

INPEX BROWSE LIMITED
ICHTHYS GAS FIELD DEVELOPMENT

ENVIRONMENT PLAN SUMMARY
FOR PROPOSED EXPLORATION
DRILLING PROGRAM, PERMIT AREA
WA-285-P

Document No.
DEV-EXT-RP-0015-SUMMARY

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FOR PROPOSED EXPLORATION DRILLING
PROGRAM, PERMIT AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-SUMMARY
Revision: 0
Date: 18 Jan 2007
Page No: 2 of 16

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ICHTHYS GAS FIELD DEVELOPMENT
ENVIRONMENT PLAN SUMMARY
FOR PROPOSED EXPLORATION DRILLING
PROGRAM, PERMIT AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-SUMMARY
Revision: 0
Date: 18 Jan 2007
Page No: 3 of 16

TABLE OF CONTENTS

1. INTRODUCTION	5
1.1 Location and Background Information.....	5
1.2 Project Description	5
2. DESCRIPTION OF THE RECEIVING ENVIRONMENT.....	7
2.1 Climate and Oceanography.....	7
2.2 Marine Ecology.....	7
2.3 Socio-Economic Environment	9
3. IDENTIFICATION OF MAJOR ENVIRONMENTAL HAZARDS AND MANAGEMENT ACTIONS.....	10
4. CONSULTATION	15
5. CONTACT DETAILS.....	16



**INPEX BROWSE LTD
ICHTHYS GAS FIELD DEVELOPMENT
ENVIRONMENT PLAN SUMMARY
FOR PROPOSED EXPLORATION DRILLING
PROGRAM, PERMIT AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-SUMMARY
Revision: 0
Date: 18 Jan 2007
Page No: 4 of 16

LIST OF FIGURES

Figure 1.2-1: Location of Permit Area WA-285-P 6

LIST OF TABLES

Table 3-1: Summary of major environmental hazards and management actions..... 10



**INPEX BROWSE LTD
ICHTHYS GAS FIELD DEVELOPMENT
ENVIRONMENT PLAN SUMMARY
FOR PROPOSED EXPLORATION DRILLING
PROGRAM, PERMIT AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-SUMMARY
Revision: 0
Date: 18 Jan 2007
Page No: 5 of 16

1. INTRODUCTION

1.1 Location and Background Information

Inpex Browse, Ltd (Inpex) plans to drill exploration wells in the WA-285-P Permit Area in 2007. Permit Area WA-285-P is situated between 150 km and 250 km offshore from the mainland of Western Australia and is 440km to the north of Broome and 800 km south-west of Darwin as shown in Figure 1.2-1.

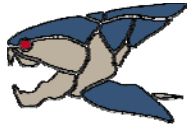
1.2 Project Description

The proposed works involve the drilling of two wells adjacent to a known gas and condensate field in Permit Area WA-285-P. The first well is located approximately 50 kilometres north-west of Browse Island. The location of the second well is not known at this stage and will be determined closer to the time of drilling.

The wells will be drilled using an Australian based Mobile Offshore Drilling Unit (MODU) rig. Water based and synthetic based drilling muds will be used to drill the wells.

If hydrocarbons are intersected the well may be tested to determine pressures and flow rates. The well will be profiled using vertical seismic profiling.

Subsequent to completion of drilling and testing (if required), the Proponent will abandon the wells in accordance with the requirements of the Petroleum (Submerged Lands) Acts, Schedule: Specific Requirements as to Offshore Petroleum Exploration and Production - 2005.



**INPEX BROWSE LTD
 ICHTHYS GAS FIELD DEVELOPMENT
 ENVIRONMENT PLAN SUMMARY
 FOR PROPOSED EXPLORATION DRILLING PROGRAM, PERMIT
 AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-SUMMARY
 0
 Revision: 18 Jan 2007
 Date: 6 of 16
 Page No:

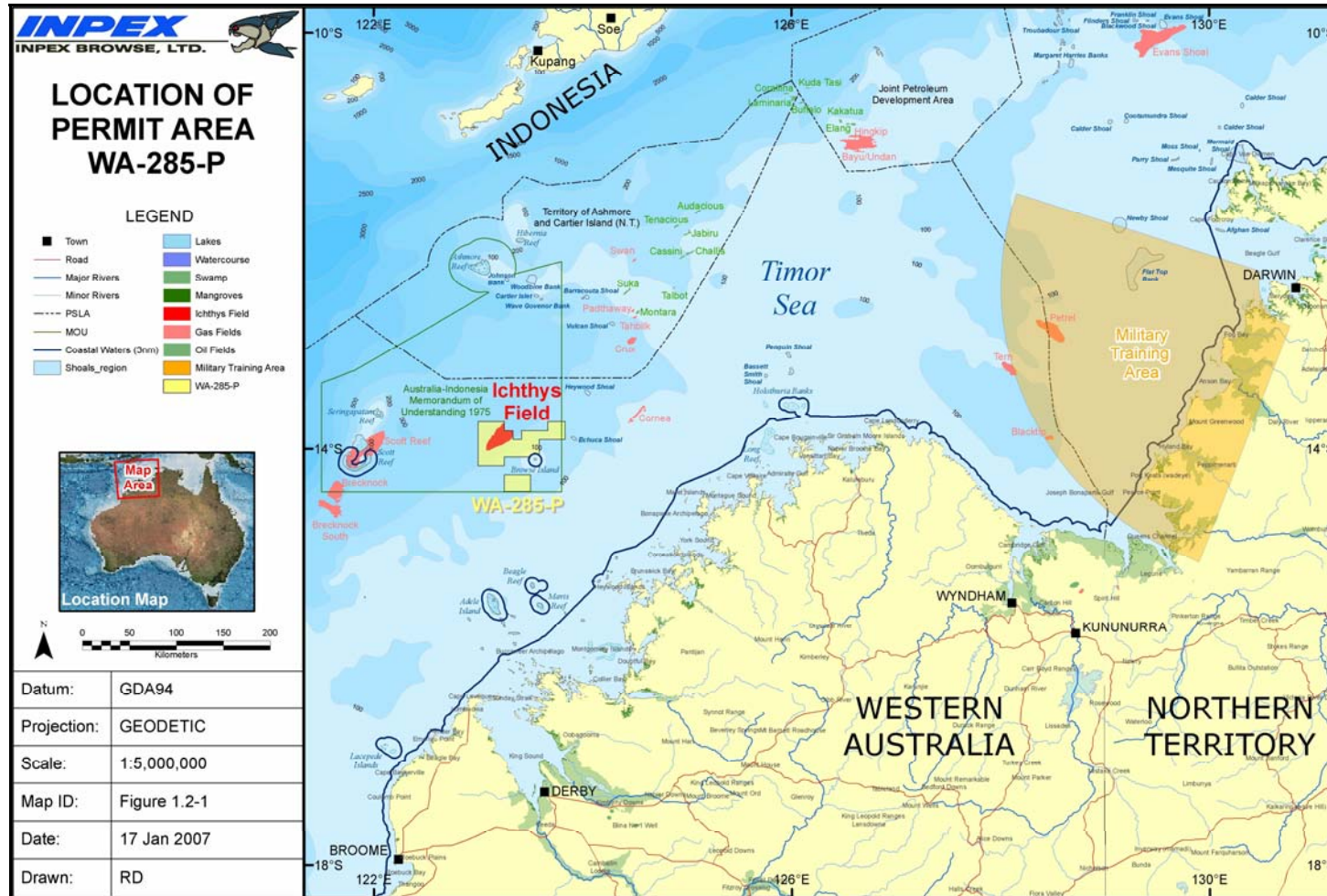


Figure 1.2-1: Location of Permit Area WA-285-P



**INPEX BROWSE LTD
ICHTHYS GAS FIELD DEVELOPMENT
ENVIRONMENT PLAN SUMMARY
FOR PROPOSED EXPLORATION DRILLING
PROGRAM, PERMIT AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-SUMMARY
Revision: 0
Date: 18 Jan 2007
Page No: 7 of 16

2. DESCRIPTION OF THE RECEIVING ENVIRONMENT

2.1 Climate and Oceanography

The study area is situated in the tropics and experiences a monsoonal climate with two predominant seasons: a summer wet season (October - April) and a winter dry season (May - September). During the wet season, prevailing winds are typically from the west and south-west, and during the dry season, winds are from the north-east, though east and south-east.

The wave climate reflects the seasonal wind regime, with waves predominantly from the west in summer and from the east in winter.

Seawater temperature in the region ranges from 25°C to 31°C at the surface and 22°C to 25°C at the seafloor. The maximum tidal range is 5.7 m.

2.2 Marine Ecology

The marine fauna of northern Australia is part of the vast Indo-West Pacific biogeographical province. Diversity in most components of the coastal northern Australia biota is relatively impoverished compared with assemblages found along the coastlines of Timor and neighbouring Nusa Tenggara islands.

Continental Shelf – Open waters

The Timor Sea supports a variety of shark and pelagic finfish species of commercial and recreational game-fishing importance (e.g. tunas, mackerels and swordfishes). The Timor Sea also supports five species of turtles and a variety of cetaceans.

Epibenthic flora and fauna

Epibenthic fauna are abundant and diverse in shallower coastal waters of the continental shelf. However, sea floor communities in deeper waters are generally depauperate. Species found in these areas include sponges, gorgonians (sea whips and sea fans), ascidians (sea squirts), echinoderms, crustaceans, bryozoans (lace corals), and soft corals.

Benthic Infauna

Across the northern continental shelf, the predominant animals living within sea floor sediments are polychaetes (burrowing worms) and crustaceans (prawns, shrimp, crabs, etc.). Other species include echinoderms (sea stars, sea urchins, feather stars, etc.), molluscs (both gastropods and bivalves), nemertean (ribbon worms), sponges and fish.

Shoals

Two small sub-tidal shoals or pinnacles occur near to or within the permit area. These are the Heywood and Echuca Shoals. The flora and fauna of the shoals



**INPEX BROWSE LTD
ICHTHYS GAS FIELD DEVELOPMENT
ENVIRONMENT PLAN SUMMARY
FOR PROPOSED EXPLORATION DRILLING
PROGRAM, PERMIT AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-SUMMARY
Revision: 0
Date: 18 Jan 2007
Page No: 8 of 16

located within Permit Area WA-285-P is not known. However, work on other shoals in the region shows that subsea mounts and shoals can be quite productive areas supporting corals, *Halimeda* (calcareous algae), sponges and a variety of associated reef type fishes.

Reefs and islands

There are over 2,000 islands of all sizes and shapes along the Kimberley coast. The closest of these is Browse Island, which is within close proximity to the permit area. The proposed well locations are approximately 50 kilometres away from Browse Island. Browse Island is believed to be an important turtle and bird nesting site, and is surrounded by extensive coral reefs.

Shallow sub-tidal and intertidal habitats also occur in the region. However, these reefs and islands are not located in close proximity to the permit area (129 km to 200 km away). This includes Ashmore Reef, Hibernia Reef, Cartier Reef, Seringapatam Reef and Scott Reef. Important assemblages and species with high conservation and protection significance are found in all of these areas as summarised below.

Seagrass and macroalgae

Macro-algae form the basis of many food webs in the marine environment and also contribute to reef structure and to sediment formation. Algal meadows grow on shallow limestone pavement while seagrass beds are generally located on sandy patches in the lagoons.

Corals

The offshore atolls have major assemblages of reef building corals. Coral reefs are ecologically important due to their high biological productivity and the high diversity and abundance of marine organisms that they support.

Dugongs and turtles

The offshore reefs are feeding grounds for dugong (*Dugong dugong*) and feeding grounds and/or beach nesting sites for green turtles (*Chelonia mydas*), loggerhead turtles (*Caretta caretta*) and hawksbill turtles (*Eretmochelys imbricata*). Turtles use seagrass and algal meadows as feeding areas and nest above the high water mark on sandy beaches.

Seabirds

Seabird feeding grounds, roosting and nesting areas are found on the offshore atolls. Migratory seabirds, a number of which are protected by international agreements (Bonn Convention, JAMBA and CAMBA) including a number of Albatross species, may pass through the study area.



**INPEX BROWSE LTD
ICHTHYS GAS FIELD DEVELOPMENT
ENVIRONMENT PLAN SUMMARY
FOR PROPOSED EXPLORATION DRILLING
PROGRAM, PERMIT AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-SUMMARY
Revision: 0
Date: 18 Jan 2007
Page No: 9 of 16

2.3 Socio-Economic Environment

The Timor Sea is the focus for a number of activities including commercial and traditional fisheries and oil exploration and production. In addition, a number of major shipping routes pass through the area.



**INPEX BROWSE LTD
 ICHTHYS GAS FIELD DEVELOPMENT
 ENVIRONMENT PLAN SUMMARY
 FOR PROPOSED EXPLORATION DRILLING PROGRAM, PERMIT
 AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-SUMMARY
 Revision: 0
 Date: 18 Jan 2007
 Page No: 10 of 16

3. IDENTIFICATION OF MAJOR ENVIRONMENTAL HAZARDS AND MANAGEMENT ACTIONS

Table 3-1: Summary of major environmental hazards and management actions

Activity	Likelihood	Consequence	Measure of Consequence	Environmental Risk	Management action
Routine					
Seabed disturbance from anchors and moorings	Will occur	Very small area of soft sediment benthos disturbed temporarily	Insignificant	Moderate	Limit anchor chain movement on the seafloor to minimise the amount of seabed disturbance. Manage Anchor Chain tension.
Drill cuttings disposal	Will occur	Low volume of cuttings will settle on seabed but not modify benthos	Insignificant	Moderate	Disposed to sea in accordance with normal operating procedures.
Drilling fluid disposal	Will occur	Synthetic-based fluids will cause temporary turbidity plume	Insignificant	Moderate	SBM will be used to drill wells. Minimise volume disposed by: optimisation of the solids control equipment; application of sound drilling fluid engineering practices; and good supervision and communication MODU shale shaker to be tested and operational to design specifications during drilling programme. Performance of shale shaker to be monitored by Inpex Drilling Supervisor. Warning Alarms for Shale Shaker shutdown. An auditable record of volume of drilling fluids discharged overboard will be maintained.



**INPEX BROWSE LTD
 ICHTHYS GAS FIELD DEVELOPMENT
 ENVIRONMENT PLAN SUMMARY
 FOR PROPOSED EXPLORATION DRILLING PROGRAM, PERMIT
 AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-SUMMARY
 Revision: 0
 Date: 18 Jan 2007
 Page No: 11 of 16

Activity	Likelihood	Consequence	Measure of Consequence	Environmental Risk	Management action
Deck washdown wastes	Will occur	Localised oil contamination of water around MODU	Insignificant	Moderate	Spill Kits are to be distributed on the platform at no less than one at each of the following areas: Engine Room, Shakers, Port and Starboard Main Deck, and Pipe Deck Significant Accumulations of oil, grease and other contaminants will be collected and removed from the decks prior to any washdown.
Sewage and grey water	Will occur	Localised contamination of water around MODU by sewage/greywater	Insignificant	Moderate	Sewage and food scraps will be discharge via direct overboard drain after being macerated and pulverised in accordance with P(SL)A regulations and MARPOL regulations Domestic wastewater treatment apparatus to be tested and checked to be operation according to design specifications during drilling programme.
Solid wastes/ Hazardous wastes (Excluding drill cuttings and mud)	Unlikely	Contamination of ocean around MODU with hazardous substance. Possible localised impacts on marine life.	Minor	Low	All solid wastes will be stored on board the rig, in appropriate containers, for transport ashore where they will be disposed of in full accordance with local and State regulations. All solid and hazardous waste materials transported to shore will be recorded (type and amount) in auditable waste register. Drill string cleaning and doping will be carried out on shore to ensure that no pipe dope is discharged to the water. Waste Oil to be collected and transported to shore for appropriate disposal.



**INPEX BROWSE LTD
 ICHTHYS GAS FIELD DEVELOPMENT
 ENVIRONMENT PLAN SUMMARY
 FOR PROPOSED EXPLORATION DRILLING PROGRAM, PERMIT
 AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-SUMMARY
 Revision: 0
 Date: 18 Jan 2007
 Page No: 12 of 16

Activity	Likelihood	Consequence	Measure of Consequence	Environmental Risk	Management action
Natural gas combustion (Flaring)	Likely	Small output of greenhouse gases	Insignificant	Low	Ensure all release of recovered gas is via flare combustion No release if flame out condition exists
Operation of air guns for Vertical Seismic Profiling	Will occur	Potential disturbance to marine fauna.	Insignificant	Moderate	Adhere to the DEH Guidelines on the application of the EPBC Act to interactions between seismic operations and larger cetaceans
Accidental					
Gas and Condensate Blow Out – large loss of gas into the water column	Rare	Widespread short term impact on pelagic productivity, potential for localise impacts on fish.	Moderate	Low	Testing of the blow out preventers (BOP's) prior to commencement of operations and regularly during operations. Pressing testing of casing strings. Continuous monitoring for abnormal pressure parameters during drilling. Ensuring the drill crew is fully trained in emergency well control and Oil Spill Contingency Plan procedures. Well design is based on experience drilling in the area.
Vessel collision and large fuel spill (500T)	Unlikely	Contaminating local waters and posing a threat to marine life	Moderate	Moderate	Establish a 500 m exclusion zone around MODU. Inform AMSA of MODU and supply vessel position. Ensure lighting of MODU and supply vessels to be "fit for purpose". Use radar and radar reflectors, in addition to implementation of a 24 hour radio watch.



**INPEX BROWSE LTD
 ICHTHYS GAS FIELD DEVELOPMENT
 ENVIRONMENT PLAN SUMMARY
 FOR PROPOSED EXPLORATION DRILLING PROGRAM, PERMIT
 AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-SUMMARY
 Revision: 0
 Date: 18 Jan 2007
 Page No: 13 of 16

Activity	Likelihood	Consequence	Measure of Consequence	Environmental Risk	Management action
Accidental Spill of Synthetic Based Mud (SBM)	Possible	Localised contamination of water and seabed around MODU	Minor	Low	Shaker Alarms to warn of shale shaker shut down. Shale Shaker run lights at the drilling controls to ensure that Shakers are running before circulation commences SBM transfer procedures to be developed and implemented by Songa (contractor). Mud recovery pumps at strategic locations.
Diesel spill during refuelling (small)	Possible	Contaminating local waters and posing a threat to marine life within about 2 km of the MODU	Minor	Low	Refuelling to be undertaken during daylight Hours Refuelling operations being continuously overseen by the vessel's Master or First Officer. An observer will monitor the refuelling operations from the MODU and will remain in radio contact with the supply vessel. Ensuring that all refuelling activities are undertaken in accordance with Songa procedures. Weak Link coupling for fuel lines in case of breakage.



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 ENVIRONMENT PLAN SUMMARY
 FOR PROPOSED EXPLORATION DRILLING PROGRAM, PERMIT
 AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-SUMMARY
 Revision: 0
 Date: 18 Jan 2007
 Page No: 14 of 16

Activity	Likelihood	Consequence	Measure of Consequence	Environmental Risk	Management action
Condensate Loss during well testing	Possible	Localised oil contamination of water around MODU. Possible localised impact on marine life.	Minor	Low	<p>Confirm that approval to conduct production test has been received from DOIR prior to test proceeding.</p> <p>The efficient operation of the test equipment to be monitored by the Inpex Drilling Supervisor during the test.</p> <p>Any spillages to be recorded on a Notice of Incident Report. Spills >80 litres to be reported to DOIR.</p> <p>Auditable record of quantities of gas and condensate flared during well testing to be maintained.</p>
Mud Loss due to Slip Joint Failure	Possible	Localised contamination of water around MODU	Minor	Low	Back up system for energising the Slip Joint.



**INPEX BROWSE LTD
ICHTHYS GAS FIELD DEVELOPMENT
ENVIRONMENT PLAN SUMMARY
FOR PROPOSED EXPLORATION DRILLING
PROGRAM, PERMIT AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-SUMMARY
Revision: 0
Date: 18 Jan 2007
Page No: 15 of 16

4. CONSULTATION

The following organisations were consulted during the preparation of this Environment Plan or its predecessor upon which this has been based:

- Department of Industry and Resources;
- Western Australian Museum;
- Australian Maritime Safety Authority;
- Department of Conservation and Land Management (Now DEC); and
- Department of Fisheries.



**INPEX BROWSE LTD
ICHTHYS GAS FIELD DEVELOPMENT
ENVIRONMENT PLAN SUMMARY
FOR PROPOSED EXPLORATION DRILLING
PROGRAM, PERMIT AREA WA-285-P**

Doc No: DEV-EXT-RP-0015-
SUMMARY
Revision: 0
Date: 18 Jan 2007
Page No: 16 of 16

5. CONTACT DETAILS

For further information about the exploration drilling program in Permit Area WA-285-P, please contact:

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