



Cultus Timor Sea Ltd (ACN 064 126 138)

Level 29, 44 St George's Tce Perth WA 6000 Australia

> Tel: (61 8) 9223 5000 Fax: (61 8) 9223 5004

THE WE WELL SOS

AUSTRALIA GIPPSLAND BASIN VIC/RL5

BALEEN-2

WELL COMPLETION REPORT BASIC GEOTECHNICAL DATA

-VOLUME 1A-Text, Figures, Appendices 1-13

Prepared by: Alex Warris

CONFIDENTIAL



Cultus Timor Sea Ltd (ACN 064 126 138)

Level 29, 44 St George's Tce Perth WA 6000 Australia

Tel: (61 8) 9223 5000

Fax: (61 8) 9223 5004

AUSTRALIA GIPPSLAND BASIN VIC/RL5

BALEEN-2

WELL COMPLETION REPORT **BASIC GEOTECHNICAL DATA**

-VOLUME 1A-**Text, Figures, Appendices 1-13**

Prepared by: Alex Warris

CONFIDENTIAL



Cultus Timor Sea Ltd (ACN 064 126 138)

Level 29, 44 St George's Tce Perth WA 6000

> Tel: (61 8) 9223 5000 Fax: (61 8) 9223 5004

AUSTRALIA GIPPSLAND BASIN VIC/RL5

BALEEN-2

WELL COMPLETION REPORT BASIC GEOTECHNICAL DATA

-VOLUME 1A-Text, Figures, Appendices 1-13

Prepared by: Alex Warris

Approved by:

Exploration Manager

July, 2000

CONFIDENTIAL

Copy No. ..5...



BALEEN-2 BASIC DATA REPORT

-Volume 1A-

TABLE OF CONTENTS

I. II. III. V.		LIST OF FIGURES LIST OF TABLES LIST OF APPENDICES DISTRIBUTION LIST	ii ii
	WI	ELL SUMMARY WELL SUMMARY CARD – BALEEN-2	1
•	. ı .2	SUMMARY	7
	.2 .3	CASING	2
•	.s .4	STRATIGRAPHY	
	. 4 .5	CONVENTIONAL CORES	
	.5 .6	SIDEWALL CORES	
-	.7	CUTTINGS	
-	. <i>r</i> .8	MDT SUMMARY	
	.9	DST SUMMARY	
2	.1	EOLOGY GEOLOGICAL SUMMARY	6
-		YDROCARBON SHOWS	•
_	3.1	OIL FLUORESCENCE SHOWS	
3	3.2	GAS SHOWS	8
4	W	IRELINE AND MUD LOGS	
-	1.1	WIRELINE LOGS	10
4	.2	MUD LOGS	
4	.3	VELOCITY SURVEY	11
5	SA	AMPLE ANALYSES	
-	5.1	OIL ANALYSES	12
	5.2	GAS ANALYSIS	12
5	5.3	MUD ANALYSES	12
5	5.4	WATER ANALYSES	12
E	: 5	EII TDATE ANALYSIS	12



I. LIST OF FIGURES

FIGURE 1	RL5 Location Map
FIGURE 2	Well Location Map
FIGURE 3	Abandonment Schematic

II. LIST OF TABLES

TABLE 1	Casing Summary	3
TABLE 2	Coring Summary	
TABLE 3	Cuttings Summary	
TABLE 4	Summary of Drilling Gas	
TABLE 5	Drilling Gas Peaks	
TABLE 6	Wireline Logging Summary	
TABLE 7	Mud Data	
TABLE 8	Fluid Sample Collection Summary	13

III. LIST OF APPENDICES

APPENDIX 1	Daily Geological Reports - Cultus
APPENDIX 2	Core Chip Description Report - Cultus
APPENDIX 3	Cuttings Description Report - Cultus
APPENDIX 4	Coring Report - Security DBS
APPENDIX 5	5 Metre Core Photography - ACS Laboratories
APPENDIX 6	Wireline Logging Report / Operations Summary - Cultus
APPENDIX 7	MDT Summary Report - Cultus
APPENDIX 8	Mud Logging Daily Reports - Geoservices
APPENDIX 9	Final Mud logging Report - Geoservices
APPENDIX 10	Palynological Report – Basic Data - Biostrata
APPENDIX 11	VSP / Geogram Report - Schlumberger
APPENDIX 12	Routine Core Analysis Report - ACS Laboratories
APPENDIX 13	Fluids Analysis Report - ACS Laboratories



-Volume 1B-

III. LIST OF APPENDICES

APPENDIX 14 Petrology and Reservoir Quality Report - ACS Laboratories

APPENDIX 15 Core Lithological Description and Sedimentological Interpretation

Report - ACS Laboratories

APPENDIX 16 Single and Multiple Failure Triaxial Tests on Baleen-2 Sands Report

- CSIRO

IV. LIST OF ENCLOSURES

ENCLOSURE 1 Merged Composite Playback (1:200 scale) - Cultus

(From Geoservices Final Report)

ENCLOSURE 2 Formation Evaluation Log

ENCLOSURE 3 Drilling Data Log

ENCLOSURE 4 Pressure Log

(From Schlumberger VSP / Geogram Report)

ENCLOSURE 5 Plot 1 - Z Median Stack

ENCLOSURE 6 Plot 2 - Downgoing Wavefield after VELF

Plot 3 – Upgoing Wavefield after VELF

Plot 4 – Downgoing Wavefield after WSF

Plot 5 - Upgoing Wavefield after WSF

ENCLOSURE 7 Plot 6 - Composite Display- normal polarity 20cm/sec

ENCLOSURE 8 Plot 7 - Composite Display- reversed polarity 20cm/sec

ENCLOSURE 9 Plot 8 - Drift Corrected Sonic

ENCLOSURE 10 Plot 9 - Velocity Crossplot

Baleen-2



V. DISTRIBUTION LIST

- 1. OMV Australia Pty Ltd Library, Perth
- 2. OMV Australia Pty Ltd Exploration Department, Perth
- 3. OMV, Vienna
- 4,5. VicDNRE, Melbourne (2 copies)
- 6,7. AGSO, Canberra (2 copies)



VIC / RL5 Baleen-2 Well Completion Report - Basic Geotechnical Data

BALEEN-2	
1 WELL SUMMARY	

VIC / RL5 Baleen-2

Well Completion Report - Basic Geotechnical Data



1.1 WELL SUMMARY CARD - BALEEN-2

WELL:	BALEEN-2	SPUD	02:15 hrs 11/10/99	
WELL TYPE:	APPRAISAL	TD REACHED:	02:45 hrs 16/10/99	
BLOCK/LICENCE:	VIC/RL5 Gippsland Basin	RIG RELEASE:	19/10/99	
RIG:	SEDCO 702	COMPLETION:	n/a	
WATER DEPTH:	55m (BMSL)	STATUS:	Plugged and abando well with gas and tra	
RT (MSL):	26.0m	TRAP TYPE	Faulted anticline	
TD:	895 m (driller)	ZONE(S):		
	895 m (TVD corrected)			
SURFACE LATITUDE:	38° 01' 55.76" S	SURFACE Y coord:	5 789 663.9 mN	
SURFACE LONGITUDE:	148° 24' 37.55" E	SURFACE X coord:	623 781.4 mE	
OBJECTIVE LATITUDE:	38° 01' 55.79" S	OBJECTIVE Y coord	: 5 789 663 N	
OBJECTIVE LONGITUDE:	148° 24' 37.57" E	OBJECTIVE X coord Spheroid/Datum:	: 623 782 E UTM Zone 55, CM 147°E ANS / AGD 66	
SURFACE Seismic Station:	GL88-62, coincident with intersecting line GL88-55	OBJECTIVE OFFSET:	1.08m at 326°T	
REMARKS: Vertical Well		CASING SIZE	SHOE DEPTH (mRT):	TYPE
Drilled without riser to 650m		30x20"	126m	Drill quip / SWF60
		9 5/8"	646m	LTC/Buttress

PERFORATIONS				
ZONE				
Nil	INTERVAL			
	m RT MD / TVD			
	_			

	CORES			
ZONE NO.		INTERVAL m RT	CUT m	REC m
	1	746 - 762.2 m	16.3	16.3
-	2	763.7 - 779.5 m	18	15.9

	MUD DATA
SUITE	SUITE 1
TYPE	NaCI / PHPA / Polymer
DENSITY	1.21 g/cm3
VISCOSITY	49 sec/qt
FLUID LOSS	3.4 cc / 30 min
рН	9
RM	0.134 ohm.m @21°C
RMF	0.115 ohm.m @22°C
RMC	0.213 ohm.m @22°C
Chlorides	46 500 mg / L
Barite	3.7% by volume

LOG TYPE	SUITE / RUN	INTERVAL mRT	BHT/TIME °C	COMMENTS
PEX-HALS-DSI-NGS	1/1	888.5-90	46.7°C/5:21hrs	Logged GR from 640-90. Full PEX-DSI high resolution data recorded at 1800ft/h.
FMI-GR	1/2	887-647	48°C/8:35hrs	Logged open hole interval
MDT (pretests and samples)	1 / 3,5	823-748	52°C/18:25hrs	32 pretests, 16 normal, 8 supercharged, 5 lost seal, 2 pumpout failure, 1 dry test
CSAT-GR (VSP Survey)	1/4	885-100	50°C/22hrs	47 checkshot levels acquired, including 3 repeat levels at 300m, 663m and 795m
Junk Basket & Bridge Plug (GR and CCL record)	6,7	200-100		Run prior to setting cement abandonment plug 3

SUMMARY

Baleen-2 was drilled as an appraisal well in the northern Gippsland Basin, in offshore Victoria. It is located on the Patricia-Baleen gasfield in VIC/RL5, 3.31 km southwest of the Baleen-1 gas discovery well, and is 350 km east of Melbourne. The well was spudded on the 11th October 1999 using the semi-submersible Sedco Forex 702 in 55 metres of water. It reached a total depth of 895mRT on the 16th October 1999.

A 36" \times 26" hole section was drilled to 126mRT, where the 30x20" casing was set, and a 30" wellhead housing was run and cemented. The top hole was drilled from the conductor depth (126mRT) to 650 mRT without a marine riser, and the 9 5/8" casing was set with the shoe at 646mRT. The FIT was performed at 654mRT to 15.1 ppg EMW, then the 8 1/2" hole section was drilled to TD. Two cores were cut. Core 1 (16.2 m) was taken from 746mRT – 762.2mRT, and Core 2 (15.8 m) was taken from 762.3mRT – 780.3mRT (Drillers depth). One suite of wireline logs was acquired at T.D.

Baleen-2 was plugged and abandoned on the 18th October. The rig was released from the location on the 19th of October 1999.



1.2 SUMMARY

At 02:30 hrs on 7th October 1999, the semi-submersible MODU SEDCO 702 commenced the tow from the Barramundi-1 (Globelex) well location to the Cultus Baleen-2 location. The rig arrived on location and dropped and set anchor # 7 at 12:00 hrs on the 10th October 1999.

The final Racal DGPS rig position for Baleen-2 is as follows;

Datum:

AGD66

Latitude:

038° 01' 55.758" S

Longitude:

148° 24' 37.549" E

Projection:

AMG Zone 55, C.M. 147° East

Eastings:

623,781.41 m

Northings:

5.789,663.90 m

This position was: 1.08 metres on a bearing of 326.0° (T) from the intended location. The Final Rig Heading was 206.4°(T).

Baleen-2 was drilled as an appraisal well, with its final location 350 km east of Melbourne in the northern Gippsland Basin, which lies on the southwest extension of the Baleen portion of the Patricia-Baleen Gas Field (Figure 1). The well was drilled 3.31 km southwest and structurally downdip of the Baleen-1 discovery well (Figure 2), which had dry gas accumulations in the Gurnard Formation and Latrobe Group Coarse Clastics.

The well spudded at 02:15hrs on the 11th October 1999, and was drilled to a total depth of 895mRT at 02:45hrs on the 16th October.

The final rig elevations are as follows;

RT - MSL = 26.0 mWater Depth = 55.0 m

RT - Sea bed = 81.0 m

A 26"x36" hole was drilled from 81mRT to 126 mRT, where a 30" X 20" conductor was run to 126 mRT and cemented with good returns seen at the wellhead. The 20" shoe track was drilled out using a 17½" BHA. A 12-1/4" hole was drilled riserless from 126mRT to 650 mRT with seawater and gel sweeps and returns to the seabed. The hole was circulated clean and a Magnetic Single Shot survey dropped prior to pulling out of the hole to run 9-5/8" casing. A total of 47 joints of 9-5/8" casing was run to 646mRT and cemented. The FIT was performed at 654mRT to 15.1 ppg EMW. The marine riser and BOP were installed and the 8 ½" hole was drilled to TD at 895mRT.

The main objective for the Baleen-2 well was to intersect the gas-water contact (GWC) of the gas accumulation intersected in Baleen-1, and test the reservoir extent, continuity and quality. All these objectives were met. A further objective of recovering gas samples was not achieved.

Two cores were cut from 746mRT to 780.3mRT stradling the GWC with 93.7% recovery. Oil shows were noted in the lower part of core #1 over the interval 756mRT to 764mRT, where moderately bright yellow green patchy fluorescence with blooming cut fluorescence is present.

The well was plugged with 3 cement plugs; Plug 1: 790mRT – 890mRT, Plug 2: 600mRT – 760mRT, Plug 3: 125mRT – 175mRT, and abandoned at 02:45hrs on the 18th October 1999 (Figure 3), and the rig released on the 19th October 1999.



1.3 CASING

Two casing strings, 30"x20" and 9 5/8", were used in the Baleen-2 well. The 30"x20" casing was set at 125.7mRT on the 11th October 1999 after the 36" x 26" hole section was drilled. The top hole was drilled from the conductor depth (126mRT) to 650mRT, where the 9 5/8" casing was set on the 13th October 1999. The riser and BOP were installed at 650mRT, and the 8 1/2" hole section was drilled to TD. Both casing strings were tested to 2500 psi.

CASING SUMMARY				
Casing Size Hole Size Weight (lb/ft) Type ShoeDepth (mRT)				
30"x20"	36"	235	Drill quip / SWF60	125.7
9 5/8"	12 1/4"	47	LTC / Butress	646.4

TABLE 1

1.4 STRATIGRAPHY

Baleen-2 penetrated a sedimentary sequence which included the following Gippsland Basin stratigraphy, described from cuttings:

•	Marine Carbonates and Clays:	650 – 725 mRT
	Calcareous marine Clays and Calcilutite:	725 – 741 mRT
•	Fine Sand and silty Claystone	741 – 759 mRT
•	Interbedded quartz Sandstone and Claystone:	762 – 791 mRT
•	Interbedded quartz Sandstone and Claystone with minor coal:	791 – 810 mRT
•	Lithic Sandstone:	810 – 859 mRT
•	Claystones with sandy Claystone interbeds	859 – 895 mRT

Interval Summaries are presented in the Daily Geological Reports in Appendix 1.

More detailed descriptions of the Baleen-2 stratigraphy were made from conventional cores and drill cuttings, and are included as Appendix 2 and 3 respectively. Returns above 650mRT were to the sea floor.

Fifteen core and cuttings samples were sent for processing and evaluation for palynology. The species distribution chart is included as Appendix 10.

1.5 CONVENTIONAL CORES

Between the depths of 746mRT and 780.3mRT, 34.3 metres of conventional 8 $\frac{1}{2}$ " x 4 1/8" core were cut from the Baleen-2 well in two cores. Due to the unconsolidated nature of the core, only 93.7% was recovered, resulting in a final length of 32.2 metres.

CORE SUMMARY						
Core No	Interval (mRT)	Metres cut	Recovery (%)	Recovery (m)		
1	746 – 762.3 762.3 – 780	16.3 18	100% 88.06%	16.3m 15.9m		

TABLE 2

The cores were cut into 1 metre intervals, and the annulus of each length was filled with an expanding isocyanate resin to prevent the core from being disturbed during transit. The core was then packed into custom designed chiller boxes for transport to ACS Laboratories Pty Ltd in Brisbane.

Core Chip Description Reports are included as Appendix 2, with a Coring Report by Security DBS included as Appendix 4

CORE SAMPLING

The core was then sampled for routine analyses by ACS Laboratories. A suite of 1½" diameter horizontal plug samples were cut at a rate of 3 per metre for Routine Core Analysis. Fluid Invasion samples were taken at 754.08mRT and 778.34mRT with a soft sediment core sampling apparatus, and divided into 5 equal sections. Three other sample points, at 757mRT, 758.5mRT, and 760.5mRT, were taken to obtain oil samples for finger print analysis over the zone of shows. One SCAL sample plug was taken every metre over the core, and were frozen and stored for further analysis.

Five whole core sections were removed and forwarded to CSIRO, Melbourne, for rock strength analysis. The depths for the removed sections are Sample 1 – 750.8mRT - 751.2mRT, Sample 2 – 756.49mRT -756.8mRT, Sample 3 – 760.19mRT -760.46mRT, Sample 4 – 770.88mRT -771.28mRT, Sample 5 – 776.69mRT -776.9mRT.

The results of the analyses by ACS Laboratories are included as Routine Core Analysis (RCA) Report, Fluid Analysis Report, Petrology and Reservoir Quality Report, and Detailed Core Lithological Description and Sedimentological Interpretation Report, in Appendices 12 to 15 respectively. Rock Strength Analysis results produced by CSIRO is included as the Single and Multiple Failure Triaxial Tests on Baleen-2 Sands Report in Appendix 16.

Core photography on 5 metre format in white and ultraviolet light was performed by ACS Laboratories, and is included as Appendix 5.

1.6 SIDEWALL CORES

No sidewall cores were acquired in the Baleen-2 well.



1.7 CUTTINGS

4 sets of cuttings were acquired over 3 intervals between 650mRT and 895mRT in the Baleen-2 well. The interval 746mRT – 780mRT were sampled at 1 metre as core chips, included as Core Chip Description Report in Appendix 2.

Cuttings sample sets were distributed as follows:

1 set to Cultus

1 set to BRS/AGSO

2 sets to VicDNRE

CUTTINGS SUMMARY								
Sample Type	No. of sets	Quantity per set	Sampling interval	From (m)	To (m)			
Washed and dried	4	200 grams	3 metres	650	746			
Washed and dried	4	200 grams	5 metres	780	810			
Washed and dried	4	200 grams	10 metres	810	895			

TABLE 3

Cuttings Description Report is included as Appendix 3.

1.8 MDT SUMMARY

MDT pretests for formation pressures were conducted across the reservoir sands in two runs (run numbers 3 and 5).

A total of 32 pretests were attempted over the two runs. Run number three attempted 29 pretests over the interval 748.02mRT and 823mRT, of which 16 were successful, 7 were supercharged, 4 had lost seals, 1 was dry, and 1 one had pumpout failure. Two of these pretests were re-attempt samples at 753.5mRT and 749.3mRT. Run five was a rerun to attempt sampling again, and attempted 3 pretests at 749.01mRT, 757.22mRT, and 757.01mRT, with 1 supercharged, 1 pumpout failure, and 1 lost seal respectively.

14 attempts were made to recover gas and water samples over the two runs in the hole. 13 attempts were aborted due to lost seal while pumping filtrate or tool plugging. One sample was successful, resulting in a 1 gallon sample of water taken from 797 mRT, which was further subdivided into 6 samples. On transfer at the surface, the evolved gas had 32ppm H₂S (by Draeger Tube). Two of the formation water samples were analysed by ACS Laboratories with the fluid analysis results included in Appendix 13.

MDT pressure data summary report is included as Appendix 7.

1.9 DST SUMMARY

No Drill Stem Tests were performed in the Baleen-2 well.



	BALEEN-2	
	2 GEOLOGY	
,		



2.1 GEOLOGICAL SUMMARY

A summary of the lithologies penetrated appears below. Detailed core chip descriptions (746mRT – 761.5mRT , 762.3mRT – 778.2mRT) can be found in Appendix 2, Cuttings sample descriptions (650mRT – 895mRT) can be found in Appendix 3

Seafloor - 650mRT No samples taken - returns to seabed.

650 - 741mRT

ARGILLACEOUS CALCILUTITE grading to and interbedded with minor CALCAREOUS CLAYSTONE.

ARGILLACEOUS CALCILUTITE – (40-100%) light grey to medium grey, medium to dark olive grey, dominantly soft, dispersive, rare firm to moderately hard, amorphous to blocky, trace subfissile, trace carbonaceous specks, 30-35% siliceous clay content, trace quartz silt, trace very fine glauconite, trace forams, occasional to 5% Calcilutite, white to very light grey, light olive, grey, soft, amorphous, slightly dispersive; trace very fine glauconite.

CALCAREOUS CLAYSTONE – (0-60%) light to medium grey, light to medium olive grey, soft, amorphous, dispersive in part, 20-30% micrite content, trace-5% very fine glauconite, trace carbonaceous specks.

741 - 792mRT

CLAYSTONE with ARGILLACEOUS CALCILUTITE, grading to ARGILLACEOUS SILTSTONE and SILTY SANDSTONE

CLAYSTONE – (0-90%) medium to dark yellowish brown, dark olive grey, soft, dispersive, 10-15% micrite content, 5-10% fine dark green glauconite, trace to 15% quartz silt, grades to silty Claystone, 5% micromica, trace fine quartz sand, trace very fine disseminated pyrite, trace hard dark brown siderite nodules, trace to minor carbonaceous flecks, trace lithics.

ARGILLACEOUS CALCILUTITE - (0-20%) as above.

ARGILLACEOUS SILTSTONE – (0-100%) medium to dark yellowish brown, soft, dispersive, 30-40% siliceous clay, trace to 5% micrite, trace to 5% very fine quartz sand, 5-10% fine dark green glauconite, trace hard dark yellowish brown siderite nodules, 5-10% micromica, trace carbonaceous specks, trace lithics.

SILTY SANDSTONE – (0-50%) clear to translucent, light grey, opaque, loose, silt size to very fine grading to fine to coarse quartz, angular to sub-rounded, poor to moderately sorted, 5% pyrite cement, 5-10% argillaceous matrix, trace nodular pyrite, trace glauconite, trace siderite nodules.



This interval (741mRT – 791mRT) also includes two unsampled intervals:

759 - 762mRT

NO RETURNS - Cuttings from core not

circulated.

771 - 780.3mRT

NO RETURNS - Cuttings from core not

circulated.

792-859mRT

SANDSTONE with interbedded SILTSTONE and trace COAL.

SANDSTONE – (40-100%) white to opaque, clear to translucent quartz grains, loose, medium to very coarse, dominantly medium to coarse, poorly sorted, sub-angular to sub-rounded, trace pyrite cement, 10-40% white kaolinitic matrix, grades to argillaceous Sandstone, 5% dark green pelloidal glauconite, trace reddish brown lithics (jasper).

COAL - (1-2%) black, firm to hard, occasionally brittle, dull to subvitreous. Observed between 800 - 810mRT.

SILTSTONE – (10-58%) pale brown to moderate yellowish brown, soft, dispersive, amorphous, 10-15% siliceous clay, grades to argillaceous Siltstone, 5% micromica, trace to 5% carbonaceous specks and microlaminae, trace to 2% glauconite, trace lithics.

859 - 895mRT

ARGILLACEOUS SANDSTONE grading to SANDY CLAYSTONE with minor CLAYSTONE interbeds.

ARGILLACEOUS SANDSTONE – (30-95%)white to opaque, clear to translucent quartz grains, trace to 5% light bluish grey, loose, medium to very coarse, dominantly medium to coarse, poorly sorted, angular to sub-angular, moderately common siliceous cement, 40-50% white kaolinitic matrix, trace pyrite nodules.

SANDY CLAYSTONE – (0-65%) white to light grey, soft to very soft, 20-30% very fine to fine quartz sand, matrix supported, kaolinitic.

CLAYSTONE – (5%) dark grayish black, dark grayish brown, hard to very hard, subfissile to fissile, siliceous, minor micromica.



BALEEN-2 3 HYDROCARBON SHOWS



3.1 OIL FLUORESCENCE SHOWS

Oil shows were observed in core #1 between the depths of 756 mRT and 764 mRT.

DEPTH:

756mRT - 762 mRT

FLUORESCENCE:

70 – 90%, dull to moderately bright yellowish green pinpoint to patchy direct fluorescence, slow to moderately fast yellowish white to bright bluish white blooming cut fluorescence, thick yellowish

white residual ring fluorescence.

DEPTH:

762mRT - 764 mRT

FLUORESCENCE:

30%, dull to moderately bright yellowish green pinpoint to patchy direct fluorescence, slow yellowish white streaming to blooming cut fluorescence, thin to thick yellowish white residual ring

fluorescence.

3.2 GAS SHOWS

Mudgas was recorded from the 9 5/8" casing shoe to TD. Some data through the reservoir was logged after tripping out the cores. The maximum gas occurred through the cored interval where 5.7% total gas was recorded. C2 (ethane) was present only over the interval 749mRT to 763mRT. Below 763 mRT, total gas declines and remains between 0.3% and 1.0%.

Geoservices Overseas SA provided a number of gas detection units for gas analysis. These included a Total Hydrocarbon Gas Flame Ionisation detector (FID) with FID chromatograph measuring C1 – C5, Hotwire total gas detector, Continuous CO2 (infra red) detector, H2S detector (continuous / catalytic), and Draeger gas detection unit with detection tubes for CO2 and H2S. No CO2 or H2S was detected from the drilling mud for the drilled interval 650 m to 895 m.

SUMMARY OF DRILLING GAS								
Interval (mRT)	TG%	C1 (ppm)	C2 (ppm)	C3 (ppm)	iC4 (ppm)	nC4 (ppm)	iC5 (ppm)	nC5 (ppm)
650 – 700	0.12	1740	27	-	-	-	-	-
700 – 742	0.395	4933	41	-	-	-	-	
742 – 746	1.13	13207	100	-	-	-	-	-
746 – 762	4.0	25600	145	-	-	-	-	
762 – 771	1.2	12377	62	-	-	-	-	-
780 – 872	0.673	6263	28	-	-	-	-	-
872 – 895	0.326	4126	18	-	-	_		

TABLE 4



GAS PEAKS						
Interval (mRT)	Туре	TG%	C1 (ppm)	C2 (ppm)		
743 – 746	Drill	1.24	13207	100		
746 – 762	Drill	5.7	29500	160		
765	Drill	1.41	14800	65		
860	Drill	1.31	14400	-		
868	Drill	0.96	11000	-		
887	Drill	0.41	4600	-		
746	Trip	0.74	9100	-		
762	Trip	2.44	14800	66		
780	Trip	1.33	13800	-		

TABLE 5



BALEEN-2

4 WIRELINE AND MUD LOGS



4.1 WIRELINE LOGS

In the openhole section at total depth (TD), a total of 7 runs were made in 1 suite. The wireline logs did not reach the drilling TD due to soft fill. A list of the logs run, and mud data is shown below:

Junk basket and bridge plug runs (runs 6 and 7), were run prior to setting the abandonment plug 3 at 125mRT – 175mRT.

BALEEN-2 WIRELINE LOGGING SUMMARY							
LOG	DATE	SUITE / RUN	INTERVAL mRT	BHT-TIME	COMMENTS		
PEX-HALS-DSI-NGS	16/10/99	1/1	888.5-90	46.7°C/5:21hrs	Logged GR from 640 to 90. Full PEX-DSI high resolution data recorded at 1800ft/h up to 640mRT.		
FMI-GR	16/10/99	1/2	887-647	48°C/8:35hrs	Logged open hole interval		
MDT (pretests and samples)	17/10/99	1/3,5	823-748	52°C/18:25hrs	32 pretests, 16 normal, 8 supercharged, 5 lost seal, 2 pumpout failure, 1 dry test		
CSAT-GR (VSP Survey)	17/10/99	1/4	885-100	50°C/22hrs	47 checkshot levels acquired, including 3 repeat levels at 300mRT, 663mRT and 795mRT		
Junk Basket & Bridge Plug (GR and CCL record)	17/10/99	6,7	200-100		Run prior to setting cement abandonment plug 3		

TABLE 6

	MUD DATA					
SUITE	SUITE 1					
TYPE	NaCI / PHPA / Polymer					
DENSITY	1.21 g/cm3					
VISCOSITY	49 s					
FLUID LOSS	3.4 g/cm3					
рН	9					
RM	0.134 ohm.m @21°C					
RMF	0.115 ohm.m @22°C					
RMC	0.213 ohm.m @22°C					
Barite	3.7% by volume					
NaCl	7.6% by volume					
Chlorides	46 500 mg / L					

TABLE 7

The Wireline logging report and operations summary are included in Appendix 6.

A merged plot of the main logs is presented as the Merged Composite Playback in Enclosure 1.

4.2 MUD LOGS

Geoservices Overseas SA provided conventional mudlogging services in conjunction with a computerized data logging and processing system.

The Geoservices unit was operated continuously throughout the well with the production of a Formation Evaluation Log, Pressure Log, and Drilling Log. All three logs are included as enclosures 2,3 and 4 respectively.

Mud Loggers Daily Reports are included in Appendix 8, and the Final Geoservices Report is included in Appendix 9.



4.3 VELOCITY SURVEY

Schlumberger Oilfield Australia Pty Ltd carried out one conventional VSP in Baleen-2. The survey was run on 17 October 1999 using the Combinable Seismic Acquisition Tool (CSAT).

The data were acquired using a 4x40 cubic inch airgun as the source, positioned 6 metres below the sea level, with a hydrophone attached 3 metres below the gun. A total of 47 levels were acquired with 3 checkshot levels at 300mRT, 663mRT and 795mRT. Recording was made on the Schlumberger Maxis 500 Unit using DLIS format.

Data processing consisted of VSP processing, sonic calibration and generating a Geogram. The vertical component of the VSP data was processed using the conventional zero offset vertical incidence processing chain. Geogram plots were generated using 40,50 and 60 Hertz - 90deg Zero Phase Ricker Wavelets.

The VSP processing report and Geogram are included in Appendix 11, with VSP plots included as Enclosures 5 to 10.



VIC / RL5 Baleen-2 Well Completion Report - Basic Geotechnical Data

BALEEN-2 5 SAMPLE ANALYSES



5.1 OIL ANALYSES

Oil was extracted from three samples of core, at 757.07mRT, 758.43mRT, and 760.55mRT. The samples were run through a liquid chromatograph to determine their composition, with the results included in the Fluids Analysis Final Report in Appendix 13.

5.2 GAS ANALYSIS

No gas samples were caught in Baleen-2. MDT sampling for gas was unsuccessful. However, 32ppm H₂S was recorded by Draeger tube from gas which exsolved from a formation water sample acquired with the MDT from 797mRT.

5.3 MUD ANALYSES

Four mud samples were collected from Baleen-2, with three flowline mud samples acquired from various depths, and one MDT sample. Sample 1 was acquired during the cutting of core 1 at 746mRT, Sample 2 was acquired during the cutting of core 2 at 762mRT, and sample 3 was collected while circulating at 895mRT (TD) before running logs. Sample 4 was taken during logging with the MDT at 757mRT.

The mud sample from core 2 (762mRT) was sent to ACS Laboratories in Brisbane for analysis, with the results included in the Fluids Analysis Report in Appendix 13.

Mud samples are summarized in the Sample Collection Summary over the page.

5.4 WATER ANALYSES

During the MDT runs, 1 gallon of formation water was taken from 1 sample point at 797mRT. The sample was later subdivided into 6 sub-samples, labelled 1.01 – 1.06.

Two core plug samples were taken at 754.08mRT and 778.34mRT and cut into 5 equal lengths, marked a - e. Pore water was then extracted from all of the samples.

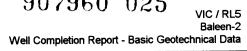
The two core plug water sample sets, and two formation water samples (1.01 and 1.06) were sent to ACS Laboratories in Brisbane for analysis, with the results included in the Fluids Analysis Report in Appendix 13.

Water samples are summarized in the Sample Collection Summary over the page.

5.5 FILTRATE ANALYSIS

A small amount of filtrate was pressed from the drilling mud during the core cutting operation, and was sent to ACS Laboratories in Brisbane for analysis. The results are included in the Fluids Analysis Report in Appendix 13.

Fluid samples are summarized in the Sample Collection Summary over the page.





SAMPLE COLLECTION SUMMARY							
Sample Type	Sample No.	Source	Depth mRT	Amount	Comments		
Mud	1	Flowline	746m	500ml	Core #1		
Mud	2	Flowline	762m	500ml	Core #2		
Mud	3	Flowline	895m (TD)	500ml	Wireline logging		
Filtrate	-	Mud from flowline	-	55ml	Pressed from mud during core cutting		
Water Mud	1.01 – 1.06 1.07	MDT MDT	797m 757m	500ml 200ml			
Water	1 (a – e)	Core plug	754.08m	-	To determine mud / filtrate invasion of core		
Water	2 (a - e)	Core plug	778.34m	-	To determine mud / filtrate invasion of core		

TABLE 8



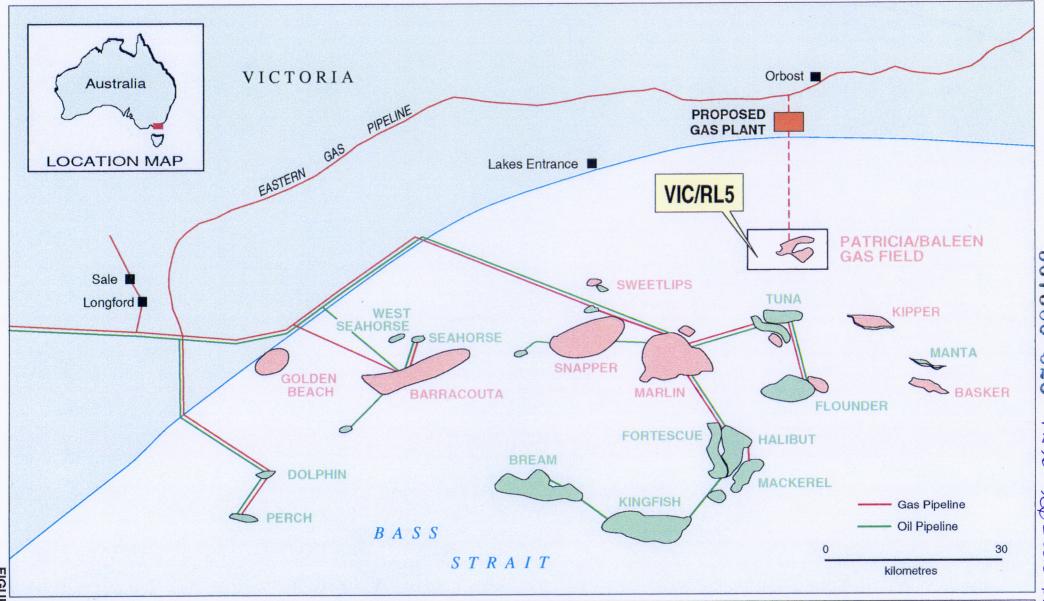
907960 027

BALEEN-2

FIGURES

PATRICIA - BALEEN GAS FIELD LOCATION MAP

GIPPSLAND BASIN - OFFSHORE VICTORIA



FIGURE

AUTHOR: OMV

DATE: MAY 2000

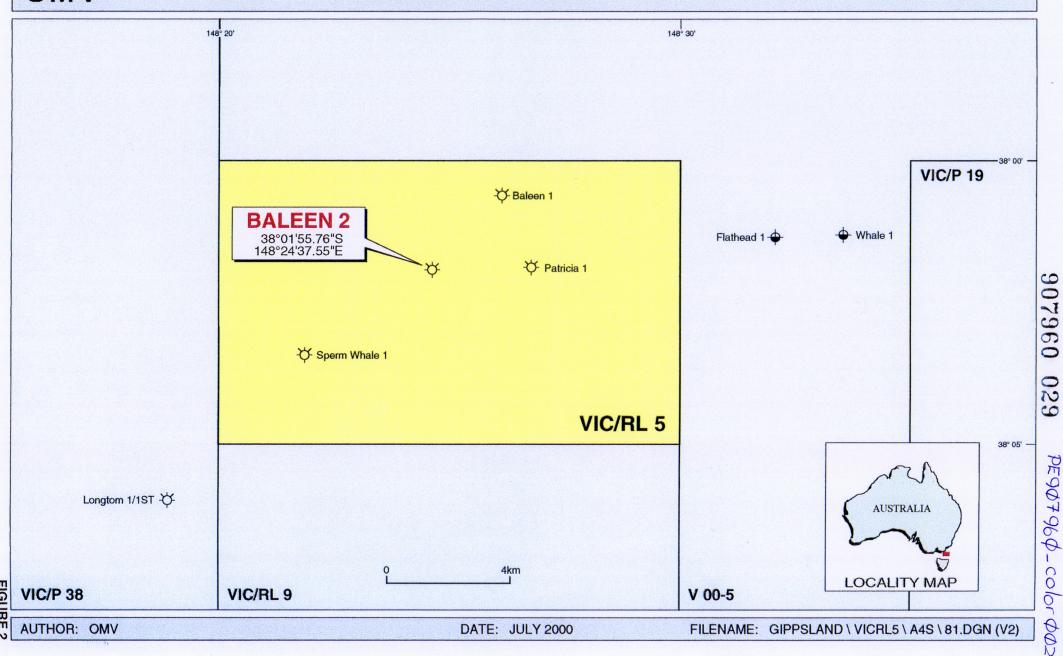
FILENAME: GIPPSLAND \ A4S \ 21.DGN (V3)

907960 02 00

PE907960 color



BALEEN-2 LOCATION MAP



BALEEN-2 ABANDONMENT SCHEMATIC

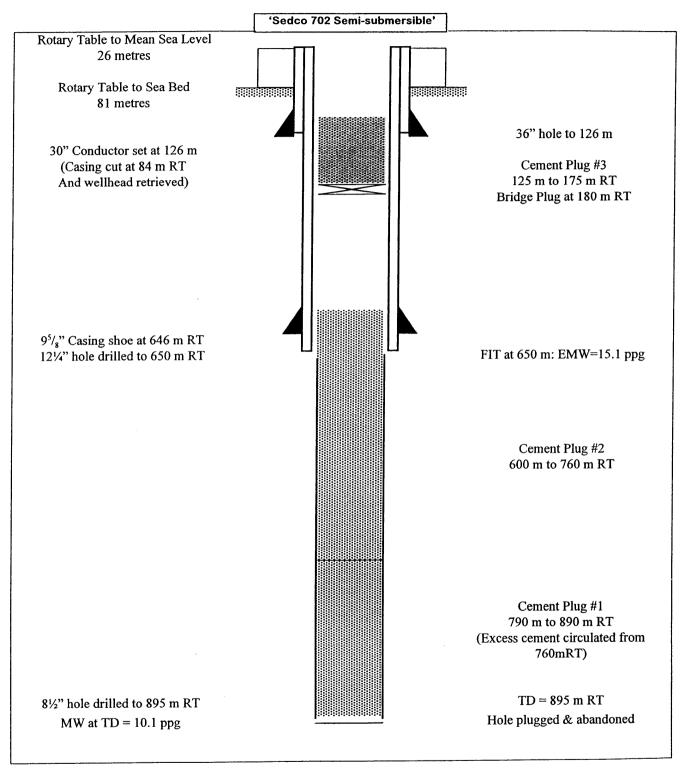


FIGURE 3



BALEEN-2

APPENDICES

1 - 13



APPENDIX 1

BALEEN-2

DAILY GEOLOGICAL REPORTS -CULTUS-



CONFIDENTIAL

Date:

10 October 1999

Ria:

SEDCO 702

Report Number:

Bit Diameter: **Last Casing:**

0 "

Report Period:

00:00 - 24:00 Hours

Spud Date:

11/10/99 2:00:00 AM

N/A m MDRT

Days From Spud:

-0.1

N/A

Depth @ 2400 Hrs:

.0 m MDRT

FIT: **Mud Weight:** ECD:

0.00 SG 0.00 SG

Lag Depth:

.0 m TVDRT .0 m MDRT

Mud Type: **Mud Chlorides:**

0 mg/l

Last Depth:

.0 m MDRT

Est. Pore Pressure: DXC:

0.00 SG

Progress: Water Depth: 0 m

Last Survey:

0.0 m MDRT

RT:

55.0 m MSL 26.0 m

Deviation:

Inc. 0.00°

Az. 0.00°

OPERATIONS SUMMARY

24 HOUR SUMMARY

Arrived on location at 12:00 hrs on the 10/10/1999. Ran and pretensioned

anchors. Sonsub performed bottom scan. Prepared spud mud.

NEXT 24 HOURS

Run and cement 30" casing. Clean out shoe track with 17.5" bit. Drill ahead 12-

1/4" hole.

CURRENT OPERATION @ 06:00 HRS (11/10/1999): 00:00 to 06:00 hrs - Completed pre-tensioning all Moved into final position and spudded well at 02:00 hrs on the 11/10/1999. Tagged seabed at 80.71 mMDRT. Water Depth is 54.81m. Drilled Wiper trip and clean hole prior to 36" hole from 80.71m to 126 m MDRT.

displacing hole with spud mud.

GEOLOGICAL SUMMARY

LITHOLOGY

INTERVAL: ROP (Range): Av. ROP:

HYDROCARBON FLUORESCENCE

No Shows

GAS SUMMARY No Gas Data

CALCIMETRY

Interval (m MDRT) Calcite Range (%)

Dolomite Range (%)

Page 1 of 2



REMARKS

Rig arrived on location at 12:00 Hrs on the 10/10/1999. Baleen-2 spudded at 02:00 hrs on the 11/10/1999.

Final Well Coordinates

Latitude

038° 01' 55.758" S

Longitude

148° 24' 37.549" E

Easting **Northing** 623781.41m 5789663.90 m

Rig Heading

206.4° T

Water Depth

55 m

RKB - MSL

26 m

RKB - Seabed

81 m

(Note: These figures are rounded to the nearest meter.)

WELLSITE GEOLOGISTS



Date:

11 October 1999

2

Ria: **Bit Diameter:** **SEDCO 702**

12.25 "

Report Number: Report Period:

00:00 - 24:00 Hours

Last Casing:

30 X 20" @ 126.0 m MDRT

Spud Date:

11/10/99 2:00:00 AM

0 SG EMW @ .0m MDRT

Days From Spud:

0.9

Mud Weight:

FIT:

1.03 SG

Depth @ 2400 Hrs:

137.0 m MDRT 137.0 m TVDRT ECD: Mud Type: 0.00 SG

Lag Depth: Last Depth: .0 m MDRT .0 m MDRT

Mud Chlorides: **Est. Pore Pressure:**

Seawater with gel sweeps. 0 ma/l

Progress:

137.0 m

DXC:

1.03 SG N/A

Water Depth: RT:

55.0 m MSL 26.0 m

Last Survey:

310.0 m MDRT Inc. 0.50°

Deviation:

Az. 0.00°

OPERATIONS SUMMARY

24 HOUR SUMMARY

Completed pre-tensioning all anchors. Moved into final position and spudded well at 02:00 hrs on the 11/10/1999. Tagged seabed at 80.71 mMDRT. Water Depth is 54.81m. Drilled 36" hole from 80.71m to 126 m MDRT. Wiper trip and clean hole prior to displacing hole with viscous bentonite. Run 30" casing to 126 mMDRT and cement as per programme. Made up 17.5" drilling assembly. Conducted emergency winch off drill. Ran into hole with 17.5" drilling assembly and tagged top of cement at 120 mMDRT. Drilled out cement and shoe track to 126 mMDRT. Pulled out of hole and layed down 17.5" drilling assembly. Made up 12.25" drilling assembly and ran into hole to 126 m. Drilled ahead from 126m to 137 mMDRT.

NEXT 24 HOURS

Drill 12.25" hole to approximately 650 mMDRT. Clean hole. POOH and run 9-

5/8" casing.

CURRENT OPERATION @ 06:00 HRS (12/10/1999) : Drilling 12.25" hole at 368 mMDRT.

GEOLOGICAL SUMMARY

LITHOLOGY

INTERVAL:

81 to 126 m MDRT

ROP (Range):

to m/hr

Av. ROP: m/hr

Drilled 36" hole riserless with returns to seabed. No ROP's recorded.

INTERVAL:

126 to 137 m MDRT

ROP (Range):

7 to 45 m/hr

Av. ROP:

22 m/hr

Drilled 12.25" hole riserless with returns to seabed.

HYDROCARBON FLUORESCENCE

No Shows

GAS SUMMARY No Gas Data

CALCIMETRY

Interval (m MDRT) Calcite Range (%) Dolomite Range (%)

SAMPLE QUALITY

Drilling riserless with returns to seabed.

MUDLOGGING EQUIPMENT / PERSONNEL

All equipment functioning normally. Full crew on board.

MWD

No MWD tool in drill string.

REMARKS

Samplex trays and aditional microscope being ordered for the Geoservices unit. No mudlog data available from spud to 126m. Unit not operational - only partial crew on board.

WELLSITE GEOLOGISTS



Date:

12 October 1999

3

Bit Diameter: Last Casing:

Rig:

SEDCO 702

Report Number: Report Period:

00:00 - 24:00 Hours

30 X 20" @ 126.0 m MDRT

Spud Date:

11/10/99 2:00:00 AM

Days From Spud:

1.9

FIT: **Mud Weight:** 0 SG EMW @ .0m MDRT 1.04 SG

Depth @ 2400 Hrs:

650.0 m MDRT

ECD:

0.00 SG

12.25 "

Lag Depth:

650.0 m TVDRT .0 m MDRT

Mud Type: **Mud Chlorides:** Seawater with gel sweeps.

Last Depth: Progress:

137.0 m MDRT 513.0 m

Est. Pore Pressure: DXC:

0 mg/l 1.03 SG normal

Water Depth:

RT:

55.0 m MSL 26.0 m

Last Survey: Deviation:

650.0 m MDRT

Inc. 0.25° Az. 0.00°

OPERATIONS SUMMARY

24 HOUR SUMMARY

Drilled 12.25" hole from 137m to 650m MDRT with surveys every 100m. Conducted wiper trip to 110m - hole in good condition. Displaced hole with

excess mud. Pulled out of hole. Commenced running 9-5/8" casing.

NEXT 24 HOURS

Run and test BOP stack.

CURRENT OPERATION @ 06:00 HRS (13/10/1999): 00:00 - 06:00 - Run into hole with 9-5/8" casing to

646 mMDRT. Cement casing as per programme. Back out running tool.

GEOLOGICAL SUMMARY

LITHOLOGY

INTERVAL:

137 to 650 m MDRT

ROP (Range):

7 to 129 m/hr

Av. ROP:

73 m/hr

Drilling riserless - returns to seabed.

HYDROCARBON FLUORESCENCE

No Shows

GAS SUMMARY No Gas Data

CALCIMETRY

Interval (m MDRT) Calcite Range **Dolomite** Range

(%)

(%)

SAMPLE QUALITY

Drilling riserless with returns to seabed.

MUDLOGGING EQUIPMENT / PERSONNEL

All equipment functioning normally.

MWD

No MWD tool in drill string.

REMARKS

Expect to be drilling out 9-5/8" casing by 06:00 hrs on the 14/10/99. 9-5/8" Casing shoe set at 646 mMDRT

WELLSITE GEOLOGISTS



Date:

13 October 1999

SEDCO 702

Report Number:

4

Bit Diameter:

Rig:

12.25 "

Report Period:

00:00 - 24:00 Hours 11/10/99 2:00:00 AM

Spud Date:

Last Casing: FIT:

9-5/8" @ 646.0 m MDRT 1.8 SG EMW @ 650.0m MDRT

Davs From Spud:

2.9

Mud Weight:

1.21 SG 0.00 SG

Depth @ 2400 Hrs:

650.0 m MDRT 650.0 m TVDRT ECD: Mud Type:

NaCI/PHPA/Polymer

Lag Depth:

.0 m MDRT

Mud Chlorides:

51000 mg/l

Last Depth: **Progress:**

650.0 m MDRT

Est. Pore Pressure: DXC:

1.03 SG

Water Depth:

0 m

Last Survey:

normal 650.0 m MDRT

RT:

55.0 m MSL 26.0 m

Deviation:

Inc. 0.25°

Az. 0.00°

OPERATIONS SUMMARY

24 HOUR SUMMARY

Continued running 9-5/8" casing to 646 mMDRT. Cemented casing as per programme. Picked up and ran BOP's and riser. Pressure tested choke and kill lines. Stroked out slip joint and installed diverter. Function and pressure tested BOP's, choke and kill lines as required. Rigged down Dowell and pulled out of hole with test plug.

NEXT 24 HOURS

Drill 8.5" hole to core point. Pull out of hole and pick up core barrel. Run into

hole and cut core # 1.

CURRENT OPERATION @ 06:00 HRS (14/10/1999) : 00:00 - 06:00 Function and test diverter system. Installed flex joint bore protector. Layed down 8" BHA. Picked up 8.5" BHA and run into hole. Tagged top of cement at 596 m. Commenced drilling cement.

GEOLOGICAL SUMMARY

LITHOLOGY

INTERVAL: ROP (Range): Av. ROP:

HYDROCARBON FLUORESCENCE

No Shows

GAS SUMMARY No Gas Data

CALCIMETRY

Interval (m MDRT) Calcite Range

Dolomite Range

(%)

(%)

MUDLOGGING EQUIPMENT / PERSONNEL



All equipment functioning normally. H2S Sensor in Active pit area not functioning and has been removed. H2S sensors in gas line and at shakers tested OK. 500ml Pyrex jars (7) are on order and will arrive on Friday's helicopter.

REMARKS

A total of 4 Schlumberger Crew now on board. Two more operators to arrive on Friday. All coring equipment ready.

WELLSITE GEOLOGISTS



Date:

14 October 1999

Ria:

FIT:

SEDCO 702

Report Number:

Bit Diameter:

8.5 "

Report Period:

00:00 - 24:00 Hours 11/10/99 2:00:00 AM

Spud Date:

Last Casing:

9-5/8" @ 646.0 m MDRT 1.8 SG EMW @ 650.0m MDRT

Days From Spud:

3.9

Mud Weight:

1.21 SG

Depth @ 2400 Hrs:

746.0 m MDRT 746.0 m TVDRT ECD: Mud Type: 1.29 SG

Lag Depth:

746.0 m MDRT

Mud Chlorides:

NaCI/PHPA/Polymer

Last Depth:

650.0 m MDRT

Est. Pore Pressure:

45500 mg/l 1.03 SG

Progress:

96.0 m

DXC:

normal

Water Depth: RT:

55.0 m MSL 26.0 m

Last Survey: Deviation:

650.0 m MDRT Inc. 0.25°

Az. 0.00°

OPERATIONS SUMMARY

24 HOUR SUMMARY

Completed function and pressure testing BOP's. Layed down 121/4" BHA, picked up 8½" BHA. Ran into hole and tagged top of cement at 596 mMDRT. Drilled out cement and shoe track and clean out rat hole to 650mMDRT. Drilled new formation from 650 to 654 mMDRT. Cleaned and displaced hole to 10.1 ppg NACI/PHPA/Polymer mud system. Performed FIT to 15.1 ppg EMW. Drilled 81/2" 654 to 698 m. Drilled ahead to core point at 746 mMDRT circulating samples at 698 m and 736. Circulated bottom up and pulled out of hole for Core #1.

NEXT 24 HOURS

Cut cores through Gurnard Reservoir.

CURRENT OPERATION @ 06:00 HRS (15/10/1999): 00:00 - 06:00 Pull out of hole - strapping out, picked up core barrel, run into hole to cut core # 1.

GEOLOGICAL SUMMARY

LITHOLOGY

INTERVAL:

650 to 675 m MDRT

ROP (Range):

3 to 34 m/hr

Av. ROP:

23 m/hr

ARGILLACEOUS CALCILUTITE grading to and interbedded with minor CALCILUTITE.

ARGILLACEOUS CALCILUTITE: (95 - 100%) light grey to medium grey, medium to dark olive grey, soft, dispersive, firm in part, amorphous to blocky, trace subfissile, trace carbonaceous specks, 20-25% siliceous clay content, grades in part to Calcareous Claystone, trace quartz silt,

CALCILUTITE: (Trace-5%) white to very light grey, light olive, grey, soft, amorphous, slightly dispersive, trace very fine glauconite.

INTERVAL:

675 to 720 m MDRT

ROP (Range):

3 to 33 m/hr

Av. ROP:

13 m/hr

ARGILLACEOUS CALCILUTITE grading to CALCAREOUS CLAYSTONE

ARGILLACEOUS CALCILUTITE: (70 - 100%) light grey to medium grey, medium to dark olive grey,



dominantly soft, dispersive, rare firm to moderately hard, amorphous to blocky, trace subfissile, trace carbonaceous specks, 30-35% siliceous clay content, grades in part to Calcareous Claystone, trace quartz silt. trace very fine Glauconite, trace forams.

CALCAREOUS CLAYSTONE: (Trace - 30%) light to medium grey, light olive grey, soft, amorphous, dispersive in part, 20-30% micrite content, trace very fine Glauconite.

INTERVAL:

720 to 740 m MDRT

ROP (Range):

5 to 21 m/hr

Av. ROP:

11 m/hr

CALCAREOUS CLAYSTONE with decreasing interbedded ARGILLACEOUS CALCILUTITE.

ARGILLACEOUS CALCILUTITE: (40 - 70%) as above.

CALCAREOUS CLAYSTONE: (30 - 60%) light to medium grey, pale yellowish brown in part, soft, dispersive, 20-25% micrite content, 5% fine dark green glauconite increasing, trace carbonaceous specks.

INTERVAL:

740 to 746 m MDRT

ROP (Range):

11 to 14 m/hr

Av. ROP:

13 m/hr

Predominantly CLAYSTONE with minor ARGILLACEOUS CALCILUTITE.

CLAYSTONE: (80 - 90%) medium to dark yellowish brown, dark olive grey, soft, dispersive, 10-15% micrite content, 5-10% fine dark green galuconite, trace to 5% quartz silt, trace fine quartz sand, trace very fine disseminated pyrite, trace hard dark brown siderite nodules, trace to minor carbonaceous flecks, trace lithics.

ARGILLACEOUS CALCILUTITE: (10 - 20%) as above.

HYDROCARBON FLUORESCENCE

No Shows

GAS SUMMARY

Background	d Gas						
INTERVAL	Total Gas (%)	C1 (ppm)	C2 (ppm)	C3 (ppm)	iC4 (ppm)	nC4 (ppm)	C5 (ppm)
650 <i>-</i> 675	0.104	1245	0	0	0	0	0
675 - 720	0.254	3238	0	0	0	0	0
720 - 740	0.495	6234	0	0	0	0	0
Gas Peak		•					
INTERVAL	Total Gas (%)	C1 (ppm)	C2 (ppm)	C3 (ppm)	iC4 (ppm)	nC4 (ppm)	C5 (ppm)
743 - 746	1.24	13207	100	0	0	0	0

CALCIMETRY



Interval (m MDRT)	Calcite Range	Dolomite Range
((%)	(%)
650 - 675	46 - 65 %	0 - 7 %
675 - 720	56 - 83 %	4 - 11 %
720 - 740	25 - 37 %	2 - 5 %
740 - 746	2 %	1 %

MUDLOGGING EQUIPMENT / PERSONNEL

All equipment functioning normally. H2S Sensor in Active pit area not functioning and has been removed. H2S sensors in gas line and at shakers tested OK. 500ml Pyrex jars (7) are on order and will arrive on Friday's helicopter.

WELLSITE GEOLOGISTS



Date:

15 October 1999

Rig:

FIT:

SEDCO 702

Report Number:

Bit Diameter:

8.5 "

Report Period:

00:00 - 24:00 Hours 11/10/99 2:00:00 AM

Last Casing:

9-5/8" @ 646.0 m MDRT 1.8 SG EMW @ 650.0m MDRT

Spud Date: Days From Spud:

4.9

Mud Weight:

1.21 SG

Depth @ 2400 Hrs:

780.3 m MDRT

ECD:

0.00 SG

780.3 m TVDRT

Mud Type: **Mud Chlorides:** NaCI/PHPA/Polymer

Lag Depth: Last Depth: 771.0 m MDRT 746.0 m MDRT

Est. Pore Pressure:

44000 mg/l 1.03 SG

Progress: Water Depth:

RT:

34.0 m 55.0 m MSL DXC: Last Survey:

normal 650.0 m MDRT

26.0 m

Deviation:

Inc. 0.25°

Az. 0.00°

OPERATIONS SUMMARY

24 HOUR SUMMARY

Continued pulling out of hole with drilling assembly. Picked up 18m core barrel and ran into hole. Cut core # 1 from 746 to 762.3 (16.3m) - core jammed off. Pulled out of hole at controlled rate. Tested core for H2S gas - nil. Layed out inner core barrel and recovered 16.3m of core (100%). Made up 18m core barrel and ran into hole. Cut core # 2 from 762.3 to 780.3 (18m). Pulled out of hole at controlled rate.

NEXT 24 HOURS

Drill to TD of 925m MDRT and log with Schlumberger.

CURRENT OPERATION @ 06:00 HRS (16/10/1999): 00:00 - 06:00 Recoved core # 2 (88%) Layed down core barrel. Make up new bit and loacked drilling assembly and run into hole.

GEOLOGICAL SUMMARY

LITHOLOGY

INTERVAL:

746 to 757 m MDRT

ROP (Range): Av. ROP:

7 to 34 m/hr 19 m/hr

From Core Chip Descriptions

SANDY SILTSTONE grading to predominantly SILTY SANDSTONE

SANDY SILTSTONE: (20%) moderate to dark yellowish brown, firm to hard, blocky, 40-50% very fine to fine quartz sand, commonly grades to Silty Sandstone, 10% -15% siliceous clay, 20-25% siderite nodules, locally patchy siderite cement, trace to 5% glauconite, 5% micromica, trace to 5% carbonaceous specks, trace lithics.

SILTY SANDSONE: (80%) moderate to dark yellowish brown, clear to translucent quartz grains, friable to locally firm, very fine to fine grained, moderately well sorted, angular to sub-rounded, trace to 2% patchy siderite cement, 20-25% dark yellowish brown quartz silt matrix, grades to Sandy Siltstone, trace to 5% dark green Glauconite, trace to 5% micromica, trace feldspar, fair to locally good visible porosity. No shows.

INTERVAL:

757 to 762 m MDRT

ROP (Range):

23 to 42 m/hr

Av. ROP:

31 m/hr

From Core Chip Descriptions

SILTY SANDSTONE sequence

SILTY SANDSTONE: (100%) moderate to dark yellowish brown, clear to translucent quartz grains, friable to locally firm, very fine to fine grained, moderately well sorted, angular to sub-rounded, trace patchy siderite cement, 20-25% dark yellowish brown quartz silt matrix, grades to Sandy Siltstone, trace dark green Glauconite, trace to 5% micromica, trace feldspar, fair to locally good visible porosity. FLUORESCENCE: (70-90%) as described below.

INTERVAL:

762 to 771 m MDRT

ROP (Range):

11 to 23 m/hr

Av. ROP:

17 m/hr

From Cuttings Descriptions whilst Coring.

SILTSTONE grading to and interbedded with SILTY SANDSTONE

SILTSTONE: (80 - 90%) dark yellowish brown to moderate yellowish brown, very soft to soft, amorphous to subblocky, argillaceous, minor very fine quartz sand, 5% micromica, trace carbonaceous specks.

SILTY SANDSTONE: (10 - 20%) clear to translucent, opaque in part, loose, silt size to very fine grained quartz, trace medium quartz grains, angular to sub-angular, poor to moderately sorted, trace siderite cement, minor silty / argillaceous matrix, trace glauconite, poor to fair inferred porosity.

NOTE: suspect very fine sands not being seen in cuttings.

INTERVAL:

771 to 780.3 m MDRT

ROP (Range):

11 to 30 m/hr

Av. ROP:

18 m/hr

Samples not circulated. Core chips not yet described.

HYDROCARBON FLUORESCENCE

757 to 762 (70-90%) (From Core Chip Descriptions) dull to moderately bright yellowish green pinpoint to patchy direct fluorescence, slow to moderately fast yellowish white to bright bluish white blooming cut fluorescence, thick yellowish white residual ring fluorescence.

GAS SUMMARY

Background	l Gas	:					
INTERVAL	Total Gas (%)	C1 (ppm)	C2 (ppm)	C3 (ppm)	iC4 (ppm)	nC4 (ppm)	C5 (ppm)
762 - 771	1.2	12377		" 0	0	0	0
Gas Peak							
INTERVAL	Total Gas (%)	C1 (ppm)	C2 (ppm)	C3 (ppm)	iC4 (ppm)	nC4 (ppm)	C5 (ppm)
746 - 762	5.7	29500	160	0	0	0	0
Trip Gas							
INTERVAL	Total Gas	C1	C2	C3	iC4	nC4	C5 (
	(%)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
746 - 746	0.74	9100	0	0 ,	0	0	0
762 - 762	2.44	14800	105	0	0	0	0

CALCIMETRY



Interval (m MDRT) Calcite Range (%) Dolomite Range (%)

MUDLOGGING EQUIPMENT / PERSONNEL

All equipment functioning normally. Crews working well.

REMARKS

ACS has completed resinating the core and may be able to leave today. Core # 1 is now in refrigerated container. Core # 2 is curing and will be moved into contained this morning.

Timing for the shipment of core to Port Welshpool is not clear. Boat may sail on Tuesday or Wednesday from the Amity Oil location.

WELLSITE GEOLOGISTS



Date:

16 October 1999

Rig:

SEDCO 702

Report Number:

Bit Diameter: **Last Casing:**

8.5 "

Report Period:

00:00 - 24:00 Hours 11/10/99 2:00:00 AM

9-5/8" @ 646.0 m MDRT 1.8 SG EMW @ 650.0m MDRT

Spud Date: **Days From Spud:**

5.9

Mud Weight:

1.21 SG

Depth @ 2400 Hrs:

895.0 m MDRT

ECD:

FIT:

11.10 SG

Lag Depth:

895.0 m TVDRT 895.0 m MDRT

Mud Type: **Mud Chlorides:** NaCI/PHPA/Polymer

Last Depth: **Progress:**

780.3 m MDRT

Est. Pore Pressure:

47000 mg/l 1.03 SG

115.0 m 55.0 m MSL DXC:

normal

Water Depth:

26.0 m

Last Survey: Deviation:

650.0 m MDRT Inc. 0.25°

Az. 0.00°

OPERATIONS SUMMARY

24 HOUR SUMMARY

Continued pulling out of hole with core # 2. Layed down core and recovered 15.8m (88%). Layed down core barrrel assembly. Picked up packed BHA and ran into hole. Drilled 81/2" hole from 780.3 to 895m MDRT. Circulated hole Pulled out of hole. Rigged up Schlumberger and logged Run 1 (Pex/DSI/NGS), Run 2 (FMI/GR).

NEXT 24 HOURS

Complete logging with Sclumberger. Plug and abandon well.

CURRENT OPERATION @ 06:00 HRS (17/10/1999): Logging pressure points with MDT

GEOLOGICAL SUMMARY

LITHOLOGY

INTERVAL:

780.3 to 810 m MDRT

ROP (Range):

5.2 to 61 m/hr

Av. ROP:

23 m/hr

SANDSTONE with minor interbedded SILTSTONE and trace COAL.

SANDSTONE: (40 - 90%) white to opaque, clear to translucent quartz grains, loose, medium to very coarse, dominantly medium to coarse, poorly sorted, sub-angular to sub-rounded, trace pyrite cement, 10-20% white kaolinitic matrix, grades to Arg Sandstone, 5% dark green pelloidal Glauconite, trace reddish brown lithics (jasper), good inferred porosity. No shows.

COAL: (1 - 2%) black, firm to hard, occasional brittle, dull to subvitreous.

SILTSTONE: (10 - 58%) pale brown to moderate yellowish brown, soft, dispersive, amorphous, 10-15% siliceous clay, grades to argillaceous Siltstone, 5% micromica, trace to 5% carbonaceous specks and microlaminae, trace to 2% Glauconite, trace lithics.

INTERVAL:

810 to 870 m MDRT

ROP (Range):

18 to 184 m/hr

Av. ROP:

63 m/hr

SANDSTONE (Argillaceous) with minor interbedded CLAYSTONE and SILTSTONE.

SANDSTONE: (95 - 100%) white to opaque, clear to translucent quartz grains, trace light bluish grey, loose,

fine to very coarse, dominantly medium to coarse, poorly sorted, angular to sub-angular, moderately common siliceous cement, 15-20% white kaolinitic matrix, grades to argillaceous Sandstone, trace Glauconite, fair to good inferred porosity. No shows.

CLAYSTONE: (5 - 5%) dark greyish black, dark greyish brown, hard to very hard, subfissile to fissile, siliceous, minor micromicaceous.

SILTSTONE: (5 - 5%) as above.

INTERVAL:

870 to 895 m MDRT

ROP (Range):

9 to 35 m/hr

Av. ROP:

16 m/hr

CLAYSTONE with SANDY CLAYSTONE interbeds.

SANDY CLAYSTONE: (40%) white to light grey, soft to very soft, 20-30% very fine to fine quartz sand, matrix supported, Kaolinitic.

CLAYSTONE: (60%) medium grey to medium light grey, very soft to soft, amorphous, occasionally blocky, homogenous, trace carbonacceous specks and micro-lamiae, trace pyrite nodules.

HYDROCARBON FLUORESCENCE

No Shows

GAS SUMMARY

Backgroun	d Gas						
INTERVAL	Total Gas (%)	C1 (ppm)	C2 (ppm)	C3 (ppm)	iC4 (ppm)	nC4 (ppm)	C5 (ppm)
780 - 810	0.459	5481	23	0	0	0	0
810 - 870	0.764	7626	30	0	0	0	0
870 - 895	0.326	4126	18	0	0	0	0

CALCIMETRY

Interval	Calcite	Dolomite
(m MDRT)	Range	Range
•	(%)	(%)

SAMPLE QUALITY

Due to high ROP through Latrobe section sampling was conducted at 10m intervals.

MUDLOGGING EQUIPMENT / PERSONNEL

All equipment functioning normally. Crews working well.

WELLSITE GEOLOGISTS



Date:

17 October 1999

Rig:

SEDCO 702

Report Number:

Bit Diameter:

8.5 "

Report Period:

00:00 - 24:00 Hours 11/10/99 2:00:00 AM

9-5/8" @ 646.0 m MDRT

Spud Date:

Last Casing:

1.8 SG EMW @ 650.0m MDRT

Days From Spud:

6.9

Mud Weight:

FIT:

1.21 SG

Depth @ 2400 Hrs:

895.0 m MDRT 895.0 m TVDRT

ECD: **Mud Type:**

0.00 SG NaCI/PHPA/Polymer

Lag Depth:

.0 m MDRT

Mud Chlorides:

Last Depth:

895.0 m MDRT

Est. Pore Pressure:

46500 mg/l 0.00 SG

Progress:

 $0 \, \text{m}$

DXC:

N/A

Water Depth: RT:

55.0 m MSL 26.0 m

Last Survey: Deviation:

0.0 m MDRT Inc. 0.00° Az. 0.00°

OPERATIONS SUMMARY

24 HOUR SUMMARY

Picked up and ran in hole with run 3 MDT/GR. Conducted prressure survey as per program. Unable to obtain samples in Gurnard section. Rigged up and ran inhole with Run 4 VSP (CSAT/GR). Recorded 39 levels. Ran into hole with Run 5 (MDT/GR) with services pump out module and standard area probe. Ran into hole and attempted to sample at 749 and at 757.2 m without success pump out module malfunctioned. Pulled out of hole and inspected tool. Pump Added 6 gallon dump chamber and out module full of very fine sand. reconfigured tool appropriately. Ran into hole. Attempted to sample at 757.0m. Pump out malfunctioned. Opened to 6 Gallon chamber - lost probe seal. Commenced pulling out of hole.

NEXT 24 HOURS

Plug and abandon well as per programme. Recover stack and pull secondary

anchors.

CURRENT OPERATION @ 06:00 HRS (18/10/1999): 00:00 - 06:00 Pulled out of hole with MDT and inspected tool. Evaluated options. Rigged down Schlumberger. Picked up cement stinger and ran in hole to commence abandonment programme.

GEOLOGICAL SUMMARY

LITHOLOGY

INTERVAL: ROP (Range): Av. ROP:

HYDROCARBON FLUORESCENCE No Shows

GAS SUMMARY No Gas Data

CALCIMETRY



Interval (m MDRT) Calcite Range (%) Dolomite Range (%)

SAMPLE QUALITY

Due to high ROP through Latrobe section sampling was conducted at 10m intervals.

MUDLOGGING EQUIPMENT / PERSONNEL

Crews completed sample splits. Mudloggers departed rig on the 17/10/1999.

WELLSITE GEOLOGISTS



Date:

18 October 1999

9

Ria: **Bit Diameter:** **SEDCO 702**

Report Number: Report Period:

00:00 - 24:00 Hours

0 " 9-5/8" @ 646.0 m MDRT

11/10/99 2:00:00 AM

Last Casing:

1.8 SG EMW @ 650.0m MDRT

Spud Date: Davs From Spud:

7.9

Mud Weight:

1.21 SG 0.00 SG

Depth @ 2400 Hrs:

895.0 m MDRT 895.0 m TVDRT ECD: Mud Type:

NaCI/PHPA/Polymer

Lag Depth: Last Depth:

.0 m: MDRT 895.0 m MDRT **Mud Chlorides:**

0 ma/l

Est. Pore Pressure:

0.00 SG

Progress:

0 m

DXC: Last Survey: N/A 0.0 m MDRT

Water Depth: RT:

55.0 m MSL 26.0 m

Deviation:

Inc. 0.00° Az. 0.00°

OPERATIONS SUMMARY

24 HOUR SUMMARY

Logged with Run 5b MDT/GR - misrun unable to obtain sample. Rigged down MDT tool. Evaluated options. Rigged down Schlumberger. Commenceed plug and abandonment programme. Set cement plug # 1 from 890m to 790 m. Set balanced plug # 2 from 760 to 600m. Layed down tubing and drill collars. Ran into hole with drill pipe and tagged top of cement at 580m. Ran 8.5" EZSV bridge plug on Schlumberger wireline and set at 180m MDRT. Set cement plug # 3 from 175m to 125m. Circulated hole until clean. Commenced pulling flex

joint bore protector and wear bushing.

NEXT 24 HOURS

Pull stack and retrieve wellhead. Pull anchors.

CURRENT OPERATION @ 06:00 HRS (19/10/1999) : 00:00 - 06:00 Pulled flex joint bore protector and wear bushing. Make up jetting stand. Pulling diverter and pin slip joint. Unlatch

BOP's.

GEOLOGICAL SUMMARY

LITHOLOGY

INTERVAL: ROP (Range): Av. ROP:

HYDROCARBON FLUORESCENCE

No Shows

GAS SUMMARY No Gas Data

CALCIMETRY

Interval (m MDRT) Calcite Range

Dolomite Range

(%)

(%)



REMARKS

All cuttings and fluid samples are packed in 4 boxes and are in container # 22532. The container is to be backloaded with the core on the Challenger and is due in Port Welshpool on Thursday the 21/10/1999.

WELLSITE GEOLOGISTS

2



APPENDIX 2

BALEEN-2

CORE CHIPS DESCRIPTION REPORT

-CULTUS-



Cultus Petroleum N.L. CORE DESCRIPTION REPORT

Well Name:

BALEEN-2

Core Number : Hole Size ("):

8.50

Barrel Length (m):

18.00 Aluminium

Barrel Type: Mud Type:

NaCL/PHPA/Polymer

Mud Weight (sg): ROP Min (m/hr):

1.210 6.7 42.0

ROP Max (m/hr): ROP Avg (m/hr):

22.9

Service Company:

15 Oct 1999

Security DBS

Core Diameter ("): Bit Type:

4.00 DBS CD76

Start Depth (m):

746.0

End Depth (m): Meters Cut (m):

762.3 16.3

Recovery Length (m):

16.3

(100.00%)

Formation:

Gurnard Formation

Geologists: Comments:

Peter Boothby Core jammed off at 762.3

Core Chip	Core Chip Depth	Lithology / Shows
1	746.0	SANDY SILTSTONE: (100%) dark yellowish brown to moderate yellowish brown, firm to locally moderately hard, blocky, 30-40% very fine to fine grained quartz sand, commonly grades to Silty Sandstone, trace Glauconite, 5% siliceous clay, 5-10% micromica, common patchy siderite cement, trace to minor carbonaceous specks, trace lithics. No shows.
2	747.0	SANDY SILTSTONE: (100%) moderate to dark yellowish brown, firm to hard, blocky, 40-50% very fine to fine quartz sand, commonly grades to Silty Sandstone, 10% -15% siliceous clay, 20-25% siderite nodules, locally patchy siderite cement, trace to 5% glauconite, 5% micromica, trace to 5% carbonaceous specks, trace lithics.
3	748.0	SILTY SANDSTONE: (100%) moderate to dark yellowish brown, friable to locally firm, clear to translucent quartz grains, very fine to fine grained, moderately well sorted, angular to sub-rounded, trace to 5% patchy siderite cement, 20-30% dark yellowish brown quartz silt matrix, grades to Sandy Siltstone, 5% dark green Glauconite, trace to 5% micromica, trace feldspar, fair to locally good visible porosity.
4	749.0	SILTY SANDSTONE: (100%) moderate to dark yellowish brown, friable to locally firm, clear to translucent quartz grains, very fine to fine grained, moderately well sorted, angular to sub-rounded, trace to 2% patchy siderite cement, 20-25% dark yellowish brown quartz silt matrix, grades to Sandy Siltstone, trace to 2% dark green Glauconite, trace to 5% micromica, trace feldspar, fair to locally good visible porosity. No shows.
5	750.0	SILTY SANDSTONE: (100%) moderate to dark yellowish brown, clear to translucent quartz grains, friable to locally firm, very fine to fine grained, moderately well sorted, angular to sub-rounded, trace to 2% patchy siderite cement, 20-25% dark yellowish brown quartz silt matrix, grades to Sandy Siltstone, trace dark green Glauconite, trace to 5% micromica, trace feldspar, fair to locally good visible porosity. No shows.
6	751.0	SILTY SANDSTONE: (100%) dark greyish brown, dusky brown, dark yellowish brown, friable, very fine to fine quartz grains, moderately well sorted, angular to sub-rounded, trace patchy siderite cement, 20-30% dark yellowish brown silty matrix, 10-15% siliceous clay matrix, 5% micromica, trace Glauconite, trace lithics, poor to fair visible porosity. No shows.
7	752.0	SILTY SANDSTONE: (100%) moderate to dark yellowish brown, clear to translucent

 Well Name :BALEEN-2
 Interval : /46.0m to /62.3 m

 Core #: 1
 Cut: 16.30m Recovered : 16.30m (100.00%)

Core Chip #	Core Chip Depth	Lithology / Shows
#	Берш	quartz grains, friable to locally firm, very fine to fine grained, moderately well sorted, angular to sub-rounded, trace patchy siderite cement, 20-25% dark yellowish brown quartz silt matrix,10-15% siliceous clay matrix, grades to Sandy Siltstone, trace dark green Glauconite, trace to 5% micromica, poor to fair visible porosity. No shows.
8	752.6	SILTY SANDSTONE: (100%) dominantly as above. No shows. Note: dull to moderately bright yellowish green patchy fluorescence observed on surface of core only. Contamination
9	753.0	SILTY SANDSTONE: (100%) as above, Grades to Argillaceous Sandstone. No shows.
10	754.0	SILTY SANDSTONE: (100%) as above trace to 5% Glauconite. No shows. minor dull yellowish green fluorescence on surface of core. Contamination.
11	755.0	SILTY SANDSTONE: (100%) moderate to dark yellowish brown, clear to translucent quartz grains, friable to locally firm, very fine to fine grained, moderately well sorted, angular to sub-angular, trace to 10% patchy siderite cement, 20-25% dark yellowish brown quartz silt matrix, 10-15% siliceous clay matrix, grades to Sandy Siltstone, 5% dark green Glauconite, trace to 5% micromica, poor to fair visible porosity. No shows.
12	756.0	SILTY SANDSTONE: (100%) moderate to dark yellowish brown, clear to translucent quartz grains, friable, very fine to fine grained, moderately well sorted, angular to sub-angular, trace to 2% patchy siderite cement, 20-25% dark yellowish brown quartz silt matrix, 10-15% siliceous clay matrix, grades to Sandy Siltstone, 5-8% dark green Glauconite, trace to 5% micromica, fair visible porosity. FLUORESCENCE: Nil direct fluorescence, slow to moderately fast yellowish green to yellowish white diffuse crush cut fluorescence, thin yellowish white residual ring fluorescence.
13	757.0	SILTY SANDSTONE: (100%) as above. Fair to Good Show FLUORESCENCE: (80%) dull to moderately bright yellowish green pinpoint to patchy direct fluorescence, slow yellowish white blooming cut fluorescence, thick yellowish white residual ring fluorescence.
14	758.0	ARGILLACEOUS SANDSTONE: (100%) moderate to dark yellowish brown, clear to translucent quartz grains, friable to commonly firm, very fine to fine grained quartz, poor to moderately well sorted, angular to sub-angular, trace patchy siderite cement, 30-40% argillaceous matrix, 15-20 quartz silt matrix, trace Glauconite, trace to 5% micromica, trace lithics, poor to locally fair visible porosity. Fair to Good Show FLUORESCENCE: (80%) Strong gassy / HC odour. Dull to moderately bright yellowish green pinpoint to patchy direct fluorescence, slow yellowish white to bluish white blooming cut fluorescence, thick yellowish white residual ring fluorescence.
15	759.0	SILTY SANDSTONE: (100%) moderate to dark yellowish brown, clear to translucent quartz grains, friable, very fine to fine grained, moderately well sorted, angular to sub-angular, trace patchy siderite cement, 20-25% dark yellowish brown quartz silt matrix, 10-15% siliceous clay matrix, grades to Sandy Siltstone, trace to 2% dark green Glauconite, trace to 5% micromica, fair visible porosity. Fair to Good Show. FLUORESCENCE: (90%) Strong gassy / HC odour. Dull to moderately bright yellowish green pinpoint to patchy direct fluorescence, slow yellowish white to moderately bright bluish white blooming cut fluorescence, thick yellowish white residual ring fluorescence.

 Well Name :BALEEN-2
 Interval : /46.0m to /62.3 m

 Core # : 1
 Cut : 16.30m Recovered : 16.30m (100.00%)

Core Chip #	Core Chip Depth	Lithology / Shows
16	760.0	SILTY SANDSTONE: (100%) as above, firm to locally moderately hard, trace to 10% patchy siderite cement, poor to fair visible porosity. Good show. FLUORESCENCE: (90%) Strong gassy / HC odour. Dull to moderately bright yellowish green pinpoint to patchy direct fluorescence, slow to moderately fast yellowish white to moderately bright bluish white blooming cut fluorescence, thick yellowish white residual ring fluorescence. Bright bluish white fluorescence on surface of core.
17	761.0	SILTY SANDSTONE: (100%) as above, commonly grades to Sandy Siltstone, moderately common patchy siderite cement. poor to locally fair visible porosity. Good show. FLUORESCENCE: (70%) Strong gassy / HC odour. Dull to moderately bright yellowish green pinpoint to patchy direct fluorescence, slow to moderately fast yellowish white to moderately bright bluish white blooming cut fluorescence, thick yellowish white residual ring fluorescence.
18	761.5	SILTY SANDSTONE: (100%) as above, 5% very fine Glauconite. 15-20% argillaceous matrix, grades to Argillaceous Sandstone. FLUORESCENCE: (70%) Strong gassy / HC odour. Dull to moderately bright yellowish green pinpoint to patchy direct fluorescence, slow to moderately fast yellowish white to moderately bright bluish white blooming cut fluorescence, thick yellowish white residual ring fluorescence.
		Page 3 of 3



Cultus Petroleum N.L.

CORE DESCRIPTION REPORT

Well Name:

BALEEN-2

Core Number : Hole Size ("):

2 8.50

Barrel Length (m): Barrel Type:

18.00 Aluminium

Mud Type:

NaCl/PHPA/Polymer

Mud Weight (sg): ROP Min (m/hr):

10.100 11.3 30.2

ROP Max (m/hr): ROP Avg (m/hr):

17.8

Date:

15 Oct 1999

Service Company:

Security DBS 4.00

Core Diameter ("): Bit Type:

CD73 762.3

Start Depth (m): End Depth (m): Meters Cut (m):

780.3 18.0

Recovery Length (m):

15.9

(88.06%)

Formation:

Gurnard Formation

Geologists:

Peter Boothby

Comments:

Core Chip #	Core Chip Depth	Lithology / Shows
1	762.3	SIDERITIC SANDSTONE: (100%) moderately to dark yellowish brown, olive grey, clear to translucent quartz grains, firm to hard, very fine to fine grained, moderately sorted, angular to sub-angular, 40-50% siderite cement, 5-10% argillaceous / silty matrix, 5-10% Glauconite, micromica, trace lithics, poor visible porosity. No shows.
2	763.0	SIDERITIC SANDSTONE: (100%) as above. No shows.
3	764.0	SIDERITIC SANDSTONE: (100%) moderately to dark yellowish brown, olive grey, clear to translucent quartz grains, firm to hard, very fine to fine grained, moderately sorted, angular to sub-angular, 20-30% patchy siderite cement, 5-10% argillaceous / silty matrix, 10-15% Glauconite, micromica, trace lithics, poor visible porosity. No shows. FLUORESCENCE: (30%) dull to moderately bright yellowish green pinpoint to patchy
		direct fluorescence, slow yellowish white streaming to blooming cut fluorescence, thin to thick yellowish white residual ring fluorescence. Shows where not cemented.
4	765.0	SILTY SANDSTONE: (100%) moderate to dark yellowish brown, clear to translucent quartz grains, friable to locally firm, very fine to fine grained quartz, moderately well sorted, sub-angular to angular, trace to 5% siderite cement, 25-30% argillaceous / silty matrix, 15% dark green Glauconite, trace to 5% micromica, trace lithics, poor to fair visible porosity. No shows.
5	766.0	SILTY SANDSTONE: (100%) as above. Grades to an Argillaceous Sandstone. No shows.
6	767.0	ARGILLACEOUS SANDSTONE: (100%) moderate to dark yellowish brown, clear to translucent quartz grains, friable to firm, silt size quartz to fine grained quartz, dominantly very fine grained, grades to Sandy Siltstone, moderately well sorted, angular, trace siderite cement, 40-50% dark yellowish brown argillaceous matrix, 10-15% glauconite, 5% micromica, trace lithics, poor visible porosity. No shows.
7	768.0	SANDY CLAYSTONE : (100%) dark yellowish brown, soft, 25-30% very fine to fine grained quartz sand, 15-20% quartz silt, trace to 2% galuconite, 5% micromicaceous, trace lithics. No shows.
. 8	768.4	SANDY CLAYSTONE: (100%) as above. Grades to Argillaceous Siltstone No shows.
9	769.0	SANDY CLAYSTONE: (100%) as above. Grades to Argillaceous Siltstone No shows.

 Well Name :BALEEN-2
 Interval : /62.3m to /80.3 m

 Core # : 2
 Cut : 18.00m
 Recovered : 15.85m (88.06%)

Core Chip	Core Chip Depth	Lithology / Shows
10	770.0	SANDY CLAYSTONE: (100%) as above. Grades to Argillaceous Siltstone No shows.
11	771.0	SILTY SANDSTONE: (100%) moderate to dark yellowish brown, clear to translucent quartz grains, friable to locally firm, very fine to fine grained quartz, moderately well sorted, sub-angular to angular, trace to 5% siderite cement, 25-30% argillaceous / silty matrix, 5% dark green Glauconite, trace to 5% micromica, trace lithics, poor to fair visible porosity. No shows.
12	772.0	SILTY SANDSTONE: (100%) as above. Grades to Argillaceous Silstone. No shows.
13	773.0	SILTY SANDSTONE: (100%) moderate to dark yellowish brown, clear to translucent quartz grains, firm to moderately hard, friable in part, very fine to fine grained quartz, moderately well sorted, sub-angular to angular, trace to 15% patchy siderite cement, 25-30% argillaceous / silty matrix, 5-8% dark green Glauconite, trace to 5% micromica, trace lithics, poor to fair visible porosity. No shows.
14	774.0	SILTY SANDSTONE: (100%) as above. trace to 5% patchy siderite cement. No shows.
15	775.0	SILTY SANDSTONE: (100%) as above, grades to Argillaceous Sandstone. No shows.
16	776.0	SILTY SANDSTONE: (100%) as above. No Shows.
17	777.0	SILTY SANDSTONE: (100%) as above. Grades to Argillaceous Sandstone / Sandy Claystone. No shows.
18	777.4	SILTY SANDSTONE: (100%) moderate to dark yellowish brown, pale brown, clear to translucent quartz grains, friable, very fine to fine grained quartz, moderately well sorted, sub-angular to angular, trace patchy siderite cement, 20-30% argillaceous / silty matrix, Trace to 5% dark green Glauconite, trace to 5% micromica, trace lithics, fair visible porosity. No shows.
19	778.2	SILTY SANDSTONE: (100%) as above. No shows.

3



APPENDIX 3

BALEEN-2

CUTTINGS DESCRIPTION REPORT

-CULTUS-



Cultus Petroleum N.L.

Cuttings Descriptions Report

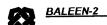
Well Name: BALEEN-2 Print Date Wed 28/06/2000
Wellsite Geologist(s): Peter Boothby

I41	%	Lithology / Show Descriptions	Ca	Mg
Interval (mRT)	70	Littlology / Stiow Descriptions	(%)	(%)
650 to 654	70	ARGILLACEOUS CALCILUTITE: medium to dark grey, olive grey, soft to firm, amorphous to blocky, 20-25% siliceous clay content, trace quartz silt, trace forams.	46	0
	30	CEMENT: <none></none>		
654 to 657	80	ARGILLACEOUS CALCILUTITE: as above.		
	20	Note: Poor quality samples. CEMENT: as above		
657 to 660	95	ARGILLACEOUS CALCILUTITE: medium to dark grey, olive grey, soft to firm, amorphous to blocky, 30-35% siliceous clay content, grades to Calcareous Claystone, trace quartz silt, trace forams.	62	1
	5	CEMENT: as above		
660 to 663	100	ARGILLACEOUS CALCILUTITE: light grey to medium grey, medium to dark olive grey, soft, dispersive, firm in part, amorphous to blocky, trace subfissile, trace carbonaceous specks, 20-25% siliceous clay content, grades in part to Calcareous Claystone, trace quartz silt,		
663 to 666	95	ARGILLACEOUS CALCILUTITE: as above	65	4
	5	CALCILUTITE: white to very light grey, light olive, grey, soft, amorphous, slightly dispersive, trace very fine glauconite.		
666 to 669	95 5	ARGILLACEOUS CALCILUTITE: light grey to medium grey, medium to dark olive grey, soft, dispersive, firm in part, amorphous to blocky, trace subfissile, trace carbonaceous specks, 20-25% siliceous clay content, grades in part to Calcareous Claystone, trace quartz silt, trace very fine Glauconite. CALCILUTITE: as above, trace firm to moderately hard calcite cemented.		
669 to 672	95	ARGILLACEOUS CALCILUTITE: as above	63	7
009 10 072	5	CALCILUTITE: as above.		
672 to 675	95	ARGILLACEOUS CALCILUTITE: as above		
	5	CALCILUTITE: as above		
675 to 678	100	ARGILLACEOUS CALCILUTITE: light grey to medium grey, medium to dark olive grey, dominantly soft, dispersive, rare firm to moderately hard, amorphous to blocky, trace subfissile, trace carbonaceous specks, 30-35% siliceous clay content, grades in part to Calcareous Claystone, trace quartz silt, trace very fine Glauconite, trace forams.	83	4
678 to 681	95	ARGILLACEOUS CALCILUTITE: as above, trace to 5% forams,		L

Page: 1 of 6



Interval (mRT)	%	Lithology / Show Descriptions	Ca (%)	Mg (%)
	5	trace Glauconite. CALCAREOUS CLAYSTONE: light to medium grey, light olive grey, soft, amorphous, dispersive in part, 20-30% micrite content, trace very fine Glauconite.		
681 to 684	95 5	ARGILLACEOUS CALCILUTITE: as above, trace calcisiltite, trace Glauconite, trace to 5% forams. CALCAREOUS CLAYSTONE: as above.	62	4
684 to 687	90	ARGILLACEOUS CALCILUTITE: as above CALCAREOUS CLAYSTONE: as above.		
687 to 690	90	ARGILLACEOUS CALCILUTITE: light grey to medium grey, medium olive grey, mottled, dominantly soft, dispersive, rare firm to moderately hard, amorphous to blocky, trace carbonaceous specks, 30-35% siliceous clay content, grades in part to Calcareous Claystone, trace quartz silt, trace very fine Glauconite, trace forams. CALCAREOUS CLAYSTONE: as above	61	5
690 to 693	85 15	ARGILLACEOUS CALCILUTITE: as above CALCAREOUS CLAYSTONE: light grey to medium grey, medium olive grey, soft to firm, amorphous to rare blocky, 20-30% micrite content, trace very fine Glauconite.		
693 to 696	85 15	ARGILLACEOUS CALCILUTITE: as above, trace to 5% calcisiltite. CALCAREOUS CLAYSTONE: as above	65	8
696 to 699	85 15	ARGILLACEOUS CALCILUTITE: light to medium grey, medium olive grey, mottled, dominantly soft, dispersive, rare firm to moderately hard, amorphous to blocky, trace carbonaceous specks, 30-35% siliceous clay content, grades in part to Calcareous Claystone, trace quartz silt, trace to 5% calcisiltite, trace very fine Glauconite, trace forams. CALCAREOUS CLAYSTONE: as above.		
699 to 702	85 10	ARGILLACEOUS CALCILUTITE: as above, trace Glauconite, trace calcisiltite. CALCAREOUS CLAYSTONE: as above	63	9
	5	CALCILUTITE: white to very light grey, light olive grey, soft to firm, blocky, trace carbonaceous specks, 5-10% siliceous clay content, grades to Argillaceous Calcilutite.		
702 to 705	85 10	ARGILLACEOUS CALCILUTITE: as above, trace hard to very hard dark brown Siderite nodules. CALCAREOUS CLAYSTONE: as above		
	5	CALCILUTITE: as above		
705 to 708	80	ARGILLACEOUS CALCILUTITE: as above.	56	11



Interval (mRT)	%	Lithology / Show Descriptions	Ca (%)	Mg (%)
705 to 708	20	CALCAREOUS CLAYSTONE: light grey to medium grey, medium olive grey, soft to firm, amorphous to rare blocky, 20-30% micrite content, trace very fine to medium pelletal Glauconite, 5% carbonaceous specks.	56	11
708 to 711	80	ARGILLACEOUS CALCILUTITE: as above		
	20	CALCAREOUS CLAYSTONE: as above		
711 to 714	70	ARGILLACEOUS CALCILUTITE: as above, commonly grades to Calcareous Claystone.	59	8
	30	CALCAREOUS CLAYSTONE: as above		
714 to 717	70	ARGILLACEOUS CALCILUTITE: as above		
	30	CALCAREOUS CLAYSTONE: as above		
717 to 720	70	ARGILLACEOUS CALCILUTITE: as above	40	4
	30	CALCAREOUS CLAYSTONE: as above		
720 to 723	70	ARGILLACEOUS CALCILUTITE: as above, trace fossil fragments and forams.		
	30	CALCAREOUS CLAYSTONE: as above		
723 to 726	70	ARGILLACEOUS CALCILUTITE: as above	37	3
	30	CALCAREOUS CLAYSTONE: light grey to medium grey, light to medium olive grey, soft, amorphous, 20-30% micrite content, trace very fine to medium pelletal Glauconite, 5% carbonaceous specks.		
726 to 729	65	ARGILLACEOUS CALCILUTITE: as above		
	35	CALCAREOUS CLAYSTONE: as above, trace to 2% dark green Glauconite.		
729 to 732	50	ARGILLACEOUS CALCILUTITE: as above	25	5
	50	CALCAREOUS CLAYSTONE: light to medium grey, pale yellowish brown in part, soft, dispersive, 20-25% micrite content, 5% fine dark green glauconite increasing, trace carbonaceous specks		
732 to 735	50	CALCAREOUS CLAYSTONE: as above, 5-8% fine dark green Glauconite, trace disseminated pyrite.		
	50	ARGILLACEOUS CALCILUTITE: as above, commonly grades to Calcareous Claystone.		
735 to 738	60	CALCAREOUS CLAYSTONE: as above	28	2
	40	ARGILLACEOUS CALCILUTITE: as above		
738 to 741	60	CALCAREOUS CLAYSTONE: as above, 8-10% Glauconite, trace disseminated pyrite. 15 - 20% micrite content, commonly grades to Claystone.		
	40	ARGILLACEOUS CALCILUTITE: as above		I



Interval (mRT)	%	Lithology / Show Descriptions	Ca (%)	Mg (%)
741 to 744	80	CLAYSTONE: medium to dark yellowish brown, dark olive grey, soft, dispersive, 10-15% micrite content, 5-10% fine dark green galuconite, trace to 5% quartz silt, trace fine quartz sand, trace very fine disseminated pyrite, trace hard dark brown siderite nodules, trace to minor carbonaceous flecks, trace lithics. ARGILLACEOUS CALCILUTITE: as above	2	1
744 to 746	90	CLAYSTONE: as above		
	10	ARGILLACEOUS CALCILUTITE: as above		
746 to 748	70	CLAYSTONE: medium to dark yellowish brown, dark olive grey, soft, dispersive, 10-15% micrite content, 5-10% fine dark green galuconite, 10-15% quartz silt, grades to Silty Claystone, 5% micromica, trace fine quartz sand, trace very fine disseminated pyrite, trace hard dark brown siderite nodules, trace to minor carbonaceous flecks, trace lithics.		
	25	ARGILLACEOUS SILTSTONE: medium to dark yellowish brown, soft, dispersive, 30-40% siliceous clay, trace to 5% micrite, trace very fine quartz sand, 5-10% fine dark green Glauconite, trace hard dark yellowish brown siderite nodules, trace to 5% micromica, trace carbonaceous specks, trace lithics.		
	5	ARGILLACEOUS CALCILUTITE: as above		
748 to 750	50 50	ARGILLACEOUS SILTSTONE: as above SILTY CLAYSTONE: as above increasing silt content. 20-30% quartz silt.		
750 to 753	80	ARGILLACEOUS SILTSTONE: medium to dark yellowish brown, soft, dispersive, 30-40% siliceous clay, trace to 5% micrite, trace to 5% very fine quartz sand, 5-10% fine dark green Glauconite, trace hard dark yellowish brown siderite nodules, trace to 5% micromica, trace carbonaceous specks, trace lithics. SILTY CLAYSTONE: as above		
753 to 756	90	ARGILLACEOUS SILTSTONE: medium to dark yellowish brown, pale brown, soft, dispersive, 30-40% siliceous clay, trace to 5% micrite, 5% very fine quartz sand, 5% fine dark green Glauconite, trace hard dark yellowish brown siderite nodules, 5% to 10% micromica, trace carbonaceous specks, trace lithics. SILTY CLAYSTONE: as above		
756 to 759	100	ARGILLACEOUS SILTSTONE: as above.		
759 to 762	0	NO RETURNS: Samples not circulated.		
762 to 765	90	SILTSTONE: dark yellowish brown to moderate yellowish brown, very soft to soft, amorphous to subblocky, argillaceous, minor very fine quartz sand, 5% micromica, trace carbonaceous specks.		
	10	SILTY SANDSTONE: clear to translucent, opaque in part, loose, silt		



Trensite GeU		s): Peter Boothby		
Interval (mRT)	%	Lithology / Show Descriptions	Ca (%)	Mg (%)
, , ,		size to very fine grained quartz, trace medium quartz grains, angular to sub-angular, poor to moderately sorted, trace siderite cement, minor silty / argillaceous matrix, trace glauconite, poor to fair inferred porosity.		
765 to 768	90	SILTSTONE: as above		
	10	SILTY SANDSTONE: as above		
768 to 771	80	SILTSTONE: as above		
	20	SILTY SANDSTONE: as above		
771 to 780	0	NO RETURNS: Cuttings from core not circulated.		
780 to 790	60 40	SANDSTONE: clear to translucent quartz, light grey, opaque, fine to coarse, dominantly fine to medium, poorly sorted, angular to sub-rounded, 5% pyrite cement, 5-10% argillaceous matrix where aggregated, trace nodular pyrite, trace Glauconite, trace siderite nodules, fair to good inferred porosity. No shows. SILTSTONE: moderate yellowish brown, medium olive grey, soft, dispersive, 15-20% siliceous clay content, grades to argillaceous Claystone, 10-15% very fine to fine grained quartz sand, trace to 2%		
790 to 795	90	Glauconite, trace nodular pyrite, trace micromica, trace lithics. SANDSTONE: white to opaque, clear to translucent quartz grains, medium to v coarse, dominantly medium to coarse, poorly sorted, sub-angular to sub-rounded, trace pyrite cement, 5% white kaolinitic matrix, trace Glauconite, trace lithics, good inferred porosity. No shows. SILTSTONE: as above		
795 to 800	70 30	SANDSTONE: white to opaque, clear to translucent quartz grains, loose, medium to very coarse, dominantly medium to coarse, poorly sorted, sub-angular to sub-rounded, trace pyrite cement, 10-20% white kaolinitic matrix, grades to Arg Sandstone, 5% dark green pelloidal Glauconite, trace reddish brown lithics (jasper), good inferred porosity. No shows. SILTSTONE: as above		
800 to 805	58 40 2	SILTSTONE: pale brown to moderate yellowish brown, soft, dispersive, amorphous, 10-15% siliceous clay, grades to argillaceous Siltstone, 5% micromica, trace to 5% carbonaceous specks and micro-laminae, trace to 2% Glauconite, trace lithics. SANDSTONE: dominantly as above. No shows. COAL: black, firm to hard, occasional brittle, dull to subvitreous.		
805 to 810	70	ARGILLACEOUS SANDSTONE: white to opaque, clear to translucent quartz grains, loose, fine to coarse, dominantly medium to coarse, poorly sorted, sub-angular to sub-rounded, trace weak silica cement, 35 to 40% white kaolinitic / feldspathic matrix,		



Interval (mRT)	%	Lithology / Show Descriptions	Ca (%)	Mg (%)
((possibly matrix supported?), trace Glauconite,		
	29	SILTSTONE: as above		
	1	COAL: as above		
810 to 820	95 5	SANDSTONE: white to opaque, clear to translucent quartz grains, trace light bluish grey, loose, fine to very coarse, dominantly medium to coarse, poorly sorted, angular to sub-angular, moderately common siliceous cement, 15-20% white kaolinitic matrix, grades to argillaceous Sandstone, trace Glauconite, poor to fair inferred porosity. No shows. SILTSTONE: as above.		
820 to 830	100	SANDSTONE: as above. No shows.		
830 to 840	100	SANDSTONE: as above, medium grained, moderately well sorted, 15-20% white kaolinitic matrix, poor inferred porosity. No shows.		
840 to 850	100	SANDSTONE : as above, dominantly medium to coarse, occasional very coarse. siliceous, poor inferred porosity. No shows.		
850 to 860	95 5	SANDSTONE: white to opaque, clear to translucent quartz grains, trace to 5% light bluish grey, loose, medium to very coarse, dominantly medium to coarse, poorly sorted, angular to sub-angular, moderately common siliceous cement, 15-20% white kaolinitic matrix, grades to argillaceous Sandstone, poor to fair inferred porosity. No shows. CLAYSTONE: dark greyish black, dark greyish brown, hard to very hard, subfissile to fissile, siliceous, minor micromicaceous.		
860 to 870	95 5	ARGILLACEOUS SANDSTONE: as above with 40-50% white kaolinitic matrix. trace pyrite nodules, poor inferred porosity. No shows. CLAYSTONE: as above.		
	3			
870 to 880	55 40	ARGILLACEOUS SANDSTONE: as above SANDY CLAYSTONE: white to light grey, soft to very soft, 20-30%		
	40	very fine to fine quartz sand, matrix supported, Kaolinitic.		
	5	CLAYSTONE: as above		
880 to 890	65	CLAYSTONE: as above.		
	30 5	ARGILLACEOUS SANDSTONE: as above with 40-50% white kaolinitic matrix. trace pyrite nodules, poor inferred porosity. No shows. CLAYSTONE: as above.		
				<u> </u>
890 to 895	65	CLAYSTONE: as above.		
	30	ARGILLACEOUS SANDSTONE: as above		
	5	CLAYSTONE: as above		

4



APPENDIX 4

BALEEN-2

CORING REPORT

-SECURITY DBS-



CORING REPORT BALEEN-2

CULTUS BASIN OIL NL

Edited to Remove all Interpretive Data

Prepared For

Chris Way & Mark Adamson

TARGET SUMMARY

CORING OBJECTIVE

Potentially three 18m non-oriented core were programmed for the Reservoir Sands, Coring point was picked based on confirmation of bottoms up sample, with the aim of coring from approximately 2-3m above "Top Reservoir" in order to obtain core over most of the reservoir. The programmed core point of 736mrt was reached and no indications of the reservoir had been seen, so another 10m was drilled, bottoms up samples confirmed core point at 746m, The amount of core required was reviewed once the Top Reservoir depth was established, it would have been no more than 30m if the stratigraphy was as prognosed. On further discussion at rig site, it was decided to run two 18m cores.

The Core was to be cut into 1m lengths for the transportation to ACS at their Brisbane base.

FORMATION DESCRIPTION

SANDY SILTSTONE: moderate to dark yellowish brown, firm to hard, 40%-50% very fine to fine quartz sand, commonly grades to silty sandstone, 10%- 25% siliceous nodules, locally patchy siderite cement, trace to 5% glauconite, 5% micromica, trace to 5% carbonaceous specks, trace lithics.

SILTY SANDSTONE: (80%) moderate to dark yellowish brown, clear to translucent quartz grains, friable to locally firm, very fine to fine grained, moderately well sorted, angular to sub-rounded, trace to 2% patchy siderite cement, 20%-25% dark yellowish brown quartz silt matrix, grades to sandy siltstone, trace to 5% dark green glauconite, trace to 5% micromica, trace feldspar, fair to good visible porosity.

CORING SUMMARY REPORT

Core Point

: 746m

Depth finish

: 780.3m

Hole Angle

: 0°

Hole Temp

: 40°C

Shoe Depth

:646m (9-5/8 casing)

Mud Type

:10.1ppg polymer, viscosity 52cp, PV 22, YP 25

CORING SUMMARY

Length Cut

: 34.3 m

Core Recovery

: 32.15m

% Recovered

: 93.70 %

Hours total

: 0.62 hr

Average ROP

: 16.6 m/hr

Dull conditions

: Corehead is in very good condition, No wear encountered during core run, Corehead

suitable for re-run

CORING PARAMETERS

W.O.B:

2 - 20 lbs

R.P.M:

70 - 90 rpm

G.P.M:

200 gpm

TORQUE:

2-5 ft/lbs

PRESSURE:

380 - 580 psi

The first half meter of core cut, is cut using controlled parameters, this is to allow the core to establish itself inside the core catcher, once this is done the coring parameters can be increased to the optimum parameters, there was no problem on either of the run's once the optimum parameters were reached, the remainder of core was cut with constant parameters, the only noted change was to the pressure, which fluctuated during both runs, this was probably due to the unconsolidated nature of the core, this proved not to be a problem as torque & ROP remained constant.

RUN SUMMARY

CORING

ASSEMBLY 6-3/4"x 4" x 18m Heavy Duty Thread Core Barrel dressed with 3 x 8-15/32" Cobra stabilisers at 9m interval from near bit. 2 x 4" Aluminium fluted inner sleeve dressed with internal lip shoe.

CORE BIT

8-1/2" x 4" CD 73. The CD 73 is a low Invasion style, matrix body, seven bladed light-medium set corebit, set with 13mm cutters, spiralled blades and gauge.

This design is suitable for applications in soft unconsolidated but potentially abrasive sandstone formations, interbedded with claystone and siltstone stringers.

B.H.A. Coring Assembly, 1 x Circ-sub, 9 x 6 ½ DC 1x X-over, 1 x Drilling Jar 3 x 6 ½ DC

Made up coring assembly for 18m conventional core run. Used CD 73 corehead, R.I.H.. broke circulation at shoe, washed and reamed though shoe track, continued to R.I.H. again broke circulation one stand off bottom, Reamed last stand and tagged bottom, spaced out to allow core to be cut with no connections, took SCRs, Dropped ball, noted 300psi pressure increase when ball seated, established off bottom parameters commenced coring. Started coring with low parameters to establish first half meter in core catcher, increased rpm and weight on bottom, after first meter cut. First 16m cut with no problems, pressure increased and decreased over the period of core cut, indicating the unconsolidated nature of core, on the next 0.3m Noted lost torque and ROP indicating barrel had jammed off. Stopped coring and P.O.O.H.

On surface found catcher packed off with loose sandstone, laid out core and redressed assembly for next run. Core head was found to have four ports blocked with claystone. Cleaned corehead and prepared for next run, No wear found on corehead, 1,2,CT,S,X,I,PN,PR

CORE – 2 R.I.H for core two, no problems going though shoe on this run, broke circulation one stand off bottom, Reamed last stand and tagged bottom, spaced out to allow core to be cut with no connections, took SCRs, Dropped ball, noted 300psi pressure increase when ball seated, established off bottom parameters commenced coring. Started coring with low parameters to establish first half meter in core catcher, increased rpm and weight on bottom. After first meter cut, continued coring with no problems, as in the first run pressure varied over length of core increasing and decreasing alternately, ROP, WOB & TORQUE remained consistent though rest of core cut.

Stopped coring once 18m had been cut, P.O.O.H. On surface found core head with three ports blocked with claystone and soft sandstone, laid out core and coring assembly as program was complete, lost two meters of core on recovery. This was initially thought to have been lost due to loose friable sands falling from barrel during tripping, however it is believed from GR results on captured core, that the first two meters of the run may have been washed/milled away.

FURTHER REMARKS AND CONCLUSIONS

On surface core head throat was found to be blocked and three ports plugged off with soft friable sandstone. Core shoe assembly was also packed, (i.e. no annulus in core). CD 73 corehead was found to be in good condition with no new wear on bit, 1,2,CT,S,X,I,PN,PR, core head would be suitable for re-run in future coring programmes. Held J.H.A. prior to laying out inner barrel sleeves, this job was completed successfully, following surface handling procedures as listed in the coring program, with the use of a hydraulic shear plate boot. The core was sheared with a single stroke as opposed to being hammered though. The core was then checked measured and cut into 1m lengths, and prepared for resination and transportation to ACS Brisbane.

Flow ports on corehead were most likely blocked due to breaking circulation at shoe, and reaming through shoe track, it is also possible ports blocked up reaming last stand to bottom. Security DBS can provide port plugs, which will work if circulation is not broken while running in hole. The plugs are designed to allow fluid out and not in. However if the pumps are run the plugs will release, and then the only way to try to prevent the ports from blocking up is to maintain a reasonably high flow rate. However flow rate has to be restricted until the diverter ball has been dropped, at this point the flow rate can be increased and should help to clear blocked ports prior to commencing core run

MUD TYPE

TYPE:

Water Base/polymer

VISC:

52

WT:

10.1ppg

% SOLIDS:

0.5

PV: YP: 22 25

The mud system used for the 8½ section was a NaCl/EZ-MUD/POLYMER/GEM-CP system. The cores were cut using a bland drilling fluid with no surfactants, thinners or defoamers added to the system, no problems encountered with filter cake or build-up of mud in the inner barrels or the annulus of the outer barrels, no invasion of shoe assembly or swivel assembly found.

A mud system of this formula would be suitable for fourth coming coring programs of similar depth and formation.

RECOMMENDATIONS FOR THE FUTURE

Security DBS recommend the use of the Posiclose System for maximum recovery in unconsolidated formations. Other considerations are: core head type and length of barrel to be run. We would recommend the option of running shorter barrels, 9 meter to start with and then increasing barrel length depending on core cut and recovered There is also the option of running with slick stabilisation in conjunction with the Poiseclose system to improve the length cut and recovery.

We perceive that the CD 73 Corehead performed well in this application. The CD 73 is a low invasion style, matrix body, seven bladed light/medium set core bit, set with 22 face and 6 gauge medium diamond volume content 13mm Claw cutters, spiraled blades and gauge to combat bit whirl, the gauge is set with natural diamond and carbide for added protection. The 4" gauge helps to give good stability at the bitface. This corebit is ideal for fast penetration coring whilst being able to cope with moderately hard stringers. The CD 73 is designed for soft to medium formations. The angled face discharge ports are directed outwards at the bit face, directing mud flow away from the core, minimising core washing.

The CD 73 can be run in conjunction with an internal lip Posi-close catcher system. The CD73 has a labyrinth which the posi-close inner lip lower half shoe locates into, diverting the drilling fluid away to the face discharge ports. The lowermost innersleeve is dressed with the posi-close bottom section, full closure catcher system sub. This section includes several components that conceal the core catchers during coring, expose the catchers at the end of the run, and shut the full closure core catchers. An inner sleeve conceals the core catchers and provides a smooth, unrestricted bore for core entry into the inner tube. The sub also houses a backup standard tungsten spring catcher, to catch a more consolidated formation. If the clam shells are unable to cut through the core, the conventional spring catcher below them will catch the core in the usual manner.

In order to activate the full closure catcher system on bottom after a core run, a second 2" steel ball is dropped from a slotted ball valve, this ball valve is installed at surface, between the top drive and the drill string. The box and pin of the sub are 4 ½" IF.

ALTERNATIVE COREBIT SELECTION FC 264 L/I (T.F.A. 0.90)

An optional corehead choice would be the 8 ½" x 4" FC 264 L/I set with 13mm and 9mm cutters. The FC 264 L/I is a low invasion style, matrix body, six bladed, light set core bit, set with 13mm and 9mm cutters, spiraled blades and gauge to combat bit whirl.

This design is for the posi-close application in formations of a soft unconsolidated sandstone with interbedding of claystones and siltstones.

The angled face discharge ports are directed outwards at the bitface, directing the flow away from the core, minimising core washing. The FC 264 L/I has a labyrinth where the inner lip lower half shoe fits into, diverting the flow to the face discharge ports. The design is aggressive, to cut unconsolidated formations at maximum penetration rates and get the core into the inner assembly as quickly as possible, with little time for possible washing or giving undergauge coresize.



PENETRATION AND PARAMETERS LOG



1	COMPAN WEL		CULTUS BALEEN-2	COR	E No.:	1		SHE	ET No.:	1
NTERVAL	746		ROP. ■/■				OPRE	ATION C	ONDITION	s
748 2 749 3 750 4 751 5 752 6 753 7 754 8 755 9 756 10 757 10 758 9 755 9 756 10 757 11 758 12 759 13 760 14 761 10 762 6 753 7 756 10 757 11 758 12 759 13 760 14 761 15 762 16 762.3 17 19 19 20 12 20 12 30 12 30 12 30 12 <td< th=""><th></th><th>М</th><th>0.00 5.00 10.00 15.00 20.00 25.00 30.00 35.0</th><th>MIN/M</th><th>WOB</th><th>RPM</th><th>GPM</th><th>PSI</th><th>TRQ</th><th>FORMATION</th></td<>		М	0.00 5.00 10.00 15.00 20.00 25.00 30.00 35.0	MIN/M	WOB	RPM	GPM	PSI	TRQ	FORMATION
748 2 2 3 3 5 5 2 5 5 5 5 5 5 5	747	1		20.0	12	90	200	550	1-2	GURNARD
749 3 3 5 5 5 5 5 5 5 5						100		575	2	
Total Tota				5.0	14	100	200	550	2-3	SILTY SANDSTONE
752 6	750	4		5.0	16	100	200	580	2-3	
753 7 754 8 755 9 756 10 757 11 758 12 759 13 760 14 761 15 762 16 762.3 17 18 19 20 21 21 22 20 21 21 22 22 21 22 23 24 24 25 26 27 28 29 30 31 31 32 33 33 34 34 35 36 36 37 37 38	751	5		5.0	16	100	200	630		SILTY SANDSTONE
754 8 8 755 9 756 10 757 11 758 12 759 13 760 14 761 15 762 16 762.3 17 788 19 20 20 20 20 20 20 20 20 20 20 20 20 20	752	6	11111							SILTY SANDSTONE
755 9 756 10 757 11 758 12 759 13 760 14 761 15 762 16 762 3 17 18 19 20 21 21 20 20 20 460 2 3 51LTY 9 750 12 10 20 20 540 2 3 51LTY 9 750 15 762 3 17 2 18 18 19 20 21 21 22 22 22 23 23 23 24 24 25 25 26 27 28 28 29 30 30 31 31 32 32 33 33 34 34 35 5 36 6 3 37 38 38 36 36 37 37 38 38 36 36 37 37 38 38 36 37 37 38 38 36 37 37 38 38 36 37 37 38 38 36 37 37 38 38 37 38 38 38 38 38 38 38 38 38 38 38 38 38		_								CTLTV CANDETONE
755 10 757 11 758 12 759 13 760 14 761 15 762 16 762.3 17 18 19 20 21 22 23 24 24 255 26 277 28 29 30 30 31 31 32 33 34 34 35 36 37 38										SILTY SANDSTONE SILTY SANDSTONE
757 11 758 12 759 13 760 14 761 15 762 16 762 3 17 18 19 20 21 22 23 24 25 26 27 28 29 30 30 31 31 32 33 34 35 36 37 37 38										SILIT SANDSTONE
758 12 759 13 760 14 761 15 762 16 762.3 17 18 199 20 21 21 22 23 24 24 25 25 26 27 27 28 29 30 30 31 31 32 32 33 34 34 35 36 37 38 38										SILTY SANDSTONE
759 13 760 14 761 15 762 16 762 16 762 3 17 18 19 20 20 21 21 22 23 23 24 25 26 27 28 28 29 30 30 31 31 31 32 32 33 34 34 33 38 38										SILTY SANDSTONE
760 14 761 15 762 16 763 17 18 19 20 21 22 23 24 25 26 27 28 29 30 30 31 31 31 32 32 33 34 34 33 34 35 36 37 38								480	2-3	
761 15 762 16 762 16 762 3 17 18 19 20 21 21 22 23 23 24 24 25 26 27 28 29 30 30 31 31 32 33 34 34 35 36 37 38					12	100	200	540	2-3	SILTY SANDSTONE
762.3 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 31 32 33 34 35 36 37 38					12	100	200	525	2-4	SILTY SANDSTONE
18				3.0	12	100	200	530	1-5	
19 20 21 22 23 24 25 26 27 28 29 30 31 31 32 32 33 34 35 36 37 38	762.3	17		9.0	12	100	200	460	2	SILTY SANDSTONE
20 21 21 22 23 23 24 24 25 25 26 27 28 29 30 30 31 31 32 32 33 34 34 35 36 37 38 38 38 38 38 38 38 38 38 38 38 38 38		18								
21 22 23 3 24 3 25 3 26 3 27 3 28 3 29 3 30 31 32 33 33 34 35 36 37 38 38 38		-				ļ				
22 23 24 24 25 26 27 28 29 30 30 31 32 33 33 34 35 36 37 38 38 38				 		ļ				
23 24 25 25 26 27 28 29 30 31 31 32 33 34 35 36 37 38										
24 25 26 27 28 29 30 31 32 33 34 35 36 37 38										
25 26 27 28 29 30 31 32 33 34 35 36 37 38				-						
26 27 28 29 30 31 32 33 34 35 36 37 38				-						
27 28 29 30 31 31 32 33 33 34 35 36 37 38				l						
28 29 30 31 32 33 33 34 35 36 37 38										
29 30 31 32 33 34 35 36 37 38									1	
30 31 32 33 34 35 36 37 38										
31 32 33 34 35 36 37 38										
33 34 35 36 37 38										
34 35 36 37 38		32								
35 36 37 38		33		L						
36 37 38		34		ļ		ļ				
37 38		35		<u> </u>						
38		36		ļ		ļ	ļ			
20		37		ļ						
39 40 41 42 43 44 45 46 47 48 48 49 50 50 51		38				ļ				
40 41 42 43 44 45 46 47 48 49 50 50 51						<u> </u>				
41 42 43 44 45 46 47 48 49 50 50 51				-	 	 	 			
172 43 44 45 46 47 48 49 50 51 52 53					 					
44 45 46 47 48 49 50 51 52 53					†	 			 	
45 46 47 48 49 50 51 52 53						<u> </u>				
46 47 48 49 50 51 52 53						<u> </u>				
47 48 49 50 51 52 53										
48 49 50 51 52 53										
49 50 51 51 52 53										
50		49								
51 52 53		50					ļ		ļ	
52 53 53		51			ļ				L	
53		52		L	<u> </u>	<u> </u>	ļ	<u> </u>	<u> </u>	
Teat transferration of the first transferration of the fir							ļ	<u> </u>	ļ	
54 []		54		<u> </u>	<u> </u>			<u> </u>	ļ	



PENETRATION AND PARAMETERS LOG

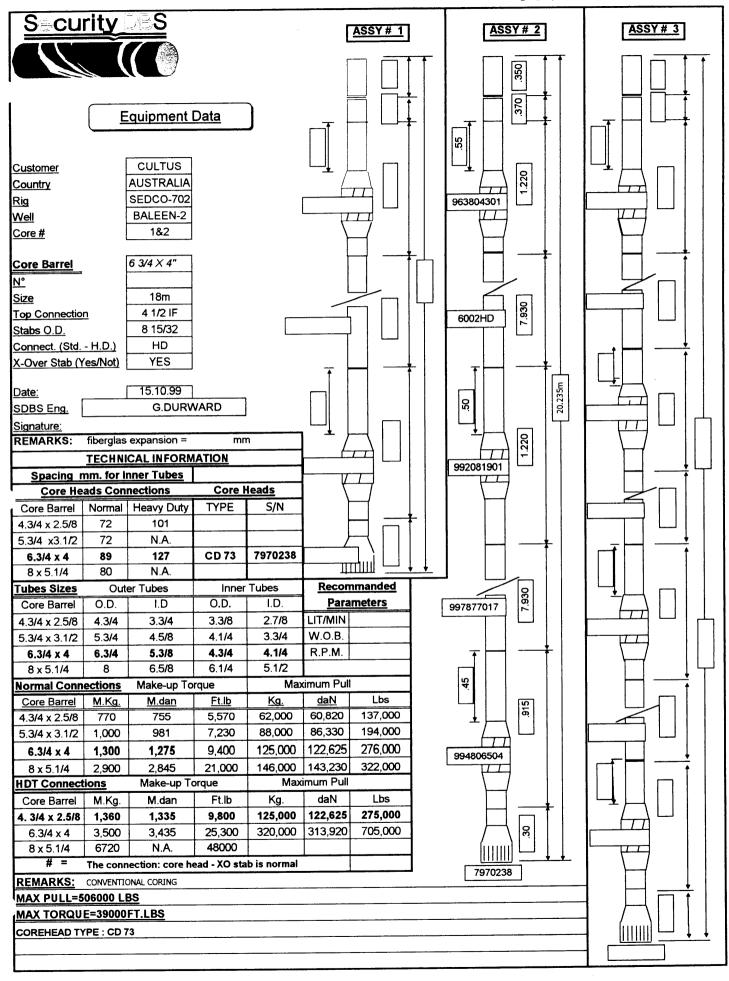


COMPANY: CULTUS

CORE No.: 2

SHEET No.:

WE	ELL:	BALEEN-2	COR	E No.:	2		SHE	ET No.:	1
762.3		ROP. m/br	OPREATION CONDITIONS						
INTERVAL	М	0.00 5.00 10.00 15.00 20.00 25.00 30.00 35.00	MIN/M	WOB	RPM	GPM	PSI	TRQ	FORMATION
763.3	1		5	6	90	200	380	2 -3	GURNARD
764.3	2		3.0	6	90	200	380	2 - 4	
765.3	3		3.0	6	90	200	420	2 - 4	SILTY SANDSTONE
766.3	4		3.0	8	90	200	460	2 - 4	
767.3	5		6.0	8	90	200	480	2 - 4	
768.3	6		3.0	10	90	200	460	2 - 4	
769.3	7		4.0	10	90	200	460	2 - 4	
770.3	8		5.0	10	90	200	460	2 - 4	
771.3	9		3.0	10	90	200	460	2 - 4	
772.3	10		5.0	12	90	200	500	2 - 4	
773.3	11		3.0	12	90	200	520	2 - 4	SILTY SANDSTONE
774.3	12		4.0	12	90	200	520	2 - 4	
775.3	13		3.0	12	90	200	480	2 - 3	
776.3	14		3.0	12	90	200	500	2 - 3	
777.3	15		3.0	12	90	200	475	2 - 3	
778.3	16		3.0	12	90	200	510	2 - 3	
779.3	17		4.0	12	90	200	460	2 -4	
780.3	18		4.0	12	90	200	460	2 - 4	SILTY SANDSTONE
	19								
	20								
	21								
	22								
	23								
	24								
	25								
	26								
	27								
	28								
	29								
	30								
	31								
	32					<u> </u>			
	33								
	34				-				
	35								
	36 37		<u> </u>						
<u> </u>			-						
	38								
	39 40					<u> </u>			
ļ	40								
<u> </u>	41		 -		-	 			
	42		 -	-					
	43								
 	45		 						
<u></u>	46					<u> </u>	<u> </u>		
	47								
	48								
	49		 						
-	50					T			
	51				<u> </u>				
<u> </u>	52								
	53								
	54			Ì		<u> </u>	Î		
	+			 		 		l	



S⊜cu	rity DBS								\$
			CO	RING LC	G				
								CORE N.	1
WEI	L INFORMATIO	<u>N</u>						SHEET# DATE:	15.10.99
OPERATOR:		CULTUS				HOLE SIZI	∷	8 1/2	
WELL N.: CONTRACTO COUNTRY:	OR:	SEDCO AUST		702]	ROCK TYPE		GURNARD SANDSTONE	
HOLE ANGL	<u>E:</u>	0							
E	QUIP. DESCRIP	TION							
CORE BARR		6 3/4 X 4" ; ALUMINIU			SAFETY J. TYP		TYPE:	6" SPRING	
CORE HEAD		CD 73 N/A		<u>SIZE:</u> THIS CORE:	8 1/2 X 4" 16.30		SER. N. TOT CORE	D <u>:</u>	7970238 16.30
CORE HEAD		1		D COND. AT	RUN START:	•	1,2,CT,S,X,I		
CORING B.H	I.A.	CD 73,CBI		(iadc code) B,9 X 6 1/2 D	AT RUN END: C, X-OVER,JARS	S,3 X 6 1/2 [1,2,CT,S,X,I C		
	CKGROUND RE								
A	STRING WTS		TRQ. OFF	В.	DROP BALL PF	RESS INCR		ON/OFF PRES	S INCR.
	190	40 rpm			Flow R.	175		Flow R.	200gpm
-	180	. ——	1-2000 ft.lb	s	Press incr.	300 psi		On Bottom	540
	190] <u>80 rpm</u>	2000 ft.lbs		Mins, to drop	5	l	Off Bottom	460
MUI	D PROPERTIES								
TYPE	VISC	WT	W/Loss	% SAND	% SOLIDS	H2O/OIL	PV	YP	
POLYMER	52	10.1PPG		0.5	7.1	0	22	25	
TIMING	ST. IN HOLE	<u>s</u> :	r, coring		ST. OUT OF H.	, !	BBL AT SUR	<u>F. BBL</u>	READY TO R.
Day/Time								J	
OVERP	ULL (Last conne	ection is at	P.O.O.H.)						
Conn. (Lbs)	1	2	3	4	5	6	7	8	9
PE	RFORMANCE		· · · · · · · · · · · · · · · · · · ·						
DEPTH IN	DEPTH OUT	CORED	HOURS	R.O.P.	REC.	% REC]		
746m	762.30	16.30	62mins	15.7m/ph	16.30 BARREL JAMME	1.00			
	ED/ DAMAGE S LOWER QUAD F	USPECTE		1 X SHOE AS	SSEMBLY, 2 X AL		1 UPPER & L	OWER "O" RING	S SEALS
REMARKS.		Held IHA se	ior to nicking :	n 18m coring as	sembly, dressed wit	h CD 73 PDC	and two alumi	nium tubes, R.I.H	
REMARKS: Broke circulation	n at shoe, washed				n with no problems,				
pressure increa	se, took S.C.R'S an	d off bottom	perameters co	mmenced coring	, ROP picked up aft	er first meter	cut and remaind	steady for first	
16m, noted pre	ssure change and to	orque drop, in	dicating barrel	had jammed, lo	st ROP, stopped cor	ing, no over-p	ull observed. P	.O.O.H	- /

SDBS REP. G.DURWARD D.WHITBY

COMPANY REP.

RAY KOHUT

Secu	rity DBS)	COF	RING LO	G				
								CORE N.	2
WE	LL INFORMATIO	<u>N</u>						SHEET# DATE:	2 15.10.99
OPERATOR:		CULTUS				HOLE SIZE	i:	8 1/2]
WELL N.:		BALEEN-2		700	1	DOCK TVD)E.	GURNARD	1
CONTRACTO	<u>OR:</u>	SEDCO AUST	RIG:	702]	FORM. DE		SANDSTONE	
HOLE ANGL	<u>E:</u>	0							
E	QUIP. DESCRIP	TION						•	
CORE BARF	REL SIZE:	6 3/4 X 4"	X 18m		SAFETY J. TYP	E :		6"]
INN. STRING		ALUMINIU	М		LOWER SHOE	CATCHER '	TYPE:	SPRING]
CORE HEAD	TYPE:	CD 73]	SIZE;	8 1/2 X 4"]	SER. N.		7970238
PREV. FOOT	TAGE:	16.30		THIS CORE:] ,	TOT CORE		34.3m
CORE HEAD	<u>) N.:</u>	11			RUN START: AT RUN END:		1,2,CT,S,X,I		
CORING B.H	ł.A.	CD 73.CB		(iadc code) B.9 X 6 1/2 D	C, X-OVER,JARS	5,3 X 6 1/2 E		't	
	CKGROUND RE]		· · · · · · · · · · · · · · · · · · ·				
				_				ONOEE DRES	e INCD
1	STRING WTS	1 40	TRQ. OFF	3.	DROP BALL PF	176		ON/OFF PRES	200
	185 190	1 —	1000ft.lbs		Press incr.	180		On Bottom	350
	190		1-2000ft.lbs	i	Mins. to drop	5		Off Bottom	340
MU	D PROPERTIES								
TYPE	VISC	WT	W./Loss	% SAND	% SOLIDS	H2O/OIL	PV	YP	
POLYMER	52	10.1PPG		0.5	7.1	0	22	25]
TIMING Day/Time	ST, IN HOLE	: <u>s</u>	T. CORING		ST. OUT OF H.		BBL AT SUF	RF. BBI	READY TO R.
]							
OVERP	ULL (Last conn	ection is at	P.O.O.H.)						
Conn. (Lbs)	1	2	3	4	5	6	7	8	9
		<u> </u>	J		<u></u>	.1	l		<u> </u>
PE	RFORMANCE								
DEPTH IN	DEPTH OUT	CORED	HOURS	R.O.P.	REC.	% REC			
762.30	780.30	18M	62mins	17.4m/hr	15.85 18m CUT	88%	L		
Efficiency SPARES US	SED/ DAMAGE S		r stopping co		SSEMBLY, 2 X AL	LUMINIUM 1	UBES		
REMARKS:					, R.I.H., tagged and s O.H. on surface laye				rs
					ble sands falling fror				
			· · · · · · · · · · · · · · · · · · ·						

SDBS REP. G.DURWARD D.WHITBY

COMPANY REP.

RAY KOHUT

COMPANY:

34.3m 32.15m 93.70% 124min 16.6m/hr



OVERALL PERFORMANCE

CORING SUMMARY



CULTUS

									WELL	NO. :	Baleen-2	
SERVICE EN	IGINEERS NAME											
G.DURW	ARD				CSG SIZE :		9 5/8		RIG:		SEDCO 702)
D.WHITB	Y											
D				_	SHOE DEPTH	:	645m		HOLE	SIZE:	8 1/2	
DATE ON	•	13.10.99				_	6"		UOLE	ANGLE:		
DATE OF	Ξ.	16.10.99			PUMP/LINERS	5 : T	6		HOLE	ANGLE:	0	y
DATE OF	•	10,10,33		†	MUD TYPE-W	т:	POLYMER		FORM.	ATION:	GURNARD	
UNITS:		8 DAYS		_				-				
RATHOLE		ORIENTED		CORIENTED		LONG' [SOFT		MOTOR		
CORE	COREHEAD		COREBA	RREL		MOTOR	EFFICIEN.	CORE	CORE	REC	HRS	R.O.P
NO.	SER.NO.	TYPE	S'JT	SIZE	I.TUBE		%	СИТ	REC	%		
1	7970238	CD 73	6"	6 3/4X4"X 18m	ALUM		90%	16.3	16.3	100%		15.7m/hr
2	7970238	CD 73	6"	6 3/4X4"X 18m	ALUM		100%	18	15.85	88%	62mins	17.4m/hr
	 		 			ļ			 			
	 	 	 	-		<u> </u>						
			† · · · · ·									
			1									
						ļ	ļ		ļ			
<u> </u>				<u> </u>		<u> </u>	<u> </u>		 		+	
	- 	 	-			ļ			 		-	
			-			 	 		 	 	+	
			+			-	 		<u> </u>			
		_	-	+								
			+			1						
		1										
	1		T									
			1			1				ł		

CORE HEAD PERFORMANCE AND EVALUATION

NO	SERIAL NO.	SIZE	TYPE	SPC	NO OF	FT/MT	HRS	ROP	REC	COREHEAD
					CORES	CUT			%	CONDITION
1	7970238	8 1/2	CD 73		2	34.3	124mins	16.6	93.70%	20%
		1 1					1 1			

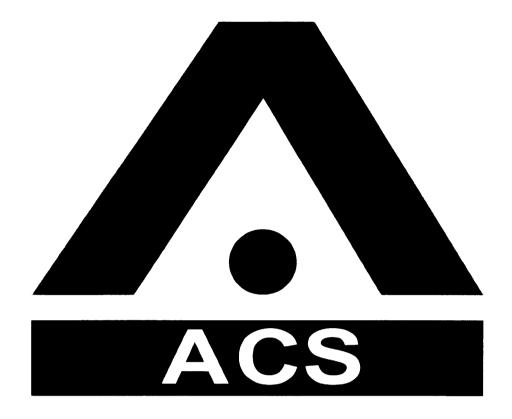


APPENDIX 5

BALEEN-2

5 METRE CORE PHOTOGRAPHS

-ACS LABORATORIES-



LABORATORIES

PTY. LTD.

5m WHITE LIGHT & UV PHOTOGRAPHY

of

BALEEN-2

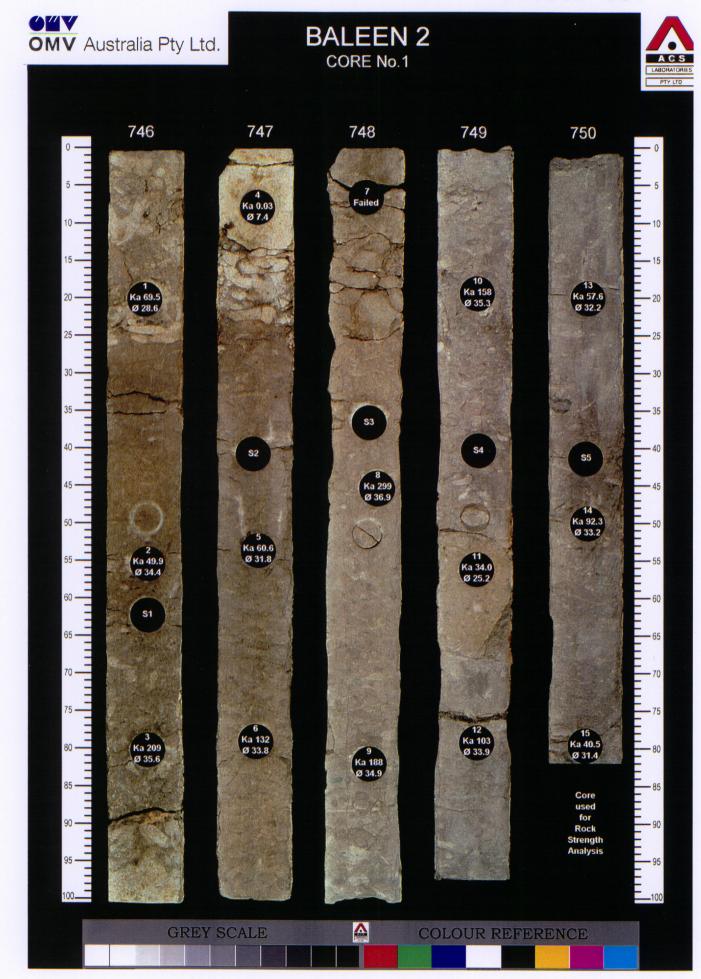
for

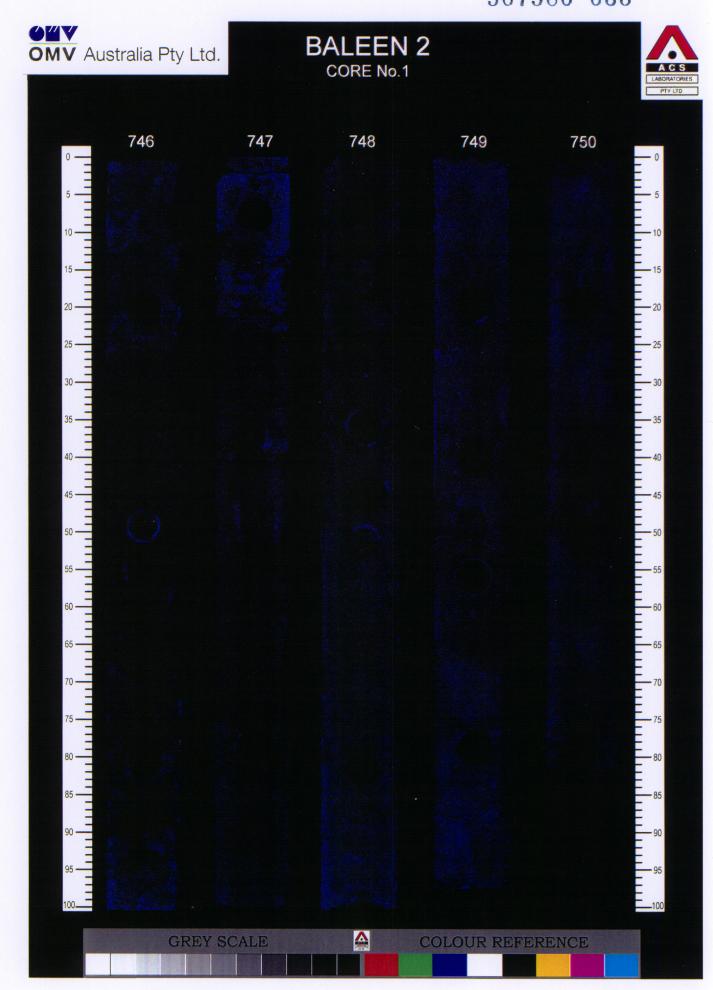
OMV AUSTRALIA PTY LTD

by

ACS LABORATORIES PTY LTD

DOC. No. 30000150

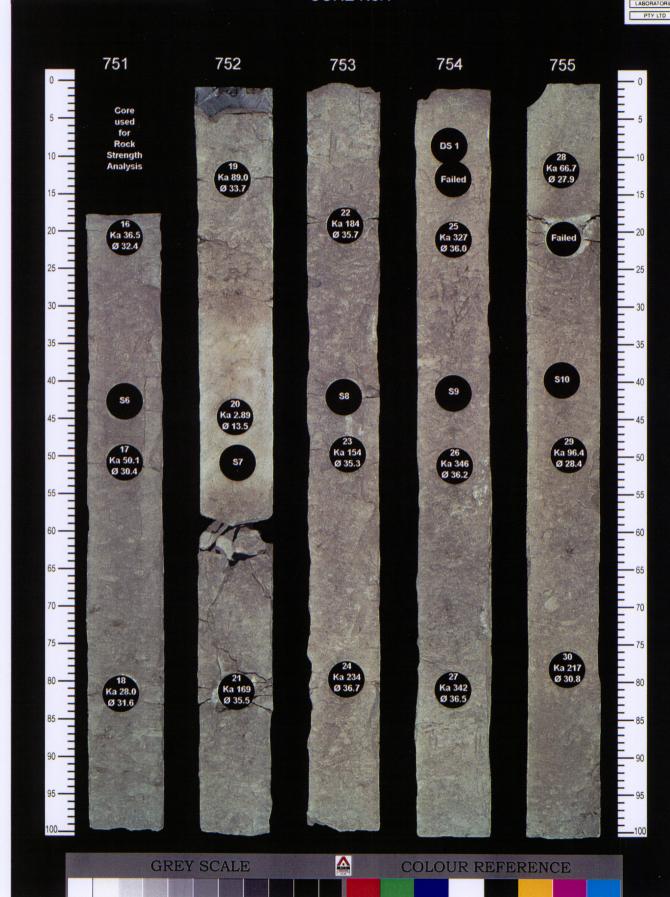


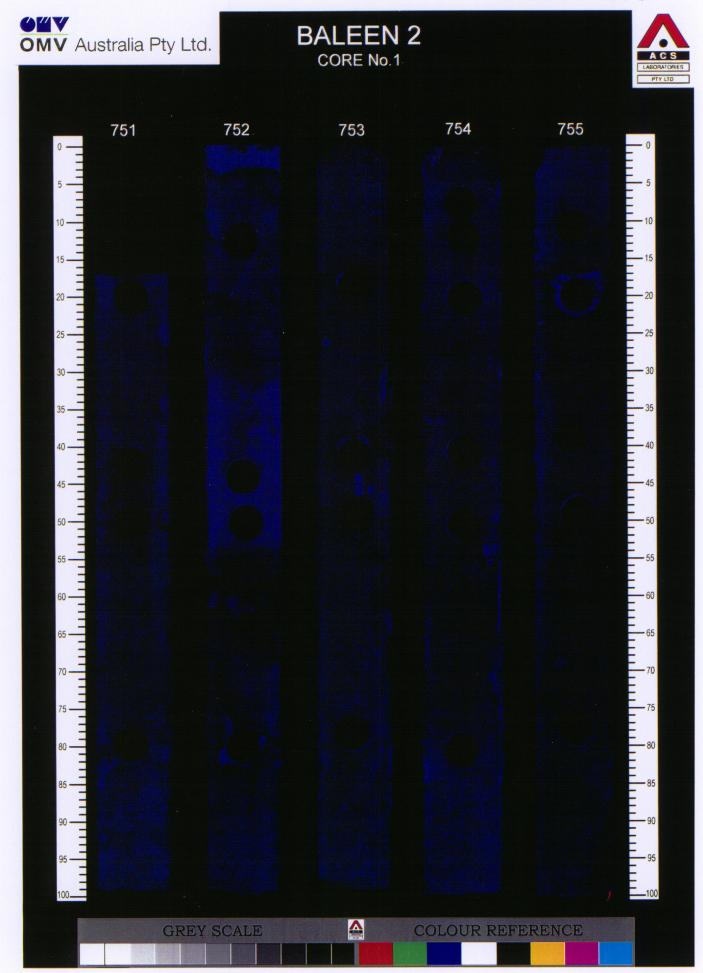


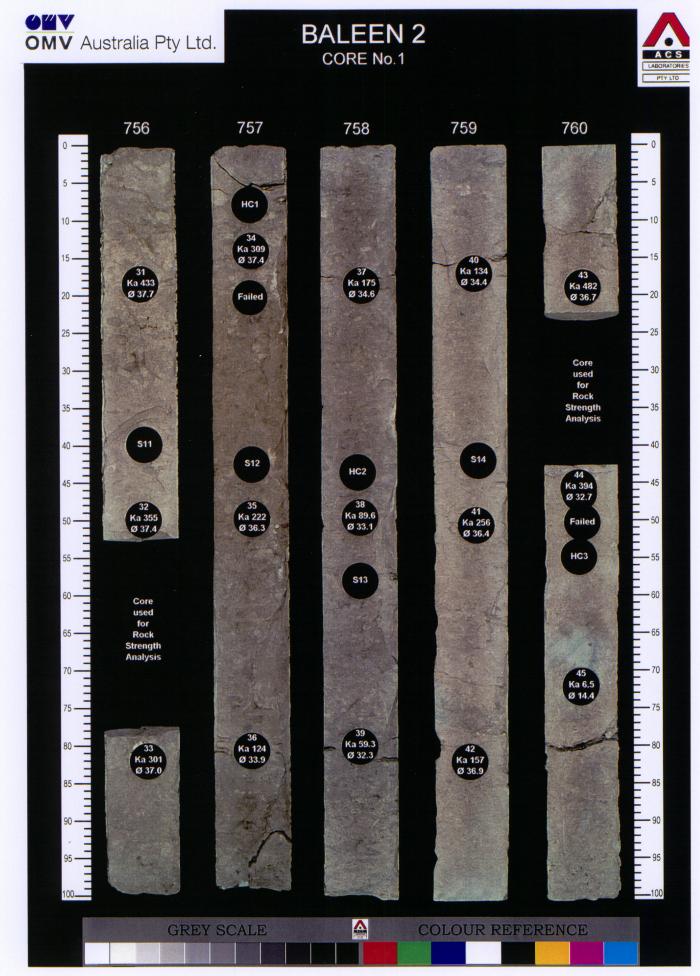
OMV Australia Pty Ltd.

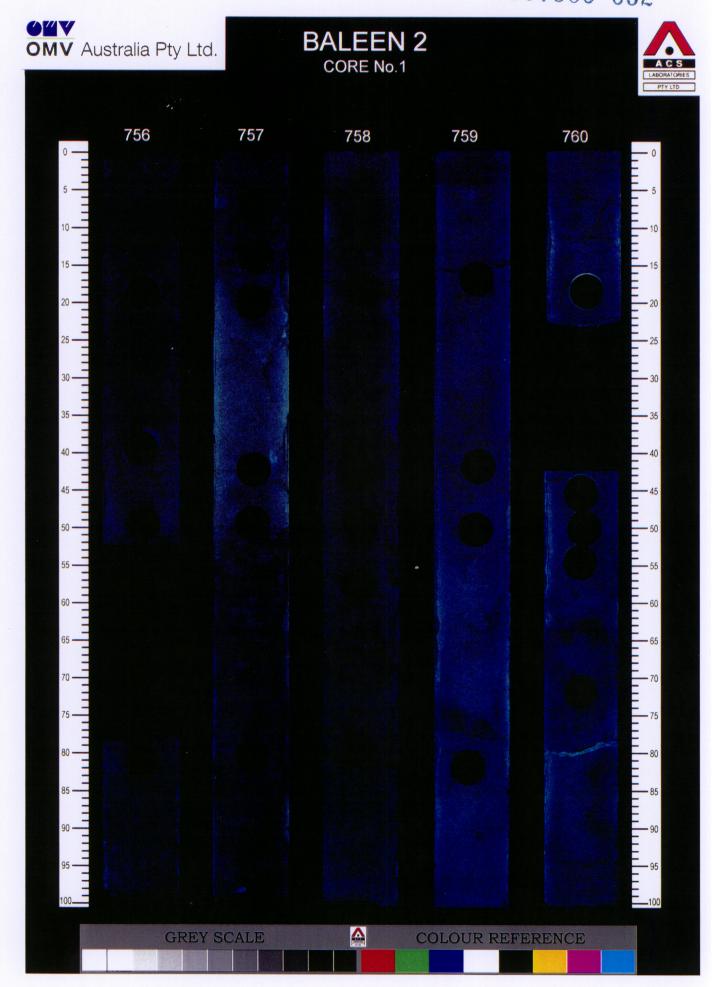
BALEEN 2 CORE No.1

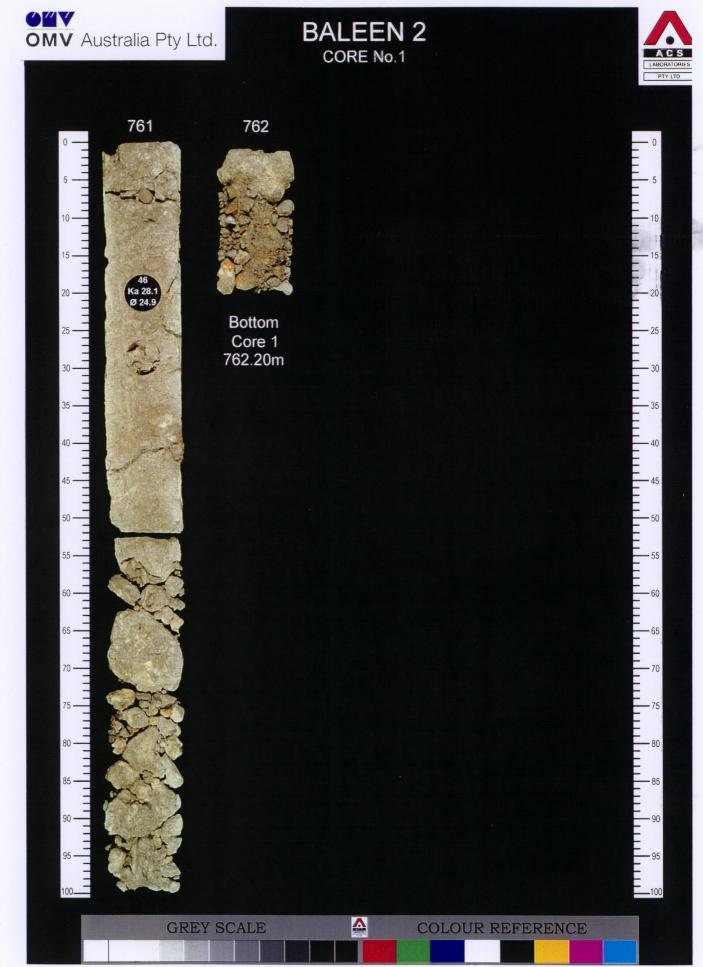


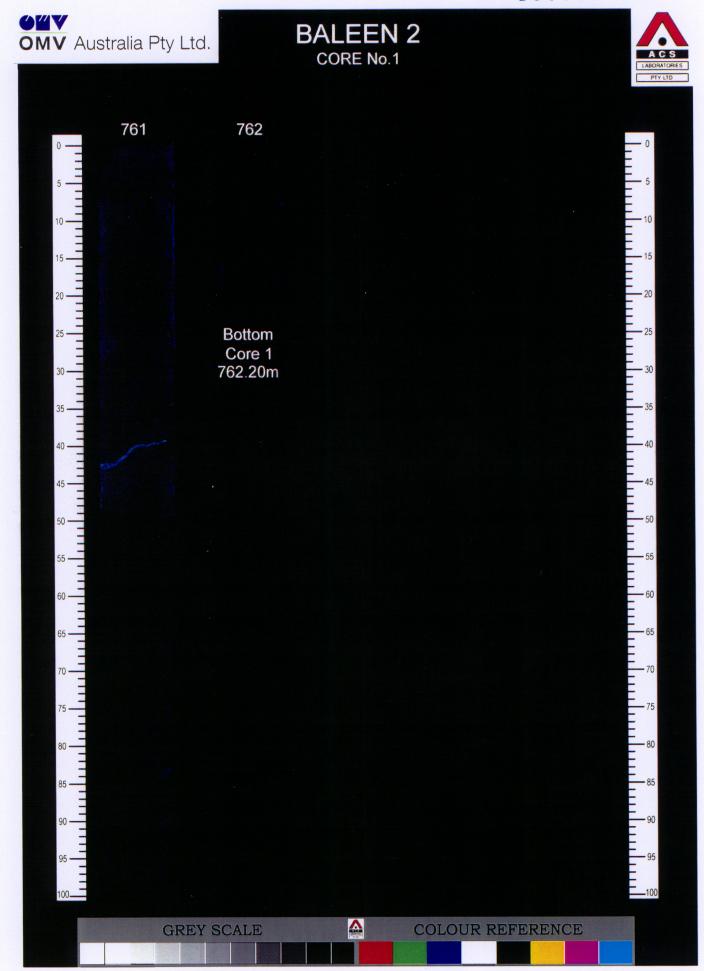




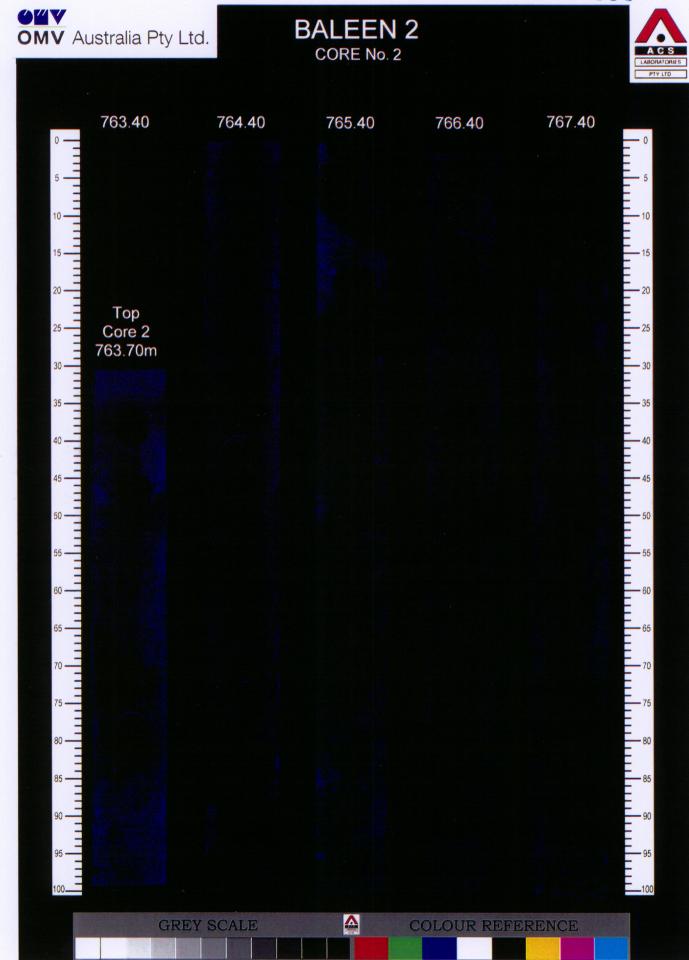








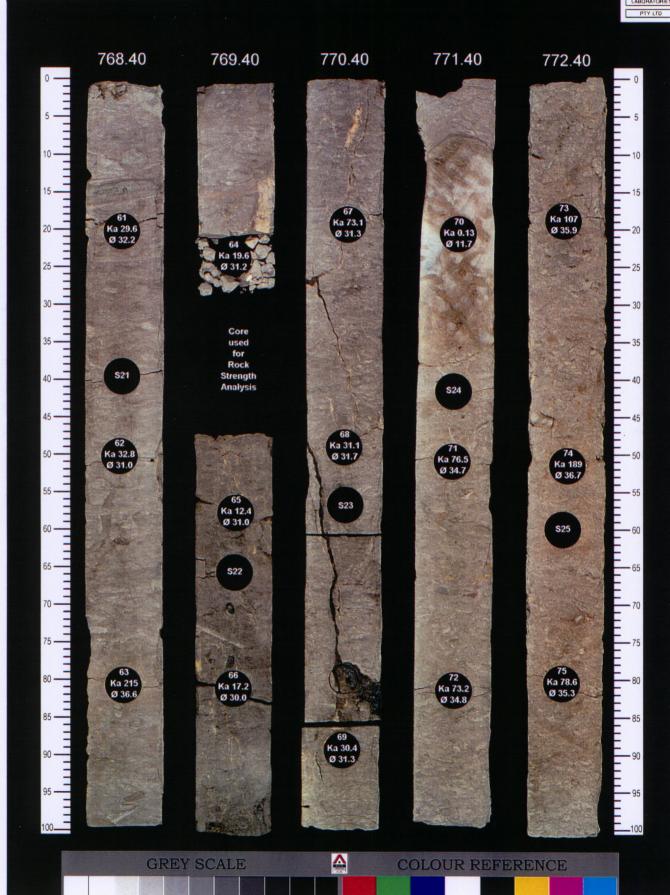


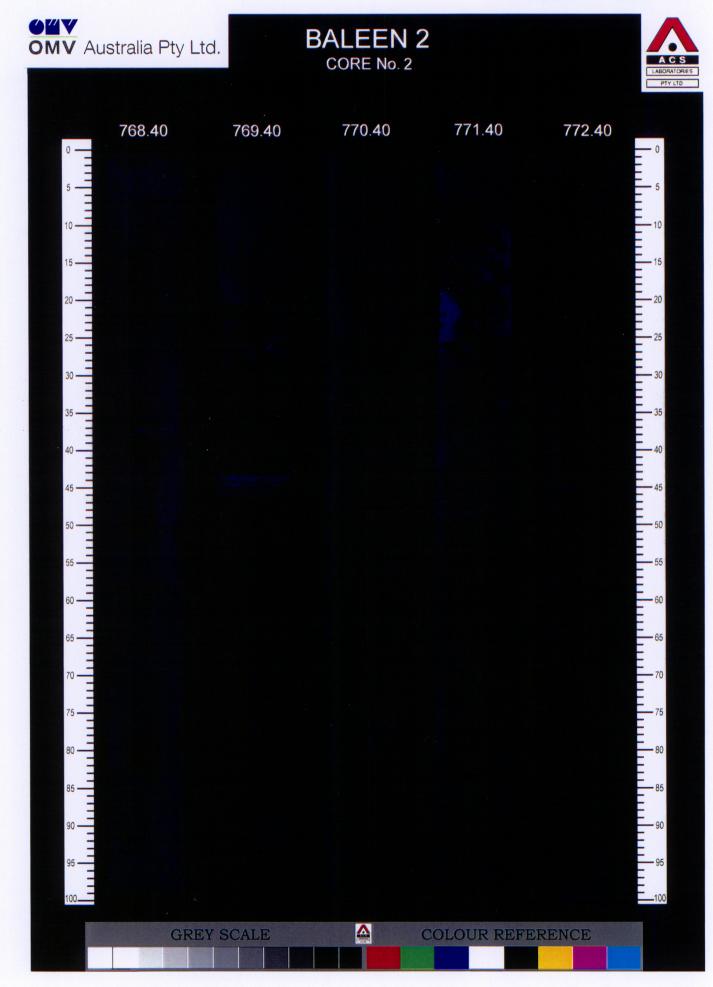


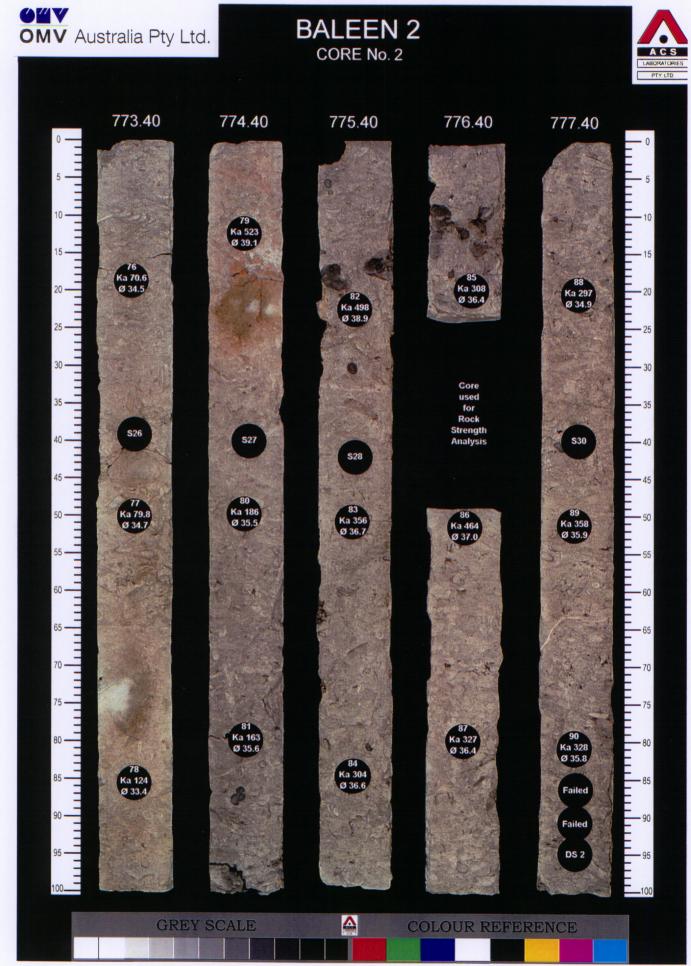


BALEEN 2 CORE No. 2





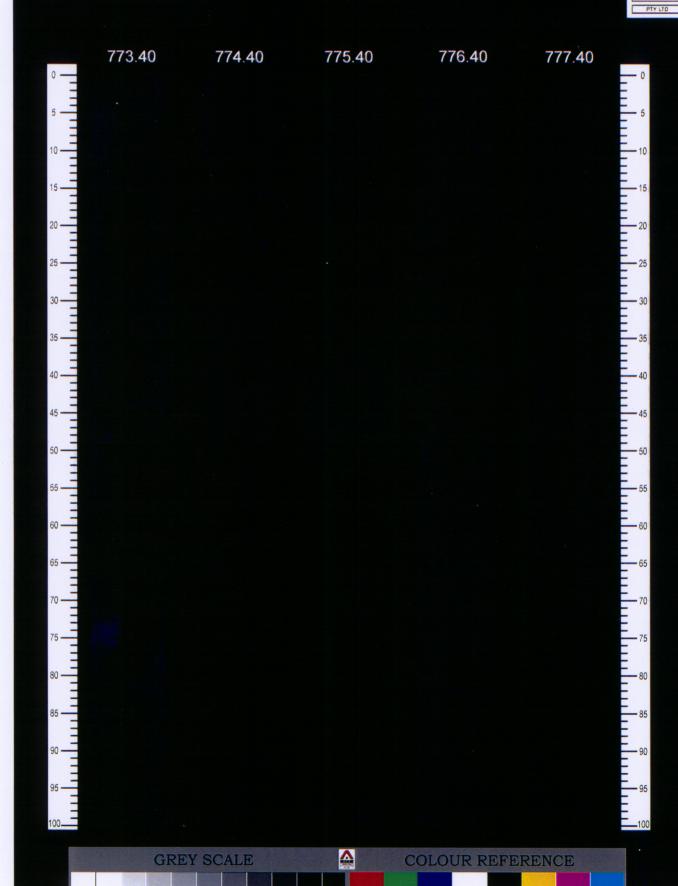






BALEEN 2 CORE No. 2

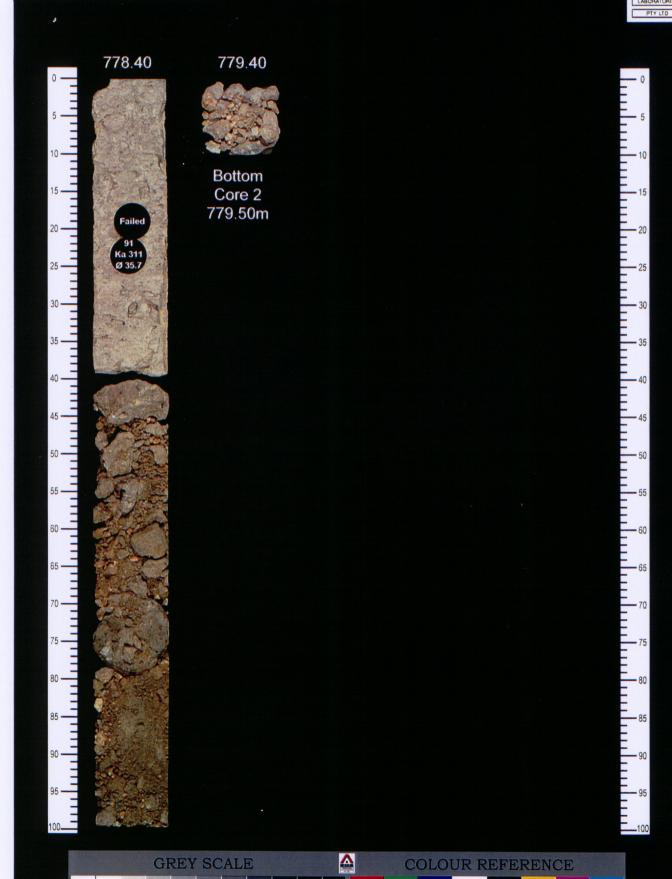


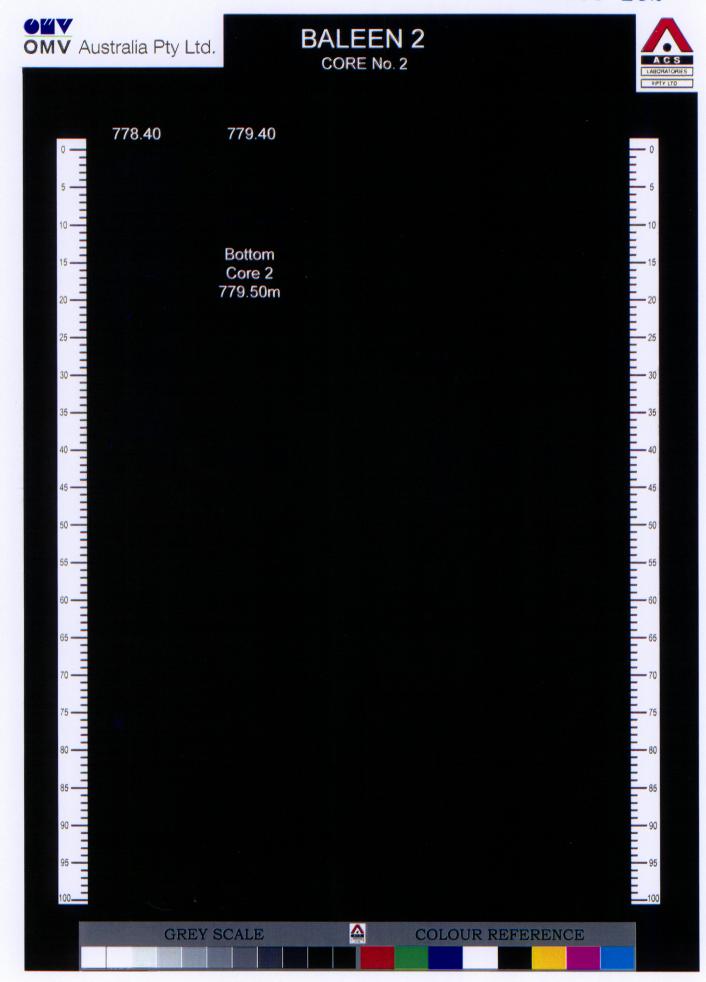




BALEEN 2 CORE No. 2









APPENDIX 6

BALEEN-2

WIRELINE LOGGING REPORT / OPERATION SUMMARY

-CULTUS-



Cultus Petroleum N.L. WIRELINE LOGGING REPORT

GENERAL WELL DATA

Well Name: BALEEN-2 Permit: VIC / RL5

Depth Ref.: RT

LocationLat: 038° 01' 55.758 " South

Long: 148° 24' 37.549" East

Easting X: 623781.41 Northing Y: 5789663.90 Suite:

Date 1st Log: 16 Oct 1999

Depth Ref. Elev 26.00

Service Comp Schlumberger

D.Wong / D.Pastor Engineer(s):

Rig:

SEDCO 702

Date Last Log18 Oct 1999

GL Elev.: -55.0 Siesmic Ref: Line G92A-3017, SP 2

Witnesses: P.Boothby / Phillip

Reichardt

HOLE DATA

Hole Size : Driller's Depth;

Sea Bed Temp:

895.0m 25.00° C

8.50"

Survey Type:

Logger's Depth: 890.5 Max BHT:

50.00

m ° C Max Hole Dev: 0.50

Max Dev Depth: 0.0

Meters

Hole Problems: Hole in good condition

CASING DATA

Casing String	Shoe Depth (mRT)	Shoe Depth (mTVDRT)	Casing OD (")	Casing ID (")	Weight (lbs/ft)	Hole Size (")
30 X 20"	126.0	126.0	0.000	N/A	N/A	36.00
9-5/8"	646.0	646.0	9.630	N/A	47.00	12.25

WATER BASED MUD DATA

Date Muc Check		Date Time Circ Stopped (date/time)			MW (sg)		(%)	mg/l		Barite (%)	Rmf Deg C	Rm Deg C	Rmc Deg C
16 Oct 99	Flowline	16 Oct 99 13:55	0.58	NaCL/PHPA/Polymer	1.21	9.0	0.0	46500	3.0	3.7	[0.1150@21.60°C	0.1340 @ 21.40° C	0.2130 (0) 21.70 C

OIL BASED MUD DATA

Date Mud Check	Sample Taken From	Date Time Circ Stopped	Circ Time (Mins)	Mud Type	MW (sg)	MW Hot (sg)	Water Phase CaCl2	Water Phase Salinity	 Funnel Viscosity	Fluid Loss (ml)	Electrical Stability (mV)	Ester Water Ratio

WIRELINE RUN SUMMARY DATA

Date of Mud Check: 10/16/99 Date / Time Circ. Stopped: 16 Oct 1999 13:55 Circ. Time (Hrs): 0.58

Run Number	Run Date	Tool String	Max BHT ℃	Max BHT Depth	Date Time Logger on Bottom	Time Since Circ. Stopped (hrs)
1	16 Oct 1999	PEX/HALS/DSI/NGS	46.67	860.5	16 Oct 99 19:16	5.35
2	16 Oct 1999	FMI/GR	48.00	878.5	16 Oct 99 22:27	8.53
3	17 Oct 1999	MDT/GR	52.00	797.0	17 Oct 99 08:20	18.42
4	17 Oct 1999	VSP (CSAT)	50.00	877.0	17 Oct 99 11:56	22.02
5	17 Oct 1999	MDT/GR	50.00	727.0	17 Oct 99 17:44	27.82

RUN SUMMARY DATA

Run #	Tool String	Log From Depth	To	From	To	Comments
		T				



1	PEX/HALS/DSI/NGS	889	90	820	809	Logged GR from 640 to 90. Full PEX-DSI high resolution data recorded at 1800ft/hr up to 640m. High resolution PEX data and NGT recorded upto 640m.
2	FMI/GR	887	647	810	716	Logged open hole interval.
3	MDT/GR	748	823			Took a total of 29 pretests, 25 normal, 3 lost seals, 1 dry test. 12 sample points were attempted - 11 attempts were aborted due to lost seals whilst using pump out module. 1 one gallon sample of water from the Latrobe Sandstones was taken. Water sample tested at surface whilst decantingfrom chamber contained 32 ppm H2S when tested with Draeger tube.
4	VSP (CSAT)	885	100			Shot 3 checkshot levels running in at 300m, 663m and 795 as repeat levels. Shot 42 levels from 885 to 100m. Airgun depth was 6m relative to MSL. Two Hydrophones positioned 3m below the guns. 32 VSP levels shot in open hole, 10 VSP levels shot in cased hole.
5	MDT/GR	749	757			Tool configured with POS and standard area probe. Attempted Pretest at 749m - supercharged. Moved to 757.2m and attempted sample. Pump unable to draw down formation -suspected pump failure or probe plugging. Pulled out of hole to trouble shoot tools. Pump displacement unit blocked with sand. Redressed pump and changed out probe to Martineau probe and picked up 6 gallon dump chamber and ran into hole. Attempted Sample at 757.0 with pump - no draw down on formation. Open 6 gallon dump and immediately lost seal. Pulled out of hole and rigged down. Probe and flow line were later found to completly plugged with fine sand mud cake and mud.



Cultus Petroleum N.L.

WIRELINE LOGGING Operations Diary / Time Summary

WELL NAME: BALEEN-2

FIELD:

PATRICIA BALEEN GAS FIELD

PERMIT:

VIC / RL5

LOCATION

Latitude: 038° 01' 55.758 " South 148° 24' 37.549" East

Longitude: Easting (m): 623781.41

lorthing (m): 5789663.90

SUITE:

SERVICE COMPANY: Schlumberger

ENGINEERS:

D.Wong / D.Pastor

WITNESSES:

P.Boothby / Phillip Reichardt

DATE FIRST LOG:

16 Oct 1999

DATE LAST LOG:

18 Oct 1999

Date	Time From	Time To	Elapsed Time	Cumm. Time	Logging Code	Event Description
Run Numb	er: 1	PEX/HA	ALS/DSI/	NGS		
6 Oct 1999	17:10	17:17	0.12	0.12	Logging	Hold JSA on Rig floor.
	17:17	18:10	0.88	1.00	Logging	Rig up sheaves and run 1 PEX-DSI tool
	18:10	18:15	0.08	1.08	Logging	Install radioactive sources
	18:15	18:23	0.13	1.21	Logging	Commence running into hole.
	18:23	18:27	0.07	1.28	Logaina	Commence logging down from 640 m at 1000 ft/hr
	18:27	18:42	0.25	1.53	Logaina	Initialisation to logging hung up - restarted logging down from 667 m. Initialised OK increased speed to 2000 ft/hr. down to 796 m
	18:42	18:50	0.13	1.66	Logaina	Log up repeat section over reservoir interval from 796 to 745 m at 1000 ft/hr.
	18:50	18:54	0.07	1.73	Logging	Run back in hole to 820 - did not allow for tool length of 30m for logging repeat section over the reservoir interval.
	18:54	19:04	0.17	1.90	Logging	Log up repeat section from 820 m at 1800 ft/hr to 721m. 0.2m differnece from the down log. Hence Add 0.2m (Subract 1.0 m for tide).
	19:04	19:16	0.20	2.10	Logging	Run into hole from 714 to TD at 895m
	19:16	19:44	0.47	2.57	Logging	Commence logging main pass from 890.5m TI to 628m. Shoe at 647m
	19:44	19:49	0.08	2.65	Logaina	Stop and log GR only to seabed.
	19:49	19:53	0.07	2.72	Logging	Commence logging up GR only through casing from 641m to 604 at 4000 ft/hr.
	19:53	19:57	0.07	2.79	Logging	Stop logging and run back into 675 to ensure overlap of GR curves.
	19:57	20:27	0.50	3.29	Logging	Log up GR from 675 to 90m at 4500 ft/hr
	20:27	20:30	0.05	3.34	Logging	Decompensate at 90m.
	20:30	20:35	0.08	3.42	Logging	Pull out of hole to surface.
	20:35	21:10	0.58	4.00	Logging	Rig down tools
						Cumulative Run Time (Hrs): 4.0
Run Num	ber: 2	FMI/GI	3		Т	T
16 Oct 1999	21:10	21:40	0.50	0.50	Logging	Pick up FMI/GR tool
	21:40	21:48	0.13	0.63	Logging	Surface checks.



	Time	Time	Elapsed	Cumm.	Logging Code	Event Description
Date 1000	From 21:48	To 22:07	7ime 0.32	Time 0.95	Logging	Commence running into hole.
16 Oct 1999	21.46	22:21	0.32	1.18	Logging	Log repeat section from 715.7 and run back to TD.
	22:24	22:27	0.10	1.28	Logging	Run in hole to TD
	22:21	23:00	0.10	1.83	Logging	Log up main pass from 890.5 to 647 m.
	23:00	23:20	0.33	2.16	Logging	Pull out of hole to surface decompensate at 90m.
	23:20	23:55	0.58	2.74	Logging	Rigged down FMI/GR
	25.20	25.55	0.00		Logania	Cumulative Run Time (Hrs): 6.74
Run Numb	ner· 3	MDT/G	R			
16 Oct 1999	23:55	00:50	0.92	0.92	Logging	Rig up MDT. Configured with Martineau Probe, 3 X 1 gallon Chambers, 3 X MRSC 450 cc bottles, 3 X SPMC 250cc bottles, OFA and pump out module.
47.0 -4.4000	00:50	00:55	0.08	1.00	Logging	Run into hole to 90m. compensate.
17 Oct 1999	00:55	01:00	0.08	1.08	Logging	Set compensators
	00:55	01:20	0.33	1.41	Logging	Run into hole to 825m.
	01:20	01:35	0.35	1.66	Logging	Commence correlation pass from 825m to 767 - subtract 0.7m.
	01:35	08:20	6.75	8.41	Logaina	Commence taking pretests at 748 to 823 mMDRT. Took a total of 29 pretests, 25 normal, 3 lost seals, 1 dry test. 12 sample points were attempted - 11 attempts were aborted due to lost seals whilst using pump out module. A 1 Gal Sample taken at 797m.
	08:20	08:34	0.23	8.64	Logaina	Perform correlation pass from
	08:34	08:36	0.04	8.68	Logging	Move back to 753.5 to re-attempt sample.
	08:36	09:02	0.43	9.11	Logging	Take pretest attempt sample at 753.5 and at 749.3. Pumpout failed at 749.3 m unable to drawdown on formation. POOH.
	09:02	10:05	1.05	10.16	Logging	Pull out of hole.
	09:55	10:20	0.42	10.58	Logaina	Rig down MDT tools.
	<u> </u>	<u> </u>				Cumulative Run Time (Hrs): 17.32
Run Num	ber: 4	VSP (C	SAT)			
17 Oct 1999	10:20	10:42	0.37	0.37	Logging	Make up tools
17 Oct 1999	10:42	10:59	0.29	0.66	Logging	Run in hole to 300m for first checkshot.
	10:59	11:08	0.25	0.81	Logging	Check shot at 300m.
	11:08	11:17	i	0.96	Logging	Run in hole to 755 for correlation pass.
	11:17	11:26		1.11	Logging	Run correlation pass from 775 to 728 - adjust -1.1m. and rerun correllation from 755m. Correct -0.1m
	11:26	11:28	0.03	1.14	Logging	Run into hole to 663 from
	11:28	11:35	ļ	1.26	Logging	Check shot at 663m running in.
	11:35	11:41	0.12	1.36	Logging	Run in hole to 795m.
	11:41	11:48	1	1.48	Logging	Check shot at 795m running into hole.
	11:48	11:55		1.60	Logging	Run inhole to TD.
	11.40	100	<u> </u>			Page 2 of



	Time	Time	Elapsed	Cumm.	Logging Code	Event Description
Date	From	To	Time	Time 6.72	Logging	Commence VSP Survey at 885m to 100m.
17 Oct 1999	11:55	17:02	5.12	1		Decompensate at 100m.
	17:02	17:04	0.03	6.75	Logging	Pull out of hole to surface.
	17:04	17:08	0.07	6.82	Logaina	
	17:08	17:35	0.45	7.27	Logging	Rig Down CSAT. Cumulative Run Time (Hrs): 24.59
						Cumulative Run Time (HTS). 24.59
Run Numb	er: 5	MDT/G	R			
17 Oct 1999	17:35	18:24	0.82	0.82	Logging	Rig up MDT tool with standard area probe, 2 iGal chambers, 3 X MRSC 450cc, 3 SPMC 250 bottles, OFA and pump out.
	18:24	18:28	0.07	0.89	Logging	Run into hole to 100m and compensate.
	18:28	18:32	0.07	0.96	Logging	Set Compensators at 100m.
	18:32	18:49	0.28	1.24	Logging	Run into hole
	18:49	18:49	0.01	1.25	Logging	Correlation pass from 800 to 729m
	18:49	19:07	0.29	1.54	Logging	Get on depth at 749.0m for First Sample.
	19:07	19:44	0.62	2.16	Logging	Commence pretest at 749.0m. Supercharged. Move to 757.2 and attempt sample. Pump out module not functioning. Unable to draw down formation. Pump malfunction or probe/flow line plugged?
	19:44	20:05	0.35	2.51	Logging	Pull out of hole to inspect tool.
	20:05	21:10	1.08	3.59	Logging	Trouble shoot POS whilst tool in derrick. POS failed surface checks. Inspection found displacement unit to be blocked with sand. Redressed POS. Unable to adequetly test flowine from probe to POS for blockages due to low rig air pressure.
	21:10	23:00	1.83	5.42	Logging	Decision taken to pick up 6 gallon chamber and re-attempt sampling of Gurnard sands. Pump out module to be layed out and chambers reconfigured.
	23:00	23:20	0.33	5.75	Loaaina	Run in hole with MDT - Martinaeu Probe, 6 Gal Chamber, 2 X 1 gallon chamber, 3 x SPMC, 3 X MPSR. POS and OFA.
	23:20	23:35	0.25	6.00	Logaina	Commence correlation pass from 800m to 731m make -7m correction. Run bacin hole to 780 and relog correlation pass. On depth. Move to sample point at 757m.
	23:35	23:46	0.20	6.20	Logaina	Attempt to sample at 757m Pump out module failed - unable to draw down formation. Opened 6 gal chamber. lost seal - formation collapsing around the seal.
	23:46	00:10	0.38	6.58	Logging	Pull out of hole and rig down.
18 Oct 1999	00:10	01:00		7.41	Loagina	Rigged Down MDT. Probe found to be totally plugged and the screen had collapsed. Flow line was alos totally plugged.
	01:00	02:50	1.83	9.24	Lost Time	Wait on confirmation to rig down Schlumberger
	02:50	03:15	0.42	9.66	Logaina	Complete rigging down remainder of MDT components.

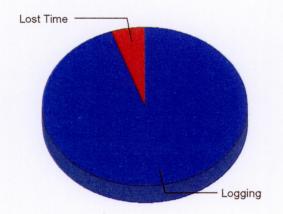


Date	Time From	Time To	Elapsed Time	Cumm. Time	Logging Code	Event Description	
Oct 1999	03:15	03:30	0.25	9.91	Logging	Rig down Sheaves. End Of Job.	
						Cumulative Run Time (Hrs):	34.50
-							

Wireline Logging Time Summary

	Logging	Lost Time	Total
FMI/GR	2.74	0.00	2.74
MDT/GR	18.66	1.83	20.49
PEXIHALS/DSI/NGS	4.00	0.00	4.00
VSP (CSAT)	7.27	0.00	7.27
Total	32.67	1.83	34.50

Units in decimal hours





Wireline Logging Detailed Time Breakdown

Γ	1	2	3	4	5	Total
Correlation Pass	0.00	0.00	0.48	0.15	0.26	0.89
Decompensat e	0.05	0.00	0.00	0.03	0.00	0.08
Hold JSA	0.12	0.00	0.00	0.00	0.00	0.12
Log Down	0.32	0.00	0.00	0.00	0.00	0.32
Log Main Pass	1.04	0.55	7.22	5.12	0.82	14.75
Log Repeat Section	0.30	0.23	0.00	0.00	0.00	0.53
Lost Time due to Other	0.00	0.00	0.00	0.00	1.83	1.83
Make Up Tools	0.00	0.50	0.92	0.37	0.82	2.61
РООН	0.08	0.33	1.05	0.07	0.73	2.26
Pre Log Tool Checks	0.08	0.13	0.00	0.00	0.00	0.21
Rig Down Sheaves	0.00	0.00	0.00	0.00	0.25	0.25
Rig Down Tools	0.58	0.58	0.42	0.45	1.25	3.28
Rig up Sheave	0.88	0.00	0.00	0.00	0.00	0.88
RÍH	0.47	0.42	0.41	0.69	0.97	2.96
Set Compensator	0.00	0.00	0.08	0.00	0.07	0.15
Verify Tools	0.08	0.00	0.00	0.39	2.91	3.38
Total	4.00	2.74	10.58	7.27	9.91	34.50

Units in decimal hours

7



VIC / RL5 Baleen-2

Well Completion Report - Basic Geotechnical Data

APPENDIX 7

BALEEN-2

MDT SUMMARY REPORT

-CULTUS-

Sultus Petroleum N.L.

Wireline Pressure Data Report

CENEDA! WE!! DATA	I DATA	ATAC SINIS DATA	
מבווער אר	בר מאוא	בממוואם האו	
WELL NAME:	BALEEN-2	WIRELINE SERVICE CO.: Schlumberger	Schlumberger
FIELD:	PATRICIA BALEEN GAS FIE	SUITE NUMBER:	_
BASIN:	OFFSHORE GIPPSLAND BASIN	RUN NUMBER:	3
PERMIT:	VIC / RL5	RUN DATE:	17 Oct 1999
LATITUDE:	038° 01' 55.758 " South	ENGINEERS:	D.Wong / D.Pastor
LONGITUDE :	148° 24' 37.549" East	WITNESSES:	P.Boothby / Phillip Reichardt
EASTING:	623781.41	HOLE SIZE ("):	8.50
NORTHING:	5789663.90	SECTION TD (Lgr meters): 890.5	: 890.5
PRIMARY OBJECTI	PRIMARY OBJECTIVE: Gurnard Formation	TOOL TYPE:	MDT-GR
RIG RTE (m):	26.0	PROBE TYPE:	Martineau Probe
WATER DEPTH (m):	: 55.0	PROBE DIAMETER (mm):	0.0
SPUD DATE:	11 Oct 1999	QUARTZ GUAGE TYPE:	CQG-G
DATE COMPLETED:		TOOL CONFIGURATION:	TOOL CONFIGURATION: 3 X 1 Gal, 3 X 450cc MRSC's, 3 X 250cc
			SPMC's, OFA / POS
Pretest Mini P	Pretest Pretest Hydro. Draw Initial	Final Gauge Hydro After	Gauge Hydro, After Mobility Sample Comments

Pretest Number	Mini Pretest Number	Pretest Depth MD	Pretest Depth TVDSS	Hydro. before psia	Draw Down Volcc	Initial Pressure psia	Final Pressure psia	Gauge Temp. ° C	Hydro. After Mobility psia		Sample Taken	Comments
-	а	748.0	722.0	1,333.5	20	564.0	1,075.1	46.20	1,333.0	3.1	^o N	Slow build up ??
2	r	749.3	723.3	1,335.5	50		1,071.0	46.74	1,335.2	4.2	°Z	Seems Low?
က	ര	750.5	724.5	1,337.5	9.7		1,081.0	46.93	1,337.4	1.6	°Z	Abort Tight.
4	Ø	750.7	724.7	1,337.9	8.8						8 Z	Abort Tight test
2	Ø	751.5	725.5	1,339.4	6.8		1,085.5	47.18	1,338.9	0.8	å	Abort - Tight test.
9	Ø	753.5	727.5	1,342.7	19.9		1,071.3	47.46	1,342.8	3.8	°Z	Good Test.
7	Ø	754.7	728.7	1,344.9	19.9		1,070.9	47.75	1,344.8	5.6	°Z	Good Test.
8	Ø	7.54.7	728.7	1,344.8	19.9						8 N	Lost seal whilst pumping.
6	Ø	757.0	731.0	1,348.8	20		1,071.9	48.18	1,348.8	10.7	Š	Good Pretest. Lost seal after
												starting pump out.
9	Ø	757.0	731.0	1,348.8	20						Š	Seal failed whilst pumping. Formation collapsing?
-	Ø	757.0	731.0	1,348.7	20			48.25	1,348.7		8 N	Seal Failed during pretest.
12	Ø	757.5	731.5	1,349.7	20		1,075.2	48.47	1,349.5		ž	Aborted Test -
												supercharging.
13	Ø	757.3	731.3	1,349.7	20		1,073.5	48.50	1,349.2		o N	Aborted test - supercharging.



FEN-2	
ΑĮ	
83	

Pretest Number	Mini Pretest Number	Pretest Depth MD	Pretest Depth TVDSS	Hydro. before psia	Draw Down Volcc	Initial Pressure psia	Final Pressure psia	Gauge Temp. ° C	Hydro. After psia	Mobility	Sample Taken	Comments
14	В	758.5	732.5	1,351.4	20		1,076.7	48.54	1,351.2		2	Aborted test - supercharging.
15	Ø	768.0	742.0	1,368.1	20		842.0	48.63	1,367.8		Š	Aborted test - tight.
16	ď	771.5	745.5	1,374.3	20		1,086.1	48.95	1,374.2	3.3	^o Z	Good Test
17	Ø	774.5	748.5	1,379.4	20		1,086.6	49.14	1,379.5	10.6	^o Z	Good test
18	Ø	778.5	752.5	1,386.5	50		1,091.6	49.34	1,386.4	44.9	o Z	High perm. Attempt sample - lost seal.
19	യ	779.5	753.5	1,388.2	20		1,093.3	49.58	1,388.1	14.3	<u>8</u>	High Perm. Attempt sample - lost seal.
20	Ø	783.5	757.5	1,395.3	20		1,099.4	49.75	1,395.2	13.1	o Z	High Perm. Attempt sample - Lost seal.
21	В	785.0	759.0	1,398.0	20		1,102.4	49.94	1,397.4	4.9	S S	Low to moderate perm. Attempt Sample - Lost seal.
22	ಹ	795.0	769.0	1,415.4	20		1,110.3	49.98	1,415.4	3,399.6	8 N	V. High perm.
23	Ø	797.0	771.0	1,419.0	20		1,113.2	50.14	1,418.4	79.1	Yes	High Perm. Sample # 1 to chamber 19 (1 gallon)
24	ಹ	802.5	776.5	1,427.4	20		1,120.9	51.50		2,668.4	^o Z	Good Test
25	ત્	805.0	779.0	1,432.1	20		1,124.6	51.50	1,432.2	740.0	8 N	Good Test
56	Ø	817.0	791.0	1,453.1	20		1,141.5	51.50	1,453.2	91.4	2 N	Good Test
27	Ø	823.0	797.0	1,463.7	20		1,150.0	51.60	1,463.8	2,596.0	8 Z	Good test.
28	Ø	753.5	727.5	1,341.3	20		1,070.4	50.50	1,341.2		^o Z	Pretest not stable - attempt to sample. Lost seal.
59	Ø	749.3	723.3	1,333.8	18.9						2 Z	Attempt to sample - pumpout failed. POOH

Cultus Petroleum N.L.

Wireline Pressure Data Report

GENERAL	GENERAL WELL DATA	A			-	7	LOGGING DATA			
WELL NAME: FIELD: BASIN: PERMIT: LATITUDE: LONGITUDE: EASTING: NORTHING: NORTHING: WATER DEPTH (m): SPUD DATE: DATE COMPLETED:		BALEEN-2 PATRICIA BALEEN GAS FIEI OFFSHORE GIPPSLAND BASIN VIC / RL5 038° 01' 55.758 " South 148° 24' 37.549" East 623781.41 5789663.90 Gurnard Formation 26.0 55.0	EEN GAS F PPSLAND 3 " South 9" East tion	BASIN		WIRELINE SERVICE CO. SUITE NUMBER: RUN NUMBER: RUN DATE: ENGINEERS: WITNESSES: HOLE SIZE ("): SECTION TD (Lgr meters) TOOL TYPE: PROBE TYPE: PROBE DIAMETER (mm) QUARTZ GUAGE TYPE: TOOL CONFIGURATION	WIRELINE SERVICE CO.: Schlumberger SUITE NUMBER: 1 RUN NUMBER: 5 RUN DATE: 17 Oct 1999 ENGINEERS: D.Wong / D.P. WITNESSES: P.Boothby / PI WITNESSES: 8.50 HOLE SIZE (""): 8.50 SECTION TD (Lgr meters): 890.5 TOOL TYPE: Std Area PROBE TYPE: Std Area PROBE DIAMETER (mm): 0.0 QUARTZ GUAGE TYPE: CQG-G TOOL CONFIGURATION: 2 X 1 Gal / 3; SPMC's/ OFA SPMC's/ OFA	Schlumberger 1 5 17 Oct 1999 D.Wong / D.Pastor P.Boothby / Phillip Reichardt 8.50 890.5 MDT/GR Std Area 0.0 CQG-G 2 X 1 Gal / 3 X 450cc MRSC SPMC's/ OFA / POS	Schlumberger 1 5 17 Oct 1999 D.Wong / D.Pastor P.Boothby / Phillip Reichardt 8.50 890.5 MDT/GR Std Area 0.0 CQG-G 2 X 1 Gal / 3 X 450cc MRSC's / 3 X 250cc SPMC's/ OFA / POS	
B	749.0	723.0	1,332.1	20	1,080.4	0.4 47.10		<u>2</u>	Aborted test. Supercharged.	
Ø	757.2	731.2	1,346.3	20	1,064.7	1.7 47.70		Ž	Abort test - Attempted	
	757.0	731.0	1,345.7	18.6				2 	sample. Pumpout not functioning. Attempt to Sample using	
					-			-	Pump out - No go. Opened 6 gal Chamber. Lost seal.	



APPENDIX 8

BALEEN-2

MUD LOGGER DAILY REPORTS

-GEOSERVICES-

307960 120



Cultus Petroleum N.L. Morning Report

Well: Baleen 2	Date: 11-10-1999	Drilling Day: 1
24 ^h 00 Depth 137 m TVD	Metres Last 24 hrs: 56 m	Prepared by M. SMITH
Present Operation: Drilling 12 1/4" hole	e to casing point.	

BIT DATA

				
Bit#	3	Size: 12.25	Type: HYCALOG DS	640H
Depth In:	126.0m	Jets: 5 x 18	TFA: in ²	Condition
Depth Out:		Bit Run 11 m	Bit hrs: 0.1	Lag Time: 4 min
Pump Press	1475 psi	Flow: 1055 gpm R	pm/Krev 62/1	Torq: 500-700 ftlbs

ROP	M/HR	DEPTH
MINIMUM	6.67	134
MAXIMUM	45.45	133
AVERAGE	22	

-	INTERVAL	LITHOLOGY
Ĺ	HALLICALIE	
)		

GAS DATA [Total Gas in units, Chromatograph in ppm, 50 units = 10,000 ppm.]

DRILLED BACKGROUND GAS

Depth	Depth to	TG units	C1 ppm	C2	СЗ	iC4	nC4	iC5	nC5
	,								

DRILLED GAS PEAKS

Depth	Туре	TG units	C1 ppm	C2	C3	iC4	nC4	iC5	nC5

06 ^h 00 Depth 35	6 m TVD	
Present Operation	: Drilling 12 1/4" h	ole to casing point.

Comments: Realigned RPM sensor. Calibrated Total Gas. Began calibration of Low Scale Chromatograph. Degasser and gas line fine.



Well: Baleen 2	Date: 12-10-1999	Drilling Day: 2
24 ^h 00 Depth 650.0m 650m TVD	Metres Last 24 hrs: 513 m Prepare	ed by M. Smith
Present Operation: Run 9 ⁵ / ₈ " Casing.		

BIT DATA

Bit #:	3	Size: 121/4	Type:	HYCALOG DS	340H
Depth In:	126.0 m	Jets: 5 x 18	TFA:	in ²	Condition
Depth Out:	650 m	Bit Run 524 m	Bit hrs:	7.5	Lag Time: 11.2 min
Pump Press	2150 psi	Flow: 1050 gpm	Rpm/Krev	128/61	Torg: 6-10 kft/lbs

ROP	M/HR	DEPTH
MINIMUM	6.60	138
MAXIMUM	128.69	640
AVERAGE	73.3	

	INTERVAL	LITHOLOGY
1	126 - 650m	RETURNS TO SEABED

GAS DATA [Total Gas in units, Chromatograph in ppm, 50 units = 10,000 ppm.]

DRILLED BACKGROUND GAS

Depth	Depth to	TG units	C1 ppm	C2	C3	iC4	nC4	iC5	nC5

DRILLED GAS PEAKS

Depth	Туре	TG units	C1 ppm	C2	C3	iC4	nC4	iC5	nC5

13-10-99 0600 6	50	650m TVD	_
Present Operation:	W	.O.C.	

Comments: Calibrated Chromatograph. Calibrated CO2. Loaded ADOBE print driver.



Well: Bale	en 2		Date:	13-10-1999)		Drilling Day:	3
24 ^h 00 Depth	746.0m	746m TVD	Metres	Last 24 hrs:	96 m	Prepared by	y M. Smith	
Present Opera	ation: Pu	lling out of the	hole for co	ore.				

BIT DATA

Bit#:	4	Size:	8 ¹ / ₂ "		Type:	REED MH13	3G	
Depth In:	650 m	Jets:	3x18		TFA:	0.75 in²	C	ondition
Depth Out:	m	Bit Run	96 m		Bit hrs:	9.6		Lag Time: 11.4 min
Pump Press	1500 psi	Flow:	650 gpm	Rpn	n/Krev	80/61		Torq: 900 ft/lbs

ROP	M/HR	DEPTH
MINIMUM	2.90	660
MAXIMUM	25.21	698
AVERAGE	10	

INTERVAL	LITHOLOGY
650-675	Argillaceous Calcilutite
675-746	Calcareous Claystone & Argillaceous Calcilutite

GAS DATA [Total Gas in units, Chromatograph in ppm, 50 units = 10,000 ppm.]

DRILLED BACKGROUND GAS

	T		1		1	1	1		T
Depth	Depth to	TG%	C1 ppm	C2	C3	iC4	nC4	iC5	nC5
650	675	0.104	1245						
675	720	0.254	3238						
720	742	0.495	6234						
742	746	1.13	13207	100					

DRILLED GAS PEAKS

Depth	Туре	TG %	C1 ppm	C2	C3	iC4	nC4	iC5	nC5
746	Drill	1.24	13667	100					

14-10-99 0600 7	746m	746mTVD	
Present Operation:	Runni	ng in to core.	



Well: Baleen 2	Date: 14-10-1999	Drilling Day: 4
24 ^h 00 Depth 780.0m 780m TVD	Metres Last 24 hrs: 34 m Prepared b	by M. Smith
Present Operation: Pulling out of the h	ole after core 2.	

BIT DATA

Bit #:	5 CR#1	Size: 8 1/2"		Type:	DBS CD73	
Depth In:	746 m	Jets: OPEN		TFA:		Condition
Depth Out:	762 m	Bit Run 16 m		Bit hrs:	1.2	Lag Time: 39 min
Pump Press	500 psi	Flow: 195 gpm	Rpm	n/Krev	102/4	Torq: 1500-2200 ft/lbs
Bit#:	5RR CR#2	Size: 8 ¹ / ₂ "		Туре:	DBS CD73	
Depth In:	762 m	Jets: OPEN		TFA:		Condition
Depth Out:	780 m	Bit Run 18 m		Bit hrs:	1.2	Lag Time: 40 min
Pump Press	350 psi	Flow: 205 gpm	Rpm	/Krev	88-98/5	Torq: 1200-2300 ft/lbs

ROP	M/HR	DEPTH
MINIMUM	10.40	750
MAXIMUM	42.34	772
AVERAGE	14.2	

INTERV	'AL LITHOLOGY	
746-74	7 ARENACEOUS SILTSTONE	
747-76	SILTY SANDSTONE	

GAS DATA [Total Gas in units, Chromatograph in ppm, 50 units = 10,000 ppm.]

DRILLED BACKGROUND GAS

Depth	Depth to	TG %	C1 ppm	C2	СЗ	iC4	nC4	iC5	nC5
746	762	4.0	25600	145					
762	771	1.0	12200						

DRILLED GAS PEAKS

Depth	Туре	TG %	C1 ppm	C2	СЗ	iC4	nC4	iC5	nC5
746	Trip	0.74	9100						
762	Trip	2.44	14800	66	<u>.</u>				
753	Drill	5.15	30500	157					
765	Drill	1.41	14800	65					

14-10-99 0600	780 m	780 m TVD		
Present Operation:	Run	in hole to drill to	TD.	

MR-1210.DOC



Well: Baleen 2	Date: 16-10-1999	Drilling Day: 5
24 ^h 00 Depth 895.0m 895m TVD	Metres Last 24 hrs: 115 m Prepared	by M. Smith
Present Operation: Make up tools for	ogging run #3.	

BIT DATA

Bit #:	5	Size: 8 1/2"	Type:	REED EHP43	
Depth In:	780 m	Jets: OPEN	TFA:	0.45	Condition
Depth Out:	895 m	Bit Run 115 m	Bit hrs:	5.1	Lag Time: 39 min
Pump Press	2300 psi	Flow: 605 gpm	Rpm/Krev	90/27	Torq: 1000-1500 ft/ibs

_			
	ROP	M/HR	DEPTH
	MINIMUM	6.46	793
Γ	MAXIMUM	184.99	845
	AVERAGE	22.55	

INTERVAL	LITHOLOGY
780-870	SANDSTONE W/ MINOR SILTSTONE
870-895	CLAYSTONE

GAS DATA [Total Gas in units, Chromatograph in ppm, 50 units = 10,000 ppm.]

DRILLED BACKGROUND GAS

Depth	Depth to	TG %	C1 ppm	C2	Ç3	iC4	nC4	iÇ5	nC5
780	870	0.6	6500						
870	895	0.35	3200						

DRILLED GAS PEAKS

Depth	Type	TG %	C1 ppm	Ç2	Ç3	iÇ4	nC4	iC5	nC5
780	Trip	1.33	13800						
860	Drill	1.31	14400						
868	Drill	0.96	11000						
887	Drill	0.41	4600						

17-10-99 0600	895 m	895 m TVD	
Present Operation	n: Logg	ing run #3.	

Geografices

Cultus Petroleum N.L. Morning Report

Well: Baleen 2	Date: 17-10-1999	Drilling Day: 6
24 ^t 00 Depth 895.0m 895m TVD	Metres Last 24 hrs:	Prepared by M. Smith
Present Operation: Continue wireline I	ogging.	·

BIT DATA

Bit#:	5	Size: 8 1/2"	Type:	REED EHP43	
Depth In:	780 m	Jets: OPEN	TFA:	0.45	Condition 1-1-NO-A-E-I-NO-TD
Depth Out:	895 m	Bit Run 115 m	Bit hrs:	5.1	Lag Time: min
Pump Press		Flow:	Rpm/Krev		Torg:

ROP	M/HR	DEPTH
MINIMUM		
MAXIMUM		
AVERAGE		

INTERVAL	LITHOLOGY

GAS DATA [Total Gas in units, Chromatograph in ppm, 50 units = 10,000 ppm.]

DRILLED BACKGROUND GAS

Depth	Depth to	TG %	C1 ppm	C2	Ç3	iÇ4	nÇ4	iÇ5	nC5

DRILLED GAS PEAKS

Depth	Туре	TG %	Ç1 ppm	Ç2	Ç3	iÇ4	nC4	iÇ5	nÇ5

18-10-99 0600	895 m	895 m TVD		
Present Operation:	Runn	ing in to set cem	ent plugs.	

Geografices

Cultus Petroleum N.L. Morning Report

Well: Baleen 2	Date: 18-10-1999	Drilling Day: 7
24 ^h 00 Depth 895.0m 895m TVD	Metres Last 24 hrs:	Prepared by M. Smith
Present Operation: Completed Cemer	t plug #3 (175m to 125m). At 120r	m

BIT DATA

Bit #:	Size:	Type:		
Depth In:	Jets:	TFA:	Condition	
Depth Out:	Bit Run	Bit hrs:	Lag Time:	
Pump Press	Flow:	Rpm/Krev	Torq:	

ROP	M/HR	DEPTH
MUMIMIM		
MAXIMUM		
AVERAGE		

INTERVAL	LITHOLOGY
;	

GAS DATA [Total Gas in units, Chromatograph in ppm, 50 units = 10,000 ppm.]

DRILLED BACKGROUND GAS

									,
Depth	Depth to	TG %	C1 ppm	C2	C3	iC4	nC4	iC5	nC5
	1								1
									l i

DRILLED GAS PEAKS

						,	,		
Depth	Type	TG %	C1 ppm	Ç2 ·	Ç3	iÇ4	nC4	iC5	nC5
								†	
						1		(1
1						1		ļ	

				
19-10-99 0600	895 m	895 m TVD	1	
19-10-99 0000	090 111	090 111 1 412		
		505		
Present Operation	i: Pullini	BOP stack.		
1		<u> </u>		

VIC / RL5

APPENDIX 9

BALEEN-2

FINAL MUD LOGGER REPORT

-GEOSERVICES-



Cultus Petroleum N.L.

BALEEN 2

FINAL WELL REPORT
-BASIC DATA-

Prepared By



Geoservices Overseas S.A.

Edited to Remove all Interpretive Data

Cultus Petroleum NL / Basin Oil NL, Level 4, 828 Pacific Highway, Gordon, Sydney, NSW, 2072, Australia,

Tel: (02) 9418 1522 Fax: (02) 9418 1756 Geoservices Overseas, S.A. 8/14-22 Farrall Road Midvale, Perth Western Australia 6056 Australia

Tel: (08) 9250-2010 Fax: (08) 9250-2715



DRILLING LOG

OVERPRESSURE LOG

BALEEN 2 CULTUS PETROLEUM N.L.

ContentsPage 2 of 20

CONTENTS

907960 130

SECTION 1 GENERAL WELL SUMMARY		3
WELL DATA		4
MUD LOGGING		5
WELL SUMMARY	•	6
WELL PROFILE		7
DAY VERSUS DEPTH PLOT	:	8
CEMENTING DETAILS	•	9
WELL DIARY		10
SECTION 2 GEOLOGICAL SUMMARY		12
GEOLOGY		13
FLUORESCENCE REPORT		16
GAS REPORT		17
OVERPRESSURE SUMMARY		19
SECTION 3 GEOSERVICES LOGS & Appendix		
MASTERLOG	1:500 scale (from 126 m to 895 m)	

1:1000 scale (from 126 m to 895 m)

1:500scale (from 126 m to 895 m)

Revision	Date	Issued by	Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	

Section 1 General Well Summary



Contents Page 4 of 20

WELL DATA

907960 132

Operator

: Cultus Petroleum N.L.

Platform

: SEDCO 702 (semi-submersible)

Well name

: Baleen - 2

Country Location : Australia

Well Type

: Bass Basin

Field

: Appraisal : Baleen

Location

Longitude

= 148° 24' 37.549" E

Latitude = 38° 01' 55.758" S

AMG co-ordinates

X

= 623,781.41 m E

Y

= 5,789,663.9 m N

Profile

: Vertical

Reference depth

: Rotary Table (RT)

Elevation RT A.M.S.L.

: 26 m

Seawater depth

: 55 m

Proposed total depth (MDRT)

: 925 m MDRT

Actual total depth

: 895 m MDRT

True vertical depth

: 895 m MDRT

Hole Spudded on

: 11 October 1999

TD reached on

: 16 October 1999

Drilling Contractor

Drilling Contractor : Schlumberger - Sedco Forex

Rig name

: SEDCO 702

Rig type

: Semi-Submersible

Drilling Phases

Diameter (inch)	From (m)	To (m)	Mud Type			
36"	81 m	126.0 m	Seawater with Hivis sweeps			
121/4"	126 m	650.0 m	Seawater with Hivis sweeps			
8½"	650.0 m	895.0 m	NaCl/EZ-MUD/Polymer mud			
Cased Hole						
 Casing Diameter (inch)	Casing Type	Shoe Depth (m)	Top (m)			
30"	Drill quip/SF60	126 m	77 m			
9 ⁵ / ₈ "	LTC/Buttress	646 m	77 m			

Revision	Date	Issued by	Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	



Contents
Page 5 of 20

MUD LOGGING

907960 133

Logging Unit Number

: 93

Engineers

Phil Rady

Mark Smith

Mudloggers

Cherie Clark-Moore

Adam Walsh

Cuttings Collection

Sample Type	Number of sets	Quantity per set	Sampling interval	From (m)	To (m)
Washed and Dried	4	200 grams	3 metres	650	746
Washed and Dried	4	200 grams	5 metres	78 0	810
Washed and Dried	4	200 grams	10 metres	810	895

Cuttings Distribution

Company	Washed and dried paper envelope	
Cultus (100 grams)	1 sets	
BRS	1 set	
Vic DNRE	2 set	

Revision	Date	Issued by	Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	



Contents
Page 6 of 20

WELL SUMMARY

907960 134

Baleen 2 was planned as a vertical appraisal well, designed to locate the GWC within the Gurnard Formation of the La Trobe Group. A further aim was to test the reservoir distribution, quality and continuity within the gas field. The well is located within permit VIC/RL5, encompassing the Patricia Baleen Gasfield. Baleen 2 lies on the northern flank of the Gippsland Basin, at the extreme south-westerly end of the Baleen portion of the gasfield. The primary objective was planned to be met at 710m SS RT and to TD the well in 8½" hole at 925 m. The well was to be drilled in 8 days plus time for plug and abandon procedures. Cores were to be cut over the zone of interest.

Baleen 2 was spudded on the 11th of October 1999 by the semi-submersible rig Sedco Forex 702 in 55 metres of water. Top hole was drilled from the conductor depth of 126 m to 650 m and 9 $^5/_8$ " casing was set at 646 m in $12^1/_4$ " hole. The 12½" hole section was drilled with seawater and gel sweeps and returns were to the seabed. The 8 $^1/_2$ " hole section was drilled to a TD of 895 m in 5 drilling days, with a water based NaCl/EZ-MUD/Polymer mud system and four bit runs; including 2 cores.

Background gas levels in this well were very low. There were no quantifiable indications of abnormal formation pressures and a mud weight of 10.1 ppg was utilized in the $8^{-1}/2$ " hole section. No major losses to the formations were experienced, with minor seepage losses. Static losses while logging at TD were around 0.5 bbl/hr. Hole condition was good, with no significant overpull on connections or during trips.

In this well, the practice of backreaming each stand at connections and circulating until the hole was clean before tripping was successful in maintaining good hole conditions. By monitoring overpull / drag and torque at connections and studying trends, hole condition could be determined. In this well no wiper trips were necessary, just routine trips at phase TD. Drilling fluid losses were not a problem in this well.

The final status for this well was plugged and abandoned. The rig was released from the location on 19th of October 1999.

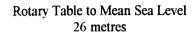
Revision	Date	Issued by	Approved by	· Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	



Contents
Page 7 of 20

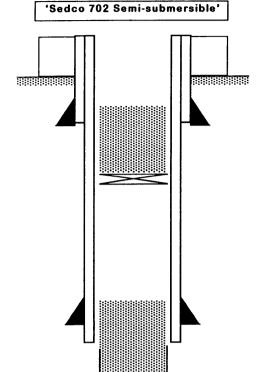
WELL PROFILE

907960 135



Rotary Table to Sea Bed 81 metres

30" Conductor set at 126 m (Casing cut at 84 m RT And wellhead retrieved)



36" hole to 126 m

Cement Plug #3 125 m to 175 m RT Bridge Plug at 180 m RT

9⁵/₈" Casing shoe at 646 m RT 12¹/₄" hole drilled to 650 m RT

FIT at 650 m: EMW=15.1 ppg

Cement Plug #2 580 m to 760 m RT

Cement Plug #1 760 m to 890 m RT

8½" hole drilled to 895 m RT MW at TD = 10.1 ppg TD = 895 m RT Hole plugged & abandoned

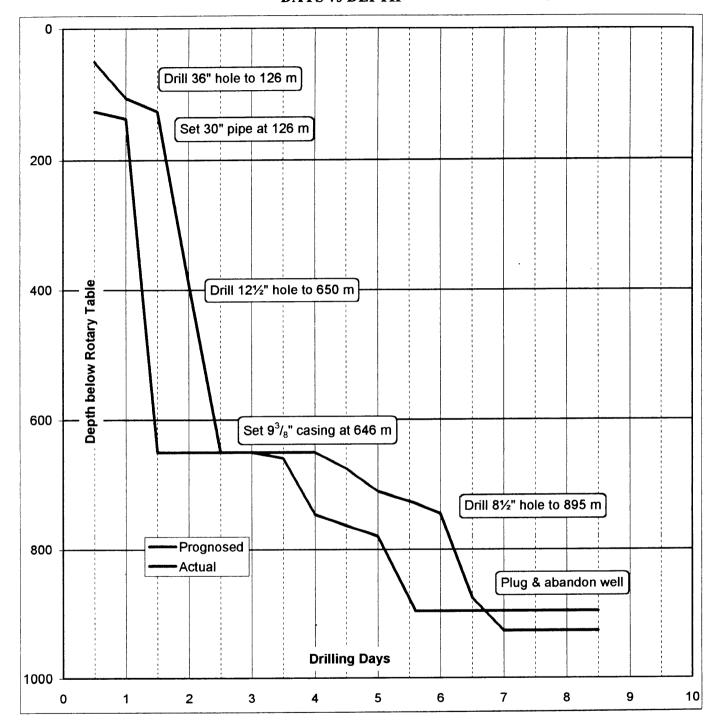
Revision	Date	Issued by	Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	



Contents
Page 8 of 20

DAYS vs DEPTH

907960 136



Revision	Date	Issued by	Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	
	1			



Contents
Page 9 of 20

CEMENTING DETAILS

907960 137

Baleen 2 was cased with the 30" shoe at 126 m and the $9^5/8$ " shoe at 646 m. The well was plugged and abandoned with 3 cement plugs as described below.

SLURRY DETAILS	CEMENT TYPE	DRY CMT VOLUME	CMT ADDITIVES (as per program)	MIX WATER	SLURRY VOL.	SLURRY DENSITY	CEMENT to/from
30" csg	Class G	850 sx	1.0% CaCl2 1 gal NF5	107 bbl seawater	191 bbl	15.8 ppg	126 m to seabed
9 ⁵ / ₈ " csg Lead	Class G	488 sx	14.6 gal/10 bbl econolite + 1 gal NF5	150 bbl fresh	194.5 bbl	12.5 ppg	to seabed
9 ⁵ / ₈ " csg Tail	Class G	227 sx	Neat	28 bbl seawater	53 bbl	15.8 ppg	frm 646 m to 496 m
Cement Plug #1	Class G	128 sx	l gal NF-5	15.5 bbl	25 bbl	15.8 ppg	890 m to 790 m
Cement Plug #2	Class G	217 sx	1 gal NF-5	26.5 bbl	48 bbl	15.8 ppg	760 m to 600 m
Cement Plug #3	Class G	50 sx	1 gal NF-5	7 bbl	10 bbl	15.8 ppg	175 m to 125 m

Revision	Date	Issued by	Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	



Contents
Page 10 of 20

WELL DIARY

907960 138

11 October 1999

Partention anchors, position rig over location and confirm with Surveyor. Run in with 36" BHA and tag Seabed, 81 m, confirm depth and drill 26" hole to 126 m and 36" hole to 123 m pumping Hivis sweeps every single and back ream and wipe each stand before connection. Displace hole with 50 Bbls Hivis gel and drop Survey marker. Pull out of hole and recover Totco - 3/4 deg - rack back BHA and pick up 30" running tool, run in hole and engage to 30" casing. Run in hole with ROV assistance, make up cement stand and land out well head, hold JHA, make up cement hose, pressure test same to 2500 psi and cement 30" casing. Pull out of hole with 1 stand, make up TDS, flush DP, and continue to pull out of hole laying out 30" running tool. Lay out 36" drilling assembly, Slm 30" landing string and make up 17½" assembly and run in to 20 m. Install guide ropes, wait on cement, hold emergency winch off drill, continue to run in hole from 20 m to 105 m with ROV assistance through wellhead and wait on cement. Wash down from 105 m to 120 m, tag top of cement and drill out cement and shoe from 120 m to 126 m. Sweep hole clean with Gel mud pull out of hole, lay out 17½" bit assembly and service TDS and block whilst repairing Geoservices RPM sensor. Make up 12¼" bit and run in hole to 125.71 m with ROV assistance through wellhead. Drill 12½" hole from 126 m to 137 m.

12 October 1999

Continue to drill 12¼" hole from 137 m to 650 m pumping Hivis pills every ½ stand, Spot Hivis pill on bottom on connection, pump Hivis round and drop MSS. POOH from 650 m to 110 m - wiper trip - retrieve MSS survey - ¼ deg. RIH to 650 m, tag ½ m fill, sweep hole, spot 375 bbls Hivis mud and POOH. Jet Wellhead, break out bit, rig up to run 95/8" Casing, hold JHA, pick up shoe joint and test same. RIH attach guide ropes on way in with ROV assistance through Wellhead to 557 m and rig down casing gear and make up x/o.

13 October 1999

Pick up & make up 20" Hanger, install plugs, fill cavity above plugs with water. Run 9⁵/₈" Casing on landing string, land out 20" housing in 30" and confirm with 50k overpull. Make up cement hose, pressure test same 2500 psi, hold JHA and cement 9⁵/₈" Casing - Lead slurry 488 sx 12.5 ppg/ Tail slurry 220 sx 15.8 ppg. Remove cement hose, back out running tool, POOH and lay out cement stand. Jet Wellhead, lay out running tool and Plug launcher, rig up to run BOP's, hold JHA, pick up and make up double of riser and rack back same. Move BOP's, LMRP on to Spider beams, function test BOP's, pick up double Riser and make up to LMRP.

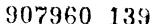
14 October 1999

Continue to pull BOP test tool out of hole. Function test diverter system port and starboard. Continue to POOH, lay out test tool, rack 4 stands HWDP below test tool. Make up and run flex joint wear bushing. POOH and lay out running tool. Lay out 12¼" BHA. Pick up 8½" BHA from Catwalk. RIH and tag TOC at 596 m. Drill cement from 596 m to 647 m. Drill out rat hole from 647 m to 650 m. Continue to drill new hole from 650 m to 654 m. Sweep hole 50 bbls Hivis, 50 bbls seawater and displace hole, Choke and Kill lines to 10.1 ppg mud. Pull back to 650 m and perform FIT 560 psi - 15.1 ppg. Continue to drill 8½" hole from 654 m to 698 m at control drill rate of parameters. Flow check well and circulate sample up for Geologist. Continue to drill 8½" hole from 698 m to 716 m. Flow check well and continue to drill from 716 m to 736 m. Circulate sample up for Geologist. Continue to drill 8½" hole from 736 m to 746 m. Circulate up sample for Geologist. Flow check and POOH from 746 m to the shoe at 646 m. SCR at 669 m, MW 10.0+ ppg.

15 October 1999

Continue to POOH from 646 m to surface, rack BHA, break bit. Hold JHA, pick up Outer core barrels, make up Core head, load Inner barrel, make up safety joint. Pick up BHA from derrick, RIH with Core assembly to 744 m. Circulate bottoms up, drop ball, set same and take SCR, 10.1 ppg. Commence cutting core from 746 m to 763 m. Flow check and POOH. POOH at a controlled rate as per program from 400 m. Core barrel at rotary table - test for H_2S . Hold JHA, pull inner Core barrel and lay out same - 100% recovery. Pull outer Core barrel to Rotary table and break out bit (2xNozzles blocked). Make up bit and RIH, load 2 inner Core barrel assembly to 757 m. Circulate hole clean, drop ball observe psi increase, take SCR's and wash down and tag @ 763 m,

Revision	Date	Issued by	Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	





Contents
Page 11 of 20

cut Core from 763 m to 780 m, flow check and POOH @ a controlled rate as per program to 134 m.

16 October 1999

Continue to POOH, rack BHA in Derrick from 134 m. Hold JHA for laying out Core barrel, Hold JHA andpick up BHA from catwalk. Make up bit, pick up BHA from Derrick and RIH to 646 m. Drill stringstabilizes hanging up @ float collar of Shoe. Wash and ream to 780 m and drill 8¹/₂" hole from 780 m to 895 m. Circulate hole clean, flow check and POOH to 688 m. Pump slug and POOH to shoe. Flow check and continue to POOH, rackback BHA and break bit. Hold JHA and rig up wireline. Make up and run tool string #1. Lay out run #1 and make up and run tool string #2. Lay out run #2.

17 October 1999

Make up MDT, function test at surface and run tool string #3. Run #3 at surface and lay out. Make up and run tool string #4. Run #4 at surface and lay out. Make up MDT and run tool string #5. Pull to surface and troubleshoot problem with probe. Rerun MDT tool string.

18 October 1999

Continue to run MDT. Pull to surface and lay out tool string. Hold JHA and rig down wireline. Hold JHA and rig up and pick up cement stinger on $2^{7}/8^{\circ}$ tubing and run to 197.33 m. Run in with cement stinger on DP to 890 m and circulate bottoms up. Pressure test cement lines and pump cement plug #1 from 890 m to 790 m. Pull back to 760 m, circulate bottoms up and pump cement plug #2, from 760 m to 600 m. Pull out to 550 m, circulate bottoms up and function test BOP and annulus. Pull out of hole, hold JHA and lay out $2^{7}/8^{\circ}$ tubing and cement stinger. Lay out $6^{1}/2^{\circ}$ DC's. Make up mule shoe and run in on DP to 580 m and tag cement. Circulate hole to inhibited mud. Pull out of hole and lay out mule shoe. Rig up wireline and make up tool string junk basket and guage ring. Run wireline, pull out, lay out and make up tool string #2 - EZSV. Run and set EZSV at 180 m, pull out and rig down wireline. Run in with DP and tag EZSV and pull up to 175 m. Circulate hole to seawater and flush choke and kill lines to same. Pressure test cement lines and pump cement plug #3 from 175 m to 125 m. Rig down cement line and pull back to 120 m.

19 October 1999

Reverse circulate contents of drill string. Function test BOPs. POOH to surface. Make up running tool. RIH and retrieve flex joint wear bushing. RIH and retrieve wellhead wear bushing. Hold JHA. Rig up equipment to pull marine riser and BOPs. Pull diverter. Pick up landing joint. Make up and close inner barrel. Unlatch connector. Pull up BOPs. Remove choke & kill lines. Remove rucker lines. Pull riser and BOPs. Continue pulling up riser and BOPs. Land BOPs in moonpool. End Geoservices well diary.

Revision	Date	Issued by	Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	



Contents
Page 12 of 20

907960 140

Section 2

Geological Summary

Revision	Date	Issued by	Approved by	. Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	



Contents
Page 13 of 20

907960 141

GEOLOGICAL SUMMARY

Seafloor to 650 m MD

RETURNS TO SEAFLOOR.

650-717 m MD

ARGILLACEOUS CALCILUTITE WITH MINOR INTERBEDDED CALCILUTITE AND

CALCAREOUS CLAYSTONE.

ARG. CALCILUTITE

Light grey to medium grey, medium to dark olive grey, soft, dispersive, firm in part, amorphous to blocky, trace subfissile, trace carbonaceous speaks, 20% to 30% siliceous clay content, grades in part to Calcareous Claystone, trace Calcisiltite in part, trace to 5% forams,

trace quartz silt, trace very fine glauconite.

CALCILUTITE

White to very light grey, light olive, grey, soft to firm, amorphous, blocky in part, slightly

dispersive, trace very fine glauconite.

CALC. CLAYSTONE

Light to medium grey, light to medium olive grey, soft to firm, amorphous to rarely subblocky, dispersive in part, 20% to 30% micrite, trace very fine to medium pelletal glauconite,

5% carbonaceous specks in part.

717-746 m MD

ARGILLACEOUS CALCILUTITE, INTERBEDDED CALCAREOUS CLAYSTONE AND

MINOR CLAYSTONE.

ARG. CALCILUTITE

Light grey to medium grey, medium olive grey, mottled, soft, dispersive, rarely firm to moderately hard, amorphous to blocky, trace carbonaceous speaks, 30% to 35% siliceous clay content, grades in part to Calcareous Claystone, trace to 5% Calcisiltite, trace fossil

fragments and forams, trace quartz silt, trace very fine glauconite.

CALC. CLAYSTONE

Light to medium grey, light to medium olive grey, soft, amorphous, 20% to 30% micrite,

trace to 10% very fine to medium pelletal glauconite, 5% carbonaceous specks.

CLAYSTONE:

Medium to dark yellowish brown, dark olive grey, soft, dispersive, 10%-15% micrite, 5%-10% fine dark green glauconite, trace to 15% quartz silt, grades to Silty Claystone, 5% micromica, trace fine quartz sand, trace very fine disseminated pyrite, trace hard dark

siderite nodules, trace to minor carbonaceous flecks, trace lithics.

746-762 m MD

SANDSTONE WITH MINOR SILTSTONE.

SILTY SANDSTONE

Moderate to dark yellowish brown, clear to translucent quartz grains, very fine to fine grained, moderately well sorted, angular to sub-rounded, trace-2% patchy siderite cement, 20-25% dark yellowish brown quartz silt matrix, grading to SILTY SILTSTONE, trace dark green glauconite, trace-5% micromica, trace feldspar, friable to locally firm, fair to locally

good visible porosity.

Revision	Date Issued by		Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	



Contents
Page 14 of 20

SANDY SILTSTONE

Dark yellowish brown to moderate yellowish brown, arenaceous, 30-40% very fine to fine quartz sand, commonly grading to silty SANDSTONE, trace glauconite, 5% siliceous clay, 5-10% micomica, common patchy siderite cement, trace to minor carbonaceous specks, trace lithics, firm to locally moderately hard, blocky, no fluorescence.

762-780 m MD

SANDSTONE WITH INTERBEDDED CLAYSTONE.

SANDSTONE

Moderate to dark yellowish brown, olive grey, clear to translucent quartz grains, firm to hard, very fine to fine grained, moderately sorted, angular to sub-angular, 20%-50% siderite cement, 5%-10% argillaceous/silty matrix, 5%-15% glauconite, micromica, trace lithics, poor visible porosity.

SILTY SANDSTONE

Moderate to dark yellowish brown, olive grey, clear to translucent quartz grains, friable to firm, very fine to fine grained quartz grades to Sandy Siltstone, moderately sorted, subangular to angular, trace to 15% siderite cement, 25%-50% dark yellowish brown argillaceous matrix, 5%-15% dark green glauconite, trace to 5% micromica, trace lithics, poor to fair in part visible porosity, no shows.

SANDY CLAYSTONE

Dark yellowish brown, soft, 25%-30% very fine to fine grained quartz sand, 15%-20% quartz silt, grades to Argillaceous Siltstone, trace to 2% glauconite, 5% micromica, trace lithics, no shows.

780-791m MD

SANDSTONE WITH INTERBEDDED SILTSTONE.

SANDSTONE

Clear to translucent quartz, light grey, opaque, fine to coarse, dominantly fine to medium, poorly sorted, sub-angular to angular, 5% pyrite cement, 5%-10% argillaceous matrix where aggregated, trace nodular pyrite, trace glauconite, trace siderite nodules, fair to good porosity, no shows.

SILTSTONE

Moderate yellowish brown, medium olive grey, soft, dispersive, 15%-20% siliceous clay, grades to Claystone, 10%-15% very fine to fine quartz sand, trace to 2% glauconite, trace nodular pyrite, trace micromica, trace lithics.

791-872m MD

SANDSTONE WITH MINOR SILTSTONE AND TRACE COAL.

SANDSTONE

Clear to translucent, opaque, light blue grey in part, predominantly medium to coarse grained, occasionally fine, common very coarse angular milky quartz, poor sort, angular to sub-rounded, trace pyrite cement, minor white kaolinitic matrix, trace to rare pyrite nodules, locally trace glauconite, commonly loose grains, friable aggregates in part, fair to good porosity, no fluorescence.

SILTSTONE

Moderate yellowish brown to pale brown, argillaceous, minor siliceous clay, trace micromica and disseminated pyrite, occasionally local carbonaceous specks, trace to rare glauconite, soft to firm, amorphous, occasionally sub-blocky.

COAL

Black, firm to hard, occasionally brittle, dull to sub-vitreous.

Revision	Date	Issued by	Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	



Contents
Page 15 of 20

872-895m MD

CLAYSTONE WITH MINOR INTERBEDDED SANDSTONE.

907960 143

CLAYSTONE

Medium to light medium grey, trace carbonaceous specks and microlaminations, trace pyrite nodules, homogenous, very soft to soft, amorphous, occasionally sub-blocky.

ARG. SANDSTONE

White to opaque, clear to translucent quartz grains, trace light bluish grey, loose, medium to very coarse, dominantly medium to coarse, poorly sorted, angular to sub-angular moderately common siliceous cement, 40%-50% white kaolinitic matrix, trace pyrite nodules, poor inferred porosity, no shows.

Revision	Date	Issued by	Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	



Contents
Page 16 of 20

FLUORESCENCE REPORT

907960 144

DEPTH

756 m to 762 m MD

SILTY SANDSTONE

Moderate to dark yellowish brown, clear to translucent quartz grains, very fine to fine grained, moderately well sorted, angular to sub-rounded, trace-2% patchy siderite cement, 20-25% dark yellowish brown quartz silt matrix, grading to arenaceous SILTSTONE, trace dark green glauconite, trace-5% micromica, trace feldspar, friable to locally firm, fair to locally good visible porosity.

FLUORESCENCE

80 %, dull to moderately bright yellowish green pinpoint to patchy direct fluorescence, slow yellowish white blooming cut fluorescence, thick yellowish white residual ring fluorescence.

ASSOCIATED GAS

Depth	Tot Gas	C1 ppm	C2 ppm	C3	iC4	nC4	iC5	nC5
752	4.21	21000	65	-	-		_	-
753	5.15	29500	147	-	-	-	-	-
756	5.07	30500	157	-		-	-	-
758	4.95	30200	149	_	-	-	-	-
756	4.53	29100	135	-	-	-	_	

DEPTH

763 m to 764 m MD

SANDSTONE

Moderately to dark yellowish brown, olive grey, clear to translucent quartz grains, firm to hard, very fine to fine grained, moderately sorted, angular to sub-angular, 20%-50% siderite cement, 5%-10% argillaceous/silty matrix, 5%-15% glauconite, micromica, trace lithics, poor visible porosity.

FLUORESCENCE

30%, dull to moderately bright yellowish green pinpoint to patchy direct fluorescence, slow yellowish white streaming to blooming cut fluorescence, thin to thick yellowish white residual ring fluorescence.

ASSOCIATED GAS

Depth	Tot Gas	C1 ppm	C2 ppm	C3	iC4	nC4	iC5	nC5
763	1.21	12800	60	-	-	-	-	-
764	1.21	12900	61	-	-	_	-	

Revision	Date	Issued by	Approved by	Remarks	
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator		



Contents
Page 17 of 20

GAS REPORT

907960 145

Background gas levels while drilling Baleen 2 were initially low during the $8\frac{1}{2}$ " phase, but increased dramatically on drilling into the Primary Objective (746mRT - 762mRT) and remained high till the GWC, where they decreased from $5\frac{1}{2}$ to $1\frac{1}{2}$. Until TD at 895 m the background gas level was $0.4\frac{1}{2}$ to $0.6\frac{1}{2}$, with peaks of greater than $1\frac{1}{2}$.

The only heavy gas component detected was C2 in very low amounts in the Primary Objective. Gas peaks were generated from sands and the highest peaks were associated with sample fluorescence.

Gas was recorded on drilling out of the $9^5/8^\circ$ Casing shoe and slowly increased to a background of around 0.4% (methane equivalent) at 705 m. Gas upon drilling into the Primary Objective increased dramatically and whilst drilling Core #1 reached 5.15%. After the GWC the gas level decreased to just over 1%. Between 780mRT and 872mRT, gas ran at between 0.2% to 0.6%, with peaks above 1%. In the interval 872mRT – 895mRT, the gas averaged 0.35%.

Gas ratio analysis shows a gas well regime. Gas ratios were very dry for the whole well, especially over the cored section.

No CO2 was detected for the drilled interval 650 m to 895 m. There was no H2S recorded in this well.

A summary of highest gas peaks and trip gas peaks appears on the following page. For gas peaks in surface sample oil shows, see the Fluorescence section on the previous page.

Revision	Date	Issued by	Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	



Contents
Page 18 of 20

907960 146

DRILLED GAS PEAKS

Depth	MW ppg	TG %	C1 ppm	C2 ppm	C3	iC4	nC4	iC5	nC5
686	10.1	0.26	3400						
707	10.1	0.40	5000						
724	10.1	0.60	7200						
729	10.1	0.57	7700						
743	10.1	1.21	13700	54					
753	10.1	5.15	30500	157	···				
756	10.1	5.07	29500	151					
765	10.1	1.41	14800	65					
785	10.1	0.77	8800						
807	10.1	0.76	9100						
834	10.1	0.77	9100						
852	10.1	1.68	14700	78					
860	10.1	1.31	14400						
868	10.1	0.96	11000						
887	10.1	0.41	4600						

TRIP GAS PEAKS

Depth (m MD)	Туре	MW (ppg)	Tot. Gas
746	Trip Gas	10.1	0.74
762	Trip Gas	10.1	2.44
780	Trip Gas	10.1	1.33
895	Trip Gas-Post Logs	10.1	0.79

Revision	Date	Issued by	Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	



Contents
Page 19 of 20

OVERPRESSURE SUMMARY

907960 147

The following techniques were utilized as indicators of abnormal formation pressures during the drilling of Baleen 2.

D-EXPONENT: This is a normalized rate of penetration which takes into account variables such as weight on bit, rotation, and mud weight. It is designed to quantitatively predict pore pressures in shaley formations. It may also be used as an indicator in Siltstones, silty Shales and calcareous Claystones since the fundamental principle that underbalanced bottom hole conditions result in faster drilling applies to all these formations. A shift in the normal trend (representing a normal compaction trend) to the left (representing relative undercompaction) may indicate overpressure or increased porosity due to lithological changes.

GAS: Overpressure may be indicated by increases in the background gas, trip gas, and connection gas readings. Similar changes may however also occur as a result of formation porosity changes which are unrelated to pore pressures.

CUTTINGS: Small splintery cuttings indicate overpressured formations. Long propeller-shaped cavings are usually caused by overpressure or by the hydration of reactive or swelling clays.

HOLE CONDITIONS: As mentioned above, cavings resulting from overpressure may be introduced into the hole. Subsequently, increased overpull and drag on the drill collars and stabilizers during connections and trips may occur. Increasing torque trends show deteriorating hole condition for similar reasons. Encountering hole fill on running back to bottom may also be indicative of overpressure.

TEMPERATURE: Changes in downhole temperature can be measured at the surface by means of a temperature sensor positioned in the flow line. The primary factor that enables this measurement to be of use in overpressure studies, is thermal conductivity. In an undercompacted sequence, the presence of an abnormally high percentage of pore fluids causes heat to be trapped. Hence the area immediately above the overpressured unit is a zone of heat starvation. Changes in thermal gradient can therefore be used to map a transition from normally pressured to overpressured environments. Limitations of this technique include riser cooling by seawater, surface mud additions, circulation breaks, changes in ROP, hole size and flow rate, all of which may mask or distort surface mud temperature readings. The use of all these methods in conjunction with each other will give the most reliable indication of any abnormal formation pressures.

A D Exponent plot was maintained to monitor formation pressures while drilling Baleen 2. The known Marls and Calcareous claystones were used to establish a trend in the drillability of the sediments. The D Exponent coefficients used were as follows:

Overburden coefficients	A = 0.01304
(Soft Formation)	B = -0.17314
	C = 1.4335
Poisson coefficients	A = 0.266
(Soft Formation)	B = -2.667
Trend line coefficients	A = 0.0002159
	B = -0.3509563

C = -0.098

Sand line

From 280 m onwards, although very high in the well, a slight trend of compaction maybe seen to around 390 m. From this point onwards to 650 m the trend moves to suggest sediments are under compacted and therefore overpressured. However due to the nature of compaction in carbonates and that all mud returns were to the Seafloor, this is of limited validity.

After drilling out of the 9⁵/₈" Casing shoe, the clay increased. With this increase in Claystone there was an increase in the drillability of the formation and a definite leftward trend can be seen in the D exponent curve. Although again the

Revision	Date	Issued by	Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	



Contents
Page 20 of 20

validity of the D exponent can be questioned due to the presence of Calcareous sediments, a slow build up of background gas was observed and this may indicate an increase in formation pressures down to 745 m.

In the cored sections, we see a negative trend in the first core and a positive trend line in the second. Due to the short duration of each run and the fact they are both predominantly sandstone formations, no definite conclusion can be drawn on the formation pressure. The only possible supposition that one could make, is that the gas present in the first core has led to a slight positive abnormal pressure situation.

In the interval 791mRT – 872mRT, the sandstone lithology lead to an erratic plot line, due mainly to a function of change in ROP. The sudden leftward shift in the Dexp was due to coarser and looser sandstones and coincided with gas peaks. This would tend to indicate a fluctuating formation pressure due to variance in the sandstone lithology, thus showing the limitations of Dexp calculations in sandstone lithologies. Other indicators, such as background gas, connection gas, torque and such indicate a normal formation pressure.

Background gas levels in this well reflected lithology type, peaking in the reservoir and decreasing after the GWC. The other formations showed low gas levels. In this way, they indicate the formations to be of generally normal formation pressures. Isolated sand gas peaks did occur in this interval and they may have their own localised pressure regimes. No background level trend due to formation pressures could be readily discerned. Trip gas was negligible and connection gas was not recorded. A table of trip gas peaks appears on the preceding page.

No splintery or unusually shaped cuttings were observed in the cuttings samples during this well.

Hole conditions were closely monitored during this well. Drag, overpull and torque values were noted while drilling the $12^{1}/4$ " and $8^{1}/2$ " phases. Drag and overpull were minimal with no increasing trend and no fill encountered after trips. Hole conditions were good in Baleen 2, with the caliper log showing little washout. Erratic torque values were evident during the second core section, due to variance in sandstone lithology, ie cementation and pyrite content.

Mud temperatures were low in this well, ranging up to 37.0°C at 895 m. As drilling progressed temperatures rose gradually from 26.0°C from casing point to 36.0°C at the first core point. After the second core, the temperature rose from an initial 29.5°C to 37.0°C at TD. Plots show no evidence of an abnormal temperature gradient.

Revision	Date	Issued by	Approved by	Remarks
1	10/07/99	Geoservices Unit 093	Base Mudlogging Coordinator	

APPENDIX 10

BALEEN-2

PALYNOLOGICAL REPORT BASIC DATA

-BIOSTRATA-

Palynological analysis of core and cuttings samples from Baleen–2 well, Gippsland Basin.
-BASIC DATA-

by

Alan D. Partridge

Biostrata Pty Ltd A.C.N. 053 800 945

Biostrata Report 2000/1
29 February 2000

Sample Type	Depth metres	Lithology	Weight (grams)
Cuttings	660	Very light grey calcarenite	19.0
Cuttings	720	Light grey calcarenite	16.1
Cuttings	747	Light grey marl	23.9
Core-1	753	Medium brown-grey muddy glauconitic sandstone	32.6
Core-1	754	Medium brown-grey muddy glauconitic sandstone	33.3
Core-1	758	Medium brown-grey muddy micaceous and glauconitic? sandstone	31.5
Core-1	764	Hard light grey glauconitic sandstone	29.5
Core-2	768	Medium grey muddy glauconitic sandstone	18.4
Core-2	772	Medium grey muddy glauconitic sandstone	25.7
Cuttings	790	Medium grey quartz sandstone	29.9
Cuttings	795	Light grey quartz sandstone	37.5
Cuttings	800	Medium grey argillaceous quartz sandstone with ~1% coal or carbonaceous shale	28.9
Cuttings	810	Medium brown-grey argillaceous quartz sandstone with <1% coal or carbonaceous shale	27.9
Composite picked cuttings	850-870	Medium to dark grey carbonaceous mudstone and coally fragments picked from cuttings	0.9
Cuttings	880	Medium grey clumped mudstone? with continued presence of significant coarse quartz sandstone	26.6
Cuttings	895	Clumps of light grey mudstones and sandstone	19.3
		Average:	25.1

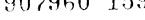
I adie 7: D	asic Samb	e and Falyn	omorph data fr	om balcu-z			
Sample Type	Depth metres	Visual Yield	Palynomorph Concentration	Preservation	No. SP Spp.	No. MP Spp.	
Cuttings	660	Very Low	Very Low	Poor	1+	1+	
Cuttings	720	Very Low	Low	Fair	21+	6+	
Cuttings	747	Low	Moderate	Good	23+	1.6+	
Core-1	753	Moderate	High	Good	70+	21+	
Core-1	754	Low	High	Fair-Good	55+	17+	
Core-1	758	High	High	Good	62+	16+	
Core-1	764	Low	Moderate	Good	52+	20+	
Core-2	768	High	Low	Fair 45+		3+	
Core-2	772	High	Low-Moderate	Fair-Good	46+	16+	
Cuttings	790	Low	Moderate	Fair	38+	4+	
Cuttings	795	Very Low	Low	Poor	15+		
Cuttings	800	High	High	Poor	30+	2+	
Cuttings	810	Low	Moderate	Poor-fair	26+		
Composite picked cuttings	850–870	Very Low	Low	Good	25+		
Cuttings	880	High	High	Poor-good	22+	1	
Cuttings	895	High	High	Good	44+	2+	
				AVERAGES:	35+	9+	

Sample/Depths (m)	Cts	Cts	Cts	C-1	C-1	C-1	C-1	C-2	C-2	Cts	Cts	Cts	Cts	Cts	Cts
	660	720	747	753	754	758	764	768	772	790	795	800	810	850 870	1895
SPORE-POLLEN SPECIES	_									L				0.0	
Anacolosidites sectus					Х										
Araucariacites australis		X	X	Х	Х		X	Х	X	X	Х	X			
Australopollis obscurus													X		
Baculatisporites spp.	X			X	X	X	X	Х	Х	X					
Beaupreaidites elegansiformis					X	X			-						
Beaupreaidites verrucosus						X									
Camarozonosporites heskermensis				Х	Х	X							Х	X	
Camarozonosporites horrendus ms														W	
Clavifera triplex				X	X								X	X	<u> </u>
Cranwellia striatus				cf											
Cupanieidites orthoteichus							X	X	X		-			 	
Cupressacites sp.				Х										ļ	
Cyatheacidites annulatus		X								CV		CV	<u> </u>		
Cyathidites australis		W	w					-	w		w	<u> </u>	-	 	-
Cyathidites paleospora		X		Х	X	X	Х	X	X	Х	X	X	-	X	-
Cyathidites splendens	-	-					X	X	X		- · ·	X	 		
Cayathidites subtilis		X	Х											 	<u></u>
Dacrycarpites australiensis			X	Х											
Dicotetradites clavatus				X	X	Х	X		X	Х		X			-
Dictyophyllidites spp.					Λ	X	$\frac{\lambda}{X}$		X	X			-		-
		X	X	Х	Х	X	X		X	X	X	Х	Х	-	-
Dilwynites granulatus			X	X		X	X	ļ	X	X			^		
Dilwynites tuberculatus			_^_										X		
Diporites delicatus ms						X									
Dryptopollenites semilunatus			Х	X		X		-							
Ericipites crassiexinus				X	Х	^	X	X		<u> </u>		Х			-
Ericipites scabratus				X	^	V	^	^				^			
Foveotriletes balteus				^		Х						-	17		
Gambierina rudata			77		77	37			X	17		,,,	X	X	<u> </u>
Gleicheniidites circinidites		V	X	X	X	X	X	X	X	X	37	X	X	X	CV
Haloragacidites harrisii		X	X	X			L	Α.		X	Х	X	X	Х	CV
Haloragacidites trioratus				X	X	X	Х						ļ.,,		<u> </u>
Herkosporites elliottii				X	Х	X			ļ.,,-	1,,		X	Х	<u> </u>	ļ
Ilexpollenites spp.		ļ <u></u> .	ļ.,.	X		X		X	X	X	·			<u> </u>	ļ
Ischyosporites gremius		Х	Х	X					X		Х		L		ļ
Ischyosporites irregularis ms				Х	,,,	X	X	X	X			X	X		ļ
Laevigatosporites major		X	X	ļ	X	X	X	Х	X	ļ.,,		X	ļ	<u> </u>	<u> </u>
Laevigatosporites ovatus		Х	Х	X	Х		Х		Х	Х	Х	X	X	X	<u> </u>
Latrobosporites crassus				ļ.,,.					,,				X	X	<u> </u>
Latrobosporites marginatus				X		Х			X				<u> </u>		
Liliacidites spp.				Х	Х								L	L	L
Lygistepollenites balmei						W		L				X	X	X	CV
Lygistepollenites florinii		X	X	X	X	X	X	X	X	X	X	X	X	X	<u> </u>
Malvacipollis robustus ms				X	X	X	Х	X						<u></u>	
Malvacipollis subtilis				X	X	X	X	Х	Х	Х		X			
Matonisporites ornamentalis		<u> </u>	Х	X			Х		L						↓
Microcachryidites antacticus				X	Х	X	Х			Х		X		Х	<u> </u>
Microalatidites paleogenicus				X								X	X		
Milfordia homeopunctatus					X										
Monosulcites gemmatus					cf										
Myrtaceidites parvus/mesonesus						Х	Х			Х					
Nothofagidites asperus		Х		Х	Х	Х	Х	Х		Х					
Nothofagidites brachyspinulosus				Х	X	Х		X	Х						
Nothofagidites deminutus				Х	Х	Х	Х	Х	Х						
Nothofagidites emarcidus/heturus			X	X	Х	Х	X	X	X	X	Х	X	X		CV
Nothofagidites endurus		<u> </u>	 					T				X	Х		
Nothofagidites falcatus			Х	х	Х	Х	Х	X	X	Х					
Nothofagidites flemingii	<u> </u>	t	—	X	Х	Х	Х	X	X	Х	Х	 	 	+	+

Sample/Depths (m)	Cts	Cts	Cts	C-1	C-1	C-1	C-1	C-2	C-2	Cts	Cts	Cts	Cts	Cts	Cts
	660	720	747	753	754	758	764	768	772	790	795	800	810	850 870	
Nothofagidites goniatus				Х	X	Х	X	Х	Х	Х			Ī		
Nothofagidites longispinosus					Х										
Nothofagidites vansteenisii				Х	Х	Х				X					
Paripollis ochesis			-											Х	
Parvisaccites catastus		Х		Х	Х	X									
Peninsulapollis gillii														X	
Periporopollenites demarcatus				X	Х	Х	Х		X	X					
Periporopollenites polyoratus						Х				Х		X			
Periporopollenites vesicus								X							
Peromonolites densus												Х			
Peromonolites vellosus				Х	Х			Х		Х					
Perotrilites n.sp.							X								
Phyllocladidites mawsonii		X	X	X	X	X	Х	Х	X	Х	X	Х	X	Х	
Phyllocladidites verrucosus													X	Х	
Podocarpidites spp.		Х	Х	X	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	
Polypodiidites perverrucatus				X	Х		Х	X	Х						
Proteacidites adenanthoides				Х	Х		Х	Х	Х					Х	
Proteacidites alveolatus				cf		cf									
Proteacidites annularis				Х	X	Х	Х							Х	
Proteacidites asperopolus						X				Х					
Proteacidites callosus					Х					Х					
Proteacidites carobelindiae				Х											
Proteacidites crassus						Х	X		Х						
Proteacidites grandis		W	W												
Proteacidites kopiensis								Х	Х				 	†	<u> </u>
Proteacidites latrobensis				X	X	<u> </u>	X								
Proteacidites nasus						X									
Proteacidites obscurus				X	X	X	X	X	X				†		<u> </u>
Proteacidites pachypolus				X	1	X		X	X					<u> </u>	†
Proteacidites prodigus		 										Х		<u> </u>	
Proteacidites pseudomoides	-		-	X	Х	X			X						ļ
Proteacidites recavus								X	X						
Proteacidites rectomarginis		Х			<u> </u>										
Proteacidites reflexus		-		X											
Proteacidites reticuloscabratus		<u> </u>	 	X		X	Х	X		<u> </u>		-			<u> </u>
Proteacidites tenuiexinus			<u> </u>		†	X	Х		X	· · · · ·	<u> </u>	Х	†		
Proteacidites truncatus		X	<u> </u>		1	 								†	<u> </u>
Proteacidites tuberculatus											CV				<u> </u>
Proteacidites tuberculiformis			<u> </u>		_		<u> </u>		X	<u> </u>					
Proteacidites uncinatus ms								X							<u> </u>
Proteacidites spp.				X	Х	Х	X	X	Х	Х	Х	X	X	X	CV
Pseudowinterapollis couperi			1.		X										
Pseudowinterapollis cranwellae			<u> </u>									1	X		
Reticuloidosporites escharus ms			T	X	X				X						
Retitriletes spp.			X	X	X	X	X	X				<u> </u>		<u> </u>	
Rhoipites alveolatus				Х	 	 	 	X		· ·					
Ricciaesporites boxatus ms	-		-	Х				 		<u> </u>		· · · · · ·			
Rugulatisporites mallatus			X	X	X		 		X						
Santalumidites cainozoicus						X	X	X	X	X					
Sapotaceoidaepollenites rotundus		†	 	<u> </u>	1	X	1		†	†		t			
Schizocolpus marlinensis		†	 	†	+	-	†	X	<u> </u>	†	<u> </u>	 	 	†	†
Sparganiaceaepollenites barungensis		 	 	X	+	†	 -						†	+	-
Stereisporites antiquisporites		X	 	X	X	X	 	X	X	X	-	 		X	†
Tetracolporites multistrixus ms		 '`	 	 ``	+	+	-	+	 	+	 	 		X	+
Tetracolporites textus ms		 	-		+		-		 		 	+	X	X	+
Tetradopollis securus ms		+	+	 	+	-	+	 	 	+	<u> </u>	-	A	W	+
Trichotomosulcites subgranulatus			1	X		 	X	-		X	 	X	X	X	+
	1	1	1		1	1		1	1				1 1	1 4	1

Sample/Depths (m)	Cts	Cts	Cts	C-1	C-1	C-1	C-1	C-2	C-2	Cts	Cts	Cts	Cts	Cts	Cts
	660	720	747	753	754	758	764	768	772	790	795	800	810	850 870	
Tricolpites simatus						Х	Х			Х					
Tricolporites spp.			X	X	X	X	X	X	X	X	X	X	X		
Tricolporites adelaidensis		X	X	X	X	X		Х							
Tricolporites leuros				X			X	X	X						
Tricolporites lilliei														W	
Tricolporites paenestriatus							X			X					
Tricolporites scabratus					X					X					
Tricolporites sphaerica							Х					X			
Triletes tuberculiformis												X			
Triporopollenites ambiguus						Х	Х								
Tripunctisporis maastrichtiensis				X	X	Х	X	X		X				X	
Verrucatosporites attinatus ms				cf		cf									
Verrucosisporites kopukuensis		Х		Х	X	Х	X	X	X		X				
MICROPLANKTON SPECIES															
Achomosphaera spp.			Х			Х				Х					
Apteodinium australiense										Х	İ	Х			
Batiacasphaera amplectus ms				X		Х	Х								
Batiacasphaera denticulia ms				Х					X						
Cooksonidium capricornum				cf											
Cordosphaeridium inodes						Х									<u> </u>
Corrudinium corrugatum ms				X			Х		x						<u> </u>
Cyclopsiella vieta			Х												
Dapsilidinium pseudocolligerum			X												CV
Deflandrea antarctica			^	X									ļ		LV
Deflandrea heterophlycta			-	X			X		X						
Deflandrea phosphoritica				^	cf		cf		^						
Deflandrea sp. indent.				х	CI		X								
•				^				-	Х			cf			<u> </u>
Diphyes colligerum					cf		cf		cf			CI			
Enneadocysta arcuata				Х	X	X	CI	ļ	X						
Enneadocysta partridgei				^	X			ļ	X				-		
Heteraulacacysta paxilla				v					X						
Hystiocysta variata ms				Х			Х	 		CV	ļ				ļ
Hystrichokolpoma rigaudae			X				1,,			CV					
Hystrichosphaeridium tubiferum	- 1,	,,		17			X			.,,					
Impagidinium spp.	X	Х		Х						Х					
Impagidinium dispertitum					Х		Х		Х						
Impagidinium maculatum			ct												
Impagidinium victorianum				X		X						CV			
Lingulodinium machaerophorum			X						Х	CV					
Lingulodinium solarum			X			X				CV					
Micrhystridium sp.												X			
Nematosphaeropsis rhizoma ms			X												
Operculodinium centrocarpum		X	X	X	X	X	Х	X	X	CV					CV
Operculodinium tabulatum ms			Х												
Paralecaniella indentata				Х	Х	Х	X	Х	X						
Paucilobimorpha inaequalis				Х											
Pentadinium laticinctum			X												
Phthanoperidinium comatum				Х	X	Х	X			Х					
Phthanoperidinium eocenicum					X	Х	Х								
Protoellipsodinium simplex ms.		Х	Х							CV	CV	CV			
Pyxidinopsis pontus ms		Х	Х							CV	CV				
Rhombodinium glabrum			1		Х		Х				T				
Rottnestia borussica			X					<u> </u>							
Samlandia reticulifera			<u> </u>			 	X								
Spinidinium macmurdoense				X	X	 	 -	<u> </u>		cf		l	 		
Spiniferites ramosus		X	X	X	X	X	Х	Х	Х	CV	-			<u> </u>	CV
Stoveracysta sp.			cf	-	<u> </u>	<u> </u>		^		-				<u> </u>	
JUNCTUCATOR OF	1	1	, CI	1	1	1	1	1	l	1	1	1	1	I	i

Table-3: Tertiary Species Distribution in Baleen-2, Gippsland Basin.															
Sample/Depths (m)	Cts	Cts	Cts	C-1	C-1	C-1	C-1	C-2	C-2	Cts	Cts	Cts	Cts	Cts	Cts
	660	720	747	753	754	758	764	768	772	790	795	800	810	850 870	205
Systematophora placacantha			Х												
Tectatodinium marlum ms					X	X				X					
Tectatodinium scabroellipticus ms		cf													
Thalassiphora pelagica						Х	X		X						
Valensiella clathroderma				cf	cf										
Vozzhennikova apertura				X	Х	Х	Х								
Indeterminate Micro-dinoflagellates		X	X	X	Х	X	Х		X	CV					
OTHER PALYNOMORPHS															
Botryococcus braunii				X				X							X
Fungal fruiting bodies				X	Х	Х		X							
Fungal spores & hyphae			Х	X	Х	Х	Х	X	Х	X		X			
Microforaminiferal liners		Х	X	Х			X	X	Х	X	CV	X	Х		CV
Scolecodonts		Х	Х												
ABBREVIATIONS															
X = Present															
W = Reworked															
CV = Caved											ĺ				
cf = Compared with															





APPENDIX 11

BALEEN-2

VSP / GEOGRAM REPORT

-SCHLUMBERGER-

Schlumberger

GeoQuest

Schlumberger Oilfield Australia Pty Limited A.C.N. 003 264 597 Level 4, 150 Albert Road South Melbourne Victoria 3205 Ph: (03) 9696 6266 Fax: (03) 9690 0309

CULTUS PETROLEUM NL WELL SEISMIC PROCESSING REPORT VSP/Geogram

Baleen-2

FIELD: Patricia-Baleen

COUNTRY: AUSTRALIA

COORDINATES: Longitude: 148 24'37.5496" E

: Latitude : 38 01'55.758" S

DATE OF VSP SURVEY: 17 Oct 1999

REFERENCE NO: AMF-561295/561296

INTERVAL: 885-100 MKb

Prepared by:

Yuri Solovyov (Schlumberger Geoquest)

CONTENTS

Intro	duction	-
Data	Acquisition	4
Well	Seismic Edit	5
3.1	Data quality	5
3.2	Transit Time Measurement	5
3.3	Correction to Datum	5
VSP	Processing	6
4.1	Stacking	6
4.2	Spherical Divergence Correction and Bandpass Filter	6
4.3	Velocity Filter	8
4.4	Waveshaping Deconvolution	8
Sonic	c Calibration Processing	9
5.1	Sonic Calibration	9
5.2	Open Hole Logs	10
5.3	Correction to Datum and Velocity Modeling	11
5.4	Sonic Calibration Results	11
Syntl	hetic Seismogram Processing	11
6.1	Depth to Time Conversion	11
6.2	Primary Reflection Coefficients	11
6.3	Primaries with Transmission Loss	12
6.4	Primaries plus Multiples	12
6.5	Multiples Only	12
6.6	Wavelet	12
6.7	Polarity Convention	12
6.8	Convolution	12
	Neta Well 3.1 3.2 3.3 VSP 4.1 4.2 4.3 4.4 Sonic 5.1 5.2 5.3 5.4 Synt 6.1 6.2 6.3 6.4 6.5 6.6 6.7	3.2 Correction to Datum VSP Processing 4.1 Stacking 4.2 Spherical Divergence Correction and Bandpass Filter 4.3 Velocity Filter 4.4 Waveshaping Deconvolution Sonic Calibration Processing 5.1 Sonic Calibration 5.2 Open Hole Logs 5.3 Correction to Datum and Velocity Modeling 5.4 Sonic Calibration Results Synthetic Seismogram Processing 6.1 Depth to Time Conversion 6.2 Primary Reflection Coefficients 6.3 Primaries with Transmission Loss 6.4 Primaries plus Multiples 6.5 Multiples Only 6.6 Wavelet 6.7 Polarity Convention

907960 162

A	Summary	y of Geophysical Listings	13
	A1	Well Seismic Report	13
	A2	Drift & Sonic Adjustment	13
	A3	Velocity Report	14
	A4	Time to Depth Report	15
	A5	Depth to Time Report	15
Li	st of Figur	res	
	1	Amplitude Spectrum	7
	2	Wavelet Polarity Convention	16

1. Introduction

One vertical seismic profile was recorded with the Combinable Seismic Acquisition Tool (CSAT) at the *Baleen-2* well. The survey was run on 17 October 1999.

Processing of the data consisted of performing the VSP processing, sonic calibration and generating a Geogram. This report describes the processing, explains the parameter choices and presents the results.

2. Data Acquisition

The data were acquired in one logging run using the three components Combinable Seismic Acquisition Tool (CSAT). An Air Gun was used as the source. The gun was positioned 6 meters below the sea level. The hydrophone was attached 3 m below the gun. Recording was made on the Schlumberger Maxis 500 Unit using DLIS format.

Table 1. Survey Parameters

Elevation of KB	26 M
Elevation of DF	26 M
Elevation of GL	-55 M
Energy Source	Airgun
Source Offset	40 M
Source Depth	6 M below Sea Level
Reference Sensor	Hydrophone
Hydrophone Offset	40 M
Hydrophone Depth	9 M below Sea Level
Source & Hyd. Azimuth	40 Degr.
Tool Type	CSAT
Tool Combination	GAC geophone
De-coupled Geophones	Yes
Shaker Fitted	Yes
Number of Axis	3
Geophone Type	GAC
Frequency Response (GAC)	3-200 Hz
q, ()	3 200 112
Sampling Rate	1 ms.
Recording Time	3.0 sec.
Acquisition Unit	MAXIS
Recording Format	DLIS

3. Well Seismic Edit

Each shot of the raw geophone data was evaluated and edited as necessary. The hydrophone data were also evaluated for signature changes and timing shifts.

The good shots at each level were stacked, using a median stacking technique, to increase the signal to noise ratio of the data. The transit time of each trace was re-computed after stacking.

3.1 Data Quality

The overall quality of the data is good. Some tube wave noise was present in raw data. It was effectively reduced after velocity filtering.

3.2 Transit Time Measurement

The transit time measured, Delta t, corresponds to a difference between arrivals recorded by surface and downhole sensors. The reference time (zero time) is the physical recording of the source signal by accelerometers on the gun or sensors positioned near the source. In this case, a hydrophone positioned 3 m below the gun was used as the reference. First break picking algorithms were used on both the hydrophone and the geophone.

3.3 Correction to Datum

Seismic Reference Datum (SRD) is at Mean Sea Level.

The source was positioned 6 meters below the sea level. A hydrophone was located 3 meter below airgun. A static correction of 5.9 msec (OWT) was thus applied to all data to correct it to SRD.

4. VSP Processing

The vertical component of the VSP data was processed using the conventional zero offset vertical incidence processing chain. The following subsections describe the main aspects of the processing chain the final VSP data set.

- load data
- edit bad records and sort raw VSP traces
- Z component median stack
- peak break time
- bandpass filter: 5-140 HZ
- time varying gain: (T0/T1)exp1
- static shifting to SRD: 0.0059 S
- wavefield separation (mean filter, 9 levels, 1 sample)
- waveshaping deconvolution (decon operator created by filtered unit impulse, 5-80 HZ,
- filter length: 2.5 S)
- upgoing wavefield enhancement (median filter, 7 levels, 1 sample)
- corridor stack: 0.2 S window, (all traces except the deepest 5)

4.1 Stacking

After reordering and selecting the raw shots, a median stack was performed on the vertical component data. In this method of stacking, at each sample time, the amplitudes of the input traces are read and sorted in ascending order. The output is the median amplitude value from this ordering. If an even number of traces are input, the first is dropped and a median calculated. Then the last is dropped and another median found. The final output is the average of these two median values. The surface sensor (hydrophone) breaks are used as the zero time for stacking. The break time of each trace is recomputed after stacking.

The data quality is good with. The Amplitude Spectrum of vertical component for each stacked level is presented in Figure 1.

4.2 Spherical Divergence Correction and Bandpass Filter

A bandpass filter of 5-140 hertz bandwidth was applied and time varying gain function of the exponential form :

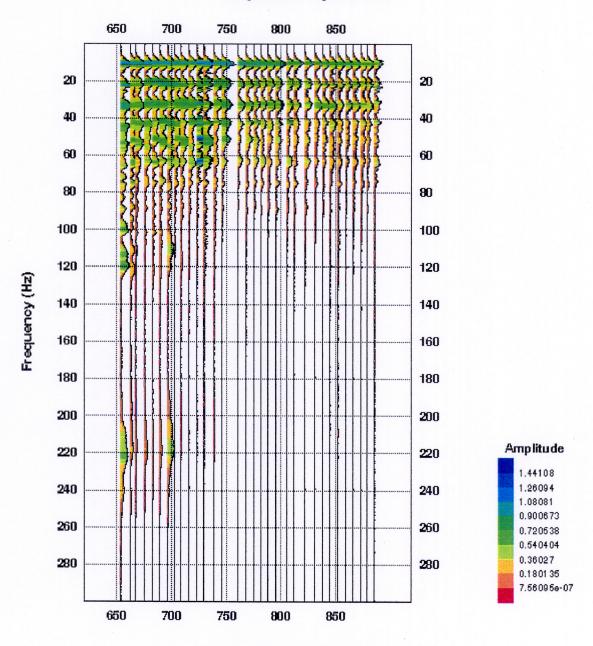
$$Gain(T) = \left(\frac{T}{T_0}\right)^{\alpha}$$

where T is the recorded time, T_0 is the first break time and a = 1

Trace equalization was applied by normalizing the RMS amplitude of the first break to correct for transmission losses of the direct wave. A normalization window of 100 millisecs was used. Static shifting to SRD= - 0.0059 s was applied to Z component stacked data. Stacked Z component data presented in Plot1.

Figure 1. Amplitude Spectrum

Amplitude Spectrum



RECEIVER_POSITION_Z (m)

4.3 Velocity filter

The downgoing coherent energy is estimated using nine levels mean velocity filter. The filter array is moved down one level after each computation and the process is repeated level by level over the entire dataset. As a result, the deepest and shallowest levels are lost because of edge effects.

The residual wavefield is obtained by subtracting the downgoing coherent energy from the total wavefield. The residual wavefield is dominated by reflected compressional events (Plot 3).

The downoing wavefield is displayed in one way time (Plot 2).

4.4 Waveshaping Deconvolution

The Waveshaping deconvolution operator is a double sided operator and is designed trace by trace opening 20 ms before the first break with a window length of 1 S. The desired outputs were chosen to be zero phase with a band width of 5-80 Hz. Once the design is made upon the downgoing wavefield, it is applied to the downgoing and subtracted wavefield at the same level. The upgoing compressional wavefield is enhanced in an exactly analogous manner to before.

The trace by trace deconvolution is applied in order to collapse the multiple sequence of shear arrivals, diffractions or out of plane reflections. The result of Waveshaping deconvolution on the upgoing wavefield, enhanced by 7 level median filter is shown in Plot 5.

The downoing wavefield is displayed in one way time (Plot 4).

A corridor stack was computed on the Waveshaping deconvolution output by defining a constant 200 ms timing window along the time depth curve and stacking the data onto a single trace. All traces were used except the deepest 5 traces. This trace under normal circumstances should satisfy the assumption of one dimensionality and provide the best seismic representation of the borehole. This is displayed in Plot 6 (Normal Polarity) and Plot 7 (Reversed Polarity).

5. Sonic Calibration Processing

5.1 Sonic Calibration

A 'drift' curve is obtained using the sonic log and the vertical check level times. The term 'drift' is defined as the seismic time (from check shots) minus the sonic time (from integration of edited sonic). Commonly the word 'drift' is used to identify the above difference, or to identify the gradient of drift versus increasing depth, or to identify a difference of drift between two levels.

The gradient of drift, that is the slope of the drift curve, can be negative or positive.

For a negative drift (Δ drift/ Δ depth < 0) the sonic time is greater than the seismic time over a certain section of the log.

For a positive drift (Δ drift/ Δ depth > 0), the sonic time is less than the seismic time over a certain section of the log.

The drift curve, between two levels, is then an indication of the error on the integrated sonic or an indication of the amount of correction required on the sonic to have the TTI of the corrected sonic match the check shot times.

Two methods of correction to the sonic log are used.

- 1. Uniform or block shift. This method applies a uniform correction to all the sonic values over the interval. This uniform correction is applied in the case of positive drift and is the average correction represented by the drift curve gradient expressed in µsec/ft.
- 2. ΔT Minimum. In the case of negative drift a second method is used, called Δ minimum. This applies a differential correction to the sonic log, where it is assumed that the greatest amount of transit time error is caused by the lower velocity sections of the log. Over a given interval the method will correct only Δt values which are higher than a threshold, the Δt_{min} . Values of Δt which are lower than the threshold are not corrected. The correction is a reduction of the excess of Δt over Δt_{min} , Δt Δt_{min} .

 Δt - Δt_{min} is reduced through multiplication by a reduction coefficient which remains constant over the interval. This reduction coefficient, named G, can be defined as:

$$G = 1 + ----- (\Delta t - \Delta t_{min})dZ$$

Where drift is the drift over the interval to be corrected and the value $(\Delta t - \Delta t_{min})dZ$ is the time difference between the integrals of the two curves Δt and Δt_{min} . only over the intervals where $\Delta t > \Delta t_{min}$.

Hence the corrected sonic: $\Delta t = G(\Delta t - \Delta t_{min}) + \Delta t_{min}$.

5.2 Open Hole Logs

The DTCO curve after STC processing (see Plots 6,7) was used for a drift computation.

The density log has been edited to take into account bad hole condition and extended from 628 mSRD to mean sea level, using constant value of 2.0 g/cm3.

The gamma ray, induction resistivity, neutron porosity and caliper logs are included as correlation curves.

5.3 Correction to Datum and Velocity Modeling

The sonic calibration processing has been referenced to mean sea level which the seismic reference datum. Static corrections are applied to correct for source offset and source depth.

5.4 Sonic Calibration Results

The top of the sonic log (628 meters below SRD) is chosen as the origin for the calibration drift curve.

The drift curve is the correction imposed upon the sonic log. The adjusted sonic curve is considered to be the best result using the available data. A list of shifts used on the sonic data is given in A2 Listing.

Raw sonic log, adjusted sonic log and integrated raw and adjusted travel times are displayed in Plot 8 - Drift Corrected Sonic.

Velocity Crossplot is presented in Plot 9.

6. Synthetic Seismogram Processing

GEOGRAM plots were generated using 40, 50 and 60 HZ -90deg 0 Phase Ricker Wavelets.

The presentations include both normal and reversed polarity on a time scale of 20 cm/sec (Plots 6,7).

GEOGRAM processing produces synthetic seismic traces based on reflection coefficients generated form sonic and density measurements in the well-bore. The steps in the processing chain are the following:

- Depth to time conversion
- Reflection coefficient generation
- Attenuation coefficient calculation
- Convolution
- Output

6.1 Depth to Time Conversion

Open hole logs are recorded from the bottom to top with a depth index. This data is converted to a two-way time index.

6.2 Primary Reflection Coefficients

Sonic and density data are averaged over chosen time intervals (normally 2 or 4 millisecs). Reflection coefficients are then computed using:

where:

 r_1 = density of the layer above the reflection interface

 r_2 = density of the layer below the reflection interface

 v_1 = compressional wave velocity of the layer above the reflection interface

v2 = compressional wave velocity of the layer below the reflection interface

This computation is done for each time interval to generate a set of primary reflection coefficients without transmission losses.

6.3 Primaries with Transmission Loss

Transmission loss on two-way attenuation coefficients is computed using:

$$A_n = (1 - R_1^2).(1 - R_2^2).(1 - R_3^2)...(1 - R_n^2)$$

A set of primary reflection coefficients with transmission loss is generated using:

$$Primary_n = R_n.A_{n-1}$$

6.4 Primaries plus Multiples

Multiples are computed from these input reflection coefficients using the transform technique from the top of the well to obtain the impulse response of the earth. The transform outputs primaries plus multiples.

6.5 Multiples Only

By subtracting previously calculated primaries form the above result we obtain multiples only.

6.6 Wavelet

A theoretical wavelet is chosen to use for convolution with the reflection coefficients previously generated. Choices available include:

Klauder wavelet Ricker zero phase wavelet Ricker minimum phase wavelet Butterworth wavelet User defined wavelet

Time variant Butterworth filtering can be applied after convolution.

6.7 Polarity Convention

An increase in acoustic impedance gives a positive reflection coefficient, is written to tape as a negative number and is displayed as a white trough under normal polarity. Polarity conventions are displayed in figure 2.

6.8 Convolution

The standard procedure of convolving the wavelet with reflection coefficients; the output is the synthetic seismogram.

A Summary of Geophysical Listings

Five geophysical data listings are appended to this report. Following is a brief description of the format of each listing.

A1 Check Shot Data

- 1. Level number: the level number starting from the top level (includes any imposed shots).
- 2. Vertical depth form SRD: dsrd, the depth in metres from seismic reference datum.
- 3. Measured depth from KB: dkb, the depth in metres from kelly bushing.
- 4. Observed travel time HYD to GEO: *tim*0, the transit time picked form the stacked data by subtracting the surface sensor first break time from the downhole sensor first break time.
- 5. Vertical travel time SRD to GEO: *shtm*, is *timv* corrected for the vertical distance between source and datum.
- 6. Delta depth between shots: $\Delta depth$, the vertical distance between each level.
- 7. Delta time between shots: $\Delta time$, the difference in vertical travel time (*shtm*), between each level.
- 8. Interval velocity between shots: the average seismic velocity between each level, $\Delta depth/\Delta time$
- 9. Average velocity SRD to GEO: the average seismic velocity from datum to the corresponding checkshot level, dsrd shtm

A2 Drift & Sonic Adjustment

Zone Set Data

- 1. Knee number: the knee number starting from the highest knee. (The first knees listed will generally be at SRD and the top of sonic. The drift imposed at these knees will normally be zero.)
- 2. Measured depth from KB: the depth in metres from kelly bushing
- 3. Vertical depth from SRD: the depth in metres from seismic reference datum.
- 4. Selected Drift at knee: the value of drift imposed at each knee.
- 5. Shift: the change in drift divided by the change in depth between any two levels.
- 6. Delta-T: see section 4 of report for an explanation of Δ t_{min}.

- 7. Reuction factor G: see section 4 of report.
- 8. Selected Drift Gradient: the gradient of the imposed drift curve.

Sonic Adjustment Data

- 1. Measured depth from KB: the depth in metres from kelly bushing
- 2. Vertical depth from SRD: the depth in metres from seismic reference datum.
- 3. Vertical shot time SRD to GEO: the calculated vertical travel time from datum to downhole geophone.
- 4. Adjusted Sonic Time.
- 5. Computed drift at level: the checkshot time minus the integrated raw sonic time.
- 6. Residual Shot Time Adjusted Sonic Time.
- 7. Adjusted Interval Velocity.
- 8. Adjusted RMS Velocity.
- 9. Adjusted Average Velocity.

A3 Velocity Report

The data in this listing has been resampled in time.

- 1. Two way travel time from SRD: this is the index for the data in this listing. The first value is at SRD (0 millisecs) and the sampling rate is 2 millisecs.
- 2. Measured depth from KB: the depth from KB at each corresponding value of two way time.
- 3. Vertical depth from SRD: the vertical depth from SRD at each corresponding value of two way time.
- 4. Average velocity SRD to GEO: the vertical depth from SRD divided by half the two way time.
- 5. RMS velocity: the root mean square velocity from datum to the corresponding value of two way time.

$$\mathbf{v}_{rms} = \sqrt{s_1}^n \mathbf{v_i}^2 \mathbf{t_i} / s^n_1 \mathbf{t_i}$$

where v_i is the velocity between each 2 millisecs interval.

6. Interval velocity: the velocity between each sampled depth. Typically, the sampling rate is 2 millisecs two way time, (1 millisec one way time) therefore the interval velocity will be equal to the depth increment divided by 0.002. It is equivalent to column 9 from the Velocity Report.

A4 Time to Depth

- 1. Two Way Sonic Time from SRD
- 2-11. Depth at Time 0-9 ms: moveout times every 1 ms

A5 Depth to Time Report

- 1. Vertical Depth from SRD
- 2-11. Two Way Travel Time 0-27 m: moveout depths every 3 m.

Schlumberger GeoQuest

VSP PLOTS

- Plot 1 Z Median Stack
- Plot 2 Downgoing Wavefield after VELF
- Plot 3 Upgoing Wavefield after VELF
- Plot 4 Downgoing Wavefield after WSF
- Plot 5 Upgoing Wavefield after WSF
- Plot 6 Composite Display normal polarity 20 cm/sec
- Plot 7 Composite Display reversed polarity 20 cm/sec

GEOGRAM PLOTS

907960 175

- Plot 8 Drift Corrected Sonic
- Plot 9 Velocity Crossplot

GEOGRAM+ Well Seismic Report

Schlumberger

DATE 11/4/99

Client and Well Information

Country

AUSTRALIA

State

VICTORIA

Logging Date

16-OCT-1999

Company

Field

WILDCAT

Well

BALEEN 2

Check Shot Data

LEVEL NUMBER	VERTICAL DEPTH FROM SRD	MEASURED DEPTH FROM KB	OBSERVED TRAVEL TIME (owt)	Vertical Transit Time-SRD (owt)	DELTA DEPTH	DELTA TIME	SEISMIC INTERVAL VELOCITY	SEISMIC AVERAGE VELOCITY
	m skD	m	s	s	m	s	m/s	m/s
1	0.0			0.0000				
							1573	
2	74.0	100.0	0.0480	0.0470				1573
					50.0	0.0268	1863	
3	124.0	150.0	0.0719	0.0739				1678
<u> </u>	:				50.0	0.0264	1893	
4	174.0	200.0	0.0971	0.1003				1735
					50.0	0.0232	2155	
5	224.0	250.0	0.1196	0.1235				1814
					50.0	0.0218	2298	
6	274.0	300.0	0.1409	0.1452				1886
			: .		50.0	0.0233	2149	
7	324.0	350.0	0.1639	0.1685				1923
			·		50.0	0.0228	2191	
8	374.0	400.0	0.1865	0.1913				1955
}					50.0	0.0236	2122	

Schlumberger

GEOGRAM+

Well Seismic Report

Check Shot Data (Continued)

LEVEL NUMBER	VERTICAL DEPTH FROM SRD	MEASURED DEPTH FROM KB	OBSERVED TRAVEL TIME (owt)	Vertical Transit Time-SRD (owt)	DELTA DEPTH	DELTA TIME	SEISMIC INTERVAL VELOCITY	SEISMIC AVERAGE VELOCITY
	m	m	S	S	m	s	m/s	m/s
9	424.0	450.0	0.2100	0.2149				1973
					50.0	0.0228	2197	
10	474.0	500.0	0.2326	0.2377				1994
1.0					50.0	0.0220	2270	
11	524.0	550.0	0.2545	0.2597				2018
					50.0	0.0212	2359	-
12	574.0	600.0	0.2757	0.2809				2044
J					54.0	0.0227	2377	
13	628.0	654.0	0.2983	0.3036				2068
					9.0	0.0040	2226	
14	637.0	663.0	0.3024	0.3076				2071
					5.0	0.0020	2522	
15	642.0	668.0	0.3043	0.3096				2073
					8.0	0.0032	2491	
16	650.0	676.0	0.3075	0.3128			5	2078
					7.0	0.0029	2399	
17	657.0	683.0	0.3104	0.3158				2081
					7.0	0.0030	2301	
18	664.0	690.0	0.3135	0.3188				2083
					7.0	0.0035	1988	
19	671.0	697.0	0.3170	0.3223				2082
					6.0	0.0027	2250	
20	677.0	703.0	0.3197	0.3250				2083
					6.0	0.0029	2084	
21	683.0	709.0	0.3225	0.3279				2083

Schlumberger

GEOGRAM+

Well Seismic Report

Check Shot Data (Continued)

LEVEL NUMBER	VERTICAL DEPTH FROM SRD	MEASURED DEPTH FROM KB	OBSERVED TRAVEL TIME (owt)	Vertical Transit Time-SRD (owt)	DELTA DEPTH	DELTA TIME	SEISMIC INTERVAL VELOCITY	SEISMIC AVERAGE VELOCITY
	m	m	s	S	m	s	m/s	m/s
					7.0	0.0032	2168	
22	690.0	716.0	0.3258	0.3311				2084
					7.0	0.0037	1913	
23	697.0	723.0	0.3294	0.3348				2082
					7.0	0.0029	2439	
24	704.0	730.0	0.3323	0.3376				2085
					9.0	0.0040	2262	
25	713.0	739.0	0.3362	0.3416				2087
					7.0	0.0030	2341	
26	720.0	746.0	0.3392	0.3446				2089
					14.0	0.0067	2082	
27	734.0	760.0	0.3459	0.3513				2089
					8.0	0.0031	2584	
28	742.0	768.0	0.3490	0.3544				2094
	:				7.0	0.0029	2447	
29	749.0	775.0	0.3519	0.3573				2096
					6.0	0.0024	2522	gi eri
30	755.0	781.0	0.3543	0.3597				2099
					7.0	0.0029	2413	
31	762.0	788.0	0.3572	0.3626				2102
					7.0	0.0028	2534	
32	769.0	795.0	0.3599	0.3653				2105
					10.0	0.0041	2469	
33	779.0	805.0	0.3640	0.3694				2109
					7.0	0.0029	2449	

GEOGRAM+

Schlumberger

Well Seismic Report

Check Shot Data (Continued)

LEVEL NUMBER	VERTICAL DEPTH FROM SRD	MEASURED DEPTH FROM KB	OBSERVED TRAVEL TIME (owt)	Vertical Transit Time-SRD (owt)	DELTA DEPTH	DELTA TIME	SEISMIC INTERVAL VELOCITY	SEISMIC AVERAGE VELOCITY
	m	m	s	S	m	S	m/s	m/s
34	786.0	812.0	0.3668	0.3722				2112
					10.0	0.0036	2796	
35	796.0	822.0	0.3704	0.3758				2118
					9.0	0.0032	2797	
36	805.0	831.0	0.3736	0.3790				2124
					7.0	0.0024	2922	
37	812.0	838.0	0.3760	0.3814				2129
					7.0	0.0027	2553	
38	819.0	845.0	0.3787	0.3842				2132
					7.0	0.0025	2799	
39	826.0	852.0	0.3812	0.3867				2136
	-				7.0	0.0024	2864	
40	833.0	859.0	0.3836	0.3891				2141
					7.0	0.0023	3092	
41	840.0	866.0	0.3859	0.3914				2146
					7.0	0.0025	2807	
42	847.0	873.0	0.3884	0.3939				2151
					5.0	0.0019	2654	
43	852.0	878.0	0.3903	0.3957				2153
					7.0	0.0030	2326	
44	859.0	885.0	0.3933	0.3988				2154
								2

GEOGRAM+ Drift & Sonic Adjustment

DATE 11/4/99

Schlumberger

Client and Well Information

Country

AUSTRALIA

State

VICTORIA

Logging Date

16-OCT-1999

Company

Field Well **WILDCAT**

BALEEN 2

Knee and Zone Data

Raw Drift is computed at each shot level as

Shot Time - Sonic Time

From the raw drift curve, knees are selected. Knee depths define the zones for adjustment. Selected drift values define the amount of time adjustment to the sonic log in each zone.

When the gradient versus depth of the selected drift is POSITIVE, sonic velocities are deemed too fast. Sonic transit times are increased by a constant shift, the value of the selected drift gradient:

Adjusted DT = DT + Shift

Then the gradient is NEGATIVE, sonic velocities are deemed too low. The excess sonic transit time over a threshold DT_Minimum is reduced by a constant reduction factor, G:

When DT < DT Minimum

Adjusted DT = DT

When DT > DT_Minimum

Adjusted $DT = G *(DT - DT_Minimum) +$

DT_Minimum

AFTER THE ADJUSTMENT OF THE SONIC LOG:

Residual is computed at each shot level as

Shot Time - Adjusted Sonic Time

indicates how closely the adjustment has followed the shot times

GEOGRAM+ Drift & Sonic Adjustment

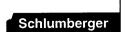
Schlumberger

Zone Set Data

KNEE NUMBER	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	SELECTED DRIFT AT KNEE ms	SHIFT us/ft	DELTA_T MINIMUM us/ft	REDUCTION FACTOR G	SELECTED DRIFT GRADIENT us/ft
1	653.7	627.7	-0.0001				
				7.2			7.2
2	723.6	697.6	0.0015				
					128.4	0.99	-0.1
3	761.4	735.4	0.0015				
				2.6			2.6
4	791.8	765.8	0.0018				
				0.9			0.9
5	814.2	788.2	0.0019				
				0.1			0.1
6	863.8	837.8	0.0019				
				2.8			2.8
7	879.2	853.2	0.0020				
				66.5			66.5
8		860.6	0.0036				

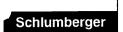
Sonic Adjustment Data

MEASURE D DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	VERTICAL SHOT TIME ms	ADJUSTED SONIC TIME ms	DRIFT	SHOT -	INTERVAL	RMS	ADJUSTED AVERAGE VELOCITY m/s
	0.0	0.0	0.0					



Drift & Sonic Adjustment

MEASURE D DEPTH FROM KB	VERTICAL DEPTH FROM SRD	VERTICAL SHOT TIME	ADJUSTED SONIC TIME	RAW DRIFT SHOT - SONIC	SHOT -	INTERVAL	ADJUSTED RMS VELOCITY	AVERAGE
m	m	ms	ms	ms	ms	m/s	m/s	m/s
						1573		
100.0	74.0	47.0	47.0				1573	1573
						1573		
150.0	124.0	73.9	73.9				1684	1678
						1863		
200.0	174.0	100.3	100.3				1741	1735
						1893		
250.0	224.0	123.5	123.5				1826	1814
						2298		e ja jake ja
300.0	274.0	145.2	145.2				1904	1886
						2149		
350.0	324.0	168.5	168.5				1940	1923
						2190		
400.0	374.0	191.3	191.3				1972	1955
						2190		
450.0	424.0	214.9	214.9				1989	1973
						2122		
500.0	474.0	237.7	237.7				2010	1994
						2197		
550.0	524.0	259.7	259.7				2033	2018
						2270		
600.0	574.0	280.9	280.9				2059	2043
				·		2378		
654.0	628.0	303.6	303.6	0.0	0.0		2085	2068
11.14.44.4				·	·	2041		



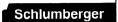
Drift & Sonic Adjustment

MEASURE D DEPTH FROM KB	VERTICAL DEPTH FROM SRD	VERTICAL SHOT TIME	ADJUSTED SONIC TIME	RAW DRIFT SHOT - SONIC	SHOT -	INTERVAL	RMS	ADJUSTED AVERAGE VELOCITY
m	m	ms	ms	ms	ms	m/s	m/s	m/s
663.0	637.0	307.6	307.6	0.3	0.1		2088	2071
						2226		
668.0	642.0	309.6	309.5	0.4	0.1		2091	2074
						2535		
676.0	650.0	312.8	312.8	0.6	0.0		2095	2078
						2223		
683.0	657.0	315.8	315.8	0.6	-0.1		2098	2080
						2205		
690.0	664.0	318.8	319.0	0.7	-0.2		2099	2082
						2029		
697.0	671.0	322.3	322.3	1.0	0.0		2099	2082
						1908		
703.0	677.0	325.0	325.3	0.9	-0.3		2098	2081
						2131		
709.0	683.0	327.9	328.1	1.1	-0.2		2099	2082
						2056		
716.0	690.0	331.1	331.4	1.1	-0.3		2099	2082
						2140		
723.0	697.0	334.8	334.8	1.6	-0.1		2098	2082
						2032		
730.0	704.0	337.6	337.9	1.4	-0.3		2100	2084
						2479		
739.0	713.0	341.6	341.7	1.5	-0.1		2103	2087
						2274		
746.0	720.0	344.6	344.6	1.6	-0.0		2106	2089

Schlumberger

Drift & Sonic Adjustment

MEASURE D DEPTH FROM KB	VERTICAL DEPTH FROM SRD	VERTICAL SHOT TIME	ADJUSTED SONIC TIME	RAW DRIFT SHOT - SONIC	SHOT -	INTERVAL	_	ADJUSTED AVERAGE VELOCITY
m	m	ms	ms	ms	ms	m/s	m/s	m/s
						2453		
760.0	734.0	351.3	351.4	1.5	-0.1		2105	2089
					·	2294		
768.0	742.0	354.4	354.5	1.6	-0.1		2110	2093
1						2390		
775.0	749.0	357.3	357.3	1.7	-0.1		2113	2096
						2451		
781.0	755.0	359.7	359.8	1.7	-0.1		2116	2098
						2485		
788.0	762.0	362.6	362.6	1.8	-0.1		2119	2101
						2503		
795.0	769.0	365.3	365.4	1.8	-0.1		2122	2104
						2349		
805.0	779.0	369.4	369.5	1.8	-0.2		2126	2108
						2413		
812.0	786.0	372.2	372.3	1.9	-0.1		2129	2111
						2673		
822.0	796.0	375.8	375.9	1.8	-0.1		2136	2118
						2616		
831.0	805.0	379.0	379.4	1.6	-0.4		2141	2122
						3046		
838.0	812.0	381.4	381.7	1.7	-0.3		2148	2127
				·		3060		
845.0	819.0	384.2	384.2	1.9	-0.0		2152	2132
						2614		



Drift & Sonic Adjustment

MEASURE D DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	VERTICAL SHOT TIME ms	ADJUSTED SONIC TIME ms	RAW DRIFT SHOT - SONIC ms	SHOT -	INTERVAL	RMS	ADJUSTED AVERAGE VELOCITY m/s
852.0	826.0	386.7	386.7	1.9	-0.1		2157	2136
						2802		
859.0	833.0	389.1	389.2	1.9	-0.1		2162	2140
						3190		
866.0	840.0	391.4	391.5	1.9	-0.1		2168	2146
		1,0				3128		
873.0	847.0	393.9	394.0	1.9	-0.2		2173	2150
						2238		
878.0	852.0	395.7	396.2	1.7	-0.4		2174	2151
[2566		
885.0	859.0	398.8	397.5	3.6	1.2			2161

GEOGRAM+ Time To Depth Report

Schlumberger

DATE 11/4/99

Client and Well Information

Country

AUSTRALIA

State

VICTORIA

Logging Date

16-OCT-1999

Company

Field

WILDCAT

Well

BALEEN 2

Time To Depth Data

TWO WAY SONIC TIME	DEPTH AT TIME									
FROM SRD	+0 ms	+1 ms	+2 ms	+3 ms	+4 ms	+5 ms	+6 ms	+7 ms	+8 ms	+9 ms
ms	m	m	m	m	m	m	m	m	m	m
0	0.0	0.8	1.5	2.3	3.2	4.0	4.7	5.5	6.2	7.0
10	7.9	8.7	9.4	10.2	11.0	11.7	12.6	13.4	14.2	14.9
20	15.7	16.5	17.4	18.1	18.9	19.7	20.4	21.2	22.1	22.9
30	23.6	24.4	25.1	25.9	26.8	27.6	28.3	29.1	29.9	30.6
40	31.4	32.3	33.1	33.8	34.6	35.4	36.1	37.0	37.8	38.6
50	39.3	40.1	40.8	41.8	42.5	43.3	44.0	44.8	45.6	46.5
60	47.2	48.0	48.8	49.5	50.3	51.2	52.0	52.7	53.5	54.3
70	55.0	55.8	56.7	57.5	58.2	59.0	59.7	60.5	61.4	62.2
80	62.9	63.7	64.5	65.2	66.1	66.9	67.7	68.4	69.2	70.0
90	70.9	71.6	72.4	73.2	73.9	74.8	75.7	76.7	77.7	78.6
100	79.6	80.5	81.4	82.3	83.2	84.1	85.0	86.1	87.0	87.9
110	88.8	89.8	90.7	91.6	92.5	93.4	94.5	95.4	96.3	97.2
120	98.1	99.1	100.0	100.9	101.8	102.9	103.8	104.7	105.6	106.5
130	107.4	108.4	109.3	110.2	111.3	112.2	113.1	114.0	114.9	115.8
140	116.7	117.7	118.6	119.6	120.5	121.5	122.4	123.3	124.2	125.1

Schlumberger

GEOGRAM+ Time To Depth Report

Time To Depth Data (Continued)

TWO WAY SONIC TIME	DEPTH AT TIME									
FROM SRD	+0 ms	+1 ms	+2 ms	+3 ms	+4 ms	+5 ms	+6 ms	+7 ms	+8 ms	+9 ms
ms	m	m	m	m	m	m	m	m	m	m
150	126.2	127.1	128.0	128.9	129.8	130.9	131.8	132.7	133.7	134.6
160	135.6	136.6	137.5	138.4	139.3	140.4	141.3	142.2	143.1	144.0
170	145.1	146.0	146.9	147.8	148.9	149.8	150.7	151.6	152.6	153.6
180	154.5	155.4	156.4	157.3	158.3	159.3	160.2	161.1	162.0	163.1
190	164.0	164.9	165.8	166.9	167.8	168.7	169.6	170.5	171.6	172.5
200	173.4	174.5	175.6	176.6	177.7	178.8	179.8	180.9	182.0	183.0
210	184.1	185.2	186.2	187.3	188.4	189.6	190.7	191.7	192.8	193.9
220	194.9	196.0	197.1	198.1	199.2	200.3	201.3	202.4	203.5	204.7
230	205.7	206.8	207.9	208.9	210.0	211.1	212.1	213.2	214.3	215.3
240	216.4	217.5	218.5	219.8	220.8	221.9	223.0	224.0	225.1	226.3
250	227.4	228.6	229.7	230.9	232.1	233.2	234.4	235.5	236.7	237.7
260	239.0	240.0	241.2	242.3	243.5	244.8	245.8	247.0	248.1	249.3
270	250.4	251.6	252.7	253.9	255.0	256.2	257.3	258.5	259.7	260.8
280	262.0	263.0	264.3	265.3	266.5	267.6	268.8	269.9	271.1	272.2
290	273.4	274.5	275.5	276.6	277.7	278.7	280.0	281.0	282.1	283.2
300	284.2	285.3	286.4	287.4	288.5	289.6	290.6	291.7	292.8	293.8
310	294.9	296.0	297.0	298.1	299.2	300.4	301.4	302.5	303.6	304.6
320	305.7	306.8	307.8	308.9	310.0	311.0	312.1	313.2	314.2	315.3
330	316.4	317.4	318.5	319.6	320.6	321.9	322.9	324.0	325.1	326.1
340	327.2	328.3	329.5	330.6	331.6	332.7	333.8	334.8	336.0	337.1
350	338.2	339.2	340.3	341.5	342.6	343.7	344.7	345.8	347.0	348.1
360	349.1	350.2	351.3	352.3	353.6	354.6	355.7	356.8	357.8	359.1
370	360.1	361.2	362.3	363.3	364.5	365.6	366.7	367.7	368.8	369.9
380	371.1	372.2	373.2	374.3	375.4	376.4	377.5	378.6	379.6	380.7

Schlumberger

Time To Depth Report

Time To Depth Data (Continued)

TWO WAY SONIC	DEPTH AT TIME									
TIME FROM	+0 ms	+1 ms	+2 ms	+3 ms	+4 ms	+5 ms	+6 ms	+7 ms	+8 ms	+9 ms
SRD ms	m	m	m	m	m	m	m	m	m	m
390	381.8	382.8	383.9	385.0	386.0	387.1	388.2	389.2	390.3	391.4
400	392.4	393.3	394.4	395.5	396.5	397.6	398.7	399.7	400.8	401.9
410	402.9	404.0	405.1	406.1	407.2	408.3	409.3	410.4	411.5	412.5
420	413.6	414.7	415.7	416.8	417.9	418.9	420.0	421.1	422.0	423.1
430	424.1	425.3	426.4	427.5	428.5	429.6	430.8	431.9	433.0	434.0
440	435.1	436.3	437.4	438.5	439.5	440.7	441.8	442.9	443.9	445.0
450	446.2	447.3	448.4	449.4	450.5	451.7	452.8	453.8	454.9	456.0
460	457.2	458.3	459.3	460.4	461.5	462.7	463.8	464.8	465.9	467.1
470	468.2	469.2	470.3	471.4	472.6	473.7	474.7	475.9	477.0	478.1
480	479.3	480.4	481.6	482.7	483.9	484.9	486.2	487.2	488.3	489.5
490	490.6	491.8	492.9	494.1	495.1	496.4	497.4	498.5	499.7	500.8
500	502.0	503.1	504.3	505.4	506.6	507.6	508.9	509.9	511.0	512.2
510	513.3	514.5	515.6	516.8	517.9	519.1	520.1	521.2	522.4	523.5
520	524.7	525.9	527.0	528.2	529.4	530.7	531.7	532.9	534.2	535.4
530	536.4	537.7	538.9	540.1	541.2	542.4	543.6	544.7	545.9	547.1
540	548.3	549.4	550.6	551.8	553.1	554.1	555.3	556.6	557.8	558.9
550	560.1	561.3	562.5	563.6	564.8	566.0	567.2	568.3	569.5	570.7
560	571.8	573.0	574.2	575.5	576.7	577.7	579.0	580.2	581.4	582.6
570	583.7	584.9	586.1	587.3	588.6	589.6	590.9	592.1	593.3	594.5
580	595.6	596.8	598.0	599.2	600.5	601.5	602.7	604.0	605.2	606.4
590	607.5	608.7	609.9	611.1	612.3	613.4	614.6	615.8	617.1	618.3
600	619.4	620.6	621.8	623.0	624.2	625.3	626.5	627.7	628.8	629.9
610	631.1	632.3	633.5	634.4	635.5	636.9	638.1	639.5	640.7	641.9
620	643.1	644.2	645.3	646.8	648.0	649.4	650.4	651.7	652.9	653.9

Schlumberger

GEOGRAM+ Time To Depth Report

Time To Depth Data (Continued)

TWO WAY SONIC TIME	DEPTH AT TIME									
FROM SRD	+0 ms	+1 ms	+2 ms	+3 ms	+4 ms	+5 ms	+6 ms	+7 ms	+8 ms	+9 ms
ms	m	m	m	m	m	m	m	m	m	m
630	655.0	656.2	657.3	658.4	659.4	660.7	661.7	663.1	664.2	665.1
640	666.1	667.2	668.3	669.3	670.4	671.3	672.2	673.3	674.4	675.3
650	676.4	677.4	678.5	679.6	680.6	681.7	682.9	684.0	685.0	686.0
660	687.0	688.1	689.0	690.2	691.3	692.4	693.4	694.3	695.4	696.3
670	697.4	698.4	699.5	700.7	701.8	703.0	704.2	705.5	706.7	707.9
680	709.1	710.2	711.4	712.5	713.7	714.8	716.0	717.2	718.4	719.6
690	720.9	722.1	723.0	724.1	725.0	726.0	727.1	728.2	729.1	730.0
700	731.1	732.0	733.0	734.1	735.3	736.5	737.9	739.3	740.5	742.0
710	743.3	744.5	745.7	746.9	748.1	749.4	750.6	751.8	753.0	754.2
720	755.4	756.8	758.0	759.3	760.5	761.7	762.9	764.1	765.4	766.7
730	767.9	769.2	770.4	771.6	772.8	774.0	775.1	776.5	777.7	778.9
740	780.1	781.2	782.6	783.8	785.2	786.5	787.8	789.3	790.7	792.0
750	793.5	794.9	796.1	797.5	798.7	800.1	801.3	802.5	803.9	805.3
760	807.0	808.5	809.9	811.4	812.9	814.3	815.8	817.2	818.5	819.8
770	821.1	822.5	824.0	825.4	826.8	828.1	829.5	831.0	832.4	833.9
780	835.5	837.0	838.5	840.0	841.6	843.1	844.4	845.8	846.9	848.1
790	849.2	850.4	851.6	852.8	853.7	854.7				

GEOGRAM+ Velocity Report

Schlumberger

DATE 11/4/99

Client and Well Information

Country

AUSTRALIA

State

VICTORIA

Logging Date

16-OCT-1999

Company

Field

WILDCAT

Well

BALEEN 2

Velocity Data

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
0		0.0			
					1573
2	· · · · · · · · · · · · · · · · · · ·	1.5	1573	1573	
					1573
4		3.2	1573	1573	
					1573
6		4.7	1573	1573	
					1573
8		6.2	1573	1573	
					1573
10		7.9	1573	1573	
					1573
12		9.4	1573	1573	
					1573
14		11.0	1573	1573	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					1573
16		12.6	1573	1573	
					1573
18		14.2	1573	1573	
					1573
20		15.7	1573	1573	
					1573
22		17.4	1573	1573	
					1573
24		18.9	1573	1573	
	//				1573
26		20.4	1573	1573	
-					1573
28		22.1	1573	1573	
					1573
30		23.6	1573	1573	
					1573
32		25.1	1573	1573	
					1573
34		26.8	1573	1573	
					1573
36		28.3	1573	1573	
					1573
38		29.9	1573	1573	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					1573
40		31.4	1573	1573	
					1573
42		33.1	1573	1573	
					1573
44		34.6	1573	1573	
					1573
46		36.1	1573	1573	
					1573
48		37.8	1573	1573	
					1573
50		39.3	1573	1573	
					1573
52		40.8	1573	1573	
	:				1573
54		42.5	1573	1573	
					1573
56		44.0	1573	1573	
					1573
58		45.6	1573	1573	
***************************************				·	1573
60		47.2	1573	1573	
N-W-					1573
62		48.8	1573	1573	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					1573
64		50.3	1573	1573	
					1573
66		52.0	1573	1573	
					1573
68		53.5	1573	1573	
					1573
70		55.0	1573	1573	
				·	1573
72		56.7	1573	1573	
-		***			1573
74		58.2	1573	1573	
					1573
76		59.7	1573	1573	
					1573
78		61.4	1573	1573	
					1573
80		62.9	1573	1573	
					1573
82		64.5	1573	1573	
					1573
84		66.1	1573	1573	
					1573
86		67.7	1573	1573	

Schlumberger

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					1573
88		69.2	1573	1573	
					1573
90		70.9	1573	1573	
					1573
92		72.4	1573	1573	
					1573
94		73.9	1573	1573	
					1573
96	101.7	75.7	1579	1579	
					1573
98	103.7	77.7	1585	1586	
					1863
100	105.6	79.6	1590	1592	
	:				1863
102	107.4	81.4	1596	1597	
	1100				1863
104	109.2	83.2	1601	1603	
		-			1863
106	111.0	85.0	1606	1608	
					1863
108	113.0	87.0	1611	1613	
					1863
110	114.8	88.8	1615	1618	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					1863
112	116.7	90.7	1619	1623	
<u> </u>					1863
114	118.5	92.5	1624	1627	
					1863
116	120.5	94.5	1628	1632	
					1863
118	122.3	96.3	1632	1636	
					1863
120	124.1	98.1	1636	1640	
					1863
122	126.0	100.0	1639	1644	
					1863
124	127.8	101.8	1643	1648	
	·				1863
126	129.8	103.8	1647	1651	
					1863
128	131.6	105.6	1650	1655	
					1863
130	133.4	107.4	1653	1658	
					1863
132	135.3	109.3	1656	1661	
					1863
134	137.3	111.3	1659	1665	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					1863
136	139.1	113.1	1662	1668	
					1863
138	140.9	114.9	1665	1671	
					1863
140	142.7	116.7	1668	1674	
					1863
142	144.6	118.6	1671	1676	
					1863
144	146.5	120.5	1674	1679	
					1863
146	148.4	122.4	1676	1682	
					1863
148	150.2	124.2	1679	1684	
					1863
150	152.2	126.2	1682	1687	
					1893
152	.154.0	128.0	1684	1690	
					1893
154	155.8	129.8	1687	1693	
					1893
156	157.8	131.8	1690	1696	
					1893
158	159.7	133.7	1692	1698	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					1893
160	161.6	135.6	1695	1701	
					1893
162	163.5	137.5	1697	1703	
					1893
164	165.3	139.3	1699	1706	
					1893
166	167.3	141.3	1702	1708	
					1893
168	169.1	143.1	1704	1710	
					1893
170	171.1	145.1	1706	1713	
					1893
172	172.9	146.9	1708	1715	
<u> </u>					1893
174	174.9	148.9	1711	1717	
					1893
176	176.7	150.7	1713	1719	
					1893
178	178.6	152.6	1715	1721	
	<u> </u>				1893
180	180.5	154.5	1717	1723	
,				:	1893
182	182.4	156.4	1719	1725	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					1893
184	184.3	158.3	1721	1727	
					1893
186	186.2	160.2	1722	1729	
					1893
188	188.0	162.0	1724	1731	
					1893
190	190.0	164.0	1726	1733	
					1893
192	191.8	165.8	1728	1734	
					1893
194	193.8	167.8	1729	1736	
					1893
196	195.6	169.6	1731	1738	
					1893
198	197.6	171.6	1733	1739	
					1893
200	199.4	173.4	1734	1741	
					1893
202	201.6	175.6	1738	1745	
					1893
204	203.7	177.7	1742	1749	
					2155
206	205.8	179.8	1746	1754	

10

GEOGRAM+

Schlumberger

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2155
208	208.0	182.0	1750	1758	
			·		2155
210	210.1	184.1	1754	1762	
					2155
212	212.2	186.2	1757	1766	
					2155
214	214.4	188.4	1761	1770	
					2155
216	216.7	190.7	1765	1774	
					2155
218	218.8	192.8	1768	1778	
					2155
220	220.9	194.9	1772	1782	
					2155
222	223.1	197.1	1775	1785	
					2155
224	225.2	199.2	1779	1789	
					2155
226	227.3	201.3	1782	1793	
					2155
228	229.5	203.5	1785	1796	
					2155
230	231.7	205.7	1789	1800	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2155
232	233.9	207.9	1792	1803	
				* .	2155
234	236.0	210.0	1795	1806	
				·	2155
236	238.1	212.1	1798	1810	
					2155
238	240.3	214.3	1801	1813	
					2155
240	242.4	216.4	1804	1816	
					2155
242	244.5	218.5	1807	1819	
					2155
244	246.8	220.8	1810	1822	
					2155
246	249.0	223.0	1812	1825	
					2155
248	251.1	225.1	1816	1828	
					2155
250	253.4	227.4	1819	1833	
					2298
252	255.7	229.7	1823	1837	
					2298
254	258.1	232.1	1827	1841	

Schlumberger

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2298
256	260.4	234.4	1831	1845	
					2298
258	262.7	236.7	1834	1849	
					2298
260	265.0	239.0	1838	1853	
					2298
262	267.2	241.2	1841	1857	
444					2298
264	269.5	243.5	1845	1860	
					2298
266	271.8	245.8	1848	1864	
,					2298
268	274.1	248.1	1852	1868	
					2298
270	276.4	250.4	1855	1871	
					2298
272	278.7	252.7	1858	1875	
					2298
274	281.0	255.0	1861	1878	
					2298
276	283.3	257.3	1865	1881	
					2298
278	285.7	259.7	1868	1885	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2298
280	288.0	262.0	1871	1888	
					2298
282	290.3	264.3	1874	1891	
					2298
284	292.5	266.5	1877	1894	
			:		2298
286	294.8	268.8	1880	1898	
					2298
288	297.1	271.1	1883	1901	
					2298
290	299.4	273.4	1886	1904	
					2298
292	301.5	275.5	1888	1906	
					2298
294	303.7	277.7	1889	1907	
					2149
296	306.0	280.0	1891	1909	
					2149
298	308.1	282.1	1893	1911	
					2149
300	310.2	284.2	1895	1913	
					2149
302	312.4	286.4	1896	1914	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2149
304	314.5	288.5	1898	1916	
					2149
306	316.6	290.6	1900	1918	
					2149
308	318.8	292.8	1901	1919	
					2149
310	320.9	294.9	1903	1921	
					2149
312	323.0	297.0	1904	1922	
				·	2149
314	325.2	299.2	1906	1924	
					2149
316	327.4	301.4	1908	1925	
					2149
318	329.6	303.6	1909	1927	
					2149
320	331.7	305.7	1911	1928	
					2149
322	333.8	307.8	1912	1930	
					2149
324	336.0	310.0	1913	1931	
					2149
326	338.1	312.1	1915	1933	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2149
328	340.2	314.2	1916	1934	
					2149
330	342.4	316.4	1918	1935	
					2149
332	344.5	318.5	1919	1937	
					2149
334	346.6	320.6	1920	1938	
					2149
336	348.9	322.9	1922	1939	
					2149
338	351.1	325.1	1923	1941	
					2149
340	353.2	327.2	1925	1942	
1					2191
342	355.5	329.5	1926	1944	
					2190
344	357.6	331.6	1928	1945	
					2190
346	359.8	333.8	1929	1947	
					2190
348	362.0	336.0	1931	1948	
					2191
350	364.2	338.2	1932	1950	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2191
352	366.3	340.3	1934	1951	
					2190
354	368.6	342.6	1935	1953	
					2191
356	370.7	344.7	1937	1954	
					2191
358	373.0	347.0	1938	1956	
					2190
360	375.1	349.1	1940	1957	
					2190
362	377.3	351.3	1941	1958	
					2190
364	379.6	353.6	1942	1960	
					2191
366	381.7	355.7	1944	1961	
					2191
368	383.8	357.8	1945	1962	
					2190
370	386.1	360.1	1946	1964	
					2191
372	388.3	362.3	1948	1965	
					2190
374	390.5	364.5	1949	1966	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2191
376	392.7	366.7	1950	1967	
					2191
378	394.8	368.8	1952	1969	
					2190
380	397.1	371.1	1953	1970	
				1 14	2191
382	399.2	373.2	1954	1971	
					2191
384	401.4	375.4	1955	1972	
					2190
386	403.5	377.5	1956	1973	
					2122
388	405.6	379.6	1957	1974	
					2122
390	407.8	381.8	1958	1975	
					2122
392	409.9	383.9	1959	1975	
					2122
394	412.0	386.0	1959	1976	
					2122
396	414.2	388.2	1960	1977	
					2122
398	416.3	390.3	1961	1978	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2122
400	418.4	392.4	1962	1978	
					2122
402	420.4	394.4	1963	1979	
					2122
404	422.5	396.5	1963	1980	
					2122
406	424.7	398.7	1964	1981	
					2122
408	426.8	400.8	1965	1981	
					2122
410	428.9	402.9	1966	1982	
					2122
412	431.1	405.1	1966	1983	
	·				2122
414	433.2	407.2	1967	1983	
					2122
416	435.3	409.3	1968	1984	
					2122
418	437.5	411.5	1969	1985	
					2122
420	439.6	413.6	1969	1985	
					2122
422	441.7	415.7	1970	1986	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2122
424	443.9	417.9	1971	1987	
					2122
426	446.0	420.0	1972	1987	
					2122
428	448.0	422.0	1972	1988	
					2122
430	450.1	424.1	1973	1989	
					2122
432	452.4	426.4	1974	1990	
					2197
434	454.5	428.5	1975	1991	
					2197
436	456.8	430.8	1976	1992	
	:				2197
438	459.0	433.0	1977	1993	
					2197
440	461.1	435.1	1978	1994	
					2197
442	463.4	437.4	1979	1995	
					2197
444	465.5	439.5	1980	1996	
					2197
446	467.8	441.8	1981	1997	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2197
448	469.9	443.9	1982	1998	
14					2197
450	472.2	446.2	1983	1998	
					2197
452	474.4	448.4	1984	1999	
					2197
454	476.5	450.5	1985	2000	
					2197
456	478.8	452.8	1986	2001	
					2197
458	480.9	454.9	1987	2002	
					2197
460	483.2	457.2	1988	2003	
	:				2197
462	485.3	459.3	1989	2004	
					2197
464	487.5	461.5	1989	2005	
					2197
466	489.8	463.8	1990	2006	
					2197
468	491.9	465.9	1991	2006	
					2197
470	494.2	468.2	1992	2007	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2197
472	496.3	470.3	1993	2008	
					2197
474	498.6	472.6	1994	2009	
					2197
476	500.7	474.7	1995	2010	
					2197
478	503.0	477.0	1996	2011	
					2269
480	505.3	479.3	1997	2012	
					2270
482	507.6	481.6	1998	2013	
					2269
484	509.9	483.9	1999	2015	
4.4.	· · · · · · · · · · · · · · · · · · ·				2270
486	512.2	486.2	2000	2016	
					2270
488	514.3	488.3	2001	2017	
					2269
490	516.6	490.6	2003	2018	
					2269
492	518.9	492.9	2004	2019	
					2270
494	521.1	495.1	2005	2020	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2270
496	523.4	497.4	2006	2021	
					2269
498	525.7	499.7	2007	2022	
					2270
500	528.0	502.0	2008	2023	
				:	2269
502	530.3	504.3	2009	2024	
					2270
504	532.6	506.6	2010	2025	
					2269
506	534.9	508.9	2011	2026	
4					2270
508	537.0	511.0	2012	2027	
					2270
510	539.3	513.3	2013	2028	
					2269
512	541.6	515.6	2014	2029	
					2270
514	543.9	517.9	2015	2030	
			<u> </u>		2270
516	546.1	520.1	2016	2031	
					2269
518	548.4	522.4	2017	2032	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2270
520	550.7	524.7	2018	2033	
					2270
522	553.0	527.0	2019	2035	
					2359
524	555.4	529.4	2021	2036	
					2359
526	557.7	531.7	2022	2037	
					2359
528	560.2	534.2	2023	2039	
					2359
530	562.4	536.4	2024	2040	
				and the second s	2359
532	564.9	538.9	2026	2041	
]					2359
534	567.2	541.2	2027	2042	
					2359
536	569.6	543.6	2028	2044	
					2359
538	571.9	545.9	2029	2045	
200					2359
540	574.3	548.3	2031	2046	
 					2359
542	576.6	550.6	2032	2047	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2360
544	579.1	553.1	2033	2049	
					2360
546	581.3	555.3	2034	2050	
					2359
548	583.8	557.8	2036	2051	
					2359
550	586.1	560.1	2037	2052	
					2359
552	588.5	562.5	2038	2054	
					2359
554	590.8	564.8	2039	2055	
					2359
556	593.2	567.2	2040	2056	
	<u> </u>				2359
558	595.5	569.5	2041	2057	
					2359
560	597.8	571.8	2042	2058	
					2359
562	600.2	574.2	2044	2059	
		·			2359
564	602.7	576.7	2045	2061	
					2378
566	605.0	579.0	2046	2062	

Schlumberger

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2378
568	607.4	581.4	2047	2063	
				·	2378
570	609.7	583.7	2048	2064	
					2377
572	612.1	586.1	2049	2065	
					2377
574	614.6	588.6	2051	2067	
					2378
576	616.9	590.9	2052	2068	
					2378
578	619.3	593.3	2053	2069	
					2378
580	621.6	595.6	2054	2070	
1					2378
582	624.0	598.0	2055	2071	
					2378
584	626.5	600.5	2056	2072	
					2378
586	628.7	602.7	2057	2073	
					2378
588	631.2	605.2	2058	2075	
					2378
590	633.5	607.5	2059	2076	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2377
592	635.9	609.9	2061	2077	
					2377
594	638.3	612.3	2062	2078	
					2378
596	640.6	614.6	2063	2079	
					2378
598	643.1	617.1	2064	2080	
					2378
600	645.4	619.4	2065	2081	
					2378
602	647.8	621.8	2066	2082	
					2378
604	650.2	624.2	2067	2083	
					2378
606	652.5	626.5	2068	2084	
					2378
608	654.8	628.8	2068	2085	
					2378
610	657.1	631.1	2069	2085	
					2168
612	659.5	633.5	2070	2087	
•					2939
614	661.5	635.5	2070	2087	

Schlumberger

GEOGRAM+

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					2148
616	664.1	638.1	2072	2088	
					2283
618	666.7	640.7	2074	2090	
					2436
620	669.1	643.1	2075	2092	
					2091
622	671.3	645.3	2075	2092	
					2065
624	674.0	648.0	2077	2094	
					2456
626	676.4	650.4	2078	2096	
		1			2306
628	678.9	652.9	2079	2097	
	:				2566
630	681.0	655.0	2080	2097	
					2124
632	683.3	657.3	2080	2098	
					2113
634	685.4	659.4	2080	2098	
					1977
636	687.7	661.7	2081	2098	
					2380
638	690.2	664.2	2082	2099	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED VERTICAL DEPTH FROM FROM SRD		AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY	
ms	m	m	m/s	m/s	m/s	
					2443	
640	692.1	666.1	2082	2099		
					1897	
642	694.3	668.3	2082	2099		
					2334	
644	696.4	670.4	2082	2099		
					2050	
646	698.2	672.2	2081	2099		
					1890	
648	700.4	674.4	2081	2098		
					1902	
650	702.4	676.4	2081	2098		
					1945	
652	704.5	678.5	2081	2098		
					2151	
654	706.6	680.6	2082	2099		
					1953	
656	708.9	682.9	2082	2099		
•					2952	
658	711.0	685.0	2082	2099		
					2085	
660	713.0	687.0	2082	2099		
					2023	
662	715.0	689.0	2082	2099		

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	DEPTHDEPTHVELOCITYFROMFROMSRD/GEO		RMS VELOCITY	INTERVAL VELOCITY
ms	m	m	m/s	m/s	m/s
					1971
664	717.3	691.3	2082	2099	
					2325
666	719.4	693.4	2082	2099	
					2074
668	721.4	695.4	2082	2099	
			The second second		2037
670	723.4	697.4	2082	2098	
					1946
672	725.5	699.5	2082	2099	
					2016
674	727.8	701.8	2083	2099	
					2219
676	730.2	704.2	2084	2100	
***					2369
678	732.7	706.7	2085	2101	
					2494
680	735.1	709.1	2086	2102	
					2397
682	737.4	711.4	2086	2103	
		·			2366
684	739.7	713.7	2087	2104	
	:				2310
686	742.0	716.0	2087	2104	

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED VERTICAL DEPTH DEPTH FROM FROM KB SRD		AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY	
ms	m	m	m/s	m/s	m/s	
					2238	
688	744.4	718.4	2088	2105		
					2503	
690	746.9	720.9	2090	2106		
					2447	
692	749.0	723.0	2090	2107		
					2568	
694	751.0	725.0	2089	2106		
10, 100 mm					1855	
696	753.1	727.1	2090	2106		
					2089	
698	755.1	729.1	2089	2106		
					2230	
700	757.1	731.1	2089	2106		
					1903	
702	759.0	733.0	2088	2105		
					1920	
704	761.3	735.3	2089	2106		
					2251	
706	763.9	737.9	2091	2108		
					2351	
708	766.5	740.5	2092	2109		
					2287	
710	769.3	743.3	2094	2111		

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	VERTICAL DEPTH FROM SRD	DEPTH VELOCITY FROM SRD/GEO		INTERVAL VELOCITY	
ms	m	m	m/s	m/s	m/s	
3117					2592	
712	771.7	745.7	2095	2112		
					2457	
714	774.1	748.1	2096	2113		
					2493	
716	776.6	750.6	2097	2114		
		·			2480	
718	779.0	753.0	2098	2115		
					2430	
720	781.4	755.4	2099	2116		
					2428	
722	784.0	758.0	2100	2117		
					2513	
724	786.5	760.5	2101	2118		
					2451	
726	788.9	762.9	2102	2119		
					2459	
728	791.4	765.4	2103	2120		
					2509	
730	793.9	767.9	2104	2122		
					2435	
732	796.4	770.4	2105	2122		
					2618	
734	798.8	772.8	2106	2124		

Schlumberger

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD	MEASURED VERTICAL DEPTH DEPTH FROM FROM KB SRD		AVERAGE VELOCITY SRD/GEO	RMS VELOCITY	INTERVAL VELOCITY	
ms	m	m	m/s	m/s	m/s	
					2478	
736	801.1	775.1	2106	2124		
			·		2485	
738	803.7	777.7	2108	2125		
	117				2355	
740	806.1	780.1	2108	2126		
•					2502	
742	808.6	782.6	2109	2127		
					2245	
744	811.2	785.2	2111	2129		
					2542	
746	813.8	787.8	2112	2130		
					2703	
748	816.7	790.7	2114	2132		
**************************************					2716	
750	819.5	793.5	2116	2135		
					2418	
752	822.1	796.1	2118	2136		
					2925	
754	824.7	798.7	2119	2138		
					2616	
756	827.3	801.3	2120	2139		
					2661	
758	829.9	803.9	2121	2140		

© 1994 Schlumberger 32

Schlumberger

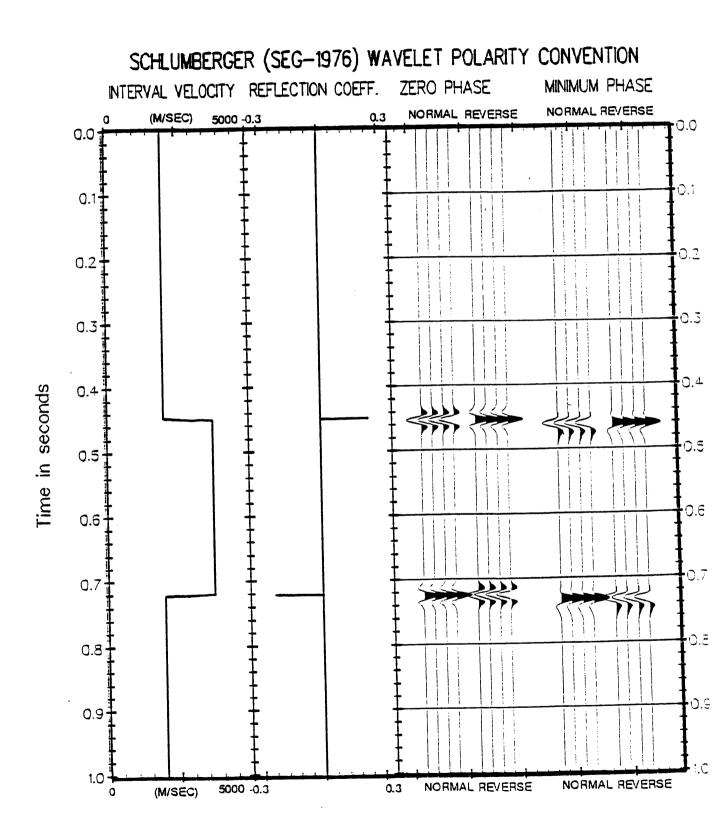
Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	DEPTH DEPTH VELOCITY		RMS VELOCITY	INTERVAL VELOCITY	
ms	m	m	m/s	m/s	m/s	
					2504	
760	833.0	807.0	2123	2143		
					2733	
762	835.9	809.9	2126	2145		
					3166	
764	838.9	812.9	2128	2148		
					3105	
766	841.8	815.8	2130	2150		
					2963	
768	844.5	818.5	2132	2152		
					2543	
770	847.1	821.1	2133	2154		
					2596	
772	850.0	824.0	2135	2156		
					2662	
774	852.8	826.8	2136	2158		
					2821	
776	855.5	829.5	2138	2159		
					2716	
778	858.4	832.4	2140	2161		
					2961	
780	861.5	835.5	2142	2164		
					2892	
782	864.5	838.5	2145	2167		

Schlumberger

Velocity Report

TWO WAY TRAVEL TIME FROM SRD	MEASURED DEPTH FROM KB	DEPTH DEPTH FROM		RMS VELOCITY	INTERVAL VELOCITY	
ms	m	m	m/s	m/s	m/s	
					3062	
784	867.6	841.6	2147	2170		
					2846	
786	870.4	844.4	2149	2172		
				-	3135	
788	872.9	846.9	2150	2173		
					2563	
790	875.2	849.2	2150	2173		
					2224	
792	877.6	851.6	2150	2174		
					2329	
794	879.7	853.7	2151	2174		



12



APPENDIX 12

BALEEN-2

ROUTINE CORE ANALYSIS REPORT

-ACS LABORATORIES-

907960 227



ROUTINE CORE ANALYSIS FINAL REPORT

of

BALEEN-2

for

OMV AUSTRALIA PTY LTD

by

ACS LABORATORIES PTY LTD



OMV Australia Pty Ltd Level 29, St Martins Tower 44 St Georges Tce PERTH WA 6000

Attention:

Mr Mark Adamson

FINAL REPORT: 0308-02 BALEEN-2

CLIENT REFERENCE:

OSA-1999-008

MATERIAL:

4" diameter Whole Core

LOCALITY:

VIC RL5

WORK REQUIRED:

Routine Core Analysis and Core Stabilization

Please direct technical inquiries regarding this work to the signatory below under whose supervision the work was conducted.

IAN MANGELSDORF

Field Services & Core Properties Supervisor

PETER N CROZIER
Operations Manager

ACS Laboratories Pty. Ltd. shall not be liable or responsible for any loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from any information or interpretation given in this report. In no case shall ACS Laboratories Pty. Ltd. be responsible for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report.

CONTENTS

CH A	PTE	RS PAG	÷Е
1.	LOG	SISTICS AND INTRODUCTION	
	1.1	Logistics and Core Resination	. 2
	1.2	Introduction	. 2
2.	STU	DY AIMS	. 3
3.	SAM	IPLING	
	3.1	Initial Inspection of Core Slab	. 7
	3.2	Routine Core Analysis Samples	. 7
	3.3	Fluid Invasion Samples	. 7
	3.4	Oil Finger Print Samples	7
	3.5	Full Diameter Samples	7
	3.6	Special Core Analysis Samples	7
	3.7	1/3 : 2/3 Core Slab	8
4.	SAM	IPLE PREPARATION	
	4.1	Sample Extraction	10
	4.2	Sample Drying	10
5.	TES	T PROCEDURES	
	5.1	Continuous Core Gamma	12
	5.2	Porosity	12
	5.3	Permeability	13
	5.4	Apparent Grain Density	13
	5.5	Porosity and Permeability at Overburden Pressure	13
	5.6	Core Photography	13
6.	CON	MMENTS	14
7.	SAM	APLE DISTRIBUTION and STORAGE	16
API	PEND	ICES	
I.	TES	ST RESULTS	
II.		BIENT & OVERBURDEN POROSITY vs PERMEABILITY PLOTS	
III.		RE LOG PLOT	
IV.		CIAL CORE ANALYSIS SAMPLE LISTING	

LOGISTICS AND INTRODUCTION

1. LOGISTICS AND INTRODUCTION

1.1 Logistics and Core Resination

ACS personnel travelled to the Baleen-2 well site on 11th October 1999 to resinate the core and to supervise the handling of the core to ensure minimal damage prior to arriving in the laboratory. The cored intervals were cut into one metre lengths for processing. The annulus of each length of core was then filled with an expanding isocyanate resin to prevent the core from being disturbed during transit. All core was then packed into custom designed core chiller boxes for transport back to the laboratory. The core was picked up at the Toll Energy Logistics yard, Geelong by ACS personnel on the 21st October 1999 and transported to ACS Laboratories Brisbane laboratory for analysis.

Core No. 1	746.00 m – 762.20 m	(16.20 m)
Core No. 2	763.70 m – 779.50 m	(15.80 m)

(Note: Core No. 2 depths have been adjusted to reflect the wireline depths)

1.2 Introduction

This final report presents the results from a routine core analysis study performed on core from the Baleen-2 well. The study was undertaken as per instructions received from OMV Australia Pty Ltd on the 26th October 1999.

The following report includes tabular data of ambient and overburden permeability to air and helium injection porosity, and density determinations. Data presented graphically includes a core log plot of the above and porosity versus permeability to air plots.

STUDY AIMS

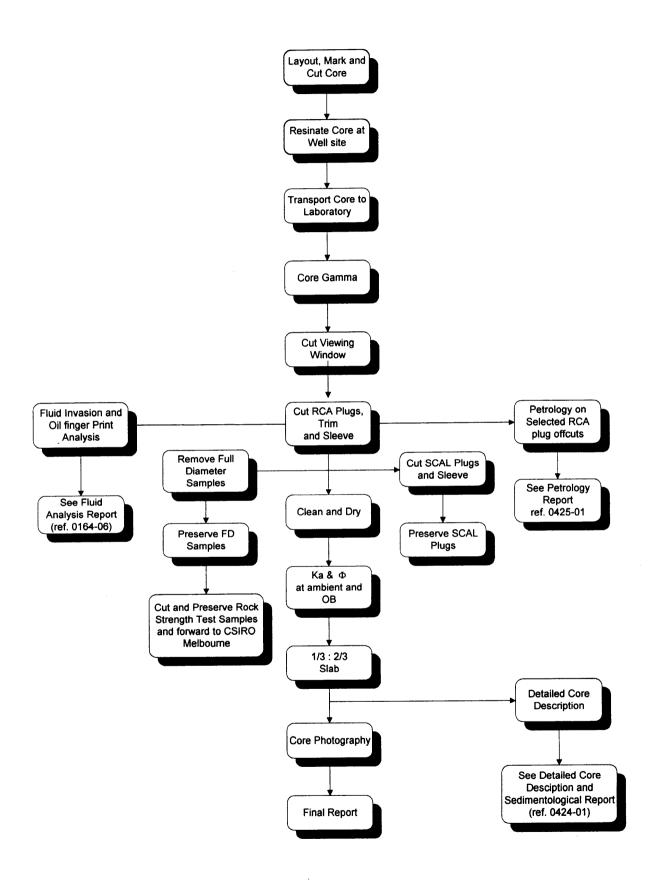
2. STUDY AIMS

The analyses were performed with the following aims:

- 1. To provide depth correlation through the provision of a continuous core gamma log over the cored interval.
- 2. To provide air permeability, helium injection porosity and density data.
- 3. To investigate the effects of Overburden Stress on the core through provision of multiple overburden analysis.
- 4. To investigate invasion of drilling mud and filtrate into the core.
- 5. Extract oil from zones with show for finger print analysis.
- 6. Preserve sample for further studies.

The data from the core invasion by drilling mud and filtrate and extracted oil analysis is found in the Fluids Analysis Final Report (ref. 0164-06).

STUDY OUTLINE



SAMPLING

3. SAMPLING

3.1 Initial Inspection of Core Slab

A two-inch inspection "window" was cut from the top of the core to ensure samples were selected at the best possible location (ie less likely to be fractured or contain resin).

3.2 Routine Core Analysis Samples

A suite of $1\frac{1}{2}$ " diameter horizontal plug samples were cut, at a rate of 3 per metre, using liquid N_2 as the bit lubricant. All plugs were trimmed to right cylinders and placed in lead sleaves with stainless steel mesh end screens. The off-cuts were labelled and bagged for possible future analysis.

3.3 Fluid Invasion Samples

Three samples points were chosen by OMV Australia Pty Ltd personnel for fluid invasion profiles. Each sample was punched from the core using a specially designed soft sediment core sampling apparatus. The sample was then divided into five equal sections prior to being sleeved in lead with stainless steal end screens. The results of this study are found in Fluids Analysis Final Report (ref. 0164-06), dated 23rd February.

3.4 Oil Finger Print Samples

Two sample points were chosen to obtain oil samples for finger print analysis. Each sample was punched from the core using a specially designed soft sediment core sampling apparatus. The sample was then crushed and extracted with Di-Chloromethane to remove the oil. The results of this study are found in Fluids Analysis Final Report (ref. 0164-06), dated 23rd February.

3.5 Full Diameter Samples

Five whole core sections were taken from the core and preserved for further analysis. These whole core samples were subsequently completely drilled out and the plug samples forwarded to the CSIRO, Melbourne, as requested, for rock strength analysis.

3.6 Special Core Analysis Samples

One SCAL sample was taken every metre throughout the core using liquid N_2 as the bit lubricant. Each sample was sleeved using Teflon heat shrink tubing and stainless steel end screens. The samples were frozen and stored waiting for further analysis. See sample listing in Appendix IV.

3.7 1/3: 2/3 Core Slab

Upon completion of the sampling, the core was slabbed longitudinally into two sections (1/3:2/3) using air as the blade cooling and lubricating medium.

SAMPLE PREPARATION

4. SAMPLE PREPARATION

4.1 Sample Extraction

The RCA samples were initially dried under humid conditions at 60°C for two hours to remove the majority of the pore water, aiding the efficiency of the extraction process. They were then placed in a soxhlet extractor to remove any remaining oil and salt from the pore spaces. The solvent used was 3:1 chloroform:methanol. Cleaning continued until a sample of solvent from the soxhlet chamber tested negative to salt precipitation, using silver nitrate, and no fluorescence was observed in the sample under ultra-violet light. The sample fluorescence was checked by carefully removing the screens of a representative selection of samples. The screens were then replaced.

4.2 Sample Drying

After extraction, the samples were humidity dried at 60°C and 40% relative humidity to a constant weight. Once dried, they were stored in an airtight container and allowed to cool to room temperature before analysis.

TEST PROCEDURES

5. TEST PROCEDURES

5.1 Continuous Core Gamma

The core was laid out according to depth markings, and a continuous core gamma trace produced by passing the core beneath a gamma radiation detector. The detector is protected from extraneous radiation by a lead tunnel. The detector signal is amplified and digitised to produce a gamma trace for comparison with the down hole log. After comparison with the down hole gamma log it was decided by OMV Australia Pty Ltd personnel that the depth of Core No.2 was to be shifted to match with the down hole data. A plus 1.4 metre correction was made to the drillers depths of core 2 to match the Schlumberger GR log.

5.2 Porosity

The porosity of the cleaned and dried core plugs was determined as follows. Each plug was first placed in a sealed matrix cup. Helium held at 100 psi reference pressure was then introduced to the cup. From the resultant pressure change the unknown grain volume was calculated using Boyle's Law.

$$P_1V_1 = P_2V_2$$

 $\Rightarrow P_1Vr = P_2(Vr+Vc-Vg)$
where: $P_1 = initial \ pressure \ (atmospheres)$
 $P_2 = final \ pressure \ (atmospheres)$
 $Vr = reference \ cell \ volume \ (cm^3)$
 $Vc = matrix \ cup \ volume \ (cm^3)$
 $Vg = grain \ volume \ (cm^3)$

To determine the pore volume of the core plug at overburden pressure, the sample was placed in a thick walled rubber sleeve. This assembly was then loaded into a hydrostatic cell. A confining pressure of 400 psi was then applied to the samples and the pore volume determined.

The bulk volume is determined by the addition of the pore volume and the grain volume. The porosity is calculated as the volume percentage of the pore space with respect to the bulk volume.

$$Vb = Vp + Vg$$

$$Porosity \% = \frac{Vp}{Vb} \times 100$$

$$where: Vp = pore \ volume \ (cm^3)$$

$$Vb = bulk \ volume \ (cm^3)$$

$$Vg = grain \ volume \ (cm^3)$$

5.3 Permeability

The plugs were placed in a Hassler cell at a confining pressure of 400 psig. This pressure is used to prevent bypassing of air around the sample when the measurement is made.

During the measurement a known air pressure is applied to the upstream face of the sample, creating a flow of air through the sample. Permeability for each sample is then calculated using Darcy's Law, through knowledge of the upstream pressure and flow rate during the test, the viscosity of air and the plug dimensions.

$$Ka = \frac{2000. BP. \mu. q. L}{(P_1^2 - P_2^2). A}$$

where Ka = air permeability (milliDarcy's)

BP = barometric pressure (atmospheres)

 μ = gas viscosity (cP)

 $q = flow rate (cm^3/s)$ at barometric pressure

L = sample length (cm)

 P_1 = upstream pressure (atmospheres) P_2 = downstream pressure (atmospheres)

A = sample cross sectional area (cm²)

5.4 Apparent Grain Density

The apparent grain density is calculated by dividing the weight of the plug by the grain volume determined from the helium injection porosity measurement.

5.5 Porosity and Permeability at Overburden Pressure

To determine the porosity and permeability of the core plug at overburden pressure, the sample is placed in a heavy duty Hassler sleeve. The assembly is loaded into a thick walled hydrostatic cell capable of withstanding the simulated reservoir overburden stress. After loading, helium injection porosity and air permeability are determined at simulated reservoir load conditions. Two reservoir pressures (700 psi and 1040 psi) as supplied by OMV Australia Pty Ltd, were used.

5.6 Core Photography

The core photography was carried out on the 2/3 slab of core.

Photographs of the core were taken in a 5 metre format under white and ultra violet light. 30cm, 1:1 scale photos were taken over sections of core where SCAL plugs were taken. The sections of core coinciding with SCAL samples #15 and #29 were not photographed as this core had been sealed for rock strength analysis. The film was then digitally scanned, edited and printed.

COMMENTS

6. COMMENTS

Due to the soft nature of the core while wet, special care and attention was given to make sure the core was in good condition, and representative core analysis data could be obtained when the core arrived in the laboratory. This process relied on the cooperation of the DBS coring contactors, the ACS core hands, the well site geologist, and the drill and deck crew of the rig. The laying down and cutting up of the core was organized so as to keep the movement of the core to a minimum. Each one-meter section was inspected to determine the state of the annulus and it was decided that the best method of stabilizing the core was to pump the resin into the barrels. On inspection of the core after slabbing it can be seen that the resin has filled the entire anulus as well as intruding into some of the fractured sections of the core.

Once the resin had set, the core was placed in a rig chiller container for transport to shore. The container was kept at a temperature of 2-3°C. This reduced temperature helps keep the pore structure of the core intact. Once on shore the core was transferred to special ACS core transport boxes for transport to our Brisbane laboratory. Dry Ice was used to keep the temperature low.

The porosity versus permeability cross plots indicate a regular trend throughout the cored interval, with the few outliers that do appear, likely to be associated with lithology rather than fracturing. The grain densities vary throughout the core because of the presence of many siderite and pyrite filled burrows.

SAMPLE DISTRIBUTION AND STORAGE

7. SAMPLE DISTRIBUTION AND STORAGE

The 2/3 slab of core has been forwarded to OMV Australia Pty Ltd Core and Cuttings Store at Kestrel Information Management Pty Ltd, Welshpool, WA.

The 1/3 slab of core has been forwarded to the Victorian Department of Natural Resources and energy Core Store at Werribee, Victoria.

All RCA samples and off-cuts have been sent to OMV Australia Pty Ltd Core and Cuttings Store.

APPENDIX I

TEST RESULTS

OVERBURDEN CORE ANALYSIS FINAL REPORT

Client: : OMV Australia Pty Ltd

Well Field

: Baleen-2 : Baleen

Core Int. : 746.00m - 762.20m Core Int. : 763.70m - 779.50m

Date

: 2/11/1999

File Location

: 0308-02 : VIC/RL5

Analysts

: pnc, ijm, kw

Sample Number	Depth	Dir	Porosity @ 400 psi	Porosity @ 700 psi	Porosity @1040 psi	Grain Density	Ka @ 400 psi	Ka @ 700psi	Ka @ 1040psi
1	746.20	R	28.6	27.9	27.3	3.04	69.5	43.0	31.5
	746.20	R	34.4	33.4	32.3	2.80	49.9	26.0	17.0
2	746.81	R	35.6	34.8	33.8	2.88	209	172	141
3 4	747.07	R	7.4	7.3	7.3	3.17	0.03	0.02	0.02
5	747.54	R	31.8	31.6	31.0	2.66	60.6	55.2	41.9
6	747.80	R	33.8	33.4	32.9	2.67	132	113	93.8
7	Failed	IX.	33.6	33.4	32.9	2.0.			
8	748.45	R	36.9	36.0	35.1	2.66	299	247	215
9	748.82	R	34.9	34.0	33.3	2.65	188	165	146
10	749.19	R	35.3	35.0	34.0	2.67	158	151	126
11	749.56	R	25.2	24.9	24.6	2.77	34.0	29.2	26.6
12	749.80	R	33.9	33.0	32.3	2.66	103	87.3	80.0
13	750.19	R	32.2	31.7	30.9	2.67	57.6	46.1	36.6
14	750.50	R	33.2	32.3	31.7	2.65	92.3	75.5	65.2
15	750.80	R	31.4	30.6	30.1	2.66	40.5	33.3	28.2
16	751.20	R	32.4	31.5	30.7	2.66	36.5	27.5	22.6
17	751.50	R	30.4	29.5	28.9	2.84	50.1	40.1	33.9
18	751.81	R	31.6	30.4	29.8	2.66	28.0	19.0	16.4
19	752.12	R	33.7	32.8	32.3	2.66	89.0	68.3	58.6
20	752.44	R	13.5	13.4	13.3	3.03	2.89	2.83	2.80
21	752.81	R	35.5	34.8	34.1	2.68	169	136	115
22	753.19	R	35.7	35.4	34.8	2.66	184	171	158
23	753.49	R	35.3	34.6	34.1	2.65	154	137	126
24	753.79	R	36.7	36.1	35.7	2.68	234	217	205
25	754.20	R	36.0	35.5	35.1	2.67	327	302	282
26	754.51	R	36.2	35.7	35.5	2.68	346	318	301
27	754.81	R	36.5	36.0	35.6	2.69	342	313	293
28	755.11	R	27.9	27.6	27.3	2.79	66.7	63.8	62.3
29	755.49	R	28.4	28.1	27.8	2.78	96.4	93.3	90.8
30	755.78	R	30.8	30.6	30.3	2.75	217	208	203
31	756.18	R	37.7	37.2	36.6	2.67	433	393	363
32	756.50	R	37.4	36.5	36.0	2.65	355	324	295
33	756.82	R	37.0	36.2	35.8	2.66	301	279	256
34	757.14		37.4	36.5	35.9	2.66	309	273	244
35	757.50	R	36.3	35.5	34.9	2.65	222	193	171
36	757.81	R	33.9	33.1	32.6	2.64	124	107	96.4
37	758.18	R	34.6	33.8	33.3	2.63	175	154	138
38	758.49	R	33.1	32.4	31.9	2.63	89.6	77.5	68.9
39	758.80	R	32.3	31.6	31.1	2.63	59.3	46.6	40.2
40	759.17	R	34.4	33.7	33.3	2.65	134	119	110
40 41	759.50	R	36.4	35.5	34.8	2.73	256	176	147
42	759.82	R	36.9	36.2	35.7	2.69	187	167	153
42	760.19	R	36.7	36.3	35.7	2.73	482	382	328
43 44	760.19	R	32.7	32.4	32.1	2.80	394	218	167
44 45	760.43	R	32.7 14.4	14.2	14.1	3.01	6.5	6.3	6.2

Sample Number	Depth	Dir	Porosity @ 400 psi	Porosity @ 700 psi	Porosity @1040 psi	Grain Density	Ka @ 400 psi	Ka @ 700psi	Ka @ 1040psi
46	761.19	R	24.9	24.7	24.5	2.94	28.1	26.2	25.2
47	763.87	R	9.2	9.1	9.0	3.09	0.07	0.05	0.03
48	764.19	R	26.8	26.6	26.4	2.95	72.8	70.5	68.8
49	764.60	R	34.8	34.5	34.3	2.80	276	262	253
50	764.89	R	37.5	37.0	36.7	2.77	310	289	274
51	765.15	R	39.0	38.4	37.9	2.71	242	217	198
52	765.59	R	14.4	14.4	14.3	3.04	0.05	0.03	0.02
53	765.86	R	30.9	30.5	30.1	2.90	176	165	159
54	766.22	R	22.6	22.4	22.3	3.07	2.76	2.28	2.00
55	766.59	R	37.8	37.1	36.4	2.77	148	118	103
56	766.91	R	34.7	34.1	33.5	2.89	120	90.1	76.2
	767.18	R	25.1	24.8	24.6	3.01	57.0	41.4	33.6
57 59	767.18	R	13.8	13.7	13.7	3.03	0.39	0.35	0.33
58		R	22.3	22.1	21.9	3.00	14.4	14.0	13.8
59	767.99		33.1	32.3	31.6	2.67	91.9	80.4	73.2
60	768.32	R		31.1	30.3	2.66	29.6	19.3	15.7
61	768.60	R	32.2	30.1	29.4	2.65	32.8	19.3	15.4
62	768.90	R	31.0		33.7	2.80	215	108	67.0
63	769.22	R	36.6	35.1	29.6	2.67	19.6	15.2	12.6
64	769.63	R	31.2	30.3		2.68	12.4	8.5	6.7
65	769.97	R	31.0	29.9	29.1	2.65	17.2	11.8	8.7
66	770.22	R	30.0	29.1	28.3		73.1	37.8	25.0
67	770.59	R	31.3	30.3	29.5	2.64	31.1	22.0	17.7
68	770.89	R	31.7	30.6	29.8	2.66		21.0	16.1
69	771.29	R	31.3	30.4	29.4	2.69	30.4		0.12
70	771.60	R	11.7	11.7	11.6	3.13	0.13	0.13	
71	771.90	R	34.7	33.8	33.1	2.69	76.5	63.9	56.5
72	772.22	R	34.8	34.1	33.3	2.67	73.2	59.8	52.6
73	772.58	R	35.9	34.8	34.1	2.66	107	72.3	57.7
74	772.91	R	36.7	35.7	34.9	2.71	189	140	113
75	773.21	R	35.3	34.5	34.0	2.69	78.6	64.9	58.0
76	773.58	R	34.5	33.8	33.1	2.71	70.6	53.9	46.7
77	773.90	R	34.7	34.0	33.3	2.68	79.8	67.0	59.6
78	774.26	R	33.4	33.1	32.8	2.76	124	118	113
79	774.52	R	39.1	38.5	38.0	2.70	523	471	434
80	774.90	R	35.5	34.9	34.5	2.66	186	168	155
81	775.20	R	35.6	34.8	34.3	2.66	163	137	119
82	775.62	R	38.9	37.7	36.9	2.73	498	389	319
83	775.91	R	36.7	36.0	35.5	2.66	356	294	258
84	776.25	R	36.6	35.9	35.4	2.65	304	263	238
85	776.60	R	36.4	35.8	35.3	2.66	308	279	256
86	776.91	R	37.0	36.0	35.3	2.79	464	371	318
87	777.20	R	36.4	35.9	35.4	2.65	327	294	272
88	777.60	R	34.9	34.4	34.0	2.66	297	272	257
89	777.91	R	35.9	35.2	34.8	2.65	358	320	297
90	778.21	R	35.8	35.1	34.7	2.66	328	297	280
91	778.63	R	35.7	35.1	34.7	2.65	311	279	260

APPENDIX II

AMBIENT AND OVERBURDEN POROSITY vs PERMEABILITY PLOTS

907960 251



POROSITY vs PERMEABILITY Ambient & Overburden



Client:

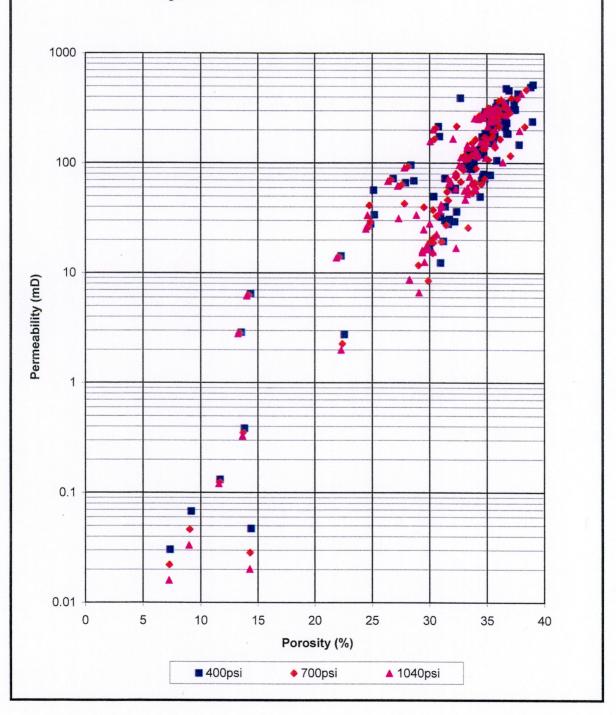
OMV Australia Pty Ltd

Well:

Baleen-2

Depth:

746.00m - 779.50m



907960 252



POROSITY vs PERMEABILITY Ambient



Client:

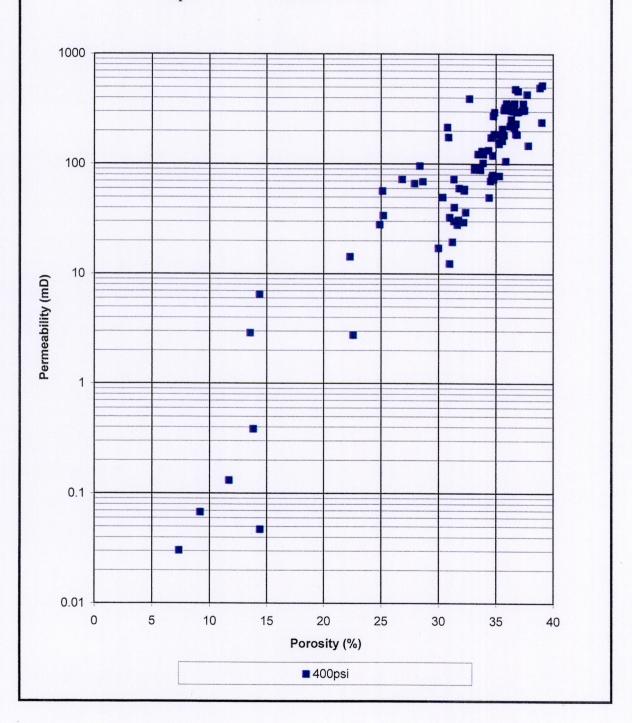
OMV Australia Pty Ltd

Well:

Baleen-2

Depth:

746.00m - 779.50m



907960 253



POROSITY vs PERMEABILITY Overburden



Client:

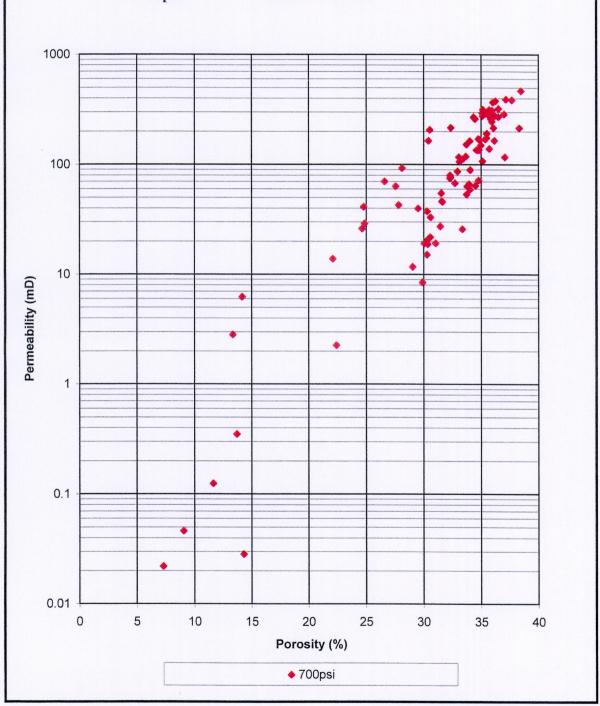
OMV Australia Pty Ltd

Well:

Baleen-2

Depth:

746.00m - 779.50m



907960 254



POROSITY vs PERMEABILITY Overburden



Client:

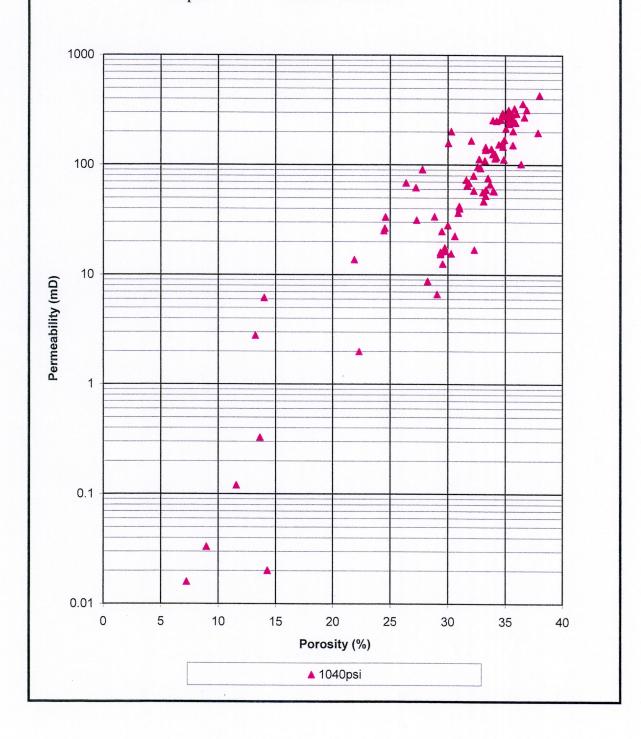
OMV Australia Pty Ltd

Well:

Baleen-2

Depth:

746.00m - 779.50m



APPENDIX III

CORE LOG PLOT



CORE PLOT

Scale 1:200

Client:

OMV Australia Pty Ltd

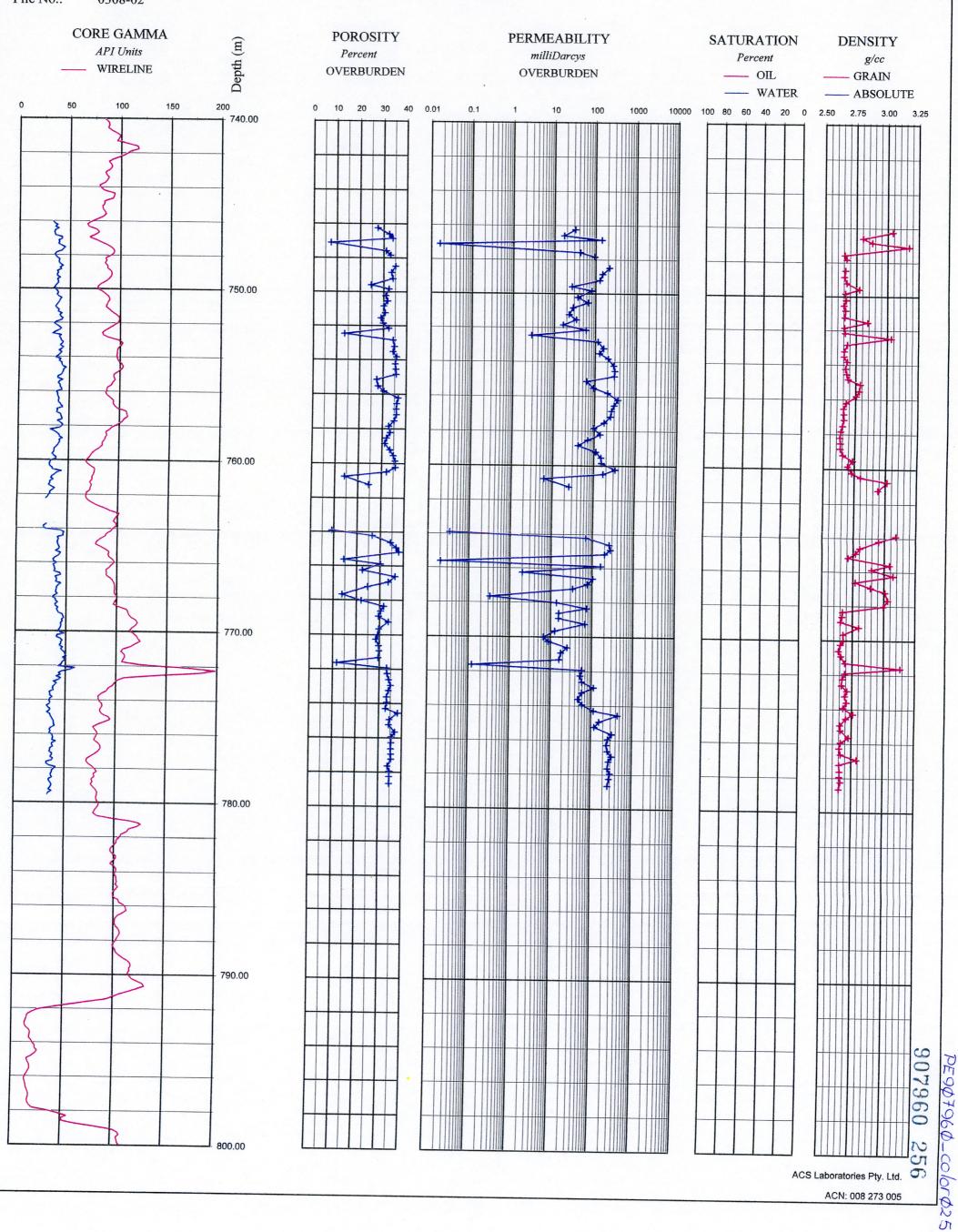
Well: File No.: Baleen-2

0308-02

Core 1: 746.00m - 762.20m Core 2: 763.70m - 779.50m



ACN: 008 273 005



APPENDIX IV

SPECIAL CORE ANALYSIS SAMPLE LISTING

PRESERVED SPECIAL CORE ANALYSIS SAMPLE LISTING

Client:

OMV Australia Pty Ltd

Well:

Baleen-2

		Approximate		
	Depth	Length	Similar	·
Number	(m)	(cm)	RCA plugs	Remarks
S1	746.63	6.0	2	SCAL study
S2	747.41	7.5	5	SCAL study
S3	748.36	5.5	8	
S4	749.40	7.0	10	
S5	750.41	6.5	14	SCAL study
S6	751.42	6.5	17	SCAL study
S7	752.50	9.0	20	
S8	753.42	5.5	23	Slight irreg. surface
S9	754.41	9.0	26	SCAL study
S10	755.39	3.5	29	SCAL study
S11	756.40	7.5	31, 32	SCAL study
S12	757.42	6.5	35	SCAL study
S13	758.58	6.5	38	
S14	759.42	7.0	41	
S15	760.38	4.0		Short, off-cuts bagged
S16	763.78	3.5	47	Short, off-cuts bagged
S17	764.82	7.0	50	
S18	765.76	9.5		
S19	766.81	7.0	56	
S20	767.87	10.0	59	SCAL study
S21	768.79	7.0	62	SCAL study
S22	770.05	6.5	65	
S23	770.97	7.5	68	SCAL study
S24	771.81	7.0	71	SCAL study
S25	772.99	7.0	74	SCAL study
S26	773.79	7.0	77	SCAL study
S27	774.80	7.0	80	SCAL study
S28	775.82	7.0	83	SCAL study
S29	776.80	7.0		SCAL study
S30	777.80	8.5	89	SCAL study

13



APPENDIX 13

BALEEN-2

FLUIDS ANALYSIS REPORT

-ACS LABORATORIES-

23 February, 2000



OMV Australia Pty Ltd Level 29 44 St Georges Terrace PERTH WA 6000

Attention:

Mark Adamson

FLUIDS ANALYSIS - FINAL REPORT 0164-06

BALEEN-2

Drilling Fluid Invasion Analysis:

Two full length plug samples were cut through the core, at depths selected by OMV Australia representatives, to try to ascertain, and quantify, if any drilling mud invasion into the core had occurred. These samples were cut into 5 equal pieces along their length (marked A to E) and the pore water extracted from them. Standard 10 ion water analysis and nitrate content analysis was performed on each of the extracted water samples, plus two formation water samples and two mud filtrate samples, to try and determine the degree of mud invasion in the core.

It is evident from the nitrate concentrations and cation and anion data that the core has been invaded by the drilling fluid filtrate.

Extracted Oil Analysis:

In an attempt to type the oil in the core, three samples of core were extracted of residual oil for analysis. Due to the oil saturation being too low to extract by centrifuge, it was decided to extract the residual oil with solvent (Dichloromethane – DCM). A portion of the core was taken at selected depths, crushed, and extracted of the residual oil. Due to the small amounts of oil extracted it was necessary to concentrate the solution by evaporating off the majority of the DCM. The resulting concentrated samples were then run through a liquid chromatograph to determine their composition.

E-mail: acs.bris@acslabs.com.au

On the attached chromatographs the first peak (retention time of approximately 6.2 minutes) is Dichloromethane. All fractions lighter than DCM, if any were present, would have been lost in the extraction and concentration processes.

Based on the compositional analyses, the extracted oil is likely to be hydrocarbon, but due to the small volumes of extracted oil, and the lack of any other physical properties, no further comment can be made.

Please find enclosed final results of fluid analyses for water and extracted oil samples from the above well.

If ACS can assist you in any way or if you require any further information, please do not hesitate to contact the undersigned.

LINGANATHAN SIVACHALAM

Mighth

RFL Laboratory Supervisor

PETER N CROZIER
Operations Manager

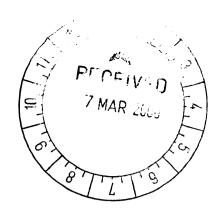
ACS Laboratories Pty. Ltd. shall not be liable or responsible for any loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from any information or interpretation given in this report. In no case shall ACS Laboratories Pty. Ltd. be responsible for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report.

CONTENTS

		Page
1.	WATER ANALYSIS RESULTS	2
2.	EXTRACTED OIL COMPOSITION	. 30
API	PENDICES	
I. II.	SUMMARY OF WATER ANALYSIS RESULTS CHROMATOGRAMS FOR OIL ANALYSIS	

CHAPTER 1

WATER ANALYSIS RESULTS





907960 265

FLUIDS ANALYSIS FINAL REPORT

of

BALEEN-2

for

OMV AUSTRALIA PTY LTD

by

ACS LABORATORIES PTY LTD

Client:

OMV Australia Pty Ltd

File: 0164-06

Well:

Baleen-2

Sample: Water 1.01

Tool:

N/A

	Cations			Anions		
	mg/L	meq/L			mg/L	meq/L
Sodium (Na):	2980	129.6		Chloride (Cl):	4610	129.8
Calcium (Ca):	76	3.8		Bi-Carbonate (HCO3):	616	12.3
Magnesium (Mg):	82.0	6.7		Sulphate (SO ₄):	80	1.7
Iron (Fe):	< 0.1	0.0		Carbonate (CO ₃):	<1	0.0
Potassium (K):	142	3.6		Fluoride (F)	1.10	0.1
1 0 4 4 5 5 4 4 1 5 1				Hydroxide (OH):	<1	0.0
Calculated (HCO ₃ Total Hardness (as Carotal Alkalinity (as Carotal Alkalinity)	a CO ₃)		9430 525 616	Ion Balance (Diff*100/si Sodium Adsorption Rati Difference (Anions - Cat Sum (Anions + Cations)	o ions)	0.026 56.5 0.07 287.7
OTHER ANALYSE		1	C			
Resistivity		ohm.m @ 25 %	1			
Conductivity (E.C)	14500.0 7.4	μS/cm @ 25 °C	-			

Nitrate (N) Content = 10.4 mg/L

WATER ANALYSIS (mg/L)

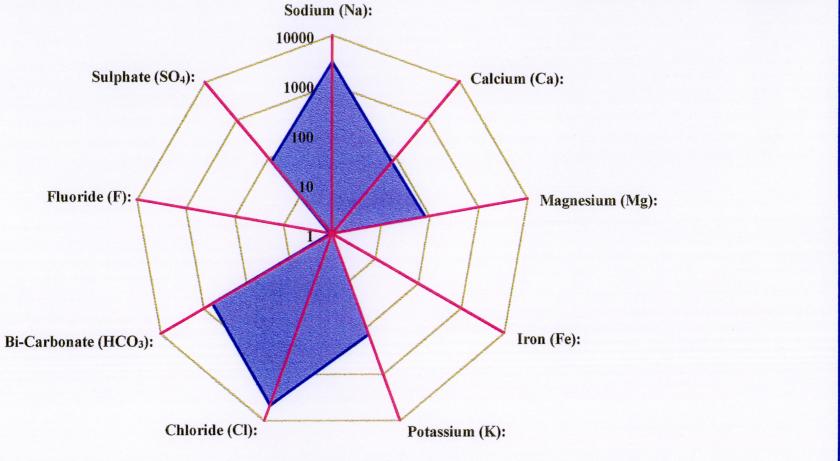
Client: OMV Australia Pty Ltd

Well: Baleen-2

File: 0164-06

Sample: Water 1.01





Client:

OMV Australia Pty Ltd

Well:

Baleen-2

Tool:

N/A

File: 0164-06

Sample: Water 1.06

	Cati	ons		An	ions
	mg/L	meq/L		mg/L	meq/L
Sodium (Na):	3000	130.5	Chloride (Cl):	4610	129.8
Calcium (Ca):	76	3.8	Bi-Carbonate (HCO ₃):	618	12.3
Magnesium (Mg):	82.0	6.7	Sulphate (SO ₄):	79	1.6
Iron (Fe):	< 0.1	0.0	Carbonate (CO ₃):	<1	0.0
Potassium (K):	142	3.6	Fluoride (F)	1.00	0.1
1 0 4400 0 1441 (4 =)			Hydroxide (OH):	<1	0.0
DERIVED DATA			TOTAL AND BALA	NCE	
Total Dissolved Soli	ds:	r	Cations		145
Based on E.C		8	Anions		144
Calculated (HCO ₃	$= CO_3$	9	Ion Balance (Diff*100	/sum)	-0.271
Total Hardness (as C	Ca CO ₃)		Sodium Adsorption Ra	atio	56.8
Total Alkalinity (as C	Ca CO ₃)		Difference (Anions - Cations)		-0.78
•			Sum (Anions + Cation	s)	288.6
OTHER ANALYS	EC.				
OTHER ANALIS	EAS				
	0.709	ohm.m@ 25 °C			
Resistivity					
Resistivity Conductivity (E.C)	14100.0	μS/cm @ 25 °C			
•	14100.0 7.4	μS/cm @ 25 °C			

Nitrate (N) Content = 10.4 mg/L

WATER ANALYSIS (mg/L)

Client: OMV Australia Pty Ltd

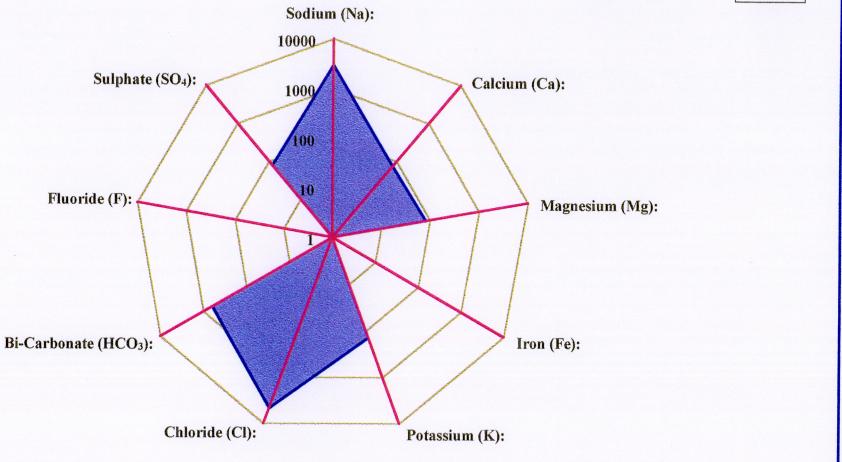
Baleen-2

Well:

File: 0164-06

Sample: Water 1.06





Client:

OMV Australia Pty Ltd

Well:

Baleen-2

Tool:

N/A

File: 0164-06

Sample: 1A - 754.08m

	Cations			Anions	
	mg/L	meq/L		mg/L	meq/L
Sodium (Na):	11500	500.3	Chloride (Cl):	17700	498.5
Calcium (Ca):	< 50	0.0	Bi-Carbonate (HCO ₃):	<1	0.0
Magnesium (Mg):	80.0	6.6	Sulphate (SO ₄):	400	8.3
Iron (Fe):	<5	0.0	Carbonate (CO ₃):	<1	0.0
Potassium (K):	80	2.0	Fluoride (F)	<5	0.0
(- " / "			Hydroxide (OH):	<1	0.0
DERIVED DATA			TOTAL AND BALAN	CE	
Total Dissolved Solic	ls:	mg/L	Cations		509
Based on E.C		29700	Anions		507
Calculated (HCO ₃	$= CO_3$	33100	Ion Balance (Diff*100/s	um)	-0.198
Total Hardness (as C	Ca CO ₃)	360	Sodium Adsorption Rat		0.0
Total Alkalinity (as C	Ca CO ₃)	<1	Difference (Anions - Cat	ions)	-2.01
			Sum (Anions + Cations)	•	1015.7
OTHER ANALYS	<u>ES</u>				
Resistivity		ohm.m@ 25 °C			
Conductivity (E.C)	55200.0	μS/cm @ 25 °C			

Nitrate (N) Content = 44.8 mg/L

PE907960-color 028

WATER ANALYSIS (mg/L)

Client: OMV Australia Pty Ltd

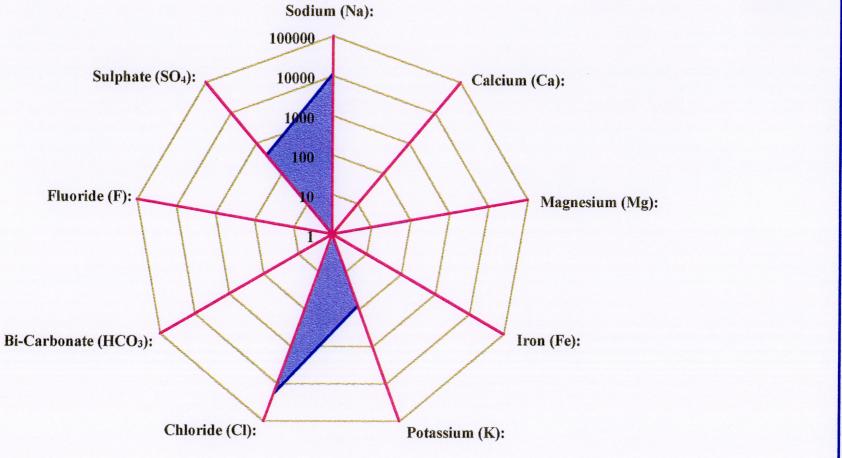
Well:

Baleen-2

File: 0164-06

Sample: 1A - 754.08m





Client:

OMV Australia Pty Ltd

Well:

Baleen-2

Tool:

N/A

File: 0164-06

Sample: 1B - 754.08m

	Cati	ons		Aı	nions
Sodium (Na): Calcium (Ca): Magnesium (Mg): Iron (Fe): Potassium (K):	mg/L 11600 <50 120.0 <5 160	meq/L 504.6 0.0 9.9 0.0 4.1	Chloride (CI): Bi-Carbonate (HCO ₃): Sulphate (SO ₄): Carbonate (CO ₃): Fluoride (F) Hydroxide (OH):	mg/L 18100 <1 560 <1 <5 <1	meq/L 509.8 0.0 11.7 0.0 0.0
Total Dissolved Solid Based on E.C Calculated (HCO ₃ Total Hardness (as C Total Alkalinity (as C	$= CO_3)$ $Ca CO_3)$	mg/L 30600 36000 480 <1	Cations Anions Ion Balance (Diff*100/s Sodium Adsorption Rat Difference (Anions - Cat	um) io ions)	519 521 0.278 0.0 2.90
OTHER ANALYS	<i>3</i> ,	~1	Sum (Anions + Cations)		

Nitrate (N) Content = 111 mg/L

WATER ANALYSIS (mg/L)

Client: OMV Australia Pty Ltd

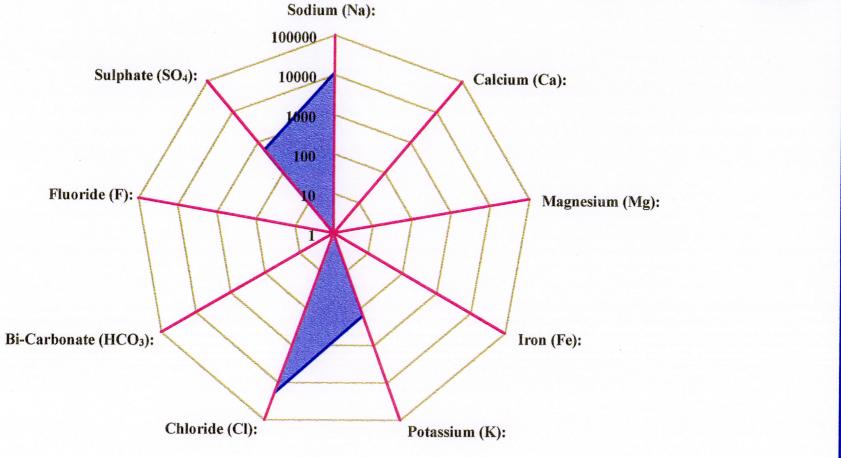
Baleen-2

Well:

File: 0164-06

Sample: 1B - 754.08m





Client:

OMV Australia Pty Ltd

File: 0164-06

Well:

Baleen-2

Sample: 1C - 754.08m

Tool:

N/A

	Cations			Aı	ions	
	mg/L	meq/L		mg/L	meq/L	
odium (Na):	12700	552.5	Chloride (CI):	19800	557.7	
alcium (Ca):	< 50	0.0	Bi-Carbonate (HCO ₃):	3	0.1	
lagnesium (Mg):	150.0	12.3	Sulphate (SO ₄):	650	13.5	
ron (Fe):	<5	0.0	Carbonate (CO ₃):	<1	0.0	
otassium (K):	150	3.8	Fluoride (F)	<5	0.0	
()·			Hydroxide (OH):	<1	0.0	
otal Dissolved Solids Based on E.C Calculated (HCO ₃ = otal Hardness (as Ca otal Alkalinity (as Ca	CO ₃)	mg/L 33500 39000 550	Cations Anions Ion Balance (Diff*100/s Sodium Adsorption Rat Difference (Anions - Cations)	io ions)	569 571 0.232 0.0 2.65 1139.9	
Calculated (HCO ₃ = Cotal Hardness (as Ca	CO ₃)	39000 550	Ion Balance (Diff*100/s Sodium Adsorption Rat	io ions)		

Nitrate(N) Content = 27.5 mg/L

WATER ANALYSIS (mg/L)

Client: OMV Australia Pty Ltd

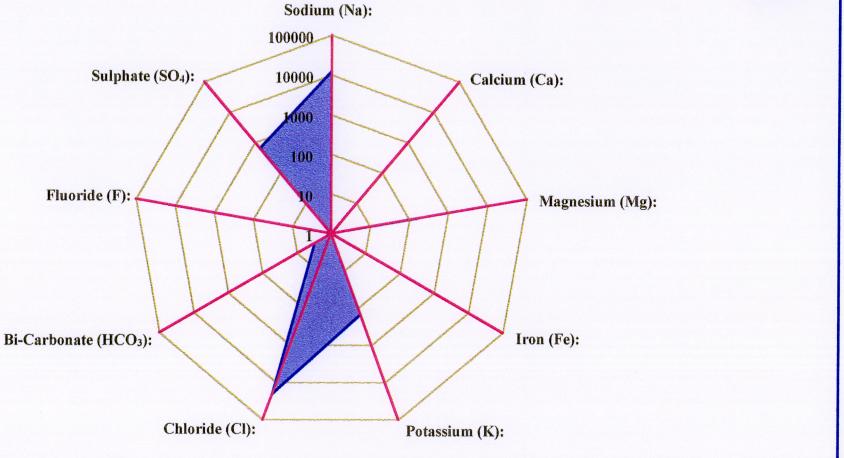
Well:

Baleen-2

File: 0164-06

Sample: 1C - 754.08m





Client:

OMV Australia Pty Ltd

Well:

Baleen-2

Tool:

N/A

File: 0164-06

Sample: 1D - 754.08m

	Cati	ons			Anions	
	mg/L	meq/L			mg/L	meq/L
Sodium (Na):	11800	513.3		Chloride (C1):	18500	521.1
Calcium (Ca):	< 50	0.0		Bi-Carbonate (HCO ₃):	1	0.0
Magnesium (Mg):	100.0	8.2		Sulphate (SO ₄):	750	15.6
Iron (Fe):	<5	0.0		Carbonate (CO ₃):	<1	0.0
Potassium (K):	150	3.8		Fluoride (F)	<5	0.0
,				Hydroxide (OH):	<1	0.0
DERIVED DATA				TOTAL AND BALAN	<u>CE</u>	
Total Dissolved Soli	ds:		mg/L	Cations		525
Based on E.C			31400	Anions		537
Calculated (HCO ₃	$= CO_3$		36600	Ion Balance (Diff*100/s		1.068
Total Hardness (as C	Ca CO ₃)		500	Sodium Adsorption Rati		0.0
Total Alkalinity (as C	Ca CO ₃)		1	Difference (Anions - Cations)		11.34
				Sum (Anions + Cations)		1062.1
OTHER ANALYS	ES					
Resistivity		ohm.m @ 25				
Conductivity (E.C)		μS/cm @ 25	°C			
Reaction - pH	4.9	µ5/cm @ 23	C			

Nitrate(N) Content = 47.5 mg/L

WATER ANALYSIS (mg/L)

Client: OMV Australia Pty Ltd

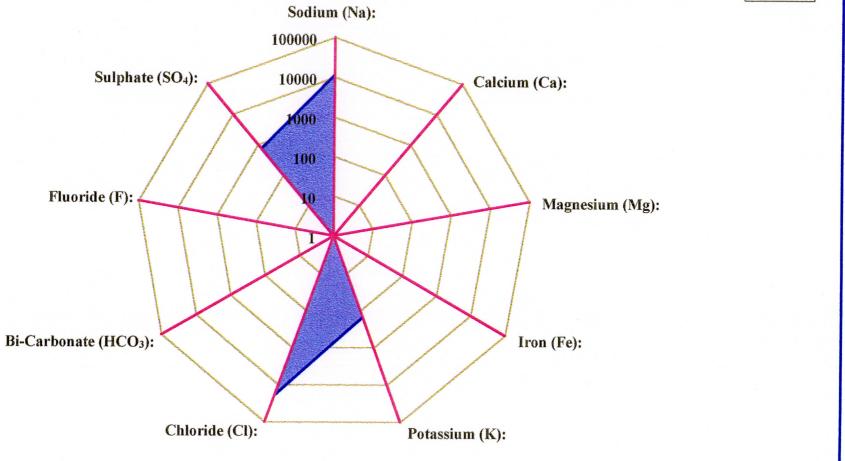
Baleen-2

Well:

File: 0164-06

Sample: 1D - 754.08m





Client:

OMV Australia Pty Ltd

File: 0164-06

Well:

Baleen-2

Sample: 1E - 754.08m

Tool:

N/A

	Cati	ons		Anions	
	mg/L	meq/L		mg/L	meq/L
Sodium (Na):	14700	639.5	0.20	22800	642.2
Cakium (Ca):	< 50	0.0	Bi-Carbonate (HCO ₃):	<1	0.0
Magnesium (Mg):	100.0	8.2	Sulphate (SO_4) :	750	15.6
Iron (Fe):	<5	0.0	Carbonate (CO_3) :	<1	0.0
Potassium (K):	150	3.8	Fluoride (F)	<5	0.0
` '			Hydroxide (OH):	<1	0.0
DERIVED DATA			TOTAL AND BALANC	E	
Total Dissolved Soli	ds:	mg/I	Cations		652
Based on E.C		38600			658
Calculated (HCO ₃	$= CO_3$)	44100	,	n)	0.480
Total Hardness (as C	Ca CO ₃)	500	4		0.0
Total Alkalinity (as C	Ca CO ₃)	<1	Difference (Anions - Catio	ns)	6.28
			Sum (Anions + Cations)		1309.3
OTHER ANALYS	ES				
Resistivity	0.136	ohm.m @ 25 °C			
Conductivity (E.C)	73500.0	μS/cm @ 25 °C			
Reaction - pH	4.2	AD. 0 © 2 0			

Nitrate(N) Content = 111 mg/L

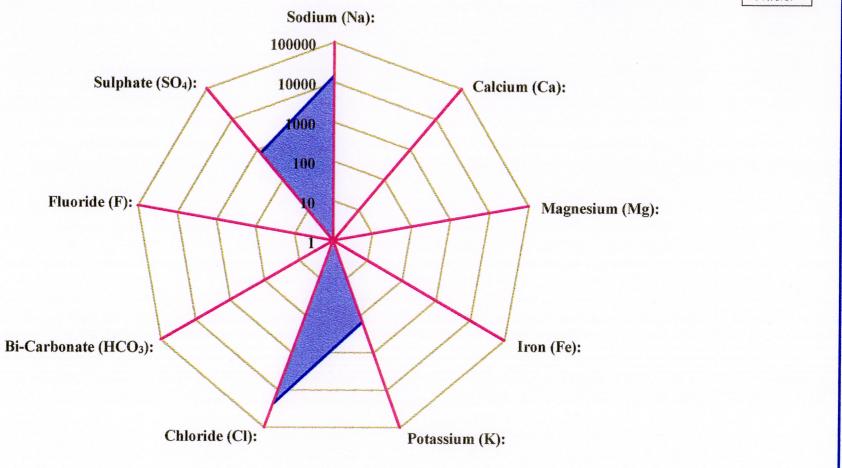
907960

File:

0164-06

Sample: 1E - 754,08m





WATER ANALYSIS (mg/L)

Client: OMV Australia Pty Ltd

Baleen-2

Well:

Client:

OMV Australia Pty Ltd

File: 0164-06

Well:

Baleen-2

Sample: 2A - 778.34m

Tool:

N/A

	Cati	ons			Ar	iions
Sodium (Na): Calcium (Ca): Magnesium (Mg):	mg/L 9640 <50 120.0	meq/L 419.3 0.0 9.9		Chloride (Cl): Bi-Carbonate (HCO ₃): Sulphate (SO ₄):	mg/L 15200 1 520	meq/L 428.1 0.0 10.8
Iron (Fe): Potassium (K):	<5 80	0.0 2.0		Carbonate (CO ₃): Fluoride (F) Hydroxide (OH):	<1 <5 <1	0.0 0.0 0.0
DERIVED DATA				TOTAL AND BALAN	CE	
Total Dissolved Solid Based on E.C Calculated (HCO ₃ Total Hardness (as C Total Alkalinity (as C	$= CO_3)$ $Ca CO_3)$		mg/L 25300 29000 560	Cations Anions Ion Balance (Diff*100/s Sodium Adsorption Rati Difference (Anions - Cat Sum (Anions + Cations)	io ions)	431 439 0.886 0.0 7.71 870.2
OTHER ANALYS Resistivity Conductivity (E.C) Reaction - pH	0.206	ohm.m @ 25 μS/cm @ 25				

Nitrate (N) Content = 61.2 mg/L

PE907960-color033

907960 281

WATER ANALYSIS (mg/L)

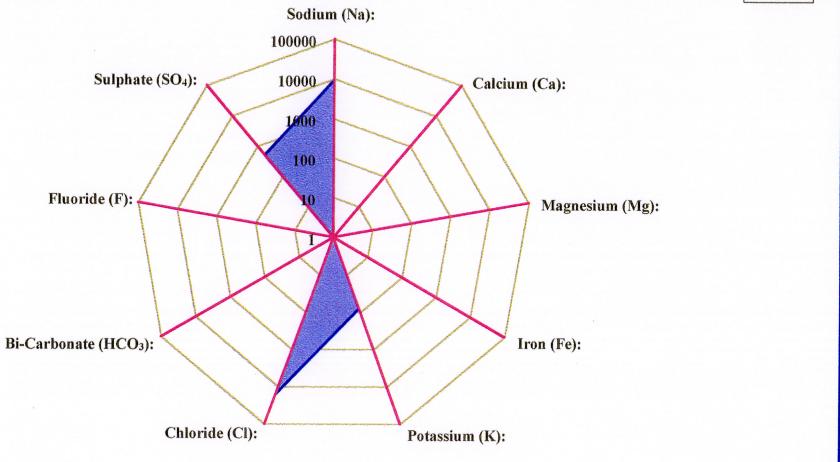
Client: OMV Australia Pty Ltd

Well: Baleen-2

File: 0164-06

Sample: 2A - 778.34m





Client:

OMV Australia Pty Ltd

Well:

Baleen-2

Tool:

N/A

File: 0164-06

Sample: 2B - 778.34m

	Cati	ons			Anions	
	mg/L	meq/L			mg/L	meq/L
Sodium (Na):	7280	316.7		Chloride (Cl):	11200	315.5
Calcium (Ca):	<50	0.0		Bi-Carbonate (HCO ₃):	<1	0.0
Magnesium (Mg):	40.0	3.3		Sulphate (SO ₄):	80	1.7
Iron (Fe):	<5	0.0		Carbonate (CO ₃):	<1	0.0
Potassium (K):	80	2.0		Fluoride (F)	<5	0.0
()				Hydroxide (OH):	<1	0.0
DERIVED DATA				TOTAL AND BALAN	CE	
Total Dissolved Solic	ls:		mg/L	Cations		322
Based on E.C			18600	Anions		317
Calculated (HCO ₃	$= CO_3$		20200	Ion Balance (Diff*100/s		-0.766
Total Hardness (as C	Ca CO ₃)		240	Sodium Adsorption Rati		0.0
Total Alkalinity (as C	Ca CO ₃)		<1	Difference (Anions - Cat	ions)	-4.89
				Sum (Anions + Cations))	639.1
OTHER ANALYS	<u>es</u>					
Resistivity	0.298	ohm.m@2	25 ℃			
Conductivity (E.C)	33600.0	μS/cm @ 2	5 ℃			

Nitrate (N) Content = 136 mg/L

WATER ANALYSIS (mg/L)

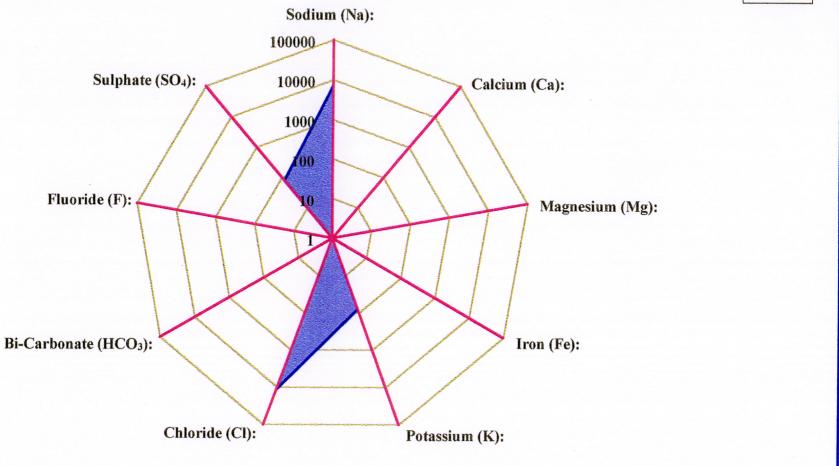
Client: OMV Australia Pty Ltd

Well: Baleen-2

File: 0164-06

Sample: 2B - 778.34m





Client:

OMV Australia Pty Ltd

Well:

Baleen-2

Tool:

N/A

File: 0164-06

Sample: 2C - 778.34m

	Cat	ions		Aı	nions
	mg/L	meq/L		mg/L	meq/L
Sodium (Na):	6360	276.7	Chloride (CI):	9920	279.4
Calcium (Ca):	<50	0.0	Bi-Carbonate (HCO ₃):	3	0.1
Magnesium (Mg):	< 50	0.0	Sulphate (SO ₄):	80	1.7
Iron (Fe):	<5	0.0	Carbonate (CO ₃):	<1	0.0
Potassium (K):	80	2.0	Fluoride (F)	<5	0.0
2 0 000 0 000 000 000 000 000 000 000 0			Hydroxide (OH):	<1	0.0
Calculated (HCO ₃ Total Hardness (as C	Ca CO ₃)	18700 200 3	Ion Balance (Diff*100/s Sodium Adsorption Rati Difference (Anions - Cat	0	0.433 0.0 2.43
Total Alkalinity (as C	37		Sum (Anions + Cations)		559.8

Nitrate (N) Content = 32.0 mg/L

WATER ANALYSIS (mg/L)

Client: OMV Australia Pty Ltd

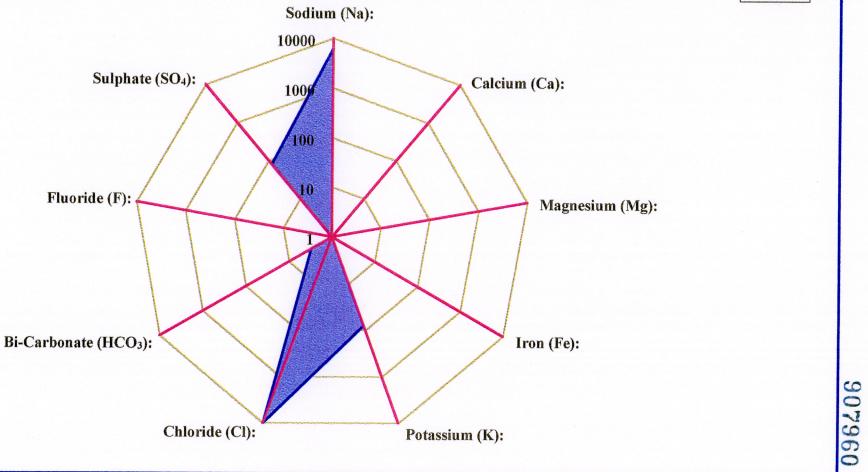
Baleen-2

Well:

File: 0164-06

Sample: 2C - 778.34m





Client:

OMV Australia Pty Ltd

File: 0164-06

Well:

Baleen-2

Sample: 2D - 778.34m

Tool:

N/A

/L meq/L 00 304.5 0 0.0 0 0.0 5 0.0 80 2.0		Chloride (Cl): Bi-Carbonate (HCO ₃): Sulphate (SO ₄): Carbonate (CO ₃): Fluoride (F) Hydroxide (OH):	mg/L 11000 3 40 <1 <5 <1	0.8 0.0 0.0	
0 0.0 0 0.0 5 0.0		Bi-Carbonate (HCO ₃): Sulphate (SO ₄): Carbonate (CO ₃): Fluoride (F)	3 40 <1 <5	0.1 0.8 0.0 0.0	
0 0.0 5 0.0		Sulphate (SO_4) : Carbonate (CO_3) : Fluoride (F)	40 <1 <5	0.8 0.0 0.0	
5 0.0		Carbonate (CO ₃): Fluoride (F)	<1 <5	0.0 0.0	
		Fluoride (F)	<5	0.0	
80 2.0		* *			
		Hydroxide (OH):	<1	0.0	
				0.0	
DERIVED DATA			TOTAL AND BALANCE		
	mg/L	Cations		307	
Based on E.C 18200		Anions		311	
Calculated ($HCO_3 = CO_3$) 21200		``		0.676	
Total Hardness (as Ca CO ₃) 80		Sodium Adsorption Ratio		0.0	
Total Alkalinity (as Ca CO ₃) 3			,		
		Sum (Anions + Cations)	1	617.3	
0.282 ohm.m@2	25 ℃				
	.5 ℃				
	o.282 ohm.m@2	18200 21200 3) 80 3) 3 2.282 ohm.m@ 25 °C 00.0 μS/cm@ 25 °C	18200 Anions Ion Balance (Diff*100/s Sodium Adsorption Rati Difference (Anions - Cat Sum (Anions + Cations)	Anions Ion Balance (Diff*100/sum) Sodium Adsorption Ratio Difference (Anions - Cations) Sum (Anions + Cations) 2.282 ohm.m@ 25 °C 0.00 µS/cm@ 25 °C	

Nitrate (N) Content = 10.0 mg/L

PE907960_color 036

WATER ANALYSIS (mg/L)

Client: OMV Australia Pty Ltd

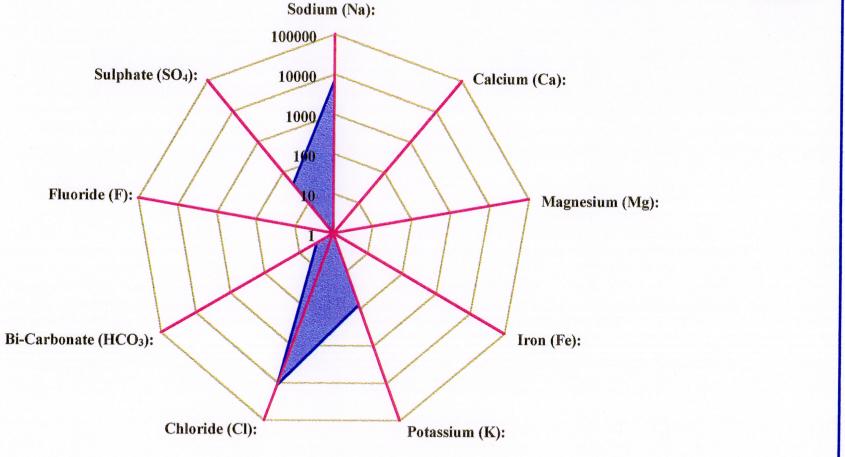
Well:

Baleen-2

File: 0164-06

Sample: 2D - 778.34m





Client:

OMV Australia Pty Ltd

Well:

Baleen-2

Tool:

N/A

File: 0164-06

Sample: 2E - 778.34m

	Cat	ions		Anions	
Sodium (Na): Calcium (Ca): Magnesium (Mg):	mg/L 6520 <50 <50	meq/L 283.6 0.0 0.0	Chloride (Cl): Bi-Carbonate (HCO ₃): Sulphate (SO ₄):	mg/L 10200 <1 80	meq/L 287.3 0.0 1.7
Iron (Fe): Potassium (K):	<5 80	0.0 2.0	Carbonate (CO ₃): Fluoride (F) Hydroxide (OH):	<1 <5 <1	0.0 0.0 0.0
DERIVED DATA			TOTAL AND BALANCE		
Total Dissolved Solids: Based on E.C Calculated ($HCO_3 = CO_3$) Total Hardness (as $Ca CO_3$) Total Alkalinity (as $Ca CO_3$)		mg/L 16800 20200 120 <1	Cations Anions Ion Balance (Diff*100/sum) Sodium Adsorption Ratio Difference (Anions - Cations) Sum (Anions + Cations)		286 289 0.573 0.0 3.29 574.6
OTHER ANALYSI Resistivity Conductivity (E.C) Reaction - pH	0.298	ohm.m @ 25 °C μS/cm @ 25 °C			

Nitrate (N) Content = 51.6 mg/L

907960 ;

WATER ANALYSIS (mg/L)

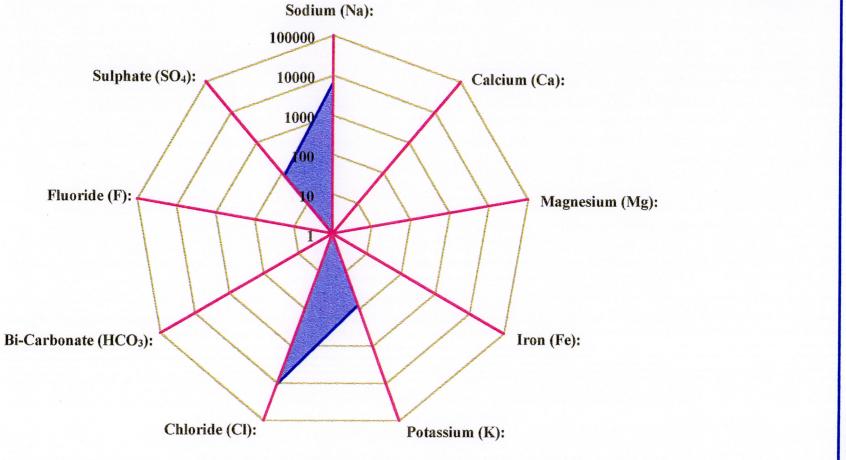
Client: OMV Australia Pty Ltd

Well: Baleen-2

File: 0164-06

Sample: 2E - 778.34m





WATER ANALYSIS

Client:

OMV Australia Pty Ltd

File: 0164-06

Well:

Baleen-2

Sample: Filtrate

Tool:

N/A

	Cati	ons			Aı	nions	
	mg/L	meq/L			mg/L	meq/L	
Sodium (Na):	28000	1218.0		Chloride (Cl):	43200	1216.8	
Calcium (Ca):	160	8.0		Bi-Carbonate (HCO ₃):	6	0.1	
Magnesium (Mg):	360.0	29.6		Sulphate (SO ₄):	1440	30.0	
Iron (Fe):	<5	0.0		Carbonate (CO ₃):	<1	0.0	
Potassium (K):	440	11.3		Fluoride (F)	<5	0.0	
				Hydroxide (OH):	<1	0.0	
DERIVED DATA				TOTAL AND BALAN	CE	,	
Total Dissolved Soli	ds:		mg/L	Cations	1267		
Based on E.C			74000	Anions	1247		
Calculated (HCO	$S = CO_3$		80800	Ion Balance (Diff*100/s	-0.795		
Total Hardness (as 0	Ca CO ₃)		2000	Sodium Adsorption Rat	io	0.0	
Total Alkalinity (as C	Ca CO ₃)		6	Difference (Anions - Cat	-19.99		
				Sum (Anions + Cations))	2513.7	
OTHER ANALYS	ES						
Resistivity	0.075	ohm.m@2	5 ℃				
Conductivity (E.C)	134000.0	μS/cm @ 25	5 ℃				
Reaction - pH	6.6						

Nitrate (N) Content = 233 mg/L

Specific Gravity not measurable due to low sample volume.

907960

WATER ANALYSIS (mg/L)

Client: OMV Australia Pty Ltd

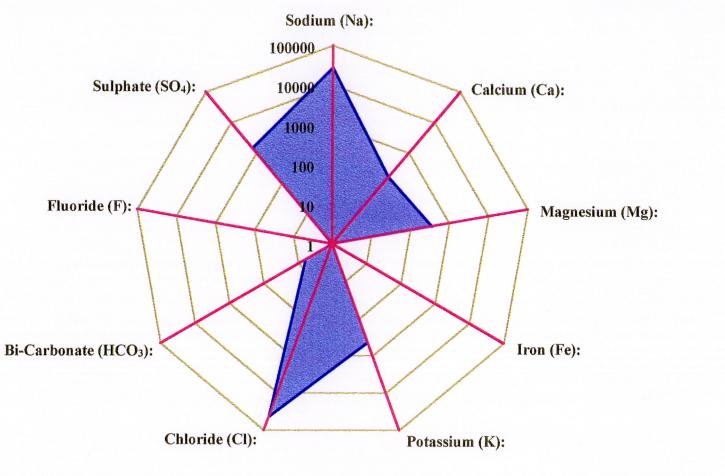
Baleen-2

Well:

File: 0164-06

Sample: Filtrate





WATER ANALYSIS

Client:

OMV Australia Pty Ltd

Well:

Baleen-2

Tool:

N/A

File: 0164-06

Sample: Mud, Core 2, 762m

	Cati	ons			A	nions		
	mg/L	meq/L			mg/L	meq/L		
Sodium (Na):	25700	1118.0		Chloride (Cl):	38800	1092.8		
Calcium (Ca):	454	22.7		Bi-Carbonate (HCO ₃):	5510	110.1		
Magnesium (Mg):	348.0	28.6		Sulphate (SO ₄):	1430	29.8		
Iron (Fe):	4.8	0.2		Carbonate (CO ₃):	<1	0.0		
Potassium (K):	434	11.1		Fluoride (F)	< 0.1	0.0		
. • • • • • • • • • • • • • • • • • • •				Hydroxide (OH):	<1	0.0		
DERIVED DATA				TOTAL AND BALAN	CE			
Total Dissolved Solid	is:		mg/L	Cations		1181		
Based on E.C			33900	Anions		1233		
Calculated (HCO ₃	$= CO_3$		41500	Ion Balance (Diff*100/s	um)	2.163		
Total Hardness (as C	Ca CO ₃)		2570	Sodium Adsorption Rat	io	0.0		
Total Alkalinity (as C	Ca CO ₃)		5510	Difference (Anions - Cat	52.19			
				Sum (Anions + Cations))	2413.2		
OTHER ANALYS	ES							
Resistivity		ohm.m@ 25						
Conductivity (E.C)	63800.0	μS/cm @ 25 °	C ,					

Nitrate (N) Content = 300 mg/L

Specific Gravity not measurable due to low sample volume.

WATER ANALYSIS (mg/L)

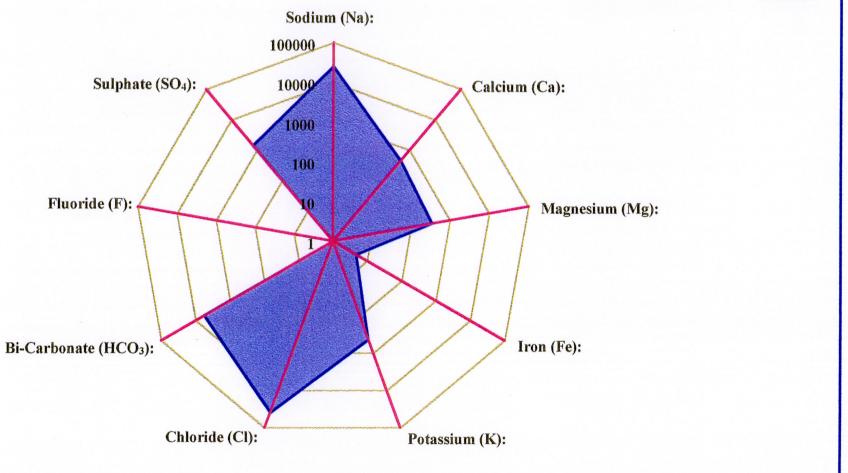
Client: OMV Australia Pty Ltd

Well: Baleen-2

File: 0164-06

Sample: Mud, Core 2, 762m PTY, LTD.





CHAPTER 2

EXTRACTED OIL COMPOSITION

Client:

OMV Australia Pty Ltd

Well:

Baleen-2

Cylinder No:

Sample 1

Component	(Mole %)	(Weight %)	Density (g/cc)	Molecular Weight		
Hydrogen Sulphide	0.00	0.00	0.80064	34.0800		
Carbon Dioxide	0.00	0.00	0.81720	44.0100		
Nitrogen	0.00	0.00	0.80860	28.0134		
Methane	0.00	0.00	0.29970	16.0430		
Ethane	0.00	0.00	0.35619	30.0700		
Propane	0.00	0.00	0.50698	44.0970		
iso-Butane	0.00	0.00	0.56286	58.1230		
n-Butane	0.00	0.00	0.58402	58.1230		
iso-Pentane	0.00	0.00	0.62441	72.1500		
n-Pentane	0.00	0.00	0.63108	72.1500		
Hexanes	0.00	0.00	0.68500	84.0000		
Heptanes	0.00	0.00	0.72200	96.0000		
Octanes	0.00	0.00	0.74500	107.0000		
Nonanes	0.00	0.00	0.76400	121.0000		
Decanes	3.67	2.17	0.77800	134.0000		
Undecanes	4.60	2.99	0.78900	147.0000		
Dodecanes	7.04	5.01	0.80000	161.0000		
Tridecanes	11.61	8.98	0.81100	175.0000		
Tetradecanes	11.02	9.25	0.82200	190.0000		
Pentadecanes	12.44	11.32	0.83200	206.0000		
Hexadecanes	8.99	8.82	0.83900	222.0000		
Heptadecanes	7.29	7.63	0.84700	237.0000		
Octadecanes	6.16	6.83	0.85200	251.0000		
Nonadecanes	5.00	5.81	0.85700	263.0000		
Eicosanes	4.77	5.79	0.86200	275.0000		
Heneicosanes	4.27	5.49	0.86700	291.0000		
Docosanes	3.25	4.38	0.87200	305.0000		
Tricosanes	2.13	2.99	0.87700	318.0000		
Tetracosanes	1.96	2.87	0.88100	331.0000		
Pentacosanes	1.61	2.46	0.88500	345.0000		
Hexacosanes	1.23	1.95	0.88900	359.0000		
Heptacosanes	1.05	1.73	0.89300	374.0000		
Octacosanes	0.71	1.22	0.89600	388.0000		
Nonacosanes	0.44	0.79	0.89900	402.0000		
Triacontanes plus	0.76	1.52	0.91000	450.0000		
TOTALS:	100.00	100.00				

Client:

OMV Australia Pty Ltd

Well:

Baleen-2

Cylinder No:

Sample 1

Properties of Plus Fractions

Plus Fractions	(Mole %)	(Weight %)	Density (g/cc)	Molecula Weight		
Heptanes plus	100.00	100.00	0.8430	226		
Undecanes plus	96.33	97.83	0.8440	230		
Pentadecanes plus	62.06	71.60	0.8580	261		
Eicosanes plus	22.18	31.19	0.8770	318		
Triacontanes plus	0.76	1.52	0.9100	450		

Total Sample Properties

Molecular Weight:

226.3

Calculated Liquid Density at 60°F, g/scc:

0.8438

Client:

OMV Australia Pty Ltd

Well:

Baleen-2

Cylinder No:

Sample 2

Component	(Mole %)	(Weight %)	Density (g/cc)	Molecular Weight		
Hydrogen Sulphide	0.00	0.00	0.80064	34.0800		
Carbon Dioxide	0.00	0.00	0.81720	44.0100		
Nitrogen	0.00	0.00	0.80860	28.0134		
Methane	0.00	0.00	0.29970	16.0430		
Ethane	0.00	0.00	0.35619	30.0700		
Propane	0.00	0.00	0.50698	44.0970		
iso-Butane	0.00	0.00	0.56286	58.1230		
n-Butane	0.00	0.00	0.58402	58.1230		
iso-Pentane	0.00	0.00	0.62441	72.1500		
n-Pentane	0.00	0.00	0.63108	72.1500		
Hexanes	0.00	0.00	0.68500	84.0000		
Heptanes	0.00	0.00	0.72200	96.0000		
Octanes	0.00	0.00	0.74500	107.0000		
Nonanes	0.00	0.00	0.76400	121.0000		
Decanes	3.26	1.98	0.77800	134.0000		
Undecanes	5.01	3.34	0.78900	147.0000		
Dodecanes	8.02	5.86	0.80000	161.0000		
Tridecanes	12.87	10.22	0.81100	175.0000		
Tetradecanes	11.63	10.03	0.82200	190.0000		
Pentadecanes	12.98	12.14	0.83200	206.0000		
Hexadecanes	8.97	9.04	0.83900	222.0000		
Heptadecanes	7.27	7.82	0.84700	237.0000		
Octadecanes	6.13	6.98	0.85200	251.0000		
Nonadecanes	4.78	5.71	0.85700	263.0000		
Eicosanes	4.62	5.77	0.86200	275.0000		
Heneicosanes	4.19	5.53	0.86700	291.0000		
Docosanes	2.95	4.09	0.87200	305.0000		
Tricosanes	1.99	2.87	0.87700	318.0000		
Tetracosanes	1.95	2.93	0.88100	331.0000		
Pentacosanes	1.09	1.71	0.88500	345.0000		
Hexacosanes	0.91	1.48	0.88900	359.0000		
Heptacosanes	0.61	1.03	0.89300	374.0000		
Octacosanes	0.30	0.53	0.89600	388.0000		
Nonacosanes	0.09	0.16	0.89900	402.0000		
Triacontanes plus	0.38	0.78	0.91000	450.0000		
TOTALS:	100.00	100.00				

Client:

OMV Australia Pty Ltd

Well:

Baleen-2

Cylinder No:

Sample 2

Properties of Plus Fractions

Plus Fractions	(Mole %)	(Weight %)	Density (g/cc)	Molecula Weight		
Heptanes plus	100.00	100.00	0.8400	220		
Undecanes plus	96.74	98.02	0.8410	223		
Pentadecanes plus	59.21	68.57	0.8550	255		
Eicosanes plus	19.08	26.88	0.8740	310		
Triacontanes plus	0.38	0.78	0.9100	450		

Total Sample Properties

Molecular Weight:

220.3

Calculated Liquid Density at 60°F, g/scc:

0.8405

Client:

OMV Australia Pty Ltd

Well:

Baleen-2

Cylinder No:

Sample 3

Component	(Mole %)	(Weight %)	Density (g/cc)	Molecular Weight		
Hydrogen Sulphide	0.00	0.00	0.80064	34.0800		
Carbon Dioxide	0.00	0.00	0.81720	44.0100		
Nitrogen	0.00	0.00	0.80860	28.0134		
Methane	0.00	0.00	0.29970	16.0430		
Ethane	0.00	0.00	0.35619	30.0700		
Propane	0.00	0.00	0.50698	44.0970		
iso-Butane	0.00	0.00	0.56286	58.1230		
n-Butane	0.00	0.00	0.58402	58.1230		
iso-Pentane	0.00	0.00	0.62441	72.1500		
n-Pentane	0.00	0.00	0.63108	72.1500		
Hexanes	0.00	0.00	0.68500	84.0000		
Heptanes	0.00	0.00	0.72200	96.0000		
Octanes	0.00	0.00	0.74500	107.0000		
Nonanes	0.00	0.00	0.76400	121.0000		
Decanes	2.55	1.56	0.77800	134.0000		
Undecanes	5.10	3.42	0.78900	147.0000		
Dodecanes	8.61	6.33	0.80000	161.0000		
Tridecanes	12.97	10.36	0.81100	175.0000		
Tetradecanes	11.83	10.26	0.82200	190.0000		
Pentadecanes	13.78	12.98	0.83200	206.0000		
Hexadecanes	8.87	8.99	0.83900	222.0000		
Heptadecanes	7.12	7.70	0.84700	237.0000		
Octadecanes	6.60	7.56	0.85200	251.0000		
Nonadecanes	4.37	5.25	0.85700	263.0000		
Eicosanes	4.68	5.87	0.86200	275.0000		
Heneicosanes	4.15	5.51	0.86700	291.0000		
Docosanes	2.89	4.03	0.87200	305.0000		
Tricosanes	1.95	2.83	0.87700	318.0000		
Tetracosanes	1.76	2.66	0.88100	331.0000		
Pentacosanes	1.10	1.73	0.88500	345.0000		
Hexacosanes	0.71	1.17	0.88900	359.0000		
Heptacosanes	0.46	0.79	0.89300	374.0000		
Octacosanes	0.12	0.22	0.89600	388.0000		
Nonacosanes	0.03	0.06	0.89900	402.0000		
Triacontanes plus	0.35	0.72	0.91000	450.0000		
TOTALS:	100.00	100.00				

Client:

OMV Australia Pty Ltd

Well:

Baleen-2

Cylinder No:

Sample 3

Properties of Plus Fractions

Plus Fractions	(Mole %)	(Weight %)	Density (g/cc)	Molecula Weight		
Heptanes plus	100.00	100.00	0.8390	219		
Undecanes plus	97.45	98.44	0.8400	221		
Pentadecanes plus	58.94	68.07	0.8540	253		
Eicosanes plus	18.20	25.59	0.8740	308		
Triacontanes plus	0.35	0.72	0.9100	450		

Total Sample Properties

Molecular Weight:

219

Calculated Liquid Density at 60°F, g/scc:

0.8397

APPENDIX I

SUMMARY OF WATER ANALYSIS RESULTS

SUMMARY OF WATER ANALYSIS RESULTS

	_	_																Г																		- 1
1E	mg/L	14700.	<50	100.	\$	150.	22800.	$\overline{\lor}$	750.	▽	<>	⊽	111.	38600.	44100.	652.	658.		2E	mg/L	6520.	<50	<50	\$	80.	10200.	⊽	80.	⊽	<>	7	51.6	16800.	20200.	286.	289.
ID	mg/L	11800.	<50	100.	\$	150.	18500.		750.	~	\$	▽	47.5	31400.	36600.	525.	537.		2D	mg/L	7000.	<50	<50	\$	80.	11000.	3.	40.		<>	⊽	10.	18200.	21200.	307.	311.
21	mg/L	12700.	<50	150.	\$	150.	19800.	3.	650.	~	\$>	⊽	27.5	33500.	39000.	569.	571.		2C	mg/L	6360.	<50	<\$0	\$	80.	9920.	3.	80.	<u>-</u>	\$	7	32.	16500.	18700.	279.	281.
18	mg/L	11600.	<50	120.	\$	160.	18100.	7	560.	~	<>>	7	111.	30600.	36000.	519.	521.		2B	mg/L	7280.	<50	40.	\$	80.	11200.	⊽	80.		\$	⊽	136.	18600.	20200.	322.	317.
ΙΑ	mg/L	11500.	<50	80.	\$	80.	17700.		400.	\ 	< \$	-	44.8	29700.	33100.	509.	507.		2A	mg/L	9640.	<50	120.	<\$	80.	15200.	1.	520.	⊽	\$	~	61.2	25300.	29000.	431.	439.
Mud, Core 2		25700.	454.	348.	8.4	434.	38800.	5510.	1430.	~	<0.1	⊽	300.	33900.	41500.	1181.	1233.		Mud, Core 2		25700.	454.	348.	8.4	434.	38800.	5510.	1430.	▽	<0.1	⊽	300.	33900.	41500.	1181.	1233.
Filtrate		28000.	160.	360.	\$	440.	43200.	9	1440.	7	\$	⊽	233.	74000.	80800.	1267.	1247.		Filtrate		28000.	160.	360.	\$	440.	43200.	9	1440.	⊽	\$	~	233.	74000.	80800.	1267.	1247.
1.06		3000.	76.	82.	<0.1	142.	4610.	618.	79.	~	_:	~	10.4	8490.	9170.	145.	144.		1.06		3000.	76.	82.	<0.1	142.	4610.	618.	79.	7	1.	^	10.4	8490.	9170.	145.	144.
1.01		2980.	76.	82.	<0.1	142.	4610.	616.	81.	~	=	~	10.4	525.	616.	144.	144.		1.01		2980.	76.	82.	<0.1	142.	4610.	616.	81.	~	-:-	~	10.4	525.	616.	144.	144.
		Sodium	Calcium	Magnesium	Iron	Potassium	Chloride	Bicarbonate	Sulphate	Carbonate	Fluoride	Hydroxide	Nitrate	T.D.S EC	T.D.S Calc	Cations	Anions				Sodium	Calcium	Magnesium	Iron	Potassium	Chloride	Bicarbonate	Sulphate	Carbonate	Fluoride	Hydroxide	Nitrate	T.D.S EC	T.D.S Calc	Cations	Anions

APPENDIX II

CHROMATOGRAMS FOR OIL ANALYSIS

エエじエピ Run File : C:\STAR\SAMPL032.RUN Method File : C:\STAR\STD6DHA.MTH

Sample ID : Baleen No.1

907960 304

Calculation Date: 8-NOV-99 5:03 PM Injection Date: 8-NOV-99 2:30 PM

Operator : ACS Lab Brisbane

Detector Type: ADCB (10 Volts)

:station:

Instrument : Varian Star #1 Channel : A = FID 10 VOLTS

12

13 -

15 -

16 -

17 -

18

19 -

20

21 -

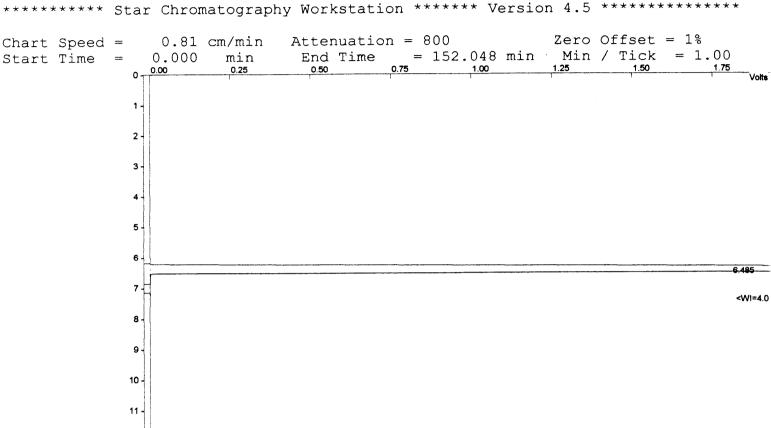
22 -

23

---12.154

Bus Address : 16 Sample Rate : 10.00 Hz : 152.048 min Run Time

******* Star Chromatography Workstation ****** Version 4.5 ***********



```
25
26
          <del>----</del>27.306
28 -
     28.284
28.693
     29.111
                            29.334
30
                                            -29.760 <sub>29.869</sub>
                       30.175
                               <del>-3</del>0.702 <sub>30.780</sub>
       31.046
31.212
32 - 32.068 32.175 32.369

32.580 32.667 32.748
                                                                                   -31.566
       32.369
32.580 32.667 32.748 32.915
32.990 33.092 33.250
33.778 33.546 33.652
33.778 33.903 34.067
34.123 34.240 34.386
34.347 34.580 34.718
        34.804 34.995
35.091 35.178 35.247
35.323 35.435 35.247
               35.797 35.897
36
             36.274
36.377
36.5327
36.602
                                                 36.137
           36.813 36.974 37.119
37.240 37.617 37.751
               37.950 <sub>38.058</sub>
38
              38,339

38,553

38,798

38,798

38,858

39,058
39
           39.058 39.549 39.262
39.603 39.603
39.814 39.906 40.000
40.074 40.158 40.298
313.89 40.453 40.580
40.674 40.837 40.871
40
                  40.837 40.871 4

41.623 41.335 41.460

41.623 41.722

42.038 41.947

42.556 42.398 42.470

42.556 42.782
41
                                                                41.114
 42 -
                     42.556 42.783 42.876

43.059 43.165

43.330 43.385 43.518
 43
                               -43.969 44.043 44.169
 44
                        44.652 44.736 44.809 44.993
                           45.222 45.341 45.401 45.504

45.621 45.710 45.858

46.321 46.718 46.318 46.234

46.521 46.578

46.521 46.578

46.621 46.896

47.185
 45 -
 46
 47
                            47.692 47.758 47.

48.078 48.191

48.387 48.540

49.100 49.207 49.010
                                47.272
47.438
47.692
47.75
                                                                   47.880
 48
                            48.754
49.207 49.383
49.481 49.604
49.715
49.967
 49
                                49.967

-50.437 50.371

-50.798 50.905 51.034

-51.152 51.350
 50
                                                                            -50.149
 51
                                 51.534 51.688 51.803
                              51.949 52.173 52.353 52.576
 52
                               52.784 52.784
52.971 52.784
 53
                               32.97 1 53 197 53.288 53.38 197
                                53.832 54.001 54.249
                                54.349

54.349

54.535

54.610

54.978

55.176
 54
                                 55.435 55.706 55.855
55.635 55.706 55.855
 55
  56 J
```

24 -

```
56.438 56.631 56.774 56.925
                                               56.925
57.116 56.925
57.356 57.537 57.720 57.90
57
                                                57.537 57.720 57.809

57.860 58.046 58.046

58.149 58.282

58.702 58.836 58.255

59.036 59.101 58.944

59.288 59.434
58
59
                                            59.036 59.101 58.944
59.288 59.434 59.569
59.288 59.434 59.569
59.333 69.128 59.863
60.073 60.292 60.375 60.207
60.60570 60.6260.528
61.013 61.135 61.255
61.500 61.448 61.715 61.829
61.988 62.197 62.333
60
61
                                                     61.988 62.197 62.333

62.439 67.546

62.627 67.920 63.069

63.231 63.375 63.531

63.569 63.637 63.754

63.561 63.957 64.079

64.502 64.604

64.792 64.881 65.027

65.168 65.220 65.248
62
63
64
                                                         64.502 64.604
64.792 64.881 65.027
65.106 65.220 65.348
65.463 65.544 65.641
66.684 66.220 66.325
66.491 66.220 67.037
67.739 67.554 67.681
67.759 66.288 68.380
67.654 68.383 68.384
67.554 68.383 68.384
67.555 68.383 68.384
67.555 68.383 68.384
67.555 68.383 68.384
67.555 68.383 68.384
67.555 68.383 68.384
67.555 68.383 68.384
67.555 68.383 68.383
67.555 68.383 68.383
67.555 68.383 68.383
67.555 68.383 68.383
67.555 68.383 68.383
65
66
67
68
69
                                             769.887 70.001

70.0867 70.0352

70.0552 70.4673 70.493

70.399 71.703 71.223

71.598 71.703 71.512

71.598 71.703 71.837
70
71
                                                71.955 72.088
72.252 72.343
72
                                                                                     72.489 72.606
                                            72.728

772.982 73.64931

73.246 73.353 73.403

73.468 73.573 73.712
                                                =72.728
=72.982 7
73
                                          73.800 74.024

74.114 74.192 74.253

74.329 74.455 74.495

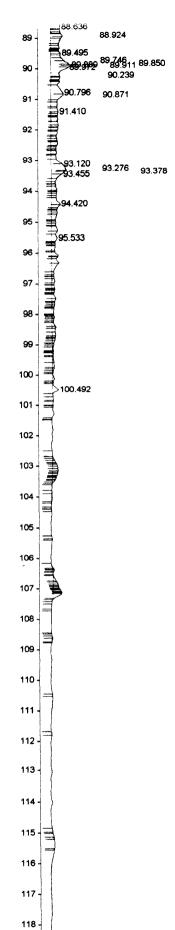
74.712 74.833 74.918
75
                                     75.207 75.284
75.373 75.479
75.642 75.785
                                   76.088-945-76.885

76.375 76.453

76.453

76.453

76.800 76.600
                                    75.785
76.085.945
76
                                                  76.802 76.681
77.058 77.131
77.735 77.65
77
                                                                       77.909
78
                                                  78.156
78.371
                                                                      78.490
                       378.584
                                              78.554
79
                         79.181
                                                 79.221
                                      >79.606
                           780 583 80.011
80
                                            80.392
80.641
80.965
80.965
81.351
81
                         81.528
                                             81,708
                   82.030 82.142 81.970
82.332 82.550 82.504
82
                        82.686 82.550
                                                                 82.591
83
                  83.333
                                           83 157
83 187
                                                                83.551
                  ₹83:878
                                         83.802
84.008
84
                                                                84.271
                 384.992
85
                                         85.269
85:415 85.458
                 85.365
85.606
86
                        ≥86.040 86.082
                  <del>≤</del>86.440 <sub>86.554</sub>
87
                      87.286 87.358
                    ⇒87.698 87.728
88
               88.125 RR 317
```



120 -

<WI=2.0

<WI=4.0

<WI=2.0

<WI=4.0

121 -122 -123 -124 -125 -126 -127 128 129 130 -131 -132 -133 -134 -135 -136 -137 -138 -139 -140 -141 -142 -143 -144 -145 -146 -147 -148 -149

150 -

151 -

152

Run File : C:\STAR\SAMPL033.RUN Method File : C:\STAR\STD6DHA.MTH

Sample ID : Baleen No.2

Wo istation:

907960 309

Injection Date: 8-NOV-99 5:13 PM Calculation Date: 8-NOV-99 8:33 PM

Operator : ACS Lab Brisbane

Detector Type: ADCB (10 Volts)

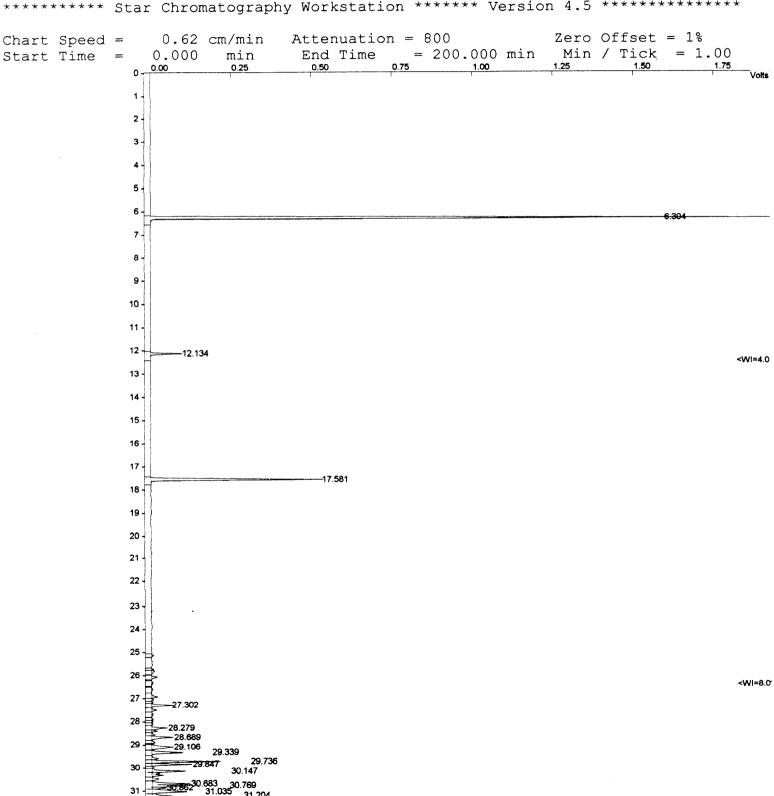
Bus Address : 16

Instrument : Varian Star #1

Sample Rate : 10.00 Hz

Run Time : 200.002 min Channel : A = FID 10 VOLTS

******* Star Chromatography Workstation ****** Version 4.5 **********



32 -	31.725 31.854 32.050 32.157 32.356 32.568 32.660 32.739 32.889 33.085 33.085 33.289
33 -	32.568 32.660 32.739 32.889 32.976 33.085 33.238
34 -	33.440 33.534 33.644 33.771 33.894 34.061
35 -	32.680 32.739 32.889 33.440 33.534 33.644 33.771 33.894 34.061 34.364 34.231 34.061 34.703 34.792 34.552 34.703 35.311 35.169 35.330 35.780
36 -	35.331 35.780 35.780 35.691 35.780
37 -	35.587 35.691 35.780 36.36149 36.212 36.3531 36.443 36.532 36.967 37.110 37.248 37.428 37.607 37.743 37.946 38.050
	37.428 37.607 37.743
38 -	37.428 37.607 37.743 31.946 38.050 33.38.331 338.459 39.043 38.850 39.043 38.850 39.043 38.850
39 -	39.947 39.900 39.957 39.807 39.900 39.996
40 -	39,807 39,900 39,993 30,069 40,151 40,291 40,667 40,832 40,858 41,106
41 -	
42 -	42.033 42.459 41.938 42.5502.390 42.459 221
43 -	41.618 41.715 41.938 = 42.033 42.459 221 = 42.5562.390 42.459 221 = 42.5562 42.772 42.868 = 43.3502 43.373.157 = 43.866 43.854
44 -	43.960 44.036 44.161 44.248 44.389 44.526
45 -	44.389 44.161 44.543 44.389 34.526 44.543 44.388 45.333 45.385,213 45.333 45.385,213
46 -	45.433 45.345.213 45.935 46.524 45.849 45.935 46.524 46.821 45.935 46.885 47.172
47 -	46.750 46.885 47.172 47.255 47.426 47.549
48 -	47.678 47.746 47.875
49 -	49.100 48.893 48.993
50 -	49.701 49.948 50.111 503.75 50.880 51.009
51 -	
52 -	51.926 52.146 space
53 -	52.763 52.944 53.175 53.253 53.361
54 -	53.602 53.805
55 ·	54.311 54.375 54.216 54.311 54.375 54.518 54.725 54.5180 55.265
56 -	55.150 55.265 55.265 55.265 55.265 55.265 55.265 55.265
57 -	
58 ·	57.964 772 57.689
59 -	58.668 58.476 58.595 58.007 58.808 58.910
60 ·	59.259 59.259 59.401 59.839 59.615 59.707 50.60.262 60.607.47 60.177
61 -	60.60 50.50 50.60 60.499
62	61.619 61.689 61.802
63	62.415 62.523 £2.660 62.415
64	63 536 63 676 63 733 63 536 63 676 63 733
	54,653 65,0775 64,663 65,0775 64,663 65,0775 65,577 65,570 65,324
65	03./01 65 963 00:010
66	36 462 66 673 66 302
67	7,96,893 67,010 68,781 67,300 67,408 257 67,531 67,531 67,539 68,054 68,183 68,538 76,586 68,362
68	
69	69.704
70	70.086 70.375 70.688 70.638 70.486
71	70.879 71.060 71.207 71.207 71.207 71.207 71.207 71.207 71.207 71.207 71.207 71.207
72	72.318 72.578
73	77.35 77.16 73.342 73.690

0.8=IW>

<WI=4.0

<WI=8.0

<WI=16.0

<Wi=8.0

<WI=8.0

<WI=16.0

<WI=32.0

<WI=8.0

<WI=16.0

1.23 -85 -86 ->86.027 87 -87.330 87.673 88 89 -89.831 90 -<WI=8.0 90.832 <WI=16.0 92 93 93.259 94 95 96 97 98 99 100 101 102 102.980 103.180 103 -104 105 106 107 107.082 108 109 110 110.565 111 112 113 <WI=16.0 114 115 116

75

76

77

78

79

80

81

82

83 -84 - 75.923

3 76.698 1728

77.894

78.348

79.210

79.816

80.619

78.154

78.655

79.592

80.501 80.944

81.492

82.145 82.685

80.068

₹79.366

₹80.375 ₹80.717

₹79.983

117 -118 119 120 -121 -122 -123 -124 -125 -126 -127 -128 -129 -130 -131 -132 -133 -134 -135 -136 -137 -138 -139 -140 -141 -142 -143 -144 -145 -146 -147 -148 -149 -150 -151 -152 -153 -154 -155 -156 -

> 157 -158 -

160 -161 -162 -163 164 -165 -166 -167 -168 -169 -170 -171 -172 -173 -174 -175 -176 -177 178 -179 -180 -181 -182 -183 -184 -185 -186 -187 -188 -189 -

190 -191 -192 -193 -194 -195 -196 -197 -198 -199 - : SANTUS LILU.

Run File : C:\STAR\SAMPL034.RUN Method File : C:\STAR\STD6DHA.MTH

Sample ID : Baleen No.3

Wc .station:

Channel

907960 314

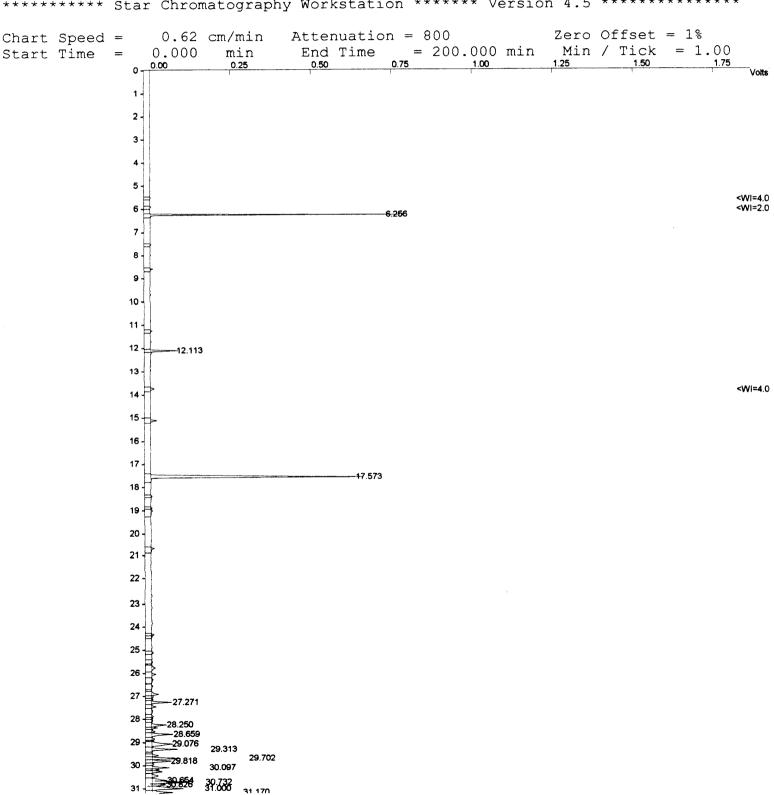
Calculation Date: 9-NOV-99 12:46 PM Injection Date: 9-NOV-99 9:25 AM

Operator : ACS Lab Brisbane

Detector Type: ADCB (10 Volts)

Bus Address : 16

Sample Rate : 10.00 Hz Instrument : Varian Star #1 Run Time : 200.002 min : A = FID 10 VOLTS



33,203 33,389 33,496 33,610 33,389 33,496 33,610 33,738 34,607 34,506 35,037 35 34,965 35,037 35 34,965 5,382 35 35.658 35.738 36,120 36,168 36,549 36,489 36,549 36,489 36,760 36,489 37,068 37,212 37,212 37,904 38,004 38,285 38,417 8,537 38,818 37.386 38.818 39.213 39.552 39.552 39.860 39.554 40.405 40.533 40.625 40.792 40.822 40.625 40.792 40.822 41.183 41.285 41.412 41.578 41.677 41.900 41.994 42.781 42.736 42.420 42.736 42.826 43.014 42.735 42.826 43.339 17 43.546 43.539 43.546 43.813 43.920 43.996 44.117 12.09 44.348 44.687 44.466 44.646 44.687 44.762 44.540
44.346
44.347
44.347
44.446
44.347
44.446
44.347
45.233
45.456
45.233
45.456
45.234
45.234
46.841
47.216
47.635
47.767
505
47.667
48.134
48.327
48.478
48.688
48.327
48.478
48.688
48.327
48.478
48.688
48.327
48.478
48.688
48.327
48.478
48.688
48.327
50.325
50.735
50.735
50.735
50.735
50.503 50 719 50.719 51.074 51.074 50.954 51.454 51.606 51.728 51.873 52.084 52.264 50.827 -51.074 51,728 52.664
52.669
52.883
53.112
53.194
53.297
53.391
53.739
54.248
54.315
54.745
55.088
55.088
55.088
55.770 52.483 56.356¹³⁹56.379²⁴⁷5 5.356¹⁻³56.5¹6.5¹79.2⁴7 56.666 56.842 57.136 57.275 57.033 57.900 57.998 58.066 56 57.900 57.7517 57.792 57.900 57.7517 57.792 58.616 58.421 58.563 58.953 58.755 58.663 58.9467 59.955 58.863 59.9467 59.955 58.9656 59.943 59.955 58.0656 59.943 69.656 68.129 50.943 69.656 61.181 61.456 61.579 61.641 61.758 61.920 62.366 62.370 63.165 63.692 63.692 63.165 63.692 64.548 63.165 63.692 64.548 63.165 65.879 65.579 65.263 65.879 65.579 66.366 66.721 66.366 66.721 66.366 66.721 66.367 67.23 66.367 67.23 66.367 67.23 66.367 67.23 66.367 67.23 66.368 68.380 68.993 68 024 68 089 236 68 330 68 330 68 169 68 993 69 520 69 69 69.665 7**68.9**β9 70.201 70.20 70.805 71.8257 70.805 71.175 71.479 71.764 72.051 72.536 72.933 77 6580 73 6651

36

37

38 39

40

41 42 43

50

51

52

53

55 56

57

58 59

66 67

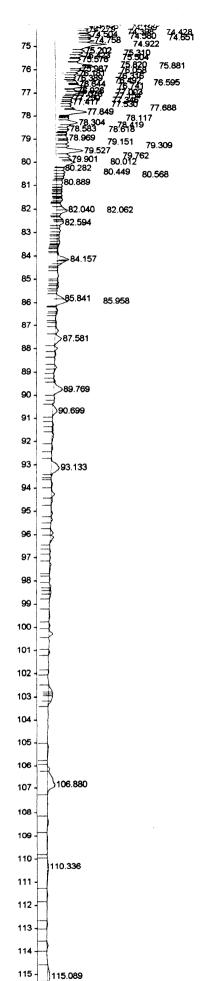
68 69

70

71

72 -

73



116

<WI=8.0

<WI=8.0

<WI=16.0

<WI=8.0

<WI=16.0

<WI=8.0

<WI=16.0

<WI=8.0

<WI=16.0

<WI=32.0

<WI=16.0

<WI=32.0

<WI=16.0

120 -121 -

119

122 -

123 -

124 -125 -

126 -

127 -

128 -

129 -

130 -

131 -

132 -

133 -

134 -

135 -

136 -137 -

138 -

139 -

140 -

141 -

142 -

143 -

145 -

148 -

147 -

148 -

149 -

150 -

151 -

152 -

153 -

...

155 -

156 -

157 -158 -

160 -161 -162 -163 -164 -165 -166 -167 -168 -170 -171 -172 -173 -174 -175 -176 -177 -178 -179 -180 -181 -182 -183 -184 186 -187 -188 -189 -190 -191 -192 -193 -194 -195 -196 -

> 197 -198 -199 -200 -