



Pomodoro 2D MSS Extension  
Environment Plan: Public Summary  
November 2011

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*This summary has been submitted to comply with Regulation 11(7)(8) of the Offshore Petroleum and Greenhouse Gas Storage (Environment) (OPGGSE) Regulations 2009*

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## Introduction

Apache Energy Ltd (Apache) proposes to undertake a two-dimensional (2D) marine seismic survey (MSS) program within Commonwealth waters of the offshore Carnarvon Basin, within exploration permits, WA-426-P and WA-427-P (Pomodoro MSS extension) during November 2011. The program is referred to as the **Pomodoro 2D Marine Seismic Survey Extension**.

## Location

The proposed survey line (see **Figure 1**) is located within the Carnarvon Basin off Western Australia. The proposed Pomodoro extension survey line covers a distance of approximately 58.8 km within Commonwealth Waters (**Figure 1**), and is located within water depths ranging from 100 to 470 m. Coordinates of the Pomodoro extension survey are listed in **Table 1**.

**Table 1: Proposed Pomodoro 2D MSS Extension Coordinates**

Location point	Latitude			Longitude		
	degrees	minutes	seconds	degrees	minutes	seconds
Start	20	29	51.39	114	57	10.04
End	20	07	43.69	114	57	10.03

Datum: GDA94, UTM Zone: 50.

## Timing

The Pomodoro extension survey is scheduled to be undertaken around the 14<sup>th</sup> of November 2011. The proposed seismic survey schedule is estimated to take 10 hours to complete, however any delays to the start date of the survey or adverse prevailing sea and weather conditions during the survey could potentially delay the start date or extend the duration.

## Project Description

### *Seismic Operations*

During the proposed activity, the survey vessel will traverse a pre-determined sail line within the Pomodoro survey area at a speed of approximately 4.5–5.0 knots. As the vessel travels along the survey line a series of sound pulses (every 7–8 seconds) will be directed down through the water column and seabed. The released sound will be attenuated and reflected at geological boundaries and the reflected signals will be detected using sensitive microphones arranged along a hydrophone cable (or streamer) towed behind the survey vessel. The reflected sound will be processed to provide information about the structure and composition of geological formations below the seabed in an attempt to identify hydrocarbon reservoirs.

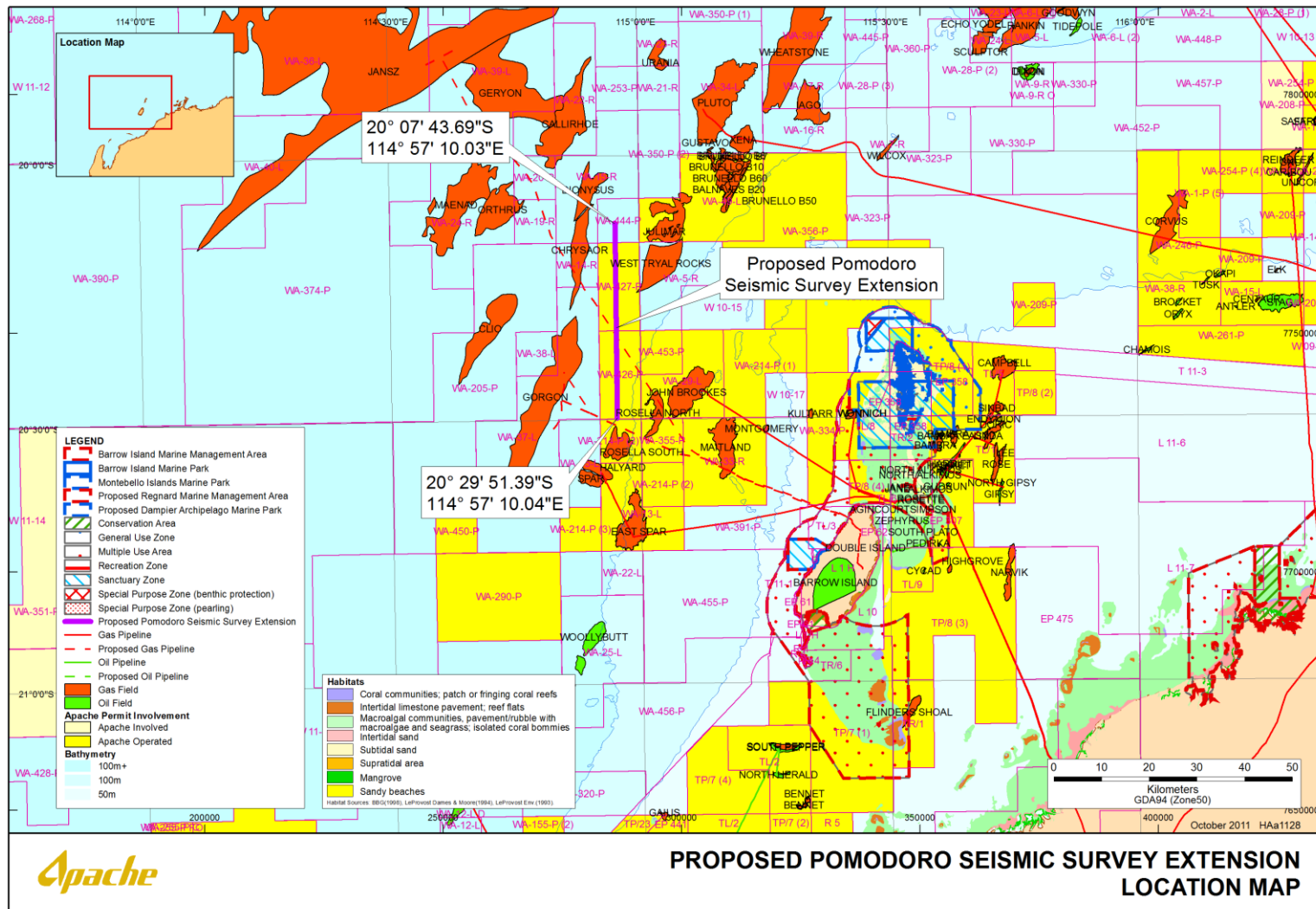


Figure 1: Location of the proposed Pomodoro 2D seismic extension survey west of Montebello Islands

The seismic array will comprise one towed streamer cable, approximately 6.5 km in length. The source (airgun array) tow depth will be 6 m and the streamer tow depth will be 15 m. The operating pressure for the source array will be approximately 2,000 psi. The source array will consist of three sub-arrays, with a total volume of 4,130 cui. This source will be fired at an interval of 18.75 m, and will produce at source (i.e. within a few metres of the airguns) sound pulses in the order of 210 dB re 1 $\mu$ Pa-m at frequencies extending up to approximately 110 Hz. Based on a spherical spreading noise propagation model, these sound pulses will decrease to levels in the order of 150 to 160 dB re 1 $\mu$ Pa-m within 1 km of the source and approximately 145 dB re 1 $\mu$ Pa-m within 2 km, dependent on the sound propagation characteristics of the area. Details of the seismic array are given in **Table 2**.

**Table 2: Seismic survey parameters**

Parameter	Value
No. of streamers	1
Streamer length	6,500 m
Streamer depth	15 m
Size of source array	4,130 cui
Operating pressure	14 Mpa (2,000 psi)
Shotpoint interval	18.75 m (no flip flop)
Source depth	6 m
Peak at source sound levels (<1m)	210 dB re 1 $\mu$ Pa-m
Frequency range	0–110 Hz
Distance between survey sail lines	N/A

### Vessels

Apache proposes to conduct the survey using the purpose-built seismic survey vessel the *M/V Ramform Explorer* (**Figure 2**). The *M/V Ramform Explorer* is owned and operated by the geophysical acquisition company Petroleum Geo-Sciences Pty Ltd. The vessel will travel within the survey area at an average speed of 5 knots.



Vessel Dimensions	
Length :	83.07m
Width :	39.6m
Draft :	7.5m
Vessel Tonnage	
Gross (IMO-69) :	9874 metric tons
Net :	2963 metric tons
Streamers :	Up to 12
Source :	2 x 4130 cu in

**Figure 2: M/V Ramform Explorer**

Two supply vessels, the *M/V Nautika Pride* (**Figure 3**) and *M/V No Limit* (**Figure 4**), will accompany the seismic survey vessel to maintain a safe distance between the survey array and other vessels, and also to manage interactions with fishing activities, if required. The supply vessels will also re-supply the survey vessel if necessary.



**Basic function - purpose built for**

- ✓ Transportation of equipment & fuel.
- ✓ Seismic support
- ✓ Chase Boat

**General**

Type :	59 M Supply Vessel
Year Built	2009
Classification	ABS (A1 + AMS for unrestricted services)
IMO No.	9541162
Official No. / Call Sign	333126 / 9 WKC2
Port of Registry & Flag	Kuching

**Main Dimension**

Length O.A	59.00 M
Beam	13.80 M
Depth	5.50 M
Max Draft	4.50 M
Gross/Net Tonnage	1302 / 390

**Tank & Loading Capacity**

Cargo fuel storage	820.7m <sup>3</sup>
Ship's fuel tank capacity	526.5m <sup>3</sup>
FW holding tank	122.2m <sup>3</sup>
Deck Area	430 M <sup>2</sup>
Deadweight	1671.25 Tonnes
Displacement	2730.57 Tonnes

**Performance**

Speed	12 knots at 100 % MCR
Power	2x1800 HP@1800RPM

Control	Fwd & Aft o/w emergency stop at controls
Water Maker -	Reverse Osmosis type 2 x 5m <sup>3</sup> / day

**Navigation and Communication**

- Complying with GMDSS A1, A2, A3
- 3 x VHF Radio
- 1 x MF/HF
- 1 x Felcom 15 - inmarsat C
- 2 x Radar
- 1 x Echo Sounder
- 1 x GPS with 3 remote displays
- 1 x Gyrocompass
- 1 x Magnetic compass
- 1 x Autopilot
- 1 x AIS
- 1 x SSAS
- 1 x satellite ( Iridium ) phone

**Deck Machinery**

- Bow Anchor 2 x 1590 kg Stockless anchor with 7 shackles port 8 shackles stbd.
- Electro / Hydraulic Windlass;
- Twin Gypsy / double wrapping heads- 30 tonnes brake Holding
- Gypsy Pull – 7 tonnes x 14 m / min
- Reefer Point 6 Nos.
- Crane 3 Tonnes @ 13m reach
- Capstan 2 x 5 Tonnes ( 15 m / min )
- Towing Hook( Mentrade ) – pneumatic quick release type – 40 T SWL

**Safety and Fire Fighting Equipment**

- In compliance with CLASS & FLAG requirement.
- Liferafts- 6 units ( 4 x 20 & 2 x 12 )
- Life jackets – 80 pcs
- Rescue boat – 1 x semi rigid ( 6 persons )
- Fitted with fixed CO2 system
- Vessel comply to MARPOL 1 & IV, V

**Accommodations**

Fully air-conditioned	40 berth ( all cabins provided with WC )
Crew	12

**Figure 3: MV Nautika Pride**



CLASSIFICATION		DIMENSIONS	
<b>Marine &amp; safety:</b>	WA USL 2B	<b>Length</b>	LOA 21.5M
<b>M number:</b>	4252	<b>Beam</b>	6.0M
<b>Call sign:</b>	VJT 6185	<b>Draft</b>	1.5M
MACHINERY		BRIDGE	
<b>Main engines</b>	2 x Caterpillar 3412TA 735kw	<b>Flybridge</b>	Engine controls & 2nd steering
<b>Gear box</b>	2 x ZF550 2 speed 1.99:1 & 2.23:1 Reduction With electronic trolling valves	<b>Radar Raymarine</b>	48nm , Furuno 48nm
<b>Propeller</b>	2 x Mikado 5 blade	<b>Plotter</b>	Maxsea, Raymarine C120
<b>Auxiliary engines</b>	1 x Yanmar 30kva - 3 phase Mase 1 X 8 kva - 1 phase	<b>Gps</b>	Furuno GP31, Raymarine C120
		<b>AIS</b>	Receiver / Transmitter group 2
		<b>Sat communications</b>	Optus Westinghouse Satphone, Inmarsat C Thrane & Thrane, Inmarsat Fleet 33, Voice Fax Data
		<b>Auto pilot</b>	Saura Marine 3000at
		<b>HF radio</b>	Furuno FS 1550au
		<b>VHF radio</b>	Gme Gx548
		<b>VHF handhelds</b>	Icom ICM 33 x 3
		<b>Searchlight</b>	Aircraft landing light 240v
		<b>Compass</b>	kvh gyrotrac, Plastimo magnetic
		<b>Fire monitoring</b>	Avac mk iii FA2
		<b>Inverter</b>	Seletronic sine wave 2000watt
		<b>EPIRB</b>	McMurdo 406
SPEED AND CONSUMPTION			
<b>Maximum Speed</b>	28 knots (2164 rpm)		
<b>Economical Service Speed</b>	22 knots (1800 rpm)		
CAPACITIES			
<b>Cargo</b>	12 tonne		
<b>Clear Deck</b>	8 m x 6 m		
<b>Power</b>	2 x 3 phase reefer plugs 32amps		
<b>Fuel</b>	14,900 litres		

**Figure 4: M/V No Limit**

## Receiving Environment

A general overview of the receiving environment in terms of its physical and biological aspects is provided in the following sections.

### Biological Environment

#### *Bathymetry and Seabed Sediments*

The proposed Pomodoro extension seismic survey area is located within the central section of the continental shelf, at approximately 100 to 470 m depth and is characterised by a thick sequence of carbonate rock that is overlain by thin layers of unconsolidated fine to medium grained, carbonate sediments with occasional shell or gravel patches. Surveys conducted over the North West Shelf indicate that a similar seafloor occurs extensively over this geographic region, but with spatial variation in the grain size and origin of the surface sediments.

## Biological Environment

### *Marine Habitats*

The survey areas are located in the North West Marine Bioregion, in the North West Shelf Province. A description of the marine habitats within the North West Shelf Province associated with the proposed survey areas are outlined in this section. The proposed Pomodoro extension survey area is distant from the shallow intertidal and shoreline habitats of the mainland and offshore islands (**Figure 1**).

Deeper subtidal reefs support a luxuriant and diverse assemblage of filter feeding animals, comprising mostly of sponges, gorgonians, whip corals, bryozoans, ascidians and hydroids. Comparative surveys of the predominant faunal groups indicate that the area supports species characteristic of both the Pilbara coast and islands further offshore (e.g., Ashmore Reef) together with tropical Indo-west Pacific species with a widespread distribution.

### *Marine Fauna*

A summary of the number of fauna that may be encountered within the proposed survey areas is provided in **Table 3**. The proposed Pomodoro extension survey area is not considered a habitat that is critical to the survival of any listed species. Similarly, there are no listed threatened ecological communities as defined in the EPBC Act in the vicinity of the survey areas. There are no known nesting, breeding and feeding areas for these listed species within the seismic survey area.

**Table 3: Number of Listed Threatened and Migratory Marine Species in the Pomodoro Survey Area**

Seismic Survey	Total number of Marine Fauna	Number of listed Threatened marine species	Number of migratory marine species
Pomodoro	69	7	13*

Note: \* 7 of these being the same as the threatened species  
Source: DSEWPC (2010) Protected Matters Search Tool

A number of marine mammals (whales and dolphins) and turtles are known to occur in the Carnarvon Basin, some being seasonal visitors while others occur at low densities all year round. Several of these species are discussed below with regard to their potential presence in the survey area.

### *Marine Mammals*

A number of whale species, including the blue whale (*Balaenoptera musculus*), humpback whale (*Megaptera novaeangliae*), Bryde's whale (*Balaenoptera edeni*), killer whale (*Orcinus orca*), Antarctic minke whale (*Balaenoptera bonaerensis*) and the sperm whale (*Physeter macrocephalus*) may occur infrequently in the survey area.

The most commonly sighted whale is the humpback whale. Humpback whales are listed as an endangered migratory species under the EPBC Act and are known to migrate between the Antarctic waters and the Kimberly region of Western Australia.

The peak of the northerly migration occurs around mid-June to late July, while the southerly return migration peaks around late August to early September, with a peak of cow and calves occurring in early to mid-October (**Table 4**).

**Table 4: 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	Low	Low	None	None	None	Low	Low	Low	Peak	Peak	Peak
Flatback turtle nesting	Peak	Low	None	None	None	None	None	None	None	Low	Low	Peak
Green turtle nesting	Peak	Low	Low	None	None	None	None	None	None	Peak	Peak	Peak
Loggerhead turtle nesting	Low	Low	None	None	None	None	None	None	Low	Low	Low	Low
Whale migration	None	None	None	None	None	North	None	None	South	None	None	None
Whale sharks	None	None	Main aggregation period	None	None	None	None	None	None	None	None	None
Seabird nesting (terns and shearwaters)	Peak	Low	Low	None	None	None	None	None	Low	Peak	Peak	Peak
Proposed Seismic program	None	None	None	None	None	None	None	None	None	None	Pomodoro 2D MSS Extension	None

**Key**

Peak	Peak activity, presence reliable and predictable
Low	Low level of abundance/activity/presence
None	Activity not occurring within the area
Green	Pomodoro 2D MSS Extension

The migratory whale route, where most whales are observed, occurs in deeper waters (> 20 metres), passing to the west and north of Serrurier Island, westward of Barrow Island and north of the Montebello Islands (Woodside, 2002).

The timing of the proposed seismic surveys will not coincide with the migration periods of the humpback whale.

*Sea Turtles*

Four species of marine turtle nest on sandy shore sites of Dampier Archipelago, Montebello Islands, Lowendal Islands, Barrow Island, Airlie Island, Thevenard Island, other coastal islands and the Exmouth region. These include the loggerhead turtle (*Caretta caretta*), the green turtle (*Chelonia mydas*), the hawksbill turtle (*Eretmochelys imbricata*) and the flatback turtle (*Natator depressus*). The leatherback turtle (*Dermochelys coriacea*) is also known to visit open waters. These five species are on the National List of Threatened Species as either endangered or vulnerable under the EPBC Act.

The nearest turtle nesting sites, the nearest 58 km from the survey area, are located in the Montebello Islands, Lowendal Islands and Barrow Island. The peak turtle nesting and hatching period occurs from November to January (Table 4). The regional sea turtle population is estimated to be over 49,000 animals. The distribution, abundance and activity of turtles vary widely across the North West Shelf and among the different species. For all species, hatchling emergence occurs six to eight weeks after the females have nested.

*Fish*

The demersal habitat of the North West Shelf hosts a diverse assemblage of fish, with up to 1,400 species known to occur, with a great proportion of these occurring in

shallow coastal waters. Many of these are commercially exploited by trawl and trap fisheries.

Whale sharks (*Rhincodon typus*), the world's largest fish (growing up to 12 m in length), are oceanic and cosmopolitan in their distribution, and are known to aggregate in and near the waters of the Ningaloo Marine Park during autumn, approximately 150 km south west of the survey area. The main period of the whale shark aggregation is late March to June, with the largest numbers recorded around April. However, the season is variable and individual whale sharks have been recorded at other times of the year

#### *Seabirds*

At least 64 species of birds feed and nest on the surrounding waters and islands within the Barrow/Montebello/Lowendal islands region. The main seabird breeding/nesting season occurs between October and January on the island group. As the proposed seismic survey will take place in offshore waters distant from breeding sites it is highly unlikely that the proposed survey areas cover any habitat critical to the survival of any seabirds in the region.

Giant-petrels are migratory species (i.e. Bonn Convention, JAMBA and CAMBA) and tend to be the most oceanic of all seabirds, opting for land primarily for breeding purposes (Environment Australia, 2001). It is highly unlikely that the survey area covers any habitat critical to the survival of any listed migratory seabird species. It is possible that this species may fly over the survey area, however it is not anticipated that the seismic survey will have any impact on these or other seabirds due to their mobility and distance of the survey areas from any critical nesting or feeding sites.

### **Areas of Environmental Significance**

There are currently three Marine Conservation Reserves (MCRs) in the North West Shelf region:

- Ningaloo Marine Park and Muiron Islands Marine Management Area;
- Montebello/Barrow Islands Marine Conservation Reserves; and
- Dampier Archipelago Marine Park and Cape Preston Management Area.

All of the above MCRs are located a substantial distance from the survey area (**Figure 1**).

### **Socio-economic Environment**

#### *Commercial Fisheries*

The survey area falls within the State-managed Pearl Oyster Managed Fishery and the Pilbara Fish Trawl (Interim) Managed Fishery.

The Western Australian pearl oyster fishery is the only significant wild-stock fishery for pearl oysters in the world. The species targeted is the silver-lipped pearl oyster (*Pinctada maxima*). The harvest method is a drift dive in which six to eight divers are attached to large outrigger booms on a trawler style vessel and towed slowly over pearling beds, harvesting legal-sized oysters as they are seen. It is a dive fishery operating in shallow waters along the North West Shelf. The main areas of fishing are Exmouth Gulf, Port Hedland, Eighty Mile Beach and Lacepede Islands.

The majority of demersal finfish caught in the Pilbara region are taken by the Pilbara Fish Trawl (Interim) Managed Fishery. The trawl fishery targets 10 main species: blue spot emperor (*Lethrinus hutchinsi*), threadfin bream (*Nemipteridae*), flagfish (*Lutjanus vitta*), crimson snapper (*Lutjanus erythropterus*), red emperor (*Lutjanus sebae*), saddletail snapper (*Lutjanus malabaricus*), goldband snapper (*Pristipomoides multidens*), spangled emperor (*Lethrinus nebulosus*), frypan snapper (*Argyrops spinifer*) and Rankin cod (*Epinephelus multinotatus*).



## *Commercial Shipping*

The Pomodoro extension survey is located within the main north/south coastal shipping lane paralleling the WA coastline, which then heads north to SE Asia. The survey area is also partially located within the Dampier inbound and outbound shipping route, associated with vessel movements to and from the ports of the North West Shelf, in particular Dampier. Consequently there is the possibility that the seismic and support vessel could encounter minor merchant vessel traffic during data acquisition.

As part of the normal duties associated with a seismic vessel, the Vessel Master will notify various Australian marine agencies of the vessel's position and progress during the survey. The normal Australian Coast warnings and Notices to Mariners and shipping agents will be issued closer to the survey date, requesting adequate clearance zone around the vessels.

### **Major Environmental Hazards and Controls**

The main aspects or activities associated with the operations of the seismic program that have the potential to result in environmental risks and effects are:

- Operation of the seismic source, recording and deployment vessels and towing of the airgun and streamer through the survey area;
- Discharge of the air source arrays in the survey area;
- Routine waste discharges from vessels;
- Accidental fuel and oil spills from the support vessels; and
- Collision with another vessel.

The environmental and social issues potentially resulting from these activities are:

- Disturbance to marine fauna – disruptions to populations of cetaceans (dolphins and whales), fish, reptiles, benthic invertebrates and plankton from the discharge of the airgun array;
- Interference with shipping and boating in the area – disruption to vessels;
- Interference with commercial and recreational fishing – disruption to fishing vessels, disruption to commercial/recreational catches;
- Waste disposal impact on marine environment – sewage, putrescible waste, chemicals and solid and hazardous wastes;
- Fuel spill impact on marine environment – spillage from the supply vessels;
- Interference with existing oil and gas production infrastructure (existing or under construction);
- Introduction of exotic marine species; and
- Loss of tourism-related values from any oil spills and waste discharges, (if these were to occur).

A qualitative risk assessment has been carried out using a risk assessment matrix based on managing risks to as low as reasonably practical.

### **Risks and Effects of Routine Operations**

Marine seismic surveying involves the discharge of compressed air to create sound pulses that are reflected from layers under the sea floor and recorded back at the surface. Interpretation of these reflections is a key step in exploration for hydrocarbons. There is currently no other method that has sufficient resolution to identify rock structure beneath the surface.

A review of the marine impacts from seismic surveys, as part of an independent scientific review commissioned by the Australian Petroleum Production and Exploration Association (APPEA), concluded the following:

- The response of Australian marine animals to marine seismic survey sounds will range from no effect to various behavioural changes;
- Except for plankton and larvae at close range, few species are likely to be killed outright;
- The sound intensities required to produce pathological changes in marine mammals probably occur at <100 m and at < 200 m for fish;
- Most invertebrates, dugong and small toothed whales have poor hearing at low frequencies (e.g. the range of seismic discharges);
- Some fishes, baleen whales and possibly sea turtles may hear seismic sounds well and behavioural changes may occur at greater distances;
- It is possible that animals will habituate to sound;
- Behavioural impacts can include flight response, displacement, dispersal, and disruption of feeding or breeding activity;
- Operating seismic vessels for protracted periods across narrow, restricted migratory paths may hinder the passage of migrating animals;
- The greatest risk from marine seismic surveys to marine animals appears to be during breeding or spawning periods; and
- Provided that seismic surveys are avoided at locations and times of particular sensitivity, and given the relatively small scale of seismic activity, the often large scales over which biological events occur, the low probability of encounter between seismic surveys and 'at risk' populations at an appropriate time and place, then the wider implications of disruption by seismic surveys appear to be small for most species.

The proposed survey airgun array will produce at source (i.e., within a few metres of the airguns) sound pulses in the order of 210 dB re 1 $\mu$ Pa-m at frequencies extending up to approximately 110 Hz. Based on a spherical spreading noise propagation model, these sound pulses will decrease to levels in the order of 150–160 dB re 1 $\mu$ Pa-m within 1 km of the source and approximately 145 dB re 1 $\mu$ Pa-m within 2 km dependent on the sound propagation characteristics of the area.

### *Impacts on Cetaceans*

Baleen whales such as blue, southern right and humpback whales, communicate by low frequency sounds and are therefore considered to be the most sensitive of the marine mammals to specific low frequency sounds. The hearing of baleen whales is thought to overlap with the energy output of seismic related noise. The proposed timing of the seismic survey is outside the peak migration of the Humpback whale.

Marine seismic surveys do not necessarily constitute a threat to marine mammals if care is taken to avoid situations that could potentially harm the animals (JNCC, 1998). As mitigation for this, the guidelines on the application of the EPBC Act Policy Statement 2.1 to interactions between offshore seismic operations and whales will be applied. Given the timing, duration and location of the seismic program and the adherence to DSEWPC cetacean Policy Statement, the risk of effects to cetaceans from the proposed seismic program is considered negligible.

### *Interference with Commercial and Recreational Fisheries*

Potential impacts on commercial fisheries are largely due to navigational conflicts, given that seismic vessels tow long streamers, and fishers often deploy trawl nets or long lines over the same areas. Due to the long length of the towed cable the vessel requires a 2 NM clearance to the bow, port and starboard side, and a 4 NM clearance to the stern.

Adequate clearances, effective communication and up to date notification of the location of the seismic vessel to commercial fishermen in the region will further assist in avoiding any impacts. All vessel operations will be conducted in compliance with the Australian Maritime Safety Authority (AMSA) Offshore Support Vessel Code of



Safe Working Practice (OSV Code), which includes standards for radar monitoring and vessel communications.

#### *Onboard Storage and Handling of Materials*

All oils or chemicals used or stored onboard the survey vessels will be contained and managed to prevent damage to the containers or leakage/spillage onto the deck or into the ocean. These materials will be stored in bunded areas such that any spills or leaks can be contained and recovered. Sufficient absorbent materials will be held onboard to mop up possible leaks.

Should onboard spills or leaks occur, they would be cleaned up immediately using absorbent materials held on the vessel. Recovered oils or chemicals and used absorbent materials will be placed in appropriately marked drums for recycling or onshore disposal. The vessels will follow AEL's "Environmental Requirements For Offshore Marine Vessels" ([AE-91-IQ-202](#)).

#### *Disposal of Wastes*

All wastes generated on the vessels will be managed in accordance with MARPOL 73/78 regulations. The risk of adversely affecting water quality within any of the survey areas is considered negligible based on the constant movement of the vessel, the extremely short duration of the survey, the highly dynamic and extensive receiving water and the small quantity and concentration of pollutants within waste-waters discharged from the support vessel. A quantitative waste tracking log will be maintained in accordance with regulatory requirements for all relevant wastes.

#### *Anchoring*

Anchoring will only be required under exceptional circumstances. Under normal operations, no anchoring is required in the field during this seismic program. Relative depths at the proposed survey areas make it highly unlikely that any of the towed equipment will make contact with the seafloor or benthic communities.

#### *Refuelling*

Refuelling at sea is unlikely to be required during the seismic program. In the event that refuelling is required at sea, refuelling would be in accordance with Apache's "Refuelling and Chemical Transfer Management Procedure" ([AE-91-IQ-098](#)).

In the extremely unlikely event of an accidental oil spill to the ocean, the contractor vessel's approved Shipboard Oil Pollution Emergency Procedure (SOPEP) would be immediately activated, in conjunction with the Emergency Procedures Manual if necessary. All spills must be logged and reported to the Vessel Master. Any spills greater than 80 L must also be immediately reported to the DMP.

#### *Exhaust Emissions*

The combustion of fossil fuels in vessel engines and onboard power generators will contribute to exhaust emissions including the greenhouse gas CO<sub>2</sub>. Emissions will be minimised by ensuring that all engines and generators are serviced to manufacturers specifications.

## **Risks and Effects from Unplanned Events**

#### *Vessel Collision*

There is the potential for vessel traffic transiting from and to the Port of Dampier to pass through the survey areas. The potential for a hydrocarbon spill resulting from the collision of the seismic vessels with another ocean going vessel is considered negligible for the following reasons:

- Radio communication will be maintained with any vessels observed transiting the area;



- Information on the location and timing of the seismic program will be communicated to vessels via AMSA through a Notice to Mariners;
- Notification of the position of the seismic vessels and the area proposed to be working in will be communicated to fishing industry representatives and forwarded to respective members (vessel owners). This will ensure no fishing vessels are operating within the nominated daily run line of the survey; and
- Seismic vessel will request a 2 NM clearance to the bow, port and starboard side, and a 4 NM clearance to the stern

#### *Introduction of Marine Pests*

Australia has mandatory ballast water requirements are enforced under the Quarantine Act 1908. These requirements are consistent with International Maritime Organisation (IMO) Guidelines for minimising the translocation of harmful aquatic species in ship's ballast water.

The vessels proposed to be used for the survey currently operate within Western Australian waters and pose no risk from the introduction of marine pests. Should a vessel be required to be sourced from outside WA waters, then it will be required to comply with the Australian Ballast Water Management Requirements. This will involve a full ballast water exchange at sea prior to entering Australian waters. Additionally, all vessels will comply with DAFF National Biofouling Management Guidelines. The seismic source array and receivers will be cleaned prior to their deployment.

#### **Management Controls**

Controls to be implemented during the seismic program to safeguard against the potential environmental risks and effects identified, consist of both procedural and operational practices that will be undertaken during the seismic survey to protect against any adverse environmental impact. Such controls are recognised as additional measures to further manage environmental risks.

A summary of the main environmental hazards and management controls for the Pomodoro extension survey to be implemented to reduce the risk to as low as practicable is outlined in **Table 5**.

#### **Consultation**

The Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) was notified with a letter of intent of the proposed survey on the 14<sup>th</sup> of October 2011.

The proposed survey is an extension to the recently completed Pomodoro 3D MSS, which was assessed by DSEWPC on the 1<sup>st</sup> of June 2010 (EPBC 2010/5472) as *not a controlled action* provided it was undertaken in the manner set out in the decision. As such, the DSEWPC was notified of the proposed Pomodoro 2D MSS extension with a letter of intent on the 14<sup>th</sup> of October 2011.

In addition, A Bridging Plan to the Pomodoro, Chamois & Orcus 3D Marine Seismic Surveys Environment Plan (EP) (EA-00-RI-0174) was submitted to the Western Australian Department of Mines and Petroleum (DMP) for approval under the *Offshore Petroleum Greenhouse Gas Storage Act and (Environment) Regulations*. The Bridging Plan was accepted on the 10<sup>th</sup> of November 2011.

**Table 5: Apache Environmental Guidelines and Environmental Commitments for the Pomodoro 2D MSS Extension Program**

Activity	Requirement
Release of sound from acoustic source	<p><i>EPBC Act</i> Policy Statement 2.1 cetacean observation and seismic operations guidelines employed using Standard Management Procedures with a 2 km 'low power' zone. Night time use of the acoustic source to adhere to start-up procedures in <i>EPBC Act</i> Policy Statement 2.1. Adhere to <i>EPBC Act</i> Policy Statement 2.1 for avoiding interference with cetaceans during seismic surveys. 'Soft start' procedures will be implemented at the start of the line. The seismic source (airgun) will not be operated within the boundaries of the Montebello Islands Marine Park.</p>
Grey water/sewage disposal	<p>Use of biodegradable detergents only. Treat sewage in line with MARPOL 73/78 Annex IV requirements. Maintain the sewage treatment plant in order to ensure effective treatment. No discharge of sewage within the Montebello Islands Marine Park.</p>
Discharge of oily water from bilges	<p>Bilge discharges treated to &lt;15 ppm hydrocarbons. Oily water separator (set at 15 ppm) operational with discharge quality continuously monitored. Ability to store &gt;15ppm water in sludge tank.</p>
Solid waste disposal	<p>No disposal into marine environment of solid wastes. Collection and disposal onshore to landfill site Adherence to MARPOL 73/78 Annex V requirements.</p>
Disposal of waste oil	<p>Adherence to MARPOL 73/78 Annex 1 requirements. All waste oils collected and returned to shore for recycling/disposal</p>
Atmospheric emissions	<p>Engines maintained to operate at optimum efficiency to minimise emissions.</p>
Artificial lighting	<p>Lighting minimum required for navigation and safety requirements.</p>
Anchoring activity	<p>Anchoring not required during normal operations.</p>
Spillage of diesel fuel or oil	<p>No refuelling within 10 km of the Montebello Islands Marine Park Refuelling only during suitable weather and sea-state conditions, discretion of both skippers, integrity checks on equipment etc.). Adhere to the Petroleum Geo-Services Re-fuelling Procedure. According to Apache's "<i>Refuelling and Chemical Transfer Management Procedure</i>" (<a href="#">AE-91-IQ-098</a>)</p>
Introduction of marine pests into the marine environment	<p>Compliance with AQIS and Australian Ballast Water Management Requirements 2001. No exchange of ballast water &lt;12 nautical miles from land. Compliance with National Biofouling Management Guidance for the Petroleum Production and Exploration Industry.</p>



Apache has consulted with the following stakeholders of the proposed Pomodoro 2D MSS Extension Program:

- Department of Minerals & Petroleum (DMP);
- Fisheries WA (DOF);
- WA Fishing Industry Council (WAFIC);
- Australian Fisheries Management Authority (AFMA);
- Commonwealth Fisheries Association (CFA);
- Northern Fishing Companies Association;
- Western Australian Fishing Industry Council (WAFIC);
- Recfish WA;
- A Raptis and Sons; and
- Westmore Seafoods.

Stakeholder communications will continue for the duration of the seismic survey program.

### **Further Details**

For further information about the Pomodoro 2D MSS extension program, please contact:

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