Job Competency**
We will ensure that employees are suitably trained, supervised and provided with the resources to perform their work in a competent manner. ROC will foster an awareness of shared responsibility and accountability for the environment.
- **Contractors**
We will only engage contractors who share our vision and will work with us to implement these guiding principles whilst working on any of our facilities.
- **Management Systems & Standards**
We will develop, implement and continuously improve effective health, safety, and environmental management systems and develop standards that reflect best industry practices.
- **Performance Review**
We will set measurable goals for HSE performance and track progress against these goals.

Alan Linn



Chief Executive Officer
23 February 2011

Roc Oil Company Limited



AGR HSEQ Policy



Health, Safety, Environmental and Quality Policy

AGR Field Operations recognises that management of health, safety, environment and quality is fundamental to the success of our business. We will systematically aim to become a best-in-class performer in our work towards the prevention of:

- Injuries to personnel
- Work related illnesses
- Hazardous environmental discharges
- Economic loss caused by HSE incidents

We will achieve this by:

- Maintaining an effective management system that complies with internationally recognised standards on quality, safety, health and environmental management, focused on continuous improvement and meeting the requirements of both our internal and external customers.
- Working jointly with our employees and contractors to ensure a safe and healthy working environment for all personnel and controlling workplace risks to personnel to as low as reasonably practicable.
- Responsibly and sustainably managing impacts to the environment.
- Promoting safety, environmental and quality awareness and continuous improvement amongst our personnel and establishing and monitoring measurable targets and objectives.
- Complying, as a minimum, with all applicable statutory requirements wherever we operate.

Signed by:

Brett Smith / Senior Vice President

15/02/2010

1 Activity Description

Roc Oil (WA) Pty Ltd (ROC), a wholly owned subsidiary of Roc Oil Company Limited, together with AWE Oil (WA) Pty Ltd and CIECO E&P (Australia) Pty Ltd are the participants of the Cliff Head Development Joint Venture (JV). The Cliff Head Alpha (CHA) Platform and production pipelines, the offshore portion of this development, lie in Commonwealth and WA state water jurisdictions. ROC is the operator of the Licence area WA-31-L on behalf of the JV Participants.

1.1 Scope of Work

ROC will undertake a well intervention activity on the Cliff-Head 12 (CH12) well, in order to enhance oil recovery from the Cliff Head oil field. To undertake this activity, initial work-over activity will be undertaken by the Coiled Tubing Unit¹ (CTU) however in the event that the CTU is not suitable to complete the intervention, it will be necessary to modify the CHA topsides to temporarily install a Hydraulic Workover Unit (HWU). Note that while the HWU facilities will be removed at the end of the CH12 workover, HWU activities will occur on an 'as needs' basis for the HWU for future intervention activities.

In preparation for HWU operations² the coiled tubing unit (CTU) will be dismantled, packaged and removed from CHA using the platform's crane and a support vessel. The HWU and substructure will be brought to the field on either a supply barge supported by tugs or a larger support vessel operating under its own power and will be lifted onto CHA using the platform's crane. Upon completion of the HWU well intervention operations the unit and substructure will be dismantled, shipped back to shore, and the CTU re-installed.

HWU well intervention activities planned for CH12 will involve the following:

- Hydrocarbon liquids will be removed from CH12 and the well fluid replaced with weighted brine fluid;
- Fishing and recovery of the Electronic Submersible Pump (ESP) and ECT will be undertaken from the completion tubing.
- Completion tubing will either be repaired/remediated or pulling and replacement with new tubing; and
- CH12 will be recommissioned with the CHA Production system.

Potassium Chloride (KCl brine) will be utilised for the workover of this well. This chemical is a chemical listed under the North Sea Offshore Chemical Notification system as a chemical which poses little or no risk (PLONOR). This brine will be recirculated during the activity with the intention that excess brine is either processed through the CHA production system or collected in tanks for onshore disposal. Cuttings (from milling operations if required) contained within the brine will be captured and disposed onshore via waste disposal (skip bins) (i.e. not discharged overboard).

No stand-alone testing or well-cleanup activities on CHA are planned for the CH12 well workover. At the completion of work-over activities, work-over fluids which remain in CH12 will be processed via the CHA/ASP hydrocarbon processing system for separation and returned with the PFW stream for reinjection into the offshore water wells.

The CH12 well will be returned to production at the completion of work-over activities.

¹ Coiled Tubing Unit activities are contained within the current Operational Environment Management Plan (10/HSEQ/ENV/PL01).

² Note HWU Operations are contingent on the CTU not being able to complete work-over operations

For the duration of HWU operations the following support services are required at the CHA Platform:

- Access to the offshore facility will be by helicopter from Dongara Airport. Helicopter operations to CHA Platform are planned at a frequency of two trips per day per shift (four trips per day in total) for shift change with flying time approximately seven (7) minutes each way.
- A standby vessel (SBV) will be provided at CHA during well intervention activities at all times when the facility is manned. The vessel will be moored (via temporary mooring) within the Petroleum Safety Zone (PSZ) south of CHA. The vessel will mobilise from Port Denison approximately 45mins steaming time from CHA.
- One support vessel will assist with the temporary HWU installation activities at CHA. This vessel will mobilise from Geraldton which is approximately 8hrs steaming time from CHA.
- A support vessel, will service CHA with supplies/provisions throughout the work-over activities. The vessel will moor to the permanent mooring located adjacent to the CHA platform to off-load cargo and will undertake supply operations on an 'as-required' basis. The supply base for the standby and support vessel is Geraldton.

These proposed works will be undertaken in a water depth of approximately 15-20m, within the existing gazetted PSZ for the CHA Platform. Fishermen have been advised of the activity and will be excluded from the PSZ for the duration of the activity. HWU installation and CH12 Work-over activities on CHA have the expected durations provided in **Table 1**.

Table 1: Duration of Activities

Activity	Duration (approx)
Installation of Temporary Mooring (SBV)	14days
CTU Demobilisation	14days
HWU Installation	21days
HWU Well Intervention Activities	60days
HWU Demobilisation	10days
CTU Remobilisation	7days

Activity will be undertaken on a 24hr/7day basis during this operation.

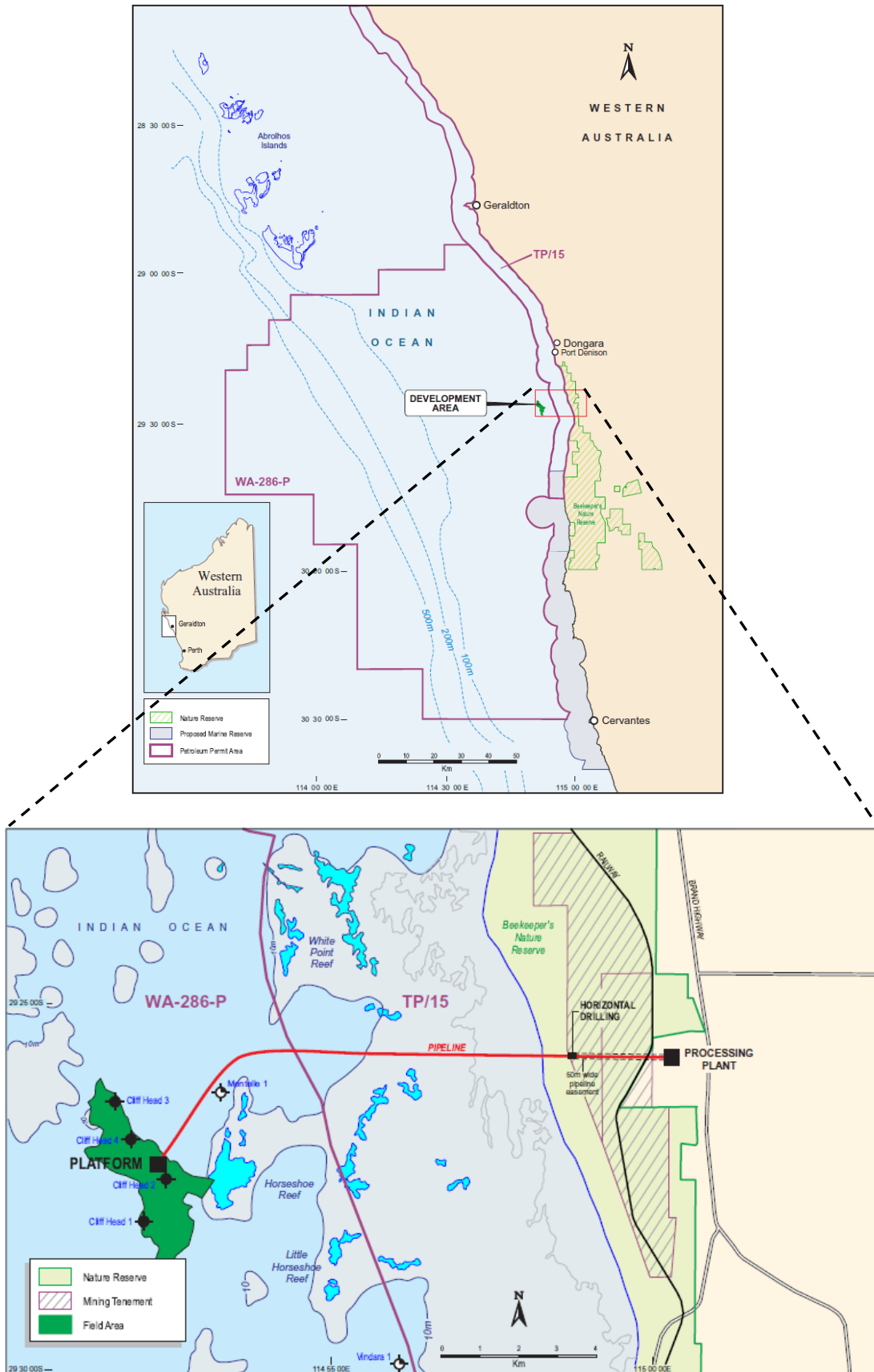
1.2 Location

The Cliff Head oil field is located off the Western Australian coast (Production Licence WA-31-L), west of the Big Horseshoe Reef; approximately 20 km south-southwest of Dongara (refer **Table 2** and **Figure 1**). The water depth in the vicinity of the field is approximately 16m and the closest landfall is some 10km due east. A PSZ of 500m has been gazetted around the CHA Platform facility. The CH12 well location (top-hole) is located at the CHA platform location.

Table 2: CHA Platform Location

MGA Coordinates (GDA94) UTM 80 Zone 50			
Locations	Longitude	Latitude	Water Depth
CHA	114° 52' 11"E	29° 27' 0" S	16

Figure 1: CHA Platform Location



2 Receiving Environment

2.1 Climate

The oil field is within a region that has a Mediterranean type climate characterised by seasonal patterns of hot, dry summers and mild, wet winters, with a low number of rain days. The highest temperatures occur in January and February while the lowest temperatures occur in August. There is a dominant winter rainfall with approximately 55% of annual rainfall occurring in June and August.

Winds over the region are relatively strong (mean 12–16 knots; maximum 30–35 knots) and are most frequently from the southern sector (southeast to southwest) during the summer months and from the eastern sector (northeast to southeast) during the winter months.

2.2 Marine Environment

2.2.1 Meteorological Ocean Conditions

Water circulation in the area is primarily influenced by wind-driven currents, although localised wave-forced currents may occur around the shallow reefs, particularly during large swell events. The currents at the surface to mid-depth have typical mean speeds of 0.08 to 0.15 ms⁻¹ and near the seabed this is reduced to 0.06 to 0.1 ms⁻¹. The currents run mostly parallel to the local bathymetry/shoreline (WNI, 2000) with the regionally-dominant Leeuwin Current not having significant influence in the inshore areas where the CHA Platform is located. As a result of the strong land/sea breezes, seas are slightly greater than swell in summer. Oceanic swells predominantly arrive from the southwest during summer.

Tides are diurnal, with a small maximum range of less than one meter, and have very limited effect on water circulation in the area.

2.2.2 Marine Benthic Environment

The offshore seabed environment generally consists of smooth calcarenite rock strata of varying thickness with a thin layer of sand overlaying. On the offshore pipeline corridor the sand thickness varies by approximately 0.2m to 1m. The region is characterised by a relatively narrow continental shelf with diverse moderate energy coastal landforms (IMCRA, 1997). The area has a range of temperate species and is also at the southern limit of a suite of sub-tropical and tropical species.

Limestone ridges, a relic of previous sea level rises/recessions are present in the offshore marine area. The ridges, now below sea level form sub-littoral reefs, often undercut and cavernous on the seaward side. The sea floor in the near shore areas is characterised by seagrass and macroalgae cover of varying densities and types. The predominant seagrass is *Amphibolis*, *Thallasodendron* and *Heterozostera* species. The offshore environment is a mosaic of limestone reefs and platforms, sandy mobile seafloor and beds of algae and seagrass.

ROV surveys have indicated that the platform location is comprised of sandy sediment overlying limestone pavement. Seagrass meadows are not a significant feature at the CHA platform.

2.2.3 Marine Fauna

The following marine mammal species may be present in the vicinity of the CHA platform:

- Blue whales while possibly present normally remain in deeper waters off the shelf break (Rafic, 1999) and would be unlikely to occur in the vicinity of the CHA Platform;
- Humpback whales migrate between their summer feeding grounds near Antarctica to their winter breeding grounds adjacent to Australia's Kimberley coastline. On the west coast, northbound migration occurs between mid-June and mid-July, while the southbound migration occurs between October and November (Jenner et al., 2001). Within the region, it is considered that the whales follow a predictable migratory pattern within the continental shelf boundary (200m bathymetry) and between the Houlman Abrolhos Islands and the mainland (>30nm offshore). Northward migration is generally offshore, whereas southward migration is typically closer to the coastline.
- The Southern Right Whale migrates from sub-Antarctic feeding grounds to breeding grounds on Australia's south coast during winter and spring (Bannister, 1994) with regular calving occurring between Augusta in Western Australia and Port Lincoln in South Australia and less regular calving occurring around the southwest coast up to Perth. During the winter and spring period, occasional sightings of southern right whales have been made as far north as Geraldton.
- Bryde's whales are the smallest of the baleen-type whales and are found in oceanic and nearshore tropical and subtropical waters. Bryde's whales have previously been recorded near the Abrolhos Islands (Bannister et al, 1996) and may occasionally pass near to the Cliff Head development area.
- Sei and fin whales generally tend to stay in deeper oceanic waters and migrate to the sub-Antarctic, below latitude 35°S, to feed during the warmer months (Bannister et al., 1996).
- Australian sea lions are regularly observed feeding around the larger reefs in the area. The nearest breeding grounds are on the Beagle Islands some 35 km to the south and the Abrolhos Islands approximately 100km northwest of the area.

Leathery turtles generally frequent deeper offshore waters; however, it is common for them to be sighted in the shallower coastal habitats.

The following fish species may be present in the vicinity of the CHA platform:

- The Great White Shark, Grey Nurse Shark and Whale Shark may have habitat in the area. Whale sharks, occurring in both tropical and temperate waters, are known to aggregate in the waters adjacent to North West Cape in late March to early May, with the largest numbers being recorded in April. The season is, however, somewhat variable and whale sharks have been recorded between mid-March and the beginning of June. It is unlikely that the whale shark would occur in the CHA Platform area, however, they migrate long distances and have been observed further south than Dongara so their presence cannot be discounted.
- The diverse range of ecological niches afforded by the patch reefs across the area is expected to provide suitable habitat for the listed *Osteichthyes* species of seahorses, sea-dragons and pipefish.

- The varieties of benthic habitats support diverse and abundant fish communities. Reef associated fishes, such as scalyfin (*Parma spp.*) and wrasse (*Labridae spp.*) are common, along with commercial species such as baldchin groper (*Choerodon rubescens*) and dhufish (*Glaucosoma hebraicum*) on outer reefs. Offshore, pelagic fishes such as Spanish mackerel (*Scomberomorus commerson*) and Samson fish (*Seriola hippos*) also occur.

Migratory seabirds, some protected by international agreements (Bonn Convention, JAMBA, CAMBA, ROKAMBA) may pass through the CHA platform area. They are, however, uncommon due to the lack of suitable roosting and breeding habitat but foraging groups of seabirds are sighted occasionally.

The western edge of the CHA Platform area is an area of lobster breeding. The western rock lobster (*Panulirus cygnus*) supports the most valuable single species fishery in Australia. The life cycle of the western rock lobster has been well studied. Breeding occurs in spring and early summer in waters near the edge of the continental shelf of 35 to 90m depth.

2.3 Social Environment

The CHA Platform and Arrowsmith Stabilisation Plant are located in the Mid West region of Western Australia. The twin towns of Dongara and Port Denison are the nearest townships to the development.

The Cliff Head oil field is located in an area of high commercial rock lobster fishing activity, which represents the main economic activity in the project area.

The region has also historically supported petroleum exploration. The Perth Basin has become a prominent oil and gas production province supporting a number of onshore operators. Similarly, mineral extraction is undertaken in the onshore area, primarily for mineral sands.

The CHA Platform lies on a coastline with many historic shipwrecks although no known significant shipwrecks lie nearby to the development.

3 Major Environmental Hazards and Controls

A risk analysis has been undertaken for all aspects of the proposed flowline installation and pre-commissioning activities in accordance with the requirements of ISO14001 – *Environment Management Systems*, AS4360:2004 *Risk Management* and HB203-*Environmental Risk Assessment – Principles and Process*. The analysis indicates that, with the proposed management/mitigation measures implemented, no significant environmental impacts are expected and the activities carry a low to medium residual environmental risk. Further details of key environmental aspects of the installation and pre-commissioning activities are provided in **Table 3**.

4 Summary of Management Approach

ROC has established a Corporate Health Safety and Environment Management System (HSEMS) for all of its activities within Australia and internationally. The pinnacle document of the Corporate HSEMS is the ROC HSE Policy. The ROC HSE Policy applies to all ROC subsidiary companies such as Roc Oil (WA) Pty Ltd.



As Production Licence 'operator', ROC has engaged AGR Asia Pacific (AGR). AGR has been contracted to act as facility (contract) operator of the Cliff Head facilities to manage the day-to-day activities on the facilities and have the immediate responsibility for ensuring that activities are managed in such a way to reduce the risk of negative impacts to the environment to As Low As Reasonably Practicable (ALARP). Work-over activities (i.e. ROC Drilling) are integrated into this management system structure.

For this activity, ROC adopts the AGR Integrated Management System (IMS) to fulfil the company's environmental policy, objectives and ensure environmentally responsible management of activities. AGR's IMS is certified to ISO 14001 and provides a framework to management of environment during the installation and work-over activities. The IMS applies to all employees, contractors and other associated third parties.

Accordingly ROC and AGR have, using a systematic approach, identified and assessed HWU installation and workover activities, their associated impacts and environmental risk after environmental control measures have been implemented. This process has also established objectives, performance standards and criteria to manage and measure environmental performance during the HWU and CH12 work-over activities.

5 Consultation Process

ROC, throughout the history of the Cliff Head development has undertaken comprehensive stakeholder consultation. Parties consulted specific to the operations phase of the Cliff Head Development include:

- Local communities of Dongara and Port Denison.
- Commercial fishing organisations (i.e. Western Rock Lobster Council, Dongara Professional Fishermen's Association, Geraldton Professional Fishermen's Association, United Mid West Professional Fishermen's, Longline Association, Western Australian Fishing Industry Council, Kalbarri Professional Fishermen's Association and Western Australian Fishing Industry Council).
- Local government (i.e. Irwin Shire Council, Greenough Shire and Geraldton City).
- Western Australian Government Departments.
- Commonwealth Government Departments.
- AMSA.
- Geraldton Port Authority.
- Western Australian Conservation Council.
- Active Community Environmentalists Inc.

Stakeholder consultation has continued through the operational phase and specifically for the HWU Installation and CH12 interventional activity, has included consultation with the Dongara Professional Fishermen's Association and the Dongara Fishing Cooperative. This activity will increase vessel traffic to the CHA Platform and restrict fishing within the PSZ for the duration of the activity. Fishermen have not raised any concerns to date.



6 Contact Details

Further information associated with the environmental aspects of the HWU Installation and CH12 Work-over activities may be obtained from ROC by writing to:

Barry Ashwin
Cliff Head Development Asset Manager
Roc Oil Company Limited
Level 2, 201 Adelaide Terrace
Perth, WA, 6004

Table 3: Summary of Environmental Risk Assessment

No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
Support/Standby Vessel: Physical Presence					
1	Standby/Support Vessel	<ul style="list-style-type: none"> Restricted access to PSZ area causing disruption to fishing activities 	Minimise interference with commercial fishing vessels	<ul style="list-style-type: none"> Consultation with and notification to fishing industry groups on HWU activity in accordance with DPFA Agreement. Fishermen will not be permitted in PSZ for duration of activities. Continued consultation during activity Limited period of Impact (approx 100days) – fishing catch deferral only 	Low
2		<ul style="list-style-type: none"> Possible collision with marine fauna (EPBC listed) causing injury or death 	Minimise disruption to Marine Life	<ul style="list-style-type: none"> Environmental induction for crews. Whale & dolphin sighting reports to be completed and submitted to DSEWPC. All vessels will adhere to the 2005 Australian National Guidelines for Whale & Dolphin Watching (DEWHA, 2005). 	Low
3	Seabed disturbance (Temporary Mooring & Dropped Objects)	<ul style="list-style-type: none"> Impact to Benthic Habitats 	Minimise disturbance to the seabed and benthic habitats	<ul style="list-style-type: none"> Permanent mooring for support vessels and temporary mooring installed for SBV Seabed area around CHA sandy (readily recolonised) and does not have high environmental sensitivity Temporary mooring removed after HWU activity. 	Low
4		<ul style="list-style-type: none"> Impact to Benthic Habitats Fishing Snag Hazards 	Minimise disturbance to the seabed and benthic habitats	<ul style="list-style-type: none"> CHA crane and rigging appropriately rated for lifts Lifting equipment inspected and maintained Lifts occur under a PTW and after a JSEA Weather limitations on lifting events Dropped Objects Program (report & retrieval where practicable else position recorded) Environmental Induction 	Low



No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
Support/Standby Vessels: Discharges to Sea					
5	Ballast Water Discharge and Bio-fouling	<ul style="list-style-type: none"> Discharge of exotic organisms causing ecological disruption 	Minimise possible exotic marine organism introduction into WA waters	<ul style="list-style-type: none"> Vessels are sourced and routinely work from local ports (Geraldton/Port Denison) where possible For international vessels compliance with the AQIS Australian Ballast Water Management Requirements While at CHA – no ballast exchange activities to occur. 	Low
6		<ul style="list-style-type: none"> Introduce exotic marine species (hull and vessel niche fouling) 	Minimise possible exotic marine organism introduction into WA waters	<ul style="list-style-type: none"> Vessels are sourced and routinely work from local ports (Geraldton/Port Denison) where possible For international vessels, prior to entry into Australian waters a bio-fouling risk assessment will be undertaken with any inspection, cleaning and coating reapplication undertaken as appropriate All vessels to have current statement of Compliance for International Anti-fouling Inspection Systems 	Low
7	Deck Drainage	<ul style="list-style-type: none"> Toxic impacts to marine flora and fauna Reduction in water quality 	Minimise impact of routine vessel discharges on marine environment	<ul style="list-style-type: none"> High standards of house-keeping maintained on vessels Bunding (temporary or permanent) is provided for those areas/activities with increased risk of oil/chemical spill; Spill cleanup materials (e.g. absorbents, containers) located in accessible locations; Spill material removed prior to any deck washing activities; Absorbent material, used for cleanup, is containerised and sent to shore as hazardous waste; Material Safety Data Sheets are available for all chemicals used (includes spill response requirements); Chemicals used are assessed for environmental impact prior to purchase (e.g. fully biodegradable detergent). Bunded oil areas directed to shipboard oily water system (<i>refer below</i>). 	Low



No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
8	Equipment/Machine Space Drainage	<ul style="list-style-type: none"> Toxic impacts to marine flora and fauna Reduction in water quality 	Minimise impact of routine vessel discharges on marine environment	<ul style="list-style-type: none"> Equipment and machine spaces are fully contained and have dedicated drains leading to the bilge water system for oily waste products; Oily residues collected in this system are containerised in transit tanks and returned to shore for disposal. Whilst <i>en route</i> OIW discharge is monitored and meets MARPOL Annex 1 discharge criteria (>15ppm). When <i>stationary</i>, oily water mixtures contained onboard. 	Low
9	Disposal of sewage, greywater and food-scrap	<ul style="list-style-type: none"> Nutrient enrichment of surrounding water Visual amenity impacts 	Minimise impact of routine vessel discharges on marine environment	<ul style="list-style-type: none"> MARPOL Annex IV compliant sewage treatment plant (comminutes/disinfects) else all sewage stored in on-board for onshore disposal; Foodscrap to be containerised given proximity to CHA and WA coastline (i.e. <12nm). 	Low
Atmospheric Emissions					
10	Hydrocarbon release during Work-over	<ul style="list-style-type: none"> Greenhouse Gas Contributor Lost resource utilisation 	Minimise impacts of atmospheric emissions	<ul style="list-style-type: none"> Low GOR crude reservoir Well circulated to brine prior to work-over and fluid maintained over balance (fluid monitored) Degasser unit vents gas to safe location 	Low
11	Combustion products (HWU engines, helicopter, support & stand-by vessels)	<ul style="list-style-type: none"> Reduction in air quality Aesthetic impacts of smoke Greenhouse Gas Contributor 	Minimise impacts of atmospheric emissions	<ul style="list-style-type: none"> Regular equipment monitoring and maintenance undertaken to ensure maximum efficiencies; Fuel use monitored and equipment performance assessed; Emissions from marine utilities in accordance with MARPOL Annex IV Prevention of Air Pollution from Ships 	Low
Noise					



No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
12	Noise	<ul style="list-style-type: none"> Behavioural disturbance to marine mammals, seabirds and other marine fauna 	Minimise disruption to marine life	<ul style="list-style-type: none"> Noise levels generated are below documented fauna 'avoidance' criteria All mobile vessels will adhere to 2005 Australian National Guidelines for Whale & Dolphin Watching; Cetacean sighting data collected during the well intervention program and will be forwarded to DSEWPC & DMP. 	Low
CHA & Vessel: Disposal of Wastes and Hazardous Materials					
13	Hazardous & General Wastes (non-NORM)	<ul style="list-style-type: none"> Possible toxic and physical impacts to marine flora and fauna Visual pollution to the marine environment 	Minimise potential impacts of general and hazardous wastes on the environment	<ul style="list-style-type: none"> Waste minimisation principles adopted within HWU activities No solid/hazardous waste disposed overboard Clear waste identification, segregation, containment (in skips or sealed drums) and labelling for onshore disposal; Waste storage areas are routinely inspected; Training and reinforcement to all personnel of waste management requirements; Documented Disposal Records. 	Low
14	NORM Contaminated Materials (CH12 Tubing)	<ul style="list-style-type: none"> Harmful low-level radioactive discharges to the marine environment 	Minimise potential impacts of hazardous wastes on the environment	<ul style="list-style-type: none"> Identify materials with radiation levels above background levels (undertaken by trained radiation specialists) in accordance with Radiation Management Plan (10/HSEQ/GEN/PL09) Cap pipe, segregate and containerise all NORM wastes clearly identifying and send onshore for further onshore assessment and possible treatment/disposal via water injection system. 	Low



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CH12 Workover Summary Environment Plan



No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
15	NORM Contaminated Materials (CH12 Tubing)	<ul style="list-style-type: none"> Exposure to humans of low-level radioactive materials 	Minimise potential impacts hazardous wastes to personnel	<ul style="list-style-type: none"> Radiation Management Plan (10/HSEQ/GEN/PL09) Carry out offshore radiation surveys to confirm exposure risks and identify above-background radiation areas (undertaken by trained radiation specialists). Implement NORM awareness, management and OHS protection measures for all personnel Establish area entry protocols with clear identification of potential hazards 	Low
Accidental Releases					
16	Diesel Spill – Fuel Tank Transfer (1800litres)	<ul style="list-style-type: none"> Water quality impacts Marine fauna impacts Shoreline pollution Disruption to fishing activities 	Minimise impacts to marine fauna and commercial fishing activities	<ul style="list-style-type: none"> No bunkering via transfer hose to CHA platform instead fuel tank lifted in leak-proof open top basket, refilled on vessel deck and tank replacement onto platform Crane/rigging & lifting connections designed, constructed, installed, inspected and maintained; Weather limitations on lifting events; All lifts undertaken by Permit to Work & JSEA; Implemented & tested OSCP 	Medium



Cliff Head Development HWU Installation and CH12 Workover Summary Environment Plan



No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
17	Diesel Spill – Rupture of support vessel fuel tank (collision, grounding, loss of vessel) (Third Party)	<ul style="list-style-type: none"> • Water quality impacts • Marine fauna impacts • Shoreline pollution • Disruption to fishing activities 	<ul style="list-style-type: none"> • Minimise impacts to marine fauna and commercial fishing activities 	<p><u>Third Party Vessels</u></p> <ul style="list-style-type: none"> • CHA Development not located within commercial shipping lanes but located in rock lobster fishing area • A 500m petroleum safety zone declared around CHA. Moored vessels for HWU activity located within the PSZ; • Navigation charts identify CHA Facilities • <i>Notice to Mariners</i> issued for HWU Activities; • Navigation lighting and continuous radar/radio monitoring during HWU activities; • SBV to ward off errant vessels; • Consultation/notification to fishing industry groups on activity – no fishing vessels within PSZ during HWU activity • Operation under an implemented Emergency Response/ OSCP 	Low

No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
18	Diesel Spill – Rupture of support vessel fuel tank (collision, grounding, loss of vessel) (Intra-field)	<ul style="list-style-type: none"> Water quality impacts Marine fauna impacts Shoreline pollution Disruption to fishing activities 	<ul style="list-style-type: none"> Minimise impacts to marine fauna and commercial fishing activities 	<p><u>Intra-Field Vessels</u></p> <ul style="list-style-type: none"> Rigorous Marine Contractor selection (i.e. suitably qualified and experienced); Vessels maintained (navigation/communication systems, propulsion and steering); Marine operations undertaken in fair weather only visible to all other vessels; Intra-field vessels to observe the OSV Code Approved SIMOPS Plan Dedicated transit routes to/from CHA to avoid reef areas and to reduce collision hazards Vessel navigation and communication systems regularly maintained and tested. Low-speed in PSZ Mooring locations located to allow for drift away from CHA in the event of mooring failure 	Low
19	Crude Spill – Well Blowout	<ul style="list-style-type: none"> Water quality impacts Marine fauna impacts Shoreline pollution Disruption to fishing activities 	<ul style="list-style-type: none"> Minimise impacts to marine fauna and commercial fishing activities 	<ul style="list-style-type: none"> CHA heavy waxy crude oil with high pour point (solidify at ambient conditions) CHA wells require ESP to flow (only small volume would be released) Down-hole mechanical barrier installed for work-over operations The composition of the workover fluids is constantly monitored to ensure sufficient density to control subsurface pressures; Blow-out Preventers (BOP) and related well control equipment are installed, operated, maintained and tested in accordance with manufacturer’s recommendations and relevant Australian/International Standards; Well is designed and constructed in accordance with regulated international standards 	Low



Cliff Head Development HWU Installation and CH12 Workover Summary Environment Plan



No	Environmental Aspect	Description of Potential Impact (Consequence)	Environmental Objective	Management Measures/Actions	Residual Risk
20	Chemical/package oil spill	<ul style="list-style-type: none"> Impact on water quality and marine life 	<ul style="list-style-type: none"> Minimise occurrence and effects of spills 	<ul style="list-style-type: none"> Chemicals stored on CHA are minimised; Chemicals store in contained areas; Chemicals are assessed for environmental hazard prior to introduction to platform; Chemical storage and handling areas are routinely inspected for leaks and spills an if detected, are cleaned-up immediately; Training is provided for personnel handling chemicals and operating CHA drain system; Containment system is routinely monitored during manned operations; MSDSs are to be made available for all chemicals; Training in Spill kits provided to personnel; and Spill kits to be provided in appropriate locations 	Low
21	Work-over Fluid Spill	<ul style="list-style-type: none"> Impact on water quality and marine life 	<ul style="list-style-type: none"> Minimise occurrence and effects of spills 	<ul style="list-style-type: none"> Preferred disposal method via PFW system (offshore water well reinjection) or collection in tanks for onshore disposal PLONOR KCL brine used with low environmental hazard additive chemicals Milled cuttings form shale shakers collected in skips for onshore disposal Rapid dispersal in marine environment 	Low