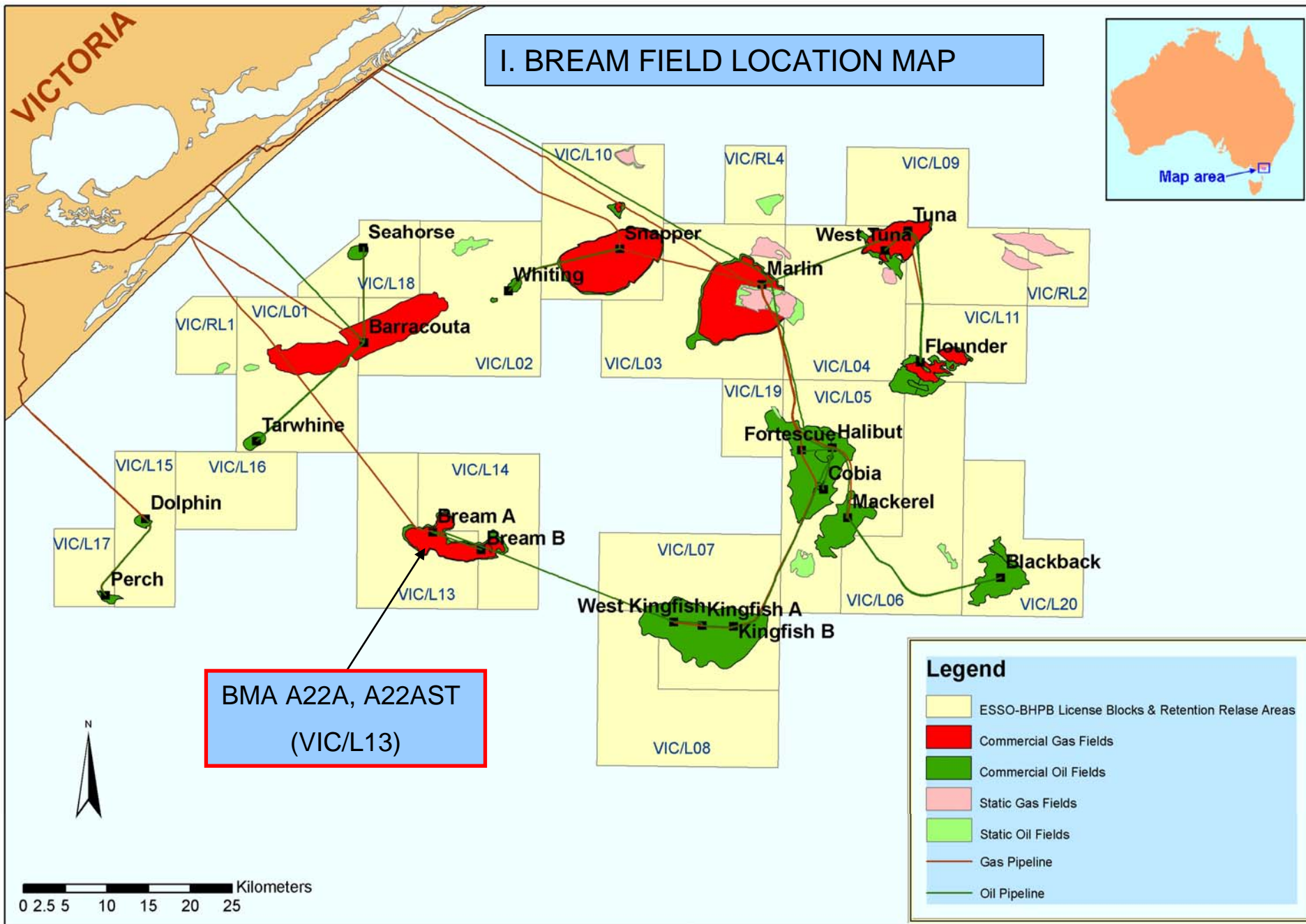


**WELL COMPLETION REPORT**  
**BREAM A22A & A22AST**  
**GIPPSLAND BASIN, VICTORIA**

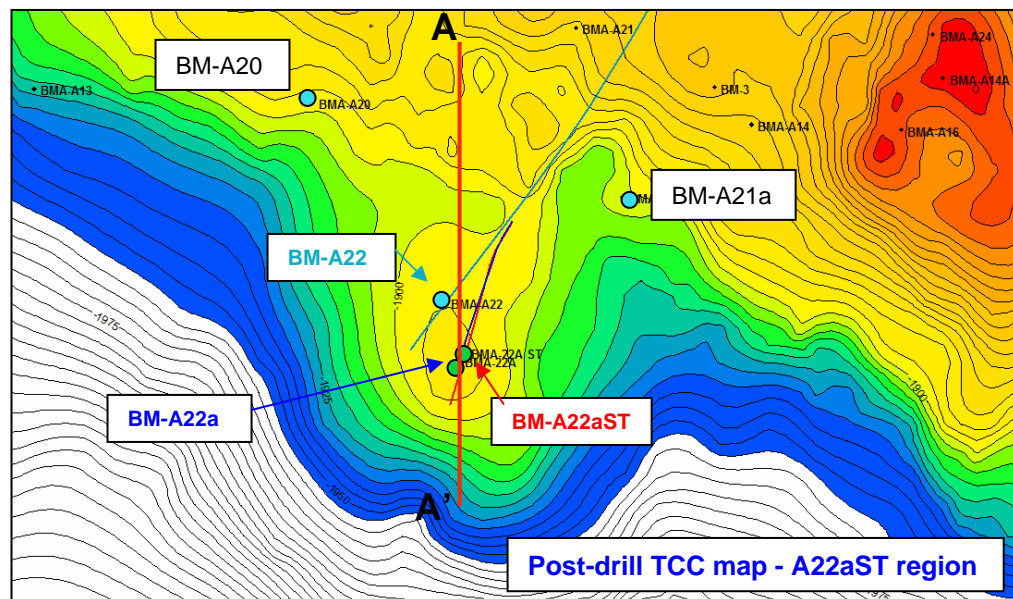
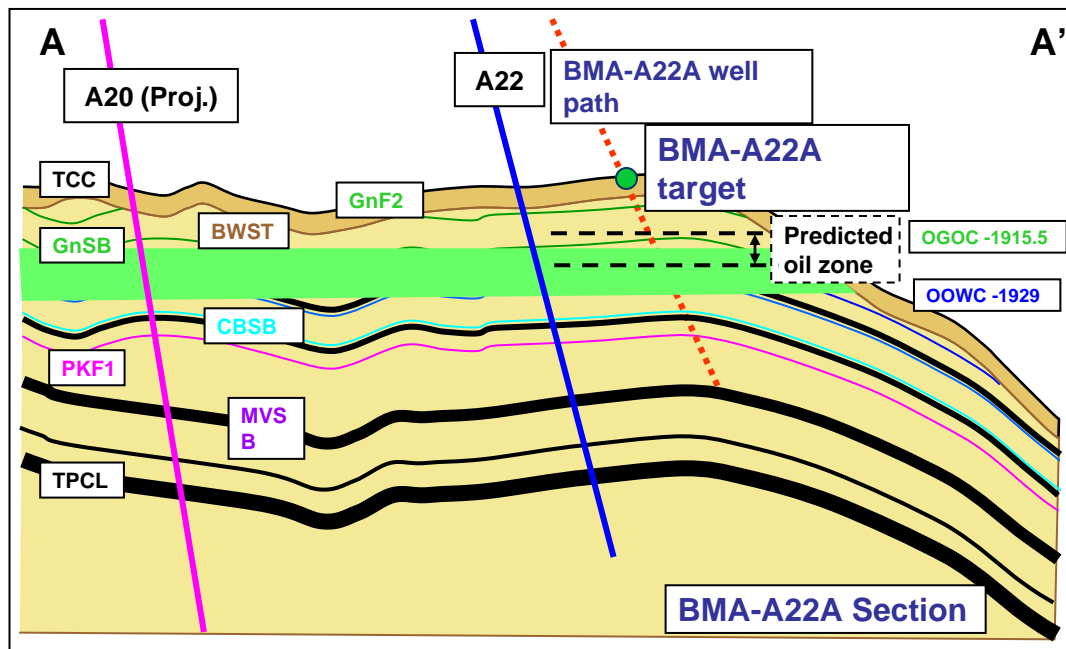
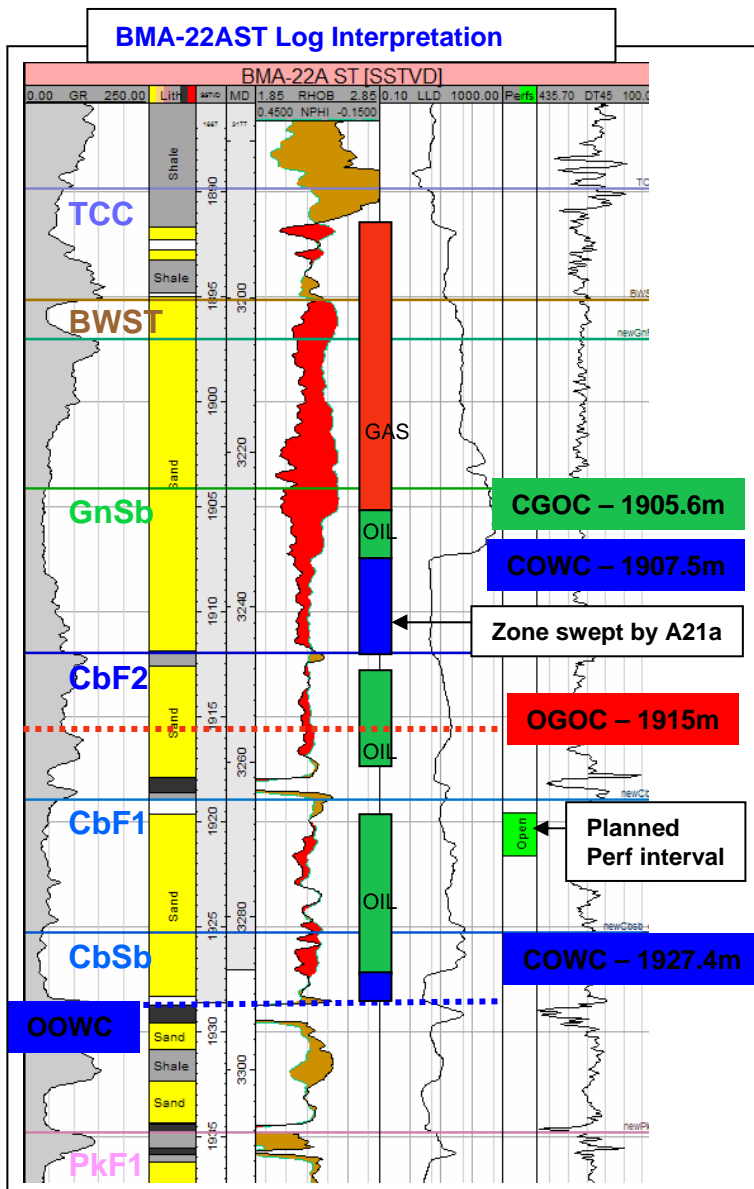
Author: Peter Ryan  
Compiler: Sheryl Sazenis  
March 2006

# CONTENTS

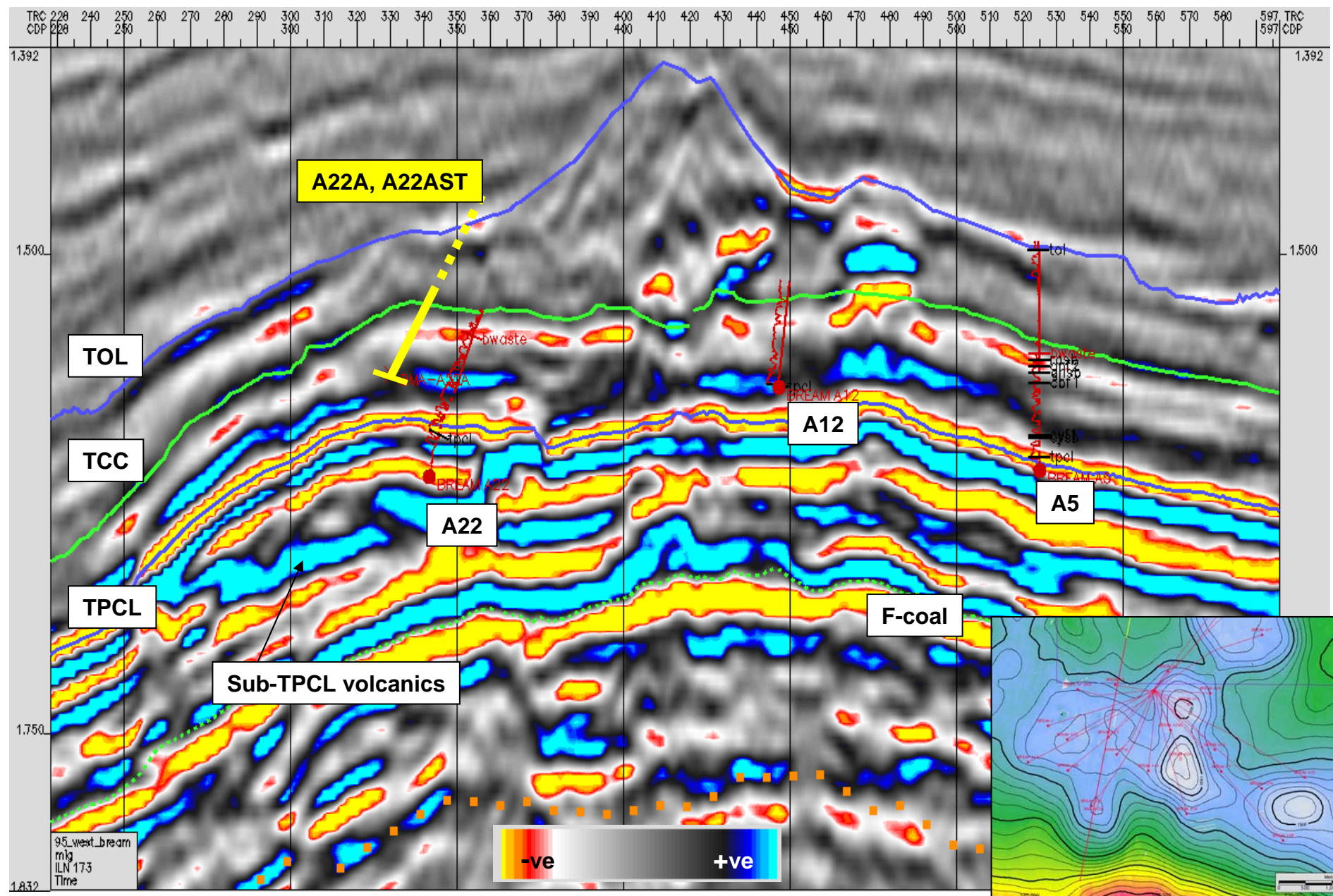
<b>BREAM A22A &amp; A22AST WELL COMPLETION REPORT</b>	<b>1</b>
<b>I. BREAM FIELD LOCATION MAP</b>	<b>1</b>
<b>II. WELL DATA RECORD: BREAM A22AST SUMMARY LOG, MAP &amp; SECTION</b>	<b>2</b>
<b>II. WELL DATA RECORD: BREAM A22AST SEISMIC PROFILE ALONG WELLPATH</b>	<b>3</b>
<b>LOCATION</b>	<b>4</b>
<b>ELEVATIONS &amp; DEPTHS</b>	<b>4</b>
<b>MISCELLANEOUS</b>	<b>4</b>
<b>WELL CLASSIFICATION</b>	<b>4</b>
<b>CASING RECORD</b>	<b>5</b>
<b>CEMENTING RECORD</b>	<b>5</b>
<b>DRILLING PERFORMANCE</b>	<b>6</b>
<i>GENERAL</i>	<b>6</b>
<i>TIME ANALYSIS</i>	<b>6</b>
<i>COSTS (based on projected)</i>	<b>6</b>
<i>CASING (all depths herein are based on Rig 453 elevations: RT-MSL=32.82m)</i>	<b>6</b>
<i>COMPLETION</i>	<b>6</b>
<i>ADDITIONAL</i>	<b>6</b>
<b>COMPLETION SCHEMATIC</b>	<b>7</b>
<b>III. SAMPLES</b>	<b>8</b>
<b>CUTTINGS-BREAM A22AST</b>	<b>8</b>
<b>CONVENTIONAL CORING</b>	<b>9</b>
<b>SIDEWALL CORING</b>	<b>9</b>
<b>IV. LOGS AND SURVEYS</b>	<b>9</b>
<b>V. FORMATION RESERVOIR TOPS - BREAM A22AST</b>	<b>10</b>
<b>VI. GEOLOGICAL ANALYSIS - BREAM A22A &amp; A22AST</b>	<b>11</b>
<b>VII. APPENDICES</b>	
1. Survey Data & Listing	
1a. Survey Data- BMA A22A	
1b. Survey Data- BMA A22AST	
1c. MD-TVD Survey Data Listing- BMA A22A	
1d. MD-TVD Survey Data Listing- BMA A22AST	
2. Petrophysics	
2a. Petrophysics Evaluation Summary	
3. Sample Descriptions	
3a. Lithology/Show Descriptions- BMA A22A	
3b. Lithology/Show Descriptions- BMA A22AST	
4. Logs	
4a. Mud Log- BMA A22A	
4b. Mud Log- BMA A22AST	
4c. Well Completion Log- BMA A22AST	



## II. WELL DATA RECORD: BREAM A22AST Summary Log, Map & N-1 section



## II. WELL DATA RECORD: BREAM A22AST Seismic Profile along well path





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

### LOCATION

<b>Field</b>	<b>Bream</b>	<b>Conductor #22 Surface Coordinates</b>	
<b>Well Name</b>	<b>A22A (Loc H)</b>	(GDA94 ) X	567342.5m E
<b>Conductor Number</b>	Slot 22	(MGA94) Y	5738457.6m N
<b>State</b>	Victoria	Latitude	38° 29' 58.910" S
<b>Permit/Licence</b>	Vic/L13	Longitude	147° 46' 20.233" E
<b>Geological Basin</b>	Gippsland	<b>Perforations (driller)</b>	None- Well plugged back and sidetracked
<b>Top of Latrobe</b>	2965.0 m MDRT	<b>(A22A)</b>	3266.8 – 3271.5m MDRT
<b>A22AST</b>	1839.0m TVDRT	<b>(A22AST)</b>	1952.5 – 1954.2m TVDRT
	-1806.2m TVDSS	<b>Datum</b>	GDA94 (GRS80)
MGA94 X	566399.4m E	<b>Projection</b>	Transverse Mercator
MGA94 Y	5736525.4m N		MGA94/UTM Zone 55 (S)
Latitude	38° 31' 1.848" S		
Longitude	147° 45' 41.918 E		

### ELEVATIONS & DEPTHS

<b>Water Depth</b>	59.43 m
<b>Top Wellhead to MSL</b>	27.71m
<b>Main Deck Rel to MSL</b>	25.12 m
<b>RT Relative to MSL</b>	32.82 m
<b>Average Well Angle</b>	67.6 deg (Tan)
<b>Total Depth</b>	3249.0 m MDRT
<b>(A22A)</b>	1937.9 m TVDRT
	-1905.1m TVDSS
<b>Total Depth</b>	3364.0m MDRT
<b>(A22AST)</b>	1987.3m TVDRT
	-1954.5m TVDSS
<b>Plug Back Depth</b>	3335.0m MDRT
<b>(A22AST)</b>	

### DATES

<b>Skid Rig</b>	31/08/2005
<b>Kicked Off</b>	03/09/2005
<b>Sidetracked A22A</b>	15/09/2005
<b>Development Rig Days</b>	30.8
<b>NPT Days</b>	12.7
<b>Rig Released A22AST</b>	01/10/2005
<b>I.P. Established</b>	08/10/2005

### 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>	L0501F462		

### 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 A22 Surface	10 <sup>3</sup> / <sub>4</sub>	40.5	K-55	BTC	1346.0
Whipstock	7	26	N80/K55	LTC	2702.0
Liner (A22AST)	4 ½	12.6	L-80	Vam Ace	2561.0- 3363.0

### 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)
4½" 29 lb/ft	ABC HTB	200	HALAD 413L 30 gal / 10 bbl NF-6 0.25 gal / 10 bbl  CFR-3L 3 gal / 10 bbl  SCR-100L 0.5 gal / 10 bbl	22.7	40.3	15.8	3363.0 to 2561.0	2500 for 15 minutes

## II. WELL DATA RECORD (cont.)

### DRILLING PERFORMANCE

#### BMA A22A - Final Well Report

##### GENERAL

<b>Platform:</b>	Bream A	<b>Rig:</b>	453	<b>Reservoir:</b>	N-1 (TCC) Sands
<b>Well:</b>	A22A/A22A ST	<b>Well Slot:</b>	#22	<b>RT-MSL (Rig453)</b>	32.82m
<b>Drilling Complexity Index</b>	3.1	<b>Completion Complexity Index</b>	NA		

DEPTH		PERFORMANCE		MUD	
m MDRT	3,249.00	20" Cond. Hole	N/A	Max Wt (ppg)	10.2
m TVDRT	1,937.94	12-1/4" Surf. Hole	N/A	Type (Surf. Hole)	N/A
Vert. Section (m)	2,416.45	8-1/2" Prod. Hole	N/A	Type (Inter. Hole)	N/A
INCLINATION		6" Liner Hole	77 m/day	Type (Prod. Hole)	N/A
Max (deg) / Ave (deg)	69.5 / 67.6 (Tang)	* time to drill interval, incl's Connections & NPT.		Type (Liner Hole)	KCl/PHPA/Poly/Glycol

Comments: New hole drilled: 2,702m to 3,249mMDRT (547m drilled).

##### SIDETRACK WELL

DEPTH		PERFORMANCE		MUD	
m MDRT	3,364.00	20" Cond. Hole	N/A	Max Wt (ppg)	10.2
m TVDRT	1,987.33	12-1/4" Surf. Hole	N/A	Type (Surf. Hole)	N/A
Vert. Section (m)	2,516.07	8-1/2" Prod. Hole	N/A	Type (Inter. Hole)	N/A
INCLINATION		6" Liner Hole	212 m/day	Type (Prod. Hole)	N/A
Max (deg) / Ave (deg)	69.5 / 68.2 (Tang)	* time to drill interval, incl's Connections & NPT.		Type (Liner Hole)	KCl/PHPA/Poly/Glycol

Comments: New sidetrack hole drilled: 2,702m to 3,364mMDRT (662m drilled).

##### TIME ANALYSIS

<b>Start Date:</b>	31/08/2005, 1700hrs	<b>Finish Date:</b>	01/10/2005, 1100hrs		
<b>Target Days (P10):</b>	17.1	<b>Total Days:</b>	30.8	<b>% Under Target:</b>	180% (over)
<b>AFE Days (P50):</b>	20.1	<b>NPT Days:</b>	12.7	<b>% of Total Days:</b>	41.2%
<b>Supplementary AFE Days (P50):</b>	N/A				

##### COSTS (based on projected)

AFE No.:	L0501F462	Revisions:	--	\$ per m	A \$5.40k / metre (new hole)	
\$ per day:	A\$ 211k/day	\$ per day (excl. T + L) * Equipment, LWD & Reeves	A\$ 175 k/day		A\$ 1.94 k / metre* * based on TD not new hole	
	Equipment	Materials	Contracts	Allocations	Contingency	Total
AFE (Original)	615,000	584,000	2,992,740	351,600	179,000	A\$4,722,340
AFE (Supplement)	615,000	1,627,400	5,071,160	676,440	360,000	A\$8,350,000
Projected	400,000	1,270,000	3,836,000	700,000	308,000	A\$6,514,000

##### CASING (all depths herein are based on Rig 453 elevations: RT-MSL=32.82m)

	<u>Size / Weight / Grade / Thread</u>	<b>m MDRT</b>	<b>m TVDRT</b>	<b>PIT (ppg)</b>
<b>Conductor Casing *</b>	22"	169	169	N/A
<b>Surface Casing *</b>	10-3/4", 40.5ppf, K55, BTC	1,346	959	N/A
<b>Intermediate Casing</b>	N/A	N/A	N/A	N/A
<b>Prod Casing *</b>	7", 26.0ppf, N80/K55, LTC	2,702	1,719	13.0
<b>Prod Liner</b>	4-1/2", 12.6ppf, L80, Vam Ace Top of Liner	3,363 2,561	1,987 1,643	N/A

Comments: \* Pre-existing casing strings.

##### COMPLETION

	<u>Size / Weight / Grade / Thread</u>	<b>MMDRT</b>	<b>MTVDRT</b>	<b>Type</b>
<b>Completion</b>	3-1/2", 9.2 ppf, 13Cr80, Vam Ace	2,561	1,643	Single oil

	<b>Upper Interval [m MDRT]</b>	<b>Upper Interval [m TVDRT]</b>	<b>Lower Interval [mMDRT]</b>	<b>Lower Interval [mTVDRT]</b>	<b>Gun Type</b>
<b>Perforation Interval:</b>	3,266.8-3,271.5	1952.5 – 1954.2m	NA	NA	Wireline 2-7/8" HSD guns

Comments: Completion was 3-1/2" 13Cr80 with TR-SSSV and 2 SPM's for gas lift and one packer.

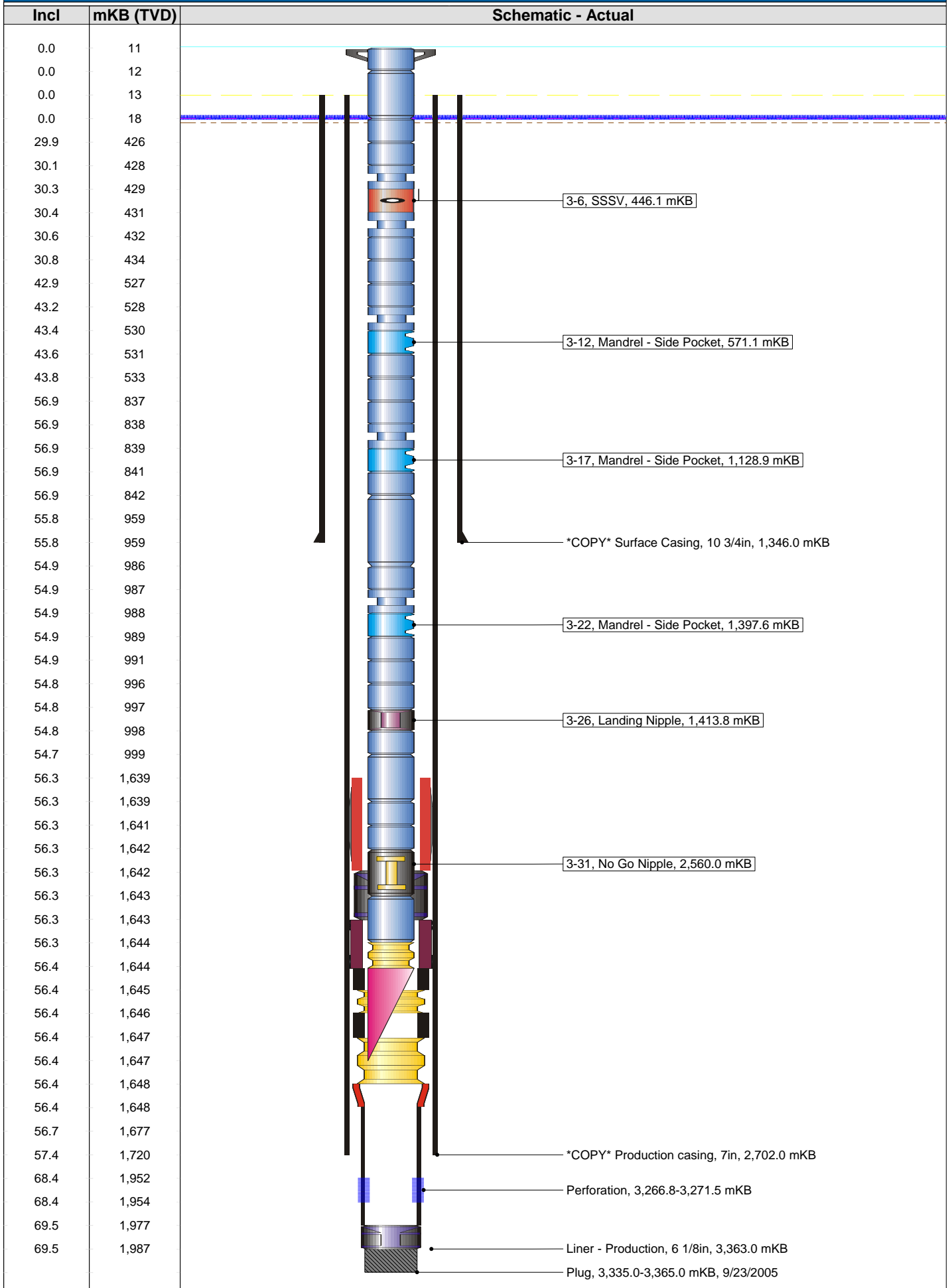
##### ADDITIONAL

		<b>Upper Interval [m MDRT]</b>	<b>Lower Interval [m MDRT]</b>
<b>Logs Run</b>	GR-Resistivity-Density-Neutron-Sonic-Caliper	N/A	N.A
<b>Logs Run (Sidetrack)</b>	GR-Resistivity-Density-Neutron-Sonic-Caliper	2,680	3,361

Comments: The 6" hole interval was logged using the Reeves well shuttle system.



# Bream A22Ast1: Existing Schematic



### III. SAMPLES

The cuttings sampling programme for BREAM A22A are detailed in the following table:

Interval	Formation	Sampling Details
<b>KOP</b> to 150 m above Top of Latrobe (prognosed at 2981.2mMDRT)  2700.0 – 2820.0 mMDRT	Lakes Entrance	Cuttings samples for description only at 30 m intervals.
150 m above Top of Latrobe to Top of Latrobe (prognosed at 2981.2mMDRT)  2820.0 – 2980.0 mMDRT	Latrobe Group	Three sets of washed and oven dried cuttings at 10 m intervals.
Top of Latrobe (prognosed at 2981.2mMDRT) to <b>Total Depth (TD)</b>  2980.0 – 3249.0 mMDRT	Latrobe Group / Coarse Clastics	Three sets of washed and oven dried cuttings at 5 m intervals.

Detailed cuttings descriptions for the interval 2700.0 to 3249.0mMDRT (TD) are contained in Appendix 3a.

#### CUTTINGS-BREAM A22AST

The cuttings sampling programme for BREAM A22A ST are detailed in the following table:

Interval	Formation	Sampling Details
<b>KOP</b> to 150 m above Top of Latrobe (prognosed at 2983.6mMDRT)  2700.0 – 2820.0 mMDRT	Lakes Entrance	Cuttings samples for description only at 30 m intervals.
150 m above Top of Latrobe to Top of Latrobe (prognosed at 2983.6mMDRT)  2830.0 – 2980.0 mMDRT	Latrobe Group	Three sets of washed and oven dried cuttings at 10 m intervals.
Top of Latrobe (prognosed at 2983.6mMDRT) to <b>Total Depth (TD)</b>  2980.0 – 3364.0 mMDRT	Latrobe Group / Coarse Clastics	Three sets of washed and oven dried cuttings at 5 m intervals.

Detailed cuttings descriptions for the interval 2700.0 to 3364.0 mMDRT (TD) are contained in Appendix 3b.

### III. SAMPLES (cont'd)

#### CONVENTIONAL CORING

No conventional cores were cut in BREAM A22A & A22AST.

#### SIDEWALL CORING

No sidewall core samples were shot in BREAM A22A & A22AST.

### IV. LOGS AND SURVEYS

#### BREAM A22A

Survey/Log	Company	Top (m MDRT)	Bottom (m MDRT)
MWD Run 1, Powerpulse (Directional & GR)	Schlumberger/Anadrill	2698.0	2709.0
MWD Run 2, Powerpulse (Directional & GR)	Schlumberger/Anadrill	2709.0	2715.0
MWD Run 3, Powerpulse (Directional & GR)	Schlumberger/Anadrill	2715.0	3104.0
MWD Run 4, Powerpulse (Directional & GR)	Schlumberger/Anadrill	3104.0	3249.0

#### BREAM A22AST

Survey/Log	Company	Top (m MDRT)	Bottom (m MDRT)
MWD Run 1, Powerpulse (Directional & GR)	Schlumberger/Anadrill	2702.0	2717.0
MWD Run 2, Powerpulse (Directional & GR)	Schlumberger/Anadrill	2717.0	3364.0
Run 1: Drillpipe conveyed Logging MCG-MDN-MPD-MSS-MDL	Reeves (Precision Logging) Compact wireline tools run on drillpipe (Shuttle System, memory mode)	3361.0	2680.0

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

## V. FORMATION RESERVOIR TOPS - BREAM A22AST

Horizon	m TVDSS			m MDRT  ACTUAL	mTVT HC Column	
	Predicted Tops	ACTUAL	Diff. (m)		Predicted	ACTUAL
Top of Latrobe (TOL)	-1804.0	-1806.2	2.2 low	2965.0	-	-
Top of Coarse Clastics (TCC)	-1895.0	-1889.9	5.1 high	3186.0	-	3.6/3.5m gross/net gas
Base of Waste (BWST)	-1898.0	-1895.2	2.8 high	3200.4	15m gross	10.4m gross/net
newRdsb	-	-1896.8	-	3204.8	gas in	gas in Red
newGnF2	-1900.0	-1898.2	1.8 high	3208.5	Green	and Green
GOC	-1913.0	-1905.6	7.4 high	3228.7	unit	1.9m gross/net oil
OWC (not prognosed)	-	-1907.5		3233.9	-	in Green
newGnsb	-	-1908.2		3235.7	-	-
NewCbF2	-1918.0	-1912.5	5.5 m high	3247.3		5.2m gross/net oil in Mid Cobalt
newCbf1	-1925.0	-1919.0	6.0 m high	3265.0	6m gross oil	
OWC	-1919.0	-1927.4	8.4 low	3287.8	in Cobalt unit	8.2m gross/net oil
newCbsb	-1935.0	-1928.5	6.5 m high	3290.7	-	in Lwr Cobalt
newPkf2	-	-1932.4	-	3301.6	-	-
newPkf1	-1942.0	-1936.1	5.9m high	3311.8	-	-
newPkbsb	-	-1940.0	-	3322.9	-	-
Total Depth (TD)	-1954.0	-1954.5	0.5m low	3364.0	-	-

## VI. GEOLOGICAL ANALYSIS - BREAM A22A & A22AST

### Objectives

The BMA-A22A well was designed to capture N-1 oil reserves from a local structural crest on the southern edge of the Bream A area. This drainage point was originally drilled for development by the A22 well. The A22 well was proven to have corroded casing within the N-1 hydrocarbon column and was deemed incapable of accessing the oil reservoired within this local culmination.

The A22A well was designed effectively as a re-drill of the A22 well and was therefore expected to replicate the stratigraphy of the A22 well with the current N-1 hydrocarbon column predicted to straddle the Green (GnSb-GnF2) and Upper Cobalt (CbF1/F2- GnSb). BMA-22A was targeted approximately 175m to the north-northwest at Top of Coarse Clastics (TCC) level.

The BMA-A22 well was originally completed in the N-1 reservoir Cobalt sands as an oil producer and recovered 2.7 MB of crude and condensate before the well was shut-in due to the failure of the sub-sea safety valve control line in 2000. The A22 was producing 100 kLd oil at 50% water-cut prior to the control line failure.

Recent cased hole logging in nearby wells has suggested the gas-oil contact, and hence oil column, is moving more slowly on the flanks of the Bream field than observed in wells in more central field locations and that the remaining oil leg is thicker. The A22A well was designed to intersect a local structural high that has not been in production since 2000 and is also isolated by a structural saddle from nearby wells A21A and A20 (A20 has since been plugged and abandoned following diagnosis of a mechanical problem).

The GOC was observed at -1913.6mTVDss in A21A and was expected at about this depth in A22A, located near the base of the lower Green and uppermost Cobalt sand. Pre-drill reservoir simulation studies estimated the oil column to be about 5-6m thick in this area.

### Results

The A22 well was plugged and abandoned and a 7" whipstock was set at 2702.8mMDRT. A 6" window was milled from 2698.2 to 2709.4m MDRT. The A22A well was kicked off at 2709.0mMDRT on 3rd September, 2005 and drilled a 6" production hole to 3249.0m MDRT before becoming differentially stuck. After several unsuccessful attempts to free the stuck pipe, the borehole assembly was 'backed off' at 2933.0mMDRT and a plug was set over the fish from 2933 to 2648.0mMDRT. The well was then sidetracked by cutting a window in 7" casing at 2702.4mMDRT. The A22AST1 well drilled a 6" production hole to a Total Depth of 3364.0mMDRT. The well was logged with the Precision Energy Services compact shuttle system. The well was completed with 4½" liner and 3½" completion tubing and handed over to production at 11:00 hours on the 1st of October 2005.

## **VI. GEOLOGICAL ANALYSIS - BREAM A22A & A22AST (continued)**

The Top of Latrobe Group was intersected at 2695.0mMDRT (-1806.2mSS), 2.2m TVD low to prediction. A thick 53.4m MD section of volcanogenic clastics was intersected between 2971.6 and 3025.0mMD. This section has been described on the mud-logs as sandstone but is more likely to be a clastic sequence derived mainly from abundant nearby volcanogenic sediments such as the common volcanic mounds active around Bream at this time. Below these deposits, the sequence is dominated by claystones and occasional dolomitic banded streaks.

The Top of Coarse Clastics was intersected at 3186.0m MDRT (-1889.9m TVDSS), 5.1m high to prognosis. The N-1 reservoir sandstone units were found to be present and well developed, as predicted from nearby control. Several hydrocarbon bearing zones with variable saturations were intersected in the A22AST1 well. A 13.9mTVD net gas column was logged from the Waste Zone to a GOC at -1905.6m TVDSS. A 1.9m TVD net oil column was intersected below the gas within the Green unit above a 5.2m net residual oil column or swept zone (within the upper Cobalt unit). The average oil saturation is estimated to be 49% within this swept zone. Immediately below the Cobalt Flooding Surface 2 (NewCbF2) at -1912.5m TVDSS, a 14.1mMD net (5.2m TVD) oil-on-rock interval was also intersected. Below the next Cobalt Flooding Surface (new Cbf1) a 8.2m TVD net oil column was logged within the lower Cobalt sand unit down to an interpreted OWC at -1927.4m TVDss. All deeper sands down to TD were found to be water bearing.

In total, 15.3m TVD of net oil in 3 separate zones was logged in the A22A versus a pre-drill estimate of 6m TVD net oil. The most likely explanation for this high-side outcome is that the Cobalt unit flooding surfaces are locally continuous beyond the structural saddle surrounding the A22A high, shielding some of the trapped oil from vertical oil migration due to gas cap blowdown in the main field and also from surrounding well oil sweep. In addition, the A22A well was optimally positioned in a crestal location with the TCC being intersected approximately 5m up-dip of the original producer, A22, thereby capturing some incremental oil above any originally produced zones.

The A22AST1 well was initially completed at the top of the lowest oil column below the lowermost Cobalt flooding surface (newCBf1).

## **APPENDIX 1a**

### **BREAM A22A**

#### **Survey Data**





## BMA A-22A Final Geodetic Survey

Report Date: September 27, 2005	Survey / DLS Computation Method: Minimum Curvature / Lubinski
Client: Esso Australia Pty Ltd	Vertical Section Azimuth: 205.020°
Field: Bream A GDA 94	Vertical Section Origin: S 4.820 m, E 5.990 m
Structure / Slot: Bream A / 22	TVD Reference Datum: RKB
Well: 22	TVD Reference Elevation: 32.8 m relative to MSL
Borehole: BMA A-22A	Sea Bed / Ground Level Elevation: -59.400 m relative to MSL
UWI/API#:	Magnetic Declination: 13.100°
Survey Name / Date: BMA A-22A Final / August 2, 2005	Total Field Strength: 60144.983 nT
Tort / AHD / DDI / ERD ratio: 142.088° / 2436.28 m / 6.280 / 1.257	Magnetic Dip: -69.024°
Grid Coordinate System: GDA94/MGA94 Zone 55	Declination Date: August 02, 2005
Location Lat/Long: S 38 29 58.910, E 147 46 20.232	Magnetic Declination Model: BGGM 2004
Location Grid N/E Y/X: N 5738457.640 m, E 567342.490 m	North Reference: Grid North
Grid Convergence Angle: -0.48077454°	Total Corr Mag North -> Grid North: +13.581°
Grid Scale Factor: 0.99965585	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
	0.00	0.00	0.00	0.00	0.00	-4.82	5.99	0.00	5738457.64	567342.49	S 38 29 58.910	E 147 46 20.232
	60.00	0.00	0.00	60.00	0.00	-4.82	5.99	0.00	5738457.64	567342.49	S 38 29 58.910	E 147 46 20.232
	89.32	0.25	344.00	89.32	-0.05	-4.76	5.97	0.26	5738457.70	567342.47	S 38 29 58.908	E 147 46 20.231
	104.32	1.00	162.00	104.32	0.02	-4.85	6.01	2.50	5738457.61	567342.50	S 38 29 58.911	E 147 46 20.232
	119.32	3.00	162.00	119.31	0.41	-5.35	6.17	4.00	5738457.11	567342.67	S 38 29 58.927	E 147 46 20.239
	134.32	5.00	164.00	134.27	1.19	-6.35	6.47	4.01	5738456.11	567342.97	S 38 29 58.959	E 147 46 20.252
	149.32	7.50	164.00	149.18	2.42	-7.92	6.92	5.00	5738454.54	567343.42	S 38 29 59.010	E 147 46 20.271
	154.32	8.00	164.00	154.14	2.93	-8.57	7.11	3.00	5738453.89	567343.60	S 38 29 59.031	E 147 46 20.279
	176.32	9.50	175.57	175.88	5.66	-11.85	7.67	3.14	5738450.61	567344.16	S 38 29 59.137	E 147 46 20.303
	184.32	9.50	178.77	183.77	6.83	-13.17	7.73	1.98	5738449.29	567344.23	S 38 29 59.180	E 147 46 20.306
	194.32	9.70	181.87	193.63	8.35	-14.84	7.72	1.66	5738447.63	567344.22	S 38 29 59.234	E 147 46 20.306
	203.32	10.40	189.27	202.49	9.82	-16.40	7.57	4.89	5738446.07	567344.06	S 38 29 59.285	E 147 46 20.301
	210.32	13.70	189.67	209.34	11.23	-17.84	7.33	14.15	5738444.63	567343.82	S 38 29 59.332	E 147 46 20.291
	212.32	11.40	191.77	211.29	11.65	-18.27	7.25	35.17	5738444.20	567343.74	S 38 29 59.345	E 147 46 20.288
	221.32	12.30	193.17	220.10	13.46	-20.07	6.85	3.15	5738442.40	567343.34	S 38 29 59.404	E 147 46 20.272
	231.32	13.00	191.07	229.86	15.59	-22.21	6.39	2.51	5738440.26	567342.89	S 38 29 59.474	E 147 46 20.254
	249.32	14.40	189.97	247.34	19.72	-26.40	5.61	2.37	5738436.07	567342.11	S 38 29 59.610	E 147 46 20.223
	258.32	15.60	191.37	256.04	21.97	-28.69	5.18	4.18	5738433.78	567341.68	S 38 29 59.684	E 147 46 20.206
	276.32	17.40	189.97	273.29	26.93	-33.72	4.24	3.07	5738428.76	567340.73	S 38 29 59.847	E 147 46 20.169
	304.32	18.00	190.67	299.97	35.16	-42.09	2.71	0.68	5738420.38	567339.21	S 38 30 0.119	E 147 46 20.109
	331.32	20.50	192.47	325.46	43.82	-50.81	0.92	2.85	5738411.67	567337.42	S 38 30 0.402	E 147 46 20.038
	359.32	22.20	193.17	351.54	53.78	-60.75	-1.35	1.84	5738401.73	567335.15	S 38 30 0.725	E 147 46 19.948
	386.32	24.20	194.27	376.35	64.21	-71.08	-3.87	2.27	5738391.41	567332.63	S 38 30 1.061	E 147 46 19.847
	415.32	27.10	194.57	402.49	76.55	-83.23	-7.00	3.00	5738379.26	567329.50	S 38 30 1.456	E 147 46 19.722
	443.32	30.00	194.93	427.08	89.72	-96.17	-10.41	3.11	5738366.32	567326.09	S 38 30 1.877	E 147 46 19.586
	472.32	32.80	195.67	451.83	104.61	-110.74	-14.40	2.92	5738351.76	567322.10	S 38 30 2.350	E 147 46 19.427
	500.32	35.40	195.67	475.02	120.10	-125.86	-18.64	2.79	5738336.65	567317.87	S 38 30 2.842	E 147 46 19.257
	530.32	38.60	195.27	498.97	137.90	-143.25	-23.45	3.21	5738319.25	567313.05	S 38 30 3.407	E 147 46 19.064
	558.32	42.00	196.37	520.33	155.77	-160.67	-28.40	3.72	5738301.84	567308.11	S 38 30 3.973	E 147 46 18.866
	587.32	45.10	197.37	541.34	175.55	-179.79	-34.20	3.29	5738282.73	567302.31	S 38 30 4.595	E 147 46 18.634
	614.32	48.20	198.77	559.87	195.04	-198.45	-40.29	3.63	5738264.08	567296.22	S 38 30 5.202	E 147 46 18.389
	643.32	51.60	198.47	578.55	217.08	-219.47	-47.37	3.53	5738243.07	567289.14	S 38 30 5.885	E 147 46 18.104
	672.32	55.00	198.77	595.88	240.18	-241.50	-54.80	3.53	5738221.04	567281.72	S 38 30 6.602	E 147 46 17.805
	682.32	56.50	198.77	601.51	248.40	-249.33	-57.46	4.50	5738213.22	567279.06	S 38 30 6.856	E 147 46 17.698
	699.32	58.30	198.47	610.67	262.63	-262.90	-62.03	3.21	5738199.65	567274.49	S 38 30 7.298	E 147 46 17.514
	728.32	58.10	199.17	625.95	287.13	-286.23	-69.98	0.65	5738176.33	567266.54	S 38 30 8.056	E 147 46 17.194
	756.32	58.50	199.87	640.66	310.84	-308.68	-77.94	0.77	5738153.89	567258.59	S 38 30 8.787	E 147 46 16.873
	785.32	57.90	200.17	655.94	335.40	-331.84	-86.38	0.67	5738130.74	567250.15	S 38 30 9.540	E 147 46 16.533
	814.32	58.10	200.57	671.31	359.91	-354.89	-94.94	0.41	5738107.69	567241.60	S 38 30 10.290	E 147 46 16.188
	843.32	58.20	200.57	686.61	384.47	-377.96	-103.59	0.10	5738084.63	567232.94	S 38 30 11.040	E 147 46 15.838
	872.32	58.20	200.17	701.90	409.03	-401.06	-112.17	0.35	5738061.54	567224.37	S 38 30 11.792	E 147 46 15.492
	900.32	57.90	201.27	716.71	432.72	-423.28	-120.58	1.05	5738039.32	567215.96	S 38 30 12.515	E 147 46 15.153
	929.32	58.00	201.27	732.10	457.25	-446.19	-129.49	0.10	5738016.43	567207.05	S 38 30 13.260	E 147 46 14.793
	958.32	57.90	201.27	747.49	481.78	-469.09	-138.41	0.10	5737993.53	567198.14	S 38 30 14.005	E 147 46 14.433
	986.32	57.70	200.57	762.41	505.41	-491.23	-146.87	0.67	5737971.40	567189.68	S 38 30 14.725	E 147 46 14.091
	1015.32	57.70	201.27	777.91	529.86	-514.12	-155.62	0.61	5737948.52	567180.93	S 38 30 15.470	E 147 46 13.738
	1044.32	57.60	201.27	793.43	554.31	-536.95	-164.51	0.10	5737925.69	567172.05	S 38 30 16.213	E 147 46 13.379
	1072.32	57.50	201.57	808.45	577.89	-558.95	-173.14	0.29	5737903.70	567163.42	S 38 30 16.928	E 147 46 13.031



3016.31	67.24	199.20	1849.55	2202.83	-1986.06	-957.56	1.52	5736477.09	566379.27	S 38 31 3.421	E 147 45 41.145
3045.28	67.24	199.08	1860.76	2229.41	-2011.29	-966.31	0.11	5736451.86	566370.52	S 38 31 4.241	E 147 45 40.792
3074.05	67.01	198.29	1871.94	2255.75	-2036.40	-974.81	0.80	5736426.76	566362.03	S 38 31 5.058	E 147 45 40.450
3102.25	69.50	197.04	1882.39	2281.73	-2061.36	-982.75	2.92	5736401.81	566354.09	S 38 31 5.870	E 147 45 40.131
3130.51	68.39	196.46	1892.54	2307.83	-2086.61	-990.35	1.31	5736376.56	566346.49	S 38 31 6.691	E 147 45 39.826
3159.67	68.41	197.26	1903.28	2334.66	-2112.56	-998.22	0.77	5736350.63	566338.63	S 38 31 7.534	E 147 45 39.510
3188.15	67.48	198.34	1913.97	2360.85	-2137.69	-1006.28	1.44	5736325.50	566330.56	S 38 31 8.351	E 147 45 39.185
3216.78	66.23	198.74	1925.22	2387.01	-2162.65	-1014.65	1.37	5736300.55	566322.19	S 38 31 9.163	E 147 45 38.848
3249.00	67.30	199.20	1937.94	2416.45	-2190.65	-1024.28	1.07	5736272.56	566312.57	S 38 31 10.073	E 147 45 38.461

**Survey Type:** Definitive Survey

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

**Surveying Prog:**

<b><u>MD From ( m )</u></b>	<b><u>MD To ( m )</u></b>	<b><u>EOU Freq</u></b>	<b><u>Survey Tool Type</u></b>	<b><u>Borehole -&gt; Survey</u></b>
0.00	92.22	Act-Stns	SLB_MWD-STD-Depth Only	BMA A-22A -> BMA A-22A Final
92.22	3249.00	Act-Stns	SLB_MWD-STD	BMA A-22A -> BMA A-22A Final

**APPENDIX 1b**

**BREAM A22AST**

**Survey Data**



## BMA A-22A ST Final Geodetic Survey

Report Date: September 23, 2005	Survey / DLS Computation Method: Minimum Curvature / Lubinski
Client: Esso Australia Pty Ltd	Vertical Section Azimuth: 205.020°
Field: Bream A GDA 94	Vertical Section Origin: S 4.820 m, E 5.990 m
Structure / Slot: Bream A / 22	TVD Reference Datum: RKB
Well: 22	TVD Reference Elevation: 32.8 m relative to MSL
Borehole: BMA A-22A ST	Sea Bed / Ground Level Elevation: -59.400 m relative to MSL
UWI/API#:	Magnetic Declination: 13.102°
Survey Name / Date: BMA A-22A ST Final / September 19, 2005	Total Field Strength: 60141.296 nT
Tort / AHD / DDI / ERD ratio: 139.778° / 2539.39 m / 6.295 / 1.278	Magnetic Dip: -69.023°
Grid Coordinate System: GDA94/MGA94 Zone 55	Declination Date: September 19, 2005
Location Lat/Long: S 38 29 58.910, E 147 46 20.232	Magnetic Declination Model: BGGM 2004
Location Grid N/E Y/X: N 5738457.640 m, E 567342.490 m	North Reference: Grid North
Grid Convergence Angle: -0.48077454°	Total Corr Mag North -> Grid North: +13.583°
Grid Scale Factor: 0.99965585	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
Tie-In	0.00	0.00	0.00	0.00	0.00	-4.82	5.99	0.00	5738457.64	567342.49	S 38 29 58.910	E 147 46 20.232
	60.00	0.00	0.00	60.00	0.00	-4.82	5.99	0.00	5738457.64	567342.49	S 38 29 58.910	E 147 46 20.232
	89.32	0.25	344.00	89.32	-0.05	-4.76	5.97	0.26	5738457.70	567342.47	S 38 29 58.908	E 147 46 20.231
	104.32	1.00	162.00	104.32	0.02	-4.85	6.01	2.50	5738457.61	567342.50	S 38 29 58.911	E 147 46 20.232
	119.32	3.00	162.00	119.31	0.41	-5.35	6.17	4.00	5738457.11	567342.67	S 38 29 58.927	E 147 46 20.239
	134.32	5.00	164.00	134.27	1.19	-6.35	6.47	4.01	5738456.11	567342.97	S 38 29 58.959	E 147 46 20.252
	149.32	7.50	164.00	149.18	2.42	-7.92	6.92	5.00	5738454.54	567343.42	S 38 29 59.010	E 147 46 20.271
	154.32	8.00	164.00	154.14	2.93	-8.57	7.11	3.00	5738453.89	567343.60	S 38 29 59.031	E 147 46 20.279
	176.32	9.50	175.57	175.88	5.66	-11.85	7.67	3.14	5738450.61	567344.16	S 38 29 59.137	E 147 46 20.303
	184.32	9.50	178.77	183.77	6.83	-13.17	7.73	1.98	5738449.29	567344.23	S 38 29 59.180	E 147 46 20.306
	194.32	9.70	181.87	193.63	8.35	-14.84	7.72	1.66	5738447.63	567344.22	S 38 29 59.234	E 147 46 20.306
	203.32	10.40	189.27	202.49	9.82	-16.40	7.57	4.89	5738446.07	567344.06	S 38 29 59.285	E 147 46 20.301
	210.32	13.70	189.67	209.34	11.23	-17.84	7.33	14.15	5738444.63	567343.82	S 38 29 59.332	E 147 46 20.291
	212.32	11.40	191.77	211.29	11.65	-18.27	7.25	35.17	5738444.20	567343.74	S 38 29 59.345	E 147 46 20.288
	221.32	12.30	193.17	220.10	13.46	-20.07	6.85	3.15	5738442.40	567343.34	S 38 29 59.404	E 147 46 20.272
	231.32	13.00	191.07	229.86	15.59	-22.21	6.39	2.51	5738440.26	567342.89	S 38 29 59.474	E 147 46 20.254
	249.32	14.40	189.97	247.34	19.72	-26.40	5.61	2.37	5738436.07	567342.11	S 38 29 59.610	E 147 46 20.223
	258.32	15.60	191.37	256.04	21.97	-28.69	5.18	4.18	5738433.78	567341.68	S 38 29 59.684	E 147 46 20.206
	276.32	17.40	189.97	273.29	26.93	-33.72	4.24	3.07	5738428.76	567340.73	S 38 29 59.847	E 147 46 20.169
	304.32	18.00	190.67	299.97	35.16	-42.09	2.71	0.68	5738420.38	567339.21	S 38 30 0.119	E 147 46 20.109
	331.32	20.50	192.47	325.46	43.82	-50.81	0.92	2.85	5738411.67	567337.42	S 38 30 0.402	E 147 46 20.038
	359.32	22.20	193.17	351.54	53.78	-60.75	-1.35	1.84	5738401.73	567335.15	S 38 30 0.725	E 147 46 19.948
	386.32	24.20	194.27	376.35	64.21	-71.08	-3.87	2.27	5738391.41	567332.63	S 38 30 1.061	E 147 46 19.847
	415.32	27.10	194.57	402.49	76.55	-83.23	-7.00	3.00	5738379.26	567329.50	S 38 30 1.456	E 147 46 19.722
	443.32	30.00	194.93	427.08	89.72	-96.17	-10.41	3.11	5738366.32	567326.09	S 38 30 1.877	E 147 46 19.586
	472.32	32.80	195.67	451.83	104.61	-110.74	-14.40	2.92	5738351.76	567322.10	S 38 30 2.350	E 147 46 19.427
	500.32	35.40	195.67	475.02	120.10	-125.86	-18.64	2.79	5738336.65	567317.87	S 38 30 2.842	E 147 46 19.257
	530.32	38.60	195.27	498.97	137.90	-143.25	-23.45	3.21	5738319.25	567313.05	S 38 30 3.407	E 147 46 19.064
	558.32	42.00	196.37	520.33	155.77	-160.67	-28.40	3.72	5738301.84	567308.11	S 38 30 3.973	E 147 46 18.866
	587.32	45.10	197.37	541.34	175.55	-179.79	-34.20	3.29	5738282.73	567302.31	S 38 30 4.595	E 147 46 18.634
	614.32	48.20	198.77	559.87	195.04	-198.45	-40.29	3.63	5738264.08	567296.22	S 38 30 5.202	E 147 46 18.389
	643.32	51.60	198.47	578.55	217.08	-219.47	-47.37	3.53	5738243.07	567289.14	S 38 30 5.885	E 147 46 18.104
	672.32	55.00	198.77	595.88	240.18	-241.50	-54.80	3.53	5738221.04	567281.72	S 38 30 6.602	E 147 46 17.805
	682.32	56.50	198.77	601.51	248.40	-249.33	-57.46	4.50	5738213.22	567279.06	S 38 30 6.856	E 147 46 17.698
	699.32	58.30	198.47	610.67	262.63	-262.90	-62.03	3.21	5738199.65	567274.49	S 38 30 7.298	E 147 46 17.514
	728.32	58.10	199.17	625.95	287.13	-286.23	-69.98	0.65	5738176.33	567266.54	S 38 30 8.056	E 147 46 17.194
	756.32	58.50	199.87	640.66	310.84	-308.68	-77.94	0.77	5738153.89	567258.59	S 38 30 8.787	E 147 46 16.873
	785.32	57.90	200.17	655.94	335.40	-331.84	-86.38	0.67	5738130.74	567250.15	S 38 30 9.540	E 147 46 16.533
	814.32	58.10	200.57	671.31	359.91	-354.89	-94.94	0.41	5738107.69	567241.60	S 38 30 10.290	E 147 46 16.188
	843.32	58.20	200.57	686.61	384.47	-377.96	-103.59	0.10	5738084.63	567232.94	S 38 30 11.040	E 147 46 15.838
	872.32	58.20	200.17	701.90	409.03	-401.06	-112.17	0.35	5738061.54	567224.37	S 38 30 11.792	E 147 46 15.492
	900.32	57.90	201.27	716.71	432.72	-423.28	-120.58	1.05	5738039.32	567215.96	S 38 30 12.515	E 147 46 15.153
	929.32	58.00	201.27	732.10	457.25	-446.19	-129.49	0.10	5738016.43	567207.05	S 38 30 13.260	E 147 46 14.793
	958.32	57.90	201.27	747.49	481.78	-469.09	-138.41	0.10	5737993.53	567198.14	S 38 30 14.005	E 147 46 14.433
	986.32	57.70	200.57	762.41	505.41	-491.23	-146.87	0.67	5737971.40	567189.68	S 38 30 14.725	E 147 46 14.091
	1015.32	57.70	201.27	777.91	529.86	-514.12	-155.62	0.61	5737948.52	567180.93	S 38 30 15.470	E 147 46 13.738
	1044.32	57.60	201.27	793.43	554.31	-536.95	-164.51	0.10	5737925.69	567172.05	S 38 30 16.213	E 147 46 13.379
	1072.32	57.50	201.57	808.45	577.89	-558.95	-173.14	0.29	5737903.70	567163.42	S 38 30 16.928	E 147 46 13.031

	1101.32	57.10	201.57	824.12	602.25	-581.64	-182.11	0.41	5737881.02	567154.45	S 38 30 17.667	E 147 46 12.668
	1130.32	56.90	201.97	839.91	626.53	-604.23	-191.13	0.40	5737858.44	567145.43	S 38 30 18.402	E 147 46 12.304
	1160.32	56.80	201.57	856.32	651.61	-627.56	-200.45	0.35	5737835.12	567136.12	S 38 30 19.161	E 147 46 11.927
	1188.32	56.70	202.27	871.67	674.99	-649.28	-209.19	0.64	5737813.41	567127.38	S 38 30 19.868	E 147 46 11.574
	1217.32	56.80	201.97	887.57	699.21	-671.75	-218.32	0.28	5737790.95	567118.25	S 38 30 20.599	E 147 46 11.205
	1245.32	57.00	201.97	902.86	722.63	-693.50	-227.10	0.21	5737769.20	567109.48	S 38 30 21.307	E 147 46 10.850
	1274.32	56.70	202.67	918.72	746.89	-715.96	-236.32	0.68	5737746.75	567100.26	S 38 30 22.037	E 147 46 10.478
	1303.32	56.40	202.27	934.70	771.06	-738.32	-245.56	0.46	5737724.40	567091.02	S 38 30 22.765	E 147 46 10.104
	1310.32	56.30	202.67	938.58	776.88	-743.70	-247.79	1.49	5737719.01	567088.79	S 38 30 22.940	E 147 46 10.014
	1333.32	56.10	202.27	951.38	795.97	-761.36	-255.10	0.51	5737701.36	567081.49	S 38 30 23.515	E 147 46 9.718
	1381.32	54.90	203.67	978.56	835.50	-797.79	-270.53	1.04	5737664.95	567066.06	S 38 30 24.700	E 147 46 9.094
	1407.32	54.90	204.77	993.51	856.77	-817.18	-279.26	1.04	5737645.56	567057.34	S 38 30 25.332	E 147 46 8.740
	1436.32	54.30	206.17	1010.31	880.41	-838.53	-289.42	1.33	5737624.22	567047.18	S 38 30 26.027	E 147 46 8.328
	1465.32	54.60	207.27	1027.18	903.99	-859.60	-300.03	0.98	5737603.16	567036.57	S 38 30 26.713	E 147 46 7.898
	1494.32	52.60	206.57	1044.38	927.32	-880.41	-310.60	2.15	5737582.35	567026.01	S 38 30 27.391	E 147 46 7.469
	1523.32	55.70	207.57	1061.37	950.81	-901.34	-321.30	3.31	5737561.43	567015.31	S 38 30 28.072	E 147 46 7.034
	1552.32	57.30	208.67	1077.37	974.95	-922.66	-332.70	1.91	5737540.12	567003.92	S 38 30 28.767	E 147 46 6.571
	1581.32	57.80	209.37	1092.93	999.37	-944.06	-344.57	0.80	5737518.72	566992.05	S 38 30 29.464	E 147 46 6.089
	1611.32	57.18	209.67	1109.06	1024.59	-966.08	-357.03	0.67	5737496.72	566979.59	S 38 30 30.181	E 147 46 5.582
	1639.32	57.60	209.37	1124.15	1048.10	-986.60	-368.65	0.53	5737476.20	566967.97	S 38 30 30.850	E 147 46 5.109
	1667.32	56.80	209.67	1139.31	1071.56	-1007.08	-380.25	0.90	5737455.73	566956.38	S 38 30 31.517	E 147 46 4.638
	1696.32	57.00	210.07	1155.15	1095.77	-1028.15	-392.35	0.40	5737434.67	566944.28	S 38 30 32.204	E 147 46 4.145
	1725.32	56.30	210.07	1171.09	1119.90	-1049.11	-404.49	0.72	5737413.71	566932.15	S 38 30 32.887	E 147 46 3.652
	1752.32	55.90	210.37	1186.15	1142.22	-1068.48	-415.77	0.52	5737394.35	566920.88	S 38 30 33.518	E 147 46 3.193
	1781.32	56.40	210.37	1202.31	1166.20	-1089.26	-427.94	0.52	5737373.58	566908.70	S 38 30 34.195	E 147 46 2.697
	1814.32	56.80	211.07	1220.47	1193.61	-1112.94	-442.02	0.64	5737349.90	566894.63	S 38 30 34.967	E 147 46 2.125
	1843.32	56.90	210.77	1236.33	1217.76	-1133.77	-454.49	0.28	5737329.08	566882.16	S 38 30 35.646	E 147 46 1.617
	1871.32	56.80	211.07	1251.64	1241.08	-1153.88	-466.54	0.29	5737308.98	566870.12	S 38 30 36.301	E 147 46 1.127
	1900.32	56.70	211.07	1267.54	1265.20	-1174.65	-479.06	0.10	5737288.21	566857.61	S 38 30 36.978	E 147 46 0.617
	1929.32	56.40	211.07	1283.53	1289.26	-1195.38	-491.54	0.31	5737267.49	566845.13	S 38 30 37.654	E 147 46 0.109
	1958.32	56.30	211.07	1299.60	1313.27	-1216.06	-504.00	0.10	5737246.82	566832.67	S 38 30 38.328	E 147 45 59.602
	1986.32	56.20	211.07	1315.15	1336.42	-1236.00	-516.02	0.11	5737226.89	566820.66	S 38 30 38.978	E 147 45 59.113
	2015.32	55.90	211.47	1331.35	1360.33	-1256.56	-528.50	0.46	5737206.33	566808.18	S 38 30 39.648	E 147 45 58.604
	2043.32	55.50	211.07	1347.13	1383.32	-1276.33	-540.51	0.56	5737186.57	566796.18	S 38 30 40.292	E 147 45 58.116
	2072.32	55.20	211.77	1363.62	1407.03	-1296.69	-552.95	0.67	5737166.22	566783.74	S 38 30 40.956	E 147 45 57.609
	2101.32	54.90	212.17	1380.23	1430.63	-1316.85	-565.53	0.46	5737146.06	566771.16	S 38 30 41.613	E 147 45 57.097
	2129.32	54.50	211.77	1396.41	1453.31	-1336.24	-577.63	0.55	5737126.68	566759.07	S 38 30 42.245	E 147 45 56.604
	2157.32	54.60	212.47	1412.65	1475.95	-1355.55	-589.76	0.62	5737107.37	566746.94	S 38 30 42.875	E 147 45 56.110
	2185.32	54.80	212.87	1428.83	1498.59	-1374.79	-602.10	0.41	5737088.14	566734.61	S 38 30 43.502	E 147 45 55.608
	2214.32	54.90	213.17	1445.52	1522.07	-1394.67	-615.02	0.27	5737068.27	566721.70	S 38 30 44.150	E 147 45 55.081
	2242.32	54.80	213.17	1461.64	1544.74	-1413.84	-627.54	0.11	5737049.11	566709.17	S 38 30 44.775	E 147 45 54.571
	2271.32	54.50	213.17	1478.42	1568.15	-1433.64	-640.48	0.31	5737029.32	566696.24	S 38 30 45.421	E 147 45 54.043
	2300.32	54.50	214.27	1495.26	1591.49	-1453.27	-653.59	0.93	5737009.69	566683.14	S 38 30 46.061	E 147 45 53.509
	2329.32	54.70	214.27	1512.06	1614.82	-1472.81	-666.90	0.21	5736990.16	566669.83	S 38 30 46.698	E 147 45 52.967
	2357.32	54.90	214.57	1528.20	1637.39	-1491.68	-679.83	0.34	5736971.29	566656.90	S 38 30 47.314	E 147 45 52.439
	2386.32	55.30	214.97	1544.80	1660.83	-1511.22	-693.40	0.54	5736951.76	566643.34	S 38 30 47.951	E 147 45 51.886
	2414.32	55.50	214.97	1560.69	1683.53	-1530.11	-706.61	0.21	5736932.88	566630.14	S 38 30 48.567	E 147 45 51.347
	2443.32	55.80	215.27	1577.06	1707.11	-1549.69	-720.38	0.40	5736913.30	566616.37	S 38 30 49.206	E 147 45 50.785
	2472.32	55.80	215.67	1593.36	1730.69	-1569.22	-734.30	0.34	5736893.78	566602.45	S 38 30 49.843	E 147 45 50.218
	2500.32	56.00	216.07	1609.06	1753.46	-1588.01	-747.89	0.41	5736875.00	566588.87	S 38 30 50.456	E 147 45 49.663
	2529.32	56.20	216.37	1625.23	1777.08	-1607.43	-762.11	0.33	5736855.58	566574.65	S 38 30 51.089	E 147 45 49.083
	2558.32	56.30	216.77	1641.34	1800.70	-1626.80	-776.47	0.36	5736836.22	566560.29	S 38 30 51.721	E 147 45 48.497
	2586.32	56.60	216.77	1656.82	1823.55	-1645.49	-790.44	0.32	5736817.54	566546.33	S 38 30 52.331	E 147 45 47.926
	2614.32	56.70	217.07	1672.21	1846.43	-1664.19	-804.49	0.29	5736798.85	566532.28	S 38 30 52.941	E 147 45 47.353
	2642.32	56.80	216.77	1687.56	1869.35	-1682.91	-818.56	0.29	5736780.13	566518.22	S 38 30 53.552	E 147 45 46.779
	2671.32	57.10	217.07	1703.38	1893.13	-1702.34	-833.16	0.40	5736760.70	566503.63	S 38 30 54.187	E 147 45 46.183
	2697.00	57.01	216.79	1717.34	1914.22	-1719.57	-846.11	0.29	5736743.48	566490.68	S 38 30 54.749	E 147 45 45.654
Tie-in	2702.00	57.44	216.13	1720.05	1918.34	-1722.95	-848.61	4.21	5736740.10	566488.19	S 38 30 54.859	E 147 45 45.552
	2818.30	61.07	204.37	1779.65	2017.61	-1809.14	-898.65	2.77	5736653.94	566438.16	S 38 30 57.668	E 147 45 43.516
	2846.66	63.02	200.48	1792.95	2042.63	-1832.30	-908.20	4.18	5736630.79	566428.62	S 38 30 58.421	E 147 45 43.130
	2875.53	66.54	196.48	1805.25	2068.56	-1857.06	-916.46	5.25	5736606.04	566420.36	S 38 30 59.226	E 147 45 42.797
	2904.24	68.82	195.84	1816.15	2094.80	-1882.57	-923.85	2.46	5736580.54	566412.97	S 38 31 0.056	E 147 45 42.501
	2932.64	67.67	194.34	1826.68	2120.78	-1908.04	-930.72	1.91	5736555.08	566406.10	S 38 31 0.883	E 147 45 42.226
	2961.11	67.71	194.19	1837.49	2146.66	-1933.56	-937.21	0.15	5736529.56	566399.61	S 38 31 1.713	E 147 45 41.967
	2989.53	67.94	195.04	1848.22	2172.55	-1959.03	-943.85	0.87	5736504.11	566392.98	S 38 31 2.541	E 147 45 41.702
	3018.06	67.18	194.88	1859.11	2198.51	-1984.50	-950.66	0.81	5736478.64	566386.17	S 38 31 3.368	E 147 45 41.429
	3047.04	67.46	194.08	1870.28	2224.80	-2010.39	-957.34	0.82	5736452.76	566379.49	S 38 31 4.210	E 147 45 41.162

3075.33	67.49	197.11	1881.12	2250.57	-2035.56	-964.37	2.97	5736427.60	566372.47	S 38 31 5.028	E 147 45 40.881
3104.27	68.12	196.99	1892.05	2277.11	-2061.18	-972.22	0.66	5736401.99	566364.61	S 38 31 5.861	E 147 45 40.565
3132.27	68.06	196.72	1902.50	2302.82	-2086.04	-979.75	0.28	5736377.14	566357.08	S 38 31 6.669	E 147 45 40.263
3161.24	67.83	196.45	1913.38	2329.38	-2111.77	-987.42	0.35	5736351.42	566349.42	S 38 31 7.506	E 147 45 39.955
3190.70	68.11	196.04	1924.43	2356.37	-2137.99	-995.06	0.48	5736325.21	566341.78	S 38 31 8.358	E 147 45 39.649
3219.49	68.65	196.29	1935.04	2382.82	-2163.70	-1002.51	0.61	5736299.51	566334.34	S 38 31 9.194	E 147 45 39.350
3248.61	68.12	196.83	1945.76	2409.59	-2189.65	-1010.23	0.75	5736273.57	566326.62	S 38 31 10.037	E 147 45 39.041
3277.49	68.49	196.60	1956.44	2436.15	-2215.35	-1017.94	0.44	5736247.88	566318.91	S 38 31 10.873	E 147 45 38.731
3306.00	68.79	196.69	1966.82	2462.42	-2240.79	-1025.55	0.33	5736222.45	566311.30	S 38 31 11.700	E 147 45 38.425
3335.00	69.50	196.14	1977.15	2489.21	-2266.78	-1033.21	0.91	5736196.46	566303.65	S 38 31 12.545	E 147 45 38.118
3347.19	69.40	196.66	1981.43	2500.50	-2277.73	-1036.43	1.22	5736185.51	566300.43	S 38 31 12.901	E 147 45 37.989
Projected to TD 3364.00	69.50	196.70	1987.33	2516.07	-2292.81	-1040.95	0.19	5736170.44	566295.91	S 38 31 13.391	E 147 45 37.808

**Survey Type:** Definitive Survey

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

**Surveying Prog:**

<u>MD From ( m )</u>	<u>MD To ( m )</u>	<u>EOU Freq</u>	<u>Survey Tool Type</u>	<u>Borehole -&gt; Survey</u>
0.00	92.22	Act-Stns	SLB_MWD-STD-Depth Only	BMA A-22A ST -> BMA A-22A ST Final
92.22	3364.00	Act-Stns	SLB_MWD-STD	BMA A-22A ST -> BMA A-22A ST Final



**APPENDIX 1c**

**BREAM A22A**

**MD-TVD Survey Data Listing**

Report Date:	17 February 2006
Well:	Bream A22A
Structure / Slot:	NABORS Rig 453
TVD Reference Datum:	DrillSite Elevation
TVD Reference Elevation:	32.82 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' 58.909200", E 147 46 20.233200"
Location Grid N/E:	N 5738457.6564 m, E 567342.5298 m
Survey Azimuth Reference:	Grid North

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
0	0	360	0	32.82	0	0	5738457.64	567342.49
5	0	0	5	27.82	0	0	5738457.64	567342.49
10	0	0	10	22.82	0	0	5738457.64	567342.49
15	0	0	15	17.82	0	0	5738457.64	567342.49
20	0	0	20	12.82	0	0	5738457.64	567342.49
25	0	0	25	7.82	0	0	5738457.64	567342.49
30	0	0	30	2.82	0	0	5738457.64	567342.49
35	0	0	35	-2.18	0	0	5738457.64	567342.49
40	0	0	40	-7.18	0	0	5738457.64	567342.49
45	0	0	45	-12.18	0	0	5738457.64	567342.49
50	0	0	50	-17.18	0	0	5738457.64	567342.49
55	0	0	55	-22.18	0	0	5738457.64	567342.49
60	0	360	60	-27.18	0	0	5738457.64	567342.49
65	0.04	357.27	65	-32.18	0.01	0	5738457.65	567342.49
70	0.09	354.54	70	-37.18	0.02	-0.01	5738457.66	567342.49
75	0.13	351.81	75	-42.18	0.03	-0.01	5738457.67	567342.48
80	0.17	349.09	80	-47.18	0.04	-0.01	5738457.69	567342.48
85	0.21	346.36	85	-52.18	0.05	-0.01	5738457.7	567342.48
90	0.28	352.07	90	-57.18	0.06	-0.02	5738457.7	567342.48
95	0.53	51.4	95	-62.18	0.03	-0.01	5738457.67	567342.49
100	0.78	110.74	100	-67.18	0	0	5738457.64	567342.5
105	1.09	162	105	-72.18	-0.05	0.02	5738457.59	567342.51
110	1.76	162	110	-77.18	-0.22	0.08	5738457.42	567342.57
115	2.42	162	114.99	-82.17	-0.39	0.13	5738457.26	567342.62
120	3.09	162.09	119.99	-87.17	-0.57	0.19	5738457.07	567342.68
125	3.76	162.76	124.97	-92.15	-0.91	0.29	5738456.73	567342.78
130	4.42	163.42	129.96	-97.14	-1.24	0.39	5738456.4	567342.88
135	5.11	164	134.95	-102.13	-1.6	0.5	5738456.04	567342.99
140	5.95	164	139.92	-107.1	-2.13	0.65	5738455.52	567343.14
145	6.78	164	144.89	-112.07	-2.65	0.8	5738454.99	567343.29
150	7.57	164	149.86	-117.04	-3.19	0.95	5738454.45	567343.44
155	8.05	164.36	154.81	-121.99	-3.85	1.13	5738453.79	567343.62
160	8.39	166.99	159.75	-126.93	-4.6	1.26	5738453.05	567343.75
165	8.73	169.62	164.69	-131.87	-5.34	1.39	5738452.3	567343.88
170	9.07	172.25	169.63	-136.81	-6.09	1.51	5738451.56	567344
175	9.41	174.88	174.58	-141.76	-6.83	1.64	5738450.81	567344.13
180	9.5	177.04	179.51	-146.69	-7.64	1.7	5738450.01	567344.2
185	9.51	178.98	184.44	-151.62	-8.46	1.74	5738449.18	567344.23
190	9.61	180.53	189.37	-156.55	-9.3	1.73	5738448.35	567344.23
195	9.75	182.43	194.3	-161.48	-10.13	1.72	5738447.51	567344.21
200	10.14	186.54	199.22	-166.4	-11	1.63	5738446.64	567344.12
205	11.19	189.37	204.14	-171.32	-11.92	1.52	5738445.72	567344.01
210	13.55	189.65	209.03	-176.21	-12.95	1.34	5738444.69	567343.84
215	11.67	192.19	213.91	-181.09	-13.98	1.14	5738443.66	567343.63
220	12.17	192.96	218.81	-185.99	-14.98	0.91	5738442.66	567343.4
225	12.56	192.4	223.69	-190.87	-16.04	0.69	5738441.61	567343.18

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
230	12.91	191.35	228.57	-195.75	-17.11	0.46	5738440.54	567342.95
235	13.29	190.85	233.43	-200.61	-18.25	0.24	5738439.4	567342.73
240	13.68	190.54	238.29	-205.47	-19.41	0.02	5738438.23	567342.51
245	14.06	190.23	243.15	-210.33	-20.57	-0.19	5738437.07	567342.3
250	14.49	190.08	248	-215.18	-21.75	-0.41	5738435.89	567342.08
255	15.16	190.85	252.83	-220.01	-23.03	-0.65	5738434.62	567341.84
260	15.77	191.24	257.65	-224.83	-24.34	-0.9	5738433.3	567341.59
265	16.27	190.85	262.44	-229.62	-25.73	-1.16	5738431.91	567341.33
270	16.77	190.46	267.24	-234.42	-27.13	-1.43	5738430.51	567341.07
275	17.27	190.07	272.03	-239.21	-28.52	-1.69	5738429.12	567340.8
280	17.48	190.06	276.8	-243.98	-29.99	-1.96	5738427.65	567340.53
285	17.59	190.19	281.56	-248.74	-31.49	-2.23	5738426.15	567340.26
290	17.69	190.31	286.33	-253.51	-32.99	-2.5	5738424.66	567339.99
295	17.8	190.44	291.09	-258.27	-34.48	-2.77	5738423.16	567339.72
300	17.91	190.56	295.85	-263.03	-35.98	-3.05	5738421.67	567339.44
305	18.06	190.72	300.61	-267.79	-37.49	-3.33	5738420.16	567339.16
310	18.53	191.05	305.33	-272.51	-39.1	-3.66	5738418.54	567338.83
315	18.99	191.38	310.05	-277.23	-40.72	-3.99	5738416.93	567338.5
320	19.45	191.72	314.77	-281.95	-42.33	-4.32	5738415.31	567338.17
325	19.91	192.05	319.49	-286.67	-43.95	-4.66	5738413.7	567337.84
330	20.38	192.38	324.21	-291.39	-45.56	-4.99	5738412.08	567337.5
335	20.72	192.56	328.89	-296.07	-47.29	-5.37	5738410.35	567337.12
340	21.03	192.69	333.54	-300.72	-49.07	-5.78	5738408.58	567336.71
345	21.33	192.81	338.2	-305.38	-50.84	-6.18	5738406.8	567336.31
350	21.63	192.94	342.86	-310.04	-52.62	-6.59	5738405.03	567335.91
355	21.94	193.06	347.51	-314.69	-54.39	-6.99	5738403.25	567335.5
360	22.25	193.2	352.16	-319.34	-56.18	-7.4	5738401.46	567335.09
365	22.62	193.4	356.76	-323.94	-58.1	-7.87	5738399.55	567334.62
370	22.99	193.61	361.35	-328.53	-60.01	-8.34	5738397.63	567334.15
375	23.36	193.81	365.95	-333.13	-61.92	-8.81	5738395.72	567333.68
380	23.73	194.01	370.54	-337.72	-63.84	-9.27	5738393.81	567333.22
385	24.1	194.22	375.14	-342.32	-65.75	-9.74	5738391.89	567332.75
390	24.57	194.31	379.67	-346.85	-67.8	-10.26	5738389.85	567332.23
395	25.07	194.36	384.17	-351.35	-69.89	-10.8	5738387.75	567331.69
400	25.57	194.41	388.68	-355.86	-71.99	-11.34	5738385.65	567331.15
405	26.07	194.46	393.19	-360.37	-74.09	-11.88	5738383.56	567330.61
410	26.57	194.51	397.69	-364.87	-76.18	-12.42	5738381.46	567330.07
415	27.07	194.57	402.2	-369.38	-78.28	-12.96	5738379.37	567329.53
420	27.58	194.63	406.6	-373.78	-80.57	-13.56	5738377.07	567328.93
425	28.1	194.69	410.99	-378.17	-82.88	-14.17	5738374.76	567328.32
430	28.62	194.76	415.38	-382.56	-85.2	-14.78	5738372.45	567327.71
435	29.14	194.82	419.78	-386.96	-87.51	-15.39	5738370.14	567327.1
440	29.66	194.89	424.17	-391.35	-89.82	-16	5738367.83	567326.49
445	30.16	194.97	428.52	-395.7	-92.19	-16.63	5738365.45	567325.86
450	30.64	195.1	432.78	-399.96	-94.71	-17.32	5738362.94	567325.17
455	31.13	195.23	437.05	-404.23	-97.22	-18.01	5738360.42	567324.48
460	31.61	195.36	441.32	-408.5	-99.73	-18.7	5738357.91	567323.79
465	32.09	195.48	445.59	-412.77	-102.24	-19.39	5738355.4	567323.11
470	32.58	195.61	449.85	-417.03	-104.76	-20.07	5738352.89	567322.42
475	33.05	195.67	454.05	-421.23	-107.37	-20.8	5738350.28	567321.69
480	33.51	195.67	458.19	-425.37	-110.07	-21.56	5738347.58	567320.94
485	33.98	195.67	462.33	-429.51	-112.77	-22.31	5738344.88	567320.18
490	34.44	195.67	466.47	-433.65	-115.46	-23.07	5738342.18	567319.42
495	34.91	195.67	470.61	-437.79	-118.16	-23.83	5738339.48	567318.66
500	35.37	195.67	474.75	-441.93	-120.86	-24.58	5738336.78	567317.91
505	35.9	195.61	478.75	-445.93	-123.75	-25.38	5738333.89	567317.11
510	36.43	195.54	482.75	-449.93	-126.65	-26.19	5738331	567316.31
515	36.97	195.47	486.74	-453.92	-129.55	-26.99	5738328.1	567315.5

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
520	37.5	195.41	490.73	-457.91	-132.45	-27.79	5738325.2	567314.7
525	38.03	195.34	494.72	-461.9	-135.35	-28.59	5738322.3	567313.9
530	38.57	195.27	498.72	-465.9	-138.25	-29.39	5738319.4	567313.1
535	39.17	195.45	502.54	-469.72	-141.34	-30.27	5738316.3	567312.22
540	39.78	195.65	506.35	-473.53	-144.46	-31.15	5738313.19	567311.34
545	40.38	195.85	510.17	-477.35	-147.57	-32.04	5738310.08	567310.46
550	40.99	196.04	513.98	-481.16	-150.68	-32.92	5738306.97	567309.57
555	41.6	196.24	517.79	-484.97	-153.79	-33.8	5738303.86	567308.69
560	42.18	196.43	521.54	-488.72	-156.96	-34.72	5738300.68	567307.77
565	42.71	196.6	525.17	-492.35	-160.26	-35.72	5738297.39	567306.77
570	43.25	196.77	528.79	-495.97	-163.55	-36.72	5738294.09	567305.77
575	43.78	196.95	532.41	-499.59	-166.85	-37.72	5738290.8	567304.77
580	44.32	197.12	536.04	-503.22	-170.14	-38.72	5738287.5	567303.77
585	44.85	197.29	539.66	-506.84	-173.44	-39.73	5738284.2	567302.77
590	45.41	197.51	543.18	-510.36	-176.82	-40.79	5738280.82	567301.7
595	45.98	197.77	546.61	-513.79	-180.28	-41.92	5738277.37	567300.57
600	46.56	198.03	550.04	-517.22	-183.73	-43.05	5738273.91	567299.44
605	47.13	198.29	553.48	-520.66	-187.19	-44.18	5738270.46	567298.31
610	47.7	198.55	556.91	-524.09	-190.64	-45.31	5738267	567297.18
615	48.28	198.76	560.31	-527.49	-194.12	-46.45	5738263.52	567296.04
620	48.87	198.71	563.53	-530.71	-197.75	-47.67	5738259.9	567294.82
625	49.45	198.66	566.75	-533.93	-201.37	-48.89	5738256.27	567293.6
630	50.04	198.61	569.97	-537.15	-204.99	-50.11	5738252.65	567292.38
635	50.62	198.56	573.19	-540.37	-208.62	-51.33	5738249.03	567291.16
640	51.21	198.5	576.41	-543.59	-212.24	-52.55	5738245.4	567289.94
645	51.8	198.49	579.55	-546.73	-215.93	-53.79	5738241.72	567288.7
650	52.38	198.54	582.54	-549.72	-219.72	-55.07	5738237.92	567287.42
655	52.97	198.59	585.53	-552.71	-223.52	-56.35	5738234.12	567286.14
660	53.56	198.64	588.52	-555.7	-227.32	-57.63	5738230.32	567284.86
665	54.14	198.69	591.5	-558.68	-231.12	-58.91	5738226.52	567283.58
670	54.73	198.75	594.49	-561.67	-234.92	-60.2	5738222.73	567282.3
675	55.4	198.77	597.39	-564.57	-238.78	-61.5	5738218.87	567280.99
680	56.15	198.77	600.2	-567.38	-242.69	-62.83	5738214.95	567279.66
685	56.78	198.72	602.95	-570.13	-246.64	-64.17	5738211	567278.32
690	57.31	198.63	605.64	-572.82	-250.64	-65.51	5738207.01	567276.98
695	57.84	198.55	608.34	-575.52	-254.63	-66.86	5738203.02	567275.63
700	58.3	198.49	611.02	-578.2	-258.62	-68.21	5738199.02	567274.28
705	58.26	198.61	613.66	-580.84	-262.65	-69.58	5738195	567272.91
710	58.23	198.73	616.29	-583.47	-266.67	-70.95	5738190.98	567271.54
715	58.19	198.85	618.93	-586.11	-270.69	-72.32	5738186.95	567270.17
720	58.16	198.97	621.56	-588.74	-274.71	-73.69	5738182.93	567268.8
725	58.12	199.09	624.2	-591.38	-278.73	-75.06	5738178.91	567267.43
730	58.12	199.21	626.83	-594.01	-282.75	-76.45	5738174.89	567266.04
735	58.2	199.34	629.46	-596.64	-286.76	-77.87	5738170.88	567264.62
740	58.27	199.46	632.09	-599.27	-290.77	-79.29	5738166.87	567263.2
745	58.34	199.59	634.71	-601.89	-294.78	-80.71	5738162.86	567261.78
750	58.41	199.71	637.34	-604.52	-298.79	-82.13	5738158.85	567260.36
755	58.48	199.84	639.97	-607.15	-302.8	-83.56	5738154.84	567258.93
760	58.42	199.91	642.6	-609.78	-306.8	-85	5738150.85	567257.49
765	58.32	199.96	645.24	-612.42	-310.79	-86.46	5738146.85	567256.03
770	58.22	200.01	647.87	-615.05	-314.78	-87.91	5738142.86	567254.58
775	58.11	200.06	650.5	-617.68	-318.78	-89.37	5738138.87	567253.12
780	58.01	200.11	653.14	-620.32	-322.77	-90.82	5738134.88	567251.67
785	57.91	200.17	655.77	-622.95	-326.76	-92.28	5738130.88	567250.22
790	57.93	200.23	658.42	-625.6	-330.74	-93.75	5738126.91	567248.74
795	57.97	200.3	661.07	-628.25	-334.71	-95.23	5738122.93	567247.26
800	58	200.37	663.72	-630.9	-338.69	-96.7	5738118.96	567245.79
805	58.04	200.44	666.37	-633.55	-342.66	-98.18	5738114.98	567244.31

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
810	58.07	200.51	669.02	-636.2	-346.64	-99.65	5738111.01	567242.84
815	58.1	200.57	671.67	-638.85	-350.61	-101.13	5738107.03	567241.36
820	58.12	200.57	674.31	-641.49	-354.59	-102.63	5738103.05	567239.87
825	58.14	200.57	676.95	-644.13	-358.57	-104.12	5738099.08	567238.37
830	58.15	200.57	679.58	-646.76	-362.54	-105.61	5738095.1	567236.88
835	58.17	200.57	682.22	-649.4	-366.52	-107.1	5738091.13	567235.39
840	58.19	200.57	684.86	-652.04	-370.49	-108.59	5738087.15	567233.9
845	58.2	200.55	687.5	-654.68	-374.47	-110.08	5738083.17	567232.41
850	58.2	200.48	690.13	-657.31	-378.46	-111.56	5738079.19	567230.93
855	58.2	200.41	692.77	-659.95	-382.44	-113.04	5738075.2	567229.45
860	58.2	200.34	695.4	-662.58	-386.42	-114.52	5738071.22	567227.97
865	58.2	200.27	698.04	-665.22	-390.41	-116	5738067.24	567226.49
870	58.2	200.2	700.67	-667.85	-394.39	-117.48	5738063.25	567225.01
875	58.17	200.28	703.31	-670.49	-398.37	-118.97	5738059.28	567223.52
880	58.12	200.47	705.96	-673.14	-402.34	-120.47	5738055.31	567222.02
885	58.06	200.67	708.61	-675.79	-406.3	-121.97	5738051.34	567220.52
890	58.01	200.86	711.25	-678.43	-410.27	-123.47	5738047.37	567219.02
895	57.96	201.06	713.9	-681.08	-414.24	-124.97	5738043.4	567217.52
900	57.9	201.26	716.54	-683.72	-418.21	-126.47	5738039.44	567216.02
905	57.92	201.27	719.2	-686.38	-422.16	-128.01	5738035.49	567214.48
910	57.93	201.27	721.85	-689.03	-426.11	-129.55	5738031.54	567212.95
915	57.95	201.27	724.5	-691.68	-430.06	-131.08	5738027.59	567211.41
920	57.97	201.27	727.16	-694.34	-434.01	-132.62	5738023.64	567209.87
925	57.99	201.27	729.81	-696.99	-437.95	-134.16	5738019.69	567208.33
930	58	201.27	732.46	-699.64	-441.9	-135.69	5738015.74	567206.8
935	57.98	201.27	735.12	-702.3	-445.85	-137.23	5738011.79	567205.26
940	57.96	201.27	737.77	-704.95	-449.8	-138.77	5738007.84	567203.72
945	57.95	201.27	740.42	-707.6	-453.75	-140.31	5738003.89	567202.18
950	57.93	201.27	743.08	-710.26	-457.7	-141.84	5737999.94	567200.65
955	57.91	201.27	745.73	-712.91	-461.65	-143.38	5737995.99	567199.11
960	57.89	201.23	748.39	-715.57	-465.6	-144.91	5737992.04	567197.58
965	57.85	201.1	751.05	-718.23	-469.55	-146.42	5737988.09	567196.07
970	57.82	200.98	753.71	-720.89	-473.5	-147.93	5737984.14	567194.56
975	57.78	200.85	756.38	-723.56	-477.46	-149.44	5737980.19	567193.05
980	57.75	200.73	759.04	-726.22	-481.41	-150.95	5737976.24	567191.54
985	57.71	200.6	761.71	-728.89	-485.36	-152.46	5737972.28	567190.03
990	57.7	200.66	764.38	-731.56	-489.31	-153.97	5737968.33	567188.52
995	57.7	200.78	767.05	-734.23	-493.26	-155.48	5737964.39	567187.01
1000	57.7	200.9	769.72	-736.9	-497.2	-156.99	5737960.44	567185.5
1005	57.7	201.02	772.39	-739.57	-501.15	-158.5	5737956.49	567183.99
1010	57.7	201.14	775.07	-742.25	-505.1	-160.01	5737952.54	567182.48
1015	57.7	201.26	777.74	-744.92	-509.05	-161.52	5737948.6	567180.97
1020	57.68	201.27	780.41	-747.59	-512.98	-163.05	5737944.66	567179.44
1025	57.67	201.27	783.09	-750.27	-516.92	-164.58	5737940.72	567177.91
1030	57.65	201.27	785.76	-752.94	-520.86	-166.11	5737936.79	567176.38
1035	57.63	201.27	788.44	-755.62	-524.79	-167.65	5737932.85	567174.85
1040	57.61	201.27	791.11	-758.29	-528.73	-169.18	5737928.91	567173.31
1045	57.6	201.28	793.79	-760.97	-532.66	-170.71	5737924.98	567171.78
1050	57.58	201.33	796.47	-763.65	-536.59	-172.25	5737921.05	567170.24
1055	57.56	201.38	799.16	-766.34	-540.52	-173.79	5737917.12	567168.7
1060	57.54	201.44	801.84	-769.02	-544.45	-175.33	5737913.2	567167.16
1065	57.53	201.49	804.52	-771.7	-548.38	-176.88	5737909.27	567165.62
1070	57.51	201.55	807.2	-774.38	-552.3	-178.42	5737905.34	567164.08
1075	57.46	201.57	809.9	-777.08	-556.22	-179.96	5737901.42	567162.53
1080	57.39	201.57	812.6	-779.78	-560.14	-181.51	5737897.51	567160.98
1085	57.33	201.57	815.3	-782.48	-564.05	-183.05	5737893.59	567159.44
1090	57.26	201.57	818	-785.18	-567.96	-184.6	5737889.68	567157.89
1095	57.19	201.57	820.7	-787.88	-571.88	-186.15	5737885.77	567156.34

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1100	57.12	201.57	823.4	-790.58	-575.79	-187.69	5737881.86	567154.8
1105	57.07	201.62	826.12	-793.3	-579.69	-189.25	5737877.96	567153.24
1110	57.04	201.69	828.84	-796.02	-583.58	-190.8	5737874.06	567151.69
1115	57.01	201.76	831.57	-798.75	-587.48	-192.36	5737870.17	567150.13
1120	56.97	201.83	834.29	-801.47	-591.37	-193.91	5737866.27	567148.58
1125	56.94	201.9	837.01	-804.19	-595.26	-195.47	5737862.38	567147.02
1130	56.9	201.97	839.74	-806.92	-599.16	-197.02	5737858.48	567145.47
1135	56.88	201.91	842.47	-809.65	-603.05	-198.58	5737854.6	567143.92
1140	56.87	201.84	845.2	-812.38	-606.93	-200.13	5737850.71	567142.36
1145	56.85	201.77	847.94	-815.12	-610.82	-201.68	5737846.82	567140.81
1150	56.83	201.71	850.67	-817.85	-614.71	-203.23	5737842.93	567139.26
1155	56.82	201.64	853.41	-820.59	-618.6	-204.79	5737839.05	567137.7
1160	56.8	201.57	856.14	-823.32	-622.48	-206.34	5737835.16	567136.15
1165	56.78	201.69	858.88	-826.06	-626.36	-207.9	5737831.28	567134.59
1170	56.77	201.81	861.62	-828.8	-630.24	-209.46	5737827.4	567133.03
1175	56.75	201.94	864.36	-831.54	-634.12	-211.02	5737823.52	567131.47
1180	56.73	202.06	867.11	-834.29	-638	-212.58	5737819.64	567129.91
1185	56.71	202.19	869.85	-837.03	-641.88	-214.14	5737815.76	567128.35
1190	56.71	202.25	872.59	-839.77	-645.76	-215.71	5737811.88	567126.78
1195	56.72	202.2	875.33	-842.51	-649.63	-217.28	5737808.01	567125.21
1200	56.74	202.15	878.07	-845.25	-653.51	-218.86	5737804.14	567123.63
1205	56.76	202.1	880.81	-847.99	-657.38	-220.43	5737800.26	567122.06
1210	56.77	202.05	883.56	-850.74	-661.25	-222.01	5737796.39	567120.48
1215	56.79	201.99	886.3	-853.48	-665.13	-223.58	5737792.52	567118.91
1220	56.82	201.97	889.03	-856.21	-669.01	-225.15	5737788.64	567117.34
1225	56.85	201.97	891.76	-858.94	-672.89	-226.72	5737784.75	567115.77
1230	56.89	201.97	894.49	-861.67	-676.77	-228.29	5737780.87	567114.21
1235	56.93	201.97	897.22	-864.4	-680.66	-229.85	5737776.98	567112.64
1240	56.96	201.97	899.95	-867.13	-684.54	-231.42	5737773.1	567111.07
1245	57	201.97	902.68	-869.86	-688.43	-232.99	5737769.22	567109.5
1250	56.95	202.08	905.42	-872.6	-692.3	-234.58	5737765.34	567107.92
1255	56.9	202.2	908.15	-875.33	-696.17	-236.16	5737761.47	567106.33
1260	56.85	202.32	910.89	-878.07	-700.05	-237.75	5737757.6	567104.74
1265	56.8	202.45	913.62	-880.8	-703.92	-239.34	5737753.72	567103.15
1270	56.74	202.57	916.36	-883.54	-707.79	-240.93	5737749.85	567101.56
1275	56.69	202.66	919.09	-886.27	-711.66	-242.52	5737745.98	567099.97
1280	56.64	202.59	921.85	-889.03	-715.52	-244.12	5737742.13	567098.37
1285	56.59	202.52	924.6	-891.78	-719.37	-245.71	5737738.27	567096.78
1290	56.54	202.45	927.36	-894.54	-723.23	-247.31	5737734.42	567095.18
1295	56.49	202.38	930.12	-897.3	-727.08	-248.9	5737730.56	567093.59
1300	56.43	202.32	932.87	-900.05	-730.94	-250.5	5737726.71	567091.99
1305	56.38	202.37	935.63	-902.81	-734.79	-252.09	5737722.85	567090.4
1310	56.3	202.65	938.4	-905.58	-738.64	-253.68	5737719.01	567088.81
1315	56.26	202.59	941.19	-908.37	-742.48	-255.27	5737715.17	567087.22
1320	56.22	202.5	943.97	-911.15	-746.31	-256.86	5737711.33	567085.63
1325	56.17	202.41	946.75	-913.93	-750.15	-258.45	5737707.49	567084.05
1330	56.13	202.33	949.53	-916.71	-753.99	-260.03	5737703.65	567082.46
1335	56.06	202.32	952.33	-919.51	-757.82	-261.63	5737699.83	567080.86
1340	55.93	202.46	955.16	-922.34	-761.61	-263.24	5737696.03	567079.25
1345	55.81	202.61	957.99	-925.17	-765.41	-264.84	5737692.24	567077.65
1350	55.68	202.76	960.82	-928	-769.2	-266.45	5737688.44	567076.04
1355	55.56	202.9	963.66	-930.84	-772.99	-268.06	5737684.65	567074.43
1360	55.43	203.05	966.49	-933.67	-776.79	-269.67	5737680.86	567072.82
1365	55.31	203.19	969.32	-936.5	-780.58	-271.27	5737677.06	567071.22
1370	55.18	203.34	972.15	-939.33	-784.37	-272.88	5737673.27	567069.61
1375	55.06	203.49	974.98	-942.16	-788.17	-274.49	5737669.48	567068
1380	54.93	203.63	977.82	-945	-791.96	-276.1	5737665.68	567066.39
1385	54.9	203.83	980.68	-947.86	-795.71	-277.76	5737661.93	567064.73

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1390	54.9	204.04	983.56	-950.74	-799.44	-279.43	5737658.2	567063.06
1395	54.9	204.25	986.43	-953.61	-803.17	-281.11	5737654.47	567061.38
1400	54.9	204.46	989.31	-956.49	-806.9	-282.79	5737650.74	567059.7
1405	54.9	204.67	992.18	-959.36	-810.63	-284.47	5737647.01	567058.02
1410	54.84	204.9	995.07	-962.25	-814.34	-286.19	5737643.31	567056.3
1415	54.74	205.14	997.96	-965.14	-818.01	-287.94	5737639.63	567054.55
1420	54.64	205.38	1000.86	-968.04	-821.69	-289.69	5737635.95	567052.8
1425	54.53	205.62	1003.76	-970.94	-825.37	-291.44	5737632.27	567051.05
1430	54.43	205.86	1006.65	-973.83	-829.05	-293.2	5737628.59	567049.29
1435	54.33	206.11	1009.55	-976.73	-832.73	-294.95	5737624.91	567047.54
1440	54.34	206.31	1012.45	-979.63	-836.38	-296.76	5737621.27	567045.73
1445	54.39	206.5	1015.36	-982.54	-840.01	-298.59	5737617.63	567043.9
1450	54.44	206.69	1018.27	-985.45	-843.64	-300.42	5737614	567042.07
1455	54.49	206.88	1021.18	-988.36	-847.28	-302.25	5737610.36	567040.25
1460	54.54	207.07	1024.08	-991.26	-850.91	-304.08	5737606.73	567038.42
1465	54.6	207.26	1026.99	-994.17	-854.55	-305.9	5737603.1	567036.59
1470	54.28	207.16	1029.95	-997.13	-858.14	-307.73	5737599.51	567034.76
1475	53.93	207.04	1032.92	-1000.1	-861.72	-309.55	5737595.92	567032.94
1480	53.59	206.92	1035.89	-1003.07	-865.31	-311.37	5737592.33	567031.12
1485	53.24	206.79	1038.85	-1006.03	-868.9	-313.19	5737588.74	567029.3
1490	52.9	206.67	1041.82	-1009	-872.49	-315.02	5737585.16	567027.48
1495	52.67	206.59	1044.78	-1011.96	-876.08	-316.84	5737581.56	567025.65
1500	53.21	206.77	1047.71	-1014.89	-879.69	-318.69	5737577.96	567023.81
1505	53.74	206.94	1050.64	-1017.82	-883.29	-320.53	5737574.35	567021.96
1510	54.28	207.11	1053.57	-1020.75	-886.9	-322.38	5737570.74	567020.12
1515	54.81	207.28	1056.49	-1023.67	-890.51	-324.22	5737567.13	567018.27
1520	55.35	207.46	1059.42	-1026.6	-894.12	-326.06	5737563.52	567016.43
1525	55.79	207.63	1062.29	-1029.47	-897.75	-327.95	5737559.89	567014.54
1530	56.07	207.82	1065.05	-1032.23	-901.43	-329.91	5737556.22	567012.58
1535	56.34	208.01	1067.81	-1034.99	-905.1	-331.88	5737552.54	567010.61
1540	56.62	208.2	1070.57	-1037.75	-908.78	-333.85	5737548.86	567008.65
1545	56.9	208.39	1073.33	-1040.51	-912.46	-335.81	5737545.19	567006.68
1550	57.17	208.58	1076.09	-1043.27	-916.13	-337.78	5737541.51	567004.72
1555	57.35	208.73	1078.81	-1045.99	-919.82	-339.78	5737537.83	567002.71
1560	57.43	208.86	1081.49	-1048.67	-923.51	-341.83	5737534.14	567000.66
1565	57.52	208.98	1084.18	-1051.36	-927.2	-343.88	5737530.45	566998.61
1570	57.6	209.1	1086.86	-1054.04	-930.89	-345.93	5737526.76	566996.57
1575	57.69	209.22	1089.54	-1056.72	-934.58	-347.97	5737523.07	566994.52
1580	57.78	209.34	1092.22	-1059.4	-938.27	-350.02	5737519.38	566992.47
1585	57.72	209.41	1094.91	-1062.09	-941.94	-352.09	5737515.7	566990.4
1590	57.62	209.46	1097.6	-1064.78	-945.61	-354.17	5737512.03	566988.32
1595	57.52	209.51	1100.29	-1067.47	-949.28	-356.24	5737508.37	566986.25
1600	57.41	209.56	1102.97	-1070.15	-952.95	-358.32	5737504.7	566984.17
1605	57.31	209.61	1105.66	-1072.84	-956.62	-360.4	5737501.03	566982.09
1610	57.21	209.66	1108.35	-1075.53	-960.29	-362.48	5737497.36	566980.01
1615	57.24	209.63	1111.04	-1078.22	-963.95	-364.55	5737493.69	566977.94
1620	57.31	209.58	1113.73	-1080.91	-967.62	-366.63	5737490.03	566975.86
1625	57.39	209.52	1116.43	-1083.61	-971.28	-368.7	5737486.36	566973.79
1630	57.46	209.47	1119.12	-1086.3	-974.95	-370.78	5737482.7	566971.71
1635	57.54	209.42	1121.82	-1089	-978.61	-372.85	5737479.03	566969.64
1640	57.58	209.38	1124.51	-1091.69	-982.28	-374.93	5737475.37	566967.56
1645	57.44	209.43	1127.22	-1094.4	-985.93	-377	5737471.71	566965.49
1650	57.29	209.48	1129.93	-1097.11	-989.59	-379.07	5737468.05	566963.42
1655	57.15	209.54	1132.64	-1099.82	-993.25	-381.14	5737464.4	566961.35
1660	57.01	209.59	1135.35	-1102.53	-996.91	-383.21	5737460.74	566959.28
1665	56.87	209.65	1138.06	-1105.24	-1000.56	-385.28	5737457.08	566957.21
1670	56.82	209.71	1140.78	-1107.96	-1004.21	-387.36	5737453.44	566955.13
1675	56.85	209.78	1143.51	-1110.69	-1007.84	-389.45	5737449.81	566953.04



MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1680	56.89	209.84	1146.24	-1113.42	-1011.47	-391.53	5737446.17	566950.96
1685	56.92	209.91	1148.97	-1116.15	-1015.1	-393.62	5737442.54	566948.87
1690	56.96	209.98	1151.7	-1118.88	-1018.73	-395.71	5737438.91	566946.79
1695	56.99	210.05	1154.43	-1121.61	-1022.37	-397.79	5737435.28	566944.7
1700	56.91	210.07	1157.17	-1124.35	-1025.99	-399.88	5737431.66	566942.61
1705	56.79	210.07	1159.92	-1127.1	-1029.6	-401.98	5737428.04	566940.52
1710	56.67	210.07	1162.67	-1129.85	-1033.21	-404.07	5737424.43	566938.42
1715	56.55	210.07	1165.42	-1132.6	-1036.83	-406.16	5737420.81	566936.33
1720	56.43	210.07	1168.17	-1135.35	-1040.44	-408.25	5737417.2	566934.24
1725	56.31	210.07	1170.92	-1138.1	-1044.06	-410.35	5737413.59	566932.14
1730	56.23	210.12	1173.7	-1140.88	-1047.65	-412.44	5737410	566930.06
1735	56.16	210.18	1176.49	-1143.67	-1051.23	-414.52	5737406.41	566927.97
1740	56.08	210.23	1179.28	-1146.46	-1054.82	-416.61	5737402.83	566925.88
1745	56.01	210.29	1182.07	-1149.25	-1058.4	-418.7	5737399.24	566923.79
1750	55.93	210.34	1184.86	-1152.04	-1061.99	-420.79	5737395.65	566921.7
1755	55.95	210.37	1187.65	-1154.83	-1065.57	-422.88	5737392.07	566919.61
1760	56.03	210.37	1190.43	-1157.61	-1069.16	-424.98	5737388.49	566917.51
1765	56.12	210.37	1193.22	-1160.4	-1072.74	-427.08	5737384.9	566915.41
1770	56.2	210.37	1196	-1163.18	-1076.32	-429.18	5737381.32	566913.31
1775	56.29	210.37	1198.79	-1165.97	-1079.91	-431.28	5737377.74	566911.21
1780	56.38	210.37	1201.57	-1168.75	-1083.49	-433.38	5737374.16	566909.11
1785	56.44	210.45	1204.33	-1171.51	-1087.08	-435.51	5737370.57	566906.99
1790	56.51	210.55	1207.08	-1174.26	-1090.66	-437.64	5737366.98	566904.85
1795	56.57	210.66	1209.84	-1177.02	-1094.25	-439.77	5737363.39	566902.72
1800	56.63	210.77	1212.59	-1179.77	-1097.84	-441.9	5737359.8	566900.59
1805	56.69	210.87	1215.34	-1182.52	-1101.43	-444.04	5737356.21	566898.46
1810	56.75	210.98	1218.09	-1185.27	-1105.02	-446.17	5737352.63	566896.32
1815	56.8	211.06	1220.84	-1188.02	-1108.61	-448.3	5737349.04	566894.19
1820	56.82	211.01	1223.58	-1190.76	-1112.2	-450.45	5737345.45	566892.04
1825	56.84	210.96	1226.31	-1193.49	-1115.79	-452.6	5737341.85	566889.89
1830	56.85	210.91	1229.05	-1196.23	-1119.38	-454.76	5737338.26	566887.74
1835	56.87	210.86	1231.78	-1198.96	-1122.97	-456.91	5737334.67	566885.58
1840	56.89	210.8	1234.51	-1201.69	-1126.56	-459.06	5737331.08	566883.43
1845	56.89	210.79	1237.25	-1204.43	-1130.15	-461.21	5737327.49	566881.28
1850	56.88	210.84	1239.98	-1207.16	-1133.74	-463.36	5737323.9	566879.13
1855	56.86	210.9	1242.72	-1209.9	-1137.34	-465.51	5737320.31	566876.98
1860	56.84	210.95	1245.45	-1212.63	-1140.93	-467.66	5737316.72	566874.83
1865	56.82	211	1248.19	-1215.37	-1144.52	-469.81	5737313.12	566872.68
1870	56.8	211.06	1250.92	-1218.1	-1148.11	-471.96	5737309.53	566870.53
1875	56.79	211.07	1253.66	-1220.84	-1151.69	-474.12	5737305.95	566868.37
1880	56.77	211.07	1256.4	-1223.58	-1155.28	-476.28	5737302.37	566866.21
1885	56.75	211.07	1259.14	-1226.32	-1158.86	-478.44	5737298.79	566864.06
1890	56.74	211.07	1261.88	-1229.06	-1162.44	-480.59	5737295.2	566861.9
1895	56.72	211.07	1264.63	-1231.81	-1166.02	-482.75	5737291.62	566859.74
1900	56.7	211.07	1267.37	-1234.55	-1169.6	-484.91	5737288.04	566857.58
1905	56.65	211.07	1270.12	-1237.3	-1173.18	-487.06	5737284.47	566855.43
1910	56.6	211.07	1272.88	-1240.06	-1176.75	-489.22	5737280.89	566853.27
1915	56.55	211.07	1275.63	-1242.81	-1180.32	-491.37	5737277.32	566851.12
1920	56.5	211.07	1278.39	-1245.57	-1183.9	-493.52	5737273.75	566848.97
1925	56.44	211.07	1281.15	-1248.33	-1187.47	-495.68	5737270.17	566846.82
1930	56.4	211.07	1283.9	-1251.08	-1191.04	-497.83	5737266.6	566844.66
1935	56.38	211.07	1286.67	-1253.85	-1194.61	-499.98	5737263.04	566842.52
1940	56.36	211.07	1289.45	-1256.63	-1198.17	-502.12	5737259.47	566840.37
1945	56.35	211.07	1292.22	-1259.4	-1201.74	-504.27	5737255.91	566838.22
1950	56.33	211.07	1294.99	-1262.17	-1205.3	-506.42	5737252.34	566836.07
1955	56.31	211.07	1297.76	-1264.94	-1208.87	-508.57	5737248.78	566833.92
1960	56.29	211.07	1300.53	-1267.71	-1212.43	-510.71	5737245.21	566831.78
1965	56.28	211.07	1303.31	-1270.49	-1215.99	-512.86	5737241.65	566829.63

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1970	56.26	211.07	1306.09	-1273.27	-1219.55	-515.01	5737238.09	566827.49
1975	56.24	211.07	1308.86	-1276.04	-1223.11	-517.15	5737234.53	566825.34
1980	56.22	211.07	1311.64	-1278.82	-1226.67	-519.3	5737230.97	566823.19
1985	56.2	211.07	1314.42	-1281.6	-1230.23	-521.44	5737227.41	566821.05
1990	56.16	211.12	1317.21	-1284.39	-1233.78	-523.59	5737223.86	566818.9
1995	56.11	211.19	1320	-1287.18	-1237.33	-525.75	5737220.31	566816.74
2000	56.06	211.26	1322.79	-1289.97	-1240.87	-527.9	5737216.77	566814.59
2005	56.01	211.33	1325.58	-1292.76	-1244.42	-530.05	5737213.22	566812.44
2010	55.96	211.4	1328.38	-1295.56	-1247.96	-532.2	5737209.68	566810.29
2015	55.9	211.47	1331.17	-1298.35	-1251.51	-534.36	5737206.13	566808.13
2020	55.83	211.4	1333.99	-1301.17	-1255.04	-536.5	5737202.6	566805.99
2025	55.76	211.33	1336.8	-1303.98	-1258.57	-538.65	5737199.07	566803.84
2030	55.69	211.26	1339.62	-1306.8	-1262.1	-540.79	5737195.54	566801.7
2035	55.62	211.19	1342.44	-1309.62	-1265.63	-542.93	5737192.01	566799.56
2040	55.55	211.12	1345.26	-1312.44	-1269.16	-545.08	5737188.48	566797.41
2045	55.48	211.11	1348.08	-1315.26	-1272.69	-547.22	5737184.96	566795.27
2050	55.43	211.23	1350.92	-1318.1	-1276.2	-549.37	5737181.45	566793.12
2055	55.38	211.35	1353.77	-1320.95	-1279.71	-551.51	5737177.94	566790.98
2060	55.33	211.47	1356.61	-1323.79	-1283.22	-553.66	5737174.43	566788.84
2065	55.28	211.59	1359.45	-1326.63	-1286.73	-555.8	5737170.92	566786.69
2070	55.22	211.71	1362.3	-1329.48	-1290.24	-557.94	5737167.41	566784.55
2075	55.17	211.81	1365.15	-1332.33	-1293.73	-560.1	5737163.91	566782.39
2080	55.12	211.88	1368.01	-1335.19	-1297.21	-562.27	5737160.44	566780.22
2085	55.07	211.94	1370.88	-1338.06	-1300.68	-564.44	5737156.96	566778.05
2090	55.02	212.01	1373.74	-1340.92	-1304.16	-566.61	5737153.48	566775.88
2095	54.97	212.08	1376.61	-1343.79	-1307.63	-568.78	5737150.01	566773.71
2100	54.91	212.15	1379.47	-1346.65	-1311.11	-570.95	5737146.53	566771.54
2105	54.85	212.12	1382.35	-1349.53	-1314.58	-573.11	5737143.07	566769.38
2110	54.78	212.05	1385.24	-1352.42	-1318.04	-575.27	5737139.6	566767.22
2115	54.7	211.97	1388.13	-1355.31	-1321.5	-577.44	5737136.14	566765.06
2120	54.63	211.9	1391.02	-1358.2	-1324.96	-579.6	5737132.68	566762.9
2125	54.56	211.83	1393.91	-1361.09	-1328.42	-581.76	5737129.22	566760.73
2130	54.5	211.79	1396.8	-1363.98	-1331.88	-583.92	5737125.76	566758.57
2135	54.52	211.91	1399.7	-1366.88	-1335.33	-586.08	5737122.31	566756.41
2140	54.54	212.04	1402.6	-1369.78	-1338.78	-588.25	5737118.86	566754.24
2145	54.56	212.16	1405.5	-1372.68	-1342.23	-590.42	5737115.41	566752.08
2150	54.57	212.29	1408.4	-1375.58	-1345.68	-592.58	5737111.96	566749.91
2155	54.59	212.41	1411.3	-1378.48	-1349.13	-594.75	5737108.51	566747.74
2160	54.62	212.51	1414.2	-1381.38	-1352.57	-596.93	5737105.07	566745.56
2165	54.65	212.58	1417.09	-1384.27	-1356.01	-599.13	5737101.63	566743.36
2170	54.69	212.65	1419.98	-1387.16	-1359.44	-601.34	5737098.2	566741.15
2175	54.73	212.72	1422.86	-1390.04	-1362.88	-603.54	5737094.76	566738.95
2180	54.76	212.79	1425.75	-1392.93	-1366.31	-605.74	5737091.33	566736.75
2185	54.8	212.87	1428.64	-1395.82	-1369.75	-607.95	5737087.89	566734.55
2190	54.82	212.92	1431.52	-1398.7	-1373.18	-610.17	5737084.47	566732.32
2195	54.83	212.97	1434.4	-1401.58	-1376.61	-612.4	5737081.04	566730.09
2200	54.85	213.02	1437.28	-1404.46	-1380.03	-614.63	5737077.61	566727.86
2205	54.87	213.07	1440.16	-1407.34	-1383.46	-616.86	5737074.18	566725.64
2210	54.89	213.13	1443.04	-1410.22	-1386.89	-619.08	5737070.75	566723.41
2215	54.9	213.17	1445.92	-1413.1	-1390.32	-621.31	5737067.33	566721.18
2220	54.88	213.17	1448.79	-1415.97	-1393.74	-623.55	5737063.9	566718.94
2225	54.86	213.17	1451.67	-1418.85	-1397.16	-625.79	5737060.48	566716.71
2230	54.84	213.17	1454.55	-1421.73	-1400.58	-628.02	5737057.06	566714.47
2235	54.83	213.17	1457.43	-1424.61	-1404.01	-630.26	5737053.64	566712.23
2240	54.81	213.17	1460.31	-1427.49	-1407.43	-632.5	5737050.22	566710
2245	54.77	213.17	1463.19	-1430.37	-1410.85	-634.73	5737046.8	566707.76
2250	54.72	213.17	1466.09	-1433.27	-1414.26	-636.96	5737043.38	566705.53
2255	54.67	213.17	1468.98	-1436.16	-1417.67	-639.19	5737039.97	566703.3

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2260	54.62	213.17	1471.87	-1439.05	-1421.09	-641.42	5737036.56	566701.07
2265	54.57	213.17	1474.77	-1441.95	-1424.5	-643.65	5737033.14	566698.84
2270	54.51	213.17	1477.66	-1444.84	-1427.91	-645.89	5737029.73	566696.61
2275	54.5	213.31	1480.56	-1447.74	-1431.31	-648.14	5737026.34	566694.35
2280	54.5	213.5	1483.46	-1450.64	-1434.69	-650.4	5737022.95	566692.09
2285	54.5	213.69	1486.37	-1453.55	-1438.08	-652.66	5737019.57	566689.83
2290	54.5	213.88	1489.27	-1456.45	-1441.46	-654.92	5737016.18	566687.57
2295	54.5	214.07	1492.17	-1459.35	-1444.85	-657.18	5737012.79	566685.31
2300	54.5	214.26	1495.08	-1462.26	-1448.23	-659.44	5737009.41	566683.05
2305	54.53	214.27	1497.98	-1465.16	-1451.6	-661.73	5737006.04	566680.76
2310	54.57	214.27	1500.87	-1468.05	-1454.97	-664.02	5737002.67	566678.47
2315	54.6	214.27	1503.77	-1470.95	-1458.34	-666.32	5736999.3	566676.17
2320	54.64	214.27	1506.66	-1473.84	-1461.71	-668.61	5736995.94	566673.88
2325	54.67	214.27	1509.56	-1476.74	-1465.08	-670.91	5736992.57	566671.58
2330	54.7	214.28	1512.45	-1479.63	-1468.44	-673.21	5736989.2	566669.29
2335	54.74	214.33	1515.34	-1482.52	-1471.81	-675.52	5736985.83	566666.98
2340	54.78	214.38	1518.22	-1485.4	-1475.18	-677.82	5736982.46	566664.67
2345	54.81	214.44	1521.1	-1488.28	-1478.55	-680.13	5736979.09	566662.36
2350	54.85	214.49	1523.98	-1491.16	-1481.93	-682.44	5736975.72	566660.05
2355	54.88	214.55	1526.87	-1494.05	-1485.3	-684.75	5736972.35	566657.74
2360	54.94	214.61	1529.74	-1496.92	-1488.66	-687.08	5736968.98	566655.41
2365	55.01	214.68	1532.6	-1499.78	-1492.03	-689.42	5736965.61	566653.07
2370	55.07	214.74	1535.46	-1502.64	-1495.4	-691.76	5736962.24	566650.74
2375	55.14	214.81	1538.32	-1505.5	-1498.77	-694.09	5736958.87	566648.4
2380	55.21	214.88	1541.18	-1508.36	-1502.14	-696.43	5736955.5	566646.06
2385	55.28	214.95	1544.04	-1511.22	-1505.51	-698.77	5736952.14	566643.72
2390	55.33	214.97	1546.88	-1514.06	-1508.88	-701.13	5736948.76	566641.37
2395	55.36	214.97	1549.72	-1516.9	-1512.25	-703.48	5736945.39	566639.01
2400	55.4	214.97	1552.56	-1519.74	-1515.62	-705.84	5736942.02	566636.65
2405	55.43	214.97	1555.4	-1522.58	-1519	-708.2	5736938.65	566634.29
2410	55.47	214.97	1558.24	-1525.42	-1522.37	-710.56	5736935.27	566631.93
2415	55.51	214.98	1561.08	-1528.26	-1525.74	-712.92	5736931.9	566629.57
2420	55.56	215.03	1563.9	-1531.08	-1529.12	-715.3	5736928.52	566627.19
2425	55.61	215.08	1566.72	-1533.9	-1532.5	-717.67	5736925.15	566624.82
2430	55.66	215.13	1569.54	-1536.72	-1535.87	-720.05	5736921.77	566622.44
2435	55.71	215.18	1572.36	-1539.54	-1539.25	-722.42	5736918.39	566620.07
2440	55.77	215.24	1575.18	-1542.36	-1542.63	-724.8	5736915.02	566617.7
2445	55.8	215.29	1578	-1545.18	-1546	-727.18	5736911.64	566615.31
2450	55.8	215.36	1580.81	-1547.99	-1549.37	-729.58	5736908.28	566612.91
2455	55.8	215.43	1583.62	-1550.8	-1552.73	-731.98	5736904.91	566610.51
2460	55.8	215.5	1586.43	-1553.61	-1556.1	-734.38	5736901.54	566608.11
2465	55.8	215.57	1589.24	-1556.42	-1559.47	-736.78	5736898.17	566605.71
2470	55.8	215.64	1592.05	-1559.23	-1562.84	-739.18	5736894.81	566603.31
2475	55.82	215.71	1594.86	-1562.04	-1566.2	-741.59	5736891.44	566600.9
2480	55.85	215.78	1597.66	-1564.84	-1569.55	-744.02	5736888.09	566598.47
2485	55.89	215.85	1600.47	-1567.65	-1572.91	-746.44	5736884.73	566596.05
2490	55.93	215.92	1603.27	-1570.45	-1576.26	-748.87	5736881.38	566593.62
2495	55.96	215.99	1606.07	-1573.25	-1579.62	-751.3	5736878.02	566591.2
2500	56	216.07	1608.88	-1576.06	-1582.98	-753.72	5736874.67	566588.77
2505	56.03	216.12	1611.67	-1578.85	-1586.32	-756.17	5736871.32	566586.32
2510	56.07	216.17	1614.46	-1581.64	-1589.67	-758.62	5736867.97	566583.87
2515	56.1	216.22	1617.24	-1584.42	-1593.02	-761.08	5736864.62	566581.41
2520	56.14	216.27	1620.03	-1587.21	-1596.37	-763.53	5736861.28	566578.96
2525	56.17	216.33	1622.82	-1590	-1599.72	-765.98	5736857.93	566576.51
2530	56.2	216.38	1625.61	-1592.79	-1603.06	-768.44	5736854.58	566574.05
2535	56.22	216.45	1628.39	-1595.57	-1606.4	-770.91	5736851.24	566571.58
2540	56.24	216.52	1631.16	-1598.34	-1609.74	-773.39	5736847.9	566569.1
2545	56.25	216.59	1633.94	-1601.12	-1613.08	-775.87	5736844.56	566566.62

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2550	56.27	216.66	1636.72	-1603.9	-1616.42	-778.34	5736841.22	566564.15
2555	56.29	216.72	1639.5	-1606.68	-1619.76	-780.82	5736837.89	566561.67
2560	56.32	216.77	1642.27	-1609.45	-1623.1	-783.3	5736834.55	566559.19
2565	56.37	216.77	1645.03	-1612.21	-1626.43	-785.8	5736831.21	566556.69
2570	56.43	216.77	1647.8	-1614.98	-1629.77	-788.29	5736827.87	566554.2
2575	56.48	216.77	1650.56	-1617.74	-1633.11	-790.79	5736824.53	566551.7
2580	56.53	216.77	1653.32	-1620.5	-1636.45	-793.28	5736821.2	566549.21
2585	56.59	216.77	1656.09	-1623.27	-1639.79	-795.78	5736817.86	566546.72
2590	56.61	216.81	1658.84	-1626.02	-1643.12	-798.28	5736814.52	566544.21
2595	56.63	216.86	1661.59	-1628.77	-1646.46	-800.79	5736811.18	566541.7
2600	56.65	216.92	1664.34	-1631.52	-1649.8	-803.3	5736807.84	566539.19
2605	56.67	216.97	1667.09	-1634.27	-1653.14	-805.81	5736804.5	566536.68
2610	56.68	217.02	1669.84	-1637.02	-1656.48	-808.32	5736801.16	566534.17
2615	56.7	217.06	1672.58	-1639.76	-1659.82	-810.83	5736797.82	566531.66
2620	56.72	217.01	1675.32	-1642.5	-1663.16	-813.34	5736794.48	566529.15
2625	56.74	216.96	1678.07	-1645.25	-1666.51	-815.85	5736791.14	566526.64
2630	56.76	216.9	1680.81	-1647.99	-1669.85	-818.36	5736787.79	566524.13
2635	56.77	216.85	1683.55	-1650.73	-1673.19	-820.87	5736784.45	566521.62
2640	56.79	216.79	1686.29	-1653.47	-1676.53	-823.38	5736781.11	566519.11
2645	56.83	216.8	1689.02	-1656.2	-1679.88	-825.9	5736777.76	566516.59
2650	56.88	216.85	1691.75	-1658.93	-1683.23	-828.42	5736774.41	566514.07
2655	56.93	216.9	1694.48	-1661.66	-1686.58	-830.93	5736771.06	566511.56
2660	56.98	216.95	1697.2	-1664.38	-1689.93	-833.45	5736767.71	566509.04
2665	57.03	217	1699.93	-1667.11	-1693.28	-835.97	5736764.36	566506.52
2670	57.09	217.06	1702.66	-1669.84	-1696.63	-838.49	5736761.01	566504
2675	57.09	217.03	1705.38	-1672.56	-1699.99	-841.01	5736757.66	566501.48
2680	57.07	216.98	1708.1	-1675.28	-1703.34	-843.53	5736754.3	566498.96
2685	57.05	216.92	1710.82	-1678	-1706.7	-846.05	5736750.95	566496.44
2690	57.03	216.87	1713.54	-1680.72	-1710.05	-848.57	5736747.59	566493.92
2695	57.02	216.81	1716.26	-1683.44	-1713.4	-851.09	5736744.24	566491.4
2700	57.28	216.42	1718.83	-1686.01	-1716.95	-853.49	5736740.7	566489.01
2705	57.74	215.79	1721.32	-1688.5	-1720.61	-855.79	5736737.03	566486.7
2710	58.19	215.17	1723.8	-1690.98	-1724.28	-858.1	5736733.37	566484.39
2715	58.65	214.54	1726.28	-1693.46	-1727.94	-860.41	5736729.7	566482.08
2720	59.1	213.92	1728.77	-1695.95	-1731.61	-862.72	5736726.03	566479.77
2725	59.56	213.29	1731.25	-1698.43	-1735.27	-865.03	5736722.37	566477.46
2730	60.01	212.67	1733.74	-1700.92	-1738.94	-867.34	5736718.7	566475.15
2735	60.47	212.04	1736.22	-1703.4	-1742.61	-869.65	5736715.04	566472.85
2740	60.92	211.42	1738.7	-1705.88	-1746.27	-871.95	5736711.37	566470.54
2745	61.38	210.8	1741.19	-1708.37	-1749.94	-874.26	5736707.71	566468.23
2750	61.83	210.17	1743.67	-1710.85	-1753.6	-876.57	5736704.04	566465.92
2755	62.29	209.55	1746.15	-1713.33	-1757.27	-878.88	5736700.37	566463.61
2760	62.75	208.92	1748.64	-1715.82	-1760.94	-881.19	5736696.71	566461.3
2765	63.2	208.3	1751.12	-1718.3	-1764.6	-883.5	5736693.04	566458.99
2770	63.61	207.53	1753.49	-1720.67	-1768.4	-885.68	5736689.24	566456.81
2775	63.94	206.5	1755.68	-1722.86	-1772.45	-887.65	5736685.2	566454.84
2780	64.26	205.48	1757.86	-1725.04	-1776.49	-889.62	5736681.15	566452.87
2785	64.59	204.46	1760.05	-1727.23	-1780.53	-891.59	5736677.11	566450.9
2790	64.92	203.48	1762.16	-1729.34	-1784.7	-893.37	5736672.95	566449.12
2795	65.25	202.53	1764.22	-1731.4	-1788.94	-895.02	5736668.7	566447.47
2800	65.58	201.57	1766.28	-1733.46	-1793.18	-896.68	5736664.46	566445.82
2805	65.91	200.62	1768.34	-1735.52	-1797.42	-898.33	5736660.22	566444.16
2810	66.25	199.67	1770.4	-1737.58	-1801.67	-899.98	5736655.98	566442.51
2815	66.58	198.72	1772.46	-1739.64	-1805.91	-901.64	5736651.74	566440.85
2820	66.64	198.96	1774.45	-1741.63	-1810.22	-903.21	5736647.43	566439.29
2825	66.67	199.38	1776.43	-1743.61	-1814.54	-904.76	5736643.1	566437.73
2830	66.69	199.8	1778.41	-1745.59	-1818.86	-906.31	5736638.78	566436.18
2835	66.72	200.22	1780.39	-1747.57	-1823.18	-907.87	5736634.46	566434.62

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2840	66.74	200.64	1782.37	-1749.55	-1827.5	-909.42	5736630.14	566433.07
2845	66.75	200.9	1784.35	-1751.53	-1831.82	-910.98	5736625.82	566431.51
2850	66.7	200.51	1786.33	-1753.51	-1836.13	-912.54	5736621.51	566429.95
2855	66.65	200.12	1788.32	-1755.5	-1840.45	-914.1	5736617.19	566428.39
2860	66.6	199.73	1790.3	-1757.48	-1844.77	-915.66	5736612.88	566426.83
2865	66.55	199.34	1792.28	-1759.46	-1849.08	-917.22	5736608.56	566425.27
2870	66.5	198.96	1794.27	-1761.45	-1853.4	-918.78	5736604.25	566423.71
2875	66.54	198.86	1796.25	-1763.43	-1857.73	-920.31	5736599.92	566422.18
2880	66.64	198.97	1798.22	-1765.4	-1862.07	-921.82	5736595.58	566420.68
2885	66.73	199.08	1800.19	-1767.37	-1866.41	-923.32	5736591.23	566419.17
2890	66.83	199.18	1802.16	-1769.34	-1870.75	-924.82	5736586.89	566417.67
2895	66.93	199.29	1804.14	-1771.32	-1875.09	-926.33	5736582.55	566416.16
2900	67.03	199.4	1806.11	-1773.29	-1879.43	-927.83	5736578.21	566414.66
2905	67.14	199.37	1808.04	-1775.22	-1883.79	-929.35	5736573.86	566413.14
2910	67.26	199.31	1809.96	-1777.14	-1888.15	-930.87	5736569.5	566411.62
2915	67.38	199.24	1811.89	-1779.07	-1892.5	-932.39	5736565.14	566410.1
2920	67.5	199.18	1813.81	-1780.99	-1896.86	-933.91	5736560.78	566408.58
2925	67.62	199.11	1815.73	-1782.91	-1901.22	-935.43	5736556.42	566407.06
2930	67.74	199.05	1817.65	-1784.83	-1905.58	-936.95	5736552.07	566405.54
2935	67.9	199.08	1819.53	-1786.71	-1909.96	-938.47	5736547.69	566404.02
2940	68.06	199.12	1821.38	-1788.56	-1914.34	-939.99	5736543.3	566402.5
2945	68.22	199.15	1823.23	-1790.41	-1918.73	-941.52	5736538.91	566400.97
2950	68.38	199.19	1825.08	-1792.26	-1923.12	-943.04	5736534.53	566399.45
2955	68.54	199.22	1826.94	-1794.12	-1927.51	-944.57	5736530.14	566397.92
2960	68.67	199.27	1828.78	-1795.96	-1931.89	-946.1	5736525.75	566396.39
2965	68.73	199.38	1830.59	-1797.77	-1936.29	-947.65	5736521.36	566394.84
2970	68.78	199.48	1832.4	-1799.58	-1940.68	-949.21	5736516.96	566393.28
2975	68.83	199.58	1834.21	-1801.39	-1945.08	-950.76	5736512.57	566391.73
2980	68.89	199.69	1836.02	-1803.2	-1949.47	-952.32	5736508.17	566390.17
2985	68.76	199.68	1837.86	-1805.04	-1953.85	-953.87	5736503.79	566388.62
2990	68.52	199.61	1839.73	-1806.91	-1958.22	-955.41	5736499.42	566387.08
2995	68.28	199.53	1841.59	-1808.77	-1962.6	-956.96	5736495.05	566385.53
3000	68.03	199.45	1843.46	-1810.64	-1966.97	-958.51	5736490.67	566383.99
3003	67.89	199.41	1844.58	-1811.76	-1969.59	-959.43	5736488.05	566383.06
3004	67.84	199.39	1844.96	-1812.14	-1970.47	-959.74	5736487.18	566382.75
3005	67.79	199.37	1845.33	-1812.51	-1971.34	-960.05	5736486.3	566382.44
3006	67.74	199.36	1845.7	-1812.88	-1972.22	-960.36	5736485.43	566382.13
3007	67.69	199.34	1846.08	-1813.26	-1973.09	-960.67	5736484.55	566381.82
3008	67.64	199.33	1846.45	-1813.63	-1973.97	-960.98	5736483.68	566381.51
3009	67.6	199.31	1846.82	-1814	-1974.84	-961.29	5736482.8	566381.2
3010	67.55	199.3	1847.2	-1814.38	-1975.72	-961.6	5736481.93	566380.89
3011	67.5	199.28	1847.57	-1814.75	-1976.59	-961.91	5736481.05	566380.58
3012	67.45	199.27	1847.94	-1815.12	-1977.46	-962.22	5736480.18	566380.28
3013	67.4	199.25	1848.32	-1815.5	-1978.34	-962.52	5736479.3	566379.97
3014	67.35	199.24	1848.69	-1815.87	-1979.21	-962.83	5736478.43	566379.66
3015	67.3	199.22	1849.06	-1816.24	-1980.09	-963.14	5736477.55	566379.35
3016	67.26	199.2	1849.44	-1816.62	-1980.96	-963.45	5736476.68	566379.04
3017	67.24	199.2	1849.82	-1817	-1981.84	-963.76	5736475.81	566378.73
3018	67.24	199.19	1850.21	-1817.39	-1982.71	-964.06	5736474.94	566378.43
3019	67.24	199.19	1850.59	-1817.77	-1983.58	-964.36	5736474.07	566378.13
3020	67.24	199.18	1850.98	-1818.16	-1984.45	-964.66	5736473.19	566377.83
3021	67.24	199.18	1851.37	-1818.55	-1985.32	-964.97	5736472.32	566377.53
3022	67.24	199.18	1851.75	-1818.93	-1986.19	-965.27	5736471.45	566377.22
3023	67.24	199.17	1852.14	-1819.32	-1987.06	-965.57	5736470.58	566376.92
3024	67.24	199.17	1852.53	-1819.71	-1987.93	-965.87	5736469.71	566376.62
3025	67.24	199.16	1852.91	-1820.09	-1988.8	-966.18	5736468.84	566376.32
3026	67.24	199.16	1853.3	-1820.48	-1989.68	-966.48	5736467.97	566376.01
3027	67.24	199.16	1853.69	-1820.87	-1990.55	-966.78	5736467.1	566375.71

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
3028	67.24	199.15	1854.07	-1821.25	-1991.42	-967.08	5736466.23	566375.41
3029	67.24	199.15	1854.46	-1821.64	-1992.29	-967.38	5736465.35	566375.11
3030	67.24	199.14	1854.85	-1822.03	-1993.16	-967.69	5736464.48	566374.8
3031	67.24	199.14	1855.23	-1822.41	-1994.03	-967.99	5736463.61	566374.5
3032	67.24	199.14	1855.62	-1822.8	-1994.9	-968.29	5736462.74	566374.2
3033	67.24	199.13	1856.01	-1823.19	-1995.77	-968.59	5736461.87	566373.9
3034	67.24	199.13	1856.4	-1823.58	-1996.65	-968.9	5736461	566373.6
3035	67.24	199.12	1856.78	-1823.96	-1997.52	-969.2	5736460.13	566373.29
3036	67.24	199.12	1857.17	-1824.35	-1998.39	-969.5	5736459.26	566372.99
3037	67.24	199.11	1857.56	-1824.74	-1999.26	-969.8	5736458.38	566372.69
3038	67.24	199.11	1857.94	-1825.12	-2000.13	-970.11	5736457.51	566372.39
3039	67.24	199.11	1858.33	-1825.51	-2001	-970.41	5736456.64	566372.08
3040	67.24	199.1	1858.72	-1825.9	-2001.87	-970.71	5736455.77	566371.78
3041	67.24	199.1	1859.1	-1826.28	-2002.74	-971.01	5736454.9	566371.48
3042	67.24	199.09	1859.49	-1826.67	-2003.61	-971.31	5736454.03	566371.18
3043	67.24	199.09	1859.88	-1827.06	-2004.49	-971.62	5736453.16	566370.87
3044	67.24	199.09	1860.26	-1827.44	-2005.36	-971.92	5736452.29	566370.57
3045	67.24	199.08	1860.65	-1827.83	-2006.23	-972.22	5736451.42	566370.27
3046	67.23	199.06	1861.04	-1828.22	-2007.1	-972.52	5736450.54	566369.97
3047	67.23	199.03	1861.43	-1828.61	-2007.97	-972.81	5736449.67	566369.68
3048	67.22	199.01	1861.82	-1829	-2008.85	-973.11	5736448.8	566369.38
3049	67.21	198.98	1862.21	-1829.39	-2009.72	-973.4	5736447.92	566369.09
3050	67.2	198.95	1862.59	-1829.77	-2010.59	-973.7	5736447.05	566368.79
3051	67.19	198.92	1862.98	-1830.16	-2011.46	-973.99	5736446.18	566368.5
3052	67.19	198.9	1863.37	-1830.55	-2012.34	-974.29	5736445.31	566368.2
3053	67.18	198.87	1863.76	-1830.94	-2013.21	-974.58	5736444.43	566367.91
3054	67.17	198.84	1864.15	-1831.33	-2014.08	-974.88	5736443.56	566367.61
3055	67.16	198.81	1864.54	-1831.72	-2014.96	-975.18	5736442.69	566367.32
3056	67.15	198.79	1864.93	-1832.11	-2015.83	-975.47	5736441.82	566367.02
3057	67.15	198.76	1865.32	-1832.5	-2016.7	-975.77	5736440.94	566366.73
3058	67.14	198.73	1865.7	-1832.88	-2017.57	-976.06	5736440.07	566366.43
3059	67.13	198.7	1866.09	-1833.27	-2018.45	-976.36	5736439.2	566366.14
3060	67.12	198.68	1866.48	-1833.66	-2019.32	-976.65	5736438.32	566365.84
3061	67.11	198.65	1866.87	-1834.05	-2020.19	-976.95	5736437.45	566365.55
3062	67.11	198.62	1867.26	-1834.44	-2021.07	-977.24	5736436.58	566365.25
3063	67.1	198.59	1867.65	-1834.83	-2021.94	-977.54	5736435.71	566364.95
3064	67.09	198.57	1868.04	-1835.22	-2022.81	-977.83	5736434.83	566364.66
3065	67.08	198.54	1868.42	-1835.6	-2023.68	-978.13	5736433.96	566364.36
3066	67.07	198.51	1868.81	-1835.99	-2024.56	-978.42	5736433.09	566364.07
3067	67.07	198.48	1869.2	-1836.38	-2025.43	-978.72	5736432.21	566363.77
3068	67.06	198.46	1869.59	-1836.77	-2026.3	-979.01	5736431.34	566363.48
3069	67.05	198.43	1869.98	-1837.16	-2027.17	-979.31	5736430.47	566363.18
3070	67.04	198.4	1870.37	-1837.55	-2028.05	-979.6	5736429.6	566362.89
3071	67.03	198.37	1870.76	-1837.94	-2028.92	-979.9	5736428.72	566362.59
3072	67.03	198.35	1871.15	-1838.33	-2029.79	-980.19	5736427.85	566362.3
3073	67.02	198.32	1871.53	-1838.71	-2030.67	-980.49	5736426.98	566362
3074	67.01	198.29	1871.92	-1839.1	-2031.54	-980.78	5736426.1	566361.71
3075	67.09	198.25	1872.29	-1839.47	-2032.42	-981.07	5736425.22	566361.43
3076	67.18	198.2	1872.67	-1839.85	-2033.31	-981.35	5736424.34	566361.14
3077	67.27	198.16	1873.04	-1840.22	-2034.19	-981.63	5736423.45	566360.86
3078	67.36	198.11	1873.41	-1840.59	-2035.08	-981.91	5736422.57	566360.58
3079	67.45	198.07	1873.78	-1840.96	-2035.96	-982.19	5736421.68	566360.3
3080	67.54	198.03	1874.15	-1841.33	-2036.85	-982.47	5736420.8	566360.02
3081	67.62	197.98	1874.52	-1841.7	-2037.73	-982.76	5736419.91	566359.73
3082	67.71	197.94	1874.89	-1842.07	-2038.62	-983.04	5736419.03	566359.45
3083	67.8	197.89	1875.26	-1842.44	-2039.5	-983.32	5736418.14	566359.17
3084	67.89	197.85	1875.63	-1842.81	-2040.39	-983.6	5736417.26	566358.89
3085	67.98	197.8	1876	-1843.18	-2041.27	-983.88	5736416.37	566358.61

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
3086	68.07	197.76	1876.37	-1843.55	-2042.16	-984.17	5736415.49	566358.33
3087	68.15	197.72	1876.74	-1843.92	-2043.04	-984.45	5736414.6	566358.04
3088	68.24	197.67	1877.11	-1844.29	-2043.93	-984.73	5736413.72	566357.76
3089	68.33	197.63	1877.48	-1844.66	-2044.81	-985.01	5736412.83	566357.48
3090	68.42	197.58	1877.85	-1845.03	-2045.7	-985.29	5736411.95	566357.2
3091	68.51	197.54	1878.22	-1845.4	-2046.58	-985.57	5736411.06	566356.92
3092	68.59	197.49	1878.59	-1845.77	-2047.47	-985.86	5736410.18	566356.64
3093	68.68	197.45	1878.96	-1846.14	-2048.35	-986.14	5736409.29	566356.35
3094	68.77	197.41	1879.33	-1846.51	-2049.24	-986.42	5736408.41	566356.07
3095	68.86	197.36	1879.7	-1846.88	-2050.12	-986.7	5736407.52	566355.79
3096	68.95	197.32	1880.07	-1847.25	-2051.01	-986.98	5736406.64	566355.51
3097	69.04	197.27	1880.45	-1847.63	-2051.89	-987.26	5736405.75	566355.23
3098	69.12	197.23	1880.82	-1848	-2052.78	-987.55	5736404.87	566354.95
3099	69.21	197.18	1881.19	-1848.37	-2053.66	-987.83	5736403.98	566354.66
3100	69.3	197.14	1881.56	-1848.74	-2054.55	-988.11	5736403.1	566354.38
3101	69.39	197.1	1881.93	-1849.11	-2055.43	-988.39	5736402.21	566354.1
3102	69.48	197.05	1882.3	-1849.48	-2056.32	-988.67	5736401.33	566353.82
3103	69.47	197.02	1882.66	-1849.84	-2057.21	-988.95	5736400.43	566353.55
3104	69.43	197	1883.02	-1850.2	-2058.1	-989.21	5736399.54	566353.28
3105	69.39	196.98	1883.38	-1850.56	-2059	-989.48	5736398.65	566353.01
3106	69.35	196.96	1883.74	-1850.92	-2059.89	-989.75	5736397.75	566352.74
3107	69.31	196.94	1884.1	-1851.28	-2060.78	-990.02	5736396.86	566352.47
3108	69.27	196.92	1884.46	-1851.64	-2061.68	-990.29	5736395.97	566352.2
3109	69.23	196.9	1884.82	-1852	-2062.57	-990.56	5736395.07	566351.93
3110	69.2	196.88	1885.17	-1852.35	-2063.46	-990.83	5736394.18	566351.66
3111	69.16	196.86	1885.53	-1852.71	-2064.36	-991.1	5736393.29	566351.39
3112	69.12	196.84	1885.89	-1853.07	-2065.25	-991.37	5736392.39	566351.13
3113	69.08	196.82	1886.25	-1853.43	-2066.15	-991.64	5736391.5	566350.86
3114	69.04	196.8	1886.61	-1853.79	-2067.04	-991.9	5736390.6	566350.59
3115	69	196.78	1886.97	-1854.15	-2067.93	-992.17	5736389.71	566350.32
3116	68.96	196.76	1887.33	-1854.51	-2068.83	-992.44	5736388.82	566350.05
3117	68.92	196.74	1887.69	-1854.87	-2069.72	-992.71	5736387.92	566349.78
3118	68.88	196.72	1888.05	-1855.23	-2070.61	-992.98	5736387.03	566349.51
3119	68.84	196.7	1888.41	-1855.59	-2071.51	-993.25	5736386.14	566349.24
3120	68.8	196.68	1888.77	-1855.95	-2072.4	-993.52	5736385.24	566348.97
3121	68.76	196.66	1889.13	-1856.31	-2073.29	-993.79	5736384.35	566348.7
3122	68.72	196.63	1889.49	-1856.67	-2074.19	-994.06	5736383.46	566348.44
3123	68.68	196.61	1889.84	-1857.02	-2075.08	-994.32	5736382.56	566348.17
3124	68.65	196.59	1890.2	-1857.38	-2075.98	-994.59	5736381.67	566347.9
3125	68.61	196.57	1890.56	-1857.74	-2076.87	-994.86	5736380.77	566347.63
3126	68.57	196.55	1890.92	-1858.1	-2077.76	-995.13	5736379.88	566347.36
3127	68.53	196.53	1891.28	-1858.46	-2078.66	-995.4	5736378.99	566347.09
3128	68.49	196.51	1891.64	-1858.82	-2079.55	-995.67	5736378.09	566346.82
3129	68.45	196.49	1892	-1859.18	-2080.44	-995.94	5736377.2	566346.55
3130	68.41	196.47	1892.36	-1859.54	-2081.34	-996.21	5736376.31	566346.28
3131	68.39	196.47	1892.72	-1859.9	-2082.23	-996.48	5736375.41	566346.01
3132	68.39	196.5	1893.09	-1860.27	-2083.12	-996.75	5736374.52	566345.74
3133	68.39	196.53	1893.46	-1860.64	-2084.01	-997.02	5736373.64	566345.47
3134	68.39	196.56	1893.83	-1861.01	-2084.9	-997.29	5736372.75	566345.21
3135	68.39	196.58	1894.2	-1861.38	-2085.79	-997.56	5736371.86	566344.94
3136	68.39	196.61	1894.56	-1861.74	-2086.68	-997.83	5736370.97	566344.67
3137	68.39	196.64	1894.93	-1862.11	-2087.57	-998.09	5736370.08	566344.4
3138	68.4	196.67	1895.3	-1862.48	-2088.46	-998.36	5736369.19	566344.13
3139	68.4	196.69	1895.67	-1862.85	-2089.35	-998.63	5736368.3	566343.86
3140	68.4	196.72	1896.04	-1863.22	-2090.24	-998.9	5736367.41	566343.59
3141	68.4	196.75	1896.4	-1863.58	-2091.13	-999.17	5736366.52	566343.32
3142	68.4	196.78	1896.77	-1863.95	-2092.02	-999.44	5736365.63	566343.05
3143	68.4	196.8	1897.14	-1864.32	-2092.91	-999.71	5736364.74	566342.78

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
3144	68.4	196.83	1897.51	-1864.69	-2093.8	-999.98	5736363.85	566342.51
3145	68.4	196.86	1897.88	-1865.06	-2094.69	-1000.25	5736362.96	566342.24
3146	68.4	196.88	1898.24	-1865.42	-2095.58	-1000.52	5736362.07	566341.97
3147	68.4	196.91	1898.61	-1865.79	-2096.47	-1000.79	5736361.18	566341.7
3148	68.4	196.94	1898.98	-1866.16	-2097.35	-1001.06	5736360.29	566341.43
3149	68.4	196.97	1899.35	-1866.53	-2098.24	-1001.33	5736359.4	566341.16
3150	68.4	196.99	1899.72	-1866.9	-2099.13	-1001.6	5736358.51	566340.89
3151	68.4	197.02	1900.09	-1867.27	-2100.02	-1001.87	5736357.62	566340.62
3152	68.4	197.05	1900.45	-1867.63	-2100.91	-1002.14	5736356.73	566340.35
3153	68.41	197.08	1900.82	-1868	-2101.8	-1002.41	5736355.84	566340.08
3154	68.41	197.1	1901.19	-1868.37	-2102.69	-1002.68	5736354.95	566339.81
3155	68.41	197.13	1901.56	-1868.74	-2103.58	-1002.95	5736354.06	566339.54
3156	68.41	197.16	1901.93	-1869.11	-2104.47	-1003.22	5736353.17	566339.27
3157	68.41	197.19	1902.29	-1869.47	-2105.36	-1003.49	5736352.28	566339
3158	68.41	197.21	1902.66	-1869.84	-2106.25	-1003.76	5736351.39	566338.73
3159	68.41	197.24	1903.03	-1870.21	-2107.14	-1004.03	5736350.5	566338.46
3160	68.4	197.27	1903.4	-1870.58	-2108.03	-1004.3	5736349.61	566338.19
3161	68.37	197.31	1903.78	-1870.96	-2108.91	-1004.58	5736348.73	566337.91
3162	68.33	197.35	1904.15	-1871.33	-2109.79	-1004.87	5736347.85	566337.62
3163	68.3	197.39	1904.53	-1871.71	-2110.68	-1005.15	5736346.97	566337.34
3164	68.27	197.42	1904.9	-1872.08	-2111.56	-1005.43	5736346.08	566337.06
3165	68.24	197.46	1905.28	-1872.46	-2112.44	-1005.72	5736345.2	566336.77
3166	68.2	197.5	1905.65	-1872.83	-2113.32	-1006	5736344.32	566336.49
3167	68.17	197.54	1906.03	-1873.21	-2114.21	-1006.28	5736343.44	566336.21
3168	68.14	197.58	1906.41	-1873.59	-2115.09	-1006.57	5736342.55	566335.92
3169	68.11	197.61	1906.78	-1873.96	-2115.97	-1006.85	5736341.67	566335.64
3170	68.07	197.65	1907.16	-1874.34	-2116.85	-1007.13	5736340.79	566335.36
3171	68.04	197.69	1907.53	-1874.71	-2117.74	-1007.42	5736339.91	566335.07
3172	68.01	197.73	1907.91	-1875.09	-2118.62	-1007.7	5736339.02	566334.79
3173	67.97	197.77	1908.28	-1875.46	-2119.5	-1007.98	5736338.14	566334.51
3174	67.94	197.8	1908.66	-1875.84	-2120.38	-1008.27	5736337.26	566334.22
3175	67.91	197.84	1909.03	-1876.21	-2121.27	-1008.55	5736336.38	566333.94
3176	67.88	197.88	1909.41	-1876.59	-2122.15	-1008.83	5736335.49	566333.66
3177	67.84	197.92	1909.78	-1876.96	-2123.03	-1009.12	5736334.61	566333.37
3178	67.81	197.96	1910.16	-1877.34	-2123.91	-1009.4	5736333.73	566333.09
3179	67.78	197.99	1910.54	-1877.72	-2124.8	-1009.68	5736332.85	566332.81
3180	67.75	198.03	1910.91	-1878.09	-2125.68	-1009.97	5736331.96	566332.52
3181	67.71	198.07	1911.29	-1878.47	-2126.56	-1010.25	5736331.08	566332.24
3182	67.68	198.11	1911.66	-1878.84	-2127.44	-1010.53	5736330.2	566331.96
3183	67.65	198.14	1912.04	-1879.22	-2128.33	-1010.82	5736329.32	566331.67
3184	67.62	198.18	1912.41	-1879.59	-2129.21	-1011.1	5736328.43	566331.39
3185	67.58	198.22	1912.79	-1879.97	-2130.09	-1011.38	5736327.55	566331.11
3186	67.55	198.26	1913.16	-1880.34	-2130.97	-1011.67	5736326.67	566330.82
3187	67.52	198.3	1913.54	-1880.72	-2131.86	-1011.95	5736325.79	566330.54
3188	67.48	198.33	1913.92	-1881.1	-2132.74	-1012.23	5736324.9	566330.26
3189	67.44	198.35	1914.31	-1881.49	-2133.61	-1012.52	5736324.03	566329.97
3190	67.4	198.37	1914.7	-1881.88	-2134.48	-1012.82	5736323.16	566329.67
3191	67.36	198.38	1915.09	-1882.27	-2135.36	-1013.11	5736322.29	566329.38
3192	67.31	198.39	1915.49	-1882.67	-2136.23	-1013.4	5736321.42	566329.09
3193	67.27	198.41	1915.88	-1883.06	-2137.1	-1013.69	5736320.54	566328.8
3194	67.22	198.42	1916.27	-1883.45	-2137.97	-1013.99	5736319.67	566328.5
3195	67.18	198.44	1916.66	-1883.84	-2138.84	-1014.28	5736318.8	566328.21
3196	67.14	198.45	1917.06	-1884.24	-2139.71	-1014.57	5736317.93	566327.92
3197	67.09	198.46	1917.45	-1884.63	-2140.59	-1014.86	5736317.06	566327.63
3198	67.05	198.48	1917.84	-1885.02	-2141.46	-1015.16	5736316.19	566327.34
3199	67.01	198.49	1918.24	-1885.42	-2142.33	-1015.45	5736315.31	566327.04
3200	66.96	198.51	1918.63	-1885.81	-2143.2	-1015.74	5736314.44	566326.75
3201	66.92	198.52	1919.02	-1886.2	-2144.07	-1016.03	5736313.57	566326.46



MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
3202	66.88	198.53	1919.42	-1886.6	-2144.94	-1016.33	5736312.7	566326.17
3203	66.83	198.55	1919.81	-1886.99	-2145.82	-1016.62	5736311.83	566325.87
3204	66.79	198.56	1920.2	-1887.38	-2146.69	-1016.91	5736310.96	566325.58
3205	66.74	198.58	1920.59	-1887.77	-2147.56	-1017.2	5736310.08	566325.29
3206	66.7	198.59	1920.99	-1888.17	-2148.43	-1017.49	5736309.21	566325
3207	66.66	198.6	1921.38	-1888.56	-2149.3	-1017.79	5736308.34	566324.7
3208	66.61	198.62	1921.77	-1888.95	-2150.18	-1018.08	5736307.47	566324.41
3209	66.57	198.63	1922.17	-1889.35	-2151.05	-1018.37	5736306.6	566324.12
3210	66.53	198.65	1922.56	-1889.74	-2151.92	-1018.66	5736305.72	566323.83
3211	66.48	198.66	1922.95	-1890.13	-2152.79	-1018.96	5736304.85	566323.54
3212	66.44	198.67	1923.35	-1890.53	-2153.66	-1019.25	5736303.98	566323.24
3213	66.4	198.69	1923.74	-1890.92	-2154.53	-1019.54	5736303.11	566322.95
3214	66.35	198.7	1924.13	-1891.31	-2155.41	-1019.83	5736302.24	566322.66
3215	66.31	198.72	1924.53	-1891.71	-2156.28	-1020.13	5736301.37	566322.37
3216	66.26	198.73	1924.92	-1892.1	-2157.15	-1020.42	5736300.49	566322.07
3217	66.24	198.74	1925.31	-1892.49	-2158.02	-1020.71	5736299.62	566321.78
3218	66.27	198.76	1925.71	-1892.89	-2158.89	-1021.01	5736298.75	566321.48
3219	66.3	198.77	1926.1	-1893.28	-2159.76	-1021.31	5736297.88	566321.18
3220	66.34	198.79	1926.5	-1893.68	-2160.63	-1021.61	5736297.02	566320.88
3221	66.37	198.8	1926.89	-1894.07	-2161.5	-1021.91	5736296.15	566320.58
3222	66.4	198.81	1927.28	-1894.46	-2162.37	-1022.21	5736295.28	566320.29
3223	66.44	198.83	1927.68	-1894.86	-2163.23	-1022.5	5736294.41	566319.99
3224	66.47	198.84	1928.07	-1895.25	-2164.1	-1022.8	5736293.54	566319.69
3225	66.5	198.86	1928.47	-1895.65	-2164.97	-1023.1	5736292.67	566319.39
3226	66.54	198.87	1928.86	-1896.04	-2165.84	-1023.4	5736291.8	566319.09
3227	66.57	198.89	1929.26	-1896.44	-2166.71	-1023.7	5736290.93	566318.79
3228	66.6	198.9	1929.65	-1896.83	-2167.58	-1024	5736290.06	566318.49
3229	66.64	198.91	1930.05	-1897.23	-2168.45	-1024.3	5736289.2	566318.19
3230	66.67	198.93	1930.44	-1897.62	-2169.32	-1024.6	5736288.33	566317.9
3231	66.7	198.94	1930.83	-1898.01	-2170.19	-1024.89	5736287.46	566317.6
3232	66.74	198.96	1931.23	-1898.41	-2171.06	-1025.19	5736286.59	566317.3
3233	66.77	198.97	1931.62	-1898.8	-2171.92	-1025.49	5736285.72	566317
3234	66.8	198.99	1932.02	-1899.2	-2172.79	-1025.79	5736284.85	566316.7
3235	66.84	199	1932.41	-1899.59	-2173.66	-1026.09	5736283.98	566316.4
3236	66.87	199.01	1932.81	-1899.99	-2174.53	-1026.39	5736283.11	566316.1
3237	66.9	199.03	1933.2	-1900.38	-2175.4	-1026.69	5736282.24	566315.8
3238	66.93	199.04	1933.6	-1900.78	-2176.27	-1026.99	5736281.37	566315.51
3239	66.97	199.06	1933.99	-1901.17	-2177.14	-1027.28	5736280.51	566315.21
3240	67	199.07	1934.39	-1901.57	-2178.01	-1027.58	5736279.64	566314.91
3241	67.03	199.09	1934.78	-1901.96	-2178.88	-1027.88	5736278.77	566314.61
3242	67.07	199.1	1935.17	-1902.35	-2179.74	-1028.18	5736277.9	566314.31
3243	67.1	199.11	1935.57	-1902.75	-2180.61	-1028.48	5736277.03	566314.01
3244	67.13	199.13	1935.96	-1903.14	-2181.48	-1028.78	5736276.16	566313.71
3245	67.17	199.14	1936.36	-1903.54	-2182.35	-1029.08	5736275.29	566313.42
3246	67.2	199.16	1936.75	-1903.93	-2183.22	-1029.37	5736274.42	566313.12
3247	67.23	199.17	1937.15	-1904.33	-2184.09	-1029.67	5736273.55	566312.82
3248	67.27	199.19	1937.54	-1904.72	-2184.96	-1029.97	5736272.68	566312.52
3249	67.3	199.2	1937.94	-1905.12	-2185.83	-1030.27	5736271.82	566312.22

**APPENDIX 1d**

**BREAM A22AST**

**MD-TVD Survey Data Listing**

Report Date:	17 February 2006
Well:	Bream A22AST
Structure / Slot:	NABORS Rig 453
TVD Reference Datum:	DrillSite Elevation
TVD Reference Elevation:	32.82 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' 58.909200", E 147 46 20.233200"
Location Grid N/E:	N 5738457.6564 m, E 567342.5298 m
Survey Azimuth Reference:	Grid North

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
0	0	360	0	32.82	0	0	5738457.64	567342.49
5	0	0	5	27.82	0	0	5738457.64	567342.49
10	0	0	10	22.82	0	0	5738457.64	567342.49
15	0	0	15	17.82	0	0	5738457.64	567342.49
20	0	0	20	12.82	0	0	5738457.64	567342.49
25	0	0	25	7.82	0	0	5738457.64	567342.49
30	0	0	30	2.82	0	0	5738457.64	567342.49
35	0	0	35	-2.18	0	0	5738457.64	567342.49
40	0	0	40	-7.18	0	0	5738457.64	567342.49
45	0	0	45	-12.18	0	0	5738457.64	567342.49
50	0	0	50	-17.18	0	0	5738457.64	567342.49
55	0	0	55	-22.18	0	0	5738457.64	567342.49
60	0	360	60	-27.18	0	0	5738457.64	567342.49
65	0.04	357.27	65	-32.18	0.01	0	5738457.65	567342.49
70	0.09	354.54	70	-37.18	0.02	-0.01	5738457.66	567342.49
75	0.13	351.81	75	-42.18	0.03	-0.01	5738457.67	567342.48
80	0.17	349.09	80	-47.18	0.04	-0.01	5738457.69	567342.48
85	0.21	346.36	85	-52.18	0.05	-0.01	5738457.7	567342.48
90	0.28	352.07	90	-57.18	0.06	-0.02	5738457.7	567342.48
95	0.53	51.4	95	-62.18	0.03	-0.01	5738457.67	567342.49
100	0.78	110.74	100	-67.18	0	0	5738457.64	567342.5
105	1.09	162	105	-72.18	-0.05	0.02	5738457.59	567342.51
110	1.76	162	110	-77.18	-0.22	0.08	5738457.42	567342.57
115	2.42	162	114.99	-82.17	-0.39	0.13	5738457.26	567342.62
120	3.09	162.09	119.99	-87.17	-0.57	0.19	5738457.07	567342.68
125	3.76	162.76	124.97	-92.15	-0.91	0.29	5738456.73	567342.78
130	4.42	163.42	129.96	-97.14	-1.24	0.39	5738456.4	567342.88
135	5.11	164	134.95	-102.13	-1.6	0.5	5738456.04	567342.99
140	5.95	164	139.92	-107.1	-2.13	0.65	5738455.52	567343.14
145	6.78	164	144.89	-112.07	-2.65	0.8	5738454.99	567343.29
150	7.57	164	149.86	-117.04	-3.19	0.95	5738454.45	567343.44
155	8.05	164.36	154.81	-121.99	-3.85	1.13	5738453.79	567343.62
160	8.39	166.99	159.75	-126.93	-4.6	1.26	5738453.05	567343.75
165	8.73	169.62	164.69	-131.87	-5.34	1.39	5738452.3	567343.88
170	9.07	172.25	169.63	-136.81	-6.09	1.51	5738451.56	567344
175	9.41	174.88	174.58	-141.76	-6.83	1.64	5738450.81	567344.13
180	9.5	177.04	179.51	-146.69	-7.64	1.7	5738450.01	567344.2
185	9.51	178.98	184.44	-151.62	-8.46	1.74	5738449.18	567344.23
190	9.61	180.53	189.37	-156.55	-9.3	1.73	5738448.35	567344.23
195	9.75	182.43	194.3	-161.48	-10.13	1.72	5738447.51	567344.21
200	10.14	186.54	199.22	-166.4	-11	1.63	5738446.64	567344.12
205	11.19	189.37	204.14	-171.32	-11.92	1.52	5738445.72	567344.01
210	13.55	189.65	209.03	-176.21	-12.95	1.34	5738444.69	567343.84
215	11.67	192.19	213.91	-181.09	-13.98	1.14	5738443.66	567343.63
220	12.17	192.96	218.81	-185.99	-14.98	0.91	5738442.66	567343.4
225	12.56	192.4	223.69	-190.87	-16.04	0.69	5738441.61	567343.18

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
230	12.91	191.35	228.57	-195.75	-17.11	0.46	5738440.54	567342.95
235	13.29	190.85	233.43	-200.61	-18.25	0.24	5738439.4	567342.73
240	13.68	190.54	238.29	-205.47	-19.41	0.02	5738438.23	567342.51
245	14.06	190.23	243.15	-210.33	-20.57	-0.19	5738437.07	567342.3
250	14.49	190.08	248	-215.18	-21.75	-0.41	5738435.89	567342.08
255	15.16	190.85	252.83	-220.01	-23.03	-0.65	5738434.62	567341.84
260	15.77	191.24	257.65	-224.83	-24.34	-0.9	5738433.3	567341.59
265	16.27	190.85	262.44	-229.62	-25.73	-1.16	5738431.91	567341.33
270	16.77	190.46	267.24	-234.42	-27.13	-1.43	5738430.51	567341.07
275	17.27	190.07	272.03	-239.21	-28.52	-1.69	5738429.12	567340.8
280	17.48	190.06	276.8	-243.98	-29.99	-1.96	5738427.65	567340.53
285	17.59	190.19	281.56	-248.74	-31.49	-2.23	5738426.15	567340.26
290	17.69	190.31	286.33	-253.51	-32.99	-2.5	5738424.66	567339.99
295	17.8	190.44	291.09	-258.27	-34.48	-2.77	5738423.16	567339.72
300	17.91	190.56	295.85	-263.03	-35.98	-3.05	5738421.67	567339.44
305	18.06	190.72	300.61	-267.79	-37.49	-3.33	5738420.16	567339.16
310	18.53	191.05	305.33	-272.51	-39.1	-3.66	5738418.54	567338.83
315	18.99	191.38	310.05	-277.23	-40.72	-3.99	5738416.93	567338.5
320	19.45	191.72	314.77	-281.95	-42.33	-4.32	5738415.31	567338.17
325	19.91	192.05	319.49	-286.67	-43.95	-4.66	5738413.7	567337.84
330	20.38	192.38	324.21	-291.39	-45.56	-4.99	5738412.08	567337.5
335	20.72	192.56	328.89	-296.07	-47.29	-5.37	5738410.35	567337.12
340	21.03	192.69	333.54	-300.72	-49.07	-5.78	5738408.58	567336.71
345	21.33	192.81	338.2	-305.38	-50.84	-6.18	5738406.8	567336.31
350	21.63	192.94	342.86	-310.04	-52.62	-6.59	5738405.03	567335.91
355	21.94	193.06	347.51	-314.69	-54.39	-6.99	5738403.25	567335.5
360	22.25	193.2	352.16	-319.34	-56.18	-7.4	5738401.46	567335.09
365	22.62	193.4	356.76	-323.94	-58.1	-7.87	5738399.55	567334.62
370	22.99	193.61	361.35	-328.53	-60.01	-8.34	5738397.63	567334.15
375	23.36	193.81	365.95	-333.13	-61.92	-8.81	5738395.72	567333.68
380	23.73	194.01	370.54	-337.72	-63.84	-9.27	5738393.81	567333.22
385	24.1	194.22	375.14	-342.32	-65.75	-9.74	5738391.89	567332.75
390	24.57	194.31	379.67	-346.85	-67.8	-10.26	5738389.85	567332.23
395	25.07	194.36	384.17	-351.35	-69.89	-10.8	5738387.75	567331.69
400	25.57	194.41	388.68	-355.86	-71.99	-11.34	5738385.65	567331.15
405	26.07	194.46	393.19	-360.37	-74.09	-11.88	5738383.56	567330.61
410	26.57	194.51	397.69	-364.87	-76.18	-12.42	5738381.46	567330.07
415	27.07	194.57	402.2	-369.38	-78.28	-12.96	5738379.37	567329.53
420	27.58	194.63	406.6	-373.78	-80.57	-13.56	5738377.07	567328.93
425	28.1	194.69	410.99	-378.17	-82.88	-14.17	5738374.76	567328.32
430	28.62	194.76	415.38	-382.56	-85.2	-14.78	5738372.45	567327.71
435	29.14	194.82	419.78	-386.96	-87.51	-15.39	5738370.14	567327.1
440	29.66	194.89	424.17	-391.35	-89.82	-16	5738367.83	567326.49
445	30.16	194.97	428.52	-395.7	-92.19	-16.63	5738365.45	567325.86
450	30.64	195.1	432.78	-399.96	-94.71	-17.32	5738362.94	567325.17
455	31.13	195.23	437.05	-404.23	-97.22	-18.01	5738360.42	567324.48
460	31.61	195.36	441.32	-408.5	-99.73	-18.7	5738357.91	567323.79
465	32.09	195.48	445.59	-412.77	-102.24	-19.39	5738355.4	567323.11
470	32.58	195.61	449.85	-417.03	-104.76	-20.07	5738352.89	567322.42
475	33.05	195.67	454.05	-421.23	-107.37	-20.8	5738350.28	567321.69
480	33.51	195.67	458.19	-425.37	-110.07	-21.56	5738347.58	567320.94
485	33.98	195.67	462.33	-429.51	-112.77	-22.31	5738344.88	567320.18
490	34.44	195.67	466.47	-433.65	-115.46	-23.07	5738342.18	567319.42
495	34.91	195.67	470.61	-437.79	-118.16	-23.83	5738339.48	567318.66
500	35.37	195.67	474.75	-441.93	-120.86	-24.58	5738336.78	567317.91
505	35.9	195.61	478.75	-445.93	-123.75	-25.38	5738333.89	567317.11
510	36.43	195.54	482.75	-449.93	-126.65	-26.19	5738331	567316.31
515	36.97	195.47	486.74	-453.92	-129.55	-26.99	5738328.1	567315.5

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
520	37.5	195.41	490.73	-457.91	-132.45	-27.79	5738325.2	567314.7
525	38.03	195.34	494.72	-461.9	-135.35	-28.59	5738322.3	567313.9
530	38.57	195.27	498.72	-465.9	-138.25	-29.39	5738319.4	567313.1
535	39.17	195.45	502.54	-469.72	-141.34	-30.27	5738316.3	567312.22
540	39.78	195.65	506.35	-473.53	-144.46	-31.15	5738313.19	567311.34
545	40.38	195.85	510.17	-477.35	-147.57	-32.04	5738310.08	567310.46
550	40.99	196.04	513.98	-481.16	-150.68	-32.92	5738306.97	567309.57
555	41.6	196.24	517.79	-484.97	-153.79	-33.8	5738303.86	567308.69
560	42.18	196.43	521.54	-488.72	-156.96	-34.72	5738300.68	567307.77
565	42.71	196.6	525.17	-492.35	-160.26	-35.72	5738297.39	567306.77
570	43.25	196.77	528.79	-495.97	-163.55	-36.72	5738294.09	567305.77
575	43.78	196.95	532.41	-499.59	-166.85	-37.72	5738290.8	567304.77
580	44.32	197.12	536.04	-503.22	-170.14	-38.72	5738287.5	567303.77
585	44.85	197.29	539.66	-506.84	-173.44	-39.73	5738284.2	567302.77
590	45.41	197.51	543.18	-510.36	-176.82	-40.79	5738280.82	567301.7
595	45.98	197.77	546.61	-513.79	-180.28	-41.92	5738277.37	567300.57
600	46.56	198.03	550.04	-517.22	-183.73	-43.05	5738273.91	567299.44
605	47.13	198.29	553.48	-520.66	-187.19	-44.18	5738270.46	567298.31
610	47.7	198.55	556.91	-524.09	-190.64	-45.31	5738267	567297.18
615	48.28	198.76	560.31	-527.49	-194.12	-46.45	5738263.52	567296.04
620	48.87	198.71	563.53	-530.71	-197.75	-47.67	5738259.9	567294.82
625	49.45	198.66	566.75	-533.93	-201.37	-48.89	5738256.27	567293.6
630	50.04	198.61	569.97	-537.15	-204.99	-50.11	5738252.65	567292.38
635	50.62	198.56	573.19	-540.37	-208.62	-51.33	5738249.03	567291.16
640	51.21	198.5	576.41	-543.59	-212.24	-52.55	5738245.4	567289.94
645	51.8	198.49	579.55	-546.73	-215.93	-53.79	5738241.72	567288.7
650	52.38	198.54	582.54	-549.72	-219.72	-55.07	5738237.92	567287.42
655	52.97	198.59	585.53	-552.71	-223.52	-56.35	5738234.12	567286.14
660	53.56	198.64	588.52	-555.7	-227.32	-57.63	5738230.32	567284.86
665	54.14	198.69	591.5	-558.68	-231.12	-58.91	5738226.52	567283.58
670	54.73	198.75	594.49	-561.67	-234.92	-60.2	5738222.73	567282.3
675	55.4	198.77	597.39	-564.57	-238.78	-61.5	5738218.87	567280.99
680	56.15	198.77	600.2	-567.38	-242.69	-62.83	5738214.95	567279.66
685	56.78	198.72	602.95	-570.13	-246.64	-64.17	5738211	567278.32
690	57.31	198.63	605.64	-572.82	-250.64	-65.51	5738207.01	567276.98
695	57.84	198.55	608.34	-575.52	-254.63	-66.86	5738203.02	567275.63
700	58.3	198.49	611.02	-578.2	-258.62	-68.21	5738199.02	567274.28
705	58.26	198.61	613.66	-580.84	-262.65	-69.58	5738195	567272.91
710	58.23	198.73	616.29	-583.47	-266.67	-70.95	5738190.98	567271.54
715	58.19	198.85	618.93	-586.11	-270.69	-72.32	5738186.95	567270.17
720	58.16	198.97	621.56	-588.74	-274.71	-73.69	5738182.93	567268.8
725	58.12	199.09	624.2	-591.38	-278.73	-75.06	5738178.91	567267.43
730	58.12	199.21	626.83	-594.01	-282.75	-76.45	5738174.89	567266.04
735	58.2	199.34	629.46	-596.64	-286.76	-77.87	5738170.88	567264.62
740	58.27	199.46	632.09	-599.27	-290.77	-79.29	5738166.87	567263.2
745	58.34	199.59	634.71	-601.89	-294.78	-80.71	5738162.86	567261.78
750	58.41	199.71	637.34	-604.52	-298.79	-82.13	5738158.85	567260.36
755	58.48	199.84	639.97	-607.15	-302.8	-83.56	5738154.84	567258.93
760	58.42	199.91	642.6	-609.78	-306.8	-85	5738150.85	567257.49
765	58.32	199.96	645.24	-612.42	-310.79	-86.46	5738146.85	567256.03
770	58.22	200.01	647.87	-615.05	-314.78	-87.91	5738142.86	567254.58
775	58.11	200.06	650.5	-617.68	-318.78	-89.37	5738138.87	567253.12
780	58.01	200.11	653.14	-620.32	-322.77	-90.82	5738134.88	567251.67
785	57.91	200.17	655.77	-622.95	-326.76	-92.28	5738130.88	567250.22
790	57.93	200.23	658.42	-625.6	-330.74	-93.75	5738126.91	567248.74
795	57.97	200.3	661.07	-628.25	-334.71	-95.23	5738122.93	567247.26
800	58	200.37	663.72	-630.9	-338.69	-96.7	5738118.96	567245.79
805	58.04	200.44	666.37	-633.55	-342.66	-98.18	5738114.98	567244.31

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
810	58.07	200.51	669.02	-636.2	-346.64	-99.65	5738111.01	567242.84
815	58.1	200.57	671.67	-638.85	-350.61	-101.13	5738107.03	567241.36
820	58.12	200.57	674.31	-641.49	-354.59	-102.63	5738103.05	567239.87
825	58.14	200.57	676.95	-644.13	-358.57	-104.12	5738099.08	567238.37
830	58.15	200.57	679.58	-646.76	-362.54	-105.61	5738095.1	567236.88
835	58.17	200.57	682.22	-649.4	-366.52	-107.1	5738091.13	567235.39
840	58.19	200.57	684.86	-652.04	-370.49	-108.59	5738087.15	567233.9
845	58.2	200.55	687.5	-654.68	-374.47	-110.08	5738083.17	567232.41
850	58.2	200.48	690.13	-657.31	-378.46	-111.56	5738079.19	567230.93
855	58.2	200.41	692.77	-659.95	-382.44	-113.04	5738075.2	567229.45
860	58.2	200.34	695.4	-662.58	-386.42	-114.52	5738071.22	567227.97
865	58.2	200.27	698.04	-665.22	-390.41	-116	5738067.24	567226.49
870	58.2	200.2	700.67	-667.85	-394.39	-117.48	5738063.25	567225.01
875	58.17	200.28	703.31	-670.49	-398.37	-118.97	5738059.28	567223.52
880	58.12	200.47	705.96	-673.14	-402.34	-120.47	5738055.31	567222.02
885	58.06	200.67	708.61	-675.79	-406.3	-121.97	5738051.34	567220.52
890	58.01	200.86	711.25	-678.43	-410.27	-123.47	5738047.37	567219.02
895	57.96	201.06	713.9	-681.08	-414.24	-124.97	5738043.4	567217.52
900	57.9	201.26	716.54	-683.72	-418.21	-126.47	5738039.44	567216.02
905	57.92	201.27	719.2	-686.38	-422.16	-128.01	5738035.49	567214.48
910	57.93	201.27	721.85	-689.03	-426.11	-129.55	5738031.54	567212.95
915	57.95	201.27	724.5	-691.68	-430.06	-131.08	5738027.59	567211.41
920	57.97	201.27	727.16	-694.34	-434.01	-132.62	5738023.64	567209.87
925	57.99	201.27	729.81	-696.99	-437.95	-134.16	5738019.69	567208.33
930	58	201.27	732.46	-699.64	-441.9	-135.69	5738015.74	567206.8
935	57.98	201.27	735.12	-702.3	-445.85	-137.23	5738011.79	567205.26
940	57.96	201.27	737.77	-704.95	-449.8	-138.77	5738007.84	567203.72
945	57.95	201.27	740.42	-707.6	-453.75	-140.31	5738003.89	567202.18
950	57.93	201.27	743.08	-710.26	-457.7	-141.84	5737999.94	567200.65
955	57.91	201.27	745.73	-712.91	-461.65	-143.38	5737995.99	567199.11
960	57.89	201.23	748.39	-715.57	-465.6	-144.91	5737992.04	567197.58
965	57.85	201.1	751.05	-718.23	-469.55	-146.42	5737988.09	567196.07
970	57.82	200.98	753.71	-720.89	-473.5	-147.93	5737984.14	567194.56
975	57.78	200.85	756.38	-723.56	-477.46	-149.44	5737980.19	567193.05
980	57.75	200.73	759.04	-726.22	-481.41	-150.95	5737976.24	567191.54
985	57.71	200.6	761.71	-728.89	-485.36	-152.46	5737972.28	567190.03
990	57.7	200.66	764.38	-731.56	-489.31	-153.97	5737968.33	567188.52
995	57.7	200.78	767.05	-734.23	-493.26	-155.48	5737964.39	567187.01
1000	57.7	200.9	769.72	-736.9	-497.2	-156.99	5737960.44	567185.5
1005	57.7	201.02	772.39	-739.57	-501.15	-158.5	5737956.49	567183.99
1010	57.7	201.14	775.07	-742.25	-505.1	-160.01	5737952.54	567182.48
1015	57.7	201.26	777.74	-744.92	-509.05	-161.52	5737948.6	567180.97
1020	57.68	201.27	780.41	-747.59	-512.98	-163.05	5737944.66	567179.44
1025	57.67	201.27	783.09	-750.27	-516.92	-164.58	5737940.72	567177.91
1030	57.65	201.27	785.76	-752.94	-520.86	-166.11	5737936.79	567176.38
1035	57.63	201.27	788.44	-755.62	-524.79	-167.65	5737932.85	567174.85
1040	57.61	201.27	791.11	-758.29	-528.73	-169.18	5737928.91	567173.31
1045	57.6	201.28	793.79	-760.97	-532.66	-170.71	5737924.98	567171.78
1050	57.58	201.33	796.47	-763.65	-536.59	-172.25	5737921.05	567170.24
1055	57.56	201.38	799.16	-766.34	-540.52	-173.79	5737917.12	567168.7
1060	57.54	201.44	801.84	-769.02	-544.45	-175.33	5737913.2	567167.16
1065	57.53	201.49	804.52	-771.7	-548.38	-176.88	5737909.27	567165.62
1070	57.51	201.55	807.2	-774.38	-552.3	-178.42	5737905.34	567164.08
1075	57.46	201.57	809.9	-777.08	-556.22	-179.96	5737901.42	567162.53
1080	57.39	201.57	812.6	-779.78	-560.14	-181.51	5737897.51	567160.98
1085	57.33	201.57	815.3	-782.48	-564.05	-183.05	5737893.59	567159.44
1090	57.26	201.57	818	-785.18	-567.96	-184.6	5737889.68	567157.89
1095	57.19	201.57	820.7	-787.88	-571.88	-186.15	5737885.77	567156.34

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1100	57.12	201.57	823.4	-790.58	-575.79	-187.69	5737881.86	567154.8
1105	57.07	201.62	826.12	-793.3	-579.69	-189.25	5737877.96	567153.24
1110	57.04	201.69	828.84	-796.02	-583.58	-190.8	5737874.06	567151.69
1115	57.01	201.76	831.57	-798.75	-587.48	-192.36	5737870.17	567150.13
1120	56.97	201.83	834.29	-801.47	-591.37	-193.91	5737866.27	567148.58
1125	56.94	201.9	837.01	-804.19	-595.26	-195.47	5737862.38	567147.02
1130	56.9	201.97	839.74	-806.92	-599.16	-197.02	5737858.48	567145.47
1135	56.88	201.91	842.47	-809.65	-603.05	-198.58	5737854.6	567143.92
1140	56.87	201.84	845.2	-812.38	-606.93	-200.13	5737850.71	567142.36
1145	56.85	201.77	847.94	-815.12	-610.82	-201.68	5737846.82	567140.81
1150	56.83	201.71	850.67	-817.85	-614.71	-203.23	5737842.93	567139.26
1155	56.82	201.64	853.41	-820.59	-618.6	-204.79	5737839.05	567137.7
1160	56.8	201.57	856.14	-823.32	-622.48	-206.34	5737835.16	567136.15
1165	56.78	201.69	858.88	-826.06	-626.36	-207.9	5737831.28	567134.59
1170	56.77	201.81	861.62	-828.8	-630.24	-209.46	5737827.4	567133.03
1175	56.75	201.94	864.36	-831.54	-634.12	-211.02	5737823.52	567131.47
1180	56.73	202.06	867.11	-834.29	-638	-212.58	5737819.64	567129.91
1185	56.71	202.19	869.85	-837.03	-641.88	-214.14	5737815.76	567128.35
1190	56.71	202.25	872.59	-839.77	-645.76	-215.71	5737811.88	567126.78
1195	56.72	202.2	875.33	-842.51	-649.63	-217.28	5737808.01	567125.21
1200	56.74	202.15	878.07	-845.25	-653.51	-218.86	5737804.14	567123.63
1205	56.76	202.1	880.81	-847.99	-657.38	-220.43	5737800.26	567122.06
1210	56.77	202.05	883.56	-850.74	-661.25	-222.01	5737796.39	567120.48
1215	56.79	201.99	886.3	-853.48	-665.13	-223.58	5737792.52	567118.91
1220	56.82	201.97	889.03	-856.21	-669.01	-225.15	5737788.64	567117.34
1225	56.85	201.97	891.76	-858.94	-672.89	-226.72	5737784.75	567115.77
1230	56.89	201.97	894.49	-861.67	-676.77	-228.29	5737780.87	567114.21
1235	56.93	201.97	897.22	-864.4	-680.66	-229.85	5737776.98	567112.64
1240	56.96	201.97	899.95	-867.13	-684.54	-231.42	5737773.1	567111.07
1245	57	201.97	902.68	-869.86	-688.43	-232.99	5737769.22	567109.5
1250	56.95	202.08	905.42	-872.6	-692.3	-234.58	5737765.34	567107.92
1255	56.9	202.2	908.15	-875.33	-696.17	-236.16	5737761.47	567106.33
1260	56.85	202.32	910.89	-878.07	-700.05	-237.75	5737757.6	567104.74
1265	56.8	202.45	913.62	-880.8	-703.92	-239.34	5737753.72	567103.15
1270	56.74	202.57	916.36	-883.54	-707.79	-240.93	5737749.85	567101.56
1275	56.69	202.66	919.09	-886.27	-711.66	-242.52	5737745.98	567099.97
1280	56.64	202.59	921.85	-889.03	-715.52	-244.12	5737742.13	567098.37
1285	56.59	202.52	924.6	-891.78	-719.37	-245.71	5737738.27	567096.78
1290	56.54	202.45	927.36	-894.54	-723.23	-247.31	5737734.42	567095.18
1295	56.49	202.38	930.12	-897.3	-727.08	-248.9	5737730.56	567093.59
1300	56.43	202.32	932.87	-900.05	-730.94	-250.5	5737726.71	567091.99
1305	56.38	202.37	935.63	-902.81	-734.79	-252.09	5737722.85	567090.4
1310	56.3	202.65	938.4	-905.58	-738.64	-253.68	5737719.01	567088.81
1315	56.26	202.59	941.19	-908.37	-742.48	-255.27	5737715.17	567087.22
1320	56.22	202.5	943.97	-911.15	-746.31	-256.86	5737711.33	567085.63
1325	56.17	202.41	946.75	-913.93	-750.15	-258.45	5737707.49	567084.05
1330	56.13	202.33	949.53	-916.71	-753.99	-260.03	5737703.65	567082.46
1335	56.06	202.32	952.33	-919.51	-757.82	-261.63	5737699.83	567080.86
1340	55.93	202.46	955.16	-922.34	-761.61	-263.24	5737696.03	567079.25
1345	55.81	202.61	957.99	-925.17	-765.41	-264.84	5737692.24	567077.65
1350	55.68	202.76	960.82	-928	-769.2	-266.45	5737688.44	567076.04
1355	55.56	202.9	963.66	-930.84	-772.99	-268.06	5737684.65	567074.43
1360	55.43	203.05	966.49	-933.67	-776.79	-269.67	5737680.86	567072.82
1365	55.31	203.19	969.32	-936.5	-780.58	-271.27	5737677.06	567071.22
1370	55.18	203.34	972.15	-939.33	-784.37	-272.88	5737673.27	567069.61
1375	55.06	203.49	974.98	-942.16	-788.17	-274.49	5737669.48	567068
1380	54.93	203.63	977.82	-945	-791.96	-276.1	5737665.68	567066.39
1385	54.9	203.83	980.68	-947.86	-795.71	-277.76	5737661.93	567064.73

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1390	54.9	204.04	983.56	-950.74	-799.44	-279.43	5737658.2	567063.06
1395	54.9	204.25	986.43	-953.61	-803.17	-281.11	5737654.47	567061.38
1400	54.9	204.46	989.31	-956.49	-806.9	-282.79	5737650.74	567059.7
1405	54.9	204.67	992.18	-959.36	-810.63	-284.47	5737647.01	567058.02
1410	54.84	204.9	995.07	-962.25	-814.34	-286.19	5737643.31	567056.3
1415	54.74	205.14	997.96	-965.14	-818.01	-287.94	5737639.63	567054.55
1420	54.64	205.38	1000.86	-968.04	-821.69	-289.69	5737635.95	567052.8
1425	54.53	205.62	1003.76	-970.94	-825.37	-291.44	5737632.27	567051.05
1430	54.43	205.86	1006.65	-973.83	-829.05	-293.2	5737628.59	567049.29
1435	54.33	206.11	1009.55	-976.73	-832.73	-294.95	5737624.91	567047.54
1440	54.34	206.31	1012.45	-979.63	-836.38	-296.76	5737621.27	567045.73
1445	54.39	206.5	1015.36	-982.54	-840.01	-298.59	5737617.63	567043.9
1450	54.44	206.69	1018.27	-985.45	-843.64	-300.42	5737614	567042.07
1455	54.49	206.88	1021.18	-988.36	-847.28	-302.25	5737610.36	567040.25
1460	54.54	207.07	1024.08	-991.26	-850.91	-304.08	5737606.73	567038.42
1465	54.6	207.26	1026.99	-994.17	-854.55	-305.9	5737603.1	567036.59
1470	54.28	207.16	1029.95	-997.13	-858.14	-307.73	5737599.51	567034.76
1475	53.93	207.04	1032.92	-1000.1	-861.72	-309.55	5737595.92	567032.94
1480	53.59	206.92	1035.89	-1003.07	-865.31	-311.37	5737592.33	567031.12
1485	53.24	206.79	1038.85	-1006.03	-868.9	-313.19	5737588.74	567029.3
1490	52.9	206.67	1041.82	-1009	-872.49	-315.02	5737585.16	567027.48
1495	52.67	206.59	1044.78	-1011.96	-876.08	-316.84	5737581.56	567025.65
1500	53.21	206.77	1047.71	-1014.89	-879.69	-318.69	5737577.96	567023.81
1505	53.74	206.94	1050.64	-1017.82	-883.29	-320.53	5737574.35	567021.96
1510	54.28	207.11	1053.57	-1020.75	-886.9	-322.38	5737570.74	567020.12
1515	54.81	207.28	1056.49	-1023.67	-890.51	-324.22	5737567.13	567018.27
1520	55.35	207.46	1059.42	-1026.6	-894.12	-326.06	5737563.52	567016.43
1525	55.79	207.63	1062.29	-1029.47	-897.75	-327.95	5737559.89	567014.54
1530	56.07	207.82	1065.05	-1032.23	-901.43	-329.91	5737556.22	567012.58
1535	56.34	208.01	1067.81	-1034.99	-905.1	-331.88	5737552.54	567010.61
1540	56.62	208.2	1070.57	-1037.75	-908.78	-333.85	5737548.86	567008.65
1545	56.9	208.39	1073.33	-1040.51	-912.46	-335.81	5737545.19	567006.68
1550	57.17	208.58	1076.09	-1043.27	-916.13	-337.78	5737541.51	567004.72
1555	57.35	208.73	1078.81	-1045.99	-919.82	-339.78	5737537.83	567002.71
1560	57.43	208.86	1081.49	-1048.67	-923.51	-341.83	5737534.14	567000.66
1565	57.52	208.98	1084.18	-1051.36	-927.2	-343.88	5737530.45	566998.61
1570	57.6	209.1	1086.86	-1054.04	-930.89	-345.93	5737526.76	566996.57
1575	57.69	209.22	1089.54	-1056.72	-934.58	-347.97	5737523.07	566994.52
1580	57.78	209.34	1092.22	-1059.4	-938.27	-350.02	5737519.38	566992.47
1585	57.72	209.41	1094.91	-1062.09	-941.94	-352.09	5737515.7	566990.4
1590	57.62	209.46	1097.6	-1064.78	-945.61	-354.17	5737512.03	566988.32
1595	57.52	209.51	1100.29	-1067.47	-949.28	-356.24	5737508.37	566986.25
1600	57.41	209.56	1102.97	-1070.15	-952.95	-358.32	5737504.7	566984.17
1605	57.31	209.61	1105.66	-1072.84	-956.62	-360.4	5737501.03	566982.09
1610	57.21	209.66	1108.35	-1075.53	-960.29	-362.48	5737497.36	566980.01
1615	57.24	209.63	1111.04	-1078.22	-963.95	-364.55	5737493.69	566977.94
1620	57.31	209.58	1113.73	-1080.91	-967.62	-366.63	5737490.03	566975.86
1625	57.39	209.52	1116.43	-1083.61	-971.28	-368.7	5737486.36	566973.79
1630	57.46	209.47	1119.12	-1086.3	-974.95	-370.78	5737482.7	566971.71
1635	57.54	209.42	1121.82	-1089	-978.61	-372.85	5737479.03	566969.64
1640	57.58	209.38	1124.51	-1091.69	-982.28	-374.93	5737475.37	566967.56
1645	57.44	209.43	1127.22	-1094.4	-985.93	-377	5737471.71	566965.49
1650	57.29	209.48	1129.93	-1097.11	-989.59	-379.07	5737468.05	566963.42
1655	57.15	209.54	1132.64	-1099.82	-993.25	-381.14	5737464.4	566961.35
1660	57.01	209.59	1135.35	-1102.53	-996.91	-383.21	5737460.74	566959.28
1665	56.87	209.65	1138.06	-1105.24	-1000.56	-385.28	5737457.08	566957.21
1670	56.82	209.71	1140.78	-1107.96	-1004.21	-387.36	5737453.44	566955.13
1675	56.85	209.78	1143.51	-1110.69	-1007.84	-389.45	5737449.81	566953.04



MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1680	56.89	209.84	1146.24	-1113.42	-1011.47	-391.53	5737446.17	566950.96
1685	56.92	209.91	1148.97	-1116.15	-1015.1	-393.62	5737442.54	566948.87
1690	56.96	209.98	1151.7	-1118.88	-1018.73	-395.71	5737438.91	566946.79
1695	56.99	210.05	1154.43	-1121.61	-1022.37	-397.79	5737435.28	566944.7
1700	56.91	210.07	1157.17	-1124.35	-1025.99	-399.88	5737431.66	566942.61
1705	56.79	210.07	1159.92	-1127.1	-1029.6	-401.98	5737428.04	566940.52
1710	56.67	210.07	1162.67	-1129.85	-1033.21	-404.07	5737424.43	566938.42
1715	56.55	210.07	1165.42	-1132.6	-1036.83	-406.16	5737420.81	566936.33
1720	56.43	210.07	1168.17	-1135.35	-1040.44	-408.25	5737417.2	566934.24
1725	56.31	210.07	1170.92	-1138.1	-1044.06	-410.35	5737413.59	566932.14
1730	56.23	210.12	1173.7	-1140.88	-1047.65	-412.44	5737410	566930.06
1735	56.16	210.18	1176.49	-1143.67	-1051.23	-414.52	5737406.41	566927.97
1740	56.08	210.23	1179.28	-1146.46	-1054.82	-416.61	5737402.83	566925.88
1745	56.01	210.29	1182.07	-1149.25	-1058.4	-418.7	5737399.24	566923.79
1750	55.93	210.34	1184.86	-1152.04	-1061.99	-420.79	5737395.65	566921.7
1755	55.95	210.37	1187.65	-1154.83	-1065.57	-422.88	5737392.07	566919.61
1760	56.03	210.37	1190.43	-1157.61	-1069.16	-424.98	5737388.49	566917.51
1765	56.12	210.37	1193.22	-1160.4	-1072.74	-427.08	5737384.9	566915.41
1770	56.2	210.37	1196	-1163.18	-1076.32	-429.18	5737381.32	566913.31
1775	56.29	210.37	1198.79	-1165.97	-1079.91	-431.28	5737377.74	566911.21
1780	56.38	210.37	1201.57	-1168.75	-1083.49	-433.38	5737374.16	566909.11
1785	56.44	210.45	1204.33	-1171.51	-1087.08	-435.51	5737370.57	566906.99
1790	56.51	210.55	1207.08	-1174.26	-1090.66	-437.64	5737366.98	566904.85
1795	56.57	210.66	1209.84	-1177.02	-1094.25	-439.77	5737363.39	566902.72
1800	56.63	210.77	1212.59	-1179.77	-1097.84	-441.9	5737359.8	566900.59
1805	56.69	210.87	1215.34	-1182.52	-1101.43	-444.04	5737356.21	566898.46
1810	56.75	210.98	1218.09	-1185.27	-1105.02	-446.17	5737352.63	566896.32
1815	56.8	211.06	1220.84	-1188.02	-1108.61	-448.3	5737349.04	566894.19
1820	56.82	211.01	1223.58	-1190.76	-1112.2	-450.45	5737345.45	566892.04
1825	56.84	210.96	1226.31	-1193.49	-1115.79	-452.6	5737341.85	566889.89
1830	56.85	210.91	1229.05	-1196.23	-1119.38	-454.76	5737338.26	566887.74
1835	56.87	210.86	1231.78	-1198.96	-1122.97	-456.91	5737334.67	566885.58
1840	56.89	210.8	1234.51	-1201.69	-1126.56	-459.06	5737331.08	566883.43
1845	56.89	210.79	1237.25	-1204.43	-1130.15	-461.21	5737327.49	566881.28
1850	56.88	210.84	1239.98	-1207.16	-1133.74	-463.36	5737323.9	566879.13
1855	56.86	210.9	1242.72	-1209.9	-1137.34	-465.51	5737320.31	566876.98
1860	56.84	210.95	1245.45	-1212.63	-1140.93	-467.66	5737316.72	566874.83
1865	56.82	211	1248.19	-1215.37	-1144.52	-469.81	5737313.12	566872.68
1870	56.8	211.06	1250.92	-1218.1	-1148.11	-471.96	5737309.53	566870.53
1875	56.79	211.07	1253.66	-1220.84	-1151.69	-474.12	5737305.95	566868.37
1880	56.77	211.07	1256.4	-1223.58	-1155.28	-476.28	5737302.37	566866.21
1885	56.75	211.07	1259.14	-1226.32	-1158.86	-478.44	5737298.79	566864.06
1890	56.74	211.07	1261.88	-1229.06	-1162.44	-480.59	5737295.2	566861.9
1895	56.72	211.07	1264.63	-1231.81	-1166.02	-482.75	5737291.62	566859.74
1900	56.7	211.07	1267.37	-1234.55	-1169.6	-484.91	5737288.04	566857.58
1905	56.65	211.07	1270.12	-1237.3	-1173.18	-487.06	5737284.47	566855.43
1910	56.6	211.07	1272.88	-1240.06	-1176.75	-489.22	5737280.89	566853.27
1915	56.55	211.07	1275.63	-1242.81	-1180.32	-491.37	5737277.32	566851.12
1920	56.5	211.07	1278.39	-1245.57	-1183.9	-493.52	5737273.75	566848.97
1925	56.44	211.07	1281.15	-1248.33	-1187.47	-495.68	5737270.17	566846.82
1930	56.4	211.07	1283.9	-1251.08	-1191.04	-497.83	5737266.6	566844.66
1935	56.38	211.07	1286.67	-1253.85	-1194.61	-499.98	5737263.04	566842.52
1940	56.36	211.07	1289.45	-1256.63	-1198.17	-502.12	5737259.47	566840.37
1945	56.35	211.07	1292.22	-1259.4	-1201.74	-504.27	5737255.91	566838.22
1950	56.33	211.07	1294.99	-1262.17	-1205.3	-506.42	5737252.34	566836.07
1955	56.31	211.07	1297.76	-1264.94	-1208.87	-508.57	5737248.78	566833.92
1960	56.29	211.07	1300.53	-1267.71	-1212.43	-510.71	5737245.21	566831.78
1965	56.28	211.07	1303.31	-1270.49	-1215.99	-512.86	5737241.65	566829.63

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1970	56.26	211.07	1306.09	-1273.27	-1219.55	-515.01	5737238.09	566827.49
1975	56.24	211.07	1308.86	-1276.04	-1223.11	-517.15	5737234.53	566825.34
1980	56.22	211.07	1311.64	-1278.82	-1226.67	-519.3	5737230.97	566823.19
1985	56.2	211.07	1314.42	-1281.6	-1230.23	-521.44	5737227.41	566821.05
1990	56.16	211.12	1317.21	-1284.39	-1233.78	-523.59	5737223.86	566818.9
1995	56.11	211.19	1320	-1287.18	-1237.33	-525.75	5737220.31	566816.74
2000	56.06	211.26	1322.79	-1289.97	-1240.87	-527.9	5737216.77	566814.59
2005	56.01	211.33	1325.58	-1292.76	-1244.42	-530.05	5737213.22	566812.44
2010	55.96	211.4	1328.38	-1295.56	-1247.96	-532.2	5737209.68	566810.29
2015	55.9	211.47	1331.17	-1298.35	-1251.51	-534.36	5737206.13	566808.13
2020	55.83	211.4	1333.99	-1301.17	-1255.04	-536.5	5737202.6	566805.99
2025	55.76	211.33	1336.8	-1303.98	-1258.57	-538.65	5737199.07	566803.84
2030	55.69	211.26	1339.62	-1306.8	-1262.1	-540.79	5737195.54	566801.7
2035	55.62	211.19	1342.44	-1309.62	-1265.63	-542.93	5737192.01	566799.56
2040	55.55	211.12	1345.26	-1312.44	-1269.16	-545.08	5737188.48	566797.41
2045	55.48	211.11	1348.08	-1315.26	-1272.69	-547.22	5737184.96	566795.27
2050	55.43	211.23	1350.92	-1318.1	-1276.2	-549.37	5737181.45	566793.12
2055	55.38	211.35	1353.77	-1320.95	-1279.71	-551.51	5737177.94	566790.98
2060	55.33	211.47	1356.61	-1323.79	-1283.22	-553.66	5737174.43	566788.84
2065	55.28	211.59	1359.45	-1326.63	-1286.73	-555.8	5737170.92	566786.69
2070	55.22	211.71	1362.3	-1329.48	-1290.24	-557.94	5737167.41	566784.55
2075	55.17	211.81	1365.15	-1332.33	-1293.73	-560.1	5737163.91	566782.39
2080	55.12	211.88	1368.01	-1335.19	-1297.21	-562.27	5737160.44	566780.22
2085	55.07	211.94	1370.88	-1338.06	-1300.68	-564.44	5737156.96	566778.05
2090	55.02	212.01	1373.74	-1340.92	-1304.16	-566.61	5737153.48	566775.88
2095	54.97	212.08	1376.61	-1343.79	-1307.63	-568.78	5737150.01	566773.71
2100	54.91	212.15	1379.47	-1346.65	-1311.11	-570.95	5737146.53	566771.54
2105	54.85	212.12	1382.35	-1349.53	-1314.58	-573.11	5737143.07	566769.38
2110	54.78	212.05	1385.24	-1352.42	-1318.04	-575.27	5737139.6	566767.22
2115	54.7	211.97	1388.13	-1355.31	-1321.5	-577.44	5737136.14	566765.06
2120	54.63	211.9	1391.02	-1358.2	-1324.96	-579.6	5737132.68	566762.9
2125	54.56	211.83	1393.91	-1361.09	-1328.42	-581.76	5737129.22	566760.73
2130	54.5	211.79	1396.8	-1363.98	-1331.88	-583.92	5737125.76	566758.57
2135	54.52	211.91	1399.7	-1366.88	-1335.33	-586.08	5737122.31	566756.41
2140	54.54	212.04	1402.6	-1369.78	-1338.78	-588.25	5737118.86	566754.24
2145	54.56	212.16	1405.5	-1372.68	-1342.23	-590.42	5737115.41	566752.08
2150	54.57	212.29	1408.4	-1375.58	-1345.68	-592.58	5737111.96	566749.91
2155	54.59	212.41	1411.3	-1378.48	-1349.13	-594.75	5737108.51	566747.74
2160	54.62	212.51	1414.2	-1381.38	-1352.57	-596.93	5737105.07	566745.56
2165	54.65	212.58	1417.09	-1384.27	-1356.01	-599.13	5737101.63	566743.36
2170	54.69	212.65	1419.98	-1387.16	-1359.44	-601.34	5737098.2	566741.15
2175	54.73	212.72	1422.86	-1390.04	-1362.88	-603.54	5737094.76	566738.95
2180	54.76	212.79	1425.75	-1392.93	-1366.31	-605.74	5737091.33	566736.75
2185	54.8	212.87	1428.64	-1395.82	-1369.75	-607.95	5737087.89	566734.55
2190	54.82	212.92	1431.52	-1398.7	-1373.18	-610.17	5737084.47	566732.32
2195	54.83	212.97	1434.4	-1401.58	-1376.61	-612.4	5737081.04	566730.09
2200	54.85	213.02	1437.28	-1404.46	-1380.03	-614.63	5737077.61	566727.86
2205	54.87	213.07	1440.16	-1407.34	-1383.46	-616.86	5737074.18	566725.64
2210	54.89	213.13	1443.04	-1410.22	-1386.89	-619.08	5737070.75	566723.41
2215	54.9	213.17	1445.92	-1413.1	-1390.32	-621.31	5737067.33	566721.18
2220	54.88	213.17	1448.79	-1415.97	-1393.74	-623.55	5737063.9	566718.94
2225	54.86	213.17	1451.67	-1418.85	-1397.16	-625.79	5737060.48	566716.71
2230	54.84	213.17	1454.55	-1421.73	-1400.58	-628.02	5737057.06	566714.47
2235	54.83	213.17	1457.43	-1424.61	-1404.01	-630.26	5737053.64	566712.23
2240	54.81	213.17	1460.31	-1427.49	-1407.43	-632.5	5737050.22	566710
2245	54.77	213.17	1463.19	-1430.37	-1410.85	-634.73	5737046.8	566707.76
2250	54.72	213.17	1466.09	-1433.27	-1414.26	-636.96	5737043.38	566705.53
2255	54.67	213.17	1468.98	-1436.16	-1417.67	-639.19	5737039.97	566703.3

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2260	54.62	213.17	1471.87	-1439.05	-1421.09	-641.42	5737036.56	566701.07
2265	54.57	213.17	1474.77	-1441.95	-1424.5	-643.65	5737033.14	566698.84
2270	54.51	213.17	1477.66	-1444.84	-1427.91	-645.89	5737029.73	566696.61
2275	54.5	213.31	1480.56	-1447.74	-1431.31	-648.14	5737026.34	566694.35
2280	54.5	213.5	1483.46	-1450.64	-1434.69	-650.4	5737022.95	566692.09
2285	54.5	213.69	1486.37	-1453.55	-1438.08	-652.66	5737019.57	566689.83
2290	54.5	213.88	1489.27	-1456.45	-1441.46	-654.92	5737016.18	566687.57
2295	54.5	214.07	1492.17	-1459.35	-1444.85	-657.18	5737012.79	566685.31
2300	54.5	214.26	1495.08	-1462.26	-1448.23	-659.44	5737009.41	566683.05
2305	54.53	214.27	1497.98	-1465.16	-1451.6	-661.73	5737006.04	566680.76
2310	54.57	214.27	1500.87	-1468.05	-1454.97	-664.02	5737002.67	566678.47
2315	54.6	214.27	1503.77	-1470.95	-1458.34	-666.32	5736999.3	566676.17
2320	54.64	214.27	1506.66	-1473.84	-1461.71	-668.61	5736995.94	566673.88
2325	54.67	214.27	1509.56	-1476.74	-1465.08	-670.91	5736992.57	566671.58
2330	54.7	214.28	1512.45	-1479.63	-1468.44	-673.21	5736989.2	566669.29
2335	54.74	214.33	1515.34	-1482.52	-1471.81	-675.52	5736985.83	566666.98
2340	54.78	214.38	1518.22	-1485.4	-1475.18	-677.82	5736982.46	566664.67
2345	54.81	214.44	1521.1	-1488.28	-1478.55	-680.13	5736979.09	566662.36
2350	54.85	214.49	1523.98	-1491.16	-1481.93	-682.44	5736975.72	566660.05
2355	54.88	214.55	1526.87	-1494.05	-1485.3	-684.75	5736972.35	566657.74
2360	54.94	214.61	1529.74	-1496.92	-1488.66	-687.08	5736968.98	566655.41
2365	55.01	214.68	1532.6	-1499.78	-1492.03	-689.42	5736965.61	566653.07
2370	55.07	214.74	1535.46	-1502.64	-1495.4	-691.76	5736962.24	566650.74
2375	55.14	214.81	1538.32	-1505.5	-1498.77	-694.09	5736958.87	566648.4
2380	55.21	214.88	1541.18	-1508.36	-1502.14	-696.43	5736955.5	566646.06
2385	55.28	214.95	1544.04	-1511.22	-1505.51	-698.77	5736952.14	566643.72
2390	55.33	214.97	1546.88	-1514.06	-1508.88	-701.13	5736948.76	566641.37
2395	55.36	214.97	1549.72	-1516.9	-1512.25	-703.48	5736945.39	566639.01
2400	55.4	214.97	1552.56	-1519.74	-1515.62	-705.84	5736942.02	566636.65
2405	55.43	214.97	1555.4	-1522.58	-1519	-708.2	5736938.65	566634.29
2410	55.47	214.97	1558.24	-1525.42	-1522.37	-710.56	5736935.27	566631.93
2415	55.51	214.98	1561.08	-1528.26	-1525.74	-712.92	5736931.9	566629.57
2420	55.56	215.03	1563.9	-1531.08	-1529.12	-715.3	5736928.52	566627.19
2425	55.61	215.08	1566.72	-1533.9	-1532.5	-717.67	5736925.15	566624.82
2430	55.66	215.13	1569.54	-1536.72	-1535.87	-720.05	5736921.77	566622.44
2435	55.71	215.18	1572.36	-1539.54	-1539.25	-722.42	5736918.39	566620.07
2440	55.77	215.24	1575.18	-1542.36	-1542.63	-724.8	5736915.02	566617.7
2445	55.8	215.29	1578	-1545.18	-1546	-727.18	5736911.64	566615.31
2450	55.8	215.36	1580.81	-1547.99	-1549.37	-729.58	5736908.28	566612.91
2455	55.8	215.43	1583.62	-1550.8	-1552.73	-731.98	5736904.91	566610.51
2460	55.8	215.5	1586.43	-1553.61	-1556.1	-734.38	5736901.54	566608.11
2465	55.8	215.57	1589.24	-1556.42	-1559.47	-736.78	5736898.17	566605.71
2470	55.8	215.64	1592.05	-1559.23	-1562.84	-739.18	5736894.81	566603.31
2475	55.82	215.71	1594.86	-1562.04	-1566.2	-741.59	5736891.44	566600.9
2480	55.85	215.78	1597.66	-1564.84	-1569.55	-744.02	5736888.09	566598.47
2485	55.89	215.85	1600.47	-1567.65	-1572.91	-746.44	5736884.73	566596.05
2490	55.93	215.92	1603.27	-1570.45	-1576.26	-748.87	5736881.38	566593.62
2495	55.96	215.99	1606.07	-1573.25	-1579.62	-751.3	5736878.02	566591.2
2500	56	216.07	1608.88	-1576.06	-1582.98	-753.72	5736874.67	566588.77
2505	56.03	216.12	1611.67	-1578.85	-1586.32	-756.17	5736871.32	566586.32
2510	56.07	216.17	1614.46	-1581.64	-1589.67	-758.62	5736867.97	566583.87
2515	56.1	216.22	1617.24	-1584.42	-1593.02	-761.08	5736864.62	566581.41
2520	56.14	216.27	1620.03	-1587.21	-1596.37	-763.53	5736861.28	566578.96
2525	56.17	216.33	1622.82	-1590	-1599.72	-765.98	5736857.93	566576.51
2530	56.2	216.38	1625.61	-1592.79	-1603.06	-768.44	5736854.58	566574.05
2535	56.22	216.45	1628.39	-1595.57	-1606.4	-770.91	5736851.24	566571.58
2540	56.24	216.52	1631.16	-1598.34	-1609.74	-773.39	5736847.9	566569.1
2545	56.25	216.59	1633.94	-1601.12	-1613.08	-775.87	5736844.56	566566.62

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2550	56.27	216.66	1636.72	-1603.9	-1616.42	-778.34	5736841.22	566564.15
2555	56.29	216.72	1639.5	-1606.68	-1619.76	-780.82	5736837.89	566561.67
2560	56.32	216.77	1642.27	-1609.45	-1623.1	-783.3	5736834.55	566559.19
2565	56.37	216.77	1645.03	-1612.21	-1626.43	-785.8	5736831.21	566556.69
2570	56.43	216.77	1647.8	-1614.98	-1629.77	-788.29	5736827.87	566554.2
2575	56.48	216.77	1650.56	-1617.74	-1633.11	-790.79	5736824.53	566551.7
2580	56.53	216.77	1653.32	-1620.5	-1636.45	-793.28	5736821.2	566549.21
2585	56.59	216.77	1656.09	-1623.27	-1639.79	-795.78	5736817.86	566546.72
2590	56.61	216.81	1658.84	-1626.02	-1643.12	-798.28	5736814.52	566544.21
2595	56.63	216.86	1661.59	-1628.77	-1646.46	-800.79	5736811.18	566541.7
2600	56.65	216.92	1664.34	-1631.52	-1649.8	-803.3	5736807.84	566539.19
2605	56.67	216.97	1667.09	-1634.27	-1653.14	-805.81	5736804.5	566536.68
2610	56.68	217.02	1669.84	-1637.02	-1656.48	-808.32	5736801.16	566534.17
2615	56.7	217.06	1672.58	-1639.76	-1659.82	-810.83	5736797.82	566531.66
2620	56.72	217.01	1675.32	-1642.5	-1663.16	-813.34	5736794.48	566529.15
2625	56.74	216.96	1678.07	-1645.25	-1666.51	-815.85	5736791.14	566526.64
2630	56.76	216.9	1680.81	-1647.99	-1669.85	-818.36	5736787.79	566524.13
2635	56.77	216.85	1683.55	-1650.73	-1673.19	-820.87	5736784.45	566521.62
2640	56.79	216.79	1686.29	-1653.47	-1676.53	-823.38	5736781.11	566519.11
2645	56.83	216.8	1689.02	-1656.2	-1679.88	-825.9	5736777.76	566516.59
2650	56.88	216.85	1691.75	-1658.93	-1683.23	-828.42	5736774.41	566514.07
2655	56.93	216.9	1694.48	-1661.66	-1686.58	-830.93	5736771.06	566511.56
2660	56.98	216.95	1697.2	-1664.38	-1689.93	-833.45	5736767.71	566509.04
2665	57.03	217	1699.93	-1667.11	-1693.28	-835.97	5736764.36	566506.52
2670	57.09	217.06	1702.66	-1669.84	-1696.63	-838.49	5736761.01	566504
2675	57.09	217.03	1705.38	-1672.56	-1699.99	-841.01	5736757.66	566501.48
2680	57.07	216.98	1708.1	-1675.28	-1703.34	-843.53	5736754.3	566498.96
2685	57.05	216.92	1710.82	-1678	-1706.7	-846.05	5736750.95	566496.44
2690	57.03	216.87	1713.54	-1680.72	-1710.05	-848.57	5736747.59	566493.92
2695	57.02	216.81	1716.26	-1683.44	-1713.4	-851.09	5736744.24	566491.4
2700	57.27	216.39	1718.97	-1686.15	-1716.77	-853.6	5736740.87	566488.89
2705	57.53	215.83	1721.59	-1688.77	-1720.35	-855.89	5736737.29	566486.6
2710	57.69	215.32	1724.15	-1691.33	-1724.06	-858.04	5736733.59	566484.45
2715	57.85	214.82	1726.71	-1693.89	-1727.76	-860.19	5736729.88	566482.3
2720	58	214.31	1729.28	-1696.46	-1731.47	-862.34	5736726.18	566480.15
2725	58.16	213.8	1731.84	-1699.02	-1735.17	-864.5	5736722.47	566478
2730	58.31	213.3	1734.4	-1701.58	-1738.88	-866.65	5736718.76	566475.84
2735	58.47	212.79	1736.96	-1704.14	-1742.59	-868.8	5736715.06	566473.69
2740	58.63	212.29	1739.52	-1706.7	-1746.29	-870.95	5736711.35	566471.54
2745	58.78	211.78	1742.09	-1709.27	-1750	-873.1	5736707.65	566469.39
2750	58.94	211.28	1744.65	-1711.83	-1753.7	-875.25	5736703.94	566467.24
2755	59.09	210.77	1747.21	-1714.39	-1757.41	-877.4	5736700.23	566465.09
2760	59.25	210.27	1749.77	-1716.95	-1761.11	-879.56	5736696.53	566462.94
2765	59.41	209.76	1752.34	-1719.52	-1764.82	-881.71	5736692.82	566460.78
2770	59.56	209.25	1754.9	-1722.08	-1768.53	-883.86	5736689.12	566458.63
2775	59.72	208.75	1757.46	-1724.64	-1772.23	-886.01	5736685.41	566456.48
2780	59.87	208.24	1760.02	-1727.2	-1775.94	-888.16	5736681.71	566454.33
2785	60.03	207.74	1762.59	-1729.77	-1779.64	-890.31	5736678	566452.18
2790	60.19	207.23	1765.15	-1732.33	-1783.35	-892.46	5736674.29	566450.03
2795	60.34	206.73	1767.71	-1734.89	-1787.05	-894.62	5736670.59	566447.87
2800	60.5	206.22	1770.27	-1737.45	-1790.76	-896.77	5736666.88	566445.72
2805	60.65	205.71	1772.83	-1740.01	-1794.47	-898.92	5736663.18	566443.57
2810	60.81	205.21	1775.4	-1742.58	-1798.17	-901.07	5736659.47	566441.42
2815	60.97	204.7	1777.96	-1745.14	-1801.88	-903.22	5736655.77	566439.27
2820	61.19	204.14	1780.45	-1747.63	-1805.71	-905.21	5736651.93	566437.28
2825	61.53	203.45	1782.79	-1749.97	-1809.79	-906.9	5736647.85	566435.59
2830	61.87	202.77	1785.14	-1752.32	-1813.87	-908.58	5736643.77	566433.91
2835	62.22	202.08	1787.48	-1754.66	-1817.96	-910.26	5736639.69	566432.23

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2840	62.56	201.39	1789.83	-1757.01	-1822.04	-911.95	5736635.61	566430.54
2845	62.91	200.71	1792.17	-1759.35	-1826.12	-913.63	5736631.52	566428.86
2850	63.43	200.02	1794.37	-1761.55	-1830.34	-915.14	5736627.3	566427.35
2855	64.04	199.32	1796.5	-1763.68	-1834.63	-916.58	5736623.01	566425.92
2860	64.65	198.63	1798.63	-1765.81	-1838.92	-918.01	5736618.73	566424.48
2865	65.26	197.94	1800.76	-1767.94	-1843.21	-919.44	5736614.44	566423.05
2870	65.87	197.25	1802.89	-1770.07	-1847.5	-920.87	5736610.15	566421.62
2875	66.48	196.55	1805.03	-1772.21	-1851.79	-922.3	5736605.86	566420.19
2880	66.89	196.38	1806.95	-1774.13	-1856.21	-923.6	5736601.43	566418.89
2885	67.29	196.27	1808.85	-1776.03	-1860.65	-924.89	5736596.99	566417.6
2890	67.69	196.16	1810.75	-1777.93	-1865.1	-926.18	5736592.55	566416.32
2895	68.09	196.05	1812.64	-1779.82	-1869.54	-927.46	5736588.11	566415.03
2900	68.48	195.93	1814.54	-1781.72	-1873.98	-928.75	5736583.66	566413.74
2905	68.79	195.8	1816.44	-1783.62	-1878.43	-930.03	5736579.21	566412.47
2910	68.59	195.54	1818.29	-1785.47	-1882.91	-931.23	5736574.73	566411.26
2915	68.38	195.27	1820.14	-1787.32	-1887.4	-932.44	5736570.25	566410.05
2920	68.18	195.01	1822	-1789.18	-1891.88	-933.65	5736565.76	566408.84
2925	67.98	194.74	1823.85	-1791.03	-1896.36	-934.86	5736561.28	566407.63
2930	67.78	194.48	1825.7	-1792.88	-1900.85	-936.07	5736556.8	566406.42
2935	67.67	194.33	1827.58	-1794.76	-1905.33	-937.25	5736552.31	566405.24
2940	67.68	194.3	1829.47	-1796.65	-1909.81	-938.39	5736547.83	566404.1
2945	67.69	194.27	1831.37	-1798.55	-1914.3	-939.53	5736543.35	566402.96
2950	67.69	194.25	1833.27	-1800.45	-1918.78	-940.67	5736538.86	566401.82
2955	67.7	194.22	1835.17	-1802.35	-1923.26	-941.81	5736534.38	566400.68
2960	67.71	194.2	1837.07	-1804.25	-1927.75	-942.95	5736529.9	566399.54
2965	67.74	194.31	1838.96	-1806.14	-1932.23	-944.11	5736525.42	566398.38
2966	67.75	194.34	1839.33	-1806.51	-1933.12	-944.34	5736524.52	566398.15
2967	67.76	194.37	1839.71	-1806.89	-1934.02	-944.58	5736523.63	566397.92
2968	67.77	194.4	1840.09	-1807.27	-1934.91	-944.81	5736522.73	566397.68
2969	67.77	194.43	1840.47	-1807.65	-1935.81	-945.04	5736521.83	566397.45
2970	67.78	194.46	1840.84	-1808.02	-1936.71	-945.28	5736520.94	566397.21
2971	67.79	194.49	1841.22	-1808.4	-1937.6	-945.51	5736520.04	566396.98
2972	67.8	194.52	1841.6	-1808.78	-1938.5	-945.74	5736519.14	566396.75
2973	67.81	194.55	1841.98	-1809.16	-1939.39	-945.98	5736518.25	566396.51
2974	67.81	194.58	1842.35	-1809.53	-1940.29	-946.21	5736517.35	566396.28
2975	67.82	194.61	1842.73	-1809.91	-1941.19	-946.44	5736516.46	566396.05
2976	67.83	194.64	1843.11	-1810.29	-1942.08	-946.68	5736515.56	566395.81
2977	67.84	194.67	1843.49	-1810.67	-1942.98	-946.91	5736514.66	566395.58
2978	67.85	194.7	1843.86	-1811.04	-1943.87	-947.15	5736513.77	566395.35
2979	67.85	194.73	1844.24	-1811.42	-1944.77	-947.38	5736512.87	566395.11
2980	67.86	194.75	1844.62	-1811.8	-1945.67	-947.61	5736511.98	566394.88
2981	67.87	194.78	1845	-1812.18	-1946.56	-947.85	5736511.08	566394.64
2982	67.88	194.81	1845.37	-1812.55	-1947.46	-948.08	5736510.18	566394.41
2983	67.89	194.84	1845.75	-1812.93	-1948.36	-948.31	5736509.29	566394.18
2984	67.9	194.87	1846.13	-1813.31	-1949.25	-948.55	5736508.39	566393.94
2985	67.9	194.9	1846.51	-1813.69	-1950.15	-948.78	5736507.5	566393.71
2986	67.91	194.93	1846.88	-1814.06	-1951.04	-949.01	5736506.6	566393.48
2987	67.92	194.96	1847.26	-1814.44	-1951.94	-949.25	5736505.7	566393.24
2988	67.93	194.99	1847.64	-1814.82	-1952.84	-949.48	5736504.81	566393.01
2989	67.94	195.02	1848.01	-1815.19	-1953.73	-949.72	5736503.91	566392.78
2990	67.93	195.04	1848.39	-1815.57	-1954.63	-949.95	5736503.02	566392.54
2991	67.9	195.03	1848.78	-1815.96	-1955.52	-950.19	5736502.12	566392.3
2992	67.87	195.03	1849.16	-1816.34	-1956.41	-950.43	5736501.23	566392.06
2993	67.85	195.02	1849.54	-1816.72	-1957.3	-950.67	5736500.34	566391.82
2994	67.82	195.01	1849.92	-1817.1	-1958.2	-950.91	5736499.45	566391.58
2995	67.79	195.01	1850.3	-1817.48	-1959.09	-951.14	5736498.55	566391.35
2996	67.77	195	1850.68	-1817.86	-1959.98	-951.38	5736497.66	566391.11
2997	67.74	195	1851.07	-1818.25	-1960.88	-951.62	5736496.77	566390.87

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2998	67.71	194.99	1851.45	-1818.63	-1961.77	-951.86	5736495.87	566390.63
2999	67.69	194.99	1851.83	-1819.01	-1962.66	-952.1	5736494.98	566390.39
3000	67.66	194.98	1852.21	-1819.39	-1963.56	-952.34	5736494.09	566390.15
3001	67.63	194.98	1852.59	-1819.77	-1964.45	-952.58	5736493.19	566389.91
3002	67.61	194.97	1852.97	-1820.15	-1965.34	-952.82	5736492.3	566389.68
3003	67.58	194.96	1853.36	-1820.54	-1966.23	-953.05	5736491.41	566389.44
3004	67.55	194.96	1853.74	-1820.92	-1967.13	-953.29	5736490.52	566389.2
3005	67.53	194.95	1854.12	-1821.3	-1968.02	-953.53	5736489.62	566388.96
3006	67.5	194.95	1854.5	-1821.68	-1968.91	-953.77	5736488.73	566388.72
3007	67.47	194.94	1854.88	-1822.06	-1969.81	-954.01	5736487.84	566388.48
3008	67.45	194.94	1855.27	-1822.45	-1970.7	-954.25	5736486.94	566388.24
3009	67.42	194.93	1855.65	-1822.83	-1971.59	-954.49	5736486.05	566388.01
3010	67.39	194.93	1856.03	-1823.21	-1972.49	-954.72	5736485.16	566387.77
3011	67.37	194.92	1856.41	-1823.59	-1973.38	-954.96	5736484.27	566387.53
3012	67.34	194.91	1856.79	-1823.97	-1974.27	-955.2	5736483.37	566387.29
3013	67.31	194.91	1857.17	-1824.35	-1975.16	-955.44	5736482.48	566387.05
3014	67.29	194.9	1857.56	-1824.74	-1976.06	-955.68	5736481.59	566386.81
3015	67.26	194.9	1857.94	-1825.12	-1976.95	-955.92	5736480.69	566386.57
3016	67.23	194.89	1858.32	-1825.5	-1977.84	-956.16	5736479.8	566386.34
3017	67.21	194.89	1858.7	-1825.88	-1978.74	-956.39	5736478.91	566386.1
3018	67.18	194.88	1859.08	-1826.26	-1979.63	-956.63	5736478.01	566385.86
3019	67.19	194.85	1859.47	-1826.65	-1980.52	-956.86	5736477.12	566385.63
3020	67.2	194.83	1859.85	-1827.03	-1981.42	-957.1	5736476.23	566385.4
3021	67.21	194.8	1860.24	-1827.42	-1982.31	-957.33	5736475.33	566385.17
3022	67.22	194.77	1860.62	-1827.8	-1983.2	-957.56	5736474.44	566384.93
3023	67.23	194.74	1861.01	-1828.19	-1984.1	-957.79	5736473.55	566384.7
3024	67.24	194.72	1861.4	-1828.58	-1984.99	-958.02	5736472.65	566384.47
3025	67.25	194.69	1861.78	-1828.96	-1985.88	-958.25	5736471.76	566384.24
3026	67.26	194.66	1862.17	-1829.35	-1986.78	-958.48	5736470.87	566384.01
3027	67.27	194.63	1862.55	-1829.73	-1987.67	-958.71	5736469.97	566383.78
3028	67.28	194.61	1862.94	-1830.12	-1988.56	-958.94	5736469.08	566383.55
3029	67.29	194.58	1863.32	-1830.5	-1989.46	-959.17	5736468.19	566383.32
3030	67.3	194.55	1863.71	-1830.89	-1990.35	-959.4	5736467.29	566383.09
3031	67.31	194.52	1864.09	-1831.27	-1991.24	-959.63	5736466.4	566382.86
3032	67.31	194.5	1864.48	-1831.66	-1992.14	-959.86	5736465.51	566382.63
3033	67.32	194.47	1864.87	-1832.05	-1993.03	-960.09	5736464.61	566382.4
3034	67.33	194.44	1865.25	-1832.43	-1993.92	-960.32	5736463.72	566382.17
3035	67.34	194.41	1865.64	-1832.82	-1994.82	-960.56	5736462.83	566381.94
3036	67.35	194.38	1866.02	-1833.2	-1995.71	-960.79	5736461.93	566381.7
3037	67.36	194.36	1866.41	-1833.59	-1996.6	-961.02	5736461.04	566381.47
3038	67.37	194.33	1866.79	-1833.97	-1997.5	-961.25	5736460.15	566381.24
3039	67.38	194.3	1867.18	-1834.36	-1998.39	-961.48	5736459.25	566381.01
3040	67.39	194.27	1867.57	-1834.75	-1999.28	-961.71	5736458.36	566380.78
3041	67.4	194.25	1867.95	-1835.13	-2000.18	-961.94	5736457.47	566380.55
3042	67.41	194.22	1868.34	-1835.52	-2001.07	-962.17	5736456.57	566380.32
3043	67.42	194.19	1868.72	-1835.9	-2001.96	-962.4	5736455.68	566380.09
3044	67.43	194.16	1869.11	-1836.29	-2002.86	-962.63	5736454.79	566379.86
3045	67.44	194.14	1869.49	-1836.67	-2003.75	-962.86	5736453.89	566379.63
3046	67.45	194.11	1869.88	-1837.06	-2004.64	-963.09	5736453	566379.4
3047	67.46	194.08	1870.26	-1837.44	-2005.54	-963.32	5736452.11	566379.17
3048	67.46	194.18	1870.65	-1837.83	-2006.43	-963.57	5736451.22	566378.92
3049	67.46	194.29	1871.03	-1838.21	-2007.32	-963.82	5736450.33	566378.67
3050	67.46	194.4	1871.41	-1838.59	-2008.21	-964.07	5736449.44	566378.42
3051	67.46	194.5	1871.8	-1838.98	-2009.09	-964.32	5736448.55	566378.17
3052	67.47	194.61	1872.18	-1839.36	-2009.98	-964.56	5736447.66	566377.93
3053	67.47	194.72	1872.56	-1839.74	-2010.87	-964.81	5736446.77	566377.68
3054	67.47	194.83	1872.95	-1840.13	-2011.76	-965.06	5736445.88	566377.43
3055	67.47	194.93	1873.33	-1840.51	-2012.65	-965.31	5736444.99	566377.18

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
3056	67.47	195.04	1873.71	-1840.89	-2013.54	-965.56	5736444.1	566376.93
3057	67.47	195.15	1874.1	-1841.28	-2014.43	-965.81	5736443.21	566376.69
3058	67.47	195.25	1874.48	-1841.66	-2015.32	-966.05	5736442.32	566376.44
3059	67.47	195.36	1874.86	-1842.04	-2016.21	-966.3	5736441.43	566376.19
3060	67.47	195.47	1875.25	-1842.43	-2017.1	-966.55	5736440.54	566375.94
3061	67.47	195.58	1875.63	-1842.81	-2017.99	-966.8	5736439.65	566375.69
3062	67.48	195.68	1876.01	-1843.19	-2018.88	-967.05	5736438.76	566375.44
3063	67.48	195.79	1876.39	-1843.57	-2019.77	-967.3	5736437.87	566375.2
3064	67.48	195.9	1876.78	-1843.96	-2020.66	-967.54	5736436.98	566374.95
3065	67.48	196	1877.16	-1844.34	-2021.55	-967.79	5736436.09	566374.7
3066	67.48	196.11	1877.54	-1844.72	-2022.44	-968.04	5736435.21	566374.45
3067	67.48	196.22	1877.93	-1845.11	-2023.33	-968.29	5736434.32	566374.2
3068	67.48	196.32	1878.31	-1845.49	-2024.22	-968.54	5736433.43	566373.95
3069	67.48	196.43	1878.69	-1845.87	-2025.11	-968.79	5736432.54	566373.71
3070	67.48	196.54	1879.08	-1846.26	-2026	-969.03	5736431.65	566373.46
3071	67.49	196.65	1879.46	-1846.64	-2026.89	-969.28	5736430.76	566373.21
3072	67.49	196.75	1879.84	-1847.02	-2027.78	-969.53	5736429.87	566372.96
3073	67.49	196.86	1880.23	-1847.41	-2028.67	-969.78	5736428.98	566372.71
3074	67.49	196.97	1880.61	-1847.79	-2029.55	-970.03	5736428.09	566372.46
3075	67.49	197.07	1880.99	-1848.17	-2030.44	-970.27	5736427.2	566372.22
3076	67.5	197.11	1881.37	-1848.55	-2031.33	-970.54	5736426.31	566371.95
3077	67.53	197.1	1881.75	-1848.93	-2032.22	-970.81	5736425.43	566371.68
3078	67.55	197.1	1882.13	-1849.31	-2033.1	-971.08	5736424.54	566371.41
3079	67.57	197.09	1882.51	-1849.69	-2033.99	-971.35	5736423.66	566371.14
3080	67.59	197.09	1882.88	-1850.06	-2034.87	-971.62	5736422.77	566370.87
3081	67.61	197.09	1883.26	-1850.44	-2035.76	-971.9	5736421.89	566370.6
3082	67.64	197.08	1883.64	-1850.82	-2036.64	-972.17	5736421	566370.32
3083	67.66	197.08	1884.02	-1851.2	-2037.53	-972.44	5736420.12	566370.05
3084	67.68	197.07	1884.39	-1851.57	-2038.41	-972.71	5736419.23	566369.78
3085	67.7	197.07	1884.77	-1851.95	-2039.3	-972.98	5736418.35	566369.51
3086	67.72	197.07	1885.15	-1852.33	-2040.18	-973.25	5736417.46	566369.24
3087	67.74	197.06	1885.53	-1852.71	-2041.07	-973.53	5736416.58	566368.97
3088	67.77	197.06	1885.91	-1853.09	-2041.95	-973.8	5736415.69	566368.69
3089	67.79	197.05	1886.28	-1853.46	-2042.84	-974.07	5736414.8	566368.42
3090	67.81	197.05	1886.66	-1853.84	-2043.72	-974.34	5736413.92	566368.15
3091	67.83	197.05	1887.04	-1854.22	-2044.61	-974.61	5736413.03	566367.88
3092	67.85	197.04	1887.42	-1854.6	-2045.49	-974.88	5736412.15	566367.61
3093	67.87	197.04	1887.79	-1854.97	-2046.38	-975.15	5736411.26	566367.34
3094	67.9	197.03	1888.17	-1855.35	-2047.26	-975.43	5736410.38	566367.07
3095	67.92	197.03	1888.55	-1855.73	-2048.15	-975.7	5736409.49	566366.79
3096	67.94	197.02	1888.93	-1856.11	-2049.04	-975.97	5736408.61	566366.52
3097	67.96	197.02	1889.31	-1856.49	-2049.92	-976.24	5736407.72	566366.25
3098	67.98	197.02	1889.68	-1856.86	-2050.81	-976.51	5736406.84	566365.98
3099	68.01	197.01	1890.06	-1857.24	-2051.69	-976.78	5736405.95	566365.71
3100	68.03	197.01	1890.44	-1857.62	-2052.58	-977.05	5736405.07	566365.44
3101	68.05	197	1890.82	-1858	-2053.46	-977.33	5736404.18	566365.17
3102	68.07	197	1891.19	-1858.37	-2054.35	-977.6	5736403.3	566364.89
3103	68.09	197	1891.57	-1858.75	-2055.23	-977.87	5736402.41	566364.62
3104	68.11	196.99	1891.95	-1859.13	-2056.12	-978.14	5736401.53	566364.35
3105	68.12	196.98	1892.32	-1859.5	-2057	-978.41	5736400.64	566364.08
3106	68.12	196.97	1892.7	-1859.88	-2057.89	-978.68	5736399.75	566363.81
3107	68.11	196.96	1893.07	-1860.25	-2058.78	-978.95	5736398.86	566363.54
3108	68.11	196.95	1893.44	-1860.62	-2059.67	-979.22	5736397.98	566363.27
3109	68.11	196.94	1893.82	-1861	-2060.56	-979.49	5736397.09	566363.01
3110	68.11	196.93	1894.19	-1861.37	-2061.44	-979.76	5736396.2	566362.74
3111	68.11	196.93	1894.56	-1861.74	-2062.33	-980.02	5736395.31	566362.47
3112	68.1	196.92	1894.94	-1862.12	-2063.22	-980.29	5736394.42	566362.2
3113	68.1	196.91	1895.31	-1862.49	-2064.11	-980.56	5736393.54	566361.93

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
3114	68.1	196.9	1895.68	-1862.86	-2065	-980.83	5736392.65	566361.66
3115	68.1	196.89	1896.06	-1863.24	-2065.88	-981.1	5736391.76	566361.39
3116	68.09	196.88	1896.43	-1863.61	-2066.77	-981.37	5736390.87	566361.12
3117	68.09	196.87	1896.8	-1863.98	-2067.66	-981.64	5736389.98	566360.85
3118	68.09	196.86	1897.18	-1864.36	-2068.55	-981.91	5736389.1	566360.58
3119	68.09	196.85	1897.55	-1864.73	-2069.43	-982.18	5736388.21	566360.32
3120	68.09	196.84	1897.92	-1865.1	-2070.32	-982.45	5736387.32	566360.05
3121	68.08	196.83	1898.29	-1865.47	-2071.21	-982.71	5736386.43	566359.78
3122	68.08	196.82	1898.67	-1865.85	-2072.1	-982.98	5736385.54	566359.51
3123	68.08	196.81	1899.04	-1866.22	-2072.99	-983.25	5736384.66	566359.24
3124	68.08	196.8	1899.41	-1866.59	-2073.87	-983.52	5736383.77	566358.97
3125	68.08	196.79	1899.79	-1866.97	-2074.76	-983.79	5736382.88	566358.7
3126	68.07	196.78	1900.16	-1867.34	-2075.65	-984.06	5736381.99	566358.43
3127	68.07	196.77	1900.53	-1867.71	-2076.54	-984.33	5736381.11	566358.16
3128	68.07	196.76	1900.91	-1868.09	-2077.43	-984.6	5736380.22	566357.89
3129	68.07	196.75	1901.28	-1868.46	-2078.31	-984.87	5736379.33	566357.63
3130	68.06	196.74	1901.65	-1868.83	-2079.2	-985.14	5736378.44	566357.36
3131	68.06	196.73	1902.03	-1869.21	-2080.09	-985.4	5736377.55	566357.09
3132	68.06	196.72	1902.4	-1869.58	-2080.98	-985.67	5736376.67	566356.82
3133	68.05	196.71	1902.77	-1869.95	-2081.87	-985.94	5736375.78	566356.55
3134	68.05	196.7	1903.15	-1870.33	-2082.75	-986.2	5736374.89	566356.29
3135	68.04	196.69	1903.53	-1870.71	-2083.64	-986.47	5736374	566356.02
3136	68.03	196.69	1903.9	-1871.08	-2084.53	-986.73	5736373.11	566355.76
3137	68.02	196.68	1904.28	-1871.46	-2085.42	-987	5736372.22	566355.49
3138	68.01	196.67	1904.65	-1871.83	-2086.31	-987.26	5736371.34	566355.23
3139	68.01	196.66	1905.03	-1872.21	-2087.2	-987.53	5736370.45	566354.97
3140	68	196.65	1905.4	-1872.58	-2088.08	-987.79	5736369.56	566354.7
3141	67.99	196.64	1905.78	-1872.96	-2088.97	-988.06	5736368.67	566354.44
3142	67.98	196.63	1906.15	-1873.33	-2089.86	-988.32	5736367.78	566354.17
3143	67.97	196.62	1906.53	-1873.71	-2090.75	-988.58	5736366.89	566353.91
3144	67.97	196.61	1906.9	-1874.08	-2091.64	-988.85	5736366.01	566353.64
3145	67.96	196.6	1907.28	-1874.46	-2092.53	-989.11	5736365.12	566353.38
3146	67.95	196.59	1907.66	-1874.84	-2093.41	-989.38	5736364.23	566353.11
3147	67.94	196.58	1908.03	-1875.21	-2094.3	-989.64	5736363.34	566352.85
3148	67.94	196.57	1908.41	-1875.59	-2095.19	-989.91	5736362.45	566352.58
3149	67.93	196.56	1908.78	-1875.96	-2096.08	-990.17	5736361.57	566352.32
3150	67.92	196.55	1909.16	-1876.34	-2096.97	-990.44	5736360.68	566352.05
3151	67.91	196.55	1909.53	-1876.71	-2097.85	-990.7	5736359.79	566351.79
3152	67.9	196.54	1909.91	-1877.09	-2098.74	-990.97	5736358.9	566351.53
3153	67.9	196.53	1910.28	-1877.46	-2099.63	-991.23	5736358.01	566351.26
3154	67.89	196.52	1910.66	-1877.84	-2100.52	-991.49	5736357.12	566351
3155	67.88	196.51	1911.03	-1878.21	-2101.41	-991.76	5736356.24	566350.73
3156	67.87	196.5	1911.41	-1878.59	-2102.3	-992.02	5736355.35	566350.47
3157	67.86	196.49	1911.79	-1878.97	-2103.18	-992.29	5736354.46	566350.2
3158	67.86	196.48	1912.16	-1879.34	-2104.07	-992.55	5736353.57	566349.94
3159	67.85	196.47	1912.54	-1879.72	-2104.96	-992.82	5736352.68	566349.67
3160	67.84	196.46	1912.91	-1880.09	-2105.85	-993.08	5736351.79	566349.41
3161	67.83	196.45	1913.29	-1880.47	-2106.74	-993.35	5736350.91	566349.14
3162	67.84	196.44	1913.66	-1880.84	-2107.63	-993.61	5736350.02	566348.88
3163	67.85	196.43	1914.04	-1881.22	-2108.52	-993.87	5736349.13	566348.62
3164	67.86	196.41	1914.41	-1881.59	-2109.41	-994.13	5736348.24	566348.37
3165	67.87	196.4	1914.79	-1881.97	-2110.3	-994.38	5736347.35	566348.11
3166	67.88	196.38	1915.16	-1882.34	-2111.19	-994.64	5736346.46	566347.85
3167	67.88	196.37	1915.54	-1882.72	-2112.08	-994.9	5736345.57	566347.59
3168	67.89	196.36	1915.91	-1883.09	-2112.97	-995.16	5736344.68	566347.33
3169	67.9	196.34	1916.29	-1883.47	-2113.86	-995.42	5736343.79	566347.07
3170	67.91	196.33	1916.66	-1883.84	-2114.75	-995.68	5736342.9	566346.81
3171	67.92	196.31	1917.04	-1884.22	-2115.64	-995.94	5736342.01	566346.55



MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
3172	67.93	196.3	1917.41	-1884.59	-2116.53	-996.2	5736341.12	566346.29
3173	67.94	196.29	1917.79	-1884.97	-2117.42	-996.46	5736340.23	566346.03
3174	67.95	196.27	1918.16	-1885.34	-2118.31	-996.72	5736339.34	566345.77
3175	67.96	196.26	1918.54	-1885.72	-2119.2	-996.98	5736338.45	566345.51
3176	67.97	196.24	1918.91	-1886.09	-2120.09	-997.24	5736337.56	566345.25
3177	67.98	196.23	1919.29	-1886.47	-2120.98	-997.5	5736336.67	566344.99
3178	67.99	196.22	1919.66	-1886.84	-2121.87	-997.76	5736335.78	566344.74
3179	68	196.2	1920.04	-1887.22	-2122.76	-998.02	5736334.89	566344.48
3180	68.01	196.19	1920.41	-1887.59	-2123.65	-998.27	5736334	566344.22
3181	68.02	196.17	1920.79	-1887.97	-2124.54	-998.53	5736333.11	566343.96
3182	68.03	196.16	1921.16	-1888.34	-2125.43	-998.79	5736332.22	566343.7
3183	68.04	196.15	1921.54	-1888.72	-2126.32	-999.05	5736331.33	566343.44
3184	68.05	196.13	1921.91	-1889.09	-2127.21	-999.31	5736330.44	566343.18
3185	68.06	196.12	1922.29	-1889.47	-2128.1	-999.57	5736329.55	566342.92
3186	68.07	196.11	1922.67	-1889.85	-2128.99	-999.83	5736328.66	566342.66
3187	68.07	196.09	1923.04	-1890.22	-2129.88	-1000.09	5736327.77	566342.4
3188	68.08	196.08	1923.42	-1890.6	-2130.77	-1000.35	5736326.88	566342.14
3189	68.09	196.06	1923.79	-1890.97	-2131.66	-1000.61	5736325.99	566341.88
3190	68.1	196.05	1924.17	-1891.35	-2132.55	-1000.87	5736325.1	566341.62
3191	68.12	196.04	1924.54	-1891.72	-2133.44	-1001.13	5736324.21	566341.36
3192	68.13	196.05	1924.91	-1892.09	-2134.33	-1001.39	5736323.31	566341.11
3193	68.15	196.06	1925.28	-1892.46	-2135.22	-1001.64	5736322.42	566340.85
3194	68.17	196.07	1925.64	-1892.82	-2136.12	-1001.9	5736321.53	566340.59
3195	68.19	196.08	1926.01	-1893.19	-2137.01	-1002.16	5736320.63	566340.33
3196	68.21	196.09	1926.38	-1893.56	-2137.9	-1002.42	5736319.74	566340.07
3197	68.23	196.09	1926.75	-1893.93	-2138.79	-1002.68	5736318.85	566339.81
3198	68.25	196.1	1927.12	-1894.3	-2139.69	-1002.94	5736317.96	566339.55
3199	68.27	196.11	1927.49	-1894.67	-2140.58	-1003.2	5736317.06	566339.29
3200	68.28	196.12	1927.85	-1895.03	-2141.47	-1003.46	5736316.17	566339.03
3201	68.3	196.13	1928.22	-1895.4	-2142.37	-1003.72	5736315.28	566338.78
3202	68.32	196.14	1928.59	-1895.77	-2143.26	-1003.97	5736314.38	566338.52
3203	68.34	196.15	1928.96	-1896.14	-2144.15	-1004.23	5736313.49	566338.26
3204	68.36	196.16	1929.33	-1896.51	-2145.04	-1004.49	5736312.6	566338
3205	68.38	196.16	1929.7	-1896.88	-2145.94	-1004.75	5736311.71	566337.74
3206	68.4	196.17	1930.07	-1897.25	-2146.83	-1005.01	5736310.81	566337.48
3207	68.42	196.18	1930.43	-1897.61	-2147.72	-1005.27	5736309.92	566337.22
3208	68.43	196.19	1930.8	-1897.98	-2148.62	-1005.53	5736309.03	566336.96
3209	68.45	196.2	1931.17	-1898.35	-2149.51	-1005.79	5736308.13	566336.71
3210	68.47	196.21	1931.54	-1898.72	-2150.4	-1006.04	5736307.24	566336.45
3211	68.49	196.22	1931.91	-1899.09	-2151.29	-1006.3	5736306.35	566336.19
3212	68.51	196.22	1932.28	-1899.46	-2152.19	-1006.56	5736305.46	566335.93
3213	68.53	196.23	1932.64	-1899.82	-2153.08	-1006.82	5736304.56	566335.67
3214	68.55	196.24	1933.01	-1900.19	-2153.97	-1007.08	5736303.67	566335.41
3215	68.57	196.25	1933.38	-1900.56	-2154.87	-1007.34	5736302.78	566335.15
3216	68.58	196.26	1933.75	-1900.93	-2155.76	-1007.6	5736301.88	566334.89
3217	68.6	196.27	1934.12	-1901.3	-2156.65	-1007.86	5736300.99	566334.63
3218	68.62	196.28	1934.49	-1901.67	-2157.54	-1008.12	5736300.1	566334.38
3219	68.64	196.29	1934.86	-1902.04	-2158.44	-1008.37	5736299.21	566334.12
3220	68.64	196.3	1935.22	-1902.4	-2159.33	-1008.64	5736298.31	566333.85
3221	68.62	196.32	1935.59	-1902.77	-2160.22	-1008.9	5736297.42	566333.59
3222	68.6	196.34	1935.96	-1903.14	-2161.11	-1009.17	5736296.53	566333.33
3223	68.59	196.36	1936.33	-1903.51	-2162	-1009.43	5736295.64	566333.06
3224	68.57	196.37	1936.7	-1903.88	-2162.89	-1009.7	5736294.75	566332.8
3225	68.55	196.39	1937.07	-1904.25	-2163.79	-1009.96	5736293.86	566332.53
3226	68.53	196.41	1937.43	-1904.61	-2164.68	-1010.23	5736292.97	566332.27
3227	68.51	196.43	1937.8	-1904.98	-2165.57	-1010.49	5736292.08	566332
3228	68.5	196.45	1938.17	-1905.35	-2166.46	-1010.76	5736291.18	566331.74
3229	68.48	196.47	1938.54	-1905.72	-2167.35	-1011.02	5736290.29	566331.47

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
3230	68.46	196.48	1938.91	-1906.09	-2168.24	-1011.29	5736289.4	566331.21
3231	68.44	196.5	1939.28	-1906.46	-2169.13	-1011.55	5736288.51	566330.94
3232	68.42	196.52	1939.64	-1906.82	-2170.02	-1011.82	5736287.62	566330.68
3233	68.4	196.54	1940.01	-1907.19	-2170.91	-1012.08	5736286.73	566330.41
3234	68.39	196.56	1940.38	-1907.56	-2171.81	-1012.35	5736285.84	566330.15
3235	68.37	196.58	1940.75	-1907.93	-2172.7	-1012.61	5736284.95	566329.88
3236	68.35	196.6	1941.12	-1908.3	-2173.59	-1012.88	5736284.06	566329.62
3237	68.33	196.61	1941.49	-1908.67	-2174.48	-1013.14	5736283.16	566329.35
3238	68.31	196.63	1941.85	-1909.03	-2175.37	-1013.41	5736282.27	566329.09
3239	68.29	196.65	1942.22	-1909.4	-2176.26	-1013.67	5736281.38	566328.82
3240	68.28	196.67	1942.59	-1909.77	-2177.15	-1013.94	5736280.49	566328.56
3241	68.26	196.69	1942.96	-1910.14	-2178.04	-1014.2	5736279.6	566328.29
3242	68.24	196.71	1943.33	-1910.51	-2178.93	-1014.46	5736278.71	566328.03
3243	68.22	196.73	1943.7	-1910.88	-2179.83	-1014.73	5736277.82	566327.76
3244	68.2	196.74	1944.06	-1911.24	-2180.72	-1014.99	5736276.93	566327.5
3245	68.19	196.76	1944.43	-1911.61	-2181.61	-1015.26	5736276.04	566327.23
3246	68.17	196.78	1944.8	-1911.98	-2182.5	-1015.52	5736275.14	566326.97
3247	68.15	196.8	1945.17	-1912.35	-2183.39	-1015.79	5736274.25	566326.7
3248	68.13	196.82	1945.54	-1912.72	-2184.28	-1016.05	5736273.36	566326.44
3249	68.12	196.83	1945.91	-1913.09	-2185.17	-1016.32	5736272.47	566326.17
3250	68.14	196.82	1946.28	-1913.46	-2186.06	-1016.59	5736271.58	566325.9
3251	68.15	196.81	1946.65	-1913.83	-2186.95	-1016.85	5736270.69	566325.64
3252	68.16	196.8	1947.02	-1914.2	-2187.84	-1017.12	5736269.8	566325.37
3253	68.18	196.8	1947.39	-1914.57	-2188.73	-1017.39	5736268.91	566325.1
3254	68.19	196.79	1947.76	-1914.94	-2189.62	-1017.66	5736268.02	566324.83
3255	68.2	196.78	1948.13	-1915.31	-2190.51	-1017.92	5736267.13	566324.57
3256	68.21	196.77	1948.49	-1915.67	-2191.4	-1018.19	5736266.24	566324.3
3257	68.23	196.76	1948.86	-1916.04	-2192.29	-1018.46	5736265.35	566324.03
3258	68.24	196.76	1949.23	-1916.41	-2193.18	-1018.73	5736264.46	566323.77
3259	68.25	196.75	1949.6	-1916.78	-2194.07	-1018.99	5736263.57	566323.5
3260	68.27	196.74	1949.97	-1917.15	-2194.96	-1019.26	5736262.68	566323.23
3261	68.28	196.73	1950.34	-1917.52	-2195.85	-1019.53	5736261.79	566322.96
3262	68.29	196.72	1950.71	-1917.89	-2196.74	-1019.79	5736260.9	566322.7
3263	68.3	196.72	1951.08	-1918.26	-2197.63	-1020.06	5736260.01	566322.43
3264	68.32	196.71	1951.45	-1918.63	-2198.52	-1020.33	5736259.12	566322.16
3265	68.33	196.7	1951.82	-1919	-2199.41	-1020.6	5736258.23	566321.89
3266	68.34	196.69	1952.19	-1919.37	-2200.3	-1020.86	5736257.34	566321.63
3267	68.36	196.68	1952.56	-1919.74	-2201.19	-1021.13	5736256.45	566321.36
3268	68.37	196.68	1952.93	-1920.11	-2202.08	-1021.4	5736255.56	566321.09
3269	68.38	196.67	1953.3	-1920.48	-2202.97	-1021.67	5736254.67	566320.83
3270	68.39	196.66	1953.67	-1920.85	-2203.86	-1021.93	5736253.78	566320.56
3271	68.41	196.65	1954.04	-1921.22	-2204.75	-1022.2	5736252.89	566320.29
3272	68.42	196.64	1954.41	-1921.59	-2205.64	-1022.47	5736252	566320.02
3273	68.43	196.64	1954.78	-1921.96	-2206.53	-1022.73	5736251.11	566319.76
3274	68.45	196.63	1955.15	-1922.33	-2207.42	-1023	5736250.22	566319.49
3275	68.46	196.62	1955.52	-1922.7	-2208.31	-1023.27	5736249.33	566319.22
3276	68.47	196.61	1955.89	-1923.07	-2209.2	-1023.54	5736248.44	566318.96
3277	68.48	196.6	1956.26	-1923.44	-2210.09	-1023.8	5736247.55	566318.69
3278	68.5	196.6	1956.62	-1923.8	-2210.98	-1024.07	5736246.66	566318.42
3279	68.51	196.6	1956.99	-1924.17	-2211.87	-1024.34	5736245.77	566318.15
3280	68.52	196.61	1957.35	-1924.53	-2212.76	-1024.6	5736244.88	566317.89
3281	68.53	196.61	1957.72	-1924.9	-2213.66	-1024.87	5736243.99	566317.62
3282	68.54	196.61	1958.08	-1925.26	-2214.55	-1025.14	5736243.09	566317.35
3283	68.55	196.62	1958.45	-1925.63	-2215.44	-1025.4	5736242.2	566317.09
3284	68.56	196.62	1958.81	-1925.99	-2216.33	-1025.67	5736241.31	566316.82
3285	68.57	196.62	1959.17	-1926.35	-2217.23	-1025.94	5736240.42	566316.55
3286	68.58	196.63	1959.54	-1926.72	-2218.12	-1026.2	5736239.53	566316.29
3287	68.59	196.63	1959.9	-1927.08	-2219.01	-1026.47	5736238.63	566316.02

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
3288	68.6	196.63	1960.27	-1927.45	-2219.9	-1026.74	5736237.74	566315.75
3289	68.61	196.64	1960.63	-1927.81	-2220.79	-1027	5736236.85	566315.49
3290	68.62	196.64	1961	-1928.18	-2221.69	-1027.27	5736235.96	566315.22
3291	68.63	196.64	1961.36	-1928.54	-2222.58	-1027.54	5736235.06	566314.95
3292	68.64	196.65	1961.72	-1928.9	-2223.47	-1027.81	5736234.17	566314.69
3293	68.65	196.65	1962.09	-1929.27	-2224.36	-1028.07	5736233.28	566314.42
3294	68.66	196.65	1962.45	-1929.63	-2225.26	-1028.34	5736232.39	566314.15
3295	68.67	196.66	1962.82	-1930	-2226.15	-1028.61	5736231.49	566313.89
3296	68.68	196.66	1963.18	-1930.36	-2227.04	-1028.87	5736230.6	566313.62
3297	68.7	196.66	1963.54	-1930.72	-2227.93	-1029.14	5736229.71	566313.35
3298	68.71	196.66	1963.91	-1931.09	-2228.83	-1029.41	5736228.82	566313.09
3299	68.72	196.67	1964.27	-1931.45	-2229.72	-1029.67	5736227.93	566312.82
3300	68.73	196.67	1964.64	-1931.82	-2230.61	-1029.94	5736227.03	566312.55
3301	68.74	196.67	1965	-1932.18	-2231.5	-1030.21	5736226.14	566312.29
3302	68.75	196.68	1965.37	-1932.55	-2232.39	-1030.47	5736225.25	566312.02
3303	68.76	196.68	1965.73	-1932.91	-2233.29	-1030.74	5736224.36	566311.75
3304	68.77	196.68	1966.09	-1933.27	-2234.18	-1031.01	5736223.46	566311.48
3305	68.78	196.69	1966.46	-1933.64	-2235.07	-1031.27	5736222.57	566311.22
3306	68.79	196.69	1966.82	-1934	-2235.96	-1031.54	5736221.68	566310.95
3307	68.81	196.67	1967.18	-1934.36	-2236.86	-1031.8	5736220.78	566310.69
3308	68.84	196.65	1967.54	-1934.72	-2237.76	-1032.07	5736219.89	566310.42
3309	68.86	196.63	1967.89	-1935.07	-2238.65	-1032.33	5736218.99	566310.16
3310	68.89	196.61	1968.25	-1935.43	-2239.55	-1032.6	5736218.09	566309.9
3311	68.91	196.6	1968.6	-1935.78	-2240.45	-1032.86	5736217.2	566309.63
3312	68.94	196.58	1968.96	-1936.14	-2241.34	-1033.12	5736216.3	566309.37
3313	68.96	196.56	1969.32	-1936.5	-2242.24	-1033.39	5736215.4	566309.1
3314	68.99	196.54	1969.67	-1936.85	-2243.14	-1033.65	5736214.51	566308.84
3315	69.01	196.52	1970.03	-1937.21	-2244.03	-1033.92	5736213.61	566308.57
3316	69.03	196.5	1970.38	-1937.56	-2244.93	-1034.18	5736212.72	566308.31
3317	69.06	196.48	1970.74	-1937.92	-2245.82	-1034.44	5736211.82	566308.05
3318	69.08	196.46	1971.1	-1938.28	-2246.72	-1034.71	5736210.92	566307.78
3319	69.11	196.44	1971.45	-1938.63	-2247.62	-1034.97	5736210.03	566307.52
3320	69.13	196.42	1971.81	-1938.99	-2248.51	-1035.24	5736209.13	566307.25
3321	69.16	196.41	1972.16	-1939.34	-2249.41	-1035.5	5736208.23	566306.99
3322	69.18	196.39	1972.52	-1939.7	-2250.31	-1035.76	5736207.34	566306.73
3323	69.21	196.37	1972.88	-1940.06	-2251.2	-1036.03	5736206.44	566306.46
3324	69.23	196.35	1973.23	-1940.41	-2252.1	-1036.29	5736205.54	566306.2
3325	69.26	196.33	1973.59	-1940.77	-2253	-1036.56	5736204.65	566305.93
3326	69.28	196.31	1973.94	-1941.12	-2253.89	-1036.82	5736203.75	566305.67
3327	69.3	196.29	1974.3	-1941.48	-2254.79	-1037.08	5736202.86	566305.41
3328	69.33	196.27	1974.65	-1941.84	-2255.68	-1037.35	5736201.96	566305.14
3329	69.35	196.25	1975.01	-1942.19	-2256.58	-1037.61	5736201.06	566304.88
3330	69.38	196.23	1975.37	-1942.55	-2257.48	-1037.88	5736200.17	566304.61
3331	69.4	196.22	1975.72	-1942.9	-2258.37	-1038.14	5736199.27	566304.35
3332	69.43	196.2	1976.08	-1943.26	-2259.27	-1038.41	5736198.37	566304.09
3333	69.45	196.18	1976.43	-1943.62	-2260.17	-1038.67	5736197.48	566303.82
3334	69.48	196.16	1976.79	-1943.97	-2261.06	-1038.93	5736196.58	566303.56
3335	69.5	196.14	1977.15	-1944.33	-2261.96	-1039.2	5736195.68	566303.29
3336	69.49	196.18	1977.5	-1944.68	-2262.86	-1039.46	5736194.79	566303.03
3337	69.48	196.23	1977.85	-1945.03	-2263.76	-1039.73	5736193.89	566302.77
3338	69.48	196.27	1978.2	-1945.38	-2264.65	-1039.99	5736192.99	566302.5
3339	69.47	196.31	1978.55	-1945.73	-2265.55	-1040.25	5736192.09	566302.24
3340	69.46	196.35	1978.9	-1946.08	-2266.45	-1040.52	5736191.19	566301.97
3341	69.45	196.4	1979.25	-1946.43	-2267.35	-1040.78	5736190.29	566301.71
3342	69.44	196.44	1979.6	-1946.78	-2268.25	-1041.05	5736189.4	566301.44
3343	69.43	196.48	1979.96	-1947.14	-2269.15	-1041.31	5736188.5	566301.18
3344	69.43	196.52	1980.31	-1947.49	-2270.04	-1041.58	5736187.6	566300.91
3345	69.42	196.57	1980.66	-1947.84	-2270.94	-1041.84	5736186.7	566300.65

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
3346	69.41	196.61	1981.01	-1948.19	-2271.84	-1042.11	5736185.8	566300.39
3347	69.4	196.65	1981.36	-1948.54	-2272.74	-1042.37	5736184.91	566300.12
3348	69.4	196.66	1981.71	-1948.89	-2273.64	-1042.64	5736184.01	566299.85
3349	69.41	196.66	1982.06	-1949.24	-2274.53	-1042.91	5736183.11	566299.58
3350	69.42	196.67	1982.41	-1949.59	-2275.43	-1043.18	5736182.21	566299.32
3351	69.42	196.67	1982.76	-1949.94	-2276.33	-1043.44	5736181.32	566299.05
3352	69.43	196.67	1983.11	-1950.29	-2277.22	-1043.71	5736180.42	566298.78
3353	69.43	196.67	1983.47	-1950.65	-2278.12	-1043.98	5736179.52	566298.51
3354	69.44	196.68	1983.82	-1951	-2279.02	-1044.25	5736178.63	566298.24
3355	69.45	196.68	1984.17	-1951.35	-2279.91	-1044.52	5736177.73	566297.97
3356	69.45	196.68	1984.52	-1951.7	-2280.81	-1044.79	5736176.83	566297.7
3357	69.46	196.68	1984.87	-1952.05	-2281.71	-1045.06	5736175.94	566297.43
3358	69.46	196.69	1985.22	-1952.4	-2282.61	-1045.33	5736175.04	566297.17
3359	69.47	196.69	1985.57	-1952.75	-2283.5	-1045.59	5736174.14	566296.9
3360	69.48	196.69	1985.92	-1953.1	-2284.4	-1045.86	5736173.24	566296.63
3361	69.48	196.69	1986.27	-1953.45	-2285.3	-1046.13	5736172.35	566296.36
3362	69.49	196.7	1986.62	-1953.8	-2286.19	-1046.4	5736171.45	566296.09
3363	69.49	196.7	1986.98	-1954.16	-2287.09	-1046.67	5736170.55	566295.82
3364	69.5	196.7	1987.33	-1954.51	-2287.99	-1046.94	5736169.66	566295.55

**APPENDIX 2a**

**BREAM A22A & A22AST**

**Petrophysics Evaluation Summary**

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

**Bream A22AST1**  
**Petrophysics Report**

**Analysist: B.L. Rayner**  
**February 2006**

# Bream A22AST1 Petrophysics Report

## INTRODUCTION

Bream A22A ST1 is a side track directional well of the original Bream A22A well which was designed to capture- N-1 oil reserves from a local structural crest on the Southern edge of the Bream A field.

Bream A22A was plugged back from 2933.0 mMDRT to 2648.0 mMDRT and then Bream A22AST1 was then spudded by cutting a window in the 7" casing at 2702.4 mMDRT.

A 6" production hole was then drilled to a Total Depth of 3364.0 mMDRT.

LWD GR and D&I data was acquired using Schlumberger Drilling & Measurements PowerPulse while drilling from 2717 – 3364 mMDRT.

After reaching TD, the well was logged up in memory mode with Precision Energy Service's shuttle on drill pipe from 3356.0 mMDRT to 2699.0 mMDRT.

The Precision logs were depth matched to the Schlumberger GR log and analysed for porosity, water saturation and net pay over the interval 3330 - 3175 mMDRT.

Note that all depth 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 (mMDRT)	Bottom (mMDRT)
LWD-GR	2	Schlumberger	2717	3364
Dual Laterolog (DDL, DSL), Gamma Ray (GRGC), Photo Density (PDPE, DEN), Caliper (CLDC), Compensated Neutron (NPRL) and Compensated Sonic (DT)	1	Precision	2699	3356

## Deviation

The well deviation over the reservoir was 69.4° towards an azimuth of 199.66°.

## Mud Data

Mud Type : KCl/Glycol/PHPA  
Mud Weight: 10.2 ppg  
Rm: 0.154 @ 25 °C  
Rmf: 0.099 @ 25 °C  
Rmc: 0.283 @ 25 °C  
Potassium 8%  
BHT: 95 °C (as measured by the Precision tools)

## Hole Size

2702-3364 mMDRT 6 inches

## Data Acquisition & Log Quality

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

# Bream A22AST1 Petrophysics Report

## 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 3326 mMDRT, 1<sup>st</sup> reading of the LWD-GR log measurement is 3347 mMDRT) a complete GR for the well was generated by depth splicing the two GR

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.

## INTERPRETATION

### Logs Used

The primary logs used in the interpretation were the depth matched DDL (deep resistivity), GRGC (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)
93	10
3342	105

The temperature at depth 93 mMDRT represents the temperature of the sea-bed and the temperature at 3342 mMDRT (first reading of the Precision logs) is the estimated formation temperature –BHT +10 deg.

### 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	Hydrocarbon Type
N1_Grn_Gas	3190.5	3228.7	Gas Bearing
N1_Cob_Oil	3228.7	3233.9	Oil Bearing
N1_Cob_ResHy	3233.9	3246.1	Residual Oil & Gas
N1_Mid_Cob_Oil	3247.5	3261.6	Oil Bearing
N1_Lwr_Cob_Oil	3263.7	3287.8	Oil Bearing
N1_Lwr_Cob_ResOil	3287.8	3291.0	Residual Oil
N1_Pin1.1_ResHy	3294.0	3297.8	Water Bearing
N1_Pin1.2_ResHy	3301.2	3306.8	Water Bearing
N1_Pin1.3_ResHy	3311.7	3329.8	Water Bearing

### Shale Volume, Porosity and Water Saturation

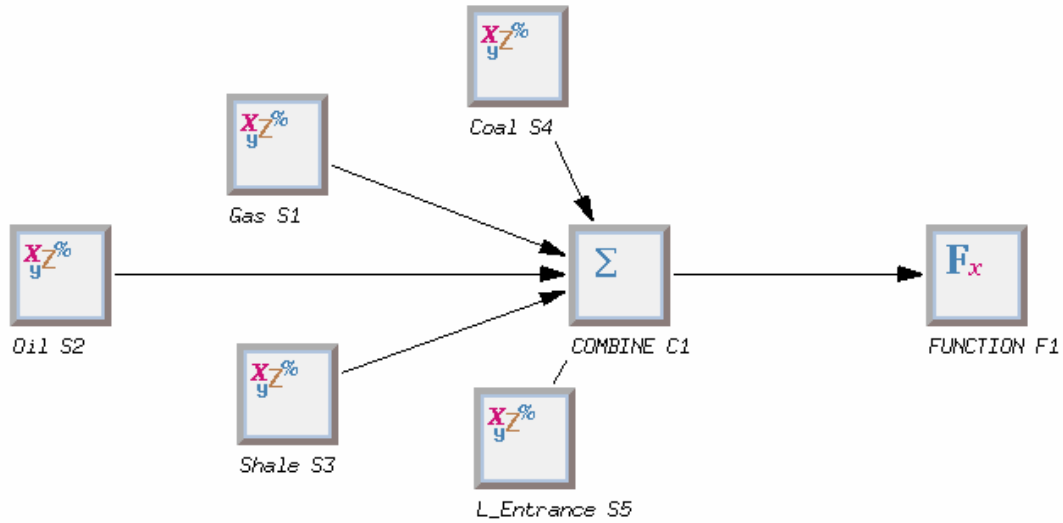
Schlumberger's Geoframe ELAN+ module was used to determine mineral volumes, total porosity, effective porosity and effective saturation. The details of the models are illustrated in the figures and tables below.



# Bream A22AST1 Petrophysics Report

## ELAN+ MODEL

### Elan + Model and Module Configuration



### ELAN Input Channels

Log Curve Selector	Selector Options	
	Compound Name Spec	BREAM A22AST1
TEMP_CH	TEMP;*	TEMP TEMP@ELANINPUTV1;7 .WELLEDIT [A1427
RHOB_IFAC_CH	IFRH;*	
NPHI_IFAC_CH	INPH;*	
RHOB_CH	DEN:BPB;*	DEN DEN@ELANINPUTV1;8 .MOPED_LOAD .RAW
NPHI_CH	NPRL:BPB;*	NPRL NPRL@ELANINPUTV1;7 .MOPED_LOAD .Rf
U_CH	U;*	U U@ELANINPUTV1;2 .DF [A1427335]
CUDC_CH/RT_CH	DDLL:BPB;*	DDLL DDLL@ELANINPUTV1;6 .MOPED_LOAD .Rf
GR_CH	GRGC:BPB;*	GRGC GRGC@ELANINPUTV1;7 .LWD .NEW .LWD
PRB1_CH	FLAG_RHOH;*	FLAG_RHOH FLAG_RHOH@ELANINPUTV1;8 .GET
PRB2_CH	DEPT;*	DEPT DEPT@ELANINPUTV1;3 .WELLEDIT [A1427
PRB3_CH	PRB3;*	
PRB4_CH	FLAG_COAL;*	FLAG_COAL FLAG_COAL@ELANINPUTV1;8 .WELL
PRB5_CH	PRB5;*	
M_CH	MXP;*	
N_CH	SXP;*	

### ELAN Global Parameters

Reference Index	MD
Processing Interval	3175.0000(m) To 3330.0002(m)
Sampling Rate	0.3281(m)
Uncertainty Channel	FALSE
Clay Input	DRY
Special Fluids	IMMOVABLE_HYDROCARBON

# Bream A22AST1 Petrophysics Report

## ELAN Zone Definition

Name	Bottom To Top
N1-Sands	3339.9983(m) To 3262.5000(m)
NGR_SND	3262.5000(m) To 3175.0000(m)

## ELAN Process Definition

<b>Process</b>	<b>SOLVE1 "Gas"</b>						
Equations	RHOB	NPHI	U	CUDC_DWA	GR	CT1	
Volumes	QUAR	ORTH	ILLI	XWAT	UWAT	XGAS	UGAS
Constraint Zones	Bottom			Top			
UNDEFINED	3339.9983(m )			3175.0000(m )			

### Constraints Applied

UNDEFINED	- WaterBaseMud_SXO_gt_SW
UNDEFINED	- IrreducibleXWater
UNDEFINED	- IrreducibleUWater

<b>Process</b>	<b>SOLVE2 "Oil"</b>						
Equations	RHOB	NPHI	U	CUDC_DWA	GR	CT2	
Volumes	QUAR	ORTH	ILLI	XWAT	UWAT	XOIL	UOIL
Constraint Zones	Bottom			Top			
UNDEFINED	3339.9983(m )			3175.0000(m )			

### Constraints Applied

UNDEFINED	- IrreducibleXWater
UNDEFINED	- IrreducibleUWater
UNDEFINED	- WaterBaseMud_SXO_gt_SW

<b>Process</b>	<b>SOLVE3 "Shale"</b>						
Equations	RHOB	NPHI		CUDC_DWA	GR		
Volumes	QUAR	ILLI	XWAT	UWAT			
Constraint Zones	Bottom			Top			
UNDEFINED	3339.9983(m )			3175.0000(m )			

<b>Process</b>	<b>SOLVE4 "Coal"</b>						
Equations	RHOB						
Volumes	COAL						
Constraint Zones	Bottom			Top			
UNDEFINED	3339.9983(m )			3175.0000(m )			

<b>Process</b>	<b>SOLVE5 "L_Entrance"</b>						
Equations	RHOB						
Volumes	ILLI						
Constraint Zones	Bottom			Top			
UNDEFINED	3339.9983(m )			3175.0000(m )			

<b>Process</b>	<b>COMBINE 1 "COMBINE"</b>						
Order	SOL.2	SOL.1	SOL.3	SOL.4	SOL.5		

# Bream A22AST1 Petrophysics Report

## Combine Method

"Coarse Clast" 10958.0000 (m ) Internal Average

"L Entrance " 10465.8789 (m ) Sol.5

## 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-Sands	NGR_SND		
n*****	*****	*****	*****	*****
CXDC_XWAT (mS/m )	19.130	18.736		
CXDC_XBWA (mS/m )	10.930	10.707		
CUDC_UWAT (mS/m )	13.748	13.761		
CUDC_UBWA (mS/m )	4.925	4.931		
RW (ohm.m )	0.388	0.381		
GR_UNC_WM ( )	0.300	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	0.974 (g/cm3 )
RHOB_XOIL	0.600 (g/cm3 )	RHOB_UOIL	0.600 (g/cm3 )
RHOB_XGAS	-0.033 (g/cm3 )	RHOB_UGAS	-0.033 (g/cm3 )
RHOB_XBWA	0.963 (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	0.900 (m3/m3 )	NPHI_UOIL	0.900 (m3/m3 )
NPHI_XGAS	0.139 (m3/m3 )	NPHI_UGAS	0.139 (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 )

## Bream A22AST1 Petrophysics Report

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( )
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( )

## Bream A22AST1 Petrophysics Report

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 )
ARHOB_KAOL	2.620 (g/cm3 )	WCLP_GLAU	0.156 (m3/m3 )
WCLP_ILLI	0.154 (m3/m3 )	WCLP_KAOL	0.058 (m3/m3 )
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 )
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/cm3 )
NPHI_UNC_ZP	0.015 (m3/m3 )	DT_UNC_ZP	2.250 (us/m )
U_UNC_ZP	0.225 ( )	CXDC_UNC_ZP	0.072 (mS/m )
CUDC_UNC_ZP	0.056 (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 (m3/m3 )
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	0.100 ( )	NPHI_IFAC_ZP	0.800 ( )
A_ZP	1.000 ( )	N_ZP	2.000 ( )
C_DWA	0.000 ( )	M_DWA	2.000 ( )
BVIRR	0.010 (m3/m3 )		

## RESULTS AND DISCUSSION

It is clear from the logs that the N-1 reservoir over the interval 3190 – 3260 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.

The petrophysical analysis indicates that there are three oil productive intervals in this well. The top oil zone extends from a GOC at 3228.7 mMDRT to an OWC at 3233.9 mMDRT (Fig 1 & Table 1). The second oil zone extends from 3247.5 mMDRT to 3261.6 mMDRT (LPO). The third oil zone extends from 3263.7 mMDRT to an OWC at 3287.8 mMDRT.

The analysis also indicates that the interval from 3233.9 mMDRT to 3246.1 mMDRT has an effective water saturation (SWE) of 51%. Normally this would be considered to be a hydrocarbon productive zone. However, in this instance, the zone is considered to be a residual hydrocarbon zone. It contains trapped gas-cap gas, residual oil, and, the mobile phase being water. The zone was originally part of the gas cap as indicated by the position of the original GOC. It was swept by the oil column with the blow down of the gas cap, trapping as

# Bream A22AST1 Petrophysics Report

much as 25% of the pore volume gas. The oil was then subsequently swept by water, however leaving behind the trapped gas. The combination of trapped gas and the residual oil is postulated to be the reason for the observed residual hydrocarbon saturation of 49% in this zone.

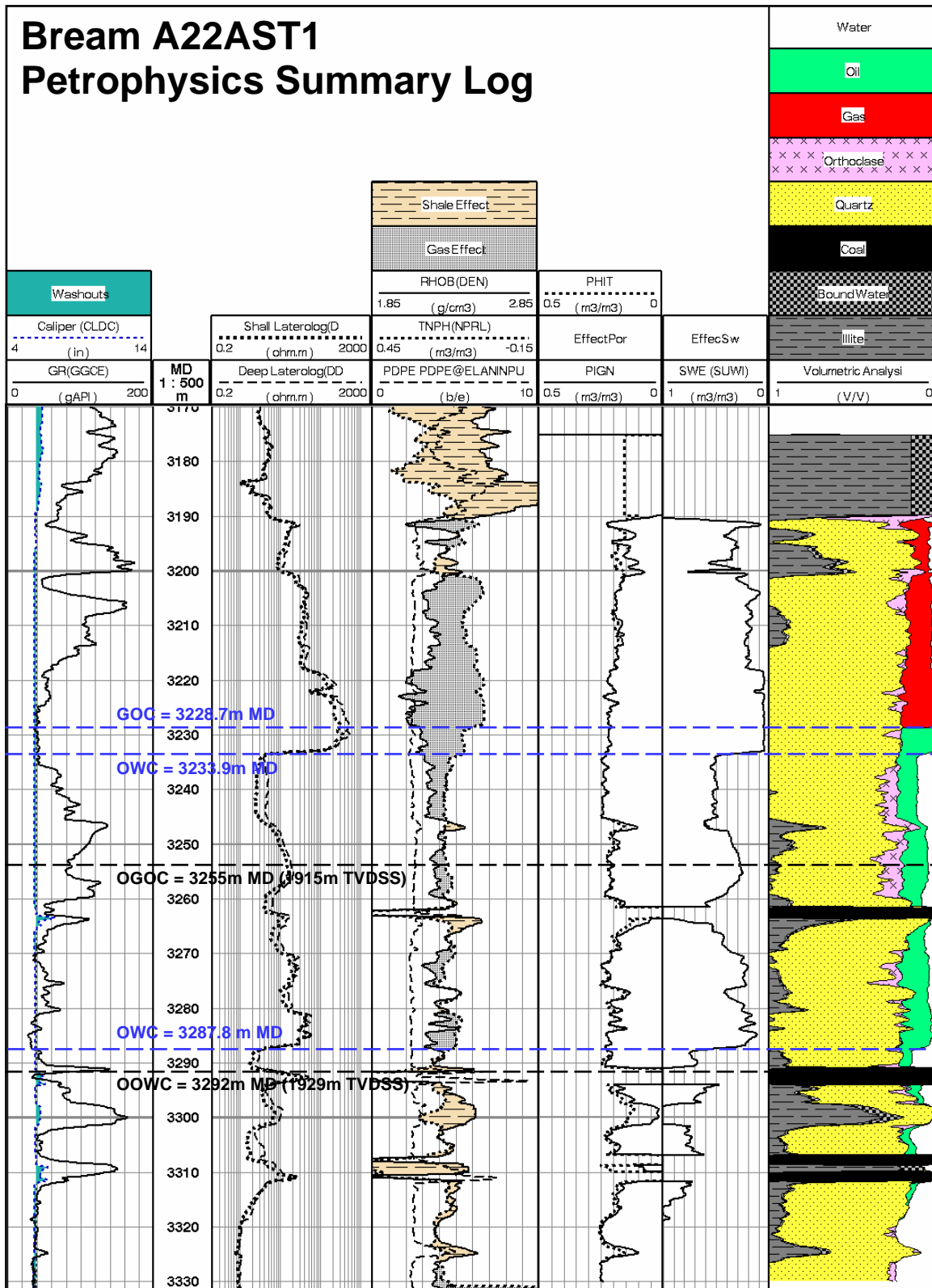


Figure 1

## Bream A22AST1

Petrophysical Summary 3175 - 3330m 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_Grn_Gas	3190.5	1891.6	3228.7	1905.6	38.2	14.1	0.99	0.08	0.178	0.18	Gas Bearing, GOC@3228.7 mMD (1938.4 mTVD)	37.8	13.9
N1_Grn_Oil	3228.7	1905.6	3233.9	1907.5	5.2	1.9	1.00	0.00	0.217	0.09	Oil Bearing, OWC@3233.9 mMD (1940.3 mTVD)	5.2	1.9
N1_Cob_ResHy	3233.9	1907.5	3246.1	1912.0	12.2	4.5	1.00	0.01	0.234	0.51	Residual Oil & Gas		
N1_Mid_Cob_Oil	3247.5	1912.6	3261.6	1917.8	14.1	5.2	1.00	0.07	0.199	0.35	Oil Bearing	14.1	5.2
N1_Lwr_Cob_Oil	3263.7	1918.5	3287.8	1927.4	24.1	8.9	0.93	0.06	0.196	0.28	Oil Bearing, OWC@3287.8 mMD (1960.2 mTVD)	22.4	8.2
N1_Lwr_Cob_ResOil	3287.8	1927.4	3291.0	1928.6	3.2	1.2	0.97	0.11	0.213	0.71	Residual Oil		
N1_Pin1.1_ResHy	3294.0	1929.7	3297.8	1931.0	3.8	1.4	0.76	0.24	0.157	0.62	Water Bearing		
N1_Pin1.2_ResHy	3301.2	1932.3	3306.8	1934.3	5.6	2.0	0.94	0.12	0.192	0.74	Water Bearing		
N1_Pin1.3_ResHy	3311.7	1936.1	3329.8	1942.5	18.1	6.5	0.94	0.09	0.209	0.96	Water Bearing		

Table 1



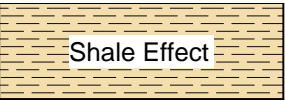
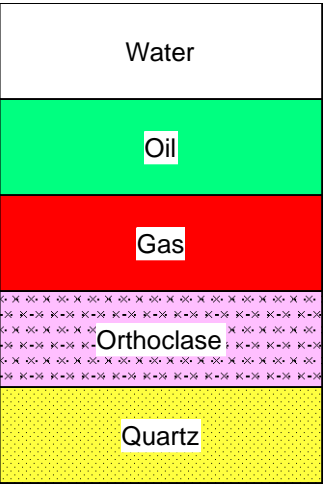
# BREAM A22AST1

## Petrophysical Analysis

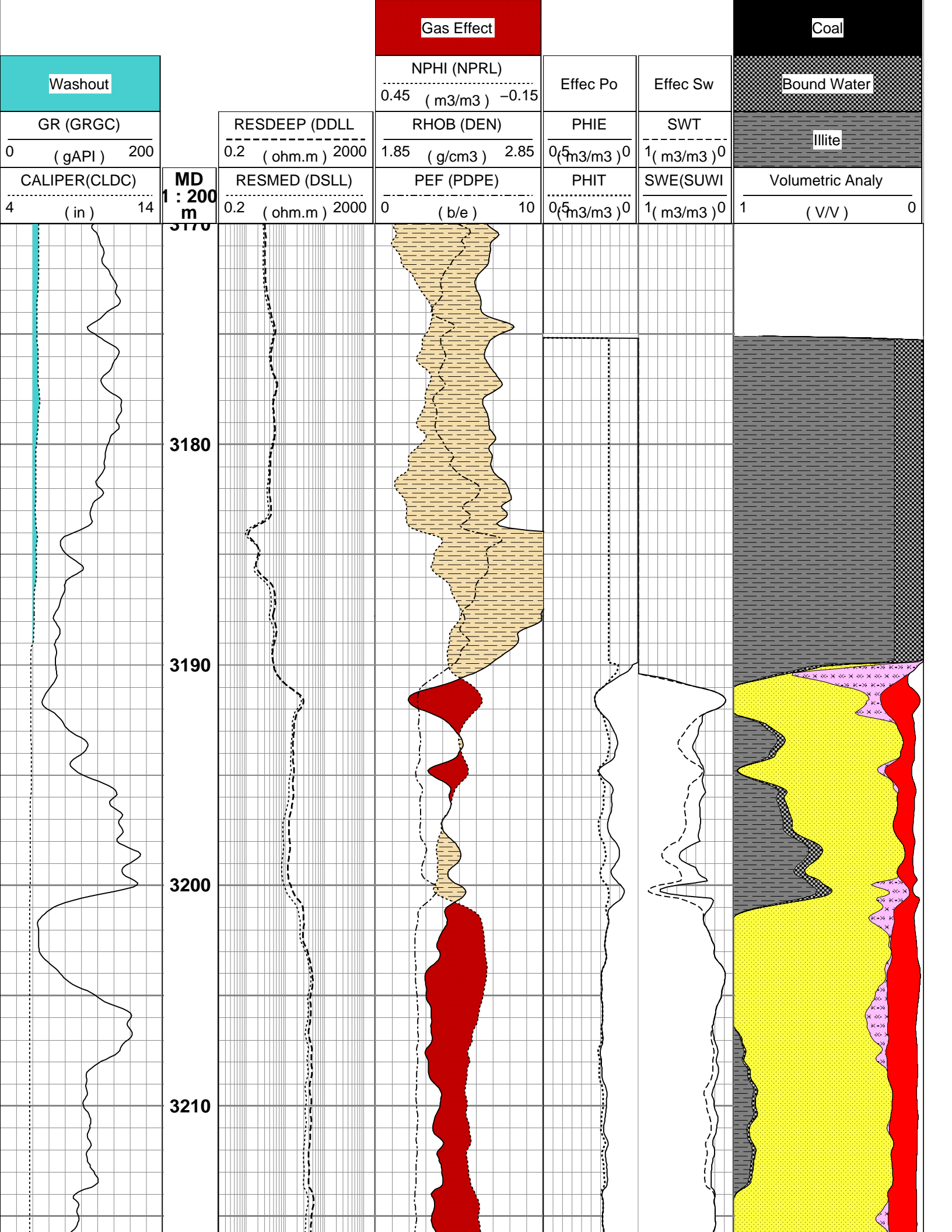
COMPANY: Esso Australia Pty. Ltd.  
WELL: BREAM A22  
BOREHOLE: BREAM A22AST1  
FIELD: BREAM  
STATE: VIC  
COUNTRY: AUSTRALIA

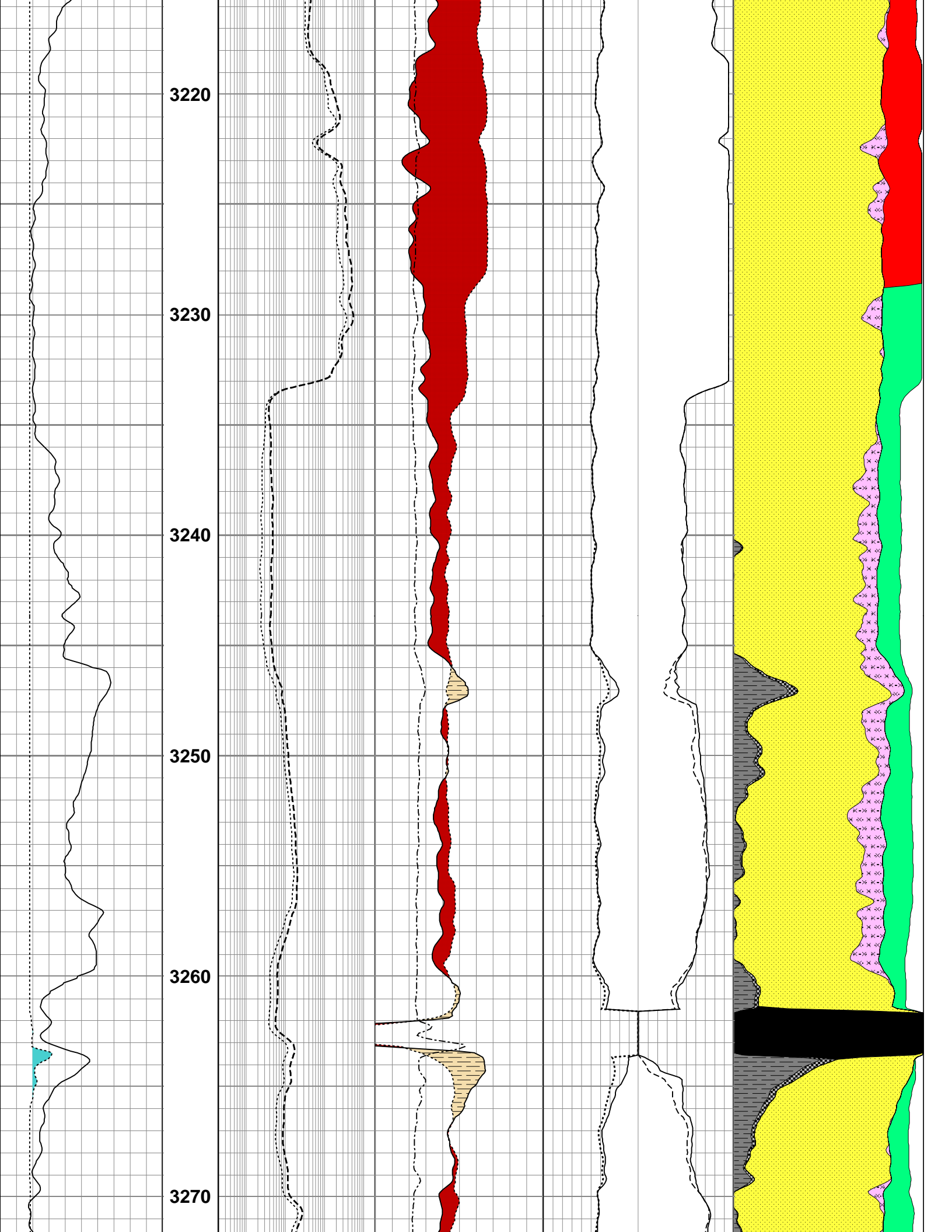
PETROPHYSICIST: BERNIE RAYNER

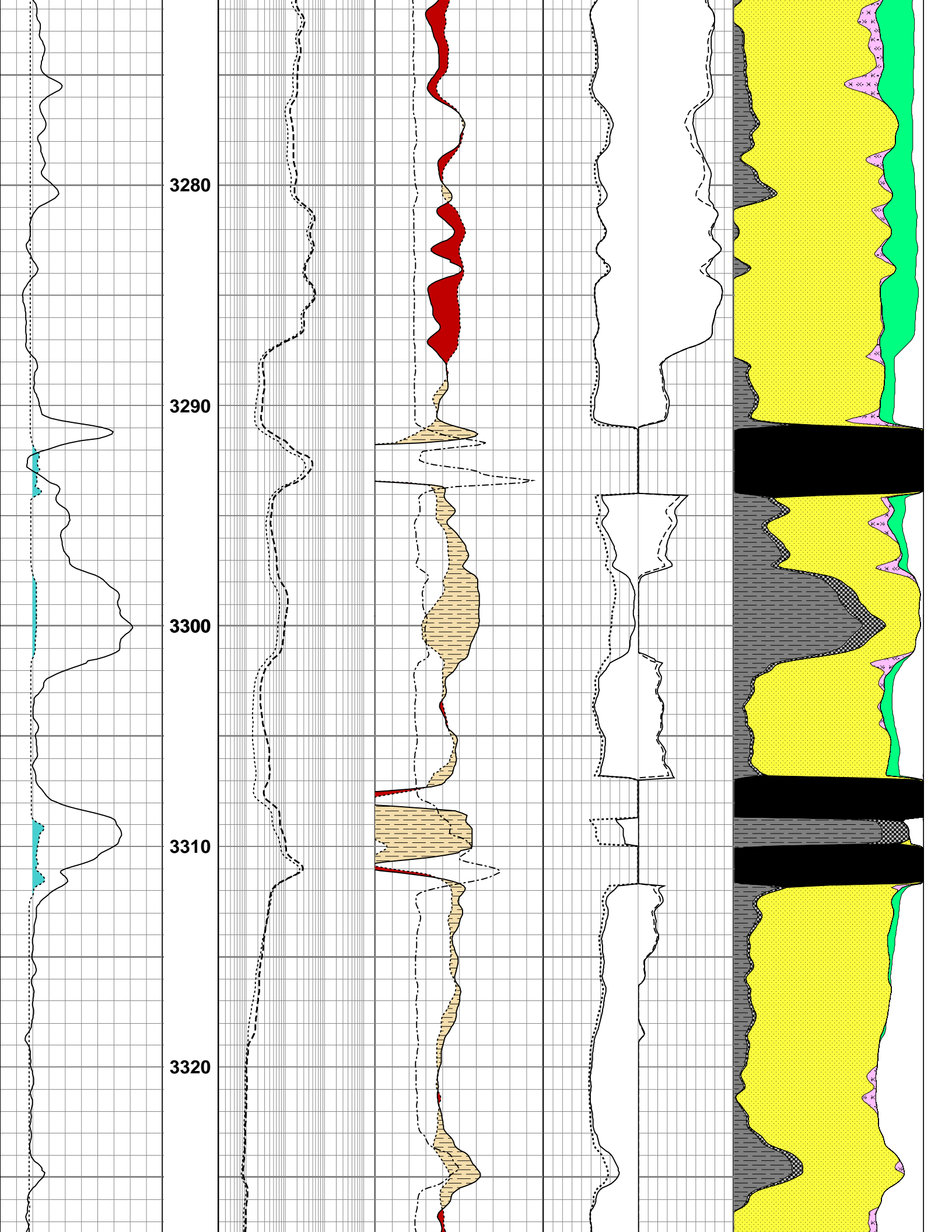
Date Logged: November 2005      Date of Analysis: February 2006  
Well Location: <FL>  
Elevations: K.B. 32.82 m      D.F. <DF>  
Latitude: <LATI>      G.L. <GL>  
Longitude: <LONG>

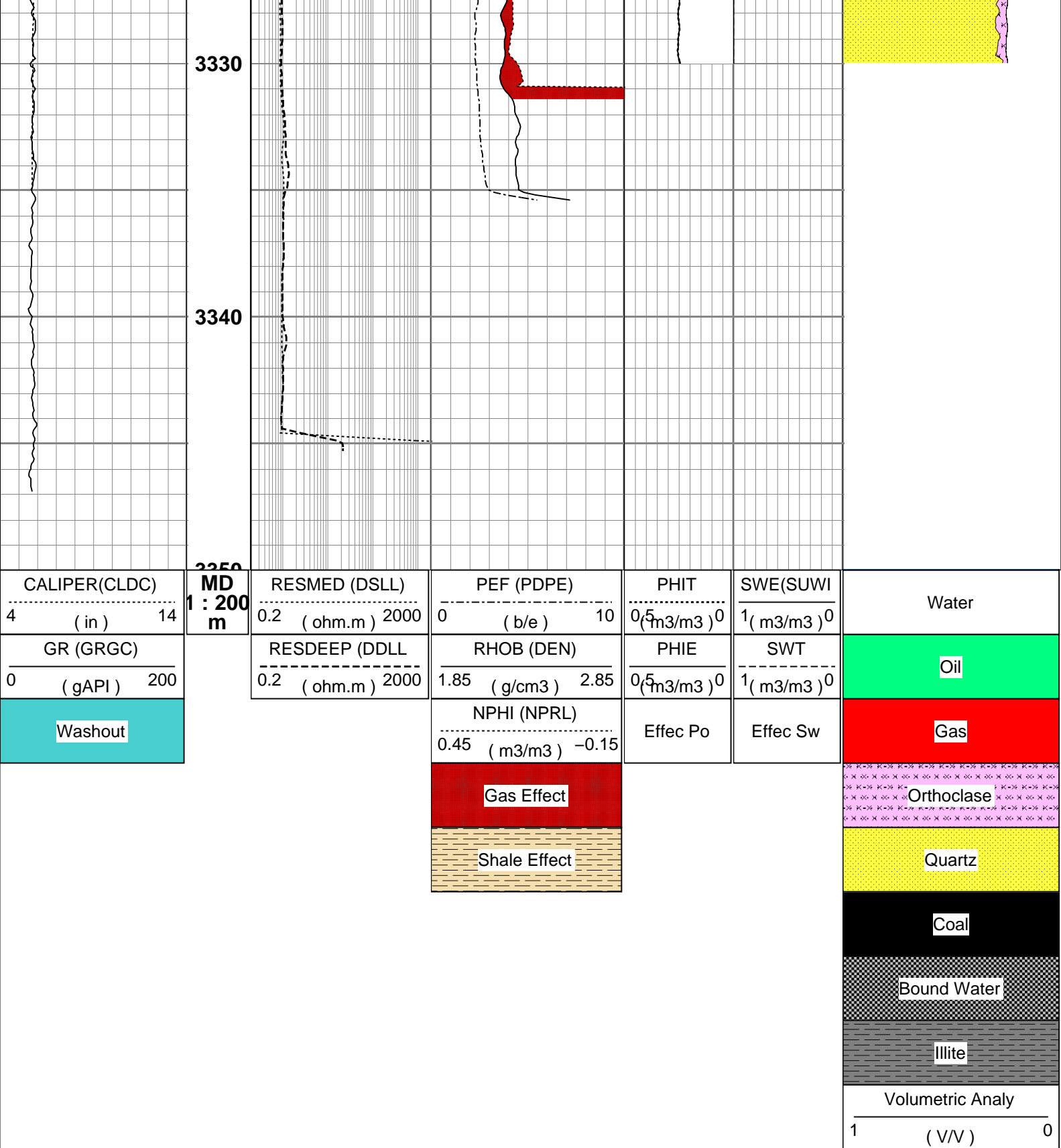












**APPENDIX 3a**

**BREAM A22A**

**Lithology/Show Descriptions**

## Bream A22A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
			<p>Previous Well History:</p> <p>Bream A22 Previous Well History:</p> <p>Bream A22 Plugged and Abandoned on 31 August 2005.</p> <p>Milled the 7.00" Casing : Top of window at 2698.0 mMDRT. : Bottom of window at 2702.3 mMDRT.</p> <p>BMA A22A Kick-off point with Milling assembly at 2698.0 mMDRT at 0930 hrs on 02 September 2005.</p> <p>Drilled from 2709.2 mMDRT (1724.1 mTVDRT) at 1545 hrs 03 September 2005, to the 2715.0 mMDRT (1727.5 mTVDRT) at 2210 hrs 03 September 2005, with a Hycalog PDC bit on steerable motor assembly.</p> <p>Bit Details: BHA # 2, Bit # 2.</p> <p>Size: 6.0", Manufacturer / Type: Hycalog DSX143A3DGJ, Serial #: 208913.</p> <p>Jets: 10 x 3, 12 x 3, TFA: 0.561 sq.in, Grading: <b>0-0-BU-A-X-IN-CT-PR.</b></p> <p>Krevs: 37.0, RPM: 105-120 ( + 134 RPM DHM).</p> <p>Metres drilled: 6.0 m, HOB: 6.40 Average ROP: 6.0 / 6.40 = 0.94 m/hr.</p> <p>Rotating: 6.0 metres / Rotating HOB = 6.40, Average Rotating ROP = 0.94 m/hr. Steering: 0.0 metres / Steering HOB = 0.00 , Average Steering ROP = N/A m/hr.</p> <p>Spot 1 metre samples from 2698.0-2709.2 mMDRT showed an increasing percentage of new formation (Calcareous Claystone). The 2709.2 mMDRT spot sample had 80% new formation.</p> <p>Cuttings samples for description only at 30 m intervals from 2700.0 to 2820.0 mMDRT. (To 150 mMD above the Top of Latrobe prognosed at 2981.2 mMDRT).</p> <p>Cuttings samples bagged at 10 m intervals from 2820.0 to 2970.0 mMDRT</p> <p>Cuttings samples bagged at 5 m intervals from 2970.0 to TD of 3xxx.0 mMDRT.</p> <p><b>Geologist on Rig from 2702.0 mMDRT(1720.1 mTVDRT), at 1330 hrs 02 September 2005.</b> <b>Midnight depth 02 September 2005 = 2709.2 mMDRT (1724.0 mTVDRT).</b></p>
2709	2715	100	<p>CALCAREOUS CLAYSTONE: light grey to medium light grey, moderately calcareous (15%), soft to firm, occasionally moderately hard, amorphous to sub blocky.</p>

## Bream A22A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
<p><b>Drill from 2709.2 to 2712.0 mMDRT.</b></p> <p><b>PIT at 1700 hrs 03 September 2005, at 2712.0 mMDRT (1725.5 mTVDRT), 940 psi using 9.8 ppg mud, EMW of 13.0 ppg.</b></p> <p><b>Drill from 2712.0 to 2714.0 mMDRT.</b>  <b>Due to suspect bit balling, pump 15 bbls caustic pill.</b>  <b>Continue drilling to 2715.0 mMDRT.</b>  <b>POOH at 2715.0 mMDRT due to poor ROP.</b>  <b>Change out bit and mud motor.</b>  <b>Midnight depth 03 September 2005 = 2715.0 mMDRT (1727.5 mTVDRT)</b></p> <p>Drilled from 2715.0 mMDRT (1727.5 mTVDRT) at 1530 hrs 04 September 2005, to 3104.0 mMDRT (1883.9 mTVDRT) at 1030 hrs 07 September 2005, with a Smith PDC bit on steerable motor assembly.</p> <p>Bit Details:  BHA # 3, Bit # 3.</p> <p>Size: 6.0", Manufacturer / Type: Smith MA74PX, Serial #: JT8258.</p> <p>Jets: 16 x 3, TFA: 0.589 sq.in, Grading: <b>0-0-PN-A-X-IN-NO-PR.</b></p> <p>Krevs: 646.0, RPM: 100-112 ( + 134 RPM DHM).</p> <p>Metres drilled: 389.0 m, HOB: 50.5 : Average ROP: 389.0 / 50.50 = 7.7 m/hr.</p> <p>Rotating: 335.0 metres / Rotating HOB = 38.33, Average Rotating ROP = 8.74 m/hr.  Steering: 54.0 metres / Steering HOB = 12.17 , Average Steering ROP = 4.44 m/hr.</p>			
2715	2720	100	CALCAREOUS CLAYSTONE: light grey to medium light grey, occasionally light olive grey, moderately calcareous, silty in part, soft to moderately hard, amorphous to sub blocky.
2720	2730	100	CALCAREOUS CLAYSTONE: light grey to medium light grey, occasionally light olive grey, moderately calcareous, silty in part, trace disseminated pyrite and laminations, firm to occasionally moderately hard, sub blocky. <b>Midnight depth 04 September 2005 = 2730.0 mMDRT (1735.4 mTVDRT).</b>
2730	2745	100	CALCAREOUS CLAYSTONE: light grey to medium light grey, occasionally light olive grey, moderately calcareous, silty in part, trace disseminated pyrite and laminations, trace forams, firm to moderately hard, sub blocky.
2745	2760	100	CALCAREOUS CLAYSTONE: light grey to medium light grey, occasionally light olive grey, moderately calcareous, silty in part, trace disseminated pyrite and laminations, trace forams, rare micromicaceous, firm to moderately hard, sub blocky.
2760	2790	100	CALCAREOUS CLAYSTONE: light grey to light olive grey, moderately calcareous, silty in part, trace disseminated pyrite and laminations, trace forams, rare micromicaceous, firm to moderately hard, sub blocky.
2790	2820	100	CALCAREOUS CLAYSTONE: as above, rare glauconite. <b>Start bagging at 10 metre intervals from 2830 mMDRT.</b>

## Bream A22A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2820	2830	100	CALCAREOUS CLAYSTONE: light grey to light olive grey, occasionally medium light grey, moderately calcareous, silty in part, trace disseminated pyrite and laminations, rare forams, rare micromicaceous, rare glauconite, soft to moderately hard, sub blocky.
2830	2840	100	CALCAREOUS CLAYSTONE: as above, common disseminated pyrite and laminations.
2840	2850	100	CALCAREOUS CLAYSTONE: as above, common disseminated pyrite and laminations.
2850	2860	100	CALCAREOUS CLAYSTONE: light grey to light olive grey, occasionally medium light grey, moderately calcareous, silty in part, common disseminated pyrite and laminations, rare forams, rare glauconite, soft to moderately hard, sub blocky.
2860	2870	100	CALCAREOUS CLAYSTONE: as above, trace disseminated pyrite and laminations, trace forams, trace glauconite,.
2870	2880	95	CALCAREOUS CLAYSTONE: as above.
		5	SANDSTONE: translucent to very pale orange, fine to occasionally very coarse, poorly sorted, sub rounded, trace siliceous cement, trace fossil fragments, trace ooids, generally loose, poor inferred porosity. No fluorescence.
			<b>Midnight depth 05 September 2005 = 2885.0 mMDRT (1800.0 mTVDRT)</b>
2880	2890	100	CALCAREOUS CLAYSTONE: as above.
		Trace	SANDSTONE: Trace, as above.
2890	2900	100	CALCAREOUS CLAYSTONE: light grey to light olive grey, occasionally medium light grey, moderately calcareous, silty in part, trace disseminated pyrite and laminations, trace forams, trace glauconite, trace pyrite nodules, soft to moderately hard, sub blocky.
		5	SANDSTONE: as above.
2900	2910	100	CALCAREOUS CLAYSTONE: as above.
		Trace	SANDSTONE: Trace, as above.
2910	2920	100	CALCAREOUS CLAYSTONE: light olive grey to light grey, moderately calcareous, silty in part, trace disseminated pyrite and laminations, trace pyrite nodules, soft to moderately hard, amorphous to sub blocky.
2920	2930	100	CALCAREOUS CLAYSTONE: as above, trace glauconite.
2930	2940	100	CALCAREOUS CLAYSTONE: light olive grey to medium light grey, as above.
2940	2950	100	CALCAREOUS CLAYSTONE: light olive grey to medium light grey, moderately calcareous, silty in part, trace disseminated pyrite and laminations, rare micromicaceous, rare forams, soft to moderately hard, amorphous to sub blocky.
2950	2960	100	CALCAREOUS CLAYSTONE: as above.
2960	2970	100	CALCAREOUS CLAYSTONE: as above.
2970	2980	100	CALCAREOUS CLAYSTONE: as above.
			<b>Start 5 metre samples from 2980 mMDRT to TD.</b>
2980	2985	100	CALCAREOUS CLAYSTONE: light olive grey to medium light grey, moderately calcareous, silty in part, trace disseminated pyrite and laminations, rare nodular pyrite, rare glauconite, trace very fine sand, firm to moderately hard, sub blocky.
2985	2990	100	CALCAREOUS CLAYSTONE: as above.
2990	2995	100	CALCAREOUS CLAYSTONE: as above, trace nodular pyrite.
		Trace	SANDSTONE: Trace, translucent to very pale orange, very fine to fine, moderately well sorted, sub angular to sub rounded, trace siliceous cement, poor inferred porosity. No fluorescence.
2995	3000	100	CALCAREOUS CLAYSTONE: as above.
			<b>Top of Latrobe at 3003.0 mMDRT (1844.3 mTVDRT, -1811.5 mTVDSS)</b>
3000	3005	95	CALCAREOUS CLAYSTONE: as above.



## Bream A22A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3005	3010	5	SANDSTONE: translucent to pale green, white, very fine to fine, sub angular to sub rounded, moderate siliceous cement, common glauconite matrix, common dark green glauconite pellets, hard aggregates, poor visible and inferred porosity. No fluorescence.
		75	CALCAREOUS CLAYSTONE: 70%, light olive grey to medium light grey, moderately calcareous, silty in part, trace disseminated pyrite and laminations, rare nodular pyrite, rare glauconite, trace very fine sand, firm to moderately hard, sub blocky. CLAYSTONE: 5%, light olive brown to light olive, non calcareous, soft, amorphous.
		10	SILTSTONE: pale yellowish brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky to blocky.
3010	3015	15	SANDSTONE: as above, common bit crushed to rock flour.
		25	CALCAREOUS CLAYSTONE: 20%, as above. CLAYSTONE: 5%, as above.
		15	SILTSTONE: as above.
		60	SANDSTONE: translucent to pale green, white, very fine to rare coarse, sub angular to sub rounded, moderate siliceous cement, common glauconite matrix, common dark green glauconite pellets, weak pyrite cement, hard aggregates, common bit crushed to rock flour, poor visible and inferred porosity. No fluorescence.
3015	3020	5	CALCAREOUS CLAYSTONE: 5%, as above. CLAYSTONE: Trace, as above.
		10	SILTSTONE: as above.
		85	SANDSTONE: Trace, as above, common rock flour.
3020	3025	Trace	CALCAREOUS CLAYSTONE: as above.
		10	SILTSTONE: as above.
3025	3030	90	SANDSTONE: Trace, as above, common rock flour.
		5	SILTSTONE: as above.
3030	3035	95	SANDSTONE: Trace, as above, common rock flour.
		5	SILTSTONE: pale yellowish brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky to blocky.
3035	3040	95	SANDSTONE: translucent to pale green, white, very fine to rare coarse, sub angular to sub rounded, moderate siliceous cement, common glauconite matrix, common dark green glauconite pellets, weak pyrite cement, hard aggregates, common bit crushed to rock flour, poor visible and inferred porosity. No fluorescence.
		15	SILTSTONE: as above.
		85	SANDSTONE: Trace, as above, common rock flour.
3040	3045	5	SILTSTONE: as above.
		95	SANDSTONE: Trace, as above, common rock flour.
3045	3050	5	SILTSTONE: as above.
		95	SANDSTONE: Trace, as above, common rock flour.
3050	3055	50	SILTSTONE: moderate yellowish brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite pellets, firm to moderately hard, sub blocky to blocky.

## Bream A22A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
		50	SANDSTONE: translucent to pale green, white, very fine to rare coarse, sub angular to sub rounded, moderate siliceous cement, common glauconite matrix, common dark green glauconite pellets, weak pyrite cement, hard aggregates, common bit crushed to rock flour, poor visible and inferred porosity. No fluorescence.
3055	3060	90	SILTSTONE: as above.
		10	SANDSTONE: Trace, as above.
3060	3065	80	SILTSTONE: as above.
		20	SANDSTONE: Trace, as above.
Spot	3069.5	70	SILTSTONE: as above.
Slow	drilling	5	SANDSTONE: Trace, as above.
		25	VOLCANICS: greyish blue green to greyish green, dominantly chlorite, trace disseminated pyrite, trace biotite, crystalline, hard to very hard, common bit crushed to rock flour.
3065	3070	75	SILTSTONE: moderate yellowish brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite pellets, soft to moderately hard, sub blocky.
		5	SANDSTONE: translucent to pale green, white, very fine to rare coarse, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, common glauconite matrix, common dark green glauconite pellets, weak pyrite cement, trace chlorite, hard aggregates, common bit crushed to rock flour, poor visible and inferred porosity. No fluorescence.
		20	VOLCANICS: greyish blue green to greyish green, dominantly chlorite, trace disseminated pyrite, trace biotite, crystalline, hard to very hard, common bit crushed to rock flour.
3070	3075	70	SILTSTONE: as above.
		5	SANDSTONE: Trace, as above.
		25	VOLCANICS: as above, 10% cavings.
3075	3080	70	SILTSTONE: as above.
		5	SANDSTONE: Trace, as above.
		25	VOLCANICS: as above, 10% cavings.
			<b>Midnight depth 06 September 2005 = 3083.0 mMDRT (1875.6 mTVDRT)</b>
3080	3085	80	SILTSTONE: moderate yellowish brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, soft to moderately hard, sub blocky.
		Trace	SANDSTONE: translucent to pale green, white, very fine to rare coarse, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, common glauconite matrix, common dark green glauconite pellets, weak pyrite cement, trace chlorite, hard aggregates, common bit crushed to rock flour, poor visible and inferred porosity. No fluorescence.
		20	VOLCANICS: 10% cavings, greyish blue green to greyish green, dominantly chlorite, trace disseminated pyrite, trace biotite, crystalline, hard to very hard, common bit crushed to rock flour.
3085	3090	80	SILTSTONE: as above.
		Trace	SANDSTONE: Trace, as above.
		20	VOLCANICS: as above, 10% cavings.
3090	3095	85	SILTSTONE: as above.
		Trace	SANDSTONE: Trace, as above.
		15	VOLCANICS: as above, 10% cavings.

## Bream A22A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3095	3100	90	SILTSTONE: as above.
		Trace	SANDSTONE: Trace, as above.
		10	VOLCANICS: as above, 5% cavings.
3100	3103	95	SILTSTONE: as above.
		Trace	SANDSTONE: Trace, as above.
		5	VOLCANICS: as above, all 5% cavings.
<p>Stop drilling at 1030 hrs, 07 September 2005 at 3104.0 mMDRT (1883.9 mTVDRT).  No CBU. POOH at 1045 hrs. On surface at 1750 hrs. Change out Bit.  BOP stack test. Start RIH at 0130 hrs 08 September 2005. Rig service at shoe.  Trip gas = 29 units at 1345 hrs 08 September 2005.  On bottom drilling at 1345 hrs 08 September 2005.</p> <p>Drilled from 3104.0 mMDRT (1383.8 mTVDRT) at 1345 hrs 08 September 2005, to 3249.0 mMDRT (1938.7 mTVDRT) at 1930 hrs 10 September 2005, with a Reed Hycalog PDC bit on steerable motor assembly.</p> <p>Bit Details:  BHA # 4, Bit # 4RR.</p> <p>Size: 6.0", Manufacturer / Type: Hycalog DSX143A3DGJ, Serial #: 208913.</p> <p>Jets: 10 x 3, 12 x 3, TFA: 0.561 sq.in, Grading: <b>Stuck in hole.</b></p> <p>Krevs: 579.0, RPM: 105-120 ( + 134 RPM DHM).</p> <p>Metres drilled: 145.0 m, HOB: 42.30  Average ROP: 145.0 / 42.30 = 3.43 m/hr.</p> <p>Rotating: 118.0 metres / Rotating HOB = 27.75, Average Rotating ROP = 4.25 m/hr.  Steering: 27.0 metres / Steering HOB = 14.55 , Average Steering ROP = 1.86 m/hr.</p>			
B/U LAT	3104	95	SILTSTONE: pale yellowish brown to dark yellowish brown, occasionally greyish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace green glauconite pellets, soft to moderately hard, sub blocky to blocky.
		5	SANDSTONE: white to translucent, occasionally pale green, very fine to occasionally very coarse, common fractured quartz grains, sub angular to sub rounded, moderate siliceous cement, trace glauconite matrix, trace chlorite, hard aggregates, common bit crushed to rock flour, poor visible and inferred porosity. No fluorescence.
		Cavings	VOLCANICS: All 10% cavings, greyish blue green to greyish green, dominantly chlorite, trace disseminated pyrite, trace biotite, crystalline, hard to very hard, trace bit crushed to rock flour.
3100	3105	95	SILTSTONE: as above.
		5	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, all 5% cavings.
Spot	3107	95	SILTSTONE: as above.
		5	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, trace cavings.

## Bream A22A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3105	3110	100	SILTSTONE: as above.
		Trace	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, all 5% cavings.
3110	3115	100	SILTSTONE: as above.
		Trace	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, all 5% cavings.
			<b>Midnight depth 08 September 2005 = 3116.0 mMDRT (1888.5 mTVDRT)</b>
3115	3120	95	SILTSTONE: pale yellowish brown to dark yellowish brown, occasionally greyish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace green glauconite pellets, soft to moderately hard, sub blocky to blocky.
		5	SANDSTONE: white to translucent, moderate siliceous cement, inferred hard aggregates, common bit crushed to rock flour, poor visible and inferred porosity.
			No fluorescence.
		Cavings	VOLCANICS: All 5% cavings, greyish blue green to greyish green, dominantly chlorite, trace disseminated pyrite, trace biotite, crystalline, hard to very hard, trace bit crushed to rock flour.
Spot	3122	90	SILTSTONE: as above.
		10	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, trace cavings.
3120	3125	90	SILTSTONE: as above, common bit crushed rock flour.
		10	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, trace cavings.
3125	3130	90	SILTSTONE: pale yellowish brown to dark yellowish brown, occasionally greyish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare green glauconite pellets, soft to moderately hard, sub blocky to blocky.
		10	SANDSTONE: white to translucent, moderate siliceous cement, inferred hard aggregates, common bit crushed to rock flour, poor visible and inferred porosity.
			No fluorescence.
		Cavings	VOLCANICS: All 5% cavings, greyish blue green to greyish green, dominantly chlorite, trace disseminated pyrite, trace biotite, crystalline, hard to very hard, trace bit crushed to rock flour.
Spot	3133	90	SILTSTONE: as above, common bit crushed rock flour.
		10	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, trace cavings.
3130	3135	90	SILTSTONE: as above, common bit crushed rock flour.
		10	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, trace cavings.
Spot	3137	90	SILTSTONE: as above, common bit crushed rock flour.
		10	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, trace cavings.
3135	3140	95	SILTSTONE: pale brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare green glauconite pellets, soft to moderately hard, amorphous to sub blocky .
		5	SANDSTONE: white to translucent, very fine to occasionally very coarse, poorly sorted, trace fractured quartz grains, moderate siliceous cement, hard aggregates, common bit crushed to rock flour, poor visible and inferred porosity.
			No fluorescence.

## Bream A22A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
		Cavings	VOLCANICS: All 5% cavings, greyish blue green to greyish green, dominantly chlorite, trace disseminated pyrite, trace biotite, crystalline, hard to very hard, trace bit crushed to rock flour.
3140	3145	100	SILTSTONE: as above, common bit crushed rock flour.
		Trace	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, trace cavings.
3145	3150	100	SILTSTONE: as above, common bit crushed rock flour.
		Trace	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, trace cavings.
3150	3155	100	SILTSTONE: pale brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare green glauconite pellets, soft to moderately hard, amorphous to sub blocky, common bit crushed rock flour.
		Trace	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, trace cavings.
3155	3160	100	SILTSTONE: as above, rare pyrite nodules, common bit crushed rock flour.
		Trace	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, trace cavings.
3160	3165	100	SILTSTONE: as above, (no pyrite nodules), common bit crushed rock flour.
		Trace	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, trace cavings.
			<b>Midnight depth 09 September 2005 = 3168.0 mMDRT (1906.6 mTVDRT)</b>
3165	3170	90	SILTSTONE: as above, common bit crushed rock flour.
		Trace	SANDSTONE: Trace, as above.
		10	VOLCANICS: greyish blue green to greyish green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed to rock flour.
3170	3175	80	SILTSTONE: pale brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare green glauconite pellets, firm to moderately hard, sub blocky, trace bit crushed rock flour.
		Trace	SANDSTONE: Trace, as above.
		20	VOLCANICS: as above, (+5% cavings).
3175	3180	90	SILTSTONE: as above, common bit crushed rock flour.
		Trace	SANDSTONE: Trace, as above.
		10	VOLCANICS: as above, (+ trace cavings).
3180	3185	90	SILTSTONE: pale brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare green glauconite pellets, firm to moderately hard, sub blocky, trace bit crushed rock flour.
		Trace	SANDSTONE: Trace, as above.
		Cavings	VOLCANICS: as above, trace cavings.
Spot	3188	70	SILTSTONE: as above, trace bit crushed rock flour.
Fast	drilling	30	SANDSTONE: white to translucent, very fine to occasionally very coarse, poorly sorted, sub angular to sub rounded, moderate siliceous cement, weak pyrite cement, hard aggregates, dominantly bit crushed rock flour, poor visible and inferred porosity.
24	4 m/hr		No fluorescence.
m/hr	BG		
Peak	BG	Cavings	VOLCANICS: as above, trace cavings.
65	10		
Gas	units		
3185	3190	80	SILTSTONE: as above, common bit crushed rock flour.
		20	SANDSTONE: as above.
		Cavings	VOLCANICS: as above, trace cavings.

## Bream A22A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3190	3195	90	SILTSTONE: as above, trace bit crushed rock flour.
		10	SANDSTONE: as above.
			<b>Cavings</b> VOLCANICS: as above, trace cavings.
3195	3200	85	SILTSTONE: pale brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare green glauconite pellets, firm to moderately hard, sub blocky, trace bit crushed rock flour.
		10	SANDSTONE: white to translucent, very fine to occasionally very coarse, poorly sorted, sub angular to sub rounded, moderate siliceous cement, weak pyrite cement, hard aggregates, dominantly bit crushed rock flour, poor visible and inferred porosity. No fluorescence.
		5	VOLCANICS: greyish blue green to greyish green, dominantly chlorite, crystalline, hard, common bit crushed to rock flour.
3200	3205	95	SILTSTONE: as above, trace bit crushed rock flour.
		5	SANDSTONE: as above. No fluorescence.
			<b>Cavings</b> VOLCANICS: as above, trace cavings.
3205	3210	100	SILTSTONE: as above, trace bit crushed rock flour.
		Trace	SANDSTONE: Trace, as above. No fluorescence.
			<b>Cavings</b> VOLCANICS: as above, trace cavings.
			<b>Top of Coarse Clastics (partially eroded N-1) at 3212.0 mMDRT. (1923.4 mTVDRT, -1890.6 mTVDSS)</b>
Spot	3213	15	CLAYSTONE: light olive, non calcareous, soft, amorphous.
		35	SILTSTONE: pale brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace green glauconite pellets, firm to moderately hard, sub blocky.
		50	SANDSTONE: translucent to medium light grey, very fine to fine, moderately well sorted, sub angular to sub rounded, strong pyrite cement, dominantly micropyrte, hard aggregates, dominantly bit crushed rock flour, very poor visible and inferred porosity. No fluorescence.
3210	3215	25	CLAYSTONE: as above.
		50	SILTSTONE: as above.
		25	SANDSTONE: as above. No fluorescence.
Spot	3217	20	CLAYSTONE: as above.
		30	SILTSTONE: as above.
		50	SANDSTONE 1: 25%, as above. SANDSTONE 2: 25%, as below. No fluorescence.
3215	3220	20	CLAYSTONE 1: 10%, light olive, non calcareous, soft, amorphous. CLAYSTONE 2: 10%, light grey to light blueish grey, non calcareous, moderately hard to hard, blocky.
		20	SILTSTONE: pale brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace green glauconite pellets, firm to moderately hard, sub blocky.

## Bream A22A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3220	3225	60	SANDSTONE 1: 10%, translucent to medium light grey, very fine to fine, moderately well sorted, sub angular to sub rounded, strong pyrite cement, dominantly micropyrte, hard aggregates, dominantly bit crushed rock flour, very poor visible and inferred porosity. SANDSTONE 2: 50%, clear to translucent, medium to occasionally very coarse, occasionally fractured quartz grains, poorly sorted, sub angular to sub rounded, trace pyrite nodules, generally loose, clean, poor to fair visible and inferred porosity. No fluorescence.
			<b>Base of "Waste" at 3223.0 mMDRT, (1927.7 mTVDRT, -1894.9 mTVDSS).</b>
		20	CLAYSTONE 1: 5%, light olive, non calcareous, soft, amorphous. CLAYSTONE 2: 15%, light grey to light blueish grey, non calcareous, moderately hard to hard, blocky.
		30	SILTSTONE: as above.
3225	3230	50	SANDSTONE 1: Trace, cavings, as above SANDSTONE 2: 50%, clear to translucent, medium to occasionally very coarse, dominantly coarse, occasionally fractured quartz grains, moderately well sorted, sub angular to sub rounded, weak siliceous cement, weak pyrite cement, trace pyrite nodules, dominantly loose, occasionally hard aggregates, poor to fair visible and inferred porosity. No fluorescence.
			<b>Top GNF2 at 3227.0 mMDRT, (1929.3 mTVDRT, -1896.5 mTVDSS).</b>
		5	CLAYSTONE: as above.
		20	SILTSTONE: as above.
3230	3235	75	SANDSTONE: clear to translucent, fine to occasionally very coarse, common fractured quartz grains, poorly sorted, sub angular to sub rounded, weak siliceous cement, weak pyrite cement, trace pyrite nodules, dominantly loose, poor to fair visible and inferred porosity. No fluorescence.
		30	CLAYSTONE: light grey to light blueish grey, non calcareous, moderately hard to hard, blocky.
		15	SILTSTONE: pale brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		55	SANDSTONE: clear to translucent, fine to rare very coarse, poorly sorted, sub angular to sub rounded, weak siliceous cement, rare pyrite nodules, dominantly loose, poor to fair visible and inferred porosity. No fluorescence.
3235	3240	25	CLAYSTONE: as above.
		25	SILTSTONE: as above.
		50	SANDSTONE: as above. No fluorescence.
3240	3245	25	CLAYSTONE: as above.
		5	SILTSTONE: as above.
		70	SANDSTONE: clear to translucent, medium to dominantly very coarse, moderately well sorted, sub angular to dominantly sub rounded, rare pyrite nodules, loose, clean, fair to good visible and inferred porosity. No fluorescence.
3245	3249	10	CLAYSTONE: light grey to light blueish grey, non calcareous, moderately hard to hard, blocky.

## Bream A22A Lithology / Show Descriptions

Interval (m) From      To		%	Lithology / Show Description
	5		SILTSTONE: pale brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace green glauconite pellets, firm to moderately hard, sub blocky.
	85		SANDSTONE: clear to translucent, medium to dominantly very coarse, moderately well sorted, sub angular to dominantly sub rounded, rare pyrite nodules, loose, clean, good visible and inferred porosity. No fluorescence. Differentially stuck in hole at 3249.0 mMDRT (1938.7 mTVDRT), at 1930 hrs 10 September 2005. Severed drillstring at 2933.0 mMDRT. Set 2 cement plugs at 2933.0 and 2800.0 mMDRT. Sidetracked as Bream A22A at change-over time of 1800 hrs on 16 September 2005. Tagged Top of Cement at 2648.0 mMDRT. Kicked-off Bream A22A ST at 2702.0 mMDRT at 2015 hrs on 17 September 2005.



**APPENDIX 3b**

**BREAM A22AST**

**Lithology/Show Descriptions**

## Bream A22A ST Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
			<p>Previous Well History:</p> <p>Bream A22A Previous Well History:</p> <p>Bream A22A Plugged and Abandoned on 16 September 2005.</p> <p>Milled the 7.00" Casing : Top of window at 2698.0 mMDRT. : Bottom of window at 2702.3 mMDRT.</p> <p>BMA A22A ST Kick-off point with kick-off assembly at 2702.0 mMDRT at 2015 hrs on 17 September 2005.</p> <p>Tag TOC at 2648.0 mMDRT at 1545 hrs 17 September 2005. Drilled cement to 2717.0 mMDRT.</p> <p>Drilled from 2702.0 mMDRT (1724.1 mTVDRT) at 2015 hrs 17 September 2005, to 2717.0 mMDRT (1727.7 mTVDRT) at 2115 hrs 17 September 2005, with a Smith MA74PX bit on steerable motor assembly.</p> <p>Bit Details: BHA # 1, Bit # 1.</p> <p>Size: 6.0", Manufacturer / Type: Smith MA74PX, Serial #: JS2103A.</p> <p>Jets: 12 x 3, TFA: 0.3313 sq.in, Grading: <b>0-6-BT-G-X-1/16"-CT-BHA.</b></p> <p>Krevs: 37.0, RPM: 105-120 ( + 134 RPM DHM).</p> <p>Metres drilled: 15.0 m, HOB: 0.80 Average ROP: 15.0 / 0.80 = 18.75 m/hr.</p>
2702	2717	SPOT	Spot 1 metre samples from 2702.0-2717.0 mMDRT showed an increasing percentage of new formation (Calcareous Claystone). The 2717.0 mMDRT spot sample had 30% new formation.

## Bream A22A ST Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
			<p>Drilled from 2717.0 mMDRT (1727.7 mTVDRT) at 1350 hrs 18 September 2005, to the TD of 3364.0 mMDRT (1987.3 mTVDRT) at 1645 hrs 21 September 2005, with a Smith MA74PX bit on steerable motor assembly.</p> <p>Bit Details: BHA # 2, Bit # 2.</p> <p>Size: 6.0", Manufacturer / Type: Smith MA74PX, Serial #: JT8258.</p> <p>Jets: 12 x 3, TFA: 0.331 sq.in, Grading: <b>1-1-WT-A-X-IN-NO-TD</b>.</p> <p>Krevs: 764.0, RPM: 100-115 ( + 134 RPM DHM).</p> <p>Metres drilled: 647.0 m, HOB: 53.60 Average ROP: 647.0 / 53.6 = 12.07 m/hr.</p> <p>Rotating: 564.0 metres / Rotating HOB = 45.30, Average Rotating ROP = 12.45 m/hr. Steering: 83.0 metres / Steering HOB = 8.30 , Average Steering ROP = 10.00 m/hr.</p> <p>Cuttings samples for description only at 30 m intervals from 2700.0 to 2820.0 mMDRT. (To 150 mMD above the Top of Latrobe prognosed at 2981.2 mMDRT).</p> <p>Cuttings samples bagged at 10 m intervals from 2820.0 to 2980.0 mMDRT</p> <p>Cuttings samples bagged at 5 m intervals from 2980.0 to TD of 3364.0 mMDRT.</p>
2717	2730	SPOT	<p><b>Geologist continued on rig from end of Bream A22A/Bream A22A ST (changeover time) at 1800 hrs 15 September 2005.</b></p> <p>Spot 1 metre samples from 2717.0-2730.0 mMDRT showed an increasing percentage of new formation (Calcareous Claystone) from 30% at 2717m to 95% new formation at 2730m.</p>
2730	2735	100	CALCAREOUS CLAYSTONE: medium light grey to medium grey, silty, moderately calcareous, trace glauconite, trace disseminated pyrite, rare forams, firm to moderately hard, sub blocky.
2735	2760	100	CALCAREOUS CLAYSTONE: light olive grey to medium light grey occasionally medium grey, silty, moderately calcareous, common forams, rare glauconite, firm to moderately hard, sub blocky.
2760	2790	100	CALCAREOUS CLAYSTONE: as above, trace disseminated pyrite, trace forams.
2790	2820	100	CALCAREOUS CLAYSTONE: as above, common forams.
2820	2830	100	CALCAREOUS CLAYSTONE: light olive brown, silty, moderately calcareous, common forams, trace disseminated pyrite, rare glauconite, firm, sub blocky.
2830	2840	100	CALCAREOUS CLAYSTONE: as above, trace forams, trace disseminated pyrite and laminations.
2840	2850	100	CALCAREOUS CLAYSTONE: as above, trace ooids.
2850	2860	100	CALCAREOUS CLAYSTONE: light olive brown, silty, moderately calcareous, common disseminated pyrite and laminations, trace forams, rare glauconite, firm, sub blocky.
2860	2870	100	CALCAREOUS CLAYSTONE: light olive brown, silty, moderately calcareous, trace disseminated pyrite and laminations, trace forams, soft to firm, sub blocky.

## Bream A22A ST Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2870	2880	100	CALCAREOUS CLAYSTONE: light olive brown to light olive grey, silty, moderately calcareous, trace disseminated pyrite and laminations, trace forams, rare ooids, firm, sub blocky.
2880	2890	100	CALCAREOUS CLAYSTONE: medium grey to light olive grey, silty, moderately calcareous, trace disseminated pyrite and laminations, trace forams, rare glauconite, rare ooids, firm, sub blocky.
2890	2900	100	CALCAREOUS CLAYSTONE: as above, no glauconite.
2900	2910	100	CALCAREOUS CLAYSTONE: as above, common forams, no glauconite.
2910	2920	100	CALCAREOUS CLAYSTONE: as above, trace forams, no glauconite.
2920	2930	100	CALCAREOUS CLAYSTONE: as above.
2930	2940	100	CALCAREOUS CLAYSTONE: as above.
2940	2950	100	CALCAREOUS CLAYSTONE: as above.
2950	2960	100	CALCAREOUS CLAYSTONE: light olive grey to light olive brown, silty, moderately calcareous, trace disseminated pyrite and laminations, trace forams, rare glauconite, rare ooids, firm, sub blocky. <b>Top of Latrobe at 2965.0 mMDRT, 1839.0 mTVDR (1806.2 mTVDS).</b>
2960	2970	95	CALCAREOUS CLAYSTONE 90%: light olive grey to light olive brown, silty, moderately calcareous, trace forams, trace glauconite, rare ooids, soft to firm, sub blocky. CLAYSTONE 5%: light olive brown to light olive, non calcareous, soft, amorphous.
		5	SANDSTONE: white to pale green, very fine to very coarse, poorly sorted, sub angular to sub rounded, moderate siliceous cement, common glauconitic matrix, trace glauconite pellets, hard aggregates, very poor visual and inferred porosity. No fluorescence.
2970	2980	20	CALCAREOUS CLAYSTONE 15%: as above. CLAYSTONE 5%: as above.
		15	SILTSTONE: pale brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, moderately hard to hard, sub blocky to blocky.
		65	SANDSTONE: white, pale blue green to pale green, very fine to very coarse, occasionally fractured quartzite grains, poorly sorted, sub angular to sub rounded, moderate siliceous cement, common glauconitic matrix, trace glauconite pellets, hard aggregates, very poor visual and inferred porosity. No fluorescence.
2980	2985	5	CLAYSTONE 5%: light olive brown to light olive, non calcareous, soft, amorphous.
		10	SILTSTONE: pale brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		85	SANDSTONE: white, pale blue green to pale green, very fine to very coarse, occasionally fractured quartzite grains, poorly sorted, sub angular to sub rounded, moderate siliceous cement, common glauconitic matrix, trace glauconite pellets, hard aggregates, very poor visual and inferred porosity. No fluorescence.
2985	2990	5	CLAYSTONE: as above.
		20	SILTSTONE: as above.
		75	SANDSTONE: as above. No fluorescence.
2990	2995	5	CLAYSTONE: light olive brown to light olive, non calcareous, soft, amorphous.
		15	SILTSTONE: pale brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.

## Bream A22A ST Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
		80	SANDSTONE: white, pale blue green to pale green, very fine to very coarse, common fractured quartzite grains, poorly sorted, sub angular to sub rounded, moderate siliceous cement, common glauconitic matrix, trace glauconite pellets, hard aggregates, occasionally bit crushed rock flour, very poor visual and inferred porosity. No fluorescence.
2995	3000	Trace	CLAYSTONE: as above.
		15	SILTSTONE: as above.
		85	SANDSTONE: as above. No fluorescence.
3000	3005	Trace	CLAYSTONE: as above.
		30	SILTSTONE: as above.
		70	SANDSTONE: as above. No fluorescence.
3005	3010	20	SILTSTONE: as above.
		80	SANDSTONE: as above. No fluorescence.
3010	3015	15	SILTSTONE: as above.
		85	SANDSTONE: white, pale blue green to pale green, very fine to very coarse, common fractured quartzite grains, poorly sorted, sub angular to sub rounded, moderate siliceous cement, weak pyrite cement, common glauconitic matrix, trace glauconite pellets, hard aggregates, occasionally bit crushed rock flour, very poor visual and inferred porosity. No fluorescence.
3015	3020	10	SILTSTONE: as above.
		90	SANDSTONE: as above. No fluorescence.
3020	3025	30	SILTSTONE: moderate brown to occasionally pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite pellets and laminations, firm to occasionally moderately hard, sub blocky.
		70	SANDSTONE: as above. No fluorescence.
3025	3030	50	SILTSTONE: as above.
		45	SANDSTONE: as above. No fluorescence.
		5	VOLCANICS: greyish green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.
3030	3035	75	SILTSTONE: as above.
		5	SANDSTONE: white, pale blue green to pale green, very fine to very coarse, common fractured quartzite grains, poorly sorted, sub angular to sub rounded, moderate siliceous cement, weak pyrite cement, common glauconitic matrix, trace glauconite pellets, hard aggregates, occasionally bit crushed rock flour, very poor visual and inferred porosity. No fluorescence.
		20	VOLCANICS: as above.
3035	3040	75	SILTSTONE: as above.
		5	SANDSTONE: as above. No fluorescence.
		20	VOLCANICS: as above.
3040	3045	65	SILTSTONE: moderate brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite pellets and laminations, soft to firm, amorphous to sub blocky.

## Bream A22A ST Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3045	3050	5	SANDSTONE: white to rare pale green, occasionally moderate greenish yellow, very fine to very coarse, common fractured quartzite grains, poorly sorted, sub angular to sub rounded, moderate siliceous cement, trace glauconitic matrix, trace glauconite pellets, hard aggregates, occasionally bit crushed rock flour, very poor visual and inferred porosity. No fluorescence.
		30	VOLCANICS: greyish green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.
		75	SILTSTONE: as above.
		5	SANDSTONE: as above. No fluorescence.
3050	3055	20	VOLCANICS: as above.
		85	SILTSTONE: as above.
		5	SANDSTONE: as above. No fluorescence.
3055	3060	10	VOLCANICS: as above.
		95	SILTSTONE: as above.
		5	SANDSTONE: as above. No fluorescence.
3060	3065	Trace	VOLCANICS: as above.
		100	SILTSTONE: moderate brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite pellets and laminations, soft to firm, amorphous to sub blocky.
		Trace	SANDSTONE: as above. No fluorescence.
		Trace	VOLCANICS: as above.
3065	3070		<b>Midnight Depth 19 September 2005 = 3067.5 mMDRT (1878.1 mTVDR)</b>
		90	SILTSTONE: as above.
		5	SANDSTONE: white to rare pale green, occasionally moderate greenish yellow, very fine to very coarse, common fractured quartzite grains, poorly sorted, sub angular to sub rounded, moderate siliceous cement, trace glauconitic matrix, trace glauconite pellets, hard aggregates, occasionally bit crushed rock flour, very poor visual and inferred porosity. No fluorescence.
3070	3075	5	VOLCANICS: as above.
		95	SILTSTONE: as above.
		5	SANDSTONE: as above. No fluorescence.
3075	3080	Trace	VOLCANICS: as above.
		95	SILTSTONE: as above.
		5	SANDSTONE: as above. No fluorescence.
3080	3085	Trace	VOLCANICS: as above.
		100	SILTSTONE: moderate brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite pellets and laminations, soft to firm, amorphous to sub blocky.
		Trace	SANDSTONE: as above. No fluorescence.
		Trace	VOLCANICS: as above.

## Bream A22A ST Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3085	3090	95	SILTSTONE: as above.
		Trace	SANDSTONE: as above. No fluorescence.
3090	3095	5	VOLCANICS: greyish green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.
		90	SILTSTONE: moderate brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare glauconite pellets and laminations, soft to firm, sub blocky.
		10	SANDSTONE: white to rare pale green, very fine to very coarse, common fractured quartzite grains, poorly sorted, sub angular to sub rounded, moderate siliceous cement, trace glauconitic matrix, trace glauconite pellets, hard aggregates, occasionally bit crushed rock flour, very poor visual and inferred porosity. No fluorescence.
3095	3100	Trace	VOLCANICS: as above.
		95	SILTSTONE: as above.
3100	3105	5	SANDSTONE: as above. No fluorescence.
		Trace	VOLCANICS: as above.
		90	SILTSTONE: as above.
3105	3110	10	SANDSTONE: as above. No fluorescence.
		Trace	VOLCANICS: as above.
		95	SILTSTONE: as above.
3110	3115	5	SANDSTONE: as above. No fluorescence.
		Trace	VOLCANICS: as above.
		95	SILTSTONE: moderate brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare glauconite pellets and laminations, soft to firm, sub blocky.
3115	3120	5	SANDSTONE: as above. No fluorescence.
		Trace	VOLCANICS: as above.
		95	SILTSTONE: as above.
3120	3125	5	SANDSTONE: white to rare pale green, very fine to very coarse, common fractured quartzite grains, poorly sorted, sub angular to sub rounded, moderate siliceous cement, trace glauconitic matrix, trace glauconite pellets, hard aggregates, occasionally bit crushed rock flour, very poor visual and inferred porosity. No fluorescence.
		Trace	VOLCANICS: as above.
		90	SILTSTONE: moderate brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare glauconite pellets and laminations, soft to firm, sub blocky.
		5	SANDSTONE: as above. No fluorescence.
3125	3130	5	VOLCANICS: greyish green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.
		90	SILTSTONE: as above.
		5	SANDSTONE: as above. No fluorescence.

## Bream A22A ST Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3130	3135	5	VOLCANICS: greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.
		90	SILTSTONE: as above.
		5	SANDSTONE: as above. No fluorescence.
3135	3140	5	VOLCANICS: as above.
		80	SILTSTONE: as above.
		5	SANDSTONE: as above. No fluorescence.
3140	3145	15	VOLCANICS: greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.
		30	SILTSTONE: moderate brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare glauconite pellets and laminations, soft to firm, sub blocky.
		5	SANDSTONE: white to pale green, very fine to fine, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, hard aggregates, occasionally bit crushed rock flour, poor visual and inferred porosity. No fluorescence.
		65	VOLCANICS: moderate green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.
3145	3150	10	CLAYSTONE: light grey to light brownish grey, non calcareous, moderately hard to hard, blocky.
		30	SILTSTONE: as above.
		5	SANDSTONE: as above. No fluorescence.
		55	VOLCANICS: moderate green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.
3150	3155	10	CLAYSTONE: as above.
		75	SILTSTONE: as above.
		5	SANDSTONE: as above. No fluorescence.
		10	VOLCANICS: moderate green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.
3155	3160	10	CLAYSTONE: as above.
		85	SILTSTONE: as above.
		5	SANDSTONE: white to pale green, very fine to fine, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, hard aggregates, occasionally bit crushed rock flour, poor visual and inferred porosity. No fluorescence.
		Trace	VOLCANICS: as above.
3160	3165	5	CLAYSTONE: as above.
		90	SILTSTONE: moderate brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare glauconite pellets and laminations, soft to firm, sub blocky.
		5	SANDSTONE: as above. No fluorescence.
3165	3170	Trace	VOLCANICS: as above.
		10	CLAYSTONE: light grey to light brownish grey, non calcareous, moderately hard to hard, blocky.



## Bream A22A ST Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3170	3175	75	SILTSTONE: as above.
		10	SANDSTONE: as above. No fluorescence.
		5	VOLCANICS: moderate green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.
		10	CLAYSTONE: as above.
		80	SILTSTONE: as above.
		5	SANDSTONE: as above. No fluorescence.
3175	3180	5	VOLCANICS: as above. <b>Midnight Depth 20 September 2005 = 3179.0 mMDRT (1920.0 mTVDRT)</b>
		10	CLAYSTONE: as above.
		80	SILTSTONE: as above.
		5	SANDSTONE: white to pale green, very fine to fine, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, hard aggregates, occasionally bit crushed rock flour, poor visual and inferred porosity. No fluorescence.
3180	3185	5	VOLCANICS: as above.
		25	CLAYSTONE 1: 10%: light grey to light brownish grey, non calcareous, moderately hard to hard, blocky. CLAYSTONE 2: 15%: moderate yellow to light olive brown, non calcareous, soft, amorphous.
		45	SILTSTONE: moderate brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare glauconite pellets and laminations, firm, sub blocky.
		30	SANDSTONE: translucent to medium light grey, very fine to fine, moderately well sorted, sub angular to sub rounded, strong micropyrte cement, hard aggregates, dominantly bit crushed rock flour, very poor visible and inferred porosity. No fluorescence.
		Trace	VOLCANICS: moderate green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.
			<b>Top of Coarse Clastics at 3186.0 mMDRT, 1922.6 mTVDRT (-1889.8 mTVDSS).</b>
3185	3190	15	CLAYSTONE 1: 5%: as above. CLAYSTONE 2: 10%: as above.
		20	SILTSTONE: as above.
		65	SANDSTONE 1: 15%, translucent to medium light grey, very fine to fine, moderately well sorted, sub angular to sub rounded, strong micropyrte cement, hard aggregates, dominantly bit crushed rock flour, very poor visible and inferred porosity. SANDSTONE 2: 50%, clear to translucent, medium to occasionally very coarse, occasionally fractured quartz grains, moderately well sorted, sub angular to dominantly sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, clean, fair to good visible and inferred porosity. No fluorescence.
		Trace	VOLCANICS: as above.
3190	3195	10	CLAYSTONE: medium light grey to light blueish grey, non calcareous, moderately hard to hard, blocky.
		10	SILTSTONE: moderate brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare glauconite pellets and laminations, firm, sub blocky.

## Bream A22A ST Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3195	3200	80	SANDSTONE 1: 5%, translucent to medium light grey, very fine to fine, moderately well sorted, sub angular to sub rounded, strong micropyrte cement, hard aggregates, dominantly bit crushed rock flour, very poor visible and inferred porosity. SANDSTONE 2: 75%, clear to translucent, medium to occasionally very coarse, occasionally fractured quartz grains, moderately well sorted, sub angular to dominantly sub rounded, strong pyrite cement, common pyrite nodules, dominantly loose, clean, fair to good visible and inferred porosity. No fluorescence.
		Trace	VOLCANICS: as above. <b>Base of Waste at 3200.4 mMDRT, 1928.0 mTVDRT (-1895.2 mTVDSS).</b>
		15	CLAYSTONE: as above.
		50	SILTSTONE: as above.
		35	SANDSTONE: clear to translucent, medium to occasionally very coarse, occasionally fractured quartz grains, moderately well sorted, sub angular to dominantly sub rounded, strong pyrite cement, common pyrite nodules, dominantly loose, clean, fair to good visible and inferred porosity. No fluorescence.
3200	3205	Trace	VOLCANICS: moderate green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour. <b>GNF2 at 3208.1 mMDRT, 1930.8 mTVDRT (-1898 mTVDSS).</b>
		10	CLAYSTONE: as above.
		10	SILTSTONE: as above.
		80	SANDSTONE: clear to translucent, medium to very coarse, dominantly coarse, common fractured quartz grains, moderately well sorted, sub angular to sub rounded, moderate pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair visible and inferred porosity. No fluorescence.
3205	3210	Trace	VOLCANICS: as above.
		15	CLAYSTONE: as above.
		50	SILTSTONE: as above.
		35	SANDSTONE: clear to translucent, medium to very coarse, dominantly coarse, occasionally fractured quartz grains, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, weak pyrite cement, rare pyrite nodules, hard aggregates, occasionally loose, poor to fair visible and inferred porosity. No fluorescence.
3210	3215	15	CLAYSTONE: medium light grey to light blueish grey, non calcareous, moderately hard to hard, blocky.
		20	SILTSTONE: moderate brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare glauconite pellets and laminations, firm, sub blocky.
		65	SANDSTONE: as above. No fluorescence.
3215	3220	Trace	VOLCANICS: as above.
		20	CLAYSTONE: as above.
		5	SILTSTONE: as above.
		75	SANDSTONE: as above, dominantly very coarse, trace pyrite nodules, fair inferred and visible porosity. No fluorescence.
		Trace	VOLCANICS: as above.

## Bream A22A ST Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3220	3225	20	CLAYSTONE: medium 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, rare glauconite, firm, sub blocky.
		75	SANDSTONE: clear to translucent, medium to very coarse, dominantly coarse, moderately well sorted, sub angular to sub rounded, weak siliceous cement, weak pyrite cement, rare pyrite nodules, dominantly loose, occasionally hard aggregates, generally clean, fair to good visible and inferred porosity. No fluorescence.
		Trace	VOLCANICS: moderate green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.
3225	3230	15	CLAYSTONE: as above.
		5	SILTSTONE: as above.
		80	SANDSTONE: as above. No fluorescence.
3230	3235	Trace	VOLCANICS: as above.
		10	CLAYSTONE: as above.
		5	SILTSTONE: as above.
		85	SANDSTONE: clear to translucent, medium to very coarse, dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak siliceous cement, weak pyrite cement, rare pyrite nodules, dominantly loose, clean, fair to good visible and inferred porosity. No fluorescence.
3235	3240	Trace	VOLCANICS: as above.
		20	CLAYSTONE: as above.
		5	SILTSTONE: as above.
		70	SANDSTONE: as above. No fluorescence.
3240	3245	Trace	VOLCANICS: as above.
		25	CLAYSTONE: medium 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, rare glauconite, firm, sub blocky.
		70	SANDSTONE: clear to translucent, medium to dominantly very coarse, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, trace white to light brown argillaceous matrix, trace pyrite nodules, trace disseminated pyrite, dominantly loose, generally clean, trace bit crushed rock flour, poor to fair visible and inferred porosity. No fluorescence.
3245	3250	Trace	VOLCANICS: as above.
		30	CLAYSTONE: as above.
		5	SILTSTONE: as above.
		65	SANDSTONE: clear to translucent, medium to dominantly very coarse, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, common white to light brown argillaceous matrix, trace pyrite nodules, trace disseminated pyrite, dominantly loose, generally clean, trace bit crushed rock flour, poor to fair visible and inferred porosity. No fluorescence.
		Trace	VOLCANICS: moderate green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.

## Bream A22A ST Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3250	3255	20	CLAYSTONE: medium light grey, non calcareous, moderately hard to hard, blocky.
		5	SILTSTONE: moderate brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare glauconite, firm to moderately hard, sub blocky.
		75	SANDSTONE: clear to translucent, medium to dominantly very coarse, moderately well sorted, sub angular to sub rounded, occasionally fractured quartz grains, common white to light brown argillaceous matrix, trace disseminated pyrite, generally loose, common bit crushed rock flour, poor to fair visible and inferred porosity. No fluorescence.
3255	3260	/Trace	VOLCANICS: as above.
		30	CLAYSTONE: as above.
		5	SILTSTONE: as above.
		65	SANDSTONE: as above. No fluorescence.
		Trace	VOLCANICS: as above. <span style="color: red;">At 0855 hrs 21 September 2005, at Lag depth 3264 mMDRT, the trough was cleaned out. The sample 3260 to 3265 that was collected was unrepresentative of the formation drilled, and the percentages were "guesstimated" from the trace of the Gamma Ray reading.</span>
3260	3265	20	CLAYSTONE: as above.
		5	SILTSTONE: as above.
		75	SANDSTONE: as above. No fluorescence.
3265	3270	Trace	VOLCANICS: as above.
		10	CLAYSTONE: light grey to medium light grey, non calcareous, moderately hard to hard, blocky.
		10	SILTSTONE: moderate brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare glauconite, firm to moderately hard, sub blocky.
		80	SANDSTONE: clear to translucent, medium to dominantly very coarse, moderately well sorted, sub angular to sub rounded, common fractured quartz grains, common white to light brown argillaceous matrix, trace disseminated pyrite, generally loose, common bit crushed rock flour, poor to fair visible and inferred porosity. No fluorescence.
		Trace	VOLCANICS: moderate green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.
3270	3275	5	CLAYSTONE: as above.
		10	SILTSTONE: as above.
		85	SANDSTONE: as above. No fluorescence.
3275	3280	Trace	VOLCANICS: as above.
		Trace	COAL: dusky brown, earthy, moderately hard, sub blocky, angular, woody texture.
		10	CLAYSTONE: as above.
		20	SILTSTONE: as above.
		70	SANDSTONE: as above. No fluorescence.
3280	3285	Trace	VOLCANICS: as above.
		Trace	COAL: dusky brown, earthy, moderately hard, sub blocky, angular, woody texture.
		5	CLAYSTONE: as above.
		5	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare glauconite, firm to moderately hard, sub blocky.

## Bream A22A ST Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3285	3290	90	SANDSTONE: clear to translucent, medium to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, rare glauconite, dominantly loose, clean, fair to good visible and inferred porosity. No fluorescence.
		Trace	VOLCANICS: as above.
		10	CLAYSTONE: medium light grey to light grey, non calcareous, moderately hard to hard, blocky.
		10	SILTSTONE: as above.
		80	SANDSTONE: as above. No fluorescence.
3290	3295	Trace	VOLCANICS: moderate green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour. <b>OOWC at 3292.2 mMDRT, 1961.8 mTVDRT (-1929.0 mTVDSS).</b>
		5	COAL: dusky brown, silty grading to Carbonaceous Siltstone, sub vitreous, hard, blocky, angular, trace pyrite and quartz inclusions.
		10	CLAYSTONE: as above.
		20	SILTSTONE: as above.
		65	SANDSTONE: clear to translucent, medium to very coarse, dominantly medium to coarse, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, occasionally hard aggregates, common rock flour, poor visible and inferred porosity. No fluorescence.
3295	3300	Trace	COAL: as above.
		10	CLAYSTONE: as above.
		70	SILTSTONE: as above.
		20	SANDSTONE: as above. No fluorescence.
3300	3305	5	COAL: as above.
		10	CLAYSTONE: as above.
		55	SILTSTONE: as above.
		30	SANDSTONE: as above. No fluorescence. <b>PKF1 (top of pink lower sand) at 3311.7 mMDRT, 1968.8 mTVDRT (-1936.1 mTVDSS).</b>
3305	3310	30	COAL: brownish black, silty grading to Carbonaceous Siltstone, earthy, firm to moderately hard, sub blocky, uneven, woody texture.
		10	CLAYSTONE: as above.
		30	SILTSTONE: dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky.
		30	SANDSTONE: clear to translucent, medium to very coarse, dominantly coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace nodular pyrite, dominantly loose, clean, fair visible and inferred porosity. No fluorescence.
3310	3315	5	CLAYSTONE: light grey to medium light grey, non calcareous, moderately hard to hard, blocky.
		5	SILTSTONE: dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace disseminated pyrite, rare glauconite, firm to moderately hard, sub blocky.

## Bream A22A ST Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3315	3320	90	SANDSTONE: clear to translucent, medium to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, rare nodular pyrite, dominantly loose, clean, fair visible and inferred porosity. No fluorescence.
		5	CLAYSTONE: as above.
		10	SILTSTONE: as above.
		85	SANDSTONE: as above. No fluorescence.
3320	3325	5	CLAYSTONE: as above.
		20	SILTSTONE: as above.
		75	SANDSTONE: as above. No fluorescence.
3325	3330	5	CLAYSTONE: light grey to medium light grey, non calcareous, moderately hard to hard, blocky.
		15	SILTSTONE: as above.
		80	SANDSTONE: clear to translucent, very fine to occasionally very coarse, dominantly fine, moderately well sorted, dominantly sub angular to sub rounded, rare white to light brown argillaceous matrix, rare nodular pyrite, dominantly loose, clean, poor visible and inferred porosity. No fluorescence.
3330	3335	Trace	CLAYSTONE: as above.
		5	SILTSTONE: dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace disseminated pyrite, rare glauconite, firm to moderately hard, sub blocky.
		95	SANDSTONE: as above. No fluorescence.
3335	3340	Trace	CLAYSTONE: as above.
		5	SILTSTONE: as above.
		95	SANDSTONE: clear to translucent, rare greyish pink, very fine to occasionally very coarse, dominantly medium, moderately well sorted, sub angular to sub rounded, rare nodular pyrite, dominantly loose, clean, fair visible and inferred porosity. No fluorescence.
3340	3345	Trace	CLAYSTONE: as above.
		10	SILTSTONE: as above.
		90	SANDSTONE: as above. No fluorescence.
		Trace	VOLCANICS: moderate green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.
3345	3350	5	CLAYSTONE: as above.
		10	SILTSTONE: as above.
		85	SANDSTONE: as above. No fluorescence.
3350	3355	Trace	VOLCANICS: as above.
		5	CLAYSTONE: as above.
		5	SILTSTONE: as above.
		90	SANDSTONE: clear to translucent, very fine to occasionally very coarse, dominantly medium, moderately well sorted, sub angular to sub rounded, weak pyrite cement, rare nodular pyrite, dominantly loose, clean, fair visible and inferred porosity. No fluorescence.

## Bream A22A ST Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
3355	3360	Trace	VOLCANICS: as above.
		10	CLAYSTONE: as above.
		25	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace disseminated pyrite, rare glauconite, firm to moderately hard, sub blocky.
		65	SANDSTONE: as above. No fluorescence.
3360	<b>3364</b>  <b>TD</b>	Trace	VOLCANICS: as above.
		10	CLAYSTONE: light grey to medium light grey, non calcareous, moderately hard to hard, blocky.
		35	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace disseminated pyrite, rare glauconite, firm to moderately hard, sub blocky.
		55	SANDSTONE: clear to translucent, medium to very coarse, dominantly coarse, moderately well sorted, sub angular to sub rounded, trace light brownish grey argillaceous matrix, dominantly loose, poor to fair visible and inferred porosity. No fluorescence.
		Trace	VOLCANICS: moderate green to greyish blue green, dominantly chlorite, trace biotite, crystalline, hard, common bit crushed rock flour.

**BMA A22A ST reached a TD of 3364.0 mMDRT = 1987.3 mTVDRT (-1954.5 mTVDSS) at 1645 hrs on 21 September 2005.**

CBU. Wiper Trip to shoe.

Start circulating at bottom at 2340 hrs on 21 September 2005.

Trip gas 24 units at 0200 hrs, 22 September 2005.

Last circulation on bottom at 0200 hrs, 22 September 2005.

Total circulating time on bottom = 2 hrs 15 minutes.

Start POOH at 0245 hrs, 22 September 2005 for Reeves Wireline Logging Run #1.

Bit on Surface at 10:30 hrs 22 September 2005.

At 04:30 hrs, 23 September 2005, start Reeves Logging at Logging speed (0.1 metre/second) from 3166.0 mMDRT to 2680.0 mMDRT (casing at 2702.3 mMDRT)

At 07:35 hrs, 23 September 2005, at Tripping speed from 2680.0 mMDRT to surface.

**APPENDIX 4a**

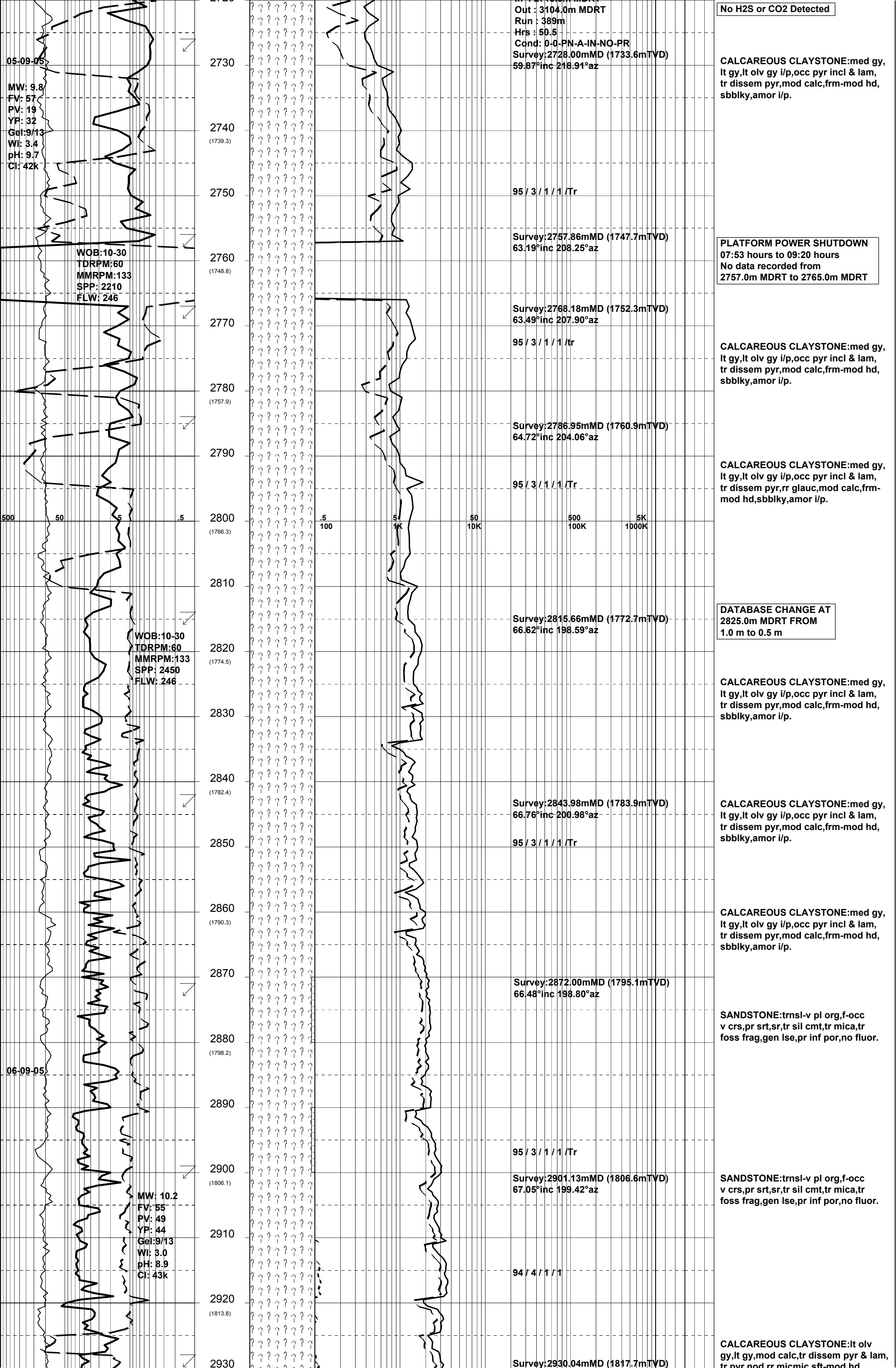
**BREAM A22A**

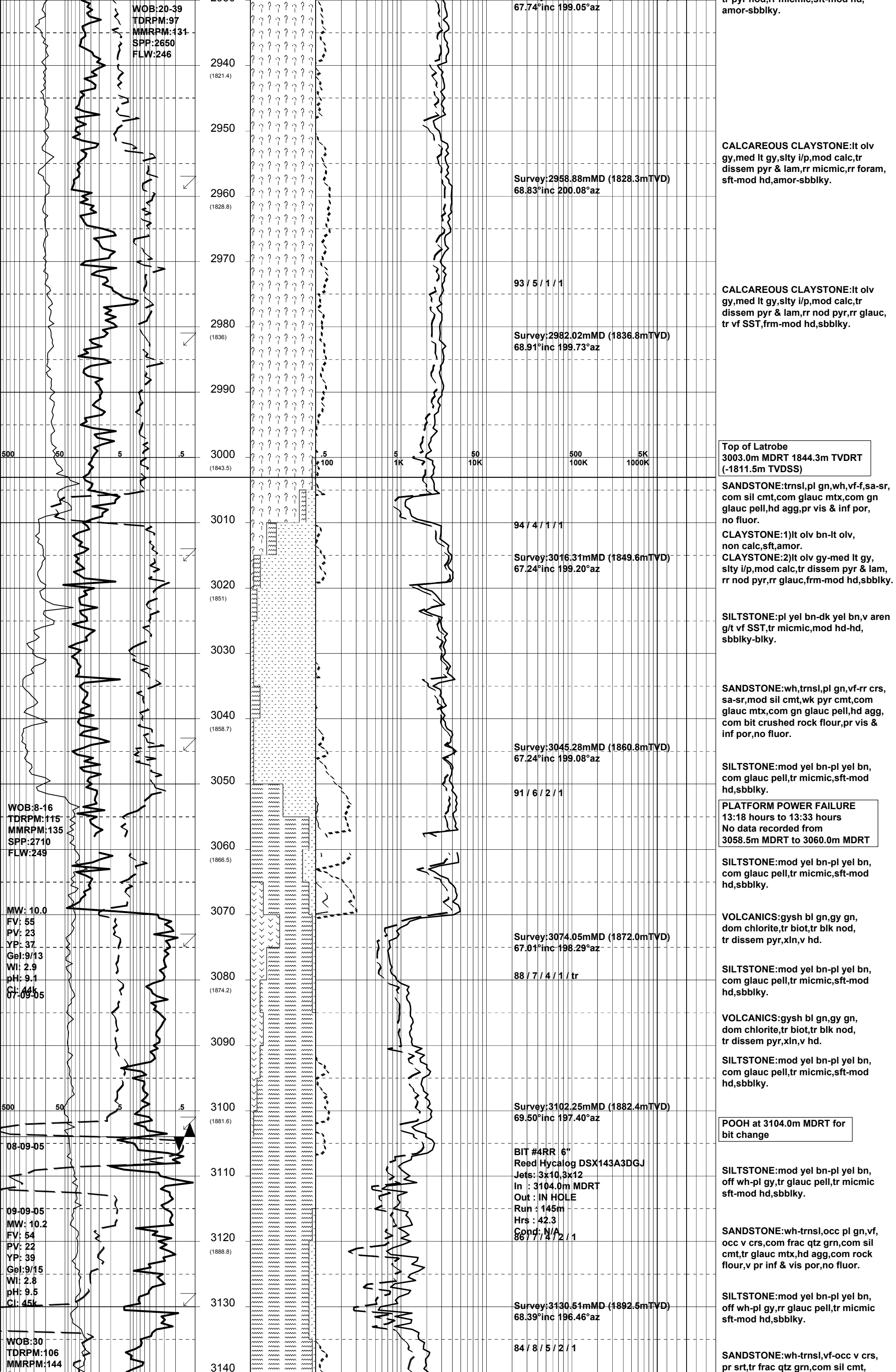
**Mud Log**

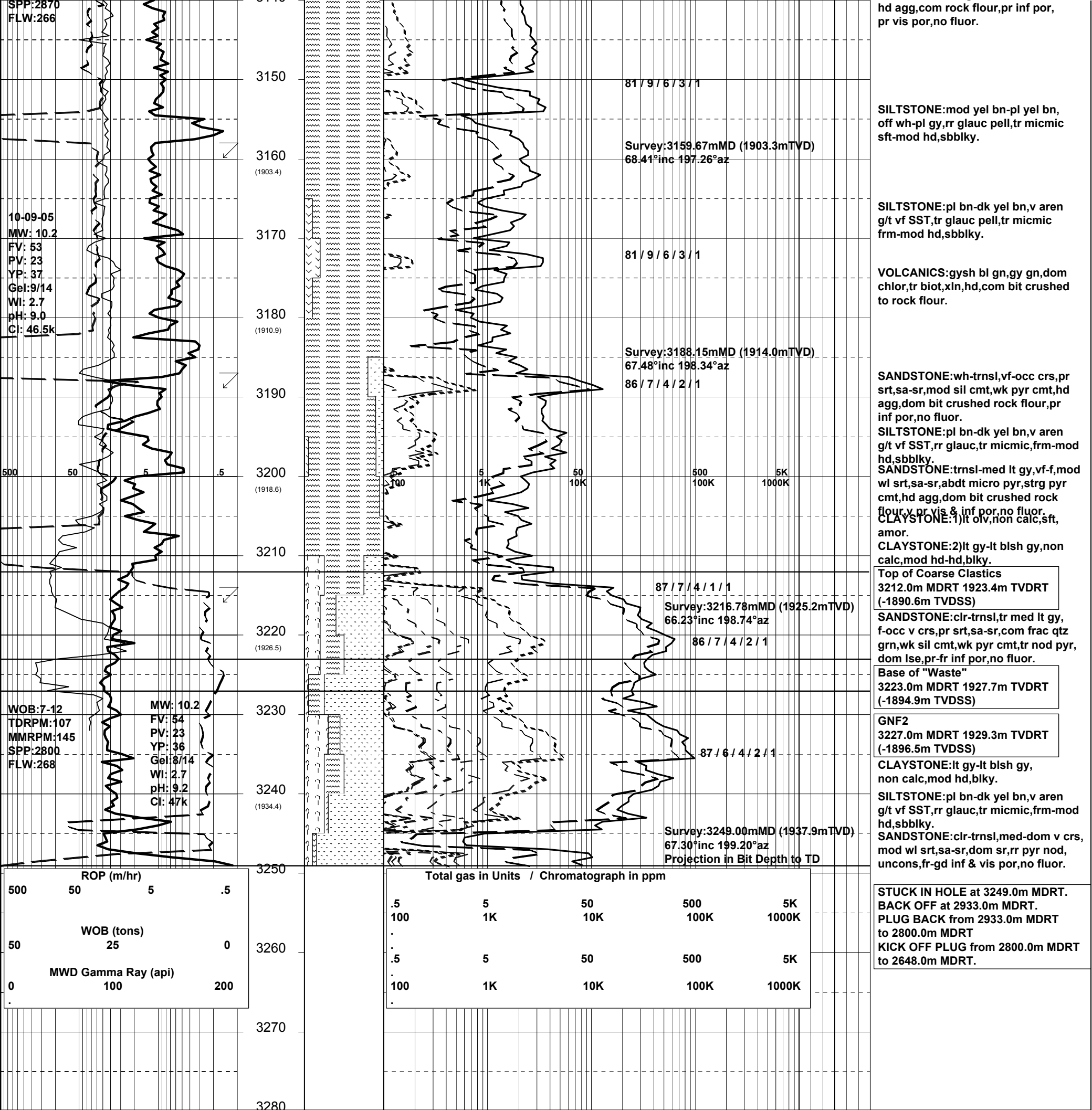




GENERAL		SURFACE POSITION		HOLE / CASING INFO		DATE / DEPTH		ENGINEERS	
Country : AUSTRALIA Permit : VIC L13 Field : Bream Basin : GIPPSLAND Well Type : DEVELOPMENT Rig Name : NABORS 453		GDA Co-ord X : 147 46 20.232 E GDA Co-ord Y : 38 29 58.910 S MGA Co-ord X : 567342.490mE MGA Co-ord Y : 5738457.640mN RT to MSL : 32.82 m RT to Sea Bed : 92.22 m		6" Hole to 3249.0m MDRT  10-3/4" Surface Csg at 1346.0m MDRT 7" Whipstock Set at 2702.8m MDRT		Kick Off Date : 03-09-2005 Total Depth Date : 10-09-2005 Total Depth : 3249.0m MDRT True Vertical Depth : 1937.9m Log Scale : 1/ 500		V.B. Jagarlamudi Mark Smith Steve Oades	
ABBREVIATIONS			LITHOLOGY LEGEND				ENGINEERING LEGEND		
MW Mud Weight FV Funnel Viscosity PV Plastic Viscosity YP Yield Point Gel Gel Strength WL Water Loss KCl Potassium Chloride Cl Chlorides Incl Inclination Az Azimuth		WOB Weight on Bit (klbs) RPM Rotations Per Min FLW Flow Rate (gpm) SPP Pump Pressure (psi) RR Re-Run Bit TG Trip Gas CG Connection Gas BG Background Gas DGP Drilled Gas Peak MM Mud Motor		<div><div><div><div><div>?</div><div>?</div></div><div>CLAYSTONE</div></div><div><div><div><div>~</div><div>~</div></div><div>SILTSTONE</div></div><div><div><div><div>·</div><div>·</div><div>·</div></div><div>SST: F - V FINE</div></div><div><div><div><div>·</div><div>·</div><div>·</div></div><div>SST: MEDIUM</div></div><div><div><div><div>·</div><div>·</div><div>·</div></div><div>SST: COARSE</div></div><div><div><div><div>—</div><div>—</div></div><div>SHALE</div></div></div><div><div><div><div>~</div><div>~</div></div><div>MARL</div></div><div><div><div><div>—</div><div>—</div></div><div>LIMESTONE</div></div><div><div><div><div>—</div><div>—</div></div><div>DOLOMITE</div></div><div><div><div><div>·</div><div>·</div><div>·</div></div><div>CHERT</div></div><div><div><div><div>·</div><div>·</div><div>·</div></div><div>CONGLOMERATE</div></div><div><div><div><div>—</div><div>—</div></div><div>COAL</div></div></div><div><div><div><div>—</div><div>—</div></div><div>BRYOZOA</div></div><div><div><div><div>·</div><div>·</div><div>·</div></div><div>RADIOLARITES</div></div><div><div><div><div>—</div><div>—</div></div><div>ECHINOIDS</div></div><div><div><div><div>·</div><div>·</div><div>·</div></div><div>CORALS</div></div><div><div><div><div>·</div><div>·</div><div>·</div></div><div>FORAMINIFERA</div></div><div><div><div><div>—</div><div>—</div></div><div>LITHIC FRAGMENT</div></div></div><div><div><div><div>—</div><div>—</div></div><div>CARB FRAGMENT</div></div><div><div><div><div>·</div><div>·</div><div>·</div></div><div>QUARTZITE</div></div><div><div><div><div>+</div><div>+</div></div><div>INTRUSIVES</div></div><div><div><div><div>—</div><div>—</div></div><div>GLAUCONITE</div></div><div><div><div><div>·</div><div>·</div><div>·</div></div><div>PYRITE</div></div><div><div><div><div>·</div><div>·</div><div>·</div></div><div>CEMENT</div></div></div><div><div><div><div>—</div><div>—</div></div><div>CASING SHOE</div></div><div><div><div><div>—</div><div>—</div></div><div>WIRELINE LOGS</div></div><div><div><div><div>—</div><div>—</div></div><div>MDT POINTS:</div></div><div><div><div><div>—</div><div>—</div></div><div>PRESSURE ONLY</div></div><div><div><div><div>—</div><div>—</div></div><div>SAMPLE</div></div><div><div><div><div>—</div><div>—</div></div><div>SEAL FAILURE</div></div><div><div><div><div>—</div><div>—</div></div><div>TIGHT</div></div></div><div><div><div><div>—</div><div>—</div></div><div>DEVI. SURVEY</div></div><div><div><div><div>—</div><div>—</div></div><div>SWC UNRECOV</div></div><div><div><div><div>—</div><div>—</div></div><div>SIDEWALL CORE</div></div><div><div><div><div>—</div><div>—</div></div><div>CORE</div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div>					







**APPENDIX 4b**

**BREAM A22AST**

**Mud Log**



# MASTERLOG

## BMA A22A ST



GENERAL	SURFACE POSITION	HOLE / CASING INFO	DATE / DEPTH	ENGINEERS
Country : AUSTRALIA Permit : VIC L13 Field : Bream Basin : GIPPSLAND Well Type : DEVELOPMENT Rig Name : NABORS 453	GDA Co-ord X : 147 46 20.232 E GDA Co-ord Y : 38 29 58.910 S MGA Co-ord X : 567342.490mE MGA Co-ord Y : 5738457.640mN RT to MSL : 32.82 m RT to Sea Bed : 92.22 m	8-1/2" Hole to 3364.0m MDRT  10-3/4" Surface Csg at 1346.0m MDRT 7" Whipstock Set at 2702.8m MDRT 4-1/2" Liner Top at 2254.3m MDRT 4-1/2" Liner Shoe at 3363.0m MDRT	Spud Date : 17-09-2005 Total Depth Date : 21-09-2005 Total Depth : 3364.0m MDRT True Vertical Depth : 1987.3m Log Scale : 1/ 500	Mark Smith Steve Oades V.B. Jagarlamudi

ABBREVIATIONS	LITHOLOGY LEGEND	ENGINEERING LEGEND
MW Mud Weight FV Funnel Viscosity PV Plastic Viscosity YP Yield Point Gel Gel Strength WL Water Loss KCl Potassium Chloride Cl Chlorides Incl Inclination Az Azimuth  WOB Weight on Bit (klbs) RPM Rotations Per Min FLW Flow Rate (gpm) SPP Pump Pressure (psi) RR Re-Run Bit TG Trip Gas CG Connection Gas BG Background Gas DGP Drilled Gas Peak MM Mud Motor	<div> CLAYSTONE</div> <div> SILTSTONE</div> <div> SST: F - V FINE</div> <div> SST: MEDIUM</div> <div> SST: COARSE</div> <div> SHALE</div> <div> MARL</div> <div> LIMESTONE</div> <div> DOLOMITE</div> <div> CHERT</div> <div> CONGLOMERATE</div> <div> COAL</div> <div> BRYOZOA</div> <div> RADIOLARITES</div> <div> ECHINOIDS</div> <div> CORALS</div> <div> FORAMINIFERA</div> <div> LITHIC FRAGMENT</div> <div> CARB FRAGMENT</div> <div> QUARTZITE</div> <div> INTRUSIVES</div> <div> GLAUCONITE</div> <div> PYRITE</div> <div> CEMENT</div>	<div> CASING SHOE</div> <div> LINER HANGER</div> <div> BIT CHANGE</div> <div> DEVIA. SURVEY</div> <div> SWC UNRECOV</div> <div> SIDEWALL CORE</div> <div> WIRELINE LOGS</div> <div>MDT POINTS:</div> <div> PRESSURE ONLY</div> <div> SAMPLE</div> <div> SEAL FAILURE</div> <div> TIGHT</div> <div> CORE</div>

ROP (m/hr)	DEPTH (m) (TVD)	CUTTINGS	LITHOLOGY	RESERVAL GAS DATA	CUT FLUOR	DIRECT FLUOR	LITHOLOGICAL DESCRIPTIONS and REMARKS
500 50 5 .5				C1 iC4 nC5			
WOB (tons)		%		C2 nC4			
50 25 0				C3 iC5 TG			
MWD Gamma Ray (api)							
0 100 200							
Window from 2698.2m to 2702.3m MDRT	2700						
18-09-05	2710						
	2720 (1729.3)						
	2730						
	2740 (1739.5)						
	2750						

**PLATFORM POWER FAILURE  
GAS DATA RECOVERED FROM  
2732.0m MDRT TO 2892.0m MDRT  
DRILLING DATA FROM ANADRILL  
2735.0m MDRT TO 2892.0m MDRT**

**CALCAREOUS CLAYSTONE:**lt olv  
gy-med lt gy,occ med gy,mod calc,  
silty i/p,com foram,rr glauc,frm-mod  
hd,sbbiky.

**CALCAREOUS CLAYSTONE:**lt olv  
gy-med lt gy,occ med gy,mod calc,  
silty i/p,tr dissem pyr,frm-mod hd,  
sbblky.

**CALCAREOUS CLAYSTONE:**lt olv  
gy-med lt gy,occ med gy,mod calc,  
silty i/p,com foram,rr glauc,tr dissem  
pyr,frm-mod hd,sbblky.

**CALCAREOUS CLAYSTONE:**lt olv  
bn,mod calc,slty i/p,com foram,  
tr disse,rr glauc,frm,sbblky.

**CALCAREOUS CLAYSTONE:**lt olv  
bn-lt olv gy,mod calc,slty i/p,tr foram,  
tr dissem & lam,rr glauc,tr ooid,  
frm,sbblky.

**CALCAREOUS CLAYSTONE:**lt olv  
bn-lt olv gy,mod calc,slty i/p,tr  
foram,tr dissemin & lam,rr ooid,sft-  
frm,sbblky.

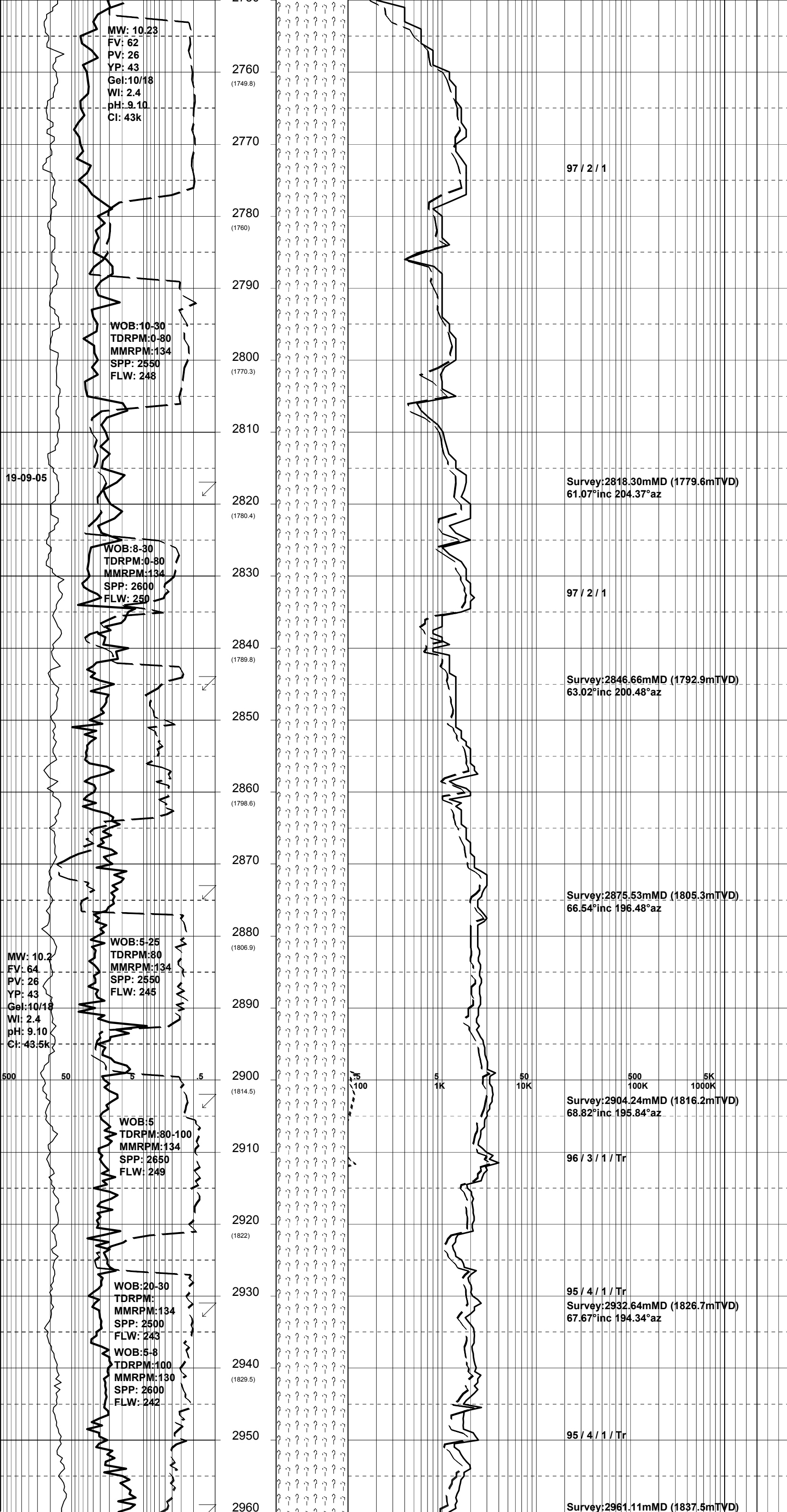
**CALCAREOUS CLAYSTONE:**lt olv  
bn-lt olv gy,mod calc,slty i/p,tr foram,  
tr dissem & lam,rr ooid,frm,sbblyk.

**CALCAREOUS CLAYSTONE:** med gy-  
lt olv gy, mod calc, slty i/p, tr dissem  
pyr & lam, tr foram, rr glauc, rr ooid,  
frm, sbblky.

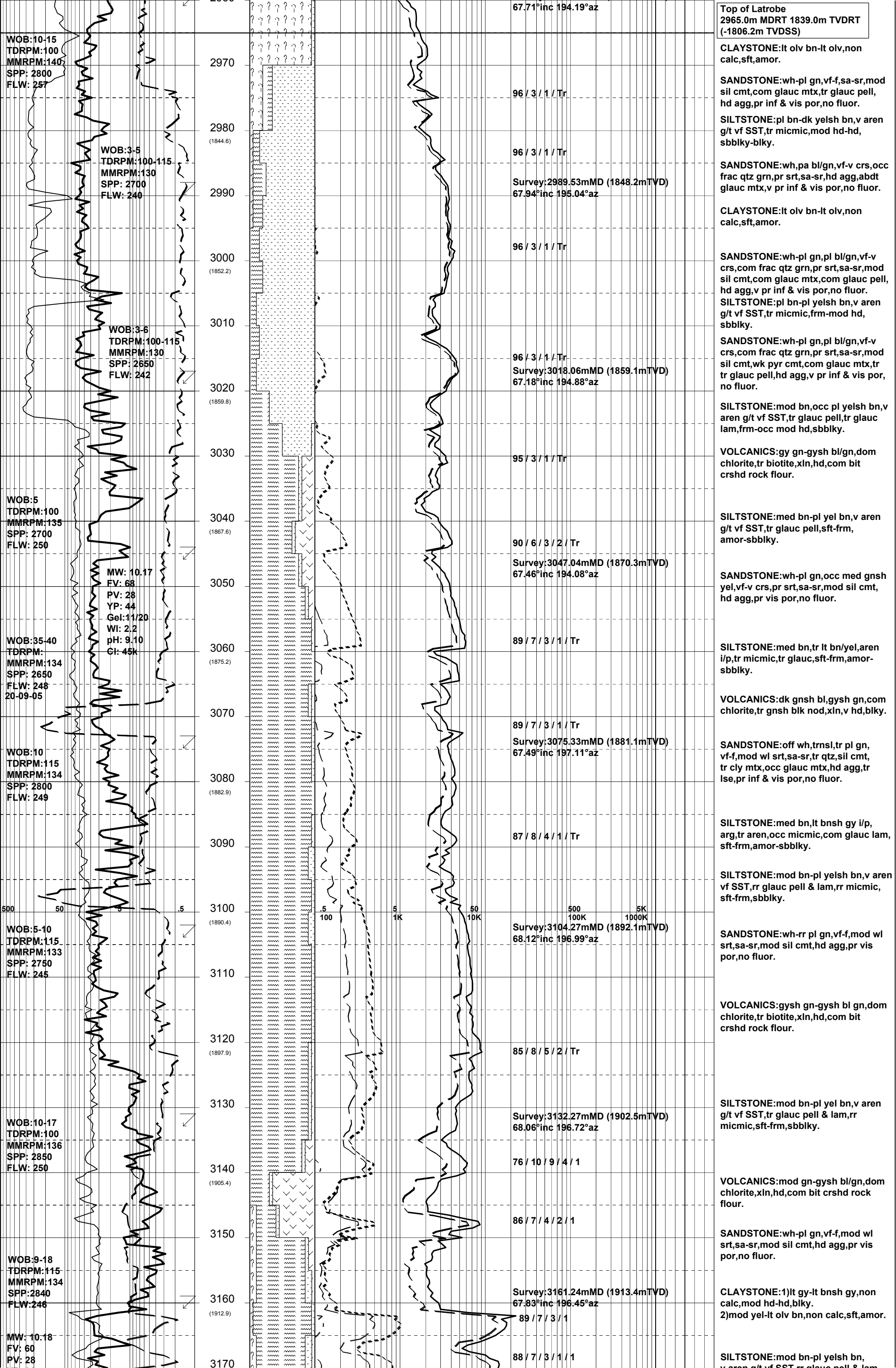
**CALCAREOUS CLAYSTONE:** med gy-  
lt olv gy, mod calc, slty i/p, tr dissem  
pyr & lam, com foram, rr ooid, frm,  
sbbly.

**CALCAREOUS CLAYSTONE:**med gy-  
lt olv gy,mod calc,slty i/p,tr dissem  
pyr & lam,tr foram,rr glauc,rr ooid,  
frm,sbblky.

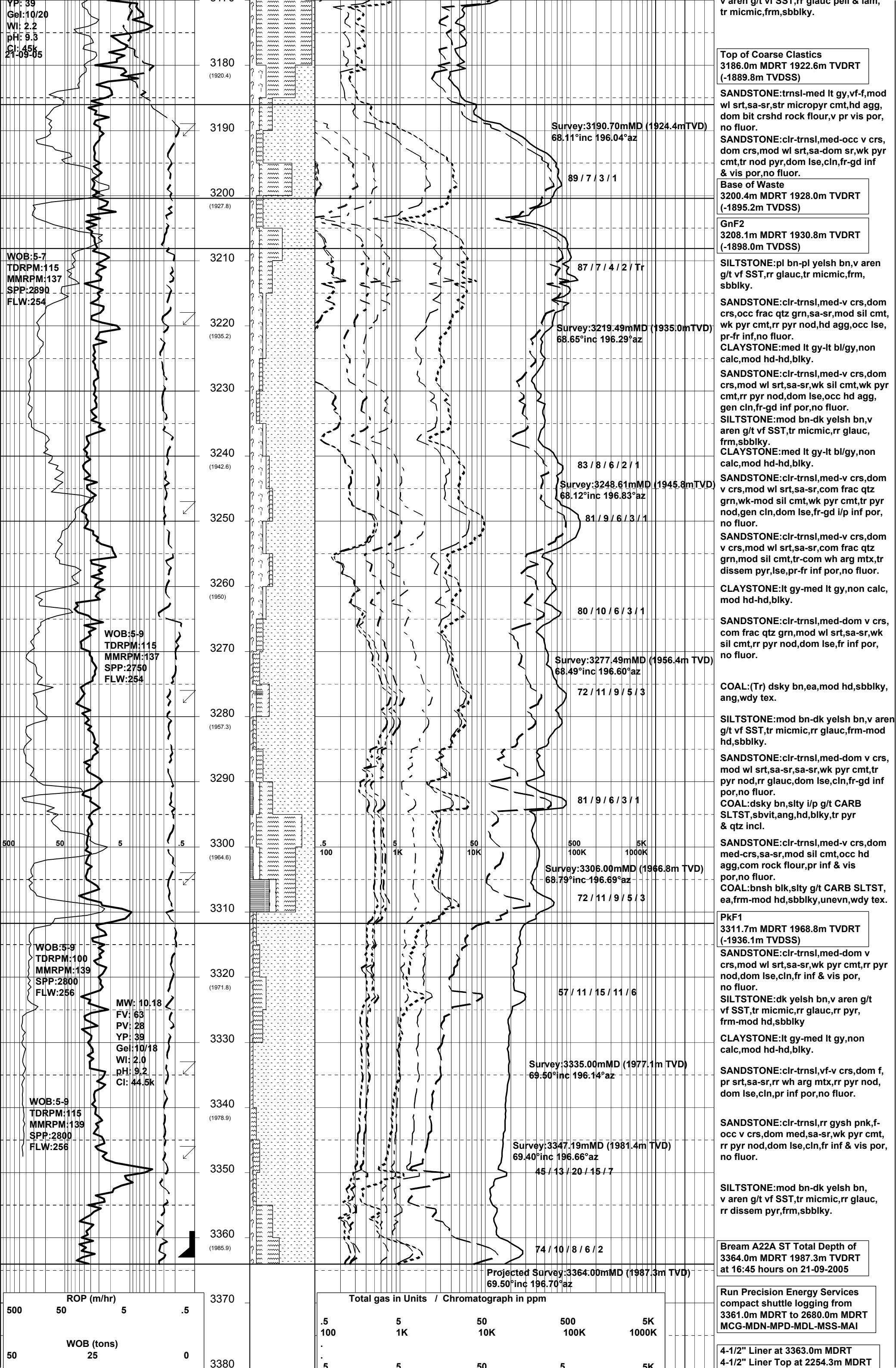
**CALCAREOUS CLAYSTONE:**lt olv  
gy-lt olv bn,mod calc,silty,tr  
glauc,sft-frm,sbbiky.











[illegible]

**APPENDIX 4c**

**BREAM A22AST**

**Well Completion Log**



WELL COMPLETION LOG  
Scale – 1:200  
BREAM A-22AST

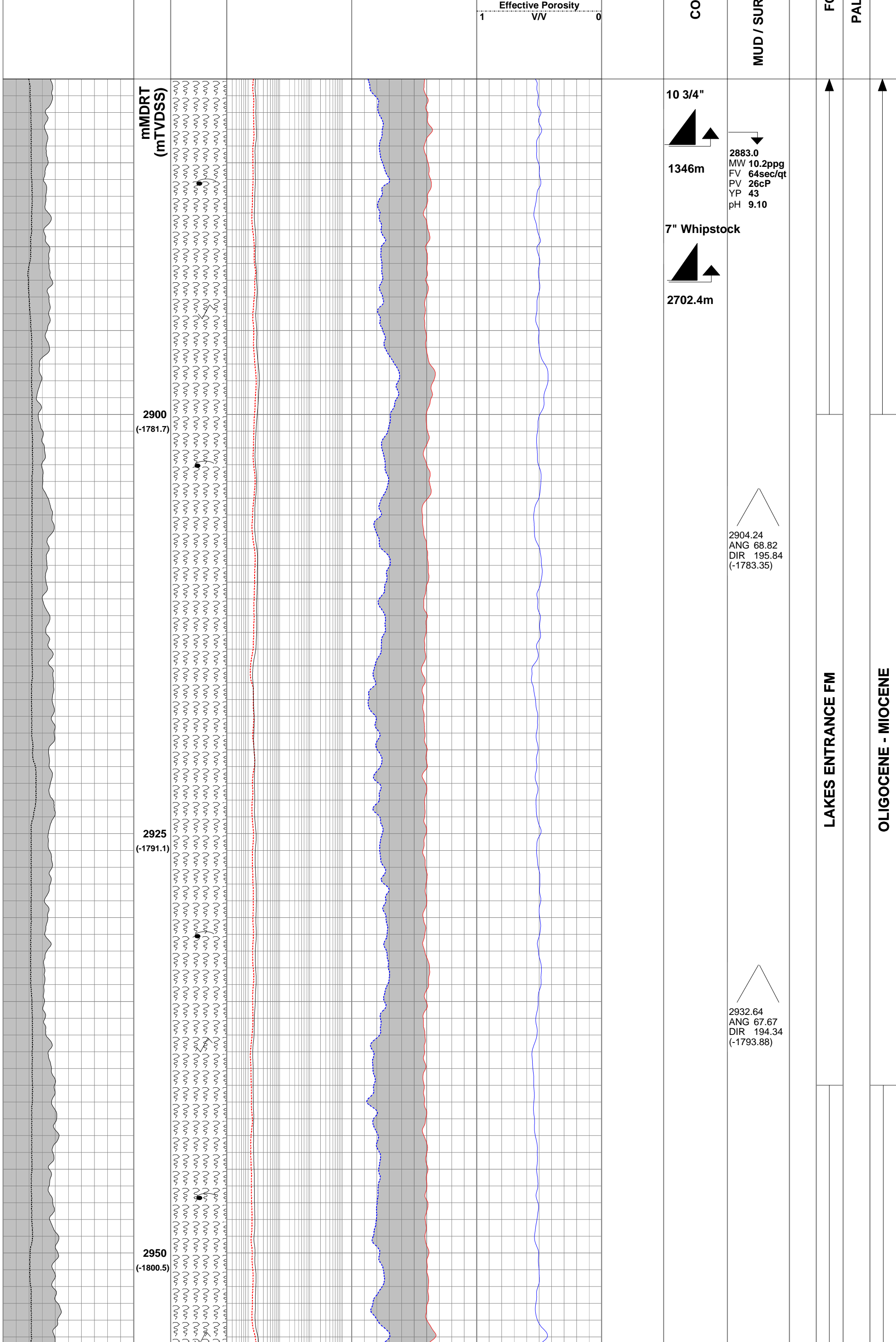
Gippsland Basin, Victoria  
Concession: VIC/L13

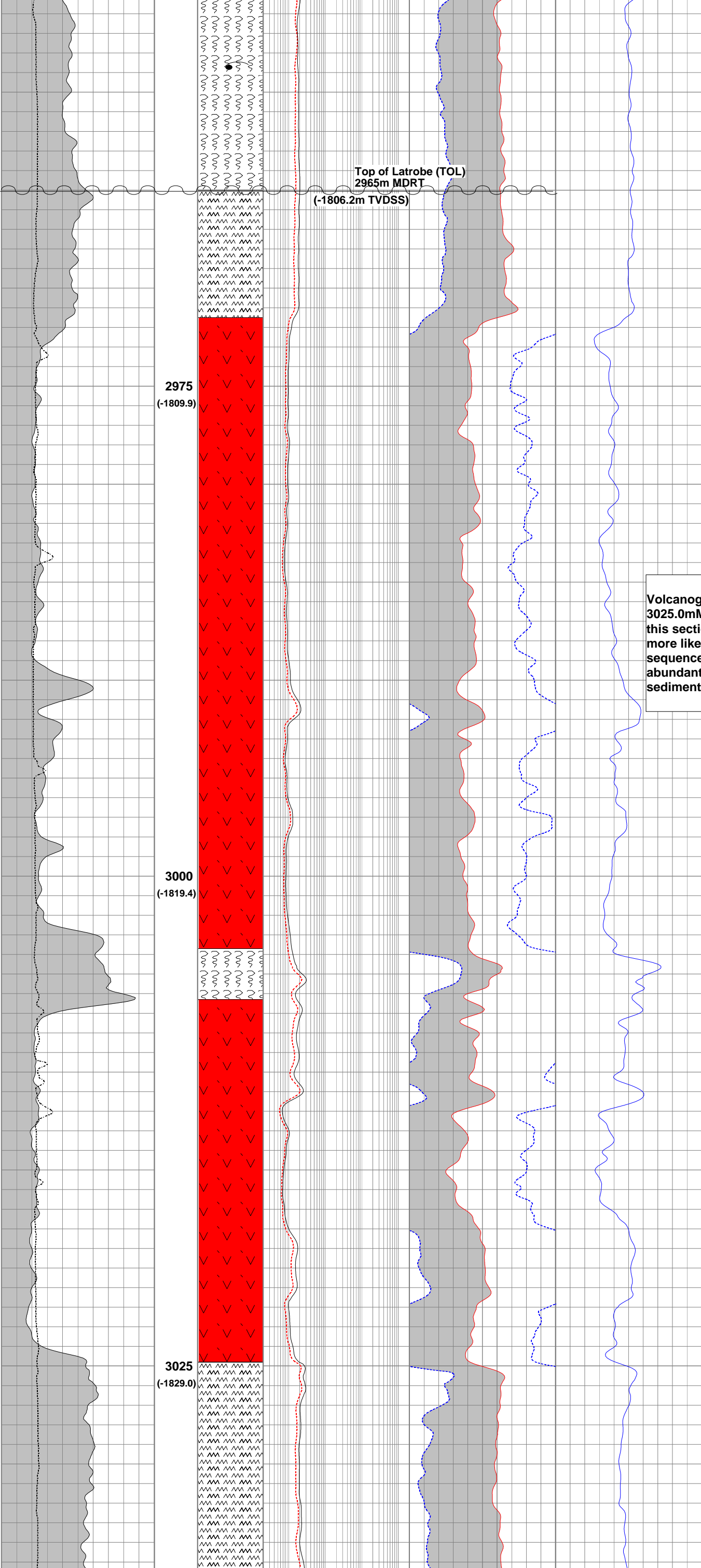
POST-DRILL LOCATION: <i>Top of Latrobe</i>	Latitude:	38° 31' 1.848" S	COMPILED BY:	Sheryl Sazenis
	Longitude:	147° 45' 41.917" E	DRAFTED BY:	Arnaldo Ribeiro
	MGA X:	566398.38 mE	DRILLED BY:	Nabors Rig 453
	MGA Y:	5736525.42 mN	Datum:	GDA94 (GRS80)
	Depth	2965.0m MDRT 1839.0m TVDRT (-1806.2mTVDSS)	Projection:	MGA/ UTM Zone 55 (S)
ELEVATION:	G.L.:	-59.40 m	TOTAL DEPTH:	3364.0 mMDRT / 1987.3 mTVDRT
	R.T.:	32.82 m above MSL		
	Water Depth:	59.40 m		
DATES:	Spudded ( <b>A22A</b> ):	01/08/2005	PLUGGED BACK T.D.:	3335.0m MDRT
	Sidetracked( <b>A22AST</b> ):	15/09/2005	CLASSIFICATION:	Oil Development
	Rig Released( <b>A22AST</b> ):	01/10/2005	STATUS:	Cased and Completed
	I.P. Established( <b>A22AST</b> ):	08/10/2005	PRODUCTION TESTING:	n/a
	(Initial production)		DIVERS:	n/a
SERVICE COMPANIES:	DRILLING CONTRACTOR:	International Sea Drilling Ltd (Nabors Rig 453)	MUD LOGGING:	Geoservices Overseas S.A.
	MWD/DIRECT. DRLG:	Schlumberger Anadrill	PRESSURE RECORDING:	n/a
	GYRO SURVEYING:	SDI	WELL VELOCITY SURVEY:	n/a
	CORING:	n/a	MUD ENGINEERING:	Halliburton- Baroid
	PIPE CONVEYED	Precision(Reeves Compact Shuttle Logging	LINER:	n/a
	LOGGING:	System)		
	CEMENTING:	Halliburton		
	CASING:	Weatherford		

LEGEND

 2.7m NOS Ø = 17% Sw = 32%	 No Rec. CORE Rec.	LOG ANALYSIS DATA NS - Net Sand NOS - Net Oil Sand NGS - Net Gas Sand Sw - Water Saturation	 SHOW OR STAIN
	PERFORATED INTERVAL	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	 HYDROCARBON CUT
	PLUG		 FLUORESCENCE
	RECOVERED SIDE WALL CORE LITHOLOGY SST - Sandstone CLST - Claystone SLST - Siltstone LMST - Limestone MST - Mudstone ML - Marl SH - Shale COAL - Coal		 GAS SHOW
	SIDE WALL CORE - NO RECOVERY		 OIL PRODUCTIVE
	FIT		 GAS PRODUCTIVE
	MDT/RFT PRETEST RUN/SEAT NUMBER		 INTERPRETED OIL PRODUCTION
	MDT/RFT SAMPLE RUN/SAMPLE NUMBER		 INTERPRETED GAS PRODUCTION
	MDT VERTICAL/HORIZONTAL PERMEABILITY TEST		 INTERPRETED WATER PRODUCTION
	PACKER		 WATER PRODUCTIVE
	BRIDGE PLUG		 CONDENSATE PRODUCTION
	DST WITH GAS RECOVERED		 INTEPRETED CONDENSATE BEARING
	DST WITH OIL RECOVERED		 SURVEY POINT
	CASING SHOE		 MUD

Density Caliper			DEPTH	LITHOLOGY	Deep Laterolog			Compensated Density			Compensated Sonic			TEST	COMPLETION	SURVEY DATA	PLUGS	FORMATION	LITHOLOGY	AGE
4	IN	14		0.2	OHMM	2000	1.85	G/C3	2.85	500	US/M	100								
Gamma Ray				Shallow Laterolog			Neutron Porosity			Bulk Vol Water										
0	GAPI	200	0.2	OHMM	2000	0.45	V/V	-0.15	1	V/V	0									





2961.11  
ANG 67.71  
DIR 194.19  
(-1804.69)

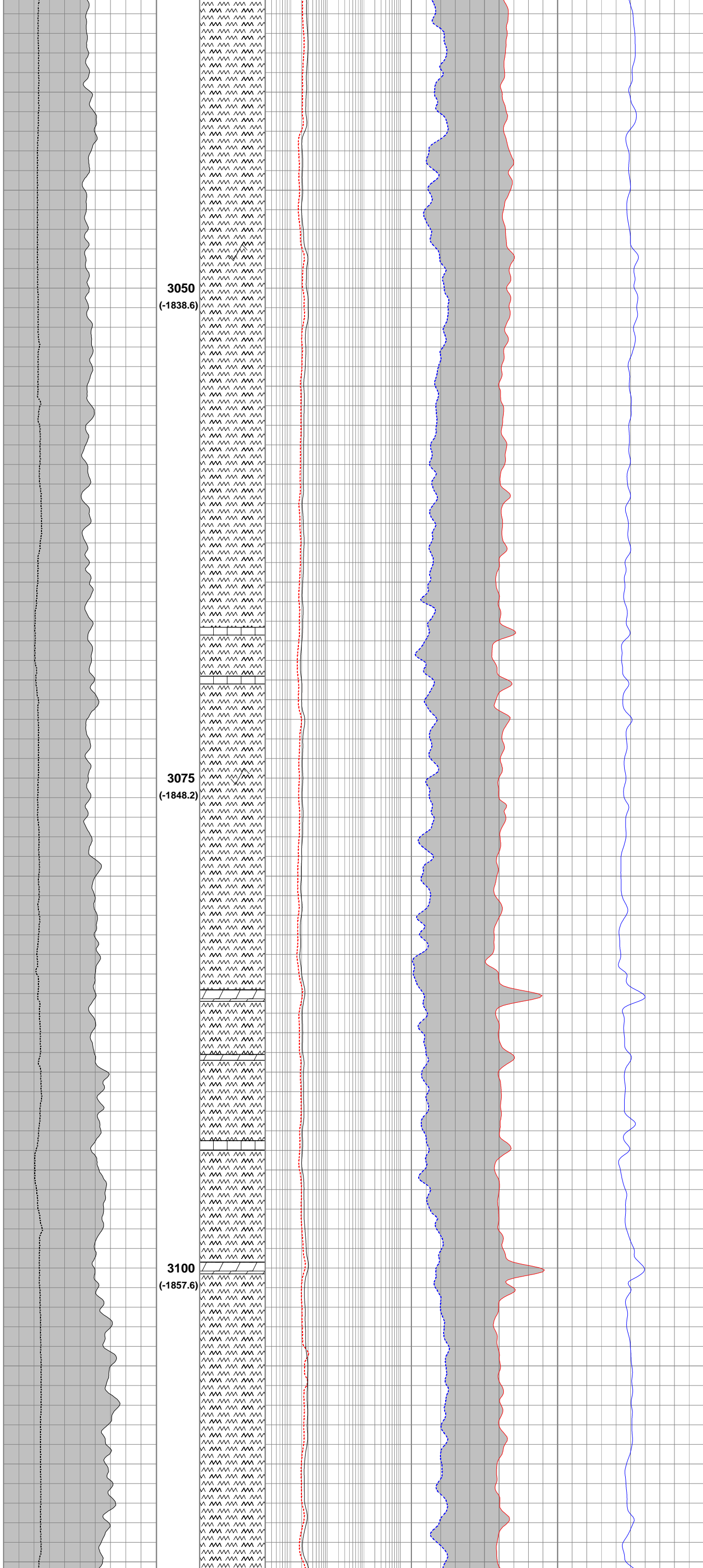
2989.53  
ANG 67.94  
DIR 195.04  
(-1779.29)

3018.06  
ANG 67.18  
DIR 194.88  
(-1826.31)

LATROBE GROUP

PALEOCENE - EARLY EOCENE





3050  
(-1838.6)

3075  
(-1848.2)

3100  
(-1857.6)

3047.04  
ANG 67.46  
DIR 194.08  
(-1837.48)

3048.0  
MW 10.17ppg  
FV 68sec/qt  
PV 28cP  
YP 44  
pH 9.10

3075.33  
ANG 67.49  
DIR 197.11  
(-1848.32)

3104.27  
ANG 68.12  
DIR 196.99  
(-1859.25)



3125  
(-1867.0)

3150  
(-1876.4)

3175  
(-1885.7)

Top of Coarse Clastics (TCC)  
3186m MDRT  
(-1889.9m TVDSS)

3132.27  
ANG 68.06  
DIR 196.72  
(-1869.70)

3161.24  
ANG 67.83  
DIR 196.45  
(-1880.58)

3165.0  
MW 10.18ppg  
FV 60sec/qt  
PV 28cP  
YP 39  
pH 9.30

Gas bearing  
37.8 MD Net  
13.9 TVD Net  
 $\phi = 17.8 \%$   
 $Sw = 18 \%$

3190.70  
ANG 68.11  
DIR 196.04

