Executive Summary – Environment Plan
Ichthys 3-D Marine Seismic Survey

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NOTICE

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This is a summary of the Environment Plan for the Ichthys 3-D Marine Seismic Survey which has been submitted by INPEX to the Western Australian Department of Mines and Petroleum for approval under the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009.

1 INTRODUCTION

INPEX proposes to undertake a three-dimensional marine seismic survey over the Ichthys Field (the Ichthys 3-D MSS) in the Browse Basin. The survey is intended to improve INPEX's ability to predict reservoir properties away from existing well bores, as well as to detail structural features and predicted reservoir properties by obtaining full imaging data over the field. The survey will be conducted by Petroleum Geo-Services (PGS) employing a purpose-built seismic survey vessel and using standard equipment and operations procedures.

The survey is scheduled to commence in late October or early November 2010 and is expected to take approximately 12 weeks.

2 CONTACT DETAILS

Contact:	Takeshi Yoshida
Position:	Manager Geophysics
Address:	INPEX Browse, Ltd.
	Level 22, 100 St Georges Terrace
	Perth WA 6000
Telephone:	+61 8 6213 6000
Fax:	+61 8 6213 6455
E-mail:	<takeshi.yoshida@inpex.com.au>

Contact:	Daniel Hazell
Position:	Environmental Adviser
Address:	INPEX Browse, Ltd.
	Level 22, 100 St Georges Terrace
	Perth WA 6000
Telephone:	+61 8 6213 6000
Fax:	+61 8 6213 6455
E-mail:	<daniel.hazell@inpex.com.au>

3 DESCRIPTION OF PLANNED ACTIVITY

3.1 Survey location and timing

The Ichthys 3-D MSS will cover an area of approximately 1810 km^2 and will consist of 140 survey lines each with 375 m spacing. This will yield a total length of 5400 km of survey line in water depths ranging from 230 to 360 m.

This survey will be conducted over the area of Petroleum Retention Lease WA-37-R and petroleum exploration permit areas WA-408-P, WA-274-P, WA-371-P, WA-344-P, WA-285-P R2 and WA–281-P. The latitudes and longitudes of the survey area are provided in Table 3-1. The extent of the survey area is the shaded area in Figure 3-1. The proposed Ichthys 3-D MSS is scheduled to commence around the last week of October or the first week of November 2010 with a duration of approximately 12 weeks.

Table 3-1: Coordinates of survey area

Location point	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
A	13	39	44.96	122	58	01.36
B	13	39	44.88	123	06	44.45
C	13	43	00.19	123	06	44.54
D	13	42	58.81	123	26	54.83
E	13	50	05.23	123	26	55.64
F	13	57	18.68	123	21	41.52
G	14	03	59.79	123	10	33.57
H	14	04	00.01	122	58	01.13

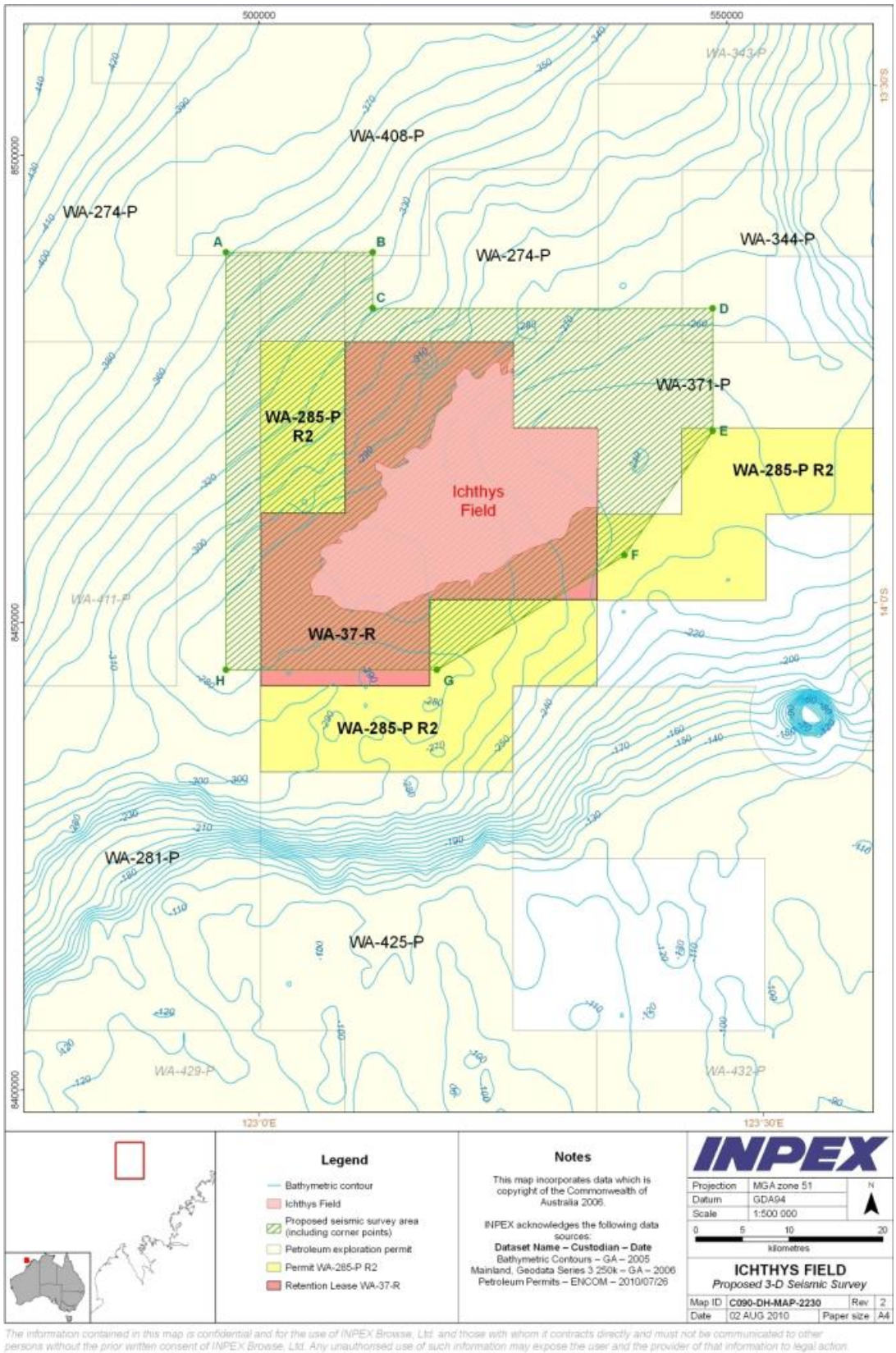


Figure 3-1: Area of the proposed 3-D seismic survey at the Ichthys Field

3.2 Survey vessels

3.2.1 Seismic vessel

The seismic vessel MV *Ramform Explorer* (Figure 3-2) will be used during the Ichthys 3-D MSS. This vessel is capable of towing eight or more (up to 12) solid streamers and is equipped with a 24-bit recording system. It is 82 m long and 39.6 m wide at its widest point, with a draught of 5.9 m. Up to 57 personnel can be accommodated on board at any given time and it has a certified helideck for use in emergency situations and routine crew change-out. During seismic operations it sails at around 4–5 knots.

Figure 3-2: The MV *Ramform Explorer*

3.2.2 Support vessel

The support vessel *Nautika Pride* has been contracted to support the operations of the seismic vessel. It will be used to transport equipment and fuel as required by the seismic vessel. At times it will also act as a chase boat.

3.3 Seismic operations

The seismic vessel will follow a series of predetermined survey lines within the planned survey area at a speed of approximately 4–5 knots. When seismic operations are under way, a series of noise pulses (once every 6–7 seconds) will be emitted downward through the water column and seabed. The released sound responds to geological boundaries and any reflected signals are recorded using hydrophones and other equipment located within the streamers towed behind the seismic vessel. The streamers proposed for this survey are filled with a gel which is impervious to water and will not result in a discharge to the marine environment in the event of accidental damage to the streamer sleeve.

The reflected sounds recorded by the hydrophones are processed to allow assessment of the structure and composition of geological formations below the seabed and to identify potential hydrocarbon resources.

A summary of the seismic survey operational parameters is provided in Table 3-2.

Table 3-2: Offshore 3-D seismic survey acquisition parameters

Parameter	Information
Number of streamers	10
Type of streamer	GeoStreamer—a dual-sensor gel-filled marine streamer
Length of streamer (m)	7050
Number of tuned airgun arrays	Two airgun arrays
Capacity (cu. in.)	3090 or 4130
Shot pressure (psi)	2000
Average peak pressure (dB rms re 1 µPa at 1 m)	210
Frequency range (Hz)	2–200
Firing interval (seconds)	6–7
Shot-point interval	18.75 m flip-flop
Airgun tow depth	approx. 8 m
Streamer tow depth	approx. 5 m
Separation between streamers	approx. 75 m
Total streamer spread width	approx. 675 m
Vessel speed (during data acquisition)	4–5 knots

3.4 Acoustic source sound pressure level

PGS plans to use one of the two standard PGS source arrays, the 3090 cu. in. or the 4130 cu. in. Both of these arrays consist of three sub-arrays (strings), and the gun type for both is the Bolt 1900LLXT airgun.

4 DESCRIPTION OF THE ENVIRONMENT

4.1 Climate

The climate in the Browse Basin region is monsoonal with warm north-west and south-west winds in summer (October–February) and cooler south-easterly winds in winter (May–August). This area is also prone to tropical cyclones, mostly during the tropical wet season (December–March). It is expected that cyclones could affect the Ichthys Field at least once every two years. Under extreme cyclone conditions winds can reach 300 km/h.

4.2 Seabed and bathymetry

Sidescan sonar surveys of the Ichthys 3-D MSS area reveal an almost featureless seabed varying in depth between 235 m in the north-east of the area to 270 m depth over the centre and sloping slightly to 360 m to the south-west. All seabed slopes are less than one degree, except where local variations in the seabed bathymetry occur in the north-east and south-west portions with sand waves. No obstructions or other forms of debris were noted on the seabed and no features such as boulders, reef pinnacles or outcropping hard layers were identified (Fugro 2005).

The Ichthys Field seabed is suggestive of strong near-seabed currents and mobile sediments that do not favour the development of diverse epibenthic communities. The presence of areas of mud and fine sand on the seabed suggests that it is a depositional area where fine sediments and detritus accumulate. Soft substrates are typical of deep continental-shelf seabeds and this habitat is very widely distributed in the deeper parts of the Browse Basin.

4.3 Oceanography and hydrodynamics

The Browse Basin generally experiences large tidal ranges and strong tidal currents. Mean sea level at the Ichthys Field is about 2.7 m above LAT, with a spring tidal range of about 5.0 m. Tides are semidiurnal, with two daily high tides and two low tides. Barotropic tidal currents predominantly flow in the cross-shelf direction at the shelf break and in the along-shelf direction when approaching the coast (McLoughlin, Davis & Ward 1988). This diurnal tide results in relatively short migrations of the thin water-surface layer. Longer-term drift is more highly dependent upon the forces of the prevailing winds.

4.4 Underwater noise

The Centre for Marine Science and Technology at Curtin University undertook a study on behalf of INPEX from September 2006 to August 2008 to determine the ambient biological and anthropogenic sea noise sources in the Browse Basin (near Browse Island) (McCauley 2009). It was determined that the ambient noise in the Ichthys Field is around 90 dB re 1 µPa; this was measured using a sea noise logger deployed on the seabed (at a depth of 240 m) 45 km north-west of Browse Island.

4.5 Water quality

The sea in the Ichthys Field area itself is between 235 m and 275 m deep and is typified by thermal stratification that varies in strength according to the season. At the Ichthys Field, surface-water temperatures are about 30 °C in summer (March) and 26–27 °C in winter (July), with major thermoclines at 30–50 m depth in summer

and 70–120 m in winter. Below the thermocline, water temperatures decrease by approximately 1 °C for each additional 10 m of depth, dropping to as low as 12 °C at 250 m. Extreme weather events, such as cyclones and monsoons, may facilitate temporary mixing of water layers across the thermocline.

Salinity is spatially and temporally consistent at 34–35 ppt as would be expected for locations that are distant from major freshwater discharges.

Dissolved oxygen concentrations in the waters of the Ichthys Field showed relatively constant levels of 6.0–6.5 ppm above the thermocline in both summer and winter. Below the thermocline, dissolved oxygen decreased with depth, with levels as low as 3 ppm at 250 m indicating that mixing is limited because of the strong thermal stratification.

4.6 Marine benthic habitats and communities

Intertidal and subtidal habitats have been surveyed at Browse Island (the closest island to the survey area) and subtidal habitats at the Ichthys Field and at Echuca Shoal (the closest subtidal shoal to the survey area).

4.6.1 Ichthys Field

The seabed at the Ichthys Field is well below the photic zone and consequently no benthic macrophytes can be expected in this area. The low dissolved-oxygen levels at depth in the offshore development area appear to limit the diversity and composition of infauna assemblages (RPS 2007a).

4.6.2 Browse Island

Browse Island is an isolated sandy cay surrounded by an intertidal reef platform and shallow fringing reef, located around 22 km from the nearest proposed seismic survey line. The reef complex is an outer-shelf biohermic structure rising from a depth of approximately 200 m and is a flat-topped, oval-shaped platform reef with a diameter of 2.2 km at its widest point. Rocky-shore habitat around the island is represented only by exposed beach rock, with no intertidal sandflats. The reef platform is high and conspicuously barren in many places. The reef crest and seaward ramp habitats around the edge of the reef support moderately rich assemblages of molluscs while the shallow subtidal zone is narrow and supports relatively small areas of well-developed coral assemblages (RPS 2008a).

The benthic habitats and biotic assemblages at Browse Island are characteristic of coral platform reefs throughout the Indo-West Pacific region. The small area of intertidal habitat at Browse Island, the elevation of the reef platform and the limited shallow subtidal area appear to have limited the development of benthic communities, including coral communities. Browse Island is also used by green turtles (*Chelonia mydas*) for nesting activities from October to May each year.

4.6.3 Echuca Shoal

Echuca Shoal is more than 50 km east of the Ichthys Field and outside the proposed 3-D MSS area.

Benthic surveys at the shoal encountered substantial areas of hard-bottom substrate with its associated epibenthic fauna. Seabed substrates are dominated by coral rubble, reflecting impacts from high-energy waves and swells generated during tropical storms and cyclones.

The shallow shoal areas are dominated by a flat "reef" platform comprising hard corals (particularly large *Porites* and *Platygyra* colonies), feather stars, sea whips and other soft corals (including *Junceella*, *Sarcophyton*, *Dendronephthya* and black corals of the genus *Antipathes*).

4.7 Protected species

There are a number of threatened marine species that may be present in the offshore development area that are protected under federal legislation or international agreements.

Species that are categorised as "endangered", "vulnerable", "migratory", or "listed" under the *Environmental Protection and Biodiversity Conservation Act 1999* are provided in Table 4-1.

Table 4-1: EPBC Act protected species that may occur in the Ichthys Field seismic survey area

Species	Common name	Status
Cetaceans (whales and dolphins)		
Balaenoptera bonaerensis	Antarctic minke whale	Migratory
Balaenoptera edeni	Bryde's whale	Migratory
Balaenoptera musculus	Blue whale	Endangered, Migratory
Megaptera novaeangliae	Humpback whale	Vulnerable, Migratory
Orcinus orca	Killer whale	Migratory
Physeter macrocephalus	Sperm whale	Migratory
Reptiles		
Caretta caretta	Loggerhead turtle	Endangered, Migratory
Chelonia mydas	Green turtle	Vulnerable, Migratory
Dermochelys coriacea	Leatherback turtle	Endangered, Migratory
Lepidochelys olivacea	Olive (or Pacific) ridley turtle	Endangered, Migratory
Natator depressus	Flatback turtle	Vulnerable, Migratory
Sharks		
Isurus oxyrinchus	Shortfin mako	Migratory
Isurus paucus	Longfin mako	Migratory
Rhincodon typus	Whale shark	Vulnerable, Migratory
Seabirds		

Species	Common name	Status
Calonectris leucomelas	Streaked shearwater	Migratory

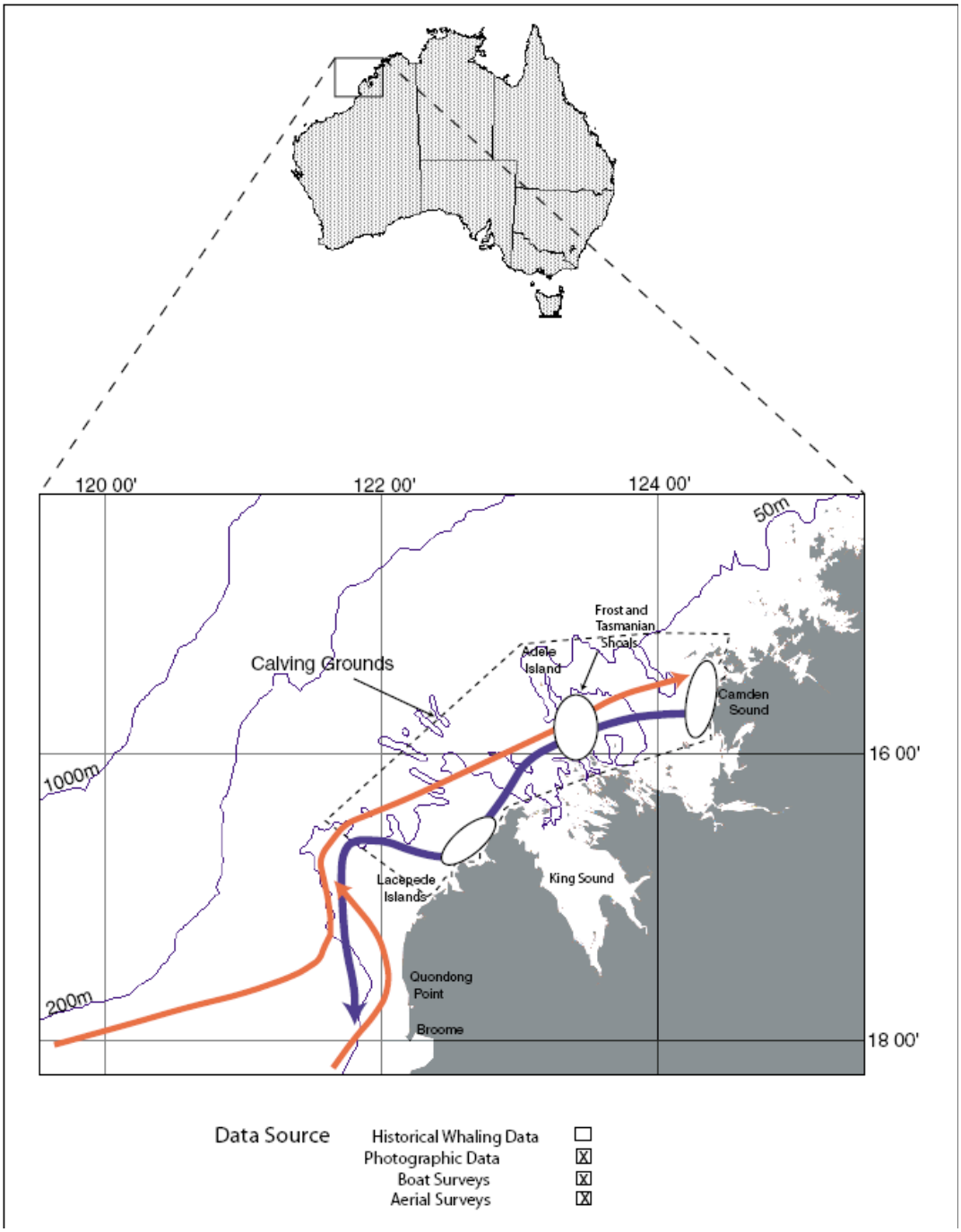
Source: DEWHA 2010.

4.7.1 Cetaceans

Cetaceans that occur in the North West Shelf and Oceanic Shoals bioregions include baleen whales, toothed whales and dolphins.

Humpback whales

Australia has two discrete populations of humpback whales—a west coast population ("Group IV") and an east coast population ("Group V"). Jenner, Jenner and McCabe (2001) report that Group IV humpback whales migrate annually from their Antarctic feeding grounds to their breeding and calving areas off the Kimberley coast, and are seasonally abundant in the Kimberley region between June and November. The northward migration of adult humpback whales generally occurs in waters shallower than the 200 m isobath, while the southward migration occurs in waters around the 20–30 m isobath as shown in Figure 4-1. The peak of the northbound migration occurs in mid to late July. The peak of the southern migration occurs in early September, with the bulk of the mother-and-calf pairs beginning their southern migration a few weeks behind the main migratory herd. The known calving area for Group IV humpback whales covers approximately 23 000 km^2 from the Lacepede Islands in the south to Adele Island in the north and to Camden Sound in the east.



Source: Jenner, Jenner and McCabe 2001.

Figure 4-1: Humpback whale migration in the Kimberley region showing relevant isobaths

The results of INPEX's humpback whale vessel studies (RPS 2007b) and acoustic logger surveys (McCauley 2009) indicate that humpback whales may be present in the Browse Basin until late September and early October, however by late October there is very low likelihood of humpback whales being present in the area near the Ichthys 3-D MSS. The majority of humpback whales will have also commenced migrating south, away from Camden Sound, by late October.

Based on this information, and including extensive research conducted by INPEX, it is not anticipated that humpback whales will be present in the Ichthys 3-D MSS area between late October and December.

However, as a precaution, acoustic propagation modelling was undertaken by SVT Engineering Consultants (SVT) to determine the noise levels reaching Camden Sound, the recognised humpback whale breeding area. The "worst-case" environmental parameters were entered into the model in order that it would predict the highest levels at the northern boundary of Camden Sound.

The model contour predictions for the seismic survey provided in Figure 4-2 show that the received levels drop to below 30 dB before reaching Camden Sound. It is therefore expected that noise from the Ichthys 3-D MSS will not be audible above background noise at Camden Sound.

This can be better understood by considering the transmission loss for depth versus range within the water column as shown in Figure 4-3. The figure shows the transmission loss of a 30-Hz signal as it travels from the survey area to Camden Sound. The white line in the plot shows the change in bathymetry with range. As can be seen, the bathymetry changes from deep water at the survey area to relatively shallow water at Camden Sound. The change in bathymetry occurs sharply at approximately 40 km from the survey area. As can be seen from the figure the signal weakens relatively quickly as it reaches this ridge (i.e. the presence of the underwater ridge results in high transmission loss of the low frequency signal). This means that very little of the seismic survey's acoustic energy is being transmitted into the shallower water.

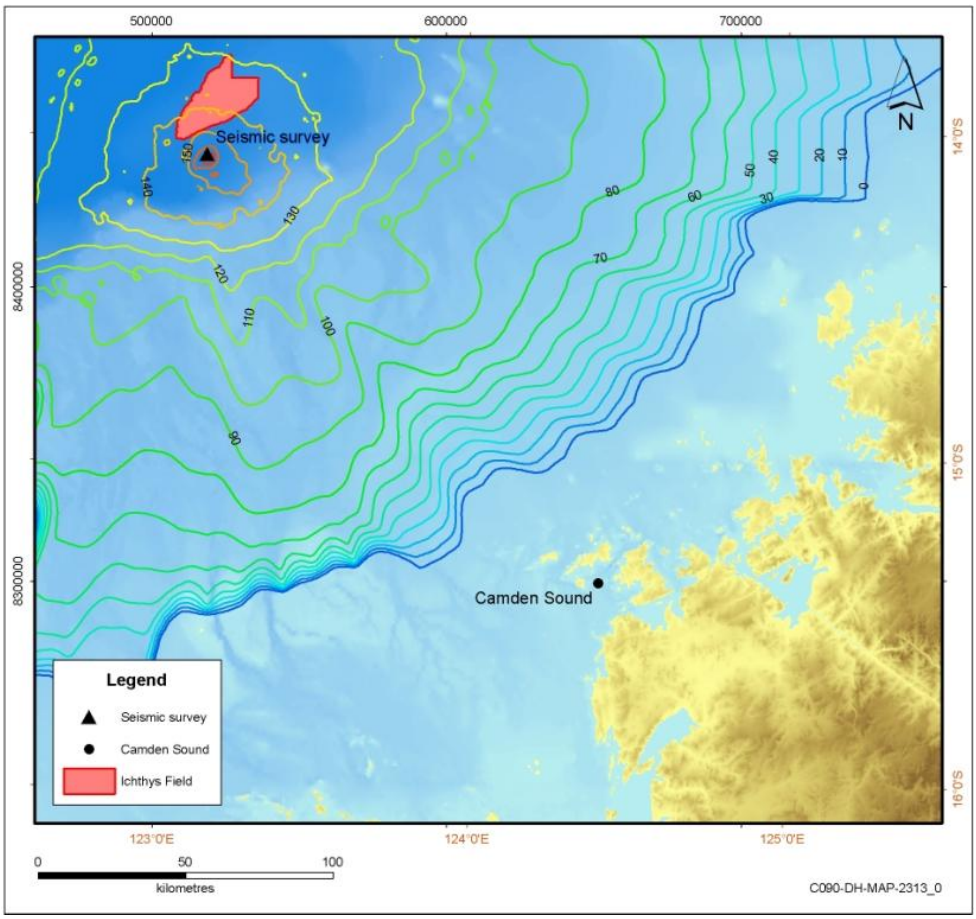


Figure 4-2: Sound propagation contour (SVT model)

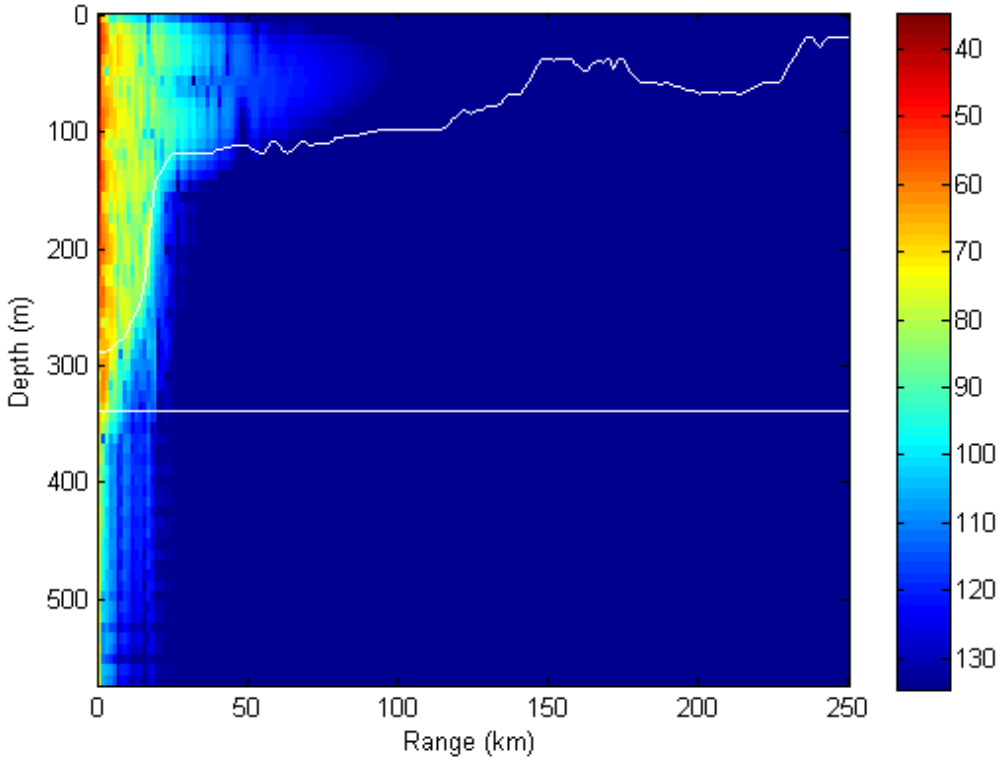


Figure 4-3: Transmission losses (SVT model)

Blue whales

The Commonwealth Government's blue, fin and sei whale recovery plan lists the Rottnest Trench as the only recognised blue whale feeding area on the Western Australian coastline (DEH 2005). No blue whales or pygmy blue whales were observed in vessel surveys of the proposed Ichthys 3-D MMS area by RPS (2007b) or by the Centre for Whale Research during 80 days of vessel surveys in the Browse Basin in 2008 (Jenner, Jenner & Pirzl 2009).

Over two years of underwater noise-logger surveys, only one single pod of a few pygmy blue whales was recorded within a 75-km radius of the proposed Ichthys 3-D MSS area; this occurred during October 2006. Based on this and other noise-logging studies in the north-west of Australia and vessel-based studies of the Browse Basin (Jenner, Jenner & Pirzl 2009), pymgy blue whales are believed to most commonly utilise an offshore migration path in water depths of around 500 m (McCauley 2009). These water depths occur around 90 km north-west of the proposed survey area.

Therefore, it is considered that the likelihood of encountering pygmy blue whales in the period October–December in the Ichthys Field is low.

Other large cetaceans

Other species of large cetaceans observed in the Browse Basin area during the 2006 and 2007 offshore surveys included the short-finned pilot whale, beaked whales (*Mesoplodon* spp.), false killer whale, melon-headed whale, minke whale and dwarf minke whale. Locations of cetacean sightings are displayed in Figure 4-4 and Figure 4-5.

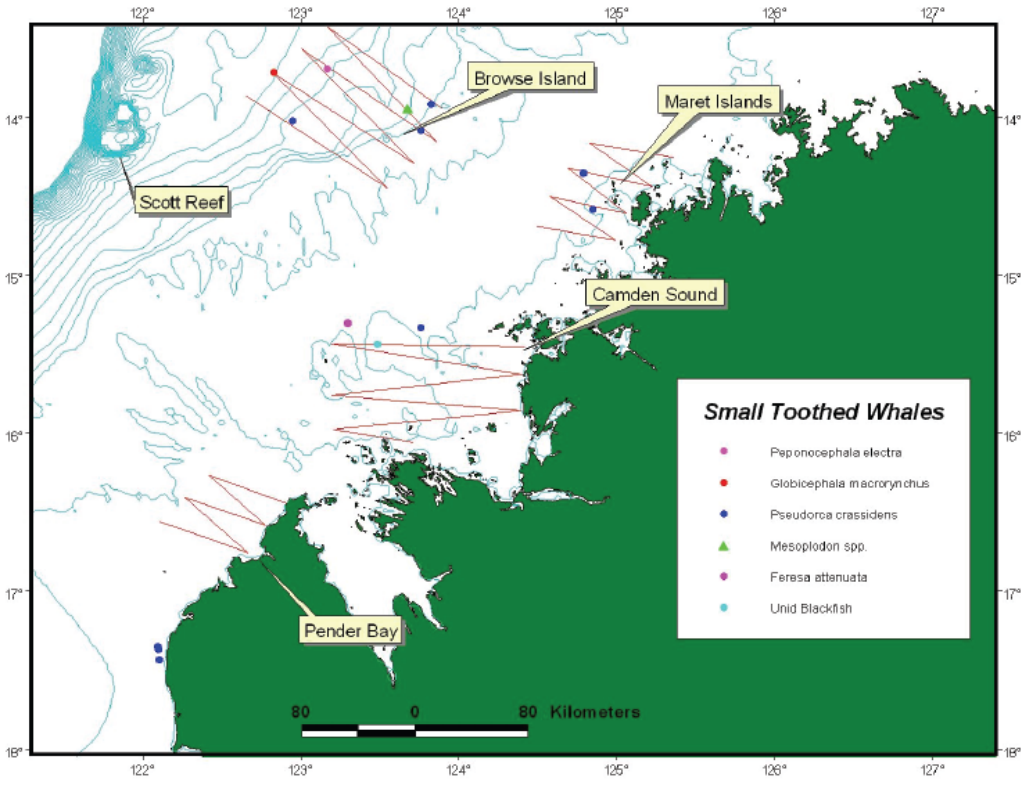


Figure 4-4: Distribution of small toothed whales during the 2006 and 2007 vessel surveys

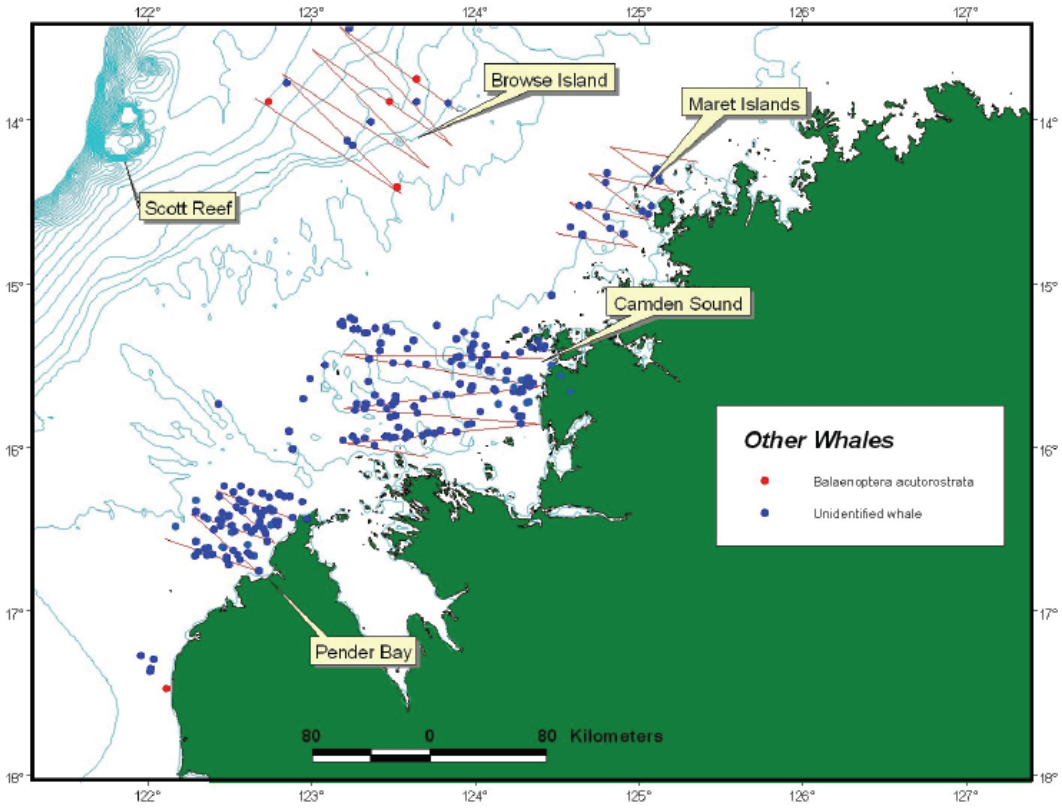


Figure 4-5: Distribution of minke and other unidentified whales during the 2006 and 2007 vessel surveys

Also, during the October 2008 vessel survey, Bryde's whales and several dolphin species were observed approximately 10 km to the south of the proposed survey area. However, large cetaceans were not observed in significant numbers in the vicinity of the Ichthys Field during the previous three 20-day survey trips in 2008.

These data suggest that other large cetaceans may sporadically be present in the vicinity of the Ichthys Field. However the area does not appear to support any significant migration, breeding or recognised foraging aggregations.

4.7.2 Marine reptiles

Five species of marine turtle are known to occur in the waters of northern Western Australia and the Northern Territory—the green turtle, flatback turtle, loggerhead turtle, leatherback turtle and the olive ridley turtle. Of these, the green, leatherback and flatback turtles could occur in the vicinity of the Ichthys Field.

The green turtle is the most common turtle species found in Western Australia and occurs as far south as Rottnest Island, through Shark Bay and the Houtman Abrolhos islands, coastal beaches in the Gascoyne and Pilbara, Barrow Island and some islands of the Montebello Islands and Dampier Archipelago. During a study of the Kimberley region by RPS (2008b), the beaches of the Lacepede Islands in the southern Kimberley region were found to support the highest level of turtle nesting activity (around 1000 beach emergences per night) in the region. Other studies have also identified the Lacepede Islands as one of the major green turtle rookeries in Western Australia, along with the Muiron Islands, Serrurier (Long) Island, the Montebello Islands, Barrow Island, the Dampier Archipelago and the sandy mainland beaches of the Ningaloo Marine Park. Green turtles also nest on Browse Island.

Flatback turtles migrate for long distances along the northern Western Australian coastline from rookeries in the Pilbara region into the Kimberley region and as far as the Northern Territory. They generally forage in turbid, shallow inshore waters in depths of 5–20 m. This species was not recorded in surveys of Browse Island or the Ichthys Field (RPS 2008b).

4.7.3 Fishes

Four seahorse species (family Syngnathidae) that are protected by the EPBC Act could potentially occur in the offshore development area (see Appendix C); however the distribution ranges of these are not well known. The flat-face seahorse has only been recorded previously in Shark Bay and Broome, and the presence of the hedgehog seahorse in Australian waters has not been confirmed (Seahorse Australia 2008). The spotted seahorse inhabits sheltered bays and estuaries from Onslow in Western Australia's Pilbara region, northwards across the Indo-Pacific region (Allen & Swainston 1988). The spiny seahorse is widespread from Japan to Indonesia but has not yet been formally recorded in Australia (Seahorse Australia 2008).

None of these seahorse species were recorded in surveys of an intertidal pool at Browse Island (RPS 2008b) and they are not expected to exist in the Ichthys Field because of the deep water and lack of suitable habitat.

4.7.4 Seabirds

Seabirds observed in the offshore area around the Ichthys Field and Browse Island included frigatebirds, boobies, terns, noddies, tropicbirds, petrels, shearwaters and gulls, with the brown booby the most common species recorded. Of the species observed, a number are migratory species listed under the EPBC Act, including the streaked shearwater, brown booby, masked booby, lesser frigatebird, Wilson's storm-petrel, bridled tern, lesser crested tern and little tern. These migratory species can be expected to pass through the offshore development area in low densities.

5 ENVIRONMENTAL RISKS, POTENTIAL IMPACTS AND MANAGEMENT

The key potential environmental impacts associated with the proposed Ichthys 3-D MSS are as follows:

- the introduction of exotic species into Australian waters resulting in threats to native species, ecosystems and commercial fisheries
- disturbance caused to marine life though noise and light emissions impacting on populations of cetaceans, reptiles and seabirds
- ecological harm from a reduction in water and sediment quality caused by inappropriate disposal of wastes
- ecological harm from a reduction in water and sediment quality caused by fuel and/or chemical discharges or spills.
- socio-economic impacts through disruption to other vessel activities including commercial shipping and fishing and recreational vessel activities.

A summary of the environmental management approach is provided in Table 5-1.

Table 5-1: Risk assessment and mitigation measures

Activities	Environmental aspect	Potential impacts	Mitigation measures
Mobilisation	Quarantine—ballast water	Potential environmental, and economic impacts from the introduction of exotic species	• Adhere to the Australian Ballast Water Management Requirements through implementation of each ship's ballast water management plan. • Adhere to AQIS management requirements. • Perform vessel risk assessment before the vessel is mobilised from Singapore for the project. Adhere to national guidelines and apply vessel risk assessment for further assurance. Based on the outcomes of the risk assessment, implement the appropriate control measures.
	Quarantine—biofouling	Potential environmental, and economic impacts from the introduction of exotic species	• Manage biofouling risk in accordance with the guidelines described in the National Biofouling Management Guidance for the Petroleum Production and Exploration Industry (Commonwealth Government 2009). • Prior to mobilisation, conduct the following: – vessel dry-dock, hull clean-up and inspection in Singapore – internal seawater system chemical treatment in Singapore – application of new antifoulant coating in Singapore – biofouling diver inspection of hull in Kupang.
Operations—seismic data acquisition	Noise emissions	Disturbance to cetaceans	• Survey timed to minimise the potential of humpback whale presence in the Ichthys Field area and Camden Sound. • Implement the Standard Management Procedures of the EPBC Act Policy Statement 2.1 (DEWHA 2008) as follows: – put in place 3-km precaution zones, 2-km low-power zone and 500-m shutdown zone – place trained staff on board the seismic vessels in accordance with the Standard Management Procedures – provide a pre-survey induction on Policy Statement 2.1 to all survey personnel – implement "soft-start" procedures (ramp up over 30 minutes) – institute night-time and low-visibility procedures – fulfil two-month post-survey reporting requirements to the DEWHA – employ dedicated marine mammal observer (MMO) on board the seismic survey vessel • Record detailed reports of all cetacean sightings using the "Cetacean Sightings Application" software developed by the DEWHA, and forward the data to the DEWHA on the completion of the program.
Transit and operations	Vessel and cetacean interactions	Vessel collision with cetacean	• Implement INPEX's Cetacean Interaction and Observation Procedure, specifically: – aiming to maintain a distance of 100 m from a large cetacean or 50 m from a dolphin – operating at a no-wash speed when within 100–300 m of a large cetacean or within 50–150 m of a dolphin

Activities	Environmental aspect	Potential impacts	Mitigation measures
			– not actively encouraging bow-riding by cetaceans by driving towards pods of animals and if any cetaceans should commence bow-riding with a vessel, the vessel master will not change course or speed suddenly.
Transit and operations	Light emissions impacting on seabirds and turtles	Behavioural disturbance to seabirds and turtles	• Ensure lighting is the minimum required to meet safety and international navigation requirements. • Survey area is >20 km from Browse Island.
Transit and operations	Waste management	Impact on water and sediment quality and associated biological communities from discharge of sewage and food scraps and other wastes	• Food scraps and sewage macerated to <25 mm and disposed of overboard only when more than 12 nautical miles from nearest land.
Transit and operations	Waste management	Impact on water and sediment quality and associated biological communities from unplanned discharge of other vessel wastes	• All other hazardous and non-hazardous wastes will be stored on board and disposed of onshore through approved waste removal contractors or incinerated onboard the vessel. • MSDS sheets maintained and management requirement implemented as appropriate for all hazardous substances. • Records of all waste disposal operations will be maintained in accordance with the requirements of MARPOL 73/78 (IMO 1978). • Waste records will be reported to INPEX.
Transit and operations	Oil and chemical discharge	Impact on water and sediment quality from bilge discharges	• All bilge discharges will be required to meet the requirements of Annex 1 of MARPOL 73/78, with no discharge to exceed 15 mg/L oil-in-water content (through the use of an onboard oily-water separator).
Transit and operations	Oil and chemical and spills	Impact on water and sediment quality from refuelling spill or other minor oil or chemical spill	• “At sea” refuelling will be undertaken in accordance with PGS’s standard operating procedures, and in calm sea conditions and daylight hours only. • GeoStreamers, filled with a buoyant gel rather than kerosene, will remove the risk of streamer buoyancy fluid (kerosene) leaks to the environment. • Each hazardous substance on board the survey vessels will have its own MSDS. These substances will be segregated and handled according to their MSDSs as part of the vessels’ normal operating procedures.

Activities	Environmental aspect	Potential impacts	Mitigation measures
			• All storage facilities will be maintained in good working order to prevent or contain any spillage as far as is practicable. • Hydrocarbons and liquid chemicals will be stored with appropriate forms of secondary containment to contain leaks or spills, e.g. by means of bunds, containment pallets, and transport packs. • All hoses carrying hydraulic fluids were checked and where necessary replaced during vessel maintenance activities in Singapore in July and August 2010. • Spill response kits will be maintained in close proximity to hydrocarbon storage areas and replenished as required. • Identified personnel will be trained in the use of spill response equipment. • Once the vessels return to port, waste will be removed and disposed of onshore using the services of a waste removal contractor. • Records of all waste disposal operations will be maintained in accordance with the requirements of MARPOL 73/78. Waste records will also be reported to INPEX.
Transit and operations	Oil and chemical spill	Impact on water quality and associated biological communities from spill from vessel collision or grounding	• All fuel will be stored in double-skin containment in the hull of the vessel. • Vessel navigation equipment, communication equipment and lighting will minimise the risk of a vessel collision or grounding. • INPEX maintains a detailed oil spill contingency plan (OSCP) which can be activated in the event of a significant oil spill. The survey vessels also maintain their own shipboard oil pollution emergency plans (SOPEPs).
Transit to field Operations	Socio-economic impact	Potential disruption to commercial shipping, fishing and recreational vessels.	• A “Notice to Mariners” will be issued from AMSA to notify vessel traffic of seismic survey operations. • Consultation with the Western Australian Fishing Industry Council (WAFIC) will minimise interaction with local fisheries. • Standard navigation lighting is being used on the survey vessels. • The support vessel will be used to warn commercial and recreational vessels of survey activities as appropriate. • Efforts will be made to retrieve any lost equipment (e.g. streamers).

6 CONSULTATION

INPEX has informed the Western Australian Fishing Industry Council of the proposed Ichthys 3-D MSS and the details of the survey have been passed on to the appropriate stakeholders through the Council prior to the start of the survey.

INPEX has also had significant discussion and information exchange with the DEWHA regarding the referral for the project which was submitted to the DEWHA in June 2010 (INPEX 2010a).

Other than this, no project-specific consultation has been undertaken for the production of this environment plan. However, INPEX has completed detailed and extensive consultation as part of the environmental impact assessment process for the Ichthys Gas Field Development Project (INPEX 2010b). All relevant aspects of this large-scale impact assessment have been considered and incorporated within this plan.

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