

North Rankin “A” Environment Plan Summary

This summary of the North Rankin “A” Environment Plan has been submitted to comply with Regulation 11(7)(8) of the Petroleum (Submerged Lands) (Management of Environment) Regulations 1999.

Introduction

Woodside Petroleum Ltd on behalf of the Joint Venture Participants is the designated Operator of the NWS Oil and Gas Project in Western Australia. Woodside Petroleum Ltd’s subsidiary, Woodside Energy Ltd (Woodside), is the Operator of the NRA facility. In 1984, NRA was the first production facility developed as part of the NWS Venture. With the development of existing field reserves and satellite fields the projected life for the NRA facility is currently 2041.

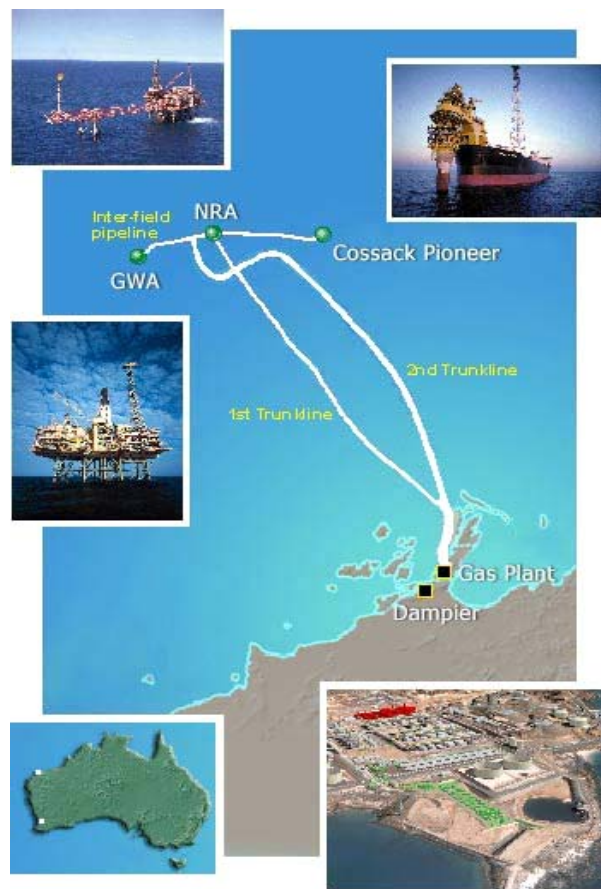
Activity Description

NRA is an integrated drilling, production (gas and condensate), utilities and accommodation platform located on the North West Shelf (NWS) of Western Australia in lease WA-5-L (1), (operating under production licence WA-5-L). The facility currently processes gas and condensate from 26 platform-based wells (note that 2 wells, NRA10 and NRA12 have been isolated).

NRA forms an integral part of the NWS offshore gas and condensate production system together with the Goodwyn 'A' Platform (GWA) and the export gas from the Cossack Pioneer (CP) floating production storage and offloading (FPSO) facility.

A 30-inch 23 km interfield pipeline (IFL) exports two phase gas and condensate from GWA to NRA. A 40-inch 135 km trunkline (1TL), connected to NRA, exports two phase gas and condensate to the Onshore Treatment Plant (OTP).

The recently completed 42-inch 134 km second trunkline (2TL), is connected to the IFL approximately 300 m from NRA, and transports two phase gas and condensate from GWA and NRA to the OTP. A 12-inch 32 km gas export pipeline (GEL) from the CP FPSO is connected to 1TL approximately 150 m from the NRA platform.



Coordinates of Activity

NRA is located in one hundred and twenty five (125) metres of water, approximately one hundred and thirty five (135) km offshore from Dampier on the north-west coast of Western Australia.

- Latitude: 19° 35' 08.02" south
- Longitude: 116° 08' 12.28" east

The platform is located towards the southern end of the North Rankin field and is approximately twenty three (23) km east of the GWA platform, and is thirty two (32) km west from CP FPSO. It is also approximately forty nine (49) km’s from the Angel field, which is currently being developed and will be tied into the existing pipeline system.

Description of the Receiving Environment

The NWS exists in an arid (mainly summer rain) subtropical environment with tropical cyclone activity from November to April. Average air temperatures in Karratha (closest regional townsite) range from 15°C to 25°C in winter, and 26°C to 40°C in summer. Rainfall is variable from year to year, with a mean of 310 mm per annum.

The seabed in the vicinity of NRA is typical of deeper offshore areas (>150 m water depth) on the NWS, being characterised by deep (>5 m) soft, silty sediments derived primarily from calcium carbonate, which become deeper, softer and finer with increasing depth. Sampling of the benthos has consistently shown that the soft sediments of the NWS support a low abundance, high diversity invertebrate fauna population, largely comprising burrowing polychaete worms (Phylum Annelida) and crustaceans (Phylum Crustacea). Echinoderms, bivalves and molluscs also contribute significantly to the faunal composition of the area.

A range of whale and dolphin species occur in the waters surrounding NRA, some being seasonal visitors while others occur at low densities all year round. The most common species include the humpback whale, false killer whale, southern bottle-nosed whale, bottle-nosed dolphin, Indo-pacific humpbacked dolphin and Risso's dolphin.

Four species of marine turtles nest on shore sites within the Pilbara region. In order of abundance these are the green turtle (*Chelonia mydas*), flatback turtle (*Natator depressor*), hawksbill turtle (*Eretmochelys imbricata*) and loggerhead turtle (*Caretta caretta*). The leatherback turtle (*Dermochelys coriacea*) may also visit the open waters.

In general, the NWS hosts a diverse assemblage of fish. This is particularly so in the shallow water environments around the oceanic island groups and the mainland coastline. Much of the area in the vicinity of the NRA facility comprises bare, flat sandy seafloor and consequently the natural fish fauna is not believed to be abundant or diverse. However, due to the presence of the platform and other underwater structures around NRA, fish species richness and abundance is probably much higher than in the relatively bare surroundings.

Major Environmental Hazards and Controls

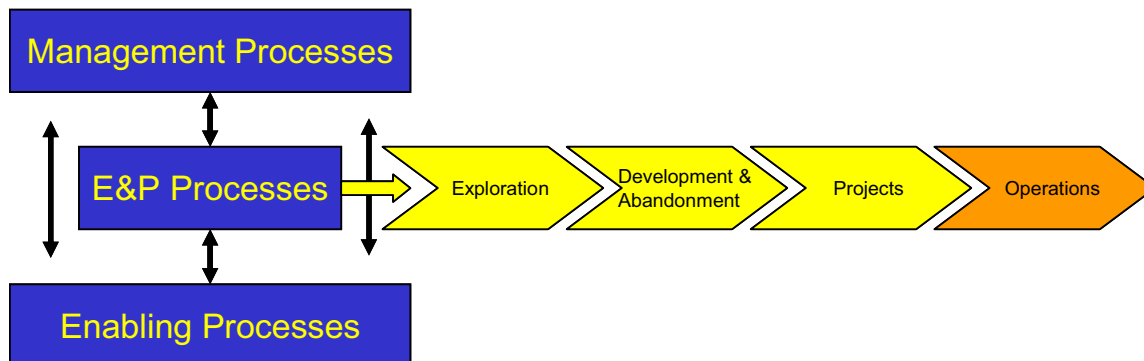
The major environmental hazards and controls associated with operating the NRA facility are outlined in the table below.

Aspect	Hazard	Key Hazard Control and Mitigation Measures
Fuel Consumption	Greenhouse gas emissions associated with combustion of fuel for power generation	Fuel gas consumption is constantly monitored and reported. Operate power generation system in accordance to relevant procedures. Inspection and maintenance of gas flow meter and turbines.
Hydrocarbon Gas	Greenhouse gas emissions associated with flaring from the facility	Flaring volumes are monitored and reported. Inspection and maintenance of flare flow meters. Operate flare system in accordance to procedures. Periodic trip reviews (to minimise the amount of trips which contribute to flaring).
Produced Formation Water	Release of produced water to the environment, containing small quantities of entrained hydrocarbons, and potentially chemicals and potential for release of produced water not meeting regulatory specifications.	Concentration of oil in water and volume of produced water discharged is recorded and monitored. Oil in water to meet legislative requirement prior to discharge (30 mg/L – 24 hr average). Oil in water processing equipment (including backup filter for period of high oil in water readings). Continual monitoring of oil in water concentration and volume discharged. Online equipment is calibrated and maintained. Online readings are verified via laboratory analysis. Research conducted at intervals (chemical characterisation, ecotoxicity and

		modelling of produced water discharge).
Hydrocarbon Inventories	Potential release of large quantities of hydrocarbons from wells and flowlines.	Operate wells and flowlines in accordance of set operating parameters. Continuous monitoring of wells and flowlines. Flowlines to be inspected periodically (in accordance to inspection monitoring and maintenance strategy). Leak off tests conducted at regular intervals. Incident notification (in accordance to internal and legislative requirements).
Hydrocarbon/ chemical Inventories	Potential release of hydrocarbons/ chemicals via the Drain Sump Caisson.	Minimise inventory of hydrocarbons in caisson (prevent inventory from entering caisson). Hydrocarbons in caisson are pumped out for onshore disposal. Risk based inspection of caisson.
Hydrocarbon/ chemical Inventories	Potential release of hydrocarbons/ chemicals via the Open Drains Caisson.	Minimise inventory of hydrocarbons in caisson (prevent inventory from entering caisson). Hydrocarbons in caisson are pumped out for onshore disposal. Risk based inspection of caisson

Summary of Management Approach

The [Woodside Management Framework](#) (WMF) describes the way in which Woodside is organised and governed. The WMF provides clarity and direction on the boundaries within which all Woodside employees and contractors will work, and empowers employees through clear delegation of authority and setting clear ways of working with clearly defined roles and accountabilities. It describes a single management system for managing Woodside’s global business processes.



The WMF and Woodside business processes are continuously improved through a modified plan-do-check-adjust management continuum as follows:

- Plan – Objectives & Leadership Commitment, Capability, Risk Management and Planning & Processes;
- Do – Planning & Processes and Management of Change;
- Measure & Improve – Management Reviews & Audits; and
- Learn & Share – Learning & Knowledge Sharing.

The Operations Business Process describes four key sub-processes as shown in the following diagram of production and activity planning, and the operation, maintenance and modification of facilities. Compliance with the Safety Case and Environment Plan is integral to the Operations Process (12.2.5 – Operate within the Safety Case and Environment Plan). The Woodside Environment Business Process describes a systematic framework for identifying hazards and managing risks, based on the Process Elements described in the Woodside Management System Business Process.

The expectations of the WMF, the Operations Business Process, and the Corporate Health and Safety and Corporate Environment Business Process are met by the NRA facility operations primarily through its implementation of:

- this NRA Environment Plan;
- the NRA Safety Case;
- the annual NRA HSE Plan;
- Woodside, Operations Division, and facility operation standards and procedures; and
- the requirement that contractors and service suppliers for the facility align their performance with Woodside's HS&E requirements.

Consultation

Woodside undertakes consultation with the community and government departments as part of the approval process for the construction and operation of new facilities. As this is an operating facility, the consultation in developing this environment plan is limited to Woodside stakeholders and WA DOIR.

In revising this EP, there was consultation between, and participation in risk assessment workshops by offshore staff, Environmental Advisers, Process and Facility Engineers, maintenance support and specialist consultants.

The NRA Operations Manager and Operations Environmental Adviser also communicate with WA DOIR to discuss various operational aspects. This includes ad hoc meetings between Woodside and the WA DoIR, which ongoing plans and operational issues with regard to legislative requirements, and to provide feedback on environmental performance against environmental commitments.

Contact Details

Further information regarding this Summary Environment Plan or the NRA facility can be obtained by contacting:

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Information of a more general nature can be found on the Woodside website: www.woodside.com.au