



Devil Creek Development Project

Bridging Document for Cold Venting at Reindeer Wellhead Platform: Summary

October 2011

This summary of the DCDP Bridging Document for Cold Venting at Reindeer Wellhead Platform has been submitted to comply with Regulation 11(7)(8) of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009.

Introduction

The Devil Creek Development Project (DCDP) is a new “green field” domestic gas development which will process gas from the offshore Reindeer gas field, located within Exploration Permit WA-209-P in Commonwealth waters (**Figure 1**). The gas field is approximately 80 km northwest of the Port of Dampier in 59 m water depth, and once the gas is processed in the onshore gas plant it will be fed into the Dampier Bunbury Natural Gas Pipeline (DBNGP).

The DCDP Construction Environmental Management Plan (CEMP), Part C – Offshore Environmental Management (DC-00-RI-005) was prepared by Apache to communicate the environmental hazards and risks and potential impacts associated with the construction and commissioning of the offshore elements of the DCDP and describe how these will be managed so as to reduce risks to ALARP. Revision 1 of the DCDP CEMP, Part C – Offshore Environmental Management was reviewed and approved by the Department of Mines and Petroleum (DMP) on the 27th August 2009.

The scope of wellhead platform (WHP) commissioning work discussed in the CEMP did not specifically describe the requirement to cold vent gas to atmosphere, and as a consequence, Apache have produced this bridging document to:

- provide additional information on the commissioning activities that necessitate cold venting; and
- address any additional environmental risks posed, if not already covered in the CEMP, and to describe the management and mitigation measures to be implemented to ensure that environmental risks and impacts are avoided, or reduced to as low as reasonably practicable (ALARP).

Project Description

As there is no flare provided on the WHP (not required under normal operating conditions due to infrequent, small volume gas releases) there is a requirement for cold venting of gas to atmosphere to take place as part of planned start-up commissioning and well fluid sampling activities including:

- Platform emergency shut down (ESD) system testing;
- Fuel gas system commissioning; and
- Condensate sampling.

Platform ESD system testing will entail carrying out a simulated platform ESD from a pressurised state to ensure that all safety shut down devices function correctly when pressurised and also to confirm manual blowdown functionality and de-pressurisation timing. This blowdown will occur through the WHP closed drain system. It should be noted that the platform will either be pressurised with air or nitrogen for the blowdown

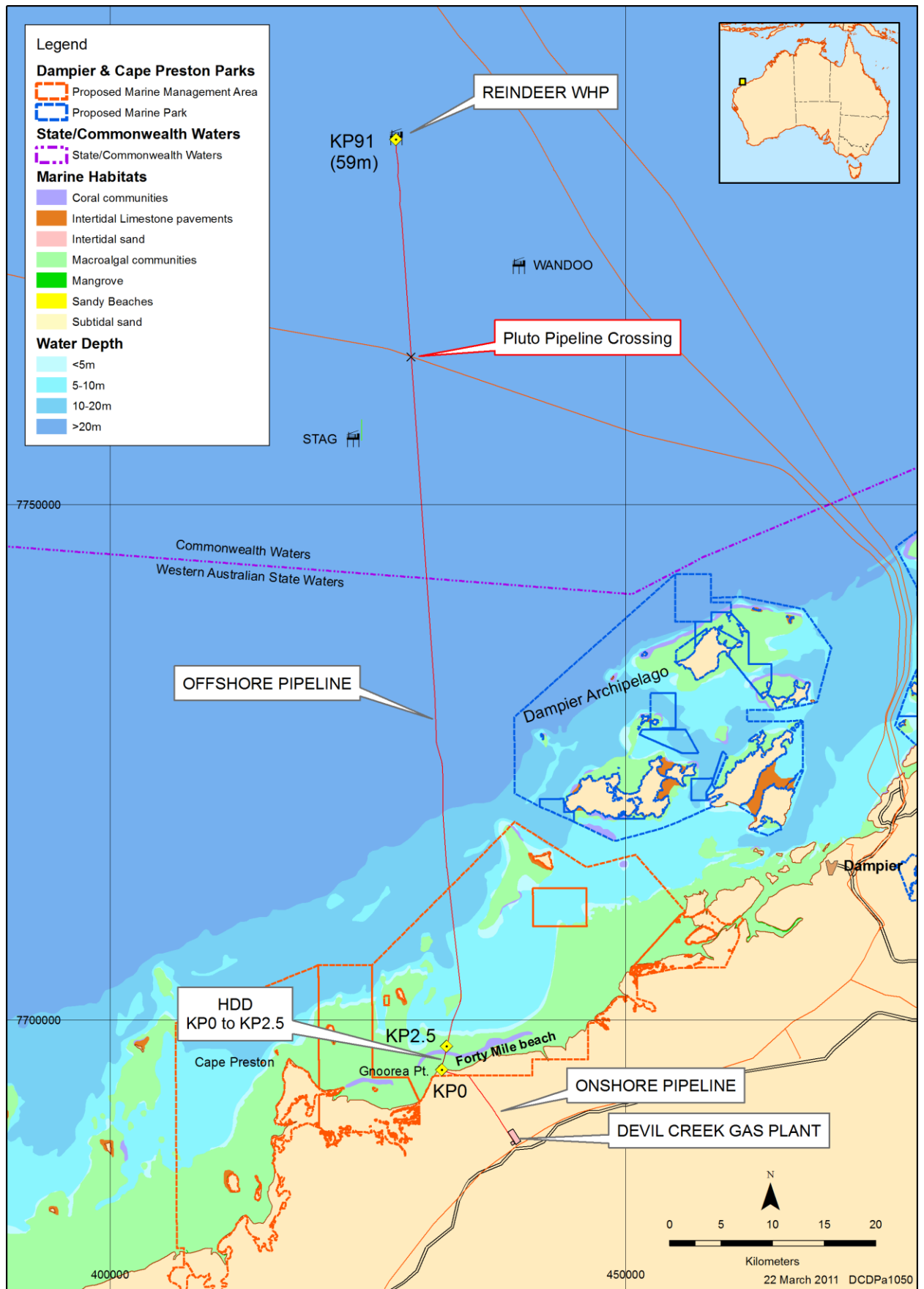


Figure 1: Location of the DCDP offshore and onshore infrastructure

and depressurisation testing and no reservoir gas is expected to cold vent to atmosphere.

Commissioning the fuel gas system (where gas from the production header is cooled in the fuel gas cooler, prior to being filtered and superheated, with condensed liquid passed to the close drains drum) will require the venting of small amounts of gas to atmosphere through the closed drain system while the fuel gas is heated to obtain minimum operating temperatures.

A two-litre condensate sample is required to be taken at the wellhead to allow for mercury and arsenic testing in a registered laboratory. A sample will be collected using a portable sample collection skid. A gas stream sample flow of 48m³/hr for a period of up to one hour will be required to collect the required condensate sample. The sample gas flow will be directed from the sample skid to the WHP closed drain system. Any liquid carry over will also be directed to the closed drain system. The closed drains system will be used to separate out any liquid, such as condensate, that may have been carried over with the gas prior to the gas being directed to the atmospheric process vent. The liquid within the closed drain sump will be pumped into the production manifold for processing at the DCGP.

Estimates of the gas to be vented during the commissioning and sampling activities are provided in **Table 1**.

Table 1: Estimates of Gas Release Volumes

Event	Estimated volume of gas to be vented
Platform emergency shutdown (ESD) testing	Negligible
Fuel gas system commissioning	2,200 Sm ³
Gas and condensate sampling	48 Sm ³

Receiving Environment

Physical Environment

The NWS lies in the arid tropics region of Australia, which experiences high summer temperatures and periodic cyclones (with associated rainfall). Rainfall is generally low, with evaporation exceeding rainfall. Mean ocean temperatures range from a minimum of 11°C in winter to a maximum of 37°C in summer. Shelf waters are usually thermally stratified at a depth of about 20 m.

Wind patterns are monsoonal with a marked seasonal pattern. From October to March, the prevailing non-storm winds are from the south-west, west and north-west at an average speed of less than 10 knots. From June to August, winds are generally lighter and more variable in direction than in spring and summer.

Non-storm winds prevail from north-east through to south-east at average speeds of 5-6 knots. Transitional wind periods, during which either pattern may predominate, can be experienced in April, May and September each year.

Biological Environment

Apache commissioned detailed marine survey of the seabed along the pipeline alignment and at the platform location, using a towed video and side scan sonar bathymetry survey. In shallower waters, divers visually inspected the seabed focussing on any features of significance.

The intertidal and nearshore subtidal habitats were typical of the region and all are widely represented along the coastline. Marine benthic primary producer habitats comprised coral reefs, limestone pavement with macroalgae, seagrass, mud and sandflats and mangroves. The benthic habitat along the pipeline route ranged from isolated coral bombores and coral patch reef dominated by macroalgae close to shore, to bare coarse sandy substrate at the seaward end of the pipeline route. Patches of seagrass and limestone pavement, with macroalgae and minor filter feeding communities, were also identified at several locations along the pipeline route amongst the predominantly bare sandy substrate.

Four species of sea turtle nest on sandy shore sites of Dampier Archipelago, Montebello Islands, Lowendal Islands, Barrow Island and other islands on the North West Shelf. These are the green turtle (*Chelonia mydas*), the flatback turtle (*Natator depressus*), the hawksbill turtle (*Eretmochelys imbricata*), and the loggerhead turtle (*Caretta caretta*). The leatherback turtle (*Dermochelys coriacea*) may also visit the open waters. These 5 species are on the National List of Threatened Species as either endangered or vulnerable under the EPBC Act. For all species, hatchling emergence occurs 6 to 8 weeks after the females have nested.

The across shelf distribution of sea turtles is not well known, but does vary among the species. All species are migratory and may transit through the waters in the vicinity of the WHP. Sea turtles are likely to occur in the vicinity of the WHP as foraging turtles and/or breeding migrants swimming through the area on their way to remote nesting grounds.

A range of marine mammals occur in the waters of this region, some being seasonal visitors while others occur at low densities all year round. The following mammal species are listed as either threatened and/or migratory under the EPBC Act as possibly occurring within the vicinity of the WHP:

- Blue whale (listed threatened and migratory)
- Humpback whale (listed threatened and migratory)
- Bryde's whale (listed migratory)
- Dugong (listed migratory)
- Orca (listed migratory)
- Indo-pacific humpback dolphin (listed migratory)
- Spotted bottlenose dolphin (listed migratory)

The most commonly sighted whale is the humpback whale. This species migrates between the Antarctic waters and the Kimberly region of Western Australia. In the region of the WHP the peak of the northerly migration occurs around June – July, while the southerly return migration peaks around September – October.

Socio-Economic Environment

Figure 1 shows the location of the proposed Dampier Archipelago and Regnard Marine Conservation Reserve. In terms of recreational use, the open waters of the North West Shelf do not support significant recreational or tourist activity. The WHP falls within Area 3 of the Onslow Prawn Managed Fishery, which is open from 1 March to 15 November. The prawn fishery is predominantly a coastal fishery with most activity confined to 5 nautical miles from the Western Australian coastline.

There are no known sites or likely to be sites of aboriginal or non-aboriginal significance in the vicinity of the WHP.

Environmental Hazards

The potential hazards and environmental impacts resulting from the cold venting activities at the WHP are summarised in **Error! Reference source not found..**

Environmental Management

No additional management controls over and above those already described in the CEMP, Part C – Onshore Environmental Management (DC-40-RI-005) are required. Spill kits and hazardous waste bins are located on the WHP to deal with any minor spillages of hydrocarbons.

Apache management documents used to guide the implementation of environmental management measures are listed below:

- Environmental Management Policy
- DCDP Part C- Offshore Environmental Management (DC-00-RI-005)
- Environmental Requirements for Offshore Marine Vessels (AE-91-IQ-202)
- Refuelling and Chemical Transfer Management Procedure (AE-91-IQ-098)
- OSCP Volume 1 – Operations (NWS) (AE-OO-EF-008/1).
- OSCP Volume 2 – Resource Atlas (NWS) (AE-OO-EF-008/2).
- Hazard Reporting, Incident Notification and Investigation Procedure (AE-91-IF-002).
- Waste Management Plan (EA-60-RI-167).

All current and relevant state, commonwealth and international legislation will be complied with.

Implementation Strategy

The implementation strategy is described in DCDP CEMP, Part C – Onshore Environmental Management (DC-00-RI-005).

All works will be carried out by the Apache Commissioning Team comprising:

- Direct hire contractors;
- Operations personnel seconded onto the team; and
- Vendor site representatives.

All works will be under the control of the Apache Permit to Work system as documented in the DCDP Commissioning Execution Plan (DC-00-RG-015).

Table 2: Environmental Impacts Associated with Gas Venting identified in the environmental risk assessment

Event	Cause	Prevention Controls	Environmental Controls	Consequences	S	L	ERR	Comments
Gas release from closed drain sump vent	Operator intervention (manual depressurisation)	Operator training and competency	Controlled Event	Release of gas through atmospheric vent	5	1	N	Pig launcher is rarely pressurised (pigging expected infrequently)
	Passing isolation valve or valve left open	Restriction orifice designed to limit flow into closed drain tank thereby limiting vent rate						
	PVS relief event on fuel gas conditioning package or pig launcher	PTW for venting operations						
	Fuel gas system passing gas to closed drains through gas breakthrough	Procedural controls (covers suitable venting conditions, vent rates etc)						Condensate is captured in the closed drain sump
								DP alarm on coalesce drain line to closed drains sump to detect gas breakthrough
								Low volume within FG KO Pot and coalescers
	FG KO Pot LL trip							

Notes: S = Severity; L = Likelihood; ERR = Environmental Risk Ranking.

S score of 5 = Negligible (short-term, localised and insignificant impacts to habitat or populations. Rapid recovery measured in days to months); L score of 1 = Expected to occur; EER score of N = Negligible (risk are at a sufficiently low level)

Consultation

Apache maintains a DCDP website (www.apachedcdp.com.au) with information and updates on the DCDP.

The following fishing groups have been consulted with regard to DCDP offshore activities:

- Commonwealth Fisheries Association
- Western Australian Fishing Industry Council
- Northern Fishing Companies Association
- A Raptis & Son
- Western Australian Northern Trawl Owners Association

Recreational users of Forty Mile Beach, Gnoorea Point and nearshore waters have also been consulted with regard to DCDP. DCDP activities have been communicated via the website, newsletters, bulletins and notifications on local radio.

Further Details

For further information please contact:

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