

Company: **Santos Limited**

**Well:**  
**Netherby 1DW1**

Field: Otway

# Rig: Ocean Patriot

State:

# Victoria

**EcoScope \* Density Neutron  
1:500 True Vertical Depth  
Recorded Mode Log**

Location	
Total depth:	2517.0 m
Spud date:	02-Aug-2008
Runs:	5 To 6
Permanent datum:	Mean Sea Level
Log measured from:	Rig Floor
Depth reference:	Driller's Depth
	Elev.: 0 m
	66.10 m above Perm. datum

## Ocean Patriot

Otway

Location: Bass Strait

Netherby 1DW1

Company: Santos Limited

Job serial no.  
08ASQ0003

X = E 142 38' 25.745"  
Y = S 38 40' 48.578"

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Longitude

Latitude  
S 38° 40' 48.578

Depth logged:

Date logged: 8-Aug-08 To 11-Aug-08

Mag decl: 10.777 deg.

Mag dip:  $-69.86$  deg.

Other services:

See Remarks

Bore hole record				Casing record			
Hole size	from	to	Size	Density	from	to	
36.00	88.0 m	130.9 m	30.000	310.0 lbm/m	88.0 m	130.9 m	
17.50	130.9 m	647.5 m	13.375	223.0 lbm/m	88.0 m	642.0 m	
12.25	647.5 m	1944.5 m	9.625	154.0 lbm/m	642.0 m	1936.0 m	
8.50	1944.5 m	2517.0 m					
						</	

Surface equipment		Software record			
Unit	OLU-KC-0702	IDEAL w/s	ID13_0C_08		
Depth system	Geolograph+GTE+CLT	HSPM	13_0c_03		
		EosScope	Karl2-V2.2		
		TeleScope	9.2C02		

# Bit Run Summary

Run number		5	6							
Bit size	in	12.25	8.5							
Bit start depth	m	1421	1944							
Bit end depth	m	1944	2517							
Top interval logged	m	1420	1936							
Bottom interval logged	m	1932	2505							
Begin log: time		20:52	13:43							
Begin log: date		2-Aug-08	7-Aug-08							
End log: time		13:43	01:03							
End log: date		7-Aug-08	13-Aug-08							
<b>Mud data</b>										
Depth	m	1421	1944							
Type		WBM	WBM							
Mud weight	ppg	11.1	9.5							
Solids	%	11.1	1.62							
Chlorides	mg/L	45000	89000							
Rm	ohmm @ °C	0.13@22.1	0.08@15.9							
Rmf	ohmm @ °C	0.19@22.9	0.13@16.5							
Rmc	ohmm @ °C	0.10@22.4	0.08@15.7							

Potassium	%	4.35	N/A								
<b>Environmental data</b>											
<b>GR</b>											
Mud weight	ppg	11.1	9.5								
Bit size	in	12.25	8.5								
<b>Resistivity</b>											
<b>Neutron porosity</b>											
Hole Size	in	12.25	8.5								
Mud weight	ppg	11.1	9.5								
Temperature	°C	80.0	65.0								
Mud salinity	ppk	N/A	130.7								
Formation salinity	N/A	N/A	N/A								
Recording rate 1	SEC	RES/GR 6	RES/GR 2								
Recording rate 2	SEC	N/A	DEN/POR 4								
Filtering GR		3 points	3 points								
Filtering density		N/A	3 points								
Filtering Neutron		N/A	3 points								
Company representative		C.Roots	N.Peri								
Anadrill personnel		J.Oldrige	U.Hassan	A.Kohli	Z.Rudd						

<p style="text-align: center;"><b>DISCLAIMER</b></p> <p>THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE OF AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.</p>		
<b>OTHER SERVICES FOR RUN5</b> Directional Survey. APWD. Ultrasonic Caliper.	<b>OTHER SERVICES FOR RUN6</b> Directional Survey. APWD Ultrasonic Caliper.	<b>OTHER SERVICES FOR RUN</b>
<b>REMARKS: RUN NUMBER 5</b> Depth is referenced to Driller's Pipe Tally.  ARC Gamma Ray is corrected for mud weight, bit size, Potassium and tool collar size.  ARC Resistivities are borehole compensated and Environmentally corrected for bit size, mud resistivity.	<b>REMARKS: RUN NUMBER 6</b> Depth is referenced to Driller's Pipe Tally.  EcoScope Gamma Ray is corrected for mud weight, bit size and potassium content.  EcoScope Resistivities are borehole compensated and Environmentally corrected.  EcoScope Thermal Neutron Porosity (TNPH) is corrected for effects of borehole size, temperature, mud salinity and mud hydrogen index ( a factor of mud weight, mud pressure, and mud temperature).  Neutron Porosity is calculated using a limestone matrix density of 2.71 g/cm3.  Geolograph cable broke at 2165m Relogged from 2165-2180m due to broken Geolograph Cable.	<b>REMARKS: RUN NUMBER</b>

Run Objectives:  
Drill to 1944m TD.

Run Objectives:  
Drill to 2517m.

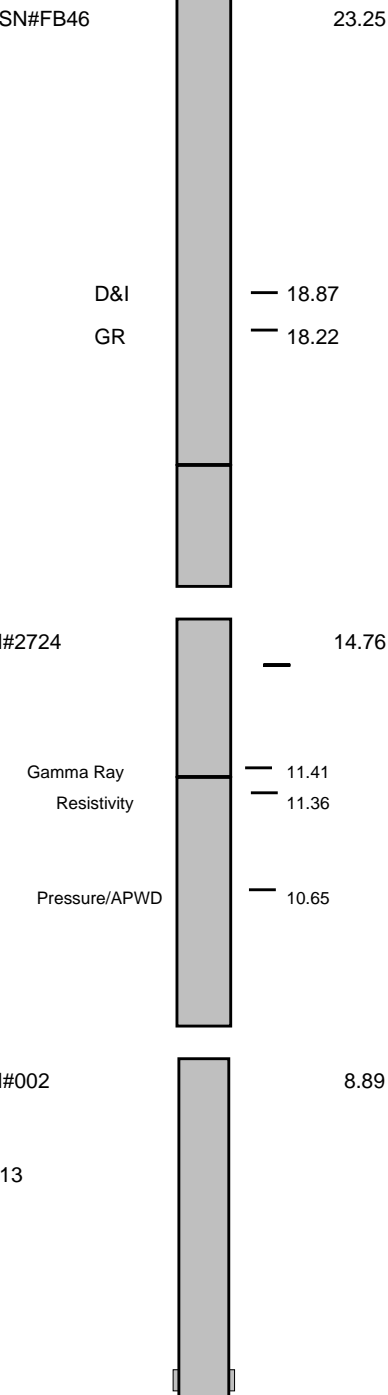
EQUIPMENT DESCRIPTION

RUN5

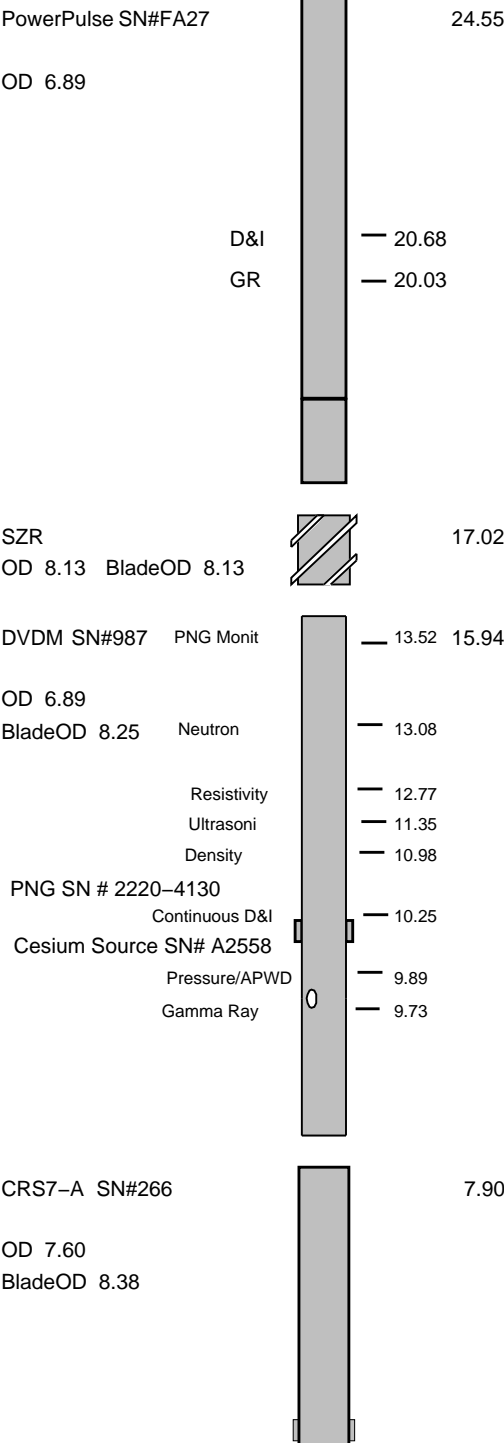
RUN6

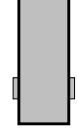
RUN

DOWNHOLE EQUIPMENT



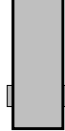
DOWNHOLE EQUIPMENT





BIT-PDC SN#215850  
OD 12.25

Maximum string diameter 12.25 in.  
All lengths in Meters



BIT-PDC SN # JX0574  
OD 8.50

Maximum string diameter 8.50 in.  
All lengths in Meters

Variable Name	Variable Description	Run Name & Value		
	Run Number		5	6
	General Information			
BHT_RM	Bottom Hole Temperature (RM)	DEGC	80.000	65.000
BSAL_RM	Mud Salinity (RM)	PPK	NA	130.746
BS_RM	Bit Size (RM)	IN	12.250	8.500
COEF_M	User Defined FEXP in Clean Sand	----	1.650	1.650
C_WS	Overpressure correction to Sw and M	----	1.000	1.000
FEXP	Formation Factor Exponent(RM)	----	2.000	2.000
FNUM	Formation Factor Enumerator(RM)	----	1.000	1.000
FPHI_RM	Formation Factor Porosity Source (RM)	----	XPLOT	XPLOT
MST_RM	Mud Sample temperature (RM)	DEGC	22.100	18.700
MW_RM	Mud Weight (RM)	LB/G	11.100	9.500
OBMF_RM	Oil Based Mud (RM)	----	NO	NO
RHOF_RM	Mud Filtrate Density (RM)	G/C3	1.000	1.000
RHOM_RM	Matrix density (RM)	G/C3	2.710	2.710
RMS_RM	Resistivity of Mud Sample (RM)	OHMM	0.128	0.073
RWA_COMP_M	Rwa computation model			
RWA_DEN_AD	Rwa Density Input ADN			
RWA_DEN_CD	Rwa Density Input CDN			
RWA_DEN_IN	Rwa Density Input			
RWA_FORM_M	Rwa computation formation model			
RWA_RES_IN	Rwa computation resistivity input			
RWS_RM	Resistivity of Connate Water (RM)	OHMM	1.000	1.000
SHT_RM	Ground Level Temperature (Mud-Line When Offshore ) (RM)	DEGC	10.000	10.000
TD_RM	Total Measured Depth (RM)	M	1944.500	2517.100
TWS_RM	Temperature of Connate Water (RM)	DEGC	23.889	23.889
VF_ILLI	Fraction of illite in shales	----	0.500	0.500
VF_KAOL	Fraction of kaolinite in shales	----	0.500	0.500
VF_MONT	Fraction of montmorillonite in shales	----	0.000	0.000
XPDM_RM	Cross plot density porosity multiplier	----	0.675	0.675
XPNM_RM	Cross plot neutron porosity multiplier	----	0.325	0.325
	ARC			
A12A	ARC Air Cal Attenuation From T1 at 2 MHz	DB	8.267	8.169
A14A	ARC Air Cal Attenuation From T1 at 400 KHz	DB	8.197	8.157
A22A	ARC Air Cal Attenuation From T2 at 2 MHz	DB	6.374	6.249
A24A	ARC Air Cal Attenuation From T2 at 400 KHz	DB	6.450	6.267
A32A	ARC Air Cal Attenuation From T3 at 2 MHz	DB	4.991	4.775
A34A	ARC Air Cal Attenuation From T3 at 400 KHz	DB	4.915	4.757
A42A	ARC Air Cal Attenuation From T4 at 2 MHz	DB	4.337	4.656
A44A	ARC Air Cal Attenuation From T4 at 400 KHz	DB	4.410	4.669
A52A	ARC Air Cal Attenuation From T5 at 2 MHz	DB	3.582	3.332
A54A	ARC Air Cal Attenuation From T5 at 400 KHz	DB	3.513	3.317
ABNT	Abnormal Transmitter Indicator	----	No_Tx_Failed	No_Tx_Failed
ADHS	ARC Down Hole Software Version		V9.3B13	----
AM2A	ARC Air Cal Amplitude Offset at 2 MHz	----	-50000.000	-50000.000
ANISO_COMPUTE	Anisotropy Computation Option	----	YES	YES
APICG	ARC5 Gamma Ray Gain Factor	----	1.078	
APIG	ARC Gamma Ray API Gain Factor	----	-1.000	
ARC_DATA_FIX	ARC: Create A Corrected ARC Time Data File	----	NO	
ARC_DATA_LTB	ARC: Create An ARC LTB Data File	----	NO	
ATMP_ARC	ARC Select Temperature Channel	----	Annulus_Temp	Annulus_Temp
ATRN	ARC Tool Run Number	----	5	----
ATSN	ARC Tool Serial Number	----	2724	----
AZMF	Formation DIP Azimuth	DEG	0.000	0.000
BH_COMPUTE	Borehole Inversion Computation Option	----	YES	YES
CALG	ARC Gamma Ray Cal Gain Factor	----	1.078	
CALI_SLCT_ARC	ARC Caliper Selection	----	BITSIZE	
CDPTH_ARC	Process Start Depth	M	30.480	30.480
DIELEC_COMPUTE	Dielectric Computation Option	----	YES	YES
DIPF	Formation DIP Angle	DEG	0.000	0.000
ERRCT	Percentage Error Cutoff	----	4.500	4.500
GRSH	GR Shale (Invasion Computation Cutoff)	GAPI	1000.000	1000.000
HIGH_BLEND	High Resistivity Threshold for Blending	OHMM	2.000	2.000
INCLIN_B0	ARC Bias Constant (mg)	----	0.000	0.000
INCLIN_B1	ARC Bias First-order Coefficient (mg/degC)	----	0.000	0.000
INCLIN_B2	ARC Bias Secod-order Coeeficient (mg/degC)	----	0.000	0.000
INCLIN_B3	ARC Bias Third-order Coefficient (mg/degC)	----	0.000	0.000
INCLIN_C0	ARC Current Scale Factor Constant (mA/g)	----	1.000	1.000

INCLIN_C1	ARC Scale First-order Coefficient (mA/g/degC)	----	0.000	0.000
INCLIN_C2	ARC Scale Second-order Coefficient (mA/g/degC)	----	0.000	0.000
INCLIN_C3	ARC Scale Third-order Coefficient (mA/g/degC)	----	0.000	0.000
INVAS_COMPUTE	Invasion Computation Option	----	YES	YES
JSD_ARC	ARC Acquisition start date	----	1-Aug-08	----
KPER	Potassium Concentration (RM)	----	4.356	
LOW_BLEND	Low Resistivity Threshold for Blending	OHMM	1.000	1.000
MSWS	ARC Wizard Model Switch Window	M	1.524	1.524
MULTIEFFECT_COM	Multi Effect Option	----	YES	YES
P11AC_RM	ARC: Air Calibration For Phase T1 to R1	DEG	-999.250	-999.250
P12A	ARC Air Cal Phase-Shift From T1 at 2 MHz	DEG	-1.295	-1.296
P14A	ARC Air Cal Phase-Shift From T1 at 400 KHz	DEG	1.663	2.074
P22A	ARC Air Cal Phase-Shift From T2 at 2 MHz	DEG	1.364	1.203
P24A	ARC Air Cal Phase-Shift From T2 at 400 KHz	DEG	-1.688	-1.994
P32A	ARC Air Cal Phase-Shift From T3 at 2 MHz	DEG	-1.375	-1.336
P34A	ARC Air Cal Phase-Shift From T3 at 400 KHz	DEG	1.672	2.082
P42A	ARC Air Cal Phase-Shift From T4 at 2 MHz	DEG	1.321	1.213
P44A	ARC Air Cal Phase-Shift From T4 at 400 KHz	DEG	-1.701	-1.913
P52A	ARC Air Cal Phase-Shift From T5 at 2 MHz	DEG	-1.400	-1.294
P54A	ARC Air Cal Phase-Shift From T5 at 400 KHz	DEG	1.648	1.915
POFFSET_ARC	ARC: Pressure Offset	PSI	0.000	
PRTD	Preferred Resistivity Log for Rt Display while Multi-Effects	----	P34B	P34B
PSOF_ADJ_T1	ARC: User Input Phase offset	DEG	0.000	0.000
RESTIK	ARC resistivity tick source	----	Phase	Phase
RSD	LWD run start date dd-mmm-yy	OHMM	0.128	0.073
RWA_COMP_MOD	Rwa computation model	----	BASIC	BASIC
RWA_DEN_ADN	Rwa Density Input	----	RHOB	RHOB
RWA_DEN_CDN	Rwa Density Input	----	RHOB	RHOB
RWA_DEN_INPUT	Rwa Density Input	----	RHOB	RHOB
RWA_FORM_MOD	Rwa computation formation model	----	CLASTIC	CLASTIC
RWA_RES_INPUT	Rwa computation resistivity input	----	RT	RT
SHIG	ARC High Shock Risk Level	CPS	0.500	
SMED	ARC Medium Shock Risk Level	CPS	0.330	
SMIN	ARC Minimum Shock Risk Level	CPS	0.160	
SUPD	ARC Real Time Shock Update Rate	S	30.000	
TCODE_ARC	ARC Tool File Code	S	30.000	
TSIZ_ARC	ARC Tool Size	IN	8.250	6.900
UNIFORM_COMPUTE	Uniform Rock Option	----	YES	YES
VERS_ARC	ARC Down hole software version Number	----	9.300	2.200
WRK	to Report Potassium Concentration (RM)	----	K_by_Wgt_%	K_by_Wgt_%

	DVD			
-----	Parameters-----	Parameters-----	Parameters-----	-----Sigma
-----	Parameters-----	Parameters-----	Parameters-----	-----Sigma
ALPHA_DEN_OPT	Density Enhanced Vertical Resolution Processing Switch	----		NO
CHI_RM	Caliper High Limit from BS (RM)	IN		10.000
CLO_RM	Caliper Low Limit from BS (RM)	IN		-5.000
DTMUD	Delta-T for Mud (RM)	US/F		190.000
DTMUD_DH	Delta-T for Mud Downhole (RT)	US/F		190.000
DVDM DHS	DVDM Down Hole Software Version	US/F		190.000
DVDM_DATA_LTB	DVDM: Create An DVDM LTB Data File	----		NO
DVD_DATA_FIX	DVDM: Create A Corrected DVDM Time Data File	----		NO
DYN_IMAGE_OPT	Generate Dynamic Normalized Image?	----		YES
EDPTH	Wizard Process Stop Depth	----		50000
EN_WIZARD	Enable ARC Wizard Processing	----		NO
EVRL	EVR Process averaging number of samples (RM)	----		49
FWVN	Firmware Version Number	----		2.200
GCSE	Generalized Caliper Selection	----		BS
GR_CF	Gamma Ray Correction Factor	----		1.800
GR_O2COR_OPT	Enable Gamma Ray Oxygen Activation Correction	----		YES
IDQT	Image Derived Quality Threshold	----		1.000
IMAGE_MAX_DCRA	Image Density Caliper Right Scale	IN		8.000
IMAGE_MAX_IDDQ	Image Density Quality Right Scale	----		1.000
IMAGE_MAX_SPEF	Image PEF(Segment) Right Scale	----		6.000
IMAGE_MAX_SRHOB	Image RHOB(Segment) Right Scale	G/C3		2.650
IMAGE_MIN_DCRA	Image Density Caliper Left Scale	IN		2.000
IMAGE_MIN_IDDQ	Image Density Quality Left Scale	----		0.000
IMAGE_MIN_SPEF	Image PEF(Segment) Left Scale	----		2.000
IMAGE_MIN_SRHOB	Image RHOB(Segment) Left Scale	G/C3		2.050
JSD	Acquisition start date	----		9-Aug-08
MATR	Rock Matrix for Neutron Porosity Corrections	----		LIMESTONE
NEU_DCOR_OPT	Density Correction Source for Neutron Processing	----		Bottom
NEU_FTUBE_OPT	Far Thermal Tube Selection	----		Both
NEU_PRESOR_OPT	Pressure Correction Source for Neutron Processing	----		Annulus_Press
NEU_TEMPOR_OPT	Temperature Correction Source for Neutron Processing	----		Tool_Temp
NTIK_SEL	Neutron Tick Channel Name	----		FAZ1
OACF	Oxygen Activation Correction Factor (RM)	----		8.000
PMUD	Potassium Concentration in Mud	----		0.000
RUN_DURATION_OP	Run Duration Type ?	----		Normal
SDPTH	Wizard Process Start Depth	----		100
SIG_PCOR_OPT	Porosity Correction Source for Sigma Processing	----		Best
SPEC_CSG_DEPTH	Casing Depth for Spectroscopy Processing	M		30.480
SPL_CLAY_MODEL	SpectroLith Clay Model	----		SUBARKOSE
SPL_MG_OPT	Magnesium Flag Switch ?	----		OFF
SPL_SULFUR_MIN	SpectroLith Sulfur Mineral Option	----		PYRITE
STAB_SIZE	Stabilizer Size	IN		8.250
STOH	Top of Hole Sector	----		SECTOR_0
TRNO	Tool Run Number	----		6
TSNO	Tool Serial Number	----		987
WPPV	Water Phase as Percent of Total Volume in OBM	----		100.000
WPSL	Salinity of the Water Phase Emulsified within the OBM	PPK		130.746
WSDI	Window Size of Dynamic Normalization Image	M		4.572

# EcoScope Density Neutron RM 500TVD Inc <90 Deg, 1930–2115m MD

IDF

ARC8A-AA

id13\_0c\_02

MWD\_10

id13\_0c\_02

Format: EcoScope Density Neutron      Vertical Scale: 1:500      Graphics File Created: 25-Aug-2008 15:19

**Rate of Penetration, Averaged over Last 5ft (ROP5\_RM)**  
**100 (M/HR) 0**

**Calibrated, Filtered Gamma Ray, Up (GRMU\_FILT)**  
**0 (GAPI) 200**

**Calibrated, Filtered Gamma Ray, Bottom (GRMB\_FILT)**  
**0 (GAPI) 200**

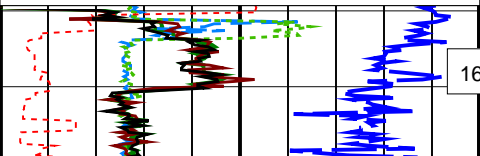
**Ultrasonic Caliper, Vertical Diameter (UCVE)**  
**6 (IN) 16**

**Ultrasonic Caliper, Horizontal Diameter (UCHO)**  
**6 (IN) 16**

**Time after BIT (between drilling and measurement) (TAB\_DEN)**  
**0 (HR) 10**

**Gamma Ray, Average (GRMA)**  
**0 (GAPI) 200**

**Collar Rotational Speed (CRPM) (RPM)**  
**0 200**



**Gamma Ray, Average (GRMA)**  
**0 (GAPI) 200**

**Collar Rotational Speed (CRPM) (RPM)**  
**0 200**

**Time after BIT (between drilling and measurement) (TAB\_DEN)**  
**0 (HR) 10**

**Ultrasonic Caliper, Horizontal Diameter (UCHO)**  
**6 (IN) 16**

**Ultrasonic Caliper, Vertical Diameter (UCVE)**  
**6 (IN) 16**

**Calibrated, Filtered Gamma Ray, Bottom (GRMB\_FILT)**  
**0 (GAPI) 200**

**Calibrated, Filtered Gamma Ray, Up (GRMU\_FILT)**  
**0 (GAPI) 200**

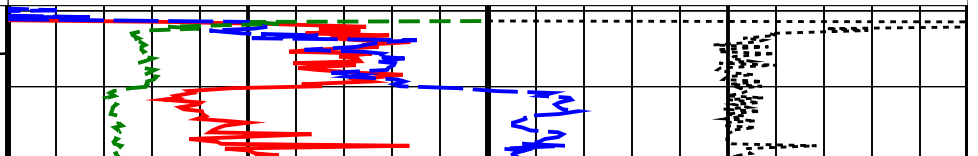
**Rate of Penetration, Averaged over Last 5ft (ROP5\_RM)**

**Photoelectric Factor, Bottom (PEB)**  
**0 (----) 10**

**Bulk Density Correction, Bottom (DRHB)**  
**-0.25 (G/C3) 0.25**

**Thermal Neutron Porosity (Ratio Method) in Selected Lithology (TNPH)**  
**45 (PU) -15**

**Bulk Density, Bottom (ROBB)**  
**1.95 (G/C3) 2.95**



**Bulk Density, Bottom (ROBB)**  
**1.95 (G/C3) 2.95**

**Thermal Neutron Porosity (Ratio Method) in Selected Lithology (TNPH)**  
**45 (PU) -15**

**Photoelectric Factor, Bottom (PEB)**  
**0 (----) 10**

**Bulk Density Correction, Bottom (DRHB)**  
**-0.25 (G/C3) 0.25**

Rate of Penetration, Averaged over Last  
5ft (ROP5\_RM)  
100 (M/HR) 0

# IDEAL Version: ID13\_0C\_08

IDF

ARC8A-AA

id13\_0c\_02

MWD\_10

id13\_0c\_02

## EcoScope Density Neutron RM 500TVD Inc > 90 Deg, 2115-2517m MD

IDF

ARC8A-AA

id13\_0c\_02

MWD\_10

id13\_0c\_02

Format: EcoScope Density Neutron

Vertical Scale: 1:500

Graphics File Created: 25-Aug-2008 15:22

Rate of Penetration, Averaged over Last  
5ft (ROP5\_RM)

100 (M/HR) 0

Calibrated, Filtered Gamma Ray, Up  
(GRMU\_FILT)

0 (GAPI) 200

Calibrated, Filtered Gamma Ray, Bottom  
(GRMB\_FILT)

0 (GAPI) 200

Ultrasonic Caliper, Vertical Diameter  
(UCVE)

6 (IN) 16

Ultrasonic Caliper, Horizontal Diameter  
(UCHO)

6 (IN) 16

Time after BIT (between drilling and  
measurement) (TAB\_DEN)

0 (HR) 10

Gamma Ray, Average (GRMA)

0 (GAPI) 200

Collar  
Rotational  
Speed  
(CRPM)  
(RPM)

0 200

Photoelectric Factor, Bottom (PEB)

0 (-----) 10

Bulk Density Correction, Bottom  
(DRHB)

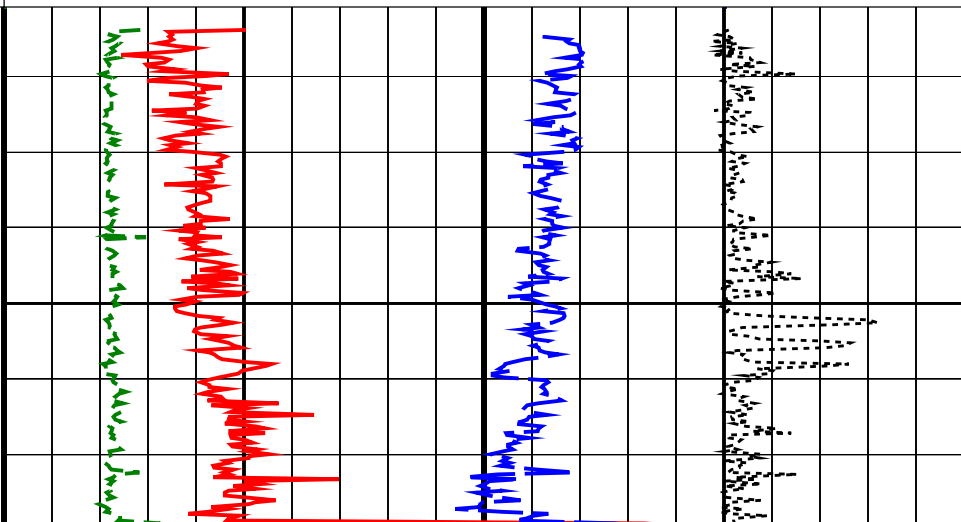
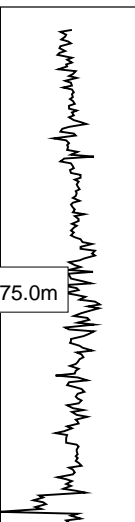
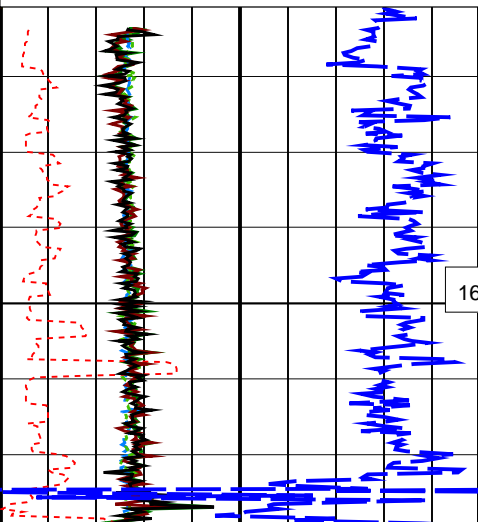
-0.25 (G/C3) 0.25

Thermal Neutron Porosity (Ratio Method) in Selected Lithology (TNPH)

45 (PU) -15

Bulk Density, Bottom (ROBB)

1.95 (G/C3) 2.95



Gamma Ray, Average (GRMA)

0 (GAPI) 200

Collar  
Rotational  
Speed  
(CRPM)  
(RPM)

0 200











Bulk Density, Bottom (ROBB)




1.95 (G/C3) 2.95

Time after BIT (between drilling and measurement), (TAB_DEN) (HR)	0	10	Thermal Neutron Porosity (Ratio Method) in Selected Lithology (TNPH) (PU)	45	-15
Ultrasonic Caliper, Horizontal Diameter (UCHO) (IN)	6	16	Photoelectric Factor, Bottom (PEB) (-----)	0	10
Ultrasonic Caliper, Vertical Diameter (UCVE) (IN)	6	16	Bulk Density Correction, Bottom (DRHB) (G/C3)	-0.25	0.25
Calibrated, Filtered Gamma Ray, Bottom (GRMB_FILT) (GAPI)	0	200			
Calibrated, Filtered Gamma Ray, Up (GRMU_FILT) (GAPI)	0	200			
Rate of Penetration, Averaged over Last 5ft (ROP5_RM) (M/HR)	100	0			

IDEAL Version: ID13_0C_08					
IDF					
ARC8A-AA	id13_0c_02	MWD_10	id13_0c_02		

8.25-in. Array Resistivity Compensated / Equipment Identification		
Primary Equipment:		
Tool Name and Serial Number	ARC8 – AA	8316
ARC825 Calibration Status		

Master: 17-Jul-2008 15:03														
8.25-in. Array Resistivity Compensated Calibration														
Resistivity: Air														
Phase	Phase-Shift T1			Value	Phase	Phase-Shift T2			Value	Phase	Phase-Shift T3			Value
Master				-1.295	Master				1.364	Master				-1.375
	-3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)		-3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)		-3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)			
Phase	Phase-Shift T4			Value	Phase	Phase-Shift T5			Value	Phase	Phase-Shift T1 at 400KHz			Value
Master				1.321	Master				-1.400	Master				1.663
	-3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)		-3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)		-3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)			
Phase	Phase-Shift T2 at 400KHz			Value	Phase	Phase-Shift T3 at 400KHz			Value	Phase	Phase-Shift T4 at 400KHz			Value
Master				-1.688	Master				1.672	Master				-1.701
	-3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)		-3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)		-3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)			
Phase	Phase-Shift T5 at 400KHz			Value										
Master				1.648										
	-3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)											










Master: 17-Jul-2008 15:03														
8.25-in. Array Resistivity Compensated Calibration														
Resistivity: Air														
Phase	Attenuation T1			Value	Phase	Attenuation T2			Value	Phase	Attenuation T3			Value
Master				8.267	Master				6.374	Master				4.991
6.500 (Minimum)		8.500 (Nominal)		10.50 (Maximum)	4.500 (Minimum)		6.500 (Nominal)		8.500 (Maximum)	2.500 (Minimum)		4.500 (Nominal)		6.500 (Maximum)
Phase	Attenuation T4			Value	Phase	Attenuation T5			Value	Phase	Attenuation T1 at 400KHz			Value



Master: 17-Jul-2008 20:12			
8.25-in. Array Resistivity Compensated Calibration			
Gamma Ray: Blanket			
Phase	Gamma ray factor (equals Calibration Gain multiplied by API Gain Factor) CPS		Value
Master			7.763
	4.960 (Minimum)	7.200 (Nominal)	9.650 (Maximum)

Master: 3-Aug-2008 15:58								
EcoScope Integrated Logging-While-Drilling Tool – 6.75 inch Calibration								
SSn LSn : Water Tank								
Phase	SSn Gain			Value	Phase	SSn Offset		Value
Master				1.069	Master			0
	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)			-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
Phase	LSn Gain			Value	Phase	LSn Offset		Value
Master				1.000	Master			0
	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)			-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

Master: 3-Aug-2008 18:01									
EcoScope Integrated Logging-While-Drilling Tool – 6.75 inch Calibration									
Gamma Density: Magnesium Block									

Master: 1–Aug–2008 12:53											
EcoScope Integrated Logging–While–Drilling Tool – 6.75 inch Calibration											
Resistivity: Air											
Phase	Attenuation T1		Value	Phase	Attenuation T2		Value	Phase	Attenuation T3		Value
Master			8.169	Master			6.249	Master			4.775
7.000 (Minimum)			9.000 (Nominal)	4.000 (Minimum)			6.000 (Nominal)	3.500 (Minimum)			7.500 (Maximum)
Phase	Attenuation T4		Value	Phase	Attenuation T5		Value	Phase	Attenuation T1 at 400KHz		Value
Master			4.656	Master			3.332	Master			8.157
2.500 (Minimum)			4.500 (Nominal)	2.000 (Minimum)			4.000 (Nominal)	7.000 (Minimum)			11.00 (Maximum)
Phase	Attenuation T2 at 400KHz		Value	Phase	Attenuation T3 at 400KHz		Value	Phase	Attenuation T4 at 400KHz		Value
Master			6.267	Master			4.757	Master			4.669
4.000 (Minimum)			6.000 (Nominal)	3.500 (Minimum)			5.500 (Nominal)	2.500 (Minimum)			6.500 (Maximum)

Master			3.317
2.000 (Minimum)	4.000 (Nominal)	6.000 (Maximum)	

# SCHLUMBERGER

## Survey report

Client..... Santos Ltd  
Field..... Otway  
  
Well..... Netherby-1 DW1  
Job number..... 08ASQ0003  
Engineer..... J. Oldridge / Z. Rudd  
  
RIG..... Ocean Patriot  
STATE..... Victoria

Spud date..... 02-Aug-08  
Last survey date..... 12-Aug-08  
Total accepted surveys... 86  
MD of first survey..... 0.00 m  
MD of last survey..... 2517.00 m

----- Survey calculation methods-----  
Method for positions..... Minimum curvature  
Method for DLS..... Mason & Taylor

----- Geomagnetic data -----  
Magnetic model..... BGGM version 2007  
Magnetic date..... 01-Aug-2008  
Magnetic field strength... 1215.17 HCNT  
Magnetic dec (+E/W-)..... 10.78 degrees  
Magnetic dip..... -69.86 degrees

----- Depth reference -----  
Permanent datum..... Mean Sea Level  
Depth reference..... Driller's Depth  
GL above permanent..... -66.10 m  
KB above permanent..... 20.80 m  
DF above permanent..... 20.80 m

----- MWD survey Reference Criteria -----  
Reference G..... 1000.07 mGal  
Reference H..... 1215.17 HCNT  
Reference Dip..... -69.86 degrees  
Tolerance of G..... (+/-) 2.50 mGal  
Tolerance of H..... (+/-) 6.00 HCNT  
Tolerance of Dip..... (+/-) 0.45 degrees

----- Vertical section origin-----  
Latitude (+N/S-)..... 0.00 m  
Departure (+E/W-)..... 0.00 m

----- Corrections -----  
Magnetic dec (+E/W-)..... 10.78 degrees  
Grid convergence (+E/W-).. -1.03 degrees  
Total az corr (+E/W-)..... 11.81 degrees  
(Total az corr = magnetic dec - grid conv)

----- Platform reference point-----  
Latitude (+N/S-).....  
Departure (+E/W-).....  
  
Azimuth from Vsect Origin to target: 0.00 degrees

Survey Correction Type ...:  
I=Sag Corrected Inclination  
M=Schlumberger Magnetic Correction  
S=Shell Magnetic Correction  
F=Failed Axis Correction  
R=Magnetic Resonance Tool Correction  
D=Dmag Magnetic Correction

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SCHLUMBERGER Survey Report

Seq #	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S- (m)	Displ +E/W- (m)	Total displ (m)	At Azim (deg)	DLS (deg/100f)	Srvy tool type	Tool Corr (deg)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIP	None
2	87.00	0.00	0.00	87.00	87.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD_M	None
3	110.29	0.34	228.85	23.29	110.29	-0.05	-0.05	-0.05	0.07	228.85	0.44	MWD_M	None
4	139.31	0.48	70.38	29.02	139.31	-0.06	-0.06	-0.00	0.06	182.21	0.85	MWD_M	None
5	168.50	0.56	302.02	29.19	168.50	0.06	0.06	-0.01	0.06	351.63	0.98	MWD_M	None
6	196.58	0.62	250.43	28.08	196.58	0.08	0.08	-0.27	0.28	286.10	0.56	MWD_M	None
7	224.66	0.70	303.64	28.08	224.66	0.12	0.12	-0.55	0.57	282.37	0.65	MWD_M	None
8	252.74	0.64	294.72	28.08	252.73	0.28	0.28	-0.84	0.88	288.58	0.13	MWD_M	None
9	280.80	0.72	298.73	28.06	280.79	0.43	0.43	-1.14	1.22	290.84	0.10	MWD_M	None
10	309.51	0.65	287.17	28.71	309.50	0.57	0.57	-1.45	1.56	291.36	0.16	MWD_M	None
11	337.98	0.69	292.15	28.47	337.97	0.68	0.68	-1.76	1.89	291.08	0.08	MWD_M	None
12	366.89	0.70	359.25	28.91	366.88	0.92	0.92	-1.93	2.14	295.57	0.81	MWD_M	None
13	395.80	0.92	12.26	28.91	395.78	1.32	1.32	-1.88	2.30	305.19	0.30	MWD_M	None
14	424.75	0.87	19.30	28.95	424.73	1.76	1.76	-1.76	2.49	315.04	0.13	MWD_M	None
15	453.68	0.56	88.31	28.93	453.66	1.97	1.97	-1.54	2.50	321.94	0.89	MWD_M	None
16	482.49	0.59	96.35	28.81	482.47	1.96	1.96	-1.26	2.33	327.35	0.09	MWD_M	None
17	511.36	0.65	96.56	28.87	511.34	1.92	1.92	-0.94	2.14	333.84	0.06	MWD_M	None
18	540.27	0.70	100.87	28.91	540.24	1.87	1.87	-0.61	1.97	341.99	0.08	MWD_M	None
19	569.05	0.71	112.99	28.78	569.02	1.77	1.77	-0.27	1.79	351.27	0.16	MWD_M	None
20	597.90	0.69	128.34	28.85	597.87	1.59	1.59	0.03	1.59	1.05	0.20	MWD_M	None
21	617.15	0.84	123.17	19.25	617.12	1.44	1.44	0.24	1.46	9.38	0.26	MWD_M	None
22	634.46	0.94	124.68	17.31	634.42	1.29	1.29	0.46	1.37	19.65	0.18	MWD_M	None
23	660.03	0.52	130.06	25.57	659.99	1.10	1.10	0.72	1.31	33.35	0.51	MWD_M	None
24	745.26	2.31	160.81	85.23	745.19	-0.77	-0.77	1.58	1.76	116.04	0.67	MWD_M	None
25	773.50	4.27	158.54	28.24	773.39	-2.29	-2.29	2.15	3.14	136.73	2.12	MWD_M	None
26	801.23	5.89	157.85	27.73	801.01	-4.57	-4.57	3.07	5.50	146.11	1.78	MWD_M	None
27	831.43	7.57	152.25	30.20	831.00	-7.76	-7.76	4.58	9.01	149.47	1.82	MWD_M	None
28	859.94	9.31	137.33	28.51	859.20	-11.12	-11.12	7.02	13.15	147.75	2.98	MWD_M	None
29	889.70	11.19	126.87	29.76	888.49	-14.63	-14.63	10.96	18.28	143.15	2.70	MWD_M	None
30	919.19	12.15	123.94	29.49	917.37	-18.08	-18.08	15.82	24.02	138.80	1.17	MWD_M	None

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SCHLUMBERGER Survey Report

Seq #	Measured depth	Incl angle	Azimuth angle	Course length	TVD depth	Vertical section	Displ +N/S-	Displ +E/W-	Total displ	At Azim	DLS (deg/100f)	Srvy tool	Tool Corr
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---	(m)	(deg)	(deg)	(m)	(m)	(m)	(m)	(m)	(m)	(deg)	100f)	type	(deg)
---	---	---	---	---	---	---	---	---	---	---	---	---	---
31	948.90	12.93	122.08	29.71	946.37	-21.59	-21.59	21.23	30.28	135.47	0.90	MWD_M	None
32	979.41	13.44	120.85	30.51	976.07	-25.22	-25.22	27.17	37.07	132.86	0.58	MWD_M	None
33	1007.51	14.16	120.45	28.10	1003.36	-28.63	-28.63	32.94	43.64	131.00	0.79	MWD_M	None
34	1036.14	14.55	118.54	28.63	1031.10	-32.13	-32.13	39.12	50.62	129.40	0.65	MWD_M	None
35	1065.20	14.60	118.24	29.06	1059.22	-35.60	-35.60	45.55	57.81	128.01	0.09	MWD_M	None
36	1096.08	14.09	118.27	30.88	1089.14	-39.23	-39.23	52.29	65.37	126.88	0.50	MWD_M	None
37	1124.66	14.01	116.68	28.58	1116.87	-42.43	-42.43	58.44	72.22	125.98	0.42	MWD_M	None
38	1153.50	15.82	116.95	28.84	1144.73	-45.78	-45.78	65.07	79.56	125.13	1.91	MWD_M	None
39	1182.04	19.92	117.65	28.54	1171.89	-49.80	-49.80	72.84	88.24	124.36	4.38	MWD_M	None
40	1210.10	23.56	117.60	28.06	1197.95	-54.62	-54.62	82.05	98.57	123.65	3.95	MWD_M	None
41	1239.36	25.76	114.79	29.26	1224.54	-59.99	-59.99	93.01	110.68	122.82	2.60	MWD_M	None
42	1267.39	29.36	115.62	28.03	1249.39	-65.52	-65.52	104.74	123.54	122.03	3.94	MWD_M	None
43	1294.27	33.74	116.12	26.88	1272.29	-71.66	-71.66	117.39	137.53	121.40	4.98	MWD_M	None
44	1322.42	33.97	116.49	28.15	1295.67	-78.61	-78.61	131.45	153.16	120.88	0.33	MWD_M	None
45	1350.13	34.69	115.42	27.71	1318.55	-85.44	-85.44	145.50	168.73	120.42	1.03	MWD_M	None
46	1379.95	34.59	115.60	29.82	1343.08	-92.74	-92.74	160.80	185.63	119.98	0.15	MWD_M	None
47	1408.27	35.05	116.50	28.32	1366.33	-99.85	-99.85	175.32	201.76	119.66	0.74	MWD_M	None
48	1429.41	34.97	116.54	21.14	1383.65	-105.26	-105.26	186.17	213.87	119.48	0.12	MWD	None
49	1487.90	35.17	112.27	58.49	1431.53	-119.14	-119.14	216.76	247.35	118.79	1.28	MWD	None
50	1505.00	35.50	109.55	17.10	1445.48	-122.67	-122.67	226.00	257.14	118.49	2.86	MWD_M	None
51	1517.15	35.81	105.68	12.15	1455.35	-124.81	-124.81	232.75	264.10	118.20	5.71	MWD	None
52	1543.44	37.54	107.13	26.29	1476.43	-129.25	-129.25	247.81	279.49	117.54	2.24	MWD	None
53	1569.82	39.74	109.42	26.38	1497.04	-134.42	-134.42	263.44	295.75	117.03	3.03	MWD	None
54	1600.60	42.06	111.11	30.78	1520.30	-141.40	-141.40	282.34	315.77	116.60	2.55	MWD	None
55	1629.46	44.65	112.85	28.86	1541.29	-148.82	-148.82	300.71	335.52	116.33	3.01	MWD	None
56	1657.18	47.47	114.86	27.72	1560.52	-156.90	-156.90	318.96	355.46	116.19	3.49	MWD	None
57	1686.89	50.14	117.99	29.71	1580.09	-166.86	-166.86	338.97	377.81	116.21	3.65	MWD	None
58	1715.23	52.55	119.95	28.34	1597.79	-177.58	-177.58	358.32	399.91	116.36	3.07	MWD	None
59	1744.26	55.92	121.19	29.03	1614.76	-189.56	-189.56	378.60	423.41	116.60	3.69	MWD	None
60	1773.52	59.64	122.89	29.26	1630.36	-202.70	-202.70	399.57	448.05	116.90	4.15	MWD	None
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Seq	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S- (m)	Displ +E/W- (m)	Total displ (m)	At Azim (deg)	DLS (deg/100f)	Srvy tool type	Tool Corr (deg)
61	1804.17	64.78	123.05	30.65	1644.64	-217.45	-217.45	422.31	475.01	117.24	5.11	MWD	None
62	1832.79	69.15	123.30	28.62	1655.84	-231.86	-231.86	444.35	501.21	117.56	4.66	MWD	None
63	1860.88	73.78	123.07	28.09	1664.76	-246.43	-246.43	466.64	527.71	117.84	5.03	MWD	None
64	1889.08	77.80	122.38	28.20	1671.68	-261.21	-261.21	489.63	554.95	118.08	4.40	MWD	None
65	1919.55	79.76	122.50	30.47	1677.61	-277.24	-277.24	514.85	584.75	118.30	1.96	MWD	None
66	1946.54	80.97	122.53	26.99	1682.13	-291.54	-291.54	537.29	611.29	118.49	1.37	PUP	None
67	1973.95	83.60	122.37	27.41	1685.81	-306.12	-306.12	560.21	638.39	118.65	2.93	PUP	None
68	2011.18	87.85	121.02	37.23	1688.58	-325.62	-325.62	591.79	675.46	118.82	3.65	PUP	None
69	2031.41	89.37	120.87	20.23	1689.08	-336.02	-336.02	609.14	695.67	118.88	2.30	PUP	None
70	2060.00	89.80	121.67	28.59	1689.28	-350.85	-350.85	633.57	724.23	118.98	0.97	PUP	None
71	2089.29	89.46	120.38	29.29	1689.47	-365.95	-365.95	658.67	753.50	119.06	1.39	PUP	None
72	2112.91	89.48	119.43	23.62	1689.69	-377.73	-377.73	679.14	777.12	119.08	1.23	PUP	None
73	2148.38	93.04	121.22	35.47	1688.91	-395.63	-395.63	709.75	812.57	119.14	3.42	PUP	None
74	2177.62	94.65	120.61	29.24	1686.95	-410.62	-410.62	734.78	841.73	119.20	1.79	PUP	None
75	2204.98	96.37	120.79	27.37	1684.32	-424.52	-424.52	758.20	868.96	119.24	1.93	PUP	None
76	2234.16	96.29	119.97	29.17	1681.11	-439.19	-439.19	783.21	897.95	119.28	0.86	PUP	None
77	2262.48	94.85	119.65	28.32	1678.36	-453.20	-453.20	807.67	926.13	119.30	1.59	PUP	None
78	2291.13	95.36	119.68	28.65	1675.81	-467.32	-467.32	832.46	954.67	119.31	0.54	PUP	None
79	2321.31	95.04	119.36	30.18	1673.07	-482.13	-482.13	858.62	984.72	119.32	0.46	PUP	None
80	2350.32	93.87	118.72	29.00	1670.82	-496.16	-496.16	883.90	1013.63	119.31	1.40	PUP	None
81	2378.82	94.18	118.17	28.51	1668.82	-509.71	-509.71	908.90	1042.07	119.28	0.67	PUP	None
82	2407.67	94.16	117.99	28.85	1666.72	-523.25	-523.25	934.29	1070.84	119.25	0.19	PUP	None
83	2436.52	94.22	117.82	28.85	1664.61	-536.72	-536.72	959.72	1099.60	119.22	0.19	PUP	None
84	2465.68	95.68	118.34	29.16	1662.10	-550.39	-550.39	985.35	1128.65	119.19	1.62	PUP	None
85	2494.27	98.42	119.26	28.59	1658.59	-564.06	-564.06	1010.21	1157.02	119.18	3.08	PUP	None
86	2517.00	98.30	119.30	22.73	1655.28	-575.06	-575.06	1029.82	1179.50	119.18	0.17	Proj.	To TD
[[c)2008 IDEAL ID13_OC_08]													

Company: Santos Limited

Well: Netherby 1DW1

Field: Otway

Rig: Ocean Patriot

State: Victoria

Schlumberger

EcoScope \* Density Neutron  
1:500 True Vertical Depth

## Recorded Mode Log