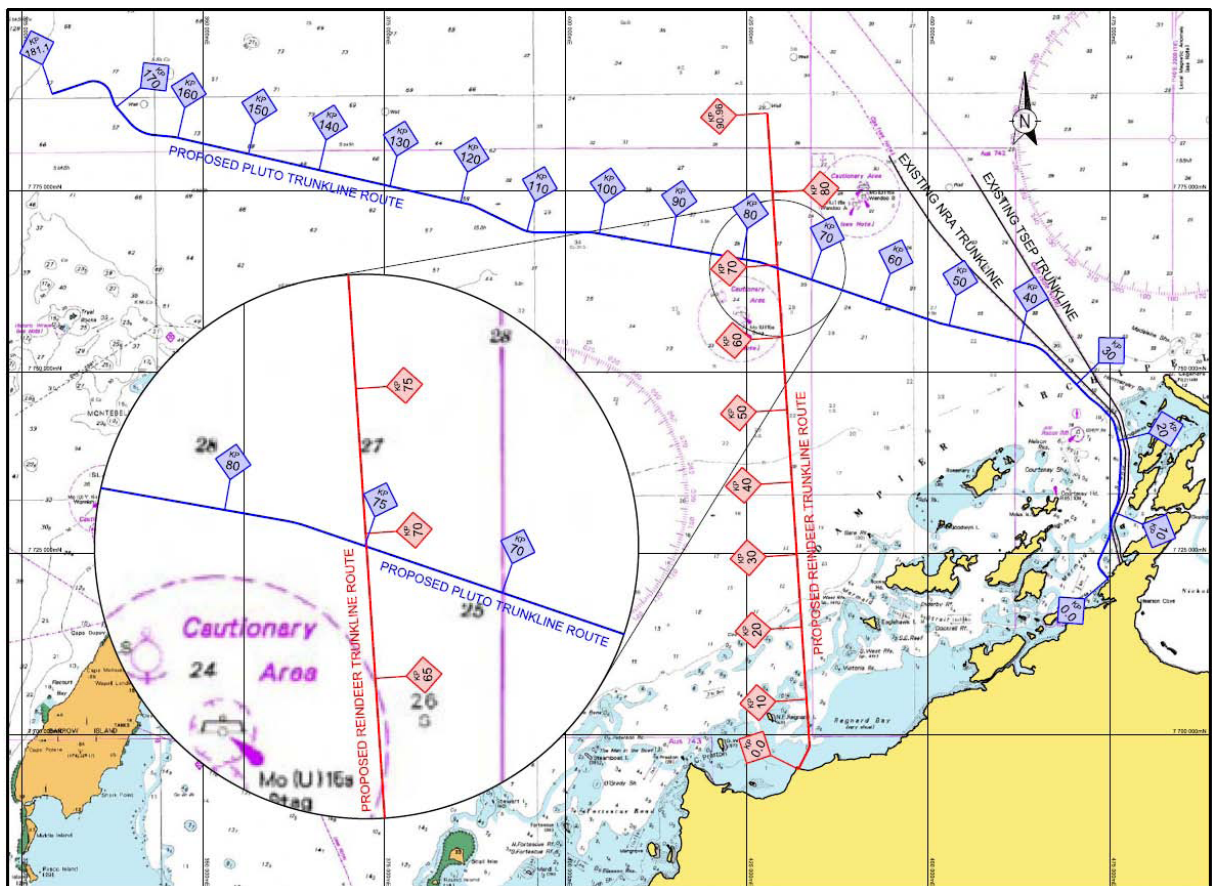


*This summary of the Reindeer-Pluto Crossing EP has been submitted to comply with Regulation 11(7)(8) of the Petroleum (Submerged Lands) (Management of Environment) [P(SL)(MoE)] Regulations 1999.*

## Introduction

Apache Energy Limited (Apache) proposes to cross over the Pluto pipelines as required for the installation of the Reindeer pipeline, an activity associated with the Devil Creek Development Project.

The proposed pipeline routes for the Reindeer and Pluto pipelines result in a pipeline crossing in approximately 50 m water depth. **Figure 1** shows the Reindeer-Pluto crossing location at approximate kilometre (KP) 75 for the Pluto pipeline and KP 69.8 for the Reindeer pipeline. Installation schedules result in the Pluto trunkline and MEG pipeline being installed first, requiring the Reindeer pipeline to cross over the top of the Pluto pipelines.



**Figure 1: Proposed location of the Reindeer-Pluto pipeline crossing.**

## Project Description

To cross over the Pluto pipelines safely, it is proposed that pipeline support trestles be installed on either side of the Pluto pipelines and quarried rock material dumped over the top of the Pluto pipelines for a distance of approximately 670 m to create a

crossing. The Reindeer pipeline will then be laid over the top of Pluto's pipeline via the installed crossing.

Ten trestles will be installed (five on either side of the Pluto pipelines) using the *Havila Harmony DP2*. This vessel will maintain position using a dynamic positioning system (DPS). Trestles will be lifted from the vessel using the onboard pedestal crane and positioned on the seabed using a ROV. Installation of the trestles is anticipated to take 4 days.

The dumping of rock will be carried out by the dynamically positioned fall pipe vessel (DPFV), *Simon Stevin*, a self-propelled vessel with a fall pipe designed to be lowered underneath the vessel. Rock will be passed through the fall pipe for accurate positioning over the pipeline on the seabed, assisted by an ROV attached to the fall pipe. Rock dumping is anticipated to take 5 days.

The maximum size of rock used to construct the berm is 300 mm. The rock required for the rock dumping is to be sourced from an overseas location (Karimun, Indonesia). Rock sourced from overseas will be subject to stringent quality control (QC) testing and inspection to ensure that the rock is free of contamination from hazardous materials and organic and/or other materials that are in such quantities that excessive sediment plumes are generated when dumped in the marine environment.

AQIS requirements with respect to the importation of rock will also be adhered to where required. The rock berm will be approximately 670 m in length, with a footprint on the seabed of 10,893 m<sup>2</sup>.

The rock dumping work is planned to commence in late February 2010 after the installation of the Reindeer pipeline support trestles. This work is expected to take approximately five days (subject to weather conditions). Re-fuelling of the vessel is not planned given the short duration of the work.

### **Existing Environment**

The Reindeer-Pluto pipeline crossing is located in approximately 50 m water depth on the North West Shelf, offshore Pilbara region, Western Australia.

The coordinates for the Reindeer-Pluto crossing are (GDA 94, Zone 50):

429 206.22 E  
7764349.15 N

### **Physical Environment**

In this region, summers (November to April) are typically very hot with maximum temperatures above 35°C. Winters (May to October) are milder with temperatures in the 20° to 30° C range. Rain events are uncommon with the 'wet season' between January to July, with heaviest falls occurring early in the season. The offshore Pilbara region is prone to cyclones between November and April.

Tides are semi-diurnal (two high and two low tides within 24 hours), with water movement during springs tides far more influenced by tidal currents than by local wind stress. The spring tidal range is approximately 4.5 m.

### **Biological Environment**

The seabed at the Reindeer-Pluto crossing comprises mainly medium to coarse sands of unknown depth and generally supports low diversity communities, with sparse benthic and epi-benthic organisms such as sea pens, heart urchins and very

occasional crinoids and bryozoans. The fine to medium sand habitats are characterised by a higher level of bioturbation than the coarser sediments in deeper waters along the Reindeer pipeline route. The epi-benthic fauna characteristic of this area suggests the presence of a deep sand layer without rock pavement close to the surface.

**Table 1** provides a summary of the key environmental factors in relation to the timing of the Reindeer-Pluto crossing activities so as to easily identify any overlap.

**Table 1: Summary of timing of key ecological factors, recreational activity and proposed DCDP activity.**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<b>Ecological Activity</b>												
Humpback Whale Migration							■	■	■			
Dugong breeding on North West Shelf	■	■	■	■	■	■	■	■	■	■	■	■
Turtle nesting on North West Shelf	■	■	■	■	■			■	■	■	■	■
Turtle hatchling emergence on North West Shelf	■	■	■	■	■					■	■	■
Migratory Birds	■	■	■	■					■	■	■	■
Mass coral spawning (few nights within month)			■							■		
<b>DCDP Activity</b>												
Reindeer-Pluto crossing		■										

**Key to activity**

- Peak of ecological activity, presence reliable and predictable
- Low level of abundance/activity/presence
- Activity not occurring
- DCDP activity – proposed timing

**Socio-Economic Environment**

In terms of recreational use, the open waters of the North West Shelf do not support significant recreational or tourist activity. The Reindeer-Pluto crossing falls within Area 3 of the Onslow Prawn Managed Fishery. The prawn fishery is open from 1 March – 15 November. The prawn fishery is predominantly a coastal fishery with most activity confined to 5 nautical miles from the Western Australian coastline. Within the extensive licensed prawn fishing zone there are relatively few areas offshore that are fished (less than 5% of the overall fishery area). The major focus is between the Ashburton River and Onslow in the nearshore waters outside the nursery areas. There is no other commercial fishing in the immediate vicinity of the Reindeer-Pluto crossing.

In relation to the mainland and Marine Conservation Reserves, the Reindeer-Pluto crossing is located:

- 61.4 km from the mainland
- 63.6 km from Dampier.
- 32.8 km from the proposed Dampier Marine Park boundary.

- 46 km from the proposed Regnard Marine Management Area (MMA) boundary.
- 71.6 km from the Montebello/Barrow Island Marine Conservation Reserve boundary.

There are no World Heritage areas or Wetlands of International Significance in or within in the vicinity of the Reindeer-Pluto crossing.

The Dampier Archipelago has been proposed as a marine park, and the area between Cape Preston and the Dampier Archipelago has been proposed as a marine management area. These proposals have received Ministerial approval and are awaiting final Cabinet approval.

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

## Major Environmental Hazards and Controls

Environmental HAZID workshops were attended by multi-disciplinary teams so as to identify the environmental hazards associated with aspects of the proposed Reindeer-Pluto Crossing as well as the mitigation and control measures to manage the identified hazards. The potential environmental hazards resulting from installation of the Reindeer-Pluto crossing are summarised in **Table 2**

**Table 2. Summary of potential environmental impacts from offshore drilling on the NWS**

Potential hazard (risk)	Potential environmental effect (consequence)	Risk ranking
Rock dumping	Potential short-term increase in water turbidity and potential for presence of hazardous material within rock material.	Negligible –quality control testing and inspection of rock to ensure free of contamination from hazardous materials and excessive fine materials. Use of vessel specifically designed for rock dumping activity and dumping of rock at depth. Short duration of activities.
Artificial lights from vessels	Potential disorientation of fauna by lights at night, especially turtle hatchlings.	Negligible – The timing of the proposed activities coincides with the sea turtle nesting season, however, location is distant from areas of the coast where minor turtle nesting activity occurs
Underwater Noise	Potential short-term physiological effects or disruption to behaviour patterns of cetaceans, birds, turtles,	Negligible – activities outside of humpback whale migration and of

Potential hazard (risk)	Potential environmental effect (consequence)	Risk ranking
	fish and other marine life.	short duration.
Disturbance to Seabed	Localised disturbance to seabed flora and fauna assemblages.	Acceptable – Side scan sonar and video surveys indicate no sensitive seabed habitats and low benthic fauna diversity and abundance. Small footprint of artificial rock habitat (10,893m <sup>2</sup> ) and trestles (580m <sup>2</sup> ) compared to the surrounding habitat.
Sewage, putrescible and solid domestic wastes	Potential localised reduction in water quality - nutrient enrichment. Modification of feeding habits of local fauna.	Negligible – food scraps macerated prior to discharge, solid wastes disposed to waste disposal facility and sewage treated to MARPOL specifications.
Waste oil, chemicals and oil-contaminated drainage water	Potential localised reduction in water quality.	Negligible – decks kept clean, oily-water separator collects any spilled material. Liquid wastes stored appropriately in enclosed containers with secondary containment and disposed of to waste disposal facility.
Vessel Movements and Presence	Potential for interaction/collision between vessels and marine fauna.	Negligible – activities outside of humpback whale migration and of short duration. Adherence to Part 8 of EPBC Regulations 2000.
Introduction of foreign marine organisms	Competition with local marine life and absence of natural predators can alter marine assemblages, favouring the introduced species and resulting in loss of flora and fauna diversity and abundance.	Acceptable – <i>Havila Harmony DP2</i> has operated in Australian waters for over 2 years and will be mobilising from Henderson, WA. <i>FPV Simon Stevin</i> to adhere to AQIS and National Bio-fouling Management Guidelines requirements. Rock sourced from land based quarry in Karimun, Indonesia.
Impact to Pluto pipelines	Potential for accidental release of hydrocarbons.	Negligible - Pluto pipelines will not be live during Reindeer-Pluto Crossing activities.

Potential hazard (risk)	Potential environmental effect (consequence)	Risk ranking
Diesel spills	Severe damage of marine habitats (e.g., coral reefs, mangroves, beaches) and death or injury to marine life (e.g., birds, mammals).	Acceptable – Vessel and Apache Oil Spill Contingency Plans in place. Location distant from shorelines.

### Consultation

In preparing the Reindeer-Pluto Crossing EP, Apache consulted with numerous stakeholder representatives, including:

- Department of Mines and Petroleum
- Department of Environment, Water, Heritage and the Arts
- Commonwealth Fisheries Association
- A. Raptis & son
- Northern Fishing Companies Association
- Western Australian Northern Trawl Owners Association
- WA Fishing Industry Council (WAFIC).

### Further Details

For further information about the Reindeer-Pluto Crossing program, please contact:

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