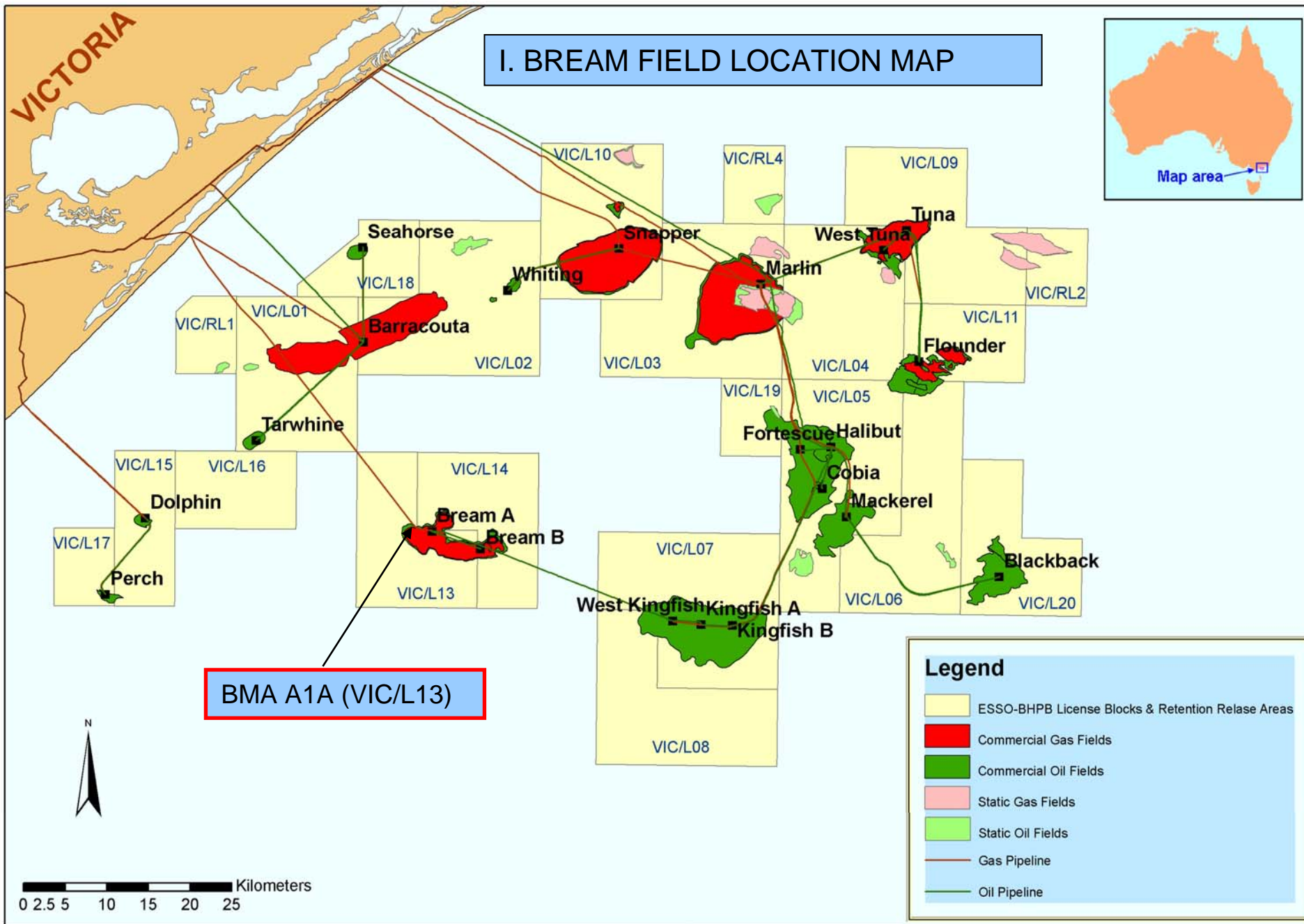


**WELL COMPLETION REPORT**  
**BREAM A1A**  
**GIPPSLAND BASIN, VICTORIA**

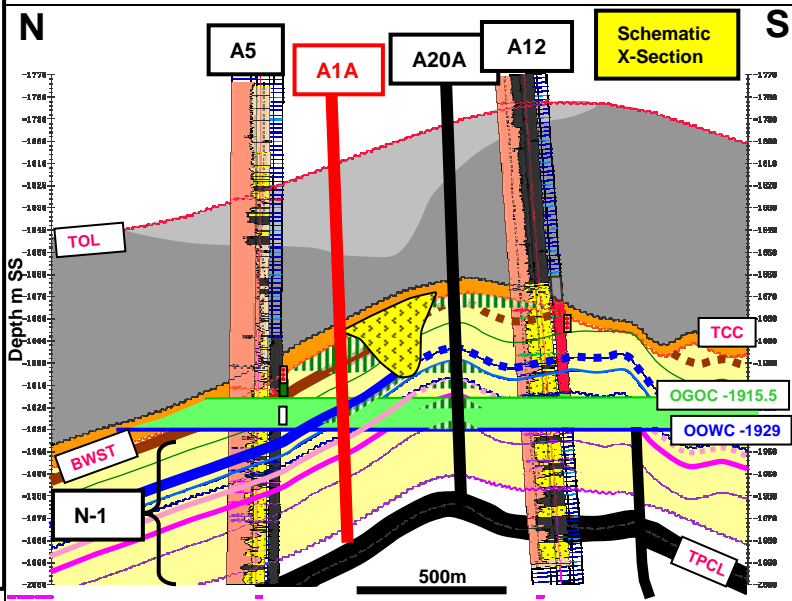
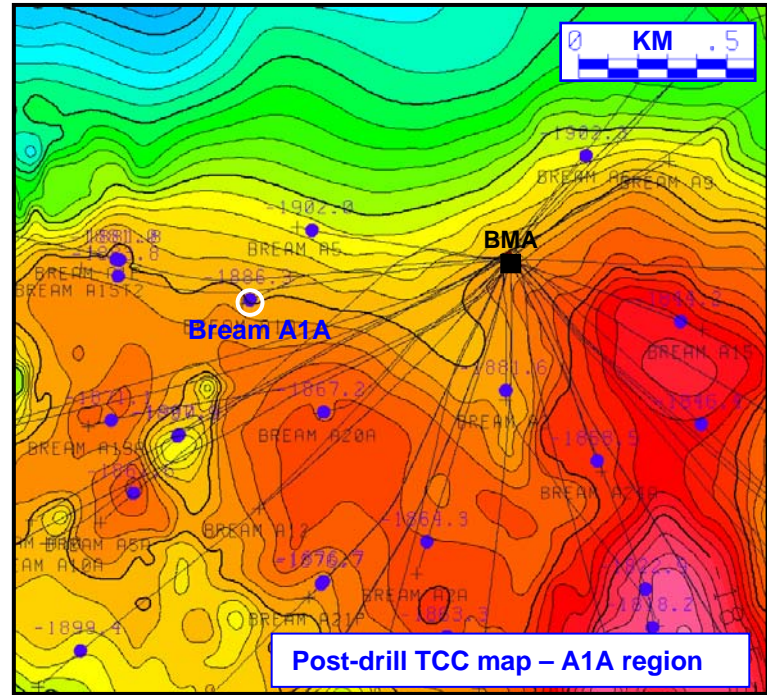
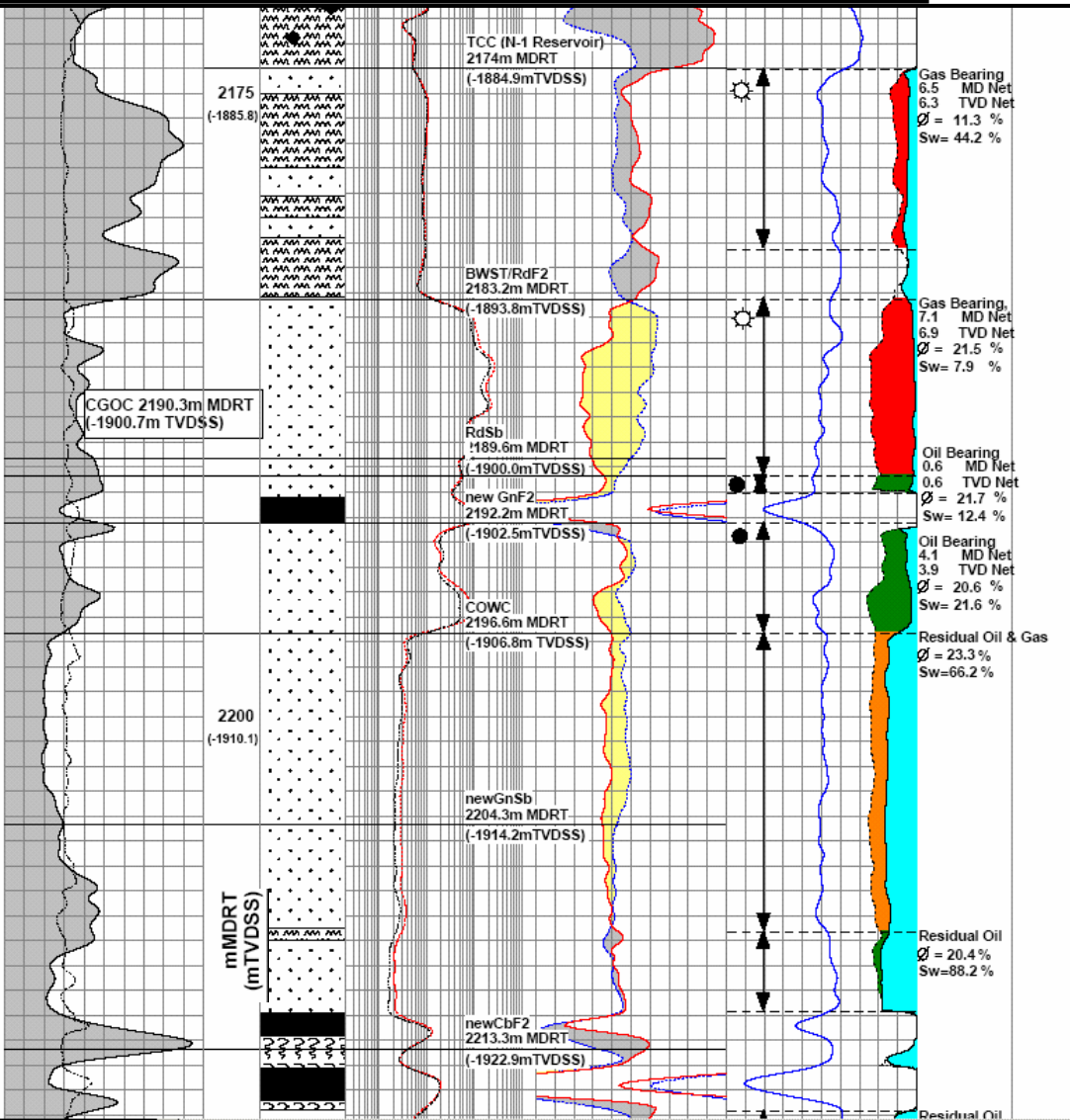
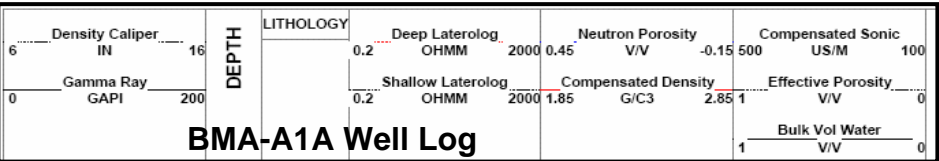
Author: Peter Ryan  
Compiler: Sheryl Sazenis  
April 2006

## **CONTENTS**

<b>BREAM A1A WELL COMPLETION REPORT</b>	<b>1</b>
<b>I. BREAM FIELD LOCATION MAP</b>	<b>1</b>
<b>II. WELL DATA RECORD: MAPS &amp; SECTIONS</b>	<b>2</b>
<b>II. WELL DATA RECORD: SEISMIC PROFILE ALONG WELLPATH</b>	<b>3</b>
LOCATION	4
ELEVATIONS & DEPTHS	4
MISCELLANEOUS	4
WELL CLASSIFICATION	4
CASING RECORD	5
CEMENTING RECORD	5
DRILLING PERFORMANCE	6
COMPLETION SCHEMATIC	7
<b>III. SAMPLES</b>	<b>8</b>
CONVENTIONAL CORING	8
SIDEWALL CORING	8
<b>IV. LOGS AND SURVEYS</b>	<b>9</b>
<b>V. FORMATION RESERVOIR TOPS</b>	<b>10</b>
<b>VI. GEOLOGICAL ANALYSIS - BREAM A1A</b>	<b>11</b>
<b>VII. APPENDICES</b>	
1. Survey Data & Listing	
1a. Survey Data	
1b. MD-TVD Survey Data Listing	
2. Petrophysics	
2a. Petrophysics Evaluation Summary	
3. Sample Descriptions	
3a. Lithology/Show Descriptions	
4. Logs	
4a. Mud Log	
4b. Well Completion Log	

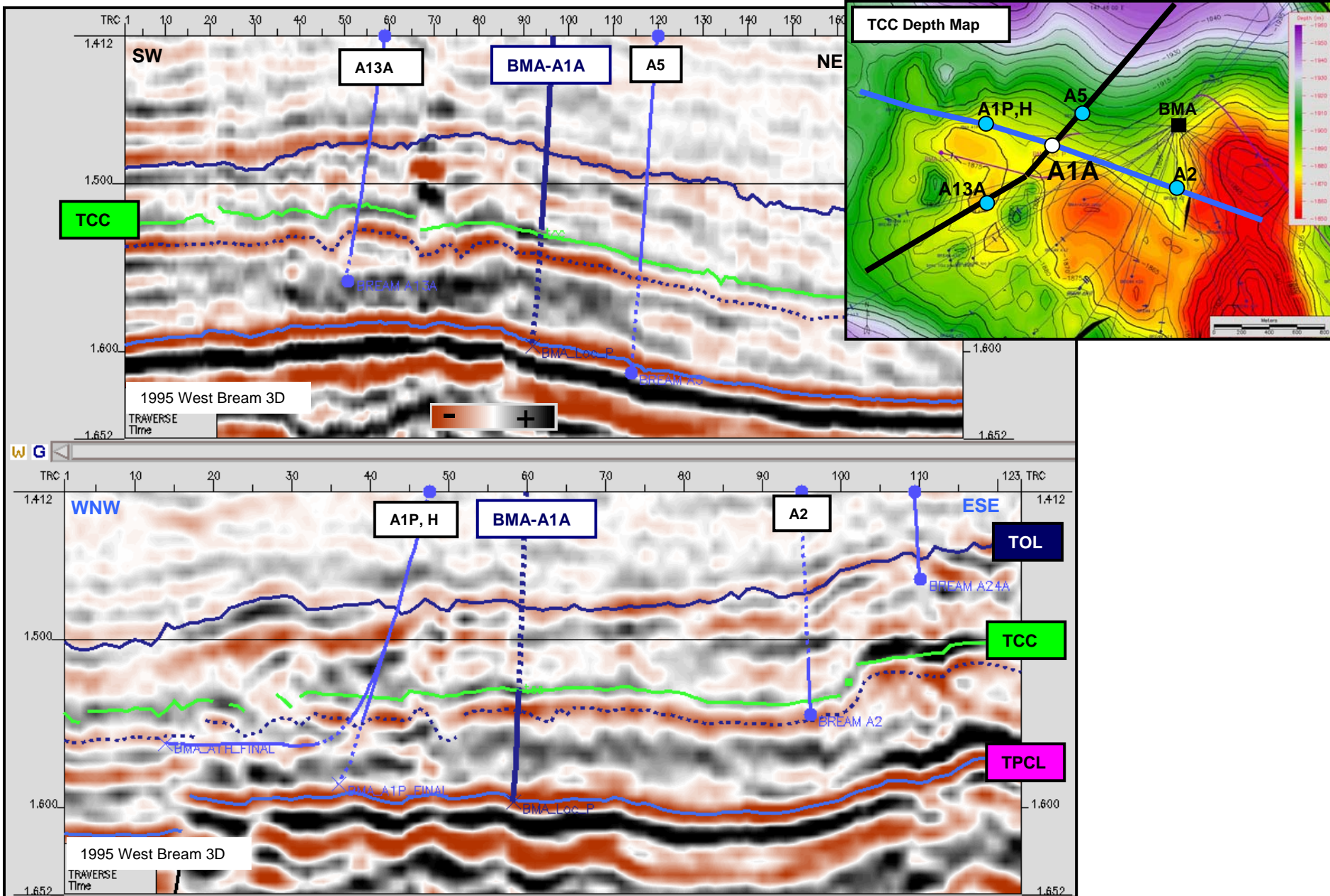


## II. WELL DATA RECORD: BREAM A1A Summary Log, Map & N-1 section





## II. WELL DATA RECORD: BREAM A1A Seismic Profile along well path



## II. WELL DATA RECORD (cont'd)

### LOCATION

<b>Field</b>	<b>Bream</b>	<b>Conductor #1 Surface Coordinates</b>	
<b>Well Name</b>	<b>A1A (Loc P)</b>	(GDA94 ) X	567336.5m E
<b>Conductor Number</b>	Slot 1	(MGA94) Y	5738462.4 N
<b>State</b>	Victoria	Latitude	38° 29' 58.755" S
<b>Permit/Licence</b>	Vic/L13	Longitude	147° 46' 19.983" E
<b>Geological Basin</b>	Gippsland	<b>Perforations (driller)</b>	None
<b>Top of Latrobe</b>	2098.5m MDRT	<b>Datum</b>	GDA94 (GRS80)
<b>A1A</b>	1844.6m TVDRT	<b>Projection</b>	Transverse Mercator
	-1811.8m TVDSS		MGA94/UTM Zone 55 (S)
MGA94 X	566470.5m E		
MGA94 Y	5738325.0m N		
Latitude	38° 30' 3.447" S		
Longitude	147° 45' 44.279" E		

### ELEVATIONS & DEPTHS

<b>Water Depth</b>	59.43 m
<b>Top Wellhead to MSL</b>	28.44m
<b>Main Deck Rel to MSL</b>	25.12 m
<b>RT Relative to MSL</b>	32.82 m
<b>Average Well Angle</b>	14.4 deg (Tan)
<b>Total Depth</b>	2294.0m MDRT
	2033.9m TVDRT
	-2001.1m TVDSS
<b>Plug Back Depth</b>	2260.0m MDRT

### DATES

<b>Skid Rig</b>	25/10/2005
<b>Kicked Off</b>	29/10/2005
<b>Development Rig Days</b>	15.2
<b>NPT Days</b>	.06
<b>Rig Released</b>	13/11/2005
<b>I.P. Established</b>	13/01/2006

### MISCELLANEOUS

<b>Operator</b>	Esso Australia Pty Ltd	<b>Contractor</b>	International Sea Drilling Ltd
<b>Esso Interest</b>	50%	<b>Rig Name</b>	Nabors Rig 453
<b>Permittee/Licensee</b>	Esso/BHPP	<b>Equipment Type</b>	Platform
<b>Other Interest</b>	50% J.V. Interest	<b>Completion Type</b>	Single
<b>Overriding Royalty</b>	2.5%	<b>Completion Size</b>	3-1/2"
<b>Drilling AFE No.</b>	L0501F464		

### WELL CLASSIFICATION

<b>Before Drilling</b>	Oil and gas Development	<b>After Drilling</b>	Oil well
------------------------	-------------------------	-----------------------	----------

## II. WELL DATA RECORD (cont.)

### CASING RECORD

Type	Size (Inches)	Weight (lb/ft)	Grade	Thread	Depth (mMDRT)
Original A1A Surface	13 <sup>3</sup> / <sub>8</sub>	40.5	J-55	BTC	853.7
Whipstock	9 <sup>5</sup> / <sub>8</sub>				1495.6 to 1501.8 (Milled Casing Window)
Production	7	26.0	L-80	Vam Top	2287.0

### CEMENTING RECORD

Casing details	Cement Type	Dry Cement Volume (sacks)	Cement Additives	Mix Water  (bbls)	Slurry Volume  (bbls)	Slurry Density  (ppg)	Cement to/from  (m MDRT)	Casing Pressure Test (psi)
7" 26 lb/ft	ABC  HTB	437	HALAD 413L 30 gal / 10 bbl NF-5 0.05 gal / 10 bbl  CFR-3L 3 gal / 10 bbl	49.0	88.0	15.8	2287.0 to 1600.0	2500  for 15 minutes

## II. WELL DATA RECORD (cont.)

### DRILLING PERFORMANCE

#### BMA A1A - Final Well Report

##### GENERAL

<b>Platform:</b>	Bream A	<b>Rig:</b>	453	<b>Reservoir:</b>	N-1 Sands
<b>Well:</b>	A1A	<b>Well Slot:</b>	#1	<b>RT-MSL (Rig453)</b>	32.82m
<b>Drilling Complexity Index</b>	3.1	<b>Completion Complexity Index</b>	1.8		

DEPTH		PERFORMANCE		MUD	
m MDRT	2,294.00	20" Cond. Hole	N/A	Max Wt (ppg)	10.25
m TVDRT	2,033.92	12-1/4" Surf. Hole	N/A	Type (Surf. Hole)	N/A
Vert. Section (m)	923.72	8-1/2" Prod. Hole	411m/day	Type (Inter. Hole)	N/A
INCLINATION		6" Liner Hole	N/A	Type (Prod. Hole)	KCl/PHPA/Poly/Glycol
Max (deg) / Ave (deg)	43.9/ 14.4 (Tang)	* time to drill interval, incl's Connections & NPT.		Type (Liner Hole)	N/A

Comments: New hole drilled: 1,496m to 2,294m MDRT (798m MDRT drilled).

##### TIME ANALYSIS

<b>Start Date:</b>	29/10/2005, 1800hrs	<b>Finish Date:</b>	13/11/2005, 2230hrs		
<b>Target Days (P10):</b>	12.3	<b>Total Days:</b>	15.2	<b>% Under Target:</b>	23.5% (over)
<b>AFE Days (P50):</b>	13.9	<b>NPT Days:</b>	0.06	<b>% of Total Days:</b>	0.4%
<b>Supplementary AFE Days (P50):</b>	N/A				

##### COSTS *(based on projected)*

<b>AFE No.:</b>	L0501F464	<b>Revisions:</b>	--	<b>\$ per m</b>	A \$4.66 k / metre (new hole)
<b>\$ per day:</b>	A\$ 245 k/day	<b>\$ per day (excl. T + L)</b> * Equipment, LWD & Reeves	A\$ 180 k/day		A\$ 1.62 k / metre* * based on TD not new hole

	Equipment	Materials	Contracts	Allocations	Contingency	Total
<b>AFE (Original)</b>	975,000	431,500	1,714,100	590,400	139,000	A\$3,850,000
<b>AFE (Supplement)</b>	N/A	N/A	N/A	N/A	N/A	N/A
<b>Projected</b>	784,000	308,500	1,849,500	626,000	152,000	A\$3,720,000

##### CASING *(all depths herein are based on Rig453 elevations: RT-MSL=32.82m)*

	<u>Size / Weight / Grade / Thread</u>	m MDRT	m TVDRT	PIT (ppg)
<b>Conductor Casing *</b>	26"	168	168	N/A
<b>Surface Casing *</b>	13-3/8", 54.5 ppf, K55, BTC	854	803	N/A
<b>Intermediate Casing *</b>	9-5/8", 43.5/47.0 ppf K55, BTC	1,496	1,286	12.8 PIT
<b>Prod Casing</b>	7", 26.0ppf, L80, Vam Top HC	2,287	2,027	N/A

Comments: \* Pre-existing casing strings.

##### COMPLETION

	<u>Size / Weight / Grade / Thread</u>	MMDRT	MTVDRRT	Type
<b>Completion</b>	3-1/2", 9.2ppf, 13Cr80, Vam Ace	2,153.0	1,897.3	Single oil

	Upper Interval [m MDRT]	Upper Interval [m TVDRT]	Lower Interval [mMDRT]	Lower Interval [mTVDRT]	Gun Type
<b>Perforation Interval:</b>	2194.5-2196.0 (N-1)	1937.5-1939.0	N/A	N/A	MAXR guns

Comments: Single completion was 3-1/2" 13Cr80 with TR-SSSV, 3 SPM's for gas lift, and one packer set at 2,143m MDRT.

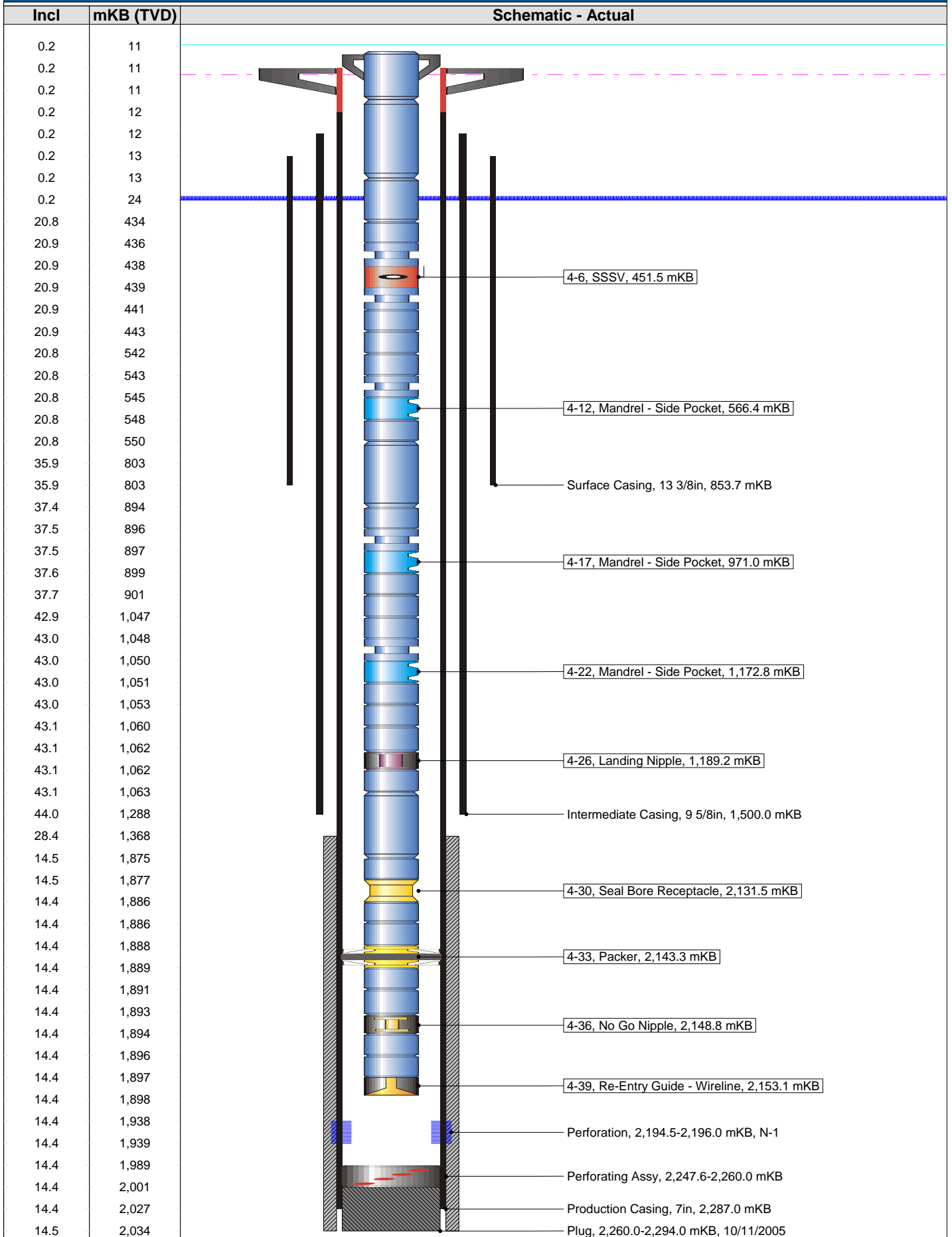
##### ADDITIONAL

		Upper Interval [m MDRT]	Lower Interval [m MDRT]
<b>Logs Run</b>	GR-Resistivity-Density-Neutron-Sonic-Caliper	2,291	1,474

Comments: The 8-1/2" hole interval was logged using the Reeves well shuttle system. All data was retrieved on first attempt.



# Bream A1A: Existing Schematic



### III. SAMPLES

The cuttings sampling programme for BREAM A1A are detailed in the following table:

Interval	Formation	Sampling Details
<b>KOP</b> to 150 m above Top of Latrobe (prognosed at 2112.5mMDRT)  1500.0 – 1950.0 mMDRT	Lakes Entrance	Cuttings samples for description only at 30 m intervals.
150 m above Top of Latrobe to Top of Latrobe (prognosed at 2112.5mMDRT)  1950.0 – 2100.0 mMDRT	Latrobe Group	Three sets of washed and oven dried cuttings at 10 m intervals.
Top of Latrobe (prognosed at 2100.9mMDRT) to <b>Total Depth (TD)</b>  2100.0 – 2294.0 mMDRT	Latrobe Group / Coarse Clastics	Three sets of washed and oven dried cuttings at 5 m intervals.

Detailed cuttings descriptions for the interval 1500.0 to 2294.0mMDRT (TD) are contained in Appendix 3a.

#### CONVENTIONAL CORING

No conventional cores were cut in BREAM A1A.

#### SIDEWALL CORING

No sidewall core samples were shot in BREAM A1A.

## IV. LOGS AND SURVEYS

<b>Survey/Log</b>	<b>Company</b>	<b>Top (m MDRT)</b>	<b>Bottom (m MDRT)</b>
MWD Run 1, Powerpulse (Directional & GR)	Schlumberger/Anadrill	1496.0	1496.0
MWD Run 2, Powerpulse (Directional & GR)	Schlumberger/Anadrill	1496.0	1496.0
MWD Run 3, Powerpulse (Directional & GR)	Schlumberger/Anadrill	1509.0	1523.0
MWD Run 4, Powerpulse (Directional & GR)	Schlumberger/Anadrill	1500.0	1500.0
MWD Run 5, Powerpulse (Directional & GR)	Schlumberger/Anadrill	1500.0	2294.0
Run 1: Compact Logging MCG-MDN-MPD-MSS-MDL	Reeves (Precision Logging) Compact wireline tools run on drillpipe (Shuttle System, memory mode)	2291.0	1490.0

(Reeves logs = memory/compact GR-Dual Neutron-Photo Density -Sonic -Dual Laterolog - Induction)

## V. FORMATION RESERVOIR TOPS -

Horizon	m TVDSS			m MDRT  ACTUAL	mTVT HC Column	
	Predicted Tops	ACTUAL	Diff. (m)		Predicted	ACTUAL
Lakes Entrance Form.	-1256.0	-1255.5	0.5 H	1505.0	-	-
Top of Latrobe (TOL)	-1824.0	-1811.7	12.3 H	2098.5	-	-
Top of Coarse Clastics (TCC)	-1879.0	-1884.9	5.9 L	2174.0	-	6.3mTVD net Gas
Base of Waste (BWST)/RdF2	-1889.0	-1893.8	4.8 L	2183.2	16m TVD gross gas	6.9m TVD gross gas (6.9m TVD net)
newRdsb	-	-1900.0	not prog.	2189.6	"	"
GOC	-	-1900.7	not prog.	2190.3	"	"
newGnF2	-1897.0	-1902.5	5.5 L	2192.2	"	4.5m
OWC	-1910.0	-1906.8	3.2 H	2196.6	5m	TVD
newGnsb	-	-1914.2	not prog.	2204.3	TVD	net
newCbF2	-1916.0	-1922.9	6.9 L	2213.3	net	oil
newCbF1	-1922.0	-1927.2	5.2 L	2217.7	oil	-
newCbsb	-1927.0	-1929.4	2.4 L	2220.0	-	-
newPkf2	-	-1934.8	not prog	2225.5	-	-
newPkf1	-1935.3	-1940.0	4.7 L	2230.9	-	-
newPk sb	-	-1944.9	not prog.	2236.0	-	-
newMvF2	-	-1947.6	not prog.	2238.8	-	-
newMvSB	-	-1951.5	not prog.	2242.8	-	-
Top P. Asp Coal	-1979.0	-1985.6	6.6 L	2278.0	-	-
Total Depth (TD)	-1994.0	-2001.1	7.1 L	2294.0	-	-

## VI. GEOLOGICAL ANALYSIS - BREAM A1A

### Objectives

BMA-A1A was designed to capture N-1 oil reserves on the north flank of the Bream A field, up-dip from the abandoned A5 producer. The well was targeted to intersect a structural high on the north side of an erosional channel interpreted to be filled with an impermeable, debritic sandstone facies. This impermeable fill was believed to form at least a partial barrier to oil migration. The A1A well was targeting oil primarily in the Red unit of the upper N-1 reservoir. The Green and Cobalt units were considered secondary objectives

The BMA-A1A well was expected to encounter a similar stratigraphy to that observed in the downdip A5 well which penetrated well developed N-1 reservoir sands.

### Results

The Bream A1A well was spudded on 29<sup>th</sup> October, 2005 after setting a whipstock and milling a hole in the 9-5/8" casing string at 1505 mMDRT. The well was drilled to a total depth of 2294 mMDRT (2034 mTVDRT) in an 8-1/2" production hole. The well was logged up with the Precision Energy Services compact shuttle system. After running 7" production casing, the well was completed with 3½" completion tubing and perforated from 2194.5 – 2196.0 mMDRT (1937.5 – 1939.0 m TVDRT). Initial production established on 13<sup>th</sup> January, 2006.

The Top of Latrobe Group (TOL) was intersected at 2098.5 mMDRT (-1811.7 mSS), 12.3m TVD high to prediction. A 73 mTVD Gurnard Formation interval comprised of siltstone with minor claystone and volcanics was intersected between the TOL and Top Coarse Clastics (TCC).

The TCC was intersected at 2174 m MDRT (-1884.9 mSS), 5.9m low to prognosis. All subsequent intra-Latrobe formation tops were intersected between 4 and 7m low to prognosis. The Top *P. Asperopolus* coal marker, which in combination with the TCC is one of the two main seismic mapping surfaces, was intersected 6.6m low to prognosis suggesting a slight depth mapping error (0.3%) at the A1A location. Given the distance to the nearest well control (BMA-A5) is 320m to the NE, the magnitude of this error is considered to be within acceptable limits.

The N-1 reservoir sandstone units were found to be present and well developed, as predicted from nearby control. The upper half of the Red unit was intersected within the lower porosity, 'Waste' interval and petrophysical analysis of the wireline logs indicates a 6.5m MD gross gas section (6.3 mTVD Net gas) with an average porosity of 11.3%. The lower portion of the Red unit intersected a 7.1 m MD gross gas (6.9 mTVD net) column above an interpreted gas-oil contact at 2190.3 m MDRT (-1900.7 m TVDSS). The average porosity for this interval is 21.5% with an average gas saturation of 92.1%. A thin oil column (0.6m MD Net oil) is interpreted above a 1 mMD thick coal at the upper Green unit flooding surface (new GnF2). Below this coal, a further 4.1 m MD gross oil (3.9 m TVD net) column is interpreted within the Green unit down to an oil-water contact at 2196.6 m MDRT (-1906.8 m TVDSS). Porosity averages 21.6% and oil saturation is calculated at 78.4%. The depth of the current OWC was intersected 3.2 m high to prognosis suggesting

## **VI. GEOLOGICAL ANALYSIS - BREAM A1A (continued)**

a better than expected sweep efficiency in this area. It may also indicate that the channel fill is not acting as an effective barrier to oil column migration at this location. A total column of 19.8 m MD gross (19.1 mTVD gross ) of residual hydrocarbon was logged across the lower Green and Cobalt units, indicating effective sweep from nearby producers. The Pink and Mauve units intersected below the original field OWC were found to be water bearing as expected.



## **APPENDIX 1a**

### **BREAM A1A**

#### **Survey Data**



# BMA A-1A ESSO Australia

# Schlumberger

Report Date: November 7, 2005

Client: Esso Australia Pty Ltd

Field: Bream A GDA 94

Structure / Slot: Bream A / 1

Well: 1

Borehole: BMA A-1A

UWI/API#:

Survey Name / Date: BMA A1A Actual Surveys / November 1, 2005

Tort / AHD / DDI / ERD ratio: 94.636° / 934.33 m / 5.515 / 0.459

Grid Coordinate System: GDA94/MGA94 Zone 55

Location Lat/Long: S 38 29 58.755, E 147 46 19.983

Location Grid N/E Y/X: N 5738462.460 m, E 567336.500 m

Grid Convergence Angle: -0.48073103°

Grid Scale Factor: 0.99965584

Survey / DLS Computation Method: Minimum Curvature / Lubinski

Vertical Section Azimuth: 259.930°

Vertical Section Origin: N 0.000 m, E 0.000 m

TVD Reference Datum: Drillsite Elevation

TVD Reference Elevation: 32.8 m relative to MSL

Sea Bed / Ground Level Elevation: -59.400 m relative to MSL

Magnetic Declination: 13.104°

Total Field Strength: 60137.981 nT

Magnetic Dip: -69.021°

Declination Date: November 01, 2005

Magnetic Declination Model: BGGM 2004

North Reference: Grid North

Total Corr Mag North -> Grid North: +13.585°

Local Coordinates Referenced To: Structure Reference Point

Comments	Measured Depth (m)	Inclination (deg)	Azimuth (deg)	TVD (m)	Vertical Section (m)	NS (m)	EW (m)	DLS (deg/30 m)	Northing (m)	Easting (m)	Latitude	Longitude
Projected-Up	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5738462.46	567336.50	S 38 29 58.755	E 147 46 19.983
	5.75	0.00	0.00	5.75	0.00	0.00	0.00	0.00	5738462.46	567336.50	S 38 29 58.755	E 147 46 19.983
	9.32	0.20	178.52	9.32	0.00	-0.01	0.00	1.68	5738462.45	567336.50	S 38 29 58.755	E 147 46 19.983
	19.32	0.10	207.33	19.32	0.01	-0.03	0.00	0.37	5738462.43	567336.50	S 38 29 58.756	E 147 46 19.982
	29.32	0.26	285.22	29.32	0.03	-0.03	-0.03	0.77	5738462.43	567336.47	S 38 29 58.756	E 147 46 19.981
	39.32	0.46	300.01	39.32	0.09	-0.01	-0.09	0.66	5738462.45	567336.41	S 38 29 58.755	E 147 46 19.979
	49.32	0.52	293.63	49.32	0.15	0.03	-0.16	0.24	5738462.49	567336.34	S 38 29 58.754	E 147 46 19.976
	59.32	0.53	287.93	59.32	0.23	0.06	-0.25	0.16	5738462.52	567336.25	S 38 29 58.753	E 147 46 19.972
	69.32	0.52	261.02	69.32	0.32	0.07	-0.34	0.73	5738462.53	567336.16	S 38 29 58.753	E 147 46 19.969
	79.32	0.26	245.34	79.32	0.39	0.05	-0.40	0.84	5738462.51	567336.10	S 38 29 58.753	E 147 46 19.966
	89.32	0.38	273.22	89.32	0.44	0.05	-0.46	0.58	5738462.51	567336.04	S 38 29 58.754	E 147 46 19.964
	99.32	1.07	278.30	99.32	0.56	0.06	-0.58	2.08	5738462.52	567335.92	S 38 29 58.753	E 147 46 19.959
	109.32	2.18	272.90	109.32	0.84	0.08	-0.86	3.36	5738462.54	567335.64	S 38 29 58.752	E 147 46 19.947
	119.32	3.82	270.24	119.30	1.35	0.10	-1.39	4.94	5738462.56	567335.11	S 38 29 58.752	E 147 46 19.925
	129.32	5.78	269.29	129.27	2.17	0.09	-2.22	5.88	5738462.55	567334.28	S 38 29 58.753	E 147 46 19.891
	139.32	7.50	268.79	139.20	3.32	0.07	-3.38	5.16	5738462.53	567333.12	S 38 29 58.754	E 147 46 19.843
	149.32	8.97	268.68	149.10	4.73	0.04	-4.81	4.41	5738462.50	567331.69	S 38 29 58.755	E 147 46 19.784
	159.32	10.42	268.08	158.95	6.40	-0.01	-6.49	4.36	5738462.45	567330.01	S 38 29 58.757	E 147 46 19.715
	169.32	11.65	267.14	168.77	8.29	-0.09	-8.41	3.73	5738462.37	567328.10	S 38 29 58.760	E 147 46 19.636
	179.32	12.29	266.99	178.55	10.35	-0.20	-10.48	1.92	5738462.26	567326.03	S 38 29 58.764	E 147 46 19.550
	189.32	12.50	268.39	188.32	12.48	-0.28	-12.62	1.10	5738462.18	567323.88	S 38 29 58.768	E 147 46 19.462
	199.32	12.74	270.44	198.08	14.63	-0.30	-14.81	1.52	5738462.16	567321.70	S 38 29 58.769	E 147 46 19.372
	209.32	13.27	272.11	207.82	16.84	-0.25	-17.06	1.95	5738462.21	567319.45	S 38 29 58.768	E 147 46 19.279
	219.32	13.91	272.96	217.54	19.13	-0.15	-19.40	2.01	5738462.31	567317.10	S 38 29 58.765	E 147 46 19.182
	229.32	14.40	272.93	227.24	21.51	-0.02	-21.85	1.47	5738462.44	567314.66	S 38 29 58.762	E 147 46 19.081
	239.32	14.79	272.23	236.91	23.97	0.09	-24.36	1.28	5738462.55	567312.14	S 38 29 58.759	E 147 46 18.977
	249.32	15.17	270.72	246.57	26.51	0.16	-26.95	1.63	5738462.62	567309.56	S 38 29 58.757	E 147 46 18.871
	259.32	15.60	268.78	256.22	29.12	0.14	-29.60	2.01	5738462.60	567306.91	S 38 29 58.758	E 147 46 18.761
	269.32	16.16	267.30	265.83	31.83	0.05	-32.33	2.07	5738462.51	567304.18	S 38 29 58.762	E 147 46 18.648
	279.32	16.92	266.51	275.42	34.65	-0.10	-35.18	2.38	5738462.36	567301.34	S 38 29 58.768	E 147 46 18.531
	289.32	17.75	266.39	284.97	37.61	-0.29	-38.15	2.49	5738462.17	567298.36	S 38 29 58.775	E 147 46 18.408
	299.32	18.35	266.61	294.47	40.69	-0.48	-41.24	1.81	5738461.98	567295.27	S 38 29 58.782	E 147 46 18.281
	309.32	18.67	266.84	303.96	43.84	-0.66	-44.41	0.98	5738461.80	567292.10	S 38 29 58.788	E 147 46 18.150
	319.32	18.82	266.93	313.43	47.03	-0.83	-47.62	0.46	5738461.63	567288.89	S 38 29 58.795	E 147 46 18.018
	329.32	18.83	266.85	322.89	50.24	-1.01	-50.84	0.08	5738461.45	567285.67	S 38 29 58.802	E 147 46 17.885
	339.32	18.83	266.77	332.36	53.44	-1.19	-54.07	0.08	5738461.27	567282.45	S 38 29 58.808	E 147 46 17.752
	349.32	18.97	266.70	341.82	56.66	-1.37	-57.30	0.43	5738461.09	567279.22	S 38 29 58.815	E 147 46 17.618
	359.32	19.28	266.53	351.26	59.91	-1.57	-60.57	0.94	5738460.89	567275.95	S 38 29 58.822	E 147 46 17.484
	369.32	19.61	266.37	360.69	63.22	-1.77	-63.89	1.00	5738460.69	567272.63	S 38 29 58.830	E 147 46 17.347
	379.32	19.89	266.32	370.11	66.58	-1.99	-67.27	0.84	5738460.47	567269.26	S 38 29 58.838	E 147 46 17.207
	389.32	20.02	266.35	379.51	69.97	-2.21	-70.67	0.39	5738460.25	567265.85	S 38 29 58.846	E 147 46 17.067
	399.32	20.00	266.42	388.90	73.37	-2.42	-74.09	0.09	5738460.04	567262.44	S 38 29 58.854	E 147 46 16.926
	409.32	20.02	266.33	398.30	76.77	-2.64	-77.50	0.11	5738459.82	567259.02	S 38 29 58.862	E 147 46 16.785
	419.32	20.16	265.92	407.69	80.18	-2.87	-80.93	0.60	5738459.59	567255.60	S 38 29 58.870	E 147 46 16.644
	429.32	20.41	265.13	417.07	83.63	-3.14	-84.39	1.11	5738459.32	567252.14	S 38 29 58.880	E 147 46 16.501
	439.32	20.68	264.12	426.43	87.13	-3.47	-87.88	1.34	5738458.99	567248.65	S 38 29 58.891	E 147 46 16.357
	449.32	20.87	263.17	435.78	90.67	-3.86	-91.40	1.16	5738458.60	567245.13	S 38 29 58.905	E 147 46 16.212
	459.32	20.94	262.51	445.13	94.23	-4.31	-94.94	0.74	5738458.15	567241.59	S 38 29 58.921	E 147 46 16.066

469.32	20.88	262.11	454.47	97.80	-4.79	-98.48	0.46	5738457.68	567238.05	S 38 29 58.937	E 147 46 15.920
479.32	20.78	261.88	463.81	101.35	-5.28	-102.00	0.39	5738457.18	567234.53	S 38 29 58.954	E 147 46 15.775
489.32	20.69	261.69	473.17	104.89	-5.79	-105.51	0.34	5738456.68	567231.03	S 38 29 58.971	E 147 46 15.631
499.32	20.58	261.49	482.52	108.42	-6.30	-108.99	0.39	5738456.16	567227.54	S 38 29 58.989	E 147 46 15.487
509.32	20.46	261.38	491.89	111.92	-6.82	-112.46	0.38	5738455.64	567224.08	S 38 29 59.007	E 147 46 15.344
519.32	20.39	261.42	501.26	115.41	-7.35	-115.91	0.21	5738455.12	567220.63	S 38 29 59.025	E 147 46 15.202
529.32	20.41	261.70	510.63	118.89	-7.86	-119.36	0.30	5738454.61	567217.18	S 38 29 59.042	E 147 46 15.060
539.32	20.53	262.41	520.00	122.39	-8.34	-122.82	0.83	5738454.12	567213.72	S 38 29 59.059	E 147 46 14.917
549.32	20.66	263.78	529.36	125.90	-8.76	-126.31	1.50	5738453.70	567210.23	S 38 29 59.074	E 147 46 14.773
559.32	20.75	265.27	538.72	129.42	-9.10	-129.83	1.60	5738453.36	567206.71	S 38 29 59.085	E 147 46 14.628
569.32	20.78	266.25	548.07	132.95	-9.36	-133.37	1.05	5738453.10	567203.18	S 38 29 59.095	E 147 46 14.482
579.32	20.75	266.77	557.42	136.47	-9.58	-136.91	0.56	5738452.88	567199.64	S 38 29 59.103	E 147 46 14.336
589.32	20.65	266.97	566.77	139.98	-9.77	-140.44	0.37	5738452.69	567196.11	S 38 29 59.110	E 147 46 14.191
599.32	20.48	267.03	576.13	143.47	-9.96	-143.94	0.51	5738452.51	567192.61	S 38 29 59.117	E 147 46 14.046
609.32	20.33	267.06	585.51	146.93	-10.14	-147.43	0.45	5738452.33	567189.12	S 38 29 59.124	E 147 46 13.902
619.32	20.29	267.11	594.89	150.37	-10.31	-150.89	0.13	5738452.15	567185.66	S 38 29 59.130	E 147 46 13.759
629.32	20.39	267.15	604.26	153.82	-10.49	-154.36	0.30	5738451.98	567182.19	S 38 29 59.137	E 147 46 13.616
639.32	20.54	267.16	613.63	157.29	-10.66	-157.86	0.45	5738451.80	567178.70	S 38 29 59.144	E 147 46 13.472
649.32	20.77	267.12	622.99	160.79	-10.84	-161.38	0.69	5738451.63	567175.18	S 38 29 59.150	E 147 46 13.327
659.32	21.18	267.08	632.33	164.34	-11.02	-164.95	1.23	5738451.45	567171.60	S 38 29 59.157	E 147 46 13.179
669.32	21.76	267.03	641.63	167.97	-11.20	-168.61	1.74	5738451.26	567167.95	S 38 29 59.164	E 147 46 13.028
679.32	22.35	266.97	650.90	171.70	-11.40	-172.36	1.77	5738451.06	567164.20	S 38 29 59.172	E 147 46 12.874
689.32	22.98	266.96	660.13	175.52	-11.61	-176.21	1.89	5738450.86	567160.35	S 38 29 59.179	E 147 46 12.715
699.32	23.64	266.94	669.31	179.45	-11.82	-180.16	1.98	5738450.65	567156.40	S 38 29 59.187	E 147 46 12.552
709.32	24.37	266.89	678.45	183.49	-12.03	-184.22	2.19	5738450.43	567152.34	S 38 29 59.195	E 147 46 12.384
719.32	25.15	266.48	687.53	187.65	-12.28	-188.40	2.40	5738450.19	567148.16	S 38 29 59.204	E 147 46 12.212
729.32	25.96	265.86	696.55	191.93	-12.57	-192.71	2.56	5738449.90	567143.86	S 38 29 59.215	E 147 46 12.035
739.32	26.78	265.08	705.51	196.36	-12.92	-197.13	2.67	5738449.55	567139.43	S 38 29 59.227	E 147 46 11.852
749.32	27.51	264.30	714.41	200.90	-13.34	-201.68	2.44	5738449.13	567134.89	S 38 29 59.242	E 147 46 11.665
759.32	28.19	263.76	723.25	205.56	-13.83	-206.32	2.18	5738448.64	567130.25	S 38 29 59.259	E 147 46 11.473
769.32	28.86	263.42	732.03	210.33	-14.36	-211.07	2.07	5738448.11	567125.50	S 38 29 59.278	E 147 46 11.277
779.32	29.50	263.35	740.77	215.19	-14.92	-215.91	1.92	5738447.54	567120.66	S 38 29 59.298	E 147 46 11.078
789.32	30.09	263.57	749.44	220.15	-15.49	-220.85	1.80	5738446.98	567115.73	S 38 29 59.317	E 147 46 10.874
799.32	30.73	263.92	758.07	225.20	-16.04	-225.88	1.99	5738446.43	567110.70	S 38 29 59.336	E 147 46 10.667
809.32	31.53	264.43	766.63	230.36	-16.56	-231.02	2.53	5738445.90	567105.56	S 38 29 59.355	E 147 46 10.455
819.32	32.71	265.11	775.10	235.66	-17.05	-236.32	3.70	5738445.42	567100.26	S 38 29 59.372	E 147 46 10.236
829.32	34.02	265.88	783.45	241.13	-17.48	-241.80	4.13	5738444.99	567094.78	S 38 29 59.387	E 147 46 10.010
839.32	35.03	266.50	791.69	246.76	-17.85	-247.45	3.21	5738444.61	567089.13	S 38 29 59.401	E 147 46 9.777
849.32	35.69	266.93	799.84	252.51	-18.19	-253.23	2.12	5738444.28	567083.36	S 38 29 59.414	E 147 46 9.539
859.32	36.07	267.16	807.94	258.33	-18.49	-259.09	1.21	5738443.98	567077.50	S 38 29 59.425	E 147 46 9.297
869.32	36.30	267.18	816.02	264.18	-18.78	-264.98	0.69	5738443.69	567071.61	S 38 29 59.436	E 147 46 9.054
879.32	36.44	267.07	824.07	270.07	-19.08	-270.90	0.46	5738443.39	567065.69	S 38 29 59.447	E 147 46 8.810
889.32	36.56	266.98	832.11	275.97	-19.38	-276.84	0.39	5738443.08	567059.75	S 38 29 59.459	E 147 46 8.565
899.32	36.67	266.91	840.13	281.89	-19.70	-282.80	0.35	5738442.76	567053.80	S 38 29 59.471	E 147 46 8.319
909.32	36.77	266.85	848.15	287.82	-20.03	-288.77	0.32	5738442.44	567047.83	S 38 29 59.483	E 147 46 8.073
919.32	36.89	266.78	856.15	293.78	-20.36	-294.76	0.38	5738442.11	567041.85	S 38 29 59.495	E 147 46 7.826
929.32	37.01	266.76	864.14	299.74	-20.70	-300.76	0.36	5738441.77	567035.85	S 38 29 59.508	E 147 46 7.578
939.32	37.09	266.75	872.13	305.73	-21.04	-306.77	0.24	5738441.43	567029.83	S 38 29 59.521	E 147 46 7.330
949.32	37.16	266.74	880.10	311.72	-21.38	-312.80	0.21	5738441.08	567023.81	S 38 29 59.533	E 147 46 7.082
959.32	37.24	266.71	888.06	317.72	-21.73	-318.83	0.25	5738440.74	567017.77	S 38 29 59.546	E 147 46 6.833
969.32	37.46	266.52	896.01	323.75	-22.09	-324.89	0.75	5738440.38	567011.72	S 38 29 59.559	E 147 46 6.583
979.32	37.77	266.21	903.93	329.81	-22.47	-330.98	1.09	5738439.99	567005.63	S 38 29 59.574	E 147 46 6.332
989.32	38.13	265.82	911.82	335.93	-22.90	-337.12	1.30	5738439.57	566999.50	S 38 29 59.589	E 147 46 6.079
999.32	38.51	265.40	919.67	342.10	-23.38	-343.30	1.38	5738439.09	566993.32	S 38 29 59.606	E 147 46 5.824
1009.32	38.95	264.84	927.47	348.33	-23.91	-349.53	1.69	5738438.56	566987.09	S 38 29 59.625	E 147 46 5.567
1019.32	39.45	264.25	935.22	354.63	-24.51	-355.82	1.87	5738437.96	566980.80	S 38 29 59.646	E 147 46 5.307
1029.32	40.03	263.65	942.91	361.01	-25.18	-362.18	2.09	5738437.28	566974.44	S 38 29 59.670	E 147 46 5.045
1039.32	40.60	263.41	950.53	367.46	-25.91	-368.61	1.77	5738436.56	566968.02	S 38 29 59.695	E 147 46 4.780
1049.32	41.04	263.28	958.10	373.99	-26.67	-375.10	1.34	5738435.80	566961.53	S 38 29 59.722	E 147 46 4.512
1059.32	41.36	263.24	965.62	380.56	-27.44	-381.64	0.96	5738435.03	566954.99	S 38 29 59.749	E 147 46 4.243
1069.32	41.48	263.23	973.12	387.17	-28.22	-388.21	0.36	5738434.25	566948.42	S 38 29 59.776	E 147 46 3.972
1079.32	41.66	263.26	980.60	393.79	-29.00	-394.80	0.54	5738433.47	566941.83	S 38 29 59.803	E 147 46 3.700
1089.32	41.88	263.31	988.06	400.44	-29.78	-401.42	0.67	5738432.69	566935.22	S 38 29 59.830	E 147 46 3.427
1099.32	42.15	263.39	995.49	407.12	-30.56	-408.07	0.83	5738431.91	566928.57	S 38 29 59.857	E 147 46 3.153
1109.32	42.31	263.42	1002.90	413.83	-31.33	-414.74	0.48	5738431.14	566921.90	S 38 29 59.884	E 147 46 2.878
1119.32	42.43	263.44	1010.28	420.56	-32.10	-421.44	0.36	5738430.37	566915.21	S 38 29 59.910	E 147 46 2.602
1129.32	42.52	263.44	1017.66	427.30	-32.87	-428.15	0.27	5738429.60	566908.50	S 38 29 59.937	E 147 46 2.325

	1139.32	42.61	263.44	1025.02	434.05	-33.64	-434.87	0.27	5738428.83	566901.78	S 38 29 59.964	E 147 46 2.048
	1149.32	42.69	263.45	1032.38	440.81	-34.42	-441.60	0.24	5738428.05	566895.05	S 38 29 59.991	E 147 46 1.771
	1159.32	42.79	263.46	1039.72	447.59	-35.19	-448.34	0.30	5738427.28	566888.31	S 38 30 0.018	E 147 46 1.493
	1169.32	42.94	263.47	1047.05	454.38	-35.97	-455.10	0.45	5738426.51	566881.56	S 38 30 0.045	E 147 46 1.214
	1179.32	43.02	263.50	1054.37	461.18	-36.74	-461.87	0.25	5738425.73	566874.79	S 38 30 0.072	E 147 46 0.935
	1189.32	43.09	263.53	1061.68	468.00	-37.51	-468.66	0.22	5738424.96	566868.00	S 38 30 0.099	E 147 46 0.655
	1199.32	43.17	263.54	1068.97	474.82	-38.28	-475.45	0.24	5738424.19	566861.21	S 38 30 0.125	E 147 46 0.375
	1209.32	43.34	263.52	1076.26	481.66	-39.05	-482.26	0.51	5738423.42	566854.41	S 38 30 0.152	E 147 46 0.095
	1219.32	43.44	263.53	1083.52	488.51	-39.83	-489.08	0.30	5738422.65	566847.58	S 38 30 0.179	E 147 45 59.813
	1229.32	43.53	263.54	1090.78	495.38	-40.60	-495.92	0.27	5738421.87	566840.75	S 38 30 0.206	E 147 45 59.531
	1239.32	43.60	263.56	1098.03	502.26	-41.38	-502.77	0.21	5738421.10	566833.90	S 38 30 0.233	E 147 45 59.249
	1249.32	43.53	263.61	1105.27	509.14	-42.15	-509.62	0.23	5738420.33	566827.06	S 38 30 0.260	E 147 45 58.967
	1259.32	43.23	263.77	1112.54	515.99	-42.90	-516.45	0.96	5738419.57	566820.23	S 38 30 0.286	E 147 45 58.685
	1269.32	42.82	263.99	1119.85	522.80	-43.63	-523.23	1.31	5738418.85	566813.45	S 38 30 0.312	E 147 45 58.405
	1279.32	42.48	264.19	1127.21	529.56	-44.33	-529.97	1.10	5738418.15	566806.71	S 38 30 0.336	E 147 45 58.127
	1289.32	42.46	264.29	1134.58	536.29	-45.00	-536.69	0.21	5738417.47	566800.00	S 38 30 0.360	E 147 45 57.850
	1299.32	42.51	264.34	1141.96	543.02	-45.67	-543.41	0.18	5738416.80	566793.28	S 38 30 0.383	E 147 45 57.573
	1309.32	42.58	264.38	1149.32	549.76	-46.34	-550.14	0.23	5738416.14	566786.55	S 38 30 0.407	E 147 45 57.296
	1319.32	42.60	264.39	1156.69	556.51	-47.00	-556.87	0.06	5738415.48	566779.82	S 38 30 0.430	E 147 45 57.018
	1329.32	42.64	264.42	1164.04	563.26	-47.66	-563.61	0.13	5738414.82	566773.08	S 38 30 0.453	E 147 45 56.740
	1339.32	42.69	264.44	1171.40	570.02	-48.32	-570.36	0.16	5738414.16	566766.34	S 38 30 0.476	E 147 45 56.462
	1349.32	42.78	264.44	1178.74	576.78	-48.97	-577.11	0.27	5738413.50	566759.59	S 38 30 0.500	E 147 45 56.184
	1359.32	42.87	264.44	1186.08	583.56	-49.63	-583.88	0.27	5738412.84	566752.83	S 38 30 0.523	E 147 45 55.905
	1369.32	42.95	264.46	1193.40	590.35	-50.29	-590.65	0.24	5738412.19	566746.05	S 38 30 0.546	E 147 45 55.625
	1379.32	43.03	264.50	1200.72	597.14	-50.95	-597.44	0.25	5738411.53	566739.27	S 38 30 0.569	E 147 45 55.345
	1389.32	43.08	264.55	1208.02	603.95	-51.60	-604.23	0.18	5738410.88	566732.47	S 38 30 0.592	E 147 45 55.065
	1399.32	43.16	264.61	1215.32	610.76	-52.24	-611.04	0.27	5738410.23	566725.67	S 38 30 0.615	E 147 45 54.785
	1409.32	43.24	264.64	1222.61	617.58	-52.89	-617.85	0.25	5738409.59	566718.86	S 38 30 0.637	E 147 45 54.504
	1419.32	43.32	264.63	1229.89	624.42	-53.53	-624.68	0.24	5738408.95	566712.03	S 38 30 0.660	E 147 45 54.222
	1429.32	43.37	264.65	1237.16	631.26	-54.17	-631.51	0.16	5738408.31	566705.20	S 38 30 0.683	E 147 45 53.940
	1439.32	43.43	264.70	1244.43	638.10	-54.81	-638.36	0.21	5738407.67	566698.36	S 38 30 0.705	E 147 45 53.658
	1449.32	43.52	264.78	1251.69	644.96	-55.44	-645.21	0.32	5738407.04	566691.51	S 38 30 0.728	E 147 45 53.376
	1459.32	43.63	264.76	1258.93	651.83	-56.07	-652.07	0.33	5738406.41	566684.65	S 38 30 0.750	E 147 45 53.093
	1469.32	43.72	264.71	1266.16	658.71	-56.70	-658.95	0.29	5738405.78	566677.78	S 38 30 0.772	E 147 45 52.809
	1479.32	43.79	264.68	1273.39	665.60	-57.34	-665.83	0.22	5738405.14	566670.90	S 38 30 0.795	E 147 45 52.525
	1489.32	43.88	264.70	1280.60	672.50	-57.98	-672.73	0.27	5738404.50	566664.00	S 38 30 0.817	E 147 45 52.241
	1499.32	43.98	264.76	1287.80	679.42	-58.62	-679.64	0.32	5738403.86	566657.10	S 38 30 0.840	E 147 45 51.956
	1500.00	43.98	264.77	1288.29	679.89	-58.66	-680.11	0.22	5738403.82	566656.63	S 38 30 0.841	E 147 45 51.936
	1531.94	40.72	253.98	1311.93	701.33	-62.55	-701.20	7.47	5738399.93	566635.54	S 38 30 0.973	E 147 45 51.067
	1561.54	34.65	246.81	1335.35	719.16	-68.54	-718.24	7.58	5738393.94	566618.51	S 38 30 1.172	E 147 45 50.366
	1589.77	28.88	243.32	1359.34	733.52	-74.77	-731.72	6.43	5738387.72	566605.03	S 38 30 1.378	E 147 45 49.812
	1618.63	27.44	243.14	1384.79	746.57	-80.90	-743.88	1.50	5738381.59	566592.88	S 38 30 1.580	E 147 45 49.312
	1647.34	24.60	242.51	1410.59	758.60	-86.65	-755.08	2.98	5738375.84	566581.68	S 38 30 1.769	E 147 45 48.852
	1674.35	20.82	242.73	1435.50	768.56	-91.44	-764.34	4.20	5738371.05	566572.42	S 38 30 1.927	E 147 45 48.472
	1704.39	17.19	246.18	1463.90	777.97	-95.68	-773.15	3.79	5738366.81	566563.62	S 38 30 2.067	E 147 45 48.110
	1733.75	16.54	246.45	1491.99	786.25	-99.11	-780.95	0.67	5738363.39	566555.82	S 38 30 2.180	E 147 45 47.789
	1762.64	16.18	246.39	1519.71	794.16	-102.36	-788.41	0.37	5738360.13	566548.36	S 38 30 2.288	E 147 45 47.482
	1791.14	15.92	246.67	1547.10	801.83	-105.50	-795.64	0.29	5738357.00	566541.14	S 38 30 2.392	E 147 45 47.185
	1820.20	15.63	246.25	1575.07	809.51	-108.66	-802.88	0.32	5738353.84	566533.90	S 38 30 2.496	E 147 45 46.887
	1847.98	15.20	245.88	1601.85	816.68	-111.65	-809.63	0.48	5738350.85	566527.15	S 38 30 2.595	E 147 45 46.610
	1877.05	15.05	245.51	1629.91	824.03	-114.77	-816.54	0.18	5738347.73	566520.24	S 38 30 2.698	E 147 45 46.325
	1906.11	14.81	245.26	1657.99	831.28	-117.89	-823.35	0.26	5738344.61	566513.44	S 38 30 2.801	E 147 45 46.046
	1934.83	14.49	244.18	1685.78	838.29	-120.99	-829.92	0.44	5738341.51	566506.87	S 38 30 2.903	E 147 45 45.776
	1963.66	14.08	244.09	1713.71	845.13	-124.10	-836.32	0.43	5738338.41	566500.47	S 38 30 3.006	E 147 45 45.512
	1992.06	14.15	246.42	1741.26	851.83	-126.99	-842.61	0.60	5738335.51	566494.18	S 38 30 3.101	E 147 45 45.254
	2020.62	13.90	245.96	1768.97	858.55	-129.79	-848.94	0.29	5738332.72	566487.85	S 38 30 3.194	E 147 45 44.994
	2049.39	13.61	245.94	1796.91	865.19	-132.58	-855.19	0.30	5738329.93	566481.61	S 38 30 3.286	E 147 45 44.737
	2078.12	13.99	245.60	1824.81	871.84	-135.39	-861.43	0.41	5738327.12	566475.36	S 38 30 3.378	E 147 45 44.480
	2106.73	14.45	246.41	1852.55	878.66	-138.25	-867.86	0.53	5738324.26	566468.94	S 38 30 3.473	E 147 45 44.216
	2135.41	14.45	245.87	1880.32	885.61	-141.14	-874.40	0.14	5738321.37	566462.40	S 38 30 3.569	E 147 45 43.947
	2164.02	14.38	245.88	1908.03	892.52	-144.05	-880.90	0.07	5738318.46	566455.90	S 38 30 3.665	E 147 45 43.679
	2192.83	14.38	245.45	1935.93	899.45	-147.00	-887.42	0.11	5738315.51	566449.39	S 38 30 3.762	E 147 45 43.411
	2221.34	14.44	245.31	1963.55	906.32	-149.96	-893.87	0.07	5738312.56	566442.94	S 38 30 3.860	E 147 45 43.146
	2249.99	14.38	244.31	1991.30	913.20	-152.99	-900.32	0.27	5738309.52	566436.49	S 38 30 3.960	E 147 45 42.881
	2273.82	14.42	243.55	2014.38	918.90	-155.59	-905.64	0.24	5738306.92	566431.17	S 38 30 4.046	E 147 45 42.662
Projection to TD	2294.00	14.45	242.91	2033.92	923.72	-157.86	-910.14	0.24	5738304.65	566426.68	S 38 30 4.120	E 147 45 42.478

**Survey Type:** Non-Def Survey

**Survey Error Model:** SLB ISCWSA version 24 \*\*\* 3-D 95.00% Confidence 2.7955 sigma

**Surveying Prog:**

<b>MD From ( m )</b>	<b>MD To ( m )</b>	<b>EOU Freq</b>	<b>Survey Tool Type</b>	<b>Borehole -&gt; Survey</b>
0.00	92.22	Act-Stns	SLB_NSG+MSHOT-Depth Only	BMA-01H -> BMA-01H Final
92.22	1500.00	Act-Stns	SLB_NSG+MSHOT	BMA-01H -> BMA-01H Final
1500.00	2273.82	Act-Stns	SLB_MWD-STD	BMA A-1A -> BMA A1A Actual Surveys
2273.82	2294.00	Act-Stns	SLB_UNKNOWN (default tool used)	BMA A-1A -> BMA A1A Actual Surveys

**APPENDIX 1b**

**BREAM A1A**

**MD-TVD Survey Data Listing**



Report Date:	14 March 2005
Well:	Bream A1A
Structure / Slot:	NABORS Rig 453
TVD Reference Datum:	DrillSite Elevation
TVD Reference Elevation:	33.50 m relative to MSL
Sea Bed / Ground Level Elevation:	59.43 m relative to MSL
Grid Coordinate System:	GDA94/MGA94 Zone 55
Location Lat/Long:	S -38 29' 58.755009", E 147 46' 19.982619"
Location Grid N/E:	N 5738462.46 m, E 567336.5 m
Survey Azimuth Reference:	Grid North

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
0	0	360	0	32.82	0	0	5738462.46	567336.5
5	0	0	5	27.82	0	0	5738462.46	567336.5
10	0.19	180.48	10	22.82	-0.01	0	5738462.46	567336.5
15	0.14	194.88	15	17.82	-0.02	0	5738462.44	567336.5
20	0.11	212.63	20	12.82	-0.03	-0.01	5738462.43	567336.5
25	0.19	251.57	25	7.82	-0.03	-0.02	5738462.43	567336.48
30	0.27	286.23	30	2.82	-0.03	-0.03	5738462.43	567336.47
35	0.37	293.62	35	-2.18	-0.02	-0.06	5738462.44	567336.44
40	0.46	299.58	40	-7.18	0	-0.09	5738462.46	567336.41
45	0.49	296.39	45	-12.18	0.01	-0.13	5738462.48	567336.37
50	0.52	293.24	50	-17.18	0.03	-0.17	5738462.5	567336.33
55	0.53	290.39	55	-22.18	0.05	-0.21	5738462.51	567336.29
60	0.53	286.1	60	-27.18	0.06	-0.25	5738462.53	567336.25
65	0.52	272.65	65	-32.18	0.07	-0.3	5738462.53	567336.2
70	0.5	259.95	70	-37.18	0.07	-0.34	5738462.53	567336.16
75	0.37	252.11	75	-42.18	0.06	-0.37	5738462.52	567336.13
80	0.27	247.24	80	-47.18	0.05	-0.41	5738462.52	567336.1
85	0.33	261.18	85	-52.18	0.05	-0.43	5738462.51	567336.07
90	0.43	273.57	90	-57.18	0.05	-0.46	5738462.51	567336.04
95	0.77	276.11	95	-62.18	0.06	-0.53	5738462.52	567335.97
100	1.15	277.93	100	-67.18	0.06	-0.6	5738462.53	567335.9
105	1.7	275.23	104.99	-72.17	0.08	-0.74	5738462.54	567335.76
110	2.29	272.72	109.99	-77.17	0.09	-0.9	5738462.55	567335.6
115	3.11	271.39	114.99	-82.17	0.09	-1.16	5738462.55	567335.34
120	3.95	270.18	119.98	-87.16	0.1	-1.44	5738462.56	567335.06
125	4.93	269.7	124.96	-92.14	0.09	-1.86	5738462.56	567334.64
130	5.9	269.26	129.94	-97.12	0.09	-2.3	5738462.55	567334.2
135	6.76	269.01	134.91	-102.09	0.08	-2.88	5738462.54	567333.62
140	7.6	268.78	139.87	-107.05	0.07	-3.48	5738462.53	567333.02
145	8.33	268.73	144.82	-112	0.05	-4.19	5738462.52	567332.31
150	9.07	268.64	149.76	-116.94	0.04	-4.93	5738462.5	567331.58
155	9.79	268.34	154.69	-121.87	0.01	-5.77	5738462.48	567330.73
160	10.5	268.02	159.62	-126.8	-0.01	-6.62	5738462.45	567329.88
165	11.12	267.55	164.52	-131.7	-0.05	-7.58	5738462.41	567328.92
170	11.69	267.13	169.43	-136.61	-0.1	-8.55	5738462.37	567327.95
175	12.01	267.05	174.32	-141.5	-0.15	-9.58	5738462.31	567326.92
180	12.3	267.09	179.21	-146.39	-0.2	-10.62	5738462.26	567325.88
185	12.41	267.79	184.09	-151.27	-0.24	-11.7	5738462.22	567324.81
190	12.52	268.53	188.98	-156.16	-0.28	-12.77	5738462.18	567323.73
195	12.64	269.55	193.86	-161.04	-0.29	-13.86	5738462.17	567322.64
200	12.78	270.55	198.73	-165.91	-0.3	-14.96	5738462.16	567321.54
205	13.04	271.39	203.61	-170.79	-0.27	-16.08	5738462.19	567320.42
210	13.31	272.17	208.48	-175.66	-0.25	-17.22	5738462.22	567319.29
215	13.63	272.59	213.34	-180.52	-0.19	-18.39	5738462.27	567318.11
220	13.94	272.96	218.2	-185.38	-0.14	-19.57	5738462.32	567316.93
225	14.19	272.94	223.04	-190.22	-0.08	-20.79	5738462.39	567315.71

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
230	14.43	272.88	227.89	-195.07	-0.02	-22.02	5738462.45	567314.48
235	14.62	272.53	232.73	-199.91	0.04	-23.28	5738462.5	567313.23
240	14.82	272.13	237.57	-204.75	0.09	-24.54	5738462.56	567311.96
245	15.01	271.37	242.4	-209.58	0.13	-25.83	5738462.59	567310.67
250	15.2	270.59	247.23	-214.41	0.16	-27.13	5738462.62	567309.37
255	15.41	269.62	252.05	-219.23	0.15	-28.45	5738462.61	567308.05
260	15.64	268.68	256.87	-224.05	0.14	-29.79	5738462.6	567306.72
265	15.92	267.94	261.67	-228.85	0.09	-31.15	5738462.55	567305.35
270	16.21	267.25	266.48	-233.66	0.04	-32.53	5738462.5	567303.97
275	16.59	266.85	271.27	-238.45	-0.04	-33.95	5738462.42	567302.55
280	16.98	266.5	276.07	-243.25	-0.12	-35.38	5738462.35	567301.12
285	17.39	266.44	280.84	-248.02	-0.21	-36.87	5738462.25	567299.64
290	17.79	266.4	285.61	-252.79	-0.3	-38.36	5738462.16	567298.14
295	18.09	266.51	290.36	-257.54	-0.4	-39.91	5738462.07	567296.59
300	18.37	266.63	295.11	-262.29	-0.49	-41.46	5738461.97	567295.04
305	18.53	266.74	299.86	-267.04	-0.58	-43.04	5738461.88	567293.46
310	18.68	266.85	304.6	-271.78	-0.67	-44.63	5738461.79	567291.87
315	18.76	266.89	309.33	-276.51	-0.76	-46.24	5738461.7	567290.27
320	18.82	266.92	314.07	-281.25	-0.85	-47.84	5738461.62	567288.66
325	18.83	266.88	318.8	-285.98	-0.93	-49.45	5738461.53	567287.05
330	18.83	266.84	323.53	-290.71	-1.02	-51.06	5738461.44	567285.44
335	18.83	266.8	328.26	-295.44	-1.11	-52.67	5738461.35	567283.83
340	18.84	266.77	333	-300.18	-1.2	-54.29	5738461.26	567282.21
345	18.91	266.73	337.73	-304.91	-1.29	-55.9	5738461.17	567280.6
350	18.99	266.69	342.45	-309.63	-1.39	-57.52	5738461.08	567278.98
355	19.15	266.6	347.18	-314.36	-1.48	-59.16	5738460.98	567277.34
360	19.3	266.52	351.9	-319.08	-1.58	-60.8	5738460.88	567275.7
365	19.47	266.44	356.62	-323.8	-1.68	-62.46	5738460.78	567274.04
370	19.63	266.37	361.33	-328.51	-1.79	-64.12	5738460.68	567272.38
375	19.77	266.34	366.04	-333.22	-1.9	-65.81	5738460.57	567270.69
380	19.9	266.32	370.74	-337.92	-2	-67.5	5738460.46	567269
385	19.96	266.34	375.44	-342.62	-2.11	-69.2	5738460.35	567267.3
390	20.02	266.35	380.14	-347.32	-2.22	-70.9	5738460.24	567265.6
395	20.01	266.39	384.84	-352.02	-2.33	-72.61	5738460.13	567263.89
400	20	266.41	389.54	-356.72	-2.44	-74.32	5738460.03	567262.18
405	20.01	266.37	394.23	-361.41	-2.55	-76.03	5738459.92	567260.47
410	20.03	266.3	398.93	-366.11	-2.65	-77.73	5738459.81	567258.77
415	20.1	266.1	403.63	-370.81	-2.77	-79.45	5738459.69	567257.05
420	20.18	265.87	408.32	-375.5	-2.89	-81.16	5738459.57	567255.34
425	20.3	265.47	413.01	-380.19	-3.02	-82.89	5738459.44	567253.61
430	20.43	265.06	417.7	-384.88	-3.16	-84.62	5738459.3	567251.88
435	20.56	264.56	422.38	-389.56	-3.33	-86.37	5738459.13	567250.13
440	20.69	264.06	427.06	-394.24	-3.5	-88.12	5738458.97	567248.38
445	20.79	263.58	431.74	-398.92	-3.69	-89.88	5738458.77	567246.62
450	20.87	263.13	436.41	-403.59	-3.89	-91.64	5738458.57	567244.86
455	20.91	262.8	441.09	-408.27	-4.12	-93.41	5738458.35	567243.09
460	20.94	262.48	445.76	-412.94	-4.34	-95.19	5738458.12	567241.32
465	20.91	262.28	450.43	-417.61	-4.58	-96.95	5738457.88	567239.55
470	20.87	262.09	455.1	-422.28	-4.82	-98.72	5738457.64	567237.78
475	20.82	261.98	459.77	-426.95	-5.07	-100.48	5738457.4	567236.02
480	20.77	261.87	464.44	-431.62	-5.31	-102.24	5738457.15	567234.26
485	20.73	261.77	469.12	-436.3	-5.57	-103.99	5738456.9	567232.51
490	20.68	261.68	473.8	-440.98	-5.82	-105.74	5738456.64	567230.76
495	20.63	261.58	478.48	-445.66	-6.08	-107.49	5738456.38	567229.01
500	20.57	261.48	483.16	-450.34	-6.34	-109.23	5738456.13	567227.27
505	20.51	261.43	487.84	-455.02	-6.6	-110.96	5738455.86	567225.54
510	20.46	261.38	492.52	-459.7	-6.86	-112.69	5738455.6	567223.81
515	20.42	261.4	497.21	-464.39	-7.12	-114.42	5738455.34	567222.08

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
520	20.39	261.44	501.89	-469.07	-7.38	-116.14	5738455.08	567220.36
525	20.4	261.58	506.58	-473.76	-7.64	-117.87	5738454.83	567218.63
530	20.42	261.75	511.27	-478.45	-7.89	-119.59	5738454.57	567216.91
535	20.48	262.1	515.95	-483.13	-8.13	-121.33	5738454.33	567215.18
540	20.54	262.5	520.63	-487.81	-8.37	-123.06	5738454.09	567213.44
545	20.6	263.19	525.32	-492.5	-8.58	-124.8	5738453.88	567211.7
550	20.67	263.88	530	-497.18	-8.79	-126.55	5738453.68	567209.95
555	20.71	264.63	534.67	-501.85	-8.96	-128.31	5738453.51	567208.19
560	20.75	265.34	539.35	-506.53	-9.12	-130.07	5738453.34	567206.43
565	20.77	265.83	544.02	-511.2	-9.25	-131.84	5738453.21	567204.66
570	20.78	266.29	548.7	-515.88	-9.38	-133.61	5738453.09	567202.89
575	20.76	266.55	553.37	-520.55	-9.49	-135.38	5738452.98	567201.12
580	20.74	266.78	558.05	-525.23	-9.59	-137.15	5738452.87	567199.36
585	20.69	266.88	562.73	-529.91	-9.69	-138.91	5738452.78	567197.59
590	20.64	266.97	567.4	-534.58	-9.78	-140.67	5738452.68	567195.83
595	20.55	267	572.09	-539.27	-9.88	-142.43	5738452.59	567194.07
600	20.47	267.03	576.77	-543.95	-9.97	-144.18	5738452.5	567192.32
605	20.39	267.05	581.45	-548.63	-10.06	-145.92	5738452.41	567190.58
610	20.33	267.06	586.14	-553.32	-10.15	-147.66	5738452.32	567188.84
615	20.31	267.09	590.83	-558.01	-10.24	-149.4	5738452.23	567187.11
620	20.3	267.11	595.52	-562.7	-10.32	-151.13	5738452.14	567185.37
625	20.35	267.13	600.21	-567.39	-10.41	-152.86	5738452.05	567183.64
630	20.4	267.15	604.9	-572.08	-10.5	-154.6	5738451.97	567181.9
635	20.48	267.16	609.58	-576.76	-10.58	-156.35	5738451.88	567180.15
640	20.56	267.16	614.26	-581.44	-10.67	-158.1	5738451.79	567178.41
645	20.67	267.14	618.94	-586.12	-10.76	-159.86	5738451.7	567176.64
650	20.8	267.12	623.62	-590.8	-10.85	-161.62	5738451.62	567174.88
655	21	267.1	628.29	-595.47	-10.94	-163.41	5738451.52	567173.09
660	21.22	267.08	632.95	-600.13	-11.03	-165.2	5738451.43	567171.3
665	21.51	267.05	637.61	-604.79	-11.12	-167.03	5738451.34	567169.47
670	21.8	267.03	642.26	-609.44	-11.22	-168.86	5738451.24	567167.64
675	22.1	267	646.89	-614.07	-11.32	-170.74	5738451.15	567165.76
680	22.39	266.97	651.52	-618.7	-11.42	-172.62	5738451.05	567163.88
685	22.71	266.96	656.14	-623.32	-11.52	-174.54	5738450.95	567161.96
690	23.02	266.96	660.75	-627.93	-11.62	-176.48	5738450.84	567160.03
695	23.35	266.95	665.34	-632.52	-11.72	-178.45	5738450.74	567158.05
700	23.69	266.94	669.93	-637.11	-11.83	-180.43	5738450.63	567156.07
705	24.05	266.91	674.5	-641.68	-11.94	-182.47	5738450.52	567154.04
710	24.42	266.86	679.06	-646.24	-12.05	-184.5	5738450.41	567152
715	24.81	266.66	683.6	-650.78	-12.17	-186.6	5738450.29	567149.91
720	25.21	266.44	688.14	-655.32	-12.3	-188.69	5738450.17	567147.81
725	25.61	266.13	692.65	-659.83	-12.44	-190.85	5738450.02	567145.65
730	26.02	265.81	697.15	-664.33	-12.59	-193.01	5738449.87	567143.49
735	26.43	265.42	701.63	-668.81	-12.77	-195.22	5738449.7	567141.28
740	26.83	265.03	706.11	-673.29	-12.95	-197.44	5738449.52	567139.06
745	27.19	264.64	710.56	-677.74	-13.16	-199.71	5738449.31	567136.79
750	27.56	264.26	715	-682.18	-13.37	-201.99	5738449.09	567134.51
755	27.9	263.99	719.42	-686.6	-13.62	-204.32	5738448.85	567132.19
760	28.24	263.74	723.84	-691.02	-13.86	-206.64	5738448.6	567129.86
765	28.57	263.57	728.23	-695.41	-14.13	-209.02	5738448.33	567127.48
770	28.9	263.42	732.62	-699.8	-14.4	-211.4	5738448.07	567125.1
775	29.22	263.38	736.99	-704.17	-14.68	-213.82	5738447.79	567122.68
780	29.54	263.36	741.35	-708.53	-14.96	-216.25	5738447.5	567120.25
785	29.84	263.47	745.69	-712.87	-15.24	-218.71	5738447.22	567117.79
790	30.13	263.59	750.03	-717.21	-15.52	-221.19	5738446.94	567115.31
795	30.45	263.77	754.34	-721.52	-15.8	-223.71	5738446.66	567112.8
800	30.78	263.95	758.65	-725.83	-16.07	-226.23	5738446.39	567110.27
805	31.18	264.21	762.93	-730.11	-16.34	-228.8	5738446.13	567107.7

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
810	31.61	264.48	767.2	-734.38	-16.6	-231.38	5738445.87	567105.12
815	32.2	264.82	771.43	-738.61	-16.84	-234.03	5738445.63	567102.47
820	32.8	265.16	775.66	-742.84	-17.08	-236.69	5738445.39	567099.81
825	33.45	265.55	779.84	-747.02	-17.29	-239.43	5738445.17	567097.07
830	34.09	265.92	784	-751.18	-17.5	-242.18	5738444.96	567094.32
835	34.59	266.23	788.12	-755.3	-17.69	-245.01	5738444.77	567091.49
840	35.07	266.53	792.24	-759.42	-17.88	-247.85	5738444.59	567088.65
845	35.4	266.74	796.32	-763.5	-18.04	-250.74	5738444.42	567085.77
850	35.72	266.95	800.39	-767.57	-18.21	-253.63	5738444.26	567082.87
855	35.91	267.06	804.44	-771.62	-18.36	-256.56	5738444.11	567079.94
860	36.09	267.16	808.49	-775.67	-18.51	-259.49	5738443.96	567077.02
865	36.2	267.17	812.53	-779.71	-18.65	-262.43	5738443.81	567074.07
870	36.31	267.17	816.56	-783.74	-18.8	-265.38	5738443.66	567071.12
875	36.38	267.12	820.59	-787.77	-18.95	-268.35	5738443.52	567068.16
880	36.45	267.06	824.61	-791.79	-19.1	-271.31	5738443.37	567065.19
885	36.51	267.02	828.63	-795.81	-19.25	-274.28	5738443.21	567062.22
890	36.57	266.98	832.65	-799.83	-19.41	-277.25	5738443.06	567059.25
895	36.62	266.94	836.66	-803.84	-19.57	-280.23	5738442.9	567056.27
900	36.68	266.91	840.67	-807.85	-19.73	-283.21	5738442.74	567053.3
905	36.73	266.88	844.68	-811.86	-19.89	-286.19	5738442.58	567050.31
910	36.78	266.85	848.69	-815.87	-20.05	-289.18	5738442.41	567047.32
915	36.84	266.81	852.69	-819.87	-20.22	-292.17	5738442.25	567044.33
920	36.9	266.78	856.69	-823.87	-20.38	-295.16	5738442.08	567041.34
925	36.96	266.77	860.69	-827.87	-20.55	-298.16	5738441.91	567038.34
930	37.02	266.76	864.68	-831.86	-20.72	-301.17	5738441.74	567035.34
935	37.06	266.75	868.67	-835.85	-20.89	-304.17	5738441.57	567032.33
940	37.09	266.75	872.66	-839.84	-21.06	-307.18	5738441.4	567029.32
945	37.13	266.74	876.65	-843.83	-21.24	-310.2	5738441.23	567026.31
950	37.17	266.74	880.64	-847.82	-21.41	-313.21	5738441.06	567023.29
955	37.21	266.72	884.62	-851.8	-21.58	-316.23	5738440.88	567020.27
960	37.25	266.7	888.6	-855.78	-21.75	-319.25	5738440.71	567017.26
965	37.36	266.6	892.58	-859.76	-21.93	-322.27	5738440.53	567014.23
970	37.48	266.5	896.55	-863.73	-22.11	-325.3	5738440.35	567011.2
975	37.64	266.34	900.51	-867.69	-22.31	-328.35	5738440.16	567008.15
980	37.79	266.18	904.47	-871.65	-22.5	-331.4	5738439.96	567005.1
985	37.97	265.99	908.41	-875.59	-22.72	-334.47	5738439.75	567002.03
990	38.16	265.79	912.35	-879.53	-22.93	-337.54	5738439.53	566998.96
995	38.35	265.58	916.27	-883.45	-23.17	-340.63	5738439.29	566995.87
1000	38.54	265.36	920.19	-887.37	-23.41	-343.72	5738439.05	566992.78
1005	38.76	265.08	924.09	-891.27	-23.68	-346.84	5738438.78	566989.66
1010	38.98	264.8	927.99	-895.17	-23.95	-349.96	5738438.51	566986.54
1015	39.23	264.5	931.86	-899.04	-24.25	-353.11	5738438.21	566983.39
1020	39.49	264.21	935.73	-902.91	-24.56	-356.26	5738437.91	566980.24
1025	39.78	263.91	939.58	-906.76	-24.89	-359.44	5738437.57	566977.07
1030	40.07	263.63	943.42	-910.6	-25.23	-362.62	5738437.23	566973.88
1035	40.35	263.51	947.23	-914.41	-25.6	-365.83	5738436.86	566970.67
1040	40.63	263.4	951.04	-918.22	-25.96	-369.05	5738436.5	566967.45
1045	40.85	263.34	954.83	-922.01	-26.34	-372.3	5738436.12	566964.2
1050	41.06	263.28	958.61	-925.79	-26.72	-375.55	5738435.74	566960.95
1055	41.22	263.26	962.37	-929.55	-27.11	-378.82	5738435.35	566957.68
1060	41.37	263.24	966.13	-933.31	-27.5	-382.09	5738434.97	566954.41
1065	41.43	263.23	969.88	-937.06	-27.89	-385.38	5738434.58	566951.13
1070	41.49	263.23	973.63	-940.81	-28.28	-388.66	5738434.19	566947.84
1075	41.58	263.25	977.37	-944.55	-28.67	-391.96	5738433.8	566944.54
1080	41.67	263.26	981.11	-948.29	-29.06	-395.25	5738433.41	566941.25
1085	41.78	263.29	984.84	-952.02	-29.45	-398.56	5738433.02	566937.94
1090	41.9	263.32	988.56	-955.74	-29.84	-401.87	5738432.63	566934.63
1095	42.03	263.36	992.28	-959.46	-30.22	-405.2	5738432.24	566931.31

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1100	42.16	263.39	995.99	-963.17	-30.61	-408.52	5738431.85	566927.98
1105	42.24	263.41	999.69	-966.87	-31	-411.86	5738431.47	566924.64
1110	42.32	263.42	1003.39	-970.57	-31.38	-415.2	5738431.08	566921.3
1115	42.38	263.43	1007.09	-974.27	-31.77	-418.55	5738430.7	566917.95
1120	42.44	263.44	1010.78	-977.96	-32.15	-421.9	5738430.31	566914.61
1125	42.48	263.44	1014.47	-981.65	-32.54	-425.25	5738429.92	566911.25
1130	42.53	263.44	1018.16	-985.34	-32.92	-428.6	5738429.54	566907.9
1135	42.57	263.44	1021.84	-989.02	-33.31	-431.96	5738429.15	566904.54
1140	42.62	263.44	1025.52	-992.7	-33.7	-435.33	5738428.77	566901.18
1145	42.66	263.45	1029.2	-996.38	-34.08	-438.69	5738428.38	566897.81
1150	42.7	263.45	1032.87	-1000.05	-34.47	-442.06	5738427.99	566894.44
1155	42.75	263.46	1036.55	-1003.73	-34.86	-445.43	5738427.61	566891.07
1160	42.8	263.46	1040.22	-1007.4	-35.24	-448.8	5738427.22	566887.7
1165	42.88	263.47	1043.88	-1011.06	-35.63	-452.18	5738426.83	566884.32
1170	42.95	263.47	1047.55	-1014.73	-36.02	-455.56	5738426.44	566880.94
1175	42.99	263.49	1051.2	-1018.38	-36.41	-458.95	5738426.06	566877.55
1180	43.02	263.5	1054.86	-1022.04	-36.79	-462.33	5738425.67	566874.17
1185	43.06	263.52	1058.52	-1025.7	-37.18	-465.73	5738425.29	566870.78
1190	43.1	263.53	1062.17	-1029.35	-37.56	-469.12	5738424.9	566867.38
1195	43.14	263.54	1065.82	-1033	-37.95	-472.52	5738424.52	566863.99
1200	43.18	263.54	1069.47	-1036.65	-38.33	-475.91	5738424.13	566860.59
1205	43.27	263.53	1073.11	-1040.29	-38.72	-479.32	5738423.74	566857.18
1210	43.35	263.52	1076.75	-1043.93	-39.11	-482.72	5738423.36	566853.78
1215	43.4	263.53	1080.38	-1047.56	-39.49	-486.14	5738422.97	566850.37
1220	43.45	263.53	1084.01	-1051.19	-39.88	-489.55	5738422.58	566846.95
1225	43.49	263.54	1087.64	-1054.82	-40.27	-492.97	5738422.2	566843.53
1230	43.53	263.54	1091.27	-1058.45	-40.65	-496.39	5738421.81	566840.11
1235	43.57	263.55	1094.89	-1062.07	-41.04	-499.81	5738421.42	566836.69
1240	43.6	263.56	1098.51	-1065.69	-41.43	-503.24	5738421.03	566833.27
1245	43.56	263.59	1102.14	-1069.32	-41.81	-506.66	5738420.65	566829.84
1250	43.51	263.62	1105.76	-1072.94	-42.2	-510.08	5738420.27	566826.42
1255	43.36	263.7	1109.4	-1076.58	-42.57	-513.5	5738419.89	566823.01
1260	43.2	263.78	1113.03	-1080.21	-42.95	-516.91	5738419.51	566819.59
1265	43	263.89	1116.69	-1083.87	-43.31	-520.3	5738419.15	566816.2
1270	42.8	264	1120.35	-1087.53	-43.68	-523.69	5738418.79	566812.81
1275	42.63	264.1	1124.02	-1091.2	-44.03	-527.06	5738418.44	566809.44
1280	42.48	264.2	1127.7	-1094.88	-44.37	-530.43	5738418.09	566806.08
1285	42.47	264.25	1131.39	-1098.57	-44.71	-533.78	5738417.75	566802.72
1290	42.46	264.29	1135.08	-1102.26	-45.05	-537.14	5738417.41	566799.36
1295	42.49	264.32	1138.77	-1105.95	-45.38	-540.5	5738417.08	566796
1300	42.51	264.34	1142.45	-1109.63	-45.72	-543.86	5738416.75	566792.64
1305	42.55	264.36	1146.14	-1113.32	-46.05	-547.23	5738416.41	566789.27
1310	42.58	264.38	1149.82	-1117	-46.38	-550.59	5738416.08	566785.91
1315	42.59	264.39	1153.5	-1120.68	-46.71	-553.96	5738415.75	566782.54
1320	42.6	264.39	1157.18	-1124.36	-47.04	-557.33	5738415.42	566779.17
1325	42.62	264.41	1160.86	-1128.04	-47.37	-560.7	5738415.09	566775.8
1330	42.64	264.42	1164.54	-1131.72	-47.7	-564.07	5738414.76	566772.43
1335	42.67	264.43	1168.22	-1135.4	-48.03	-567.44	5738414.43	566769.06
1340	42.7	264.44	1171.89	-1139.07	-48.36	-570.81	5738414.1	566765.69
1345	42.74	264.44	1175.57	-1142.75	-48.69	-574.19	5738413.77	566762.31
1350	42.79	264.44	1179.24	-1146.42	-49.02	-577.57	5738413.44	566758.93
1355	42.83	264.44	1182.9	-1150.08	-49.35	-580.95	5738413.11	566755.55
1360	42.88	264.44	1186.57	-1153.75	-49.68	-584.34	5738412.79	566752.17
1365	42.92	264.45	1190.23	-1157.41	-50.01	-587.72	5738412.46	566748.78
1370	42.96	264.46	1193.9	-1161.08	-50.34	-591.11	5738412.13	566745.39
1375	43	264.48	1197.55	-1164.73	-50.67	-594.51	5738411.8	566741.99
1380	43.03	264.5	1201.21	-1168.39	-50.99	-597.9	5738411.47	566738.6
1385	43.06	264.53	1204.86	-1172.04	-51.32	-601.3	5738411.14	566735.2

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1390	43.09	264.55	1208.52	-1175.7	-51.64	-604.7	5738410.82	566731.8
1395	43.13	264.58	1212.16	-1179.34	-51.97	-608.1	5738410.5	566728.4
1400	43.17	264.61	1215.81	-1182.99	-52.29	-611.5	5738410.17	566725
1405	43.21	264.63	1219.46	-1186.64	-52.61	-614.91	5738409.85	566721.59
1410	43.25	264.64	1223.1	-1190.28	-52.93	-618.32	5738409.53	566718.18
1415	43.29	264.63	1226.74	-1193.92	-53.25	-621.73	5738409.21	566714.77
1420	43.32	264.63	1230.38	-1197.56	-53.57	-625.15	5738408.89	566711.36
1425	43.35	264.64	1234.02	-1201.2	-53.89	-628.56	5738408.57	566707.94
1430	43.37	264.65	1237.66	-1204.84	-54.21	-631.98	5738408.25	566704.52
1435	43.4	264.68	1241.29	-1208.47	-54.53	-635.4	5738407.93	566701.1
1440	43.44	264.71	1244.92	-1212.1	-54.85	-638.82	5738407.61	566697.68
1445	43.48	264.75	1248.55	-1215.73	-55.16	-642.25	5738407.3	566694.25
1450	43.53	264.78	1252.18	-1219.36	-55.48	-645.67	5738406.98	566690.83
1455	43.58	264.77	1255.8	-1222.98	-55.79	-649.11	5738406.67	566687.4
1460	43.64	264.76	1259.42	-1226.6	-56.11	-652.54	5738406.35	566683.96
1465	43.68	264.73	1263.04	-1230.22	-56.43	-655.98	5738406.04	566680.52
1470	43.72	264.71	1266.65	-1233.83	-56.74	-659.42	5738405.72	566677.09
1475	43.76	264.69	1270.26	-1237.44	-57.06	-662.86	5738405.4	566673.64
1480	43.8	264.68	1273.87	-1241.05	-57.38	-666.3	5738405.08	566670.2
1485	43.84	264.69	1277.48	-1244.66	-57.7	-669.75	5738404.76	566666.75
1490	43.89	264.7	1281.09	-1248.27	-58.02	-673.2	5738404.44	566663.3
1495	43.94	264.73	1284.69	-1251.87	-58.34	-676.65	5738404.12	566659.85
1500	43.98	264.77	1288.29	-1255.47	-58.66	-680.11	5738403.8	566656.39
1505	43.47	263.08	1291.99	-1259.17	-59.27	-683.41	5738403.19	566653.09
1510	42.96	261.39	1295.69	-1262.87	-59.88	-686.71	5738402.59	566649.79
1515	42.45	259.7	1299.39	-1266.57	-60.49	-690.01	5738401.98	566646.49
1520	41.94	258.01	1303.09	-1270.27	-61.1	-693.32	5738401.37	566643.19
1525	41.43	256.32	1306.79	-1273.97	-61.71	-696.62	5738400.76	566639.88
1530	40.92	254.64	1310.49	-1277.67	-62.32	-699.92	5738400.15	566636.58
1535	40.09	253.24	1314.34	-1281.52	-63.17	-702.96	5738399.29	566633.54
1540	39.07	252.03	1318.3	-1285.48	-64.18	-705.84	5738398.28	566630.66
1545	38.04	250.82	1322.26	-1289.44	-65.19	-708.72	5738397.27	566627.78
1550	37.02	249.61	1326.21	-1293.39	-66.2	-711.6	5738396.26	566624.91
1555	35.99	248.39	1330.17	-1297.35	-67.22	-714.47	5738395.25	566622.03
1560	34.97	247.18	1334.13	-1301.31	-68.23	-717.35	5738394.24	566619.15
1565	33.94	246.38	1338.29	-1305.47	-69.3	-719.89	5738393.16	566616.61
1570	32.92	245.76	1342.54	-1309.72	-70.4	-722.28	5738392.06	566614.22
1575	31.9	245.15	1346.79	-1313.97	-71.51	-724.67	5738390.96	566611.84
1580	30.88	244.53	1351.04	-1318.22	-72.61	-727.05	5738389.85	566609.45
1585	29.85	243.91	1355.29	-1322.47	-73.71	-729.44	5738388.75	566607.06
1590	28.87	243.32	1359.54	-1326.72	-74.81	-731.82	5738387.65	566604.69
1595	28.62	243.29	1363.95	-1331.13	-75.88	-733.92	5738386.59	566602.58
1600	28.37	243.26	1368.36	-1335.54	-76.94	-736.03	5738385.52	566600.47
1605	28.12	243.23	1372.77	-1339.95	-78	-738.14	5738384.46	566598.37
1610	27.87	243.19	1377.18	-1344.36	-79.07	-740.24	5738383.4	566596.26
1615	27.62	243.16	1381.58	-1348.76	-80.13	-742.35	5738382.33	566594.15
1620	27.3	243.11	1386.02	-1353.2	-81.17	-744.41	5738381.29	566592.09
1625	26.81	243	1390.51	-1357.69	-82.18	-746.37	5738380.29	566590.14
1630	26.32	242.89	1395	-1362.18	-83.18	-748.32	5738379.29	566588.18
1635	25.82	242.78	1399.49	-1366.67	-84.18	-750.27	5738378.29	566586.23
1640	25.33	242.67	1403.99	-1371.17	-85.18	-752.22	5738377.28	566584.28
1645	24.83	242.56	1408.48	-1375.66	-86.18	-754.17	5738376.28	566582.33
1650	24.23	242.53	1413.04	-1380.22	-87.12	-756	5738375.34	566580.51
1655	23.53	242.57	1417.65	-1384.83	-88.01	-757.71	5738374.45	566578.79
1660	22.83	242.61	1422.26	-1389.44	-88.9	-759.42	5738373.57	566577.08
1665	22.13	242.65	1426.87	-1394.05	-89.78	-761.14	5738372.68	566575.36
1670	21.43	242.69	1431.48	-1398.66	-90.67	-762.85	5738371.79	566573.65
1675	20.74	242.8	1436.11	-1403.29	-91.54	-764.53	5738370.93	566571.97



MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1680	20.14	243.38	1440.83	-1408.01	-92.24	-766	5738370.22	566570.5
1685	19.53	243.95	1445.56	-1412.74	-92.95	-767.46	5738369.52	566569.04
1690	18.93	244.53	1450.29	-1417.47	-93.65	-768.93	5738368.81	566567.57
1695	18.32	245.1	1455.01	-1422.19	-94.36	-770.4	5738368.1	566566.1
1700	17.72	245.68	1459.74	-1426.92	-95.07	-771.86	5738367.4	566564.64
1705	17.18	246.19	1464.48	-1431.66	-95.76	-773.31	5738366.71	566563.19
1710	17.07	246.23	1469.26	-1436.44	-96.34	-774.64	5738366.12	566561.86
1715	16.96	246.28	1474.05	-1441.23	-96.92	-775.97	5738365.54	566560.53
1720	16.84	246.32	1478.83	-1446.01	-97.5	-777.3	5738364.96	566559.2
1725	16.73	246.37	1483.62	-1450.8	-98.09	-778.63	5738364.38	566557.88
1730	16.62	246.42	1488.4	-1455.58	-98.67	-779.95	5738363.79	566556.55
1735	16.52	246.45	1493.19	-1460.37	-99.25	-781.27	5738363.22	566555.23
1740	16.46	246.44	1497.99	-1465.17	-99.81	-782.56	5738362.65	566553.94
1745	16.4	246.43	1502.78	-1469.96	-100.37	-783.85	5738362.09	566552.65
1750	16.34	246.42	1507.58	-1474.76	-100.94	-785.15	5738361.53	566551.36
1755	16.28	246.41	1512.38	-1479.56	-101.5	-786.44	5738360.96	566550.07
1760	16.21	246.4	1517.18	-1484.36	-102.06	-787.73	5738360.4	566548.77
1765	16.16	246.41	1521.98	-1489.16	-102.62	-789.01	5738359.84	566547.49
1770	16.11	246.46	1526.78	-1493.96	-103.17	-790.28	5738359.29	566546.23
1775	16.07	246.51	1531.59	-1498.77	-103.72	-791.54	5738358.74	566544.96
1780	16.02	246.56	1536.39	-1503.57	-104.27	-792.81	5738358.19	566543.69
1785	15.98	246.61	1541.2	-1508.38	-104.82	-794.08	5738357.64	566542.42
1790	15.93	246.66	1546	-1513.18	-105.38	-795.35	5738357.09	566541.15
1795	15.88	246.61	1550.81	-1517.99	-105.92	-796.6	5738356.54	566539.9
1800	15.83	246.54	1555.62	-1522.8	-106.46	-797.84	5738356	566538.66
1805	15.78	246.47	1560.44	-1527.62	-107.01	-799.09	5738355.46	566537.41
1810	15.73	246.4	1565.25	-1532.43	-107.55	-800.34	5738354.92	566536.16
1815	15.68	246.33	1570.06	-1537.24	-108.09	-801.58	5738354.37	566534.92
1820	15.63	246.25	1574.87	-1542.05	-108.63	-802.83	5738353.83	566533.67
1825	15.56	246.19	1579.69	-1546.87	-109.17	-804.05	5738353.29	566532.46
1830	15.48	246.12	1584.51	-1551.69	-109.71	-805.26	5738352.75	566531.24
1835	15.4	246.05	1589.33	-1556.51	-110.25	-806.47	5738352.21	566530.03
1840	15.32	245.99	1594.15	-1561.33	-110.79	-807.69	5738351.67	566528.81
1845	15.25	245.92	1598.97	-1566.15	-111.33	-808.9	5738351.13	566527.6
1850	15.19	245.85	1603.79	-1570.97	-111.87	-810.11	5738350.6	566526.39
1855	15.16	245.79	1608.62	-1575.8	-112.4	-811.3	5738350.06	566525.2
1860	15.14	245.73	1613.45	-1580.63	-112.94	-812.49	5738349.52	566524.01
1865	15.11	245.66	1618.27	-1585.45	-113.48	-813.68	5738348.98	566522.83
1870	15.09	245.6	1623.1	-1590.28	-114.02	-814.86	5738348.45	566521.64
1875	15.06	245.54	1627.93	-1595.11	-114.55	-816.05	5738347.91	566520.45
1880	15.03	245.48	1632.76	-1599.94	-115.09	-817.23	5738347.37	566519.27
1885	14.98	245.44	1637.59	-1604.77	-115.63	-818.4	5738346.84	566518.1
1890	14.94	245.4	1642.42	-1609.6	-116.16	-819.57	5738346.3	566516.93
1895	14.9	245.36	1647.25	-1614.43	-116.7	-820.75	5738345.76	566515.76
1900	14.86	245.31	1652.08	-1619.26	-117.24	-821.92	5738345.23	566514.58
1905	14.82	245.27	1656.91	-1624.09	-117.77	-823.09	5738344.69	566513.41
1910	14.77	245.11	1661.75	-1628.93	-118.31	-824.24	5738344.15	566512.26
1915	14.71	244.93	1666.59	-1633.77	-118.85	-825.38	5738343.61	566511.12
1920	14.66	244.74	1671.42	-1638.6	-119.39	-826.52	5738343.07	566509.98
1925	14.6	244.55	1676.26	-1643.44	-119.93	-827.67	5738342.53	566508.83
1930	14.54	244.36	1681.1	-1648.28	-120.47	-828.81	5738341.99	566507.69
1935	14.49	244.18	1685.94	-1653.12	-121.01	-829.95	5738341.45	566506.55
1940	14.42	244.16	1690.78	-1657.96	-121.55	-831.06	5738340.91	566505.44
1945	14.35	244.15	1695.63	-1662.81	-122.09	-832.17	5738340.38	566504.33
1950	14.27	244.13	1700.47	-1667.65	-122.63	-833.28	5738339.84	566503.22
1955	14.2	244.12	1705.32	-1672.5	-123.16	-834.39	5738339.3	566502.11
1960	14.13	244.1	1710.16	-1677.34	-123.7	-835.5	5738338.76	566501
1965	14.08	244.2	1715.01	-1682.19	-124.23	-836.61	5738338.23	566499.89

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1970	14.1	244.61	1719.86	-1687.04	-124.74	-837.72	5738337.72	566498.78
1975	14.11	245.02	1724.71	-1691.89	-125.25	-838.83	5738337.21	566497.67
1980	14.12	245.43	1729.56	-1696.74	-125.76	-839.94	5738336.7	566496.57
1985	14.13	245.84	1734.41	-1701.59	-126.27	-841.04	5738336.19	566495.46
1990	14.14	246.25	1739.26	-1706.44	-126.78	-842.15	5738335.68	566494.35
1995	14.12	246.37	1744.11	-1711.29	-127.28	-843.26	5738335.18	566493.24
2000	14.08	246.29	1748.96	-1716.14	-127.77	-844.37	5738334.69	566492.13
2005	14.04	246.21	1753.81	-1720.99	-128.26	-845.48	5738334.2	566491.03
2010	13.99	246.13	1758.66	-1725.84	-128.75	-846.58	5738333.71	566489.92
2015	13.95	246.05	1763.51	-1730.69	-129.24	-847.69	5738333.23	566488.81
2020	13.91	245.97	1768.36	-1735.54	-129.73	-848.8	5738332.74	566487.7
2025	13.86	245.96	1773.22	-1740.4	-130.21	-849.89	5738332.25	566486.61
2030	13.81	245.95	1778.07	-1745.25	-130.7	-850.98	5738331.77	566485.53
2035	13.76	245.95	1782.93	-1750.11	-131.18	-852.06	5738331.28	566484.44
2040	13.7	245.95	1787.79	-1754.97	-131.67	-853.15	5738330.8	566483.35
2045	13.65	245.94	1792.64	-1759.82	-132.15	-854.23	5738330.31	566482.27
2050	13.62	245.93	1797.5	-1764.68	-132.63	-855.32	5738329.83	566481.18
2055	13.68	245.87	1802.36	-1769.54	-133.12	-856.41	5738329.34	566480.1
2060	13.75	245.81	1807.21	-1774.39	-133.61	-857.49	5738328.85	566479.01
2065	13.82	245.76	1812.07	-1779.25	-134.1	-858.58	5738328.36	566477.92
2070	13.88	245.7	1816.92	-1784.1	-134.59	-859.67	5738327.87	566476.83
2075	13.95	245.64	1821.78	-1788.96	-135.08	-860.76	5738327.38	566475.75
2080	14.02	245.65	1826.63	-1793.81	-135.58	-861.86	5738326.89	566474.65
2085	14.1	245.79	1831.48	-1798.66	-136.07	-862.98	5738326.39	566473.52
2090	14.18	245.94	1836.32	-1803.5	-136.57	-864.1	5738325.89	566472.4
2095	14.26	246.08	1841.17	-1808.35	-137.07	-865.22	5738325.39	566471.28
2098.5	14.32	246.18	1844.56	-1811.74	-137.42	-866.01	5738325.04	566470.49
2099	14.33	246.19	1845.05	-1812.23	-137.47	-866.12	5738324.99	566470.38
2100	14.34	246.22	1846.02	-1813.2	-137.57	-866.34	5738324.89	566470.16
2101	14.36	246.25	1846.99	-1814.17	-137.67	-866.57	5738324.79	566469.93
2102	14.37	246.28	1847.96	-1815.14	-137.77	-866.79	5738324.69	566469.71
2103	14.39	246.3	1848.93	-1816.11	-137.87	-867.02	5738324.59	566469.48
2104	14.41	246.33	1849.89	-1817.07	-137.97	-867.24	5738324.49	566469.26
2105	14.42	246.36	1850.86	-1818.04	-138.07	-867.47	5738324.39	566469.03
2106	14.44	246.39	1851.83	-1819.01	-138.17	-867.69	5738324.29	566468.81
2107	14.45	246.4	1852.8	-1819.98	-138.27	-867.92	5738324.19	566468.58
2108	14.45	246.39	1853.77	-1820.95	-138.37	-868.15	5738324.09	566468.36
2109	14.45	246.37	1854.74	-1821.92	-138.47	-868.37	5738323.99	566468.13
2110	14.45	246.35	1855.71	-1822.89	-138.58	-868.6	5738323.89	566467.9
2111	14.45	246.33	1856.68	-1823.86	-138.68	-868.83	5738323.79	566467.67
2112	14.45	246.31	1857.64	-1824.82	-138.78	-869.06	5738323.69	566467.44
2113	14.45	246.29	1858.61	-1825.79	-138.88	-869.29	5738323.59	566467.22
2114	14.45	246.27	1859.58	-1826.76	-138.98	-869.51	5738323.48	566466.99
2115	14.45	246.25	1860.55	-1827.73	-139.08	-869.74	5738323.38	566466.76
2116	14.45	246.24	1861.52	-1828.7	-139.18	-869.97	5738323.28	566466.53
2117	14.45	246.22	1862.49	-1829.67	-139.28	-870.2	5738323.18	566466.3
2118	14.45	246.2	1863.45	-1830.63	-139.38	-870.43	5738323.08	566466.07
2119	14.45	246.18	1864.42	-1831.6	-139.48	-870.66	5738322.98	566465.85
2120	14.45	246.16	1865.39	-1832.57	-139.58	-870.88	5738322.88	566465.62
2121	14.45	246.14	1866.36	-1833.54	-139.69	-871.11	5738322.78	566465.39
2122	14.45	246.12	1867.33	-1834.51	-139.79	-871.34	5738322.68	566465.16
2123	14.45	246.1	1868.3	-1835.48	-139.89	-871.57	5738322.58	566464.93
2124	14.45	246.08	1869.26	-1836.44	-139.99	-871.8	5738322.47	566464.71
2125	14.45	246.07	1870.23	-1837.41	-140.09	-872.02	5738322.37	566464.48
2126	14.45	246.05	1871.2	-1838.38	-140.19	-872.25	5738322.27	566464.25
2127	14.45	246.03	1872.17	-1839.35	-140.29	-872.48	5738322.17	566464.02
2128	14.45	246.01	1873.14	-1840.32	-140.39	-872.71	5738322.07	566463.79
2129	14.45	245.99	1874.11	-1841.29	-140.49	-872.94	5738321.97	566463.56

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2130	14.45	245.97	1875.08	-1842.26	-140.59	-873.17	5738321.87	566463.34
2131	14.45	245.95	1876.04	-1843.22	-140.69	-873.39	5738321.77	566463.11
2132	14.45	245.93	1877.01	-1844.19	-140.8	-873.62	5738321.67	566462.88
2133	14.45	245.92	1877.98	-1845.16	-140.9	-873.85	5738321.57	566462.65
2134	14.45	245.9	1878.95	-1846.13	-141	-874.08	5738321.47	566462.42
2135	14.45	245.88	1879.92	-1847.1	-141.1	-874.31	5738321.36	566462.2
2136	14.45	245.87	1880.89	-1848.07	-141.2	-874.53	5738321.26	566461.97
2137	14.45	245.87	1881.85	-1849.03	-141.3	-874.76	5738321.16	566461.74
2138	14.44	245.87	1882.82	-1850	-141.4	-874.99	5738321.06	566461.51
2139	14.44	245.87	1883.79	-1850.97	-141.51	-875.22	5738320.96	566461.29
2140	14.44	245.87	1884.76	-1851.94	-141.61	-875.44	5738320.86	566461.06
2141	14.44	245.87	1885.73	-1852.91	-141.71	-875.67	5738320.75	566460.83
2142	14.43	245.87	1886.7	-1853.88	-141.81	-875.9	5738320.65	566460.6
2143	14.43	245.87	1887.66	-1854.84	-141.91	-876.12	5738320.55	566460.38
2144	14.43	245.87	1888.63	-1855.81	-142.01	-876.35	5738320.45	566460.15
2145	14.43	245.87	1889.6	-1856.78	-142.12	-876.58	5738320.35	566459.92
2146	14.42	245.87	1890.57	-1857.75	-142.22	-876.81	5738320.25	566459.7
2147	14.42	245.87	1891.54	-1858.72	-142.32	-877.03	5738320.14	566459.47
2148	14.42	245.87	1892.51	-1859.69	-142.42	-877.26	5738320.04	566459.24
2149	14.42	245.87	1893.48	-1860.66	-142.52	-877.49	5738319.94	566459.01
2150	14.41	245.88	1894.44	-1861.62	-142.62	-877.71	5738319.84	566458.79
2151	14.41	245.88	1895.41	-1862.59	-142.73	-877.94	5738319.74	566458.56
2152	14.41	245.88	1896.38	-1863.56	-142.83	-878.17	5738319.64	566458.33
2153	14.41	245.88	1897.35	-1864.53	-142.93	-878.4	5738319.53	566458.1
2154	14.4	245.88	1898.32	-1865.5	-143.03	-878.62	5738319.43	566457.88
2155	14.4	245.88	1899.29	-1866.47	-143.13	-878.85	5738319.33	566457.65
2156	14.4	245.88	1900.26	-1867.44	-143.23	-879.08	5738319.23	566457.42
2157	14.4	245.88	1901.22	-1868.4	-143.34	-879.31	5738319.13	566457.2
2158	14.39	245.88	1902.19	-1869.37	-143.44	-879.53	5738319.02	566456.97
2159	14.39	245.88	1903.16	-1870.34	-143.54	-879.76	5738318.92	566456.74
2160	14.39	245.88	1904.13	-1871.31	-143.64	-879.99	5738318.82	566456.51
2161	14.39	245.88	1905.1	-1872.28	-143.74	-880.21	5738318.72	566456.29
2162	14.38	245.88	1906.07	-1873.25	-143.85	-880.44	5738318.62	566456.06
2163	14.38	245.88	1907.04	-1874.22	-143.95	-880.67	5738318.52	566455.83
2164	14.38	245.88	1908	-1875.18	-144.05	-880.9	5738318.41	566455.61
2165	14.38	245.87	1908.97	-1876.15	-144.15	-881.12	5738318.31	566455.38
2166	14.38	245.85	1909.94	-1877.12	-144.25	-881.35	5738318.21	566455.15
2167	14.38	245.84	1910.91	-1878.09	-144.36	-881.57	5738318.11	566454.93
2168	14.38	245.82	1911.88	-1879.06	-144.46	-881.8	5738318.01	566454.7
2169	14.38	245.81	1912.85	-1880.03	-144.56	-882.03	5738317.9	566454.47
2170	14.38	245.79	1913.82	-1881	-144.66	-882.25	5738317.8	566454.25
2171	14.38	245.78	1914.78	-1881.96	-144.77	-882.48	5738317.7	566454.02
2172	14.38	245.76	1915.75	-1882.93	-144.87	-882.71	5738317.6	566453.8
2173	14.38	245.75	1916.72	-1883.9	-144.97	-882.93	5738317.49	566453.57
2174	14.38	245.73	1917.69	-1884.87	-145.07	-883.16	5738317.39	566453.34
2175	14.38	245.72	1918.66	-1885.84	-145.17	-883.39	5738317.29	566453.12
2176	14.38	245.7	1919.63	-1886.81	-145.28	-883.61	5738317.19	566452.89
2177	14.38	245.69	1920.6	-1887.78	-145.38	-883.84	5738317.08	566452.66
2178	14.38	245.67	1921.57	-1888.75	-145.48	-884.06	5738316.98	566452.44
2179	14.38	245.66	1922.53	-1889.71	-145.58	-884.29	5738316.88	566452.21
2180	14.38	245.64	1923.5	-1890.68	-145.69	-884.52	5738316.78	566451.99
2181	14.38	245.63	1924.47	-1891.65	-145.79	-884.74	5738316.67	566451.76
2182	14.38	245.61	1925.44	-1892.62	-145.89	-884.97	5738316.57	566451.53
2183	14.38	245.6	1926.41	-1893.59	-145.99	-885.2	5738316.47	566451.31
2184	14.38	245.58	1927.38	-1894.56	-146.1	-885.42	5738316.37	566451.08
2185	14.38	245.57	1928.35	-1895.53	-146.2	-885.65	5738316.27	566450.85
2186	14.38	245.55	1929.31	-1896.49	-146.3	-885.87	5738316.16	566450.63
2187	14.38	245.54	1930.28	-1897.46	-146.4	-886.1	5738316.06	566450.4

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2188	14.38	245.52	1931.25	-1898.43	-146.5	-886.33	5738315.96	566450.17
2189	14.38	245.51	1932.22	-1899.4	-146.61	-886.55	5738315.86	566449.95
2190	14.38	245.49	1933.19	-1900.37	-146.71	-886.78	5738315.75	566449.72
2191	14.38	245.48	1934.16	-1901.34	-146.81	-887.01	5738315.65	566449.5
2192	14.38	245.46	1935.13	-1902.31	-146.91	-887.23	5738315.55	566449.27
2193	14.38	245.45	1936.1	-1903.28	-147.02	-887.46	5738315.45	566449.04
2194	14.38	245.44	1937.06	-1904.24	-147.12	-887.68	5738315.34	566448.82
2195	14.38	245.44	1938.03	-1905.21	-147.22	-887.91	5738315.24	566448.59
2196	14.39	245.43	1939	-1906.18	-147.33	-888.14	5738315.14	566448.36
2197	14.39	245.43	1939.97	-1907.15	-147.43	-888.36	5738315.03	566448.14
2198	14.39	245.42	1940.94	-1908.12	-147.54	-888.59	5738314.93	566447.91
2199	14.39	245.42	1941.91	-1909.09	-147.64	-888.82	5738314.82	566447.69
2200	14.4	245.41	1942.88	-1910.06	-147.74	-889.04	5738314.72	566447.46
2201	14.4	245.41	1943.84	-1911.02	-147.85	-889.27	5738314.62	566447.23
2202	14.4	245.4	1944.81	-1911.99	-147.95	-889.49	5738314.51	566447.01
2203	14.4	245.4	1945.78	-1912.96	-148.05	-889.72	5738314.41	566446.78
2204	14.4	245.4	1946.75	-1913.93	-148.16	-889.95	5738314.31	566446.55
2205	14.41	245.39	1947.72	-1914.9	-148.26	-890.17	5738314.2	566446.33
2206	14.41	245.39	1948.69	-1915.87	-148.36	-890.4	5738314.1	566446.1
2207	14.41	245.38	1949.66	-1916.84	-148.47	-890.63	5738313.99	566445.88
2208	14.41	245.38	1950.62	-1917.8	-148.57	-890.85	5738313.89	566445.65
2209	14.41	245.37	1951.59	-1918.77	-148.68	-891.08	5738313.79	566445.42
2210	14.42	245.37	1952.56	-1919.74	-148.78	-891.3	5738313.68	566445.2
2211	14.42	245.36	1953.53	-1920.71	-148.88	-891.53	5738313.58	566444.97
2212	14.42	245.36	1954.5	-1921.68	-148.99	-891.76	5738313.48	566444.74
2213	14.42	245.35	1955.47	-1922.65	-149.09	-891.98	5738313.37	566444.52
2214	14.42	245.35	1956.43	-1923.61	-149.19	-892.21	5738313.27	566444.29
2215	14.43	245.34	1957.4	-1924.58	-149.3	-892.44	5738313.17	566444.07
2216	14.43	245.34	1958.37	-1925.55	-149.4	-892.66	5738313.06	566443.84
2217	14.43	245.33	1959.34	-1926.52	-149.51	-892.89	5738312.96	566443.61
2218	14.43	245.33	1960.31	-1927.49	-149.61	-893.11	5738312.85	566443.39
2219	14.44	245.32	1961.28	-1928.46	-149.71	-893.34	5738312.75	566443.16
2220	14.44	245.32	1962.25	-1929.43	-149.82	-893.57	5738312.65	566442.94
2221	14.44	245.31	1963.21	-1930.39	-149.92	-893.79	5738312.54	566442.71
2222	14.44	245.29	1964.18	-1931.36	-150.03	-894.02	5738312.44	566442.48
2223	14.44	245.25	1965.15	-1932.33	-150.13	-894.24	5738312.33	566442.26
2224	14.43	245.22	1966.12	-1933.3	-150.24	-894.47	5738312.23	566442.03
2225	14.43	245.18	1967.09	-1934.27	-150.34	-894.69	5738312.12	566441.81
2226	14.43	245.15	1968.06	-1935.24	-150.45	-894.92	5738312.01	566441.58
2227	14.43	245.11	1969.03	-1936.21	-150.55	-895.14	5738311.91	566441.36
2228	14.43	245.08	1969.99	-1937.17	-150.66	-895.37	5738311.8	566441.13
2229	14.42	245.04	1970.96	-1938.14	-150.77	-895.59	5738311.7	566440.91
2230	14.42	245.01	1971.93	-1939.11	-150.87	-895.82	5738311.59	566440.68
2231	14.42	244.97	1972.9	-1940.08	-150.98	-896.04	5738311.48	566440.46
2232	14.42	244.94	1973.87	-1941.05	-151.08	-896.27	5738311.38	566440.23
2233	14.42	244.9	1974.84	-1942.02	-151.19	-896.5	5738311.27	566440.01
2234	14.41	244.87	1975.81	-1942.99	-151.3	-896.72	5738311.17	566439.78
2235	14.41	244.83	1976.77	-1943.95	-151.4	-896.95	5738311.06	566439.56
2236	14.41	244.8	1977.74	-1944.92	-151.51	-897.17	5738310.96	566439.33
2237	14.41	244.76	1978.71	-1945.89	-151.61	-897.4	5738310.85	566439.11
2238	14.41	244.73	1979.68	-1946.86	-151.72	-897.62	5738310.74	566438.88
2239	14.4	244.69	1980.65	-1947.83	-151.83	-897.85	5738310.64	566438.66
2240	14.4	244.66	1981.62	-1948.8	-151.93	-898.07	5738310.53	566438.43
2241	14.4	244.62	1982.59	-1949.77	-152.04	-898.3	5738310.43	566438.2
2242	14.4	244.59	1983.55	-1950.73	-152.14	-898.52	5738310.32	566437.98
2243	14.39	244.55	1984.52	-1951.7	-152.25	-898.75	5738310.21	566437.75
2244	14.39	244.52	1985.49	-1952.67	-152.36	-898.97	5738310.11	566437.53
2245	14.39	244.48	1986.46	-1953.64	-152.46	-899.2	5738310	566437.3

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2246	14.39	244.45	1987.43	-1954.61	-152.57	-899.42	5738309.9	566437.08
2247	14.39	244.41	1988.4	-1955.58	-152.67	-899.65	5738309.79	566436.85
2248	14.38	244.38	1989.36	-1956.54	-152.78	-899.87	5738309.68	566436.63
2249	14.38	244.34	1990.33	-1957.51	-152.89	-900.1	5738309.58	566436.4
2250	14.38	244.31	1991.3	-1958.48	-152.99	-900.32	5738309.47	566436.18
2251	14.38	244.28	1992.27	-1959.45	-153.1	-900.55	5738309.36	566435.95
2252	14.38	244.25	1993.24	-1960.42	-153.21	-900.77	5738309.25	566435.73
2253	14.39	244.21	1994.21	-1961.39	-153.32	-900.99	5738309.14	566435.51
2254	14.39	244.18	1995.18	-1962.36	-153.43	-901.22	5738309.03	566435.28
2255	14.39	244.15	1996.14	-1963.32	-153.54	-901.44	5738308.93	566435.06
2256	14.39	244.12	1997.11	-1964.29	-153.65	-901.66	5738308.82	566434.84
2257	14.39	244.09	1998.08	-1965.26	-153.76	-901.89	5738308.71	566434.61
2258	14.39	244.05	1999.05	-1966.23	-153.87	-902.11	5738308.6	566434.39
2259	14.4	244.02	2000.02	-1967.2	-153.97	-902.33	5738308.49	566434.17
2260	14.4	243.99	2000.99	-1968.17	-154.08	-902.56	5738308.38	566433.94
2261	14.4	243.96	2001.96	-1969.14	-154.19	-902.78	5738308.27	566433.72
2262	14.4	243.93	2002.93	-1970.11	-154.3	-903	5738308.16	566433.5
2263	14.4	243.9	2003.89	-1971.07	-154.41	-903.23	5738308.05	566433.27
2264	14.4	243.86	2004.86	-1972.04	-154.52	-903.45	5738307.94	566433.05
2265	14.41	243.83	2005.83	-1973.01	-154.63	-903.67	5738307.83	566432.83
2266	14.41	243.8	2006.8	-1973.98	-154.74	-903.9	5738307.72	566432.6
2267	14.41	243.77	2007.77	-1974.95	-154.85	-904.12	5738307.61	566432.38
2268	14.41	243.74	2008.74	-1975.92	-154.96	-904.34	5738307.5	566432.16
2269	14.41	243.7	2009.71	-1976.89	-155.07	-904.57	5738307.4	566431.93
2270	14.41	243.67	2010.67	-1977.85	-155.18	-904.79	5738307.29	566431.71
2271	14.42	243.64	2011.64	-1978.82	-155.29	-905.01	5738307.18	566431.49
2272	14.42	243.61	2012.61	-1979.79	-155.4	-905.24	5738307.07	566431.26
2273	14.42	243.58	2013.58	-1980.76	-155.5	-905.46	5738306.96	566431.04
2274	14.42	243.54	2014.55	-1981.73	-155.61	-905.68	5738306.85	566430.82
2275	14.42	243.51	2015.52	-1982.7	-155.73	-905.91	5738306.74	566430.59
2276	14.42	243.48	2016.49	-1983.67	-155.84	-906.13	5738306.62	566430.37
2277	14.42	243.45	2017.45	-1984.63	-155.95	-906.35	5738306.51	566430.15
2278	14.43	243.42	2018.42	-1985.6	-156.06	-906.57	5738306.4	566429.93
2279	14.43	243.39	2019.39	-1986.57	-156.18	-906.8	5738306.29	566429.7
2280	14.43	243.35	2020.36	-1987.54	-156.29	-907.02	5738306.17	566429.48
2281	14.43	243.32	2021.33	-1988.51	-156.4	-907.24	5738306.06	566429.26
2282	14.43	243.29	2022.3	-1989.48	-156.51	-907.46	5738305.95	566429.04
2283	14.43	243.26	2023.26	-1990.44	-156.63	-907.69	5738305.84	566428.81
2284	14.44	243.23	2024.23	-1991.41	-156.74	-907.91	5738305.73	566428.59
2285	14.44	243.2	2025.2	-1992.38	-156.85	-908.13	5738305.61	566428.37
2286	14.44	243.16	2026.17	-1993.35	-156.96	-908.35	5738305.5	566428.15
2287	14.44	243.13	2027.14	-1994.32	-157.07	-908.58	5738305.39	566427.92
2288	14.44	243.1	2028.11	-1995.29	-157.19	-908.8	5738305.28	566427.7
2289	14.44	243.07	2029.07	-1996.25	-157.3	-909.02	5738305.16	566427.48
2290	14.44	243.04	2030.04	-1997.22	-157.41	-909.25	5738305.05	566427.26
2291	14.45	243.01	2031.01	-1998.19	-157.52	-909.47	5738304.94	566427.03
2292	14.45	242.97	2031.98	-1999.16	-157.64	-909.69	5738304.83	566426.81
2293	14.45	242.94	2032.95	-2000.13	-157.75	-909.91	5738304.72	566426.59
2294	14.45	242.91	2033.92	-2001.1	-157.86	-910.14	5738304.6	566426.37

**APPENDIX 2a**

**BREAM A1A**

**Petrophysics Evaluation Summary**



**Esso Australia Pty Ltd.**  
**Exploration Department**

**Bream A1A**  
**Petrophysics Report**

**Petrophysicist: B.L. Rayner**  
**March 2006**

# Bream A1A Petrophysics Report

## INTRODUCTION

Bream A1A is a directional well designed to capture N-1 oil reserves contained within a structural high on the northern flank of the Bream A field.

Bream A1A was kicked-off from the 9<sup>5</sup>/<sub>8</sub>" casing window at 1505 m MDRT and drilled to a Total Depth of 2294 mMDRT (2034 mTVDRT) in an 8½" production hole.

LWD GR and D&I data was acquired using Schlumberger Drilling & Measurements PowerPulse while drilling from 1505 mMDRT to 2294 mMDRT.

After reaching TD, the well was logged up in memory mode with Precision Energy Service's shuttle on drill pipe from 2291 mMDRT to 1490 mMDRT.

The Precision logs were depth matched to the Schlumberger GR log and analysed for porosity, water saturation and net pay over the interval 2150 - 2280 mMDRT.

Note that all depths quoted in this report are logged mMDRT unless otherwise specified.

## DATA

Data from the following logging surveys were used in the interpretation:

Survey/Log	Suite	Company	Top (m MDRT)	Bottom (m MDRT)
LWD-GR	5	Schlumberger	1505	2294
Dual Laterolog (DDL, DSSL), Gamma Ray (GRGC), Photo Density (PDPE, DEN), Caliper (CLDC), Compensated Neutron (NPRL) and Compensated Sonic (DT)	1	Precision	1490	2291

### Deviation

The well deviation over the reservoir interval was 14.4° towards an average azimuth of 243°.

### Mud Data

Mud Type: KCl/Glycol/PHPA  
Mud Weight: 10.0 ppg  
Rm: 0.113 @ 25 °C  
Rmf: 0.088 @ 25 °C  
Rmc: 0.168 @ 25 °C  
KCL 6.5%  
BHT: 82 °C (as measured by the Precision tools)

### Hole Size

1505 - 2294 mMDRT 8 ½ inches

### Data Acquisition & Log Quality

Good quality Schlumberger D&M LWD data and Precision shuttle data were acquired without incident.

### Data Processing

The LWD-GR is the primary depth reference for this well and all the shuttle logs have been depth matched to the LWD-GR.

As the shuttle GR 1<sup>st</sup> reading was shallow to the LWD GR (1<sup>st</sup> reading of the shuttle GR was 2257 mMDRT, 1<sup>st</sup> reading of the LWD-GR log measurement is 2274 mMDRT) a complete GR for the well was generated by depth splicing the two GR

## Bream A1A Petrophysics Report

The resistivity logs (DDL & DSL) and the bulk density logs (DEN & related curves) were depth matched to the composite GR curve. The neutron logs (NPRL & related curves) and the sonic logs (DT-35 & related curves) were depth matched to the GR depth matched DEN curve.

The PDPE showed a sinusoidal habit that parallels the CLDC curve. The sinuosity is thought to reflect the rugosity rather than lithology. In order to damp this effect the PDPE was filtered by a factor of 9. Uma was computed using the following formulae:

$$Uma = (PEF_{filtered} - 0.35) * ((DEN + 0.1883) / 1.0704)$$

### INTERPRETATION

#### Logs Used

The primary logs used in the interpretation were the depth matched DDL (deep resistivity), GR (composite gamma from GRGC and the basal LWD-GR), DEN (bulk density), PDPE (photo-electric effect) and NPRL (thermal neutron porosity). In addition coal intervals were identified using a coal flag (Flag\_coal). Hydrocarbon types were denoted using a hydrocarbon flag (Flag\_rhoH). A temperature log was created using the following data:

Depth (mMDRT)	Temperature (deg. C)
92	10
2285	92

The temperature at depth 92 mMDRT represents the temperature of the sea-bed and the temperature at 2285 mMDRT (first reading of the Precision logs) is the estimated formation temperature –BHT +10 deg.

The Bream A1A “Waste” zone from 2174 – 2181 mMDRT is hydrocarbon bearing as indicated by a significant increase in mud gas when drilled. However, unlike the hydrocarbon bearing zones below, the resistivity (DDL) is suppressed. It is thought that a combination of clay and conductive minerals are responsible for the suppressed resistivity, resulting in pessimistic water saturation estimates.

Several radioactive reservoir sands are present in the interval 2174 – 2212 mMDRT and the GR proved to be a poor clay indicator across this interval. The approach taken here to adequately characterise the clay content was to use both the U and GR measurements below 2212 mMDRT, but only the U measurement over the interval 2174 – 2212 mMDRT.

#### Formation Water Salinity

R<sub>wa</sub> analysis using a = 1, m = 2 and n = 2 indicates clean water sands have an apparent formation water salinity of 30,000 ppm NaCl equivalent throughout the zone of interest.

#### Hydrocarbon Type Identification

A combination of resistivity, density-neutron logs, total Near-Far neutron counts, mud log shows and production from nearby Bream A wells were used to determine hydrocarbon types present in the reservoirs. The following table lists the determination made using this process:

Zone	Top Depth mMD	Bottom Depth mMD	Comments
N1_Waste_Gas	2174.0	2181.2	Gas Bearing
N1_Red_Gas	2183.2	2190.3	Gas Bearing
N1_Red_Oil	2190.3	2191.0	Oil Bearing
N1_Grn_Oil	2192.2	2196.6	Oil Bearing
N1_Grn_Resid	2196.6	2208.6	Residual Oil & Gas
N1_Cob_Upp_Resid	2208.6	2211.8	Residual Oil
N1_Cob_Lwr_Resid	2215.8	2221.5	Residual Oil
N1_Pnk_Water	2223.3	2227.8	Water Bearing
N1_Pnk_Lwr_Water	2229.2	2244.4	Water Bearing

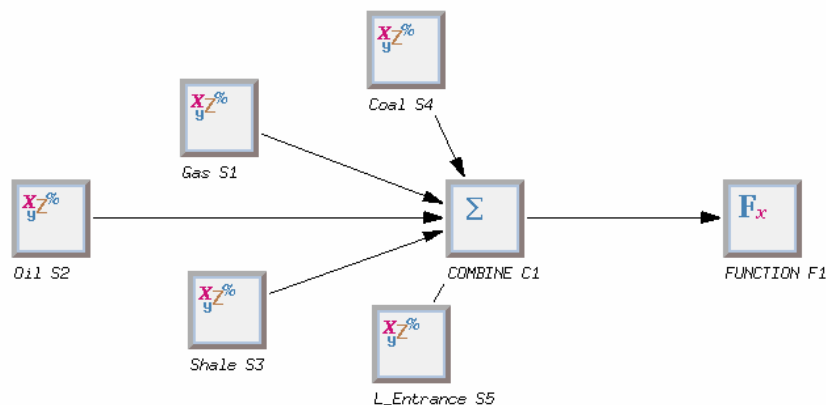
# Bream A1A Petrophysics Report

## Shale Volume, Porosity and Water Saturation

Schlumberger's Geoframe ELAN+ module was used to determine mineral volumes, total porosity, effective porosity and effective saturation. The details of the models are illustrated in the figures and tables below.

## ELAN+ MODEL

### Elan+ Model and Module Configuration



### ELAN Input Channels

Log Curve Selector	Selector Options	
	Compound Name Spec	BREAM A1A
TEMP_CH	TEMP;*	TEMP TEMP@ELANInputLogs;3 [A1450047]
RHOB_IFAC_CH	IFRH;*	
NPHI_IFAC_CH	INPH;*	
RHOB_CH	DEN:BPB;*	DEN DEN@ELANInputLogs;6 [A1450032]
NPHI_CH	NPRL:BPB;*	NPRL NPRL@ELANInputLogs;6 [A1450042]
U_CH	U;*	U U@ELANInputLogs;4 .DF [A1450044]
CUDC_CH/RT_CH	DDLL:BPB;*	DDLL DDLL@ELANInputLogs;6 [A1450026]
GR_CH	GR;*	GR GR@ELANInputLogs;9 [A1450021]
PRB1_CH	FLAG_RHOH;*	FLAG_RHOH FLAG_RHOH@ELANInputLogs;4 [A1450043]
PRB2_CH	DEPT;*	DEPT DEPT@ELANInputLogs;3 [A1450049]
PRB3_CH	PRB3;*	
PRB4_CH	FLAG_COAL;*	FLAG_COAL FLAG_COAL@ELANInputLogs;6 [A1450045]
PRB5_CH	PRB5;*	
M_CH	MXP;*	
N_CH	SXP;*	

# Bream A1A Petrophysics Report

## ELAN Global Parameters

Reference Index MD  
 Processing Interval 2100.0000(m) To 2274.0000(m)  
 Sampling Rate 0.3281(m)  
 Uncertainty Channel FALSE  
 Clay Input DRY  
 Special Fluids IMMOVABLE\_HYDROCARBON

## ELAN Zone Definition

Name Bottom To Top  
 N1\_useGR 2274.7500(m) To 2212.0000(m)  
 N1\_usePE 2212.0000(m) To 2183.2000(m)  
 Waste 2183.2000(m) To 2100.0212(m)

## ELAN Process Definition

Process SOLVE1 "Gas"  
 Equations RHOB NPHI U CUDC\_DWA GR CT1  
 Volumes QUAR ORTH ILLI XWAT UWAT XGAS UGAS  
 Constraint Zones Bottom Top  
 UNDEFINED 2274.7500(m ) 2100.0000(m )  
 Constraints Applied  
 UNDEFINED - WaterBaseMud\_SXO\_gt\_SW  
 UNDEFINED - IrreducibleXWater  
 UNDEFINED - IrreducibleUWater

Process SOLVE2 "Oil"  
 Equations RHOB NPHI U CUDC\_DWA GR CT2  
 Volumes QUAR ORTH ILLI XWAT UWAT XOIL UOIL  
 Constraint Zones Bottom Top  
 UNDEFINED 2274.7500(m ) 2100.0000(m )  
 Constraints Applied  
 UNDEFINED - IrreducibleXWater  
 UNDEFINED - IrreducibleUWater  
 UNDEFINED - WaterBaseMud\_SXO\_gt\_SW

Process SOLVE3 "Shale"  
 Equations RHOB NPHI CUDC\_DWA GR  
 Volumes QUAR ILLI XWAT UWAT  
 Constraint Zones Bottom Top  
 UNDEFINED 2274.7500(m ) 2100.0000(m )

Process SOLVE4 "Coal"  
 Equations RHOB  
 Volumes COAL  
 Constraint Zones Bottom Top  
 UNDEFINED 2274.7500(m ) 2100.0000(m )

Process SOLVE5 "L\_Entrance"  
 Equations RHOB  
 Volumes ILLI  
 Constraint Zones Bottom Top  
 UNDEFINED 2274.7500(m ) 2100.0000(m )

Process COMBINE 1 "COMBINE"  
 Order SOL.2 SOL.1 SOL.3 SOL.4 SOL.5  
 Combine Method  
 "Coarse Clast" 7463.0908 (m ) Internal Average  
 "Gurnard " 7132.5459 (m ) Sol.5

# Bream A1A Petrophysics Report

## Probability Functions

```
probability(SOL.4, PRB4_CH)
prob3 = linear(ILLI_VOL.SOL.3, 0.3, 0, 0.5, 1)
probability(SOL.3, prob3)
prob1 = if (PRB1_CH <=0.25, 1, 0)
probability(SOL.1, prob1)
```

Process FUNCTION 1 "FUNCTION"

Outputs VCL SXWI SWT SUWI PIGN PHIT

User-defined Function/n swt\_cmp=if((PRB4\_CH > 0),1,(UWAT\_VOL + XBWA\_VOL)/(UWAT\_VOL + XBWA\_VOL + UOIL\_VOL + UGAS\_VOL))

output(SWT, swt\_cmp)

## ELAN Different Parameters

Parameters	N1_useGR	N1_usePE	Waste	
n*****	*****	*****	*****	*****
CXDC_XWAT (mS/m )	18.736	18.362	18.161	
CXDC_XBWA (mS/m )	10.707	10.492	10.370	
CUDC_UWAT (mS/m )	12.294	12.037	11.920	
CUDC_UBWA (mS/m )	4.573	4.465	10.000	
CUDC_UNC_ZP (mS/m )	0.053	0.052	0.052	
GR_UNC_WM ( )	0.300	0.000	0.000	

## ELAN Same Parameters

Parameter	Value	Parameter	Value
RHOB_QUAR	2.650(g/cm3 )	RHOB_CALC	2.710(g/cm3 )
RHOB_DOLO	2.847(g/cm3 )	RHOB_ORTH	2.570(g/cm3 )
RHOB_PYRI	4.990(g/cm3 )	RHOB_GLAU	2.650(g/cm3 )
RHOB_ILLI	2.780(g/cm3 )	RHOB_KAOL	2.620(g/cm3 )
RHOB_COAL	1.200(g/cm3 )	RHOB_IGNE	3.000(g/cm3 )
RHOB_XWAT	1.000(g/cm3 )	RHOB_UWAT	0.985(g/cm3 )
RHOB_XOIL	0.500(g/cm3 )	RHOB_UOIL	0.500(g/cm3 )
RHOB_XGAS	-0.024(g/cm3 )	RHOB_UGAS	-0.024(g/cm3 )
RHOB_XBWA	0.972(g/cm3 )	NPHI_QUAR	-0.059(m3/m3 )
NPHI_CALC	0.000(m3/m3 )	NPHI_DOLO	0.032(m3/m3 )
NPHI_ORTH	-0.010(m3/m3 )	NPHI_PYRI	0.008(m3/m3 )
NPHI_GLAU	0.410(m3/m3 )	NPHI_ILLI	0.247(m3/m3 )
NPHI_KAOL	0.450(m3/m3 )	NPHI_COAL	0.450(m3/m3 )
NPHI_XWAT	1.000(m3/m3 )	NPHI_UWAT	1.000(m3/m3 )
NPHI_XOIL	0.600(m3/m3 )	NPHI_UOIL	0.600(m3/m3 )
NPHI_XGAS	0.147(m3/m3 )	NPHI_UGAS	0.147(m3/m3 )
NPHI_XBWA	1.000(m3/m3 )	DT_QUAR	55.500(us/m )
DT_CALC	47.800(us/m )	DT_DOLO	43.500(us/m )
DT_ORTH	60.000(us/m )	DT_ILLI	60.000(us/m )
DT_KAOL	91.318(us/m )	DT_COAL	121.920(us/m )
DT_IGNE	16.916(us/m )	DT_XWAT	0.000(us/m )
DT_UWAT	220.000(us/m )	DT_XOIL	0.000(us/m )
DT_UOIL	240.000(us/m )	DT_XGAS	0.000(us/m )
DT_UGAS	289.865(us/m )	DT_XBWA	189.000(us/m )
U_QUAR	5.000( )	U_CALC	14.100( )
U_DOLO	9.100( )	U_ORTH	8.700( )
U_ILLI	9.900( )	U_KAOL	5.100( )
U_COAL	1.000( )	U_XWAT	0.692( )

## Bream A1A Petrophysics Report

U_UWAT	0.000( )	U_XOIL	0.136( )
U_UOIL	0.000( )	U_XGAS	0.012( )
U_UGAS	0.000( )	U_XBWA	0.398( )
CXDC_ILLI	-999.250(mS/m )	CXDC_KAOL	-999.250(mS/m )
CUDC_GLAU	-999.250(mS/m )	CUDC_ILLI	-999.250(mS/m )
CUDC_KAOL	-999.250(mS/m )	GR_QUAR	40.000(gAPI )
GR_CALC	11.000(gAPI )	GR_DOLO	3.000(gAPI )
GR_ORTH	200.000(gAPI )	GR_PYRI	0.000(gAPI )
GR_GLAU	150.000(gAPI )	GR_ILLI	220.000(gAPI )
GR_KAOL	98.000(gAPI )	GR_COAL	40.000(gAPI )
GR_IGNE	40.000(gAPI )	GR_XWAT	0.000(gAPI )
GR_UWAT	0.000(gAPI )	GR_XOIL	0.000(gAPI )
GR_UOIL	0.000(gAPI )	GR_XGAS	0.000(gAPI )
GR_UGAS	0.000(gAPI )	GR_XBWA	0.000(gAPI )
EX1_QUAR	0.000( )	EX1_CALC	0.000( )
EX1_ORTH	0.000( )	EX1_PYRI	0.000( )
EX1_ILLI	0.000( )	EX1_COAL	0.000( )
EX1_XWAT	0.000( )	EX1_UWAT	0.000( )
EX1_XOIL	0.000( )	EX1_UOIL	0.000( )
EX1_XGAS	0.000( )	EX1_UGAS	0.000( )
EX1_XBWA	0.000( )	CT1_QUAR	0.000( )
CT1_CALC	0.000( )	CT1_DOLO	0.000( )
CT1_ORTH	0.000( )	CT1_PYRI	0.000( )
CT1_GLAU	0.000( )	CT1_ILLI	0.000( )
CT1_KAOL	0.000( )	CT1_COAL	0.000( )
CT1_IGNE	0.000( )	CT1_XWAT	0.000( )
CT1_UWAT	0.000( )	CT1_XOIL	0.000( )
CT1_UOIL	0.000( )	CT1_XGAS	1.000( )
CT1_UGAS	-0.300( )	CT1_XBWA	0.000( )
CT2_QUAR	0.000( )	CT2_CALC	0.000( )
CT2_DOLO	0.000( )	CT2_ORTH	0.000( )
CT2_PYRI	0.000( )	CT2_GLAU	0.000( )
CT2_ILLI	0.000( )	CT2_KAOL	0.000( )
CT2_COAL	0.000( )	CT2_IGNE	0.000( )
CT2_XWAT	0.000( )	CT2_UWAT	0.000( )
CT2_XOIL	1.000( )	CT2_UOIL	-0.300( )
CT2_XGAS	0.000( )	CT2_UGAS	0.000( )
CT2_XBWA	0.000( )	CT3_QUAR	-0.100( )
CT3_CALC	0.000( )	CT3_ORTH	1.000( )
CT3_PYRI	0.000( )	CT3_GLAU	0.000( )
CT3_ILLI	0.000( )	CT3_KAOL	0.000( )
CT3_COAL	0.000( )	CT3_XWAT	0.000( )
CT3_UWAT	0.000( )	CT3_XOIL	0.000( )
CT3_UOIL	0.000( )	CT3_XGAS	0.000( )
CT3_UGAS	0.000( )	CT3_XBWA	0.000( )
CT4_QUAR	0.010( )	CT4_CALC	0.000( )
CT4_ORTH	0.000( )	CT4_PYRI	-1.000( )
CT4_GLAU	0.000( )	CT4_ILLI	0.000( )
CT4_COAL	0.000( )	CT4_XWAT	0.000( )
CT4_UWAT	0.000( )	CT4_XOIL	0.000( )
CT4_UOIL	0.000( )	CT4_XGAS	0.000( )
CT4_UGAS	0.000( )	CT4_XBWA	0.000( )
ARHOB_GLAU	2.960(g/cm3 )	ARHOB_ILLI	2.780(g/cm3 )

## Bream A1A Petrophysics Report

ARHOB_KAOL	2.620(g/cm <sup>3</sup> )	WCLP_GLAU	0.156(m <sup>3</sup> /m <sup>3</sup> )
WCLP_ILLI	0.154(m <sup>3</sup> /m <sup>3</sup> )	WCLP_KAOL	0.058(m <sup>3</sup> /m <sup>3</sup> )
CBWA_GLAU	-999.250(mS/m )	CBWA_ILLI	-999.250(mS/m )
CBWA_KAOL	-999.250(mS/m )	CECA_GLAU	0.233(meq/g )
CECA_ILLI	0.200(meq/g )	CECA_KAOL	0.090(meq/g )
RMF	0.160(ohm.m )	MST	61.880(degC )
RW	0.389(ohm.m )	RWT	-999.250(degC )
SALIN_ISOL	-999.250(ppk )	SALIN_PARA	-999.250(ppk )
SALIN_XWAT	12.924(ppk )	SALIN_UWAT	30.000(ppk )
SALIN_XIWA	-999.250(ppk )	SALIN_UIWA	-999.250(ppk )
SALIN_XOIL	0.000(ppk )	SALIN_UOIL	0.000(ppk )
SALIN_XGAS	0.000(ppk )	SALIN_UGAS	0.000(ppk )
SALIN_XSFL	-999.250(ppk )	SALIN_USFL	-999.250(ppk )
CT1_ZP	0.000( )	CT2_ZP	0.000( )
CT3_ZP	0.000( )	CT4_ZP	0.000( )
RHOB_UNC_ZP	0.027(g/cm <sup>3</sup> )	NPHI_UNC_ZP	0.015(m <sup>3</sup> /m <sup>3</sup> )
DT_UNC_ZP	2.250(us/m )	U_UNC_ZP	0.225( )
CXDC_UNC_ZP	0.072(mS/m )	GR_UNC_ZP	2.250(gAPI )
EX1_UNC_ZP	0.015( )	CT1_UNC_ZP	0.015( )
CT2_UNC_ZP	0.015( )	CT3_UNC_ZP	0.015( )
CT4_UNC_ZP	0.015( )	VOLS_UNC_ZP	0.015(m <sup>3</sup> /m <sup>3</sup> )
RHOB_UNC_WM	1.000( )	NPHI_UNC_WM	1.000( )
DT_UNC_WM	0.300( )	U_UNC_WM	0.600( )
CXDC_UNC_WM	0.500( )	CUDC_UNC_WM	0.670( )
EX1_UNC_WM	1.000( )	CT1_UNC_WM	0.800( )
CT2_UNC_WM	0.800( )	CT3_UNC_WM	0.900( )
CT4_UNC_WM	1.000( )	VOLS_UNC_WM	1.000( )
RHOB_IFAC_ZP	0.600( )	NPHI_IFAC_ZP	0.400( )
A_ZP	1.000( )	N_ZP	2.000( )
C_DWA	0.000( )	M_DWA	2.000( )
BVIRR	0.010(m <sup>3</sup> /m <sup>3</sup> )		

## RESULTS AND DISCUSSION

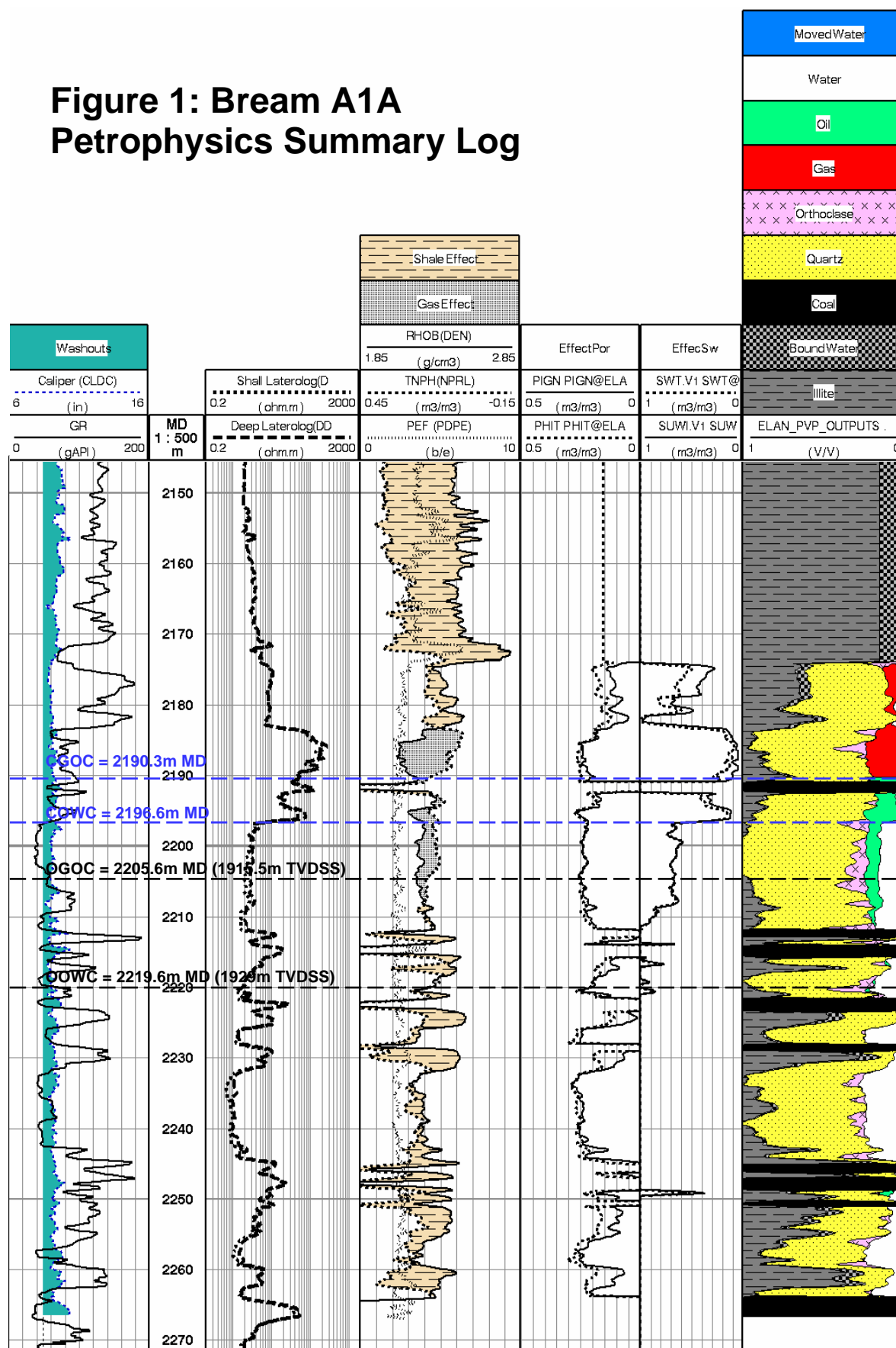
It is clear from the logs that the N-1 reservoir over the interval 2174 – 2212 mMDRT has several radioactive zones as indicated by the high GR levels. The reservoir properties of these zones are comparable to those zones with low GR levels, as indicated by their density-neutron character.

As discussed above, the “Waste” zone has suppressed resistivity readings due to the presence of clay and conductive minerals. The zone is gas bearing and has an average effective porosity and water saturation of 11% and 44% respectively.

The petrophysical analysis indicates that there are two oil productive intervals in this well. The top oil zone extends from a CGOC at 2190.3 mMDRT to a coal at 2191 mMDRT. The second oil zone extends from the base of the coal at 2192.2 mMDRT to the COWC at 2196.6 mMDRT. (see Figure 1 & Table 1).



Figure 1: Bream A1A  
Petrophysics Summary Log



## Bream A1A Petrophysics Report

Bream A1A													
Petrophysical Summary 2150 - 2280m MD													
Depth Reference: Mean VCL, Mean PHIE (or PIGN), Mean SWE (or SUWI) is based on a PHIE or PIGN cutoff:								Primary: MDKB 0.08 for Gas, 0.12 for oil and water					
Zone	Top Depth mMD	Top Depth mTVDSS	Bottom Depth mMD	Bottom Depth mTVDSS	Gross Thickness mMD	Gross Thickness mTVD	Net/Gross	Mean VCL	Mean PHIE	Mean SWE	Comments	Net Pay Thickness mMD	Net Pay Thickness mTVD
N1_Waste_Gas	2174.0	1884.9	2181.2	1891.9	7.2	7.0	0.9	0.38	0.11	0.44	Gas Bearing	6.5	6.3
N1_Red_Gas	2183.2	1893.8	2190.3	1900.7	7.1	6.9	1.0	0.14	0.21	0.08	Gas Bearing, CGOC@2190.3 mMD (1900.7 mTVDSS)	7.1	6.9
N1_Red_Oil	2190.3	1900.7	2191.0	1901.3	0.7	0.7	0.9	0.20	0.22	0.12	Oil Bearing	0.6	0.6
N1_Grn_Oil	2192.2	1902.5	2196.6	1906.8	4.4	4.3	0.9	0.12	0.21	0.22	Oil Bearing, COWC@2196.6 mMD (1906.8 mTVDSS)	4.1	3.9
N1_Grn_Resid	2196.6	1906.8	2208.6	1918.4	12.0	11.6	1.0	0.03	0.23	0.66	Residual Oil & Gas		
N1_Cob_Upp_Resid	2208.6	1918.4	2211.8	1921.5	3.2	3.1	1.0	0.13	0.20	0.88	Residual Oil		
N1_Cob_Lwr_Resid	2215.8	1925.4	2221.5	1930.9	5.7	5.5	0.8	0.13	0.17	0.95	Residual Oil		
N1_Pnk_Water	2223.3	1932.6	2227.8	1937.0	4.5	4.4	0.5	0.18	0.23	1.00	Water Bearing		
N1_Pnk_Lwr_Water	2229.2	1938.3	2244.4	1953.1	15.2	14.7	0.9	0.13	0.24	1.00	Water Bearing		

Table 1



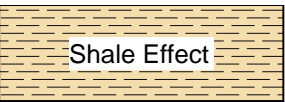
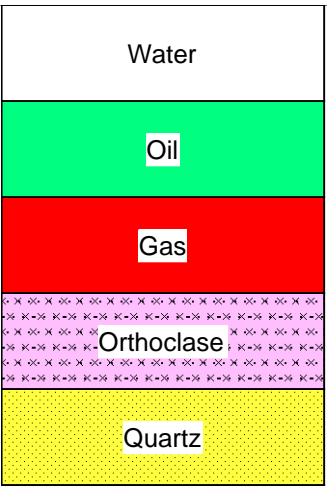
# BREAM A1A

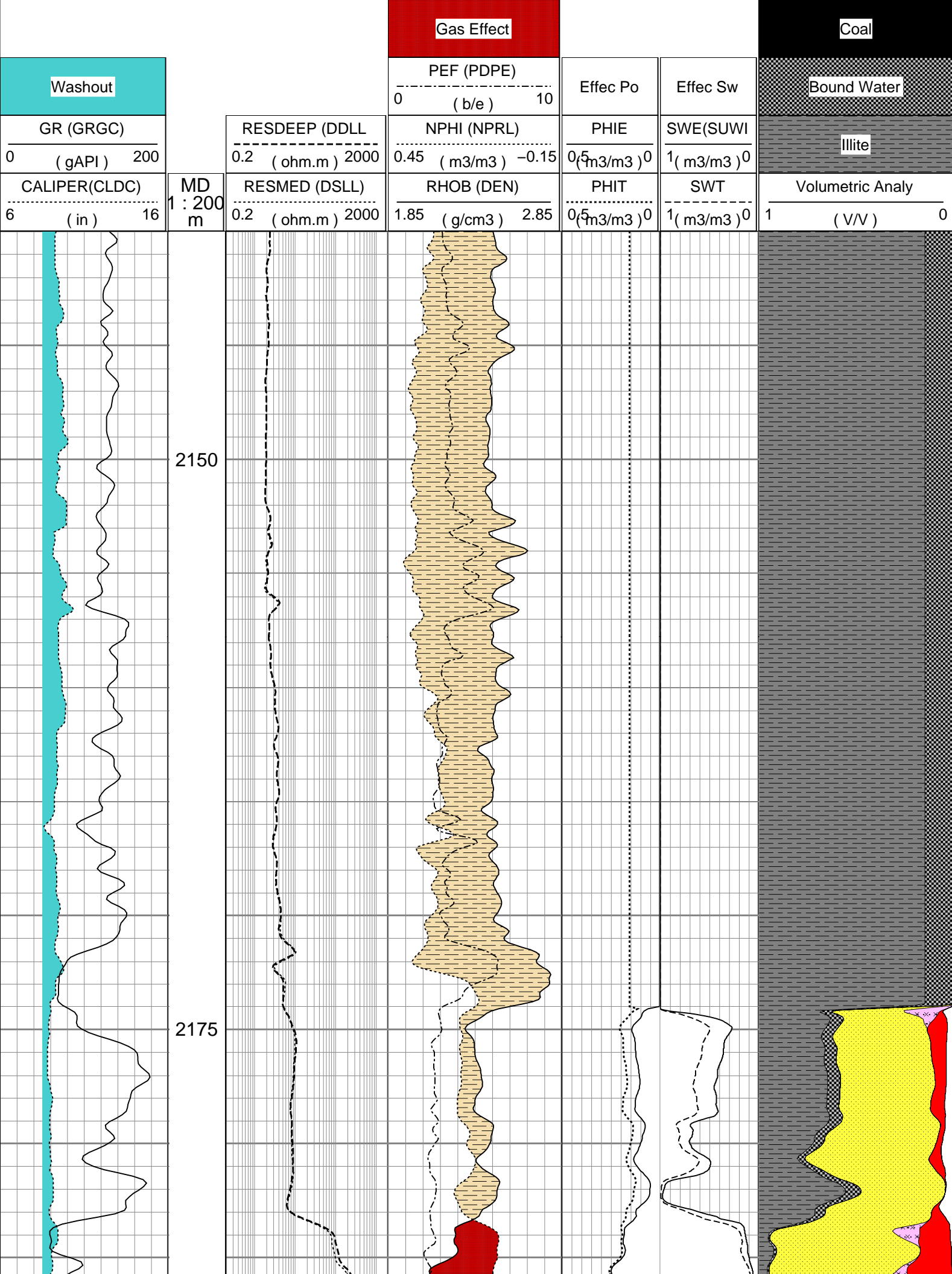
## Petrophysical Analysis

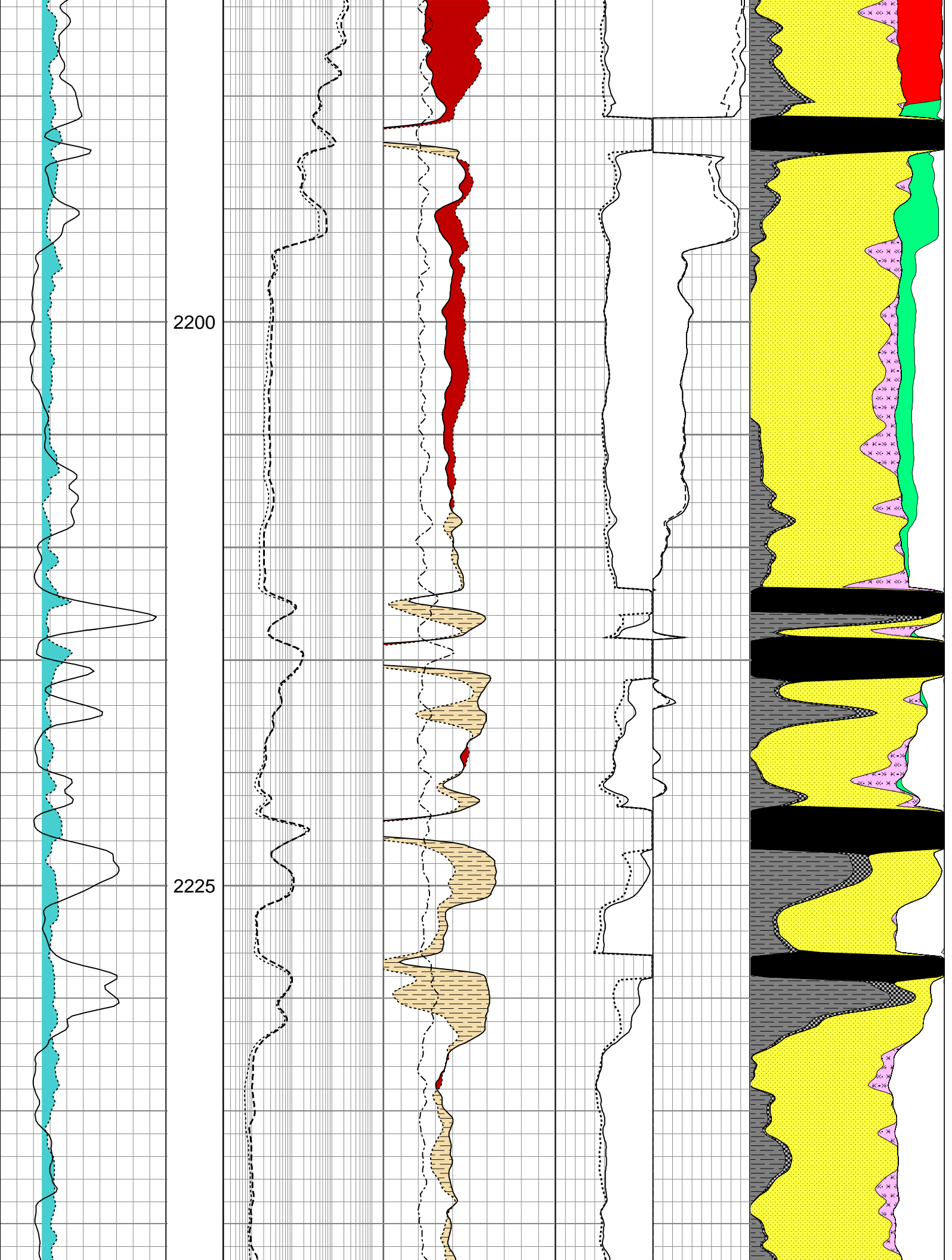
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WELL:	BREAM A1P
BOREHOLE:	BREAM A1A
FIELD:	BREAM
STATE:	VIC
COUNTRY:	AUSTRALIA

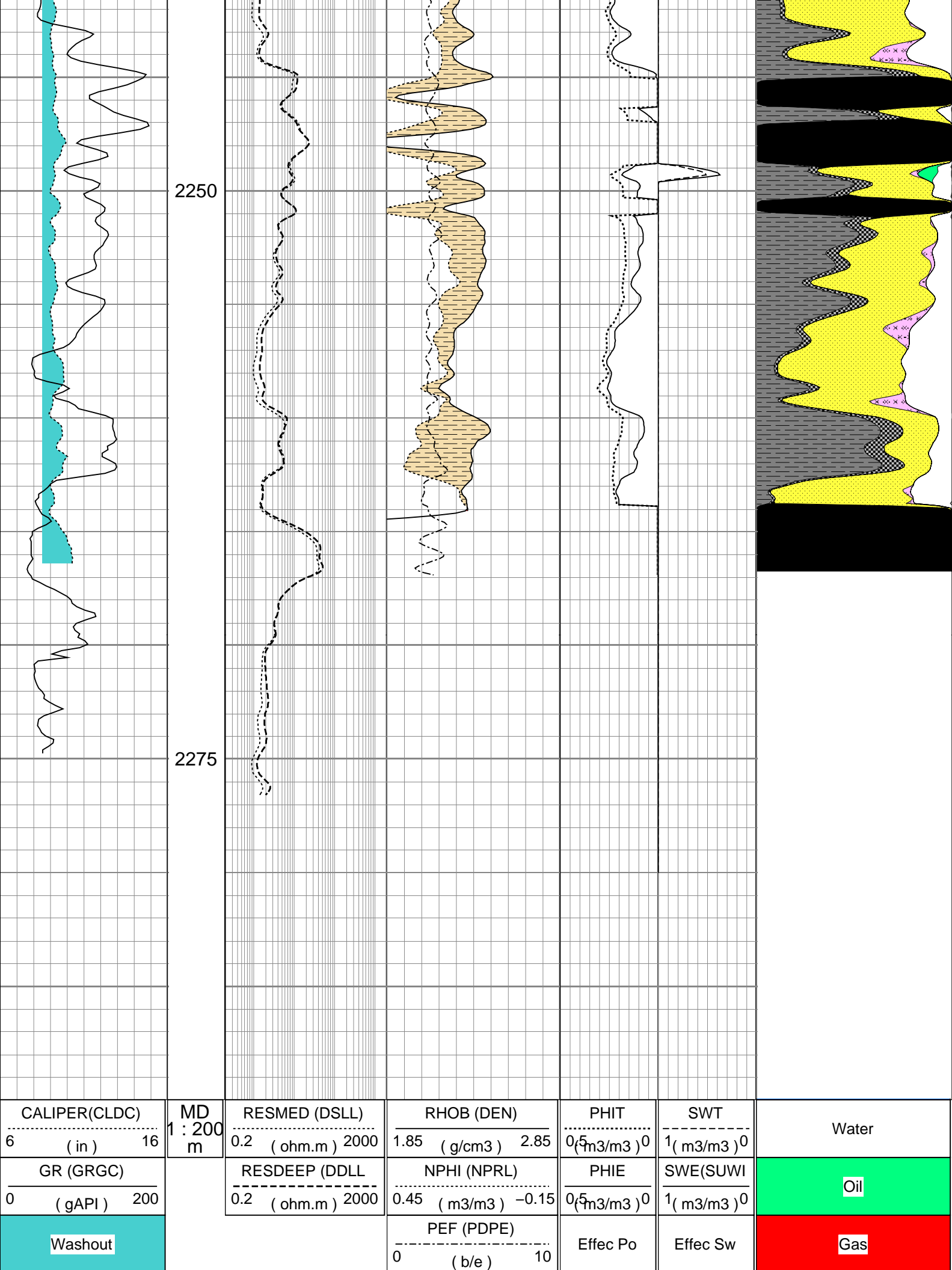
PETROPHYSICIST:	BERNIE RAYNER
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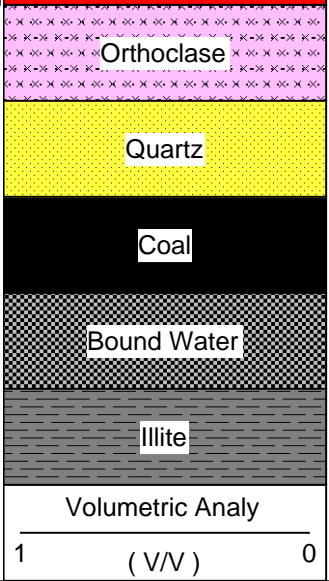
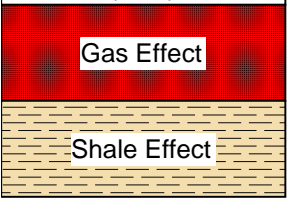
Date Logged:	November 2005	Date of Analysis:	March 2006
Well Location:	<FL>		
Elevations:	K.B. 32.82 m	D.F. <DF>	
Latitude:	<LATI>	G.L. <GL>	
Longitude:	<LONG>		











**APPENDIX 3a**

**BREAM A1A**

**Lithology/Show Descriptions**



## Bream A1A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
			<p>Previous Well History:</p> <p>13.375" casing at 894.0 mMDRT.</p> <p>9.625" casing" at 2338.0 mMDRT.</p> <p>5.50" Production Liner at 3074.0 mMDRT.</p> <p>Bream A1 Plugged and Abandoned on 28 October 2005.</p> <p>Top of Bridge Plug (EZSV) set at 1503.3 mMDRT.</p> <p>9.625" Whipstock set at 1502.2 mMDRT.</p> <p>Milled the 9.625" Casing : Top of window: 1495.6 mMDRT. : Bottom of window: 1501.8 mMDRT.</p> <p>Milled from 1495.6 mMDRT to 1509.0 mMDRT. Rat hole 7.2 m.</p> <p>Perform PIT at 1509.0 mMDRT (1294.8 mTVDRT)/ 620 psi/ 12.7 ppg EMW using 9.8 ppg mud, at 1520 hrs, 01 November 2005.</p> <p>POOH.</p> <p>Geologist on board at 1545 hrs, 31 October 2005.</p> <p>Attempt to Kick-off Bream A1A from 1509.0 mMDRT (1294.8 mTVDRT), with a Smith S73PX bit on steerable motor assembly.</p> <p>Drilled from 1509.0 mMDRT to 1523.0 mMDRT (1304.9 mTVDRT) with no kick-off.</p> <p>POOH.</p> <p>Bit Details:</p> <p>BHA # 3, Bit # 1.</p> <p>Size: 8.5", Manufacturer / Type: Smith S73PX, Serial #: JW0240.</p> <p>Jets: 20 x 6, TFA: 1.841 sq.in, Grading: <b>1-6-BT-S-X-1/16-PN-HP</b>.</p> <p>Krevs: 7.0, Top Drive RPM: 26-61 ( + 168 RPM DHM).</p> <p>Metres drilled: 14.0 m, HOB: 0.50</p> <p>Average ROP: 14.0 / 0.5 = 28.0 m/hr.</p> <p>Rotating: 10.0 metres / Rotating HOB = 0.30, Average Rotating ROP = 33.3 m/hr.</p> <p>Steering: 4.0 metres / Steering HOB = 0.20 , Average Steering ROP = 20.0 m/hr.</p> <p>Pump and squeeze cement from 1509.0 mMDRT to 1498.5 mMDRT.</p> <p>Tag top of cement at 1498.5 mMDRT.</p>

## Bream A1A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
			<p>Re-attempt to Kick-off Bream A1A with a Smith Tricone rock bit on steerable motor assembly.</p> <p>Wash down cement from 1498.5 mMDRT to 1500.0 mMDRT and encounter obstruction at 1500.0 mMDRT.</p> <p>POOH.</p> <p>Bit Details:            BHA # 7, Bit # 2.            Size: 8.5", Manufacturer / Type: Smith Gfi 11YODVDP, Serial #: MR6363.            Jets: 24 x 3, TFA: 1.33 sq.in, Grading: <b>1-1-WT-A-E-E-1-NO-HP.</b>            Krevs: 0.0, Top Drive RPM: 0-0 ( + 0 RPM DHM).            Metres drilled: 0.0 m, HOB: 0.00. Average ROP: N/A m/hr.</p> <p>Pick-up Milling assembly and mill from 1500.0 mMDRT to 1505.0 mMDRT (1291.1 mTVDRT).</p> <p>POOH.</p> <p>Kick off Bream A1A at 2140 hrs on 04 November 2005 from 1505.0 mMDRT (1291.9 mTVDRT) with a Smith S73PX bit on steerable motor assembly.</p> <p>Drill from 1505.0 mMDRT to 1523.0 mMDRT.</p> <p>After encountering 75% new formation, perform PIT at 1523.0 mMDRT (1304.9 mTVDRT)/ 669 psi/ 13.0 ppg EMW using 10.0 ppg mud, at 0300 hrs, 05 November 2005.</p> <p>Drill ahead from 1523.0 mMDRT to TD at 2294.0 mMDRT (2033.9 mTVDRT) with a KCl/Glycol/PHPA mud system.</p> <p>Bit Details:            BHA # 9, Bit # 3.            Size: 8.5", Manufacturer / Type: Smith S73PX, Serial #: JT6968.            Jets: 20 x 6, TFA: 1.841 sq.in, Grading: <b>1-2-BT-S-X-1-ER-TD.</b>            Krevs: 550.0, Top Drive RPM: 100-110 ( + 175 RPM DHM).            Metres drilled: 789.0 m, HOB: 38.42            Average ROP: 789.0 / 38.42 = 20.54 m/hr.            Rotating: 687.0 metres / Rotating HOB = 29.20, Average Rotating ROP = 23.53 m/hr.            Steering: 102.0 metres / Steering HOB = 9.22 , Average Steering ROP = 11.06 m/hr.</p>
1505	1523	Spot 1 m sample	<p>From 1505.0 to 1523.0 mMDRT, the one metre spot samples showed an increasing percentage of new formation (Calcareous Claystone). The 1520.0 mMDRT sample showed 50% of new formation. The Bottoms-up sample at 1523.0 mMDRT showed 75% new formation.</p> <p><b>Midnight Depth 04 November 2005 = 1510.0 mMDRT (1295.5 mTVDRT)</b></p>

## Bream A1A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
Perform PIT at 0300 hrs, 05 November 2005, at 1523.0 mMDRT (1304.9 mTVDRT). Pressure 669 psi, giving an EMW of 13.0 ppg, using 10.0 ppg mud.			
1523	1530	100	CALCAREOUS CLAYSTONE: medium grey to medium dark grey, silty, moderately calcareous, trace disseminated pyrite, rare fossil fragments, firm to moderately hard, sub blocky.
1530	1560	100	CALCAREOUS CLAYSTONE: as above.
1560	1590	100	CALCAREOUS CLAYSTONE: as above, rare glauconite.
1590	1620	100	CALCAREOUS CLAYSTONE: medium light grey to medium grey, silty, moderately calcareous, trace disseminated pyrite, rare fossil fragments, firm to moderately hard, sub blocky.
1620	1650	100	CALCAREOUS CLAYSTONE: as above.
1650	1680	100	CALCAREOUS CLAYSTONE: as above.
1680	1710	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace disseminated pyrite, rare forams, firm to moderately hard, sub blocky.
1710	1740	100	CALCAREOUS CLAYSTONE: as above.
1740	1770	100	CALCAREOUS CLAYSTONE: as above, rare ooids.
1770	1800	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace disseminated pyrite, trace ooids, rare nodular pyrite, firm to moderately hard, sub blocky.
1800	1830	100	CALCAREOUS CLAYSTONE: as above.
<b>Midnight Depth 05 November 2005 = 1859.0 mMDRT (1612.5 mTVDRT).</b>			
1830	1860	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, occasionally medium dark grey, silty, moderately calcareous, trace disseminated pyrite, rare nodular pyrite, soft to firm to occasionally moderately hard, sub blocky.
1860	1890	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace disseminated pyrite, rare ooids, rare gastropods, soft to firm, sub blocky.
1890	1920	100	CALCAREOUS CLAYSTONE: as above.
1920	1950	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace disseminated pyrite, rare ooids, rare forams, soft to firm, sub blocky.
Last 30 metre spot sample at 1950.0 mMDRT.			
Start bagging 10 metre samples from 1950.0 mMDRT to 2100.0 mMDRT.			
1950	1960	100	CALCAREOUS CLAYSTONE: as above.
1960	1970	100	CALCAREOUS CLAYSTONE: as above, + rare nodular pyrite.
1970	1980	100	CALCAREOUS CLAYSTONE: as above, + rare nodular pyrite.
1980	1990	100	CALCAREOUS CLAYSTONE: light brownish grey to occasionally medium grey, silty, moderately calcareous, trace disseminated pyrite, rare nodular pyrite, rare ooids, rare forams, soft to firm, sub blocky.
1990	2000	100	CALCAREOUS CLAYSTONE: as above.
2000	2010	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace disseminated pyrite, rare nodular pyrite, rare ooids, firm to moderately hard, sub blocky.
2010	2020	95	CALCAREOUS CLAYSTONE: as above.
		5	SILTSTONE: pale yellowish brown, very arenaceous grading to very fine Sandstone, slightly calcareous, firm to moderately hard, sub blocky.
2020	2030	90	CALCAREOUS CLAYSTONE: as above.
		10	SILTSTONE: as above.

## Bream A1A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2030	2040	85	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace disseminated pyrite, rare forams, rare ooids, soft to firm, sub blocky.
		15	SILTSTONE: pale yellowish brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, slightly calcareous, firm to moderately hard, sub blocky.
2040	2050	90	CALCAREOUS CLAYSTONE: as above, + rare glauconite.
		10	SILTSTONE: as above.
2050	2060	95	CALCAREOUS CLAYSTONE: as above + rare glauconite.
		5	SILTSTONE: as above. Baracarb at 5 ppb, added to the mud system at 2070.0 mMDRT (1816.9 mTVDRT /- 1784.1 mTVDSS). Baracarb seen in 2080.0 mMDRT sample.
2060	2070	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, common forams, trace disseminated pyrite, rare ooids, soft to firm, sub blocky. SILTSTONE: Trace, as above.
2070	2080	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, common forams, trace disseminated pyrite, rare ooids, rare very fine glauconite, soft to firm, sub blocky SILTSTONE: Trace, as above.
2080	2090	100	CALCAREOUS CLAYSTONE: as above. <b>Top of Latrobe at 2096.5 mMDRT, 1842.6 mTVDRT (-1809.8 mTVDSS).</b>
2090	2100	70	CALCAREOUS CLAYSTONE: 65%, light brownish grey to medium grey, silty, moderately calcareous, common forams, trace disseminated pyrite, rare ooids, rare very fine glauconite, soft to firm, sub blocky. CLAYSTONE: 5%, very light grey, slightly calcareous, soft to firm, amorphous to sub blocky.
		30	SILTSTONE: dark yellowish brown to moderate brown, very arenaceous grading to very fine Sandstone, common glauconite pellets, trace micromicaceous, firm to moderately hard, sub blocky. Last 10 metre bagged sample at 2100.0 mMDRT. Start bagging 5 metre samples from 2100.0 mMDRT to TD of 2294.0 mMDRT.
2100	2105	20	CALCAREOUS CLAYSTONE: 5%, as above.
			CLAYSTONE: 15%, as above.
		75	SILTSTONE: as above.
		5	SANDSTONE: white to pale green, very fine, moderately well sorted, sub angular to sub rounded, common silica cement, weak glauconitic matrix, hard aggregates, tight visual and inferred porosity. No fluorescence.
2105	2110	100	CALCAREOUS CLAYSTONE: 5%, as above. CLAYSTONE: 15%, as above. SILTSTONE: as above. SANDSTONE: Trace, as above. No fluorescence.
2110	2115	5	CLAYSTONE: very light grey, slightly calcareous, firm to moderately hard, sub blocky.
		95	SILTSTONE: dark yellowish brown to moderate brown, very arenaceous grading to very fine Sandstone, common glauconite pellets, trace micromicaceous, firm to moderately hard, sub blocky.
2115	2120	5	CLAYSTONE: as above.
		95	SILTSTONE: as above.

## Bream A1A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2120	2125	5	CLAYSTONE: as above.
		95	SILTSTONE: as above.
2125	2130	5	CLAYSTONE: very light grey, slightly calcareous, moderately hard, sub blocky.
		95	SILTSTONE: dark yellowish brown to moderate brown, very arenaceous grading to very fine Sandstone, common glauconite pellets, trace micromicaceous, firm to moderately hard, sub blocky.
2130	2135	40	CLAYSTONE: very light grey, slightly calcareous, firm to moderately hard, sub blocky.
		60	SILTSTONE: moderate brown to greyish brown, very arenaceous grading to very fine Sandstone, common glauconite pellets, trace micromicaceous, trace disseminated pyrite, rare nodular pyrite, firm to moderately hard, sub blocky.
2135	2140	15	CLAYSTONE: as above.
		85	SILTSTONE: as above.
2140	2145	10	CLAYSTONE: as above.
		90	SILTSTONE: as above.
2145	2150	15	CLAYSTONE: as above.
		85	SILTSTONE: as above.
2150	2155	15	CLAYSTONE: very light grey, slightly calcareous, firm to moderately hard, sub blocky.
		50	SILTSTONE: moderate brown to greyish brown, very arenaceous grading to very fine Sandstone, common very dark green glauconite pellets, trace micromicaceous, trace disseminated pyrite, rare nodular pyrite, firm to moderately hard, sub blocky.
		35	VOLCANICS: pale green to greenish grey, occasionally dark yellowish brown, dominantly chlorite, rare nodular pyrite, hard, crystalline, commonly bit crushed rock flour.
2155	2160	10	CLAYSTONE: as above.
		70	SILTSTONE: as above.
		20	VOLCANICS: as above.
2160	2165	10	CLAYSTONE: as above.
		60	SILTSTONE: as above.
		30	VOLCANICS: as above.
2165	2170	10	CLAYSTONE 1 : 5%, very light grey, slightly calcareous, firm to moderately hard, sub blocky.
			CLAYSTONE 2 : 5%, moderate yellow, non-calcareous, soft, amorphous.
		60	SILTSTONE: moderate brown to greyish brown, very arenaceous grading to very fine Sandstone, common very dark green glauconite pellets, trace micromicaceous, trace nodular pyrite, firm to moderately hard, sub blocky.
		5	SANDSTONE: clear to translucent, very coarse, moderately well sorted, sub angular to sub rounded, common fractured quartz grains, weak pyrite cement, loose, clean, fair to good inferred and visible porosity. No fluorescence.
		25	VOLCANICS: pale green to greenish grey, occasionally dark yellowish brown, dominantly chlorite, rare nodular pyrite, hard, crystalline, commonly bit crushed rock flour.
			<b>Top of Coarse Clastics at 2173.5 mMDRT, 1917.2 mTVDRT (-1884.4 mTVDSS).</b>
2170	2175	15	CLAYSTONE 1 : 5%, very light grey, slightly calcareous, firm to moderately hard, sub blocky.
			CLAYSTONE 2 : 10%, moderate yellow, non-calcareous, soft, amorphous.
		35	SILTSTONE: as above.

## Bream A1A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2175	2180	30	SANDSTONE: clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, common fractured quartz grains, weak pyrite cement, common nodular pyrite, dominantly loose, generally clean, fair inferred and visible porosity. No fluorescence.
		20	VOLCANICS: as above.
			<b>Gas rising at 2174.0 mMDRT: Gas peak of 1856 units at 2176.0 mMDRT.</b>
		10	CLAYSTONE 1 : 10%, very light grey, slightly calcareous, firm to moderately hard, sub blocky.
		30	SILTSTONE: as above.
2180	2185	45	SANDSTONE 1: 30%, clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, common fractured quartz grains, weak pyrite cement, common nodular pyrite, dominantly loose, generally clean, fair inferred and visible porosity. SANDSTONE 2: 15%, translucent to light grey, very fine to fine, moderately well sorted, sub angular to sub rounded, strong silica cement, common micropyrte matrix, hard aggregates, tight inferred and visible porosity. No fluorescence.
		15	VOLCANICS: as above.
			<b>Base of Waste (BWST) at 2183.5 mMDRT, 1926.9 mTVDRT (-1894.1 mTVDSS).</b>
		15	CLAYSTONE: very light grey, slightly calcareous, firm to moderately hard, sub blocky.
		60	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace very dark green glauconite pellets, trace micromicaceous, firm to moderately hard, sub blocky.
2185	2190	15	SANDSTONE 1: 15%, as above. SANDSTONE 2: Trace, as above. No fluorescence.
		10	VOLCANICS: as above.
		15	COAL: dusky brown to brownish black, silty in part grading to CARBONACEOUS SILTSTONE, moderately hard, sub blocky, angular, woody texture.
		10	CLAYSTONE: as above.
		35	SILTSTONE: as above.
2190	2195	35	SANDSTONE: clear to translucent, medium to very coarse, dominantly medium to coarse, moderately well sorted, sub rounded to sub angular, weak pyrite cement, trace to common nodular pyrite, dominantly loose, generally clean, fair inferred and visible porosity. No fluorescence.
		5	VOLCANICS: pale green to greenish grey, occasionally dark yellowish brown, dominantly chlorite, rare nodular pyrite, hard, crystalline, commonly bit crushed rock flour.
		10	CLAYSTONE: as above.
		30	SILTSTONE: as above.
		60	SANDSTONE: as above. No fluorescence.
2195	2200	15	CLAYSTONE: as above.
		20	SILTSTONE: as above.

## Bream A1A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2200	2205	65	SANDSTONE: clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace nodular pyrite, dominantly loose, generally clean, fair to good inferred and visible porosity. No fluorescence.
		10	CLAYSTONE: light grey, non-calcareous, firm to moderately hard, sub blocky.
		20	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare dark green glauconite pellets, firm to moderately hard, sub blocky.
		65	SANDSTONE: clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub rounded to sub angular, weak pyrite cement, rare nodular pyrite, loose, clean, fair to good inferred and visible porosity. No fluorescence.
2205	2210	5	VOLCANICS: pale green to greenish grey, occasionally dark yellowish brown, dominantly chlorite, rare nodular pyrite, hard, crystalline, commonly bit crushed rock flour. <b>Barablock at 4ppb, added to the mud system at 2200.0 mMDRT (1942.9 mTVDRT/-1910.1 mTVDSS).</b> <b>Baracarb seen in 2215.0 mMDRT sample.</b>
		5	COAL: dusky brown to brownish black, silty in part grading to CARBONACEOUS SILTSTONE, firm to moderately hard, sub fissile to sub blocky, uneven, woody texture.
		5	CLAYSTONE: as above.
		5	SILTSTONE: as above.
2210	2215	85	SANDSTONE: clear to translucent, coarse to dominantly very coarse, occasionally medium, moderately well sorted, sub rounded to sub angular, weak pyrite cement, rare nodular pyrite, loose, clean, fair to good inferred and visible porosity. No fluorescence. <b>CbF2 at 2214.0 mMDRT, 1956.4 mTVDRT (-1923.6 mTVDSS).</b>
		10	CLAYSTONE: light grey, non-calcareous, firm to moderately hard, sub blocky.
		25	SILTSTONE: as above.
		65	SANDSTONE: clear to translucent, rare very pale orange, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, rare nodular pyrite, rare glauconite, dominantly loose, generally clean, fair inferred and visible porosity. No fluorescence. <b>CbF1 at 2216.5 mMDRT, 1958.9 mTVDRT (-1926.1 mTVDSS).</b> <b>Midnight Depth 06 November 2005 = 2217.0 mMDRT (1959.3 mTVDRT)</b>
2215	2220	5	CLAYSTONE: as above.
		30	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare dark green glauconite pellets, firm to moderately hard, sub blocky.
		65	SANDSTONE: as above, medium to dominantly very coarse. No fluorescence. <b>Original OWC at 2219.6 mMDRT, 1961.8 mTVDRT (-1929.0 mTVDSS).</b> <b>Cbsb at 2220.0 mMDRT, 1962.3 mTVDRT (-1929.5 mTVDSS).</b>
2220	2225	5	CLAYSTONE: light grey, non-calcareous, firm to moderately hard, sub blocky.
		35	SILTSTONE: as above.
		55	SANDSTONE: as above, medium to dominantly very coarse. No fluorescence.

## **Bream A1A Lithology / Show Descriptions**

<b>Interval (m) From To</b>		<b>%</b>	<b>Lithology / Show Description</b>
2225	2230	5	VOLCANICS: pale green to greenish grey, occasionally dark yellowish brown, dominantly chlorite, rare nodular pyrite, hard, crystalline, commonly bit crushed rock flour.
		5	CLAYSTONE: as above.
		40	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare dark green glauconite pellets, firm to moderately hard, sub blocky.
2230	2235	55	SANDSTONE: clear to translucent, coarse to very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, rare nodular pyrite, loose, clean, fair inferred and visible porosity. No fluorescence.
		5	CLAYSTONE: as above.
		25	SILTSTONE: as above.
2235	2240	70	SANDSTONE: clear to translucent, dominantly medium to very coarse, moderately well sorted, sub rounded to sub angular, weak pyrite cement, rare nodular pyrite, loose, clean, fair inferred and visible porosity. No fluorescence.
		10	CLAYSTONE: light grey, non-calcareous, firm to moderately hard, sub blocky.
		20	SILTSTONE: as above.
2240	2245	70	SANDSTONE: as above. No fluorescence.
		Trace	CLAYSTONE: light grey to light blueish grey, non-calcareous, moderately hard to hard, blocky.
		50	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
2245	2250	50	SANDSTONE: clear to translucent, rare very pale orange, medium to dominantly very coarse, moderately well sorted, sub rounded to sub angular, weak pyrite cement, trace nodular pyrite, loose, clean, fair to good inferred and visible porosity. No fluorescence.
		5	CLAYSTONE: light grey to light blueish grey, non-calcareous, moderately hard to hard, blocky.
		65	SILTSTONE: as above.
2250	2255	30	SANDSTONE: as above, medium to dominantly very coarse. No fluorescence.
		Trace	CLAYSTONE: as above.
		65	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
2255	2260	35	SANDSTONE: as above, medium to dominantly very coarse. No fluorescence.
		5	CLAYSTONE: light grey to light blueish grey, non-calcareous, moderately hard to hard, blocky.
		70	SILTSTONE: as above.
2260	2265	25	SANDSTONE: clear to translucent, medium to dominantly very coarse, moderately well sorted, sub rounded to sub angular, occasionally fractured quartz grains, weak pyrite cement, rare nodular pyrite, loose, clean, fair inferred and visible porosity. No fluorescence.
		20	COAL: dusky brown to brownish black, silty in part grading to CARBONACEOUS SILTSTONE, moderately hard, sub blocky, uneven, woody texture.
		5	CLAYSTONE: as above.



## Bream A1A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2265	2270	40	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		35	SANDSTONE: clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, rare nodular pyrite, loose, clean, fair inferred and visible porosity. No fluorescence.
		15	COAL: as above.
		10	CLAYSTONE: light grey to light blueish grey, non-calcareous, moderately hard to hard, blocky.
		50	SILTSTONE: as above.
		25	SANDSTONE: as above. No fluorescence.
2270	2275	5	CLAYSTONE: as above.
		25	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		70	SANDSTONE: clear to translucent, medium to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, rare nodular pyrite, loose, clean, fair inferred and visible porosity. No fluorescence.
2275	2280		<b>P. asperopolus Coal at 2278.0 mMDRT, 2018.4 mTVDRT (-1985.6 mTVDSS).</b>
		30	COAL: brownish black, earthy, silty in part grading to CARBONACEOUS SILTSTONE, moderately hard, sub blocky, uneven, woody texture, trace quartz inclusions.
		5	CLAYSTONE: light grey to light blueish grey, non-calcareous, moderately hard to hard, blocky.
		10	SILTSTONE: as above.
		55	SANDSTONE: clear to translucent, medium to dominantly very coarse, moderately well sorted, sub rounded to sub angular, weak pyrite cement, rare nodular pyrite, loose, clean, fair to good inferred and visible porosity. No fluorescence.
2280	2285	40	COAL: as above.
		25	CLAYSTONE 1: 20%, very light grey to very pale orange, non-calcareous, soft, amorphous. CLAYSTONE 2: 5%, light grey to light blueish grey, non-calcareous, moderately hard to hard, blocky.
		5	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		30	SANDSTONE: clear to translucent, rare greyish pink, coarse to dominantly very coarse, moderately well sorted, sub rounded to sub angular, weak pyrite cement, rare nodular pyrite, loose, clean, fair to good inferred and visible porosity. No fluorescence.
		Trace	COAL: cavings, as above.
2285	2290	40	CLAYSTONE 1: 35%, as above. CLAYSTONE 2: 5%, as above.
		10	SILTSTONE: as above.
		50	SANDSTONE: as above.
			No fluorescence.

## Bream A1A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2290	2294 <b>TD</b>	35	CLAYSTONE 1: 30%, very light grey to very pale orange, non-calcareous, soft, amorphous. CLAYSTONE 2: 5%, light grey to light blueish grey, non-calcareous, moderately hard to hard, blocky.
		20	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		45	SANDSTONE: clear to translucent, rare very pale orange, medium to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, loose, clean, fair inferred and visible porosity. No fluorescence.
<p><b>BMA A1A reached a TD of 2294.0 mMDRT = 2033.9 mTVDRT (-2001.1 mTVDSS) at 0430 hrs on 07 November 2005.</b></p> <p>CBU. Wiper Trip to shoe.</p> <p>Start circulating at bottom at 1400 hrs on 07 November 2005.</p> <p>Trip gas 30 units at 1500 hrs, 07 November 2005.</p> <p>Last circulation on bottom at 1530 hrs, 07 November 2005. Total circulating time for last circulation on bottom = 1 hrs 30 minutes.</p> <p>Start POOH at 1545 hrs, 07 November 2005 for Reeves Wireline Logging Run #1. Bit on Surface at 01:15 hrs 08 November 2005.</p> <p>At 13:29 hrs, 08 November 2005, start Reeves Logging at Logging speed (0.1 metre/second) from 2291.0 mMDRT to 1990.0 mMDRT.</p> <p>At 14:42 hrs, 08 November 2005, at Tripping speed from 1990.0 mMDRT to 1490.0 mMDRT. Bottom of casing window at 1495.6 mMDRT.</p>			

**APPENDIX 4a**

**BREAM A1A**

**Mud Log**



ROP (m/hr)			DEPTH (m) (TVD)	CUTTINGS	TOTAL GAS & CHROMATOGRAPH DATA							CUT FLUOR	DIRECT FLR	LITHOLOGY DESCRIPTIONS and REMARKS		
WOB (tons)				LITHOLOGY	C1			C2		C3				LITHOLOGY	REMARKS	
MWD Gamma Ray (api)				%	iC4			nC4		iC5						
					nC5					TG						
					Total Gas in Units Chromatograph in Percent											
500	50	5	.5	0	100	.5	5	50	500	5K	good	fair	poor			
50	25	0		0	100	.01	.1	1	10	100						
Window Depth 1495.6 to 1501.8m MDRT Start Milling Window at 03:45 hours on 01-11-2005			1490		Tie in Survey:1500.00mMD (1288.29mTVD) 43.98°inc 264.77°az									PREVIOUS WELL HISTORY Plugged & Abandoned in October, 2005. 13-3/8" Surface Csg 894.0m KB 9-5/8" Intermediate Csg 2338.0m KB 5-1/2" Production Liner 3074.0m KB		
WOB:2:10 TDRPM:0 MMRPM:174 SPP:1800 FLW:600  05-11  MW: 9.9 FV: 63 PV: 18 YP: 28 Gel:7/11 WI: 3.0 pH: 11.35 Cl: 39k			1500		BIT #1RR 8 1/2" Smith S73PX Jets: 6x20 In : 1509.0m MDRT Out : 1523.0m MDRT Run : 14.0m Hrs : 2.0 Cond: 1-6-S-BT-S-X-IN-PN-HP									Top of Bridge Plug (EZSV): 1503.3m MDRT Top of Window at 1495.6m MDRT Bottom of Window at 1501.8m MDRT 8-1/2" Mill from 1495.6m MDRT to 1509.0m MDRT. Rat hole:7.2m		
			1510 (1295.5)	?	?	?	?	?	?	?	?	?	?	?	?	Drilled from 1509.0m MDRT to 1523.0m MDRT without kick-off. Plug back to 1498.5m MDRT. Drill out to 1500.0m MDRT. Obstruction at 1500.0m MDRT. No Go. Mill from 1500.0m MDRT to 1505.0m MDRT
			1520		?	?	?	?	?	?	?	?	?	?	?	CALCREOUS CLAYSTONE:med gy- med dk gy,silty,mod calc,tr dissem pyr,rr foss frag,frm-mod hd, sbbiky-blky.
			1530 (1309.9)		?	?	?	?	?	?	?	?	?	?	?	Bream A1A kick-off at 21:40 hours on 04-11-2005 from 1505.0m MDRT
			1540		?	?	?	?	?	?	?	?	?	?	?	At 1523.0m MDRT 1304.9m TVDRT
					100 / Tr / Tr											

**PIT:669 psi 10.0 ppg EMW:13.0 ppg**

**Drill with KCl/Glycol/PHPA mud system.**

**No H2S or CO2 Detected**

**CALCAREOUS CLAYSTONE:**med gy-  
med dk gy,slty,mod calc,tr dissem  
pyr,rr foss frag,frm-mod hd,  
sbbiky-blky.

**GAS ANALYSIS BY GEOSERVICES  
GP-FID SYSTEM, FGP/FCP GAS  
PANELS. GZ11 DEGASSER IN  
POSSUM BELLY from 1505.0m MDRT**

**CALCAREOUS CLAYSTONE:**med gy-  
med dk gy,slty,mod calc,tr dissem  
pyr,tr foss frag,rr glauc,frm-mod hd,  
sbbiky-blky.

**CALCAREOUS CLAYSTONE:**med lt  
gy-med gy,slty,mod calc,tr dissem  
pyr,rr foss frag,frm-mod hd,  
sbblky-blky.

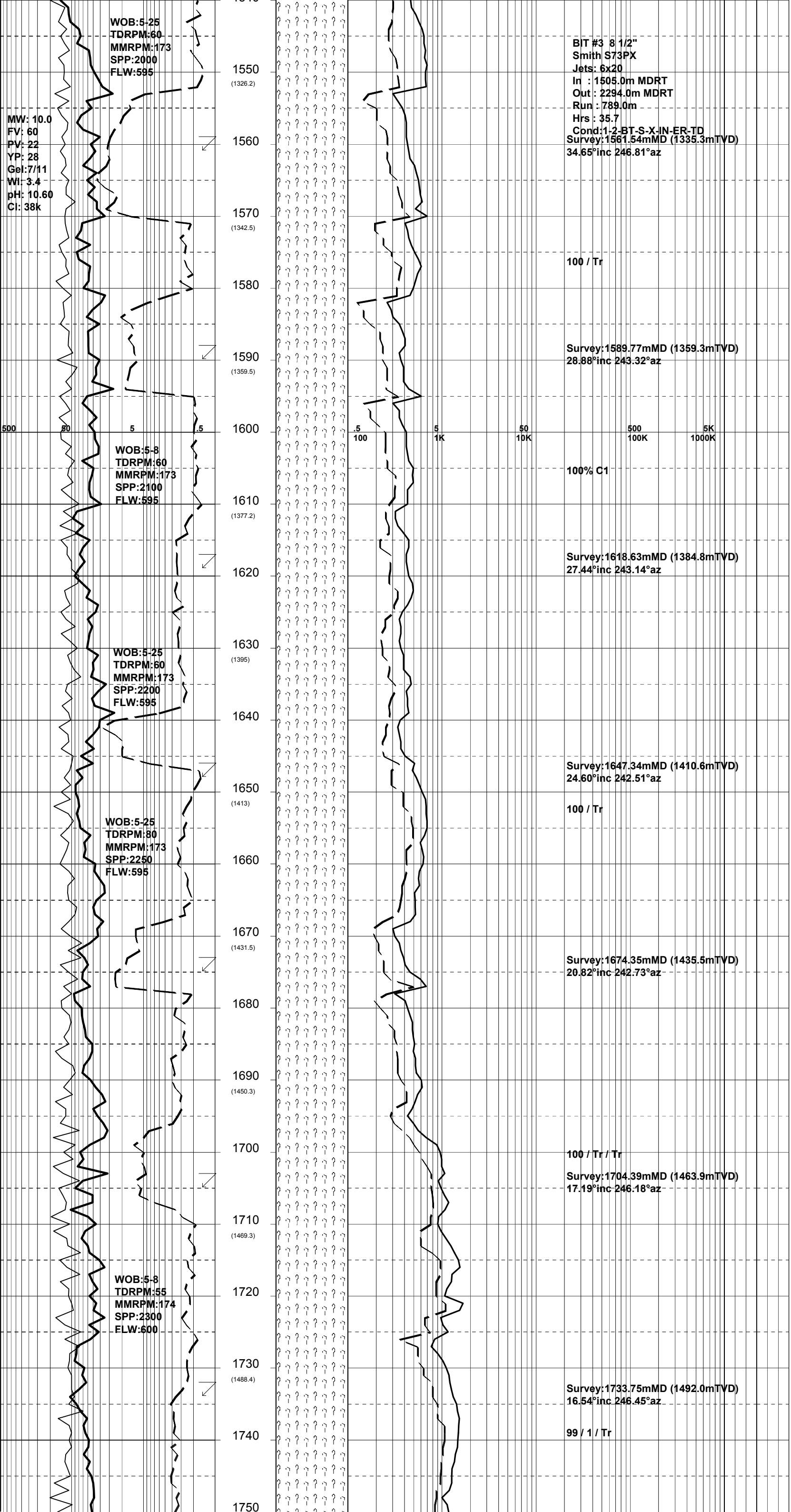
**CALCAREOUS CLAYSTONE:**med lt  
gy-med gy,slty,mod calc,tr dissem  
pyr,rr foss frag,frm-mod hd,  
sbblky-blky.

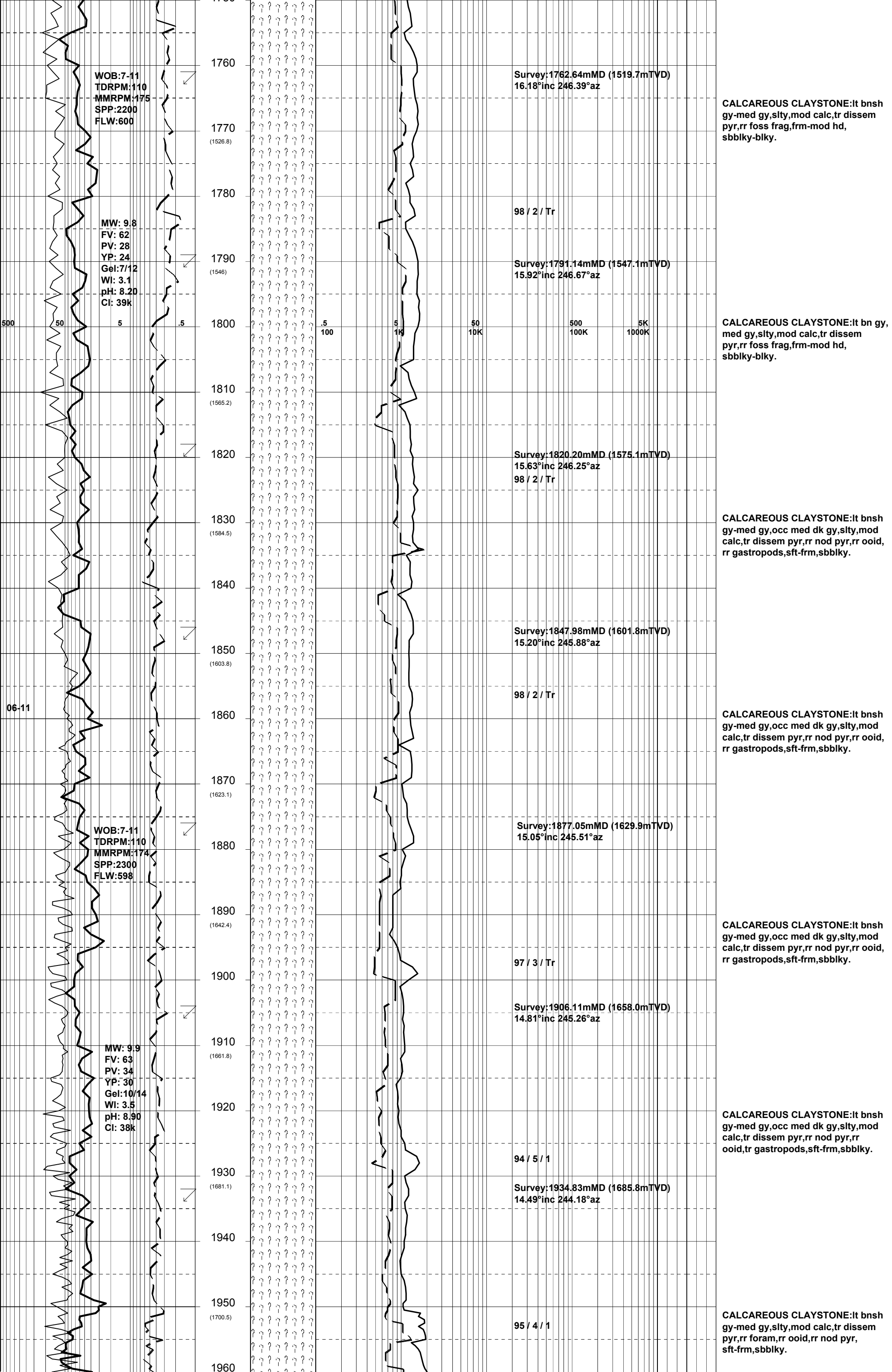
**CALCAREOUS CLAYSTONE:**med lt  
gy-med gy,slty,mod calc,tr dissem  
pyr,rr foss frag,frm-mod hd,  
sbblky-blky.

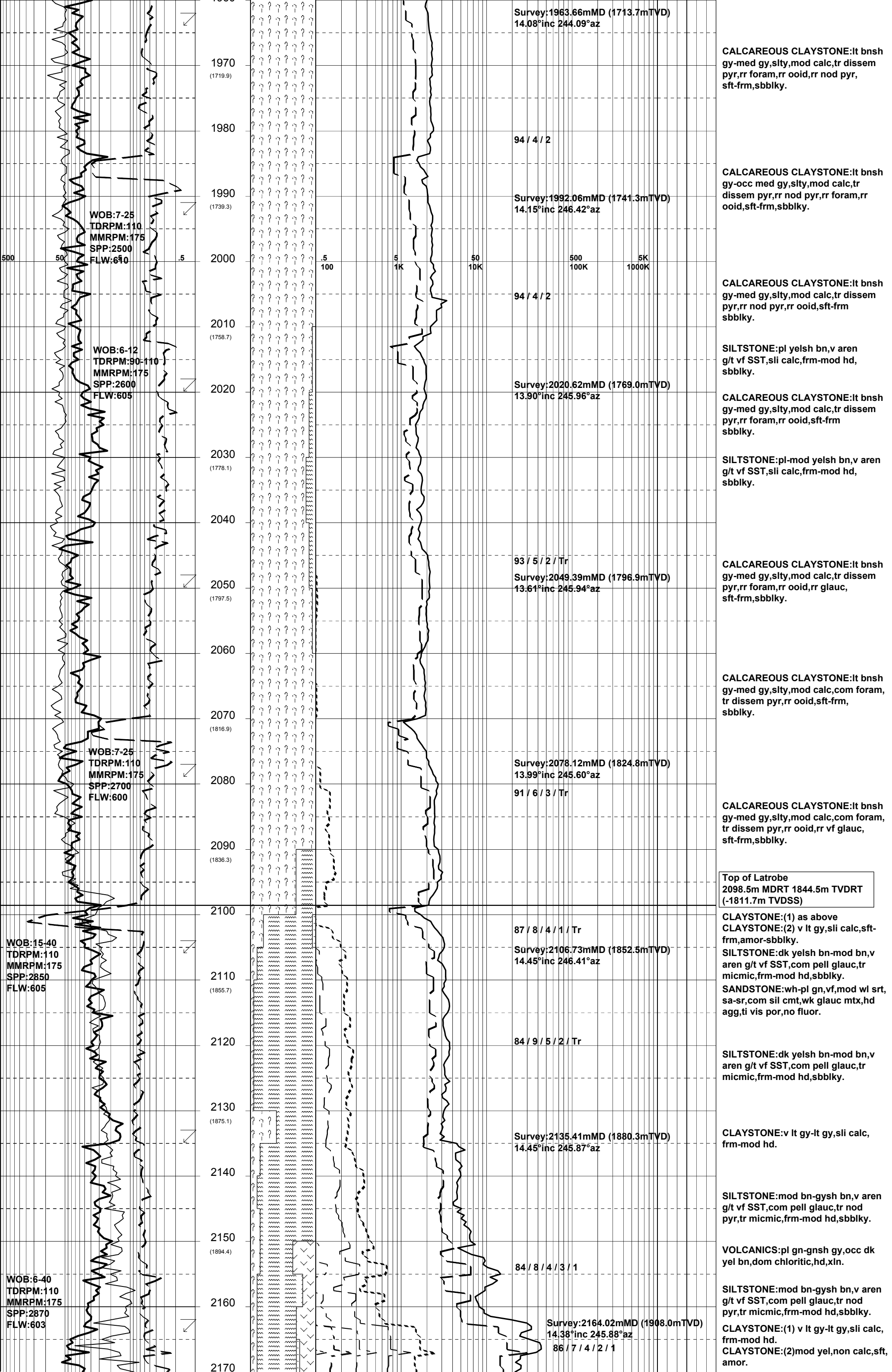
**GAS ANALYSIS BY GEOSERVICES  
GP-FID SYSTEM, FGP/FCP GAS  
PANELS. GZG DEGASSER IN FLOW  
TROUGH FROM 1698.0m MDRT.**

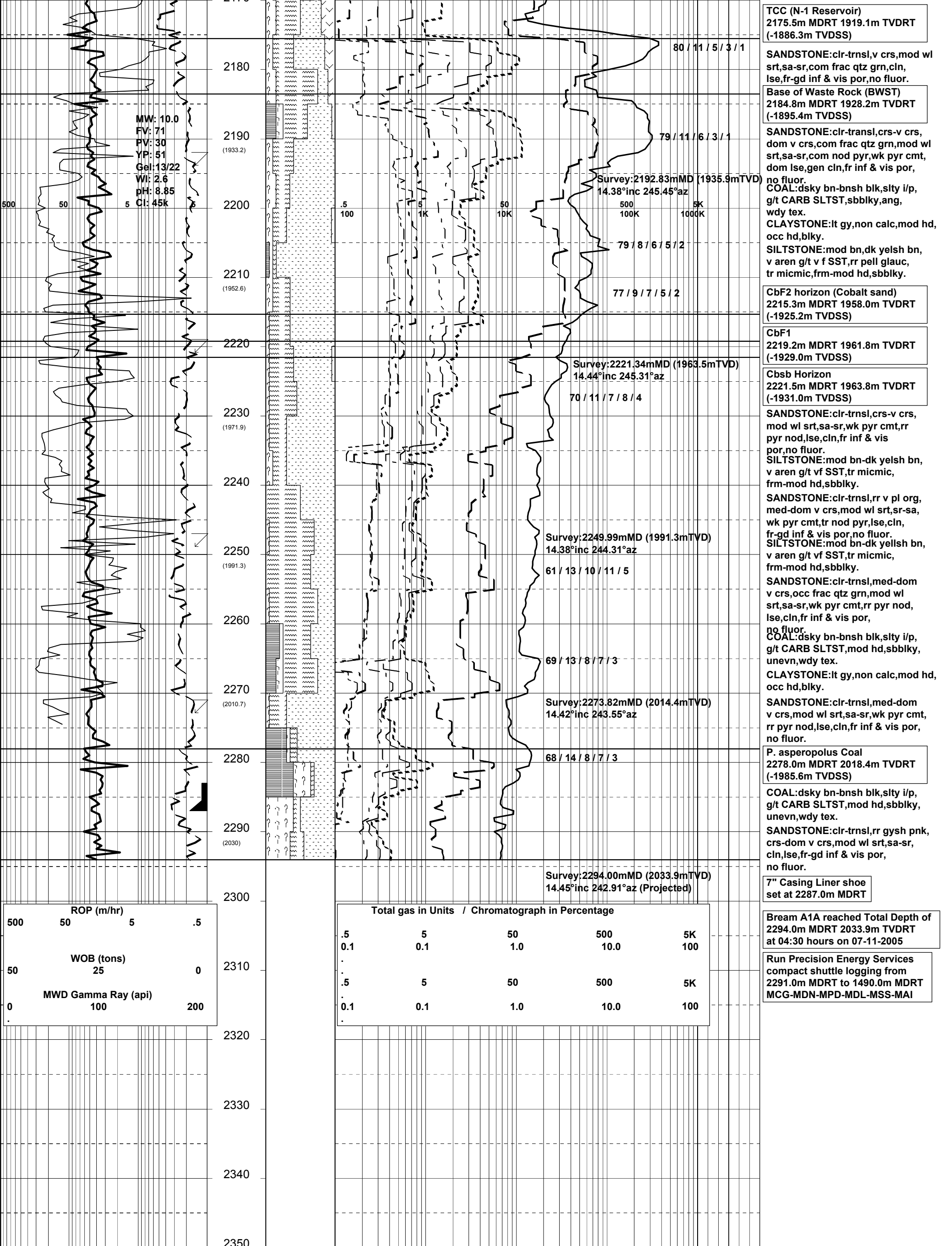
**CALCAREOUS CLAYSTONE:** It bnsh  
gy-med gy,slty,mod calc,tr dissem  
pyr,rr foss frag,frm-mod hd,  
sbbiky-blky.

**CALCAREOUS CLAYSTONE:**lt bnsh  
gy-med gy,slty,mod calc,tr dissem  
pyr,rr foss frag,frm-mod hd,  
sbbiky-blky.











**APPENDIX 4b**

**BREAM A1A**

**Well Completion Log**

WELL COMPLETION LOG

Scale – 1:200

BREAM A-1A

Gippsland Basin, Victoria

Concession: VIC/L13

POST-DRILL  
LOCATION:  
*Top of Latrobe*

Latitude: 38° 30' 3.447" S  
Longitude: 147° 45' 44.279" E  
MGA X: 566470.49 mE  
MGA Y: 5738325.04 mN  
Depth: 2098.5m MDRT  
1844.6 m TVDRT  
(-1811.8mTVDSS)

ELEVATION:

G.L.: -59.40 m  
R.T.: 32.82 m  
Water Depth: 59.40 m

DATES:

Spudded: 04/11/2005  
Rig Released: 13/11/2005  
I.P. Established: 13/01/2005  
(Initial production)

SERVICE COMPANIES:

DRILLING CONTRACTOR: International Sea Drilling Limited (Nabors Rig 453)  
MWD/DIRECT. DRLG: Schlumberger Anadrill  
GYRO SURVEYING: SDI  
CORING: n/a  
PIPE CONVEYED: Precision(Reeves Compact Shuttle Logging  
LOGGING: System)  
CEMENTING: Halliburton  
CASING: Weatherford

COMPILED BY:

Sheryl Sazenis

DRAFTED BY:

Arnaldo Ribeiro

DRILLED BY:

Nabors Rig 453

Datum:

GDA94 (GRS80)

Projection:

MGA/ UTM Zone 55 (S)

TOTAL DEPTH:

2294.0 mMDRT / 2033.9 mTVDRT

PLUGGED BACK T.D.:

2260.0m MDRT

CLASSIFICATION:

Development

STATUS:

Cased and Completed

PRODUCTION TESTING:

n/a

DIVERS:

n/a

MUD LOGGING:

Geoservices Overseas S.A.

PRESSURE RECORDING:

n/a

WELL VELOCITY SURVEY:

n/a

MUD ENGINEERING:

Halliburton- Baroid

LINER:

n/a

LEGEND

2.7m NOS  
Ø = 17%  
Sw = 32%

No Rec.  
CORE  
Rec.

PERFORATED  
INTERVAL

PLUG

←SST RECOVERED SIDE WALL CORE LITHOLOGY  
SST - Sandstone CLST - Claystone  
SLST - Siltstone LMST - Limestone  
MST - Mudstone ML - Marl  
SH - Shale COAL - Coal

← SIDE WALL CORE - NO RECOVERY

← FIT

←P2/11 MDT/RFT PRETEST RUN/SEAT NUMBER

←S11/2 MDT/RFT SAMPLE RUN/SAMPLE NUMBER

←P2/40 MDT VERTICAL/HORIZONTAL  
PERMEABILITY TEST

PACKER

BRIDGE PLUG

LOG ANALYSIS DATA

NS - Net Sand  
NOS - Net Oil Sand  
NGS - Net Gas Sand  
Sw - Water Saturation

MUD DATA

Ø - Porosity  
Snd - Sand  
MW - Mud Weight  
FV - Funnel Velocity  
PV - Plastic Velocity  
YP - Yield Point  
Gel - Gel Strength  
pH - Acidity/Alkalinity  
WL - Water Loss  
Cl - Chloride  
Ca - Calcium  
Sol - Solids  
H2O - Water  
Oil -Oil

SHOW OR STAIN

HYDROCARBON CUT

FLUORESCENCE

GAS SHOW

OIL PRODUCTIVE

GAS PRODUCTIVE

INTERPRETED OIL PRODUCTION

INTERPRETED GAS PRODUCTION

INTERPRETED WATER PRODUCTION

WATER PRODUCTIVE

CONDENSATE PRODUCTION

INTEPRETED CONDENSATE BEARING

DSTG DST WITH GAS RECOVERED

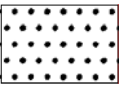
DSTO DST WITH OIL RECOVERED

SURVEY POINT

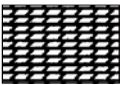
13-3/8" CASING SHOE

MUD

LITHOLOGICAL SYMBOLS



Sandstone




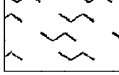



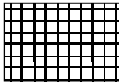

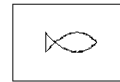
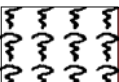

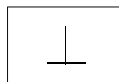
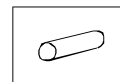
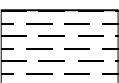

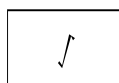



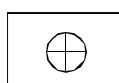
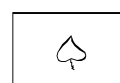
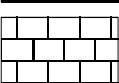
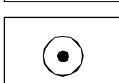
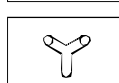
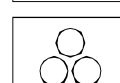
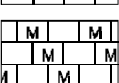

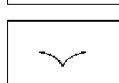

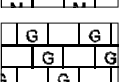


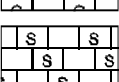
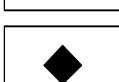
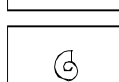
Dolomite



Mica



Pelecypods

	Siltstone		Marl		Chert		Echinoids
	Mudstone		Anhydrite		Carbonaceous Matter		Fish Remains
	Claystone		Volcanics		Calcareous		Plant Remains
	Shale		Basement		Glaucconite		Spores
	Coal		Granule		Corals		Leaves
	Limestone		Oolites		Bryozoans		Foram
	Micritic Limestone		Dolomite		Brachiopods		Fossils
	Grain Limestone				Gastropods		
	Skeletal Limestone		Pyrite		Cephalopods		

LOGGING AND SURVEYING			
Anadrill Schlumberger	Interval (mMDRT)	Reeves	Interval (mMDRT)
MWD (Directional & GR) – 5 Runs	1496.0 mMDRT - 2294.0 mMDRT	MCG-MDN-MPD-MSS-MDL – 1 Run	2291.0 mMDRT- 1490.0 mMDRT

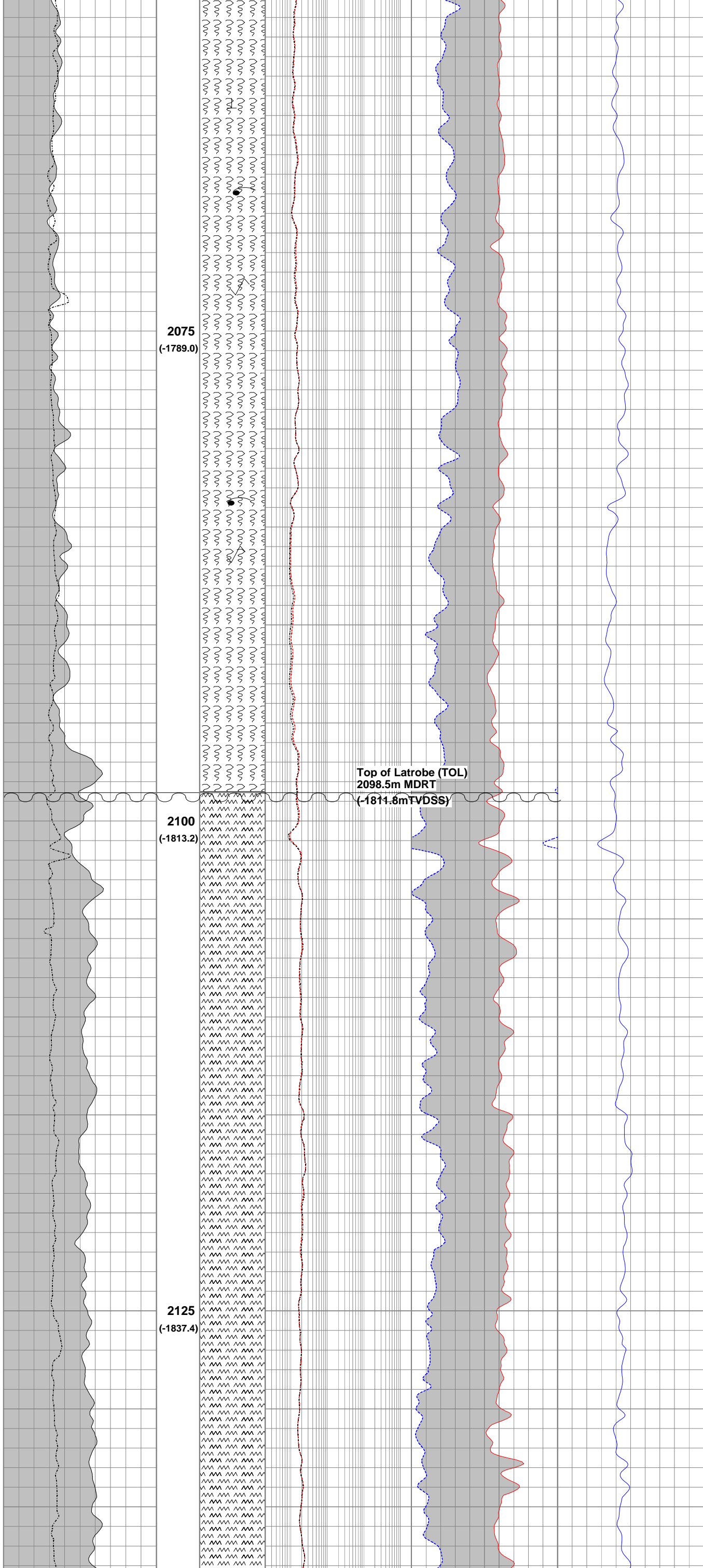
WELL DATA				
Date	31 October 2005- 31 October 2005	31 October 2005- 31 October 2005	02 November 2005- 02 November 2005	03 November 2005- 04 November 2005
Run	MWD # 1	MWD # 2	MWD # 3	MWD # 4
Log	Powerpulse Directional & GR	Powerpulse Directional & GR	Powerpulse Directional & GR	Powerpulse Directional & GR
Depth Driller	1496.0 mMDRT	1496.0 mMDRT	1523.0 mMDRT	1500.0 mMDRT
Depth Logger	1496.0 mMDRT	1496.0 mMDRT	1523.0 mMDRT	1500.0 mMDRT
Bottom Log Interval	1496.0 mMDRT	1496.0 mMDRT	1523.0 mMDRT	1500.0 mMDRT
Top Log Interval	1496.0 mMDRT	1496.0 mMDRT	1509.0 mMDRT	1500.0 mMDRT
Casing Driller	1495.6 mMDRT	1495.6 mMDRT	1495.6 mMDRT	1495.6 mMDRT
Casing Logger	1495.6 mMDRT	1495.6 mMDRT	1495.6 mMDRT	1495.6 mMDRT
Casing Size	9 .625"	9 .625"	9 .625"	9 .625"
Casing Weight	43.5 ppf	43.5 ppf	43.5 ppf	43.5 ppf
Bit Size	8.5"	8.5"	8.5"	8.5"
Type of Fluid in Hole	KCI/PHPA/GLYCOL	KCI/PHPA/GLYCOL	KCI/PHPA/GLYCOL	KCI/PHPA/GLYCOL
Density	8.65 ppg	8.65 ppg	9.80 ppg	9.80 ppg
Rm @ Measured Temp.	N/A	N/A	N/A	N/A
Rmf @ Measured Temp.	N/A	N/A	N/A	N/A
Rmc @ Measured Temp.	N/A	N/A	N/A	N/A
Max. Recorded Temp.	54.9°C	53.3°C	46.3°C	43.0°C
Equipment / Location	Sale	Sale	Sale	Sale
Recorded By	R.Borjas / R.Burns	R.Borjas / R.Burns	R.Borjas / R.Burns	J.Dolan / R.Burns
Witnessed By	Trevor Lobo	Trevor Lobo	Trevor Lobo	Trevor Lobo

WELL DATA				
Date	04 November 2005- 07 November 2005	08 November 2005- 08 November 2005		
Run	MWD # 5	Wireline Run #1 on shuttle		
Log	Powerpulse Directional & GR	MCG-MDN-MPD-MSS-MDL		
Depth Driller	2294.0 mMDRT	2294.0 mMDRT		
Depth Logger	2294.0 mMDRT	2294.0 mMDRT		
Bottom Log Interval	2294.0 mMDRT	2291.0 mMDRT		
Top Log Interval	1500.0 mMDRT	1490.0 mMDRT		
Casing Driller	1495.6 mMDRT	1495.6 mMDRT		
Casing Logger	1495.6 mMDRT	1495.6 mMDRT		
Casing Size	9 .625"	9 .625"		
Casing Weight	43.5 ppf	43.5 ppf		
Bit Size	8.5"	8.5"		
Type of Fluid in Hole	KCI/PHPA/GLYCOL	KCI/PHPA/GLYCOL		
Density	10.00 ppg	10.10 ppg		
Rm @ Measured Temp.	N/A	0.113		
Rmf @ Measured Temp.	N/A	0.088		
Rmc @ Measured Temp.	N/A	0.168		
Max. Recorded Temp.	72.94°C	82.0°C		
Equipment / Location	Sale	Sale		
Recorded By	J.Dolan / R.Burns	R.Tench / B.Moss		
Witnessed By	Trevor Lobo	Trevor Lobo		

CORES			PERFORATIONS		
From (mMDRT)	To (mMDRT)	Rec %	From (mMDRT)	To (mMDRT)	Gun Type
			2194.5	2196	MaxR

CASING	PLUGS
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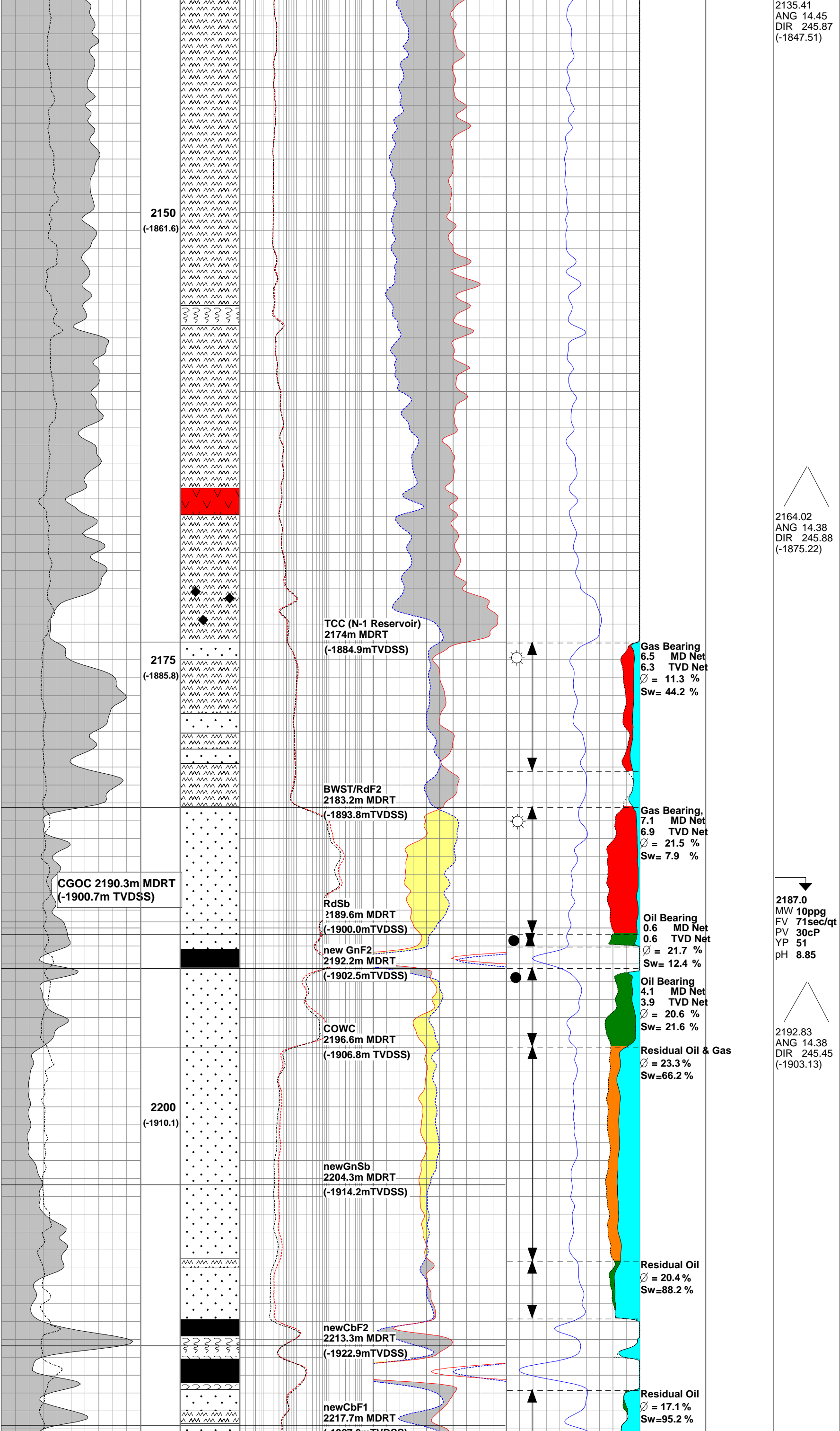




2078.12  
ANG 13.99  
DIR 245.60  
(-1792.01)

2106.73  
ANG 14.45  
DIR 246.41  
(-1819.74)

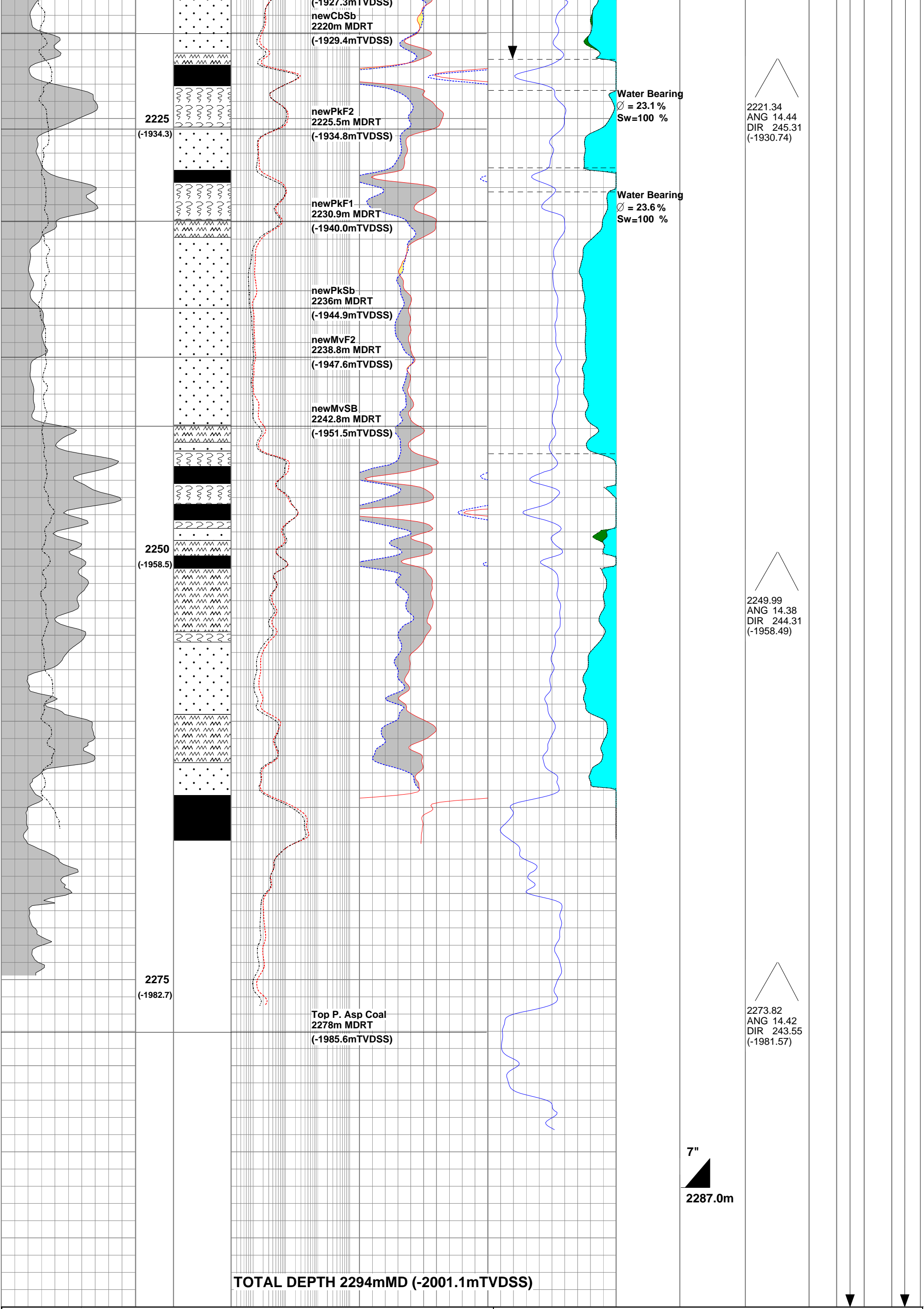




LATROBE GROUP

OLIGOCENE - MIOCENE





GRGC  
CLDC  
DSLL  
DGLI

Gamma Ray  
Density Caliper  
Shallow Laterolog  
Groningen Deep Laterolog

DGLL	Groningen Deep Latency	Bream ATA
DEN	Compensated Density	Initial Production Date: 13/01/2006
NPRL	Limestone Neutron Porosity	Production Zone N-1
DT35	Compensated Sonic	Initial Total Liquid Rate 318 kL/day, 70%watercut
PIGN	Effective Porosity	
VUWA	Bulk Volume Water	