



## **END OF WELL REPORT**

**ESSO AUSTRALIA PTY LTD**

**SCALLOP - 1**

**FEBRUARY 2003**

**by**

**BAKER HUGHES INTEQ**

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# Esso Australia Pty Ltd: Scallop-1

## End of Well Report

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## **Section 1**

### **Operations Summary**

## 1. Operations Summary

### 1.1 Introduction

Baker Hughes INTEQ Mudlogging provided formation evaluation, drill monitoring and pressure evaluation services for Scallop-1 from 261m until suspension. Data was processed and stored using Drillbyte V.2.3.1 software. All depths in this report unless otherwise stated refer to mMDRT - measured distance in metres from the rig's rotary table and are not tide corrected

Scallop-1 was planned as a 3126m MDRT vertical hole to test the sub-volcanic hydrocarbon potential of the Golden Beach Group, expected to be composed of good quality braided fluvial to upper deltaic sands.

The well was spudded at 12:00 Hrs on the 2<sup>nd</sup> February 2003, drilling the 36" hole with a 26" bit and a 36" hole opener, without a riser, from the seabed at 135.5m to 179m using seawater and with all returns to the seabed.

The 17.5" hole was drilled with penetration rates averaging 56m/hr, using seawater and hi-vis sweeps mid stand and at every connection to the section TD of 917m. The 13.375" casing was run smoothly with the shoe set at 900.8m. The BOPs and riser were then landed and tested as per programme.

With a 12.25" drilling assembly, the float collar was drilled using seawater and hi-vis sweeps. Before drilling out the casing shoe, the hole was displaced to 9.0 ppg KCl polymer mud and the Leak Off Test (LOT) conducted to 16.5 ppg EMW. The 12.25" hole was drilled initially with a PDC bit, drilling from 917m to 2618m with penetration rates ranging from 0.5 to 105.1m/hr. The MW was increased to 10.3ppg until the bit was pulled due to poor penetration rates within the volcanic formations. A tricone bit was then used to drill volcanics, and inter-bedded claystones and sandstones to a depth of 2933m with penetration rates averaging 4.6m/hr. The bit was pulled due to erratic torque readings. With the same 12.25 drilling" assembly but with an LWD tool, another tricone bit run produced penetration rates of 4.6m/hr through the same formations. Several flow checks were conducted on all drill breaks, all with static hole results. The original target depth of 3126m was extended another 48m to 3174m due to formation tops appearing deeper than prognosis. The maximum gas readings whilst drilling the reservoir sections was 0.25% over a background of 0.02-0.06%. After a wiper trip to the shoe, the hole was circulated clean before running E-logs. After more than three(3) days of running electric logs, it was decided to plug and abandon the hole without the need to run the 9 5/8" casing.

## 1.2 Well and Rig Information

Well Name:	Scallop-1		
Well Type:	Wildcat Exploration		
Operator:	ESSO Australia Pty Ltd.		
Location:	Gippsland Basin, Offshore Victoria, Australia		
Block:	VIC/RL2		
Final Coordinates:	Latitude	038° 12' 48.615" S	
	Longitude	148° 35' 28.879" E	
Rig:	Transocean Sedco 702		
Type:	Semi-submersible		
Rig Floor - Seabed:	135.5 mRT		
Rig Floor - MSL	25.9 m		
Spud Date:	02 February 2003		
Total Depth:	3174 mMDRT		
Status:	Plugged and Abandoned		
Baker Hughes INTEQ:	Data Engineers:	Matt de Leon Matt Goode	
	Logging Geologists:	Trent Liang Peter Morris	
	Trainee Logging Geologists:	Dan Walding Ryan Burns	

## **Section 2**

### **Drilling and Engineering**

## 2.1 Bit Run Summaries

### 914mm (36") Hole Section

02<sup>nd</sup> February 2003

#### Bit Run No. 1 Summary

Bit No.	NB1
Bit Size	660mm (26")
W/	914mm (36") H/O
Bit Type	Reed Y11
Serial Number	660478
Jets	1 x20, 3x18 H.O. - 4 x 20
Depth In	135.5m
Depth Out	179m
Metres Drilled	43.5m
Drill Hours	2.0 hrs
Total Bit Revolutions	10.8 krevs
Circulating Hours	2.5 hrs
ROP min-max / avg	*NA - NA / 21.8
Bit Grading	1/1/PN/A/1/I/RR/TD

#### **Drilling Parameters \*(Rig drilling data)**

WOB	2 klbs
RPM	90
Torque	3 kft-lbs
Pump Pressure	2800 psi
Flow In	1204 gpm

#### **Mud**

Sea Water	1.03 sg
High viscosity gel sweeps	

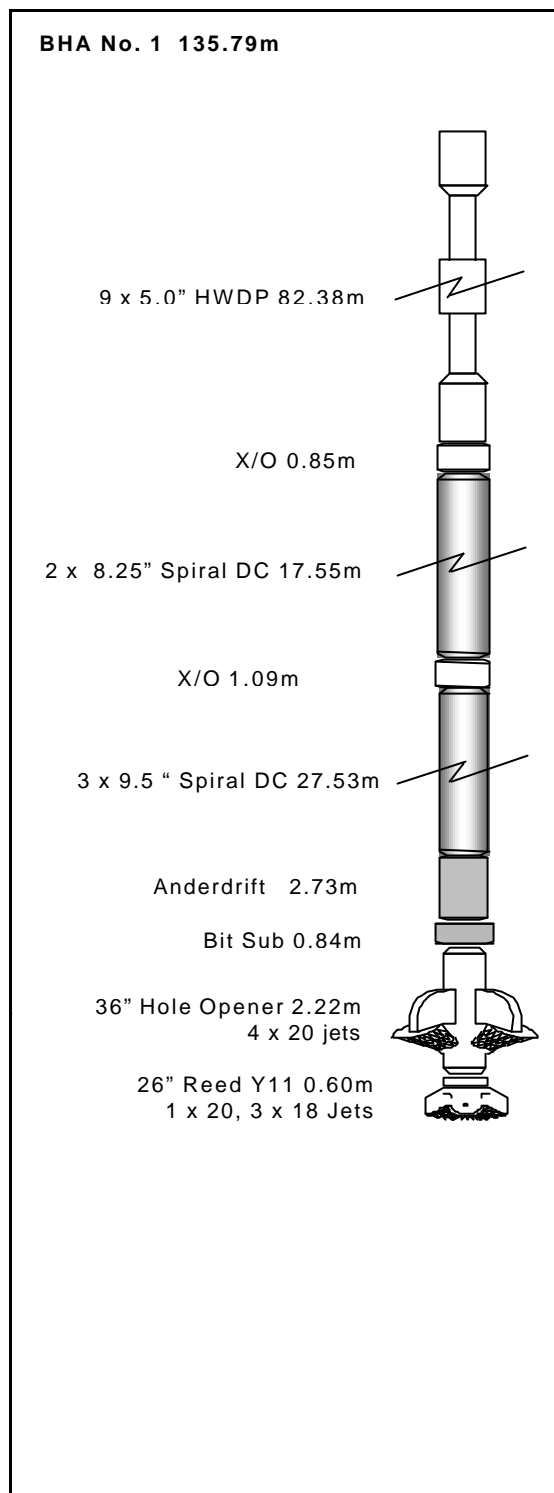
#### **Lithology**

Returns to seabed

#### **Drilling Summary**

RR1 was made up on a rotary BHA, with a 914mm (36") hole opener and run in the hole, tagging the seabed at 135.5m. Scallop-1 was spudded at 1200hrs on 2<sup>d</sup> February 2003. The 914mm (36") hole was drilled riserless to a TD for of 179m with seawater. At 185m the Anderdrift tool indicated an inclination of 0.37°. The bit was then pulled out of the hole in preparation for running the 762mm (30") casing. The PGB and 762mm (30") casing was run with 5" drillpipe running tool, stabbing into the 914mm (36") hole with the assistance of the ROV(No mudlogging services in this section).

\*BHI SLS not required for monitoring this section.



## 444mm (17.5") Hole Section 03<sup>rd</sup> - 04<sup>th</sup> February 2003

### Bit Run No. 2 Summary

Bit No.	NB2
Bit Size	444mm (17.5")
Bit Type	Hycalog DS34HF
Serial Number	24400Z
Jets	8 x 14
Depth In	179m
Depth Out	917m
Metres Drilled	738m
Drill Hours	14.1 hrs
Total Bit Revolutions	118.8 krevs
Circulating Hours	22.1 hrs
ROP min-max / avg	8.5 – 361.7 / 52.3 m/hr
Bit Grading	1/1ER/T/X/1/NO/TD

### Drilling Parameters

WOB	0.5 – 13.2 klbs
RPM	54 - 152
Torque	1.5 – 11.6 kft-lbs
Pump Pressure	1585 - 2840 psi
Flow In	1090 - 1233 gpm

### Mud

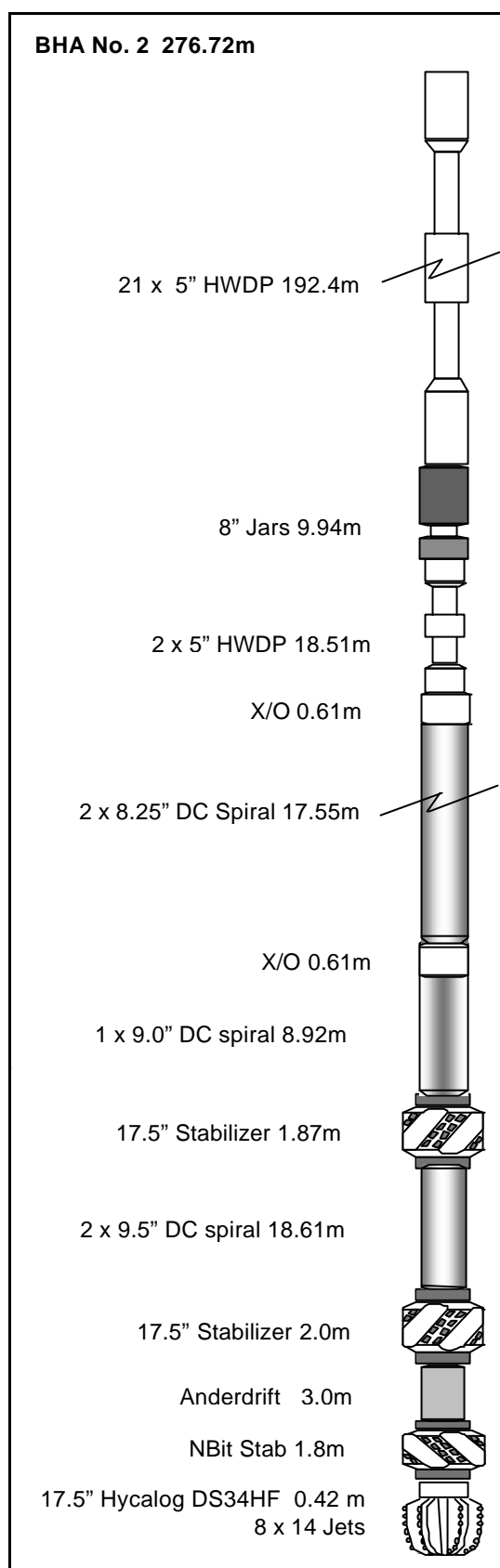
Sea Water	1.03 sg
High viscosity gel sweeps	

### Lithology

Returns to seabed

### Drilling Summary

NB2 bit was run in the hole with the same rotary assembly as NB1 minus the hole opener. Tagged and drilled out cement. Drilled new formation with seawater from 179m to 261m without problems. Mudlogging data collection commenced from 261m. Continued drilling from 261m to 917 with seawater, pumping 40-50 bbls of hi-vis sweeps at mid-stand and prior to connections. Upon reaching 917mTD, circulated the hole clean and made a few wiper trips before finally pumping 120 bbls of hi-vis sweep displaced by seawater. Pumped 1200 bbls of 12 ppg prehydrated Bentonite prior to POOH. At 907.8m, the Gyro tool indicated an inclination of 0.39 deg. The bit was pulled out of the hole without problems.





### 311mm (12.25") Hole Section 08<sup>th</sup> – 14<sup>th</sup> February 2003

#### Bit Run No. 3 Summary

Bit No.	NB3
Bit Size	311mm (12.25")
Bit Type	Smith MA89PX
Serial Number	JT0152
Jets	7 x 14
Depth In	917m
Depth Out	2618m
Metres Drilled	1701m
Drill Hours	127.8 hrs
Total Bit Revolutions	859.7 krevs
Circulating Hours	141.1 hrs
ROP min-max / avg	0.5 – 105.1 / 13.3 m/hr
Bit Grading	2/4/CT/S/X/0/BT/PR

#### Drilling Parameters

WOB	3.8 - 20 klbs
RPM	23 - 148
Torque	1.6 – 12.7 kftlbs
Pump Pressure	1000 - 3408 psi
Flow In	800 - 1014 gpm

#### Mud

KCl Polymer/Glycol	1.08 - 1.23 sg
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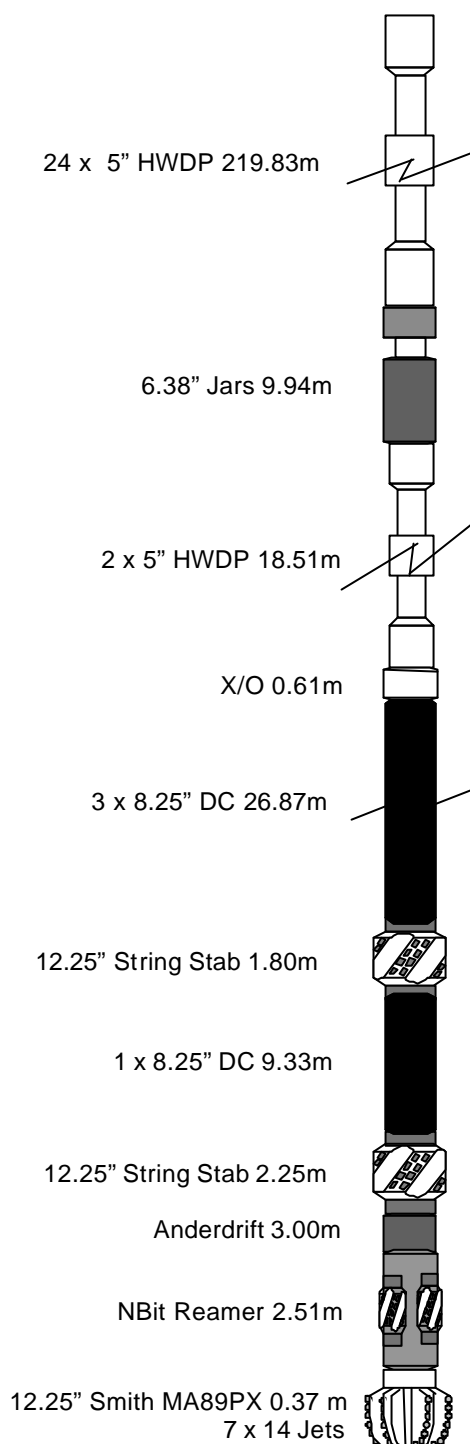
#### Lithology

Limestone, Claystone, Siltstone, Sandstone,  
Altered Volcanics

#### Drilling Summary

NB3, a Smith 12 ¼" PDC bit was made up with a rotary assembly and an Anderdrift survey tool. The bit was run in the hole and tagged cement at 843.6m. The cement and the float collar were drilled with seawater and hi-vis sweeps. Before drilling out the casing shoe, displaced the hole with 9.0 ppg(1.08sg) KCl Polymer mud. After the mud displacement, drilled out the casing shoe and rat hole from 900m to 917m. Drilled out three(3) meters of formation to 920m. CBU and conditioned mud to 9.0 ppg prior to conducting the Leak-Off Test(LOT) to 16.5 ppg EMW(1.98sg). Drilled ahead from 920m to 2145m without problems, increasing the mud weights to 9.6 to 9.7+ ppg(1.16-1.17sg). Drilled ahead without problems from 2145m to 2500m where the mud weight was increased to 10.2-10.3 ppg(1.22-1.23 sg) in anticipation of drilling thru the volcanics. Drilled down to 2618m after drilling thru the volcanics, CBU and pumped slug prior to POOH for bit change. POOH pumping out stands of DPs without problems.

#### BHA No. 3 295.02m



### 311mm (12.25") Hole Section 15<sup>th</sup> February- 18<sup>th</sup> February 2003

#### Bit Run No. 4 Summary

Bit No.	NB4
Bit Size	311mm (12.25")
Bit Type	Hughes MX20DDT
Serial Number	6007902
Jets	3 x 20
Depth In	2618m
Depth Out	2933m
Metres Drilled	315m
Drill Hours	69.1 hrs
Total Bit Revolutions	403.9 krevs
Circulating Hours	74.6 hrs
ROP min-max / avg	1.7 – 16.1 / 4.6 m/hr
Bit Grading	4/7/BT/S/E/1/WT/TQ

#### Drilling Parameters

WOB	11 - 54 klbs
RPM	77 - 138
Torque	5 – 6 kftlb
Pump Pressure	2605 - 3000 psi
Flow In	820 - 830 gpm

#### Mud

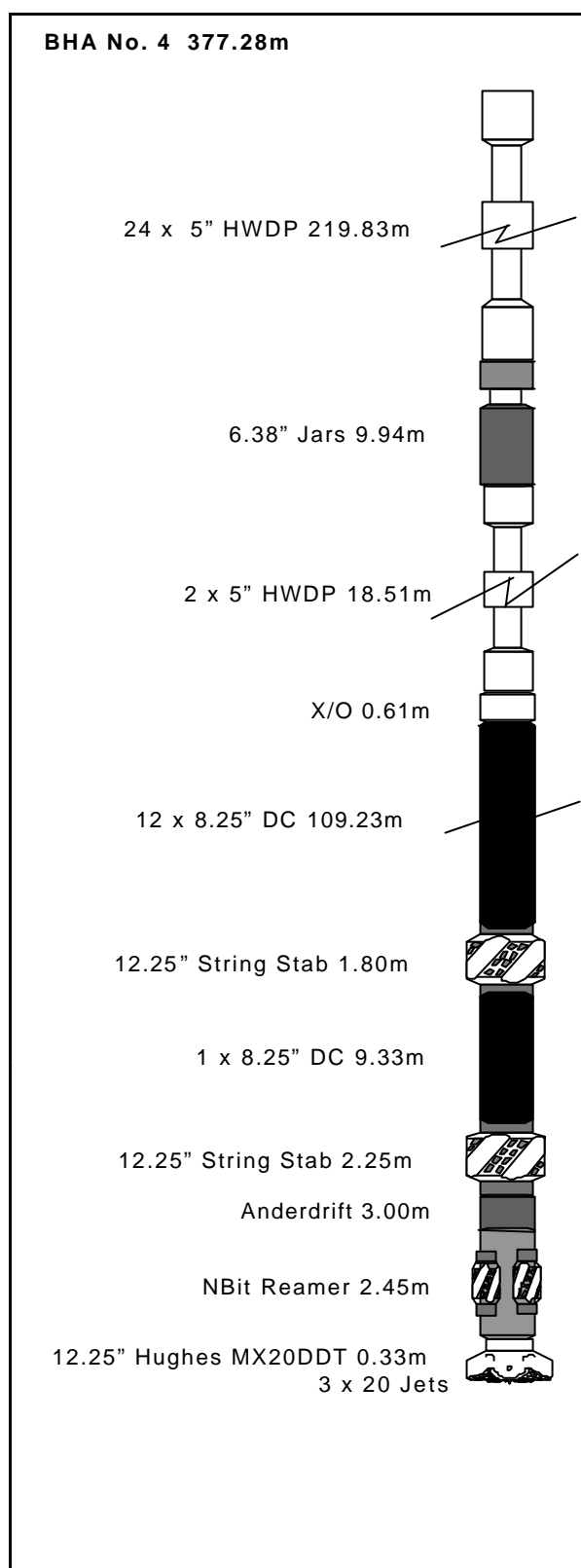
KCl/PHPA/Polymer/Glycol 1.22 - 1.23+ sg

#### Lithology

Altered Volcanics, Sandstone, Claystone

#### Drilling Summary

A 12 ¼" tri-cone bit was made up with a rotary assembly, without the MWD/LWD tool. Ran in hole and washed/reamed from 2578m down to 2618m. Drilled ahead from 2618m to 2933m using 10.2+ to 10.3 ppg mud(1.23 sg), maximizing penetration rates while monitoring the hole deviation every stand drilled using the Anderdrift tool. Flow checks were conducted at the driller's discretion whenever significant change in the drilling parameters was observed, especially rates of penetration. CBU at 2933m, then boosted the riser. A flow check was performed before pumping down the Gyro survey tool. Pulled out the first five(5) stands without problems, but the sixth(6<sup>th</sup>) AND 7<sup>th</sup> stand were tight. Continued pulling out slowly without overpulls to surface for bit change.



### 311mm (12.25") Hole Section 19<sup>th</sup> February- 22<sup>nd</sup> February 2003

#### Bit Run No. 5 Summary

Bit No.	NB5
Bit Size	311mm (12.25")
Bit Type	Hughes MX20DX
Serial Number	W42DV
Jets	3 x 18
Depth In	2933m
Depth Out	3174m
Metres Drilled	241m
Drill Hours	69.3 hrs
Total Bit Revolutions	404.3 krevs
Circulating	77.9 hrs
ROP min – max / ave	1.4-15.7 / 3.5
Bit Grading	3/7/BT/S/E/2/RG/TD

#### Drilling Parameters

WOB	32 - 55 klbs
RPM	75 - 133
Torque	5 - 7 kftlb
Pump Pressure	3400 - 3500 psi
Flow In	750 - 850 gpm

#### **Mud**

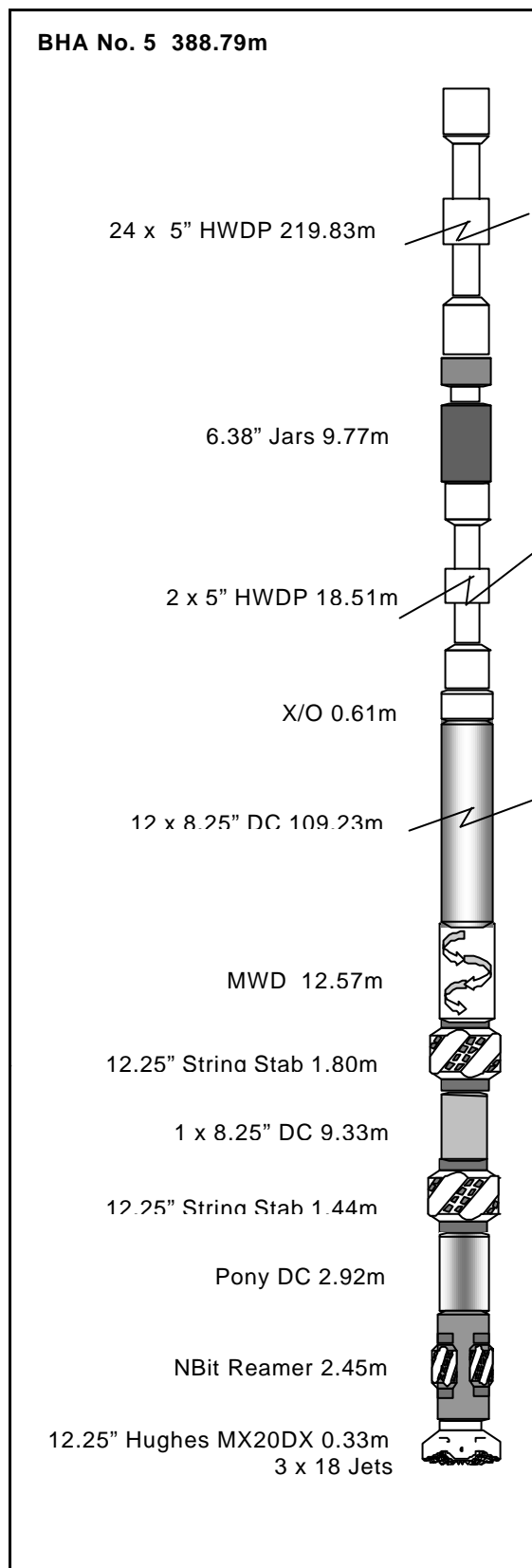
KCl/PHPA/Polymer/Glycol 1.22+ - 1.23 sg

#### **Lithology**

Claystone, Sandstone, Altered Volcanics

#### **Drilling Summary**

NB5 was made up on a rotary assembly and LWD tool. Ran in hole and washed/reamed a stand from 2933m. Drilled ahead from 2933m to 3174m (hole TD) without problems, drilling thru the altered volcanics, the interbedded Claystone and Sandstone. Reached the hole TD 09:45 hrs 22 February. The maximum gas detected while drilling was 0.25%, with a background gas of 0.02-0.06%. CBU at 3174m, then pulled out to the casing shoe for a wiper trip. Ran back to bottom, pumped 100 bbls of hi-vis pill, then circulated bottoms up twice until the hole was clean. Pulled out twenty (20) stands, pumped slug, then pulled out of hole for BOP test and electric logging.



## 2.2 Casing and Cementing Summaries

### 914mm (30") Casing 02<sup>nd</sup> February 2003

HOLE: SIZE: 914mm (36")  
 HOLE DEPTH: 179.0m  
 SEABED: 109.6  
 (RKB to seabed = 135.5m)

#### Casing Details

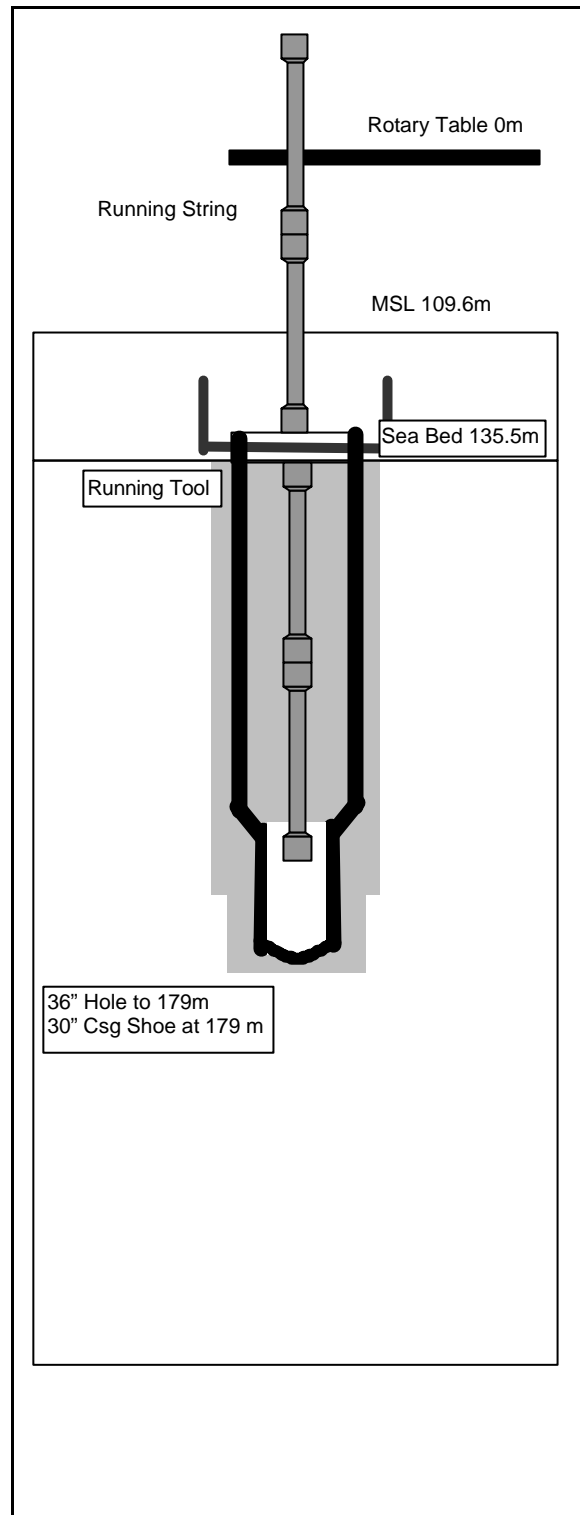
OD 762 mm (30")  
 Grade / Weight: X 52 / 457 and 310 ppf.  
 Joints: 1 shoe joint / 1 INT  
 04 casing joints  
 SHOE: 179.0m

#### LEAD CEMENT:

TYPE: Class G  
 SACKS: 1149 sx  
 WEIGHT: 15.9 ppg  
 MIX FLUID: Mix with seawater  
 1%BWOC CACL  
 11 GAL NF-5

#### Summary

A total of 4 joints of 762 mm (30") casing were run, including the shoe track, without problems. The casing shoe was landed at 179.0m and landed in place using the inner string. Dowell mixed and pumped 240 bbls of lead cement slurry (15.9 ppg). Dowell pumped 35 bbls seawater. Changed to rig pumps and continued displacement. Floats held.



### 340 mm (13 3/8") Casing 05<sup>th</sup> February 2003

HOLE: SIZE: 444 mm (17.5")  
DEPTH: 917m

#### Casing Details

OD 340 mm (13 3/8")  
Grade / Weight: L 80 / 68 ppf.  
Joints: 1 shoe joint / 1 INT  
1 float collar joint  
58 casing joints

SHOE: 900.8m

#### Cement Details

##### LEAD CEMENT:

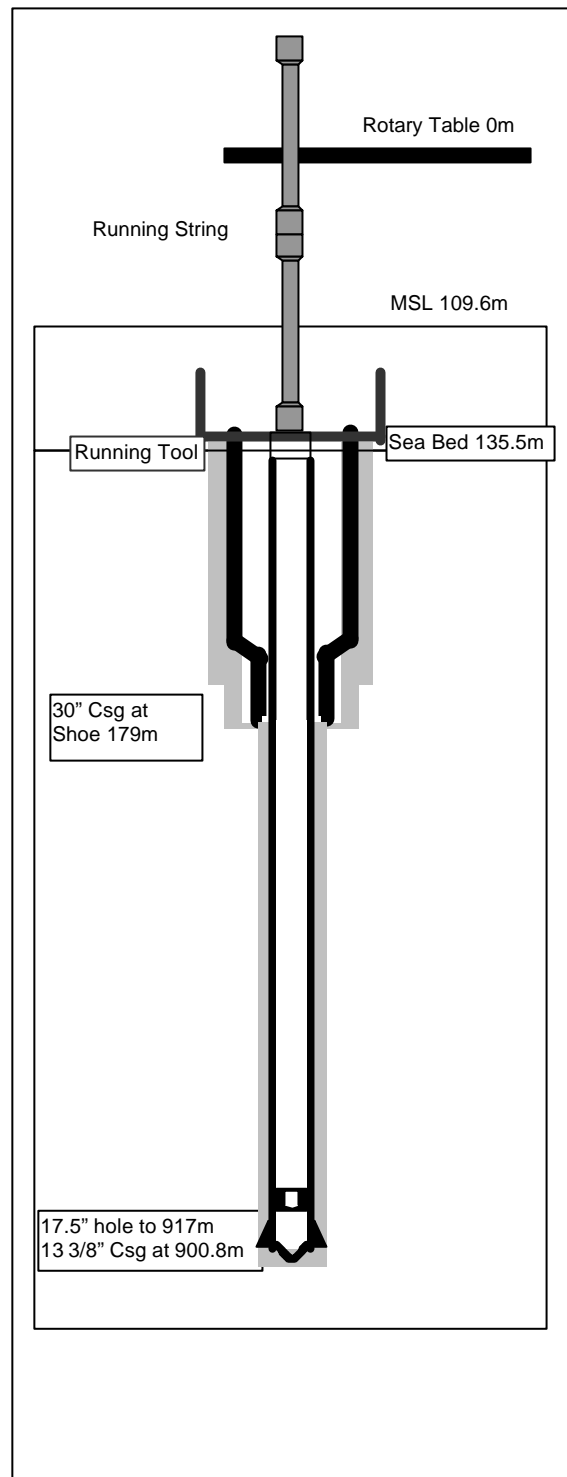
TYPE: Class G  
SACKS: 1358 sx  
WEIGHT: 12.5 ppg  
MIX FLUID: Mix with seawater  
420 bbls of total mix fluid  
614 gals Econolite  
11 gals of NF-5  
84 gals of retarder

##### TAIL CEMENT:

TYPE: Class G  
SACKS: 89 sx  
WEIGHT: 15.8 ppg  
MIXFLUID: Mix with Fresh water  
89 bbls of total mix fluid  
5 gals of NF-5

#### Summary

A total of 60 joints of 340 mm (13 3/8") casing were run, including the shoe track, without problems. The casing shoe was landed at 900.7m off the 20" wellhead. Mixed and pumped 535 bbls of lead cement slurry (12.5 ppg), followed by 150 bbls of tail cement slurry (15.8 ppg). Drop dart, Dowell pumped 25 bbls seawater, no latch on plug observed. Changed to rig pump and continued displacement with 340 bbls of seawater at 10BPM. Did not bump plug.



## Plug and Abandonment 26<sup>th</sup> - 01<sup>st</sup> March 2003

HOLE: SIZE: 12.5" Open hole  
DEPTH: 3174m

### Casing Details

Open Hole stacked cement plug arrangement.

### Cement Details

#### CEMENT PLUGS 1a-d:

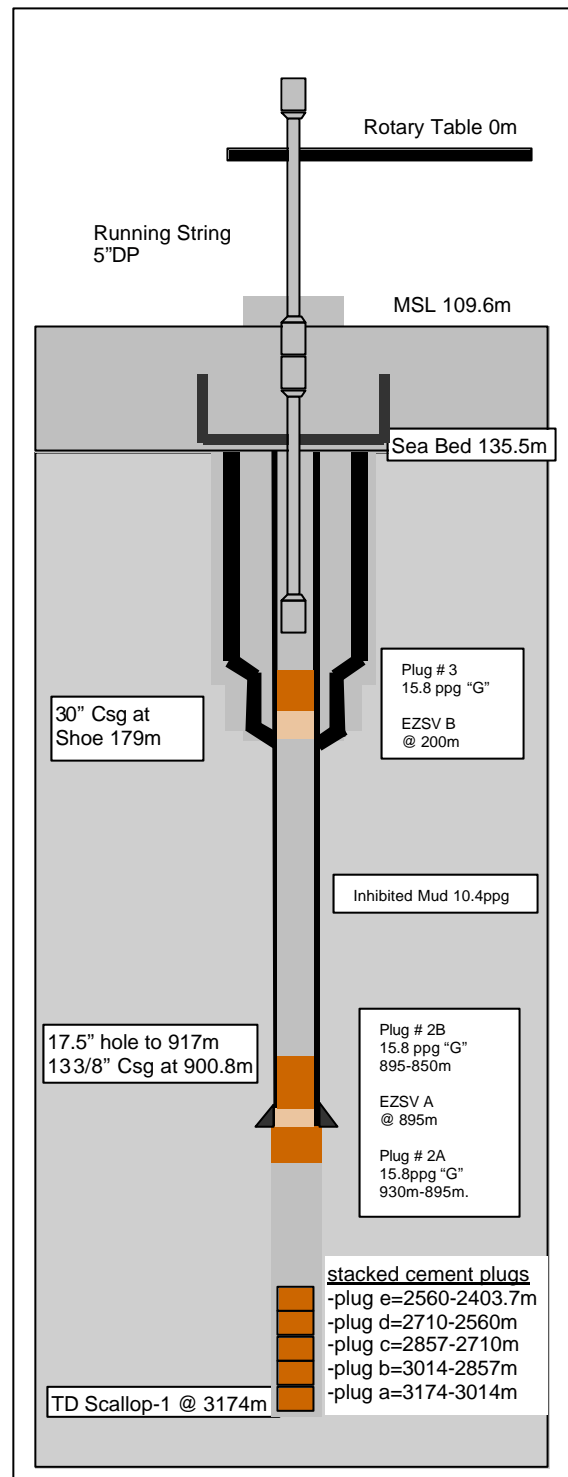
TYPE: Class G  
SACKS: 1491 sx  
WEIGHT: 15.8 ppg  
MIX FLUID: Mix with freshwater  
300 bbls of total mix fluid  
541 gals HALAD 413L  
05 gals of NF-5  
51 gals SCR-100L

#### CEMENT PLUG 1e:

TYPE: Class G  
SACKS: 343 sx  
WEIGHT: 15.8 ppg  
MIXFLUID: Mix with Fresh water  
69 bbls of total mix fluid  
125 gals HALAD 413L  
01 gals of NF-5  
08 gals SCR-100L

### Summary

Run in hole with 3.5" slotted mule shoe and 25 joints of 3.5" DP on 5" DP to 3174mTD. Circulated B/U with a max gas (associated with MDT pumps) of 7.91%. Set 5 balanced cement plugs in consecutive stages and circulate B/U in between each plug. WOC. Tag top cement plug at 2403.7m. Plug 2A set across the 13 3/8" shoe, POH to lay down cement stinger. R/U Schlumberger and set EZSV at 895mMD. RIH w/DP and pressure test EZSV and set Plug 2B. Displace to inhibited mud. R/U Schlumberger and set EZSV Bridge Plug B at 200mMD. RIH w/DP and pressure test EZSV. Set Plug 3 and POH.



## **Section 3**

### **Geology and Shows**

### 3.1 GEOLOGY AND SHOWS

Geological logging for Scallop-1 commenced in the 311mm (12.25") hole section from 917m MDRT and continued to the total depth of 3174m MDRT (All depths given in this section are taken from the datum of the Rotary Table, and the Measured Depth taken from the driller's depth unless otherwise specified). Full samples as per the Scallop-1 Drilling Programme were collected in the 311mm (12.25") hole section of Scallop-1.

During the course of the well, all gas equipment was checked and calibrated regularly, and spot samples were taken at drilling breaks and other changes in drilling parameters to better assess lithological change.

The Lithology as logged in Scallop-1 is described below. For more detailed descriptions, see Appendix 1, Formation Evaluation Log.

#### SAMPLE INTERVALS

Scallop-1	
917-930m	23m
930-1500m	30m
1500-1660m	10m
1660-3170m	5m
3170-3174m	4m

#### FORMATION DESCRIPTIONS:

##### **914mm (36") Hole Section (135.5m to 179m)**

Returns to seabed

##### **444mm (17.5") Hole Section (179m to 917m)**

Returns to seabed

##### **311mm (12.25") Hole Section (917m to 3174m)**

##### **917m – 1410m: ARGILLACEOUS CALC ILUTITE with minor MARL**

**ARGILLACEOUS CALCILUTITE:** Light grey to medium dark grey, light olive grey to olive grey, very soft to firm, dispersive in part, sub-blocky to blocky, argillaceous, trace carbonaceous specks, trace glauconite, trace dolomite, trace calcareous concretions, trace forams, trace fossil fragments.

**MARL:** Medium light grey, olive grey, soft to firm, sub-blocky to blocky, trace glauconite, trace carbonaceous specks, trace forams.

The section from 917m to 1410m was drilled with an average rate of penetration of 36.2 m/hr and ranged from 3.6 m/hr to 67.4 m/hr.

Total Gas (%)	C1 (%)	C2 (%)	C3 (%)	IC4 (%)	NC4 (%)	IC5 (%)	NC5 (%)
0.01 – 0.06	0 – 0.048	0	0	0	0	0	0

##### **1410m – 1720m: MARL with minor ARGILLACEOUS CALCILUTITE**

**MARL:** Light grey to medium light grey, medium grey to medium dark grey, light olive grey to olive grey, soft to firm, dispersive in part, sub-blocky to blocky, occasionally minor siltstone laminae, trace glauconite, trace pyrite nodules, trace carbonaceous specks, trace forams, trace fossil fragments.

**ARGILLACEOUS CALCILUTITE:** Light grey to medium grey, occasional light olive grey, soft to firm, sub-blocky to blocky, trace carbonaceous specks, trace foram, trace pyrite nodules, trace glauconite, trace fossil fragments, trace unconsolidated rounded quartz grains.



The section from 1410m to 1720m was drilled with an average rate of penetration of 37.6 m/hr and ranged from 9.5 m/hr to 86.4 m/hr.

Total Gas (%)	C1 (%)	C2 (%)	C3 (%)	IC4 (%)	NC4 (%)	IC5 (%)	NC5 (%)
0.01–0.04	0.014–0.044	0	0	0	0	0	0

**1720m – 2610m: Interbedded CLAYSTONE and SANDSTONE with minor COAL and rare SILTSTONE and CONGLOMERATE**

**CLAYSTONE:** Very light grey to dark grey, light brownish grey to brownish grey, greyish orange to dark yellowish orange, pale to dark yellowish brown, dusky brown to yellowish brown, greyish brown, brownish black, olive grey to dark olive grey, olive black, white to yellowish grey, occasional greenish grey, occasionally black, occasionally mottled, very soft to firm, amorphous, sub-blocky to blocky, occasionally dispersive, occasional micro-laminations, occasionally kaolinitic, trace to rare carbonaceous specks, occasionally trace to common glauconite, trace pyrite nodules, trace disseminated pyrite, trace quartz silt, sandy in part.

**SANDSTONE:** White to medium grey, greyish brown, very light grey to light brownish grey, moderate pink, clear to translucent quartz grains, occasionally frosted, predominantly loose, occasionally friable to hard aggregates, very fine to very coarse, occasional granules, predominantly very fine to medium, angular to rounded, sub-spherical to sub-elongate, very poorly to well sorted, occasionally broken loose grains, weak silica cement, occasional quartz overgrowths, trace pyrite cement, trace pyrite nodules, occasionally argillaceous, occasional to abundant kaolinite matrix, trace smoky quartz, trace grey chert and jasper, trace glauconite, trace coal, poor to good visual porosity, poor to good inferred porosity for loose grains.

**FLUORESCENCE**

1760-1770m: 30% decreasing to trace, moderate pale yellow, no cut, strong yellow crush cut, strong ring residue associated with dense argillaceous aggregates.

1790-1800m: 10% decreasing to trace, dull to moderate bright yellow, very slow faint diffuse cut, slow to moderate crush cut associated with argillaceous aggregates.

**COAL:** Bituminous, greyish black to black, dull to sub-vitreous, brownish black, occasional earthy lustre, firm to hard, sub-conchoidal, sub-angular to angular, sub-blocky to blocky, sub-fissile, uneven fracture.

**SILTSTONE:** Medium light grey to medium grey, brownish grey, off white, soft to firm, blocky, dispersive, abundant white kaolinite matrix, carbonaceous material, very fine to fine disseminated quartz grains, trace pyrite nodules, occasional quartz grains.

**CONGLOMERATE:** Disaggregated quartz granules (3-5mm), rounded, moderate to high sphericity, occasional clay matrix.

The section from 1720m to 2610m was drilled with an average rate of penetration of 16.8 m/hr and ranged from 0.5 m/hr to 105.1 m/hr.

Total Gas (%)	C1 (%)	C2 (%)	C3 (%)	IC4 (%)	NC4 (%)	IC5 (%)	NC5 (%)
0.01–0.12	0.012–0.059	0.021– 0.040	0–0.030	0–0.040	0–0.004	0.016	0–0.010

**2610m – 3174m: ALTERED VOLCANICS and CLAYSTONE with minor SANDSTONE**

**ALTERED VOLCANICS:** Black, white to very light grey to light grey to light brownish grey to brown, greyish red to greyish pink, greenish grey to dark greenish grey to light olive grey, very soft to very hard, amorphous to subangular to blocky, predominantly subangular, commonly kaolinitic, trace of chlorite, trace of silica.

**CLAYSTONE:** very light grey to dark grey, pale brown to greyish brown to dusky brown to dark yellowish brown, brownish black to black, very soft to firm, trace of carbonaceous matrix, trace of nodular pyrite, amorphous to sub blocky to sub fissile occasionally fissile, trace of carbonaceous specks.

**SANDSTONE:** Clear to transparent to translucent, white to light grey to dark grey to brownish grey quartz grains, predominantly loose, occasional hard to very hard aggregates, very fine to very coarse grained, predominantly fine to medium grained, angular to rounded, poorly sorted, trace pyrite cement, trace nodular pyrite, occasional trace of argillaceous matrix, occasional kaolinite matrix, fair inferred porosity, poor visible porosity.

**FLUORESCENCE**

2627-2635m: 80% moderate bright white fluorescence with very bright spots, very slow blooming white cut, thin ring residue, poor fluorescence for 2630-2635m, calcite cement mineral fluorescence.

2836-2838: 30%, bright white, patchy, associated with aggregates, occasional pinpoint, faint instant, strong blooming white crush cut, dull yellow ring residue.

2888m (spot sample): Trace dull yellow, spotty, slow bleeding cut, moderate ring residue, associated with tight sandstone aggregates with clay matrix.

2993m (spot sample): Moderate yellow-white, moderate blooming cut, moderate green-yellow ring residue, associated with lower porosity sand aggregates.

3026-3030m: 50%, bright white to yellowish white, spotted, associated with kaolinitic sandstone, slow cut, crush cut: pale blue film residue, blue-white ring residue.

3097-3107m: 10-70%, dull, pale yellow to pale brown, patchy, slow blooming cut, thin film residue, milky ring residue, associated with soft to firm kaolinitic matrix supported sandstone.

3115-3127m: 60% to trace, very dull pale yellowish white, no cut, moderate yellowish white crush cut, thin ring residue.

3137-3145m: 60% to trace, very dull pale yellowish white, no cut, moderate yellowish white crush cut, thin ring residue.

3150-3161m: 70%, decreasing to 10%, very dull yellow fluorescence, spotty on loose grains, solid on kaolinitic aggregates, nil cut, very faint crush cut, thin spotty yellow to white ring residue.

**COAL:** Black, moderately hard to hard, earthy to vitreous lustre, sub-angular to angular.

The section from 2610m to 3174m was drilled with an average rate of penetration of 4.9 m/hr and ranged from 1.0 m/hr to 16.1 m/hr.

Total Gas (%)	C1 (%)	C2 (%)	C3 (%)	IC4 (%)	NC4 (%)	IC5 (%)	NC5 (%)
0.02-0.25	0.006–0.170	0 – 0.025	0 – 0.020	0 –0.006	0 – 0.007	0 – 0.008	0 – 0.005

**INTEQ****CONTAINER: #112**

Well Name: Scallop-1  
Rig: Sedco 702  
Operator: Esso Australia Pty.Ltd.

**Lightly Washed and Dried (Palynology)**

**Set A**                      **ESSO, Melbourne** (200g)  
**Attn:** Diana Giodano  
C/O Kestrel Information Management (Australia)  
596-600 Somerville Rd  
Sunshine VIC 3020

**Washed and Dried (100g)**

**Set B**                      **ESSO, Melbourne** (100g)  
**Attn:** Diana Giodano  
C/O Kestrel Information Management (Australia)  
596-600 Somerville Rd  
Sunshine VIC 3020

**Set C**                      **BHP Billiton, Melbourne** (100g)  
**Attn:** Diana Giodano  
C/O Kestrel Information Management (Australia)  
596-600 Somerville Rd  
Sunshine VIC 3020

**Set D**                      **Santos, Adelaide** (100g)  
**Attn:** Andy Pietsch  
Santos Core Library  
C/o Ascot Transport  
Francis Street  
Gillman, South Australia 5013

**Set E**                      **Woodside, Perth** (100g)  
**Attn:** Gary Kemp  
Core Laboratories  
447-449 Belmont Ave  
Kewdale, WA 6105

**Set F**                      **DPI Core Sample Library** (100g)  
South Road (off Sneydes Rd)  
Werribee, VIC 3030

**Set G**                      **Geoscience Australia** (100g)  
**Attn:** Eddie Resiak  
Cnr Jerrabomberra Ave & Hindmarsh Drive  
Symonston ACT 2069

**Set H (Charts etc.):**    **ESSO, Melbourne** (Charts etc.)  
**Attn:** Diana Giodano  
C/O Kestrel Information Management (Australia)  
596-600 Somerville Rd  
Sunshine VIC 3020

## INTEQ

### Lightly Washed, Set A:

Split Box	1:	917m – 1440m
	2:	1440m – 1675m
	3:	1675m – 1795m
	4:	1795m – 1870m
	5:	1870m – 1945m
	6:	1945m – 2035m
	7:	2035m – 2140m
	8:	2140m – 2235m
	9:	2235m – 2325m
	10:	2325m – 2445m
	11:	2445m – 2520m
	12:	2520 m – 2595m
	13:	2595 m – 2670m
	14:	2670m – 2750m
	15:	2750m – 2825m
	16:	2825m – 2900m
	17:	2900m – 2990m
	18:	2990m – 3080m
	19:	3080m – 3174m

### Washed & dried, Sets B,C, D, E, F &G (100g) :

Split Box	1:	917m – 1530m
	2:	1530m – 1705m
	3:	1705m – 1840m
	4:	1840m – 1920m
	5:	1920m – 2030m
	6:	2030m – 2130m
	7:	2130m – 2260m
	8:	2260m – 2360m
	9:	2360m – 2470m
	10:	2470m – 2585m
	11:	2585m – 2700m
	12:	2700m – 2805m
	13:	2805m – 2900m
	14:	2900m – 3020m
	15:	3020m – 3120m
	16:	3120m – 3174m

### Printouts, Charts & Plots, Set H:

Siemens Charts  
Chromatograph printouts  
Online Drilling/Tripping/Reaming data  
Loggers worksheets

## **INTEQ**

SET A: 2 large boxes and one small box  
SET B: 2 large boxes  
SET C: 2 large boxes  
SET D: 2 large boxes  
SET E: 2 large boxes  
SET F: 2 large boxes  
SET G: 2 large boxes  
SET H: 1 large box

Total 16 boxes for distribution to Esso Melbourne and onward forwarding to above addresses.

## **Section 4**

### **Pressure Evaluation**

## 4.1 PORE PRESSURE EVALUATION

Baker Hughes INTEQ formation pressure evaluation services commenced at 261m. Formation evaluation was carried out using data collected whilst drilling, with the aid of offset data provided by the client for correlation purposes and on-line MWD data. An average sea water density of 8.6 ppg was assumed as the normal saline pressure gradient for all calculations for Scallop-1. Using real-time data, such as the hydrocarbon gas trend, lithology, flowline temperature, character of drilled cuttings, constant drilling fluid parameters, corrected drilling exponent (Dxc) data, as well as wireline logging data when available, pore pressure estimates were made during the drilling of Scallop-1. For more details, please refer to Appendix 3, "Pressure Summary Plot".

### 444mm (17.5") Hole Section: 179m – 917m

The 17.5" hole section was drilled with returns to seabed, and was drilled with a PDC bit. Baker Hughes INTEQ commenced mudlogging services from 261m. No indications of shallow gas was seen in any offset wells or on seismic interpretations, and no shallow gas indications were observed (by ROV) while drilling this section. Rig safety on shallow gas procedures were adhered to throughout the drilling of this hole section. Seawater was used as the primary drilling fluid, with prehydrated gel sweeps pumped to assist in hole cleaning.

The Dxc profile while drilling from 261m to around 500m (Limestone lithology) showed no clear Dxc trend, but not as widely scattered as the typical Dxc profile in shallow depth drilling. The Dxc values ranged from 0.29 to 1.06 (average = 0.67). The interval below 500m down to 650m showed a steeper, near-vertical Dxc trend with depth. The Dxc values ranged from 0.59 to 0.99 (average = 0.76) which possibly correspond to silty/marly sections of the Gippsland Limestone formation. Below 650m to 800m, no clear Dxc trend could be discerned from the Dxc plot (Dxc range = 0.51 – 0.87, average = 0.67). From 800m to section TD of 917m, again, a steep Dxc trend with depth was shown by the Dxc plot (Dxc range = 0.68 – 0.99, average = 0.79).

The above Dxc profile trend analysis (while drilling without returns) merely suggested the absence of any significant Dxc trend (or compaction trend) which could be established after drilling the section from 179m to 917m. The prognosticated Limestone formation to be drilled in this interval seemed to agree with the general Dxc profile.

As this section was drilled successfully using seawater, the pore pressure was assumed to be normal at 8.6 ppg (1.03 sg) EMW.

### 311mm (12.25") Hole Section: 917m – 3174m (TD)

A KCI/PHPA/Polymer/Glycol water-based mud system was used throughout this section, with mud weights ranging from 9.0 ppg (1.08 sg) to 10.2 ppg (1.23 sg). The ECD varied from 9.1 ppg to 10.5 ppg (1.09 sg to 1.26 sg).

The 311mm (12.25") section consisted predominantly of Limestone, altered volcanics, Sandstone, Claystone, with minor Siltstone and Marl lithologies. This section was drilled initially with a PDC bit (NB3) from 917m down to 2618m. Penetration rates were maximized throughout most of the section, with the mud weight being increased with depth based on the predicted lithologic characteristics, and based on marginal overpressures in the offset wells. The drilling parameters like weight on bit was occasionally controlled depending on the deviation surveys (Anderdrift) taken after every stand of drillpipe drilled. The rates of penetration ranged from 1 m/hr to 105 m/hr, with an average of 13 m/hr. The second bit (NB4) was an insert bit which drilled from 2618m down to 2933m. This bit drilled thru predominantly the altered volcanics, with some minor Claystone and Sandstone interbeds. The rates of penetration ranged from 2 m/hr to 16 m/hr, with an average of 5 m/hr. The last bit (NB5) was another insert bit which drilled from 2933m to the hole TD of 3174m. The lithologies drilled were altered volcanics, Claystone and Sandstone. The rates of penetration ranged from 1 m/hr to 16 m/hr, with an average of 4 m/hr.

The Dxc plot analysis while drilling was utilized throughout the section, especially while drilling below 1700m with the intention of assessing for any indications of pore pressure increase(s) with depth. Although conditions were not ideal, due to bit type and lithologic interbeds/impurities, what was thought to represent a normal (1.03 sg EMW) compaction curve could be established from the Dxc plot below 1700m to approximately 1850m (Dxc range = 0.57 to 1.38), and below 2000m to nearly 2300m (Dxc range = 0.70 to 1.45). Below 2300m down to approximately 2570m, a different trend in the Dxc plot was apparent with the Dxc values ranging from 0.72 to 1.18 only. This could possibly be correlated to a rock formation change. Also, a minor shift in the Dxc trend was discernible within the depth intervals of about 2400m to 2500m. The lower Dxc values within the depth interval equate to an estimated pore pressure of 8.9 ppg (1.07 sg) EMW, or higher.

The Dxc plot corresponding to the two(2) insert bits run from 2618m to the hole TD of 3174m both showed a Dxc trend of generally decreasing drillability with depth. Both the Dxc trend lines showed a low-angle, positive slope with depth, e.g. from 2628m to 2933m, the Dxc values ranged from 1.06 to 1.87 (average = 1.54); and from 2933m to 3174m, the Dxc values ranged from 1.22 to 1.99 (average = 1.63). A sand-line could also be established from approximately 2940m to 3110m which appeared to run parallel the above-mentioned Dxc trend line. No increasing pore pressure, therefore, were indicated by the Dxc plot from 2618m to TD.

The background gas from 1000m to 2300m ranged from 0.01% to 0.08%, with an average of 0.03%. Below 2300m to around 2520m, the background gas ranged from 0.02% to 0.12%, with an average of 0.04%, despite the mud weight increasing from 9.9 ppg (1.19 sg) to 10.2 ppg (1.23 sg). The background gas below 2520m to TD (average was 0.05-0.06%) was relatively higher due to the gas-bearing sand interbeds and stringers drilled thru. No connection gasses were observed during the entire drilling. Trip gas at 2618m was 0.05% over a background of 0.02%, while at 2933m, the trip gas was 0.10% over a background of 0.04%.

The hole conditions whilst drilling the section were generally good, except for some tight spots when tripping out which could possibly be Sandstone/volcanic ledges. A wiper trip was performed after reaching the hole TD of 3174m, and the hole was circulated twice the annular volume with not much cuttings coming out over the shakers. Nill cavings were observed in the drill cuttings throughout the drilling of the 311mm (12.25") section.

Temperature data showed no abnormal variations, with all variations being attributed to surface mud transfers, changes in pump rates, and occasional cuttings accumulation in the possum belly.

Overall, no strong indications of increasing pore pressure were interpreted while drilling Scallop-1 based on the available pore pressure parameters. A possible higher (than normal) pore pressure regime was apparent in the Dxc plot between 2400m-2500m, which could correlate to slightly higher background gas in the same depth interval. As a corollary of the aforementioned pore pressure assessment, the hole was drilled with a good overbalance from 917m to the final TD of 3174m.



## 4.2 FRACTURE PRESSURE EVALUATION

Fracture pressure estimation for Scallop-1 was made using the Baker Hughes INTEQ zero tensile strength method. For a full explanation of this method, refer to INTEQ Manual MS-156 "The Theory and Evaluation of Formation Pressures".

The 660mm / 914mm (26" / 36") and 444mm (17 1/2") hole sections were drilled with seawater, with returns to the seabed. With no returns to surface it was not possible to estimate the fracture pressure through the 17.5" hole sections.

After running and testing the BOP stack and riser, the cement and the 340mm (13.375") casing shoe was drilled out from 843m to 900m, and the rathole was cleaned out to 917m. Three(3) meters of new 311mm (12.25") hole was drilled to 920m, and a Leak-Off Test (LOT) was performed. The results are shown below :

Casing Depth	Casing Size		Hole Size		Test Mud Density	PIT EMW	Test type
mMDRT	in	mm	in	mm	(sg/ppg)	(sg/ppg)	
900	13.375	340	12.25	311	1.15/9.0	1.98/16.5	LOT

The hole was displaced to a KCL/PHPA/Glycol/Polymer water-based mud system weighted at 9.0 ppg while drilling out the cement and casing shoe. A leak-off test was then performed recording a 16.5 ppg EMW formation leak-off strength. Drilling resumed with minimal surface losses. The mud system was weighted up slowly to 9.5 ppg to 9.8 ppg at approximately 2000m while drilling. Baracarb limestone mud additive was gradually added to the drilling fluid to minimise seepage losses into the Latrobe sands. Further additions of KCl and Baracarb then increased the mud weight to 10.2 ppg at around 2500m without significant mud loss into the formation. Flow checks conducted at drilling breaks showed static hole conditions. The maximum ECD of the mud while drilling the 12 1/4" hole from 917m to 3174m was 10.5 ppg(1.26 sg) which was low compared to the 16.5 ppg(1.98 sg) EMW measured strength of the weakest formation. The calculated maximum fracture pressure gradient in this section ranged from 15.8 ppg to 17.6 ppg(1.90-2.12 sg) EMW.

## Tables

Table 1:Bit Run Summary

Tables



<div><div> INTEQ</div><div></div></div>				LOCATION / WELL NAME <b>Vic / RL2</b> <b>Scallop-1</b> OPERATOR <b>ESSO Australia Pty. Ltd.</b>  CONTRACTOR / RIG <b>Transocean Sedco Forex</b> <b>Sedco 702</b>				<b>Rotary Type Abbreviations</b> <i>TS - Top Drive System</i> <i>RT - Rotary Table</i> <i>PD - Positive Displacement Motor</i> <i>SB - Steerable PDM &amp; Bent Sub</i> <i>TB - Turbine</i> <i>m - suffix designates MWD</i>				<b>Geology Abbreviations</b> <i>Sd : Sand</i> <i>Sst : Sandstone</i> <i>Lst : Limestone</i> <i>Slt : Silt</i> <i>Sstt : Siltstone</i> <i>Cl : Clay</i> <i>Clst : Claystone</i> <i>Volc: Volcanics</i> <i>Sh : Shale</i> <i>Mrl : Marls</i>				<b>Dull Grade &amp; Reason Pulled</b> <div><div><i>A - All Rows</i> <i>BC - Broken Cone</i> <i>BHA - Bottomhole Assembly</i> <i>BU - Balled Up Bit</i> <i>CM - Condition Mud</i> <i>CP - Core Point</i> <i>DMF - Down Hole Motor</i> <i>Failure</i> <i>DP - Drill Plug</i> <i>DSF - Drill String Failure</i></div><div><i>DTF - Down Hole Tool</i> <i>Failure</i> <i>E - Seals Effective</i> <i>F - Seals Failed</i> <i>FC - Flat Crested Wear</i> <i>G - Gage Rows as 1/16</i> <i>H - Heel</i> <i>HP - Hole Problems</i> <i>HR - Hours on Bit</i> <i>L - In Gauge</i></div><div><i>PR - Penetration rate</i> <i>RG - Rounded Gauge</i> <i>SD - Shirt Tail Damage</i> <i>TD - Total / Csg Depth</i> <i>TQ - Torque</i> <i>TW - Twist Off</i> <i>WC - Weather Condition</i> <i>WT - Worn Teeth</i> <i>BT - Broken Teeth</i></div><div><i>JD - Junk Damage</i> <i>LIH - Left In Hole</i> <i>LOG - Run Logs</i> <i>LT - Lost Teeth</i> <i>M - Middle Rows</i> <i>MH - Mid Heel</i> <i>NO - No Dull Wear</i> <i>O - Out of Gauge</i> <i>PP - Pump Pressure</i></div></div>																			
								<b>Mud Type Abbreviations</b> <i>PHG - Gel Sweeps GLY - Glycol</i> <i>G - Gel PHPA - Polyacrylamide</i> <i>SBM - Synthetic-Based Mud</i>																											
Run No.	Bit No.	Vendor	Type	Serial Number	Size (in)	IADC Code	Nozzles (x 1/32")	Depth		Drilled		ROP (m/hr)	WOB (klb)	RPM (at bit)	TORQ. (kftlb)	TBR x1000	RT	Pump Pr (psi)	Flow Rate (gpm)	Dev (deg)	Geology Formation	W sg	Mud Type	PV/YP	IADC Dull Grade (G in 1/16")										
								In	Out	m	hrs														I	O	D	L	B	G	O	R			
<b>660mm / 914mm (26" / 36") Hole Section 135.5 - 179m</b>																																			
1	NB1	Reed	Y11	660478	26"	111	1 X 20 3 x 18	135.5	179	43.5	2	21.8	2	90	3.00	10.8	TS	2800	1204	0.00	Returns to seabed	1.03	SW / Hi-Vis	1 / 1	1	1	PN	A	1	1	RR	TD			
			Hole Opener		36"		5 x 20																	(Start M/Logging F/261m)											
<b>444mm (17.5") Hole Section 179 - 917m</b>																																			
2	NB2	Hycalog	DS34HF	24400Z	17.5"		8 x 14	179	917	738	14.1	52.3	0.5 - 13.2	54 - 152	1.5 - 11.6	118.7	TS	1585 - 2840	1090 - 1230	0.00	Returns to seabed	1.03	SW / Hi-Vis	1 / 1	1	1	ER	T	X	1	NO	TD			
								(Start M/Logging F/261m)																		(Start M/Logging F/261m)									
3	NB3	Smith	MA89PX	JT 0152	12.25"	M223	7 x 14	917	2618	1701	127.8	13.3	3.8 - 20	23 - 148	1.6 - 12.7	14.5	TS	1000 - 3408	800 - 1014	2.12	Sst, Clst, Sst	1.20	KCL/PHPAPoly/Glycol	21/24	2	4	CT	S	X	0	BT	PR			
4	NB4	Hughes	MX20DDT	6007902	12.25"	1/05/2007	3 x 20	2618	2933	315	69.1	4.6	11-54	77-138	5 - 6	403.9	TS	2605-3000	820 - 830	2.00	Sst, Clst, Sst, Volc	1.23	KCL/PHPAPoly/Glycol	24/37	4	7	BT	S	E	1	WT	TQ			
5	NB5	Hughes	MX20DX	WD42DV	12.25"	1/05/2007	3 x 18	2933	3174	241	69.3	3.5	32-55	75-133	5 - 7	404.3	TS	3400 - 3500	750-850	1.52	Sst, Clst, Volc	1.22	KCL/PHPAPoly/Glycol	24/38	3	7	BT	S	E	2	RG	TD			

Table 2: Bit Hydraulics Summary

Tables

<div><div><div><div><div></div><div>BAKER</div><div>HUGHES</div></div><div>INTEQ</div></div><div>Bit Hydraulics Summary</div><div><div><div>Esso</div></div></div></div></div>																				
Operator					Well Name					Location		Drilling Contractor					Rig			
ESSO Australia Pty. Ltd.					Scallop-1					VIC / RL2		Transocean Sedco Forex					Sedco 702			
Drillstring Abbreviations									Hydraulics Models											
N Normal M MWD P Positive Displacement Motor A Adjustable Gauge Stabilizer									S Camco SRD Tool T Halliburton TRACS Tool C Core Power Law Model used for drilling with Mud Bingham Model used for coring and drilling with sea water											
Bit No.	Depth	Hole Size	Jets	Drill String Type	Mud Type	Mud Density	PV	YP	Flow Rate	Jet Vel	Impact Force	Hydraulic Power	Power/ Area	Bit Loss	Bit Loss %	Pipe Loss	ECD	Annular Velocities		
																		DP OH	DC OH	DC Critical
(m)	in		x 1/32"			sg	cP	lbs/100 ft sq	gpm	m/sec	lbf	hhp	hp/sq in	Psi	%	Psi	sg	m/min	m/min	m/min
914mm (36") Hole Section																				
NB1	179	36"	3x18	N	SW&Hi-Vis Pills	1.03	1	36"	855	70	855	195.0	0.8	395	64.0	165	1.04	-	4	24
444mm (17.5") Hole Section																				
NB2	917	17.5"	8x14	N	SW&Hi-Vis Pills	1.03	1	1	1220	99	1765	577.0	2.4	813	33.3	655	1.03	32	42	45
311mm (12.25") Hole Section																				
NB3	1303	12.25	7x14	N	KCl/Polymer/Glycol	1.15	14	25	1000	93	1513	464.2	4.0	796	36.4	1223	1.17	60	91	138
	1870	12.25	7x14	N	KCl/Polymer/Glycol	1.15	20	26	950	88	1365	398.0	3.4	719	28.1	1678	1.17	57	87	144
	2154	12.25	7x14	N	KCl/Polymer/Glycol	1.16	21	31	990	92	1495	454.0	3.9	787	27.0	1947	1.18	59	90	160
	2303	12.25	7x14	N	KCl/Polymer/Glycol	1.19	20	35	1000	93	1565	480.0	4.1	824	26.9	1997	1.22	60	91	168
	2465	12.25	7x14	N	KCl/Polymer/Glycol	1.22	22	40	1005	93	1621	500.0	4.3	853	26.1	2189	1.25	57	85	176
	2595	12.25	7x14	N	KCl/Polymer/Glycol	1.23	21	35	1005	93	1634	504.0	4.3	860	25.5	2297	1.26	57	85	162
NB4	2706	12.25	3x20	N	KCl/Polymer/Glycol	1.23	21	37	825	88	1259	364.0	3.1	758	26.6	1889	1.26	47	75	170
	2830	12.25"	3x20	N	KCl/Polymer/Glycol	1.23	22	34	810	86	1214	345.0	3.0	731	25.3	1972	1.25	47	74	163
	2933	12.25"	3x20	N	KCl/Polymer/Glycol	1.23	24	37	800	85	1184	332.0	2.9	713	24.4	2033	1.26	48	73	172
NB5	2996	12.25"	3x18	N	KCl/Polymer/Glycol	1.23	22	36	830	109	1573	565.0	4.9	1169	31.1	2415	1.26	47	73	166
	3174	12.25"	3x18	N	KCl/Polymer/Glycol	1.22	24	38	820	108	1523	541.0	4.7	1132	29.5	2522	1.25	47	75	175

Table 3: Survey data summary

Tables

Esso Australia Pty Ltd.

February 2003

Gyro Survey listings

Survey number	Measured Depth Depth	Inclination Deg.	Azimuth Deg.	Survey number	Measured Depth Depth	Inclination Deg.	Azimuth Deg.
1	157.8	0.25	195.26	51	1610.8	0.84	19.01
2	185.1	2.83	2.83	52	1639.9	0.96	51.87
3	212.5	0.35	350.71	53	1668.9	0.99	5.3
4	239.9	0.32	1.45	54	1698	1.05	16.09
5	267.5	0.35	15.59	55	1727.1	1.07	8.49
6	296.4	0.35	357.5	56	1756.1	0.97	37.88
7	325.4	0.35	358.93	57	1785.1	1.64	8.97
8	354.4	0.31	351.16	58	1814.2	1.49	355.64
9	383.2	0.28	342.33	59	1843.1	1.39	352.07
10	412.2	0.28	333.71	60	1871.8	1.36	10.96
11	441.3	0.3	330.59	61	1900.9	1.42	5.91
12	470.3	0.26	329.95	62	1930.1	1.06	350.75
13	499.3	0.27	316.67	63	1959.1	1.45	318.73
14	528.3	0.29	341.21	64	1988.2	1.54	10.39
15	557.3	0.35	334.17	65	2017.3	1.5	350.44
16	586.3	0.37	339.92	66	2046.2	1.62	18.76
17	644.2	0.44	344.86	67	2075.3	1.4	356.86
18	673.1	0.48	339.4	68	2104.3	1.68	29.66
19	702.1	0.47	355.15	69	2133.1	1.45	11.55
20	731.1	0.49	354.85	70	2162.1	1.41	6
21	760.1	0.46	355.22	71	2191.2	1.38	355.52
22	789.1	0.46	350.78	72	2220.2	1.25	3.94
23	818.2	0.41	301.7	73	2249.3	1.27	342.71
24	847.2	0.51	355.47	74	2278.2	1.32	17.85
25	876.2	0.53	338.22	75	2307.2	1.42	358.33
26	885.8	0.51	327.67	76	2336.3	1.52	359.27
27	907.8	0.39	329.98	77	2365.4	1.49	352.09
28	945.5	0.45	10.33	78	2394.5	1.39	344.11
29	974.4	0.51	49.51	79	2423.4	1.31	350.73
30	1003.2	0.5	44.1	80	2452.4	1.36	357.28
31	1032.1	0.56	65.45	81	2481.2	1.28	8.12
32	1060.9	0.53	47.97	82	2510.2	1.31	3.41
33	1089.8	0.58	59.57	83	2539.1	1.3	359.16
34	1118.7	0.56	29.96	84	2568.1	1.17	4.09
35	1147.6	0.64	46.68	85	2597.1	1.09	6.25
36	1176.5	0.62	19.17	86	2626.2	1.14	1.74
37	1205.3	0.56	31.6	87	2655.2	1.19	357.56
38	1234.1	0.58	34.13	88	2684.2	1.36	10.59
39	1263	0.64	42.47	89	2713.1	1.15	121.25
40	1291.9	0.64	44.73	90	2742.1	1.26	336.84
41	1321	0.6	16.43	91	2771.1	1.18	349.21
42	1350.1	0.6	43.77	92	2800.1	1.12	286.24
43	1378.9	0.63	46.82	93	2829	1.3	317.47
44	1407.6	0.65	54.2	94	2858	1.13	327.9
45	1436.5	0.63	47.67	95	2887	1.27	345.2
46	1465.3	0.64	55.52	96	2916	1.29	328.73
47	1494.5	0.73	32.93	97	2923	1.35	28.95
48	1523.6	0.83	36.39				
49	1552.7	0.85	12.09				
50	1581.8	0.88	5.86				

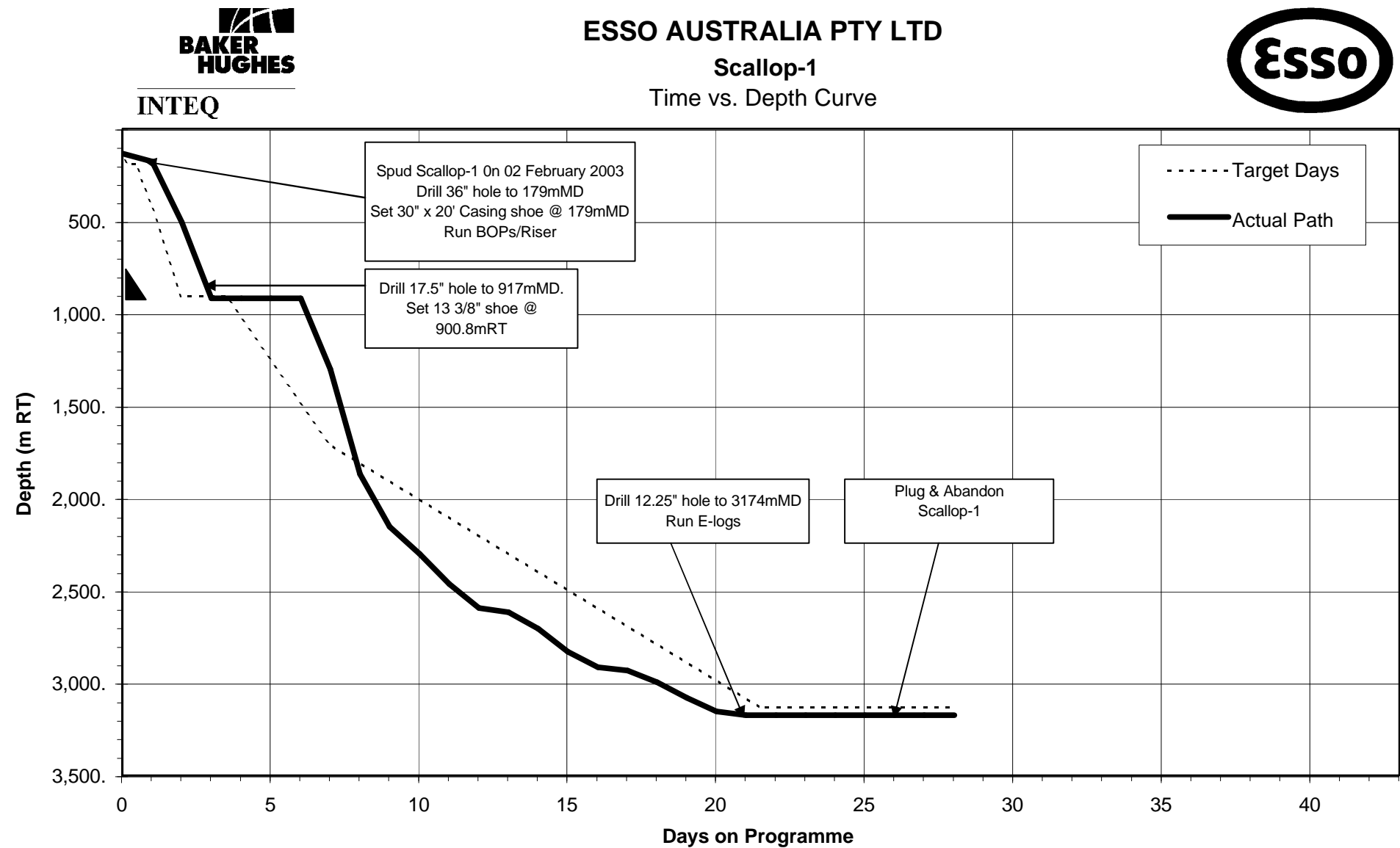
Table 3: Survey data summary

Tables

**Directional Survey listings**

Seq # -	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S- (m)	Displ +E/W- (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 10m)	Srvy tool type	Tool Corr (deg)
1	2923	1.35	28.95	0	2922.61	37.24	37.24	2.84	37.35	4.36	0	TIP	None
2	2936.3	1.36	325.18	13.3	2935.91	37.51	37.51	2.83	37.61	4.31	1.08	MWD	None
3	2964.01	1.45	327.72	27.71	2963.61	38.07	38.07	2.45	38.15	3.68	0.04	MWD	None
4	2993.09	1.51	327.61	29.08	2992.68	38.71	38.71	2.05	38.76	3.03	0.02	MWD	None
5	3023.62	1.56	335.57	30.53	3023.2	39.43	39.43	1.66	39.46	2.41	0.07	MWD	None
6	3051.74	1.55	335.18	28.12	3051.31	40.12	40.12	1.34	40.14	1.92	0.01	MWD	None
7	3080.66	1.55	331.24	28.92	3080.22	40.82	40.82	0.99	40.83	1.39	0.04	MWD	None
8	3110.84	1.52	333.82	30.18	3110.39	41.53	41.53	0.62	41.54	0.85	0.02	MWD	None
9	3138.26	1.52	333.59	27.42	3137.8	42.19	42.19	0.3	42.19	0.4	0	MWD	None

Table 4: Time vs Depth Curve



## **Appendices**



# **Formation Evaluation Log**

1: 500

# **Drilling Data Plot**

1: 1000

## **Pressure Data Plot**

1: 1000

**Pressure Summary Plot**  
1: 7500

# **Gas Ratio Analysis Plot**

1: 500