



Stag-41 & Stag-42
Appraisal Wells
Environment Plan: Summary
December 2011

This summary of the Stag-41 & Stag-42 Environment Plan (EP) has been submitted to comply with Regulation 11(7)(8) of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009.

Introduction

Apache Energy Ltd (Apache) proposes to drill two appraisal wells targeting the Stag oilfield in permit area WA-15-L, in Commonwealth waters. These wells will be drilled approximately 1.5 km to the east-northeast of the Stag Platform.

Drilling is proposed to commence around 22 January 2011 dependent on rig availability; and weather conditions permitting) using the *EnSCO 104* jack-up drill rig and is expected to take about 20 days to complete. As part of these activities, Apache plans to carry out a geophysical seabed survey prior to the drill rig arriving on site and a debris clearance survey after the drilling has been completed

Apache's generic Environment Plan (EP) for its drilling programme on the North West Shelf (NWS) in State and Commonwealth waters will be used to manage the drilling activities (EA-00-RI-164). The seabed surveys will be carried out under Apache's General Petroleum Support Activities EP (EA-00-RI-158). A bridging document to these EPs was approved by the DMP on the 12 December 2011, in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009*.

Project Description

The location of the Stag-41 & 42 wells (**Figure 1**) is approximately 60 km southeast of the nearest mainland point (Burrup Peninsula), 35 km southeast of the nearest island in the Dampier Archipelago, 85 km southwest from Varanus Island, and 63 km west of the nearest Montebello Islands. A summary of the well surface hole locations, water depths, duration of drilling and total depth of wells is provided in **Table 1**. Further detail is provided in the Stag-41 & 42 EP bridging document.

Table 1: Well Details

Parameter	Stag-41	Stag-42
Surface hole location (GDA 94)	Lat 20° 17' 08.20' S Long 116° 16' 57.67' E	Lat 20° 17' 01.61' S Long 116° 17' 41.66' E
	7,756,750mN 425,100.00mE	7,756,958mN 426,375.00mE
Approximate water depth (m)	49 m AHD	49 m AHD
Approximate length of drilling period (days)	10 days each	
Proposed total depth of well	785 m RT	785 m RT

Drilling will be undertaken from the EnSCO 104 jack-up rig, which will arrive on site after the Stag-43H well has been completed. The procedures for drilling Stag-41 and Stag-42 are similar. The two wells are approximately 200 m distant from each other.

The Stag-41 and Stag-42 drilling operations will be carried out conventionally by drilling a 406mm hole before running and cementing the casing and nipping up and testing of the Blow-Out Preventors (BOPs). A 311mm (12 1/4") hole will then be drilled with the 244mm (9 5/8") casing run and cemented. Then the 216mm (8 1/2") hole will be drilled to 785m MD/TVDRT and casing run. Both wells will be drilled with water based mud and seawater sweeps/gels.

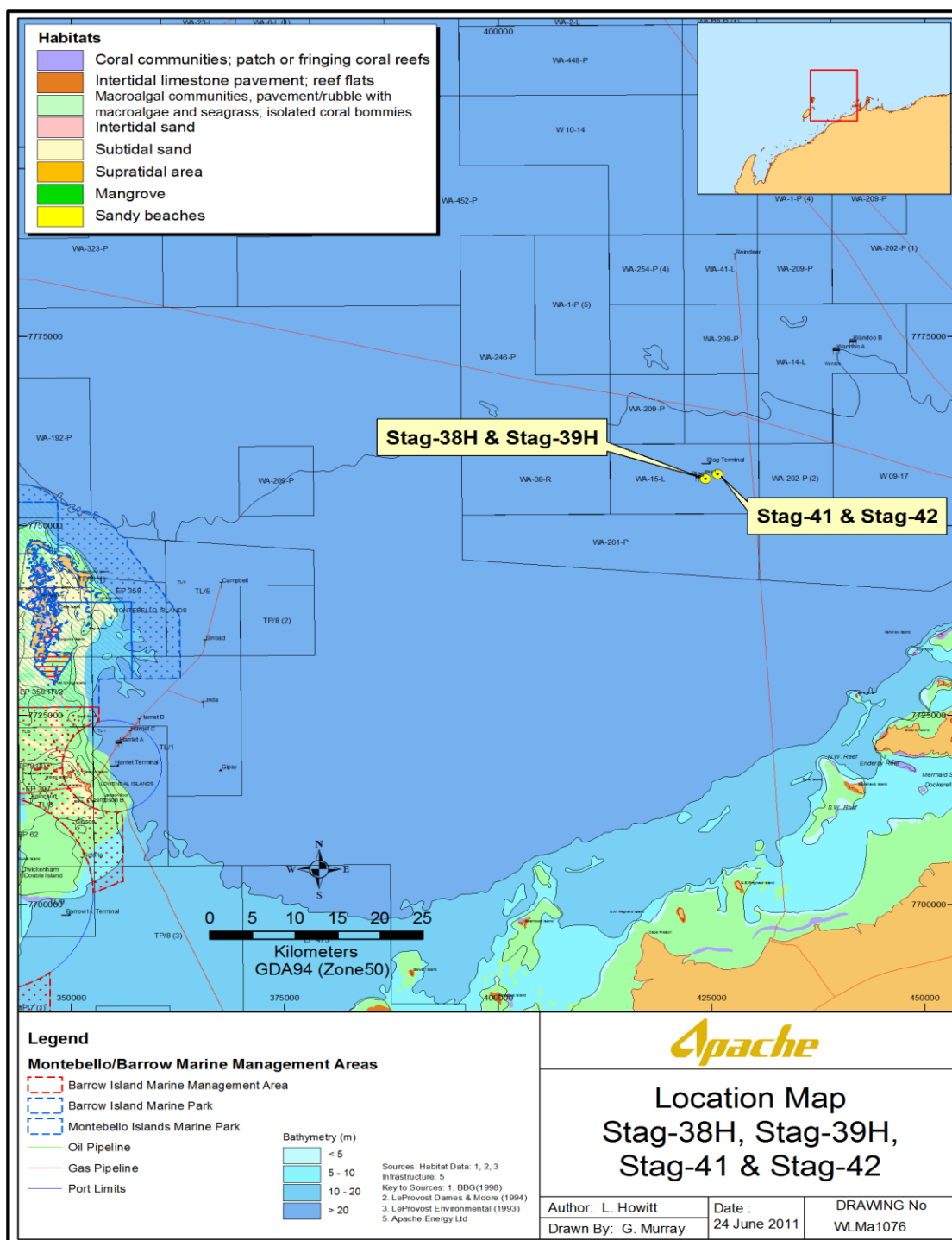


Figure 1: Location of the proposed wells: Stag-38H, 39H, 41 & 42.

The 311mm and 244mm hole sections will be evaluated using measurement whilst drilling technology (MWD) and Quad Combo (gamma ray, resistivity, density, neutron porosity & sonic) logging whilst drilling (LWD) technology respectively. No additional logging programme (Wireline) will be required.

Upon reaching total depth the two wells will be permanently abandoned.

At the end of the drilling campaign for both wells, a debris clearance survey will be carried out by the rig, using a work class ROV before moving off location. Any recovered debris will be taken to shore for disposal at an approved disposal facility.

A geophysical seabed survey will be carried out over a 1 km by 1 km grid centred around the well location. This survey will be carried out by Neptune Geomatics on the Mermaid Voyager or a similar vessel. The geophysical seabed survey will include a side scan sonar survey, boomer sub-bottom profiling and multibeam ech sounder. The survey will be carried out prior to drilling the two wells and is expected to commence around 10 December 2011.

Receiving Environment

Physical Environment

A summary of the climatic conditions for the Northwest Shelf (NWS) region is provided below. 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.

In general, wind patterns are monsoonal with a marked seasonal pattern. From October to March, 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

The key environmental considerations associated with the Stag-41 and Stag-42 programme (**Table 2**) and their potential for and likelihood of impact on the marine fauna is outlined below.

A search of the EPBC Act Protected Matters Search Tool in May 2010 identified a total of 9 threatened species listed under the EPBC Act database as threatened marine species that may occur within the proposed drilling area, with 15 species listed as migratory (nine of these being the same as the threatened species). All 15 species, with the exception of the humpback whale (*Megaptera novaeangliae*), are widely distributed and/or oceanic species and would most likely occur as vagrant transients through the area. The drilling programme coincides with the marine turtle nesting and seabird nesting period (**Table 2**).

The nearest turtle nesting sites are located about 35 km to the east (Dampier Archipelago), and at least 60 km to the south-west (Barrow, Montebello and Lowendal Islands) from the proposed Stag well sites. Although the proposed drilling period and seabed survey periods coincide with the peak turtle nesting and hatching period, the distance of the proposed activities site to the nearest turtle nesting sites mitigates against any potential impacts to nesting turtles or their hatchlings.

As with marine turtles, the proposed location for survey and drilling activities is distant from any seabird nesting sites and therefore no significant impacts on nesting seabirds from the proposed activities is anticipated.

Table 2: North West Shelf biological resources seasons and breeding cycles

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Hawksbill turtle nesting	Peak activity		Low level of abundance			Activity not occurring		Low level of abundance		Peak activity		
Flatback turtle nesting	Peak activity		Low level of abundance			Activity not occurring		Low level of abundance			Peak activity	
Green turtle nesting	Peak activity		Low level of abundance			Activity not occurring		Low level of abundance		Peak activity		
Loggerhead turtle nesting	Low level of abundance				Activity not occurring		Low level of abundance		Low level of abundance			
Whale migration	Activity not occurring						North	Low level of abundance	South	Activity not occurring		
Whale-sharks	Activity not occurring			Main aggregation period			Activity not occurring					
Seabird nesting (terns and shearwaters)	Peak activity	Low level of abundance		Activity not occurring					Low level of abundance	Peak activity		
Proposed drilling activity		Proposed drilling programme	Proposed drilling programme									

Key

Peak activity, presence reliable and predictable
Low level of abundance/activity/presence
Activity not occurring within the area
Proposed drilling programme

There is no contingency for vertical seismic profiling (VSP) as part of this drilling activity; however in the event that it should be required Apache would inform DMP prior to carrying out. Should VSP be required, then this will be of short duration (generally less than 8 hours per well) and thus this potential source of underwater noise will be limited. To mitigate any potential impacts on humpback whales or whale sharks from VSP, DMP’s (formerly DoIR) “Guidelines on Minimising Acoustic Disturbance to Marine Fauna” (2007) will be followed when undertaking VSP (also see **Table 3**). Using the DMP guidelines, the following measures will be undertaken on the rig at the commencement of the VSP:

- Not commencing VSP unless whales/whale sharks are a minimum distance of 3 km from the rig and dolphins 200 m from the rig;
- Soft-start over a 20 minute period;
- Rig crew being alert for marine fauna at least 30 minutes prior and during VSP, with a dedicated marine fauna-watcher on post if a whale or whale shark is sighted with 3–5 km of the rig or dolphins within 500 m of the rig; and
- Shut down of VSP if whales or whale sharks are observed within 1 km of the rig and if dolphins are observed within 200 m of the rig.

In addition, the Environment Protection and Biodiversity Conservation Regulations 2000, Part 8 “Interacting with cetaceans and whale watching” shall be applied. Consequently, no significant impacts to whales or whale sharks are expected.

Socio-Economic Environment

Dampier and Karratha are the main service and population centres for this region. Local people seeking aquatic recreation such as boating, diving and fishing use the coast and islands of the Pilbara. The open waters of the Commonwealth permit areas do not support significant recreational or tourism activity. Recreational fishing tends to be active within State waters in closer proximity to population centres associated with high number of local visitors and tourism. Commercial fisheries are active along the Pilbara coast; however fishing effort in the open Commonwealth waters is low, with operators favouring the inshore areas.

Further information on recreational and commercial activities that fall under the North Coast Bioregion is addressed in the in the Stag Operations EP and NWS Generic Drilling EP (EA-00-RI-164).

Major Environmental Hazards and Controls

The potential environmental impacts resulting from offshore drilling on the NWS are outlined in detail in Apache’s Generic Drilling Programme EP (EA-00-RI-164) and for drilling support activities in Apache’s General Petroleum Support Activities EP (EA-00-RI-158). **Table 3** summarises the guidelines and environmental commitments for the Stag-41 & 42 drilling programme as well as for the seabed survey.

Environmental Management

Extensive environmental management guidelines are prepared for each Apache-drilled well. Apache management documents used to guide the implementation of well-specific environmental management procedures are listed below:

- Environmental Management Policy (February 2010).
- NWS Generic Drilling EP 2007 – 2011 (EA-00-RI-164)
- General Petroleum Support Activities EP (EA-00-RI-158)
- Contaminated Waste Management Procedure (VI-SA-ON-EN-000).
- Environmental Requirements for Offshore Marine Vessels (AE-91-IQ-202)
- Lighting Management Plan (EA-60-RI-153).
- 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).
- Quarantine Procedure (AE-91-IQ-189).
- Vermin Management Plan (EA-60-RI-131).
- Waste Management Plan (EA-60-RI-167).

Consultation

Stakeholders of relevance to the drilling of the Stag wells are limited to fisheries organisations with interests in Commonwealth waters. These organisations are:

- Australian Fisheries Management Authority (AFMA)
- Commonwealth Fisheries Association (CFA)
- Northern fishing Companies Association (NFCA)
- Western Australian Fishing Industry Council (WAFIC)
- A Raptis and Sons
- WestMore Seafoods

These stakeholders were notified via email on 28 November of the upcoming activities for these two wells. Apache will continue stakeholder consultation as and where required.

Table 3: Summary of Apache Environmental Guidelines and Commitments for Stag-41 & 42

Activity	Requirement
Disposal of drilling fluid and drilling cuttings	<ul style="list-style-type: none"> • WBM cuttings discharge to seabed. • Record volume of drilling cuttings and fluid disposed into the ocean on environmental spreadsheet. Send results to the Apache Environmental Department at the end of the well.

Activity	Requirement
Pipe Dope	<ul style="list-style-type: none"> • Use pipe dope that has lowest concentration of heavy metals and hydrocarbons but still meets safety and performance criteria. • Record volume of pipe dope used on location on environmental spreadsheet. Send results to the Apache Environmental Department at the end of the well.
Liquid Discharges	<ul style="list-style-type: none"> • Discharge excess water from the water maker to sea. • Under routine operating conditions, discharge treated sewage, grey water and main deck drainage at sea level. • Discharge cooling water above seawater level to allow for sufficient cooling and oxygenation.
Incident Reporting	<ul style="list-style-type: none"> • Use the Apache incident reporting system to report incidents to DMP within 2 hours (OPGGS(E) Regulations; 26A). • Recordable incidents to be reported to DMP at the end of each month (OPGGS(E) Regulations; 26B).
Waste Management	<p style="text-align: right;">Oil</p> <ul style="list-style-type: none"> • Drum waste oil and grease and return to mainland for recycling. • Record volume of waste oil taken off rig and forward results to the Apache Environmental Department at the end of the well.
Deck drainage, chemical storage and management	<ul style="list-style-type: none"> • Maintain good housekeeping practices. • Store chemicals in bunded areas away from open drains and chemical containers are to be intact. • Use drip trays under all machinery and fuel points and valves. • In the event of a spill, take all actions to control the spill and divert deck drainage to on board containment tanks for treatment through the oil in water separator. • Ensure absorbent material is on board to use in soaking up chemical or oil spills on deck. • Maintain oil water separators regularly to ensure 15 mg/L oil concentration alarm is functional. • Report all releases of oil in water of > 30 mg/L (over a 24 hour period) to Apache Perth office. • Report all spills > 80 L to DMP within 2 hours either directly by contacting the DMP Duty Inspector on 0419 960 621 or via the Apache Perth office. • Report all spills (including < 80 L) through Apache incident reporting system. • All spills < 80 L are Recordable Incidents under the Offshore Petroleum & Greenhouse Gas Storage (Environment) Regulations 2009 (26B) and must be reported to DMP no later than 15 days after the end of the calendar month via the Apache Perth office.

Activity	Requirement
Spillage of diesel fuel or oil	<ul style="list-style-type: none"> • Follow Apache refuelling procedure (AE-91-IQ-098). • Carry out diesel refuelling during daylight hours only, weather permitting. • In event of a spill take all actions to control it. • Do not use dispersant without Australian Marine Safety Authority (AMSA) approval. • Report all releases of oil in water of > 30 mg/L (over a 24 hour period) to Apache Perth office. • Report all spills > 80 L to DMP within 2 hours either directly by contacting the DMP Duty Inspector on 0419 960 621 or via the Apache Perth office. • Report all spills (including < 80 L) through Apache incident reporting system. • All spills < 80 L are Recordable Incidents under the Offshore Petroleum & Greenhouse Gas Storage (Environment) Regulations 2009 (26B) and must be reported to DMP no later than 15 days after the end of the calendar month via the Apache Perth office. <p>Implement Apache's Oil Spill Contingency Plan (AE-00- EF-008;) if required.</p>
Discharge of combustion products from engines	<ul style="list-style-type: none"> • Include inspections and tuning of engines and equipment on a regular maintenance schedule.
Solid waste management <ul style="list-style-type: none"> • Food scraps • Garbage • Litter • Scrap metal and wood etc 	<ul style="list-style-type: none"> • Macerate all food scraps prior to ocean disposal (rig is 35 km from nearest land). • Do not dispose of debris, garbage or litter into the sea (skips need covers to prevent wind blown rubbish – especially plastics and cups). • Segregate industrial waste (scrap metals / drums etc) wherever possible for appropriate disposal onshore. • Do not use polystyrene cups. • Reduce, reuse and recycle waste wherever practicable. • Record the volume and type of waste taken off rig and forward to the Apache Environmental Department at the end of the well. • Undertake an ROV survey to check that no rubbish is left on seabed. Remove any debris if found.
Sewage discharge	<ul style="list-style-type: none"> • Treat sewage to secondary level prior to discharge through the sewage plant (aerates, macerates and chlorinates). This unit meets MARPOL 1973/78 requirements. • Maintain the sewage treatment plant in order to ensure effective treatment.
Light Overspill	<ul style="list-style-type: none"> • Minimise use of non-essential lighting when drilling near sensitive environments, while maintaining safety standards on the drill rig and support vessel.

Activity	Requirement
Noise	<ul style="list-style-type: none"> • Minimise noise emissions when drilling near noise-sensitive environments. • Should VSP be required, then DMP's "Guidelines on Minimising Acoustic Disturbance to Marine Fauna" (2007) will be followed, to mitigate any potential impacts on humpback whales or whale sharks from vertical seismic profiling (VSP). Using the DMP guidelines, the following measures will be undertaken on the rig at the commencement of the VSP: <ul style="list-style-type: none"> ○ Not commencing VSP unless whales/whale sharks are a minimum distance of 3 km from the rig and dolphins 200 m distant from the rig; ○ Soft-start over a 20 minute period; ○ Rig crew being alert for marine fauna 30 minutes prior and during VSP, with a dedicated marine fauna-watcher on post if a whale or whale-shark is sighted 3-5 km from the rig or dolphins 500 m from the rig; and ○ Shut down of VSP if whales or whale sharks are observed within 1 km of the rig and dolphins within 200 m of the rig.
Fishing	<ul style="list-style-type: none"> • No fishing is permitted from the drill rig whilst it is on location.
Anchoring & Disturbance to the seabed	<ul style="list-style-type: none"> • Side scan sonar survey results used to select a rig approach and drill site location that avoids sensitive seabed features. No sensitive seabed features in immediate vicinity of the wells. • No workboats are to anchor in areas where coral reefs occur; a designated area for mooring will be allocated. No sensitive seabed features in immediate vicinity of the wells.
Operational Environmental Awareness	<ul style="list-style-type: none"> • Through inductions and educational material present on the rig, all personnel are familiar with the environmental requirements of the EP to ensure these guidelines and procedures are being followed. • Ensure all personnel sign off on the rig register book confirming their induction.
Large Animal Observations	<ul style="list-style-type: none"> • Part 8 of the EPBC Regulations <i>Interaction with marine fauna and whale watching</i> shall be adhered to. • The DEC Code of Conduct for whale shark interactions shall be adhered to. • Fill in Marine Fauna Sighting Datasheet and send to the Apache Environmental Department at the completion of the drilling program.

Perth Office Commitments

Activity	Requirement
Prior to drilling	<ul style="list-style-type: none"> • NWS generic drilling EP (2007-2011; EA-00-RI-164) is available to all personnel involved in drilling program. • General petroleum Support Activities EP (EA-00-RI-158) is available to all personnel involved in the seabed surveys.
Discharge of combustion products from engines	<ul style="list-style-type: none"> • Report greenhouse gas emissions data to Commonwealth Government annually.
Environmental Audit	<ul style="list-style-type: none"> • Audit drilling rigs every six months whilst under contract to Apache (1st audit to be scheduled at start of contract). • Review electronic waste and chemical log received from rig at the completion of the drilling program.

Further Details

For further information about the Stag-41 & 42 drilling programme, please contact:

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