

AUSTRALIAN DRILLING ASSOCIATES

SONGA VENUS

STUART AC/P33 OLIVER-2

DRILLING & TESTING OPERATIONS

2009

ENVIRONMENT PLAN

EXECUTIVE SUMMARY

1	0	Issued	QHSE Coordinator	QHSE Team Leader	Drilling Superintendent	01.10.09
Issue	Rev	Description	Prepared By:	Reviewed By:	Approved By:	Date



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1 EXECUTIVE SUMMARY

1.1 The Proponent

Stuart Petroleum Limited (Stuart) is the proponent for the Songa Venus AC/P33 Drilling Operations which includes the Oliver oil field. ADA is an international well engineering and project management company, conducting the operations on behalf of Stuart.

1.2 The Proposal

Stuart proposes to undertake an appraisal drilling and testing operations of Oliver-2 in the Petroleum Exploration Area AC/P33, in Commonwealth waters, approximately 273 km northwest from the nearest coast of Western Australia and 175 km from the Indonesian archipelago. Stuart Petroleum is the appointed operator of the petroleum exploration permit AC/P33.

The Songa Venus semi-submersible MODU, which has a NOPSA approved Vessel Safety Case (VSC) dated 10th July 2005, will be used to drill and test the Oliver-2 well located offshore in the in the north east region of the Territory of Ashmore and Cartier Islands Offshore Area. The Oliver-2 operations are scheduled to commence in the fourth quarter of 2009 and are expected to last for a total of approximately 42 days. Coordinates of the well location and permit area are listed in Table 1 below. Drilling will occur 24 hours per day

Two Anchor Handling Supply Vessels (AHSV) will service the rig with approximately 30 support vessel trips per month during the program. Both vessels will return to port (Darwin) for refuelling. There will be helicopter support to the drill rig.

At the Oliver-2 location, the well will be drilled vertically to an approximate depth of 3225 metres. The prime objective of this well is to determine if any hydrocarbons are present in the mapped structure and to obtain information that will provide the basis for further evaluation and exploration. The well will be drilled primarily using a combination of water based mud and seawater. No synthetic based mud will be used. Overall, approximately 575 m³ of drill cuttings will be discharged overboard.

Oliver-2 well may be tested and if the activity is confirmed, all work on the well will be undertaken in accordance with the requirements of the Offshore Petroleum Greenhouse Gas Storage Act (OPGGSA) 2006. The testing methodology for the well will be applied as per the following elements of Oliver-2 Well Test Basis of Design.

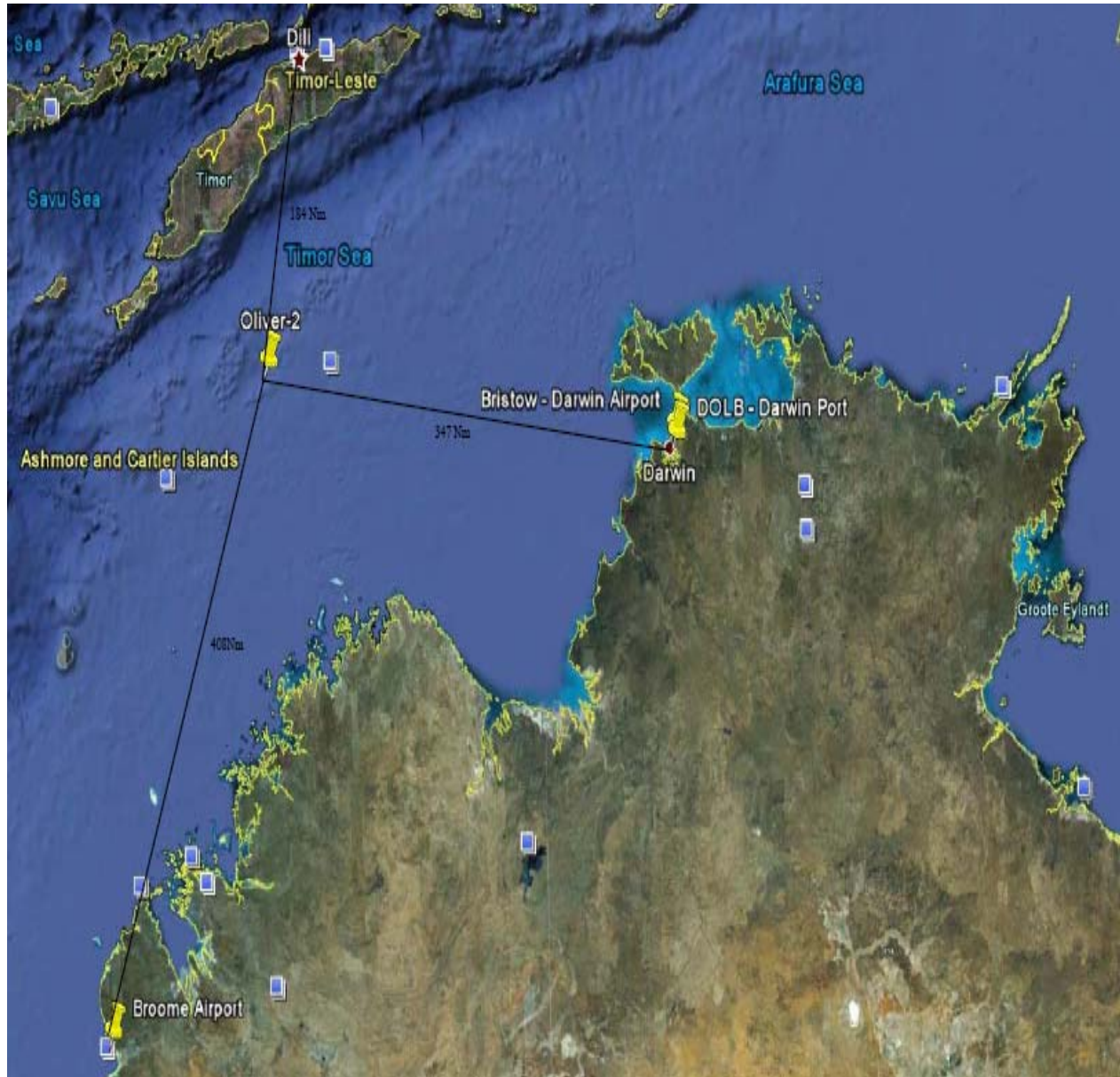
This EP was approved by the Department of Regional Development, Primary Industries, Fisheries and Resources (DRDPPIFR) on 21 October 2009.

Table 1 Well location and permit area

Location Name	Permit Area	Latitude	Longitude
Oliver-2	AC/P33	11°37'48.34"	125°01'31.36"

Projection: GDA94

Figure 1 Oliver-1 well location



1.3 Description of the Environment

Physical Environment

The proposed Oliver-2 well is located in commonwealth waters of Permit Area AC/P33 in the west of Bonaparte Basin of the southern Timor Sea. The closest landfall locations to the proposed project area are:

- Cape Bougainville on the Western Australian mainland located approximately 285 km to the south-east;
- Kupang in Timor located approximately 175 km to the north-west; and
- Ashmore Reef and Cartier Island located approximately 270 km to the south-west.

The climate of the region is tropical with two distinct seasons: the Northwest Monsoon and the Southeast Monsoon. The Northwest Monsoon season occurs from November to March (i.e. the southern summer) and the Southeast Monsoon occurs from April to September (i.e. the southern winter). Brief transitional periods occur in April and September/October (AIMS, 2001).

The water depth at the proposed Oliver-2 location is approximately 320 m MSL.

Biological Environment

The Bonaparte Basin is a large, predominantly offshore sedimentary basin that covers approximately 270,000 square kilometres of Australia's northwest continental margin. The basin contains up to 15 kilometres of Phanerozoic, marine and fluvial, siliciclastic and carbonate sediments.

Benthic infauna is likely to be present in the Oliver-2 well area. It is likely that sea stars, worms and crustaceans will also be present. Substrate composition, water depth, temperature and season all effect the spatial distribution of these species.

Five species of marine turtle occur within the project region and are on the National List of Threatened Species. These are the green turtle (*Chelonia mydas*), flatback turtle (*Natator depressus*), hawksbill turtle (*Eretmochelys imbricata*), loggerhead turtle (*Caretta caretta*) and the leatherback turtle (*Dermochelys coriacia*). The green, flatback and hawksbill turtles exhibit a summer nesting period on deep sandy beaches (Pendoley, 2005). The proposed location does not contain any emergent land or shallow reef in which the turtles usually breed and reside in. The likelihood of encountering significant numbers of turtles is low.

Whales and Dolphins are common to the Western Australian coast. However, the project area resides in deep offshore waters where there is low potential for interaction between operations and whales. Particularly due to the short period required at the Oliver-2 location and its stationary nature of the activity. The proposed operation will be undertaken in fourth quarter of 2009, which is on the outskirts of the calving periods and entering the migratory periods for the Blue Whale and Humpback Whale, where the whales will be heading south or sighted in southern Australian waters.

The project area does not reside in a known world heritage, national heritage place or near a wetland of international importance.

Socio-economic Environment

The Bonaparte Basin is a large, predominantly offshore sedimentary basin that covers approximately 270,000 square kilometres of Australia's northwest continental margin. The basin contains up to 15 kilometres of Phanerozoic, marine and fluvial, siliciclastic and carbonate sediments. The Bonaparte Basin is a proven petroleum province. The main activities in the project area include:

- Recreational fishing and tourism;
- Petroleum exploration and production;
- Commercial shipping; and
- Commercial fishing.

1.4 Stakeholder Consultation

In the course of planning the proposed operations, Stuart and ADA has to date, undertaken consultation with relevant stakeholders in the region to identify regulatory processes, potential environmental issues and management requirements. Ongoing consultation with these groups will continue up to and during the drilling program.

Stakeholders associated with the program that have been consulted are listed in **Table 2**.

Table 2 Stakeholder consultation

Stakeholder	Contact	Date	Matters Discussed
NT DRDPIFR – Petroleum Operations	Dominic Marozzi dominic.marozzi@nt.gov.au Senior Petroleum Operations Officer Ph: (08) 8999 6350	Ongoing	EP requirements <ul style="list-style-type: none"> • To commence with stakeholder consultation.
AFMA – Australian Fisheries Management Authority	Daniel Quinn Ph: (02) 6225 5555 Daniel.quinn@afma.gov.au & Mallory Terwijn, mallory.terwijn@afma.gov.au Environment Officer	17/09/09	Advice on locations and fisher groups contact. <ul style="list-style-type: none"> • Responded & declared no fishery vessels reported operated in AC/P33.
AMSA – Australian Maritime Safety Authority	James Bond via james.bond@amsa.gov.au	17/09/09	Shipping routes <ul style="list-style-type: none"> • Responded & declared no major shipping route concerns highlighted
NT DRDPIFR - Fisheries	Ian Curnow via Ian.Curnow@nt.gov.au & David Mckey via David.Mckey@nt.gov.au Aquatic Resource Manager	17/09/09	Advice on locations and fisher groups contact <ul style="list-style-type: none"> • Responded & recommended to seek further advice from WA Fishing Industry Council (WAFIC);

WAFIC – Western Australia Fishing Council	Felicity Horn, wafic@wafic.org.au Assistant Executive Director Ph: (08) 9492 8888	17/09/09	Advice on locations and fisher groups contact <ul style="list-style-type: none"> No fisheries concern highlighted in AC/P33.
NT DRDPIFR – Petroleum Operations	Luke Drever via luke.drever@nt.gov.au Petroleum Operations Officer, NT DRDPIFR	29/09/09	Advice on locations and fisher groups <ul style="list-style-type: none"> Responded & recommended to seek further advice from NT Seafood Council
NTSC - NT Seafood Council	Katherine Sarneckis via ceo@ntsc.com.au NTSC CEO	28/09/09	Advice on locations and fisher groups contact <ul style="list-style-type: none"> No fisheries concern highlighted in AC/P33.

1.5 Environmental Impact Assessment, Management and Mitigation

The main environmental hazards associated with the operations include:

- Presence of drill rig and support vessels;
- Well equipment remaining on seabed after drilling (rig to be removed from location at end of drilling);
- Drilling operations (i.e., lost equipment);
- Discharge of sewerage and putrescible wastes, deck drainage oily wastes;
- Management of solid and hazardous materials and waste;
- Ballast water discharge and hull cleaning;
- Deck drainage discharge from drill rig and vessels;
- Exhaust and well testing emissions;
- Accidental spills. and
- Testing Operations

The Environment Plan provides a detailed assessment of potential impacts. The key points of the assessment, and management and mitigation measures are summarised in **Table 3** below. The summary risk ranking is also shown in **Table 3**; there are a total of 18 potential environmental risks, all of which have been assessed as having low risk.

Table 3 Summary of environmental impact assessment results

Impact Assessment	Management and Mitigation	Risk Ranking
<p>Presence of drilling rig and support vessels: rig positioning and anchoring. Disturbance to seabed habitat</p>	<ul style="list-style-type: none"> • Pre-mobilisation survey of proposed location. • Adherence to anchoring procedures to minimise chain and anchor drag. 	Low
<p>Presence of drilling rig and support vessels: interference with other activities. Interference with commercial fishing and shipping, cumulative affects of offshore oil and gas activities and risk of collision with other vessels leading to oil spills.</p>	<ul style="list-style-type: none"> • Implementation of measures discussed in consultation with commercial fisheries. • Liaison and communication with commercial fishing operators regarding schedules and work plans during the program. • Offshore distance will reduce the extent of inconvenience. • All support vessel operations will be conducted in compliance with the AMSA OSV Code (e.g., radar monitoring, vessel communications). • 500m safety zone to protect rig infrastructure. • Navigation light present on Songa Venus. • Continuous support vessel surveillance. • Commercial shipping lanes through the WA-406-P permit area managed by liaison with AMSA. 	Low
<p>Presence of drilling rig and support vessels: artificial lighting. Attraction of seabirds and other marine life and the safety need to other vessels visibility at night.</p>	<ul style="list-style-type: none"> • Standard maritime safety procedures will be adopted (AMSA). Lighting selected to meet safety requirements. • Minimise unnecessary lights directed downwards toward water. • Crew to record observations of whales and other megafauna. These will be provided to DEWHA. 	Low
<p>Presence of drilling infrastructure and support vessels: impact to visual amenity. Visual impact in nearshore areas</p>	<ul style="list-style-type: none"> • Proposed operation is of short duration. • Distance from shoreline is 270 km away. 	Low
<p>Presence of drilling rig and support vessels: Noise from VSP survey. Behavioural changes to marine mammals.</p>	<ul style="list-style-type: none"> • Application of DEWHA VSP guidelines : <ul style="list-style-type: none"> – Pre-start up visual observations. – Soft-start up procedures. – Operating procedures including: <ul style="list-style-type: none"> i. Visual observations of the <i>observation zone</i> must be maintained continuously to identify if there are any whales present. ii. If a whale is sighted within the <i>observation zone</i> the operator of the acoustic source must be placed on stand-by to power down the acoustic source. iii. If a whale is sighted within the <i>shut down zone</i> the 	Low

	<p>acoustic source must be shut down completely.</p> <ul style="list-style-type: none"> - Low visibility operating procedures. - Observation zone: A 3 kilometre horizontal radius from the VSP acoustic source <p>Shut down zone: A 500 metre horizontal radius from the VSP acoustic source</p>	
<p>Presence of drilling rig and support vessels: noise from drill rig, drilling vessels and support vessels, helicopters. Behavioural changes to marine mammals.</p>	<ul style="list-style-type: none"> • Application of DEWHA guidelines for cetacean observation and recording on rig and support vessels. • Program will be undertaken on the outskirts of the calving period and at the beginning of the migratory, periods for whale species that are likely to occur in the region. • Program of short duration (approximately 42 days). • Noise produced from the drilling rig (low-level, low-frequency tones), and accompanying support vessels in the order of magnitude of noise produced by commercial shipping. • Adoption of encroachment distances from whales by service vessels (300 m) and helicopters (500 m) (Australian National Guidelines for Whale and Dolphin Watching 2005). 	<p>Low</p>
<p>Drilling discharges: discharge of water based drilling cuttings and muds to sea. Disturbance to water column and benthic communities in immediate area of discharge.</p>	<ul style="list-style-type: none"> • Drill cuttings are treated on the shale shaker and by centrifuges prior to disposal to maximise recovery and reuse of drill muds. • Drilling mud spills will be prevented by containment on the main deck and mud handling area. 	<p>Low</p>
<p>Drilling operations: lost equipment and well completion Disruption to commercial fishing operations.</p>	<ul style="list-style-type: none"> • Equipment retrieval at end of operations. • ROV recovery if feasible. 	<p>Low</p>
<p>Discharge of sewerage and putrescible wastes, deck drainage, oily wastes: Waste discharge to sea. Disturbance to marine environment.</p>	<ul style="list-style-type: none"> • All vessels will comply with State and Commonwealth legislation for the control of pollution and dumping at sea. • Solids will be returned to shore for disposal. • All hazardous materials will be stored in appropriately bunded areas. • Wastes will be segregated as required and stored in storage areas and transferred to onshore licensed materials handlers for disposal to a licensed depot. • Waste register will be maintained to record waste management practices and audited to verify compliance. • Records kept of unplanned emissions and discharges. • Induction training will be provided for waste management. 	<p>Low</p>
<p>Discharge of solid and hazardous materials and waste: Waste discharge to sea. Disturbance to marine environment.</p>	<ul style="list-style-type: none"> • All vessels will comply with State and Commonwealth legislation for the control of pollution and dumping at sea. • Solids will be returned to shore for disposal. • All hazardous materials will be stored in appropriately bunded areas. • Wastes will be segregated as required and stored in storage areas and transferred to onshore licensed materials handlers for disposal to a licensed depot. 	<p>Low</p>

	<ul style="list-style-type: none"> Waste register will be maintained to record waste management practices and audited to verify compliance. Records kept of unplanned emissions and discharges. Induction training will be provided for waste management. A maintenance program shall be in place for waste management equipment. 	
<p>Freight transfer: Introduction of pests such as vermin.</p>	<ul style="list-style-type: none"> Freight transfers from the shore to the rig will be managed by inspection at the shore base. Equipment arriving packaged to the shore base will be unpacked and loaded onto the supply vessel prior to loading onto the rig. 	Low
<p>Ballast water discharge and hull cleaning: Introduction of marine pests. Introduction of marine species.</p>	<ul style="list-style-type: none"> Ballast water will be exchanged as per vessel procedures, if required. Rig to comply with Australian Ballast Water Management Requirements by AQIS and the Commonwealth National Biofouling Management Guidance for the Petroleum Production and Exploration Industry. Vessel to comply with the Australian Ballast Water Management Requirements (AQIS). Vessel masters will be made aware of the AQIS Maritime Awareness Kit. 	Low
<p>Deck drainage discharge from drill rig and vessels: waste discharge to sea. Disturbance to marine environment.</p>	<ul style="list-style-type: none"> In the event of a chemical or oil spill, absorbent materials will be used to remove spill material prior to any washing activities. The absorbent material will be containerised and sent to shore as hazardous waste to ensure that no contaminated waste streams are routinely discharged from the deck drainage system. MSDS forms available for all hazardous chemicals Use of oil detection monitoring equipment (OMD-2005 scattered light sensor) for treated oily water, which is maintained under the routine maintenance system in place. Deck treatment systems (separators) for oily wastes and discharge of separated water. 	Low
<p>Exhaust and well testing emissions: Emission to atmosphere. Pollution of atmosphere.</p>	<ul style="list-style-type: none"> Emissions will be minimised by ensuring that all engines and generators are serviced to manufacturer's specifications. Fuel consumption routinely monitored. 	Low
<p>Well Testing: Hydrocarbon fallout / Pollution</p>	<ul style="list-style-type: none"> Installation of a system suitably sized to handle expected hydrocarbon flow rates during well testing. Suitable control and shutdown systems to ensure well flow is suitably controlled and stopped in the event of an extinguished burner 	Low

<p>Accidental spill: fuel spill, condensate spill. Disturbance to marine environment.</p>	<ul style="list-style-type: none"> • Ensure that the vessel has an Oil Spill Contingency Plan (OSCP) in place and staff appropriately trained in its execution. • Ensure that all necessary fuel spill equipment is functional and accessible on the vessel. • Ensure that fuel will not be transferred during inappropriate weather conditions. • Ensure that equipment and procedures used for transferring fuel from vessel to rig (e.g., 'Dry-Break' hose couplings), conform to the AMSA Code for the safe working of support vessels. • Supply vessels will cease operating and seek safe harbour (or deep water) where conditions make it unsafe, in the view of the Vessel Master, to continue drilling operations. • Ensure that all vessel operations are conducted in compliance with the AMSA OSV Code (e.g., radar monitoring, vessel communications). • Spill modelling undertaken to enable oil spill contingency planning. • Ensure that all personnel are aware of the existence and location of the above-listed documents. 	<p>Low</p>
<p>Accidental spill: Chemical spill. Impacts to water quality and marine life. Impacts to water quality and marine life.</p>	<ul style="list-style-type: none"> • Minimisation of chemical usage and generation of waste. • Education in waste handling procedures during transfer and operational usage for relevant personnel. 	<p>Low</p>
<p>Accidental spills: Blow out, uncontrolled release of reservoir fluids. Impacts to marine fauna.</p>	<ul style="list-style-type: none"> • Shallow gas survey to understand risk of intersecting hydrocarbon bearing zone while drilling before BOPs are installed. • Offset well review to understand likelihood of intersecting over-pressured strata. • Maintenance of all well control equipment including routine maintenance of choke and kill line hoses and other fittings to the BOP, and other well control equipment. • Installation of blowout preventers. • Routine monitoring of pressure within the drilling fluid system. • Oils spill and emergency response plan. 	<p>Low</p>

In summary, the appraisal well is located in the Bonaparte Basin, in Commonwealth waters. The duration of the program is an estimated 42 days, the rig location is distant from marine protected areas and has low impact to the marine environment. Stakeholders have been consulted, and mitigation measures have been put in place to manage whale interaction.

Management and mitigation measures that will be followed during the project are provided in the Environment Plan. The implementation strategy for the Environment Plan specifically details the measures needed to ensure that the environmental performance objectives and standards are met, and identifies:

- Systems, practices and procedures;
- Specific roles and responsibilities;
- Employee training;
- Monitoring, auditing and recording requirements;
- Emergency response planning; and
- Consultation with government and stakeholders.

1.6 Contact Details

Please direct all queries, comments or request for a copy of the approved Stuart AC/P33 Drilling Operations Environment Plan to:

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Drilling Superintendent
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