WELL COMPLETION REPORT

WEST KINGFISH W19A

GIPPSLAND BASIN, VICTORIA

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November 2006

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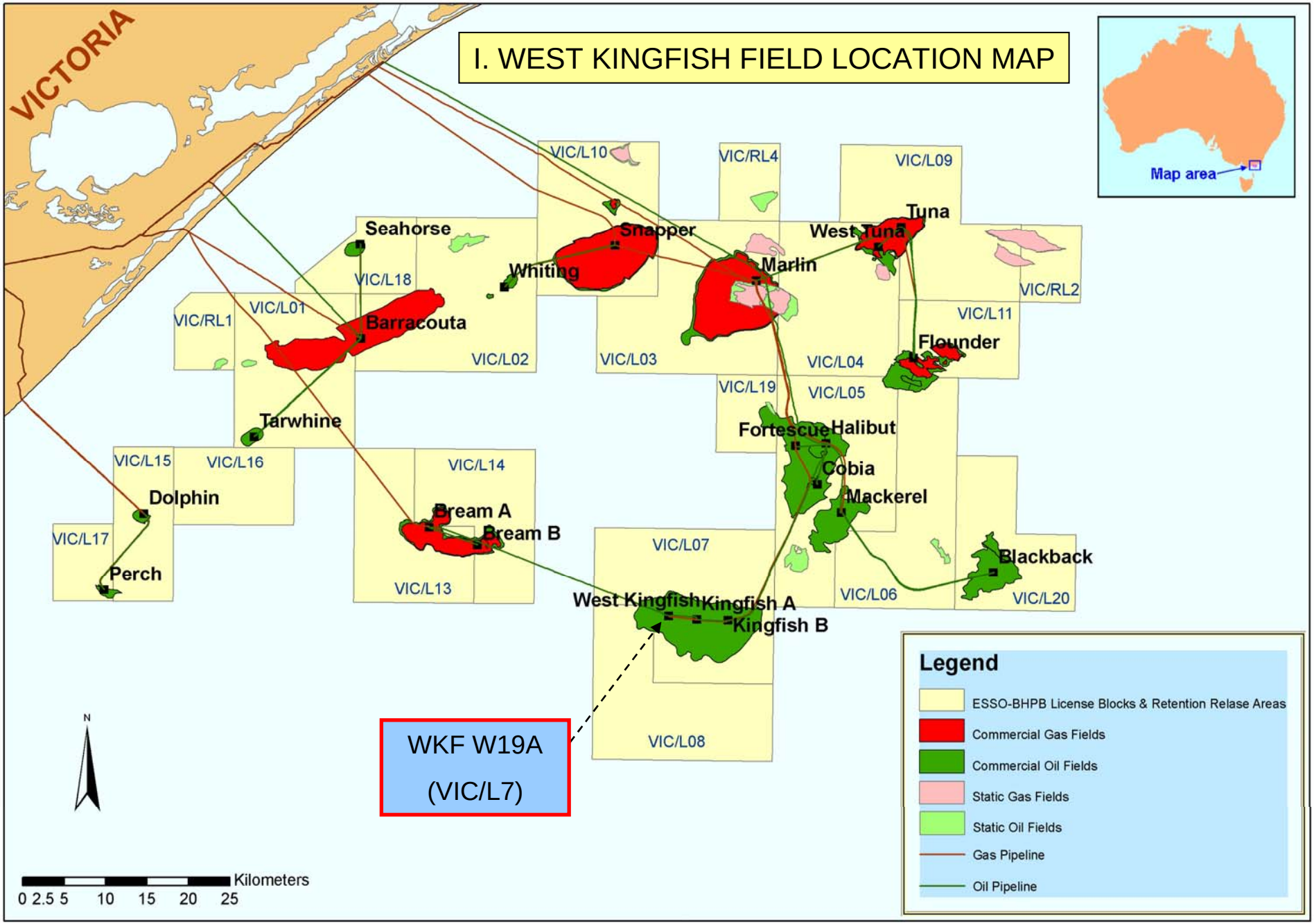
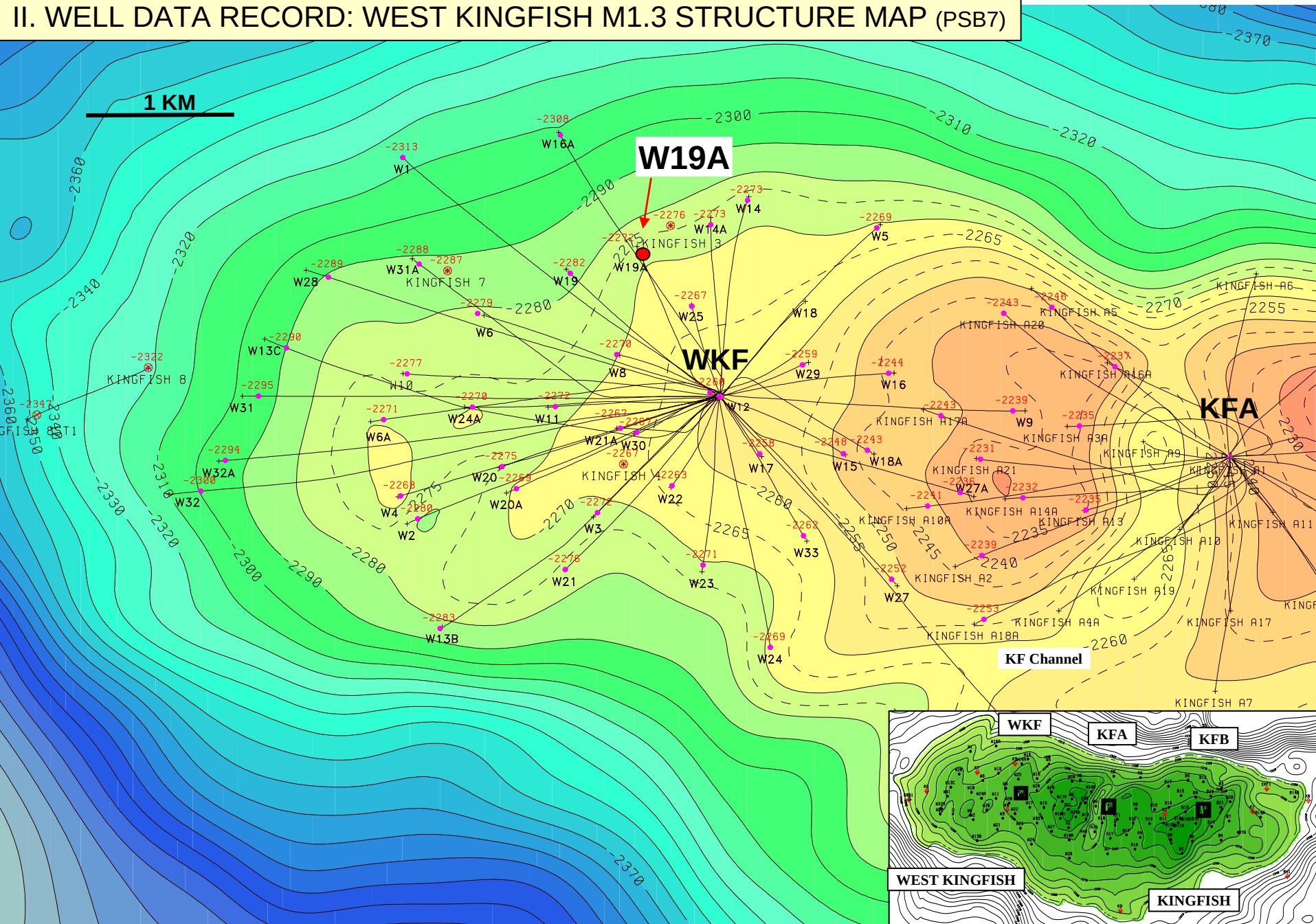
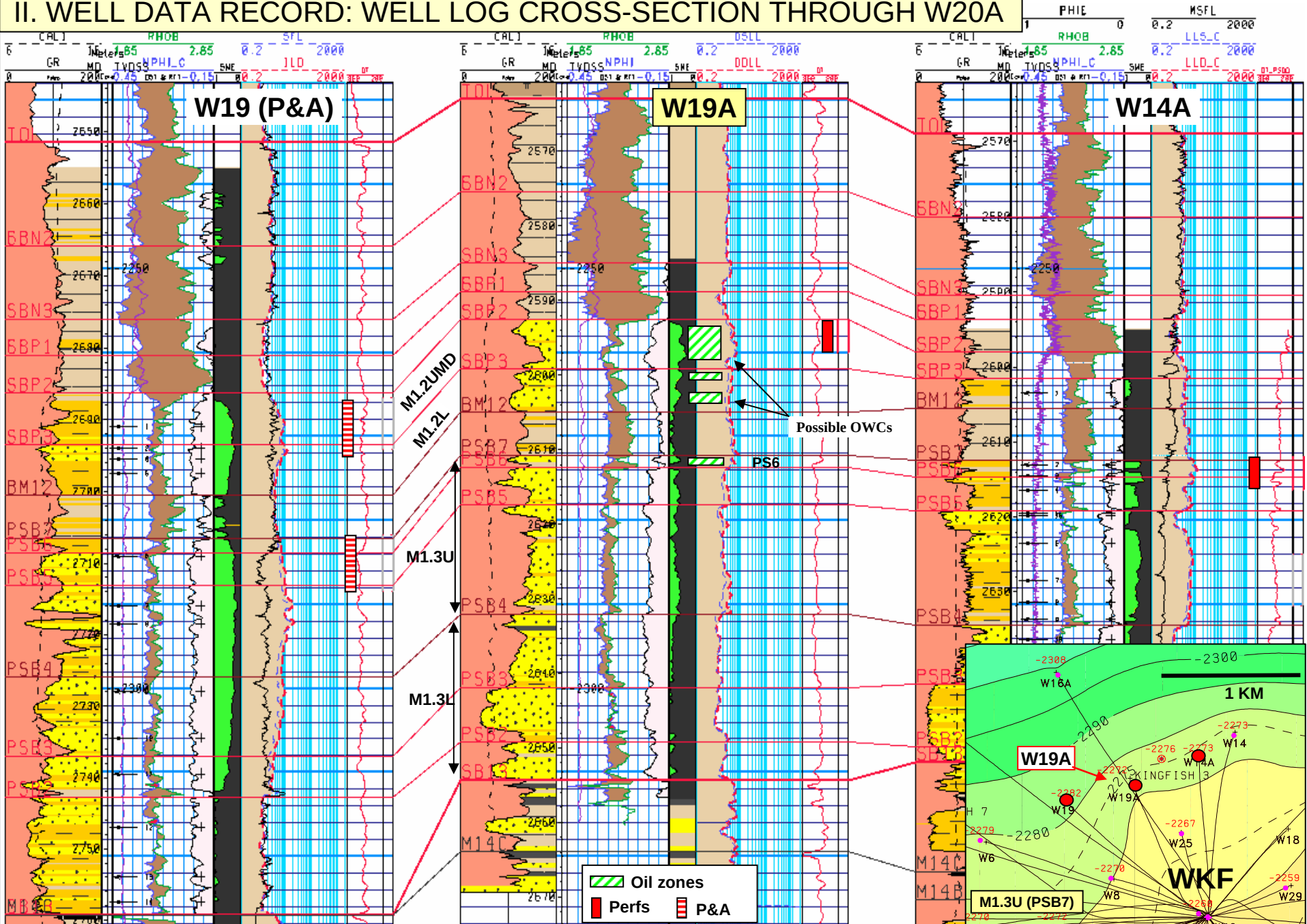

I. WEST KINGFISH FIELD LOCATION MAP
VICTORIA
Map area
VIC/L10
VIC/RL4
VIC/L09
Seahorse
Snapper
Tuna
West Tuna
Whiting
Marlin
VIC/L18
VIC/RL2
VIC/L01
VIC/RL1
Barracouta
VIC/L11
Flounder
VIC/L02
VIC/L03
VIC/L04
VIC/L19
VIC/L05
Tarwhine
Fortescue
Halibut
VIC/L15
VIC/L16
VIC/L14
Cobia
Dolphin
Mackerel
Bream A
Bream B
VIC/L17
VIC/L07
Blackback
Perch
VIC/L13
VIC/L06
VIC/L20
West Kingfish
Kingfish A
Kingfish B
VIC/L08
WKF W19A
(VIC/L7)
N
Legend
ESSO-BHPB License Blocks & Retention Relase Areas
Commercial Gas Fields
Commercial Oil Fields
Static Gas Fields
Static Oil Fields
Gas Pipeline
Oil Pipeline
Kilometers
0 2.5 5 10 15 20 25

II. WELL DATA RECORD: WEST KINGFISH M1.3 STRUCTURE MAP (PSB7)



II. WELL DATA RECORD: WELL LOG CROSS-SECTION THROUGH W20A



II. WELL DATA RECORD – W19A (cont'd)

LOCATION

Field	**West Kingfish**
Well Name	**W19A** (Loc E)
Conductor Number	Slot 19
State	Victoria
Permit/Licence	Vic/L7
Geological Basin	Gippsland
Top of Latrobe	2563.0m MDRT 2263.2m TVDRT -2229.8m TVDSS
(MGA94) X	595739.8m E
(MGA94) Y	5728760.0m N
Latitude	38º 35' 4.10" S
Longitude	148º 05' 57.22" E

Conductor #19 Surface Coordinates	
(MGA94) X	596262.84m E
(MGA94) Y	5727806.79m N
Latitude	38° 35' 34.833" S
Longitude	148° 06' 19.318" E
Perforations (driller)	2592.5 - 2597.0m MDRT 2289.5 – 2293.5m TVDRT (-2256.0 – 2260.0m TVDSS)
Datum	GDA94 (Geocentric Datum of Australia)
Spheroid	GRS80 (Geodetic Ref. System 1980)
Projection	UTM (Universal Transverse Mercator)
Map Grid / Zone	MGA Zone 55
Central Meridian	147 deg E

ELEVATIONS & DEPTHS

Water Depth	76.13 m
Main Deck Rel to MSL	25.12m
RT Relative to MSL	33.43m
Average Well Angle	27 deg in Latrobe
Max Well Angle	37 deg
Total Depth	2687.0m MDRT 2373.4m TVDRT (-2340.0m TVDSS)
Plug Back Depth	2639.0m MDRT (wireline HUD)

DATES

Skid Rig	01/06/2006
Kicked Off	03/06/2006
Development Rig Days	14.9
NPT Days	.18
Rig Released	17/06/2006
I.P. Established	27/06/2006

MISCELLANEOUS

Operator	Esso Australia Pty Ltd
Esso Interest	50%
Licensee	Esso/BHPBilliton
Other JV Interest	50% (BHPB)
Overriding Royalty	2.5% (Weekes)
Drilling AFE No.	L0501F653

Contractor	International Sea Drilling Ltd
Rig Name	Nabors Rig 453
Equipment Type	Platform
Completion Type	Single
Completion Size	2-7/8"

WELL CLASSIFICATION

Before Drilling	Oil Development
After Drilling	Cased & Completed - Oil well

CASING RECORD

Type	**Size** (Inches)	**Weight** (lb/ft)	**Grade**	**Thread**	**Depth** (mMDRT)
Conductor *	20				167
Surface *	10¾	40.5	K-55	Buttress BTC	666
Production	7	26.0	L-80	Vam Top HC	2681
Tubing	$2^{7}/_{8}$	6.4	13Cr-80	Vam Ace	2577

* Pre-existing W19 casing strings

CEMENTING RECORD

Casing details	**Cement Type**	**Dry Cement Volume** (sacks)	**Cement Additives**	**Mix Water** (bbls)	**Slurry Volume** (bbls)	**Slurry Density** (ppg)	**Cement to/from** (m MDRT)	**Casing Pressure Test** (psi)
7" 26 lb/ft	AB CLASS G Lead	501	Gascon 60 gal /10 bbl HALAD-413L 30 gal /10 bbl NF-5 0.25gal /10bbl CFR-3L 3.0 gal /10 bbl SCR-100L 6.0 gal /10 bbl	129	171	13.0	TD 2687 to 850	3000
7" 26 lb/ft	AB CLASS G Tail	197	Gascon 30 gal /10 bbl HALAD-413L 30 gal /10 bbl NF-5 0.25gal/10 bbl CFR-3L 4.0 gal /10 bbl SCR-100L 6.0 gal /10 bbl	25	41	15.8		

II. WELL DATA RECORD (cont.)

DRILLING PERFORMANCE
West Kingfish W19A - Final Well Report

GENERAL

Platform:	West Kingfish	**Rig:**	453	**Reservoir:**	M-1.2U & L (TCC) Sands
Well:	W19A	**Well Slot:**	#19	**RT-MSL (Rig453)**	33.43
Drilling Complexity Index	3.2	**Wellwork Complexity Index**	1.8		

DEPTH		**PERFORMANCE**		**MUD**	
m MDRT	2,687.0	**20" Cond. Hole**	N/A	**Max Wt (ppg)**	9.7
m TVDRT	2,373.4	**12-1/4" Surf. Hole**	N/A	**Type (Surf. Hole)**	N/A
Vert. Section (m)	1144.1	**8-1/2" Prod. Hole**	450 m/day*	**Type (Inter. Hole)**	N/A
INCLINATION		**6" Liner Hole**	N/A	**Type (Prod. Hole)**	KCl/PHPA/Poly/Glycol
Max (deg) / Ave (deg)	37/ 27 (Tang)	* time to drill interval, incl's Connections & NPT.		**Type (Liner Hole)**	N/A

Comments: New hole drilled: 666m to 2,687mMDRT (2,021m MDRT drilled).

TIME ANALYSIS

Start Date:	01/06/2006, 1100hrs	**Finish Date:**	17/06/2006, 0830hrs		
Target Days (P10):	16.24	**Total Days:**	14.9	**% Under Target:**	8.3 % (under)
AFE Days (P50):	18.29	**NPT Days:**	.18	**% of Total Days:**	1.3%
Supplementary AFE Days (P50):	N/A				

COSTS *(based on projected)*

AFE No.:	L0501G653	**Revisions:**	--	**$ per m**	A $1.97 k / metre (new hole)
$ per day:	A$ 263 k/day	**$ per day (excl. T + L)** * Equipment, LWD & Reeves	A$ 200 k/day		A$ 1.48 k / metre* * based on TD **not** new hole

	Equipment	**Materials**	**Contracts**	**Allocations**	**Contingency**	**Total**
AFE (Original)	976,000	735,000	2,442,500	860,600	185,900	A$5,200,000
AFE (Supplement)	-	-	-	-	-	-
Projected	842,123	404,000	1,920,877	534,000	149,000	A$3,922,000

CASING *(all depths herein are based on Rig 453 elevations: RT-MSL=33.43m)*

	Size / Weight / Grade / Thread	**m MDRT**	**m TVDRT**	**PIT (ppg)**
Conductor Casing *	22"	167	167	N/A
Surface Casing *	10-3/4", 40.5 ppf, K55, BTC	666	628.8	12.6 (PIT)
Prod Casing	7", 26.0 ppf, L80, Vam Top HC	2681	2368.1	N/A

Comments: * Pre-existing casing strings.

COMPLETION

	Size / Weight / Grade / Thread	**MMDRT**	**MTVDRT**	**Type**
Completion				

	Upper Interval [m MDRT]	**Upper Interval [m TVDRT]**	**Lower Interval [mMDRT]**	**Lower Interval [mTVDRT]**	**Gun Type**
Perforation Interval:	2592.5 – 2597.0	2289.5 – 2293.5	NA	NA	MAXR

Comments: Completion was 2-7/8" 13Cr80 with TR-SSSV and 3 SPMs for gas lift, and one packer.

ADDITIONAL

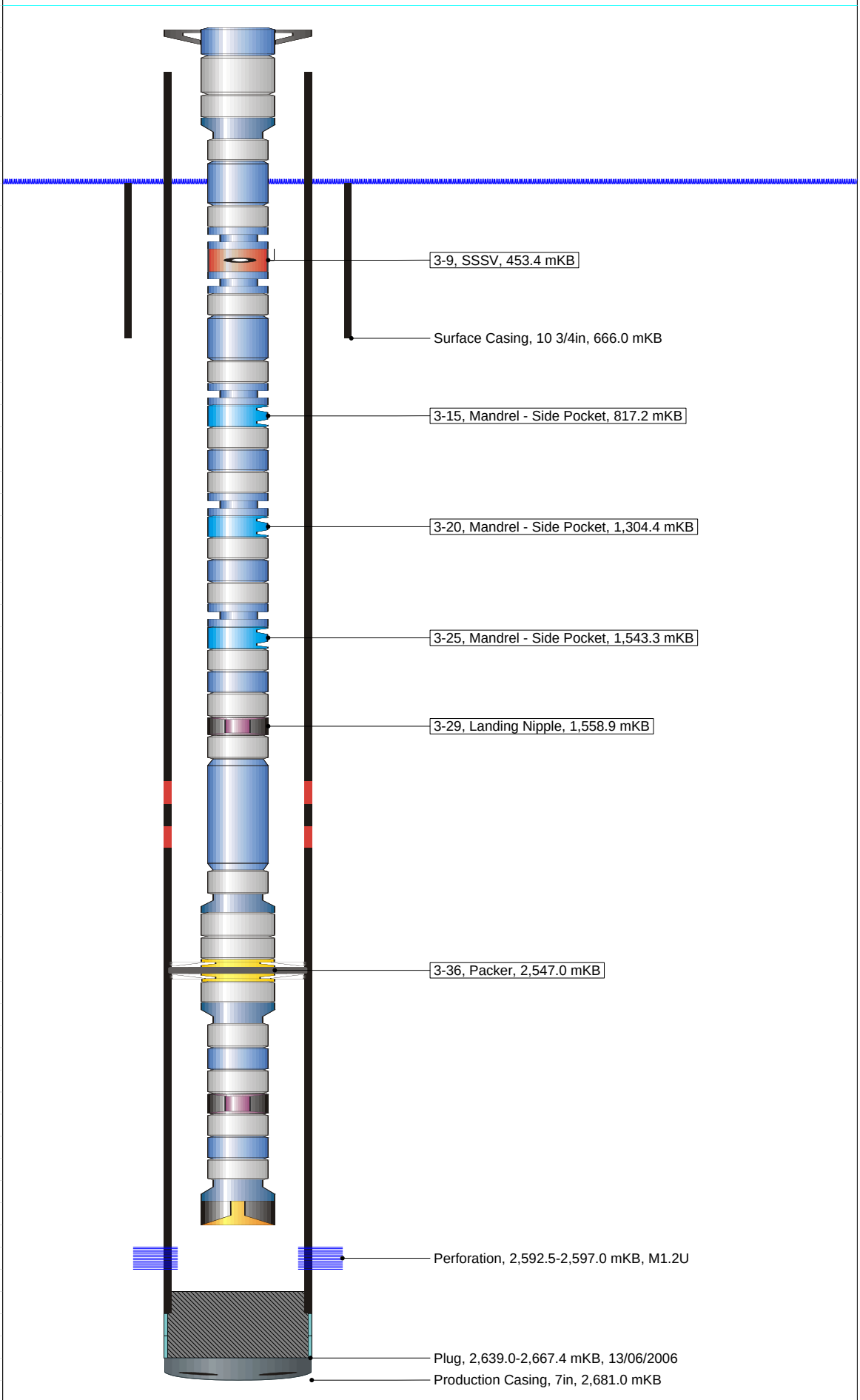
		Upper Interval [m MDRT]	**Lower Interval [m MDRT]**
Logs Run	GR-Resistivity-Density-Neutron-Sonic-Caliper	666	TD 2687

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

West Kingfish W19A: Existing Schematic

Incl	mKB (TVD)
0.0	12
0.0	12
0.0	12
0.0	14
0.0	16
0.0	16
0.0	18
0.0	20
21.1	446
21.3	447
21.5	449
21.7	450
21.9	451
22.2	454
36.9	629
30.5	753
30.5	755
30.6	756
30.7	758
30.7	760
30.1	1,172
30.2	1,173
30.2	1,175
30.4	1,177
30.5	1,178
32.0	1,376
32.0	1,378
31.9	1,380
31.9	1,381
31.9	1,383
31.7	1,391
31.6	1,393
31.6	1,393
31.7	1,395
30.2	2,107
30.0	2,118
29.1	2,214
28.7	2,225
28.1	2,244
28.0	2,245
28.0	2,246
27.9	2,247
27.9	2,249
27.8	2,251
27.7	2,253
27.7	2,253
27.6	2,254
27.3	2,262
27.2	2,264
27.2	2,265
27.2	2,266
27.2	2,275
27.2	2,275
27.2	2,276
27.2	2,276
27.2	2,289
27.2	2,293
27.7	2,331
27.7	2,336
27.6	2,345
27.0	2,356
27.0	2,368

Schematic - Actual



III. SAMPLES – W19A

The cuttings sampling programme for WEST KINGFISH W19A are detailed in the following table:

Interval	Formation	Sampling Details
KOP to ~150 m above Top of Latrobe (prognosed at 2570.9m MDRT) 690.0 – 2400.0m MDRT	Gippsland Limestone & Lakes Entrance Fm	Cuttings samples for description only at 30 m intervals.
~150 m above Top of Latrobe to ~Top of Latrobe (prognosed at 2570.9m MDRT) 2400.0 – 2560.0 mMDRT	Lakes Entrance Formation	Three sets of washed and oven dried cuttings at 10 m intervals.
~Top of Latrobe (prognosed at 2570.9m MDRT) to **Total Depth (TD)** 2560.0 – 2687.0 mMDRT	Latrobe Group	Three sets of washed and oven dried cuttings at 5 m intervals.

Detailed cuttings descriptions for the interval 690.0 to 2687.0m MDRT (TD) are contained in Appendix 3a.

CONVENTIONAL CORING

No conventional cores were cut in WEST KINGFISH W19A.

SIDEWALL CORING

No sidewall core samples were shot in WEST KINGFISH W19A.

IV. LOGS AND SURVEYS – W19A

Survey/Log	Company	Top (m MDRT)	Bottom (m MDRT)
MWD Run 1, Powerpulse (Directional & GR)	Schlumberger/Anadrill	666.0	2687.0 (GR to 2668m)
Run 1: Drillpipe conveyed Logging: MCG-MDN-MPD-MSS-MDL -MAI	Precision Energy Services compact logging (wireline tools run on drillpipe (Shuttle System, memory mode)	666.0 (2439m top of Latrobe logging)	2684.0 (2671 bottom of log interval)

(Precision logs = Compact GR- Dual Neutron - Photo Density - Sonic - Dual Laterolog Resistivity - Induction Resistivity)

V. RESERVOIR & FORMATION TOPS - W19A

Horizon	m TVDSS			m MDRT	mTVT net oil	mTVT net oil
	Predicted Tops	ACTUAL	Diff. (m)	ACTUAL	Pred.	ACTUAL
Base of Miocene High Velocity Channel	-	-1463.5	-	1681.5		
Lakes Entrance Formation	-2000	-1939.7	60.3 high	2229.5		
Top of Latrobe Group (TOL)	-2235	-2229.8	5.2 high	2563.0		
SBN3 (N.asperus Sequence Boundary)	-	-2249.4	-	2585.0		
Top of M1.2UMD (SBP2)	-2262	-2256.0	6.0 high	2592.5	4	4.3
Current OWC		*-2260.8*		*2597.8*		
Top of M1.2L ("SBP3")	-2267	-2262.0	5.0 high	2599.2	1	2.0 *
Possible COWC		*-2265.5*		*2603.2*		
BM12	-	-2267.1	-	2605.0		
Top M1.3U PS6 sand (PSB7)	-2279	-2272.2	6.8 high	2610.7	1	0.6
PS5 sand (PSB6)	-2281	-2273.6	7.4 high	2612.3		
PS4 sand (PSB5)	-2285	-2278.1	6.9 high	2617.4		
Top M1.3L PS3 sand (PSB4)	-2296	-2291.1	4.9 high	2632.0		
PS2 sand (PSB3)	-2303	-2300.0	3.0 high	2641.9		
PS1 sand (PSB2)	-	-2306.4	-	2649.3		
Base of M1.3/ Top M1.4U (SB13)	-2320	-2310.9	9.1 high	2654.3		
M14C coal (Top M1.4L)	-2324	-2319.4	4.6 high	2663.9		
TOTAL DEPTH	-2330	-2340.0	10.0 low	2687.0		

* Probable oil.

Net pay thickness is based on 10% porosity cutoff because sands are often thin or shaly yet productive.

COWC = Current Oil-Water Contact

UMD = Upper M.diversus
U = Upper
L = Lower

(The reason predicted depths were not provided for some tops predrill is that the horizons or zones were of less importance than others, rather than they were unexpected).

VI. GEOLOGICAL ANALYSIS – WEST KINGFISH W19A

Objectives

The primary objective of West Kingfish W19A (predrill Location E) was to recover M1.2Upper (M1.2UMD) and M1.2Lower oil reserves that were previously accessed by the abandoned W19 development well located northwest of the platform.

W19 was perforated in the M1.2UMD and M1.2L sands and had exhibited a flat oil rate (~100kl/d) and water cut (40-60%) for the past 4-5 years. This good performance implied a likely long production tail from the M1.2 at W19, with substantial remaining reserve estimated to be ~0.5 - 1MBO. However, in early 2005, water cut jumped dramatically to near 100% and it was interpreted that water from the underlying old M1.3 perforation zone was getting to the M1.2 perforations. A crossflow scenario was highly likely, owing to the pressure drawdown present in the M1.2 sands in this area of the field. Following subsequent diagnostic pressure testing and logging, it was interpreted that the communication was most likely behind casing due to a cement channel. Given the difficulties and cost of attempting a repair, it was decided to P&A W19 and drill a new well to access M1.2 reserves.

The proposed well (Loc E) was targeted to an area of low seismic impedance character, east of W19, interpreted to be an area of good channelised sand, and also sufficient distance from the old well to avoid risk of dumpflood effects. Other areas such as north and west of W19 were deemed unsuitable based on evidence of high impedance character (likely non-reservoir areas).

Reservoir simulation was used to evaluate the benefit of the new well, and the simulation indicated that a well near the abandoned W19 should ultimately recover about 1MBO. Other M1.2 wells much further to the south (W2, W11, W22) were also producing effectively. However it was recognised that further east/ northeast there was risk of water entry, particularly into better quality sands of the M1.2L reservoir. This was evidenced by high water cut at W8 (M1.2L) and gradually increasing water cut at W25 (M1.2UMD).

Results

West Kingfish W19A was kicked off below the W19 existing surface casing on 3 June 2006 and drilled 8 ½“ production hole to Total Depth of 2687m MDRT. The well was logged with Precision Energy Services’ compact wireline tools on drillpipe (Shuttle system) and cased and completed with 2 7/8” tubing. The well was handed over to production operations on 17 June 2006.

The Top of Latrobe was intersected at 2563.0m MDRT (-2229.8m TVDSS), 5.2mTVD high to prediction. The top of the objective M1.2UMD reservoir was intersected at 2592.5m MDRT (-2256.0m TVDSS), 6.0mTVD high to prediction, and the M1.2L sand was encountered at 2599.2mMD (-2262.0m TVDSS), 5.0m high.

This places the well about 9mTVD updip of W19 on the M1.2 horizons. Sand quality is good at W19A, with 4.3mTVD net oil sand in the M1.2UMD (18% average porosity, 48% Sw) and 2.0m net oil in two thin zones in the M1.2L (17% average porosity, 53-59% Sw). The oil-bearing intervals are also interpreted to overlie swept intervals containing only residual oil (1mTVD and 0.7mTVD net water sand respectively).

Following completion, the well came on at a moderate oil rate of 81kl/d and a very high initial water cut of 78%, which was surprising given that the well was perforated only within the M1.2UMD oil pay interval and considering its updip position compared to the W19 perforations where oil had recently been flowing at a good rate (100kl/d). When the well was drilled it was not initially clear that the lower wet sections were definitely swept despite having reduced resistivities, because it was thought that the log character might be a “rock effect” rather than water, but the interpretation has had to change following the performance of the well.

VI. GEOLOGICAL ANALYSIS – WEST KINGFISH W19A

Continued:

A thin oil interval also occurs in the M1.3Upper PS6 sand at 2610.8m MDRT, containing 0.6mTVD net oil sand with 14% porosity and 62% Sw. This zone is at a marginally higher structural level than the oil-producing interval at W14A which flows consistently at an oil rate of ~50kl/d.

Some shaley zones in the M1.3U section (eg 2615-2617m, 2626-2629m) have slightly increased resitivity due to high levels of residual oil saturation, up to 40%. This reflects their poorer reservoir quality so sweep is less effective. They might possibly be producible, however at very high water cut, and it is likely that they are being slowly drained by other completions up-structure elsewhere on the field, as oil slowly migrates from these shaley zones into cleaner streaks.

It was decided to complete only in the primary objective M1.2UMD, because the M1.3U PS6 oil sand is being produced at W14A, the M1.2L is being produced at W11 and W2, and the M1.2UMD appeared to be located in a good updip position. A 2 7/8" single tubing completion was run to enhance productivity of the M1.2UMD which is shaley and also believed to be drawndown. A tandem completion was avoided because of concerns over potential reservoir damage from overbalanced perforating.

The well has performed particularly poorly, with ever increasing water cut. Although it is possible that this is due to the same aquifer influx from the east that has watered out W8 and impacted W25, with water entering along the more permeable basal part of the M1.2UMD sand (2597.8 - 2599m MDRT), it seems strange that this water came on immediately to the perforation in the oil zone. A mechanical problem is suspected and this will be evaluated in subsequent workover operations.

APPENDIX 1a

WEST KINGFISH W19A

Survey Data

WKF W-19A Final Geodetic Survey

Report Date:	June 8, 2006	Survey / DLS Computation Method:	Minimum Curvature / Lubinski
Client:	Esso Australia Pty Ltd	Vertical Section Azimuth:	331.730°
Field:	Kingfish GDA 94	Vertical Section Origin:	S 4.260 m, W 0.200 m
Structure / Slot:	West Kingfish / 19	TVD Reference Datum:	RKB
Well:	19	TVD Reference Elevation:	33.43 m relative to MSL
Borehole:	WKF W-19A	Sea Bed / Ground Level Elevation:	-76.130 m relative to MSL
UWI/API#:		Magnetic Declination:	13.249°
Survey Name / Date:	WKF W-19A Final / June 5, 2006	Total Field Strength:	60123.630 nT
Tort / AHD / DDI / ERD ratio:	116.702° / 1169.41 m / 5.705 / 0.493	Magnetic Dip:	-69.062°
Grid Coordinate System:	GDA94/MGA94 Zone 55	Declination Date:	June 05, 2006
Location Lat/Long:	S 38 35 34.833, E 148 6 19.318	Magnetic Declination Model:	BGGM 2005
Location Grid N/E Y/X:	N 5727806.791 m, E 596262.840 m	North Reference:	Grid North
Grid Convergence Angle:	-0.68956286°	Total Corr Mag North -> Grid North:	+13.939°
Grid Scale Factor:	0.99971411	Local Coordinates Referenced To:	Structure Reference Point

*NS and EW are local offsets with respect to top of No. 1 conductor (reference point)
Northings & Eastings are absolute grid coordinates.

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	-4.26	-0.20	0.00	5727806.79	596262.84	S 38 35 34.833	E 148 6 19.318
	24.53	0.00	0.00	24.53	0.00	-4.26	-0.20	0.00	5727806.79	596262.84	S 38 35 34.833	E 148 6 19.318
	30.00	0.01	220.20	30.00	0.00	-4.26	-0.20	0.05	5727806.79	596262.84	S 38 35 34.833	E 148 6 19.318
	60.00	0.04	220.20	60.00	-0.01	-4.27	-0.21	0.03	5727806.78	596262.83	S 38 35 34.833	E 148 6 19.318
	90.00	0.08	220.20	90.00	-0.02	-4.29	-0.23	0.04	5727806.76	596262.81	S 38 35 34.834	E 148 6 19.317
	108.33	0.10	220.20	108.33	-0.03	-4.32	-0.25	0.03	5727806.73	596262.79	S 38 35 34.835	E 148 6 19.316
	118.33	0.10	28.60	118.33	-0.03	-4.32	-0.25	0.60	5727806.74	596262.79	S 38 35 34.835	E 148 6 19.316
	120.00	0.11	23.48	120.00	-0.02	-4.31	-0.25	0.25	5727806.74	596262.79	S 38 35 34.835	E 148 6 19.316
	128.33	0.15	6.20	128.33	-0.01	-4.29	-0.24	0.20	5727806.76	596262.80	S 38 35 34.834	E 148 6 19.316
	138.33	0.15	350.80	138.33	0.01	-4.27	-0.24	0.12	5727806.78	596262.80	S 38 35 34.833	E 148 6 19.316
	148.33	0.40	3.40	148.33	0.06	-4.22	-0.24	0.77	5727806.83	596262.80	S 38 35 34.832	E 148 6 19.316
	150.00	0.35	3.00	150.00	0.06	-4.21	-0.24	0.90	5727806.84	596262.80	S 38 35 34.831	E 148 6 19.316
	158.33	0.10	355.00	158.33	0.09	-4.18	-0.24	0.91	5727806.87	596262.80	S 38 35 34.830	E 148 6 19.316
	168.33	0.20	288.00	168.33	0.11	-4.16	-0.26	0.56	5727806.89	596262.78	S 38 35 34.830	E 148 6 19.315
	173.33	0.20	288.60	173.33	0.13	-4.16	-0.28	0.01	5727806.89	596262.76	S 38 35 34.830	E 148 6 19.315
	180.00	0.30	273.26	180.00	0.14	-4.15	-0.31	0.54	5727806.90	596262.73	S 38 35 34.829	E 148 6 19.314
	191.33	0.50	262.90	191.33	0.18	-4.16	-0.38	0.56	5727806.89	596262.66	S 38 35 34.830	E 148 6 19.310
	201.33	0.50	230.40	201.33	0.18	-4.19	-0.46	0.84	5727806.86	596262.58	S 38 35 34.831	E 148 6 19.307
	210.00	0.97	179.75	210.00	0.11	-4.29	-0.49	2.63	5727806.76	596262.55	S 38 35 34.834	E 148 6 19.306
	210.33	1.00	178.90	210.33	0.11	-4.29	-0.49	3.03	5727806.76	596262.55	S 38 35 34.834	E 148 6 19.306
	219.33	1.00	150.40	219.33	-0.04	-4.44	-0.45	1.64	5727806.61	596262.59	S 38 35 34.839	E 148 6 19.308
	229.33	1.75	129.90	229.32	-0.27	-4.61	-0.29	2.66	5727806.44	596262.75	S 38 35 34.844	E 148 6 19.315
	239.33	2.25	83.40	239.32	-0.48	-4.69	0.02	4.93	5727806.36	596263.06	S 38 35 34.847	E 148 6 19.327
	240.00	2.21	81.48	239.99	-0.49	-4.69	0.05	3.79	5727806.36	596263.09	S 38 35 34.847	E 148 6 19.329
	248.33	2.00	53.40	248.31	-0.53	-4.58	0.32	3.75	5727806.48	596263.36	S 38 35 34.843	E 148 6 19.340
	258.33	2.25	31.40	258.31	-0.40	-4.30	0.57	2.54	5727806.75	596263.61	S 38 35 34.834	E 148 6 19.350
	268.33	2.25	328.90	268.30	-0.11	-3.97	0.57	7.00	5727807.08	596263.61	S 38 35 34.823	E 148 6 19.350
	270.00	2.37	324.97	269.97	-0.04	-3.91	0.53	3.57	5727807.14	596263.57	S 38 35 34.821	E 148 6 19.348
	277.33	3.00	311.90	277.29	0.29	-3.66	0.30	3.58	5727807.39	596263.34	S 38 35 34.813	E 148 6 19.338
	287.33	3.75	311.90	287.27	0.84	-3.27	-0.14	2.25	5727807.78	596262.90	S 38 35 34.801	E 148 6 19.320
	297.33	4.50	311.90	297.25	1.52	-2.79	-0.67	2.25	5727808.26	596262.37	S 38 35 34.785	E 148 6 19.298
	300.00	4.57	312.82	299.91	1.72	-2.64	-0.83	1.13	5727808.41	596262.21	S 38 35 34.781	E 148 6 19.291
	306.33	4.75	314.90	306.22	2.21	-2.29	-1.20	1.17	5727808.76	596261.84	S 38 35 34.769	E 148 6 19.276
	316.33	5.75	311.90	316.18	3.08	-1.66	-1.87	3.11	5727809.39	596261.18	S 38 35 34.749	E 148 6 19.248
	326.33	6.75	310.90	326.12	4.10	-0.94	-2.68	3.02	5727810.11	596260.36	S 38 35 34.726	E 148 6 19.214
	330.00	7.26	310.00	329.76	4.52	-0.65	-3.02	4.26	5727810.40	596260.02	S 38 35 34.717	E 148 6 19.200
	335.33	8.00	308.90	335.04	5.17	-0.20	-3.57	4.25	5727810.85	596259.47	S 38 35 34.703	E 148 6 19.177
	355.33	10.50	306.90	354.78	8.11	1.77	-6.11	3.78	5727812.82	596256.93	S 38 35 34.640	E 148 6 19.071
	360.00	11.39	307.01	359.36	8.91	2.30	-6.82	5.72	5727813.35	596256.22	S 38 35 34.623	E 148 6 19.041
	384.33	16.00	307.40	383.00	14.15	5.78	-11.40	5.69	5727816.83	596251.64	S 38 35 34.511	E 148 6 18.850
	390.00	16.24	308.02	388.44	15.59	6.75	-12.65	1.56	5727817.80	596250.39	S 38 35 34.481	E 148 6 18.798
	413.33	17.25	310.40	410.78	21.80	11.00	-17.85	1.57	5727822.05	596245.19	S 38 35 34.345	E 148 6 18.581
	420.00	17.85	309.66	417.14	23.67	12.29	-19.39	2.88	5727823.34	596243.65	S 38 35 34.304	E 148 6 18.517
	432.54	19.00	308.40	429.04	27.32	14.79	-22.47	2.91	5727825.83	596240.57	S 38 35 34.224	E 148 6 18.388
	450.00	21.11	307.76	445.44	32.81	18.48	-27.19	3.64	5727829.52	596235.86	S 38 35 34.106	E 148 6 18.192
	461.44	22.50	307.40	456.06	36.68	21.07	-30.55	3.66	5727832.11	596232.49	S 38 35 34.023	E 148 6 18.051
	480.00	24.43	306.73	473.09	43.40	25.52	-36.45	3.15	5727836.56	596226.60	S 38 35 33.881	E 148 6 17.805
	490.34	25.50	306.40	482.46	47.35	28.12	-39.96	3.13	5727839.16	596223.09	S 38 35 33.798	E 148 6 17.659

	510.00	27.54	305.00	500.05	55.23	33.24	-47.09	3.26	5727844.28	596215.97	S 38 35 33.635	E 148 6 17.362
	519.24	28.50	304.40	508.21	59.10	35.71	-50.66	3.25	5727846.75	596212.40	S 38 35 33.556	E 148 6 17.213
	540.00	30.83	304.03	526.25	68.21	41.49	-59.15	3.38	5727852.53	596203.90	S 38 35 33.372	E 148 6 16.859
	548.14	31.75	303.90	533.20	71.95	43.85	-62.66	3.40	5727854.89	596200.40	S 38 35 33.297	E 148 6 16.713
	570.00	34.21	303.51	551.54	82.46	50.45	-72.56	3.39	5727861.49	596190.50	S 38 35 33.087	E 148 6 16.301
	577.04	35.00	303.40	557.33	85.98	52.65	-75.89	3.38	5727863.69	596187.17	S 38 35 33.017	E 148 6 16.162
	600.00	36.19	303.00	576.00	97.72	59.97	-87.08	1.58	5727871.00	596175.99	S 38 35 32.784	E 148 6 15.696
	605.94	36.50	302.90	580.79	100.80	61.89	-90.03	1.59	5727872.92	596173.03	S 38 35 32.723	E 148 6 15.573
	630.00	36.92	302.48	600.07	113.38	69.65	-102.14	0.61	5727880.68	596160.93	S 38 35 32.476	E 148 6 15.069
	634.84	37.00	302.40	603.94	115.91	71.21	-104.59	0.58	5727882.24	596158.48	S 38 35 32.426	E 148 6 14.967
	660.00	37.00	301.58	624.04	129.06	79.24	-117.43	0.59	5727890.26	596145.64	S 38 35 32.171	E 148 6 14.433
Tie-in	665.00	37.00	301.42	628.03	131.66	80.81	-120.00	0.58	5727891.84	596143.08	S 38 35 32.121	E 148 6 14.326
	696.25	34.26	311.48	653.45	148.05	91.55	-134.63	6.20	5727902.57	596128.45	S 38 35 31.778	E 148 6 13.716
	725.07	32.95	314.68	677.45	163.16	102.43	-146.28	2.29	5727913.45	596116.80	S 38 35 31.430	E 148 6 13.229
	753.43	31.38	320.69	701.47	177.78	113.57	-156.45	3.77	5727924.59	596106.64	S 38 35 31.073	E 148 6 12.804
	782.04	31.05	324.79	725.94	192.42	125.37	-165.42	2.25	5727936.38	596097.67	S 38 35 30.694	E 148 6 12.427
	811.84	30.43	329.43	751.55	207.59	138.14	-173.69	2.47	5727949.16	596089.40	S 38 35 30.283	E 148 6 12.079
	840.37	31.29	335.54	776.05	222.20	151.11	-180.43	3.42	5727962.12	596082.66	S 38 35 29.865	E 148 6 11.794
	869.04	31.73	335.72	800.49	237.15	164.76	-186.62	0.47	5727975.77	596076.48	S 38 35 29.424	E 148 6 11.532
	897.64	31.83	335.34	824.81	252.18	178.47	-192.86	0.23	5727989.47	596070.24	S 38 35 28.982	E 148 6 11.267
	926.33	31.92	338.22	849.17	267.27	192.39	-198.83	1.59	5728003.39	596064.27	S 38 35 28.533	E 148 6 11.013
	955.16	31.41	337.72	873.71	282.32	206.42	-204.50	0.60	5728017.41	596058.59	S 38 35 28.081	E 148 6 10.772
	984.25	30.93	337.85	898.60	297.29	220.36	-210.20	0.50	5728031.35	596052.90	S 38 35 27.631	E 148 6 10.530
	1014.37	30.61	337.91	924.48	312.61	234.63	-216.00	0.32	5728045.62	596047.10	S 38 35 27.170	E 148 6 10.283
	1042.10	30.13	337.67	948.40	326.55	247.61	-221.30	0.54	5728058.59	596041.81	S 38 35 26.751	E 148 6 10.057
	1070.66	29.82	338.14	973.14	340.74	260.84	-226.67	0.41	5728071.81	596036.44	S 38 35 26.325	E 148 6 9.829
	1098.58	29.11	338.49	997.45	354.38	273.60	-231.74	0.78	5728084.57	596031.37	S 38 35 25.913	E 148 6 9.613
	1127.56	30.32	336.99	1022.62	368.66	286.89	-237.18	1.47	5728097.86	596025.92	S 38 35 25.484	E 148 6 9.382
	1155.25	31.80	337.52	1046.34	382.88	300.06	-242.71	1.63	5728111.03	596020.40	S 38 35 25.059	E 148 6 9.147
	1183.77	30.81	338.52	1070.71	397.61	313.80	-248.25	1.18	5728124.76	596014.86	S 38 35 24.615	E 148 6 8.911
	1213.10	31.87	336.99	1095.76	412.78	327.92	-254.03	1.36	5728138.88	596009.08	S 38 35 24.160	E 148 6 8.665
	1241.19	30.27	336.91	1119.82	427.22	341.26	-259.71	1.71	5728152.21	596003.41	S 38 35 23.729	E 148 6 8.424
	1269.70	28.66	337.47	1144.64	441.18	354.19	-265.15	1.72	5728165.14	595997.97	S 38 35 23.312	E 148 6 8.193
	1298.43	29.93	336.71	1169.70	455.17	367.13	-270.62	1.38	5728178.08	595992.50	S 38 35 22.895	E 148 6 7.960
	1327.67	31.49	335.26	1194.83	470.06	380.77	-276.70	1.77	5728191.71	595986.42	S 38 35 22.455	E 148 6 7.702
	1356.54	31.48	335.54	1219.45	485.11	394.48	-282.98	0.15	5728205.42	595980.14	S 38 35 22.013	E 148 6 7.436
	1385.65	29.88	335.83	1244.49	499.93	408.02	-289.09	1.66	5728218.95	595974.03	S 38 35 21.576	E 148 6 7.177
	1414.88	31.19	335.74	1269.66	514.74	421.56	-295.18	1.35	5728232.49	595967.94	S 38 35 21.139	E 148 6 6.918
	1443.65	30.51	336.02	1294.36	529.46	435.02	-301.21	0.72	5728245.95	595961.91	S 38 35 20.705	E 148 6 6.663
	1472.27	29.96	336.80	1319.09	543.82	448.23	-306.98	0.71	5728259.15	595956.15	S 38 35 20.279	E 148 6 6.418
	1501.10	32.22	336.28	1343.78	558.65	461.89	-312.91	2.37	5728272.80	595950.22	S 38 35 19.839	E 148 6 6.166
	1529.54	32.23	335.86	1367.84	573.78	475.75	-319.06	0.24	5728286.66	595944.07	S 38 35 19.391	E 148 6 5.905
	1558.53	31.64	336.07	1392.44	589.07	489.75	-325.31	0.62	5728300.66	595937.83	S 38 35 18.940	E 148 6 5.640
	1587.52	31.83	336.73	1417.09	604.27	503.72	-331.41	0.41	5728314.63	595931.72	S 38 35 18.489	E 148 6 5.381
	1615.73	31.83	337.19	1441.06	619.08	517.42	-337.23	0.26	5728328.32	595925.90	S 38 35 18.047	E 148 6 5.134
	1644.76	32.08	338.06	1465.69	634.36	531.62	-343.08	0.54	5728342.52	595920.06	S 38 35 17.589	E 148 6 4.885
	1673.14	31.88	339.21	1489.77	649.29	545.62	-348.56	0.68	5728356.51	595914.58	S 38 35 17.137	E 148 6 4.652
	1701.73	31.44	339.05	1514.10	664.17	559.64	-353.90	0.47	5728370.53	595909.24	S 38 35 16.684	E 148 6 4.424
	1730.20	31.11	338.98	1538.43	678.83	573.44	-359.20	0.35	5728384.33	595903.95	S 38 35 16.239	E 148 6 4.198
	1758.66	30.49	337.00	1562.88	693.31	586.95	-364.66	1.25	5728397.83	595898.49	S 38 35 15.803	E 148 6 3.966
	1787.69	30.02	336.33	1587.96	707.88	600.38	-370.45	0.60	5728411.26	595892.70	S 38 35 15.370	E 148 6 3.720
	1816.72	29.37	335.96	1613.17	722.22	613.53	-376.26	0.70	5728424.41	595886.88	S 38 35 14.946	E 148 6 3.473
	1845.90	29.25	336.20	1638.62	736.46	626.59	-382.06	0.17	5728437.46	595881.09	S 38 35 14.524	E 148 6 3.228
	1874.19	28.85	336.22	1663.35	750.16	639.16	-387.60	0.42	5728450.03	595875.55	S 38 35 14.119	E 148 6 2.992
	1903.12	29.77	335.79	1688.58	764.28	652.10	-393.36	0.98	5728462.96	595869.79	S 38 35 13.702	E 148 6 2.748
	1931.93	29.68	335.20	1713.60	778.54	665.10	-399.28	0.32	5728475.96	595863.87	S 38 35 13.282	E 148 6 2.497
	1960.48	29.43	335.29	1738.43	792.59	677.89	-405.18	0.27	5728488.74	595857.98	S 38 35 12.870	E 148 6 2.247
	1989.17	28.81	334.87	1763.49	806.53	690.55	-411.06	0.68	5728501.40	595852.10	S 38 35 12.462	E 148 6 1.998
	2017.99	30.49	337.15	1788.54	820.74	703.57	-416.85	2.11	5728514.42	595846.31	S 38 35 12.041	E 148 6 1.752
	2046.82	30.07	336.92	1813.44	835.22	716.96	-422.52	0.45	5728527.80	595840.64	S 38 35 11.610	E 148 6 1.511
	2075.33	29.46	336.75	1838.19	849.32	729.97	-428.09	0.65	5728540.81	595835.07	S 38 35 11.190	E 148 6 1.275
	2104.19	29.00	336.63	1863.37	863.36	742.91	-433.67	0.48	5728553.75	595829.50	S 38 35 10.772	E 148 6 1.038
	2133.13	28.90	336.40	1888.69	877.32	755.76	-439.25	0.16	5728566.60	595823.92	S 38 35 10.358	E 148 6 0.801
	2161.45	29.11	335.76	1913.46	891.01	768.31	-444.82	0.40	5728579.14	595818.35	S 38 35 9.953	E 148 6 0.564
	2190.26	28.86	336.28	1938.66	904.93	781.07	-450.49	0.37	5728591.90	595812.68	S 38 35 9.542	E 148 6 0.324
	2218.87	28.30	336.43	1963.79	918.57	793.61	-455.98	0.59	5728604.43	595807.19	S 38 35 9.137	E 148 6 0.091
	2247.88	29.72	336.82	1989.16	932.59	806.52	-461.56	1.48	5728617.34	595801.61	S 38 35 8.720	E 148 5 59.854

	2276.89	29.26	336.78	2014.41	946.81	819.65	-467.19	0.48	5728630.46	595795.99	S 38 35 8.297	E 148 5 59.615
	2305.72	29.94	335.41	2039.48	961.01	832.66	-472.96	1.00	5728643.48	595790.22	S 38 35 7.877	E 148 5 59.370
	2334.03	29.47	335.36	2064.07	975.01	845.42	-478.80	0.50	5728656.23	595784.38	S 38 35 7.466	E 148 5 59.122
	2363.71	30.57	335.88	2089.76	989.83	858.94	-484.93	1.14	5728669.75	595778.25	S 38 35 7.030	E 148 5 58.862
	2392.30	30.07	336.47	2114.44	1004.22	872.15	-490.76	0.61	5728682.95	595772.42	S 38 35 6.604	E 148 5 58.615
	2420.84	29.26	335.66	2139.24	1018.30	885.06	-496.49	0.95	5728695.85	595766.69	S 38 35 6.187	E 148 5 58.372
	2449.59	30.55	337.13	2164.16	1032.58	898.19	-502.23	1.55	5728708.98	595760.96	S 38 35 5.764	E 148 5 58.128
	2478.26	30.12	337.06	2188.91	1047.00	911.53	-507.86	0.45	5728722.32	595755.32	S 38 35 5.333	E 148 5 57.889
	2507.09	29.10	337.16	2213.97	1061.18	924.65	-513.40	1.06	5728735.44	595749.79	S 38 35 4.910	E 148 5 57.654
	2536.11	28.29	338.04	2239.43	1075.04	937.53	-518.71	0.94	5728748.32	595744.48	S 38 35 4.494	E 148 5 57.428
	2564.78	27.16	338.44	2264.81	1088.29	949.92	-523.66	1.20	5728760.70	595739.53	S 38 35 4.094	E 148 5 57.217
	2593.34	27.21	338.26	2290.21	1101.26	962.05	-528.47	0.10	5728772.82	595734.72	S 38 35 3.703	E 148 5 57.012
	2621.58	27.41	337.56	2315.31	1114.14	974.05	-533.34	0.40	5728784.82	595729.85	S 38 35 3.316	E 148 5 56.805
	2650.13	27.81	336.15	2340.60	1127.31	986.22	-538.55	0.81	5728796.99	595724.65	S 38 35 2.923	E 148 5 56.584
	2667.00	26.98	335.29	2355.58	1135.06	993.29	-541.74	1.64	5728804.06	595721.46	S 38 35 2.695	E 148 5 56.449
Projected to TD	2687.00	26.98	335.29	2373.41	1144.11	1001.54	-545.53	0.00	5728812.30	595717.67	S 38 35 2.429	E 148 5 56.288

Survey Type: Definitive Survey

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

Surveying Prog:

MD From (m)	MD To (m)	EOU Freq	Survey Tool Type	Borehole -> Survey
0.00	109.56	Act-Stns	SLB_MWD-STD-Depth Only	WKF W-19A -> WKF W-19A Final
109.56	1701.73	Act-Stns	SLB_MWD-STD	WKF W-19A -> WKF W-19A Final
1701.73	1730.20	Act-Stns	SLB_UNKNOWN (default tool used)	WKF W-19A -> WKF W-19A Final
1730.20	2687.00	Act-Stns	SLB_MWD-STD	WKF W-19A -> WKF W-19A Final

**Italicized stations are NOT used in position calculations.*

APPENDIX 1b

WEST KINGFISH W19A

Survey Data Listing

Report Date:	22 September 2006
Well:	West Kingfish W19A
Structure / Slot:	NABORS Rig 453
TVD Reference Datum:	Drillsite Elevation
TVD Reference Elevation:	33.43 m relative to MSL
Sea Bed / Ground Level Elevation:	76.13 m relative to MSL
Grid Coordinate System:	GDA94/MGA94 Zone 55
Location Lat/Long:	S -38 35' 34.833", E 148 6' 19.318"
Location Grid N/E:	N 5727806.791 m, E 596262.840 m
Survey Azimuth Reference:	Grid North

*Dnorth and Deast are with respect to top of conductor W19, whereas NS and EW offsets on Anadrill/Schlumberger survey data are with respect to No. 1 conductor. Northings and Eastings are absolute grid coordinates.

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
0	0	360	0	33.43	0	0	5727806.79	596262.84
5	0	0	5	28.43	0	0	5727806.79	596262.84
10	0	0	10	23.43	0	0	5727806.79	596262.84
15	0	0	15	18.43	0	0	5727806.79	596262.84
20	0	0	20	13.43	0	0	5727806.79	596262.84
25	0	347.99	25	8.43	0	0	5727806.79	596262.84
30	0.01	220.20	30.00	3.43	0	0	5727806.79	596262.84
35	0.01	220.20	35.00	-1.57	0	0	5727806.79	596262.84
40	0.02	220.20	40.00	-6.57	0	0	5727806.79	596262.84
45	0.03	220.20	45.00	-11.57	0	0	5727806.79	596262.84
50	0.03	220.20	50.00	-16.57	-0.01	-0.01	5727806.78	596262.84
55	0.04	220.20	55.00	-21.57	-0.01	-0.01	5727806.78	596262.84
60	0.04	220.20	60.00	-26.57	-0.01	-0.01	5727806.78	596262.83
65	0.05	220.20	65.00	-31.57	-0.01	-0.01	5727806.78	596262.83
70	0.05	220.20	70.00	-36.57	-0.02	-0.01	5727806.77	596262.83
75	0.06	220.20	75.00	-41.57	-0.02	-0.02	5727806.77	596262.82
80	0.07	220.20	80.00	-46.57	-0.03	-0.02	5727806.76	596262.82
85	0.07	220.20	85.00	-51.57	-0.03	-0.02	5727806.76	596262.82
90	0.08	220.20	90.00	-56.57	-0.04	-0.03	5727806.75	596262.81
95	0.09	220.20	95.00	-61.57	-0.04	-0.03	5727806.75	596262.81
100	0.09	220.20	100.00	-66.57	-0.04	-0.04	5727806.74	596262.80
105	0.10	220.20	105.00	-71.57	-0.05	-0.04	5727806.74	596262.80
110	0.10	248.32	110.00	-76.57	-0.06	-0.05	5727806.73	596262.79
115	0.10	332.52	115.00	-81.57	-0.06	-0.05	5727806.73	596262.79
120	0.11	23.48	120.00	-86.57	-0.05	-0.05	5727806.74	596262.79
125	0.13	13.11	125.00	-91.57	-0.04	-0.05	5727806.75	596262.80
130	0.15	8.77	130.00	-96.57	-0.03	-0.04	5727806.76	596262.80
135	0.15	16.47	135.00	-101.57	-0.02	-0.04	5727806.77	596262.80
140	0.19	352.90	140.00	-106.57	0.00	-0.05	5727806.79	596262.80
145	0.32	359.20	145.00	-111.57	0.02	-0.05	5727806.81	596262.80
150	0.35	3.00	150.00	-116.57	0.05	-0.04	5727806.84	596262.80
155	0.20	7.80	155.00	-121.57	0.07	-0.04	5727806.86	596262.80
160	0.12	343.81	160.00	-126.57	0.09	-0.04	5727806.88	596262.80
165	0.17	310.31	165.00	-131.57	0.09	-0.05	5727806.88	596262.79
170	0.20	288.20	170.00	-136.57	0.10	-0.07	5727806.89	596262.78
175	0.23	284.76	175.00	-141.57	0.10	-0.08	5727806.89	596262.76
180	0.30	273.26	180.00	-146.57	0.11	-0.10	5727806.90	596262.74
185	0.39	268.69	185.00	-151.57	0.11	-0.13	5727806.90	596262.71
190	0.48	264.12	190.00	-156.57	0.10	-0.17	5727806.89	596262.67
195	0.50	250.97	195.00	-161.57	0.10	-0.21	5727806.89	596262.63
200	0.50	234.72	200.00	-166.57	0.08	-0.25	5727806.87	596262.59
205	0.70	208.96	205.00	-171.57	0.04	-0.28	5727806.83	596262.56
210	0.97	179.75	210.00	-176.57	-0.03	-0.29	5727806.76	596262.55
215	1.00	164.11	215.00	-181.57	-0.11	-0.28	5727806.68	596262.56

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
220	1.05	149.03	220.00	-186.57	-0.19	-0.24	5727806.60	596262.60
225	1.43	138.78	225.00	-191.57	-0.27	-0.18	5727806.52	596262.67
230	1.78	126.78	229.99	-196.56	-0.37	-0.07	5727806.42	596262.77
235	2.03	103.53	234.99	-201.56	-0.43	0.07	5727806.36	596262.91
240	2.21	81.48	239.99	-206.56	-0.43	0.25	5727806.36	596263.09
245	2.08	64.63	244.99	-211.56	-0.37	0.42	5727806.42	596263.27
250	2.04	49.73	249.98	-216.55	-0.28	0.57	5727806.51	596263.41
255	2.17	38.73	254.98	-221.55	-0.15	0.69	5727806.64	596263.54
260	2.25	41.84	259.98	-226.54	0.01	0.80	5727806.80	596263.64
265	2.25	73.09	264.97	-231.54	0.18	0.81	5727806.97	596263.66
270	2.37	324.97	269.97	-236.54	0.35	0.73	5727807.14	596263.57
275	2.80	316.05	274.96	-241.53	0.52	0.59	5727807.31	596263.43
280	3.20	311.90	279.96	-246.53	0.70	0.39	5727807.49	596263.24
285	3.58	311.90	284.95	-251.52	0.89	0.17	5727807.68	596263.02
290	3.95	311.90	289.94	-256.51	1.11	-0.07	5727807.90	596262.77
295	4.33	311.90	294.92	-261.49	1.35	-0.34	5727808.14	596262.50
300	4.57	312.82	299.91	-266.48	1.62	-0.63	5727808.41	596262.21
305	4.71	314.46	304.89	-271.46	1.89	-0.92	5727808.68	596261.92
310	5.12	313.80	309.87	-276.44	2.19	-1.22	5727808.98	596261.62
315	5.62	312.30	314.85	-281.42	2.51	-1.57	5727809.30	596261.28
320	6.12	311.53	319.83	-286.40	2.85	-1.95	5727809.64	596260.90
325	6.62	311.03	324.80	-291.37	3.22	-2.37	5727810.01	596260.48
330	7.26	310.00	329.76	-296.33	3.61	-2.82	5727810.40	596260.02
335	7.95	308.97	334.71	-301.28	4.03	-3.33	5727810.82	596259.51
340	8.58	308.43	339.66	-306.23	4.48	-3.89	5727811.27	596258.95
345	9.21	307.93	344.60	-311.17	4.95	-4.50	5727811.74	596258.34
350	9.83	307.43	349.53	-316.10	5.46	-5.16	5727812.25	596257.68
355	10.46	306.93	354.45	-321.02	5.99	-5.86	5727812.78	596256.98
360	11.39	307.01	359.37	-325.94	6.56	-6.62	5727813.35	596256.23
365	12.34	307.09	364.26	-330.83	7.18	-7.44	5727813.97	596255.41
370	13.28	307.17	369.13	-335.70	7.85	-8.32	5727814.64	596254.52
375	14.23	307.25	373.99	-340.56	8.57	-9.27	5727815.36	596253.58
380	15.18	307.33	378.83	-345.40	9.34	-10.28	5727816.13	596252.57
385	16.03	307.47	383.64	-350.21	10.15	-11.35	5727816.94	596251.49
390	16.24	308.02	388.44	-355.01	11.01	-12.45	5727817.79	596250.40
395	16.46	308.53	393.24	-359.81	11.88	-13.55	5727818.67	596249.29
400	16.67	309.04	398.03	-364.60	12.77	-14.66	5727819.56	596248.18
405	16.89	309.55	402.82	-369.39	13.68	-15.78	5727820.47	596247.07
410	17.11	310.06	407.60	-374.17	14.62	-16.90	5727821.41	596245.94
415	17.40	310.21	412.38	-378.95	15.58	-18.03	5727822.37	596244.81
420	17.85	309.66	417.14	-383.71	16.55	-19.19	5727823.34	596243.65
425	18.31	309.16	421.90	-388.47	17.53	-20.39	5727824.32	596242.45
430	18.77	308.66	426.64	-393.21	18.53	-21.62	5727825.32	596241.22
435	19.30	308.31	431.37	-397.94	19.54	-22.90	5727826.33	596239.94
440	19.90	308.13	436.07	-402.64	20.58	-24.22	5727827.37	596238.62
445	20.51	307.94	440.77	-407.34	21.64	-25.58	5727828.43	596237.26
450	21.11	307.76	445.44	-412.01	22.73	-26.98	5727829.52	596235.86
455	21.72	307.60	450.10	-416.67	23.85	-28.42	5727830.64	596234.42
460	22.33	307.45	454.73	-421.30	24.99	-29.91	5727831.78	596232.93
465	22.87	307.27	459.35	-425.92	26.16	-31.44	5727832.95	596231.40
470	23.39	307.09	463.94	-430.51	27.34	-33.00	5727834.13	596229.84
475	23.91	306.91	468.52	-435.10	28.55	-34.61	5727835.34	596228.24
480	24.43	306.73	473.09	-439.66	29.77	-36.24	5727836.56	596226.60
485	24.95	306.57	477.63	-444.20	31.02	-37.92	5727837.81	596224.92
490	25.46	306.41	482.15	-448.72	32.29	-39.63	5727839.08	596223.21
495	25.98	306.07	486.66	-453.23	33.57	-41.38	5727840.36	596221.46
500	26.50	305.71	491.14	-457.71	34.87	-43.17	5727841.66	596219.67
505	27.02	305.36	495.61	-462.18	36.17	-45.00	5727842.96	596217.84
510	27.54	305.00	500.05	-466.62	37.49	-46.88	5727844.28	596215.96

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
515	28.06	304.68	504.47	-471.04	38.82	-48.79	5727845.61	596214.05
520	28.59	304.39	508.88	-475.45	40.17	-50.74	5727846.96	596212.10
525	29.15	304.30	513.25	-479.82	41.53	-52.74	5727848.32	596210.11
530	29.71	304.21	517.61	-484.18	42.91	-54.77	5727849.70	596208.08
535	30.27	304.12	521.94	-488.51	44.31	-56.83	5727851.10	596206.01
540	30.83	304.03	526.25	-492.82	45.74	-58.94	5727852.53	596203.90
545	31.40	303.95	530.53	-497.10	47.18	-61.08	5727853.97	596201.76
550	31.96	303.87	534.78	-501.35	48.65	-63.26	5727855.43	596199.58
555	32.52	303.78	539.01	-505.58	50.13	-65.48	5727856.92	596197.37
560	33.08	303.69	543.21	-509.78	51.63	-67.73	5727858.42	596195.11
565	33.65	303.60	547.39	-513.96	53.16	-70.02	5727859.95	596192.83
570	34.21	303.51	551.54	-518.11	54.70	-72.34	5727861.49	596190.50
575	34.77	303.43	555.66	-522.23	56.26	-74.70	5727863.05	596188.14
580	35.15	303.35	559.76	-526.33	57.84	-77.10	5727864.63	596185.74
585	35.41	303.26	563.84	-530.41	59.42	-79.51	5727866.21	596183.33
590	35.67	303.17	567.90	-534.48	61.01	-81.94	5727867.80	596180.90
595	35.93	303.09	571.96	-538.53	62.61	-84.39	5727869.40	596178.45
600	36.19	303.00	576.00	-542.57	64.22	-86.86	5727871.01	596175.98
605	36.45	302.92	580.03	-546.60	65.83	-89.34	5727872.62	596173.50
610	36.57	302.83	584.05	-550.62	67.44	-91.84	5727874.23	596171.00
615	36.66	302.74	588.06	-554.63	69.06	-94.35	5727875.85	596168.49
620	36.75	302.65	592.07	-558.64	70.67	-96.86	5727877.46	596165.98
625	36.83	302.57	596.08	-562.64	72.28	-99.38	5727879.07	596163.46
630	36.92	302.48	600.08	-566.64	73.90	-101.91	5727880.69	596160.93
635	37.00	302.39	604.07	-570.64	75.51	-104.45	5727882.30	596158.39
640	37.00	302.23	608.06	-574.63	77.12	-106.99	5727883.91	596155.85
645	37.00	302.07	612.06	-578.63	78.72	-109.54	5727885.51	596153.30
650	37.00	301.91	616.05	-582.62	80.31	-112.09	5727887.10	596150.75
655	37.00	301.74	620.04	-586.61	81.90	-114.65	5727888.69	596148.19
660	37.00	301.58	624.04	-590.61	83.48	-117.21	5727890.27	596145.63
665	37.00	301.42	628.03	-594.60	85.05	-119.77	5727891.84	596143.07
670	36.56	303.03	632.03	-598.61	86.64	-122.31	5727893.43	596140.54
675	36.12	304.64	636.07	-602.64	88.28	-124.77	5727895.07	596138.08
680	35.68	306.25	640.12	-606.69	89.97	-127.15	5727896.76	596135.69
685	35.25	307.86	644.20	-610.77	91.71	-129.47	5727898.50	596133.38
690	34.81	309.47	648.30	-614.87	93.49	-131.71	5727900.28	596131.14
695	34.37	311.08	652.42	-618.99	95.32	-133.87	5727902.11	596128.97
700	34.09	311.90	656.55	-623.12	97.19	-135.97	5727903.98	596126.87
705	33.86	312.45	660.70	-627.27	99.06	-138.05	5727905.85	596124.80
710	33.63	313.01	664.86	-631.43	100.95	-140.09	5727907.74	596122.76
715	33.41	313.56	669.02	-635.60	102.84	-142.09	5727909.63	596120.75
720	33.18	314.12	673.20	-639.77	104.74	-144.08	5727911.53	596118.77
725	32.95	314.67	677.39	-643.97	106.64	-146.02	5727913.43	596116.82
730	32.68	315.72	681.60	-648.17	108.56	-147.93	5727915.35	596114.91
735	32.40	316.78	685.81	-652.38	110.50	-149.79	5727917.29	596113.05
740	32.12	317.84	690.04	-656.61	112.46	-151.60	5727919.25	596111.24
745	31.85	318.90	694.29	-660.86	114.44	-153.36	5727921.23	596109.48
750	31.57	319.96	698.54	-665.11	116.43	-155.07	5727923.22	596107.77
755	31.36	320.91	702.81	-669.38	118.44	-156.73	5727925.23	596106.11
760	31.30	321.63	707.08	-673.65	120.47	-158.36	5727927.26	596104.49
765	31.25	322.35	711.35	-677.92	122.51	-159.96	5727929.30	596102.89
770	31.19	323.06	715.63	-682.20	124.57	-161.52	5727931.36	596101.32
775	31.13	323.78	719.91	-686.48	126.65	-163.07	5727933.44	596099.78
780	31.07	324.50	724.19	-690.76	128.74	-164.58	5727935.53	596098.26
785	30.99	325.25	728.47	-695.04	130.85	-166.06	5727937.64	596096.78
790	30.88	326.03	732.76	-699.33	132.97	-167.51	5727939.76	596095.33
795	30.78	326.81	737.06	-703.63	135.10	-168.93	5727941.89	596093.91
800	30.68	327.59	741.36	-707.93	137.25	-170.31	5727944.04	596092.53
805	30.57	328.36	745.66	-712.23	139.40	-171.66	5727946.19	596091.18

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
810	30.47	329.14	749.97	-716.54	141.57	-172.98	5727948.36	596089.86
815	30.53	330.11	754.28	-720.85	143.76	-174.26	5727950.55	596088.58
820	30.68	331.18	758.58	-725.15	145.98	-175.51	5727952.77	596087.33
825	30.83	332.25	762.88	-729.45	148.23	-176.72	5727955.02	596086.12
830	30.98	333.32	767.17	-733.74	150.51	-177.89	5727957.30	596084.95
835	31.13	334.39	771.46	-738.03	152.82	-179.02	5727959.61	596083.82
840	31.28	335.46	775.73	-742.30	155.17	-180.12	5727961.96	596082.72
845	31.36	335.57	780.01	-746.58	157.53	-181.20	5727964.32	596081.65
850	31.44	335.60	784.27	-750.84	159.90	-182.27	5727966.69	596080.57
855	31.51	335.63	788.54	-755.11	162.28	-183.35	5727969.07	596079.49
860	31.59	335.66	792.80	-759.37	164.66	-184.43	5727971.45	596078.41
865	31.67	335.69	797.06	-763.63	167.05	-185.51	5727973.84	596077.33
870	31.73	335.71	801.31	-767.88	169.45	-186.59	5727976.24	596076.25
875	31.75	335.64	805.56	-772.13	171.84	-187.67	5727978.63	596075.17
880	31.77	335.57	809.81	-776.38	174.24	-188.76	5727981.03	596074.08
885	31.79	335.51	814.06	-780.63	176.64	-189.85	5727983.43	596072.99
890	31.80	335.44	818.31	-784.88	179.03	-190.94	5727985.82	596071.90
895	31.82	335.38	822.56	-789.13	181.43	-192.04	5727988.22	596070.80
900	31.84	335.58	826.81	-793.38	183.83	-193.14	5727990.62	596069.70
905	31.85	336.08	831.06	-797.63	186.23	-194.22	5727993.02	596068.62
910	31.87	336.58	835.30	-801.88	188.65	-195.28	5727995.44	596067.57
915	31.88	337.08	839.55	-806.12	191.08	-196.32	5727997.87	596066.53
920	31.90	337.58	843.80	-810.37	193.51	-197.33	5728000.30	596065.51
925	31.92	338.09	848.04	-814.61	195.96	-198.33	5728002.75	596064.51
930	31.86	338.16	852.29	-818.86	198.41	-199.31	5728005.20	596063.53
935	31.77	338.07	856.53	-823.11	200.86	-200.29	5728007.65	596062.55
940	31.68	337.98	860.79	-827.36	203.29	-201.28	5728010.08	596061.57
945	31.59	337.90	865.04	-831.62	205.72	-202.26	5728012.51	596060.58
950	31.50	337.81	869.31	-835.88	208.15	-203.25	5728014.94	596059.59
955	31.41	337.72	873.57	-840.14	210.56	-204.24	5728017.35	596058.61
960	31.33	337.74	877.84	-844.41	212.97	-205.22	5728019.76	596057.62
965	31.25	337.76	882.11	-848.68	215.37	-206.20	5728022.16	596056.64
970	31.17	337.79	886.39	-852.96	217.77	-207.19	5728024.56	596055.66
975	31.08	337.81	890.67	-857.24	220.16	-208.16	5728026.95	596054.68
980	31.00	337.83	894.95	-861.52	222.55	-209.13	5728029.34	596053.71
985	30.92	337.85	899.24	-865.81	224.93	-210.10	5728031.72	596052.74
990	30.87	337.86	903.53	-870.10	227.31	-211.07	5728034.10	596051.77
995	30.82	337.87	907.83	-874.39	229.68	-212.04	5728036.47	596050.80
1000	30.76	337.88	912.12	-878.69	232.06	-213.00	5728038.85	596049.84
1005	30.71	337.89	916.42	-882.99	234.42	-213.96	5728041.21	596048.88
1010	30.66	337.90	920.72	-887.29	236.79	-214.92	5728043.58	596047.92
1015	30.60	337.90	925.02	-891.59	239.15	-215.88	5728045.94	596046.96
1020	30.51	337.86	929.33	-895.90	241.50	-216.84	5728048.29	596046.00
1025	30.43	337.82	933.64	-900.21	243.85	-217.79	5728050.64	596045.05
1030	30.34	337.77	937.95	-904.52	246.19	-218.75	5728052.98	596044.09
1035	30.25	337.73	942.27	-908.84	248.52	-219.70	5728055.31	596043.14
1040	30.17	337.69	946.59	-913.16	250.85	-220.66	5728057.64	596042.18
1045	30.10	337.72	950.91	-917.48	253.17	-221.61	5728059.96	596041.23
1050	30.04	337.80	955.24	-921.81	255.49	-222.56	5728062.28	596040.28
1055	29.99	337.88	959.57	-926.14	257.81	-223.50	5728064.60	596039.34
1060	29.94	337.96	963.90	-930.47	260.12	-224.44	5728066.91	596038.40
1065	29.88	338.05	968.23	-934.80	262.43	-225.38	5728069.22	596037.47
1070	29.83	338.13	972.57	-939.14	264.74	-226.30	5728071.53	596036.54
1075	29.71	338.19	976.91	-943.48	267.04	-227.23	5728073.83	596035.61
1080	29.58	338.26	981.26	-947.83	269.34	-228.15	5728076.13	596034.70
1085	29.46	338.32	985.61	-952.18	271.63	-229.06	5728078.42	596033.79
1090	29.33	338.38	989.96	-956.53	273.91	-229.96	5728080.70	596032.88
1095	29.20	338.45	994.33	-960.89	276.18	-230.86	5728082.97	596031.98
1100	29.17	338.42	998.69	-965.26	278.45	-231.76	5728085.24	596031.09

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1105	29.38	338.16	1003.05	-969.62	280.72	-232.66	5728087.51	596030.18
1110	29.59	337.90	1007.41	-973.98	283.00	-233.58	5728089.79	596029.26
1115	29.80	337.64	1011.75	-978.32	285.29	-234.52	5728092.08	596028.32
1120	30.00	337.38	1016.08	-982.65	287.59	-235.47	5728094.38	596027.37
1125	30.21	337.12	1020.41	-986.98	289.91	-236.44	5728096.70	596026.40
1130	30.45	337.04	1024.73	-991.30	292.23	-237.43	5728099.02	596025.41
1135	30.72	337.13	1029.03	-995.60	294.57	-238.42	5728101.36	596024.42
1140	30.98	337.23	1033.32	-999.89	296.94	-239.41	5728103.73	596023.43
1145	31.25	337.32	1037.60	-1004.17	299.32	-240.41	5728106.11	596022.43
1150	31.52	337.42	1041.87	-1008.44	301.72	-241.41	5728108.51	596021.43
1155	31.79	337.52	1046.13	-1012.70	304.15	-242.42	5728110.94	596020.43
1160	31.64	337.69	1050.38	-1016.95	306.58	-243.42	5728113.37	596019.42
1165	31.46	337.86	1054.64	-1021.21	309.00	-244.41	5728115.79	596018.43
1170	31.29	338.04	1058.91	-1025.48	311.41	-245.39	5728118.20	596017.46
1175	31.11	338.21	1063.19	-1029.76	313.81	-246.35	5728120.60	596016.49
1180	30.94	338.39	1067.47	-1034.04	316.21	-247.30	5728123.00	596015.54
1185	30.85	338.46	1071.76	-1038.33	318.59	-248.25	5728125.38	596014.60
1190	31.04	338.20	1076.05	-1042.62	320.98	-249.20	5728127.77	596013.65
1195	31.22	337.93	1080.33	-1046.90	323.38	-250.16	5728130.17	596012.68
1200	31.40	337.67	1084.61	-1051.18	325.78	-251.14	5728132.57	596011.70
1205	31.58	337.41	1088.87	-1055.44	328.20	-252.14	5728134.99	596010.70
1210	31.76	337.15	1093.12	-1059.69	330.62	-253.16	5728137.41	596009.69
1215	31.76	336.98	1097.37	-1063.94	333.04	-254.18	5728139.83	596008.66
1220	31.48	336.97	1101.63	-1068.20	335.46	-255.21	5728142.25	596007.63
1225	31.19	336.96	1105.90	-1072.47	337.85	-256.23	5728144.64	596006.62
1230	30.91	336.94	1110.18	-1076.76	340.22	-257.24	5728147.01	596005.61
1235	30.62	336.93	1114.48	-1081.05	342.57	-258.24	5728149.36	596004.61
1240	30.34	336.91	1118.79	-1085.36	344.91	-259.23	5728151.70	596003.61
1245	30.05	336.98	1123.11	-1089.68	347.22	-260.22	5728154.01	596002.63
1250	29.77	337.08	1127.45	-1094.02	349.52	-261.19	5728156.31	596001.65
1255	29.49	337.18	1131.79	-1098.36	351.79	-262.15	5728158.58	596000.69
1260	29.21	337.28	1136.15	-1102.72	354.05	-263.10	5728160.84	595999.74
1265	28.93	337.38	1140.52	-1107.09	356.29	-264.04	5728163.08	595998.81
1270	28.67	337.46	1144.90	-1111.47	358.52	-264.96	5728165.31	595997.88
1275	28.89	337.33	1149.29	-1115.86	360.74	-265.89	5728167.53	595996.96
1280	29.12	337.20	1153.66	-1120.23	362.97	-266.82	5728169.76	595996.02
1285	29.34	337.07	1158.02	-1124.59	365.22	-267.77	5728172.01	595995.07
1290	29.56	336.93	1162.38	-1128.95	367.49	-268.73	5728174.28	595994.11
1295	29.78	336.80	1166.72	-1133.29	369.76	-269.71	5728176.55	595993.14
1300	30.01	336.63	1171.06	-1137.63	372.05	-270.69	5728178.84	595992.15
1305	30.28	336.38	1175.38	-1141.95	374.35	-271.69	5728181.14	595991.15
1310	30.55	336.14	1179.69	-1146.26	376.67	-272.71	5728183.46	595990.13
1315	30.81	335.89	1183.99	-1150.56	379.00	-273.75	5728185.79	595989.09
1320	31.08	335.64	1188.28	-1154.85	381.34	-274.80	5728188.13	595988.04
1325	31.35	335.39	1192.56	-1159.13	383.70	-275.88	5728190.49	595986.96
1330	31.49	335.28	1196.82	-1163.39	386.07	-276.97	5728192.86	595985.87
1335	31.49	335.33	1201.09	-1167.66	388.44	-278.06	5728195.23	595984.78
1340	31.49	335.38	1205.35	-1171.92	390.82	-279.15	5728197.61	595983.69
1345	31.48	335.43	1209.61	-1176.18	393.19	-280.24	5728199.98	595982.61
1350	31.48	335.48	1213.88	-1180.45	395.56	-281.32	5728202.35	595981.52
1355	31.48	335.53	1218.14	-1184.71	397.94	-282.40	5728204.73	595980.44
1360	31.29	335.57	1222.41	-1188.98	400.31	-283.48	5728207.10	595979.36
1365	31.02	335.62	1226.69	-1193.26	402.67	-284.55	5728209.46	595978.29
1370	30.74	335.67	1230.98	-1197.55	405.01	-285.61	5728211.80	595977.23
1375	30.47	335.72	1235.28	-1201.85	407.33	-286.66	5728214.12	595976.19
1380	30.19	335.77	1239.60	-1206.17	409.63	-287.69	5728216.42	595975.15
1385	29.92	335.82	1243.93	-1210.49	411.91	-288.72	5728218.70	595974.12
1390	30.07	335.82	1248.26	-1214.83	414.19	-289.74	5728220.98	595973.10
1395	30.30	335.80	1252.58	-1219.15	416.48	-290.77	5728223.27	595972.07

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1400	30.52	335.79	1256.89	-1223.46	418.79	-291.81	5728225.58	595971.03
1405	30.75	335.77	1261.19	-1227.76	421.11	-292.86	5728227.90	595969.99
1410	30.97	335.76	1265.48	-1232.06	423.45	-293.91	5728230.24	595968.93
1415	31.19	335.74	1269.77	-1236.34	425.81	-294.97	5728232.59	595967.87
1420	31.07	335.79	1274.05	-1240.62	428.16	-296.03	5728234.95	595966.81
1425	30.95	335.84	1278.33	-1244.90	430.51	-297.09	5728237.30	595965.76
1430	30.83	335.89	1282.62	-1249.19	432.85	-298.13	5728239.64	595964.71
1435	30.71	335.94	1286.92	-1253.49	435.19	-299.18	5728241.98	595963.66
1440	30.60	335.98	1291.22	-1257.79	437.52	-300.22	5728244.31	595962.62
1445	30.48	336.06	1295.53	-1262.10	439.84	-301.25	5728246.63	595961.59
1450	30.39	336.19	1299.84	-1266.41	442.15	-302.28	5728248.94	595960.57
1455	30.29	336.33	1304.15	-1270.72	444.46	-303.29	5728251.25	595959.55
1460	30.20	336.47	1308.47	-1275.04	446.77	-304.30	5728253.56	595958.54
1465	30.10	336.60	1312.80	-1279.37	449.08	-305.30	5728255.87	595957.54
1470	30.00	336.74	1317.12	-1283.69	451.38	-306.29	5728258.16	595956.55
1475	30.17	336.75	1321.45	-1288.02	453.67	-307.28	5728260.46	595955.56
1480	30.57	336.66	1325.77	-1292.34	456.00	-308.28	5728262.79	595954.56
1485	30.96	336.57	1330.06	-1296.63	458.34	-309.29	5728265.13	595953.55
1490	31.35	336.48	1334.34	-1300.91	460.71	-310.33	5728267.50	595952.52
1495	31.74	336.39	1338.60	-1305.17	463.11	-311.37	5728269.90	595951.47
1500	32.13	336.30	1342.85	-1309.42	465.53	-312.43	5728272.32	595950.41
1505	32.22	336.22	1347.08	-1313.65	467.97	-313.51	5728274.76	595949.34
1510	32.22	336.15	1351.31	-1317.88	470.41	-314.58	5728277.20	595948.26
1515	32.22	336.07	1355.54	-1322.11	472.85	-315.66	5728279.64	595947.18
1520	32.23	336.00	1359.77	-1326.34	475.29	-316.75	5728282.08	595946.10
1525	32.23	335.93	1364.00	-1330.57	477.72	-317.83	5728284.51	595945.01
1530	32.22	335.86	1368.23	-1334.80	480.15	-318.92	5728286.94	595943.92
1535	32.12	335.90	1372.46	-1339.03	482.58	-320.01	5728289.37	595942.83
1540	32.02	335.94	1376.69	-1343.27	485.01	-321.09	5728291.80	595941.75
1545	31.92	335.97	1380.94	-1347.51	487.42	-322.17	5728294.21	595940.67
1550	31.81	336.01	1385.18	-1351.75	489.84	-323.25	5728296.63	595939.60
1555	31.71	336.04	1389.43	-1356.01	492.24	-324.31	5728299.03	595938.53
1560	31.65	336.10	1393.69	-1360.26	494.64	-325.38	5728301.43	595937.46
1565	31.68	336.22	1397.95	-1364.52	497.04	-326.44	5728303.83	595936.40
1570	31.72	336.33	1402.20	-1368.77	499.44	-327.50	5728306.23	595935.35
1575	31.75	336.44	1406.45	-1373.02	501.85	-328.55	5728308.64	595934.29
1580	31.78	336.56	1410.70	-1377.27	504.27	-329.60	5728311.06	595933.24
1585	31.81	336.67	1414.95	-1381.52	506.69	-330.64	5728313.47	595932.20
1590	31.83	336.77	1419.20	-1385.77	509.11	-331.69	5728315.90	595931.16
1595	31.83	336.85	1423.45	-1390.02	511.53	-332.73	5728318.32	595930.12
1600	31.83	336.93	1427.70	-1394.27	513.96	-333.76	5728320.75	595929.08
1605	31.83	337.02	1431.95	-1398.52	516.38	-334.79	5728323.17	595928.05
1610	31.83	337.10	1436.19	-1402.76	518.81	-335.82	5728325.60	595927.02
1615	31.83	337.18	1440.44	-1407.01	521.24	-336.84	5728328.03	595926.00
1620	31.87	337.32	1444.69	-1411.26	523.67	-337.87	5728330.46	595924.98
1625	31.91	337.47	1448.93	-1415.51	526.11	-338.88	5728332.90	595923.96
1630	31.95	337.62	1453.18	-1419.75	528.56	-339.89	5728335.35	595922.95
1635	32.00	337.77	1457.42	-1423.99	531.00	-340.90	5728337.79	595921.95
1640	32.04	337.92	1461.66	-1428.23	533.46	-341.90	5728340.25	595920.95
1645	32.08	338.07	1465.90	-1432.47	535.92	-342.89	5728342.71	595919.95
1650	32.04	338.27	1470.13	-1436.70	538.38	-343.88	5728345.17	595918.97
1655	32.01	338.47	1474.37	-1440.94	540.85	-344.85	5728347.64	595917.99
1660	31.97	338.68	1478.61	-1445.18	543.31	-345.82	5728350.10	595917.02
1665	31.94	338.88	1482.86	-1449.43	545.78	-346.78	5728352.57	595916.06
1670	31.90	339.08	1487.10	-1453.67	548.25	-347.73	5728355.04	595915.11
1675	31.85	339.20	1491.35	-1457.92	550.72	-348.67	5728357.51	595914.18
1680	31.77	339.17	1495.60	-1462.17	553.18	-349.60	5728359.97	595913.24
1685	31.70	339.14	1499.85	-1466.42	555.64	-350.54	5728362.43	595912.30
1690	31.62	339.12	1504.10	-1470.67	558.09	-351.48	5728364.88	595911.37

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1695	31.54	339.09	1508.36	-1474.93	560.53	-352.41	5728367.32	595910.43
1700	31.47	339.06	1512.63	-1479.20	562.98	-353.34	5728369.77	595909.50
1705	31.40	339.04	1516.89	-1483.46	565.41	-354.27	5728372.20	595908.57
1710	31.34	339.03	1521.16	-1487.73	567.84	-355.21	5728374.63	595907.64
1715	31.29	339.02	1525.43	-1492.00	570.27	-356.14	5728377.06	595906.71
1720	31.23	339.01	1529.71	-1496.28	572.69	-357.07	5728379.48	595905.78
1725	31.17	338.99	1533.98	-1500.55	575.11	-357.99	5728381.90	595904.85
1730	31.11	338.98	1538.26	-1504.83	577.52	-358.92	5728384.31	595903.92
1735	31.01	338.65	1542.55	-1509.12	579.93	-359.85	5728386.72	595902.99
1740	30.90	338.30	1546.84	-1513.41	582.32	-360.80	5728389.11	595902.05
1745	30.79	337.95	1551.13	-1517.70	584.70	-361.75	5728391.49	595901.09
1750	30.68	337.60	1555.43	-1522.00	587.06	-362.72	5728393.85	595900.13
1755	30.57	337.25	1559.73	-1526.30	589.41	-363.69	5728396.20	595899.15
1760	30.47	336.97	1564.04	-1530.61	591.75	-364.68	5728398.54	595898.16
1765	30.39	336.85	1568.35	-1534.92	594.08	-365.68	5728400.87	595897.17
1770	30.31	336.74	1572.66	-1539.23	596.40	-366.67	5728403.19	595896.17
1775	30.23	336.62	1576.98	-1543.55	598.72	-367.67	5728405.51	595895.17
1780	30.14	336.51	1581.30	-1547.87	601.02	-368.67	5728407.81	595894.17
1785	30.06	336.39	1585.63	-1552.20	603.32	-369.67	5728410.11	595893.17
1790	29.97	336.30	1589.96	-1556.53	605.61	-370.67	5728412.40	595892.17
1795	29.86	336.24	1594.29	-1560.86	607.90	-371.68	5728414.69	595891.16
1800	29.74	336.17	1598.63	-1565.20	610.17	-372.68	5728416.96	595890.16
1805	29.63	336.11	1602.97	-1569.54	612.43	-373.68	5728419.22	595889.16
1810	29.52	336.05	1607.32	-1573.89	614.69	-374.68	5728421.48	595888.16
1815	29.41	335.98	1611.68	-1578.25	616.94	-375.68	5728423.73	595887.16
1820	29.36	335.99	1616.03	-1582.60	619.18	-376.68	5728425.97	595886.16
1825	29.34	336.03	1620.39	-1586.96	621.42	-377.68	5728428.21	595885.16
1830	29.32	336.07	1624.75	-1591.32	623.65	-378.67	5728430.44	595884.17
1835	29.29	336.11	1629.11	-1595.68	625.89	-379.66	5728432.68	595883.18
1840	29.27	336.15	1633.47	-1600.04	628.13	-380.65	5728434.92	595882.19
1845	29.25	336.19	1637.83	-1604.40	630.36	-381.64	5728437.15	595881.20
1850	29.19	336.20	1642.20	-1608.77	632.60	-382.63	5728439.39	595880.22
1855	29.12	336.21	1646.56	-1613.13	634.82	-383.61	5728441.61	595879.23
1860	29.05	336.21	1650.93	-1617.50	637.05	-384.59	5728443.84	595878.25
1865	28.98	336.21	1655.31	-1621.88	639.27	-385.57	5728446.06	595877.27
1870	28.91	336.22	1659.68	-1626.25	641.48	-386.54	5728448.27	595876.30
1875	28.88	336.21	1664.06	-1630.63	643.69	-387.52	5728450.48	595875.32
1880	29.03	336.13	1668.43	-1635.00	645.91	-388.50	5728452.70	595874.35
1885	29.19	336.06	1672.80	-1639.37	648.13	-389.48	5728454.92	595873.36
1890	29.35	335.99	1677.16	-1643.73	650.36	-390.48	5728457.15	595872.37
1895	29.51	335.91	1681.52	-1648.09	652.61	-391.48	5728459.40	595871.36
1900	29.67	335.84	1685.87	-1652.44	654.86	-392.49	5728461.65	595870.36
1905	29.76	335.75	1690.21	-1656.78	657.12	-393.50	5728463.91	595869.34
1910	29.75	335.65	1694.55	-1661.12	659.38	-394.53	5728466.17	595868.32
1915	29.73	335.55	1698.89	-1665.46	661.64	-395.55	5728468.43	595867.29
1920	29.72	335.44	1703.23	-1669.80	663.90	-396.58	5728470.69	595866.26
1925	29.70	335.34	1707.58	-1674.15	666.15	-397.61	5728472.94	595865.23
1930	29.69	335.24	1711.92	-1678.49	668.40	-398.65	5728475.19	595864.20
1935	29.65	335.21	1716.26	-1682.83	670.65	-399.68	5728477.44	595863.16
1940	29.61	335.23	1720.61	-1687.18	672.89	-400.72	5728479.68	595862.12
1945	29.57	335.24	1724.96	-1691.53	675.13	-401.75	5728481.92	595861.09
1950	29.52	335.26	1729.31	-1695.88	677.37	-402.79	5728484.16	595860.06
1955	29.48	335.27	1733.66	-1700.23	679.61	-403.82	5728486.40	595859.02
1960	29.43	335.29	1738.01	-1704.58	681.84	-404.85	5728488.63	595858.00
1965	29.33	335.22	1742.37	-1708.94	684.07	-405.87	5728490.86	595856.97
1970	29.22	335.15	1746.73	-1713.30	686.29	-406.90	5728493.08	595855.94
1975	29.12	335.08	1751.10	-1717.67	688.50	-407.92	5728495.29	595854.92
1980	29.01	335.00	1755.47	-1722.04	690.70	-408.95	5728497.49	595853.89
1985	28.90	334.93	1759.84	-1726.41	692.90	-409.97	5728499.69	595852.87

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1990	28.86	334.94	1764.22	-1730.79	695.08	-411.00	5728501.87	595851.85
1995	29.15	335.33	1768.59	-1735.16	697.28	-412.02	5728504.07	595850.83
2000	29.44	335.73	1772.95	-1739.53	699.51	-413.03	5728506.30	595849.81
2005	29.73	336.12	1777.30	-1743.87	701.76	-414.03	5728508.55	595848.81
2010	30.02	336.52	1781.64	-1748.21	704.04	-415.03	5728510.83	595847.81
2015	30.32	336.91	1785.96	-1752.53	706.35	-416.03	5728513.14	595846.82
2020	30.46	337.13	1790.27	-1756.84	708.68	-417.01	5728515.47	595845.83
2025	30.39	337.09	1794.58	-1761.15	711.02	-418.00	5728517.81	595844.85
2030	30.32	337.05	1798.90	-1765.47	713.34	-418.98	5728520.13	595843.86
2035	30.24	337.01	1803.22	-1769.79	715.66	-419.97	5728522.45	595842.88
2040	30.17	336.97	1807.54	-1774.11	717.98	-420.95	5728524.77	595841.89
2045	30.10	336.93	1811.86	-1778.43	720.29	-421.93	5728527.08	595840.91
2050	30.00	336.90	1816.19	-1782.76	722.59	-422.91	5728529.38	595839.93
2055	29.89	336.87	1820.52	-1787.09	724.89	-423.89	5728531.68	595838.95
2060	29.79	336.84	1824.86	-1791.43	727.18	-424.87	5728533.97	595837.97
2065	29.68	336.81	1829.20	-1795.77	729.46	-425.85	5728536.25	595837.00
2070	29.57	336.78	1833.55	-1800.12	731.73	-426.82	5728538.52	595836.02
2075	29.47	336.75	1837.90	-1804.47	733.99	-427.79	5728540.78	595835.05
2080	29.39	336.73	1842.25	-1808.82	736.25	-428.76	5728543.04	595834.08
2085	29.31	336.71	1846.61	-1813.18	738.50	-429.73	5728545.29	595833.11
2090	29.23	336.69	1850.97	-1817.54	740.74	-430.70	5728547.53	595832.14
2095	29.15	336.67	1855.34	-1821.91	742.98	-431.66	5728549.77	595831.18
2100	29.07	336.65	1859.71	-1826.28	745.22	-432.63	5728552.00	595830.22
2105	29.00	336.62	1864.08	-1830.65	747.44	-433.59	5728554.23	595829.25
2110	28.98	336.58	1868.45	-1835.02	749.67	-434.55	5728556.46	595828.29
2115	28.96	336.54	1872.83	-1839.40	751.89	-435.52	5728558.68	595827.33
2120	28.95	336.50	1877.20	-1843.77	754.11	-436.48	5728560.90	595826.36
2125	28.93	336.46	1881.58	-1848.15	756.33	-437.45	5728563.12	595825.40
2130	28.91	336.42	1885.95	-1852.52	758.54	-438.41	5728565.33	595824.43
2135	28.91	336.36	1890.33	-1856.90	760.76	-439.38	5728567.55	595823.46
2140	28.95	336.24	1894.71	-1861.28	762.97	-440.35	5728569.76	595822.49
2145	28.99	336.13	1899.08	-1865.65	765.19	-441.33	5728571.98	595821.51
2150	29.03	336.02	1903.45	-1870.02	767.40	-442.31	5728574.19	595820.53
2155	29.06	335.91	1907.83	-1874.40	769.62	-443.30	5728576.41	595819.54
2160	29.10	335.79	1912.19	-1878.77	771.84	-444.30	5728578.63	595818.55
2165	29.08	335.82	1916.56	-1883.13	774.06	-445.29	5728580.85	595817.55
2170	29.04	335.91	1920.93	-1887.51	776.27	-446.29	5728583.06	595816.56
2175	28.99	336.00	1925.31	-1891.88	778.49	-447.28	5728585.28	595815.57
2180	28.95	336.09	1929.68	-1896.25	780.70	-448.26	5728587.49	595814.58
2185	28.91	336.19	1934.06	-1900.63	782.91	-449.24	5728589.70	595813.61
2190	28.86	336.28	1938.44	-1905.01	785.12	-450.21	5728591.91	595812.63
2195	28.77	336.30	1942.82	-1909.39	787.33	-451.18	5728594.12	595811.66
2200	28.67	336.33	1947.20	-1913.77	789.53	-452.14	5728596.32	595810.70
2205	28.57	336.36	1951.59	-1918.16	791.72	-453.11	5728598.51	595809.74
2210	28.47	336.38	1955.98	-1922.55	793.91	-454.06	5728600.70	595808.78
2215	28.38	336.41	1960.38	-1926.95	796.09	-455.02	5728602.88	595807.83
2220	28.36	336.45	1964.78	-1931.35	798.27	-455.96	5728605.06	595806.88
2225	28.60	336.51	1969.18	-1935.75	800.45	-456.92	5728607.24	595805.93
2230	28.84	336.58	1973.56	-1940.13	802.66	-457.87	5728609.45	595804.97
2235	29.09	336.65	1977.94	-1944.51	804.88	-458.83	5728611.67	595804.01
2240	29.33	336.71	1982.30	-1948.87	807.12	-459.80	5728613.91	595803.04
2245	29.58	336.78	1986.65	-1953.22	809.38	-460.77	5728616.17	595802.07
2250	29.69	336.82	1991.00	-1957.57	811.65	-461.75	5728618.44	595801.10
2255	29.61	336.81	1995.34	-1961.91	813.93	-462.72	5728620.72	595800.12
2260	29.53	336.80	1999.69	-1966.26	816.20	-463.69	5728622.99	595799.15
2265	29.45	336.80	2004.05	-1970.62	818.46	-464.66	5728625.25	595798.18
2270	29.37	336.79	2008.40	-1974.97	820.71	-465.63	5728627.50	595797.21
2275	29.29	336.78	2012.76	-1979.33	822.97	-466.59	5728629.76	595796.25
2280	29.33	336.63	2017.12	-1983.69	825.21	-467.56	5728632.00	595795.28

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2285	29.45	336.39	2021.48	-1988.05	827.46	-468.54	5728634.25	595794.30
2290	29.57	336.16	2025.83	-1992.40	829.72	-469.53	5728636.51	595793.31
2295	29.69	335.92	2030.18	-1996.74	831.98	-470.53	5728638.77	595792.31
2300	29.81	335.68	2034.52	-2001.09	834.24	-471.55	5728641.03	595791.29
2305	29.92	335.44	2038.85	-2005.42	836.50	-472.58	5728643.29	595790.26
2310	29.87	335.40	2043.19	-2009.76	838.77	-473.62	5728645.56	595789.22
2315	29.79	335.39	2047.52	-2014.09	841.03	-474.66	5728647.82	595788.19
2320	29.70	335.38	2051.86	-2018.43	843.29	-475.69	5728650.08	595787.15
2325	29.62	335.38	2056.21	-2022.78	845.54	-476.72	5728652.33	595786.12
2330	29.54	335.37	2060.56	-2027.13	847.78	-477.75	5728654.57	595785.09
2335	29.51	335.38	2064.91	-2031.48	850.02	-478.77	5728656.81	595784.07
2340	29.69	335.46	2069.26	-2035.83	852.27	-479.80	5728659.06	595783.04
2345	29.88	335.55	2073.60	-2040.17	854.53	-480.83	5728661.32	595782.01
2350	30.06	335.64	2077.93	-2044.50	856.80	-481.86	5728663.59	595780.98
2355	30.25	335.73	2082.25	-2048.82	859.09	-482.90	5728665.88	595779.94
2360	30.43	335.82	2086.57	-2053.14	861.39	-483.94	5728668.18	595778.91
2365	30.55	335.91	2090.88	-2057.45	863.71	-484.97	5728670.50	595777.87
2370	30.46	336.01	2095.18	-2061.75	866.03	-486.01	5728672.82	595776.83
2375	30.37	336.11	2099.49	-2066.07	868.34	-487.04	5728675.13	595775.81
2380	30.29	336.22	2103.81	-2070.38	870.65	-488.06	5728677.44	595774.79
2385	30.20	336.32	2108.13	-2074.70	872.96	-489.07	5728679.75	595773.77
2390	30.11	336.42	2112.45	-2079.02	875.26	-490.08	5728682.05	595772.77
2395	29.99	336.39	2116.78	-2083.35	877.55	-491.08	5728684.34	595771.77
2400	29.85	336.25	2121.11	-2087.68	879.84	-492.08	5728686.63	595770.76
2405	29.71	336.11	2125.45	-2092.02	882.11	-493.08	5728688.90	595769.76
2410	29.57	335.97	2129.80	-2096.37	884.37	-494.09	5728691.16	595768.76
2415	29.43	335.83	2134.15	-2100.72	886.61	-495.09	5728693.40	595767.75
2420	29.28	335.68	2138.51	-2105.08	888.85	-496.10	5728695.64	595766.75
2425	29.45	335.87	2142.87	-2109.44	891.08	-497.10	5728697.87	595765.74
2430	29.67	336.13	2147.22	-2113.79	893.34	-498.11	5728700.13	595764.74
2435	29.90	336.38	2151.56	-2118.13	895.61	-499.11	5728702.40	595763.74
2440	30.12	336.64	2155.89	-2122.46	897.90	-500.10	5728704.69	595762.74
2445	30.34	336.90	2160.21	-2126.78	900.22	-501.10	5728707.01	595761.75
2450	30.54	337.13	2164.52	-2131.09	902.55	-502.09	5728709.34	595760.76
2455	30.47	337.12	2168.83	-2135.40	904.89	-503.07	5728711.68	595759.77
2460	30.39	337.10	2173.14	-2139.71	907.22	-504.06	5728714.01	595758.78
2465	30.32	337.09	2177.45	-2144.02	909.55	-505.04	5728716.34	595757.80
2470	30.24	337.08	2181.77	-2148.34	911.87	-506.02	5728718.66	595756.82
2475	30.17	337.07	2186.09	-2152.66	914.19	-507.00	5728720.98	595755.84
2480	30.06	337.07	2190.42	-2156.99	916.50	-507.98	5728723.29	595754.86
2485	29.88	337.08	2194.75	-2161.32	918.80	-508.95	5728725.59	595753.89
2490	29.70	337.10	2199.09	-2165.66	921.09	-509.92	5728727.88	595752.92
2495	29.53	337.12	2203.43	-2170.00	923.37	-510.88	5728730.16	595751.96
2500	29.35	337.14	2207.79	-2174.36	925.63	-511.84	5728732.42	595751.00
2505	29.17	337.15	2212.15	-2178.72	927.88	-512.79	5728734.67	595750.05
2510	29.02	337.25	2216.52	-2183.09	930.12	-513.73	5728736.91	595749.11
2515	28.88	337.40	2220.89	-2187.46	932.36	-514.66	5728739.15	595748.18
2520	28.74	337.55	2225.27	-2191.84	934.58	-515.59	5728741.37	595747.26
2525	28.60	337.70	2229.66	-2196.23	936.80	-516.50	5728743.59	595746.34
2530	28.46	337.85	2234.05	-2200.62	939.01	-517.40	5728745.80	595745.44
2535	28.32	338.01	2238.45	-2205.02	941.21	-518.30	5728748.00	595744.55
2540	28.14	338.09	2242.86	-2209.43	943.41	-519.18	5728750.20	595743.66
2545	27.94	338.16	2247.27	-2213.84	945.59	-520.06	5728752.38	595742.78
2550	27.74	338.23	2251.69	-2218.26	947.76	-520.93	5728754.55	595741.92
2555	27.55	338.30	2256.12	-2222.69	949.91	-521.78	5728756.70	595741.06
2560	27.35	338.37	2260.56	-2227.13	952.06	-522.64	5728758.85	595740.21
2563	27.23	338.42	2263.22	-2229.80	953.33	-523.14	5728760.12	595739.70
2564	27.19	338.43	2264.11	-2230.68	953.76	-523.31	5728760.55	595739.53
2565	27.16	338.44	2265.00	-2231.57	954.18	-523.48	5728760.97	595739.36

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2566	27.16	338.43	2265.89	-2232.46	954.61	-523.65	5728761.40	595739.20
2567	27.16	338.43	2266.78	-2233.35	955.03	-523.81	5728761.82	595739.03
2568	27.17	338.42	2267.67	-2234.24	955.46	-523.98	5728762.25	595738.86
2569	27.17	338.41	2268.56	-2235.13	955.88	-524.15	5728762.67	595738.69
2570	27.17	338.41	2269.45	-2236.02	956.31	-524.32	5728763.10	595738.52
2571	27.17	338.40	2270.34	-2236.91	956.73	-524.49	5728763.52	595738.36
2572	27.17	338.39	2271.23	-2237.80	957.16	-524.65	5728763.95	595738.19
2573	27.17	338.39	2272.12	-2238.69	957.58	-524.82	5728764.37	595738.02
2574	27.18	338.38	2273.01	-2239.58	958.01	-524.99	5728764.80	595737.85
2575	27.18	338.38	2273.90	-2240.47	958.43	-525.16	5728765.22	595737.68
2576	27.18	338.37	2274.79	-2241.36	958.85	-525.33	5728765.64	595737.51
2577	27.18	338.36	2275.68	-2242.25	959.28	-525.50	5728766.07	595737.35
2578	27.18	338.36	2276.57	-2243.14	959.70	-525.66	5728766.49	595737.18
2579	27.18	338.35	2277.46	-2244.03	960.13	-525.83	5728766.92	595737.01
2580	27.19	338.34	2278.35	-2244.92	960.55	-526.00	5728767.34	595736.84
2581	27.19	338.34	2279.24	-2245.81	960.98	-526.17	5728767.77	595736.67
2582	27.19	338.33	2280.13	-2246.70	961.40	-526.34	5728768.19	595736.50
2583	27.19	338.33	2281.02	-2247.59	961.83	-526.51	5728768.62	595736.33
2584	27.19	338.32	2281.91	-2248.48	962.25	-526.68	5728769.04	595736.17
2585	27.20	338.31	2282.80	-2249.36	962.68	-526.85	5728769.47	595736.00
2586	27.20	338.31	2283.68	-2250.26	963.10	-527.01	5728769.89	595735.83
2587	27.20	338.30	2284.57	-2251.14	963.53	-527.18	5728770.32	595735.66
2588	27.20	338.29	2285.46	-2252.03	963.95	-527.35	5728770.74	595735.49
2589	27.20	338.29	2286.35	-2252.92	964.38	-527.52	5728771.17	595735.32
2590	27.20	338.28	2287.24	-2253.81	964.80	-527.69	5728771.59	595735.15
2591	27.21	338.27	2288.13	-2254.70	965.23	-527.86	5728772.01	595734.98
2592	27.21	338.27	2289.02	-2255.59	965.65	-528.03	5728772.44	595734.81
2593	27.21	338.26	2289.91	-2256.48	966.07	-528.20	5728772.86	595734.64
2594	27.21	338.24	2290.80	-2257.37	966.50	-528.37	5728773.29	595734.47
2595	27.22	338.22	2291.69	-2258.26	966.92	-528.54	5728773.71	595734.30
2596	27.23	338.19	2292.58	-2259.15	967.35	-528.71	5728774.14	595734.13
2597	27.24	338.17	2293.47	-2260.04	967.77	-528.88	5728774.56	595733.96
2598	27.24	338.14	2294.36	-2260.93	968.20	-529.05	5728774.99	595733.79
2599	27.25	338.12	2295.25	-2261.82	968.62	-529.22	5728775.41	595733.62
2600	27.26	338.09	2296.14	-2262.70	969.05	-529.39	5728775.84	595733.45
2601	27.26	338.07	2297.02	-2263.59	969.47	-529.56	5728776.26	595733.28
2602	27.27	338.05	2297.91	-2264.48	969.90	-529.73	5728776.69	595733.11
2603	27.28	338.02	2298.80	-2265.37	970.32	-529.90	5728777.11	595732.94
2604	27.29	338.00	2299.69	-2266.26	970.75	-530.08	5728777.54	595732.77
2605	27.29	337.97	2300.58	-2267.15	971.17	-530.25	5728777.96	595732.60
2606	27.30	337.95	2301.47	-2268.04	971.60	-530.42	5728778.39	595732.42
2607	27.31	337.92	2302.36	-2268.93	972.02	-530.59	5728778.81	595732.25
2608	27.31	337.90	2303.24	-2269.82	972.45	-530.76	5728779.24	595732.08
2609	27.32	337.87	2304.13	-2270.70	972.87	-530.94	5728779.66	595731.91
2610	27.33	337.85	2305.02	-2271.59	973.30	-531.11	5728780.09	595731.73
2611	27.34	337.82	2305.91	-2272.48	973.72	-531.28	5728780.51	595731.56
2612	27.34	337.80	2306.80	-2273.37	974.15	-531.46	5728780.94	595731.39
2613	27.35	337.77	2307.69	-2274.26	974.57	-531.63	5728781.36	595731.21
2614	27.36	337.75	2308.57	-2275.15	975.00	-531.80	5728781.79	595731.04
2615	27.36	337.72	2309.46	-2276.03	975.42	-531.98	5728782.21	595730.86
2616	27.37	337.70	2310.35	-2276.92	975.85	-532.15	5728782.64	595730.69
2617	27.38	337.67	2311.24	-2277.81	976.28	-532.33	5728783.07	595730.51
2618	27.38	337.65	2312.13	-2278.70	976.70	-532.50	5728783.49	595730.34
2619	27.39	337.62	2313.01	-2279.59	977.13	-532.68	5728783.92	595730.16
2620	27.40	337.60	2313.90	-2280.47	977.55	-532.85	5728784.34	595729.99
2621	27.41	337.57	2314.79	-2281.36	977.98	-533.03	5728784.77	595729.81
2622	27.42	337.54	2315.68	-2282.25	978.40	-533.20	5728785.19	595729.64
2623	27.43	337.49	2316.57	-2283.14	978.83	-533.38	5728785.62	595729.46
2624	27.44	337.44	2317.45	-2284.02	979.25	-533.56	5728786.04	595729.29

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2625	27.46	337.39	2318.34	-2284.91	979.68	-533.73	5728786.47	595729.11
2626	27.47	337.34	2319.23	-2285.80	980.10	-533.91	5728786.89	595728.93
2627	27.49	337.29	2320.11	-2286.68	980.53	-534.09	5728787.32	595728.75
2628	27.50	337.24	2321.00	-2287.57	980.96	-534.27	5728787.75	595728.57
2629	27.51	337.19	2321.89	-2288.46	981.38	-534.45	5728788.17	595728.40
2630	27.53	337.14	2322.78	-2289.35	981.81	-534.63	5728788.60	595728.22
2631	27.54	337.09	2323.66	-2290.23	982.24	-534.81	5728789.03	595728.04
2632	27.56	337.05	2324.55	-2291.12	982.66	-534.99	5728789.45	595727.86
2633	27.57	337.00	2325.44	-2292.01	983.09	-535.17	5728789.88	595727.68
2634	27.58	336.95	2326.32	-2292.89	983.51	-535.35	5728790.30	595727.49
2635	27.60	336.90	2327.21	-2293.78	983.94	-535.53	5728790.73	595727.31
2636	27.61	336.85	2328.09	-2294.67	984.36	-535.71	5728791.15	595727.13
2637	27.63	336.80	2328.98	-2295.55	984.79	-535.90	5728791.58	595726.95
2638	27.64	336.75	2329.87	-2296.44	985.22	-536.08	5728792.01	595726.77
2639	27.65	336.70	2330.75	-2297.32	985.64	-536.26	5728792.43	595726.58
2640	27.67	336.65	2331.64	-2298.21	986.07	-536.44	5728792.86	595726.40
2641	27.68	336.60	2332.52	-2299.09	986.50	-536.63	5728793.29	595726.21
2642	27.70	336.55	2333.41	-2299.98	986.92	-536.81	5728793.71	595726.03
2643	27.71	336.50	2334.30	-2300.86	987.35	-537.00	5728794.14	595725.84
2644	27.72	336.45	2335.18	-2301.75	987.78	-537.19	5728794.57	595725.66
2645	27.74	336.40	2336.07	-2302.64	988.20	-537.37	5728794.99	595725.47
2646	27.75	336.35	2336.95	-2303.52	988.63	-537.56	5728795.42	595725.28
2647	27.77	336.30	2337.84	-2304.41	989.06	-537.74	5728795.84	595725.10
2648	27.78	336.26	2338.72	-2305.29	989.48	-537.93	5728796.27	595724.91
2649	27.79	336.21	2339.61	-2306.18	989.91	-538.12	5728796.70	595724.72
2650	27.81	336.16	2340.49	-2307.06	990.33	-538.31	5728797.12	595724.53
2651	27.77	336.11	2341.37	-2307.94	990.76	-538.50	5728797.55	595724.34
2652	27.72	336.05	2342.26	-2308.83	991.19	-538.69	5728797.98	595724.16
2653	27.67	336.00	2343.15	-2309.72	991.61	-538.87	5728798.40	595723.97
2654	27.62	335.95	2344.03	-2310.60	992.04	-539.06	5728798.83	595723.78
2655	27.57	335.90	2344.92	-2311.49	992.46	-539.25	5728799.25	595723.59
2656	27.52	335.85	2345.80	-2312.37	992.88	-539.44	5728799.67	595723.40
2657	27.47	335.80	2346.69	-2313.26	993.30	-539.63	5728800.09	595723.21
2658	27.42	335.75	2347.58	-2314.15	993.72	-539.82	5728800.51	595723.02
2659	27.37	335.70	2348.47	-2315.04	994.14	-540.01	5728800.93	595722.83
2660	27.32	335.65	2349.35	-2315.92	994.56	-540.20	5728801.35	595722.64
2661	27.28	335.60	2350.24	-2316.81	994.98	-540.39	5728801.77	595722.45
2662	27.23	335.54	2351.13	-2317.70	995.39	-540.58	5728802.18	595722.27
2663	27.18	335.49	2352.02	-2318.59	995.81	-540.77	5728802.60	595722.08
2664	27.13	335.44	2352.91	-2319.48	996.23	-540.96	5728803.02	595721.89
2665	27.08	335.39	2353.80	-2320.37	996.64	-541.15	5728803.43	595721.70
2666	27.03	335.34	2354.69	-2321.26	997.05	-541.34	5728803.84	595721.51
2667	26.98	335.29	2355.58	-2322.15	997.47	-541.53	5728804.26	595721.32
2668	26.98	335.29	2356.47	-2323.04	997.88	-541.71	5728804.67	595721.13
2669	26.98	335.29	2357.36	-2323.93	998.29	-541.90	5728805.08	595720.94
2670	26.98	335.29	2358.26	-2324.83	998.70	-542.09	5728805.49	595720.75
2671	26.98	335.29	2359.15	-2325.72	999.12	-542.28	5728805.91	595720.56
2672	26.98	335.29	2360.04	-2326.61	999.53	-542.47	5728806.32	595720.37
2673	26.98	335.29	2360.93	-2327.50	999.94	-542.66	5728806.73	595720.18
2674	26.98	335.29	2361.82	-2328.39	1000.35	-542.85	5728807.14	595719.99
2675	26.98	335.29	2362.71	-2329.28	1000.76	-543.04	5728807.55	595719.80
2676	26.98	335.29	2363.60	-2330.17	1001.18	-543.23	5728807.97	595719.61
2677	26.98	335.29	2364.49	-2331.06	1001.59	-543.42	5728808.38	595719.42
2678	26.98	335.29	2365.39	-2331.95	1002.00	-543.61	5728808.79	595719.23
2679	26.98	335.29	2366.28	-2332.85	1002.41	-543.80	5728809.20	595719.04
2680	26.98	335.29	2367.17	-2333.74	1002.82	-543.99	5728809.61	595718.85
2681	26.98	335.29	2368.06	-2334.63	1003.24	-544.18	5728810.03	595718.66
2682	26.98	335.29	2368.95	-2335.52	1003.65	-544.37	5728810.44	595718.47
2683	26.98	335.29	2369.84	-2336.41	1004.06	-544.56	5728810.85	595718.28

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2684	26.98	335.29	2370.73	-2337.30	1004.47	-544.75	5728811.26	595718.09
2685	26.98	335.29	2371.62	-2338.19	1004.89	-544.94	5728811.68	595717.90
2686	26.98	335.29	2372.51	-2339.09	1005.30	-545.13	5728812.09	595717.71
2687	26.98	335.29	2373.41	-2339.98	1005.71	-545.32	5728812.50	595717.52

APPENDIX 2a

WEST KINGFISH W19A

Petrophysics Evaluation Summary

Esso Australia Pty Ltd.

Exploration Department

West Kingfish W19A
Petrophysics Report

Petrophysicist: K.Kuttan

September 2006

West Kingfish W19A Petrophysical Analysis

West Kingfish W-19A was a directional well designed to recover M1.2UMD and M1.2L oil reserves that had previously been accessed by the abandoned W-19 well located northwest of the platform. West Kingfish W-19A was kicked off at 666mMD out of the 10.75inch surface casing of the abandoned W19 well. A 8.5 inch hole was drilled from 666mMD to the total depth of 2687.0mMD. The well was logged with the Precision Energy Services compact shuttle system from 2670mMD (first reading) to 666m MD. Over three intervals, 2670.0 - 2439.2 mMD; 1749.3 - 1519.3 mMD and 1289.4 - 666mMD logs were acquired at normal logging speed but in the intervals in-between they were acquired at tripping speed. The last two intervals were logged to evaluate the high mud gas readings observed over these intervals while drilling. After completing the logging operations, the well was completed with 7" production casing and 2⅞" tubing.

The Precision Energy Services Shuttle logs have been analysed for porosity, water saturation and net pay over the interval 2593-2655mMD.

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 (m MDRT)	Bottom (m MDRT)
Compact Gamma Ray - Compact Dual Neutron - Compact Photodensity - Compact Sonic - Compact Dual Laterolog-Compact Induction	1	Precision Energy Services	666	2670

Deviation

The well angle over the West Kingfish reservoirs was 27 degrees.

Mud Data

Mud Type : KCl/Glycol/PHPA
Mud Weight: 9.6 ppg
Rm: 0.106 @ 25 ^{0}C
Rmf: 0.085 @ 25 ^{0}C
Rmc: 0.114 @ 25 ^{0}C
BHT: 83.2 ^{0}C

Hole Size

666- 2687 mMDRT 8.5 inches

Data Acquisition & Log Quality

All log data were of acceptable quality.

Data Processing

Because of the shaly and thinly bedded nature of the upper West Kingfish reservoirs a combination of unfiltered and filtered logs (both provided by Precision) as shown below were used in the interpretation. However, the unfiltered density log (DEN) provided by Precision was considered to be too “noisy” to be used in the interpretation. Hence a 3 point-equal-weighting filter was used to filter this log.
The deep and shallow resistivity (DDL and DSLL), the filtered DEN and associated curves (photoelectric – PDPE, density correction-DCOR and caliper –CLDC), were depth-matched to the gamma ray (GRGC) which had been depth-matched and merged with LWD gamma ray (GRM1). The neutron porosity log (NPRL) was

depth matched to the filtered and GR-depth-matched DEN. Similarly, the compressional sonic log (DT35) was depth matched to the DEN.
No environmental corrections other than those applied in the field were applied to the final logs.

Logs	Status
GRGC	filtered
DDLL	Unfiltered
DSLL	Unfiltered
DEN	3 point, equal weighting
NPRL	Unfiltered
PDPE	Filtered
DT35	Filtered

INTERPRETATION

Logs Used

The primary logs used in the interpretation were, DDLL (deep resistivity), DEN (bulk density),NPRL (thermal neutron porosity in LPU), DT35 (compressional sonic) and U (photoelectric effect). U was generated from the photoelectric curve PDPE using the following relationship:

U=(PDPE-0.34) *((DEN+0.1883)/1.0704)).

The reason for adjusting the formation photoelectric curve is the fact that measured values appear to be higher than the theoretical values in clean quartz sands (of the order of 2.1+ vs the theoretical value of 1.81)
Coal intervals were identified using a coal flag (Flag_coal). A temperature log was created using the following data:

Depth	Temperature (deg. C)
109.5	10
2670	93.2

The temperature at depth 109.5mMD represents the temperature of the sea-bed and the temperature at 2670m mDRT (first reading of the Precision logs) is the estimated formation temperature BHT +10 deg.

Formation Water Salinity

R_{wa} analysis using a = 1, m = 2 and n = 2 indicates clean water sands have an apparent formation water salinity of 37000ppm NaCl equivalent. This salinity was used as the formation water salinity for all the sands.

Hydrocarbon Type Identification

In West Kingfish the only hydrocarbons to be found is oil

Shale Volume, Porosity and Water Saturation

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

ELAN+ MODEL

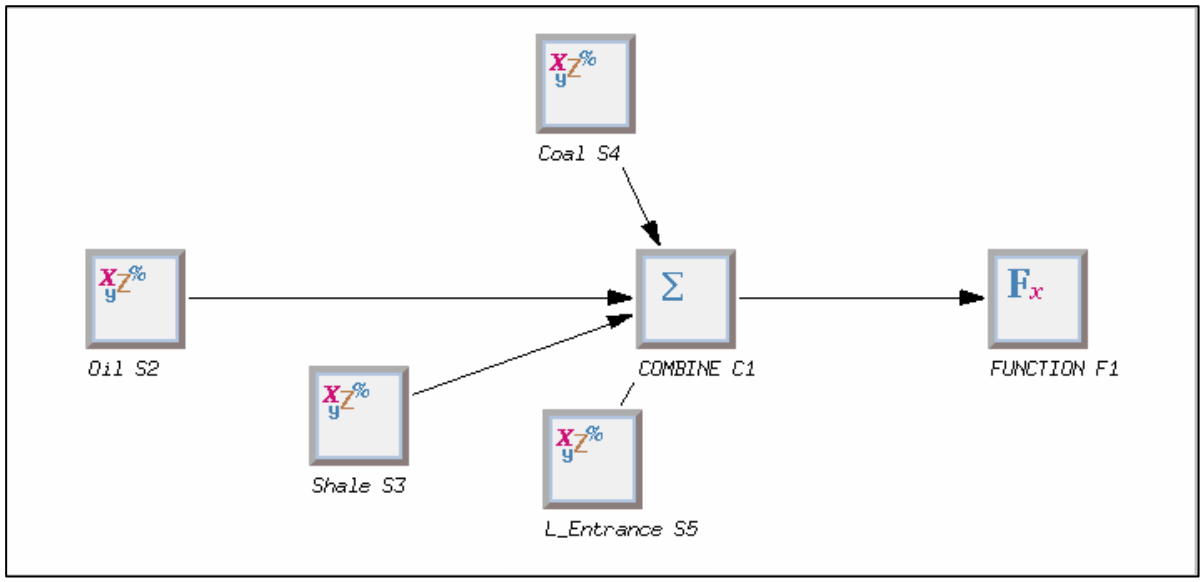


Figure 1: Elan + Model and Module Configuration

ELAN Input Channels

Log Curve Selector | Selector Options

	Compound Name Spec	WEST KINGFISH W19A
TEMP_CH	TEMP;*	TEMP TEMP TEMP@Elan_Input;3 [A1762560]
RHOB_IFAC_CH	IFRH;*	
NPHI_IFAC_CH	INPH;*	
RHOB_CH	DEN:BPB;*	DEN DEN DEN@Elan_Input;16 [A1762537]
NPHI_CH	NPRL:BPB;*	NPRL NPRL NPRL@Elan_Input;13 [A1762545]
DT_CH	DT35:BPB;*	DT35 DT35 DT35@Elan_Input;13 [A1762551]
U_CH	U;*	U U U@Elan_Input;5 [A1762555]
CUDC_CH/RT_CH	DDLL:BPB;*	DDLL DDLL DDLL@Elan_Input;12 [A1762533]
PRB2_CH	DEPT:BPB;*	
PRB3_CH	PRB3;*	
PRB4_CH	FLAG_COAL;*	FLAG_COAL FLAG_COAL FLAG_COAL@Elan_In
PRB5_CH	PRB5;*	
M_CH	MXP;*	

ELAN Global Parameters

Reference Index	MD
Processing Interval	2584.9998(m) To 2657.0000(m)
Sampling Rate	0.1(m)
Uncertainty Channel	FALSE
Clay Input	DRY
Special Fluids	IMMOVABLE_HYDROCARBON

ELAN Zone Definition

Name	Bottom To Top
No_GR	2669.9973(m) To 2584.9998(m)

ELAN Process Definition

Process SOLVE2 "Oil"

Equations	RHOB	NPHI	DT	U	CUDC_DWA	CT2		
Volumes	QUAR	ORTH	PYRI	ILLI	XWAT	UWAT	XOIL	UOIL

Constraint Zones	Bottom	Top
UNDEFINED	2669.9973(m)	2584.9998(m)

Constraints Applied

UNDEFINED	- IrreducibleXWater
UNDEFINED	- IrreducibleUWater
UNDEFINED	- WaterBaseMud_SXO_gt_SW

Process SOLVE3 "Shale"

Equations	RHOB	NPHI	CUDC_DWA	
Volumes	QUAR	ILLI	XWAT	UWAT

Constraint Zones	Bottom	Top
UNDEFINED	2669.9973(m)	2584.9998(m)

Process SOLVE4 "Coal"

Equations	RHOB
Volumes	COAL

Constraint Zones	Bottom	Top
UNDEFINED	2669.9973(m)	2584.9998(m)

Process **SOLVE5 "L_Entrance"**

```
Equations          RHOB
Volumes            ILLI

Constraint Zones   Bottom                  Top
UNDEFINED          2669.9973(m )      2584.9998(m )
```

Process **COMBINE 1 "COMBINE"**

```
Order              SOL.2 SOL.3 SOL.4 SOL.5
```

Combine Method

```
"Coarse Clast" 2540-2670(m ) Internal Average
```

Probability Functions

```
probability(SOL.4, PRB4_CH)
prob3 = linear(ILLI_VOL.SOL.3, 0.3, 0, 0.6, 1)
probability(SOL.3, prob3)
```

Process **FUNCTION 1 "FUNCTION"**

```
Outputs            VCL       SXWI      SWT       SUWI      PIGN      PHIT

User-defined Function
swt_cmp=if((PRB4_CH > 0),1,(UWAT_VOL + XBWA_VOL)/(UWAT_VOL + XBWA_VOL + UOIL_VOL))
output(SWT, swt_cmp)
```

RESULTS AND DISCUSSION

A summary of the petrophysical analysis is detailed in Table 1 and illustrated in Fig. 2.

Interval 2593.0-2599mMD (M1.2UOil, M1.2UWater-ResOil)
The interval 2593- 2597.8mMD is interpreted to be oil bearing and the interval 2597.8–2599mMD is interpreted to be a residual oil zone. Given that the average effective water saturation is 60% it is not obvious that the interval 2597.8-2599mMD is a residual oil zone. However, on perforating the interval 2592.5-2597mMD the well flowed 81klo/d, with a watercut of 78%, suggesting that this zone is probably a residual oil zone.

Interval 2599.5-2600.7mMD(M1.2Oil)
The zone is interpreted to be a possible oil zone. It is a potential perforation candidate. It is postulated that the interval 2599.0-2599.5mMD is a thin siltstone interval that is acting as a barrier to production.

Interval 2602.1-2603.9mMD (M1.2LOil, M1.2LWater-ResOil)
The interval 2602.1-2603.2 is interpreted to be a possible oil zone. It is a potential perforation candidate. It is postulated that the interval 2600.7-2602.1mMD consists of a siltstone which is acting as a barrier to production. The interval from 2603.2-2603.9mMD is interpreted to be a residual oil zone.

Interval 2610.8-2611.7mMD (M1.3UOil)
The reservoir in this interval is interpreted to be oil bearing. It is not obvious from the quantitative interpretation that this zone is oil productive (average effective water saturation is 62%); however, a nearby well (W14A) at this structural level is oil productive suggesting that this zone is likely to be oil productive.

Interval 2612.5-2632.3m(M1.3UWater-ResOil)
This interval is interpreted to be a residual oil zone. The relatively high "residual" oil saturation (average of 29% and high as 40%) is probably a reflection of the poorer quality of sands in this interval. It is possible some of this "residual" oil may be producible. This could be achieved by perforating zones with the higher "residual" oil saturations in this well or the same zones in an up-dip location and flowing the sands for a long time (production probably will be mostly water with some oil cut).

Interval 2632.3-2654.5m(M1.3LWater-ResOil)
This zone is definitely water bearing with residual oil.

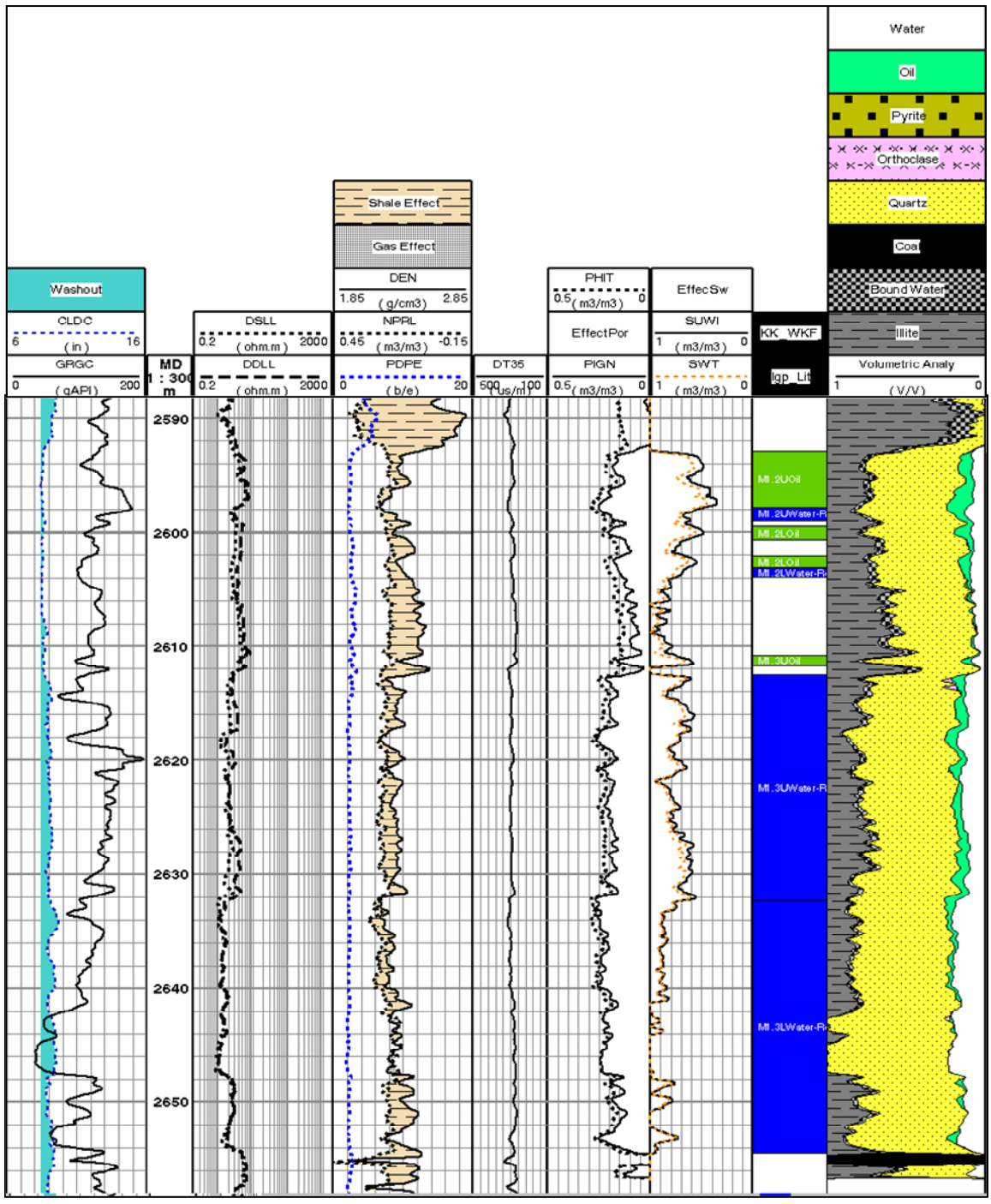


Fig. 2 West Kingfish W19A Interval 2593.0 – 2655 mMD

West Kingfish W19A

Petrophysical Summary 2593 - 2655m MD

Depth Reference: Primary: mDKB

Mean VCL, Mean PHIE (or PIGN), Mean SWE (or SUWI) is based on a PHIE or PIGN cutoff: 0.10 for oil &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
M1.2UOil	2593.0	2256.5	2597.8	2260.8	4.8	4.3	0.99	0.27	0.177	0.48	Oil bearing	4.8	4.3
M1.2UWater-ResOil	2597.8	2260.8	2599.0	2261.9	1.2	1.1	1.00	0.23	0.210	0.60	Water bearing, residual oil		
M1.2LOil	2599.5	2262.3	2600.7	2263.3	1.2	1.1	1.00	0.27	0.176	0.53	Probably oil bearing	1.2	1.1
M1.2LOil	2602.1	2264.6	2603.2	2265.5	1.0	0.9	1.00	0.29	0.166	0.59	Probably oil bearing	1.0	0.9
M1.2LWater-ResOil	2603.2	2265.5	2603.9	2266.2	0.8	0.7	1.00	0.31	0.148	0.69	Water bearing, residual oil		
M1.3UOil	2610.8	2272.3	2611.7	2273.1	0.9	0.8	0.78	0.27	0.142	0.62	Oil bearing	0.7	0.6
M1.3UWater-ResOil	2612.5	2273.8	2632.3	2291.4	19.8	17.6	1.00	0.23	0.194	0.71	Water bearing, residual oil		
M1.3LWater-ResOil	2632.3	2291.4	2654.5	2311.1	22.2	19.6	0.99	0.15	0.205	0.91	Water bearing, residual oil		

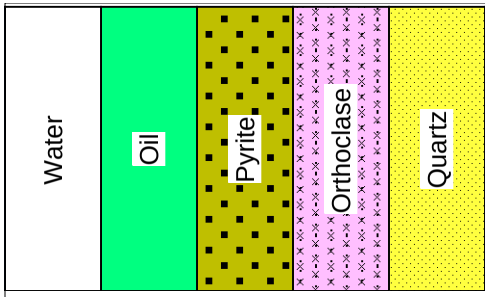
Table 1

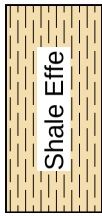
WEST KINGFISH W19A

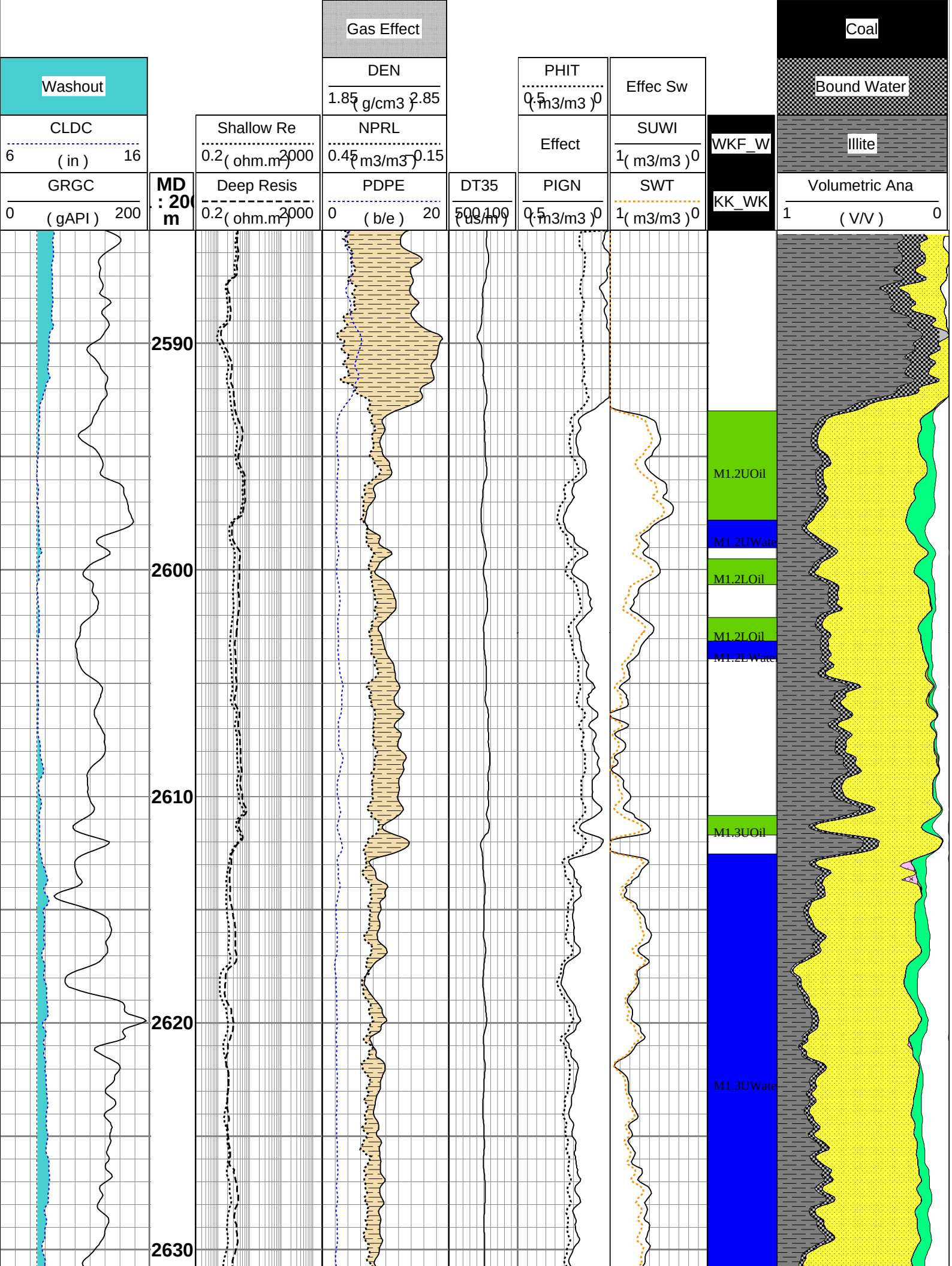
Petrophysical Analysis

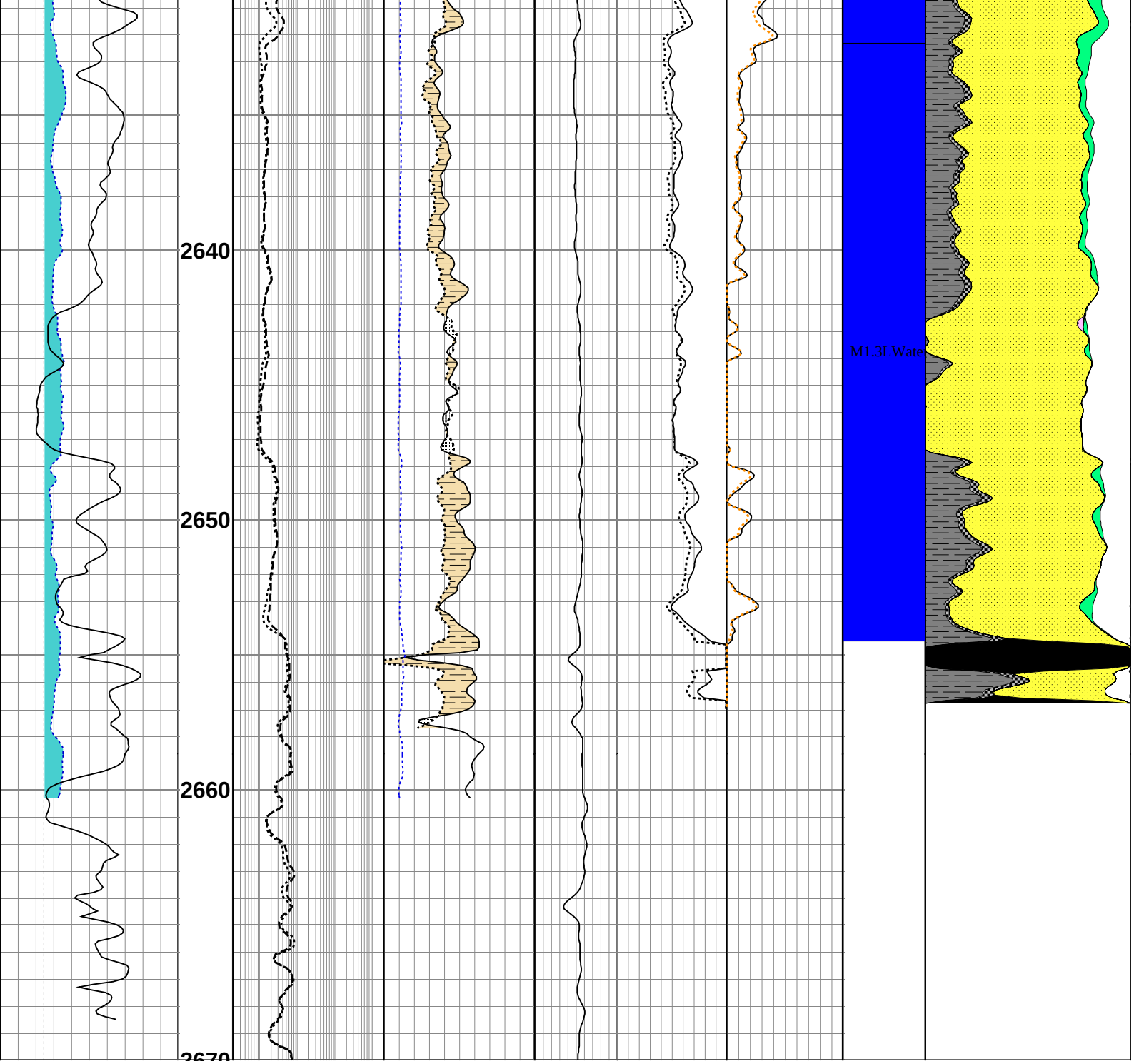
COMPANY:	Esso Australia Pty. Ltd.
WELL:	WEST KINGFISH W19A
BOREHOLE:	
FIELD:	WEST KINGFISH
STATE:	VIC
COUNTRY:	AUSTRALIA
PETROPHYSICIST:	KUMAR KUTTAN

Date Logged:	10−Jun−06	Date of Analysis: September 2006
Well Location:	<FL>	
Elevations:	K.B. 33.43 m	D.F. <DF>
Latitude:	<LATI>	G.L. <GL>
Longitude:	<LONG>	






Washout
CLDC
6 (in) 16
GRGC
0 (gAPI) 200
MD : 20(m
Shallow Re
0.2 (ohm.m) 2000
Deep Resis
0.2 (ohm.m) 2000
Gas Effect
DEN
1.85 (g/cm3) 2.85
NPRL
0.45 (m3/m3) 0.15
PDPE
0 (b/e) 20
DT35
500 (us/m) 100
PHIT
0.5 (m3/m3) 0
Effect
PIGN
0.5 (m3/m3) 0
Effec Sw
SUWI
1 (m3/m3) 0
SWT
1 (m3/m3) 0
WKF_W
KK_WK
Coal
Bound Water
Illite
Volumetric Ana
1 (V/V) 0
2590
2600
2610
2620
2630
M1.2UOil
M1.2UWate
M1.2LOil
M1.2LOil
M1.2LWate
M1.3UOil
M1.3UWate


2640
2650
2660
2670
M1.3L Wate

APPENDIX 3a

WEST KINGFISH W19A

Lithology/Show Descriptions

West Kingfish W19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
			Previous Well History: SLOT 19: WKF W19 drilled in November 1982. 13.5" hole to 666.0 mMDRT/628.8 mTVDRT. 10.75" surface casing at 666.0 mMDRT/628.8 mTVDRT, at an inclination of 37 degrees. 9.875" hole to 2778.0 mMDRT/2376.0 mTVDRT, with an inclination of 32 degrees at TD. 7.625" Production liner at 2778.0 mMDRT/2376.0 mTVDRT, cut and pulled above 745.0 mMDRT. After setting a 127 metre cement plug above 745.0 mMDRT, WKF W19 was Plugged and Abandoned in November/December 2005. RT to MSL = 33.43 metres Water depth = 76.13 metres RT to seafloor = 109.56 metres **Geologist on rig at 1600 hrs, 04 June 2006 at 1108.0 mMDRT / 1005.6 mTVDRT.** Start RIH at 0715 hrs, 03 June 2006. Tagged TOC at 0945 hrs 03 June 2006 at 618 .0 mMDRT and drilled hard cement to 669.0 mMDRT. Controlled drilled cement to start kick-off of WKF_W19A at 669.0 mMDRT at 1245 hrs 03 June 2006, with a Smith S73PX PDC bit on steerable motor assembly. Samples from 677.0 showed an increasing percentage of new formation (Gippsland Limestone Calcilutite). At 1745 hrs, at 687.0 mMDRT when 60% new formation was seen in the samples, stopped drilling for a PIT. **Perform PIT at 666.0 mMDRT (628.8 mTVDRT) / 367 psi/ 12.6 ppg EMW using 9.2 ppg mud, at 1830 hrs, 03 June 2006.** Drilled from 687.0 mMDRT to TD of 2687.0 mMDRT with a KCl/Glycol/PHPA mud system. Bit Details: BHA # 1, Bit # 1. Size: 8.5", Manufacturer / Type: Smith S73PX, Serial #: JW0241. Jets: 20 x 6, TFA: 1.841 sq.in, Grading: **1-1-WT-S-X-1-CT-TD.** Krevs: 745.0, Top Drive RPM: 60-120 (+ 176-180 DHM RPM). Depth In: 666.0 mMDRT. Depth Out: 2687.0 mMDRT. Metres drilled: 2021.0 m, HOB: 48.13. Average ROP: 41.99 m/hr. Rotating: 1834.0 metres / Rotating HOB = 31.18, Average Rotating ROP = 58.82 m/hr. Steering: 187.0 metres / Steering HOB = 16.95 , Average Steering ROP = 11.03 m/hr. **30 metre spot samples from 690.0 to 2400.0 mMDRT.**
687	690	100	CALCILUTITE: very light grey to light grey, silty in part, trace fossil fragments, trace forams, soft, dispersive, amorphous.

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Interval (m) From	To	%	Lithology / Show Description
690	720	100	CALCILUTITE: very light grey to light grey, rare light greenish grey, silty in part grading to CALCISILTITE, trace fossil fragments, trace forams, soft, dispersive, amorphous.
			03 June 2006 Midnight depth = 739.0 mMDRT / 689.3 mTVDRT.
720	750	100	CALCILUTITE: very light grey to light greenish grey, yellowish grey, silty in part grading to CALCISILTITE, trace fossil fragments, trace nodular pyrite, soft, dispersive, amorphous to sub blocky in part.
750	780	100	CALCILUTITE: very light grey to yellowish grey, silty in part grading to CALCISILTITE, trace fossil fragments, trace forams, trace gastropods, trace nodular pyrite, soft to occasionally firm, dispersive, amorphous to sub blocky in part.
780	810	100	CALCILUTITE: very light grey to yellowish grey, silty in part, trace fossil fragments, trace forams, trace gastropods, trace disseminated pyrite, soft to occasionally firm, dispersive, amorphous to sub blocky in part.
810	840	100	CALCILUTITE: very light grey to yellowish grey, silty in part, trace fossil fragments, trace forams, trace gastropods, trace disseminated pyrite, soft, dispersive, amorphous to sub blocky in part.
840	870	100	CALCILUTITE: as above.
870	900	100	CALCILUTITE: as above.
900	930	100	CALCILUTITE: very light grey to light grey, silty in part, trace fossil fragments, trace forams, trace gastropods, trace disseminated pyrite, soft, dispersive, amorphous to sub blocky in part.
930	960	100	CALCILUTITE: very light grey to light olive grey, silty in part grading to CALCISILTITE, trace fossil fragments, trace forams, trace carbonaceous material, trace disseminated pyrite, trace lithics, soft, amorphous to sub blocky in part.
960	990	100	CALCILUTITE: as above.
990	1020	100	CALCILUTITE: very light grey to light olive grey, silty in part grading to CALCISILTITE, trace fossil fragments, trace forams, trace carbonaceous material, trace disseminated pyrite, trace lithics, soft, amorphous to sub blocky in part.
1020	1050	80	CALCILUTITE: as above.
		20	SANDSTONE: light grey to white, very fine to fine, moderately well sorted, sub angular to sub rounded, very calcareous in part grading to CALCARENITE, weak siliceous cement, weak pyrite cement, trace carbonaceous specks, trace lithics, poor inferred and visible porosity. No fluorescence.
1050	1080	80	CALCILUTITE: as above.
		20	SANDSTONE: light grey to white, very fine to fine, moderately well sorted, sub angular to sub rounded, very calcareous in part grading to CALCARENITE, weak siliceous cement, trace aggregates, trace carbonaceous specks, trace lithics, poor inferred and visible porosity. No fluorescence.
1080	1110	95	CALCILUTITE: as above.
		5	SANDSTONE: as above.
1110	1140	40	CALCILUTITE: very light grey to light medium grey, silty in part grading to CALCISILTITE, trace lithics, trace fossil fragments, trace carbonaceous material, soft to firm, amorphous, sub blocky, dispersive.
		60	CALCISILTITE: light grey to light brownish grey, argillaceous in part grading to CALCILUTITE, arenaceous in part grading to very fine CALCARENITE, trace micromicaceous, trace fossil fragments, firm, sub blocky.
1140	1170	20	CALCILUTITE: as above.

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Interval (m) From	To	%	Lithology / Show Description
		80	CALCISILTITE: as above.
1170	1200	40	CALCILUTITE: as above.
		60	CALCISILTITE: as above.
1200	1230	30	CALCILUTITE: very light grey to light medium grey, silty in part grading to CALCISILTITE, trace lithics, trace fossil fragments, trace carbonaceous material, soft to firm, amorphous to sub blocky, dispersive. **04 June 2006 Midnight depth = 1233.0 mMDRT / 1112.8 mTVDRT.**
		70	CALCISILTITE: light grey to light brownish grey, argillaceous in part grading to CALCILUTITE, arenaceous in part grading to very fine CALCARENITE, trace micromicaceous, trace fossil fragments, firm, sub blocky.
1230	1260	50	CALCILUTITE: as above.
		50	CALCISILTITE: light grey to light brownish grey, argillaceous in part grading to CALCILUTITE, arenaceous in part grading to very fine CALCARENITE, trace micromicaceous, trace disseminated pyrite, trace glauconite, trace fossil fragments, firm to occasionally moderately hard, sub blocky.
1260	1290	40	CALCILUTITE: as above.
		60	CALCISILTITE: as above, trace glauconite.
1290	1320	40	CALCILUTITE: as above.
		60	CALCISILTITE: as above.
1320	1350	40	CALCILUTITE: very light grey to light grey, silty in part grading to CALCISILTITE, trace lithics, trace fossil fragments, trace carbonaceous material, soft to firm, amorphous to sub blocky, dispersive.
		60	CALCISILTITE: light grey to light brownish grey, arenaceous in part grading to very fine CALCARENITE, trace micromicaceous, trace fossil fragments, firm to moderately hard, sub fissile to sub blocky.
1350	1380	10	CALCILUTITE: as above.
		90	CALCISILTITE: as above, trace gastropods.
1380	1410	90	CALCILUTITE: medium light grey to medium grey, silty in part grading to CALCISILTITE, common fossil fragments, trace carbonaceous material, trace glauconite, soft to firm, amorphous to sub blocky, dispersive.
		10	CALCISILTITE: light grey to light brownish grey, arenaceous in part grading to very fine CALCARENITE, trace micromicaceous, trace carbonaceous material, trace fossil fragments, firm to moderately hard, sub fissile to sub blocky.
1410	1440	70	CALCILUTITE: as above.
		30	CALCISILTITE: as above.
1440	1470	60	CALCILUTITE: as above.
		40	CALCISILTITE: as above.
1470	1500	80	CALCILUTITE: as above.
		20	CALCISILTITE: as above.
1500	1530	90	CALCILUTITE: medium light grey to medium grey, silty in part grading to CALCISILTITE, common fossil fragments, trace carbonaceous material, trace glauconite, trace disseminated pyrite, soft to firm, amorphous to sub blocky, dispersive.
		10	CALCISILTITE: light grey to light brownish grey, arenaceous in part grading to very fine CALCARENITE, trace micromicaceous, trace carbonaceous material, trace fossil fragments, firm to moderately hard, sub fissile to sub blocky.
1530	1560	90	CALCILUTITE: medium light grey to light olive grey, silty in part grading to CALCISILTITE, trace fossil fragments, trace carbonaceous material, soft to firm, amorphous to sub blocky.

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Interval (m) From	To	%	Lithology / Show Description
		10	CALCISILTITE: light grey to light brownish grey, arenaceous in part grading to very fine CALCARENITE, trace micromicaceous, trace fossil fragments, firm to moderately hard, sub fissile to sub blocky.
1560	1590	80	CALCILUTITE: as above.
		20	CALCISILTITE: as above.
1590	1620	70	CALCILUTITE: medium light grey to light olive grey, silty in part grading to CALCISILTITE, trace fossil fragments, trace carbonaceous material, trace glauconite, dispersive, soft to firm, amorphous to sub blocky.
		30	CALCISILTITE: light grey to light brownish grey, arenaceous in part grading to very fine CALCARENITE, common lithics, trace micromicaceous, trace fossil fragments, firm to moderately hard, sub fissile to sub blocky.
1620	1650	90	CALCILUTITE: as above.
		10	CALCISILTITE: as above.
1650	1680	90	CALCILUTITE: as above.
		10	CALCISILTITE: as above.
			Base of Miocene at 1681.5 mMDRT / 1496.9 mTVDRT / -1463.5 mTVDSS.
1680	1710	100	CALCILUTITE: as above.
		Trace	CALCISILTITE: as above.
1710	1740	80	CALCILUTITE: medium light grey to light olive grey, silty in part grading to CALCISILTITE, trace carbonaceous material, trace glauconite, trace disseminated pyrite, trace micromicaceous, trace fossil fragments, dispersive, soft to firm, amorphous to sub blocky.
		20	CALCISILTITE: medium grey to light brownish grey, arenaceous in part grading to very fine CALCARENITE, trace micromicaceous, trace fossil fragments, firm to moderately hard, sub fissile to sub blocky.
1740	1770	80	CALCILUTITE: as above.
		20	CALCISILTITE: as above.
			05 June 2006 Midnight depth = 1779.0 mMDRT / 1580.5 mTVDRT.
1770	1800	100	CALCILUTITE: as above.
		Trace	CALCISILTITE: as above.
1800	1830	100	CALCILUTITE: medium light grey to light olive grey, silty in part grading to CALCISILTITE, trace carbonaceous material, trace glauconite, trace disseminated pyrite, trace micromicaceous, trace fossil fragments, dispersive, soft to firm, amorphous to sub blocky.
1830	1860	100	CALCILUTITE: as above.
1860	1890	100	CALCILUTITE: light grey to medium grey, occasionally light olive grey, trace disseminated pyrite, trace micromicaceous, trace fossil fragments, dispersive, soft to firm, amorphous to sub blocky.
1890	1920	100	CALCILUTITE: as above.
1920	1950	100	CALCILUTITE: light grey to medium grey, occasionally light olive grey, trace disseminated pyrite, trace nodular pyrite, trace micromicaceous, trace lithics, trace fossil fragments, dispersive, soft to firm, amorphous to sub blocky.
1950	1980	100	CALCILUTITE: as above, no nodular pyrite.
1980	2010	100	CALCILUTITE: light brownish grey to medium grey, occasionally light greenish grey, trace disseminated pyrite, trace micromicaceous, trace glauconite, trace lithics, trace fossil fragments, firm to occasionally moderately hard, amorphous to sub blocky.
2010	2040	100	CALCILUTITE: as above.
2040	2070	100	CALCILUTITE: as above.

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Interval (m) From	To	%	Lithology / Show Description
2070	2100	100	CALCILUTITE: very light grey to medium grey, occasionally light greenish grey, silty in part, trace disseminated pyrite, trace micromicaceous, trace glauconite, trace lithics, trace fossil fragments, firm to occasionally moderately hard, amorphous to sub blocky.
2100	2130	100	CALCILUTITE: very light grey to light brownish grey, occasionally light greenish grey, medium grey, silty, trace disseminated pyrite, trace micromicaceous, trace glauconite, trace fossil fragments, firm to occasionally moderately hard, amorphous to sub blocky.
2130	2160	100	CALCILUTITE: as above.
2160	2190	100	CALCILUTITE: light brownish grey to medium grey, occasionally light greenish grey, silty, trace disseminated pyrite, trace micromicaceous, trace glauconite, trace fossil fragments, soft to moderately hard, amorphous to sub blocky.
2190	2220	100	CALCILUTITE: as above.
			Top of Lakes Entrance at 2229.5 mMDRT / 1973.1 mTVDRT / -1939.7 mTVDSS.
2220	2250	80	CALCILUTITE: light brownish grey to medium grey, occasionally light greenish grey, silty, trace disseminated pyrite, trace micromicaceous, trace glauconite, trace fossil fragments, soft to moderately hard, amorphous to sub blocky.
		20	CALCAREOUS CLAYSTONE: medium light grey to medium grey, light brownish grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky.
2250	2280	40	CALCILUTITE: as above.
		60	CALCAREOUS CLAYSTONE: as above.
			06 June 2006 Midnight depth = 2259.0 mMDRT / 1998.8 mTVDRT.
2280	2310	20	CALCILUTITE: as above.
		80	CALCAREOUS CLAYSTONE: as above.
2310	2340	80	CALCAREOUS CLAYSTONE: medium light grey to medium grey, light brownish grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky.
		20	CALCILUTITE: as above.
2340	2370	100	CALCAREOUS CLAYSTONE: medium grey to medium light grey, light brownish grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, trace nodular pyrite, firm to moderately hard, sub blocky.
2370	2400	100	CALCAREOUS CLAYSTONE: as above.
			Bagged 10 metre samples from 2410.0 mMDRT to 2560.0 mMDRT.
2400	2410	100	CALCAREOUS CLAYSTONE: medium grey to medium light grey, occasionally light brownish grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky.
2410	2420	100	CALCAREOUS CLAYSTONE: as above, + trace pyritized fossil fragments, trace lithics.
2420	2430	100	CALCAREOUS CLAYSTONE: as above, trace fossil fragments.
2430	2440	100	CALCAREOUS CLAYSTONE: as above.
			Carbide Lag check at 2441.0 mMDRT:
			Theoretical in/out strokes: 7584
			Actual in/out strokes: 8230
			Difference = 646 strokes.
			Hole overgauge by 13%.
			Prior to this check, using 12% overgauge based on gas readings decrease at sliding depths.
			Average hole size = 9.0 inches.
2440	2450	100	CALCAREOUS CLAYSTONE: medium grey to medium light grey, occasionally light brownish grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, trace fossil fragments, firm to moderately hard, sub blocky.

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Interval (m) From	To	%	Lithology / Show Description
2450	2460	100	CALCAREOUS CLAYSTONE: as above.
2460	2470	100	CALCAREOUS CLAYSTONE: as above.
2470	2480	100	CALCAREOUS CLAYSTONE: light brownish grey to minor medium grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, trace fossil fragments, firm to moderately hard, sub blocky.
2480	2490	100	CALCAREOUS CLAYSTONE: as above.
2490	2500	100	CALCAREOUS CLAYSTONE: light brownish grey to minor medium grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, trace fossil fragments, firm to moderately hard, sub blocky.
2500	2510	100	CALCAREOUS CLAYSTONE: as above. **Add Baracarb at 5 ppb to the mud system from 2500.0 mMDRT.** **(2207.8 mTVDRT/ -2174.4 mTVDSS). Baracarb seen in 2530.0 mMDRT sample.**
2510	2520	100	CALCAREOUS CLAYSTONE: light brownish grey to minor medium grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, trace nodular pyrite, trace fossil fragments, firm to moderately hard, sub blocky.
2520	2530	100	CALCAREOUS CLAYSTONE: as above.
2530	2540	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, trace glauconite, trace fossil fragments, firm to moderately hard, sub blocky.
2540	2550	100	CALCAREOUS CLAYSTONE: as above.
2550	2560	90	CALCAREOUS CLAYSTONE: as above.
		5	SILTSTONE: pale brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite, trace disseminated pyrite, common rock flour, moderately hard to hard, sub fissile to sub blocky.
		5	SANDSTONE: white to pale green, dominantly very fine to fine, moderately well sorted, sub angular to sub rounded, common glauconite matrix, hard aggregates, tight inferred and visual porosity. No fluorescence. **Bagged 5 metre samples from 2560.0 mMDRT to TD (2687.0 mMDRT).** **Top of Latrobe at 2563.0 mMDRT (2263.2 mTVDRT / -2229.8 mTVDSS)**
2560	2565	70	CALCAREOUS CLAYSTONE: 50%, light brownish grey to medium grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, trace glauconite, trace fossil fragments, firm to moderately hard, sub blocky. CLAYSTONE: 20%, off white to very light green, trace glauconite pellets, soft to firm, dispersive, amorphous.
		15	SILTSTONE: medium grey to medium dark grey, minor pale brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite, common disseminated pyrite, common rock flour, moderately hard to hard, sub blocky to blocky.
		15	SANDSTONE: as above.
2565	2570	50	CALCAREOUS CLAYSTONE: 10%, light brownish grey to medium grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, trace glauconite, trace fossil fragments, firm to moderately hard, sub blocky. CLAYSTONE: 40%, as above.
		30	SILTSTONE: as above.
		20	SANDSTONE: as above.

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Interval (m) From	To	%	Lithology / Show Description
2570	2575	60	CLAYSTONE 1: 50%, off white to very light green, trace glauconite pellets, soft to firm, dispersive, amorphous. CLAYSTONE 2: 10%, light olive brown to moderate olive brown, non calcareous, soft dispersive, amorphous.
		25	SILTSTONE: as above.
		15	SANDSTONE: white to pale green, dominantly very fine to fine, moderately well sorted, sub angular to sub rounded, common glauconite matrix, hard aggregates, tight inferred and visual porosity. No fluorescence.
2575	2580	70	CLAYSTONE 1: 40%, as above. CLAYSTONE 2: 30%, as above.
		20	SILTSTONE: as above.
		10	SANDSTONE: as above.
2580	2585	65	CLAYSTONE 1: 25%, as above. CLAYSTONE 2: 40%, as above.
		15	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, minor medium grey to medium dark grey with common pyrite matrix, trace micromicaceous, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		20	SANDSTONE: as above.
2585	2590	55	CLAYSTONE 1: 10%, as above. CLAYSTONE 2: 45%, as above.
		40	SILTSTONE: as above.
		5	SANDSTONE: white to pale green, dominantly very fine to fine, moderately well sorted, sub angular to sub rounded, common glauconite matrix, hard aggregates, tight inferred and visual porosity. No fluorescence. **Top of M1.2U at 2592.5 mMDRT / 2289.5 mTVDRT / -2256.1 mTVDSS.**
2590	2595	60	CLAYSTONE 1: 30%, off white to very light green, trace glauconite, soft to firm, dispersive, amorphous. CLAYSTONE 2: 30%, light olive brown to moderate olive brown, non calcareous, soft dispersive, amorphous..
		20	SILTSTONE: as above.
		20	SANDSTONE: clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, poor to fair inferred and visual porosity. **FLUORESCENCE: 2%, dull to moderately bright pinpoint pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green film residue.** **Top of M1.2L at 2598.5 mMDRT / 2294.8 mTVDRT / -2261.4 mTVDSS.**
2595	2600	60	CLAYSTONE 1: 30%, as above. CLAYSTONE 2: 30%, as above.
		25	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, minor medium grey to medium dark grey with common pyrite matrix, trace micromicaceous, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		15	SANDSTONE: as above. **FLUORESCENCE: 5%, dull to moderately bright pinpoint pale yellowish green fluorescence, moderately fast blooming direct cut, thin dull pale green ring residue.**

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Interval (m) From	To	%	Lithology / Show Description
2600	2605	55	CLAYSTONE 1: 40%, as above. CLAYSTONE 2: 15%, as above.
		20	SILTSTONE: as above.
		25	SANDSTONE: as above. **FLUORESCENCE: 2%, dull to moderately bright pinpoint pale yellowish green fluorescence, moderately fast blooming direct cut, thin dull pale green film residue.**
2605	2610	35	CLAYSTONE 1: 30%, as above. CLAYSTONE 2: 5%, as above.
		30	SILTSTONE: as above.
		35	SANDSTONE: clear to translucent, fine to occasionally very coarse, poorly sorted, sub angular to sub rounded, strong pyrite cement, common pyrite nodules, hard aggregates, poor inferred and visual porosity. **FLUORESCENCE: Trace, dull to moderately bright pinpoint pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green film residue.** **PSB7 (Top of M1.3U) at 2610.5 mMDRT / 2305.5 mTVDRT / -2272.1 mTVDSS.** **PSB6 (Top of PS5 sand) at 2612.5mMDRT / 2307.2 mTVDRT / -2277.8 mTVDSS.**
2610	2615	40	CLAYSTONE 1: 35%, as above. CLAYSTONE 2: 5%, as above.
		30	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, minor medium grey to medium dark grey with common pyrite matrix, trace micromicaceous, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		30	SANDSTONE: clear to translucent, medium to very coarse, poorly sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, moderate siliceous cement, occasionally hard aggregates, common rock flour, poor to fair inferred and visual porosity. **FLUORESCENCE: 20%, moderately bright to bright, even, yellowish green fluorescence, moderately fast blooming direct cut, dull to moderately bright, white to pale green, thick ring residue.** **PSB5 (Top of PS4 sand) at 2617.0 mMDRT / 2311.2 mTVDRT / -2277.8 mTVDSS.**
2615	2620	30	CLAYSTONE: off white to very light green, soft to firm, dispersive, amorphous.
		30	SILTSTONE: as above.
		40	SANDSTONE: clear to translucent, fine to occasionally very coarse, poorly sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, moderate siliceous cement, occasionally hard aggregates, common rock flour, poor to fair inferred and visual porosity. **FLUORESCENCE: 30%, moderately bright to bright, even, yellowish green fluorescence, fast blooming direct cut, dull to moderately bright, white to pale green, thick ring residue.**
2620	2625	30	CLAYSTONE: as above.
		20	SILTSTONE: as above.
		50	SANDSTONE: clear to translucent, medium to occasionally very coarse, poorly sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, moderate siliceous cement, occasionally hard aggregates, common rock flour, poor to fair inferred and visual porosity. **FLUORESCENCE: 30%, as above.**
2625	2630	30	CLAYSTONE: as above.

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Interval (m) From	To	%	Lithology / Show Description
		20	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, minor medium grey to medium dark grey with common pyrite matrix, trace micromicaceous, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		50	SANDSTONE: clear to translucent, dominantly medium to occasionally very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, moderate siliceous cement, occasionally hard aggregates, common rock flour, poor to fair inferred and visual porosity. **FLUORESCENCE: 30%, moderately bright to bright, even, yellowish green fluorescence, fast blooming direct cut, dull to moderately bright, white to pale green, thin ring residue.** **PSB4 (Top of PS3 sand) at 2632.0 mMDRT / 2324.5 mTVDRT / -2291.1 mTVDSS.**
2630	2635	20	CLAYSTONE: off white to very light green, soft to firm, dispersive, amorphous.
		20	SILTSTONE: as above.
		60	SANDSTONE: as above. **FLUORESCENCE: 30%, moderately bright to bright, even, yellowish green fluorescence, fast blooming direct cut, moderately bright, white to pale green, thin ring residue.**
2635	2640	20	CLAYSTONE: as above.
		10	SILTSTONE: as above.
		70	SANDSTONE: clear to translucent, medium to very coarse, dominantly coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, moderate siliceous cement, rare hard aggregates, common rock flour, fair inferred and visual porosity. **FLUORESCENCE: 30%, moderately bright to bright, even, yellowish green fluorescence, fast blooming direct cut, moderately bright, white to pale green, thick film residue.** **PSB3 (Top of PS2 sand) at 2642.0 mMDRT / 2333.4 mTVDRT / -2300.0 mTVDSS.**
2640	2645	5	COAL: moderate brown to greyish brown, silty grading to CARBONACEOUS SILTSTONE, earthy, firm, sub blocky, uneven, woody texture.
		15	CLAYSTONE: off white to very pale orange, soft to firm, dispersive, amorphous.
		30	SILTSTONE: pale brown to moderate brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub fissile to sub blocky.
		50	SANDSTONE: clear to translucent, dominantly medium to very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, weak siliceous cement, occasionally hard aggregates, poor to fair inferred and visual porosity. **FLUORESCENCE: 7%, dull to moderately bright, pinpoint, yellowish green fluorescence, slow diffusive direct cut, dull, white to pale green, thin ring residue.**
2645	2650	20	CLAYSTONE: as above.
		40	SILTSTONE: as above.
		40	SANDSTONE: clear to translucent, medium to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, weak siliceous cement, occasionally hard aggregates, poor to fair inferred and visual porosity. **FLUORESCENCE: 3%, dull to moderately bright, pinpoint, yellowish green fluorescence, very slow diffusive direct cut, dull, white to pale green, thin ring residue.** **Top of M1.4U at 2654.5 mMDRT / 2344.5 mTVDRT / -2311.1 mTVDSS.**
2650	2655	5	COAL: moderate brown to greyish brown, silty grading to CARBONACEOUS SILTSTONE, earthy, firm, sub blocky, uneven, woody texture.

West Kingfish W19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
		15	CLAYSTONE: as above.
		30	SILTSTONE: as above.
		50	SANDSTONE: clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair inferred and visual porosity. **FLUORESCENCE: 1%, possible cavings, dull to moderately bright, pinpoint, yellowish green fluorescence, no direct cut, no crush cut.**
2655	2660	Trace	COAL: as above.
		25	CLAYSTONE: as above.
		45	SILTSTONE: pale brown to moderate brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub fissile to sub blocky.
		30	SANDSTONE: clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair inferred and visual porosity. No fluorescence.
2660	2665	Trace	COAL: as above.
		20	CLAYSTONE: off white to very pale orange, soft to firm, dispersive, amorphous.
		50	SILTSTONE: as above.
		30	SANDSTONE: as above. No fluorescence. **M1.4C (Coal) at 2667.0 mMDRT / 2355.6 mTVDRT / -2322.2 mTVDSS.**
2665	2670	5	COAL: moderate brown to greyish brown, silty grading to CARBONACEOUS SILTSTONE, earthy, firm, sub blocky, uneven, woody texture.
		15	CLAYSTONE: as above.
		60	SILTSTONE: as above.
		20	SANDSTONE: clear to translucent, occasionally medium to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair inferred and visual porosity. No fluorescence.
2670	2675	20	CLAYSTONE: as above.
		30	SILTSTONE: light brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		50	SANDSTONE: clear to translucent, dominantly fine to occasionally very coarse, moderately well sorted, sub angular to sub rounded, trace white argillaceous matrix, dominantly loose, generally clean, poor to fair inferred and visual porosity. No fluorescence.
2675	2680	15	CLAYSTONE: as above.
		20	SILTSTONE: as above.
		65	SANDSTONE: clear to translucent, fine to occasionally very coarse, dominantly fine to medium, moderately well sorted, sub angular to sub rounded, trace white argillaceous matrix, dominantly loose, generally clean, poor to fair inferred and visual porosity. No fluorescence.
2680	2685	15	CLAYSTONE: off white to very pale orange, soft to firm, dispersive, amorphous.
		15	SILTSTONE: light brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, common rock flour, firm to moderately hard, sub fissile to sub blocky.

West Kingfish W19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
		70	SANDSTONE: clear to translucent, medium to very coarse, dominantly medium to coarse, moderately well sorted, sub rounded to sub angular, weak pyrite cement, trace pyrite nodules, trace white argillaceous matrix, dominantly loose, generally clean, fair inferred and visual porosity. No fluorescence.
2685	2687	20	CLAYSTONE: as above.
	TD	15	SILTSTONE: as above.
		65	SANDSTONE: clear to translucent, medium to dominantly coarse to very coarse, moderately well sorted, sub rounded to sub angular, weak pyrite cement, trace pyrite nodules, trace white argillaceous matrix, dominantly loose, generally clean, fair inferred and visual porosity. No fluorescence.

West Kingfish W19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description

WKF W19A reached a TD of 2687.0 mMDRT = 2373.4 mTVDRT (-2340.0 mTVDSS) at 2000 hrs on 07 June 2006.

Circulate 3 x BU.
Wiper Trip to casing shoe at 666.0 mMDRT.

Start circulating at bottom from 1315 hrs, on 08 June 2006.
Trip gas at 1400 hrs, on 08 June 2006 = 199 units.
Backreamed 2 stands POOH to 2622.0 mMDRT at 1600 hrs, 08 June 2006.
Last circulation on bottom at 1600 hrs, 08 June 2006.
Total circulating time for last circulation on bottom = 2 hr 45 minutes.

Start POOH at 1600 hrs, 08 June 2006, for Reeves Wireline Logging Run #1.

Bit on Surface at 0300 hrs, 09 June 2006.
Rig up/JSA for Reeves Logging at 0300 hrs, 09 June 2006.

Bottom zone: TD-3.0 = 2684.0 mMDRT to 80.0 mTVD above the Top of Latrobe (TOL).

TOL= 2653.0 mMDRT=2263.2 mTVDRT
-80.0 mTVD
=2183.2 mTVDRT=2471.7 mMDRT.

Tag bottom at 1610 hrs, 09 June 2006.

At 1705 hrs, 09 June 2006, start Reeves Logging at Logging speed.
(0.1 metre/second) from 2684.0 mMDRT to 2439.2 mMDRT.

At 2021 hrs, 09 June 2006, start Reeves Logging at Logging speed.
(0.1 metre/second) from 1749.3 mMDRT to 1519.3 mMDRT.

At 2208 hrs, 09 June 2006, start Reeves Logging at Logging speed.
(0.1 metre/second) from 1289.4 mMDRT to 628.8 mMDRT.

In between the above Logging intervals, POOH at twice Logging speed (0.2 metre/second) from 2439.2 mMDRT to 1289.4 mMDRT.

At 0045 hrs, 10 June 2006, start POOH at Tripping speed from casing shoe at 666.0 mMDRT to surface.

APPENDIX 4a

WEST KINGFISH W19A

Mud Log

MASTERLOG
WKF W-19A

GENERAL
Country : AUSTRALIA
Permit : VIC/L7
Field : Kingfish
Basin : GIPPSLAND
Well Type : DEVELOPMENT
Rig Name : NABORS 453

SURFACE POSITON
Longitude : 148 06 19.318E
Latitude : 38 35 34.833S
MGA Co-ord X : 596262.84mE
MGA Co-ord Y : 5727806.79mN
RT to MSL : 33.43m
RT to Sea Bed : 109.56m

HOLE / CASING INFO
8-1/2" Hole to 2687.0m MDRT

10-3/4" Csg Shoe at 666.0m MDRT
7" Production Csg at 2681.0m MDRT

DATE / DEPTH
Spud Date : 03-06-2006
Total Depth Date : 07-06-2006
Total Depth : 2687.0m MDRT
True Vertical Depth : 2373.41m TVDRT
Log Scale : 1/ 500

ENGINEERS
Steve Oades
Mark Smith
Noel Elliott

ABBREVIATIONS

MW	Mud Weight	WOB	Weight on Bit (klbs)
FV	Funnel Viscosity	RPM	Rotations Per Min
PV	Plastic Viscosity	FLW	Flow Rate (gpm)
YP	Yield Point	SPP	Pump Pressure (psi)
Gel	Gel Strength	RR	Re-Run Bit
WL	Water Loss	TG	Trip Gas
KCl	Potassium Chloride	CG	Connection Gas
Cl	Chlorides	BG	Background Gas
Incl	Inclination	DGP	Drilled Gas Peak
Az	Azimuth	MM	Mud Motor

LITHOLOGY LEGEND
CLAYSTONE, MARL, BRYOZOA, CARB FRAGMENT
SILTSTONE, LIMESTONE, RADIOLARITES, QUARTZITE
SST: F - V FINE, DOLOMITE, ECHINOIDS, INTRUSIVES
SST: MEDIUM, CHERT, CORALS, GLAUCONITE
SST: COARSE, CONGLOMERATE, FORAMINIFERA, PYRITE
SHALE, COAL, LITHIC FRAGMENT, CEMENT

ENGINEERING LEGEND
CASING SHOE, WIRELINE LOGS
LINER HANGER, MDT POINTS:
BIT CHANGE, PRESSURE ONLY
DEVIA. SURVEY, SAMPLE
SWC UNRECOV, SEAL FAILURE
SIDEWALL CORE, TIGHT
CORE

ROP (m/hr) 500 50 5 .5
WOB (tons) 50 25 0
MWD Gamma Ray (api) 0 100 200
DEPTH (m) (TVD)
CUTTINGS LITHOLOGY % 0 100
RESERVAL GAS DATA
C1 C2 C3 iC4 nC4 iC5 nC5 TG
Total Gas in Units
Chromatograph in PPM
.5 5 50 500 5K
100 1K 10K 100K 1000K
CUT FLUOR good fair poor
DIRECT FLR good fair poor
LITHOLOGY DESCRIPTIONS and REMARKS

650
660
670
(632)
680
690
(648)
700

SLIDING INDICATED BY VERTICAL BAR IN DEPTH COLUMN.

MW: 9.2
FV: 51
PV: 25
YP: 20
Gel:7/13
WL: 3.0
pH: 9.5
Cl: 39k

WOB: 5-10
TDRPM:50-60
MMRPM:140
SPP:850
FLW:485

Tie in Survey:665.00mMD (628.03mTVD)
37.00°inc 301.42°az

BIT #1 8 1/2"
Smith S73PX
Jets: 6x20
In : 666.0m MDRT
Out : 2687.0m MDRT
Run : 2021.0m
Hrs : 47.4
Cond: 1-1-WT-S-X-IN-CT-TD

100% C1

Survey:696.25mMD (653.4mTVD)
34.26°inc 311.48°az

PREVIOUS WELL HISTORY
Plugged & Abandoned in December, 2005
10-3/4" Surface Csg 666.0m MDRT
7" Production Csg cut and pulled from 745.0m MDRT
Kick-off plug at 617.0m MDRT

West Kingfish W-19A kick-off at 12:45 hours on 03-06-2006 from 669.0m MDRT

Drill with KCl/Glycol/PHPA mud system.

PIT at 666.0m MDRT 628.8m TVDRT 367 psi 9.2 ppg EMW:12.6 ppg

CALCILUTITE:v lt gy-lt gy,slty i/p,occ-mnr foss frag,tr foram, disp,sft,amor.

SLIDING INDICATED BY VERTICAL BAR IN DEPTH COLUMN.

No H2S or CO2 Detected

100 / Tr

CALCILUTITE:v lt gy-lt gy,rr lt gn gy,slty i/p g/t clslt,occ foss frag,tr foram,disp,sft,amor.

Survey:725.07mMD (677.5mTVD)
32.95°inc 314.68°az

WOB:7-15
TDRPM:60
MMRPM:173
SPP:1300
FLW:595

04-06-06

100 / Tr / Tr

CALCILUTITE:v lt gy-lt gn gy,yelsh gy,slty i/p,occ foss frag,tr foram, tr nod pyr,sft,amor-sbblky i/p.

Survey:753.43mMD (701.5mTVD)
31.38°inc 320.69°az

100 / Tr / Tr

CALCILUTITE:v lt gy-yelsh gy,slty i/p g/t clslt,mnr foss frag,tr foram, tr gastropod,tr nod pyr,sft-rr frm, amor-rr sbblky.

Survey:782.04mMD (725.9mTVD)
31.05°inc 324.79°az

WOB:5-15
TDRPM:60
MMRPM:174
SPP:1400
FLW:600

100 / Tr / Tr / Tr

CALCILUTITE:v lt gy-yelsh gy,slty i/p,mnr foss frag,tr foram,tr gastropod,tr dissem pyr,sft,amor-rr sbblky.

CLEAR BLOCKED FLOW TROUGH AND POSSUM BELLY.

Survey:811.84mMD (751.6mTVD)
30.43°inc 329.43°az

100 / Tr / Tr / Tr

WOB:5-15
TDRPM:60
MMRPM:174
SPP:1500
FLW:600

CALCILUTITE:v lt gy-yelsh gy,slty i/p,mnr foss frag,tr foram,tr gastropod,tr dissem pyr,sft,amor-rr sbblky.

Survey:840.37mMD (776.1mTVD)
31.29°inc 335.54°az

Survey:869.04mMD (800.5mTVD)
31.73°inc 335.72°az

100 / Tr / Tr / Tr

WOB:5-10
TDRPM:115
MMRPM:174
SPP:1500
FLW:600

CALCILUTITE:v lt gy-yelsh gy,slty i/p,mnr foss frag,tr foram,tr gastropod,tr dissem pyr,sft,amor-rr sbblky.

Survey:897.64mMD (824.8mTVD)
31.83°inc 335.34°az

710 (664.9)
720
730 (681.6)
740
750 (698.6)
760
770 (715.6)
780
790 (732.8)
800
810 (750)
820
830 (767.1)
840
850 (784.3)
860
870 (801.3)
880
890 (818.3)
900
910

500 50 5 .5
.5 5 50 500 5K
100 1K 10K 100K 1000K

MW: 9.25
FV: 66
PV: 22
YP: 36
Gel:10/14
WI: 3.6
pH: 9.0
Cl: 40k

WOB:5-8
TDRPM:120
MMRPM:180
SPP:1500
FLW:620

WOB:15-25
TDRPM:120
MMRPM:174
SPP:1700
FLW:600

WOB:10-15
TDRPM:120
MMRPM:174
SPP:1720
FLW:600

500 50 5 .5

920
930 (852.3)
940
950 (869.3)
960
970 (886.4)
980
990 (903.5)
1000
1010 (920.7)
1020
1030 (938)
1040
1050 (955.2)
1060
1070 (972.6)
1080
1090 (990)
1100
1110 (1007.4)
1120

.5 5 50 500 5K
100 1K 10K 100K 1000K

100 / Tr / Tr / Tr

Survey:926.33mMD (849.2mTVD)
31.92°inc 338.22°az

CALCILUTITE:v lt gy-yelsh gy,slty i/p,mnr foss frag,tr foram,tr gastropod,tr dissem pyr,sft,amor-rr sbblky.

100 / Tr / Tr / Tr

Survey:955.16mMD (873.7mTVD)
31.41°inc 337.72°az

CALCILUTITE:v lt gy,lt olv gy, yelsh gy,slty i/p,tr foss frag, tr blk lith,tr foram,tr vf qtz, sft,amor-sbblky.

Survey:984.25mMD (898.6mTVD)
30.93°inc 337.85°az

CALCILUTITE:v lt gy,lt olv gy, yelsh gy,slty i/p,tr foss frag, tr blk lith,tr foram,tr vf qtz, sft,amor-sbblky.

100 / Tr / Tr / Tr

Survey:1014.37mMD (924.5mTVD)
30.61°inc 337.91°az

CALCILUTITE:v lt gy,lt olv gy,tr foss frag,tr foram,tr gastropod, com blk spk,tr qtz grn, amor-sbblky.

100 / Tr / Tr / Tr

Survey:1042.10mMD (948.4mTVD)
30.13°inc 337.67°az

SANDSTONE:clr,lt gy,wh,qtz grn,vf-f, mod srt,sa-sr,tr sil cmt,tr pyr cmt,tr blk lam,tr blk lith,com agg, fri,pr-fr vis & inf por,no fluor.

100 / Tr / Tr / Tr / Tr

Survey:1070.66mMD (973.1mTVD)
29.82°inc 338.14°az

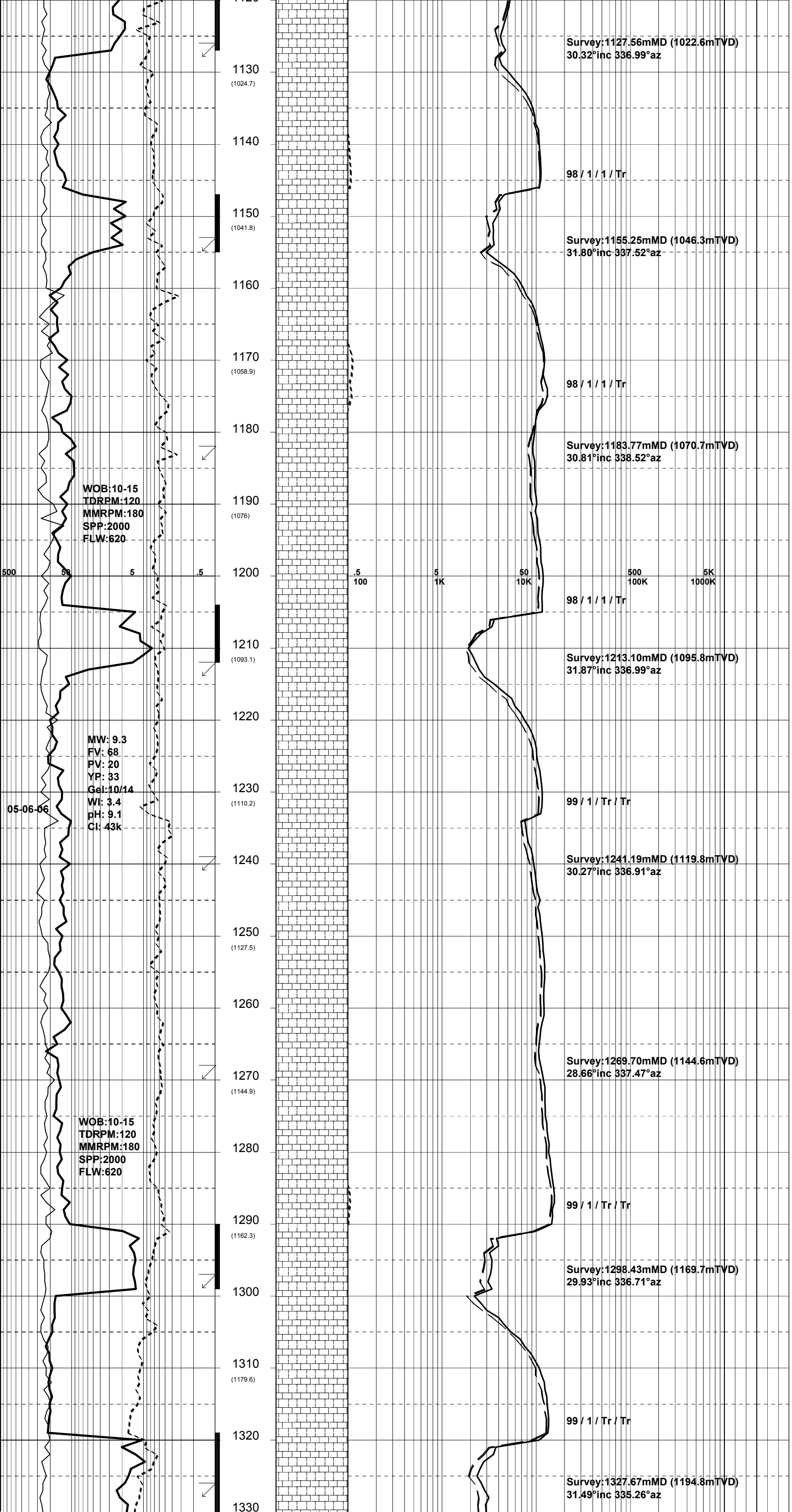
CALCILUTITE:v lt gy,lt olv gy,tr foss frag,tr foram,tr gastropod, com blk spk,tr qtz grn, amor-sbblky.

Survey:1098.58mMD (997.5mTVD)
29.11°inc 338.49°az

SANDSTONE:clr,lt gy,wh,qtz gn,vf-f, mod srt,sa-sr,tr sil cmt,tr pyr cmt, tr blk lam,tr blk lith,com agg, fri,pr-fr inf & vis por,no fluor.

99 / 1 / Tr / Tr

CALCILUTITE:v lt gy,lt olv gy,tr foss frag,tr foram,tr gastropod, com blk spk,tr qtz grn, amor-sbblky.


1130
(1024.7)
1140
1150
(1041.8)
1160
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1180
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(1076)
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(1093.1)
1220
1230
(1110.2)
1240
1250
(1127.5)
1260
1270
(1144.9)
1280
1290
(1162.3)
1300
1310
(1179.6)
1320
1330
WOB:10-15
TDRPM:120
MMRPM:180
SPP:2000
FLW:620
MW: 9.3
FV: 68
PV: 20
YP: 33
Gel:10/14
WI: 3.4
pH: 9.1
Cl: 43k
05-06-06
WOB:10-15
TDRPM:120
MMRPM:180
SPP:2000
FLW:620
500
50
5
.5
.5
100
5
1K
50
10K
500
100K
5K
1000K
Survey:1127.56mMD (1022.6mTVD)
30.32°inc 336.99°az
98 / 1 / 1 / Tr
Survey:1155.25mMD (1046.3mTVD)
31.80°inc 337.52°az
98 / 1 / 1 / Tr
Survey:1183.77mMD (1070.7mTVD)
30.81°inc 338.52°az
98 / 1 / 1 / Tr
Survey:1213.10mMD (1095.8mTVD)
31.87°inc 336.99°az
99 / 1 / Tr / Tr
Survey:1241.19mMD (1119.8mTVD)
30.27°inc 336.91°az
99 / 1 / Tr / Tr
Survey:1269.70mMD (1144.6mTVD)
28.66°inc 337.47°az
99 / 1 / Tr / Tr
Survey:1298.43mMD (1169.7mTVD)
29.93°inc 336.71°az
99 / 1 / Tr / Tr
Survey:1327.67mMD (1194.8mTVD)
31.49°inc 335.26°az
CALCISILTITE:60%,lt gy-lt bnsh gy, arg i/p g/t clclt,tr micmic,tr foss frag,frm,sbblky.
CALCILUTITE:40%,v lt gy-lt med gy, slty i/p g/t clslt,tr lith,tr foss frag,tr carb mat,disp,sft-frm, amor-sbblky.
CALCISILTITE:80%,lt gy-lt bnsh gy, arg i/p g/t clclt,tr micmic,tr foss frag,frm,sbblky.
CALCILUTITE:20%,v lt gy-lt med gy, slty i/p g/t clslt,tr lith,tr foss frag,tr carb mat,disp,sft-frm, amor-sbblky.
CALCISILTITE:60%,lt gy-lt bnsh gy, arg i/p g/t clclt,tr micmic,tr foss frag,frm,sbblky.
CALCILUTITE:40%,v lt gy-lt med gy, slty i/p g/t clslt,tr lith,tr foss frag,tr carb mat,disp,sft-frm, amor-sbblky.
CALCISILTITE:70%,lt gy-lt bnsh gy, arg i/p,aren i/p g/t clcar,tr micmic, tr foss frag,frm,sbblky.
CALCILUTITE:30%,v lt gy-lt med gy, slty i/p g/t clslt,tr lith,tr foss frag,tr carb mat,disp,sft-frm, amor-sbblky.
CALCISILTITE:50%,lt gy-lt bnsh gy, arg i/p,aren i/p g/t clcar,tr micmic,tr tr foss frag,tr dissem pyr,tr glauc, frm-occ mod hd,sbblky.
CALCILUTITE:50%,v lt gy-lt med gy, slty i/p g/t clslt,tr lith,tr foss frag,tr carb mat,disp,sft-frm, amor-sbblky.
CALCILUTITE:80%,v lt gy-lt med gy, slty i/p g/t clslt,tr lith,tr foss frag,tr carb mat,disp,sft-frm, amor-sbblky.
CALCISILTITE:20%,lt gy-lt bnsh gy, arg i/p,aren i/p g/t clcar,tr micmic, tr foss frag,tr glauc,frm-occ mod hd,sbblky.
CALCILUTITE:70%,v lt gy-lt med gy, slty i/p g/t clslt,tr lith,tr foss frag,tr carb mat,tr glauc,sft-frm, disp,amor-sbblky.
CALCISILTITE:30%,lt gy-lt bnsh gy, arg i/p,aren i/p g/t clcar,tr micmic, tr foss frag,tr glauc,frm-occ mod hd,sbblky.

WOB:15-20
TDRPM:120
MMRPM:180
SPP:2200
FLW:618

1340

1350
(1213.9)

1360

1370
(1231)

1380

WOB:15-20
TDRPM:120
MMRPM:181
SPP:2300
FLW:625

1390
(1248.2)

500 50 5 .5 | .5 100 | 5 1K | 50 10K | 500 100K | 5K 1000K

1400

1410
(1265.5)

1420

1430
(1282.6)

1440

1450
(1299.9)

1460

1470
(1317.1)

WOB:20-25
TDRPM:120
MMRPM:181
SPP:2400
FLW:625

1480

1490
(1334.3)

1500

1510
(1351.3)

1520

1530
(1368.2)

WOB:20-25
TDRPM:115
MMRPM:181
SPP:2400

1540

Survey:1356.54mMD (1219.5mTVD)
31.48°inc 335.54°az

99 / 1 / Tr / Tr

Survey:1385.65mMD (1244.5mTVD)
29.88°inc 335.83°az

99 / 1 / Tr / Tr

Survey:1414.88mMD (1269.7mTVD)
31.19°inc 335.74°az

Survey:1443.65mMD (1294.4mTVD)
30.51°inc 336.02°az

99 / 1 / Tr / Tr

Survey:1472.27mMD (1319.1mTVD)
29.96°inc 336.80°az

Survey:1501.10mMD (1343.8mTVD)
32.22°inc 336.28°az

100 / Tr / Tr / Tr

Survey:1529.54mMD (1367.8mTVD)
32.23°inc 335.86°az

CALCILUTITE:70%,v lt gy-lt gy,slty i/p g/t clslt,tr lith,tr foss frag, tr carb mat,sft-frm,disp,amor, occ sbblky.
CALCISILTITE:30%,lt gy-lt bnsh gy,aren i/p g/t vf clcar,tr micmic,tr foss frag,frm-mod hd, sbfiss-sbblky.

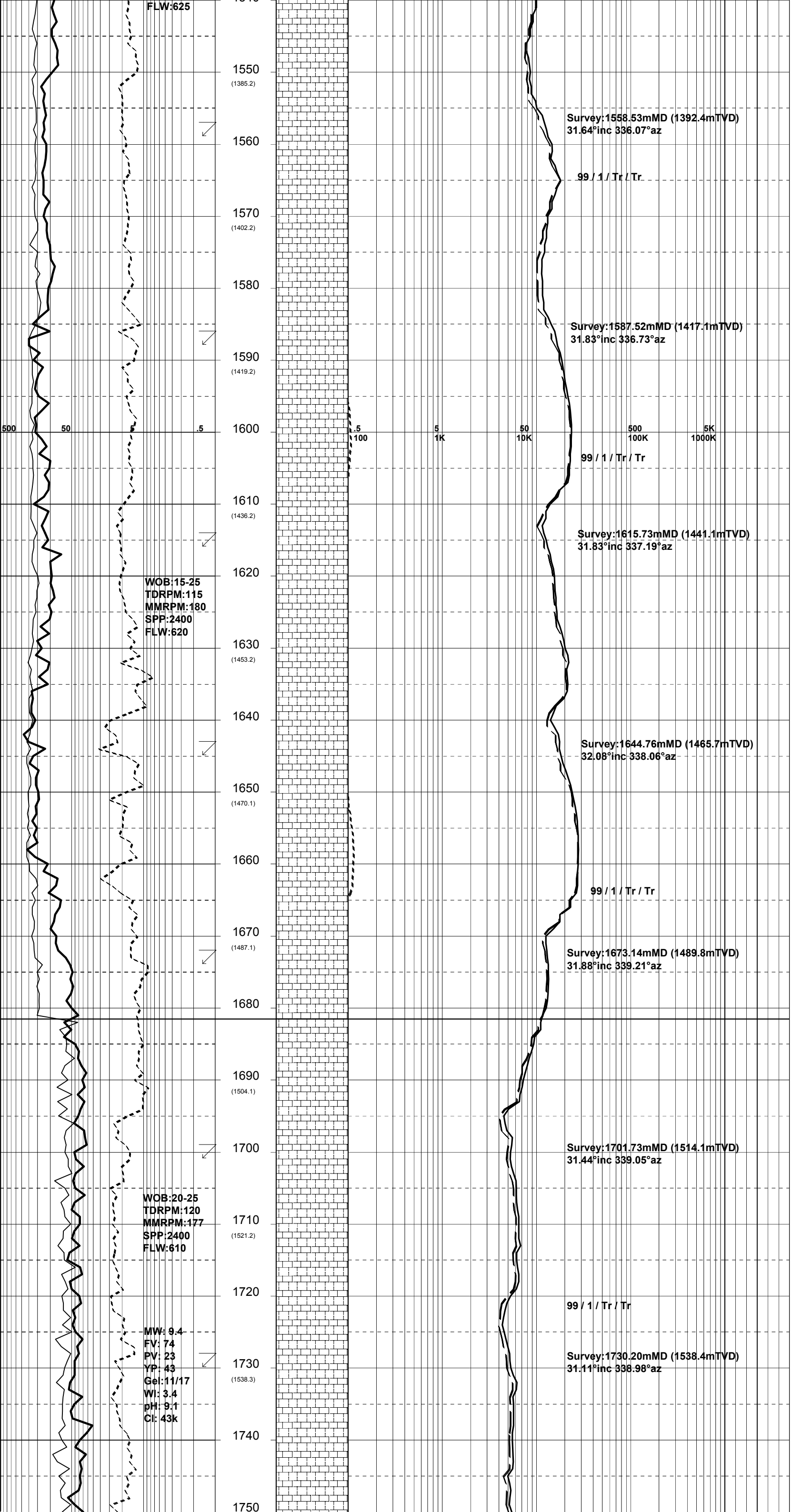
CALCILUTITE:90% med lt gy-med gy, slty i/p g/t clslt,com foss frag, sft-frm,amor-sbblky.
CALCISILTITE:10%,lt gy-lt bnsh gy, aren i/p g/t vf clcar,tr micmic, tr foss frag,frm-mod hd,sbblky-sbfiss.

CALCILUTITE:70% med lt gy-med gy, slty i/p g/t clslt,com foss frag, sft-frm,amor-sbblky.
CALCISILTITE:30%,lt gy-lt bnsh gy, aren i/p g/t vf clcar,tr micmic, tr foss frag,frm-mod hd,sbblky-sbfiss.

CALCILUTITE:60% med lt gy-med gy, slty i/p g/t clslt,com foss frag, sft-frm,amor-sbblky.
CALCISILTITE:40%,lt gy-lt bnsh gy, aren i/p g/t vf clcar,tr micmic, tr foss frag,frm-mod hd,sbblky-sbfiss.

CALCILUTITE:80% med lt gy-med gy, slty i/p g/t clslt,com foss frag, sft-frm,amor-sbblky.
CALCISILTITE:20%,lt gy-lt bnsh gy, aren i/p g/t vf clcar,tr micmic, tr foss frag,frm-mod hd,sbblky-sbfiss.

CALCILUTITE:90% med lt gy-med gy, slty i/p g/t clslt,com foss frag, tr dissem pyr,sft-frm,amor-sbblky.
CALCISILTITE:10%,lt gy-lt bnsh gy, aren i/p g/t vf clcar,tr micmic, tr foss frag,frm-mod hd,sbblky-sbfiss.



CALCILUTITE:90% med lt gy-med gy, slty i/p g/t clslt,com foss frag, tr carb mat,sft-frm,amor-sbblky.

CALCISILTITE:10%,lt gy-lt bnsh gy, aren i/p g/t vf clcar,tr micmic, tr foss frag,frm-mod hd,sbblky-sbfiss.

CALCILUTITE:80% med lt gy-med gy, slty i/p g/t clslt,com foss frag, tr carb mat,sft-frm,amor-sbblky.

CALCISILTITE:20%,lt gy-lt bnsh gy, aren i/p g/t vf clcar,tr micmic, tr foss frag,frm-mod hd,sbblky-sbfiss.

CALCILUTITE:70% med lt gy-med gy, slty i/p g/t clslt,com foss frag, tr glauc,tr carb mat,disp,sft-frm, amor-sbblky.
CALCISILTITE:30%,lt gy-lt bnsh gy, aren i/p g/t vf clcar,tr micmic, com lith,tr foss frag,frm-mod hd, sbblky-sbfiss.

CALCILUTITE:90%,med lt gy-med gy, slty i/p g/t clslt,com foss frag, tr glauc,tr carb mat,disp,sft-frm, amor-sbblky.

CALCISILTITE:10%,lt gy-lt bnsh gy, aren i/p g/t vf clcar,tr micmic, com lith,tr foss frag,frm-mod hd, sbblky-sbfiss.

CALCILUTITE:90%,med lt gy-med gy, slty i/p g/t clslt,com foss frag, tr glauc,tr carb mat,disp,sft-frm, amor-sbblky.
CALCISILTITE:10%,lt gy-lt bnsh gy, aren i/p g/t vf clcar,tr micmic, com lith,tr foss frag,frm-mod hd, sbblky-sbfiss.

Base of High Velocity Channel
1681.5mMDRT 1496.9mTVDRT
(-1463.5mTVDSS)

CALCILUTITE:med lt gy-med gy, slty i/p g/t clslt,com foss frag, tr glauc,tr carb mat,disp,sft-frm, amor-sbblky.

CALCILUTITE:40%,med lt gy-med gy, slty i/p g/t clslt,com foss frag, tr glauc,tr carb mat,disp,sft-frm, amor-sbblky.

CALCISILTITE:60%,lt gy-lt bnsh gy, aren i/p g/t vf clcar,tr micmic, com lith,tr foss frag,tr dissem pyr, frm-mod hd,sbblky-sbfiss.

SLIDING INDICATED BY VERTICAL BAR IN DEPTH COLUMN.

06-06-06

500 50 5 .5

.5 5 50 500 5K
100 1K 10K 100K 1000K

1760
1770
(1572.7)
1780
1790
(1590)
1800
1810
(1607.3)
1820
1830
(1624.8)
1840
1850
(1642.2)
1860
1870
(1659.7)
1880
1890
(1677.1)
1900
1910
(1694.6)
1920
1930
(1711.9)
1940
1950
(1729.3)
1960

WOB:27-30
TDRPM:120
MMRPM:178
SPP:2610
FLW:612

WOB:25-30
TDRPM:115
MMRPM:177
SPP:2600
FLW:605

Survey:1758.66mMD (1562.9mTVD)
30.49°inc 337.00°az

99 / 1 / Tr / Tr

CALCILUTITE:80%,med lt gy-med gy, slty i/p g/t clslt,com foss frag, tr glauc,tr carb mat,disp,sft-frm, amor-sbblky.

CALCISILTITE:20%,lt gy-lt bnsh gy, aren i/p g/t vf clcar,tr micmic, com lith,tr foss frag,tr dissem pyr frm-mod hd,sbblky-sbfiss.

Survey:1787.69mMD (1588.0mTVD)
30.02°inc 336.33°az

CALCILUTITE:med lt gy-lt olv gy, slty g/t clslt,tr dissem pyr,tr foss frag,tr micmic,disp,sft-frm, amor-sbblky.

Survey:1816.72mMD (1613.2mTVD)
29.37°inc 335.96°az

99 / 1 / Tr / Tr

CALCILUTITE:70%,med lt gy-lt olv gy, slty g/t clslt,tr dissem pyr,tr foss frag,tr micmic,disp,sft-frm, amor-sbblky.

CALCISILTITE:30%,lt gy-lt bnsh gy, aren i/p g/t vf clcar,tr micmic, com lith,tr foss frag,tr dissem pyr frm-mod hd,sbblky-sbfiss.

Survey:1845.90mMD (1638.6mTVD)
29.25°inc 336.20°az

99 / 1 / Tr / Tr

CALCILUTITE:med lt gy-lt olv gy, slty g/t clslt,tr dissem pyr,tr foss frag,tr micmic,tr glauc,disp, sft-frm,amor-sbblky.

Survey:1874.19mMD (1663.4mTVD)
28.85°inc 336.22°az

CALCILUTITE:lt gy-med gy,occ lt olv gy,tr dissem pyr,tr foss frag, tr micmic,disp,sft-frm,amor-sbblky.

Survey:1903.12mMD (1688.6mTVD)
29.77°inc 335.79°az

98 / 1 / 1 / Tr

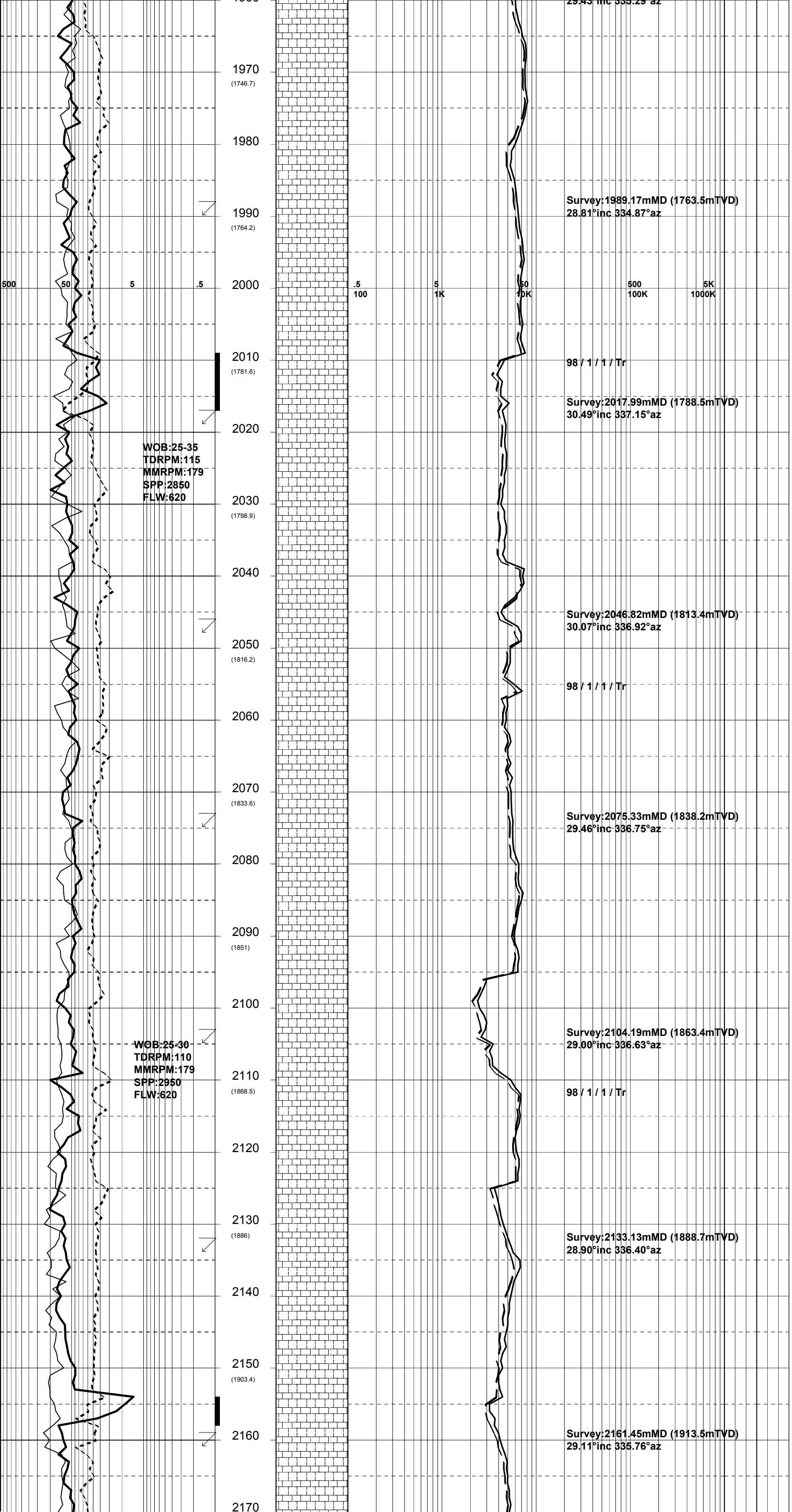
CALCILUTITE:lt gy-med gy,occ lt olv gy,tr dissem pyr,tr foss frag, tr micmic,disp,sft-frm,amor-sbblky.

Survey:1931.93mMD (1713.6mTVD)
29.68°inc 335.20°az

98 / 1 / 1 / Tr

CALCILUTITE:lt gy-med gy,occ lt olv gy,tr dissem pyr,tr nod pyr, tr micmic,tr foss frag,tr lith, frm-occ mod hd,amor-sbblky.

Survey:1960.48mMD (1738.4mTVD)
29.43°inc 335.29°az



CALCILUTITE:lt gy-med gy,occ lt olv gy,tr dissem pyr,tr micmic, tr foss frag,tr lith,frm-occ mod hd,amor-sbblky.

CALCILUTITE:lt bnsh gy-med gy,occ gnsh gy,tr dissem pyr,tr micmic, tr foss frag,tr lith,frm-occ mod hd, amor-sbblky.

CALCILUTITE:lt bnsh gy-med gy,occ gnsh gy,tr dissem pyr,tr micmic, tr foss frag,tr lith,frm-occ mod hd,amor-sbblky.

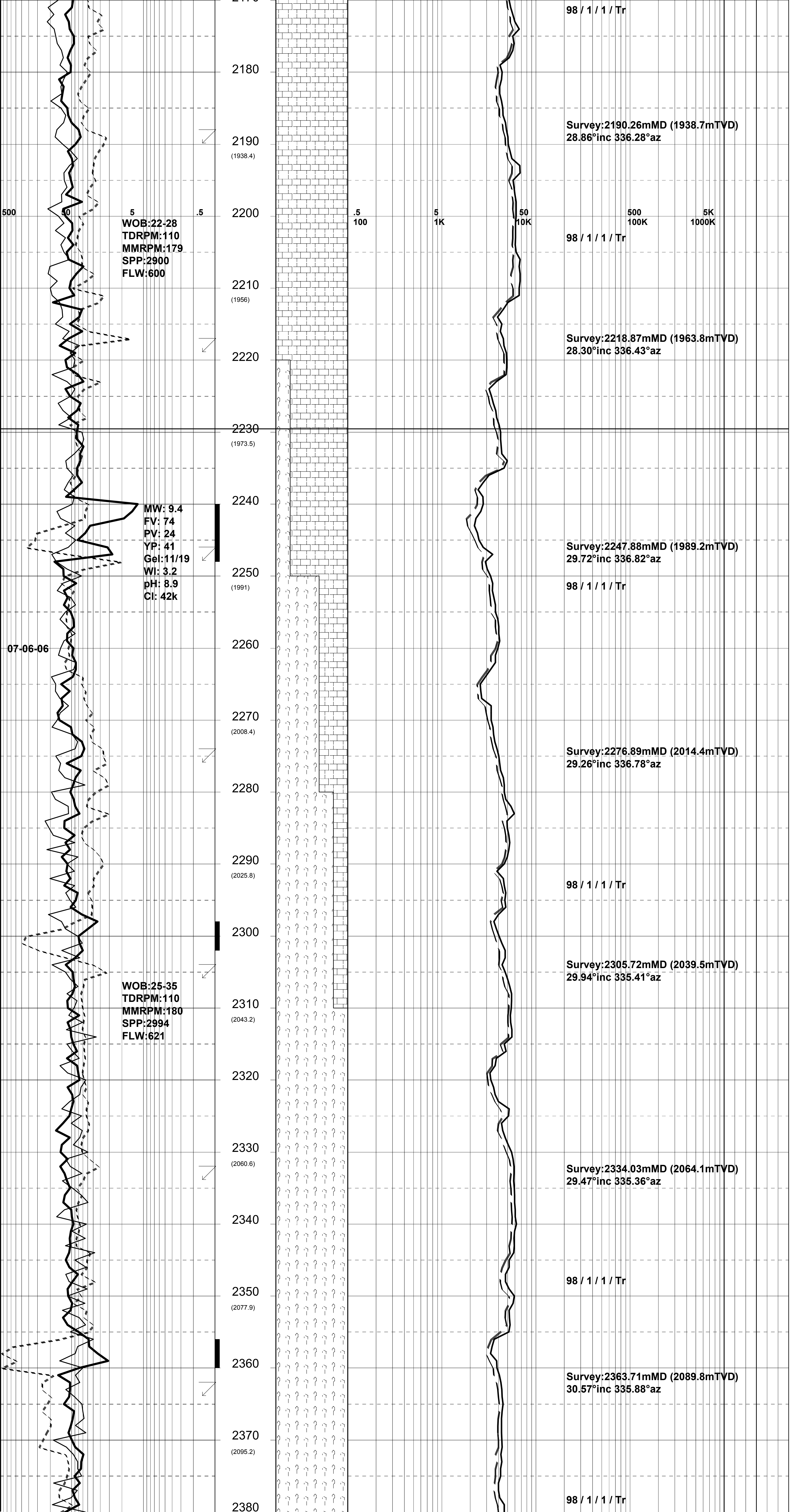
CALCILUTITE:lt bnsh gy-med gy,occ gnsh gy,tr dissem pyr,tr micmic, tr foss frag,tr lith,frm-occ mod hd,amor-sbblky.

CIRCULATE AT REDUCED FLOW RATE, WHILE FIXING MUD PUMP.

CALCILUTITE:v lt gy-med gy,occ lt gnsh gy,slty i/p,tr dissem pyr, tr micmic,tr foss frag,tr glauc, disp,sft-mod hd,amor-sbblky.

CALCILUTITE:v lt gy-lt bnsh gy,occ lt gnsh gy,slty i/p,tr dissem pyr, tr micmic,tr foss frag,tr glauc, disp,sft-mod hd,amor-sbblky.

CALCILUTITE:v lt gy-lt bnsh gy,occ lt gnsh gy,slty i/p,tr dissem pyr, tr micmic,tr foss frag,tr glauc, disp,sft-mod hd,amor-sbblky.



CALCILUTITE:v lt gy-lt bnsh gy,occ lt gnsh gy,slty i/p,tr dissem pyr, tr micmic,tr foss frag,tr glauc, disp,sft-mod hd,amor-sbblky.

CIRCULATE AT REDUCED FLOW RATE, WHILE FIXING MUD PUMP.

CALCILUTITE:v lt gy-lt bnsh gy,occ lt gnsh gy,slty i/p,tr dissem pyr, tr micmic,tr foss frag,tr glauc, disp,sft-mod hd,amor-sbblky.

Lakes Entrance
2229.5mMDRT 1973.1mTVDRT
(-1939.7mTVDSS)

CALCAREOUS CLAYSTONE:med lt gy-med gy,lt bnsh gy,slty,mod calc,tr micmic,tr dissem pyr,frm-mod hd, sbblky.

CALCILUTITE:v lt gy-lt bnsh gy,occ lt gnsh gy,slty i/p,tr dissem pyr, tr micmic,tr foss frag,tr glauc, disp,sft-mod hd,amor-sbblky.

CALCAREOUS CLAYSTONE:med lt gy-med gy,lt bnsh gy,slty,mod calc,tr micmic,tr dissem pyr,frm-mod hd, sbblky.

CALCILUTITE:v lt gy-lt bnsh gy,occ lt gnsh gy,slty i/p,tr dissem pyr, tr micmic,tr foss frag,tr glauc, disp,sft-mod hd,amor-sbblky.

CALCAREOUS CLAYSTONE:med lt gy-med gy,lt bnsh gy,slty,mod calc,tr micmic,tr dissem pyr,frm-mod hd, sbblky.

CALCILUTITE:v lt gy-lt bnsh gy,occ lt gnsh gy,slty i/p,tr dissem pyr, tr micmic,tr foss frag,tr glauc, disp,sft-mod hd,amor-sbblky.

CALCAREOUS CLAYSTONE:med lt gy-med gy,lt bnsh gy,slty,mod calc,tr micmic,tr dissem pyr,frm-mod hd, sbblky.

CALCAREOUS CLAYSTONE:med gy-med lt gy,lt bnsh gy,slty,mod calc,tr micmic,tr dissem pyr,tr nod pyr,frm-mod hd,sbblky.

500 50 5 .5 | .5 100 | 5 1K | 50 10K | 500 100K | 5K 1000K

2390
(2112.5)

Survey:2392.30mMD (2114.4mTVD)
30.07°inc 336.47°az

CALCAREOUS CLAYSTONE:med gy-med lt gy,lt bnsh gy,slty,mod calc,tr micmic,tr dissem pyr,tr nod pyr,frm-mod hd,sbblky.

2400

2410
(2129.8)

WOB:25-30
TDRPM:110
MMRPM:180
SPP:3100
FLW:621

CALCAREOUS CLAYSTONE:lt med gy-med lt gy,occ lt bnsh gy,slty, mod calc,tr dissem pyr,tr micmic, frm-mod hd,sbblky.

2420

Survey:2420.84mMD (2139.2mTVD)
29.26°inc 335.66°az

2430
(2147.2)

CALCAREOUS CLAYSTONE:lt med gy-med lt gy,occ lt bnsh gy,slty, mod calc,tr dissem pyr,tr micmic, tr pyritized foss frag,frm-mod hd, sbblky.

2440

98 / 1 / 1 / Tr

Carbide Lag check at 2441.0 mMDRT
Theoretical 7584 stks
Actual 8230 stks
Difference 646 stks
13% OPEN HOLE OVERGAUGE

2450
(2164.5)

Survey:2449.59mMD (2164.2mTVD)
30.55°inc 337.13°az

CALCAREOUS CLAYSTONE:med gy-med lt gy,occ lt bnsh gy,slty, mod calc,tr dissem pyr,tr micmic, tr foss frag,frm-mod hd,sbblky.

WOB:30-35
TDRPM:115
MMRPM:180
SPP:3300
FLW:610

2460

2470
(2181.8)

2480

Survey:2478.26mMD (2188.9mTVD)
30.12°inc 337.06°az

CALCAREOUS CLAYSTONE:lt bnsh gy-mnr med gy,slty,mod calc,tr dissem pyr,tr micmic,tr foss frag, frm-mod hd,sbblky.

94 / 4 / 1 / 1

2490
(2199.1)

WOB:30-35
TDRPM:115
MMRPM:174
SPP:3400
FLW:595

2500

Survey:2507.09mMD (2214.0mTVD)
29.10°inc 337.16°az

ADDITION OF BARACARB TO MUD SYSTEM.

2510
(2216.5)

93 / 4 / 2 / 1

CALCAREOUS CLAYSTONE:lt bnsh gy-med gy,slty,mod calc,tr dissem pyr,tr nod pyr,tr micmic,tr foss frag, frm-mod hd,sbblky.

2520

2530
(2234.1)

Survey:2536.11mMD (2239.4mTVD)
28.29°inc 338.04°az

CALCAREOUS CLAYSTONE:lt bnsh gy-med gy,slty,mod calc,tr dissem pyr,tr micmic,tr glauc,tr foss frag, frm-mod hd,sbblky.

2540

2550
(2251.7)

WOB:25
TDRPM:115
MMRPM:180
SPP:3400
FLW:605

88 / 6 / 4 / 2

SILTSTONE:pl bn-dk yelsh bn,v aren g/t vf SST,tr micmic,tr glauc,tr dissem pyr,mod hd-hd,sbfiss-sbblky.

2560

Top of Latrobe
2563.0mMDRT 2263.2mTVDRT
(-2229.8mTVDSS)

Survey:2564.78mMD (2264.8mTVD)
27.16°inc 338.44°az

SANDSTONE:wh-pl gn,dom vf-f,mod wl srt,sa-sr,com glauc mtx,hd agg, ti inf & vis por,no fluor.

CLAYSTONE:off wh-v lt gn,tr pel glauc,disp,sft-frm,amor.

2570
(2269.5)

2580

SILTSTONE:med gy-med dk gy,mnr bn-dk yelsh bn,com dissem pyr,tr micmic,com rock flour,mod hd-hd, sbblky-blky.

78 / 9 / 8 / 4 / 1

M1.2UMD
2592.5mMDRT 2289.5mTVDRT
(-2256.1mTVDSS)

2590

Survey:2593.34mMD (2290.2mTVD)

500 50 5 .5

WOB:25-28
TDRPM:115
MMRPM:170
SPP:3400
FLW:585

MW: 9.65
FV: 79
PV: 27
YP: 40
Gel:10/18
WI: 3.0
pH: 8.9
Cl: 40k

WOB:25-28
TDRPM:116
MMRPM:168
SPP:3350
FLW:580

2600
2610
(2305)
2620
2630
(2322.8)
2640
2650
(2340.5)
2660
2670
(2358.3)
2680
2690
2700
2710
2720
2730

27.21°inc 338.26°az

41 / 12 / 19 / 19 / 9

.5 5 50 500 5K
100 1K 10K 100K 1000K

44 / 13 / 19 / 17 / 7

Survey:2621.58mMD (2315.3mTVD)
27.41°inc 337.56°az

40 / 13 / 20 / 19 / 8

Survey:2650.13mMD (2340.6mTVD)
27.81°inc 336.15°az

40 / 13 / 20 / 19 / 8

Survey:2667.00mMD (2355.6mTVD)
26.98°inc 335.29°az

36 / 11 / 21 / 22 / 10

Projection to TD
Survey:2687.00mMDRT (2373.41mTVDRT)
26.98°inc 335.29°az

ROP (m/hr)
500 50 5 .5

WOB (tons)
50 25 0

MWD Gamma Ray (api)
0 100 200

Total gas in Units / Chromatograph in ppm

.5 5 50 500 5K
100 1K 10K 100K 1000K

.5 5 50 500 5K
100 1K 10K 100K 1000K

SANDSTONE:clr-trnsl,crs-v crs,dom v crs,mod wl srt,sa-sr,wk pyr cmt,tr nod,pyr,dom lse,cln,pr-fr inf por,fluor.

M1.2L Top
2598.5mMDRT 2294.8mTVDRT
(-2261.4mTVDSS)

FLUOR:2590-2610m Tr-5% dll-mod brt,sptd pl yelsh fluor,slw-mod fst blooming dir cut,dll-mod brt,wh-pl gn ptchy-thn ring/flm res.

PSB7 (Top of M1.3U)
2610.5mMDRT 2305.5mTVDRT
(-2272.1mTVDSS)

PSB6 (Top of PS5 sand)
2612.5mMDRT 2307.2mTVDRT
(-2273.8mTVDSS)

PSB5 (Top of PS4 sand)
2617.0mMDRT 2311.2mTVDRT
(-2277.8mTVDSS)

PSB4 (Top of PS3 sand)
2632.0mMDRT 2324.5mTVDRT
(-2291.1mTVDSS)

FLUOR:2610-2650m 20-30% mod brt-brt even yelsh gn fluor,mod fst-fst blooming dir cut,dll-mod brt wh-pl gn ptchy-thk film/ring res.

PSB3 (Top of PS2 sand)
2642.0mMDRT 2333.4mTVDRT
(-2300.0mTVDSS)

FLUOR:2640-2655m Tr-7% mod brt pnpt pl yelsh gn fluor,v slw diff dir cut,thn pl gn ring res.

SB13 (Top of M1.4U)
2654.5mMDRT 2344.5mTVDRT
(-2311.1mTVDSS)

SANDSTONE:clr-trnsl,dom med,occ v crs,mod wl srt,sr-sa,tr pyr cmt, tr nod pyr,rr hd agg,com rock flour, fr inf & vis por,fluor.

M1.4C (Coal)
2667.0mMDRT 2355.6mTVDRT
(-2322.2mTVDSS)

SANDSTONE:clr-trnsl,dom med-v crs,mod wl srt,sa-sr,wk pyr cmt, tr nod pyr,wk sil cmt,occ hd agg,pr-fr inf & vis por,fluor.
CLAYSTONE:off wh-lt gy,disp,sft amor,com rock flour.

SILTSTONE:lt bn-pl yelsh bn, v aren g/t vf SST,tr micmic,com rock flour,frm-mod hd,sbfiss-sbblky.

WKF W-19A reached Total Depth of 2687.0m MDRT 2373.4m TVDRT (-2340.0m TVDSS) at 20:00 hours on 07-06-2006.

Run Precision Energy Services compact shuttle logging from 2684.0m MDRT to 2439.2m MDRT, 1749.3m MDRT to 1519.3m MDRT 1289.4m MDRT to 628.8m MDRT MCG-MDN-MPD-MDL-MSS-MAI

7" Production Casing shoe set at 2681.0m MDRT

APPENDIX 4b

WEST KINGFISH W19A

Well Completion Log

ESSO AUSTRALIA RESOURCES PTY LTD.

WELL COMPLETION LOG
Scale – 1:200
WEST KINGFISH W19A

Gippsland Basin, Victoria
Concession: VIC/L7

POST-DRILL LOCATION:	Latitude:	38º 35' 4.10" S	**COMPILED BY:**	Sheryl Sazenis
	Longitude:	148º 05' 57.22" E		
Top of Latrobe	MGA X:	595740 mE	**DRAFTED BY:**	Arnaldo Ribeiro
	MGA Y:	5728760 mN		
	Depth:	2563.0 mMDRT	**DRILL RIG:**	Nabors Rig 453
		2263.2 mTVDRT		
		(-2229.8 mTVDSS)	**Datum:**	GDA94
ELEVATION:	G.L.:	-76.13 m	**Spheroid:**	GRS80
	R.T.:	33.43 m	**Projection:**	UTM
	Water Depth:	76.13 m	**Map Grid/Cent.Meridian**	MGA Zone 55/147 deg E
			TOTAL DEPTH:	2687.0 mMDRT / 2373.4 mTVDRT
DATES:	Spudded:	03/06/2006	**PLUGGED BACK T.D.:**	2639.0 mMDRT (wireline HUD)
	Rig Released:	17/06/2006		
	I.P. Established:	27/06/2006	**CLASSIFICATION:**	Oil Development
	(Initial production)			
			STATUS:	Cased and Completed

SERVICE COMPANIES:

DRILLING CONTRACTOR:	International Sea Drilling Limited (Nabors Rig 453)	PRODUCTION TESTING:	n/a
MWD/DIRECT. DRLG:	Schlumberger Anadrill	DIVERS:	n/a
GYRO SURVEYING:	SDI (Scientific Drilling Int.)	MUD LOGGING:	Geoservices Overseas S.A.
CORING:	n/a	PRESSURE RECORDING:	n/a
PIPE CONVEYED LOGGING:	Precision Energy Services (Reeves Compact Shuttle Logging System)	WELL VELOCITY SURVEY:	n/a
CEMENTING:	Halliburton	MUD ENGINEERING:	Halliburton- Baroid
CASING:	Weatherford	LINER:	n/a

LEGEND

2.7m NOS
Ø = 17%
Sw = 32%

No Rec.
CORE
Rec.

PERFORATED INTERVAL

PLUG

LOG ANALYSIS DATA
NS - Net Sand
NOS - Net Oil Sand
NGS - Net Gas Sand
Sw - Water Saturation

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

SHOW OR STAIN
HYDROCARBON CUT
FLUORESCENCE
GAS SHOW
OIL PRODUCTIVE
GAS PRODUCTIVE
INTERPRETED OIL PRODUCTION
INTERPRETED GAS PRODUCTION
INTERPRETED WATER PRODUCTION
WATER PRODUCTIVE
CONDENSATE PRODUCTION
INTEPRETED CONDENSATE BEARING
DSTG DST WITH GAS RECOVERED
DSTO DST WITH OIL RECOVERED
SURVEY POINT
13-3/8" CASING SHOE
MUD

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

SIDE WALL CORE - NO RECOVERY

FIT

P2/11 MDT/RFT PRETEST RUN/SEAT NUMBER

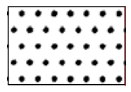
S11/2 MDT/RFT SAMPLE RUN/SAMPLE NUMBER

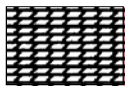
P2/40 MDT VERTICAL/HORIZONTAL PERMEABILITY TEST

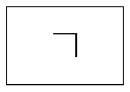
PACKER

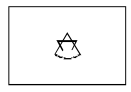
BRIDGE PLUG

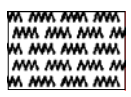
LITHOLOGICAL SYMBOLS

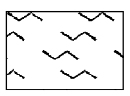

Sandstone

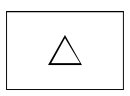

Dolomite

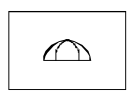

Mica


Pelecypods

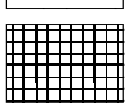

Siltstone

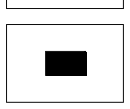

Marl

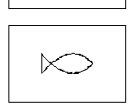

Chert

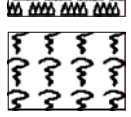

Echinoids


Mudstone

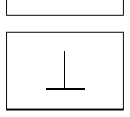

Anhydrite

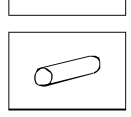

Carbonaceous Matter

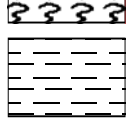

Fish Remains


Claystone

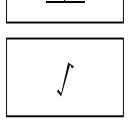

Volcanics

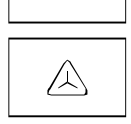

Calcareous

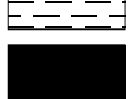

Plant Remains

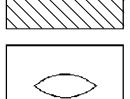

Shale

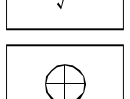

Basement

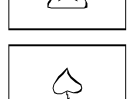

Glauconite

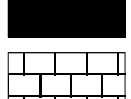

Spores

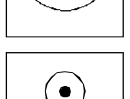

Coal

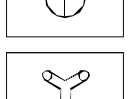

Granule

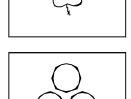

Corals

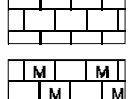

Leaves

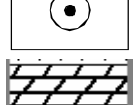

Limestone

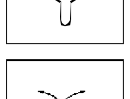

Oolites

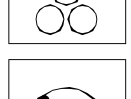

Bryozoans

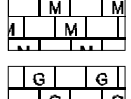

Foram

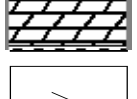

Micritic Limestone

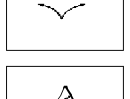

Dolomite

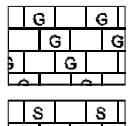

Brachiopods

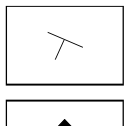

Fossils

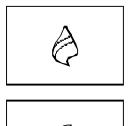

Grain Limestone




Gastropods


Skeletal Limestone


Pyrite


Cephalopods

LOGGING AND SURVEYING

Anadrill Schlumberger	Interval (mMDRT)	Precision Energy Services Logging	Interval (mMDRT)
MWD (Directional & GR) – 1 Run	666.0m MDRT - 2687.0m MDRT (GR 666m-2668m)	MCG-MDN-MPD-MSS-MDL-MAI – 1 Run (GR-Neutron-Density-Sonic-Dual Laterlog-Induction)	2684.0m – 666m MDRT (Main log from 2670m to 2439m MDRT)

WELL DATA

Date	03 June 2006 - 07 June 2006	09 June 2006 - 10 June 2006		
Run	MWD # 1	Wireline Run #1 on shuttle		
Log	Powerpulse Directional & GR	MCG-MDN-MPD-MSS-MDL		
Depth Driller	2687.0m MDRT	2687.0m MDRT		
Depth Logger	2687.0m MDRT	2684.0m MDRT		
Bottom Log Interval	2667.0m MDRT	2670.7m MDRT		
Top Log Interval	666.0m MDRT	666m MDRT (2439.2m MDRT end of Latrobe section)		
Casing Driller	666.0m MDRT	666.0m MDRT		
Casing Logger	666.0m MDRT	666.0m MDRT		
Casing Size	10 .75"	10 .75"		
Casing Weight	40.5 ppf	40.5 ppf		
Bit Size	8.5"	8.5"		
Type of Fluid in Hole	KCl/PHPA/GLYCOL	KCl/PHPA/GLYCOL		
Density	9.65 ppg	9.65 ppg		
Rm @ Measured Temp.	N/A	0.106		
Rmf @ Measured Temp.	N/A	0.085		
Rmc @ Measured Temp.	N/A	0.114		
Max. Recorded Temp.	80.78°C	83.20°C		
Equipment / Location	Sale	Sale		
Recorded By	L. Johnston / R. Borjas	B.Moss / R. Tench		
Witnessed By	Trevor Lobo	Trevor Lobo		

CORES

From (mMDRT)	To (mMDRT)	Rec %
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PERFORATIONS

From (mMDRT)	To (mMDRT)	Gun Type
2592.5	2597.0	MaxR

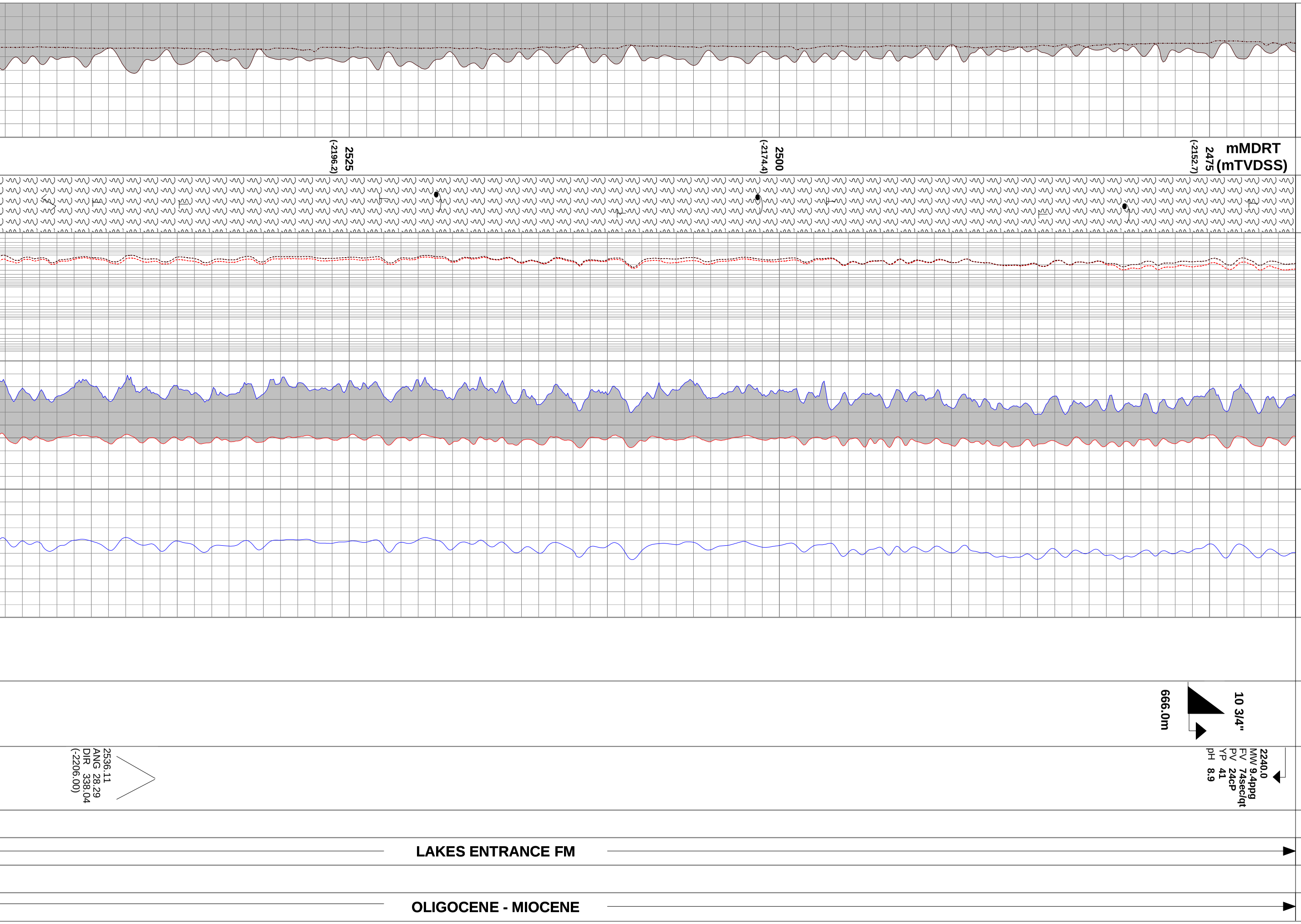
CASING

Size	Set @ (mMDRT)	SX Cmt	Formation
10. 75"	666.0	---	Gippsland Limestone
7”	2681.0	698	Latrobe Group

PLUGS

From (mMDRT)	To (mMDRT)	SXCmt
2681 (shoe)	2639.0 (Wireline HUD)	--

Caliper 6 IN 16 / Gamma Ray 0 GAPI 200	DEPTH	LITHOLOGY	Deep Laterolog 0.2 OHMM 2000 / Shallow Laterolog 0.2 OHMM 2000	Compensated Den 1.85 G/C3 2.85 / Neutron Porosity 0.45 V/V -0.15	Bulk Vol Water 1 V/V 0 / Compensated Sonic 500 US/M 100	TEST	MPLETION	RVEY DATA	PLUGS	ORMATION	LYNOLOGY	AGE


mMDRT
(mTVDSS)
2525
(-2196.2)
2500
(-2174.4)
2475
(-2152.7)
Effective Porosity
V/V
1
0
10 3/4"
666.0m
2240.0
MW 9.4ppg
FV 74sec/qt
PV 24cP
YP 41
pH 8.9
2536.11
ANG 28.29
DIR 338.04
(-2206.00)
CO
MUD / SUR
LAKES ENTRANCE FM
FO
PAL
OLIGOCENE - MIOCENE

2550
(-2218.3)

Top of Latrobe (TOL)
2563m MDRT
(-2229.8m TVDSS)

2564.78
ANG 27.16
DIR 338.44
(-2231.38)

2575
(-2240.5)

SBN3
2585m MDRT
(-2249.4m TVDSS)

FLUORESCENCE:
2590-2610m Tr-5% dll-mod brt, sptd pl yelsh fluor, slw mod fst blooming dir cut, dll-mod brt wh-pl gn ptchy-thn ring/flm res.

From 2592.5
to 2597m

SBP2(M1.2U)
2592.5m MDRT
(-2256m TVDSS)

Oil bearing
4.8 MD Net
4.3 TVD Net
∅ = 17.7%
Sw = 48%

2593.34
ANG 27.21
DIR 338.26
(-2256.78)

Water bearing, residua l oil
∅ = 21 %
Sw =60 %

SBP3(M1.2L Top)
2599.2m MDRT
(-2262m TVDSS)

2600
(-2262.7)

Probably oil bearing
1.2 MD Net
1.1 TVD Net
∅ = 17.6%
Sw = 53%

Probably oil bearing
1.0 MD Net
0.9 TVD Net
∅ = 16.6%
Sw = 59%

BM12(M1.2L base)
2605m MDRT
(-2267.1m TVDSS)

Water bearing, residua l oil
∅ = 14.8 %
Sw =69 %

Top M1.3U PS6(PSB7)
2610.7m MDRT
(-2272.2m TVDSS)

Oil bearing
0.7 MD Net
0.6 TVD Net
∅ = 14.2%
Sw = 62%

PS5 sand (PSB6)
2612.3m MDRT
(-2273.6m TVDSS)

Water bearing, residua l oil
∅ = 19.4 %
Sw =71 %

PS4 sand (PSB5)
2617.4m MDRT
(-2278.1m TVDSS)

FLUORESCENCE:
2610-2640m 20-30% mod brt-brt even yelsh gn fluor, mod fst-fst blooming dir cut, dll-mod brt wh-pl gn ptchy-thk film/ring res.

2621.58
ANG 27.41

2625

LATROBE GROUP

EARLY EOCENE

(-2284.9)

2650
(-2307.1)

2675
(-2329.3)

Top M1.3L PS3(PSB4)
2632m MDRT
(-2291.1m TVDSS)

FLUORESCENCE:
2640-2655m Tr-7%
mod brt pnpt pl yelsh
gn fluor, v slw diff dir
cut, thn pl gn ring res.

PS2 sand (PSB3)
2641.9m MDRT
(-2300m TVDSS)

SB13 (M1.4U Top)
2654.3m MDRT
(-2310.9m TVDSS)

M1.4C coal
2663.9m MDRT
(-2319.4m TVDSS)

TOTAL DEPTH 2687.0mMD (-2340mTVDSS)

Water bearing, residua l oil
∅ = 20.5 %
Sw =91 %

DIR 337.56
(-2281.88)

LATROBE

PALEOCENE -

2650.13
ANG 27.81
DIR 336.15
(-2307.17)

2670.0
MW **9.65ppg**
FV **79sec/qt**
PV **27cP**
YP **40**
pH **8.9**

2667.00
ANG 26.98
DIR 335.29
(-2322.15)

7"

2681.0m

2687.0
MW **9.65ppg**
FV **72sec/qt**
PV **27cP**
YP **40**
pH **8.9**

West Kingfish W19A
Initial Production Date: 27/06/2006
Production Zone: M1.2UMD
Initial Total Liquid Rate 369 kL/day
Initial water cut: 78%
Initial Oil rate:81 kL/day