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T/18P

**BASS BASIN,  
TASMANIA  
DRILLING PROGRAM  
WHITE IBIS-1**

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**APRIL 1998  
REV 0**

OR-0437B

**PREMIER OIL AUSTRALASIA  
DRILLING PROGRAM  
EXPLORATION WELL WHITE IBIS-1**

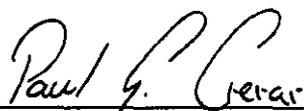
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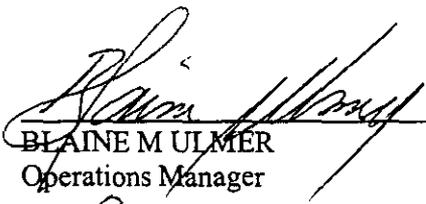
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<b>Rig Toolpusher</b>	<b>Northern Explorer III</b>
<b>Spare copies at rig x 2</b>	<b>Northern Explorer III</b>
<b>IS Coordinator</b>	<b>Schlumberger</b>

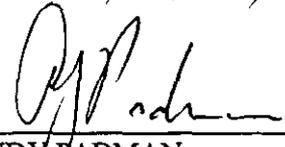
WHITE IBIS-1  
DRY-HOLE DRILLING PROGRAM

REVISION ISSUE : 0

DATE ISSUED : APRIL 1998

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**C O N T E N T S**

<b>1. OPERATIONS ORGANOGRAM</b>	<b>1</b>
<b>2. SECURITY OF INFORMATION POLICY</b>	<b>2</b>
<b>3. WELL SUMMARY</b>	<b>3</b>
<b>4. LOCATION MAPS</b>	<b>4</b>
<b>5. WELL OBJECTIVES</b>	<b>6</b>
5.1 Safety and Environmental	6
5.2 Geological & Reservoir Objectives	6
5.3 Drilling Engineering Objectives	6
<b>6. GEOLOGICAL INFORMATION</b>	<b>7</b>
6.1 Predicted Section	7
6.2 Formation Description	8
6.3 Shallow Gas	9
6.4 Pore Pressure Gradients	9
6.5 Fracture Gradients	9
6.6 Temperature Gradients	9
6.7 Anticipated Hydrocarbons / CO <sub>2</sub> / H <sub>2</sub> S	10
<b>7. DRILLING TIME DEPTH CURVE</b>	<b>11</b>
<b>8. WELL PLAN OUTLINE</b>	<b>12</b>
<b>9. RIG MOVE &amp; ANCHOR PLAN</b>	<b>13</b>
9.1 Environmental Conditions in the Bass Straits	13
9.2 Anchor Location	13
9.3 Anchor Plan	13
9.4 Rig Positioning	14
<b>10. DRILL 914MM (36") HOLE - RUN 762MM (30") CASING</b>	<b>16</b>
<b>11. DRILL 444MM (17½") HOLE - RUN 340MM (13<sup>3</sup>/<sub>8</sub>") CASING</b>	<b>22</b>
<b>12. DRILL 311MM (12¼") HOLE - RUN 244MM (9<sup>5</sup>/<sub>8</sub>") CASING</b>	<b>27</b>

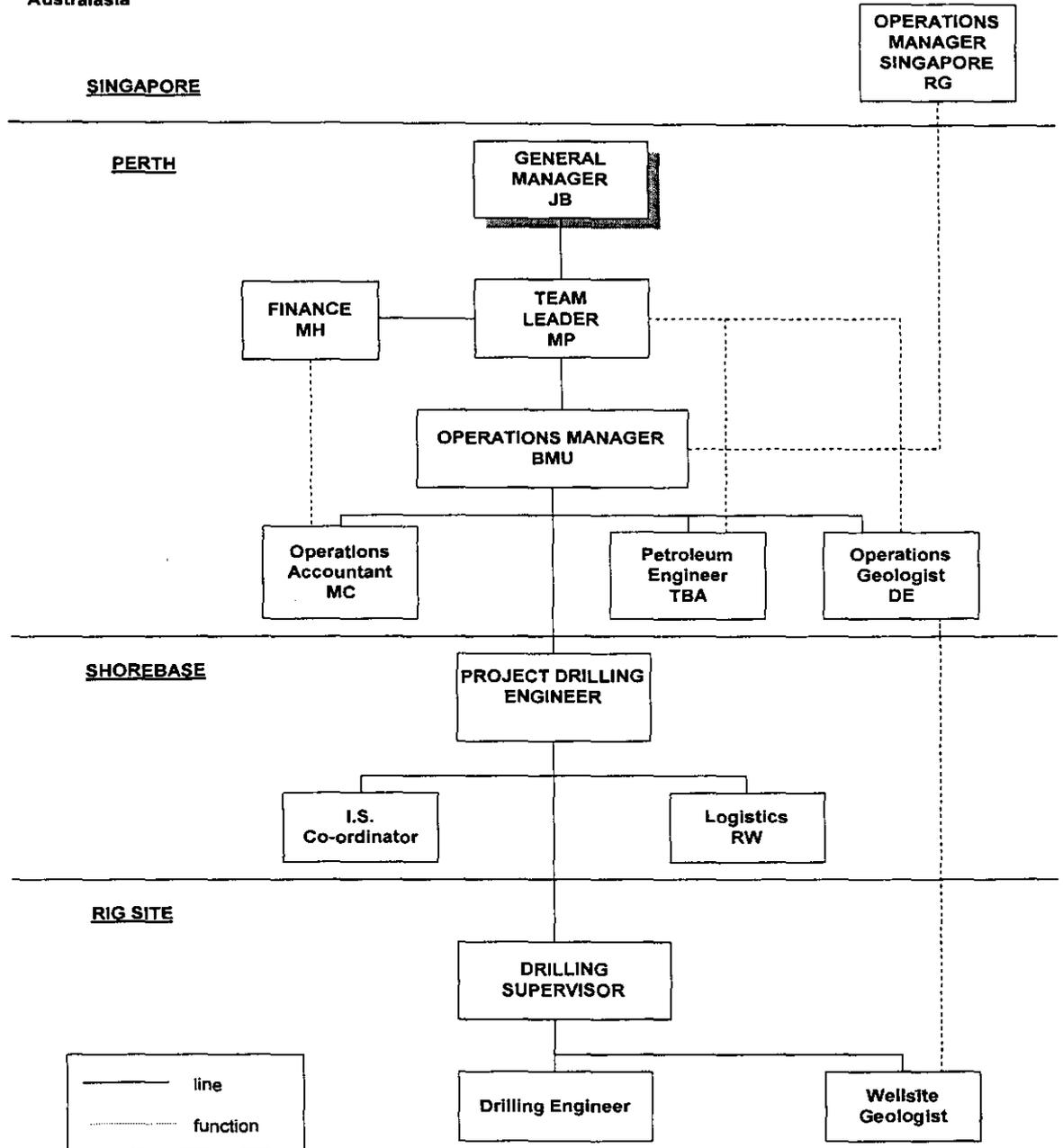
**APPENDICES**

- Appendix A Geology Summary & Formation Evaluation
- Appendix B Drilling Fluid Program
- Appendix C Cementing Program
- Appendix D Casing Design Parameters
- Appendix E Blowout Preventer Pressure Testing
- Appendix F Wellhead Stack-Up Diagram
- Appendix G Reference Documents
- Appendix H Support Services
- Appendix J Contact Listing

1. OPERATIONS ORGANOGRAM

**PremierOil**  
Australasia

**BASS BASIN ORGANOGRAM**



Operations Manager:	Blaine Ulmer (BMU)	
Project Drilling Engineer:	(Bass Basin)	Gordon Hunter
Team Leader:	(Bass Basin)	Mark Akers (MA)/ Mark Pogson (MP)
RG -	Richard Gray	RW - Rick White
MH -	Mark Hancock	DE - Dave Evans
JB -	John Begg	
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SH -	Stuart Harrison	

## 2. SECURITY OF INFORMATION POLICY

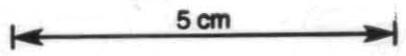
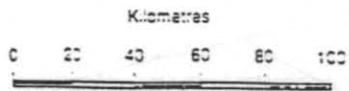
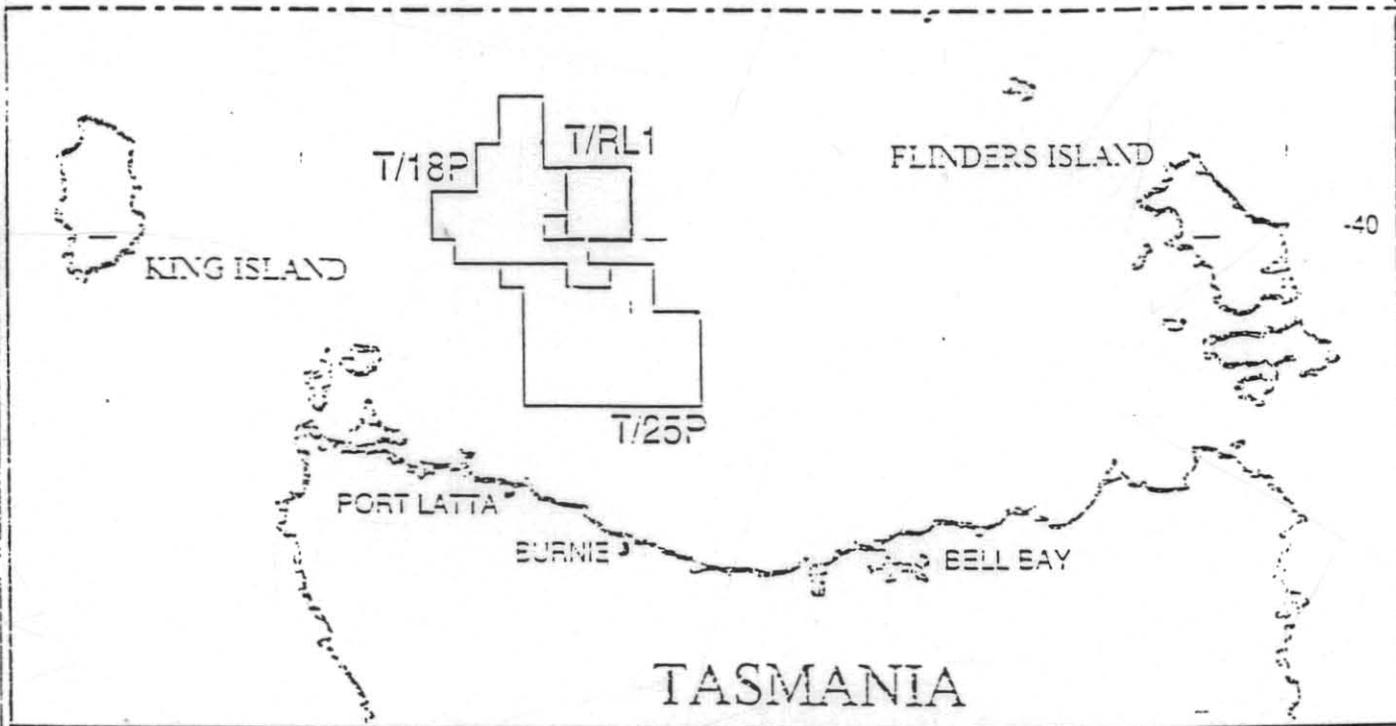
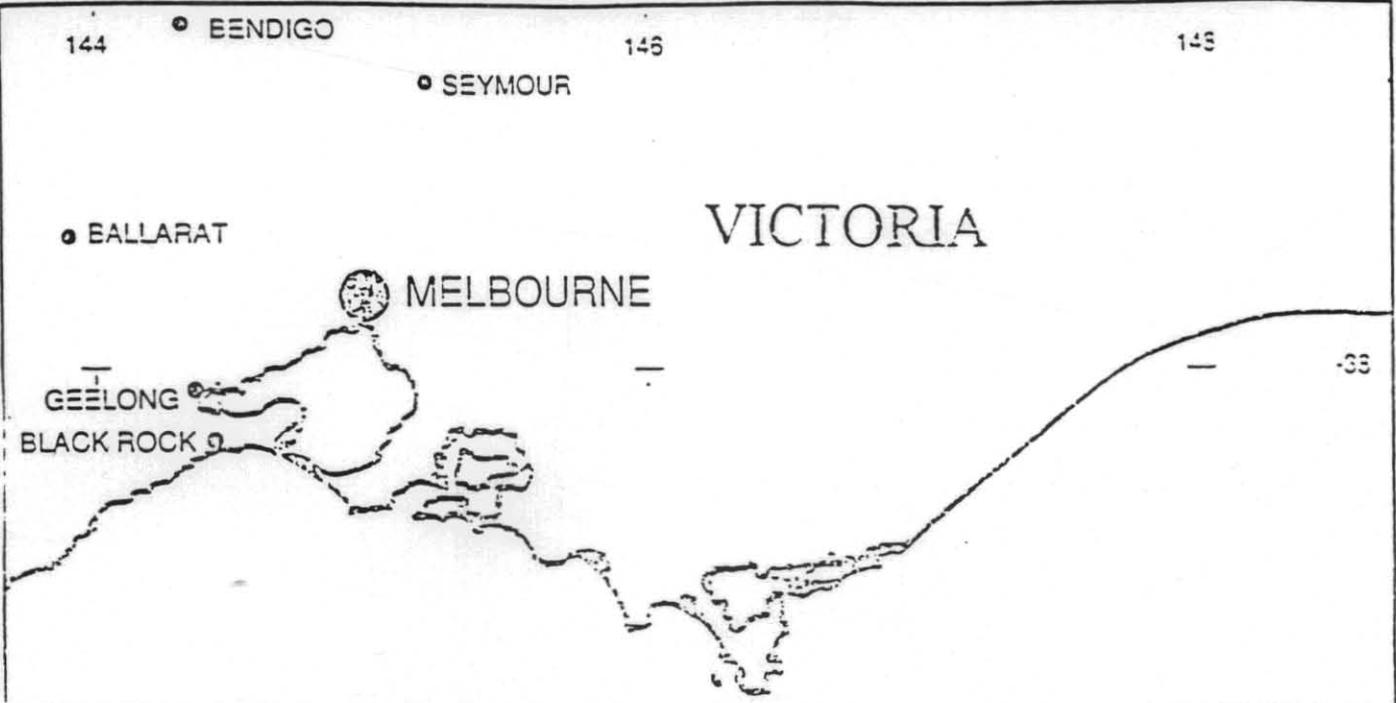
Normal security measures will be taken to ensure that all information gained from drilling White Ibis-1 will be kept confidential. To accomplish this, the following procedures will be observed.

1. Information should not be transferred to any person other than Premier personnel and service staff directly involved in the planning, drilling and testing of this well.
2. No unauthorised personnel to be allowed on the rig.
3. Only the drilling crews, Service Company personnel and Premier personnel are allowed on the rig site. No visitors will be allowed unless authorised by the Premier Project Drilling Engineer in Geelong.
4. Daily drilling information will be distributed to partners by the office in Perth. If requests are made for information, this request should be referred to the Premier Team Leader in Perth.
5. The logging operations will be supervised by Premier Oil personnel.
6. The logging information will be kept confidential. Only information which will help the Drilling Supervisor, Toolpusher and Wellsite Geologist perform more efficiently and maintain well control will be kept onboard the rig.
7. Only personnel authorised by the Drilling Supervisor and Well Site Geologist will have access to the logging unit during logging operations.
8. No public announcements will be made except as written and authorised by the Perth office of Premier Oil.
9. All service personnel, particularly Mud Loggers, Wireline Logging Engineers and Cementing Engineers, should have the above emphasised at the time of their arrival at the rig, and also at the time of their departure.
10. The Joint Venture partner after proper notification to Premier, will have full & open access for their representative(s) to monitor the drilling operations including wireline logging, coring and testing.

**3. WELL SUMMARY**

Location : Bass Basin, Offshore Tasmania  
 Block Number : T/18P  
 Well Name : White Ibis-1  
 Well Classification : Exploration  
 Structure : Large tilted fault block situated over a Lower Cretaceous ridge west of Yolla trough.  
 Surface Coordinates : Geographic Latitude : 39 57 49.61S  
 Longitude : 145 15 17.28E  
 Northing : 5574789  
 Easting : 350947  
 Target Tolerances : A radius of 25 metres centred on the proposed location.  
 Rig : Northern Explorer III  
 Rig Contractor : Northern Offshore Ltd  
 Planned Spud Date : May 1998  
 RT Elevation LAT : 12.5 m  
 Water Depth LAT : 60m  
 Planned Total Depth : 2150m RKB  
 Estimated Time : 20 days (Dry Hole)  
 Well Objectives : A vertical well with the primary target of testing the Intra EVCM sandstones of Late Cretaceous to Palaeocene age. Secondary target in the uppermost sandstones of the EVCM.  
 Offset Wells : Yolla-1  
 Tilana-1  
 King-1  
 Bass -3  
 Yolla-2

4. LOCATION MAPS



PremierOil  
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THE BASS PROJECT  
WELL AND PERMIT LOCATIONS

FEB 1998

FIGURE 1

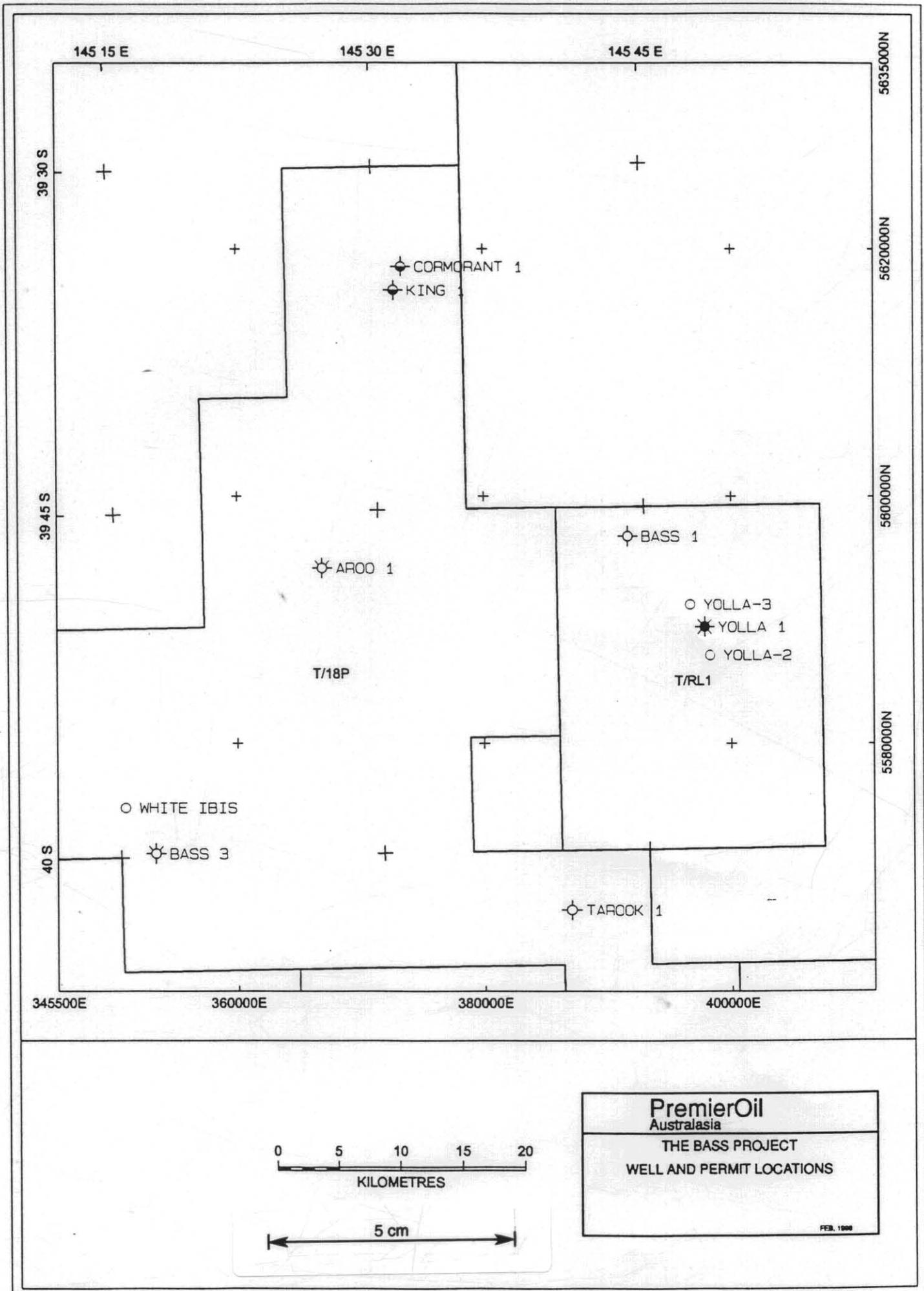


FIGURE 2

## 5. WELL OBJECTIVES

### 5.1 Safety and Environmental

- Incur no lost time accidents for the duration of the well.
- Successfully utilise water based mud throughout the well.
- Implement H<sub>2</sub>S procedures if required.

### 5.2 Geological & Reservoir Objectives

The detailed geological summary and formation evaluation programme is enclosed in Appendix A.

The geological objective is planned to be drilled in the 311mm (12¼") hole section. Planned TD for the well is 2150 m RKB.

The primary objective is to appraise the hydrocarbon bearing potential of the Eastern View Coal Measures.

- Run a full suite of electric logs and, dependent upon shows, run the following optional logs: MDT, FMS and CMR or equivalent.

### 5.3 Drilling Engineering Objectives

- Successfully drill well with modified casing program, avoiding need for drilling hole to TD in 216mm (8½") hole.
- Drill all hole sections with WBM and avoid any stuck pipe occurrences.
- Minimise formation damage particularly in the reservoir section.
- Implement Anchoring Analysis to minimise anchor handling time.
- Drill well under AFE and within 20 days

**6. GEOLOGICAL INFORMATION****6.1 Predicted Section**

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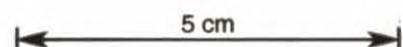
T/RL1 - BASS BASIN

**PREDICTED SECTION**  
**WHITE IBIS - 1**

STRATIGRAPHY			LITHOLOGY	REMARKS	DEPTH			
					metres below K.B.	metres subsea	TWT (msec)	
Seismic Marker *								
<b>TERTIARY</b>	<b>MIOCENE TO RECENT</b>	<b>TORQUAY GROUP</b>	*	"Sea Floor"	73	60		
				"Recent - Mid Miocene"				
					713	700		
				"Mid Miocene"				
					1163	1150		
	<b>EOCENE</b>	<b>EASTERN VIEW GROUP</b>	*	"Demons Bluff Formation"	1441	1428	1297	
			*	"Top EVCN"	1595	1582	1393	
			*	"Top Lower N. asperus"	1647	1634	1424	
			*	"Middle M. diversus"	1904	1891	1584	
			*	"Top Palaeocene"	1937	1924	1601	
<b>PALAEOCENE</b>	<b>EASTERN VIEW GROUP</b>	*	"Intra Palaeocene"	1988	1975	1630		
		*	"Late Cretaceous"	2058	2045	1668		
		*	"Near Top Basement" TD	2113	2100	1695		
<b>C.</b>				2163	2150			

**PTD 2150mSS**

**LOCATION :** Seismic Line - SP 1139 on line BHB96-107  
 Latitude - 39°57'49.61"S  
 Longitude - 145°15'17.28"E  
 K.B. Elevation - 12.5 metres



## 6.2 Formation Description

### Torquay Group; Seabed - 1440m RKB

Recent to Middle Miocene

Upper carbonate section and a lower claystone section with the change occurring at around 700m. The claystone is calcareous and is soft to firm and can be highly dispersive in parts.

### Angahook Formation

This formation is not expected to be intersected in White Ibis-1

### Demons Bluff Formation; 1440 - 1594m RKB

Late Eocene

Claystone with thin interbeds of sandstone and dolomitic limestone.

### Eastern View Coal Measures; 1594 - 2112m RKB

Late Eocene to Early Palaeocene

The contact between the EVCM and the overlying Demons Bluff Formation is gradational with shales becoming more silty and sandy.

Using Bass-3 offset data the first major sand package in the EVCM is a very fine to fine grained with minor medium to very coarse grained intervals, are glauconitic with an argillaceous matrix and show very minor cementation by mictite or dolomite elements.

The next thick section of interbedded sandstones, siltstones and shales at Bass-3 coincided with the intersection of the first clean consolidated sandstone and a series of interbedded coals from 1767m to 1898m. The sandstone, possibly a channel sand, has coarse to granule sized, milky to clear, sub rounded to rounded quartz grains with minor associated pyrite. However the dominant sandstones within this interval are micaceous and very fine to fine grained with a white (kaolinite?) matrix. These sandstones are typically interbedded with brown to black carbonaceous shales. The coals tend to be black in colour with a brilliant lustre, brittle and exhibiting a conchoidal fracture.

From 1900m until the next major sandy interval at 2054m the section at Bass-3 comprises a series of coal-dominated terrestrial deposits with lesser amounts of shale and minor sands interfingering with interbedded pyritic calcareous claystones, fossiliferous shale, and glauconitic, very fine grained sandstone with a clay matrix. Between 2054m and 2158m a series of well sorted medium to coarse grained

sandstones and friable quartz sands interbedded with brown to grey micaceous and silty shales were intersected. The sandstones at 2054m from which hydrocarbons were recovered via a FIT, exhibited a slight odour but did not fluoresce.

Between 2158m and the base of the EVCN at 2375m in Bass-3, the sedimentary package comprises an interbedded sequence of sandstone, siltstone and shale. Individual bed thickness is variable with no particular rock-type showing overall dominance. The sandstones are typically light grey, matrix supported and show a range in grain size from fine grained to granule sized. Weathered feldspar content is higher compared with sands higher up in the EVCN. The grains are typically sub-angular to rounded and poorly sorted. Matrix may also include minor amounts of mica and carbonaceous shale. The siltstones are generally light brown to light grey, argillaceous in part, micaceous and pyritic. The shale is light to mid grey, occasionally silty and micaceous. Coal may be present, but usually only in trace amounts

#### Basement: 2112 – 2150m RKB (TD)

A metamorphic interbedded sequence of quartzite, recrystallised siltstone, fine grained sandstone and black meta shales. White Ibis-1 is expected to penetrate up to 50m of basement.

### **6.3 Shallow Gas**

Shallow gas has not been encountered in any of the offset wells and is not expected on White Ibis-1.

### **6.4 Pore Pressure Gradients**

Offset data indicates that all the formations are expected to be normally pressured, with a seawater gradient 1.042 s.g. EMW. RFT data from Yolla-1 gives formation pressures of 1.040 s.g. at 2820m. Background gas is not expected until 950m.

### **6.5 Fracture Gradients**

In the primary offset wells Leak-Off tests were not performed, however Formation Integrity Tests have been performed in both the Torquay Group and the Demons Bluff Formation. These have given up to 1.83 s.g. EMW at 416m and 1.75 s.g. EMW at 1660m respectively (Tilana-1, Yolla-1 gave 1.5 s.g EMW at 400m. and 1.63 s.g. EMW at 1752m for the same formations). No leak off has been recorded in any of the offset wells.

### **6.6 Temperature Gradients**

The geothermal gradient for White Ibis-1 is expected to be 3.16 deg C/100m. with a BHT of 85 deg C (assumes a mud line temp of 14 deg C). Gradient based on offset logging data.

## 6.7 Anticipated Hydrocarbons / CO<sub>2</sub> / H<sub>2</sub>S

Bass-3 the nearest offset well produced hydrocarbon from sandstones at 2054m RKB

**CO<sub>2</sub>** In the control wells CO<sub>2</sub> contamination of the drilling fluid has been a problem, and CO<sub>2</sub> can be expected in the White Ibis-1 well. Offsets suggest that the CO<sub>2</sub> can be expected below 1700m, however using a KCl/polymer/PHPA mud system for the 311mm (12¼") section should avoid any related problems.

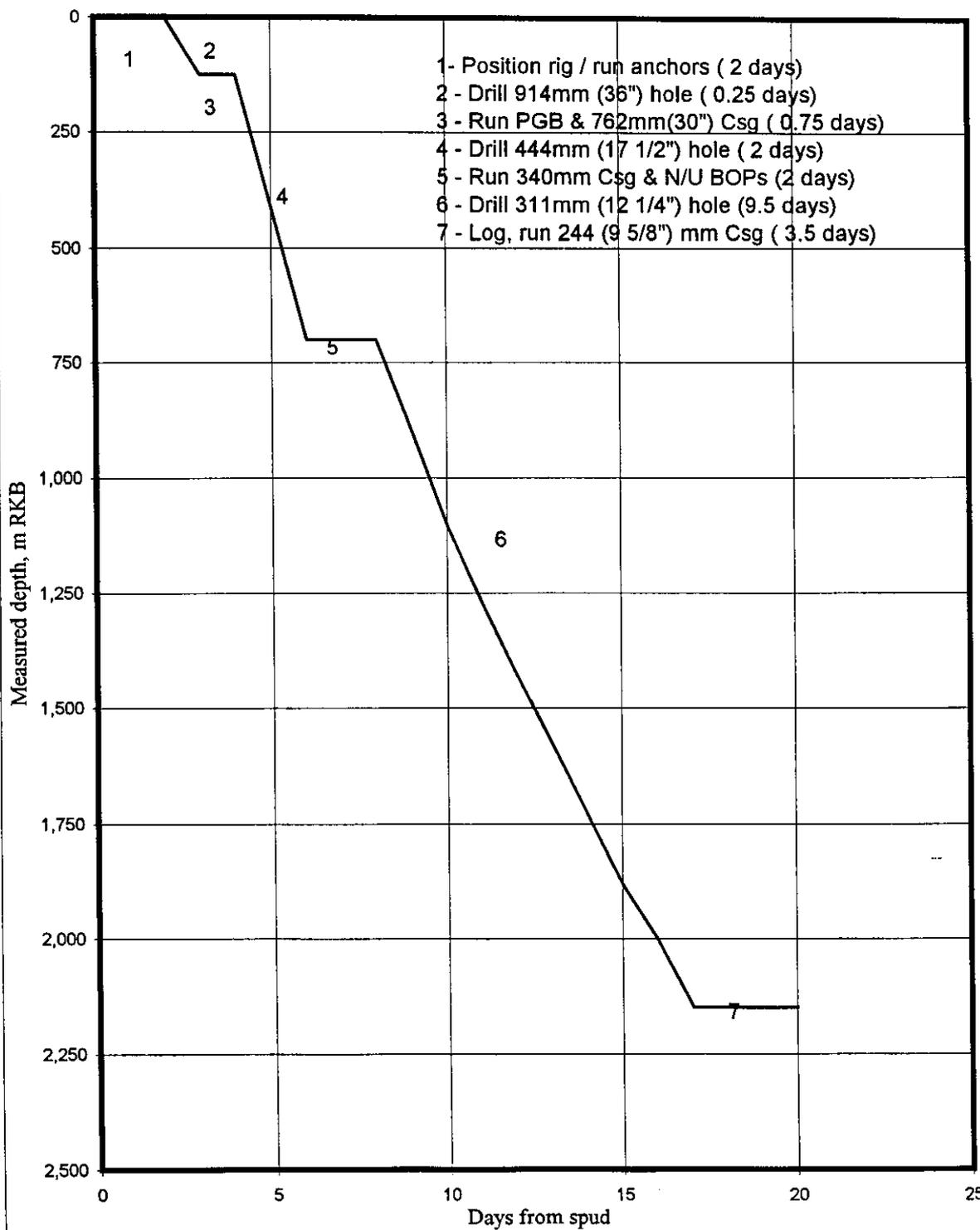
**H<sub>2</sub>S** H<sub>2</sub>S has not been recorded in any of the control wells and is not expected in the White Ibis-1 well.

**7. DRILLING TIME DEPTH CURVE**

## Premier Oil Australasia

## White Ibis-1

Preliminary time-depth prognosis, excluding contingency



5 cm

**8. WELL PLAN OUTLINE**

# White Ibis-1 : WELL PLAN OUTLINE

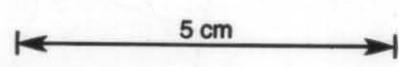
**BLOCK**  
**SURFACE LOCATION**  
**TD**  
**PROVISIONAL SPUD DATE**

T/18P, Bass Straits  
 39deg 57' 49.61"S / 145deg 15' 17.28"E  
 2150m md RKB  
 15-May-98

**WELL CLASSIFICATION**  
**RIG**  
**WATER DEPTH**  
**RTE (above sea level)**

**Exploration**  
**Drillship : Northern Explorer III**  
**60m**  
**12.5m**

Depth RKB	Form'a	Tops RKB	Bit Programme	Formation Evaluation	Potential Drilling Problems	Hole Size	Casing & Cement Programme	Well Control Equipment	Mud Program	Prognosed Pressure Profile
500			Torquay Group 1-1-1 w/ HO	None	Drag/Bridging	914mm	762mm set at 60m below ML 762mm (30") 462kg/m GR B ST-2 Slurry 1.9sg to S/B	N/A	Seawater - hi vis sweeps	
							Lead slurry 1.44sg to 700m Tail slurry 1.9sg to 850m	N/A	Seawater - hi vis sweeps	
			1-1-1	None		444mm	340mm set in claystone @ 850m RKB 340mm (13 3/8") 101kg/m L80 New VAM			
1000			M433 Hughes BD47 PDC bit (1 run)					18 3/4" 10,000psi BOF	Mud WT 1.1 -1.2sg 5% KCl / Polymer PHPA mud system	
					Self healing losses		Tail slurry 1.9sg to 1400m for possible DST in EVCM			
1500			Demons Bluff Formation Top EVCM	Platform Express Gamma -Sp-Caliper Resistivity -Density Neutron-PEF CMR  FMS- Array Sonic  MDT VSP  <i>Optional</i> CST	CO2 Contamination					
Not to Scale										
2000										
NOT TO SCALE					Washout/Sloughing	311mm	244mm (9 5/8") 79.6kg/m L80, New VAM / VAM ACE - Special Drift			
2250										
WELL TD AT 2150m RKB										
CORING		DIRECTIONAL SURVEYS								
		914mm : Anderdrift 444mm : Anderdrift with EMS at section TD 311mm : Anderdrift with EMS at TD								
<b>NOTES:</b> 1. All depths and formation tops are m tvd RKB 2. The primary objectives of the well are intra EVCM sandstones of Palaeocene to Early Eocene age 3. The secondary objectives of the well are the upper most sands of the Eastern View Coal Measures										
									Prepared By :	Stuart Harrison
									Reviewed By :	
									Date :	19th March 1998



## 9. RIG MOVE & ANCHOR PLAN

### 9.1 Environmental Conditions in the Bass Straits

Wind roses for the months April through July for the Bass Straits indicate a predominant westerly wind with a tendency towards the northwest and becoming predominantly northwest in July. These winds account for some 40% of the time. Wave roses for the same period show a predominant southwesterly direction with a trend towards west and northwest. This southwesterly tendency accounts for some 25% to 30% for April to June and then tends towards west and northwest in July.

Currents in the Bass Straits are understood to be relatively weak in the area around the White Ibis-1 location. Although tidal currents of around 1 m/s occur at both entrances (east and west) to the Bass Strait, they occur to all intents simultaneously and cancel one another out in the area concerned. Wind driven currents are said to be of the order of 2% of wind speed, and are therefore very weak.

On the basis of this information it would appear that a heading of 265deg would appear best in order to satisfy all the above elements. It is understood from the master of the Northern Explorer III that the heading can be adjusted by up to 20deg by manipulation of the mooring lines. This would allow for the vessel to stem any violent winds from 245deg round 285deg.

In July the wind as stated tends to be mainly from the northwest at around 15m/sec, but the waves remain predominantly from west by south with significant heights of around 3m. This would put the wind some 50deg on the starboard bow and the swell 45deg on the port bow. Adjustment of heading would then have to be towards the more violent of the elements, and some downtime whilst waiting on weather is bound to occur.

### 9.2 Anchor Location

White Ibis-1 location : 39deg 57' 49.61"S 145deg 15' 17.28"E

Water Depth: 60m

### 9.3 Anchor Plan

It is understood that the anchors for the Northern Explorer III are numbered sequentially clockwise from the after port bow anchor, i.e. #1 and #2 anchors are on the port bow.

The master has expressed a desire to opt for a 35deg anchor separation at the bow and similar at the stern.

This will allow for flexibility in the heading adjustment and at the same time position the bow anchors in the direction of the prevailing wind and waves.

Anchors would therefore, if the recommended heading of 265deg is used, be placed as follows :-

#1	195	#2	230	#3	300	#4	335
#5	015	#6	050	#7	120	#8	155

Each anchor leg will consist of the following :-

Maximum outreach of 2.75" rig anchor wire to  
 750ft of 3" ORQ Stud link chain  
 400ft of 2.75" wire pennant  
 25 links of 3" ORQ chain  
 1 x 9 MT Stevpris anchor  
 400ft of 2.75" wire pennant  
 surface marker buoy

The chain will be in 250ft lengths and this will require 2 Kenter Joining Links per anchor leg i.e. 16 kenters. A further 8 kenters should be available as spares. (The practice of hammering cold lead plugs into the locking pin aperture should be discouraged as it has been found on occasions that these can fail molten lead should be poured into the locking pin aperture)

Other shackles in the system should be consistent with the breaking load of the wire.

The test certificates for all the above should be available, and the AHT should note and record the identifying number and exact positions of all the shackles in use in the system. This is particularly important in the case of any accident or incident that may result in an injury.

#### 9.4 Rig Positioning

Prior to commencing run-in to new location, if time and weather permit, a gyro calibration/check should be performed.

Distance and bearing to intended location and first anchor drop are to be displayed continuously, together with speed, heading, CMG, position quality, off track distance and position of rig in geographical and grid co-ordinates. As the first anchor drop position of the relevant anchor fairlead in relation to the run-in line to be clearly seen. The system will, if selected, track the appropriate fairlead as opposed to the rig's datum. A fix is to be taken when the anchor is dropped and the GNS anchor location file updated accordingly.

As the rig continues towards location, comparison is to be made between distance travelled from the anchor drop point and the amount of chain veered to detect any anchor drag or excess of chain.

As the rig continues towards location, comparison is to be made between distance travelled from the anchor drop point and the amount of chain veered to detect any anchor drag or excess of chain.

During pre-tensioning/ballasting operations, the rig's position is to be monitored. When the rig has been accepted by the Premier Survey representative and Drilling Representatives as being within the required positioning tolerance for the location a Final Fix Analysis is to be performed within GNS.

As a minimum, 1 hour of observations, at a 10 second interval (approx. 360 samples) is to be obtained for all positioning systems. For DGPS the observation period should include at least three constellations with PDOP less than 4 and with five or more SV's.

Before collecting DGPS data for the final fix, the satellite availability for All-In-View PDOP vs Time should be consulted and/or made using Mission Planning software with a recent almanac (Note: Almanacs should be valid for 3 months from date of down load). The prediction should be made with an elevation mask of 15° and the appropriate curtains for the drilling rig's derrick. From the All-In-View PDOP vs Time prediction, a suitable period for collecting the final fix DGPS data is to be selected and advised. The minimum elevation mask to be set during the collection of the final fix DGPS data is 10° and if MultiFix 2 is in use a delta of 5° is to be set.

On completion of final fix analysis, the Premier Survey Rep and Drilling Representatives shall be advised of the rig's drill stem location in relation to the intended location and position tolerance. Graphic screen dumps should be used to ensure that all relevant personnel are fully aware of the drill stem's location.

**10. DRILL 914MM (36") HOLE - RUN 762MM (30") CASING**

This program and the procedures outlined herein are intended as a guide. The Drilling Supervisor will hold a regular morning meeting with contractor personnel to review planned operations during the next 24 hours. This project is a team effort and all personnel are expected to participate on this basis. Ideas on how to improve procedures which will result in a more efficient and safer operation will be encouraged at all times by the Drilling Supervisor.

**Objective**

**Drill sufficient 914mm (36") hole to provide 2.4m (8') from top of the 762mm (30") WH to the mud line.**

**Use lightest weight on bit reasonable to safeguard against developing hole angle.**

**914mm (36") Hole Preparation**

- Mix sufficient pre-hydrated gel mud for section and Guar Gum Hi-Vis sweeps.
- Make up 914mm (36") drilling assembly.
- Install the bullseye on the PGB.
- Paint the bottom of the 762mm (30") shoe joint white and paint 1m spacing lines on the bottom 5m of the shoe joint.
- Paint 1m spacing lines on the top 5m of the 762mm (30") below the housing joint.
- Paint the bottom of the 340mm (13<sup>3/8</sup>"), shoe joint white and paint 1m spacing lines on the bottom 5m of the shoe joint.
- Pressure test the BOP's/choke manifold/standpipe.
- Ensure 762mm (30") elevators fit around 762mm (30") conductor.
- M/U 762mm (30") running tool and rack back in derrick.
- Dispatch water samples to Cement Contractor for lab testing.

**Bit Program for 914mm (36") Hole Section**

<b>IADC</b>	<b>In/Out</b>	<b>m</b>	<b>WOB kg</b>	<b>RPM</b>	<b>Av ROP m/hr</b>	<b>Hours</b>
1-1-1 660mm (26") + 914mm (36") hole opener	Seabed /132	62	5k - 10k	80	40	1.5

A detailed hydraulics plan will be issued prior to spud, however general guidelines are:

Nozzles : Bit - 3 x 22, 1 x 20 : Hole opener - 4 x 16

Pump Pressure : 12500 kPa

Flow Rate : 4500 lpm

### Drilling Fluid Program

Refer to Drilling Fluids Program in Appendix B for details.

Mud Type : Seawater with Hi vis sweeps (Guar Gum & Bentonite Gel)

### 914mm (36") Hole Recommended BHA

Component	Size OD mm	Number	Approx. length	Comments
26" Bit	660	1	0.5	
36" Hole opener	914		1.5	
Bit sub	203	1	0.5	Bored for float; 7 5/8" Reg box/box
X/O	203	1	0.75	7 5/8" Reg x 6 5/8" Reg
8" Anderdrift	203	1	2.54	6 5/8" Reg
Totco ring		1	-	
8" DC	203	9	84.6	
X/O	203	1	0.7	6 5/8" Reg x NC50
HWDP	127	1	9.4	
HDIS		1		
BHA Total			100.49m	
HWDP	127mm	14	131.60m	

### Survey Program

Anderdrift survey at spud and throughout section.

### Potential Drilling Hazards

No problems have been reported on any of the control wells which set 762mm (30") casing at 190 - 200m depths. No problems are foreseen for this section.

### 914mm (36") Drilling Procedure

1. RIH with 914mm (36") BHA and tag seabed. Record the water depth, corrected for tide, and the air gap measurement on the IADC report noting the date and time of day.
2. Drill using hi vis Guar Gum mud sweeps and seawater. Spud the well with a maximum of 4500kg (10,000lbs) of bit weight, 70rpm and pumps at half speed until the first drill collar is

buried, then increase pumps to 4500lpm (1200gpm). The seabed survey shows the seabed to be made up of sand/shell fragments with no channelling features or debris at time of survey.

3. Drill to the approximate 762mm (30") casing point as per drilling programme, allowing 2.4m stick up above mud line to 762mm (30") wellhead.
4. Hole should be slugged with 16m<sup>3</sup> (100bbls) of Guar Gum spud mud each single.
5. At casing point displace hole with gel mud and circulate out 16m<sup>3</sup> to ensure clean hole. Drop a Totco survey prior to pulling out.
6. A wiper trip should be made to check for bridges or fill. If no fill or drag is experienced, again displace with mud and pull out of hole.

### 762mm (30") Casing

Weight kg/m	Grade	Conn.	Shoe Depth m RKB
462 (1"WT)	X-52	ST2	132

### Wellhead & 762mm (30") Casing Running Preparation

- Clean, tally and drift casing
- Have Vetco engineer check PGB and wellhead housing as per Vetco Operating and Service Procedures.
- An open ended stinger will be made up to the running tool and run to 1 joint above the shoe to ensure cement to surface with minimum excess slurry pumped.
- Position the wellhead on the spider beams orienting the guide posts with the guide wires. Run the 762mm (30") casing and float shoe through the PGB. Ensure circulation is possible through the float shoe. The 762mm (30") wellhead housing will be pre-welded to the last joint of 762mm (30") casing. ST2 connections are snap ring type with pin up box down configuration. Slings will be used with the pad eyes to handle 762mm (30") casing, these will be cut off once ST2 connections are made up.
- Prior to using running tool rotate the tool stem of the cam actuated running tool to the right to push the rams back into the ram housing. Position the running tool into the 762mm (30") housing and carefully turn the tool by hand to the right until the anti-rotation pins engage slots in the 30" housing. Rotate the tool stem to the left, approximately 2 ½ turns using chain tongs. Note the position of the word 'Lock' on the

tool stem. It should be immediately above the indicator ring. Then turn the tool stem back 1/8 of a turn to break any "seize".

- Pick up 762mm (30") housing joint and position over intermediate joint and make up ST2 connection. Pick up the string and cut off the landing pads, lower and land, using HWDP, the 762mm (30") housing in the PGB. Install the split retaining plates in the PGB to lock the wellhead housing in place. Measure 2.4m down from top of 762mm (30") housing and paint black ring on white background with 2.4m mark.

### Running and Cementing Procedure

- Pick up casing/wellhead assembly with HWDP and remove the spider beams.
- Lower the assembly to the waterline. When the casing is filled with water, close the valve on the running tool.
- Run the casing and land on bottom without rotating the running string. Jump ROV to assist in stabbing of conductor into hole and to record the stick up height of wellhead above seafloor (2.4m to top of 762mm (30") recommended).
- Adjust the motion compensator to hold the weight of running string plus 25 per cent of casing weight while cementing. Do not permit the casing to sink while cement is being mixed nor float while cement is being displaced.
- Use the ROV and check the wellhead bullseye for inclination less the 1.5 degrees. Leave the camera on bottom to observe returns while cementing.
- Mix and pump cement as specified in Appendix C.

	(seabed - 132m rkb) 150% excess
Class 'G' cement	94lb sx ( 42.6kg)
Seawater	5.16 gal/sx (458ltr/mT)
D047 Antifoam	0.01 gal/sx (0.9ltr/mT)
CaCl2 Accelerator	2% BWOC
Density	15.8ppg (1.9sg)
Yield	1.16cuft/sx (0.78m3/mT)
Thickening Time	+/- 2hrs
24hr Comp strength	+/- 3000psi

- Leave 3m of cement in 762mm (30") conductor
- Check the float shoe. Should the float not hold, shut-in at the surface and allow the cement to take an initial set prior to releasing the pressure.

- Back off the running tool, by rotating to the right approximately 2 ½ turns. When tool disengages or releases from wellhead housing the compensator will stroke closed. Pick up carefully until stinger is clear of wellhead housing and pull out of the hole.

**Materials & Equipment for 914mm (36") hole.**

<b><u>Item</u></b>	<b><u>Description</u></b>	<b><u>Qty</u></b>
1	Vetco housing assembly, 762mm (30") with full 762mm (30") x 1.5" WT casing joint w/ ST-2 box down	1
2	762mm (30") x 1"WT intermediate joint with ST-2 pin up and ST -2 box down	3
3	762mm (30") x 1"WT shoe joint with ST-2 pin up and single valve float shoe down	1
4	Vetco SG-5 Permanent Guide base, removable, plates & studs	1
5	Slope indicator on PGB	1
6	Bit 660mm (26") 1-1-1 with jets	1
7	Bit breaker plate, 660mm (26")	1
8	914mm (36") four arm hole opener with jets	1
9	Drill collars 8", 6 5/8" b x p reg conns.	9
10	O-ring for 762mm (30") running tool	1
11	Rig positioning equipment	1 set

**11. DRILL 444MM (17½") HOLE - RUN 340MM (13¾") CASING****Objectives**

Drill 444mm (17½") hole to a section TD of 850m, placing the 340mm (13¾") shoe in a competent formation to ensure good LOT.

Avoiding hole problems by ensuring the hole is kept clean by maximising flow rates and diligent use of Hi vis sweeps.

Only one bit used to drill the section by optimising hydraulics and parameters, preventing bit balling and maximising performance.

**444mm (17½") Hole Preparation**

- Break out 914mm (36") assembly and make up 508mm (20") cement drilling assembly.
- Make up 444mm (17 ½") stabiliser BHA
- Ensure enough Hi-vis mud is available for sweeping and displacing hole.
- Measure to 340mm (13¾") casing and 340mm (13¾") - 508mm (20") wellhead swedge and housing to be run and calculated the depth of hole required in order to have a 9m rathole to allow for fill and other contingencies.

**Bit Program for 444mm (17½") Hole Section**

IADC	In/Out	m	WOB kg	RPM	Av ROP m/hr	Hours	Formation
1-1-1	132/850	575	15k-20k	90-140	20	29	Torquay Group

A detailed hydraulics plan will be issued prior to spud, however general guidelines are:

Nozzles : 3 x 18, 1 x 16

Pump Pressure : 20700 kPa

Flow Rate : 4500 lpm

**Drilling Fluid Program**

Refer to Drilling Fluids Program in Appendix B for details.

Mud Type : Seawater with Hi vis sweeps. (Guar Gum & Bentonite Gel)

**444mm (17½") Hole Recommended BHA**

Component	Size OD mm	Number	Approx. length	Comments
Bit	444	1	0.5	
17 ½" NBS w/float	444	1	1.0	
Anderdrift	203	1	2.54	6 5/8" Reg
8" pony NMDC	203	1	3.0	
17 ½" String Stab	444	1	2.4	6 5/8" Reg
Totco ring		1	-	
8" NMDC	203	1	9.4	
17 ½" String Stab	444	1	2.4	6 5/8" Reg
8" DC	203	6	56.4	
Jar	203	1	3.0	
8" DC	203	3	28.2	
X/O	203	1	0.7	6 5/8" Reg x NC50
HWDP	127	1	9.4	
HDIS		1		
BHA Total			118.94 m	
HWDP	127mm	8	75.2 m	

This BHA will be used to drill out the 762mm (30") shoe with 660mm (26") bit and then to drill the 444mm (17½") hole section.

**Survey Program**

Anderdrift throughout section.

Electronic Multi-shot survey at section TD.

**Potential Drilling Hazards**

Hazard	Solution / Comment
Drag / Bridging	Hole should be slugged with 5m <sup>3</sup> (35bbbls) of viscous mud prior to making connections. Increase slug size if problem not resolved. Wiper Trip at section TD / ream if necessary

**660 mm (26") Cement Drilling Procedure**

1. RIH with 660m (26") cement drilling assembly and tag cement. Record the depth, drill out of the 762mm (30") casing using low parameters and circulating with seawater. Drill new formation. Work bit through drilled out float shoe.
2. Make up 18 3/4" wellhead & running tool c/w cement plugs and stand back in derrick. Lower the running tool into the high pressure wellhead housing, rotate the tool stem to the left approximately five times until it stops (lock), do not force. Verify that the word 'lock' is just visible above the housing. Run on HWDP
3. POOH and lay down 660mm (26") bit and pick up 444mm (17½") bit.

**444mm (17½") Drilling Procedure**

1. RIH with 444mm (17 ½") BHA tag new formation.
2. When string stabiliser is out of shoe drill using parameters shown above with hi vis mud sweeps and seawater with returns to seabed. Slug a 5m<sup>3</sup> (35bbls) viscous Guar Gum mud pill every single.
3. Drill to the section TD as calculated.
4. At section TD displace hole with a weighted gel mud 1.14sg.
5. A wiper trip should be made to check for bridges or fill. If no fill or drag is experienced, run back to bottom, check for fill, drop EMS and pump BHA out carefully ensuring hole stays full of weighted mud. Pump rate should be sufficient to keep hole full and no more.

**340mm (13 ¾") Casing**

Weight kg/m	Grade	Conn.	Shoe Depth m RKB	M/U Torque Min ft-lbs	M/U Torque Opt ft-lbs	M/U Torque Max ft-lbs
101	L80	New VAM	850	14400	15900	17400

Centraliser Placement :- 2 per joint for shoe track and 1 per two joints up to 700 m RKB

**340mm (13 ¾") Casing Running Preparation**

- Clean, tally and drift casing.
- Paint 340mm (13¾") shoe white to aid identifying the location of the shoe on TV while stabbing into the 762mm (30") housing. Soft line guides to be attached to the float shoe to aid stab in.
- Prior to using running tool rotate the shaft of the running tool to the right (unlock) and push the dogs into place.

**Running and Cementing Procedure**

- Bakerlok the threads on the shoe track.
- Run a string of 340mm (13¾") OD 101kg/m casing with New VAM connectors.
- Fill the casing with water as run. Ascertain that circulation is possible through the shoe.

- Torque the casing as per New VAM make up torque limits. Do not weld casing.
- Install the 340mm (13 3/8") New VAM x BTC crossover, 340mm (13 3/8") BTC to 508mm (20") swedge and 476mm (18 1/4") housing in the casing string.
- Fill the drill pipe every stand. Stab the 340mm (13 3/8") casing into the 762mm (30") housing. Observe the stab on TV.
- Break circulation prior to landing the high pressure housing. Land without rotating the running string. Make pick-up test of 22700kg (50,000lbs) over string weight to verify lockdown. Check bullseye with ROV.
- Mix and pump the cement as specified in Appendix C.

	Lead ( seabed - 700m rkb) 100% excess	Tail ( 700m - 850m rkb) 100% excess
Class 'G' cement	94lb sx ( 42.6kg)	94lb sx ( 42.6kg)
Seawater	15.17 gal/sx (1347ltr/mT)	5.32gal/sx (472ltr/mT)
Drillwater		
D047 Antifoam	0.01gal/sx (0.9ltr/mT)	0.01 gal/sx (0.9ltr/mT)
D075 Extender	0.5gal/sx (44.4ltr/mT)	
D300 FLAC		
D145 Dispersant		
D110 Retarder		
Density	12.0ppg (1.44sg)	15.8ppg (1.90sg)
Yield	2.55cuft/sx (1.69m3/mT)	1.16cuft/sx (0.78m3/mT)
Thickening Time	+/- 3hrs	+/- 6hrs
24hr Comp strength	+/- 500psi	+/- 4500psi

- Do not overdisplace the casing, Pump at reduced rate for half shoe track volume until plugs bump.
- Check the float shoe. If the float holds, slack off and check PGB for subsidence, if okay release the running tool by rotating the running string to the right approximately five turns and pick up carefully the running string. Should the float not hold, shut-in at the surface and allow the cement to take an initial set prior to releasing the pressure.
- Observe returns while cementing. At completion of cement job, back out the running tool and wash out the wellhead thoroughly to remove any cement that might have accumulated in the wellhead.

**Materials & Equipment for 444mm (17 ½") hole.**

<b><u>Item</u></b>	<b><u>Description</u></b>	<b><u>Qty</u></b>
1	Vetco 18 ¾" high pressure wellhead housing with housing extension 508mm(20") x 1"WT crossed over 13 3/8" BTC pin down	1
2	340mm (13 3/8") BTC box to 340mm (13 3/8") New VAM pin crossover	1
3	340mm (13 3/8") 101kg/m L80 New VAM Casing	64
4	340mm (13 3/8") 101kg/m L80 New VAM Casing shoe joint	1
5	340mm (13 3/8") 101kg/m L80 New VAM Casing collar joint	1
6	Centralisers 340mm (13 3/8") bow type	10
7	660mm (26") bit, 1-1-1	1
8	444mm (17 ½") bit 1-1-1 with jets	1
9	Bit breaker plate 660mm	1
10	Bit breaker plate 444mm	1
11	Anderdrift 8", with 6 5/8" reg conns.	1
12	NMDC 8" + 2 * 8" pony NMDC	1
13	444mm (17 ½") string stabiliser	2
14	8" drilling jars	3
15	Klampon protectors 444mm	3
16	Running tool for high pressure wellhead housing	1
17	AX gasket	2
18	O-ring for 18 ¾" wellhead housing running tool spare	1
19	Wear bushing for 18 ¾" housing	1
20	Combination running and testing tool for running WB and testing 18 ¾" housing	1
22	O-ring for running and testing tool	1
23	Tam packer with 340mm (13 3/8") element	1
24	Hevi Wate DP 5"	30

**12. DRILL 311MM (12¼") HOLE - RUN 244MM (9⅝") CASING****Objective**

- **Minimise formation damage through good mud management and tripping practices i.e. avoiding the need to back ream.**
- **Minimise open hole exposure by drilling as quickly and safely as possible.**
- **Achieve good hole quality for extensive wireline logging program.**

**Function Testing the BOP stack**

Ram position to be as follows, top down:- Blind/shear, 127mm (5") pipe, Variable bore, 127mm (5") Pipe.

Function test BOP's prior to running. Note gallons to function and closing time.

Complete the BOP test and inspection affidavits and send to shore for filing.

**Running the Stack and Riser**

The pressure and function test will be completed outside the critical path. Other preparations for running the BOP will proceed simultaneously in order to have the stack ready to run as soon as possible after cementing the 340mm (13⅜") casing,

- Position the BOP stack on the spider beams. Insert the guide lines in the posts of the BOP stack.
- Install and lock the lower marine riser package onto the 476mm (18 ¾") BOP stack with a new standard AX ring gasket.
- Install a new standard AX ring in the wellhead connector. Clean and grease with proper lubricant. Function test all preventers, failsafe valves, and the WH connector from both pods while BOP is sitting on spider beams.
- Insert the guide lines in the marine riser guide frame.
- Place the marine riser handling spider on the rotary table.
- Pick up a double joint of marine riser that has been previously racked back in the derrick using the marine riser handling sub. Lower the marine riser joint through the marine riser handling spider and make up to top of the ball joint.
- Pick up the BOP stack, remove the spider beams and lower the marine riser joint until it can be landed on the marine riser handling spider. Continue to run the marine riser spacing out as necessary. Test the choke and kill line to 34.5MPa (5000psi), as run.

- Pick up the telescopic joint (locked in the closed position) and attach to the riser assembly.
- Remove the pins that lock the slip joint in the closed position.
- Stroke out the slip joint inner barrel and pick up entire assembly. Remove the marine riser handling spider and the lower slip joint through the rotary table until the riser tensioning cables can be installed on the riser tensioning ring on the outer barrel of the slip joint. Adjust the tension on the cables to support approximately 125 percent of the weight of the marine riser.
- Install the air operating line to the slip joint packing gland; 5 to 10 psi (34kPa - 68kPa) is normally sufficient pressure to maintain an effective seal against the hydrostatic head of the drilling fluid. Install the choke line to the terminal fitting on the slip joint. Install the diverter package.
- Tension the guide wires for landing the BOP stack.
- Lower the riser and the BOP stack until the wellhead connector of the BOP stack is landed in the wellhead housing. Observe the landing with the TV.

Note: The wellhead connector should be open when the connector is on the spider beams and the control valve maintained in the open position until it is landed on the wellhead housing. Lock the BOP stack on the wellhead housing with 10.3MPa (1500psi). A pick up test of 22.6k kg (50,000lbs) above stack weight should be performed to ensure the connector is latched.

- Land and lock the diverter housing.
- Reduce the tension in the guide wires to 34.4MPa (5000psi). Set riser tension to +/- 18.1k kg (40,000lbs).
- Run in hole and land test plug. Test BOPs to 3.4/34.4 MPa (500/5000psi) for 5/10 minutes. Re-check permanent datum (top of 476mm (18 3/4") housing) and ram space out with painted test joint.
- Run the 476mm (18 3/4") nominal seat protector.
- Prior to drilling out cement, close the diverter bag on the drill pipe and function test the system. Check and record choke line friction and check hang off space out. Perform hang-off on second pipe rams from the bottom.

### **311mm (12 1/4") Hole Preparation**

- Break out 444mm (17 1/2") BHA and make up 311mm (12 1/4") drilling assembly
- Install the 476mm (18 3/4") BOP stack and marine riser
- Pressure test the BOP stack on the test stump

- Ensure adequate mud is mixed to drill the section
- Measure 244mm (9<sup>5</sup>/<sub>8</sub>" ) casing and wellhead housing to be run and calculated the depth of hole required in order to have a 9m rathole to allow for fill and other contingencies.
- Test the casing against the blind/shear ram to 7MPa (1000psi) prior to drilling out.
- Pump through choke and kill line at 45 and 90 SPM to measure the circulating pressure loss. Record along with mud weight.
- Remove lock down ring from 244mm (9 5/8") hanger.

### Well Control

The following abnormal pressure indicators will be monitored below surface casing :-

*DxC exponent*

*Cuttings morphology in shales*

*Gas Levels*

*ROP*

*Mud properties*

Conduct well control drills routinely in line with Northern Offshore policy & procedures and the Petroleum (Submerged Lands) Act

Test BOP's after setting each casing string or every 14 days operations.

Run and report slow pump rates daily.

### Bit Program for 311mm (12<sup>1</sup>/<sub>4</sub>" ) Hole Section

IADC	In/Out	m	WOB kg	RPM	Av ROP m/hr	Hours	Formation
BD447	850/2150	1300	8-15k	12/140	15	50	Torquay, Demons Bluff, Eastern View Coal Measures EVCM

BD447 is a Hughes Christensen Black Diamond PDC bit

A detailed hydraulics plan will be issued prior to spud.

**Drilling Fluid Program**

Refer to Drilling Fluids Program in Appendix B for details.

Freshwater KCl/ PHPA/ Polymer

Density (SG)	PV (cps)	YP (pa)	Gels (pa)	KCl (%w/w)	pH	Drill Solids	MBT (kg/m <sup>3</sup> )	API fluid loss
1.1 -1.2	ALAP	8.6 -10.5	2.4/4.8- 7.2/14.4	5 or as hole conditions dictate	+/- 9	<6 % v/v	<71.5	6 - 8

**311mm (12¼") Hole Recommended BHA**

Component	Size OD mm	Number	Approx. length	Comments
12 ¼" Bit	311	1	0.5	
12 ¼" NBS w/float	203	1	1.0	
8" Anderdrift	203	1	2.54	6 5/8" Reg
8" pony NMDC	203	1	3.0	
12 ¼" String Stab	311	1	2.4	6 5/8" Reg
Totco ring		1	-	
8" NMDC	203	1	9.4	
12 ¼" String Stab	311	1	2.4	6 5/8" Reg
8" DC	203	6	56.4	
Jar	203	1	3.0	
8" DC	203	3	28.2	
X/O	203	1	0.7	6 5/8" Reg x NC50
HWDP	127	1	9.4	
HDIS		1		
BHA Total			118.94 m	
HWDP	127mm	8	75.2 m	

**Survey Program**

Anderdrift throughout section.

Electronic Multi-shot survey at section TD.

**Potential Drilling Hazards**

<b>Hazard</b>	<b>Solution / Comment</b>
Drag / Bridging	Increase mud weight to a maximum of 1.2s.g. Wiper trip / ream if necessary
CO <sub>2</sub> Contamination	KCl/polymer/PHPA drilling fluid system will be not be affected by this form of contamination.
Losses	Self healing losses have been encountered in the upper half on the Angahook formation on previous wells of up to 47.7m <sup>3</sup> (300bbls).
Washout/Sloughing	Maintain low end rheology of drilling fluid with temperature stable polymers, prevent turbulent flow.

**311mm (12¼") Drilling Procedure**

1. Pick up grade "G" drill pipe or better to maintain 68k kg (150Kips) overpull (minimum).
2. Run the 340mm (13<sup>3</sup>/<sub>8</sub>") wear bushing.
3. RIH with 311mm (12¼") BHA and tag cement. Record the depth, drill out of the 340mm (13<sup>3</sup>/<sub>8</sub>") casing using low parameters.
4. After drilling out cement and cleaning to bottom, drill 3m of new formation. Circulate and condition the mud and perform FIT to 1.75sg.
5. Drill to the core point as given in the formation evaluation section of Appendix A.
6. Pull out of hole and make up and run in with coring assembly. Core as per Appendix A.
7. Retrieve core and break out as per formation evaluation programme.
8. Run in hole with drilling assembly ream to bottom and drill ahead to programmed TD.
9. Wiper trips should be made initially every 24 hours.

**244mm (9<sup>5</sup>/<sub>8</sub>" ) Casing****only to be run if testing to be carried out.**

Weight kg/m	Grade	Conn.	Shoe Depth m RKB	M/U Torque Min ft-lbs	M/U Torque Opt ft-lbs	M/U Torque Max ft-lbs
79	L80	New VAM / VAM ACE	2150	14400	15900	17400

Centraliser Placement:- 2 per joint for shoe track and 1 per joint up to 100m above the zone of interest.

**244mm (9<sup>5</sup>/<sub>8</sub>" ) Casing Running Preparation**

- Clean, tally and drift casing - 244mm (9 5/8") {79K/g/m casing is special drift for 216mm (8 1/2")}, and VAM ACE x New VAM crossover.
- Retrieve 340mm (13<sup>3</sup>/<sub>8</sub>" ) wear bushing.
- Torque the casing as per New VAM /VAM ACE make up torque limits. Do not weld casing. VAM ACE will be run first then crossed over to New VAM.
- The casing shoe, float collar, and all casing collars on the bottom two joints will be thread locked.
- Make up the 244mm (9 5/8") BTC pin x 244mm (9 5/8") cement wiper plug launching assembly on bottom of running tool. Lower assembly

**Running and Cementing Procedure**

- As soon as float equipment is picked up check floats for circulation.
- Fill the casing with water as run. Calculate the running speed to avoid excessive surge pressures.
- After installing the pup joint and hanger, the 244mm (9<sup>5</sup>/<sub>8</sub>" ) casing will be run on casing 244mm (9<sup>5</sup>/<sub>8</sub>" ), using the full bore running tool. (This will be crossed over from BTC back to New VAM for the running string.)
- When the casing is landed and cement head and lines connected, break circulation slowly.
- While circulating, keep the annular velocity the same as used when drilling.

- Mix and pump cement as per Appendix C.

	Lead (not used) 50% excess	Tail (1400m - 2150m) 50% excess
Class 'G' cement	94lb sx ( 42.6kg)	94lb sx ( 42.6kg)
Seawater	9.75 gal/sx (865ltr/mT)	
Drillwater		3.99gal/sx (354ltr/mT)
D047 Antifoam	0.01gal/sx (0.9ltr/mT)	0.03 gal/sx (2.7ltr/mT)
D075 Extender	0.35gal/sx (31.1ltr/mT)	
D300 FLAC		0.90gal/sx (79.9ltr/mT)
D145 Dispersant		0.25gal/sx (22.2ltr/mT)
D110 Retarder	0.25gal/sx (22.2ltr/mT)	0.03gal/sx (2.7ltr/mT)
Density	13.2ppg (1.58sg)	15.8ppg (1.90sg)
Yield	1.86cuft/sx (1.24m3/mT)	1.16cuft/sx (0.78m3/mT)
Thickening Time	+/- 5.5hrs	+/- 4hrs
24hr Comp strength	+/- 1000psi	+/- 4200psi

- Do not overdisplace the casing, Pump at reduced rate for half shoe track volume until plugs bump. Check the float.
- Observe returns while cementing. At completion of cement job, back out the running tool and wash out the wellhead and BOP's thoroughly to remove any cement that might have accumulated in the wellhead, BOP's or riser.

#### **Setting and Testing the 244mm (9<sup>5</sup>/<sub>8</sub>" ) Seal Assembly**

- Have wellhead service engineer on board to set 244mm (9<sup>5</sup>/<sub>8</sub>" ) seal assembly. Run on 203mm (8") drill collars and HWDP. Have spare seal on board.
- Test seal assembly to 34.5MPa (5000psi). Do not collapse the 244mm (9<sup>5</sup>/<sub>8</sub>" ) casing.
- Test the BOP stack and choke manifold to 34.5MPa (5000psi), and the annular to 17.6MPa (2500psi) prior to cleaning out the 244mm (9<sup>5</sup>/<sub>8</sub>" ) casing.

#### **Testing**

The testing programme will be issued separately.

**Materials & Equipment for 311mm (12 1/4") hole.**

<b><u>Item</u></b>	<b><u>Description</u></b>	<b><u>Qty</u></b>
1	Vetco casing hanger 18 3/4" x 244mm ( 9 5/8") made up on a pup joint of 244mm ( 9 5/8") New VAM casing	1
2	Vetco full bore running tool for 18 3/4" x 244mm ( 9 5/8") casing hanger with 244mm (9 5/8") BTC box up	1
3	O-ring for 18 3/4" x 244mm ( 9 5/8") full bore running tool	1
4	Vetco seal assembly, torque set for 244mm ( 9 5/8") casing	1
5	O-ring for 244mm (9 5/8") seal assembly	1
6	Running tool for seal assembly	1
7	Test tool, lands in 244mm ( 9 5/8") seal assembly	1
8	Wear bushing , 18 3/4" x 244mm ( 9 5/8") for torque set seal assembly	1
9	244mm (9 5/8") 79kg/m L80 Special drift VAM ACE shoe joint	1
10	244mm (9 5/8") 79kg/m L80 Special drift VAM ACE collar joint	1
11	244mm (9 5/8") 79kg/m L80 Special drift VAM ACE casing	1
12	244mm (9 5/8") 79kg/m L80 Special drift VAM ACE casing	175
13	244mm (9 5/8") 79kg/m L80 Special drift New VAM box x VAM ACE pin crossover	1
14	244mm (9 5/8") 79kg/m L80 Special drift New VAM box x BTC pin crossover	1
15	Centralisers, bow type	55
16	Klampon protectors 244mm	1
17	Tam packer with 244mm (9 5/8") element	1
18	311mm (12 1/4") bits	4
19	Bit breaker plate 311mm	1
20	Anderdrift 8", with 6 5/8" reg coons.	1
22	NMDC 8"	1
23	311mm (12 1/4") string stabiliser	3
24	8" drilling jars	3
25	Sidetrack package	1 set
26	Fishing tools	as req'd
27	Surface plug set equipment including ball and dart launching manifold	1

**APPENDIX A**

**GEOLOGY SUMMARY**

**&**

**FORMATION EVALUATION**

## CONTENTS

<b>1. WELL OBJECTIVES</b>	<b>1</b>
<b>2. GEOLOGY</b>	<b>1</b>
2.1. General	1
2.2. Structure	1
2.3. Reservoir Stratigraphy	2
2.4. Predicted Section	2
2.5. Mud Logging	2
<b>3. CONVENTIONAL WIRELINE LOGGING</b>	<b>3</b>
3.1. Wireline Logging & Testing Program	4
3.2. VSP Data Processing	5
3.2.1. Air Consumption	5
3.2.2. Downhole receiver	6
<b>4. LOGGING WHILE DRILLING (LWD)</b>	<b>6</b>
<b>5. PROPOSED CORING PROGRAM</b>	<b>6</b>
5.1. Objectives	6
5.2. Intended Core Intervals	6
5.3. Correlation and coring guidelines	6
5.4. Core 1	7
5.5. Post Coring	7
<b>6. DATA DISTRIBUTION</b>	<b>7</b>
6.1. Cuttings	7
6.2. Cores	7
6.3. Geochemistry Samples	7
6.4. Sidewall Cores	7
6.5. Wireline Logs	8
6.6. Mudlog	8
6.7. Hydrocarbon Samples	8
<b>7. REPORTING REQUIREMENTS</b>	<b>9</b>
7.1. Geological	9
7.1.1. Geological Reporting	9
7.1.2. Mud Logging and Wireline Logs	9

**FIGURES****APPENDICES****ENCLOSURES**

} Not with Report

## 1. WELL OBJECTIVES

The primary objective of White Ibis 1 is to evaluate a series of Late Cretaceous to Palaeocene intra Eastern View Coal Measures (ECVM) stacked shoreline and delta plain reservoir seal couplets in a fault dependent closure situated over a basement high west of the Yolla Trough

The secondary objective of the well is to test a fault dependent structural closure at the Top ECVM top-sealed by the Late Eocene Demons Bluff Formation.

## 2. GEOLOGY

### 2.1. General

The White Ibis 1 well is to be drilled approximately 45 metres updip and approximately 4300 metres northwest along strike from Bass-3, an exploration well drilled by Esso in 1967. Bass-3 was plugged and abandoned after a Formation Integrity Test (FIT) recovered 29cf of gas, 800cc of condensate and 12259cc of discoloured water.

### 2.2. Structure

The basement high over which the White Ibis prospect lies formed during Early Cretaceous rifting between the Australian and Antarctic plates. During and post deposition of the overlying EVCM sediments, drape, compaction and growth faulting comprised the major mechanisms forming the positive structural feature at White Ibis.

Seismic data acquired since the drilling of Bass-3 has produced improved images at depth. These data have revealed that Bass-3 was drilled "off structure" leaving approximately 45 metres of updip potential at White Ibis.

In the Palaeocene primary target, seismic reflection data over the White Ibis structure has revealed distinct amplitude, AVO and acoustic impedance anomalies at an equivalent stratigraphic level to the FIT in Bass-3. Additionally, the AVO anomaly appears to conform with the structure suggesting that the anomaly could be a DHI.

Fault – seal analysis on the major bounding fault has been undertaken at White Ibis. Calibration with data from Yolla suggests a high probability that the White Ibis fault is sealing.

The smaller, secondary target at White Ibis has been mapped as a fault-independent four way dip closure at the Top EVCM. Hydrocarbons have been encountered at this level in both Cormorant-1 in T/18P and Yolla-1 in the adjoining T/RL1 permit.

### 2.3. Reservoir Stratigraphy

The primary reservoir targets at White Ibis-1 are the shoreface and fluvial sandstone beds of the Palaeocene and Late Cretaceous Eastern View Coal Measures.

The intra-EVCM sands were deposited in a combination of terrestrial and shoreface subaqueous/subaerial environments. Therefore, sand development and reservoir quality and continuity constitute significant risks in the Bass Basin. While it is possible to correlate regional sand trends within a gross sequence at the objective level, poor well control and the depositional history of individual sand packages makes correlation difficult at smaller scales.

AMOCO in 1987 interpreted logs and core from the Late Cretaceous and Palaeocene reservoir sands at Bass-3 to be interbedded lacustrine or estuarine silts, shales and channel sands overlain by stacked shoreface, delta plain channels, crevass splay and marsh sequences. These interbedded channel and shoreface sands and shales have an average porosity of 20% and measured permeabilities ranging from <1md to >300md and represent a series of stacked reservoir/seal couplets analogous to the stacked reservoirs found at Yolla-1.

The sediments present at the Top EVCM in Bass-3 were interpreted to have been deposited in a lower to upper shoreface setting. Porosity and permeability measured from core at this level in Bass-3 shows an average porosity of 25% and permeability ranging from <1 to >250 md.

Reservoir risk is considered to be low at White Ibis-1 based on core data and the FIT recovery of hydrocarbons at Bass-3. Evidence of the lateral continuity of major sand and shale packages, albeit showing variances in thickness and reservoir quality across the basin, is demonstrated by correlation between Bass-3, Koorkah-1, Aroo-1, Yolla-1 and Tilana-1 (Figure 1).

### 2.4. Predicted Section

See accompanying Figure 2.

### 2.5. Mud Logging

Geoservices will provide a state of the art computerised mudlogging and engineering data acquisition service comprising a data engineer and mud logger on each 12 hour tour.

#### Services will include:-

- A full well pressure monitoring service
- Continuous monitoring of drilling and geological parameters

- Calculated data analysis as required
- Daily and interval reporting
- Logs and graphs of drilling parameters vs time and/or depth
- Mudlog to be electronically transmitted in digital form on a daily basis to Premiers Perth office

Drilling parameters only will be recorded down to the 13-3/8" casing shoe at approximately 850m MD. Cuttings will be collected when the BOP's and marine riser are connected prior to drilling the 12 1/4" hole.

The mud loggers will bag, pack and distribute the samples as follows:

Sample Distribution	Hole Section	Frequency (m)	Unwashed (Sets)	Unwashed (Quantity)	Washed and Dried (Sets)	Washed and Dried (Quantity)
Premier Oil Australasia	12 1/4" Hole	5m to	1	300g	1	100g
		1750m	1	300g	1	100g
		3m to TD				
Boral	12 1/4" Hole	as above	1	300g	1	100g
			1	300g	1	100g
Mineral Resources Tasmania	12 1/4" Hole	-	not required	-	1	100g
BRS	12 1/4" Hole	-	not required	-	1	100g

Additionally one Samplex sample tray will be collected over the above intervals and retained at the wellsite until the completion of the drilling campaign.

### 3. CONVENTIONAL WIRELINE LOGGING

It is the intention of the Operator to have a fit for purpose and cost effective wireline logging program comprising a firm logging package and optional tools for additional evaluation should they be required. The table below outlines the logging program and the objectives the Operator hopes to achieve by using these tool combinations. Maximum tool combinability has been achieved in order to cut down on logging runs and hence rig time.

**3.1. Wireline Logging & Testing Program**

**PROPOSED LOGGING RUNS IF SIGNIFICANT HYDROCARBON SHOWS ARE ENCOUNTERED DURING DRILLING**

Logs will be run from TD to the 13<sup>3/8</sup>" casing shoe. The 17<sup>1/2</sup>" hole will be logged behind the 13<sup>3/8</sup>" casing when the final TD logs are run, therefore no intermediate logging suite is envisaged to be run. Should 9<sup>5/8</sup>" casing be run prior to reaching TD and before intersecting the zones of interest the Operator proposes to run a PEX-Sonic logging string for intermediate petrophysical data.

FINAL LOGGING SUITE	Indicate if Firm or Optional	Yolla-2
Run 1. PEX-CMR*	Firm	Conventional logging tools will be used as backup, CMR contingent
Run 2. FMS*-Array Sonic	Firm	FMS will to obtain structural & stratigraphic dip information, sedimentary analysis and depth matching/ orientation of cores. Sonic will provide porosity, shear seismic, thin-bed and sand strength information
Run 3. Modular Dynamics Formation Tester (MDT)* and NGT* correlation tool	Firm	Objective to obtain baseline formation pressure profile in reservoir sands, to confirm hydraulic continuity and to sample zones of interest( up to 40 pressures and 3 samples)
Run 4. VSP*	Firm	A maximum of 50 levels to obtain velocity information and time correlation to surface seismic open hole (could also be run in cased hole if required)
Run 5. CST (Sidewall Cores)	Optional	Contingent on core recovery, and/or hydrocarbon evaluation (contact definition) and/or age dating. Anticipate 30 shots

\*CMR is contingent on its successful use in Yolla-2 and on significant hydrocarbon shows in drilling returns during the drilling of White Ibis. If CMR is not used the Array Sonic will be combined with the PEX tool.

\*FMS will not be run if no significant hydrocarbon shows are encountered during drilling. An SHDT dipmeter tool will be on board the rig for collecting structural dip information should it be required. The SHDT tool is part of the Schlumberger contracted "Bundle of Tools"

\*MDT a program will be undertaken if significant hydrocarbon shows are encountered during drilling. An NGT spectral gamma ray tool may be utilised with the MDT depending on its usefulness in Yolla-2.

\*VSP is contingent on significant hydrocarbon shows. If hydrocarbons are not encountered a simple velocity check shot survey will be conducted.

### 3.2. VSP Data Processing

VSP data processing will include paper prints of VSP/Synthetic Seismogram composite displaying:-

- Corridor stack
- Synthetic Seismogram
- Drift curve
- Drift corrected sonic log
- Density Log
- Reflection Coefficient Log
- Acoustic Impedance Log
- Gamma ray, caliper, resistivity and any other selected log
- T-D listing of drift corrected check shots

Each composite will be displayed in Zero Phase SEG negative. For each phase, three different filter versions are required.

Digital VSP data in SEG-Y format is required and should include the unscaled, unfiltered, corridor stack and the scaled, filtered corridor stack, with possibly three different filters applied. Digital data in SEG-Y format of the Synthetic Seismogram is also required.

#### 3.2.1. Air Consumption

A G or GI gun array is to be used as the seismic energy source. Air will be supplied from compressed nitrogen bottles.

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NO. OF PAGES: 2  
 (including this page)

**SUBJECT: Coring Philosophy Addendum White Ibis-1**

Appendix A, page 6 & 7, section 5.2, 5.3-5.4, of the White Ibis Drilling Program has been modified in light of the lessons learnt during the Yolla-2 coring program, and should read:

### 5.2 Intended Core Intervals

The Operator will utilise an antiwhirl face discharge bit in the coring BHA to minimise core damage during cutting and optimise core recovery. A disposable aluminium inner core barrel will also be used. This will act as a ready made core transportation system.

One 18 metre core will be cut in the Palaeocene to Early Eocene reservoir sequence if developed and hydrocarbon bearing in White Ibis-1. This sequence occurs over the approximate interval 1950-2150m MD in Bass-3.

A good "hydrocarbon show" is defined here as an interval of at least 4m with evidence of sufficient porosity, permeability, and hydrocarbon saturation that it would be likely to produce if tested.

### 5.3 - 5.4 Correlation and coring guidelines

Bass-3 offset data will be utilised in choosing coring point. Continuous correlation of White Ibis mudlog data with the Bass-3 mudlog and wireline log data should be maintained during drilling.

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The most likely gas bearing reservoir is the Yolla Zone 3 (Z3) Sandstone equivalent. There are approximately 15m of claystone section above the Z3 sand in Bass-3. The equivalent section in Yolla 1 and 2 was much thicker. The top Z3 sands in Bass-3 are more blocky and less interbedded in nature than in Yolla 1 & 2. It is anticipated that a positive drilling break will occur when entering the top Z3 sand.

Regards

A handwritten signature in black ink, appearing to read "D Evans". The signature is written in a cursive style with a large, circular initial "D".

DAVID EVANS  
**Operations Geologist**

### 3.2.2. Downhole receiver

A dual Combinable Seismic Acquisition Tool (CSAT) configuration will be used to record the seismic wavefield at predetermined downhole locations. The decoupled sensor module of the CSAT prevents the signal distortion inherent in conventional open hole vertical seismic profiling tools.

## 4. LOGGING WHILE DRILLING (LWD)

LWD tools will not be utilised in White Ibis 1. An Anderdrift MWD tool will be incorporated in the drilling assembly to provide inclination data

## 5. PROPOSED CORING PROGRAM

### 5.1. Objectives

The objectives of the coring program are to provide core samples for direct measurement of reservoir properties using conventional and special core analysis techniques with which to calibrate electrical log measurements and to provide core for sedimentological analysis.

### 5.2. Intended Core Intervals

The Operator will utilise an antiwhirl face discharge bit in the coring BHA to minimise core damage during cutting and optimise core recovery. A disposable aluminium inner core barrel will also be used, this will act as a ready made core transportation system.

One 18 metre core will be cut in the Palaeocene to Early Eocene reservoir sequence (ideally the Z3S2973 sand equivalent in Yolla-1 if developed and hydrocarbon bearing in White Ibis-1). This sequence occurs over the interval 2053-2100m MD in Bass-3

A "good hydrocarbon show" is defined here as an interval of at least 2m with evidence of sufficient porosity, permeability, and hydrocarbon saturation that it would be likely to produce if tested.

Bass-3 offset data will be utilised in choosing coring point.

### 5.3. Correlation and coring guidelines

Continuous correlation of White Ibis mudlog data with the Bass-3 mudlog and wireline log data should be maintained during drilling.

The proposed cores are described below, however if correlation with Bass-3 is poor or if sandstones are poorly developed at the proposed coring points there may be a need to modify the objectives of the coring program as drilling progresses.

#### 5.4. Core 1

Coring of the S2973 sandstone should commence after drilling 8-10 metres of the sandstone and establishing the presence of a good hydrocarbon show. If the S2973 sandstone is absent or poorly developed a core should be taken in the next hydrocarbon bearing sandstone with good shows, if developed.

#### 5.5. Post Coring

Once the core is cut, brought to the surface, marked up and cut into 1 metre sections, the wellsite geologist can take rock chips from each end of the core for lithological and show evaluation, after which the core will be "resinated". Non fluorescing resin is poured down the annulus of the 1 metre sections to further stabilise the core for transportation and reduce fluid evaporation.

The core will then be carefully packed and shipped in a normal sea container as soon as possible to the Operator's shore base facility for forward air freighting to the Operators Core analysis Laboratory in Perth

### 6. DATA DISTRIBUTION

#### 6.1. Cuttings

Sets of cuttings will be distributed at the conclusion of drilling. Addresses will be advised.

#### 6.2. Cores

The one meter lengths of aluminium and resin encapsulated core will be carefully packed and shipped in a normal sea container as soon as possible to the Operator's shore base facility for forward shipment to the Operators Core analysis Laboratory in Perth.

#### 6.3. Geochemistry Samples

When spot samples of cuttings, core chips, rig lubricants or mud are taken for geochemical analysis, send them to Premier Oil, Perth, attention Operations Geologist.

#### 6.4. Sidewall Cores

Sidewall cores are to be delivered or hand carried to Premier Oil, Perth, attention Operations Geologist.

## 6.5. Wireline Logs

For each suite:

An ASCII file of principle logs sampled at .1524m will be created on floppy disk and transmitted digitally to Premier Oil. The file should be prepared and transmitted between logging runs.

Fax a print of each log over the reservoir section (1:500) to Premier Oil as soon as possible.

Copies of all logs will be dispatched to Premier Oil, Perth as follows:

Film:	1 copy at 1:500 and 1:200
Paper Prints:	5 copies of each film
Digital Tape:	1 tape LIS format

Some processing of FMS, VSP and CMR data may be required. Five copies of each report will required.

At the conclusion, an edited tape for the well will be generated.

## 6.6. Mudlog

The mudlog is to be brought up to date at 0600 hours (Perth time) each morning with the information available at that time. The mudlog for the previous 24 hours progress is to be faxed to Premier Oil, Perth by 0730 hours - attention Operations Geologist.

An ASCII file of drill rate, chromatograph and other relevant curves for the same period will be prepared and transmitted to Premier Oil at the same time.

At the conclusion of drilling the following copies of the Mudlog, Pressure Log and Gas Ratio Log are required:

Film:	1 copy
Prints:	5 copies
3 1/2" disk:	1 copy ASCII file of relevant logs

A full report (5 copies) will be provided after the conclusion of the well.

## 6.7. Hydrocarbon Samples

Water and gas samples from DSTs and all fluid samples recovered from the MDT will be retained by Premier Oil for analysis.

## **7. REPORTING REQUIREMENTS**

The reporting requirements are summarised in the table below. All daily reports to partners will be sent at about 0900 hours from the Perth office. All times refer to Perth time.

### **7.1. Geological**

#### **7.1.1. Geological Reporting**

The Daily Geological Report covering the samples available in the period 0600 to 0600 hours is to be sent to Premier Oil, Perth by 07:30 hours - attention Operations Geologist. Status report to be made by telephone to Operations Geologist at 1600 hours.

#### **7.1.2. Mud Logging and Wireline Logs**

See sections 5.6, 5.7 and 5.8 above.

**APPENDIX B**

**DRILLING FLUID PROGRAM**

**DRILLING FLUID PROGRAM****914MM (36") HOLE / 762mm (30") CASING TO 132 M (RKB)****444MM (17½") HOLE / 340mm (13<sup>3</sup>/<sub>8</sub>") CASING TO 850 M (RKB)****SYSTEM DISCUSSION**

These sections are to be drilled with seawater, slugging the hole on connections with high viscosity /high yield point fluid. No shallow gas has been encountered on offset wells.

To provide adequate lifting capacity and ensure clean hole, high volume, high viscosity pills are to be pumped every single or as deemed necessary – 120+ vis, 8 -12 m<sup>3</sup>. This pill volume is sufficient to cover ca. 20 M annular volume. The frequency of these pills should be increased if there is any indication of poor hole cleaning, eg fill on connections.

For the 444mm (17½") section, the same system is to be used. The volume of hi-vis pills is reduced, 5 m<sup>3</sup> every single.

To reduce drill water requirements and provide a more economical fluid, guar gum rather than bentonite is to be used to build the hi-vis sweeps.

Prior to check trip and also the conductor/casing run, the open hole is to be over-displaced with viscous bentonite mud to minimise fill. The final displacement mud is to be un-weighted.

Sufficient chemicals are to be onboard to spud the well twice.

A contingency stock of drilling detergent should be held in the event of bit balling. 2% v/v is recommended in all sweeps pumped should this occurrence be noted.

**SPUD SYSTEM****914mm (36") Hole / 762mm (30") Casing to 132 M (RKB)****444mm (17½") Hole / 340mm (13<sup>3</sup>/<sub>8</sub>") Casing to 850 M (RKB) (Cont'd)****SYSTEM FORMULATION PER CUBIC METRE****HI-VIS SWEEPS**Sea Water: 0.99 m<sup>3</sup>Guar Gum: 10.0 kg/m<sup>3</sup>

**BENTONITE DISPLACEMENT FLUID**

Drill Water: 0.97 m3  
 Soda Ash: 0.72 kg/m3  
 Caustic Soda: 0.72 kg/m3  
 Bentonite: 85.8 kg/m3

**914mm (36") Hole / 762mm (30") Casing to 132 M (RKB)**

**444mm Hole / 340mm (13<sup>3</sup>/<sub>8</sub>") Casing to 850 M (RKB) (Cont'd)**

**SPUD SYSTEM****RECOMMENDED PROPERTIES**

	<b><u>HI-VIS SWEEPS</u></b>	<b><u>BENTONITE DISPLACEMENT</u></b>
DENSITY:	Native (1.02 s.g.)	Unweighted – 1.05 s.g.
FUNNEL VISCOSITY :	>120 secs / ltr	>100 secs / ltr
YIELD POINT:	> 28 pascals	> 19 pascals
API FL:	No control	No control

**ENGINEERING COMMENTS**

1. When Guar Gum is used, a neutral pH should be maintained. No lime or caustic soda additions should be made.
2. Prior to check trip and running casing, displace the hole to bentonite slurry and circulate out BHA to ensure clean hole and reduce hole fill.
3. Do not add lime to the displacement slurries as:
  - a) flocculation increases the fluid loss of the slurry and thus cause thicker wall cake on any exposed sands, and
  - b) flocculation results in air entrapment and difficulty in weighting up the system, if dictated by hole conditions.

Drilling Fluid Procedure (Cont'd)311 mm (12 1/4") HOLE / 244mm (9 5/8") CASING TO 2,150 M (RKB)KCl/IDBOND PHPA POLYMER SYSTEM

Reactive and dispersible shale formations will be encountered in this interval.

A KCl / IDBOND polymer is recommended to provide the level of inhibition required for successful drilling.

Based on offset well experience, a level of 5% w/w of potassium chloride is recommended. Nevertheless, cuttings must be carefully examined for any signs of hydration (lack of inhibition) and appropriate corrective action initiated, if necessary.

The inhibitive effect of the potassium ion will be supplemented by additions of **IDBOND**, PHPA polymer. This polymer encapsulates drilled cuttings, minimising their dispersion and improving solids control efficiency. Dilution rates will therefore be lowered. **IDBOND** also "plasters" off the wellbore, minimising filtrate invasion and enhancing wellbore stability. Additions will be stopped prior to reaching the prognosed depth of the reservoir.

Like all non-dispersed water-based fluids, this system is sensitive to the levels of entrained drilled solids. These must be carefully monitored and controlled at a maximum of 6% v/v to control the rheology, particularly the gel strengths in the desired ranges.

Fluid yield point is to be 18-22 kg/100ft<sup>2</sup> in this section to ensure good hole cleaning at the anticipated high rates of penetration.

Of critical importance to the successful completion of this interval is mud weight.

Mud density should be controlled initially at 1.1 s.g., and raised as hole conditions dictate. Mud weights up to 1.20 s.g. have typically been used by section TD.

Lost circulation has been observed to siltstones and sandstones below the 340mm (13 3/8") casing shoe. Any increase in mud weight should be made only in response to hole conditions.

Differential sticking in the reservoir is always a potential occurrence, though it has not been encountered on offset wells.

The fluid loss must be strictly controlled below 6mls to minimise the possibility of differential sticking. Filter cake thickness must be carefully monitored and maintained as thin and tough as possible.

No high temperature products or high temperature stabilisers will be required.

**Drilling Fluid Procedure (Cont'd)****311 mm (12 1/4") Hole 244mm (9 5/8") Casing to 2,150 M (RKB) (Cont'd)****INITIAL SYSTEM FORMULATION FOR 1 M3 OF KCl/IDBOND PHPA POLYMER**

Drill Water (m3)	0.96
IDVIS D (kg)	2.15
IDF-FLR (kg)	4.30
IDFLO B (kg)	5.7
KCl (kg)	50.0
Caustic Potash (kg)	0.57
IDBOND L (kg)	4.77 while drilling shale

**EXPECTED PROPERTIES**

DENSITY (s.g.)	1.03
PLASTIC VISCOSITY (cps) @120°F	10 – 15
YIELD POINT (pascals)	8.6 – 10.5 @ 120°F
GELS (pascals)	1.4 / 2.8
API FLUID LOSS (mls)	< 8
KCl (% w/w)	5
IDBOND Active Polymer (kg/m3)	1.43
pH	9

**RECOMMENDED PROPERTIES**

DENSITY (S.G.)	1.09 – 1.20
PLASTIC VISCOSITY @ 120 F (cps)	A.L.A.P
YIELD POINT @ 120 F (pascals)	8.6 – 10.5
FUNNEL VISCOSITY (sec/ltr)	Report with Temperature
GELS (pascals)	2.4 / 4.8 – 7.2 / 14.4
KCl (% w/w brine phase)	5 or as hole conditions dictate
IDBOND Active Polymer (kg/m3)	1.43 – 2.86 while drilling shale
pH	+/- 9.0
MAXIMUM DRILL SOLIDS (% v/v)	< 6.0
MBT (kg/m3 equivalent bentonite)	< 71.5
API FLUID LOSS (mls)	6.0 – 8.0

**Drilling Fluid Procedure (Cont'd)****311 mm (12 1/4") HOLE SECTION****SPECIFIC ENGINEERING COMMENTS****1. DRILLING OUT SHOE**

Drill out the shoe and clean out the rat hole using seawater and viscous pills (using fluid displaced from inside 340mm (13 3/8") casing). This will eliminate cement contamination of the new polymer fluid and subsequent conditioning.

**2. RESERVE VOLUME**

The properties of all water-based muds can deteriorate much more rapidly than oil-based muds due to their greater degree of interaction with formation drilled.

Frequent checking of the active system is essential. Premix volume of approximately 25-30% of the active volume must be available at all times in the event of major whole mud dilution being required to control mud properties.

**3. STOCK LEVELS**

Dilution rates of up to 0.3 m3/M can be expected.

It remains essential that sufficient stocks of materials are available to cope with these estimated dilution rates.

Suggested minimum stock levels to start this section are:

120	Sx	<b>IDVIS D polymer</b>
240	Sx	<b>IDF-FLR</b>
320	Sx	<b>IDFLO B</b>
80	Sx	<b>IDF-FLR XL</b>
80	Dm	Caustic Potash
250	MT	Barite
24	Dm	<b>IDCIDE L</b>
32	Dm	<b>DEFOAMER</b>
16	Dm	<b>DRILLING DETERGENT</b>
192	Dm	<b>IDBOND</b>

**4. MUD WEIGHT**

Initial mud weight is to be controlled at 1.1 s.g. - use of a lower density will probably result in tight hole and even caving formation. Increases in mud weight are to be made **ONLY** in response to tight hole conditions and/or caving formation due to the possibility of losses to siltstone and sandstone formation below the 340mm (13 3/8") casing shoe.

Losses and differential sticking in the reservoir are potential occurrences. Increases in mud density are to be made **ONLY** in response to alleviate tight hole and/or caving formation or control formation pressures and are to be made incrementally.

**STRICT CONTROL IS REQUIRED.** Only use a tru-weight (pressurised) mud balance.

5. **INHIBITION LEVEL**

An ion selective electrode is to be used to determine the potassium ion level in the fluid.

On no account is the chloride level to be used as an indication of the potassium ion concentration. The potassium concentration should be maintained either by direct addition of KCl powder to the active system or by suitably dosed premixes.

Should bit balling occur, inhibition levels should be reviewed. As a temporary measure, addition of 1.0% v/v Drilling Detergent (1 x 200 lt dm per 20 m<sup>3</sup> of mud) is recommended.

The inhibition of the system can be increased by incremental increases of potassium chloride of 5 ppb.

All premixes are to be formulated with 4.77 kg/m<sup>3</sup> **IDBOND Liquid PHPA**.

All maintenance additions of PHPA are to be made using **IDBOND** liquid PHPA **DIRECTLY** to the active system. Use of the liquid product will provide for easier and more effective addition while drilling.

An excess of **IDBOND** of 1.43 – 2.86 kg/m<sup>3</sup> is to be maintained. As a guideline, 2 drums of **IDBOND** liquid PHPA will have to be added directly to the active for every 30 M of hole drilled.

6. **pH**

The pH is to be maintained at ca.9 to reduce corrosion but also minimise dispersion of claystone.

Caustic potash is to be used for pH control rather than caustic soda which will provide additional potassium ions and so aid inhibition.

7. **FLUID LOSS**

API filtrate is to be controlled between 6 - 8mls down to the prognosed depth of the top of the reservoir.

Prior to drilling ahead through the reservoir, the API fluid loss must be lowered to below 6 mls to minimise the potential for differential sticking. This fluid loss must be maintained at this level to TD. Should any increases in mud density have to be made, say 0.05 s.g. and more, the fluid loss should be lowered further to ca.4mls.

**8. SOLIDS CONTROL EQUIPMENT**

Once the polymers have been sheared, the finest possible screens must be utilised on the shale shakers.

Mud cleaner / desilter is to be run only in the event of problems with shaker screen blinding.

**9. BIOCIDE TREATMENT**

Test slides are to be used on a daily basis to determine the level of bacteria present in the mud. Close monitoring of filtrate loss and pH in conjunction with the results of "bug" tests will determine whether treatment with biocide, **IDCIDE L**, is necessary. The use of biocide treated starch, **IDFLO B** should minimise, if not eliminate the need for any biocide treatment.

**10. CARBONATE CONTAMINATION**

Carbon dioxide contamination has been encountered on offset wells below 1700 M. A Garret Gas Train will be used to monitor the drilling fluid for the presence of carbonates.

Treatment with lime or calcium chloride may be required, depending on the pH of the drilling fluid.

**APPENDIX C**

**CEMENTING PROGRAM**

## Cementing program 762 mm (30") Conductor

### Objective:

Required TOC is at seabed. Case off the unconsolidated formation by setting the 30" (762 mm) casing 60m below the seabed at 151m RKB. A tail pipe below the casing running tool will be used to ensure cement to surface with minimum excess slurry pumped.

### Well considerations:

No hydrocarbons are expected and formation pressures are hydrostatic at 1.02 sg equivalent. BHST/BHCT=27/27 degrees Celsius

The maximum expected ECD for this job is 1.3 sg (referenced to sealevel) at the 30" (762 mm) shoe. Based on this value losses are unlikely to occur. If total losses do seem to occur, it should be attempted to reduce the pump rate. If total losses occur, a topfill job may be attempted through spaghetti tubing.

### Centralisation:

The well is planned vertical and for this short section no centralisers should be required. Also indications from the attached simulations show that even at minimum casing stand-off the slurry will still efficiently displace any fluid in front of it.

### Slurry considerations:

A single 1.90 sg Class 'G' slurry is proposed with the following composition:

Class 'G' cement	sk of 94 lbs (42.6 kg)
Seawater	5.16 gal/sk (458 ltr/mT)
D047 Antifoam	0.01 gal/sk (0.9 ltr/mT)
CaCl <sub>2</sub> Accelerator	2% BWOC
Density	15.8 ppg (1.90 sg)
Yield	1.16 cuft/sk (0.78 m <sup>3</sup> /mT)
Thickening time	+/-2 hrs
24 hr. comp. Strength	+/-3000 psi

### Slurry volume:

The estimated slurry volume is based on 30" (762 mm) casing in 36" (914 mm) open hole plus 150 % excess.

The slurry will be mixed and pumped until good returns of slurry are seen at the seabed. Once good slurry returns have been verified, the string can be displaced with 5 bbl (0.8 m<sup>3</sup>) seawater (is underdisplaced by +/- 2 bbl (0.3 m<sup>3</sup>)). The slurry is advised to be under displaced in order to minimise the possibility of a wet shoe.

**Spacer considerations:**

70 bbl (11.1 m<sup>3</sup>) of clean seawater ahead of the slurry should be sufficient to remove any remains of gel sweeps used while drilling.

**Note: To help spotting the slurry when it comes to the seabed, and therewith reducing the amount of excess slurry pumped, a tracer can be mixed in the last 10 bbl (1.6 m<sup>3</sup>) of seawater ahead of the slurry.**

**Pumping and Operational Program:**

1. Rig up cement lines and line for mudcirculation.
2. Circulate minimum of bottoms up till returns are clean.
3. Break circulation with cement unit and pressure test lines
4. Pump 70 bbl (11.1 m<sup>3</sup>) of seawater @ 7 bpm (1100 lpm).
5. Mix and pump slurry at 1.90 sg at 6-7 bpm (950-1100 lpm), until good slurry returns are observed at seabed.
6. Electronic density measurements to be verified against pressurised mudbalance regularly throughout the job for Quality Assurance.
7. Mixwater, dry cement and slurry samples to be taken.
8. Once good slurry returns at seabed have been verified, displace with 5 bbl (0.8 m<sup>3</sup>) seawater.

Note: Using this volume, the slurry is under displaced by +/- 2 bbl (0.3 m<sup>3</sup>). (To avoid contamination of the shoetrack when no dart is used).

**Note: Displacement volume is based on 5" (127 mm), 19.5#/ft (29 kg/m) drillpipe. The displacement volume needs to be recalculated on the rig, once the exact composition of the inner string has been confirmed.**

7. Bleed off pressure, if any, and check for returns.

## Cementing program 340mm (13<sup>3</sup>/<sub>8</sub>" ) Casing

### Objective:

Required TOC is at seabed. The 13 3/8" (340 mm) conductor will be set at 850 meter to allow use of the riser and provide well control for the next section. Subsea plug release system will be used for separating wash, slurry and displacement.

### Well considerations:

No hydrocarbons are expected and formation pressures are hydrostatic at 1.02 sg equivalent.

BHST/BHCT= 40/36 degrees Celsius (based on 3 degC/100m plus seabed of 15 degC.) The maximum expected ECD for this job is 1.40 sg (referenced to sealevel) at the 13 3/8" (340 mm) shoe and 1.12 sg at the 30" (762 mm) shoe. Based on the expected ECD's, losses are unlikely to occur.

If total losses do seem to occur, it should be attempted to reduce the pump rate. If total losses occur, a topfill job may be attempted through spaghetti tubing.

### Centralisation:

The well is planned vertical, but even a small deviation will cause the casing to sit against the borehole, which may jeopardise a good bonding and hydraulic seal. For cementing purposes, at least the first two joints are recommended to be centralised with two ST-A4 centraliser per joint and remainder of the tail slurry section upto 700 meter RKB with 1 centraliser every two joints.

### Slurry considerations:

A 1.44 sg Class 'G' slurry is proposed for the lead slurry, followed by a 1.90 sg tail slurry to provide a strong cement at the 13 3/8" shoe. Composition of slurries is as follows:

	<u>Lead</u>	<u>Tail</u>
Class 'G' cement	sk of 94 lbs (42.6 kg)	sk of 94 lbs (42.6 kg)
Seawater	15.17 gal/sk (1347 ltr/mT)	5.32 gal/sk (472 ltr/mT)
D047 Antifoam	0.01 gal/sk (0.9 ltr/mT)	0.01 gal/sk (0.9 ltr/mT)
D075 Extender	0.50 gal/sk (44.4 ltr/mT)	--
Density	12.0 ppg (1.44 sg)	15.8 ppg (1.90 sg)
Yield	2.55 cuft/sk (1.69 m3/mT)	1.16 cuft/sk (0.78 m3/mT)
Thickening time	+/-3 hrs	+/-6 hrs
24 hr comp. Strength	+/- 500 psi	+/-4500 psi

**Slurry volume:**

The estimated slurry volume is based on 13 3/8" (340 mm) casing in 17 1/2" (445 mm) open hole plus 100% excess. The excess may be increased depending on hole conditions. The volume based on 100% works out at 690 bbl (100 m<sup>3</sup>) of slurry: 122 bbl (19.5 m<sup>3</sup>) of tail slurry to cover 150 meter annular length and 568 bbl (80.5 m<sup>3</sup>) of lead slurry to take TOC to seabed.

**Spacer considerations:**

70 bbl (11.1 m<sup>3</sup>) of clean seawater ahead of the slurry should be sufficient to remove any remains of gel sweeps used while drilling.

**Note: To help spotting the slurry when it comes to the seabed, and therewith reducing the amount of excess slurry pumped, a tracer can be mixed in the last 10 bbl (1.6 m<sup>3</sup>) of seawater ahead of the slurry.**

**Pumping and Operational Program:**

1. Rig up subsea cement head, cement lines and line for mudcirculation.
2. Circulate minimum of bottoms up till returns are clean.
3. Break circulation with cement unit and pressure test lines
4. Pump 70 bbl (11.1 m<sup>3</sup>) of seawater @ 7 bpm (1100 lpm).
5. Release ball for bottom plug
6. Mix and pump 568 bbl (80.5 m<sup>3</sup>) of 1.44 sg lead slurry at 7-8 bpm (1100-1270 lpm)
7. Mix and pump a minimum 125 bbl (19.9 m<sup>3</sup>) of 1.90 sg tail slurry at 6-7 bpm (950-1100 lpm).
8. Electronic density measurements to be verified against pressurised mudbalance regularly throughout the job for Quality Assurance.
9. Mixwater, dry cement and slurry samples to be taken.
10. Release dart for top plug
11. Displace with mud at minimum 15 bpm (2385 lpm). The first 10 bbl (1.6 m<sup>3</sup>) should be pumped at reduced rate in order to get a positive pressure indication when the dart launches the top plug.

12. Slow down to 5 bpm (795 lpm) for the last 10 bbl (1.6 m3) in order to have a controlled bumping of the plug.
13. Bump plug and pressure test casing as required
14. Bleed off pressure and check for returns.

## **Cementing program 244mm (9<sup>5</sup>/<sub>8</sub>" ) Casing**

### **Objective:**

Required TOC is at 1400 meter (+/-200 meter above shallowest expected hydrocarbon bearing zone at EVCM). The 244mm (9 5/8") production casing will be set at 2150 meter. 9 5/8" casing will be run to surface and full bore plugs will be used for separating spacer, slurry and displacement.

### **Well considerations:**

Hydrocarbons are expected and formation pressures are at this point unknown but not expected to be highly over pressured. BHST/BHCT= 80/ degrees Celsius (based on 3 degC/100m plus seabed of 15 degC.). Top of zone of interest is 1400 meter.

The maximum expected ECD (based on static cement column) for this job is 1.44 sg (referenced to rigfloor) at the 9 5/8" (244 mm) shoe.

If total losses occur during the job, it should be attempted to reduce the pumprate. As U-tubing will occur during this job, a temporary reduction of returns should not be confused with losses.

### **Centralisation:**

The well is planned vertical, but even a small deviation will cause the casing to sit against the borehole, which will jeopardise a good bonding and hydraulic seal. For a good seal and bonding across the reservoir section, the first two joints are recommended to be centralised with two ST-A3 centralisers per joint, and a further 850 meter (upto 100 meter above zone of interest) should be centralised with one centraliser per joint.

If prevention of annular flows and/or pressures is a concern in this area, ST-A3 centralisers should be run at 1 per 2 joints upto required TOC at 1400 meter.

**Slurry considerations:**

Because the operator is not expecting the bottom hole static temperature to be above 90 degrees Celsius, the slurry designs are without silica. No lead slurry is required. A 1.90 sg Class 'G' filler slurry is proposed for the tail slurry to provide a strong cement across the zone of interest. The slurry compositions are as follows:

	<u>Lead</u>	<u>Tail</u>
Class 'G' cement	sk of 94 lbs (42.6 kg)	sk of 94 lbs (42.6 kg)
Seawater	9.75 gal/sk (865 ltr/mT)	--
Drillwater	--	3.99 gal/sk (354 ltr/mT)
D047 Antifoam	0.01 gal/sk (0.9 ltr/mT)	0.03 gal/sk (2.7 ltr/mT)
D075 Extender	0.35 gal/sk (31.1 ltr/mT)	--
D300 FLAC	--	0.90 gal/sk (79.9 ltr/mT)
D145 Dispersant	--	0.25 gal/sk (22.2 ltr/mT)
D110 Retarder	0.25 gal/sk (22.2 ltr/mT)	0.03 gal/sk (2.7 ltr/mT)
Density	13.2 ppg (1.58 sg)	15.8 ppg (1.90 sg)
Yield	1.86 cuft/sk (1.24 m3/mT)	1.16 cuft/sk (0.78 m3/mT)
Thickening time	+/- 5.5 hrs	+/- 4 hrs
24 hr comp. Strength	+/- 1000 psi	+/- 4200 psi

**Slurry volume:**

The slurry volume should be based on caliper log plus 10% excess. For planning purposes the volume is based on 9 5/8" (244 mm) casing in 12 1/4" (311 mm) open hole plus 50% excess. For TOC at 1400 meter, the total required slurry volume is 205 bbl (33 m3) of slurry to take TOC to 1400 meter.

**Spacer considerations:**

To thin and remove mud from the annulus, it is advised to pump 70 bbl (11.1 m3) of turbulent Chemical wash to thin the mud and breakdown the filtercake (if formation pressures allow, more wash may be pumped). The chemical wash will be followed by 60 bbl (9.5 m3) of weighted Mudpush spacer to remove the filtercake.

**Pumping and Operational Program:**

1. Make up cement head to casing.
2. Rig up cement lines and line for mudcirculation.
3. Circulate minimum of bottoms up till returns are clean.
4. Break circulation with cement unit and pressure test lines
5. Pump 70 bbl (11.1 m3) of Chemical wash @ 7-8 bpm (1100-1270 lpm).

6. Pump 60 bbl (9.5 m3) of Mudpush spacer @ 7-8 bpm (1100-1270lpm)
7. Release bottom plug
8. Mix and pump a minimum 205 bbl (33 m3) of 1.90 sg tail slurry at 6-7 bpm (950-1100 lpm)
9. Electronic density measurements to be verified against pressurised mudbalance regularly throughout the job for Quality Assurance.
10. Mixwater, dry cement and slurry samples of each stage to be taken.
11. Release top plug
12. Displace with mud at 15 bpm (2385 lpm). Slow down to 5 bpm (795 lpm) for the last 10 bbl (1.6 m3) in order to have a controlled bumping of the plug.
13. Bump plug and pressure test casing as required
14. Bleed off pressure and check for returns.

**APPENDIX D**

**CASING DESIGN**

**Casing Design Summary**

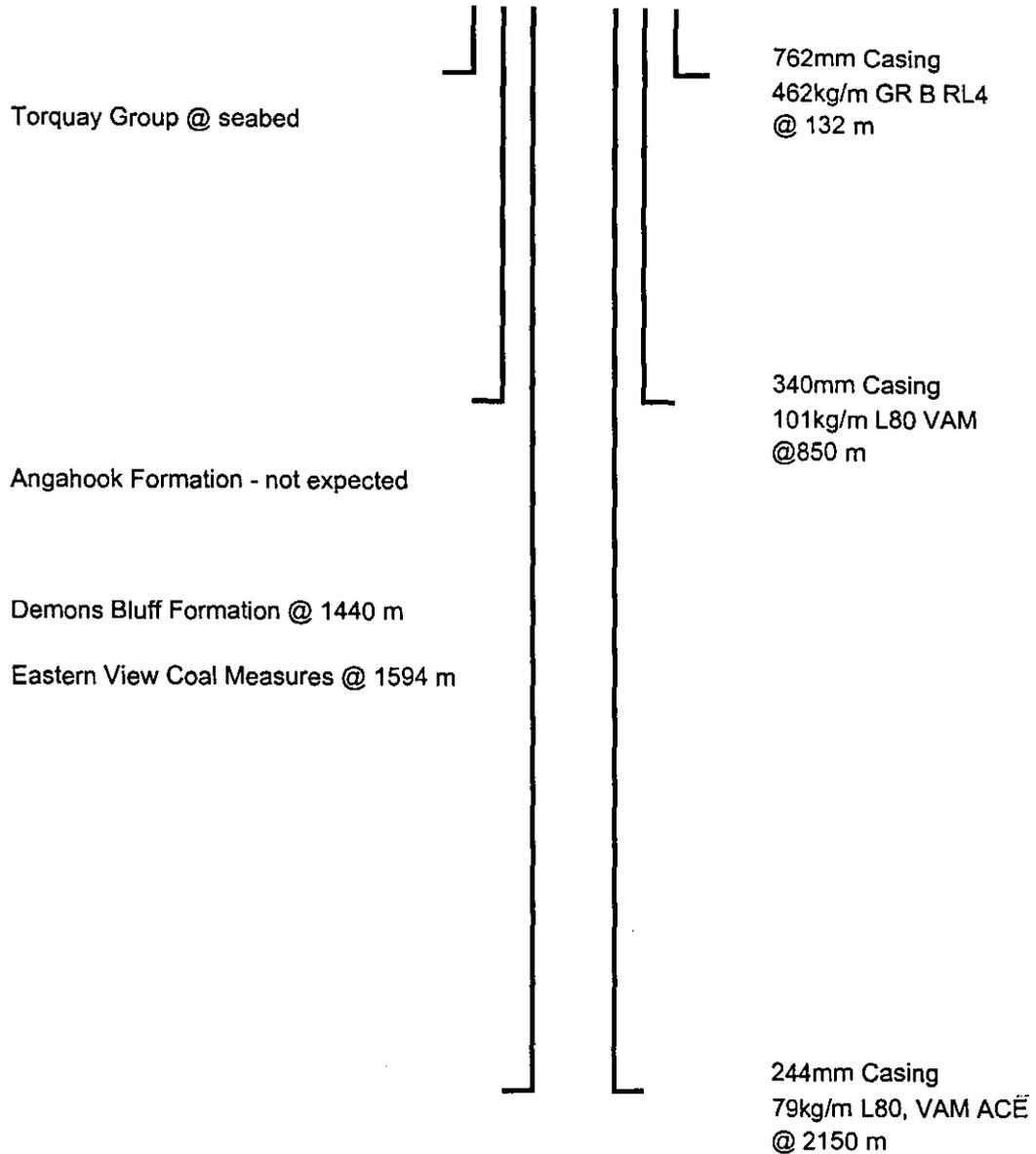
API minimum Design Safety Factors:-

BURST	1.1
COLLAPSE	1.05
TENSION	1.6

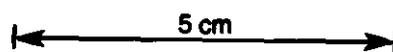
<b>Casing Size OD (mm)</b>	<b>762</b>	<b>340</b>	<b>244</b>
<b>Hole Size (mm)</b>	914	444	311
<b>Shoe Depth (m RKB)</b>	125	850	2150
<b>Casing Grade</b>	GR B	L80	L-80
<b>Casing Weight (kg/m)</b>	462	101	79.6
<b>Casing Connection</b>	ST-2	New VAM	New VAM / VAM ACE
<b>Casing Size ID (mm)</b>	711	315	216.8
<b>Casing Drift (mm)</b>		311.4	216 – special drift
<b>Minimum Internal Yield (kPa)</b>		33987	54669
<b>Collapse Resistance (kPa)</b>		15649	45638
<b>Tensile Strength (1000 kg)</b>		3431	2743
<b>Burst Design Factor</b>		2.08	2.66
<b>Collapse Design Factor</b>		1.60	2.37
<b>Tension Design Factor</b>		6.38	2.56
<b>Pressure Test (kPa)</b>		5500	28000
<b>Comments</b>	Conductor	Surface	Production

# WHITE IBIS - 1 CASING PROGRAMME (R.K.B.)

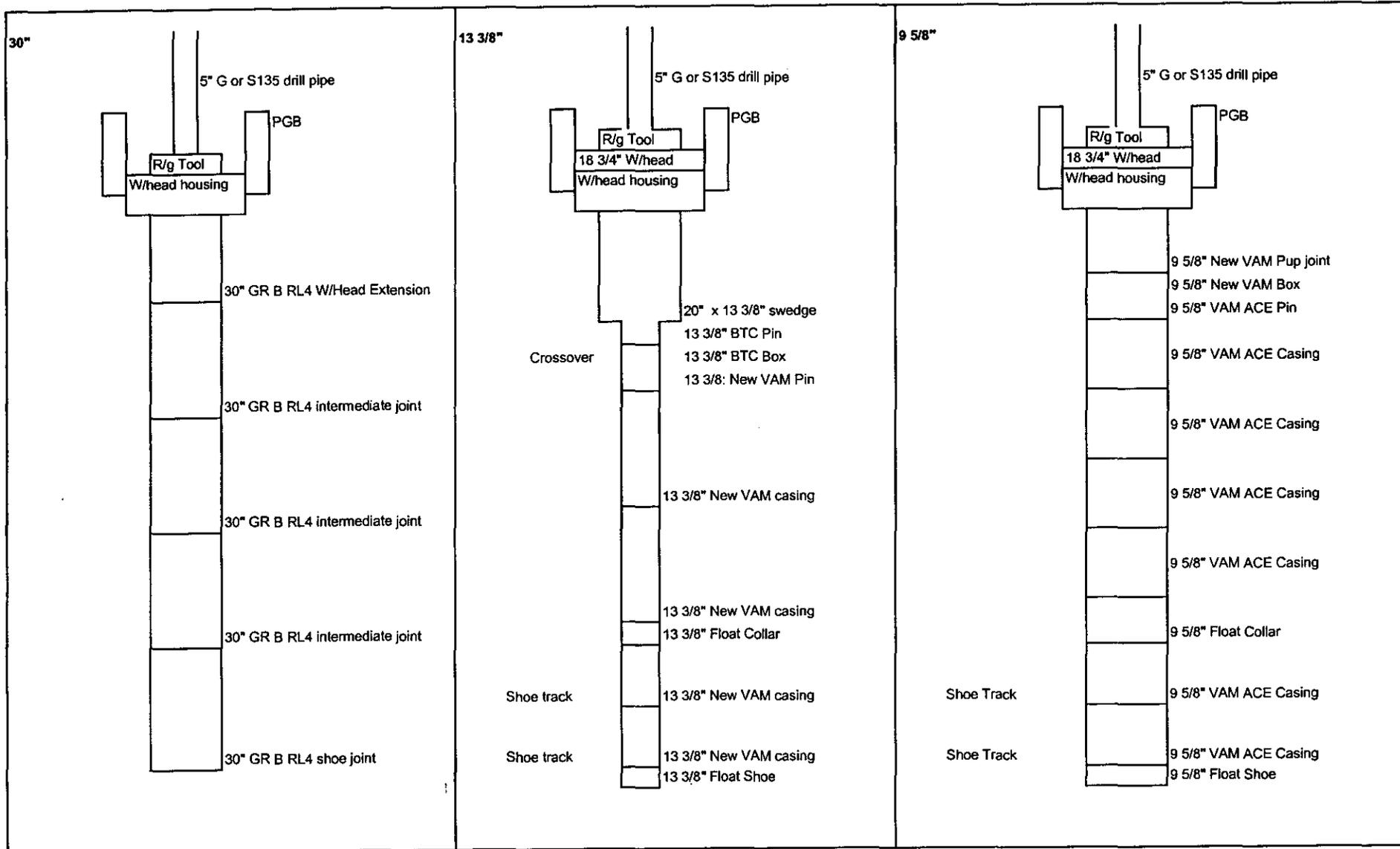
Water Depth 79.4m



\*\* Formation tops based on Yolla-1



**WHITE IBIS-1 Casing & Running Strings**



**KICK TOLERANCE  
CALCULATION SHEET**

WELL: White Ibis - 1

CURRENT MUD WT. =	10.00	ppg	1.20	s.g.
CURRENT HOLE SIZE =	12.25	in	311	mm
DRILL PIPE O.D.	5.00	in	127	mm
BHA ( COLLARS ) O.D.	8.0	in	203	mm
L.O.T. - E.M.W. =	13.34	ppg	1.60	s.g.
BHA LENGTH	404.5	ft	123.3	m
LAST CASING / LINER SET AT - TVD:	2788.85	ft	850.00	m
CURRENT DEPTH - TVD:	7054	ft	2150	m
INFLUX GRADIENT :	0.12	psi/ft	2.7	kPa/m
1 DRILL PIPE IN OPEN HOLE	3,860.75	ft	1176.7	m
2 BHA IN OPEN HOLE	404.55	ft	123.3	m
3 ANNULAR VOLUME OF O.H.				
Due to BHA	33.83	Bbls	5.4	m3
Due to D.P,	468.61	Bbls	74.5	m3
4 M.A.A.S.P.:	483.61	psi	3334.0	kPa
5 MAX SHOE PRESSURE	1,934.45	psi	13336.1	kPa
6 OH PRESSURE DUE TO MUD	2,218.93	psi	15297.3	kPa
7 ESTIMATED PORE PRESSURE	3,669.77	psi	25299.4	kPa
Assumes Mud weight only just overbalance				
8 HEIGHT OF INFLUX @ SHOE	1,208.34	ft	368.3	m
9 INFLUX VOLUME @ SHOE	146.7	Bbls	23.3	m3
10 INFLUX VOLUME @ TD	77.31	Bbls	12.3	m3
11 VOLUME AROUND COLLARS	33.83	Bbls	5.4	m3
12 HEIGHT OF INFLUX @ TD	762.82	ft	232.5	m

**KICK TOLERANCE =****77.3****Bbls****12.3****m3**

**SURFACE CASING DESIGN - 339.725 mm**

White Ibis - 1

**Selected casing specifications**

Proposed Casing Reference Number :			
Outside Diameter :	Cod	13.375 in	340 mm
Weight :	Wt	68.0 lb/ft	101.2 kg/m
Grade :		L-80	
Minimum Internal Yield pressure :	Miy	4,930 psi	33,987 kPa
Collapse Resistance :	Coll	2,270 psi	15,649 kPa
Tensile Strength :	Ten	1,556 k.lbs	3,431 k.kg
Internal Diameter :	Cid	12.415 in	315.3 mm
Casing Connection :		New VAM	

**Design Safety Factor Summary**

	Burst	Collapse	Tensile
Required DSF	1.10	1.05	1.60
Actual DSF	2.08	1.60	6.38
Meets Design Requirements?	Yes	Yes	Yes

**Design Considerations**

Depth of casing shoe	Dsh	2,789 ft	850 m
Mud density behind casing	Rmb	10.00 ppg	1.20 sg
Top of cement	Dtoc	0 ft	0 m
Cement slurry design :			
Lead slurry	Cml	12.6 ppg from	Dcmlt 0 to Dcmlb 2,297 ft
Tail slurry	Cmt	15.8 ppg from	2,297 to Dcmtb 2,789 ft
Next Hole section TD	Dtd	7,054 ft	2,150 m
Max pore pressure in next hole section	Rf	8.7 ppg	1.042 sg
Max mud weight in next hole section	Rm	10.0 ppg	1.200 sg
Leak-off at shoe	Rsh	13.3 ppg	1.60 sg
Gas gradient	Rg	0.12 psi/ft	2.71 kPa/m
Water depth	Dw	197 ft	60 m
Rotary table elevation	Drte	41 ft	12.5 m
Seawater gradient	Rsw	0.45 psi/ft	10.18 kPa/m
Casing Pressure tested to :	Cpt	800 psi	5,515 kPa/m

**Burst Design**

Internal loading condition :	Gas column to surface with influx at TD.		
External loading condition :	Water Depth		
Expected Pore Pressure :	10.0 ppg	1.20 sg	from offset data
Burst at Casing Head :	$(Dtd * Rf * 0.052) - ((Dtd - Dw - Drte) * Rg)$		
	Pbst =	2,369 psi	16,329 kPa
Burst design factor :	Miy / Pbst =	2.08	

**Collapse Design**

Internal loading condition :	Drilling at section TD and losses result in mud level dropping to 50% of hole depth		
External loading condition :	Hydrostatic pressure exerted by the column of mud behind casing		
Mud weight :	10.0 ppg	1.20 sg	
Mud level	=	3,527 ft	1,075 m
Dmcp	Maximum collapse pressure is at	2,789 ft	850 m
Max collapse pressure : Pcoll	$\{(Dmcp - (Dw + Drte)) \times Rmb \times 0.052\} + (Dw \times Rsw)$ = 1,416 psi		9,760 kPa
Collapse design factor :	Coll / Pcoll	=	1.60

**Collapse Cementing Check**

Internal loading condition :	Evacuated to seawater		
External loading condition :	Hydrostatic pressure due to a cement column 10% above programmed weight		
Collapse pressure at shoe : Pcolc	$\{(Dcmtb - Dcmtt) \times (Cmt \times 110\% \times 0.052) + (Dw \times Rsw) + \{(Dcmlt - Dw - Drte) \times Rmb \times 0.052\} + (Dcmlb - Dcmlt) \times (Cml \times 110\% \times 0.052)\} - \{(Dsh - (Dw + Drte)) \times Rsw\}$ = 917 psi		6,322 kPa
Collapse design factor :	Coll / Pcolc	=	2.48
Worst case collapse design factor :		=	1.60

**Tension Design**

Loading condition :	Weight of casing string in mud plus pressure test assuming no cement around outside of casing		
Mud weight :	10.0 ppg	1.20 sg	
Buoyancy Factor BF :	0.847		
Tension at mudline :			
due to weight :	Wt x (Dsh-Dw-Drte)	=	147,012 lbs      66,672 kg
due to press test :	Cpt x ((Cid/2) <sup>2</sup> x PI)	=	96,844 lbs      43,920 kg
	Tmax	=	243,856 lbs      110,592 kg
Tension design factor :	Ten / Tmax	=	6.38

**PRODUCTION CASING DESIGN - 9.625 in**

White Ibis - 1

**Selected casing specifications**

Proposed Casing Reference Number :			
Outside Diameter :	Cod	9.625 in	244.5 mm
Weight :	Wt	53.5 lb/ft	79.6 kg/m
Grade :		L-80	
Minimum Internal Yield pressure :	Miy	7,930 psi	54,669 kPa
Collapse Resistance :	Coll	6,620 psi	45,638 kPa
Tensile Strength :	Ten	1,244 k.lbs	2,743 k.kg
Internal Diameter :	Cid	8.535 in	216.8 mm
Casing Connection :		New VAM / VAM ACE	

**Design Safety Factor Summary**

	Burst	Collapse	Tensile
Required DSF	1.10	1.05	1.60
Actual DSF	2.66	2.37	2.56
Meets Design Requirements?	Yes	Yes	Yes

**Design Considerations**

Hole section TD	Dtd	7,054 ft	2,150.0 m
Depth of casing shoe	Dsh	7,054 ft	2,150.0 m
Mud density behind casing	Rmb	10.0 ppg	1.20 s.g
Max pore pressure	Rf	8.7 ppg	1.042 s.g
Max mud weight	Rm	10.0 ppg	1.20 s.g
Packer depth	Dpk	5,578 ft	1,700.0 m
Testing kill fluid density	Rtkf	10.8 ppg	1.30 s.g
Pore pressure at packer depth	Rftc	8.7 ppg	1.042 s.g
Top of cement	Dtoc	4,593 ft	1,400.0 m
Cement slurry design :			
Lead slurry	Cml	12.8 ppg from	Dcm1b 1,400 to 1,400 ft
Tail slurry	Cmt	15.8 ppg from	Dcm1b 1,400 to 7,054 ft
			Dcm1t Dcm1b
Gas gradient	Rg	0.12 psi/ft	2.7 kPa/m
Water depth	Dw	197 ft	60.0 m
Rotary table elevation	Drte	41 ft	12.5 m
Seawater gradient	Rw	0.45 psi/ft	10.2 kPa/m
Casing Pressure tested to :	Cpt	3,100 psi	21,371.4 kPa

**Burst Design**

Internal loading condition :	A tubing leak at surface while testing, applying reservoir pressure on top of a column of kill weight fluid		
External loading condition :	Pore pressure at packer setting depth		
Burst at Casing Head :	$((Dtd - Dw - Drte) \times Rf \times 0.052) - (Dtd \times Rg)$		
	Pbst	=	<b>2,233 psi</b>
Burst design factor :	Miy / Pbst	=	<b>3.55</b> (shoe)
Burst at Packer :	$((Dtd - Dw - Drte) \times Rf \times 0.052) - (Dtd \times Rg) + (Dpk \times Rtkf \times 0.052) - (Dtoc \times Rmb \times 0.052)$		
	Pbst	=	<b>2,987 psi</b>
Burst design factor :	Miy / Pbst	=	<b>2.66</b> (shoe)
Worst Case burst design factor :			<b>2.66</b>

**Collapse Design**

Internal loading condition :	Perforations plugged during testing and surface pressure bled to zero with full column of gas inside tubing		
External loading condition :	Hydrostatic pressure exerted by the column of mud behind casing		
Max collapse pressure : (at shoe)	$((D_{sh}-D_w-D_{rte}) \times R_{mb} \times 0.052) + \{D_w \times R_{sw} - (D_{td} \times R_g)\}$	Pcoll =	<input type="text" value="2,788 psi"/>
Collapse design factor :	Coll / Pcoll	=	<input type="text" value="2.37"/>

**Collapse Cementing Check**

Internal loading condition :	Hydrostatic pressure exerted by the column of water		
External loading condition :	Hydrostatic pressure due to a cement column 10% above programmed weight		
Collapse pressure at shoe :	$\{D_{cmlt} \times R_{mb} \times 0.052\} + \{(D_{cmtb} - D_{cmtt}) \times (C_{mt} \times 110\% \times 0.052)\} + \{(D_{cmlb} - D_{cmlt}) \times (C_{ml} \times 110\% \times 0.052)\} - (D_{sh} \times R_w)$	Pcolc =	<input type="text" value="2,664 psi"/>
Collapse design factor :	Coll / Pcolc	=	<input type="text" value="2.49"/>
Worst case collapse design factor :		=	<input type="text" value="2.37"/>

**Tension Design**

Loading condition :	Weight of casing string in mud plus pressure test assuming no cement around outside of casing		
Mud weight :	<input type="text" value="10.0 ppg"/>		
Buoyancy Factor BF :	<input type="text" value="0.85"/>		
Tension at mudline :			
due to weight :	$W_t \times (D_{sh}-D_w-D_{rte}) \times BF$	=	<input type="text" value="309,056 lbs"/>
due to press test :	$C_{pt} \times ((C_{id}/2)^2 \times PI)$	=	<input type="text" value="177,362 lbs"/>
	Tmax	=	<input type="text" value="486,418 lbs"/>
Tension design factor :	Ten / Tmax	=	<input type="text" value="2.56"/>

**APPENDIX E**

**BLOWOUT PREVENTER PRESSURE  
TESTING**

**BOP PRESSURE TESTING**

COMPONENT	311MM (12¼") HOLE
Annular Preventer	1400 / 24100
Pipe Rams	1400 / 27600
Blind Ram	1400 / 27600
Choke / Kill Lines	1400 / 27600
Choke Manifold	1400 / 27600

All pressures in kPa.

BOP's, choke manifold and other well control equipment will be tested at the following intervals, whichever comes first:

- after each new string of casing is run
- every 14 days regardless of the operation in progress

Before testing, ensure the casing annulus valve is opened to prevent casing collapse in the event of a wellhead seal leak.

Casing will be pressure tested, prior to drilling out the casing shoe, to the following pressures:

340mm (13 <sup>3</sup> / <sub>8</sub> ") Casing	5500 kPa
244mm (9 <sup>5</sup> / <sub>8</sub> ") Casing	28000 kPa

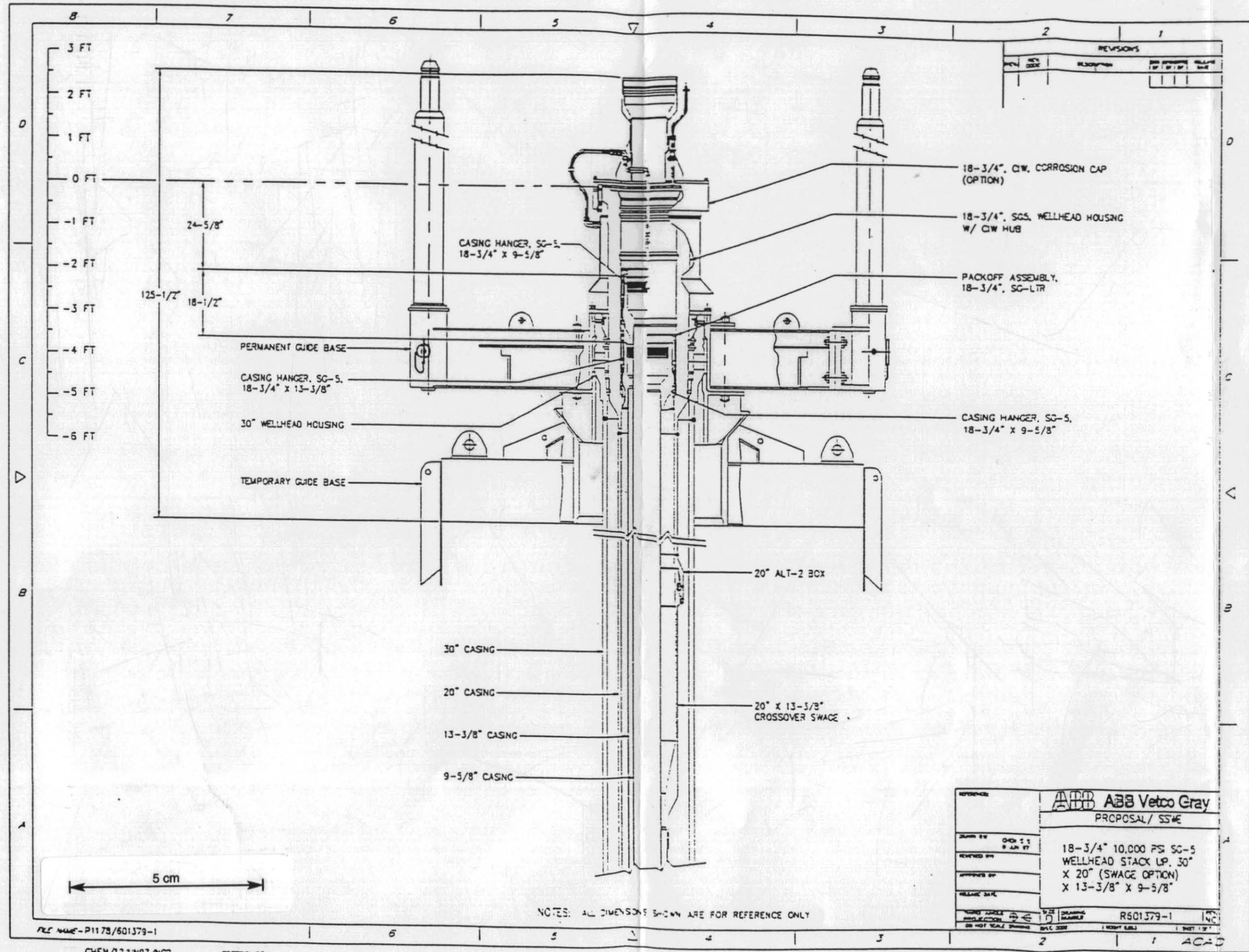
The 340mm (13<sup>3</sup>/<sub>8</sub>") casing pressure test is based on a surface pressure in excess of that required to breakdown the 340mm (13<sup>3</sup>/<sub>8</sub>") casing shoe with the casing fully evacuated to gas.

The 244mm (9<sup>5</sup>/<sub>8</sub>") casing pressure test is based on a surface pressure in excess of that expected if the well is fully evacuated to gas at TD of the 216mm (8½") hole section with a 1.04 SG equivalent formation pressure.

**APPENDIX F**

**WELLHEAD STACK-UP  
DIAGRAMS**

534086



REFERENCE	ABB Vetco Gray
	PROPOSAL/SSME
DESIGNED BY	CHEN T.T.
REVIEWED BY	9 JAN 97
APPROVED BY	
RELEASE DATE	
DRAWING NO.	R501379-1
SCALE	AS SHOWN
DATE	
BY	
CHECKED	
DATE	

FILE NAME-P1173/601379-1

CHEN/12JUN97/NC2

REFERENCE-

DRAWING NO. -

SALES ORDER-

REV-

CUSTOMER- MOBIL ESP

**APPENDIX G**

**REFERENCE DOCUMENTATION**

**Reference Documentation**

The following documents/information shall be available on the rig. Contact the Perth office if any of this information is required :

- PremierOil Australasia, Drilling Operations and HSE Manual
- PremierOil Australasia, Bass Basin Emergency Response Manual
- PremierOil Australasia, Bass Basin Oil Spill Contingency Plan
- PremierOil Australasia, Bass Basin Environmental Assessment
- PremierOil Australasia, Wellsite Geology Manual
- PremierOil Australasia, Bridging Document
- PremierOil Australasia, Well Control Procedures Manual
- Northern Explorer III Vessel Safety Case
- Northern Offshore Safety Management System
- Northern Offshore Emergency Response Manual

**APPENDIX H**

**SUPPORT SERVICES**

## SUPPORT SERVICES

### Marine Support Services

- 1) AHTS vessel details:

<u>Name</u>	<u>Type</u>	<u>Contractor</u>	<u>HP</u>	<u>Continuous Bollard Pull (Tonne)</u>
Pacific Commander	AHTS	Swire Pacific Offshore	7 040	85 T
Brute Tide	AHTS	Tidewater	8 160	126.8 sT

- 2) The shore base will be at Geelong, Victoria

- 3) One way transit time to location :

<u>Vessel</u>	<u>Economy</u>	<u>Full steam</u>
Pacific Commander	20 hrs	15 – 17 hrs
Brute Tide	20 hrs	15 – 17 hrs

### Helicopter Support Services

- 1) Helicopter Details :

<u>Type</u>	<u>Capacity to Rig</u>	<u>Capacity from Rig</u>
Sikorsky S76A++	9	11
Bell 412	9	11

- 2) The helicopter base will be at Essendon Airport.

- 3) One way transit time will be

<u>Aircraft</u>	<u>Transit Time</u>
Sikorsky S76A++	62 minutes
Bell 412	67 minutes

**APPENDIX J**

**CONTACT DIRECTORY**

534092

Premier Oil Australia Pty Limited  
(ACN 075 609 728)  
45 Ord Street (P.O. Box 1649)  
West Perth WA 6872

Telephone 61 8 9480 4100  
Facsimile 61 8 9324 1212  
Email @premieraus.com.au

**PremierOil**  
Australasia

## FACSIMILE

REF: Re081/WIB1.02/DJF/js  
CIRC: JB/MJ/BMU/PC

DATE: 4 June 1998

TO:	Mineral & Resources Tasmania	Carol Bacon	(03) 6233 8338
	DME, Victoria	Ahmed Nadji	(03) 9412 5152
	Premier Oil Far East	Richard Gray	0011 65 733 7651
	Premier Oil plc	Dermot O'Keefe	0011 44 171 730 4696
	Premier Oil, Geelong	Gordon Hunter	(03) 5272 2058
		Rick White	
	Northern Explorer III	Drilling Supervisor	872 3636 68320
		Wellsite Geologist	
		Rig Toolpusher	
	CalEnergy	Jane Duncan	0011 44 171 208 1620
	Boral Energy Resources	Angus Guthrie	(08) 8223 1851

FROM: David Evans

NO. OF PAGES: 3  
(including this page)

**SUBJECT: Amendments To White Ibis-1 Drilling Program**

Please find attached amendments to Appendix 'J' - Contact Directory - in Premier Oil's Bass Basin Tasmania Drilling Program White Ibis-1 Manual.

Regards



DAVID EVANS  
Operations Geologist

Enc.

**CONTACT DIRECTORY**

**534093**

**1 Premier Oil & Joint Venture Partners**

	<b>Work</b>	<b>After Hours</b>	<b>Emergency / Pager</b>	<b>Mobile</b>	<b>Facsimile</b>
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**1.1 Premier Oil**

<b><u>Link Emergency Response Communications Provider</u></b>			(08) 9480 5134		
<b><u>Operations Office –Geelong (+61 3)</u></b>					
<i>Project Drilling Engineer</i> Gordon Hunter	5272 2101			017 813 071	5272 2058
<i>Logistics Co-ordinator</i> Rick White	5272 2045	5241 9441		019 115 285	5272 2058
<b><u>Northern Explorer III</u></b>					
<i>Drilling Supervisor</i>	0011 872 7613 42771				0011 872 7613 42772
<b><u>Perth Office (+61 8)</u></b>					
<i>General Manager</i> John Begg	9480 4100	9488 6316		0419 903 268	9324 1212
<i>Bass Basin Team Leader</i> Mark Tringham	9480 4100	9380 0835		0412 559 852	9324 1212
<i>Operations Manager</i> Blaine Ulmer	9324 1855			0412 557 331	9324 1851
<i>Operations Geologist</i> David Evans	9324 1855	9387 2614		0412 179 506	9324 1851
<i>Operations Accountant</i> Noel O'Connor	9324 1855	9272 2213			9324 1851
<i>Drilling Engineer</i> Stuart Harrison	9324 1855	9341 4375			9324 1851

534094

## CONTACT DIRECTORY

## 1 Premier Oil &amp; Joint Venture Partners

	Work	After Hours	Emergency / Pager	Mobile	Facsimile
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## 1.2 Joint Venture Partners

<b><u>Boral Energy Resources Ltd</u></b> <b><u>(IDD ++61 8)</u></b>					
Angus Guthrie	8235 3737			0417 864 255	8323 1851
<b><u>CalEnergy Gas (UK) Ltd</u></b>					
Jane Duncan	0011 44 171 208 1600 Ext: 1223			0802 250 750	0011 44 171 208 1620

**1 Premier Oil & Joint Venture Partners**

	Work	After Hours	Emergency / Pager	Mobile	Facsimile
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**1.1 Premier Oil**

<b><u>Link Emergency Response Communications Provider</u></b>			(08) 9480 5134		
<b><u>Operations Office --Geelong (+61 3)</u></b>					
<i>Project Drilling Engineer</i> Gordon Hunter	5272 2101			017 813 071	5272 2058
<i>Logistics Co-ordinator</i> Rick White	5272 2045	5241 9441		019 115 285	5272 2058
<b><u>Northern Explorer III</u></b>					
<i>Drilling Supervisor</i>	0011 872 7613 42771				0011 872 7613 42772
<b><u>Perth Office (+61 8)</u></b>					
<i>General Manager</i> John Begg	9480 4100	9488 6316		0419 903 268	9324 1212
<i>Bass Basin Team Leader</i> Mark Pogson	9480 4100	9272 6863		0412 575 162	9324 1212
<i>Operations Manager</i> Blaine Ulmer	9324 1855			0412 557 331	9324 1851
<i>Operations Geologist</i> David Evans	9324 1855	9387 2614		0412 179 506	9324 1851
<i>Operations Accountant</i> Martin Cotton	9324 1855				9324 1851
<i>Drilling Engineer</i> Stuart Harrison	9324 1855	9341 4375			9324 1851

**1 Premier Oil & Joint Venture Partners**

	Work	After Hours	Emergency / Pager	Mobile	Facsimile
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**1.2 Joint Venture Partners**

<b><u>Boral Energy Resources Ltd</u></b> <b><u>(IDD ++61 8)</u></b>					
Angus Guthrie	8235 3737				8323 1851
<b><u>Cue Energy Resources NL</u></b> <b><u>(IDD ++61 3)</u></b>					
Andrew Adams	9629 7577			0419 372 479	9629 7318
<b><u>Santos</u></b> <b><u>(IDD ++61 8)</u></b>					
Neil Tupper	8224 7765				

**2 Drilling Contractor & Service Companies**

	Work	After Hours	Emergency / Pager	Mobile	Facsimile
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**2.1 Drilling Contractor**

<b>Northern Offshore (IDD ++61 3)</b>					
<i>Base Manager</i> Keith Ballantyne	5272 2322	5241 5686		0419 220 407	5272 2066
<i>Drilling Superintendent</i> Brian White	5272 2322	5222 2645		0419 293 292	5272 2066
<i>Material Export</i> Kerri Reeks	5272 2322	9639 4243		0411 471 805	5272 2066

## 2 Drilling Contractor & Service Companies

	Work	After Hours	Emergency / Pager	Mobile	Facsimile
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### 2.2 Service Companies

<u>Schlumberger</u>					
<i>Integrated Service</i>					
<i>Co-ordinator</i>	(03)				(03)
Paul Crerar	5272 2101			0411 043 049	5272 2058
<i>Junior Drilling Engineer</i>	(03)				(03)
Peter Hoenninger	5272 2101				5272 2058
<i>Cementing</i>	(08)				(08)
Leen Viot	9455 2144				9455 1728
<i>Drilling Fluids</i>	(08)				(08)
Joe Barker	9455 2144				9455 1728
<i>Wireline</i>	(03)				
Ryan Daniel	5143 2242				
<i>Testing</i>	(08)				(08)
Willie Ritchie	9353 1144			0419 918 654	9353 3450
<i>Directional Survey/Drilling</i>	(03)				(03)
Jack Robertson	9696 6266				9690 0309
<i>Mud Logging ( Geoservices )</i>	(08)				(08)
David Angus	9250 2010				9250 2715
<i>Drill Bits ( Hughes )</i>	(08)				(08)
Stephen Lewis	9480 3724			0418 128 986	9322 8082
<u>Supply Vessels</u>					
<b>Mermaid Marine</b>	(08)				(08)
Jim Carver	9431 7431			0418 904 317	9431 7432
<b>Mermaid Raider</b>	0145				0145
	117 240				217 240
<b>Tidewater</b>	(08)				(08)
Reg McNee	9221 3865			0418 335 242	9221 3865

## 2 Drilling Contractor & Service Companies

	Work	After Hours	Emergency / Pager	Mobile	Facsimile
<b><u>Helicopters</u></b>					
<b>Lloyds</b> Perth – Graham Bowles	(08) 9268 2523				(08) 9268 2529
Adelaide – John Boag	(08) 8373 0700			0419 828 099	(08) 8373 3366
<b><u>ROV</u></b>					
<b>Australian Underwater Contractors</b> Tim Gillingham	(08) 9430 7218	(08) 9389 8835			(08) 9340 7290
<b><u>Weather Reporting</u></b>					
Rob Cowle	(03) 9899 3140				
<b><u>Oil Spill Advisor</u></b>					
Terry Hayes	(07) 4939 4711	(07) 4939 4711			(07) 4939 4769
<b><u>Environmental Advisor</u></b>					
<b>Dames &amp; Moore</b> Melbourne – David Gwyther	(03) 9510 5050				(03) 9510 5858
Perth – Ian Le Provost	(08) 9221 1630				(08) 9221 1639
<b><u>Rental Tools</u></b>					
<b>Austoil</b> Wayne Watkins	(08) 9331 1444				(08) 9331 3087
<b>Oilserv ( TAM Packer )</b> Keith McRae	(08) 9419 5933				(08) 9419 2250
<b><u>Bits</u></b>					
<b>Varel – Colin Hunter</b>	(08) 9331 1444				(08) 9331 3087
<b>Hycalog – Tasman</b>	(08) 9330 6155				(08) 9330 1502
<b>Reed – Tasman</b>	(08) 9330 6155				(08) 9330 1502
<b><u>Reporting Software</u></b>					
<b>IDS</b> John Hanson	(08) 8359 2655				(08) 8359 2688

**2 Drilling Contractor & Service Companies**

	Work	After Hours	Emergency / Pager	Mobile	Facsimile
<b><u>Rig Positioning</u></b>					
Racal Survey Bryan Claridge	(08) 9344 7166				(08) 9344 8783
<b><u>Casing Running</u></b>					
Premium Casing Services Dave Littleton	(08) 9417 8411	(08) 9417 3364		0419 944 664	(08) 9417 7385
<b><u>Wellhead Supplier</u></b>					
ABB Vetco Don Kunath	(08) 9479 6000			0412 271 621	(08) 9479 6111
<b><u>Survey Equipment</u></b>					
Andergauge John Grullis	(08) 9358 3383			0412 074 572	(08) 9356 1003
<b><u>Testing Engineering</u></b>					
AWT Cameron Manifold	(08) 9221 8144			0412 000 912	(08) 9221 8084
<b><u>Fire Fighting Consultant</u></b>					
Boots & Coots Inc. (Houston)	0011 1713 931 8884				

## 3. Government Authorities

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
<b>3.1 Federal Authorities</b>					
<b><u>Australian Maritime Safety Authority / Australia Search and Rescue (AusSAR) (IDD ++61 2)</u></b>					
RCC – Aviation	6230 6899 (24 hrs)		1800 815 257 (24 hrs)		6230 6868 1800 622 153
RCC – Maritime	6230 6811 (24 hrs)		1800 641 792 (24 hrs)		6230 6868
<b><u>Canberra (IDD ++61 2)</u></b>					
Switchboard	6279 5000 (24 hrs)		1800 641 792 (24 hrs)		6279 5866
<i>Manager Operations</i>					
Lipscombe, Ray	6279 5929	6230 6811	6269 0800	0418 633 107	6279 5076
<i>Operations Coordinator</i>					
Beck, Greg	6279 5868		6269 0799	0418 623 353	
<i>Senior Project and Environmental Officer</i>					
Wilde, Shayne	6279 5873			0419 484 446	6279 5866
<b><u>Melbourne (IDD ++61 3)</u></b>					
Mackay, Bob	9685 5757				
<b><u>Airservices Australia – Flight Services Adelaide (IDD ++61 8)</u></b>					
Switchboard	8238 7838 (24 hrs)				8234 4174
<b><u>Bureau of Air Safety Investigation (BASI) Brisbane (IDD ++ 61 7)</u></b>					
<i>Air Safety Investigator</i>					
Cavenagh, Mike	3831 0628		1800 011 034 (24 hrs)		
<b><u>Melbourne (IDD ++61 3)</u></b>					
<i>Air Safety Investigator</i>					
Sonneveld, John	9685 3606		1800 011 034 (24 hrs)		9685 3611
<b><u>ACF Coastal Surveillance (IDD ++ 61 2)</u></b>					
Switchboard	1800 061 800 6275 6000 (24 hrs)				6275 6275

**3. Government Authorities**

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
<b>3.1 Federal Authorities</b>					

<b><u>Civil Aviation Safety Authority (CASA)</u></b> <b><u>Canberra (IDD ++61 2)</u></b> <i>Acting Director</i> Pike, John <b><u>National Number (IDD++61)</u></b> Switchboard	6217 1001  131 757				
<b><u>CSIRO – Division of Wildlife and Ecology</u></b> <b><u>Canberra (IDD ++61 2)</u></b> Switchboard	6242 1600				6241 3343
<b><u>Department of Primary Industries and Energy</u></b> <b><u>Canberra (IDD ++61 2)</u></b> <i>Assistant Secretary for Exploration/Development</i> Lee, Mike <i>Director Exploration, Petroleum and Fisheries</i> Furnell, Geoff	6272 4595  6272 4695	6231 0646			6272 4137  6272 4137
<b><u>Mineral Resources Tasmania (IDD ++61 3)</u></b> Switchboard  Bacon, Carol	6233 8333  6233 8326				6233 8338  6233 8338

**3.2 Victorian State Authorities**

<b><u>Bureau of Meteorology Melbourne (IDD++61 3)</u></b> Switchboard	1900 1553 363				
<b><u>Conservation and Natural Resources Melbourne (IDD++61 3)</u></b> Switchboard <b><u>Portland (IDD ++61 3)</u></b> Switchboard	9637 8080  5523 3232	5523 4866 5523 1395			
<b><u>Country Fire Authority (CFA) Melbourne (IDD++61 3)</u></b> Switchboard	9262 8444		000 (24 hrs)		
<b><u>Fire Department Melbourne (IDD++61 3)</u></b> Switchboard	9662 2311		000 (24 hrs)		

## 3. Government Authorities

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
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## 3.2 Victorian State Authorities cont...

P

<b><u>Police Headquarters Melbourne (IDD++61 3)</u></b>	11 444		000 (24 hrs)		
<b><u>Department of Natural Resources and Environment, Agriculture, Energy and Minerals Melbourne (IDD++61 3)</u></b>					
Switchboard	9637 8000				
<i>Manager (Minerals and Petroleum)</i> King, Robert	9412 5069			015 360 773	9412 5152
<i>Principal Drilling Engineer</i> Nadji, Ahmed	9412 5089	9848 2935		0412 110 997	9412 5152 9848 8905 (a/h)
<i>Petroleum Engineer (Emergency Response)</i> Arvidson, Graham	9412 5012	9782 4323			9412 5152
<b><u>Environmental Protection Authority Geelong (++61 3)</u></b>					
Switchboard	5226 4825				
<b><u>Melbourne (IDD++61 3)</u></b>					
Duty Officer	9628 5777				
Emergency Response Coordinator	9628 5777		016 030 #344 388		
<b><u>Geelong Port Geelong (IDD ++61 3)</u></b>					
Switchboard	5221 5855				
<b><u>Marine Supervisor</u></b> Trezise, Ian	5226 6220			0417 391 794	5221 6883
Marine Controllers			5226 6300 (24 hrs) 5226 6341 (24 hrs)		
<b><u>State Emergency Service Colac (IDD ++61 3)</u></b>					
Switchboard	5231 2535				

**3. Government Authorities**

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
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**3.2 Victorian State Authorities cont...**

<b><u>Geelong (IDD++61 3)</u></b> Switchboard	5226 4771				
<b><u>Melbourne (IDD++61 3)</u></b> State Headquarters Switchboard	9684 6659 9890 0069				
<b><u>Marine Board of Victoria</u></b> <b><u>Melbourne (IDD++61 3)</u></b>  <i>Director, Marine Pollution and Navigation Safety</i> Turnbull, Capt. John	9655 9783			017 815 838	9655 6611
<b><u>Victorian Channels Authority</u></b> <b><u>Melbourne (IDD++61 3)</u></b>  Emergency/Oil Pollution  Head Office  <i>Navigation Services Manager</i> Muir, Tim  Paulusz, Charles	9614 2861 (24 hrs)  9612 3512  9612 3540  9612 3542	9808 5105   9580 5082	016 030 # 372 881	018 358 301  018 345 496	9612 3550  9612 3350

**3.3 Victorian Local Authorities (Police and Shire Councils)**

<b><u>Police Headquarters</u></b> <b><u>Geelong (IDD++61 3)</u></b>  District Office	5225 3245		000 (24 hrs)		
<b><u>Melbourne (IDD++61 3)</u></b>  Switchboard	9247 6666		000 (24 hrs)		
<b><u>City of Greater Geelong</u></b> <b><u>(IDD ++61 3)</u></b>  Switchboard	5227 0270				
<b><u>Surfcoast Council</u></b> <b><u>Torquay (IDD ++61 3)</u></b>  Switchboard	5261 0600	0418 524 429 (24 hrs)			

## 3. Government Authorities

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
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## 3.4 Tasmanian State Authorities

<b><u>Australian Maritime Safety Authority</u></b> <b><u>Devonport (IDD ++61 3)</u></b> Switchboard	6424 1597				6424 8009
<b><u>Bureau of Meteorology</u></b> <b><u>Melbourne (IDD++61 3)</u></b> Weather by Fax	1800 061 437				
<b><u>Department of Environmental &amp; Land Management North West</u></b> <b><u>(IDD++61 3)</u></b> Switchboard	6458 1100 6458 1415			018 142 617	6458 1420
<b><u>Prospect (IDD++61 3)</u></b> Sallans, Steve	6336 5328				6344 8109
<b><u>Environmental Pollution Incidents and Complaints - Burnie TAS</u></b> <b><u>(IDD++61 3)</u></b> Switchboard	1800 005 141 (24 hrs)				
<b><u>Fire Department Burnie (IDD ++61 3)</u></b> Switchboard	6434 6700		000 (24 hrs)		
<b><u>Marine Board Tasmania (IDD++61 3)</u></b> Switchboard	6461 1155				
<b><u>Parks and Wildlife Burnie TAS (IDD++61 3)</u></b> Switchboard	6233 8011				
<b><u>Police Headquarters Hobart TAS(IDD++61 3)</u></b> Switchboard	6230 2111				
<b><u>Port Authorities - Burnie TAS (IDD ++61 3)</u></b> Switchboard	6434 7300				6434 7373
Harbour Authority	6424 0911		6424 0911		
Nasat Marine Supervisor	6424 0911				
<b><u>State Security Service Tasmania (IDD++61 3)</u></b> Switchboard	6437 1274			0418 303 447	

**3. Government Authorities**

	Work	After Hours	Emergency / Pager	Mobile	Facsimile
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**3.5 Tasmanian Local Authorities**

<b><u>Council</u></b> <b><u>Burnie, TAS (IDD++61 3)</u></b>					
Switchboard	6431 1033	6430 5799			6431 3898
<b><u>Police Headquarters</u></b> <b><u>Burnie, TAS (IDD++61 3)</u></b>					
Switchboard	6434 5211				

## 4. Oil Spill Agencies and Specialists

	Work	After Hours	Emergency / Pager	Mobile	Facsimile
<b>4.1 NATPLAN/State Combat Committee</b>					
<b><u>Australian Maritime Safety Authority</u></b> <b><u>Canberra (IDD++61 2)</u></b> <i>Manager Marine Environment Protection Unit</i> Lipscombe, Ray	6279 5929	6230 6811	6269 0800	0418 633 107	6279 5076
<i>Acting General Manager</i> Baird, David	6279 5935		6269 0843	0418 822 824	6279 5076
<i>Senior Project and Environmental Officer</i> Wilde, Shayne	6279 5873			0419 484 446	6279 5866
<i>Admin Clerk/PA</i> Stiller, Cheryl	6279 5069				
<b><u>Melbourne (IDD ++61 3)</u></b> Mackay, Bob	9685 5757				
<b><u>Geelong Port</u></b> <b><u>Geelong (IDD++61 3)</u></b> Switchboard	5221 5855				
<i>Marine Supervisor</i> Trezise, Ian	5226 6220			0417 391 794	5221 6883
Marine Controllers			5226 6300 (24 hrs) 5226 6341 (24 hrs)		
<b>4.2 AMOSC</b>					
<b><u>AMOSC (Australian Marine Oil Spill Centre)</u></b> <b><u>Geelong (IDD ++61 3)</u></b> Switchboard	5272 1555				5272 1839
Duty Officer	5272 1555		016 379 328 (24 hrs)		5272 1839
<i>Manager/Overall Industry Coordinator</i> Blackmore, Don	5272 1555		016 379 328	0418 398 363	5272 1839
<b>4.3 Oilmap Spill Trajectory Model</b>					
<b><u>GEMS</u></b> <b><u>Melbourne (IDD ++61 3)</u></b> <i>Oil Spill Trajectory Modelling Consultant</i> Hubbert, Grahame	9844 0535			0418 366 336 (24hrs)	9844 2630

**4. Oil Spill Agencies and Specialists**

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
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**4.4 Oil Spill Operations and Management Specialists**

<b><u>Altona Marine</u></b> <b><u>Melbourne (IDD ++61 3)</u></b> <i>Manager</i> Peins, Alf	9398 2026			(24 hrs) 0419 566 250	9389 2026
<b><u>Capricorn Environmental</u></b> <b><u>Yapoon (IDD ++61 7)</u></b> Switchboard  Hayes, Terry	4939 4711 (24 hrs) 4939 4711			019 631 206	4939 4769  4939 4769
<b><u>Hartec - United States</u></b> <b><u>- Anchorage Alaska</u></b> <b><u>(IDD++1)</u></b> Hartley, Brett  Switchboard	907 522 3031 (24 hrs)				907 522 3494  907 522 3494
<b><u>Oops Inc.</u></b> <b><u>Louisiana USA</u></b> <b><u>(IDD ++1 504)</u></b> O'Brien, Jim  Switchboard	368 9845 (24 hrs)  368 9845				368 0630  368 0630
<b><u>Qest Consulting Group</u></b> <b><u>Melbourne (IDD ++61 3)</u></b> <i>Manager Emergency</i> <i>Response</i> Rigby, Gary  Switchboard	9614 4133  9614 4133	5278 3121		0417 313 610	9614 5133 5277 2303 (a/h) 9614 5133

**4.5 Oil Spill Environment and Cleanup Specialists**

<b><u>Esso Australia Ltd (EAL)</u></b> <b><u>Melbourne (IDD ++61 3)</u></b> Switchboard <i>Acting Environmental</i> <i>Advisor</i> Terrens, Greg	9270 3333  9270 3509	9584 5550	016 030 #312 023		9270 3995  9270 3590
<b><u>John Wardrop</u></b> <b><u>Melbourne (IDD ++61 3)</u></b> Wardrop, John		5282 4074 5282 4075		015 830 643	

**4. Oil Spill Agencies and Specialists**

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
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**4.5 Oil Spill Environment and Cleanup Specialists**

<b>OCC</b> <b>Seattle, Washington</b> <b>USA (IDD ++1 206)</b>					
Owens, Ed	842 2951	842 6255			842 2861
Switchboard	842 2951				842 2861

**4.6 Other Agencies**

<b><u>Australian Maritime Safety Authority</u></b> <b><u>Australia Search and Rescue</u></b> <b><u>(AusSAR) (IDD ++ 61 2)</u></b>					
RCC – Aviation	6230 6899 (24 hrs)		1800 815 257 (24hrs)		6230 6868 1800 622 153
RCC – Maritime	6230 6811 (24 hrs)		1800 641 792 (24 hrs)		6230 6868
<b><u>Canberra (IDD ++61 2)</u></b> Marine Environment Protection Services Australian Maritime Safety Authority PO Box 1108 Belconnen, ACT 2616					
<i>Operations Coordinator</i> Beck, Greg	6279 5868		6269 0799	0418 623 353	
<i>Manager Operations</i> Lipscombe, Ray	6279 5929	6230 6811	6269 0800	0418 633 107	6279 5076
Switchboard	6279 5000		1800 641 792 (24hrs)	0419 484 446	6230 6868
<i>Senior Project and Environmental Officer</i> Wilde, Shayne	6279 5873				6279 5866

## 4. Oil Spill Agencies and Specialists

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
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## 4.6 Other Agencies

<b><u>EARL (East Asia Response Ltd) Singapore (IDD++ 65)</u></b> 2 Jalan Samulun Singapore 2262					
<i>Manager for Technical Services</i> Chew, Capt. J.K.	(24 hrs) 266 1566				266 2312
<i>Manager - Centre Services</i> Ooi Beng Hong, Capt. Patrick	(24 hrs) 266 1566				266 2312
<i>CEO</i> Seowhood, Jin	266 1566 (24 hrs)				266 2312
Switchboard/Duty Off.	266 1566				266 2312
<b><u>Oil Spill Response (OSR) Ltd Southampton UK (IDD ++44 1703)</u></b> Lower William Street Southampton SO14 5 QE England					
Switchboard	331 551 (24 hrs)		1523 523 523 # 604 319		331 972
<b>4.7 Bird Rehabilitation</b>					
<b><u>Taronga Park Zoo Sydney (IDD ++ 61 2)</u></b>					
Switchboard	9969 2777		9925 3911 # 299 011	018 672 323	9969 7515
Waldraven, Emma	9978 4609	9807 3558	9925 3911 #299 011	019 129 956	9978 4613
Hall, Libbi	9978 4751	9907 9496			9978 4516
<b><u>Penguin Parade Phillip Island (IDD ++61 3)</u></b>					
Switchboard	5956 8300				5956 8394

**5. Medical Services**

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
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**5.1 Hospitals**

<u>Hospital</u> <b>Geelong (IDD ++61 3)</b> Ryrie Street Geelong Switchboard	5226 7111		5226 7564		
<u>St John of God Hospital</u> <b>Geelong (IDD ++61 3)</b> Switchboard	5226 8888				

**5.2 Ambulances**

<u>Ambulance</u> <b>Geelong (IDD ++61 3)</b> Emergency			000 (24 hrs)		
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**5.3 Doctors**

<u>Doctors</u> <b>Geelong (IDD ++61 3)</b> TBA	TBA				
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## 6. Aircraft Services

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
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## 6.1 Helicopters

<b><u>Aircraft Australia – Flight Services</u></b>					
<b><u>Adelaide (IDD++61 8)</u></b>					
Switchboard	8238 7838 (24 hrs)				8234 4174
<b><u>Perth (IDD ++61 8)</u></b>					
Centre Coordination	9476 8609 (24 hrs)				9476 8606
	9476 5926 (24 hrs)				
	9476 8607				
<b><u>Lloyd Helicopters Group</u></b>					
<b><u>Adelaide Head Office</u></b>					
<b><u>(IDD ++61 8)</u></b>					
<i>Operations Logistics Manager</i>					
Martin, Doug	8373 0700	8270 5381		018 855 195	8373 1119
<i>Operations Logistics Officer</i>					
Boag, John	8373 0700	8271 3242		018 855 195	8373 1119

## 7. Marine Services

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
<b><u>Lewmarine Geelong</u></b> <b>(IDD ++61 3)</b> Switchboard					
	5221 1577				
<b><u>Tidewater Port Jackson</u></b> <b>Perth (IDD ++61 8)</b> Switchboard					
	9221 2822				
<i>Acting Marine Operations Manager</i> Tyler, Ed					
	9221 7619	9315 9672		015 334 825	9221 3865
<b><u>Australian Offshore Services Melbourne</u></b> <b>(IDD++61 3)</b> Switchboard					
	9254 1666	9254 1546	016 376 434		9686 9279
<i>Operations Manager</i> Hall, Richard					
	9254 1666	9844 1857		0412 568 780	9686 9279
Burgess, Dick					
	9254 1547	9528 5982		018 369 787	9686 9279
Hornsey, Jack					
	9254 1666	9458 4237		0412 458 423	9686 9268

## 8. Petroleum Exploration and Production Companies and Associations

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
<b>Apache Energy Ltd</b> <b>Perth (IDD ++61 8)</b> Level 3 256 St Georges Tce Perth WA 6000 Switchboard 9422 7222 9422 7444 <i>Operations Manager</i> Lake, Bruce 9422 7206 9422 7445					
<b>Boral Energy Resources Ltd</b> <b>Adelaide (IDD ++61 8)</b> 3rd Floor, Hospitality House 60 Hindmarsh Square Adelaide SA 5000 Switchboard 8235 3737 8223 1851 <i>Manager for Exploration</i> <i>Australia West</i> Bouer, Jennie 8235 3737 8223 1851 <i>Manager for Exploration</i> <i>Australia South</i> Lovibond, Rod 8235 3737 8223 1851 <i>Manager of Oil and Gas</i> <i>Production</i> Wearne, Geoff 8235 3737 8223 1851					
<b>BP</b> <b>Melbourne (IDD ++61 3)</b> 360 Elizabeth Street Melbourne VIC 3000 <i>Terminals and Distribution</i> <i>Manager</i> Watton, Mike 9268 3858 9268 3524					
<b>Esso Australia Ltd (EAL)</b> <b>Melbourne (IDD ++61 3)</b> 12 Riverside Quay Melbourne VIC 3006 Switchboard 9270 3333 9270 3995 <i>Drilling Operations Manager</i> Jenkins, Bob 9270 3422 016 030 #310 607 0417 347 499 9270 3593					
<b>Novus West Australia P/L</b> <b>Dampier Supply Base</b> <b>(IDD ++ 61 8)</b> Switchboard 9144 4099 9144 4088 Board, Dal 9144 4099 9185 4194 018 937 518 9144 4088					

## 8. Petroleum Exploration and Production Companies and Associations

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
<b>Onslow Supply Base (IDD ++ 61 8)</b>					
Switchboard	9184 6092				9184 6196
Mazneiu, Peter	9184 6192				9184 6196
<b>Perth (IDD ++ 61 8)</b>					
Switchboard	9486 7700				9486 9800
Emergency Response Centre	9420 0746 (Voice mail)				9420 0748
<i>Production Superintendent</i> Herrera, G	9486 7700	9306 0979	9324 4813	0411 757 874	9486 9800
<i>Drilling Manager</i> Mackay, Dave	9486 7700		9324 4813		9486 9800
<i>Safety Manager</i> Shand, J	9486 7700	9350 5768	9324 4813	0411 757 864	9486 9800
<b>Mobil Exploration and Producing Australia Pty Ltd Perth (IDD ++61 8)</b>					
29th Floor, QV1 Building 250 St Georges Tce Perth WA 6000					
Switchboard	9424 9200				9424 9203
<i>Drilling Superintendent</i> Honore, Royal	9424 9403				9424 9566
<i>Operations Manager Team Leader</i> Goodacre, Jack	9424 9273				9424 9544
<b>Phillips Australian Oil Company Melbourne (IDD ++61 3)</b>					
<i>Staff Drilling Director</i> Curry, Bill	9652 6537	9873 5684			9652 6124
<b>Perth (IDD ++ 61 8)</b>					
Level 2, 28-42 Ventnor Ave West Perth WA 6005					
Switchboard	9423 6666				9423 6677
<i>General Manager</i> Storer, Fred	9423 6650				9423 6677
<b>Santos Ltd Adelaide (IDD ++ 61 8)</b>					
Santos House 91 King William St Adelaide SA 5001					
<i>Drilling Manager</i> Gamblen, Jeff	8224 7195				8224 7141

## 8. Petroleum Exploration and Production Companies and Associations

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
<b>Shell Company of Australia Ltd (Melbourne) (IDD ++61 3)</b> 1 Spring St Melbourne VIC 3000					
Switchboard	9666 5444				9666 8959
<i>Drilling Manager</i> Carson, Peter	9666 5506			0419 332 614	9666 5225
<i>Business Development Manager</i> Burn, John	9666 5123				9666 5895
<i>Production Manager</i> Strobel, Wolfgang	9666 2147				9666 5895
<b>West Australian Petroleum Pty Ltd</b> <b>Perth (IDD ++61 8)</b> 24th Floor, QV1 Building 250 St Georges Tce Perth WA 6001					
Switchboard	9263 6000				9263 6699
<i>Drilling Manager</i> Haas, Mike	9263 6000			018 092 817	9263 6223
<b>WMC Resources Ltd</b> <b>Perth (IDD ++61 8)</b> QV1, 250 St Georges Tce Perth WA 6001					
Switchboard	9442 2000				9442 2613
<b>Woodside Offshore Petroleum Pty Ltd</b> <b>Perth (IDD ++61 8)</b> 1 Adelaide Tce Perth WA 6000					
Switchboard	9348 4111 (24 hrs)				9325 8178
<i>Well Construction Manager</i> Aquino, Frank	9348 4078				9348 4853
<i>Technical Services Manager</i>					

**8. Petroleum Exploration and Production Companies and Associations**

	Work	After Hours	Emergency/ Pager	Mobile	Facsimile
Woodall-Mason, Nick	9348 4088				9348 5082