

WELL COMPLETION REPORT

RM03-41-1 PL 309

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GLNG is a Santos PETRONAS Total KOGAS project.

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This Well Completion Report (WCR) includes all information available at the submission date. Well analysis or test results not available at the time of submission will be provided as an addendum to the WCR when the information becomes available.

Table 1: Well Summary Card

Well Name: RM03-41-1				Well Type: Development									
Final Survey sheet/report		Final: <input checked="" type="checkbox"/>						Revision:					
Licence:	PL 309			Joint Venture:	ATP 336P			Latitude: (GDA94, z55)	26 22 09.3746 S				
Equity:				Budget Status:				Longitude:	149 08 20.2787 E				
								Easting:	713419.302				
				Voting (%)				Northing:				7081650.803	
Santos Group				30.00				Ground Level:				369.46 m AHD	
PAPL (Upstream) Pty Ltd				27.50				Rotary Table:				373.76 m AHD	
Total E&P Australia				27.50				Rig:				ENSIGN #950 (Formerly Ensign 50)	
KGLNG E&P Pty Ltd				15.00				Nearby Facilities:					
Drilling Timing				Drilling Details:									
Spud Date:		10/05/2013						TD (driller):		489.7 mRT			
TD Reached Date:		11/05/2013						TD (logger):		482.7 mRT			
Rig Release Date:		12/05/2013						Well Status:		Suspended Gas Well			
Net Pay				Stratigraphy									
Coal Seam	Top (mRT)	Base (mRT)	Top (mTVD)	Base (mTVD)	Net Coal (m)	Net Coal (mTVD)	Formation	Depth (mRT)	Depth (mTVD)	Depth (mSS)	Thickness (mTVD)		
Springbok Sst	153.3	171.2	153.3	171.2	1.9	1.9	Blythesdale Group	4.3	4.3	369.5	77.8		
Upper Juandah CM	243.9	248.4	243.8	248.4	2.4	2.4	Mooga Sandstone	4.3	4.3	369.5	16.2		
Lower Juandah CM	282.6	329.5	282.5	329.4	2.6	2.6	Orallo Formation	20.5	20.5	353.2	21.6		
Tangalooma Sst	349.8	395.4	349.7	395.3	1.6	1.6	Gubberamunda Sandstone	42.2	42.2	331.6	39.9		
Taroom CM	410.1	463.7	410.0	463.6	7.8	7.8	Injune Creek Group	82.1	82.1	291.7	400.5		
					Total: 16.3m	Total: 16.3m	Westbourne Formation	82.1	82.1	291.7	59.8		
							Weald Sandstone	142.0	141.9	231.8	4.8		
							Springbok Sandstone	146.8	146.8	227.0	95.3		
							Walloon Sub-Group	242.1	242.1	131.7	240.6		
							Juandah Coal Measures	242.1	242.1	131.7	92.1		
							Upper Juandah	242.1	242.1	131.7	27.5		
							Proud Sandstone	269.6	269.6	104.2	11.6		
							Lower Juandah	281.2	281.2	92.6	53.0		
							Tangalooma Sandstone	334.2	334.2	39.6	75.6		
							Taroom Coal Measures	409.9	409.8	-36.0	61.2		
							Base Lowest Taroom Coal	466.7	466.6	-92.8	0.0		
							Eurombah Formation	471.1	471.0	-97.2	11.6+		
							Total Depth	482.7	482.6	-108.8			
Formation Evaluation				Hole Design / Drilling									
Logging:				Well Intent:		CSG		Primary		Secondary		Secondary 2	
Run		Log		Top (mRT)		Bottom (mRT)		Well Category:		DEV			
1		LLS, LLD, DT, HDEN, VERT, PE, SP, CALI		76.0		477.9		Hole Type:					
1		GR		4.3		477.9		Hole Size		Casing (mMD)			
								17 in		10.5			
								12 1/4 in		95.9			
								8 3/4 in		480.7			
Side Wall Cores		No Cores taken on this well											
Formation Fluid Tests		No Formation Fluid Tests conducted on this well											
Velocity Survey:		No Velocity Survey conducted on this well											
Formation Testing:				Drill Fluid:		K2SO4		Deviation Data:				Verticality surveys were recorded and data included in WCR	
FIT / LOT (after drilling through the surface casing shoe)													
FIT = 34.27 PPG EMW													
Coring:		No Cores taken on this well											
Cuttings:		A 250g bag of washed and dried, depth lagged, cutting sample was collected approximately every 10m MD. Samples collected from 10m MD to TD, or as directed by well site geologist, which was then divided into two or more plastic sample trays, labelled with well name and depth interval											
Desorpt Samples (mRT):		No core desorption samples											
				Nearby Wells:		Armidale 1 is 2.4 km to the SW COXON CREEK 14 is 2.8 km to the W COXON CREEK EAST 3 is 1.4 km to the NE							
General Comments :				ECP at 244.7m. Upper Juandah Coal Behind Casing = 1.3mMD									
				Slotted 7" Production casing from 244.7 to 480.7m				NOTE:All depths referenced from RT					
Personnel:													
Project Leader		Santos Geologist				Drilling Engineer				Completions Engineer			
David Eu		Gerhard Pauwels				Devin Harshad				Ryan McCrea			

RM03-41-1**1 SUMMARY**¹

RM03-41-1 was drilled in PL 309 as part of the Development Program targeting the Walloon Coal Measures in the Roma field. The well was designed as mud drilled, vertical well on a minimum disturbance lease with solid 7" (178 mm) production casing above an External Casing Packer (ECP), and perforated casing below the ECP, with no planned stimulation.

- The well was spudded at 03:30 hours, 10th May 2013 into a pre-installed conductor casing 10.5 m MD into the Mooga Sandstone.
- Bit #1, a 12½" (311 mm) NOV S519 PDC was used to vertically drill the surface hole from 10.5 m MD to a section total depth of 97.0 m MD, 14.9 m MD into the Westbourne Formation.
- A string of 9⅝" (245 mm) surface casing was run and cemented to surface with its shoe at 95.9 m MD. Cementing was completed by Halliburton.
- After the BOP was installed and tested, Bit #2, an 8¾" (222 mm) NOV S519 PDC was run in hole to drill out the cement, shoe track and 3.0 m MD formation to 100.0 m MD. A formation integrity test was conducted using 9.20 ppg mud and yielded an EMW of 34.27 ppg.
- Drilling continued through the production section from 100.0 m MD to a driller's total depth of 489.7 m MD, 23.0 m MD past the lowest Taroom coal seam.
- Total depth was reached at 17:30 hours, 11th May 2013 in the Eurombah Formation.
- A slick wiper trip assembly using Bit #2 was made up and a wiper trip was performed from total depth to the surface casing shoe.
- Weatherford's wireline logs were rigged up and Run#1: Gamma Ray, Density, Calliper, Resistivity, Sonic, Photo Electric, Spontaneous Potential and Verticality were recorded. The logging tool tagged a tight spot at 482.7 m MD (7.0 m MD above driller's total depth).
- Logger's total depth was recorded as 482.7 m MD. All further total depths will correspond to the logger total depth.
- The calliper arm mechanism did not fully open when running in hole out of the casing shoe, which prevented the function of the Micro-Resistivity (MMR) tool. A decision was made not to re-run the log, as acquired data was sufficient to pick the formation tops, net coal and External Casing packer (ECP) depth.
- A string of 7" (178 mm) production casing was run to 480.7 m MD with an External Casing Packer (ECP) set at 244.7 m MD.
- The casing was cemented from the ECP setting depth to surface to isolate the aquifer of the Springbok Sandstone, leaving perforated uncemented 7" (178 mm) casing below the ECP. Cementing was completed by Halliburton.
- A total of 16.3 m MD of net coal was determined from geophysical data through five coal bearing formations (Springbok Sandstone, Upper Juandah Coal Measures, Lower Juandah Coal Measures, Tangalooma Sandstone and Taroom Coal Measures).
- Most formations were penetrated between 4.8 m MD higher and 14.6 m MD lower than their prognosed depths. The Top of the Walloon Coal Measures were intersected 4.8 m MD higher than prognosis.
- After completion of casing and cementing, RM03-41-1 was suspended for future completion. Rig Ensign #950 was released at 18:00 hours, 12th May 2013 and the rig moved to RM03-60-1.

¹ N.B. All depths are measured depth relative to Rotary Table (RT) height unless otherwise stated

2 WELL HISTORY

2.1 General Data

Table 2: Well Data

Well Details		
Well Name	RM03-41-1	
Well Type	Vertical	
Field	Roma	
Intersections	No other wells intersected	
Operator Information		
Permit Operator	SANTOS QNT PTY LTD A.B.N. 33 083 077 196 Level 22 Santos Place 32 Turbot Street Brisbane Qld 4000 Ph: (07) 3838 3000	
Drilling Contractor	ENSIGN AUSTRALIA PTY LTD A.B.N. 94 000 385 704 461 Greenwattle Street Toowoomba QLD 4350 Ph: (07) 4699 1888	
Cementing Contractor	HALLIBURTON AUSTRALIA PTY LTD A.B.N. 73 009 000 775 53-558 Bannister Road Canning Vale WA 6155 Ph: (08) 9455 8300	
Location (Appendix 1)		
Geographic Coordinates (GDA 94)	Latitude	26° 22' 09.3746" S
	Longitude	149° 08' 20.2787" E
Grid Coordinates (MGA 94)	Easting	713 419.302 m
	Northing	7 081 650.803 m
	Zone	55 South
Ground Level	369.46 m A.H.D.	
Table Height (Reference Level)	373.76 m A.H.D.	
Petroleum Tenement	PL 309	
Drilling		
Drilling Rig	Rig Name	Ensign #950 (formerly reported as Ensign 50)
	Make	ADR 200
	Year of Manufacture	2005
Date Drilling Commenced	03:30 hours, 10 th May 2013	
Date Total Depth Reached	17:30 hours, 11 th May 2013	
Date Rig Released	18:00 hours, 12 th May 2013	
Drilling Time to Total Depth	1.58 days	

Table 2: Well Data - continued

Total Depth		
Driller	Measured Depth	489.7 m
	True Vertical Depth	489.6 m
Logger	Measured Depth	482.7 m
	True Vertical Depth	482.6 m
Well Status		
Status on Rig Release Day	Suspended	

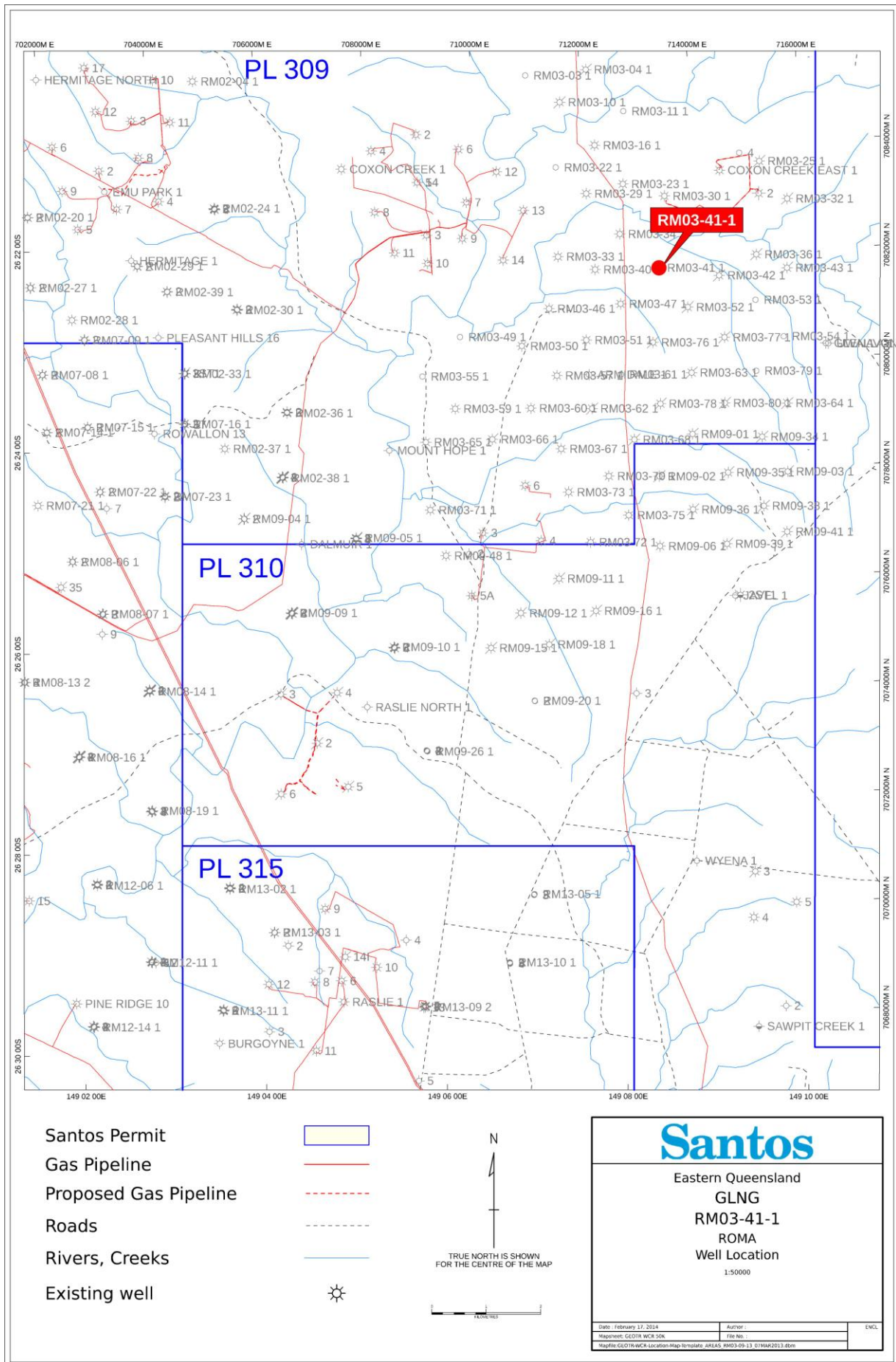


Figure 1: Location Map

2.2 Drilling Data

Table 3: Drilling Bit Type Summary

Bit Number	Size (in)	Make	Type	Model	Serial No.	In (m MD)	Out (m MD)	Metres Drilled	Hours	ROP (m/hr)
1	17"	Auger	Not recorded			4.3	10.5	6.2	N/A	N/A
1	12¼"	NOV	PDC	S519	E173557	10.5	97.0	86.5	24	22.82
2	8¾"	NOV	PDC	S519	225734	97.0	489.7*	392.7	24	37.40

*Please note, drilling bit data refers to driller's total depth

Table 4: Casing and Cementing Summary

Conductor		
Hole/Bit Size	17" (432 mm)	
Interval	4.3 – 10.5 m MD (4.3 – 10.5 m TVD)	
Drilling Fluid	No drilling fluid used to drill section (Drilled with auger)	
Casing	Casing Size	14" (356 mm) × 9.5 mm thick
	Grade	API 5L Gr 350 welded pipe with flared end
	Depth	10.5 m MD (10.5 m TVD)
Cement	Quantity	Not cemented
	Interval	Not cemented
Surface Hole		
Hole/Bit Size	12¼" (311 mm)	
Interval	10.5 – 97.0 m MD (10.5 – 96.9 m TVD)	
Drilling Fluid	K ₂ SO ₄ , MW 9.2 ppg, vis 35 sec/qt, pH N/A	
Casing	Casing Size	9⅝" (245 mm)
	Weight	36.0 lbs/ft (53.57 kg/m)
	Grade	K55
	Coupling	BTC R3 (Buttress Thread Casing)
	Shoe Depth	95.9 m MD (95.8 m TVD)
	Perforated Interval	Not perforated
	Perforation Specifications	Not perforated
Cement	Type	GP; API Class A Cement
	Quantity	Cement Slurry weight (density): 15.6 ppg Cement volume pumped: 28.0 bbl Drilling fluid displacement volume: 21.6 bbl Cement returns to surface: 3.0 bbl
	Additives	38 lbs Dispersant, 1 gal Defoamer
	Interval	4.3 – 97.0 m MD

Table 4: Casing and Cementing Summary – continued

Production Hole		
Hole/Bit Size	8¾" (222 mm)	
Interval	97.0 – 482.7 m MD (97.0 – 482.6 m TVD)	
Drilling Fluid	K ₂ SO ₄ , MW 9.2 ppg, vis 35 sec/qt, pH N/A	
Casing	Casing Size	7" (178 mm); pre-perforated below ECP
	Weight	23.0 lbs/ft (34.23 kg/m)
	Grade	K55
	Coupling	BTC R3 (Buttress Thread Casing)
	Shoe Depth	480.7 m MD (480.6 m TVD); ECP at 244.7 m MD
	Perforated Interval	244.7 – 480.7 m MD
	Perforation Specifications	18 holes per 1 ft Perforation Hole Diameter: 12.7 mm
Cement	Type	GP; API Class A Cement
	Quantity	Cement Slurry weight (density): 12.0ppg Cement volume pumped: 31.7 bbl Drilling fluid displacement volume: 31.1 bbl Cement returns to surface: 3.5 bbl
	Additives	361 lbs Thixotropic Additive, 108 lbs Water Extender, 65 lbs Fluid Loss Additive, 22 lbs Dispersant, 1 gal Defoamer
	Interval	4.3 – 244.7 m MD
Water Source		
Water Source	Dam water	

Please note, slight variation of displacement values of cement to those in the DDR due to flow meter restrictions.

RM03-41-1

GL: 369.46 m AHD RT: 373.76 m AHD

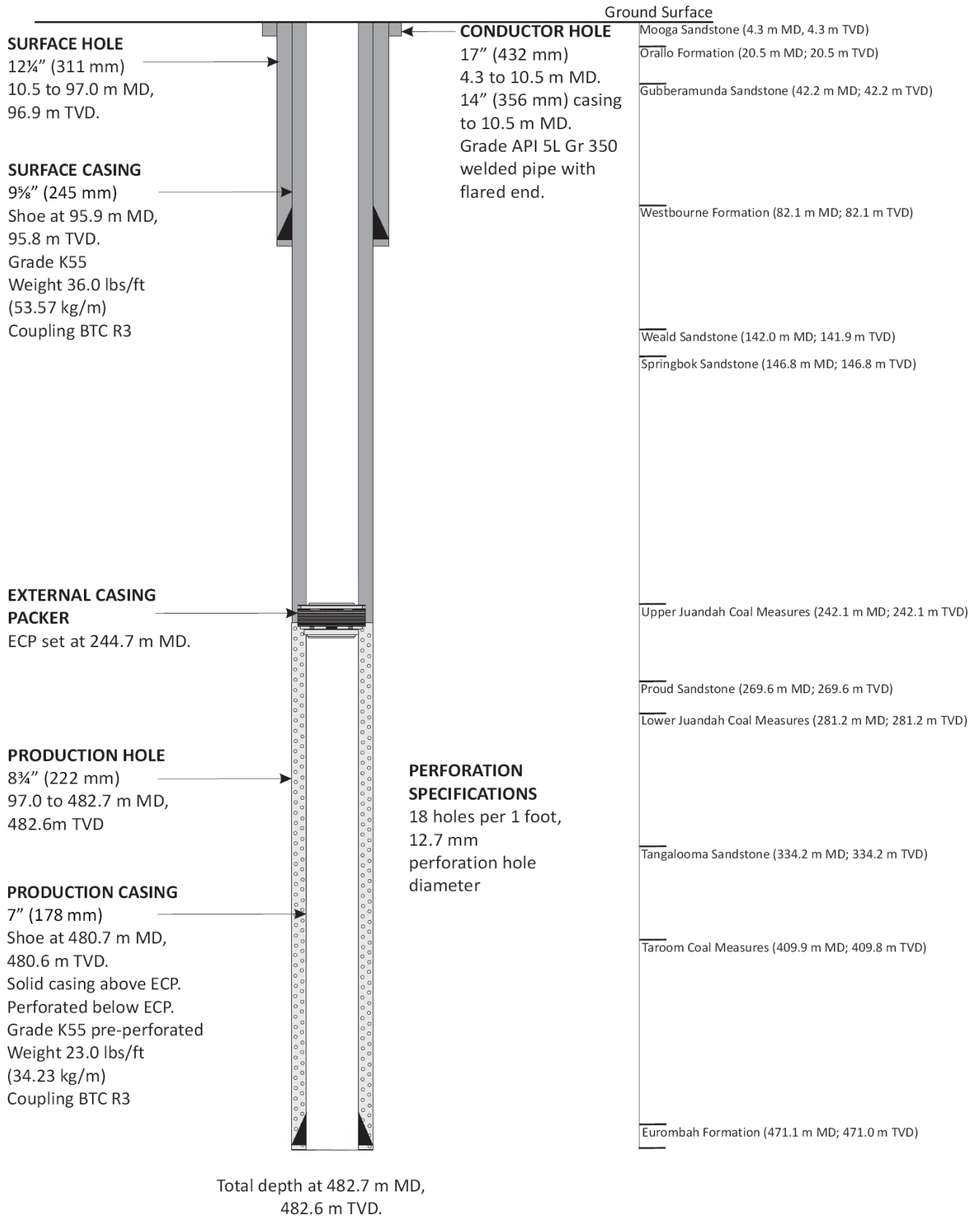


Figure 2: Well Schematic²

² Not to scale

2.3 Logging and Testing

Table 5: Summary of Logging and Testing

Sampling, Logging, Testing and Surveying	
Surveyed Well Path	Weatherford ran a verticality log to survey the well path. Results are available in <i>Appendix 5</i> .
Formation Testing	A formation integrity test was conducted using 9.20 ppg mud and yielded an EMW of 34.27 ppg at 100.0 m MD.
Drill Stem Tests	No drill stem tests were conducted on this well.
Geophysical Logs	Geophysical logging was performed by Weatherford on completion of drilling. Logging intervals are listed in <i>Table 6</i> ; copies of the logs are available in <i>Appendix 4</i> . Please refer to <i>6. Glossary of Terms</i> for log curve description. A well evaluation summary is available in <i>Appendix 6</i> .
Temperature Surveys	Maximum temperature recorded was 37.4°C at a depth of 462.8 m MD by Weatherford, 4 hours and 15 minutes after final circulation.
Geological Supervision	Santos provided onsite geological supervision.
Geological Samples	A 250g bag of washed and dried, depth lagged, cutting sample was collected approximately every 10.0 m MD from 10.5 to 489.7 m MD (driller's total depth), or as directed by the well site geologist. Samples were divided into plastic sample trays, labelled with well name and depth interval. A lithology log describing geological samples is available in <i>Appendix 7</i> , photographs of cutting sample intervals are in <i>Appendix 8</i> .
Core Logging	No core was cut in this well.
Desorption Samples	No desorption samples were taken on this well.
Coal Quality Samples	No coal quality samples were taken on this well.
Geotechnical Samples	No geotechnical samples were taken on this well.

Table 6: Logging Intervals

Run	Depth (m MD)		Log
	Top	Bottom	
1	76.0	477.9	LLS-LLD-DT-HDEN*-VERT-PE-SP-CALI
2	4.3	477.9	GR

*Please note: Weatherford High Resolution (HiRes): 0.025 m MD intervals

3 GEOLOGY

3.1 Geological Summary of Tenure Area

RM03-41-1 is a vertical development well located on the Roma Shelf, in the Northern Surat Basin. The Surat Basin forms part of the larger Great Australian Basin (Green 1997), covering approximately 300,000km² of south-eastern Queensland and northern New South Wales. Structurally the Surat Basin is relatively simple with faulting within the basin predominantly mirroring the basinal boundary faults of the underlying Bowen Basin (Green 1997).

RM03-41-1 targeted the Middle to Late Jurassic coal members of the Walloon Subgroup which are well developed across the eastern Surat Basin and outcrop along the north-eastern margin of the basin. The Walloon Subgroup dips to the south and west towards the depocentre of the basin where coal deposition is concentrated (Scott, *et al.* 2004).

Initial sedimentation of the Surat Basin occurred with the deposition of the Bundamba Group at the Late Triassic with continuous sedimentation commencing in the Early Jurassic. This group unconformably overlies the Permian - Triassic units of the Bowen Basin and is subdivided into the Precipice Sandstone, Evergreen Formation, Boxvale Sandstone Member and Hutton Sandstone.

Deposition of the Bundamba Group was followed by the Middle to Late Jurassic sediments of the Injune Creek Group, which contains the Eurombah Formation, Walloon Coal Measures, Springbok Sandstone, Weald Sandstone and Westbourne Formation. The Walloon Coal Measures represents a major episode of widespread fluvial and lacustrine deposition (Fielding *et al.* 1990a). They typically contain light to medium grey siltstone, dark grey-brown carbonaceous siltstone, fine to medium grained lithic sandstone and thick banded coal horizons (Fielding *et al.* 1990b). The coal measures are subdivided into the Upper Juandah Coal Measures, Proud Sandstone, Lower Juandah Coal Measures, Tangalooma Sandstone and Taroom Coal Measures. The primary CSG targets for the Surat Basin are the Upper Juandah, Lower Juandah and Taroom Coal Measures.

Conformably overlying the Injune Creek Group, the Blythesdale Group was deposited during the Late Jurassic to the Early Cretaceous in a fluvial dominated setting with minor coastal plain influences (Green 1997). This group includes the Gubberamunda Sandstone, Orallo Formation, Mooga Sandstone and Bungil Formation.

The final sedimentary cycle of the Surat Basin is represented by the Early Cretaceous Rolling Downs Group, which is comprised of the Grimman Creek Formation, Surat Siltstone, Cooreena Member, and Wallumbilla Formation. These sediments were deposited in fluctuating marine shelf, coastal and alluvial plain settings (Brakel *et al.* 1986). Sedimentation of the Surat Basin ceased during the Early Cretaceous, with a renewed onset of compression, responsible for the uplift and erosion of the Bowen and Surat Basins (Green 1997; Elliot 1994).

3.2 Stratigraphy

The depth at which stratigraphic units were intersected in RM03-41-1 is summarised in Table 7 and shown in Figure 4.

Table 7: Stratigraphy Summary

Formation	Measured Depth (m)	True Vertical Depth (m)
Mooga Sandstone	4.3	4.3
Orallo Formation	20.5	20.5
Gubberamunda Sandstone	42.2	42.2
Westbourne Formation	82.1	82.1
Weald Sandstone	142.0	141.9
Springbok Sandstone	146.8	146.8
Upper Juandah Coal Measures	242.1	242.1
Proud Sandstone*	269.6	269.6
Lower Juandah Coal Measures	281.2	281.2
Tangalooma Sandstone	334.2	334.2
Taroom Coal Measures	409.9	409.8
Eurombah Formation	471.1	471.0
Total Depth	482.7	482.6

*Proud Sandstone used by Santos as a marker horizon for correlation and modelling processes and therefore included in the Stratigraphy Summary.

A geological interpretation of the stratigraphic units intersected in the well is given in Table 8. The total gas of each formation, where measured, is also given.

Table 8: Stratigraphic Descriptions

GEOLOGICAL SUMMARY		
INTERVAL Average Rate of Penetration (m/hr)	LITHOLOGY	TOTAL GAS
MOOGA SANDSTONE		
4.3 – 20.5 m MD 12 – 30 m/hr Avg 2.0m/hr	SANDSTONE: clear translucent quartz grains, light orange to yellowish brown, generally fine-medium, occasionally coarse, sub angular to rounded, generally sub rounded, displaying good sphericity in parts, frosted quartz grains in parts, occasional moderately well silica cemented aggregates, common argillaceous matrix, trace lithic fragments, poor-fair inferred porosity.	nil

ORALLO FORMATION

<p>20.5 – 42.2 m MD 18 – 53 m/hr Avg 29 m/hr</p>	<p>ARGILLACEOUS SANDSTONE INTERBEDDED WITH SILTSTONE SANDSTONE: translucent, light brownish grey, medium to fine, subrounded to subangular, very poorly to well sorted, loose, commonly muddy and grading to SILTSTONE, siliceous, calcareous cement in parts, rare to common white argillaceous matrix, good trace glauconite in parts, trace pyrite, trace lithics, trace coaly and carbonaceous fragments, good inferred porosity. SILTSTONE: light to medium grey, arenaceous, grading to very fine SANDSTONE in part, trace carbonaceous specks, trace glauconite, soft to firm, blocky.</p>	<p>nil</p>
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GUBBERAMUNDA SANDSTONE

<p>42.2 – 82.1 m MD 7 – 125 m/hr Avg 50 m/hr</p>	<p>SANDSTONE WITH MINOR SILTSTONE SANDSTONE: clear, translucent, pink, red, fine to very coarse, mostly fine to medium, subrounded to subangular, well to poorly sorted, loose and clean, nil matrix, quartzose, trace translucent red, pink minerals, trace smoky quartz grains, rare small coaly fragments, rare granule sized lithics, trace green and common frosted quartz grains, trace pyrite nodules, good inferred porosity. SILTSTONE: light grey, arenaceous, trace lithics, moderately hard, blocky.</p>	<p>nil</p>
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WESTBOURNE FORMATION

<p>82.1 – 142.0 m MD 31 – 108 m/hr Avg 73 m/hr</p>	<p>SILTSTONE WITH MINOR INTERBEDDED SANDSTONE. SILTSTONE: brownish grey, medium grey in parts, moderately hard to very hard, subblocky to subfissile, occasionally tabular, non-calcareous, arenaceous, trace lithics, good trace mica flecks, trace carbonaceous specks and streaks, trace disseminated and botryoidal pyrite, grading to very fine SANDSTONE. SANDSTONE: white grey-light grey aggregates, soft to friable, occasionally moderately hard, very fine to fine, silty in parts, subangular to subrounded, moderately well sorted, trace siliceous cement, slightly calcareous in parts, common white kaolinite matrix, trace carbonaceous specks, trace lithics, friable to moderately hard, poor visual porosity.</p>	<p>nil</p>
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WEALD SANDSTONE

<p>142.0 – 146.8 m MD 79-120 m/hr Avg 98 m/hr</p>	<p>SANDSTONE and SILTSTONE interbeds. SANDSTONE: white, light grey, very fine to fine, subangular, moderately sorted, calcareous cement, abundant white argillaceous matrix, quartzose, rare lithics, rare carbonaceous specks, moderately hard, poor visual porosity. SILTSTONE: light to medium brown grey, medium grey, arenaceous, slightly micromicaceous, trace lithics, trace carbonaceous specks, firm to moderately hard, subblocky.</p>	<p>0 – 105 units Avg 63 units</p>
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SPRINGBOK SANDSTONE		
146.8 – 242.1 m MD 53-116 m/hr Avg 87 m/hr	<p>INTERBEDDED SANDSTONE and SILTSTONE with minor CARB SILTSTONE and COAL.</p> <p>SILTSTONE: Light to medium grey brown, light to medium grey, light brown, arenaceous, occasionally argillaceous, common carbonaceous specks and streaks, locally common off white lithics, locally common light green and light brown tuff fragments, soft to hard, blocky to subfissile.</p> <p>SANDSTONE: White, light grey, clear to translucent, fine to coarse, mostly fine, subrounded to mostly subangular, poorly to moderately sorted, siliceous and calcareous cement, trace to abundant white argillaceous matrix, common off white, grey and brownish lithics, locally common carbonaceous specks and streaks, locally common small coaly fragments, loose and friable to hard, poor to good visual and inferred porosity.</p> <p>CARB SILTSTONE: Dark grey, argillaceous, common carbonaceous streaks, brittle, hard, subfissile.</p> <p>COAL: black, dull to subvitreous, silty in parts, moderately hard, brittle, uneven, blocky.</p>	0.141 units Avg 56 units
UPPER JUANDAH COAL MEASURES		
242.1 – 269.6 m MD 74 – 125 m/hr Avg 102 m/hr	<p>SANDSTONE and SILTSTONE with CARB SILTSTONE and minor COAL.</p> <p>SANDSTONE: Clear, translucent, white, light grey, fine to medium, subangular, moderately to well sorted, mostly siliceous cement, common white argillaceous matrix, common carbonaceous specks and coal fragments, trace white, loose to friable, poor inferred porosity.</p> <p>SILTSTONE: Light to medium grey, light to medium brown grey, occasionally arenaceous, micromicaceous in parts, locally common off white lithics, common carbonaceous specks and streaks, soft to hard, blocky to subfissile.</p> <p>CARB SILTSTONE: Black, dark brown, argillaceous, common coaly laminae, brittle, moderately hard, subfissile.</p> <p>COAL: Black, dull to subvitreous, silty in parts, moderately hard, brittle, uneven, blocky to subfissile.</p>	52 – 906 units Avg 240 units Peaks: 906 units at 247m
PROUD SANDSTONE		
269.6 – 281.2 m MD 63 – 127 m/hr Avg 91 m/hr	<p>SANDSTONE and SILTSTONE with CARB SILTSTONE minor COAL</p> <p>SANDSTONE: Clear, translucent, white, light grey, fine to medium, subangular, well sorted, weak calcareous cement, rare to locally common white to grey argillaceous matrix, common carbonaceous specks, common brown, grey, green lithics, rare mica, rare pyrite, loose to moderately hard, fair to good visual porosity.</p> <p>SILTSTONE: Light to medium grey brown, light to medium grey, argillaceous, arenaceous in parts, common carbonaceous specks and streaks, grading to</p> <p>CARB SILTSTONE: Black, dark brown, argillaceous, micromicaceous, common coaly laminae, brittle, moderately hard, subfissile.</p> <p>COAL: Black, dull to subvitreous, moderately hard, brittle, uneven to subconchoidal, subblocky to subfissile.</p>	68 – 152 units Avg 98units

LOWER JUANDAH COAL MEASURES

<p>281.2 – 334.2 m MD 60 – 130 m/hr Avg 91 m/hr</p>	<p>Interbedded SILTSTONE, SANDSTONE and minor CARB SILTSTONE and COAL SILTSTONE: Light to medium brown grey, light to medium grey, brown, arenaceous, argillaceous in parts, common carbonaceous specks and streaks, locally common off white lithics, coaly fragments and laminations, traces of mica, rare pyrite, soft to moderately hard, blocky to subfissile. SANDSTONE: Light grey, white, off white, translucent, very fine to med with occasional coarse grains, grading to SILTSTONE in parts, mostly fine to medium, subrounded to mostly subangular, poorly to moderately sorted, calcareous, siliceous cement in parts, common white argillaceous matrix, common off white, grey, white and greenish lithics, trace to common carbonaceous specks, locally common coaly fragments, trace mica, trace siderite, friable to moderately hard, poor to fair visual porosity. CARB SILTSTONE: Black, dark grey, dark brown, argillaceous, common coaly laminations, brittle, firm to hard, subblocky to subfissile. COAL: Black, dull to subvitreous, silty, moderately hard, brittle, uneven to subconchoidal, blocky to subfissile.</p>	<p>64 – 1267 units Avg 223 units</p> <p>Peaks: 906 units at 283m 1267 units at 301m 483 units at 304m</p>
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TANGALOOMA SANDSTONE

<p>334.2 – 409.9 m MD 38 – 109 m/hr Avg 86 m/hr</p>	<p>SANDSTONE with SILTSTONE and minor CARB SILTSTONE SANDSTONE: white, translucent, light grey, off white, fine to medium, rare coarse, subrounded to subangular, poorly to moderately sorted, calcareous and arenaceous cement, trace to mostly abundant white to brown argillaceous matrix, trace grey lithics, trace to common carbonaceous specks and coaly fragments, locally common siderite and calcite, rare mica flecks, friable to hard, poor to fair visual porosity. SILTSTONE: light to medium brown grey, light to medium grey, argillaceous, arenaceous in parts, common carbonaceous specks and coaly fragments and laminations, traces of siderite, soft to moderately hard, blocky to subfissile. CARB SILTSTONE: dark brown, black, argillaceous, common thin coaly laminations, slightly micromicaceous, brittle, moderately hard, subfissile to subblocky.</p>	<p>117 – 906 units Avg 219 units</p> <p>Peak: 906 units at 328m</p>
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TAROOM COAL MEASURES

<p>409.9 – 471.1 m MD 16 – 136 m/hr Avg 81 m/hr</p>	<p>SANDSTONE and SILTSTONE with minor CARB SILTSTONE and COAL. SANDSTONE: Translucent, white, light grey, off white, pale yellow, light brown, very fine to medium with occasional coarse grains, subrounded to subangular, poorly to moderately sorted, calcareous cement, common to abundant white argillaceous/silty matrix, common calcite veins and siderite, trace to common carbonaceous specks and coaly fragments, common off white and grey lithics, friable to moderately hard, fair visual porosity. SILTSTONE: light to medium grey brown, light to medium grey, light to medium brown, argillaceous, arenaceous in parts, micromicaceous in parts, trace to locally abundant carbonaceous specks, streaks and laminations, trace to common siderite, trace lithics, firm to moderately hard, blocky to subfissile. CARB SILTSTONE: dark grey, dark brown, argillaceous, micromicaceous in parts, common thin coaly laminations, moderately hard, brittle, subfissile. COAL: black, dull to subvitreous, brittle, moderately hard, uneven to subconchoidal, blocky to subfissile.</p>	<p>102 – 1422 units Avg 296 units</p> <p>Peaks: 822 units at 373m 390 units at 384m 333 units at 409m 687 units at 427m 704 units at 446m 889 units at 453m 1240 units at 455m 1422 units at 458m 427 units at 471m</p>
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EUROMBAH FORMATION

<p>471.1 – 482.7 m MD (total depth) 38 – 88 m/hr Avg 61 m/hr</p>	<p>SANDSTONE and SILTSTONE. SANDSTONE: Translucent, white, light grey, off white, pale yellow, light brown, very fine to medium with occasional coarse grains, subrounded to subangular, poorly to moderately sorted, calcareous cement, common to abundant white argillaceous/silty matrix, common calcite veins and siderite, trace to common carbonaceous specks and coaly fragments, common off white and grey lithics, friable to moderately hard, fair visual porosity. SILTSTONE: light to medium grey brown, light to medium grey, light to medium brown, argillaceous, arenaceous in parts, micromicaceous in parts, trace to locally abundant carbonaceous specks, streaks and laminations, trace to common siderite, trace lithics, firm to moderately hard, blocky to subfissile</p>	<p>163-279 units Avg 208 units</p>
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3.3 Coal Summary

Table 9 lists the coal bearing formations identified as intervals in the well to produce coal seam gas. A net pay summary determined using geophysical logs is also provided in Table 9. A review of the geophysical logs run in this well has determined a high resolution density coal cut off of 1.75 g/cc.

Table 9: Coal Summary

Coal Intersection	Intervals (m MD)	Net Pay (m MD)	Net Pay (m TVD)
Springbok Sandstone	153.3 – 171.2	1.9	1.9
Upper Juandah Coal Measures	243.9 – 248.4	2.4	2.4
Lower Juandah Coal Measures	282.6 – 329.5	2.6	2.6
Tangalooma Sandstone	349.8 – 395.4	1.6	1.6
Taroom Coal Measures	410.1 – 463.7	7.8	7.8
Total		16.3	16.3

BOWEN and SURAT BASIN STRATIGRAPHY

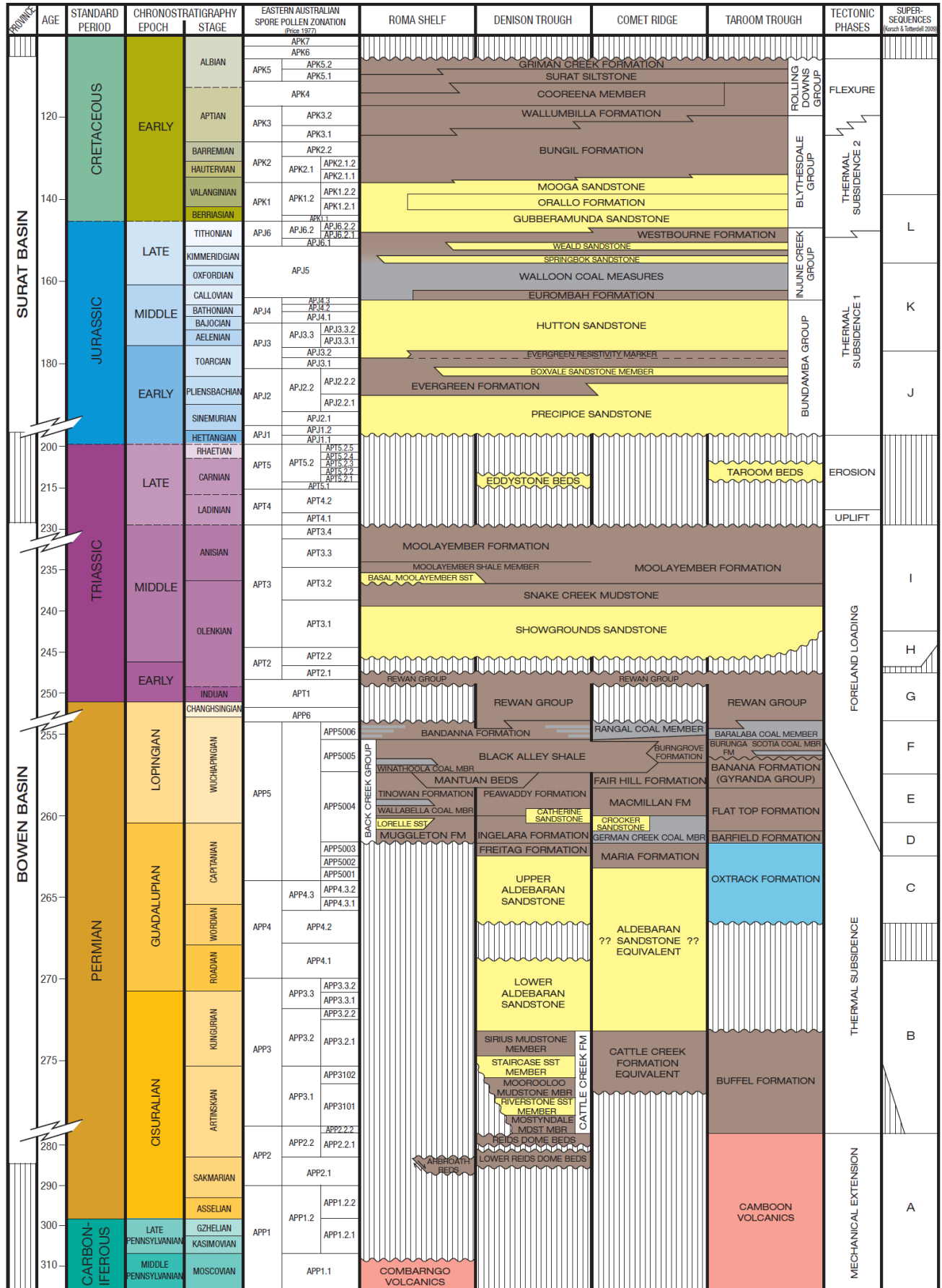


Figure 3: Stratigraphy

4 CONCLUSIONS

RM03-41-1 was successfully drilled as part of the PL 309 Development Program, aimed at targeting the Walloon Coal Measures in the Roma field to develop gas reserves. The well was drilled in an area where 1P (Proved) and 2P (Proved and Probable) reserves have been observed. Reservoir modelling determined the location of the well to provide the best economic spacing for gas supply at 880 m for the Mid-Walloon coal measures. Land access, surface constraints and topography were considered in adjusting the position of this well.

5 REFERENCES

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Queensland Government, Petroleum Regulation 2004.

6 GLOSSARY OF TERMS

AHD	Australian Height Datum
API	American Petroleum Institute
Bbl	Oilfield barrel
BOP	Blowout preventer
BS	Bit Size
Cali	Caliper - <i>a geophysical log run in the well</i>
Class A Cement	Cement classification as defined by the American Petroleum Institute
CM	Coal Measures
CSG	Coal Seam Gas
DDR	Daily Drilling Report
DGR	Daily Geology Report
DST	Drill stem test
DT	Sonic
ECP	External casing packer
EMW	Equivalent mud weight
FIT	Formation integrity test
GDA 94	Geocentric Datum of Australia 1994
GP	General Purpose - <i>cement classification</i>
GR	Gamma Ray - <i>a geophysical log run in the well</i>
KCl	Potassium Chloride - <i>a commonly used drilling mud additive</i>
KOP	Kick off point
LLD	Deep Laterlog (Resistivity) - <i>a geophysical log run in the well</i>
LLS	Shallow Laterlog (Resistivity) - <i>a geophysical log run in the well</i>
LOT	Leak off test
LWD	Logging while drilling
MD	Measured depth
MGA Zone 55	Map Grid of Australia, Zone 55
MSFL	Micro-Res Resistance - <i>a geophysical log run in the well</i>
MW	Mud weight
MWD	Measurement while drilling
NPHI	Neutron Porosity - <i>a geophysical log run in the well</i>
PDC	Polycrystalline diamond compact
PHPA	Partially hydrolyzed polyacrylamide - <i>a commonly used drilling mud additive</i>
ppg	Pounds-per-gallon
RHOB	Density - <i>a geophysical log run in the well</i>
ROP	Rate of penetration
RT	Rotary Table
S37	Section 37 of the Petroleum & Gas (Production and Safety) Regulation 2004
Sec/qt	Unit of viscosity
SP	Spontaneous Potential - <i>a geophysical log run in the well</i>
SS	Sub-sea level
SWC	Side Wall Core
TD	Total depth
TVD	True vertical depth
Vis	Viscosity
WCR	Well Completion Report

Appendix 1

Survey Report

SURVEY PLAN

DERIVED M.G.A. CO-ORDINATES (GDA-94)

STN	DESCRIPTION	EASTING	NORTHING	ZONE
4	RM03-46-1	711 388.743	7 080 931.678	55
5	RM03-46 BM1	711 441.367	7 080 950.832	55
6	RM03-46 BM2	711 417.101	7 080 891.075	55
7	ARMIDALE #1 BM1	712 072.494	7 079 843.127	55
8	ARMIDALE #1 BM2	712 193.781	7 079 794.804	55
9	RM03-34 BM2	712 686.613	7 082 241.196	55
10	RM03-34 BM1	712 685.150	7 082 304.429	55
11	RM03-16 BM1	712 337.678	7 083 917.144	55
12	RM03-16 BM2	712 290.120	7 083 870.491	55
13	RM03-16-1	712 273.487	7 083 920.352	55
20	RM03-30 BM1	713 502.458	7 083 013.024	55
21	RM03-30 BM2	713 569.064	7 083 010.857	55
22	RM03-30-1	713 542.732	7 082 967.125	55
23	RM03-41 BM2	713 442.274	7 081 609.589	55
24	RM03-41-1	713 419.302	7 081 650.803	55
25	RM03-41 BM1	713 474.638	7 081 663.952	55

DISTANCES ARE GRID

Bench Marks are deep driven Iron Star Pickets with Witness posts

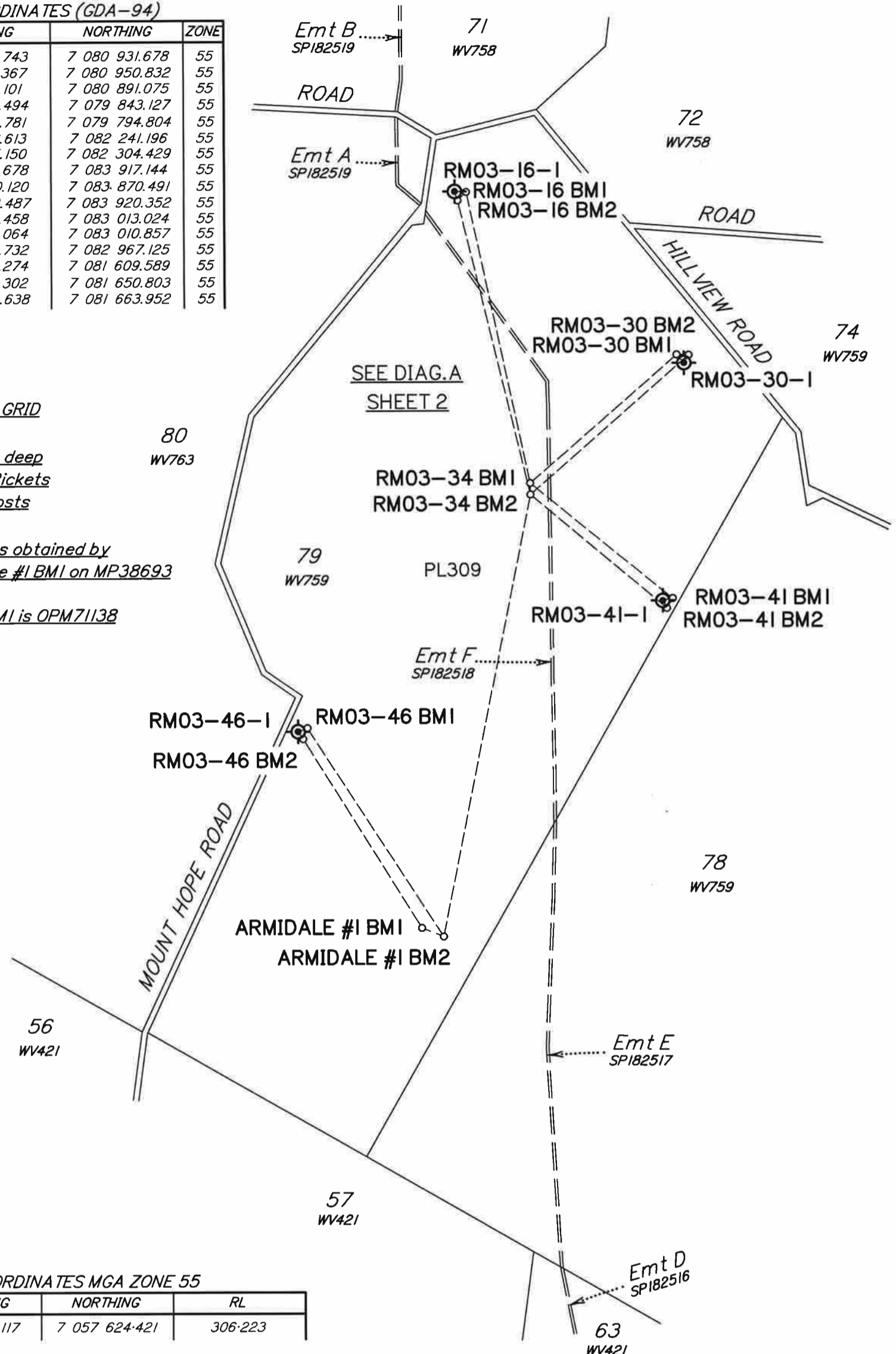
Co-ordinates and Levels obtained by RTK GPS traverse from Armidale #1 BM1 on MP38693

Origin of Armidale #1 BM1 is OPM71138

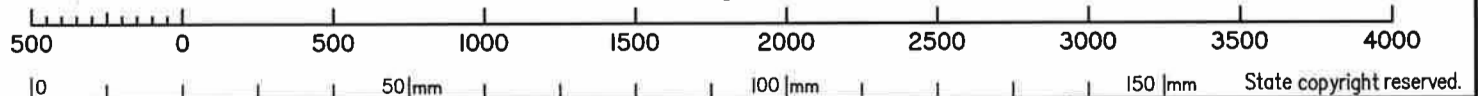


CONTROL COORDINATES MGA ZONE 55

PM	EASTING	NORTHING	RL
OPM 71138	678 047.117	7 057 624.421	306.223



Scale 1:25000 - Lengths are in Metres.



Fyfe Pty Ltd (ACN 008 116 130) hereby certify that the above/Company has surveyed the location of the petroleum well as shown on this plan, that the survey was performed in accordance with the Petroleum and Gas (Production and Safety) Act 2004 and the Survey and Mapping Infrastructure Act 2003 and associated Regulations and Standards and achieves the accuracies of the Standards and the survey was completed on 11/10/2013

[Signature]
Authorised Delegate

18-10-2013
Date

MINING RESOURCES

Plan of RM03-16-1, RM03-30-1, RM03-41-1 & RM03-46-1

PARISH: **DILGINBILLY** COUNTY: **WALDEGRAVE**
LOCALITY: **PICKANJINNIE** LOCAL AUTHORITY: **MARANOA R.C.**

SCALE: 1:25000

Mining District: **DALBY**



MP43351

Catalogued:	Examined:	Registered:	Drawn by: FYF	Meridian: MGA	Field Notes: NO
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DIAGRAM B

Not to Scale

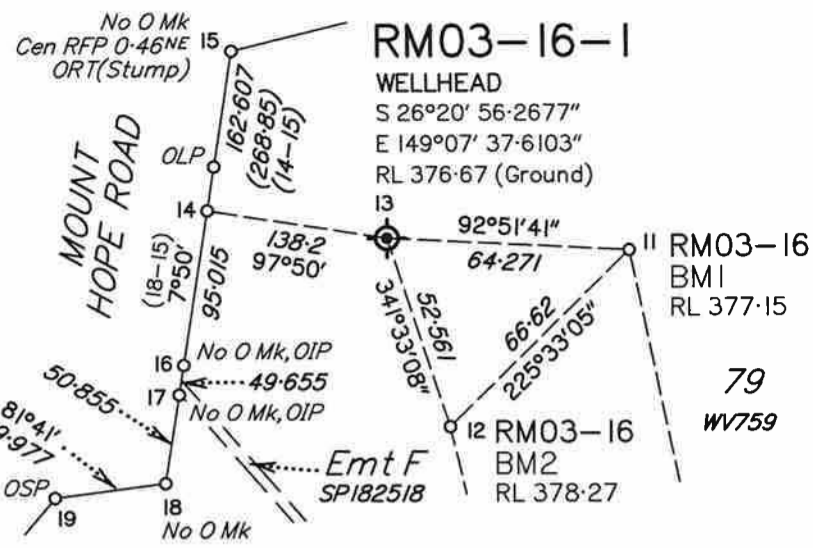
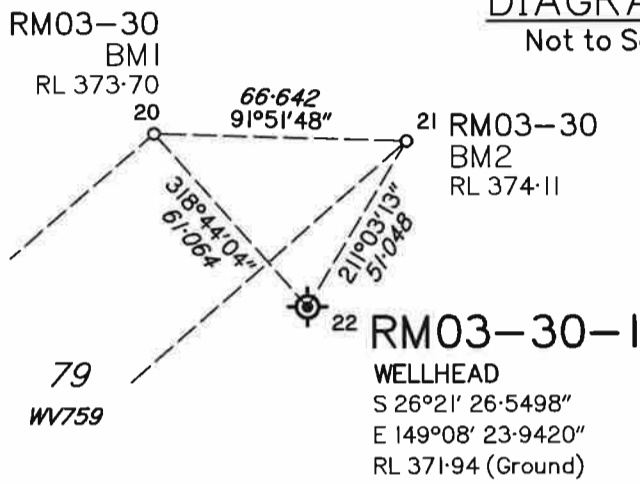


DIAGRAM C

Not to Scale



RM03-41-1

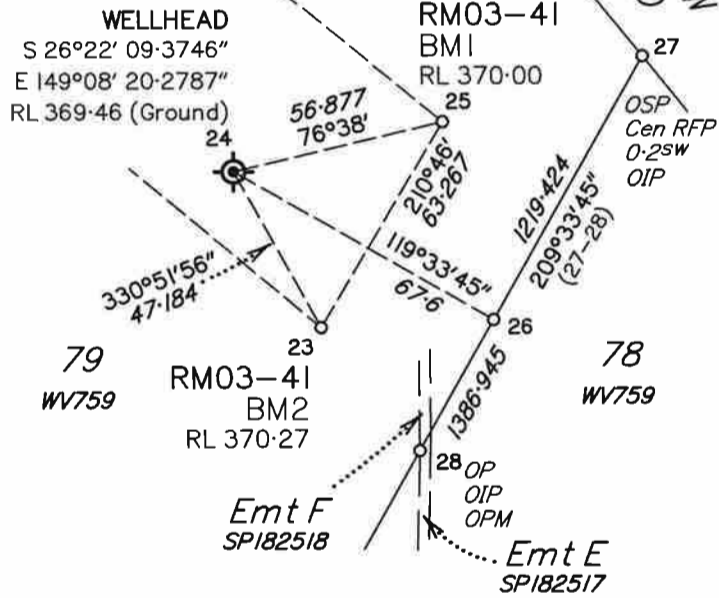


DIAGRAM D

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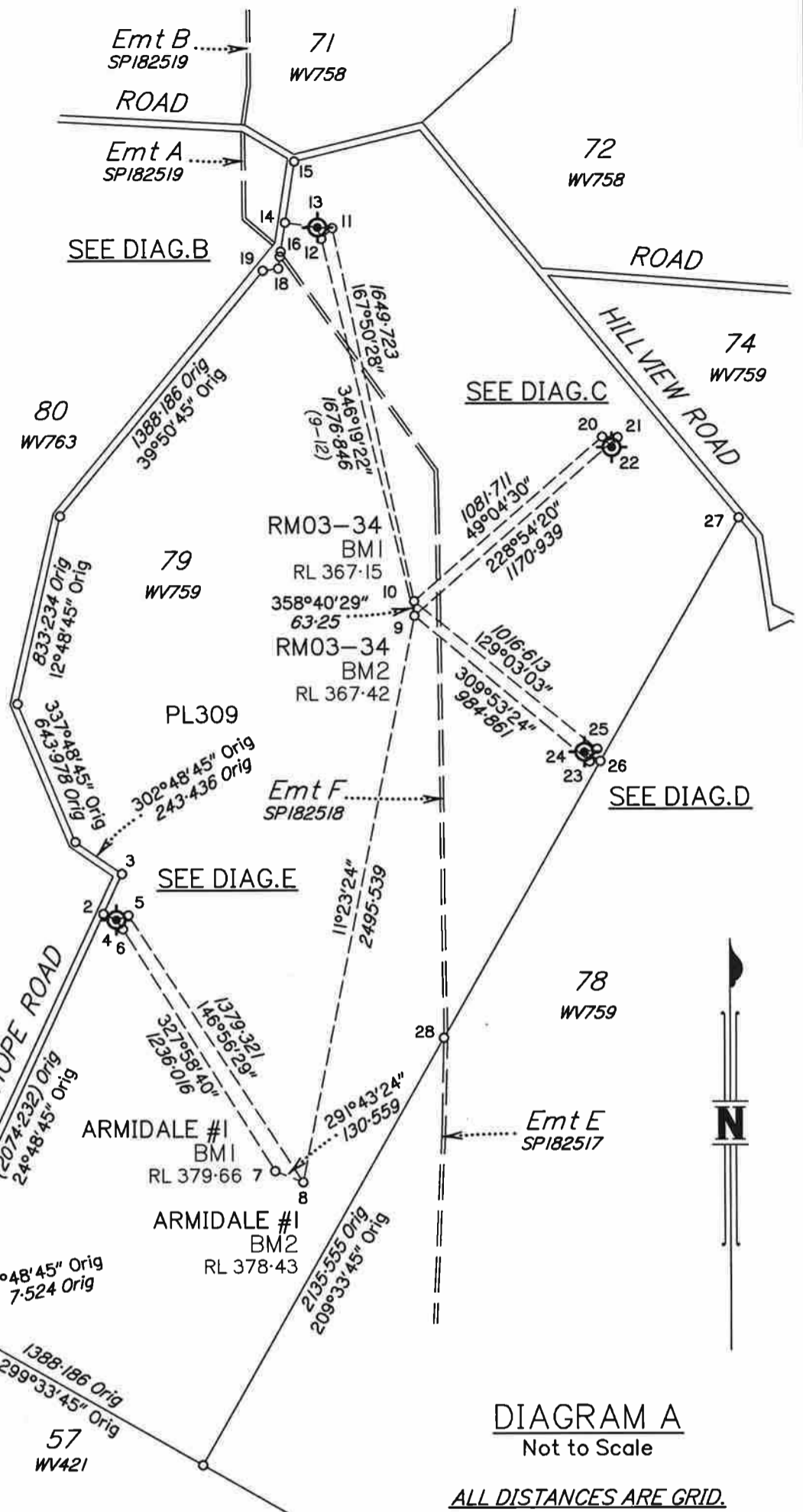


DIAGRAM A

Not to Scale

ALL DISTANCES ARE GRID.

Original Information compiled from SPI82517 & WV759 in the Department of Natural Resources and Mines

Combined sea level and grid scale factor
Grid x 0.999908487 = Ground

REFERENCE MARKS

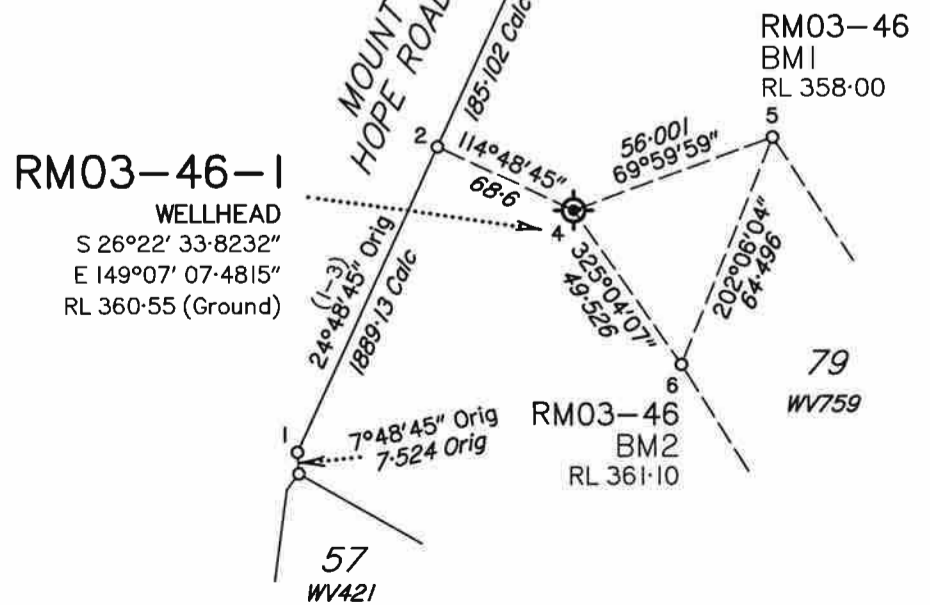
STN	TO	ORIGIN	BEARING	DIST
15	ORT(Stump)	50/WV759	110°0'	5.11
16	OIP	11/SPI82518	253°20'	1.58
17	OIP	10/SPI82518	201°09'	1.065
27	OIP	6/SPI82517	118°34'45"	1.635
28	OIP	9/SPI82517	155°28'45"	1.26

PERMANENT MARKS

PM	ORIGIN	BEARING	DIST	NUMBER
28-OPM	9/SPI82517	210°30'45"	52.965	159245

DIAGRAM E

Not to Scale



State copyright reserved.

Insert Plan Number

MP43351

Appendix 2

Daily Drilling Reports (DDR)

2013-05-09

From : Ernie Bennett/Mark Cartwright
To : Amit Sharma

Well Data				QC Not Done
Drill Co. :	Ensign	Midnight Depth(MD):	Current Hole Size:	
Resource:	Ensign 50	Midnight Depth(TVD):	Casing OD:	
Prognosed TD :	501.24m	Progress:	Shoe TVD:	
RT-GL:	4.30m	Days From Spud:	0.00	F.I.T / L.O.T: /
GL Elev. :	373.80m	Days On Well:	0.75	Resource Move Distance:
Current Op's @0600 2013-05-10		Drilling 12 1/4 hole.		
Planned Operations for 2013-05-10		Stand down for safety meeting. Prepare rig to spud. Conduct hazard hunt and function ESD. Spud and drill 12 1/4" hole to sectional T/D. Run and cement 9 5/8" casing. Nipple up BOP.		

Summary of Period 0000 to 2400 Hrs

Rigged down and moved rig to RM03-41-1. Rigged up and prepared to spud. Repaired pipe arm.

Well Related Issues To Be Addressed

Resource Related Issues To Be Addressed

Next Well Info.

Next Location : Resource Move Distance : Resource Move Contractor : Ensign

Operations For Period 0000 Hrs to 2400 Hrs on 2013-05-09

Phse	Cls	Op	From	To	Hrs	Depth (m)	Activity Description
PS	P	SM	06:00	06:15	0.25		Conducted pre-move safety meeting. With all crew members and transport personnel, Discussed rig move plan, Discussed the importance of good communication and to be aware of vehicle movements at all times
PS	P	RM	06:15	16:00	9.75		Moved carrier, lowered dog house, moved pipe tub. Rigged down all electrical, air and fuel lines. Lifted walkways, paced up booms, rigged down tank suction lines. Rigged down and moved and rigged up minicamp to 100%. Moved tanks, mud pumps, spotted carrier mud pumps, mud tanks, HPU. Raised carrier levelled and pinned, levelled dog house, installed floor handrails, installed all mud pump lines, installed cuttings bin, spotted pipe bins, rigged up mud tanks. Continued with rig up in general. Note:- DEEDI on location at 09:30hrs to 12:00hrs.
PS	P	RM	16:00	21:00	5.00		Continued with rig up in general.
PS	TP	RR	21:00	24:00	3.00		Worked on pipe arm to repair and replace bolts and re-align same. Cracks found in pedestal base, welder ground out cracks and re-welded . NDT inspection done on welds no cracks found.

Operations for Period 0000 Hrs to 0600 Hrs On 2013-05-10

Phse	Cls	Op	From	To	Hrs	Depth (m)	Activity Description
PS	P	SM	00:00	01:00	1.00		Conducted weekly agenda safety stand down meeting with both crews.
PS	P	RM	01:00	02:00	1.00		Continued preparing rig to spud.
PS	P	RI	02:00	02:30	0.50	10.5	Functioned ESD HPU 4 seconds. Total shut down 8 seconds. Picked up and made up 12-1/4" BHA assembly TIH tagged at 10.5m MD.
PS	P	RI	02:30	03:00	0.50	10.5	Conducted hazard hunt, 5 items found and closed out. Completed form DMS F120. Strapped 9-5/8" casing.
PS	P	SM	03:00	03:30	0.50	10.5	Held pre-spud meeting with all crew members for RM03-41-1. All relevant paper work DMS F199 pre-spud completed and signed off.

Operations for Period 0000 Hrs to 0600 Hrs On 2013-05-10

Phse	Cls	Op	From	To	Hrs	Depth (m)	Activity Description
SH	P	DA	03:30	06:00	2.50	55.0	[In Progress] Spudded RM03-41-1. At 03:30 hours. Drilled 12-1/4" hole from 10.5m to 55m MD. Drilling Parameters: WOB: 2 to 5 kLbs, Rotary: 30 to 40 rpm, Torque: 1.8 to 3.5 kFtLbs, Flow: 100 to 200 gpm, Pressure: 75 to 100 psi.

Bulk Stocks					
Name	Unit	In	Used	Adjust	Balance
Rig Fuel	1 L	11,000	500	0	16,500
Rig Mini Camp Fuel	1 L	550	100	0	1,000
Camp Fuel	1 L	0	200	-200	2,900
Rig Potable Water	ltr	3,600	800	0	3,200
Camp Potable Water	ltr	20,000	6,000	0	24,000
Drill Water	ltr	40,000	0	0	70,000

Mud Stocks					
Name	Unit	In	Used	Adjust	Balance
Ancor-1	25 ltr	0	0	0	0
Barites	25 kg	0	0	0	80
Calcium Chloride	25 kg	0	0	0	0
Caustic Soda (pearl)	25 kg	0	0	0	42
Citric Acid	25 kg	0	0	0	1
Defoam-E	25 kg	0	0	0	0
Fracseal Fine	11.4 kg	0	0	0	0
Fracseal Medium	11.4 kg	0	0	0	0
Idcide-20	20 kg	0	0	0	2
JK-161 LV	25 kg	0	0	0	5
Lime	20 kg	0	0	0	0
Nutplug	25 kg	0	0	0	0
Potassium Sulphate (fine)	25 kg	0	0	0	290
Quickseal - Course	18.14 kg	0	0	0	0
Quickseal - Fine	18.14 kg	0	0	0	0
Quickseal - Medium	18.14 kg	0	0	0	0
Rheoben NT	25 kg	0	0	0	0
Rheolube	25 kg	0	0	0	0
Rheopac LV	25 kg	0	0	0	2
Rheopac RD	25 kg	0	0	0	0
Rheoplug	8 kg	0	0	0	0
Rheoplug Ultra	8 kg	0	0	0	0
SAPP	25 kg	0	0	0	0
Soda Ash	25 kg	0	0	0	4
Sodium Sulphite	25 kg	0	0	0	0
Xanthan Gum (P)	25 kg	0	0	0	28
Sodium Bicarbonate	25 kg	0	0	0	0
Rheo-X-Sweep	5.45 kg	0	0	0	0
Drispac SL	25 kg	0	0	0	0
KCl	25 kg	0	0	0	32

* stocks that were replaced.

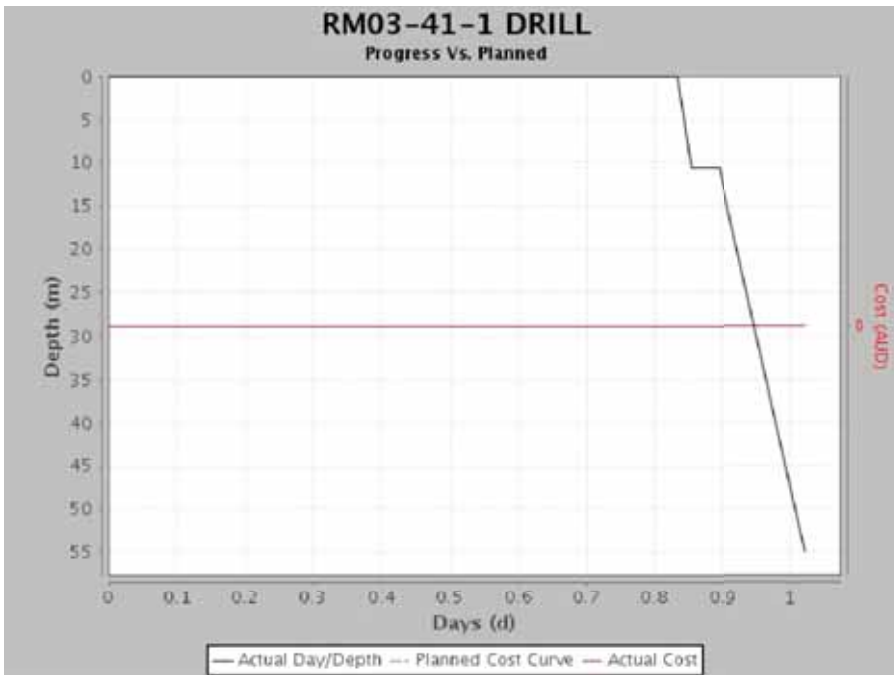
Pumps										
Pump data - Last 24 Hrs							Slow Pump Data			
No	Type	Liner (in)	SPM	Eff. (%)	Flow (gpm)	SPP (psi)	SPM	SPP	Depth (m)	MW (ppg)
1	Tri-Service Manufacturing / TSM 750	6.50		97	0					

EHS Summary				
Events	Date of Last	Days Since	Description	Remarks
Lost Time Incident	2011-09-11	606 Days	Lost Time Incident	Foreign Object in eye.
Pre-Tour Meeting	2013-05-09	0 Days	Days Pre-tour	Discussed the following: Heat stress awareness and management. Upcoming days operations: 1. Correct PPE to be used at all times. 2. Manual handling. 3. Housekeeping. 4. Nipple down BOP. 5 Cleaning mud tanks.
Pre-Tour Meeting	2013-05-09	0 Days	Night Pre-tour	Discussed the following: Heat stress awareness and management. Upcoming days operations: 1. Correct PPE to be used at all times. 2. Manual handling. 3. Housekeeping. 4. Vehicle movement 5. Handling tubulars. 6. Rigging down. 7. Loader operations.
Safety Meeting	2013-05-09	0 Days	Stand down for safety meeting	Safety meeting held with both crews. To discuss the weekly safety agenda subjects. WPTW and lock out tag out procedures.
SOP Reviewed	2013-05-09	0 Days	SOP	W015.50 Working on mud pumps. R003.50 Rig move.
Wellsite Permit to Work	2013-05-09	0 Days	PTW	M019.50 Cleaning mud tanks. PTW: #120306, #120309, #120310. Confined Space Entry Supplement: #73468. Cold Work: 1 - 1 Hot Work: 0 - 0 Pressure Systems: 1 - 4 Confined Space: 2 - 4 Cancelled: 0 - 0 Working @ Height: 1 - 2 Electrical Work: 0 - 0 Radioactive: 0 - 0

Personnel On Board						
Primary Contractor	Sub-Contractor	Name	Job Title	Manhour	Comment	Pax
Santos		Ernie Bennett	OCR	Yes		1
Santos		Mark Cartwright	Night OCR	Yes		1
Ensign		Oref Kratchmer	Rig Manager	Yes		1
Ensign		Paul Stylianou	Night Pusher	Yes		1
Ensign		Paul Watson/Rolli Coventry	Driller	Yes		2
Ensign		Allan Steger/Steve Knight	Assistant Driller	Yes		2
Ensign		Adam Flint/Simon Feldahn	Derrick Hand	Yes		2

Personnel On Board						
Primary Contractor	Sub-Contractor	Name	Job Title	Manhour	Comment	Pax
Ensign		Tony Copeland/ Glen Mostyn	Floor Hand	Yes		2
Ensign		Todd Redenbach/ Brendan Zappa	Lease Hand	Yes		2
Ensign		Luke Rudge	Operator	Yes		1
Ensign		Nate Sinclair	Rig Mechanic	Yes		1
Ensign		Darren Fisher/ Vince Belz	EHS Advisor	Yes		2
Oil Industry Catering Services		Tracy Lindsley/ Jeanine Briese	Campy	Yes		2
Oil Industry Catering Services		Jon Whitley/ Guenter Deimel	Camp Cook	Yes		2
Trican		Rhys Gilbut/Chris Nicholas	Truck Driver	Yes		2
Santos		Sam Fraser	Geologist	Yes		1
Ensign		Kyle Livingstone/ Travis Richardson	Lease Hand	Yes		2
Tom Darlington Transport		Garry Furguson	Truck Driver	Yes		1
Ensign		Greg Saverin	Superintendent	Yes		1
Ensign		Peter Sutton	Welder	Yes		1
Ensign		Ashley Thompson	Rig Electrician	Yes		1
Santos		Gavin Grice	Santos Safety Advisor	Yes		1
Resource Capacity, Max = 42.0				76.19%	Total Pax:	32

No Lessons Learned For Today



2013-05-10

From : Ernie Bennett/Mark Cartwright
To : Amit Sharma

Well Data				QC Not Done
Drill Co. :	Ensign	Midnight Depth(MD):	97.0m	Current Hole Size: 12.250in
Resource:	Ensign 50	Midnight Depth(TVD):	97.0m	Casing OD: 9.625in
Prognosed TD :	501.24m	Progress:	97.0m	Shoe TVD: 95.9m
RT-GL:	4.30m	Days From Spud:	0.85	F.I.T / L.O.T: /
GL Elev. :	373.80m	Days On Well:	1.75	Resource Move Distance: 1.0 km
Current Op's @0600 2013-05-11		Conducting dummy LOT.		
Planned Operations for 2013-05-11		Pressure test BOP. Conduct koomey draw down test. TIH with 8 3/4" assembly, conduct choke drill. Drill out float collar. Rig up and conduct dummy LOT. Drill out shoe and 3m new formation Conduct LOT as per program. Drill 8 3/4 " hole to TD.		

Summary of Period 0000 to 2400 Hrs

Stood crews down for weekly agenda safety meeting discussed WPTW and lock out tag out procedures. Prepared rig to spud. Conducted hazard hunt and functioned ESD. Spudded and drilled 12 1/4" hole to sectional T/D. Run and cemented 9 5/8" casing. Nipped up and pressure tested BOP.

Well Related Issues To Be Addressed

Resource Related Issues To Be Addressed

Next Well Info.

Next Location : RM03-60-1 Resource Move Distance : 1.0km Resource Move Contractor : Ensign

Operations For Period 0000 Hrs to 2400 Hrs on 2013-05-10

Phse	Cls	Op	From	To	Hrs	Depth (m)	Activity Description
PS	P	SM	00:00	01:00	1.00		Conducted weekly agenda safety stand down meeting with both crews.
PS	P	RM	01:00	02:00	1.00		Continued preparing rig to spud.
PS	P	RI	02:00	02:30	0.50	10.5	Functioned ESD HPU 4 seconds. Total shut down 8 seconds. Picked up and made up 12-1/4" BHA assembly TIH tagged at 10.5m MD.
PS	P	RI	02:30	03:00	0.50	10.5	Conducted hazard hunt, 5 items found and closed out. Completed form DMS F120. Strapped 9-5/8" casing.
PS	P	SM	03:00	03:30	0.50	10.5	Held pre-spud meeting with all crew members for RM03-41-1. All relevant paper work DMS F199 pre-spud completed and signed off.
SH	P	DA	03:30	05:45	2.25	53.0	Spudded RM03-41-1. At 03:30 hours. Drilled 12-1/4" hole from 10.5m to 53m MD. Drilling Parameters: WOB: 2 to 5 kLbs, Rotary: 30 to 40 rpm, Torque: 1.8 to 3.5 kFtLbs, Flow: 100 to 200 gpm, Pressure: 75 to 100 psi.
SH	TP	CIR	05:45	07:00	1.25	53.0	Conditioned drill mud and circulated out mud rings.
SH	P	DA	07:00	09:00	2.00	97.0	Continued to drill 12-1/4" hole from 53m to 97m, Circulated bottns up at 77m, 90m and 97m. Drilling Parameters: WOB: 2 to 5 kLbs, Rotary: 100-150 rpm, Torque: 1.8 to 5 kFtLbs, Flow: 150-250 gpm, Pressure: 75 to 250 psi.
SH	P	CIR	09:00	09:15	0.25	97.0	Pumped 10 bbl Hi-Vis sweep and circulated hole clean at 200-250gpm.

Operations For Period 0000 Hrs to 2400 Hrs on 2013-05-10

Phse	Cls	Op	From	To	Hrs	Depth (m)	Activity Description
SC	P	T	09:15	09:45	0.50	97.0	TOOH from 97m. Dropped survey barrel at 95m.
SC	P	HBHA	09:45	10:00	0.25	97.0	Broke out and laid out 12-1/4" String Stab and bit. Retrieved Surey barrel. Survey at 95m = 0.5°, Azimuth 241°.
SC	P	RUC	10:00	10:30	0.50	97.0	Removed conductor riser and rigged up to run 9-5/8" casing.
SC	P	SM	10:30	10:45	0.25	97.0	Held PJSM prior to running 9-5/8" casing.
SC	P	SM	10:45	11:00	0.25	97.0	Picked up and made up 9-5/8" casing shoe track and float collar and pumped though same.
SC	P	RC	11:00	11:45	0.75	97.0	Continued to TIH with 9-5/8" casing to 91m, wash down to 97m. No fill..
SC	P	RC	11:45	12:15	0.50	97.0	Picked up and made up landing joint with STS A-section and ran in hole, GE installed 2 x 2" valves to A-Section. Landed out at 300mm below ground level.
SC	P	CIR	12:15	14:30	2.25	97.0	Circulated 2 x bottoms up. Halliburton on location at 12:15hrs. Note:- continued to circulated at 3bbl/min while Halliburton spotted cement unit and cement bulker and rigged up surface lines.
SC	P	SM	14:30	14:45	0.25	97.0	Held PJSM; prior to 9-5/8" cement job.
SC	P	CMT	14:45	15:45	1.00	97.0	Cement 9-5/8" casing as pre program. Loaded top plug. Pumped 10bbl fresh water spacer and pressure tested Halliburton surface lines to 3000psi for 5min, Pumped remaining 10bbl fresh water spacer. Mixed and pumped 28bbbls of 15.6ppg EconoCem cement slurry at 4 BPM. Dropped top plug, displaced cement slurry with fresh water at 4 BPM, slowed down to 2 BPM at 18bbbls and bumped plug after 21.6bbbls at 190psi. Pressured up to 2000psi and tested casing for 15min. Bled back with 0.5bbbls returned, floats held. Observed full returns throughout cementing operations, approximately 4 bbls of cement slurry to surface.
SC	P	RUC	15:45	16:00	0.25	97.0	Rigged down Halliburton, Flushed all surface lines and cellar pumps.
SC	P	WH	16:00	16:15	0.25	97.0	Removed anti rotation screws, backed out and laid down landing joint.
SC	P	WH	16:15	17:00	0.75	97.0	Installed BOP adapter and filled void between STS casing housing O rings and GE pressure tested to 3,000 psi for 30 min - good test. Torque drive screws as per GE procedure.
SC	P	NUB	17:00	19:30	2.50	97.0	Completed nipple up on BOP. Installed bell nipple koomey lines. Pressured up koomey function tested BOP
SC	P	BOP	19:30	24:00	4.50	97.0	Pressure tested BOP's. 250psi low 5 minutes / 2500psi high 10 minutes: Test #1 - Blind rams, choke valves #5, #9, #10. Test #2 - Pipe rams, 4" Mud pump valve, 2" Kill line valve, choke valves #3, #4, #7. Test #3 - Pipe rams, 4" stand pipe valve, inner kill, choke valve s#1, #2, #6, #8. Test #4 - Pipe rams, kelly cock, outer HCR, inner kill. Test #5 - Pipe rams, FOSV, inner HCR, inner kill. Test #6 - Annular - 250psi low 5 minutes / 1000psi high 10 minutes.

Operations for Period 0000 Hrs to 0600 Hrs On 2013-05-11

Phse	Cls	Op	From	To	Hrs	Depth (m)	Activity Description
SC	TP	RR	00:00	01:00	1.00	97.0	Trouble shot problems with test unit.
SC	P	BOP	01:00	02:45	1.75	97.0	Pressure tested BOP's. Test #7 - IBOP - 250psi low 5 minutes / 2500psi high 10 minutes
SC	P	BOP	02:45	03:00	0.25	97.0	Conducted koomey draw down test completed Accumulator function test (DMS F131) and Well Control Readiness checklist (DMS F230).
SC	P	HBHA	03:00	04:00	1.00	97.0	Made up 8 3/4" BHA assembly.
SC	P	WH	04:00	04:15	0.25	97.0	Installed wear bushing.
SC	P	T	04:15	04:30	0.25	97.0	RIH with 8 3/4" assembly to 81m. Washed down and tagged cement at 82m MD.

Operations for Period 0000 Hrs to 0600 Hrs On 2013-05-11

Phse	Cls	Op	From	To	Hrs	Depth (m)	Activity Description
SC	P	ED	04:30	04:45	0.25	97.0	Conducted dynamic choke drill - pressured up 9-5/8" casing to 300 psi, held pressure below 450 psi while bringing mud pump up to slow circulating rate.
SC	P	DFS	04:45	05:30	0.75	97.0	Drilled float collar and shoe track to 94m MD.
SC	P	LOT	05:30	06:00	0.50	97.0	Rigged up and conducted dummy LOT inside casing.

WBM Data		Cost Today :			Cum. Cost AUD 2,789.76	
Mud Desc.: Spud mud	Viscosity: 35 sec/qt	API FL Loss:	CI:	Low Range Rheology	RPM	Reading
Depth: 97.0 m	PV:	Filter Cake:	KCI/			
Time: 24:00	YP:	HTHP-FL:	K2SO4			
Weight: 9.20 ppg	Gels 10s/	HTHP-Cake:	Hard/Ca:			
Temp:	10m/		MBT:			
			PM:			
			PF:			
			Solids:			
			H2O:			
			Oil:			
			Sand:			
			pH:			
			PHPA:			
			Mf:			

Comment:

Bit # 1				Wear	I	O1	D	L	B	G	O2	R
				1	1	1	WT	C	X	I	NO	TD
Size: 12 1/4"	IADC#: S222	Nozzles		Drilled over last 24 hrs				Calculated over Bit Run				
Mfr : NOV	WOB (avg) : 5.00klb	No.	Size	Progress :	97.0m	Cum. Progress :		97.0m				
Type: PDC	RPM (avg) : 125	5	14/32nd"	On Bottom	4.25h	Cum. On Btm Time :		4.25h				
Serial #: E173557	F.Rate : 235gpm			Time :		Cum. IADC Time :		0.00h				
Depth In : 10.5m	SPP : 125psi			IADC Time :		Cum. Total Revs :		0Krevs				
Depth Out : 97.0m	HSI :			Total Revs :		Overall ROP (avg) :		22.82m/h				
Bit Model: S519	TFA: 0.752			ROP (avg) :	22.82m/h							

BHA # 1			
Wt. Below Jars Dry:	Length: 116.0m	Torque (max):	DC (1) Ann Vel.: 53ft/min
Weight Dry:	String Weight:	Torque On Btm:	DC (2) Ann Vel.: 0ft/min
Type: Vertical assembly.	Pick-up Weight :	Torque Off Btm:	HWDP Ann. Vel.: 43ft/min
	Slack-off Weight:		DP Ann. Vel.: 43ft/min

#	Equipment	Tool Description	Length (m)	O.D. (in)	I.D. (in)	Serial #	Hours
1	Bit	PDC bit.	0.30	12.25		E173357	
2	Bit Sub	Bit sub, C/W float.	1.19	6.50	3.50	MSO-11676	
3	X/Over	X/Over	0.80	9.56	3.50	CSG312	
4	NMDC	NMDC	9.17	6.75	3.25	10987782	
5	X/Over	X/Over	0.59	6.25	2.44	15	
6	String Stabiliser	String Stabiliser	1.56	6.88	2.25	XM828	
7	Drill Collar	Drill Collar	9.31	6.19	2.94	50.4	
8	Drill Collar	Drill Collar	9.30	6.19	2.94	GP5979-23	
9	Drill Collar	Drill Collar	9.43	6.19	2.94	E50P4	
10	Drill Collar	Drill Collar	9.36	6.19	2.94	E50P2	
11	Drill Collar	Drill Collar	9.37	6.25	2.44	E50P1	
12	Drill Collar	Drill Collar	9.24	6.25	2.94	50.5	
13	Drill Collar	Drill Collar	8.77	6.25	2.94	50.1	
14	X/Over	X/Over	0.52	6.25	2.44	33257	
15	HWDP	HWDP	9.24	5.19	2.63	EDIC2269	
16	HWDP	HWDP	9.36	5.19	2.63	EDIC2310	
17	HWDP	HWDP	9.14	5.19	2.63	EDIC2318	
18	HWDP	HWDP	9.36	5.19	2.68	EDIC1551	

Survey

MD (m)	Incl. (°)	Corr. Az (°)	TVD (m)	'V' Sect (m)	Dogleg (deg/30m)	N/S (m)	E/W (m)	Departure (m)	Deviation (°)	Tool Type
97.00	0.50	241.00	97.0							MSS

Bulk Stocks

Name	Unit	In	Used	Adjust	Balance
Rig Fuel	1 L	0	2,000	0	14,500
Rig Mini Camp Fuel	1 L	0	100	0	900
Camp Fuel	1 L	0	200	0	2,700
Rig Potable Water	ltr	0	700	0	2,500
Camp Potable Water	ltr	0	6,000	0	18,000
Drill Water	ltr	0	40,000	0	30,000

Mud Stocks

Name	Unit	In	Used	Adjust	Balance
Ancor-1	25 ltr	0	0	0	0
Barites	25 kg	0	0	0	80
Calcium Chloride	25 kg	0	0	0	0
Caustic Soda (pearl)	25 kg	0	0	0	42
Citric Acid	25 kg	5	1	0	5
Defoam-E	25 kg	0	0	0	0
Fracseal Fine	11.4 kg	0	0	0	0
Fracseal Medium	11.4 kg	0	0	0	0
Idcide-20	20 kg	0	0	0	2
JK-161 LV	25 kg	0	2	0	3
Lime	20 kg	0	0	0	0
Nutplug	25 kg	0	0	0	0
Potassium Sulphate (fine)	25 kg	0	56	0	234
Quickseal - Course	18.14 kg	0	0	0	0
Quickseal - Fine	18.14 kg	0	0	0	0
Quickseal - Medium	18.14 kg	0	0	0	0
Rheoben NT	25 kg	0	0	0	0
Rheolube	25 kg	0	0	0	0
Rheopac LV	25 kg	10	3	0	9
Rheopac RD	25 kg	0	0	0	0
Rheoplug	8 kg	0	0	0	0

Name	Unit	In	Used	Adjust	Balance
Rheoplug Ultra	8 kg	0	0	0	0
SAPP	25 kg	0	0	0	0
Soda Ash	25 kg	0	0	0	4
Sodium Sulphite	25 kg	0	0	0	0
Xanthan Gum (P)	25 kg	0	0	0	28
Sodium Bicarbonate	25 kg	0	0	0	0
Rheo-X-Sweep	5.45 kg	0	0	0	0
Drispac SL	25 kg	0	0	0	0
KCl	25 kg	0	0	0	32

* stocks that were replaced.

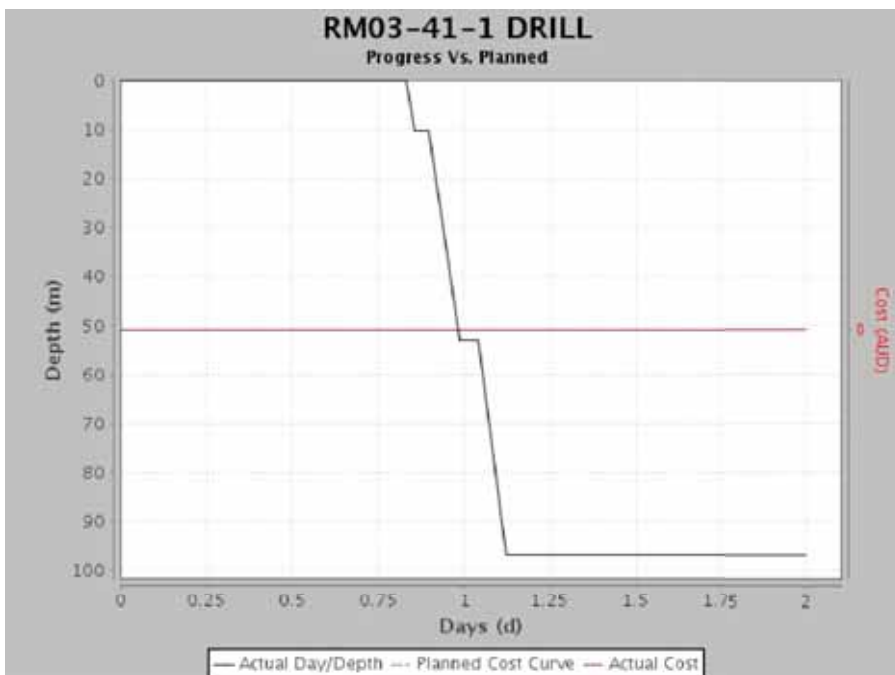
Pumps										
Pump data - Last 24 Hrs							Slow Pump Data			
No	Type	Liner (in)	SPM	Eff. (%)	Flow (gpm)	SPP (psi)	SPM	SPP	Depth (m)	MW (ppg)
1	Tri-Service Manufacturing / TSM 750	6.50	94	97	0	130			97.0	9.20

EHS Summary					
Events	Date of Last	Days Since	Description	Remarks	
Lost Time Incident	2011-09-11	607 Days	Lost Time Incident	Foreign Object in eye.	
Pre-Tour Meeting	2013-05-10	0 Days	Days Pre-tour	Discussed the following: Heat stress awareness and management. Upcoming days operations: 1. Correct PPE to be used at all times. 2. Manual handling. 3. Housekeeping. 4. Tripping operations. 5. Running casing	
Pre-Tour Meeting	2013-05-10	0 Days	Night Pre-tour	Discussed the following: Heat stress awareness and management. Upcoming days operations: 1. Correct PPE to be used at all times. 2. Manual handling. 3. Housekeeping. 4. Vehicle movement 5. Handling tubulars. 6. Cementing casing. 7. Pressure testing	
SOP Reviewed	2013-05-10	0 Days	SOP	W015.50 Working on mud pumps. R003.50 Rig move. M019.50 Cleaning mud tanks.	
Wellsite Permit to Work	2013-05-10	0 Days	PTW	PTW: #120311, #120312, #120313, #120314, Confined Space Entry Supplement: #73469. Cold Work: 1 - 3 Hot Work: 1 - 1 Pressure Systems: 2 - 6 Confined Space: 1 - 5 Cancelled: 0 - 0 Working @ Height: 1 - 3 Electrical Work: 0 - 0 Radioactive: 0 - 0	

Personnel On Board						
Primary Contractor	Sub-Contractor	Name	Job Title	Manhour	Comment	Pax
Santos		Ernie Bennett	OCR	Yes		1

Personnel On Board						
Primary Contractor	Sub-Contractor	Name	Job Title	Manhour	Comment	Pax
Santos		Mark Cartwright	Night OCR	Yes		1
Ensign		Oref Kratchmer	Rig Manager	Yes		1
Ensign		Paul Stylianou	Night Pusher	Yes		1
Ensign		Paul Watson/Rolli	Driller	Yes		2
Ensign		Coventry				
Ensign		Allan Steger/Steve Knight	Assistant Driller	Yes		2
Ensign		Adam Flint/Simon Feldahn	Derrick Hand	Yes		2
Ensign		Tony Copeland/Glen Mostyn	Floor Hand	Yes		2
Ensign		Todd Redenbach/Brendan Zappa	Lease Hand	Yes		2
Ensign		Luke Rudge	Operator	Yes		1
Ensign		Nate Sinclair	Rig Mechanic	Yes		1
Ensign		Darren Fisher/Vince Belz	EHS Advisor	Yes		2
Oil Industry Catering Services		Tracy Lindsley/Jeanine Briese	Campy	Yes		2
Oil Industry Catering Services		Jon Whitley/Guenter Deimel	Camp Cook	Yes		2
Trican		Rhys Gilbut/Chris Nicholas	Truck Driver	Yes		2
Santos		Sam Fraser	Geologist	Yes		1
Ensign		Kyle Livingstone/Travis Richardson	Lease Hand	Yes		2
Tom Darlington Transport		Garry Furguson	Truck Driver	Yes		1
Ensign		Peter Sutton	Welder	Yes		1
Resource Capacity, Max = 42.0				69.05%	Total Pax:	29

No Lessons Learned For Today



2013-05-11

From : Ernie Bennett/Mark Cartwright
To : Amit Sharma

Well Data				QC Not Done
Drill Co. :	Ensign	Midnight Depth(MD):	489.7m	Current Hole Size: 8.750in
Resource:	Ensign 50	Midnight Depth(TVD):	489.7m	Casing OD: 9.625in
Prognosed TD :	501.24m	Progress:	392.7m	Shoe TVD: 95.9m
RT-GL:	4.30m	Days From Spud:	1.85	F.I.T / L.O.T: / 34.27ppg
GL Elev. :	373.80m	Days On Well:	2.75	Resource Move Distance: 1.0 km
Current Op's @0600 2013-05-12		Rigging down logging equipment run #1.		
Planned Operations for 2013-05-12		TOH. Rig up to and log well as per program. Rig up to and TIH with 7" casing cement same.		
		Nipple down BOP release rig.		

Summary of Period 0000 to 2400 Hrs

Pressure tested BOP. Conducted koomey draw down test. TIH with 8 3/4" assembly, conducted choke drill. Drilled out float collar. Rigged up and conducted dummy LOT. Drilled out shoe and 3m new formation. Conducted LOT as per program to an EMW of 34.3ppg / 410 psi surface pressure. Drilled 8 3/4 " hole to TD. Conducted wiper trip. Displaced well to water TOOH.

Well Related Issues To Be Addressed

Resource Related Issues To Be Addressed

Next Well Info.

Next Location : RM03-60-1 Resource Move Distance : 1.0km Resource Move Contractor : Ensign

Operations For Period 0000 Hrs to 2400 Hrs on 2013-05-11

Phse	Cls	Op	From	To	Hrs	Depth (m)	Activity Description
SC	TP	RR	00:00	01:00	1.00	97.0	Trouble shot problems with test unit.
SC	P	BOP	01:00	02:45	1.75	97.0	Pressure tested BOP's. Test #7 - IBOP - 250psi low 5 minutes / 2500psi high 10 minutes
SC	P	BOP	02:45	03:00	0.25	97.0	Conducted koomey draw down test completed Accumulator function test (DMS F131) and Well Control Readiness checklist (DMS F230).
SC	P	HBHA	03:00	04:00	1.00	97.0	Made up 8 3/4" BHA assembly.
SC	P	WH	04:00	04:15	0.25	97.0	Installed wear bushing.
SC	P	T	04:15	04:30	0.25	97.0	RIH with 8 3/4" assembly to 81m. Washed down and tagged cement at 82m MD.
SC	P	ED	04:30	04:45	0.25	97.0	Conducted dynamic choke drill - pressured up 9-5/8" casing to 300 psi, held pressure below 450 psi while bringing mud pump up to slow circulating rate.
SC	P	DFS	04:45	05:30	0.75	97.0	Drilled float collar and shoe track to 94m MD.
SC	P	LOT	05:30	06:15	0.75	97.0	Rigged up and conducted dummy LOT inside casing.
SC	P	DFS	06:15	06:30	0.25	97.0	Continued to drill out shoe, rat hole to 97m and displaced hole with 9.2ppg drill mud.
PH	P	DA	06:30	06:40	0.17	100.0	Drill 3m new from 97m to 100m.
PH	P	CIR	06:40	07:00	0.33	100.0	Continued to circulate hole till even 9.2ppg drill mmud in and out.
PH	P	LOT	07:00	07:15	0.25	100.0	Rigged up to conduct LOT.
PH	P	LOT	07:15	07:30	0.25	100.0	Conducted FIT as per program with 9.2ppg mud at 100m MDRT. To an EMW of 34.3ppg / 410 psi surface pressure. 5.1 gallons pumped. 4 gallons returned.

Operations For Period 0000 Hrs to 2400 Hrs on 2013-05-11

Phse	Cls	Op	From	To	Hrs	Depth (m)	Activity Description
PH	P	DA	07:30	17:15	9.75	482.0	Drilled 8-3/4" hole from 100m to 482m TVD. Average ROP: 40m/hr Drilling Parameters: WOB - 3 to 10 kLbs Rotary - 60-150RPM Torque - 3.1 to 4.2 Kft/lbs Flow - 400-450 GPM PSi - 400 - 1054. Pressure - 890 to 1000 psi
PH	P	DA	17:15	17:30	0.25	489.7	Control Drilled 8-3/4" hole from 482m to 489.70m MD at 45m/hr for on site geologist to pick TD. Drilling Parameters: WOB - 5 kLbs Rotary - 60 to 150RPM Torque - 3.1 to 4.2 Kft/lbs Flow - 400 to 450 GPM
PH	P	CIR	17:30	18:00	0.50	489.7	Circulated bottoms up 489.70m and reciprocated drill string at 455gpm with 1065psi, with 150 rpm. T/D confirmed by WSG. Pumped 10bbl Hi-Vis sweep and circulated hole clean at 450gpm with 150rpm.
PH	P	FC	18:00	18:15	0.25	489.7	Flow checked well static.
PH	P	T	18:15	19:30	1.25	489.7	TOOH from 489.70m to 95m.
PH	P	CIR	19:30	19:45	0.25	489.7	Circulated hole clean.
PH	P	FC	19:45	20:00	0.25	489.7	Flow checked well static.
PH	P	T	20:00	21:15	1.25	489.7	TIH from 95m to 489.70m MD.
PH	P	CIR	21:15	22:45	1.50	489.7	Pumped 20bbl hi-vis sweep. Circulated and cleaned hole.
PH	P	CIR	22:45	23:15	0.50	489.7	Displaced hole to water.
PH	P	FC	23:15	23:30	0.25	489.7	Flow checked well static.
PH	P	T	23:30	24:00	0.50	489.7	TOOH from 489.70m to 180m MD.

Operations for Period 0000 Hrs to 0600 Hrs On 2013-05-12

Phse	Cls	Op	From	To	Hrs	Depth (m)	Activity Description
PH	P	T	00:00	00:30	0.50	489.7	Trip out of hole from 180m to 96m MD. Retrieved wear bushing.
PH	P	HBHA	00:30	01:30	1.00	489.7	POOH from to 96m laid down 8 3/4" BHA.
EP	P	SM	01:30	01:45	0.25	489.7	Conducted PJSM with weatherford and rig crew on making up logging tools.
EP	P	LOG	01:45	02:00	0.25	489.7	Rigged up to run wireline logs.
EP	P	LOG	02:00	03:15	1.25	489.7	Picked up and made up logging tools (MCG/MBN/MPD/MSS/MDL/MMR). TIH obstructions at 482.30m. Unable to log from 482.3 to 489.70m. Note:- Trouble discovered with micro resistivity calliper. Failed to open at bottom at 03:15hrs. Could not log last coal with density tool. Decision made to log out of hole with remaining tools and wait on confirmation on log data.
EP	P	LOG	03:15	06:00	2.75	489.7	Weatherford logged from 482.3m to surface with (MCG/MBN/MPD/MSS/MDL/MMR)

WBM Data		Cost Today :			Cum. Cost AUD 3,407.52	
Mud Desc.: Spud mud	Viscosity: 35 sec/qt	API FL Loss:	CI:	Low Range Rheology	RPM	Reading
Depth: 97.0 m	PV:	Filter Cake:	KCl/			
Time: 24:00	YP:	HTHP-FL:	K2SO4			
Weight: 9.20 ppg	Gels 10s/ 10m/	HTHP-Cake:	Hard/Ca:			
Temp:			MBT:			
			PM:			
			PF:			
			Solids:			
			H2O:			
			Oil:			
			Sand:			
			pH:			
			PHPA:			
			Mf:			

Comment:

Bit # 2		Wear	I	O1	D	L	B	G	O2	R
			1	1	CT	N	X	I	CT	TD
Size: 8 3/4"	IADC#:	Nozzles		Drilled over last 24 hrs			Calculated over Bit Run			
Mfr : NOV	WOB (avg) : 12.00klb	No.	Size	Progress :	392.7m	Cum. Progress :	392.7m			
Type: PDC	RPM (avg) : 150	7	14/ 32nd"	On Bottom	10.50h	Cum. On Btm Time :	10.50h			
Serial #: 225734	F.Rate : 450gpm			Time :		Cum. IADC Time :	10.50h			
Depth In : 97.0m	SPP : 950psi			IADC Time :	10.50h	Cum. Total Revs :	0Krevs			
Depth Out : 489.7m	HSI :			Total Revs :		Overall ROP (avg) :	37.40m/h			
Bit Model: S519	TFA: 1.052			ROP (avg) :	37.40m/h					

BHA # 2		Length:	Torque (max):	DC (1) Ann Vel.:
Wt. Below Jars Dry:	124.4m	7,500ft-lbs	321ft/min	
Weight Dry:	40,000.00klb	7,200ft-lbs	0ft/min	
Type: Vertical assembly.	Pick-up Weight : 48,000.00klb	Torque On Btm:	182ft/min	
	Slack-off Weight: 39,000.00klb	Torque Off Btm:	182ft/min	

#	Equipment	Tool Description	Length (m)	O.D. (in)	I.D. (in)	Serial #	Hours
1	Bit	PDC bit.	0.23	8.75		225734	
2	Bit Sub	Bit sub, C/W float.	1.21	6.50	3.50	12530-0-01	
3	Drill Collar	Drill collar	9.43	6.19	2.75	E50.P4	
4	X/Over	X/Over	0.80	6.25	2.44	CSG312	
5	String Stabiliser	String Stabiliser	1.31	6.50	2.75	XM1040	
6	X/Over	X/Over	0.59	6.50	2.75	CSG170	
7	Drill Collar	Drill Collar	8.77	6.19	2.94	50.4	
8	Drill Collar	Drill Collar	9.37	6.19	2.94	GP5979-23	
9	Drill Collar	Drill Collar	8.52	6.19	2.94	E50P4	
10	Drill Collar	Drill Collar	9.30	6.19	2.94	E50P2	
11	Drill Collar	Drill Collar	9.35	6.25	2.44	E50P1	
12	Drill Collar	Drill Collar	9.31	6.25	2.94	50.5	
13	Drill Collar	Drill Collar	9.24	6.19	2.94	50.1	
14	X/Over	X/Over	0.52	6.25	2.44	33257-1	
15	HWDP	HWDP	9.36	5.19	2.63	EDIC2274	
16	HWDP	HWDP	9.24	5.19	2.63	EDIC2269	
17	HWDP	HWDP	9.36	5.19	2.63	EDIC2310	
18	HWDP	HWDP	9.14	5.19	2.63	EDIC2318	
19	HWDP	HWDP	9.36	5.19	2.63	EDIC1551	

Survey										
MD (m)	Incl. (°)	Corr. Az (°)	TVD (m)	'V' Sect (m)	Dogleg (deg/30m)	N/S (m)	E/W (m)	Departure (m)	Deviation (°)	Tool Type
97.00	0.50	241.00	97.0							MSS

Bulk Stocks					
Name	Unit	In	Used	Adjust	Balance
Rig Fuel	1 L	0	2,500	0	12,000
Rig Mini Camp Fuel	1 L	0	100	0	800
Camp Fuel	1 L	0	200	0	2,500
Rig Potable Water	ltr	0	700	0	1,800
Camp Potable Water	ltr	0	6,000	0	12,000
Drill Water	ltr	15,000	0	0	45,000

Mud Stocks					
Name	Unit	In	Used	Adjust	Balance
Ancor-1	25 ltr	0	0	0	0
Barites	25 kg	0	0	0	80
Calcium Chloride	25 kg	0	0	0	0
Caustic Soda (pearl)	25 kg	0	0	0	42
Citric Acid	25 kg	0	1	0	4
Defoam-E	25 kg	0	0	0	0
Fracseal Fine	11.4 kg	0	0	0	0
Fracseal Medium	11.4 kg	0	0	0	0
Idcide-20	20 kg	0	0	0	2
JK-161 LV	25 kg	0	0	0	3
Lime	20 kg	0	0	0	0
Nutplug	25 kg	0	0	0	0
Potassium Sulphate (fine)	25 kg	0	8	0	226
Quickseal - Course	18.14 kg	0	0	0	0
Quickseal - Fine	18.14 kg	0	0	0	0
Quickseal - Medium	18.14 kg	0	0	0	0
Rheoben NT	25 kg	0	0	0	0
Rheolube	25 kg	0	0	0	0
Rheopac LV	25 kg	0	2	0	7
Rheopac RD	25 kg	0	0	0	0
Rheoplug	8 kg	0	0	0	0
Rheoplug Ultra	8 kg	0	0	0	0
SAPP	25 kg	0	0	0	0
Soda Ash	25 kg	0	0	0	4
Sodium Sulphite	25 kg	0	0	0	0
BARAZAN D (Xanthan Gum)	25 kg sx	10	1	0	9
Sodium Bicarbonate	25 kg	0	0	0	0
Rheo-X-Sweep	5.45 kg	0	0	0	0
Drispac SL	25 kg	0	0	0	0
KCl	25 kg	0	0	0	32

* stocks that were replaced.

Pumps										
Pump data - Last 24 Hrs							Slow Pump Data			
No	Type	Liner (in)	SPM	Eff. (%)	Flow (gpm)	SPP (psi)	SPM	SPP (psi)	Depth (m)	MW (ppg)
1	Tri-Service Manufacturing / TSM 750	6.50	140	97	0	1050	70 50	260 155	489.7	9.20

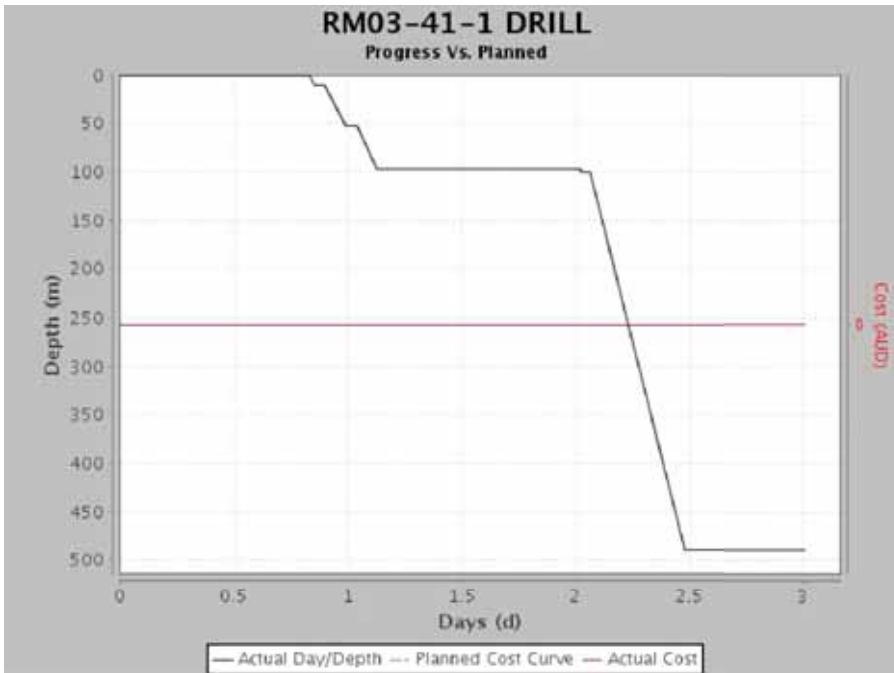
EHS Summary				
Events	Date of Last	Days Since	Description	Remarks
Lost Time Incident	2011-09-11	608 Days	Lost Time Incident	Foreign Object in eye.

EHS Summary				
Events	Date of Last	Days Since	Description	Remarks
Pre-Tour Meeting	2013-05-11	0 Days	Days Pre-tour	Discussed the following: Heat stress awareness and management. Upcoming days operations: 1. Correct PPE to be used at all times. 2. Manual handling. 3. Housekeeping. 4. Drilling operations. 5. Tripping operations.
Pre-Tour Meeting	2013-05-11	0 Days	Night Pre-tour	Discussed the following: Heat stress awareness and management. Upcoming days operations: 1. Correct PPE to be used at all times. 2. Manual handling. 3. Housekeeping. 4. Vehicle movement 5. Handling tubulars. 6. Tripping operations. 7. Wire line logging operations.
SOP Reviewed	2013-05-11	0 Days	SOP	P009.50 Pressure testing. C001.50 Camera use.
Wellsite Permit to Work	2013-05-11	0 Days	PTW	PTW: #120315, #120316, #120317, Confined Space Entry Supplement: Cold Work: 0 - 3 Hot Work: 1 - 2 Pressure Systems: 2 - 8 Confined Space: 0 - 5 Cancelled: 0 - 0 Working @ Height: 0 - 3 Electrical Work: 0 - 0 Radioactive: 0 - 0

Personnel On Board						
Primary Contractor	Sub-Contractor	Name	Job Title	Manhour	Comment	Pax
Santos		Ernie Bennett	OCR	Yes		1
Santos		Mark Cartwright	Night OCR	Yes		1
Ensign		Oref Kratchmer	Rig Manager	Yes		1
Ensign		Paul Stylianou	Night Pusher	Yes		1
Ensign		Paul Watson/Rolli Coventry	Driller	Yes		2
Ensign		Allan Steger/Steve Knight	Assistant Driller	Yes		2
Ensign		Adam Flint/Simon Feldahn	Derrick Hand	Yes		2
Ensign		Tony Copeland/ Glen Mostyn	Floor Hand	Yes		2
Ensign		Todd Redenbach/ Brendan Zappa	Lease Hand	Yes		2
Ensign		Luke Rudge	Operator	Yes		1
Ensign		Nate Sinclair	Rig Mechanic	Yes		1
Ensign		Darren Fisher/ Vince Belz	EHS Advisor	Yes		2
Oil Industry Catering Services		Tracy Lindsley/ Jeanine Briese	Campy	Yes		2
Oil Industry Catering Services		Jon Whitley/ Guenter Deimel	Camp Cook	Yes		2

Personnel On Board						
Primary Contractor	Sub-Contractor	Name	Job Title	Manhour	Comment	Pax
Trican		Rhys Gilbut/Chris Nicholas	Truck Driver	Yes		2
Santos		Sam Fraser	Geologist	Yes		1
Ensign		Kyle Livingstone/ Travis Richardson	Lease Hand	Yes		2
Tom Darlington Transport		Garry Furguson	Truck Driver	Yes		1
Ensign		Peter Sutton	Welder	Yes		1
Resource Capacity, Max = 42.0				69.05%	Total Pax:	29

No Lessons Learned For Today



2013-05-12

From : Ernie Bennett/Mark Cartwright
To : Amit Sharma

Well Data				QC Not Done
Drill Co. :	Ensign	Midnight Depth(MD):	489.7m	Current Hole Size: 8.750in
Resource:	Ensign 50	Midnight Depth(TVD):	489.7m	Casing OD: 7.000in
Prognosed TD :	501.24m	Progress:		Shoe TVD: 480.7m
RT-GL:	4.30m	Days From Spud:	2.60	F.I.T / L.O.T: /
GL Elev. :	373.80m	Days On Well:	3.50	Resource Move Distance: 1.0 km
Current Op's @0600				
Planned Operations for				

Summary of Period 0000 to 2400 Hrs

Picked up and made up logging tools. TIH obstructions at 482.30m. Unable to log from 482.3 to 489.70m. Trouble discovered with micro resistivity calliper. Failed to open at bottom could not log last coal with density tool. Weatherford logged from 482.3m to surface. TIH 7" casing cemented same, 3.5bbbs cement to surface. ACP set at 244.15m and Element bottom at 245.24m. Nippled down BOP's, Cleaned mud tanks. Released rig at 18:00 hours.

Well Related Issues To Be Addressed

Resource Related Issues To Be Addressed

Next Well Info.

Next Location : RM03-60-1 Resource Move Distance : 1.0km Resource Move Contractor : Ensign

Operations For Period 0000 Hrs to 2400 Hrs on 2013-05-12

Phse	Cls	Op	From	To	Hrs	Depth (m)	Activity Description
PH	P	T	00:00	00:30	0.50	489.7	Trip out of hole from 180m to 96m MD. Retrieved wear bushing.
PH	P	HBHA	00:30	01:30	1.00	489.7	POOH from to 96m laid down 8 3/4" BHA.
EP	P	SM	01:30	01:45	0.25	489.7	Conducted PJSM with weatherford and rig crew on making up logging tools.
EP	P	LOG	01:45	02:00	0.25	489.7	Rigged up to run wireline logs.
EP	P	LOG	02:00	03:15	1.25	489.7	Picked up and made up logging tools (MCG/MBN/MPD/MSS/MDL/MMR). TIH obstructions at 482.30m. Unable to log from 482.3 to 489.70m. Note:- Trouble discovered with micro resistivity calliper. Failed to open at bottom at 03:15hrs, Could not log last coal with density tool. Decision made to log out of hole with remaining tools and wait on confirmation on log data.
EP	P	LOG	03:15	06:00	2.75	489.7	Weatherford logged from 482.3m to surface with(MCG/MBN/MPD/MSS/MDL/MMR)
EP	P	LOG	06:00	07:15	1.25	489.7	Weatherford broke out and laid out logging tools. Sent Logging data at 06:30hrs to town Geologist, ECP setting depth conformation received at 07:15hrs. Weatherford rigged down Logging sheaves and E-line.
PC	P	RUC	07:15	07:30	0.25	489.7	Rigged up to Run 7" casing.
PC	P	RC	07:30	08:45	1.25	489.7	Held PJSM, Picked up and made up 7"guide shoe and 7" perforated casing to 229m.
PC	P	RC	08:45	09:15	0.50	489.7	Picked up and made up Weatherford packer as per Weatherford instructions and tested same.(Weatherford replaced shear wires on packer)
PC	P	RC	09:15	10:45	1.50	489.7	Continued to RIH with Solid 7" casing from 239m to 476m.
PC	P	RC	10:45	11:15	0.50	489.7	Picked up and made up 7" landing joint, casing hanger and landing out same at 480.70m.
PC	P	WH	11:15	12:30	1.25	489.7	GE international pressure tested hanger seals to 3000psi for 15 minutes. Good test.

Operations For Period 0000 Hrs to 2400 Hrs on 2013-05-12

Phse	Cls	Op	From	To	Hrs	Depth (m)	Activity Description
PC	P	CIR	12:30	12:50	0.33	489.7	Circulated 2 x casing volumes at 4bbl/min. Held PJSM with Halliburton while circulating.
PC	P	CMT	12:50	13:00	0.17	489.7	Halliburton rigged up surface lines, loaded shutoff plug into casing, loaded closing plug into cement head, rigged up cement head.
PC	P	CMT	13:00	13:45	0.75	489.7	Inflated Weatherford ECP packer as per Weatherford International Procedures. Dropped Shut off plug (Dart), displaced with 63bbls & seat on baffle Landing collar. Shut off plug bumped at 500psi with 1.3 bpm (Plug held). Increased surface pressure to 700psi. Increased surface pressure: In +/- 200 psi increments 700psi to 900psi & held for 1 min 900psi to 1100psi & held for 1 min Increased surface pressure 1196psi -Pressure dropped to 892 psi. Pressure stabilized @ 893psi for 5 minutes Increased pressure to 1400 psi and held for 2 minute to insure Packer is closed. Bleed the surface pressure back to 500 psi & recorded CAP inflation Volume of 0.1 bbls Bleed off pressure to 0 psi (Locked out the safe-loc) Increased pressure to 2075 psi to open stage tool, broke circulation Circulated 10bbls of 8.4ppg Drilling fluid.
PC	P	CMT	13:45	14:45	1.00	489.7	Cemented 7" casing as per program: Pumped 10bbls mud flush III. Mixed and pumped 31.7bbls CBMCem slurry @ 12.0ppg. OCR witnessed dropped Top (closing) plug. Displaced cement with 31.1bbls Drill fluid. Bumped plug with 180psi Pressure tested casing to 2,000psi / 30min Bleed back with 0.5 bbl returns. Note:- cement returns @ 26.5bbls into displacement, 3.5bbls cement to surface. Floats held. Observed full returns throughout entire operations. Cement in place by 14.17hours.
PC	P	RUC	14:45	15:00	0.25	489.7	Rigged down Halliburton.
PC	P	RUC	15:00	15:30	0.50	489.7	Laid out landing joint. Installed 6-1/8" BPV.
PC	P	NUB	15:30	18:00	2.50	489.7	Nippled down BOP's, Cleaned mud tanks. Released rig at 18:00 hours.

WBM Data		Cost Today :			Cum. Cost AUD 3,787.52	
Mud Desc.: Spud mud	Viscosity: 35 sec/qt	API FL Loss:	CI:	Low Range Rheology		
Depth: 489.7 m	PV:	Filter Cake:	KCl/			
Time: 24:00	YP:	HTHP-FL:	K2SO4	RPM	Reading	
Weight: 9.20 ppg	Gels 10s/10m/	HTHP-Cake:	Hard/Ca:			
Temp:			MBT:			
			PM:			
			PF:			
			Solids:			
			H2O:			
			Oil:			
			Sand:			
			pH:			
			PHPA:			
			Mf:			
Comment:						

Bit # 2			Wear	I	O1	D	L	B	G	O2	R	
				1	1	CT	N	X	I	CT	TD	
Size:	8 3/4"	IADC#:	Nozzles		Drilled over last 24 hrs			Calculated over Bit Run				
Mfr :	NOV	WOB (avg) :	No.	Size	Progress :			Cum. Progress :		392.7m		
Type:	PDC	RPM (avg) :	7	14/ 32nd"	On Bottom			Cum. On Btm Time :		10.50h		
Serial #:	225734	F.Rate :			Time :			Cum. IADC Time :		10.50h		
Depth In :	97.0m	SPP :			IADC Time :			Cum. Total Revs :		0Krevs		
Depth Out :	489.7m	HSI :			Total Revs :			Overall ROP (avg) :		37.40m/h		
Bit Model:	S519	TFA:	1.052		ROP (avg) :			0.00m/h				

BHA # 2							
Wt. Below Jars Dry:	Length:	124.4m	Torque (max):	7,500ft-lbs	DC (1) Ann Vel.:	0ft/min	
Weight Dry:	String Weight:	40,000.00klb	Torque On Btm:	7,200ft-lbs	DC (2) Ann Vel.:	0ft/min	
Type:	Vertical assembly.	Pick-up Weight :	48,000.00klb	Torque Off Btm:	5,700ft-lbs	HWDP Ann. Vel.:	0ft/min
		Slack-off Weight:	39,000.00klb			DP Ann. Vel.:	0ft/min

#	Equipment	Tool Description	Length (m)	O.D. (in)	I.D. (in)	Serial #	Hours
1	Bit	PDC bit.	0.23	8.75		225734	
2	Bit Sub	Bit sub, C/W float.	1.21	6.50	3.50	12530-0-01	
3	Drill Collar	Drill collar	9.43	6.19	2.75	E50.P4	
4	X/Over	X/Over	0.80	6.25	2.44	CSG312	
5	String Stabiliser	String Stabiliser	1.31	6.50	2.75	XM1040	
6	X/Over	X/Over	0.59	6.50	2.75	CSG170	
7	Drill Collar	Drill Collar	8.77	6.19	2.94	50.4	
8	Drill Collar	Drill Collar	9.37	6.19	2.94	GP5979-23	
9	Drill Collar	Drill Collar	8.52	6.19	2.94	E50P4	
10	Drill Collar	Drill Collar	9.30	6.19	2.94	E50P2	
11	Drill Collar	Drill Collar	9.35	6.25	2.44	E50P1	
12	Drill Collar	Drill Collar	9.31	6.25	2.94	50.5	
13	Drill Collar	Drill Collar	9.24	6.19	2.94	50.1	
14	X/Over	X/Over	0.52	6.25	2.44	33257-1	
15	HWDP	HWDP	9.36	5.19	2.63	EDIC2274	
16	HWDP	HWDP	9.24	5.19	2.63	EDIC2269	
17	HWDP	HWDP	9.36	5.19	2.63	EDIC2310	
18	HWDP	HWDP	9.14	5.19	2.63	EDIC2318	
19	HWDP	HWDP	9.36	5.19	2.63	EDIC1551	

Survey										
MD (m)	Incl. (°)	Corr. Az (°)	TVD (m)	'V' Sect (m)	Dogleg (deg/30m)	N/S (m)	E/W (m)	Departure (m)	Deviation (°)	Tool Type
97.00	0.50	241.00	97.0							MSS

Bulk Stocks					
Name	Unit	In	Used	Adjust	Balance
Rig Fuel	1 L	0	2,000	0	10,000
Rig Mini Camp Fuel	1 L	0	100	0	700
Camp Fuel	1 L	0	200	0	2,300
Rig Potable Water	ltr	5,000	800	0	6,000
Camp Potable Water	ltr	20,000	6,000	0	26,000
Drill Water	ltr	0	0	0	45,000

Mud Stocks					
Name	Unit	In	Used	Adjust	Balance
Ancor-1	25 ltr	0	0	0	0
Barites	25 kg	0	0	0	80
Calcium Chloride	25 kg	0	0	0	0
Caustic Soda (pearl)	25 kg	0	0	0	42

Name	Unit	In	Used	Adjust	Balance
Citric Acid	25 kg	0	0	0	4
Defoam-E	25 kg	0	0	0	0
Fracseal Fine	11.4 kg	0	0	0	0
Fracseal Medium	11.4 kg	0	0	0	0
Idcide-20	20 kg	0	0	0	2
JK-161 LV	25 kg	0	0	0	3
Lime	20 kg	0	0	0	0
Nutplug	25 kg	0	0	0	0
Potassium Sulphate (fine)	25 kg	0	10	0	216
Quickseal - Course	18.14 kg	0	0	0	0
Quickseal - Fine	18.14 kg	0	0	0	0
Quickseal - Medium	18.14 kg	0	0	0	0
Rheoben NT	25 kg	0	0	0	0
Rheolube	25 kg	0	0	0	0
Rheopac LV	25 kg	0	0	0	7
Rheopac RD	25 kg	0	0	0	0
Rheoplug	8 kg	0	0	0	0
Rheoplug Ultra	8 kg	0	0	0	0
SAPP	25 kg	0	0	0	0
Soda Ash	25 kg	0	0	0	4
Sodium Sulphite	25 kg	0	0	0	0
BARAZAN D (Xanthan Gum)	25 kg sx	0	0	0	9
Sodium Bicarbonate	25 kg	0	0	0	0
Rheo-X-Sweep	5.45 kg	0	0	0	0
Drispac SL	25 kg	0	0	0	0
KCl	25 kg	0	0	0	32

* stocks that were replaced.

Pumps

Pump data - Last 24 Hrs							Slow Pump Data			
No	Type	Liner (in)	SPM	Eff. (%)	Flow (gpm)	SPP (psi)	SPM	SPP (psi)	Depth (m)	MW (ppg)
1	Tri-Service Manufacturing / TSM 750	6.50	140	97	0	1050	70 50	260 155	489.7	9.20

EHS Summary

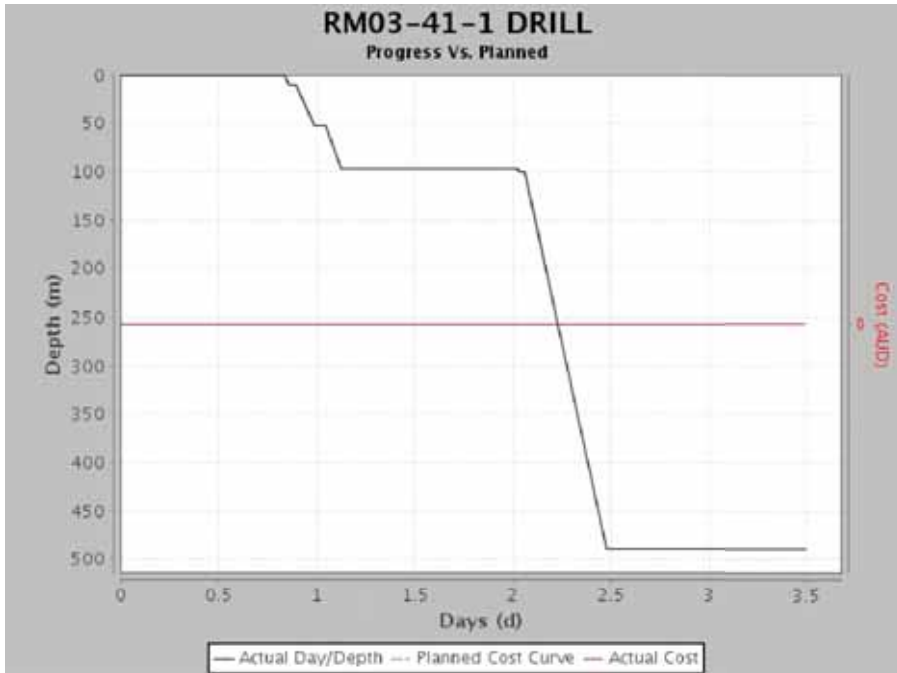
Events	Date of Last	Days Since	Description	Remarks
Lost Time Incident	2011-09-11	609 Days	Lost Time Incident	Foreign Object in eye. Discussed the following upcoming operations. 1. Correct PPE to be used at all times. 2. Manual handling. 3. Housekeeping. 4. Running and cementing casing. 5. Nipple down BOPs. Discussed the following upcoming operations. 1. Correct PPE to be used at all times. 2. Manual handling. 3. Housekeeping. 4. Vehicle movement 5. Handling tubulars. 6. Rig move operations. M019.50 Clean mud tanks. W015.50 Working on mud pumps. N001.50 Nipple down bop. C001.50 Camera use.
Pre-Tour Meeting	2013-05-12	0 Days	Days Pre-tour	
Pre-Tour Meeting	2013-05-12	0 Days	Night Pre-tour	
SOP Reviewed	2013-05-12	0 Days	SOP	

EHS Summary				
Events	Date of Last	Days Since	Description	Remarks
Wellsite Permit to Work	2013-05-12	0 Days	PTW	PTW: #120318, #120319, #120320, #120321, #120322, #120325. Confined Space Entry Supplement: #73470,73471. Cold Work: 2 - 6 Hot Work: 1 - 3 Pressure Systems: 2 - 10 Confined Space: 3 - 8 Cancelled: 0 - 0 Working @ Height: 1 - 4 Electrical Work: 0 - 0 Radioactive: 1 - 1

Personnel On Board						
Primary Contractor	Sub-Contractor	Name	Job Title	Manhour	Comment	Pax
Santos		Ernie Bennett	OCR	Yes		1
Santos		Mark Cartwright	Night OCR	Yes		1
Ensign		Oref Kratchmer	Rig Manager	Yes		1
Ensign		Paul Stylianou	Night Pusher	Yes		1
Ensign		Paul Watson/Rolli	Driller	Yes		2
Ensign		Coventry				
Ensign		Allan Steger/Steve Knight	Assistant Driller	Yes		2
Ensign		Adam Flint/Simon Feldahn	Derrick Hand	Yes		2
Ensign		Tony Copeland/Glen Mostyn	Floor Hand	Yes		2
Ensign		Todd Redenbach/Brendan Zappa	Lease Hand	Yes		2
Ensign		Luke Rudge	Operator	Yes		1
Ensign		Nate Sinclair	Rig Mechanic	Yes		1
Ensign		Vince Belz	EHS Advisor	Yes		1
Oil Industry Catering Services		Tracy Lindsley/Jeanine Briese	Campy	Yes		2
Oil Industry Catering Services		Jon Whitley/Guenter Deimel	Camp Cook	Yes		2
Trican		Rhys Gilbut/Chris Nicholas	Truck Driver	Yes		2
Santos		Sam Fraser	Geologist	Yes		1
Ensign		Kyle Livingstone/Travis Richardson	Lease Hand	Yes		2
Tom Darlington Transport		Garry Furguson	Truck Driver	Yes		1
Ensign		Dave Crosby/Matt Godwin/David Siddal	Rig Electrician	Yes		3
Weatherford		Jim Schaefer	Service Hand	Yes		1
Resource Capacity, Max = 42.0				73.81%	Total Pax:	31

No Lessons Learned For Today

Challenge with integrity.



Appendix 3

Cement Reports

Wellname: RM03-41-1 DRILL	Operator: Santos	Resource: Ensign 950
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Casing & Cementing Summary

Casing Type: Surface Casing	Originated By: Ernie Bennett	Checked By:	Date: 10 May 2013					
Hole Size: 12 1/4"			Contractor: Halliburton					
Total Depth 97.00m MD:	Total Depth 97.00m TVD:							
PRE-FLUSH @ Additives:		SPACER 20.0bbl @ 8.40ppg Additives: Water						
Water Source Dam Water								
CEMENT		ADDITIVES	% Amount Units					
DISPLACEMENT		Fluid:	Water @ 8.40ppg					
Theoretical Displ.:	21.6bbl	Bumped Plug with:	190psi					
Actual Displ.:	21.6bbl @ 4.0bbl/min	Pressure Tested To:	2,000psi					
Displaced via:	Cement unit	Bleed Back:	0.5bbl					
ACTIVITY	Time/Date	Returns to Surface: 17.0bbl mud, 3.0bbl cmt						
Start Running csg.	10:45 10/5/07	Casing Preflush : No Action Taken	Cement : No Action Displacement : No Action Taken					
Casing On Bottom	12:00 10/5/07	Action	Taken					
Start Circulation	12:00 10/5/07	During						
Start Pressure Test	14:45 10/5/07	Top Up Job No	of class					
Pump Preflush	14:50 10/5/07	run:						
Start Mixing	14:50 10/5/07	Plug Set: Manufacturer: Halliburton Type:						
Finish Mixing	15:10 10/5/07	Centralizer 9-5/8" x 12-1/4" Bow Spring	Centralizer Placement Depth: 1 every 2nd joint					
Start Displacing	15:15 10/5/07	Type:						
Stop Displ./Bump	15:25 10/5/07	Wiper Plug Yes						
Pressure Test	15:40 10/5/07	Top:						
		Wiper Plug No						
		Bottom:						
CASING AND EQUIPMENT DETAILS								
Stick Up								
No. Joints	OD	Wt	Grade	Comment	Thread	Length	From	To
1				Landing joint		6.0m	-1.9m	4.1m
1				STS well head		0.7m	4.1m	4.8m
8	9.625in	36.0lbs/ft	K55	Casing	BTC	80.0m	4.8m	84.8m
1				Float collar		0.3m	84.8m	85.1m
1	9.625in	36.0lbs/ft	K55	Casing	BTC	11.3m	85.1m	96.4m
1				Float shoe		0.4m	96.4m	96.8m
Theoretical Bouyed wt. of casing:					Bradenhead Height above GL:			
Casing wt. prior to landing csg:					Bradenhead Description / Length: /			
Actual wt. of casing (last joint run-block wt):					Tubing Spool Size:			
Landing wt. (after cementing and pressure bleed off):					Setting Slips:			
Cementing Job Remarks:								
<p>oaded top plug. Pumped 10bbl fresh water spacer and pressure tested Halliburton surface lines to 3000psi for 5min. Pumped remaining 10bbl fresh water spacer. Mixed and pumped 28bbbls of 15.6ppg EconoCem cement slurry at 4 BPM. Dropped top plug, displaced cement slurry with fresh water at 4 BPM, slowed down to 2 BPM at 18bbbls and bumped plug after 21.6bbbls at 190psi. Pressured up to 2000psi and tested casing for 15min. Bled back with 0.5bbbls returned, floats held. Observed full returns throughout cementing operations, approximately 4 bbls of cement slurry to surface.</p>								

Santos

POST JOB REPORTS
CEMENTING/PUMPING

Well Name : RM03-41-1

Rig: Ensign 50

CEMENT SURFACE CASING 7521

Prepared for Ernie Bennet

10/05/2013

Prepared by Anandam Sami

HALLIBURTON

The Future is Working Together.

Notice: Although the information contained in this report is based on sound engineering practices, the copyright owner(s) does (do) not accept any responsibility whatsoever, in negligence or otherwise, for any loss or damage arising from the use of the information given in this report

CUSTOMER	SALES ORDER No.	DATE
Santos	900416678	10 May 2013

CEMENT/PUMPING JOB SUMMARY

WELL	LOCATION/FIELD NAME	COUNTRY	HES REP	CUSTOMER REP	WELL TYPE
RM03-41-1	RM03-41-1	Australia	Anandam Sami	Ernie Bennet	Coal Bed Methane
JOB TYPE	BOD NUMBER	JOB PURPOSE CODE		BDA	RIG
Surface Casing	0	CEMENT SURFACE CASING 7521		Brisbane	Ensign 50

KEY PERFORMANCE INDICATORS

TYPE OF JOB (Cementing or Non-Cementing): <i>Select the job type (Cementing or Non-Cementing)</i>	<input type="text" value="Cementing"/>	WAS THIS A PRIMARY CEMENT JOB (YES / NO) <i>Primary cement job = Casing job, Liner Job, tie back</i>	<input type="text" value="YES"/>
TOTAL OPERATING TIME (hrs) <i>Rig up/ Pumping/ Rig Down</i>	<input type="text" value="5.0 hrs"/>	DID WE RUN WIPER PLUGS?	<input type="text" value="Top Plug"/>
HSE INCIDENT, ACCIDENT, INJURY: <i>This should be recordable incidents only</i>	<input type="text" value="NO"/>	WAS THIS A PLUG OR SQUEEZE JOB?	<input type="text" value="Neither"/>
WAS THE JOB DELIVERED CORRECTLY AS PERJOB DESIGN <i>This will be dictated by the customer</i>	<input type="text" value="YES"/>	WAS THIS A PRIMARY OR REMEDIAL JOB? <i>Remedial = Repeated attempts or corrections of initial cement job</i>	<input type="text" value="Primary"/>
TOTAL TIME PUMPING (hrs) <i>Total number of hours pumping fluid on this job</i>	<input type="text" value="1.0 hrs"/>	MIXING DENSITY OF JOB STAYED IN DESIGNED RANGE <i>Density defined as +/- 0.2ppg. Calculation: Total bbls cement mixed at designed density divided by total bbls of cement multiplied by 100</i>	<input type="text" value="98%"/>
NON -PRODUCTIVE RIG TIME: <i>As a result of Halliburton cementing PSL</i>	<input type="text" value="none"/>	WAS AUTOMATED DENSITY CONTROL USED	<input type="text" value="YES"/>
NUMBER OF JSA'S PERFORMED:	<input type="text" value="3"/>	JOB WAS PUMPED AT DESIGNED PUMP RATE <i>Pump rate ranged defined as +/- bpm. Calculation : total bbls of fluid pumped at the designed rate divided by total bbls of fluid pumped multiplied by 100</i>	<input type="text" value="0%"/>
NUMBER OF UNPLANNED SHUTDOWNS (After starting to pump)	<input type="text" value="none"/>	NUMBER OF REMEDIAL SQUEEZE JOBS REQUIRED - HES <i>Number of remedial squeeze jobs required after primary job performed by HES</i>	<input type="text" value="none"/>
TYPE OF RIG(CLASSIFICATION) JOB WAS PERFORMED ON:	<input type="text" value="LAND"/>	NUMBER OF REMEDIAL AQUEEZE JOBS REQUIRED - COMPETITION <i>Number of remedial squeeze jobs required after primary job performed by competition</i>	<input type="text" value="none"/>
REASON FOR UNPLANNED SHUTDOWNS (After starting to pump) <i>Add details in job logs</i>		NUMBER OF REMEDIAL PLUG JOBS REQUIRED - HES <i>Number of remedial plug jobs required after primary plug pumped by HES</i>	<input type="text" value="none"/>
REASON FOR NON-PRODUCTIVE RIG TIME (Cementing PSL responsibility): <i>Add details in job logs</i>		DID CEMENT RETURN TO SURFACE?	
DENSITY RECORDED WITH PRESSURISED MUD BALANCE?	<input type="text" value="YES"/> <input type="text" value="15.6"/> ppg	<input type="text" value="YES"/> <input type="text" value="24"/> bbls into displacement	<input type="text" value="4"/> bbls returned to surface

CUSTOMER SATISFACTION SURVEY

Dear Customer,

We hope that you were satisfied with the service delivery of this job performed by Halliburton. It is the aim of our management and service personnel to deliver equipment and service of a standard unmatched in the service sector of the energy industry.

Please take the time to let us know if our performance met with your satisfaction. Please be as critical as possible to ensure we constantly improve our service. Your comments are of great value to us and are intended for the exclusive use of Halliburton.

CATEGORY	CUSTOMER SATISFACTION RATING (Please circle yes or no)
Survey Conducted Date	The date the survey was conducted
Survey Interviewer	The survey interviewer is the person who initiated the survey.
Customer Participation	Did the customer participate in this survey? (Y/N)
Customer Representative	Enter the Customer representative name
HSE	Was our HSE performance satisfactory? Circle Y or N
Equipment	Were you satisfied with our Equipment? Circle Y or N
Personnel	Were you satisfied with our people? Circle Y or N
Customer Comment	

Customer and Halliburton Representative agree on the data input into the cementing report

CUSTOMER SIGNATURE

HALLIBURTON SIGNATURE

CUSTOMER	SALES ORDER No.	DATE
Santos	900416678	10 May 2013

CEMENT/PUMPING JOB SUMMARY

WELL	LOCATION/FIELD NAME	COUNTRY	HES REP	CUSTOMER REP	WELL TYPE
RM03-41-1	RM03-41-1	Australia	Anandam Sami	Ernie Bennet	Coal Bed Methane
JOB TYPE	BOD NUMBER	JOB PURPOSE CODE		BDA	RIG
Surface Casing	0	CEMENT SURFACE CASING 7521		Brisbane	Ensign 50

PERSONELL

PERSONNEL / EXPOSURE	hrs	PERSONNEL / EXPOSURE	hrs	PERSONNEL / EXPOSURE	hrs	PERSONNEL / EXPOSURE	hrs
477048 Anandam Sami	12	537302 Evan Hewison	12	#N/A Felicity Hepworth	12		

EQUIPMENT

SAP#	PUMPING / MIXING	HOURS	SAP#	BULK SUPPLY / TANKS	HOURS
12070993	CEMENT UNIT ELITE #12070993	24	#N/A	BULKER #10047249	24
SAP#	VEHICLES / TRAILERS	HOURS	SAP#	OTHER EQUIPMENT	HOURS
#N/A	LANDCRUISER UTE #12202066	24			
11209415	KENWORTH T658 TRUCK #11209415 (153-LFD)	24			
#N/A	DOLLY #12203822	24			

FLOAT EQUIPMENT AND CASING EQUIPMENT

SAP#	FLOAT EQUIPMENT	SUPPLIER	QTY	SAP#	PLUGS	SUPPLIER	QTY
		0		101214575	9 5/8" TOP PLUG HWE		1
SAP#	CASING ATTACHMENTS	SUPPLIER	QTY	SAP#	OTHER	SUPPLIER	QTY
100004485	9 5/8" x 12 1/4" CENTRALISER CSG HINGE		6				

WELL PROFILE

NEW CASING	OPEN HOLE + EXCESS OR CALIPER DATA	PREVIOUS CASINGS
9.625in 36ppf K55 : 0m to 97m MD, 97m TVD	12.25in, 40 percent excess, 0m to 97m	

CEMENT DESIGN

Lead	SLURRY ID 0	Spacer	SLURRY ID 0	0	SLURRY ID
DENSITY 15.6 ppg	WATER 5.23 gal/sk	DENSITY 8.33 ppg	WATER gal/sk		
YIELD 1.18 cuft/sk	MIX FLUID 16.6 bbl	YIELD cuft/sk	MIX FLUID 20 bbl		
WATER SOURCE Day Tank		WATER SOURCE			
CEMENT TYPE Standard Cement at 94lb/sk		CEMENT TYPE at lb/sk			
Total Cement Used 133 sks		Total Cement Used sks			
Estimated TOC 0 m		Estimated TOC m			
Additive	Concentration	Total Used	Additive	Concentration	Total Used
CFR-3	0.3 %BWOC	38lbs			
NF-6	0.125 gal/10bbl	1gals			

JOB LOGS

DATE	TIME	VOLUME (BBLs)	PRESSURE (psi)		RATE BPM	JOB DESCRIPTION
			HIGH	LOW		
10-May-13	11:00					pre mob safety meeting
	11:10					depart roma
	12:00					arrive location
	12:10					talk with the company rep
	12:20					safety induction
	12:30					lunch
	12:45					spot equipment
	13:15					complete JSA's and permit to work
	14:00					rig up surface lines
	14:20					Tool box meeting
	14:25					rig up head
	14:40		2000	0	4	pump 10 bbl water and pressure test the lines
	14:48		2000	0	4	bleed back
	14:49	10	53	4	4	pump spacer (fresh water)
	15:00					mix cement slurry
	15:05	27.9		0	4	pump cement slurry
	15:17					load and drop plug
	15:20	21.6		0	4	displace top plug (fresh water)
	15:34		170	0	4	bump plug
	15:37		2000	0	4	pressure test casing
	15:43		2000	0	4	bleed back
						.5 bbls returne
	22:05					4bbl cement back to surface
	23:20					end job wash up rig down
	16:00					do tickets

CUSTOMER	SALES ORDER No.	DATE
Santos	900416678	10 May 2013

CEMENT/PUMPING JOB SUMMARY

WELL	LOCATION/FIELD NAME	COUNTRY	HES REP	CUSTOMER REP	WELL TYPE
RM03-41-1	RM03-41-1	Australia	Anandam Sami	Ernie Bennet	Coal Bed Methane
JOB TYPE	BOD NUMBER	JOB PURPOSE CODE		BDA	RIG
Surface Casing	0	CEMENT SURFACE CASING 7521		Brisbane	Ensign 50
	5:00				returne to roma base
					The company man did not want to run bottom plug, received managers approval.

Wellname: RM03-41-1 DRILL	Operator: Santos	Resource: Ensign 950
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Casing Type: Production Casing	Originated By: Ernie Bennett	Checked By:	Date: 12 May 2013
Hole Size: 8.75"			Contractor: Halliburton
Total Depth 489.70m MD:	Total Depth 489.70m TVD:		
PRE-FLUSH @ Additives:		SPACER 10.0bbl @ 8.40ppg Additives: 10bbl K2SO4 brine 40bls Mud Flush III	
Water Source Dam			
CEMENT		ADDITIVES	% Amount Units
DISPLACEMENT		Fluid:	Dam Water @ 8.40ppg
Theoretical Displ.:	31.9bbl	Bumped Plug with:	180psi
Actual Displ.:	31.1bbl @ 2.0bbl/min	Pressure Tested To:	2,000psi
Displaced via:	Halliburton	Bleed Back:	0.5bbl
ACTIVITY	Time/Date	Returns to Surface: mud, cmt	
Start Running csg.	07:45 12/5/07	Casing Preflush : No Action Taken	Cement : No Action Displacement : No Action Taken
Casing On Bottom	11:15 12/5/07	Action	Taken
Start Circulation	12:30 12/5/07	During	
Start Pressure Test	13:05 12/5/07	Top Up Job No	of class
Pump Preflush	13:40 12/5/07	run:	
Start Mixing	13:50 12/5/07	Plug Set: Manufacturer: Weatherfro	Type:
Finish Mixing	14:05 12/5/07	Centralizer Bow spring	Centralizer Placement Depth: Bow spring every
Start Displacing	14:05 12/5/07	Type:	2nd joint to 240m.i at 246.33m, 259.83m,
Stop Displ./Bump	14:15 12/5/07		294.59m, 330.99m, 367.42m, 400.84m, 435.38m,
Pressure Test	14:45 12/5/07		469.21m.
		Wiper Plug Yes	
		Top:	
		Wiper Plug Yes	
		Bottom:	

Wellname: RM03-41-1 DRILL	Operator: Santos	Resource: Ensign 950
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CASING AND EQUIPMENT DETAILS								
Stick Up							-1.87m	
No. Joints	OD	Wt	Grade	Comment	Thread	Length	From	To
1	7.000in	23.0lbs/ft	K55	Landing joint with STS Running tool	BTC	6.0m	-1.9m	4.1m
1	7.000in	23.0lbs/ft	K-55	Hanger		0.4m	4.1m	4.5m
1	7.000in	23.0lbs/ft	K55	1 jnt 7" Casing with centeks & bow spring centralizers	BTC	11.1m	4.5m	15.6m
1	7.000in	23.0lbs/ft	K55	Solid Pup joint	BTC	3.0m	15.6m	18.7m
20	7.000in	23.0lbs/ft	K55	20 jnt 7" Casing with centeks & bow spring centralizers	BTC	222.2m	18.7m	240.9m
1	7.000in	23.0lbs/ft	K55	Solid Pup joint	BTC	1.8m	240.9m	242.6m
1			K55	Stage tool S/N 43931999	BTC	0.7m	242.6m	243.3m
1				Weatherford ECP assembly - Serial# 44404074	BTC	3.1m	243.3m	246.4m
1	7.000in	23.0lbs/ft	K55	Solid Pup joint	BTC	1.8m	246.4m	248.2m
1	7.000in	23.0lbs/ft	K55	Float Collar with baffle plate	BTC	0.4m	248.2m	248.6m
20	7.000in		K55	20jnt 7" K55 Perf casing with bow spring centralizers		232.1m	248.6m	480.6m
1			K55	Guide shoe	BTC	0.1m	480.6m	480.8m

Wellname: RM03-41-1 DRILL	Operator: Santos	Resource: Ensign 950
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Theoretical Bouyed wt. of casing:	Bradenhead Height above GL:
Casing wt. prior to landing csg:	Bradenhead Description / Length: /
Actual wt. of casing (last joint run-block wt):	Tubing Spool Size:
Landing wt. (after cementing and pressure bleed off):	Setting Slips:
Cementing Job Remarks:	<p>Rigged up Halliburton cement head and surface lines and tested to 3000psi. good test</p> <p>Inflated Weatherford ECP packer as per Weatherford International Procedures. Dropped Shut off plug (Dart), displaced with 63bbbls & seat on baffle Landing collar. Shut off plug bumped at 500psi with 1.3 bpm (Plug held). Increased surface pressure to 700psi. Increased surface pressure: In +/- 200 psi increments 700psi to 900psi & held for 1 min 900psi to 1100psi & held for 1 min Increased surface pressure 1196psi -Pressure dropped to 892 psi. Pressure stabilized @ 893psi for 5 minutes Increased pressure to 1400 psi and held for 2 minute to insure Packer is closed. Bleed the surface pressure back to 500 psi & recorded CAP inflation Volume of 0.1 bbls Bleed off pressure to 0 psi (Locked out the safe-loc) Increased pressure to 2075 psi to open stage tool, broke circulation Circulated 10bbbls of 8.4ppg Drilling fluid.</p> <p>Cemented 7" casing as per program: Pumped 10bbbls mud flush III. Mixed and pumped 31.7bbbls CBMCem slurry @ 12.0ppg. OCR witnessed dropped Top (closing) plug. Displaced cement with 31.1bbbls Drill fluid. Bumped plug with 180psi Pressure tested casing to 2,000psi / 30min Bleed back with 0.5 bbl returns.</p> <p>Note:- cement returns @ 26.5bbbls into displacement, 3.5bbbls cement to surface. Floats held. Observed full returns throughout entire operations. Cement in place by 14.17hours. eld.</p>

Santos

POST JOB REPORTS
CEMENTING/PUMPING

Well Name : RM03-41-1

Rig: Ensign 50

CEMENT PRODUCTION CASING 400M 7521

Prepared for Ernie Bennet

12/05/2013

Prepared by Anandam Sami

HALLIBURTON

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CUSTOMER	SALES ORDER No.	DATE
Santos	900416693	12 May 2013

CEMENT/PUMPING JOB SUMMARY

WELL	LOCATION/FIELD NAME	COUNTRY	HES REP	CUSTOMER REP	WELL TYPE
RM03-41-1	RM03-41-1	Australia	Anandam Sami	Ernie Bennet	Coal Bed Methane
JOB TYPE	BOD NUMBER	JOB PURPOSE CODE		BDA	RIG
Surface Casing	0	CEMENT PRODUCTION CASING 400M 7521		Brisbane	Ensign 50

KEY PERFORMANCE INDICATORS

TYPE OF JOB (Cementing or Non-Cementing): <i>Select the job type (Cementing or Non-Cementing)</i>	<input type="text" value="Cementing"/>	WAS THIS A PRIMARY CEMENT JOB (YES / NO) <i>Primary cement job = Casing job, Liner Job, tie back</i>	<input type="text" value="YES"/>
TOTAL OPERATING TIME (hrs) <i>Rig up/ Pumping/ Rig Down</i>	<input type="text" value="5.0 hrs"/>	DID WE RUN WIPER PLUGS?	<input type="text" value="Top Plug"/>
HSE INCIDENT, ACCIDENT, INJURY: <i>This should be recordable incidents only</i>	<input type="text" value="NO"/>	WAS THIS A PLUG OR SQUEEZE JOB?	<input type="text" value="Neither"/>
WAS THE JOB DELIVERED CORRECTLY AS PERJOB DESIGN <i>This will be dictated by the customer</i>	<input type="text" value="YES"/>	WAS THIS A PRIMARY OR REMEDIAL JOB? <i>Remedial = Repeated attempts or corrections of initial cement job</i>	<input type="text" value="Primary"/>
TOTAL TIME PUMPING (hrs) <i>Total number of hours pumping fluid on this job</i>	<input type="text" value="1.5 hrs"/>	MIXING DENSITY OF JOB STAYED IN DESIGNED RANGE <i>Density defined as +/- 0.2ppg. Calculation: Total bbls cement mixed at designed density divided by total bbls of cement multiplied by 100</i>	<input type="text" value="98%"/>
NON -PRODUCTIVE RIG TIME: <i>As a result of Halliburton cementing PSL</i>	<input type="text" value="none"/>	WAS AUTOMATED DENSITY CONTROL USED	<input type="text" value="YES"/>
NUMBER OF JSA'S PERFORMED:	<input type="text" value="3"/>	JOB WAS PUMPED AT DESIGNED PUMP RATE <i>Pump rate ranged defined as +/- bpm. Calculation : total bbls of fluid pumped at the designed rate divided by total bbls of fluid pumped multiplied by 100</i>	<input type="text" value="0%"/>
NUMBER OF UNPLANNED SHUTDOWNS (After starting to pump)	<input type="text" value="none"/>	NUMBER OF REMEDIAL SQUEEZE JOBS REQUIRED - HES <i>Number of remedial squeeze jobs required after primary job performed by HES</i>	<input type="text" value="none"/>
TYPE OF RIG(CLASSIFICATION) JOB WAS PERFORMED ON:	<input type="text" value="LAND"/>	NUMBER OF REMEDIAL AQUEEZE JOBS REQUIRED - COMPETITION <i>Number of remedial squeeze jobs required after primary job performed by competition</i>	<input type="text" value="none"/>
REASON FOR UNPLANNED SHUTDOWNS (After starting to pump) <i>Add details in job logs</i>		NUMBER OF REMEDIAL PLUG JOBS REQUIRED - HES <i>Number of remedial plug jobs required after primary plug pumped by HES</i>	<input type="text" value="none"/>
REASON FOR NON-PRODUCTIVE RIG TIME (Cementing PSL responsibility): <i>Add details in job logs</i>		DID CEMENT RETURN TO SURFACE?	
DENSITY RECORDED WITH PRESSURISED MUD BALANCE?	<input type="text" value="YES"/> <input type="text" value="12"/> ppg	<input type="text" value="YES"/> <input type="text" value="26.5"/> bbls into displacement	
		<input type="text" value="3.6"/> bbls returned to surface	

CUSTOMER SATISFACTION SURVEY

Dear Customer,

We hope that you were satisfied with the service delivery of this job performed by Halliburton. It is the aim of our management and service personnel to deliver equipment and service of a standard unmatched in the service sector of the energy industry.

Please take the time to let us know if our performance met with your satisfaction. Please be as critical as possible to ensure we constantly improve our service. Your comments are of great value to us and are intended for the exclusive use of Halliburton.

CATEGORY	CUSTOMER SATISFACTION RATING (Please circle yes or no)
Survey Conducted Date	The date the survey was conducted
Survey Interviewer	The survey interviewer is the person who initiated the survey.
Customer Participation	Did the customer participate in this survey? (Y/N)
Customer Representative	Enter the Customer representative name
HSE	Was our HSE performance satisfactory? Circle Y or N
Equipment	Were you satisfied with our Equipment? Circle Y or N
Personnel	Were you satisfied with our people? Circle Y or N
Customer Comment	

Customer and Halliburton Representative agree on the data input into the cementing report

CUSTOMER SIGNATURE

HALLIBURTON SIGNATURE

CUSTOMER	SALES ORDER No.	DATE
Santos	900416693	12 May 2013

CEMENT/PUMPING JOB SUMMARY

WELL	LOCATION/FIELD NAME	COUNTRY	HES REP	CUSTOMER REP	WELL TYPE
RM03-41-1	RM03-41-1	Australia	Anandam Sami	Ernie Bennet	Coal Bed Methane
JOB TYPE	BOD NUMBER	JOB PURPOSE CODE		BDA	RIG
Surface Casing	0	CEMENT PRODUCTION CASING 400M 7521		Brisbane	Ensign 50

PERSONELL

PERSONNEL / EXPOSURE	hrs	PERSONNEL / EXPOSURE	hrs	PERSONNEL / EXPOSURE	hrs	PERSONNEL / EXPOSURE	hrs
477048 Anandam Sami	12	481601 Peter Price	12	535417 Timothy Dixon	12		

EQUIPMENT

SAP#	PUMPING / MIXING	HOURS	SAP#	BULK SUPPLY / TANKS	HOURS
12070993	CEMENT UNIT ELITE #12070993	24	#N/A	BULKER #11841282	24
SAP#	VEHICLES / TRAILERS	HOURS	SAP#	OTHER EQUIPMENT	HOURS
#N/A	LANDCRUISER UTE #12202066	24			
11209415	KENWORTH T658 TRUCK #11209415 (153-LFD)	24			
#N/A	DOLLY #12203822	24			

FLOAT EQUIPMENT AND CASING EQUIPMENT

SAP#	FLOAT EQUIPMENT	SUPPLIER	QTY	SAP#	PLUGS	SUPPLIER	QTY
		0		100013899	7" MULTISTAGE CLOSING DART		1
		0		100003154	7" TOP PLUG		1
SAP#	CASING ATTACHMENTS	SUPPLIER	QTY	SAP#	OTHER	SUPPLIER	QTY
100004480	7" x 8 1/2" CENTRALISER CSG HINGED		17				

WELL PROFILE

NEW CASING	OPEN HOLE + EXCESS OR CALIPER DATA	PREVIOUS CASINGS
7in 23ppf K55 : 0m to 241m MD, 241m TVD	12.25in, 40 percent excess, 0m to 97m 8.75in, 60 percent excess, 97m to 241m	9.625in, 36ppf, 0m to 97m

CEMENT DESIGN

Lead	SLURRY ID	0	Spacer	SLURRY ID	0	0	SLURRY ID
DENSITY 12 ppg	WATER 11.98 gal/sk		DENSITY 9 ppg	WATER gal/sk			
YIELD 2.15 cuft/sk	MIX FLUID 23.7 bbl		YIELD cuft/sk	MIX FLUID 10 bbl			
WATER SOURCE Day Tank			WATER SOURCE				
CEMENT TYPE POZMIX 65:35 at 87lb/sk			CEMENT TYPE at lb/sk				
Total Cement Used 83 sks			Total Cement Used sks				
Estimated TOC 0 m			Estimated TOC m				
Additive	Concentration	Total Used	Additive	Concentration	Total Used		
CFR-3	0.3 %BWOC	22lbs	Mud Flush III	4 lb/bbl	40lbs		
NF-6	0.25 gal/10bbl	1gals					
Cal Seal 60	5 %BWOC	361lbs					
Econolite Powder	1.5 %BWOC	108lbs					
Halad 344	0.9 %BWOC	65lbs					

JOB LOGS

DATE	TIME	VOLUME	PRESSURE (psi)		RATE	JOB DESCRIPTION
			HIGH	LOW		
DAY-MTH-YR	HRS:MIN	(BBLs)			BPM	
12-May-13	9:30					pre mob safety meeting
	9:45					depart roma
	11:30					arrive location
	11:45					talk with the company rep
	12:00					spot equipment
	12:15					rig up surface lines
	12:30					Tool box meeting
	12:45					rig up head
	12:59	5	3000	0	4	pump 5 bbl water and pressure test the lines
	13:03		3000	0	4	bleed back
	13:15	26.1	150	4	4	displace ECP run to procedure
	13:35	10		0		mud flush spacer
	13:42	31.7		0	4	pump cement slurry @12ppg
	14:03					drop top plug
	14:20	30.1	150	0	4	displace top plug (fresh water)
	14:22		2000	150	4	bump plug
	14:25		2000	0	4	pressure test casing
	14:53		2000	0	4	bleed back
						.5 bbls returne
						26.5 bbls into displacement cement back to surface

CUSTOMER	SALES ORDER No.	DATE
Santos	900416693	12 May 2013

CEMENT/PUMPING JOB SUMMARY

WELL	LOCATION/FIELD NAME	COUNTRY	HES REP	CUSTOMER REP	WELL TYPE
RM03-41-1	RM03-41-1	Australia	Anandam Sami	Ernie Bennet	Coal Bed Methane
JOB TYPE	BOD NUMBER	JOB PURPOSE CODE		BDA	RIG
Surface Casing	0	CEMENT PRODUCTION CASING 400M 7521		Brisbane	Ensign 50

	15:44				end job wash up rig down
	16:20				do tickets
	16:30				returne to roma base

Appendix 4

Geophysical Logs



Weatherford®

DLL - SLL - SONIC PHOTO DENSITY 1:500 MD

COMPANY **SANTOS LTD**
 WELL **RM03-41-1**
 FIELD **ROMA**
 PROVINCE/COUNTY **QUEENSLAND**
 COUNTRY/STATE **AUSTRALIA**
 LOCATION **PL309**

Latitude **26° 22' 09.37" S**
 Longitude **149° 8' 20.27" E**

Other Services
BOREHOLE NAVIGATION

Permanent Datum M.S.L., Elevation 369.5 metres
 Log Measured From DF
 Drilling Measured From D.F. @ 373.8 m

Elevations:
 KB 373.80
 DF 373.80
 GL 369.50

Date	12-MAY-2013
Run Number	1
Service Order	40150
Depth Driller	489.70 metres
Depth Logger	482.70 metres
First Reading	477.90 metres
Last Reading	0.00 metres
Casing Driller	95.90 metres
Casing Logger	96.00 metres
Bit Size	8.750 inches
Hole Fluid Type	WATER
Density / Viscosity	1.00 g/c3 26.00 sec/qt
PH / Fluid Loss	8.40
Sample Source	MUD TANK
Rm @ Measured Temp	14.0 @ 25.0 ohm-m
Rmf @ Measured Temp	N/A
Rmc @ Measured Temp	N/A
Source Rmf / Rmc	N/A
Rm @ BHT	1.59 @ 37.0 ohm-m
Time Since Circulation	4 HRS 15 MIN
Max Recorded Temp	37.00 deg C
Equipment / Base	11564 ROMA
Recorded By	J. KOKONAS
Witnessed By	S. FRASER
Stop Circulation	23:15 / 11MAY 2013

BOREHOLE RECORD			Last Edited: 12-MAY-2013 06:11
Bit Size inches	Depth From metres	Depth To metres	
12.250	0.00	97.00	
8.750	97.00	489.70	

CASING RECORD			
Type	Size inches	Depth From metres	Shoe Depth metres
SURFACE	9.625	0.00	95.90
			Weight pounds/ft 36.00

REMARKS

RUN NUMBER 1 IS THE PRIMARY DEPTH REFERENCE LOG. ALL OTHER RUNS ARE CORRELATED BACK TO THIS LOG.

SOFTWARE ISSUE: VERSION 13.05.9583, FEB 28, 2013.

CUSTOMER SCALES AND INTERVALS LOGGED.

RUN 1: HFS, MMR,MDL,MSS, MPD, MBN, MCG, MBE, MBE, MCB TOOLS RAN IN COMBINATION.
 - TIME ON BOTTOM:03:15 / 12 MAY 2013.

HARDWARE
 RUN 1:
 - MBE: 2 X 1" STANDOFF.
 - MSS: 3 X 1.5" STANDOFF.
 - MMR: 2 X 1" STANDOFF.
 - MUG: 2 X 1" STANDOFF.

MPD CORRECTED FOR CALIPER AND MUD DENSITY.

CLIENT INFORMED ABOUT LOGGER T.D. AND DRILLER T.D. DIFFERENCE

CLIENT INFORMED THAT MICRORESISTIVITY CURVE NOT INCLUDE IN THE LOG DUE TO FAILURE OF THE MMR CALIPER ,

KCL % NOT PROVIDED ON SITE.

GR NOT ENVIROMENTAL CORRECTED.

TOTAL HOLE VOLUME (HVOL) FROM T.D. TO 9.625" SURFACE CASING SHOE = 14.5 CUBIC METRES.

TOTAL ANNULAR VOLUME (AVOL) FROM T.D. TO CASING SHOE WITH 7" PRODUCTION CASING = 5.2 CUBIC METRES.

MAXIMUM TEMPERATURE RECORDED 37.4 DEG AT 462.8 METRES.

CONVEYANCE TYPE: WIRELINE.

BOREHOLE STATUS: OPEN HOLE.

RIG: ENSIGN 50.

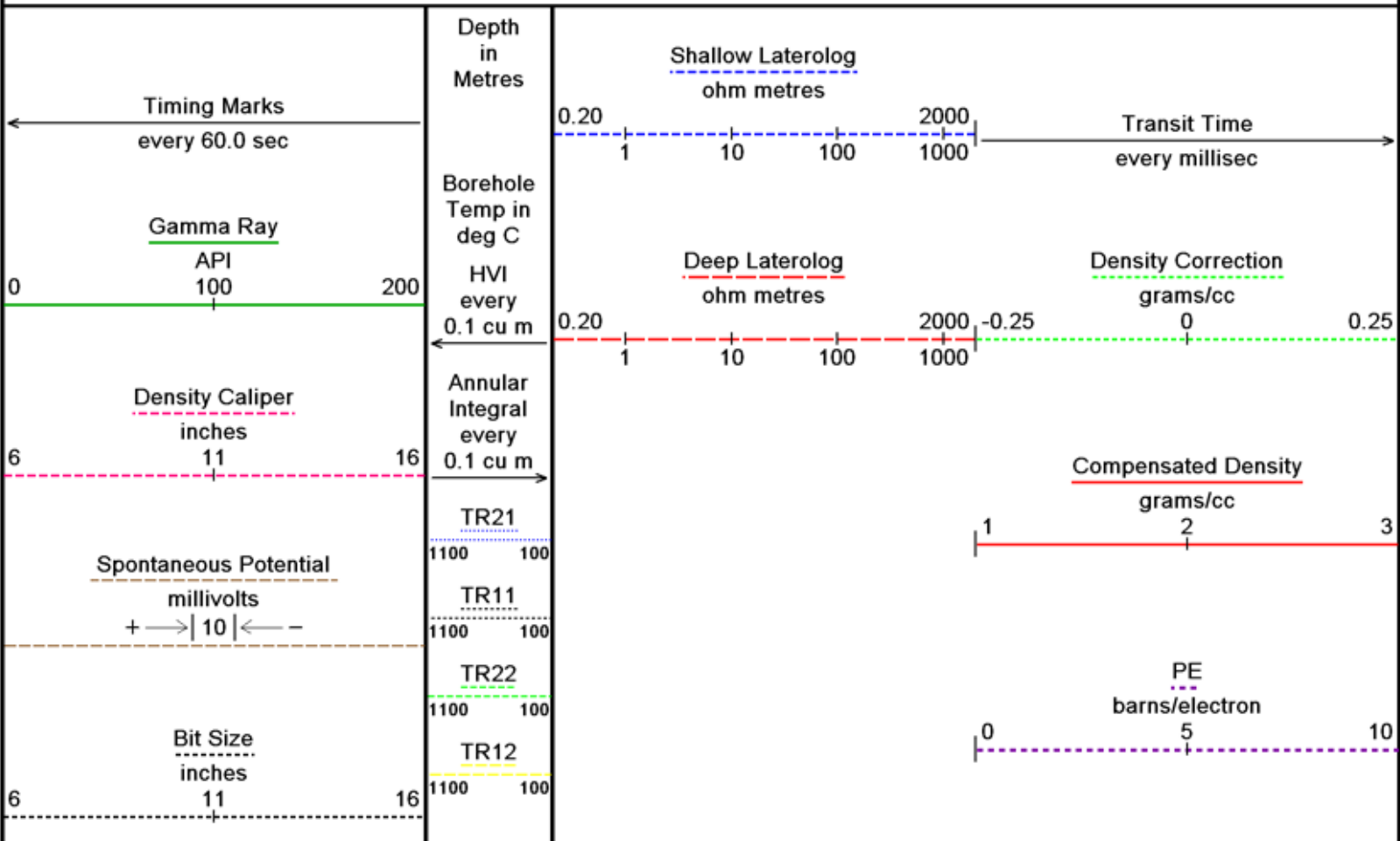
SERVICE REPORT NUMBER: 40150

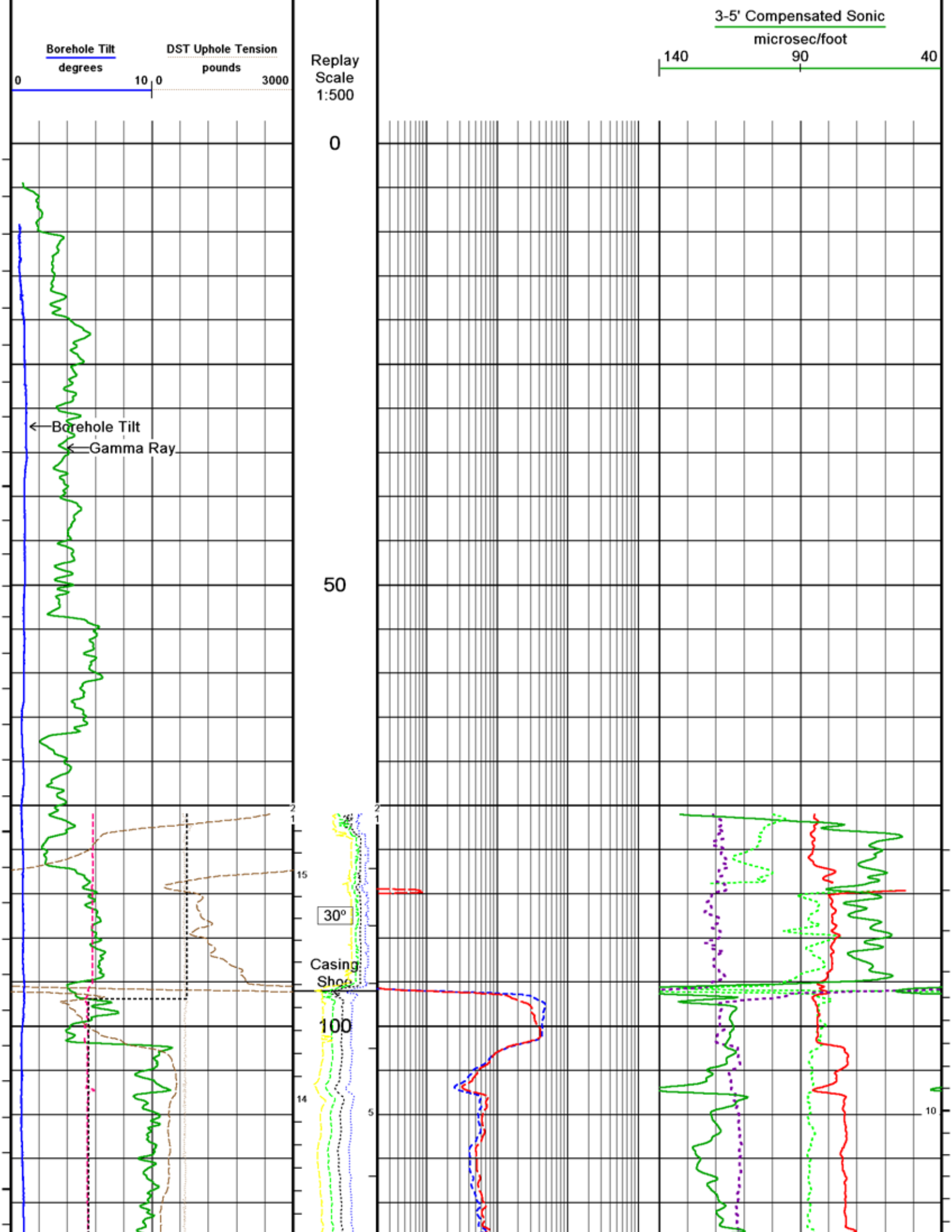
LOGGING CREW: ENGINEERS - N. SARMIENTO J. KOKONAS, OPERATORS: G. HANSEN, P. GARBUTT

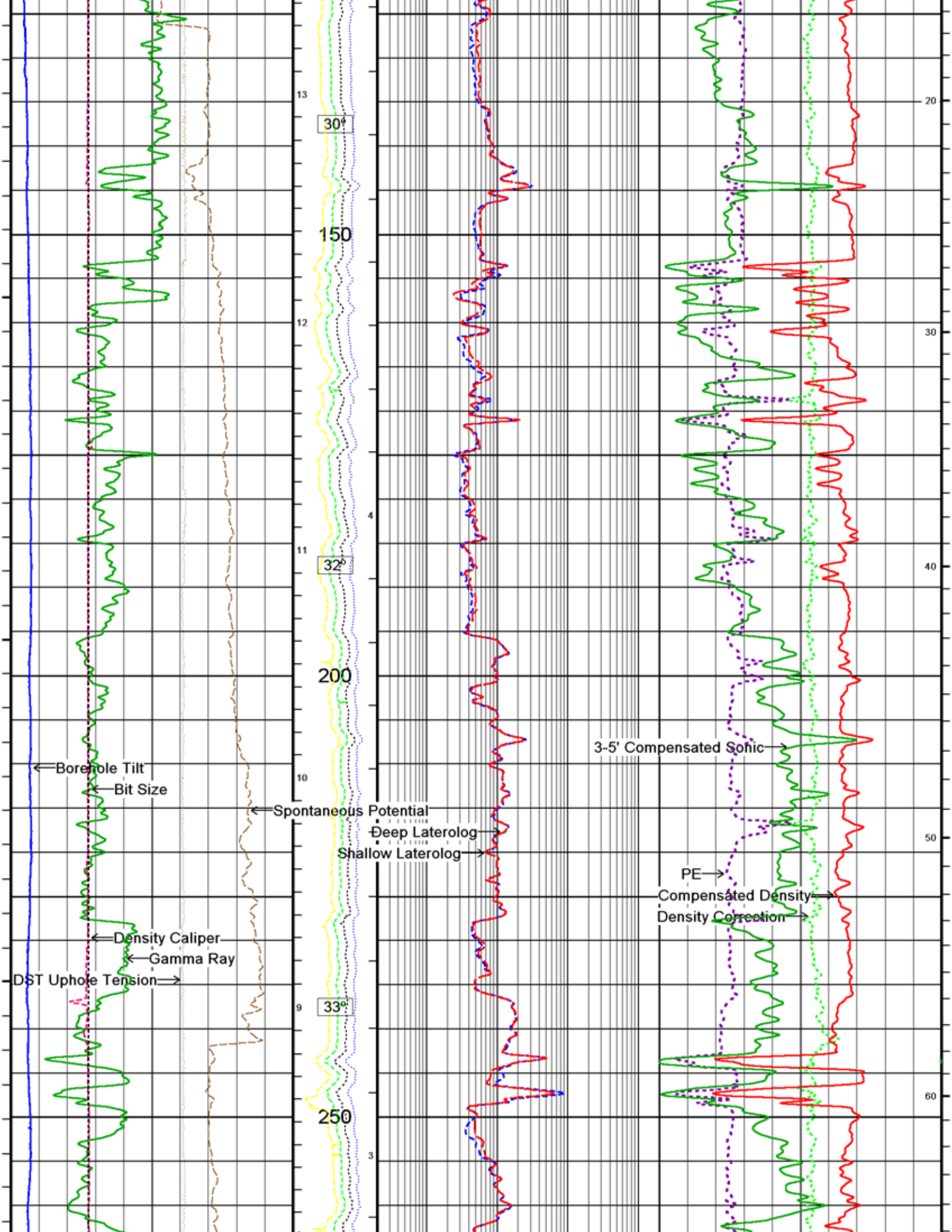
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.

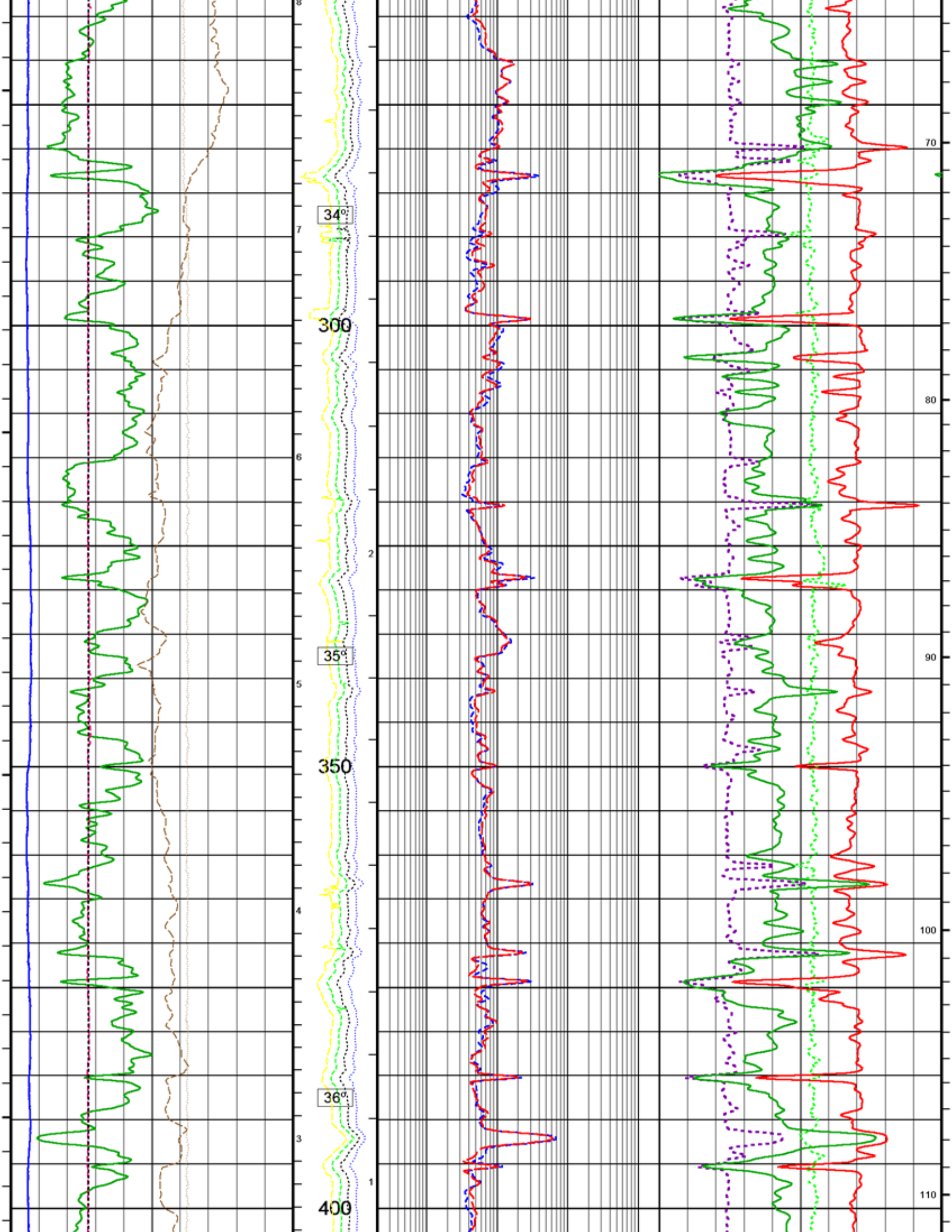
MAIN LOG 1:500

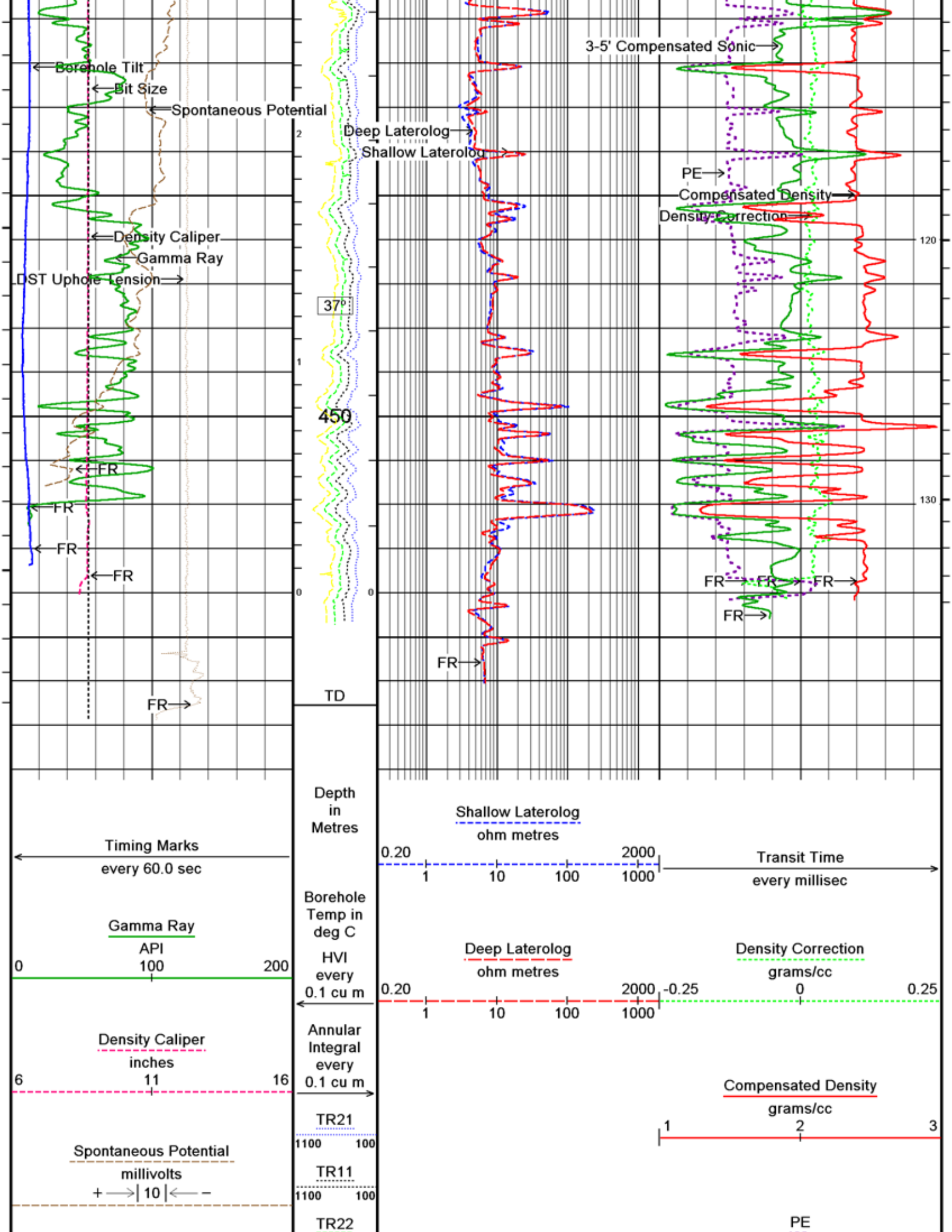
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 12-MAY-2013 07:12
 Filename: ...IRM03-41-1_WL_SUITE1_RUN1_RT_MMR-MDL-MSS-MPD-MBN-MCG_STDRES_FINAL.dta Recorded on 12-MAY-2013 03:15
 System Versions: Processed with 13.05.9583 Plotted with 13.06.9284

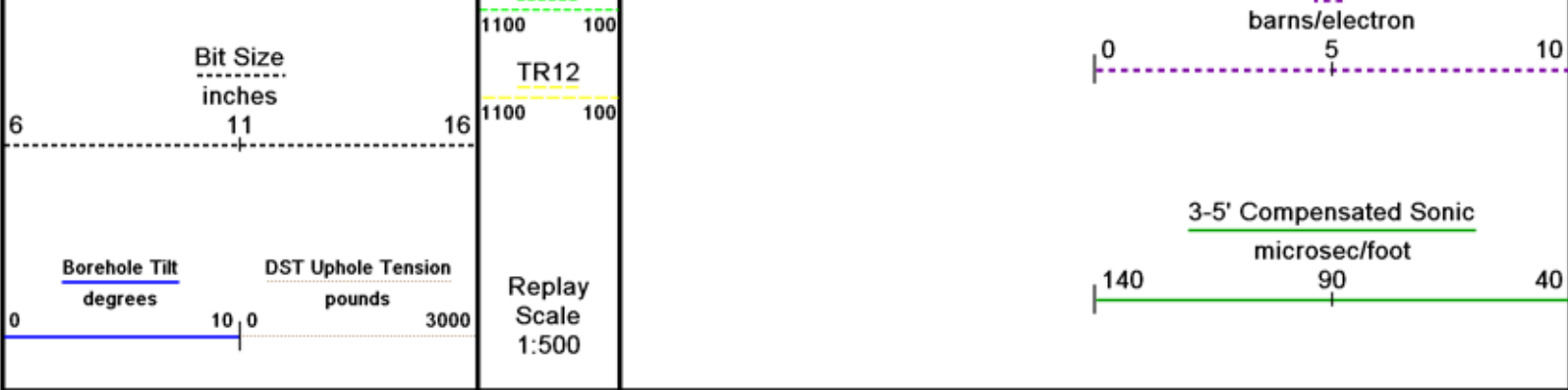












Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 12-MAY-2013 07:12
 Filename: ...IRM03-41-1_WL_SUITE1_RUN1_RT_MMR-MDL-MSS-MPD-MBN-MCG_STDRES_FINAL.dta
 Recorded on 12-MAY-2013 03:15
 System Versions: Processed with 13.05.9583 Plotted with 13.06.9284

MAIN LOG 1:500

BEFORE SURVEY CALIBRATION

C:\DOCUME~1\Owner\LOCALS~1\Te...IRM03-41-1_WL_SUITE1_RUN1_RT_MMR-MDL-MSS-MPD-MBN-MCG_STDRES_FINAL.dta

General Constants All 000 Last Edited on 12-MAY-2013,02:36

General Parameters		
Mud Resistivity	14.000	ohm-metres
Mud Resistivity Temperature	25.000	degrees C
Water Level	0.000	metres
Borehole Fluid Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	7.000	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Deep Laterolog	
RWA Constant A	0.610	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	

High Resolution Temperature Calibration MCG-C 213 Field Calibration on 30-APR-2013,12:12

	Measured	Calibrated(Deg C)
Lower	0.00	0.00
Upper	100.00	100.00

High Resolution Temperature Constants MCG-C 213 Last Edited on 30-APR-2013,12:12

Pre-filter Length	11
-------------------	----

Gamma Calibration MCG-C 213 Field Calibration on 12-MAY-2013 00:10

	Measured	Calibrated (API)
Background	52	36
Calibrator (Gross)	915	630
Calibrator (Net)	863	594

Gamma Constants MCG-C 213 Last Edited on 12-MAY-2013,02:37

Gamma Calibrator Number	GRC.C185	
Mud Density	1.00	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

Magnetometer Parameters MBN-C.A 27

Date Of Last Magnetometer Calibration	01-JAN-1998		
Slope	X Magnetometer	Y Magnetometer	Z Magnetometer
Offset	-1.000000	1.012426	0.984292
	0.005135	0.017720	-0.006533

Magnetometer Constants MBN-C.A 27

Last Edited on 15-MAR-2009,11:39

Magnetometer Calibrator Number 000

Navigation Constants MBN-C.A 27

Last Edited on 12-MAY-2013,02:58

Magnetic Declination 9.67 degrees East

Accelerometer Parameters MBN-C.A 27

Date Of Last Accelerometer Calibration	01-JAN-1998		
Slope	X Accelerometer	Y Accelerometer	Z Accelerometer
Offset	-1.112780	-1.103820	-1.102650
	0.009109	0.005046	0.009708

Accelerometer Constants MBN-C.A 27

Last Edited on 27-JUL-2008,15:49

Accelerometer Calibrator Number 000

Accelerometer Temperature Characterisation

X Accelerometer

Serial Number	246			
Calibration Date	01-Jan-1998			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	5.42762e-006	-8.86262e-009	1.12365e-010
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.71195e-004	4.23884e-007	2.27015e-010

Y Accelerometer

Serial Number	247			
Calibration Date	01-Jan-1998			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	3.16792e-005	-4.76074e-008	-5.50853e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.85656e-004	6.24425e-007	-5.26030e-010

Z Accelerometer

Serial Number	248			
Calibration Date	01-Jan-1998			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	-3.72399e-005	1.26911e-008	1.45626e-010
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.81913e-004	5.63686e-007	-5.40552e-010

Sonic Constants MSS-C.K 306

Last Edited on

Maximum Boundary Contrast	100.00	micro-sec/ft
Fluid Transit Time	189.00	micro-sec/ft
Limestone Transit Time	47.50	micro-sec/ft
Sandstone Transit Time	55.50	micro-sec/ft
Dolomite Transit Time	43.50	micro-sec/ft
Sonic used for Porosities	3-5' Compensated	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	
MN3FT	0.00	micro-sec
MX3FT	1500.00	micro-sec
Hunt-Raymer Constant	83.13	micro-sec/ft

Sonde Mode	Compensated
Hole Type	Open Hole

Sonde Parameters

	Measured	Calibrated
Offset	0.0000	0.0000
Free Pipe	0.0000	

File Type

0.0000

Peak Amplitude Source

Waveform	Start Time (micro-sec)	Width (micro-sec)	Pre Gain	Start Gain	Discriminator (mV)
3'	N/A	N/A	N/A	N/A	N/A
4'	N/A	N/A	N/A	N/A	N/A
5'	N/A	N/A	N/A	N/A	N/A
6'	N/A	N/A	N/A	N/A	N/A

Processed Fixed Gate Parameters

Waveform Used For Processing	N/A			
Start Time (micro-sec)	End Time (micro-sec)	Discriminator (mV)	Depth (m)	
0.00	0.00	0.00	0.00	
0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00

Full Waveform Parameters

Use 3' Waveform to derive TR	No		
Use 4' Waveform to derive TR	No		
Use 5' Waveform to derive TR	No		
Use 6' Waveform to derive TR	No		
3' Waveform Discriminator Level	0.30	mV	
4' Waveform Discriminator Level	0.30	mV	
5' Waveform Discriminator Level	0.15	mV	
6' Waveform Discriminator Level	0.15	mV	
3' Waveform Filter			
4' Waveform Filter			
5' Waveform Filter			
6' Waveform Filter			
Semblance Level	0.50		
Semblance Window Width	120.00	micro-sec	
Sonic 1 Despiker	100.00	micro-sec/ft	
Sonic 2 Despiker	100.00	micro-sec/ft	

SP Calibration MLE-C.A 109

Field Calibration on 12-MAY-2013 00:38

	Measured	Calibrated (mV)
Reference 1	103.8	100.0
Reference 2	-95.5	-100.0

Laterolog Calibration MLE-C.A 109

Base Calibration on 09-MAY-2013 15:07
Field Check on 12-MAY-2013 00:39

Base Calibration

Channel	Resistor 1	Measured		Calibrated (ohm-m)	
		Resistor 1	Resistor 2	Resistor 1	Resistor 2
Shallow	0.0	990.7	0.0	1284.4	
Deep	0.0	991.5	0.0	795.7	
Groningen	0.0	989.6	0.0	808.4	
Channel	Base Check (ohm-m)		Field Check (ohm-m)		
Shallow	46.6		46.6		
Deep	28.9		28.9		
Groningen	235.0		235.0		

Laterolog Constants MLE-C.A 109

Last Edited on 12-MAY-2013,00:38

Squasher Start	40000	ohm-m
Shallow Laterolog K Factor	1.2844	
Deep Laterolog K Factor	0.7957	
Groningen Laterolog K Factor	0.8084	
Interference Rejection	60 Hz	
SP Connection	SP Bridle Electrode (Lower)	
Groningen Connection	Groningen Electrode (Upper)	

Borehole Correction Constants

Bridle Type	Standard	
Stand-off	0.50	inches
Caliper Source	Density Caliper	

Hole Size N/A inches
Mud Resistivity Source Temperature Corrected
Temp. for Rm Corr. MCG External Temperature

Apparent Porosity and Water Saturation Constants
Archie Constant (A) 1.00
Cementation Exponent (M) 2.00
Saturation Exponent (N) 2.00
Saturation of Water for Apor 100.00 percent
Resistivity of Water for Apor and Sw 0.05 ohm-m
Resistivity of Mud Filtrate for Sw 0.00 ohm-m
Source for Rt 0.00
Source for Rxo 0.00

Caliper Calibration MPD-C.A 222

Base Calibration on 12-MAY-2013 00:33
Field Calibration on 12-MAY-2013 00:34

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	17760	4.01
2	25944	5.99
3	34352	7.98
4	42576	9.86
5	51760	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
8.01	7.98

Photo Density Calibration MPD-C.A 222

Base Calibration on 07-MAY-2013 15:35
Field Check on 12-MAY-2013 00:17

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	54709	27046	59513	30777
Reference 2	22419	2661	24663	2534

Field Check at Base

	1485.0	1462.7
--	--------	--------

Field Check

	1478.7	1457.9
--	--------	--------

PE Calibration

Base Calibration	WS	Measured		Calibrated Ratio
		WH	Ratio	
Background	269	1333		
Reference 1	22523	54493	0.419	0.372
Reference 2	6240	22255	0.285	0.269

Field Check at Base

	268.7	1333.5
--	-------	--------

Field Check

	268.6	1329.4
--	-------	--------

Density Constants MPD-C.A 222

Last Edited on 07-MAY-2013,15:19

Density Source Id	NSD-15756	
Nylon Calibrator Number	DNCE697	
Aluminium Calibrator Number	DACD638	
Density Shoe Profile	8 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.00	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Hybrid	

Matrix density (gm/cc)
 2.71
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00

Depth (m)
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00

DOWNHOLE EQUIPMENT

C:\DOCUME~1\Owner\LOCALS~1\Te...\RM03-41-1_WL_SUITE1_RUN1_RT_MMR-MDL-MSS-MPD-MBN-MCG_STDRES_FINAL.dta

MCB-A 11B Tension Cablehead
 MCB-A 104 LG: 0.66 m WT: 19.8 lb OD: 57 mm

Compact Stiff Bridle Electrode Sub.
 MBE-D.A 357 LG: 3.76 m WT: 77.2 lb OD: 57 mm

Compact Stiff Bridle Electrode Sub.
 MBE-D.A 355 LG: 3.76 m WT: 77.2 lb OD: 57 mm

Compact Comms Gamma
 MCG-C 213 LG: 2.65 m WT: 63.9 lb OD: 57 mm

Compact Navigation
 MBN-C.A 27 LG: 3.60 m WT: 70.5 lb OD: 57 mm

Compact Linker
 MLK-E.A 115 LG: 1.53 m WT: 50.7 lb OD: 57 mm

Compact Density/Caliper
 MPD-C.A 222 LG: 2.92 m WT: 90.4 lb OD: 62 mm



25.84 m SPDL - Spontaneous Potential

21.50 m GRGC - Gamma Ray
 20.61 m CGXT - MCG External Temperature

16.82 m BAZT - Borehole Azimuth (True)
 16.82 m BTLT - Borehole Tilt

13.72 m AVOL - Annular Volume
 13.72 m HVOL - Hole Volume
 13.72 m CLDC - Density Caliper
 13.14 m HDEN - Vectar Processed Density
 13.14 m DEN - Compensated Density
 13.14 m DCOR - Density Correction
 13.12 m PDPE - PE

Compact Sonic
 MSS-C.K 306 LG: 3.82 m WT: 72.8 lb OD: 57 mm

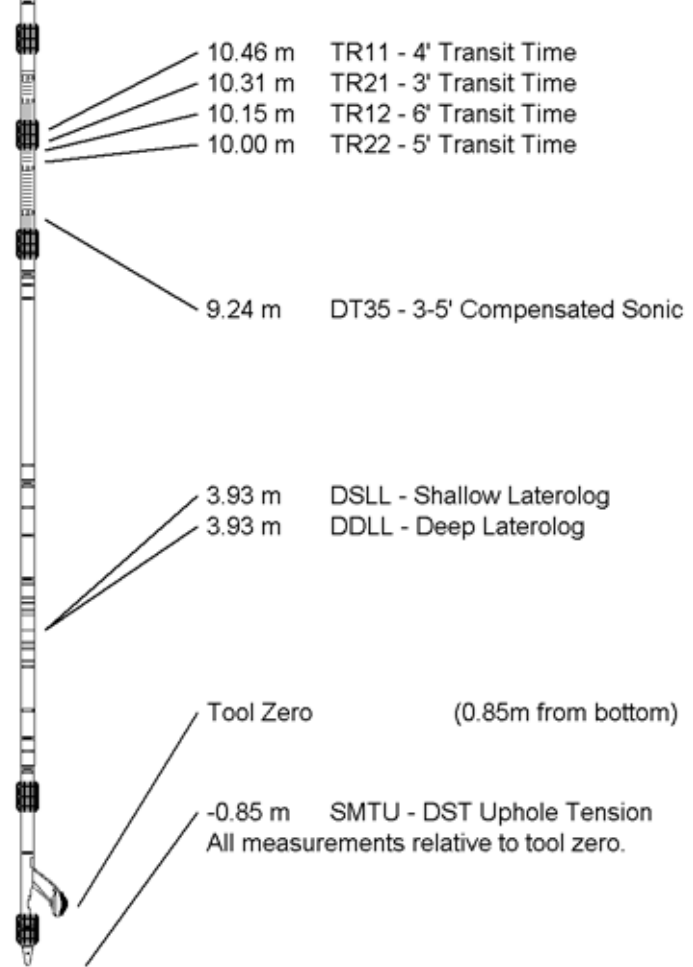
Compact Upper Guard sub
 MUG-B.B 317 LG: 2.74 m WT: 68.3 lb OD: 57 mm

Compact Laterolog Electrode Sub.
 MLE-C.A 109 LG: 3.76 m WT: 92.6 lb OD: 57 mm

Compact Micro-Resistivity
 MMR-B.A 125 LG: 2.62 m WT: 81.6 lb OD: 129 mm

Pressure Bung + Hole Finder
 HFS 3 LG: 0.28 m WT: 6.6 lb OD: 57 mm

Total Length: 32.10 m Weight: 771.6 lb



COMPANY SANTOS LTD
 WELL RM03-41-1
 FIELD ROMA
 PROVINCE/COUNTY QUEENSLAND
 COUNTRY/STATE AUSTRALIA

Elevation Kelly Bushing	373.80	metres	First Reading		metres
Elevation Drill Floor	373.80	metres	Depth Driller	489.70	metres
Elevation Ground Level	369.50	metres	Depth Logger	482.70	metres



Weatherford[®]

DLL - SLL - SONIC
 PHOTO DENSITY
 1:500 MD



Weatherford®

HOLE VOLUME LOG

1:500 MD

COMPANY SANTOS LTD
 WELL RM03-41-1
 FIELD ROMA
 PROVINCE/COUNTY QUEENSLAND
 COUNTRY/STATE AUSTRALIA
 LOCATION PL309

Latitude 26° 22' 09.37" S
 Longitude 149° 8' 20.27" E

Other Services

Permanent Datum M.S.L., Elevation 369.5 metres
 Log Measured From DF
 Drilling Measured From D.F. @ 373.8 m

Elevations:
 KB 373.80 metres
 DF 373.80 metres
 GL 369.50 metres

Date	12-MAY-2013
Run Number	1
Service Order	40150
Depth Driller	489.70 metres
Depth Logger	482.70 metres
First Reading	477.90 metres
Last Reading	76.00 metres
Casing Driller	95.90 metres
Casing Logger	96.00 metres
Bit Size	8.750 inches
Hole Fluid Type	WATER
Density / Viscosity	1.00 g/c3 26.00 sec/qt
PH / Fluid Loss	8.40
Sample Source	MUD TANK
Rm @ Measured Temp	14.0 @ 25.0 ohm-m
Rmf @ Measured Temp	N/A
Rmc @ Measured Temp	N/A
Source Rmf / Rmc	N/A
Rm @ BHT	1.59 @ 37.0 ohm-m
Time Since Circulation	4 HRS 15 MIN
Max Recorded Temp	37.00 deg C
Equipment / Base	11564 ROMA
Recorded By	J. KOKONAS
Witnessed By	S. FRASER
Stop Circulation	23:15 / 11MAY 2013

BOREHOLE RECORD			Last Edited: 12-MAY-2013 06:11
Bit Size inches	Depth From metres	Depth To metres	
12.250	0.00	97.00	
8.750	97.00	489.70	

CASING RECORD				
Type	Size inches	Depth From metres	Shoe Depth metres	Weight pounds/ft
SURFACE	9.625	0.00	95.90	36.00

REMARKS

RUN NUMBER 1 IS THE PRIMARY DEPTH REFERENCE LOG. ALL OTHER RUNS ARE CORRELATED BACK TO THIS LOG.

SOFTWARE ISSUE: VERSION 13.05.9583, FEB 28, 2013.

CUSTOMER SCALES AND INTERVALS LOGGED.

RUN 1: HFS, MMR,MDL,MSS, MPD, MBN, MCG, MBE, MBE, MCB TOOLS RAN IN COMBINATION.
- TIME ON BOTTOM:03:15 / 12 MAY 2013.

HARDWARE
RUN 1:

- MBE: 2 X 1" STANDOFF.
- MSS: 3 X 1.5" STANDOFF.
- MMR: 2 X 1" STANDOFF.
- MUG: 2 X 1" STANDOFF.

MPD CORRECTED FOR CALIPER AND MUD DENSITY.

CLIENT INFORMED ABOUT LOGGER T.D. AND DRILLER T.D. DIFFERENCE

CLIENT INFORMED THAT MICRORESISTIVITY CURVE NOT INCLUDE IN THE LOG DUE TO FAILURE OF THE MMR CALIPER ,

KCL % NOT PROVIDED ON SITE.

GR NOT ENVIROMENTAL CORRECTED.

TOTAL HOLE VOLUME (HVOL) FROM T.D. TO 9.625" SURFACE CASING SHOE = 14.5 CUBIC METRES.

TOTAL ANNULAR VOLUME (AVOL) FROM T.D. TO CASING SHOE WITH 7" PRODUCTION CASING = 5.2 CUBIC METRES.

MAXIMUM TEMPERATURE RECORDED 37.4 DEG AT 462.8 METRES.

CONVEYANCE TYPE: WIRELINE.

BOREHOLE STATUS: OPEN HOLE.

RIG: ENSIGN 50.

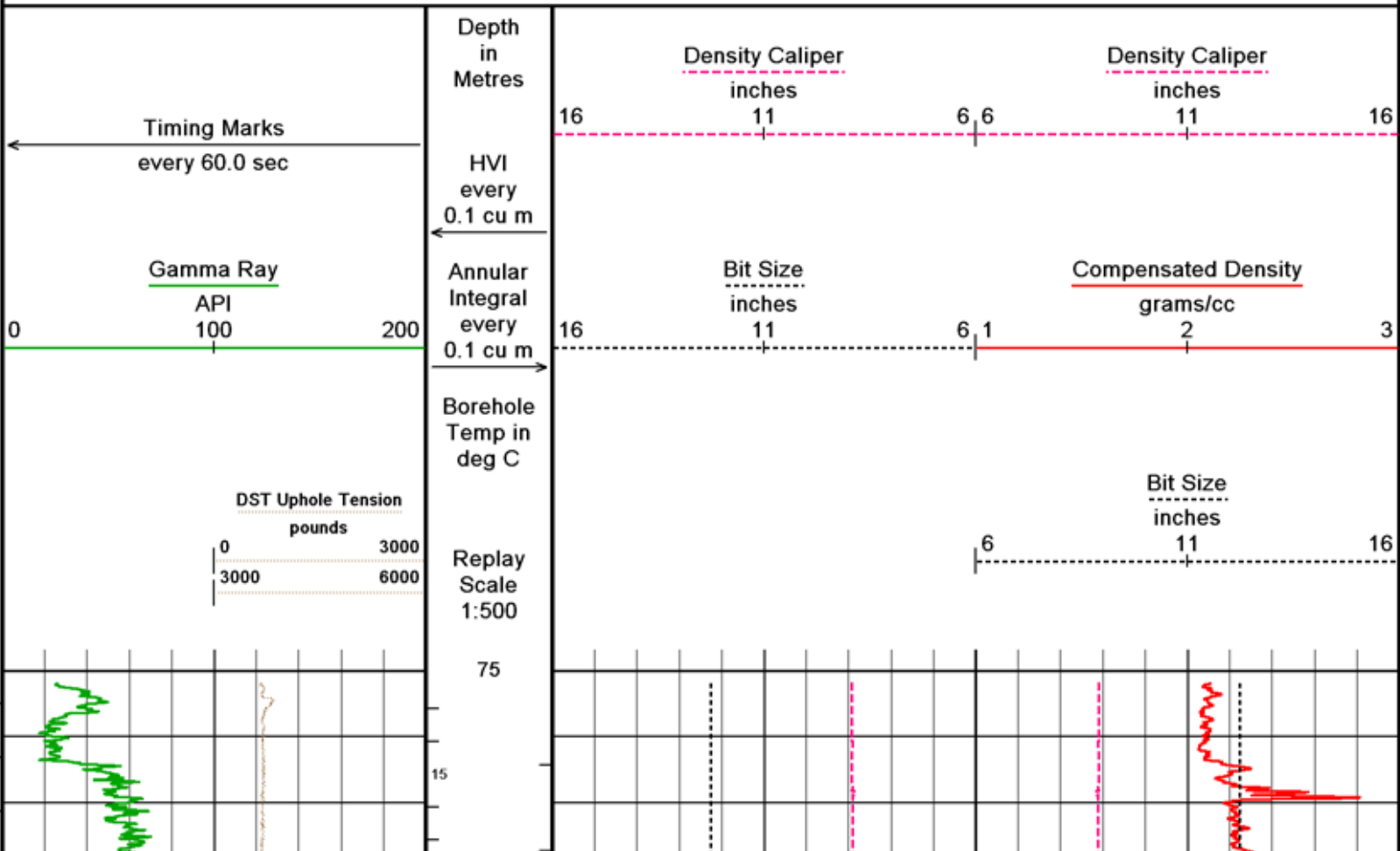
SERVICE REPORT NUMBER: 40150

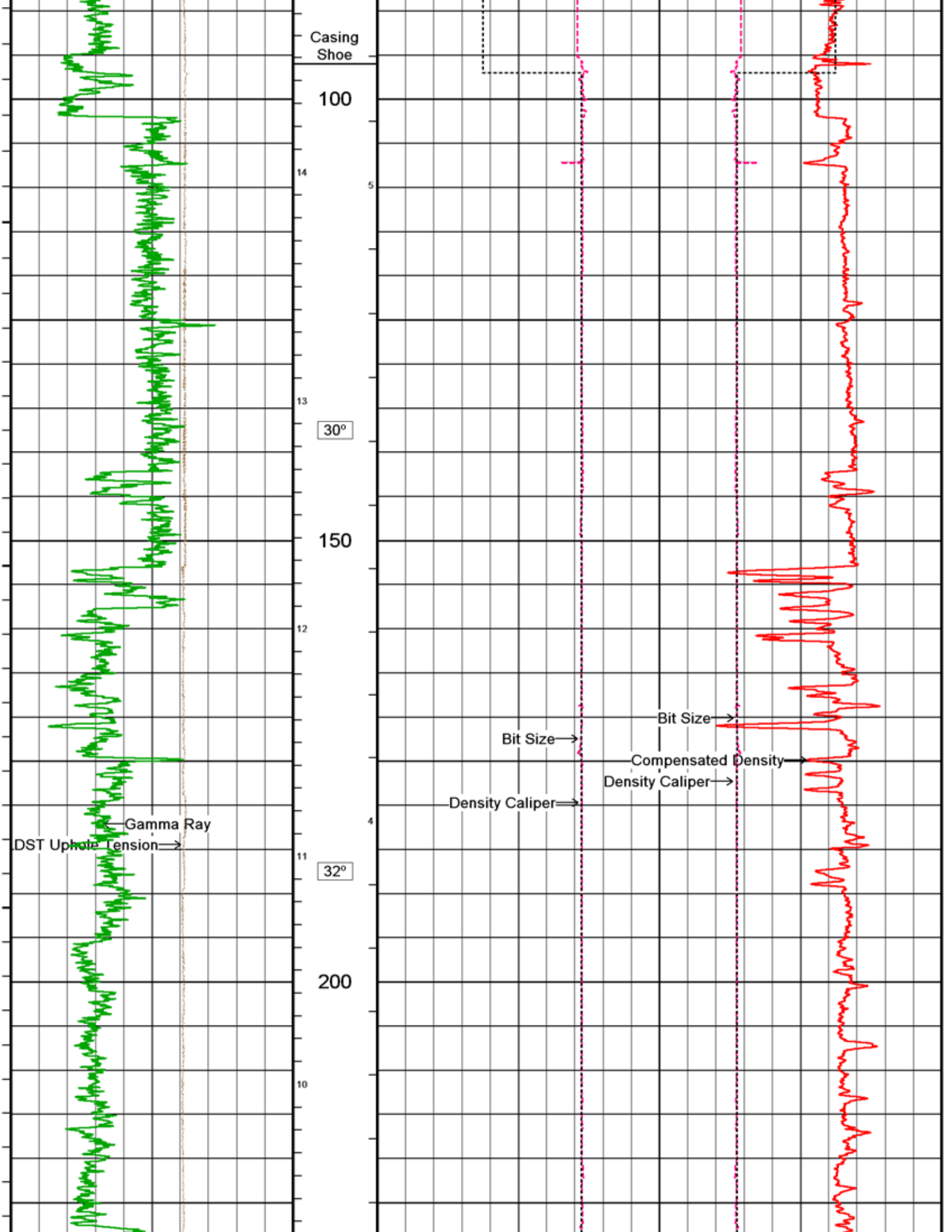
LOGGING CREW: ENGINEERS - N. SARMIENTO J. KOKONAS, OPERATORS: G. HANSEN, P. GARBUTT

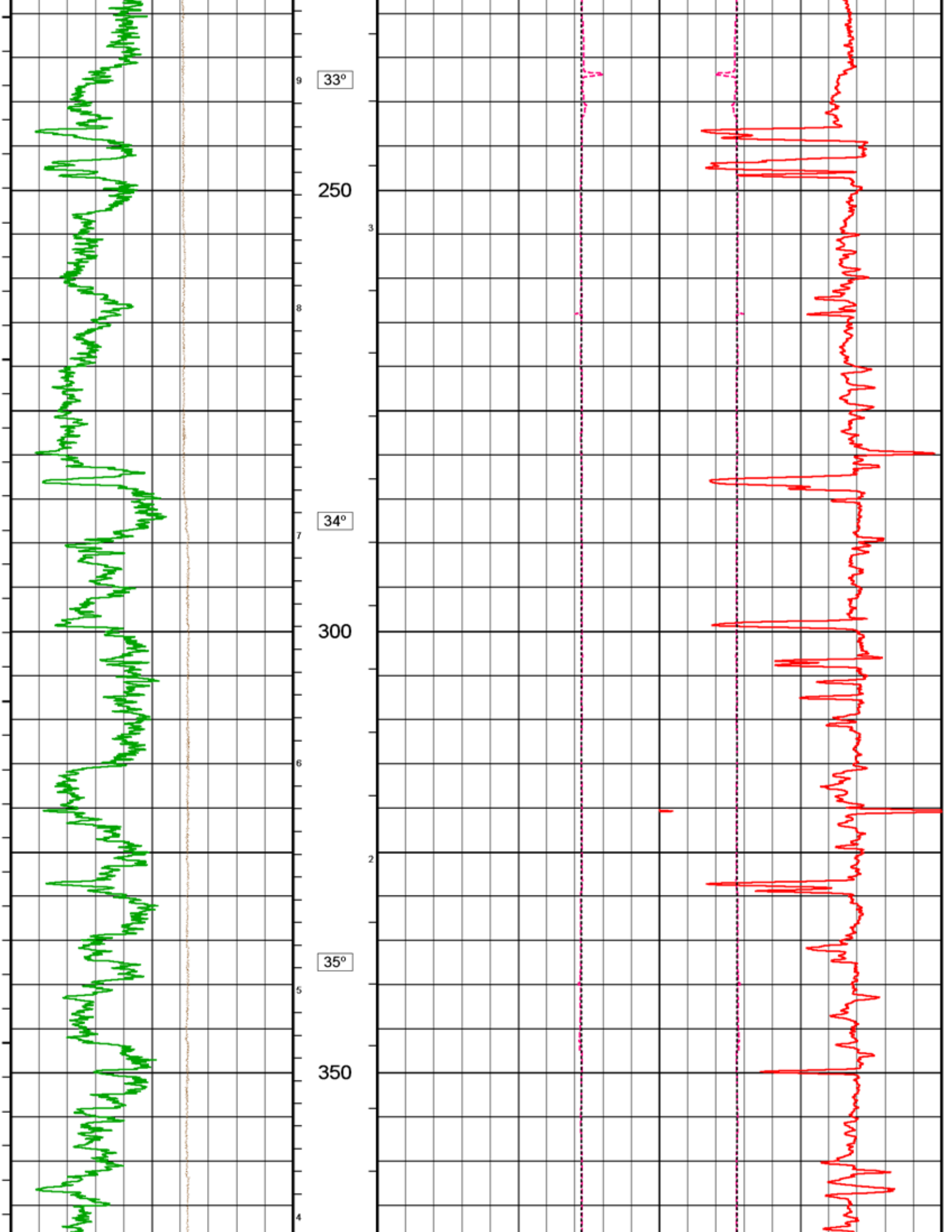
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.

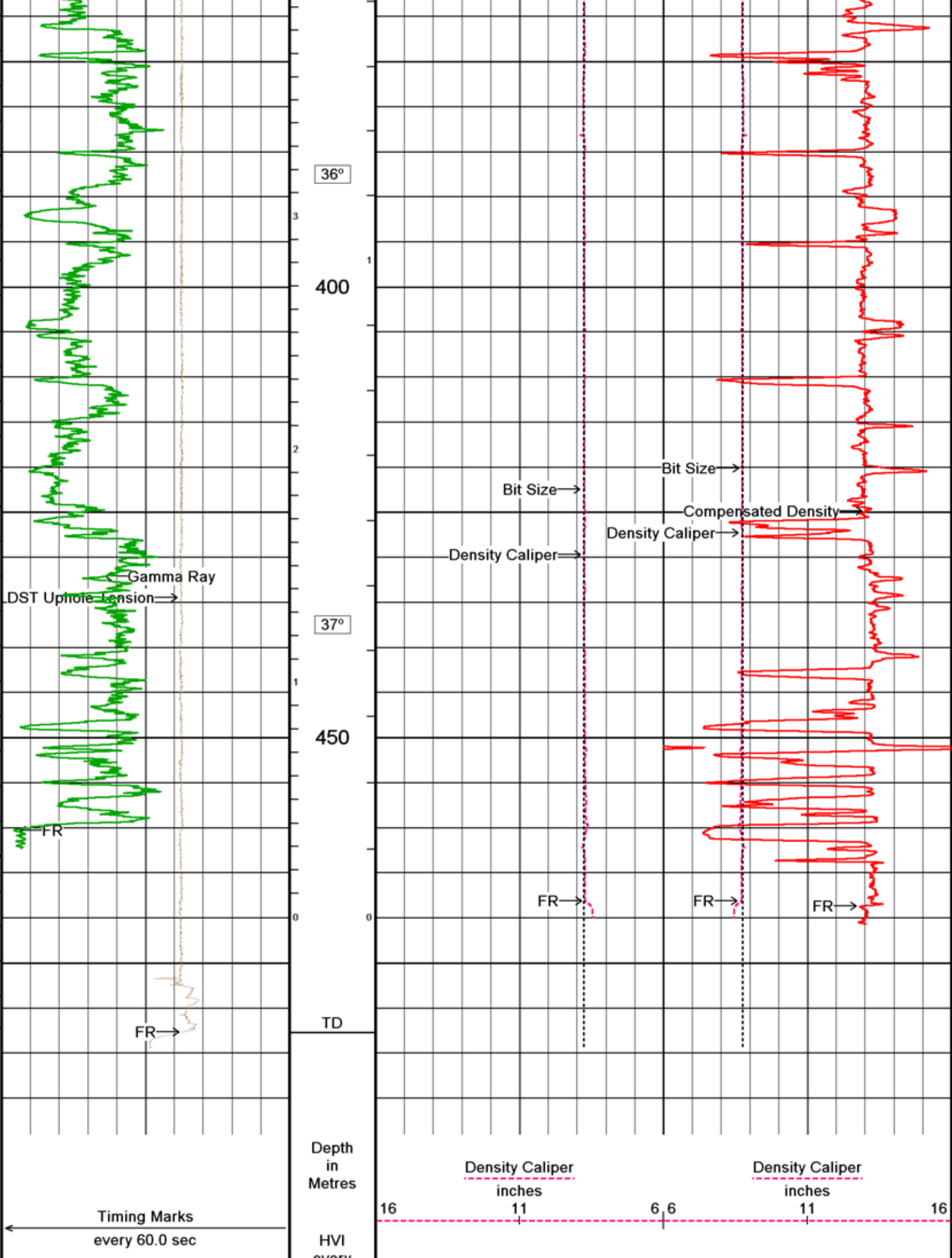
MAIN LOG 1:500

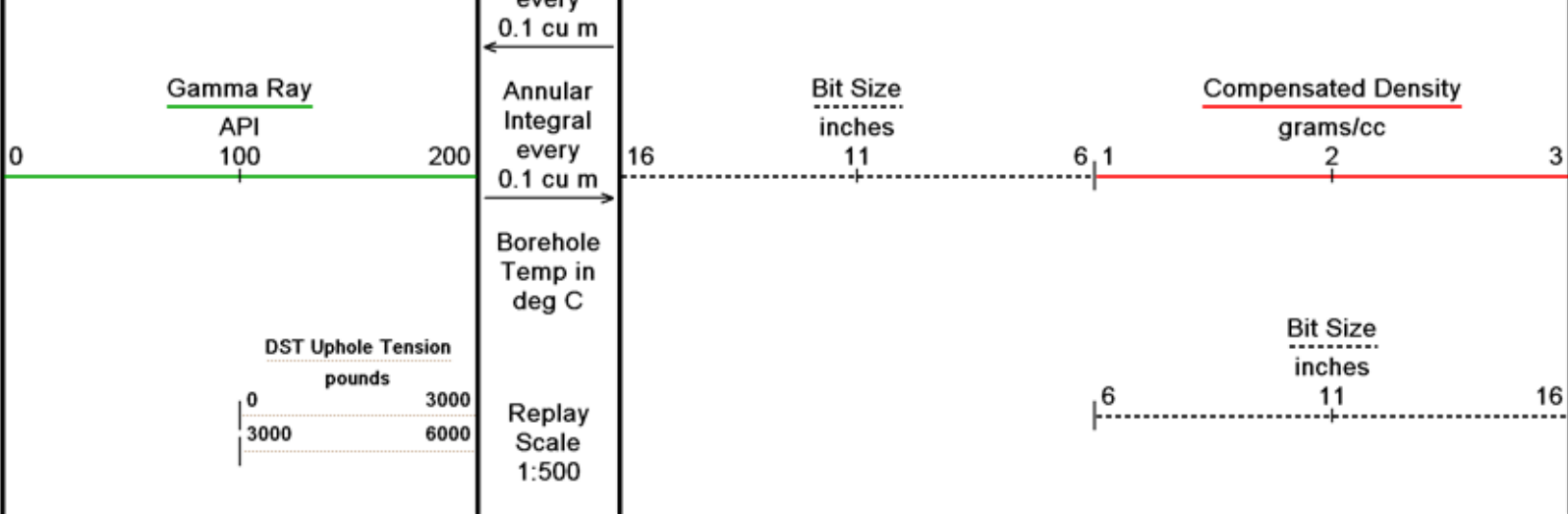
Depth Based Data - Maximum Sampling Increment 2.5cm Plotted on 12-MAY-2013 07:09
 Filename: ...IRM03-41-1_WL_SUITE1_RUN1_RT_MMR-MDL-MSS-MPD-MBN-MCG_HIRES_FINAL.dta Recorded on 12-MAY-2013 03:15
 System Versions: Processed with 13.05.9583 Plotted with 13.06.9284











Depth Based Data - Maximum Sampling Increment 2.5cm
 Plotted on 12-MAY-2013 07:09
 Filename: ...IRM03-41-1_WL_SUITE1_RUN1_RT_MMR-MDL-MSS-MPD-MBN-MCG_HIRES_FINAL.dta
 Recorded on 12-MAY-2013 03:15
 System Versions: Processed with 13.05.9583 Plotted with 13.06.9284

MAIN LOG 1:500

BEFORE SURVEY CALIBRATION
 C:\DOCUME~1\Owner\LOCALS~1\Tem...IRM03-41-1_WL_SUITE1_RUN1_RT_MMR-MDL-MSS-MPD-MBN-MCG_HIRES_FINAL.dta

General Constants All 000 Last Edited on 12-MAY-2013,02:36

General Parameters		
Mud Resistivity	14.000	ohm-metres
Mud Resistivity Temperature	25.000	degrees C
Water Level	0.000	metres
Borehole Fluid Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	7.000	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Deep Laterolog	
RWA Constant A	0.610	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	

High Resolution Temperature Calibration MCG-C 213			Field Calibration on 30-APR-2013,12:12
	Measured	Calibrated(Deg C)	
Lower	0.00	0.00	
Upper	100.00	100.00	

High Resolution Temperature Constants MCG-C 213			Last Edited on 30-APR-2013,12:12
Pre-filter Length	11		

Gamma Calibration MCG-C 213			Field Calibration on 12-MAY-2013 00:10
	Measured	Calibrated (API)	
Background	52	36	
Calibrator (Gross)	915	630	
Calibrator (Net)	863	594	

Gamma Constants MCG-C 213			Last Edited on 12-MAY-2013,02:37
Gamma Calibrator Number	GRC.C185		
Mud Density	1.00	gm/cc	
Caliper Source for Processing	Density Caliper		

Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

Magnetometer Parameters MBN-C.A 27

Date Of Last Magnetometer Calibration	01-JAN-1998		
	X Magnetometer	Y Magnetometer	Z Magnetometer
Slope	-1.000000	1.012426	0.984292
Offset	0.005135	0.017720	-0.006533

Magnetometer Constants MBN-C.A 27

Last Edited on 15-MAR-2009,11:39

Magnetometer Calibrator Number	000
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Navigation Constants MBN-C.A 27

Last Edited on 12-MAY-2013,02:58

Magnetic Declination	9.67	degrees	East
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Accelerometer Parameters MBN-C.A 27

Date Of Last Accelerometer Calibration	01-JAN-1998		
	X Accelerometer	Y Accelerometer	Z Accelerometer
Slope	-1.112780	-1.103820	-1.102650
Offset	0.009109	0.005046	0.009708

Accelerometer Constants MBN-C.A 27

Last Edited on 27-JUL-2008,15:49

Accelerometer Calibrator Number	000
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Accelerometer Temperature Characterisation
X Accelerometer

Serial Number	246			
Calibration Date	01-Jan-1998			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	5.42762e-006	-8.86262e-009	1.12365e-010
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.71195e-004	4.23884e-007	2.27015e-010

Y Accelerometer

Serial Number	247			
Calibration Date	01-Jan-1998			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	3.16792e-005	-4.76074e-008	-5.50853e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.85656e-004	6.24425e-007	-5.26030e-010

Z Accelerometer

Serial Number	248			
Calibration Date	01-Jan-1998			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	-3.72399e-005	1.26911e-008	1.45626e-010
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.81913e-004	5.63686e-007	-5.40552e-010

Caliper Calibration MPD-C.A 222

 Base Calibration on 12-MAY-2013 00:33
 Field Calibration on 12-MAY-2013 00:34

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	17760	4.01
2	25944	5.99
3	34352	7.98
4	42576	9.86
5	51760	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
8.01	7.98

Photo Density Calibration MPD-C.A 222

 Base Calibration on 07-MAY-2013 15:35
 Field Check on 12-MAY-2013 00:17

Density Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	54709	27046	59513	30777
Reference 2	22419	2661	24663	2534

Field Check at Base
1485.0 1462.7

Field Check
1478.7 1457.9

PE Calibration	Base Calibration	Measured		Calibrated Ratio
		WS	WH	
			Ratio	
Background	269	1333		
Reference 1	22523	54493	0.419	0.372
Reference 2	6240	22255	0.285	0.269

Field Check at Base
268.7 1333.5

Field Check
268.6 1329.4

Density Constants MPD-C.A 222

Last Edited on 07-MAY-2013,15:19

Density Source Id NSD-15756
 Nylon Calibrator Number DNCE697
 Aluminium Calibrator Number DACD638
 Density Shoe Profile 8 inch
 Caliper Source for Processing Density Caliper
 PE Correction to Density Not Applied
 Mud Density 1.00 gm/cc
 Mud Density Z/A Multiplier 1.11
 Mud Filtrate Density 1.00 gm/cc
 Dry Hole Mud Filtrate Density 1.00 gm/cc
 DNCT 0.00 gm/cc
 CRCT 0.00 gm/cc
 Density Z/A Correction Hybrid

Matrix density (gm/cc)	Depth (m)
2.71	
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

DOWNHOLE EQUIPMENT

C:\DOCUME~1\Owner\LOCALS~1\Tem...IRM03-41-1_WL_SUITE1_RUN1_RT_MMR-MDL-MSS-MPD-MBN-MCG_HIRES_FINAL.dta

MCB-A 11B Tension Cablehead
 MCB-A 104 LG: 0.66 m WT: 19.8 lb OD: 57 mm

Compact Stiff Bridle Electrode Sub.
 MBE-D.A 357 LG: 3.76 m WT: 77.2 lb OD: 57 mm

Compact Stiff Bridle Electrode Sub.
 MBE-D.A 355 LG: 3.76 m WT: 77.2 lb OD: 57 mm



25.84 m SPDL - Spontaneous Potential

Compact Comms Gamma
MCG-C 213 LG: 2.65 m WT: 63.9 lb OD: 57 mm

21.50 m GRGC - Gamma Ray
20.61 m CGXT - MCG External Temperature

Compact Navigation
MBN-C.A 27 LG: 3.60 m WT: 70.5 lb OD: 57 mm

16.82 m BTLT - Borehole Tilt

Compact Linker
MLK-E.A 115 LG: 1.53 m WT: 50.7 lb OD: 57 mm

Compact Density/Caliper
MPD-C.A 222 LG: 2.92 m WT: 90.4 lb OD: 62 mm

13.72 m AVOL - Annular Volume
13.72 m HVOL - Hole Volume
13.72 m CLDC - Density Caliper
13.14 m HDEN - Vectar Processed Density
13.14 m DEN - Compensated Density
13.14 m DCOR - Density Correction
13.12 m PDPE - PE

Compact Sonic
MSS-C.K 306 LG: 3.82 m WT: 72.8 lb OD: 57 mm

10.46 m TR11 - 4' Transit Time
10.31 m TR21 - 3' Transit Time
10.15 m TR12 - 6' Transit Time
10.00 m TR22 - 5' Transit Time

Compact Upper Guard sub
MUG-B.B 317 LG: 2.74 m WT: 68.3 lb OD: 57 mm

9.24 m DT35 - 3-5' Compensated Sonic

Compact Laterolog Electrode Sub.
MLE-C.A 109 LG: 3.76 m WT: 92.6 lb OD: 57 mm

3.93 m DSLL - Shallow Laterolog
3.93 m DDLL - Deep Laterolog

Compact Micro-Resistivity
MMR-B.A 125 LG: 2.62 m WT: 81.6 lb OD: 129 mm

0.00 m MRRS - MicroRes Resistance (S)
0.30 m MATC - MMR Caliper
Tool Zero (0.85m from bottom)

Pressure Bung + Hole Finder
HFS 3 LG: 0.28 m WT: 6.6 lb OD: 57 mm

-0.85 m SMTU - DST Uphole Tension
All measurements relative to tool zero.

Total Length: 32.10 m Weight: 771.6 lb



COMPANY SANTOS LTD
WELL RM03-41-1
FIELD ROMA
PROVINCE/COUNTY QUEENSLAND
COUNTRY/STATE AUSTRALIA

Elevation Kelly Bushing	373.80	metres	First Reading		metres
Elevation Drill Floor	373.80	metres	Depth Driller	489.70	metres
Elevation Ground Level	369.50	metres	Depth Logger	482.70	metres



Weatherford[®]

HOLE VOLUME LOG

1:500 MD

Appendix 5

Surveyed Well Path



Weatherford®

BOREHOLE NAVIGATION

COMPANY	SANTOS LTD
WELL	RM03-41-1
FIELD	ROMA
PROVINCE/COUNTY	QUEENSLAND
COUNTRY/STATE	AUSTRALIA
LOCATION	PL309

Latitude	26° 22' 09.37" S	Other Services	
Longitude	149° 8' 20.27" E	COMPESATED SONIC	
		PHOTO DENSITY	
		DUAL LATEROLOG	

Permanent Datum M.S.L., Elevation	369.5 metres	Elevations:	metres
Log Measured From DF		KB	373.80
Drilling Measured From D.F. @ 373.8 m		DF	373.80
		GL	369.50

Date	12-MAY-2013		
Run Number	1		
Service Order	40150		
Depth Driller	489.70	metres	
Depth Logger	482.70	metres	
First Reading	477.90	metres	
Last Reading	76.00	metres	
Casing Driller	95.90	metres	
Casing Logger	96.00	metres	
Bit Size	8.750	inches	
Hole Fluid Type	WATER		
Density / Viscosity	1.00 g/c3	26.00 sec/qt	
PH / Fluid Loss	8.40		
Sample Source	MUD TANK		
Rm @ Measured Temp	14.0 @ 25.0	ohm-m	
Rmf @ Measured Temp	N/A		
Rmc @ Measured Temp	N/A		
Source Rmf / Rmc	N/A	N/A	
Rm @ BHT	1.59 @ 37.0	ohm-m	
Time Since Circulation	4 HRS 15 MIN		
Max Recorded Temp	37.00	deg C	
Equipment / Base	11564	ROMA	
Recorded By	J. KOKONAS		N. SARMIENTO
Witnessed By	S. FRASER		
Stop Circulation	23:15 / 11MAY 2013		

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.

REMARKS

RUN NUMBER 1 IS THE PRIMARY DEPTH REFERENCE LOG. ALL OTHER RUNS ARE CORRELATED BACK TO THIS LOG.

SOFTWARE ISSUE: VERSION 13.05.9583, FEB 28, 2013.

CUSTOMER SCALES AND INTERVALS LOGGED.

RUN 1: HFS, MMR,MDL,MSS, MPD, MBN, MCG, MBE, MBE, MCB TOOLS RAN IN COMBINATION.
- TIME ON BOTTOM:03:15 / 12 MAY 2013.

HARDWARE
RUN 1:

- MBE: 2 X 1" STANDOFF.
- MSS: 3 X 1.5" STANDOFF.
- MMR: 2 X 1" STANDOFF.
- MUG: 2 X 1" STANDOFF.

MPD CORRECTED FOR CALIPER AND MUD DENSITY.

CLIENT INFORMED ABOUT LOGGER T.D. AND DRILLER T.D. DIFFERENCE
 # CLIENT INFORMED THAT MICRORESISTIVITY CURVE NOT INCLUDE IN THE LOG DUE TO FAILURE OF THE MMR CALIPER ,
 # KCL % NOT PROVIDED ON SITE.
 # GR NOT ENVIROMENTAL CORRECTED.
 # TOTAL HOLE VOLUME (HVOL) FROM T.D. TO 9.625" SURFACE CASING SHOE = 14.5 CUBIC METRES.
 # TOTAL ANNULAR VOLUME (AVOL) FROM T.D. TO CASING SHOE WITH 7" PRODUCTION CASING = 5.2 CUBIC METRES.
 # MAXIMUM TEMPERATURE RECORDED 37.4 DEG AT 462.8 METRES.
 # CONVEYANCE TYPE: WIRELINE.
 # BOREHOLE STATUS: OPEN HOLE.
 # RIG: ENSIGN 50.
 # SERVICE REPORT NUMBER: 40150
 # LOGGING CREW: ENGINEERS - N. SARMIENTO J. KOKONAS, OPERATORS: G. HANSEN, P. GARBUTT

Verticality Analysis Interpretation Notes

12-MAY-2013 07:05

All plotted output is automatically scaled to obtain the best visual effect within the physical space available. The maximum scales being 1:50000(metric) and 1:48000(imperial), and the minimum 1:1.

The analysis is derived by integrating 10cm sampled data down the borehole. The listing supplied will contain a maximum of 200 points in multiples of 1, 2, 5, 10, 20, 50 or 100 metres/feet depending on the total range of the analysis. However, the analysis is calculated for the entire range of the borehole and the final borehole position is included in the listing.

Computed verticality may only be fully derived in open sections of the borehole, away from the influence of any unusual magnetic effects, (as the azimuth calculations are derived from three solid state magnetometers). So the analysis will generally begin at the end of the casing and all borehole positional information will relate to this depth.

Up to ten cross sections may be requested for any borehole to be displayed at any scale, (the default scale is that of the cross-section for the entire hole).

Borehole positional error is derived assuming the following parameters.

	TILT (degrees)	AZIMUTH (degrees)
Typical Error	+/- 0.1000	+/- 5.0000
Maximum Error	+/- 0.2000	+/- 8.0000

Error analysis may be calculated and plotted from the data listing as follows:

- a) Plot the four coordinates from the error listing (based upon zero azimuth error) on a target plot. Origin at the start of the analysis.
- b) Describe arcs of +/- 10.00 degrees and +/- 15.00 degrees (centre at the origin) through the inner and outer points respectively.
- c) Connect the respective arcs together with straight lines to give the typical and maximum borehole positional error.

Given below is a full description of the parameters displayed on the ensuing listing:

LOG DEPTH	The depth recorded on the field logs for the borehole.
TRUE DEPTH	The true vertical depth corresponding to the above depth. Corrected from the start of the analysis.
HOLE TILT AND AZIMUTH	The sampled borehole orientation.

AXIAL COORDINATES

The coordinates North and East from the target origin.

POLAR COORDINATES

The polar or radial coordinates of the borehole.

ERROR COORDINATES

The polar coordinates corresponding to the typical and maximum tilt error.

N.B. The reference point for all bearing angles on this listing is given at the top of each sheet.

Verticality Data Listing

D:\Logs\SANTOS\IRM03-41-1\IRM03-41-1_WL_SUITE1_RUN1_RT_MMR-MDL-MSS-MPD-MBN-MCG_STDRES_FINAL.dta

All Co-ordinates With Respect To True North, all depths in metres

Date Processed: 12-MAY-2013

First Depth 95.90, 0.00 North, 0.00 East of Origin

Date Logged: 12-MAY-2013

DEPTHS		BOREHOLE		AXIAL CO-ORDS		POLAR		POLAR ERROR CO-ORDINATES (MAXIMUM & TYPICAL)							
Log	True	Tilt	Azi	North	East	Brg	Radius	Brg	Radius	Brg	Radius	Brg	Radius	Brg	Radius
97.00	97.00	1.0	6.1	0.01	0.00	1	0.01	1	0.02	1	0.01	1	0.01	1	0.01
99.00	99.00	0.9	17.1	0.03	0.01	14	0.03	14	0.04	14	0.02	14	0.04	14	0.03
101.00	101.00	0.8	353.4	0.06	0.00	4	0.06	4	0.08	4	0.04	4	0.07	4	0.05
103.00	103.00	0.8	354.2	0.09	0.00	1	0.09	1	0.11	1	0.06	1	0.10	1	0.07
105.00	105.00	0.8	356.0	0.11	-0.00	360	0.11	360	0.15	360	0.08	360	0.13	360	0.10
107.00	107.00	0.8	356.9	0.14	-0.00	359	0.14	359	0.18	359	0.10	359	0.16	359	0.12
109.00	109.00	0.8	351.1	0.17	-0.01	358	0.17	358	0.21	358	0.12	358	0.19	358	0.14
111.00	111.00	0.8	345.8	0.19	-0.01	356	0.19	356	0.25	356	0.14	356	0.22	356	0.17
113.00	113.00	0.8	344.1	0.22	-0.02	355	0.22	355	0.28	355	0.16	355	0.25	355	0.19
115.00	115.00	0.8	341.3	0.25	-0.03	353	0.25	353	0.31	353	0.18	353	0.28	353	0.21
117.00	117.00	0.9	335.1	0.27	-0.04	351	0.28	351	0.35	351	0.20	351	0.31	351	0.24
119.00	119.00	0.9	331.6	0.30	-0.06	349	0.31	349	0.39	349	0.22	349	0.35	349	0.26
121.00	121.00	0.9	329.8	0.33	-0.07	348	0.34	348	0.42	348	0.25	348	0.38	348	0.29
123.00	123.00	0.9	326.6	0.35	-0.09	346	0.37	346	0.46	346	0.27	346	0.41	346	0.32
125.00	125.00	1.0	325.5	0.38	-0.11	344	0.40	344	0.50	344	0.30	344	0.45	344	0.35
127.00	127.00	1.0	325.3	0.41	-0.13	343	0.43	343	0.54	343	0.32	343	0.48	343	0.38
129.00	129.00	1.1	322.8	0.44	-0.15	341	0.46	341	0.58	341	0.35	341	0.52	341	0.41
131.00	131.00	1.0	323.6	0.47	-0.17	340	0.50	340	0.62	340	0.38	340	0.56	340	0.44
133.00	133.00	1.1	324.4	0.50	-0.19	339	0.53	339	0.66	339	0.41	339	0.60	339	0.47
135.00	135.00	1.1	322.2	0.53	-0.22	338	0.57	338	0.71	338	0.44	338	0.64	338	0.50
137.00	136.99	1.2	322.1	0.56	-0.24	337	0.61	337	0.75	337	0.47	337	0.68	337	0.54
139.00	138.99	1.2	321.4	0.59	-0.27	336	0.65	336	0.80	336	0.50	336	0.73	336	0.58
141.00	140.99	1.2	322.2	0.63	-0.29	335	0.69	335	0.85	335	0.53	335	0.77	335	0.61
143.00	142.99	1.2	326.0	0.66	-0.32	334	0.73	334	0.90	334	0.57	334	0.81	334	0.65
145.00	144.99	1.2	324.4	0.69	-0.34	334	0.77	334	0.94	334	0.60	334	0.86	334	0.69
147.00	146.99	1.1	321.0	0.73	-0.37	333	0.81	333	0.99	333	0.63	333	0.90	333	0.72
149.00	148.99	1.2	320.2	0.76	-0.39	333	0.85	333	1.04	333	0.67	333	0.95	333	0.76
151.00	150.99	1.2	320.4	0.79	-0.42	332	0.89	332	1.09	332	0.70	332	0.99	332	0.80
153.00	152.99	1.3	319.2	0.82	-0.45	331	0.94	331	1.14	331	0.74	331	1.04	331	0.84
155.00	154.99	1.3	317.8	0.86	-0.48	331	0.98	331	1.19	331	0.77	331	1.08	331	0.88
157.00	156.99	1.3	316.9	0.89	-0.51	330	1.02	330	1.24	330	0.81	330	1.13	330	0.92
159.00	158.99	1.3	315.9	0.92	-0.54	330	1.07	330	1.29	330	0.85	330	1.18	330	0.96
161.00	160.99	1.3	317.5	0.96	-0.57	329	1.11	329	1.34	329	0.89	329	1.23	329	1.00
163.00	162.99	1.4	318.0	0.99	-0.60	329	1.16	329	1.40	329	0.93	329	1.28	329	1.05
165.00	164.99	1.4	318.7	1.03	-0.64	328	1.21	328	1.45	328	0.97	328	1.33	328	1.09
167.00	166.99	1.4	316.5	1.06	-0.67	328	1.26	328	1.51	328	1.01	328	1.38	328	1.13
169.00	168.99	1.4	312.4	1.10	-0.71	327	1.30	327	1.56	327	1.05	327	1.43	327	1.18
171.00	170.99	1.4	312.9	1.13	-0.74	327	1.35	327	1.61	327	1.09	327	1.48	327	1.22
173.00	172.99	1.4	316.3	1.17	-0.78	326	1.40	326	1.67	326	1.13	326	1.54	326	1.27
175.00	174.99	1.5	316.3	1.20	-0.81	326	1.45	326	1.73	326	1.17	326	1.59	326	1.31
177.00	176.98	1.5	315.1	1.24	-0.85	326	1.50	326	1.78	326	1.22	326	1.64	326	1.36
179.00	178.98	1.4	314.2	1.27	-0.88	325	1.55	325	1.84	325	1.26	325	1.70	325	1.41
181.00	180.98	1.4	315.2	1.31	-0.92	325	1.60	325	1.90	325	1.30	325	1.75	325	1.45
183.00	182.98	1.4	315.2	1.34	-0.95	325	1.65	325	1.95	325	1.34	325	1.80	325	1.50
185.00	184.98	1.4	314.6	1.38	-0.99	324	1.70	324	2.01	324	1.39	324	1.85	324	1.54
187.00	186.98	1.4	314.6	1.41	-1.02	324	1.75	324	2.06	324	1.43	324	1.91	324	1.59
189.00	188.98	1.5	314.6	1.45	-1.06	324	1.80	324	2.12	324	1.47	324	1.96	324	1.63
191.00	190.98	1.4	315.0	1.49	-1.10	324	1.85	324	2.18	324	1.51	324	2.01	324	1.68
193.00	192.98	1.4	315.0	1.53	-1.13	323	1.90	323	2.23	323	1.55	323	2.07	323	1.73

193.00	192.98	1.4	315.3	1.52	-1.13	323	1.90	323	2.23	323	1.56	323	2.07	323	1.73
195.00	194.98	1.4	312.7	1.56	-1.17	323	1.95	323	2.29	323	1.60	323	2.12	323	1.77
197.00	196.98	1.4	311.4	1.59	-1.21	323	1.99	323	2.35	323	1.64	323	2.17	323	1.82
199.00	198.98	1.3	310.5	1.62	-1.24	323	2.04	323	2.40	323	1.68	323	2.22	323	1.86
201.00	200.98	1.3	311.0	1.65	-1.28	322	2.08	322	2.45	322	1.72	322	2.27	322	1.90
203.00	202.98	1.3	310.9	1.68	-1.31	322	2.13	322	2.50	322	1.76	322	2.32	322	1.94
205.00	204.98	1.4	310.5	1.71	-1.35	322	2.18	322	2.56	322	1.80	322	2.37	322	1.99
207.00	206.98	1.4	311.8	1.74	-1.39	322	2.23	322	2.61	322	1.84	322	2.42	322	2.03
209.00	208.97	1.4	313.1	1.78	-1.42	321	2.28	321	2.67	321	1.88	321	2.47	321	2.08
211.00	210.97	1.4	312.4	1.81	-1.46	321	2.32	321	2.72	321	1.92	321	2.52	321	2.12
213.00	212.97	1.4	312.4	1.84	-1.49	321	2.37	321	2.78	321	1.96	321	2.57	321	2.17
215.00	214.97	1.4	310.7	1.87	-1.53	321	2.42	321	2.83	321	2.00	321	2.63	321	2.21
217.00	216.97	1.4	311.2	1.91	-1.57	321	2.47	321	2.89	321	2.05	321	2.68	321	2.26
219.00	218.97	1.5	311.1	1.94	-1.60	320	2.52	320	2.95	320	2.09	320	2.73	320	2.30
221.00	220.97	1.5	311.6	1.97	-1.64	320	2.57	320	3.00	320	2.13	320	2.79	320	2.35
223.00	222.97	1.4	313.4	2.01	-1.68	320	2.62	320	3.06	320	2.17	320	2.84	320	2.40
225.00	224.97	1.4	314.0	2.04	-1.71	320	2.66	320	3.12	320	2.21	320	2.89	320	2.44
227.00	226.97	1.4	313.0	2.07	-1.75	320	2.71	320	3.17	320	2.25	320	2.94	320	2.48
229.00	228.97	1.3	314.2	2.11	-1.78	320	2.76	320	3.22	320	2.29	320	2.99	320	2.53
231.00	230.97	1.3	315.4	2.14	-1.81	320	2.80	320	3.27	320	2.33	320	3.04	320	2.57
233.00	232.97	1.2	316.4	2.17	-1.84	320	2.84	320	3.32	320	2.37	320	3.08	320	2.60
235.00	234.97	1.2	316.2	2.20	-1.87	320	2.89	320	3.37	320	2.40	320	3.13	320	2.64
237.00	236.97	1.2	314.9	2.23	-1.90	320	2.93	320	3.42	320	2.43	320	3.17	320	2.68
239.00	238.97	1.2	313.3	2.26	-1.93	319	2.97	319	3.47	319	2.47	319	3.22	319	2.72
241.00	240.97	1.2	313.2	2.29	-1.96	319	3.01	319	3.52	319	2.51	319	3.26	319	2.76
243.00	242.97	1.2	310.1	2.31	-1.99	319	3.05	319	3.57	319	2.54	319	3.31	319	2.80
245.00	244.97	1.2	308.1	2.34	-2.03	319	3.10	319	3.62	319	2.58	319	3.36	319	2.84
247.00	246.96	1.3	305.6	2.37	-2.06	319	3.14	319	3.67	319	2.61	319	3.40	319	2.88
249.00	248.96	1.3	307.3	2.39	-2.10	319	3.19	319	3.72	319	2.65	319	3.45	319	2.92
251.00	250.96	1.4	306.9	2.42	-2.14	319	3.23	319	3.77	319	2.69	319	3.50	319	2.96
253.00	252.96	1.4	305.5	2.45	-2.18	318	3.28	318	3.83	318	2.73	318	3.56	318	3.01
255.00	254.96	1.4	305.9	2.48	-2.22	318	3.33	318	3.88	318	2.77	318	3.61	318	3.05
257.00	256.96	1.4	304.3	2.51	-2.26	318	3.38	318	3.94	318	2.81	318	3.66	318	3.10
259.00	258.96	1.3	304.2	2.53	-2.30	318	3.42	318	3.99	318	2.85	318	3.71	318	3.14
261.00	260.96	1.2	306.4	2.56	-2.33	318	3.46	318	4.04	318	2.89	318	3.75	318	3.18
263.00	262.96	1.2	307.9	2.59	-2.37	318	3.51	318	4.09	318	2.92	318	3.80	318	3.21
265.00	264.96	1.2	307.9	2.61	-2.40	317	3.55	317	4.14	317	2.96	317	3.84	317	3.25
267.00	266.96	1.2	307.8	2.64	-2.44	317	3.59	317	4.19	317	2.99	317	3.89	317	3.29
269.00	268.96	1.2	308.5	2.67	-2.47	317	3.63	317	4.24	317	3.03	317	3.94	317	3.33
271.00	270.96	1.2	308.8	2.69	-2.50	317	3.68	317	4.29	317	3.07	317	3.98	317	3.37
273.00	272.96	1.2	310.4	2.72	-2.54	317	3.72	317	4.34	317	3.10	317	4.03	317	3.41
275.00	274.96	1.2	310.7	2.75	-2.57	317	3.76	317	4.39	317	3.14	317	4.08	317	3.45
277.00	276.96	1.2	311.2	2.78	-2.60	317	3.80	317	4.44	317	3.17	317	4.12	317	3.49
279.00	278.96	1.2	310.7	2.81	-2.63	317	3.85	317	4.49	317	3.21	317	4.17	317	3.53
281.00	280.96	1.2	310.8	2.83	-2.67	317	3.89	317	4.54	317	3.24	317	4.21	317	3.57
283.00	282.96	1.2	311.3	2.86	-2.70	317	3.93	317	4.59	317	3.28	317	4.26	317	3.61
285.00	284.96	1.2	311.7	2.89	-2.73	317	3.98	317	4.64	317	3.32	317	4.31	317	3.65
287.00	286.95	1.2	311.3	2.92	-2.76	317	4.02	317	4.68	317	3.35	317	4.35	317	3.68
289.00	288.95	1.2	310.9	2.94	-2.79	317	4.06	317	4.73	317	3.38	317	4.39	317	3.72
291.00	290.95	1.2	310.5	2.97	-2.82	316	4.10	316	4.78	316	3.42	316	4.44	316	3.76
293.00	292.95	1.1	312.2	3.00	-2.85	316	4.14	316	4.82	316	3.45	316	4.48	316	3.79
295.00	294.95	1.1	311.2	3.02	-2.88	316	4.18	316	4.87	316	3.48	316	4.52	316	3.83
297.00	296.95	1.2	310.8	3.05	-2.91	316	4.22	316	4.92	316	3.51	316	4.57	316	3.86
299.00	298.95	1.2	312.6	3.08	-2.94	316	4.26	316	4.97	316	3.55	316	4.61	316	3.90
301.00	300.95	1.2	314.4	3.11	-2.97	316	4.30	316	5.01	316	3.58	316	4.66	316	3.94
303.00	302.95	1.2	316.7	3.14	-3.00	316	4.34	316	5.06	316	3.62	316	4.70	316	3.98
305.00	304.95	1.2	317.6	3.17	-3.03	316	4.38	316	5.11	316	3.65	316	4.75	316	4.02
307.00	306.95	1.2	318.6	3.20	-3.06	316	4.42	316	5.16	316	3.69	316	4.79	316	4.06
309.00	308.95	1.3	319.6	3.23	-3.08	316	4.47	316	5.21	316	3.72	316	4.84	316	4.10
311.00	310.95	1.2	320.3	3.27	-3.11	316	4.51	316	5.26	316	3.76	316	4.89	316	4.14
313.00	312.95	1.3	320.4	3.30	-3.14	316	4.56	316	5.31	316	3.80	316	4.93	316	4.18
315.00	314.95	1.2	321.5	3.33	-3.17	316	4.60	316	5.36	316	3.83	316	4.98	316	4.22
317.00	316.95	1.2	323.0	3.37	-3.19	317	4.64	317	5.41	317	3.87	317	5.03	317	4.25
319.00	318.95	1.2	323.0	3.40	-3.22	317	4.68	317	5.46	317	3.90	317	5.07	317	4.29
321.00	320.95	1.3	325.8	3.44	-3.24	317	4.73	317	5.51	317	3.94	317	5.12	317	4.33
323.00	322.95	1.3	330.0	3.48	-3.27	317	4.77	317	5.56	317	3.98	317	5.17	317	4.38
325.00	324.95	1.4	330.7	3.52	-3.29	317	4.82	317	5.62	317	4.02	317	5.22	317	4.42
327.00	326.95	1.4	330.8	3.56	-3.31	317	4.87	317	5.67	317	4.06	317	5.27	317	4.46
329.00	328.94	1.4	329.5	3.61	-3.34	317	4.91	317	5.73	317	4.10	317	5.32	317	4.51
331.00	330.94	1.4	328.4	3.65	-3.37	317	4.96	317	5.78	317	4.14	317	5.37	317	4.55
333.00	332.94	1.5	327.8	3.69	-3.39	317	5.01	317	5.84	317	4.19	317	5.43	317	4.60
335.00	334.94	1.4	328.4	3.73	-3.42	318	5.06	318	5.89	318	4.23	318	5.48	318	4.65

335.00	334.94	1.4	328.7	3.73	-3.42	318	5.06	318	5.90	318	4.23	318	5.48	318	4.65
337.00	336.94	1.4	328.1	3.78	-3.45	318	5.11	318	5.95	318	4.27	318	5.53	318	4.69
339.00	338.94	1.4	328.8	3.82	-3.47	318	5.16	318	6.01	318	4.31	318	5.58	318	4.74
341.00	340.94	1.5	329.0	3.86	-3.50	318	5.21	318	6.07	318	4.36	318	5.64	318	4.78
343.00	342.94	1.4	329.5	3.90	-3.52	318	5.26	318	6.12	318	4.40	318	5.69	318	4.83
345.00	344.94	1.4	330.4	3.95	-3.55	318	5.31	318	6.17	318	4.44	318	5.74	318	4.87
347.00	346.94	1.4	330.2	3.99	-3.57	318	5.35	318	6.23	318	4.48	318	5.79	318	4.91
349.00	348.94	1.4	331.3	4.03	-3.59	318	5.40	318	6.28	318	4.52	318	5.84	318	4.96
351.00	350.94	1.3	332.1	4.07	-3.61	318	5.44	318	6.33	318	4.55	318	5.89	318	5.00
353.00	352.94	1.2	333.1	4.10	-3.63	318	5.48	318	6.38	318	4.58	318	5.93	318	5.03
355.00	354.94	1.2	333.7	4.14	-3.65	319	5.52	319	6.42	319	4.62	319	5.97	319	5.07
357.00	356.94	1.2	333.6	4.18	-3.67	319	5.56	319	6.47	319	4.65	319	6.02	319	5.10
359.00	358.94	1.2	333.0	4.21	-3.69	319	5.60	319	6.52	319	4.68	319	6.06	319	5.14
361.00	360.94	1.1	330.9	4.25	-3.71	319	5.64	319	6.56	319	4.71	319	6.10	319	5.18
363.00	362.94	1.2	330.8	4.29	-3.73	319	5.68	319	6.61	319	4.75	319	6.15	319	5.21
365.00	364.94	1.2	332.1	4.32	-3.75	319	5.72	319	6.66	319	4.78	319	6.19	319	5.25
367.00	366.93	1.2	332.2	4.36	-3.77	319	5.76	319	6.71	319	4.82	319	6.24	319	5.29
369.00	368.93	1.2	330.1	4.40	-3.79	319	5.80	319	6.76	319	4.85	319	6.28	319	5.33
371.00	370.93	1.3	328.2	4.44	-3.81	319	5.85	319	6.81	319	4.89	319	6.33	319	5.37
373.00	372.93	1.3	330.9	4.47	-3.83	319	5.89	319	6.86	319	4.92	319	6.38	319	5.41
375.00	374.93	1.3	332.1	4.51	-3.85	320	5.94	320	6.91	320	4.96	320	6.42	320	5.45
377.00	376.93	1.3	332.0	4.56	-3.88	320	5.98	320	6.96	320	5.00	320	6.47	320	5.49
379.00	378.93	1.4	332.7	4.60	-3.90	320	6.03	320	7.02	320	5.04	320	6.52	320	5.53
381.00	380.93	1.4	332.3	4.64	-3.92	320	6.08	320	7.07	320	5.08	320	6.57	320	5.58
383.00	382.93	1.4	329.8	4.68	-3.94	320	6.12	320	7.13	320	5.12	320	6.62	320	5.62
385.00	384.93	1.3	330.6	4.72	-3.97	320	6.17	320	7.18	320	5.16	320	6.67	320	5.66
387.00	386.93	1.3	331.1	4.76	-3.99	320	6.21	320	7.23	320	5.20	320	6.72	320	5.71
389.00	388.93	1.3	331.2	4.81	-4.01	320	6.26	320	7.28	320	5.24	320	6.77	320	5.75
391.00	390.93	1.4	332.2	4.85	-4.04	320	6.31	320	7.34	320	5.28	320	6.82	320	5.79
393.00	392.93	1.4	331.8	4.89	-4.06	320	6.35	320	7.39	320	5.32	320	6.87	320	5.84
395.00	394.93	1.3	333.4	4.93	-4.08	320	6.40	320	7.44	320	5.35	320	6.92	320	5.88
397.00	396.93	1.2	334.4	4.97	-4.10	320	6.44	320	7.49	320	5.39	320	6.97	320	5.91
399.00	398.93	1.2	334.4	5.01	-4.11	321	6.48	321	7.54	321	5.42	321	7.01	321	5.95
401.00	400.93	1.2	332.0	5.05	-4.14	321	6.52	321	7.59	321	5.46	321	7.06	321	5.99
403.00	402.93	1.3	331.2	5.08	-4.16	321	6.57	321	7.64	321	5.50	321	7.10	321	6.03
405.00	404.92	1.3	332.9	5.12	-4.18	321	6.61	321	7.69	321	5.53	321	7.15	321	6.07
407.00	406.92	1.3	333.3	5.17	-4.20	321	6.66	321	7.74	321	5.57	321	7.20	321	6.11
409.00	408.92	1.3	332.4	5.21	-4.22	321	6.70	321	7.79	321	5.61	321	7.25	321	6.15
411.00	410.92	1.4	332.7	5.25	-4.24	321	6.75	321	7.85	321	5.65	321	7.30	321	6.20
413.00	412.92	1.3	331.6	5.29	-4.26	321	6.79	321	7.90	321	5.69	321	7.35	321	6.24
415.00	414.92	1.3	331.2	5.33	-4.28	321	6.84	321	7.95	321	5.73	321	7.40	321	6.28
417.00	416.92	1.3	331.7	5.37	-4.31	321	6.88	321	8.01	321	5.76	321	7.45	321	6.32
419.00	418.92	1.3	332.4	5.41	-4.33	321	6.93	321	8.06	321	5.80	321	7.49	321	6.37
421.00	420.92	1.2	333.6	5.45	-4.35	321	6.97	321	8.11	321	5.84	321	7.54	321	6.41
423.00	422.92	1.2	333.4	5.49	-4.37	321	7.01	321	8.15	321	5.87	321	7.58	321	6.44
425.00	424.92	1.2	332.6	5.52	-4.39	322	7.05	322	8.20	322	5.91	322	7.63	322	6.48
427.00	426.92	1.1	331.5	5.56	-4.40	322	7.09	322	8.25	322	5.94	322	7.67	322	6.52
429.00	428.92	1.1	330.1	5.59	-4.42	322	7.13	322	8.29	322	5.97	322	7.71	322	6.55
431.00	430.92	1.0	328.0	5.62	-4.44	322	7.17	322	8.34	322	6.00	322	7.75	322	6.58
433.00	432.92	1.0	326.0	5.65	-4.46	322	7.20	322	8.38	322	6.03	322	7.79	322	6.61
435.00	434.92	1.0	321.8	5.68	-4.48	322	7.24	322	8.42	322	6.05	322	7.83	322	6.64
437.00	436.92	1.0	318.8	5.71	-4.51	322	7.27	322	8.46	322	6.08	322	7.86	322	6.67
439.00	438.92	0.9	316.0	5.73	-4.53	322	7.30	322	8.50	322	6.10	322	7.90	322	6.70
441.00	440.92	0.9	312.3	5.75	-4.55	322	7.33	322	8.54	322	6.13	322	7.93	322	6.73
443.00	442.92	0.9	309.8	5.77	-4.57	322	7.36	322	8.57	322	6.15	322	7.97	322	6.75
445.00	444.92	0.9	308.1	5.79	-4.60	322	7.39	322	8.61	322	6.17	322	8.00	322	6.78
447.00	446.92	0.9	302.3	5.80	-4.62	321	7.42	321	8.64	321	6.19	321	8.03	321	6.81
449.00	448.92	0.9	298.0	5.82	-4.65	321	7.45	321	8.68	321	6.22	321	8.06	321	6.83
451.00	450.92	1.0	295.3	5.83	-4.68	321	7.48	321	8.72	321	6.24	321	8.10	321	6.86
453.00	452.92	1.0	292.6	5.85	-4.71	321	7.51	321	8.75	321	6.26	321	8.13	321	6.88
455.00	454.92	1.1	288.9	5.86	-4.75	321	7.54	321	8.79	321	6.29	321	8.17	321	6.91
457.00	456.92	1.2	283.6	5.87	-4.79	321	7.57	321	8.83	321	6.31	321	8.20	321	6.94
459.00	458.91	1.3	282.2	5.88	-4.83	321	7.61	321	8.87	321	6.34	321	8.24	321	6.97
461.00	460.91	1.3	283.1	5.89	-4.87	320	7.64	320	8.92	320	6.37	320	8.28	320	7.01
463.00	462.91	1.3	282.1	5.90	-4.92	320	7.68	320	8.96	320	6.40	320	8.32	320	7.04
465.00	464.91	1.4	281.0	5.91	-4.97	320	7.72	320	9.01	320	6.43	320	8.36	320	7.07

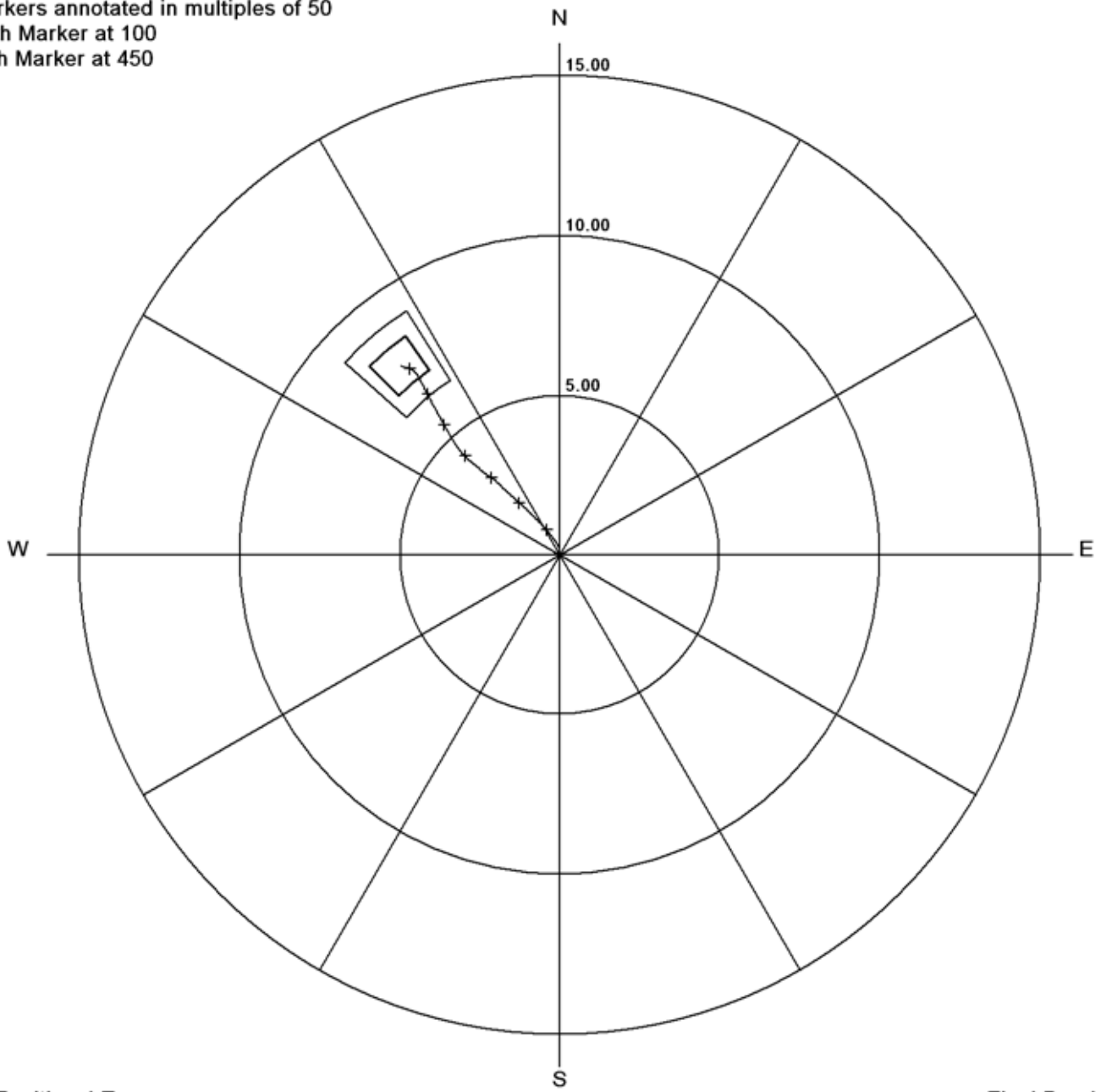
Cross Section

All Figures are Log Depths in metres

Plot With Respect to True North

Target Origin Depth 95.90
Last Plotted Depth 484.50
Depth Markers annotated in multiples of 50
First Depth Marker at 100
Last Depth Marker at 450

Scale 1:200
Declination 9.7 deg East



Borehole Positional Error

The two boxes surrounding the last plotted depth show the typical and maximum positional error at that depth.

Final Borehole Position

The last plotted depth is at
5.91 metres North
4.97 metres West
ie 7.72 metres from the origin
320 deg from True North

Vertical Sections

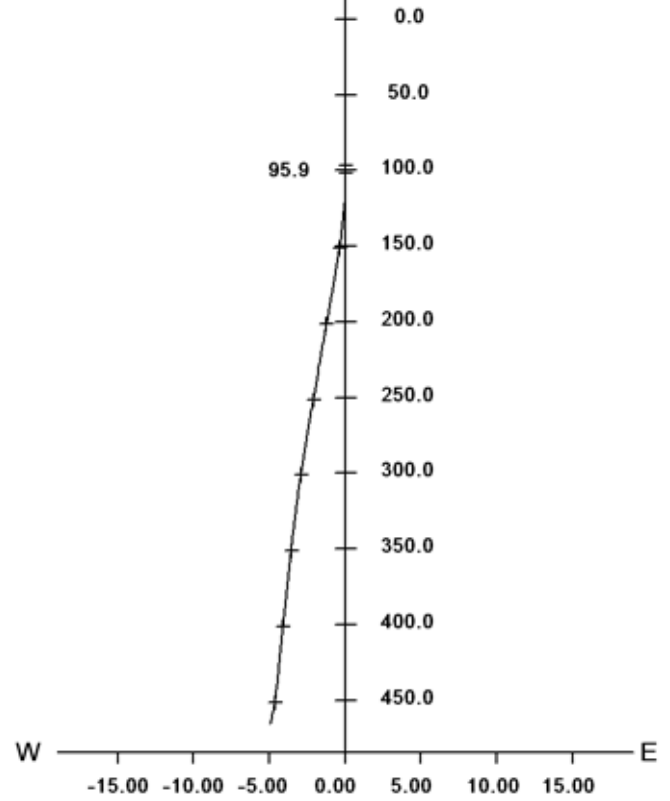
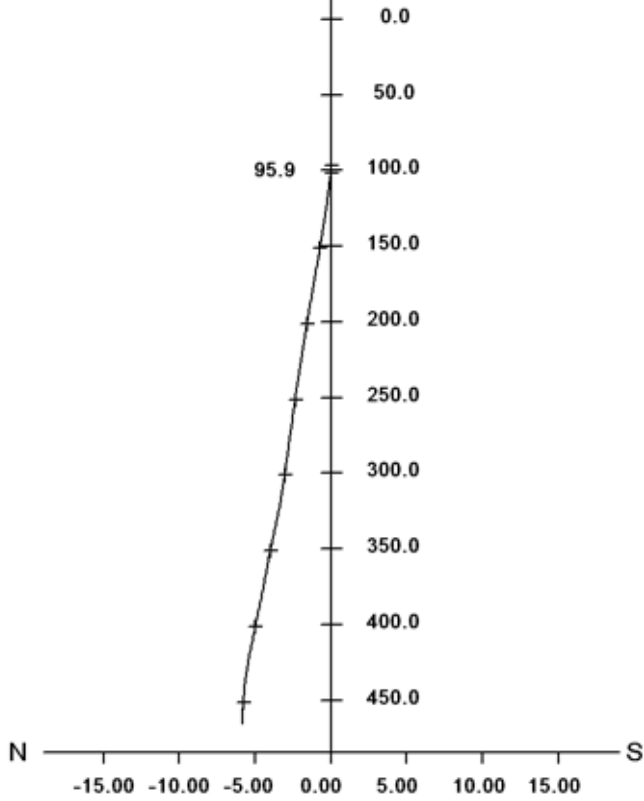
North-South Section

East-West Section

(True Depth vs Displacement)

Vertical Scale 1:5000
Horizontal Scale 1:500

Markers annotated as above

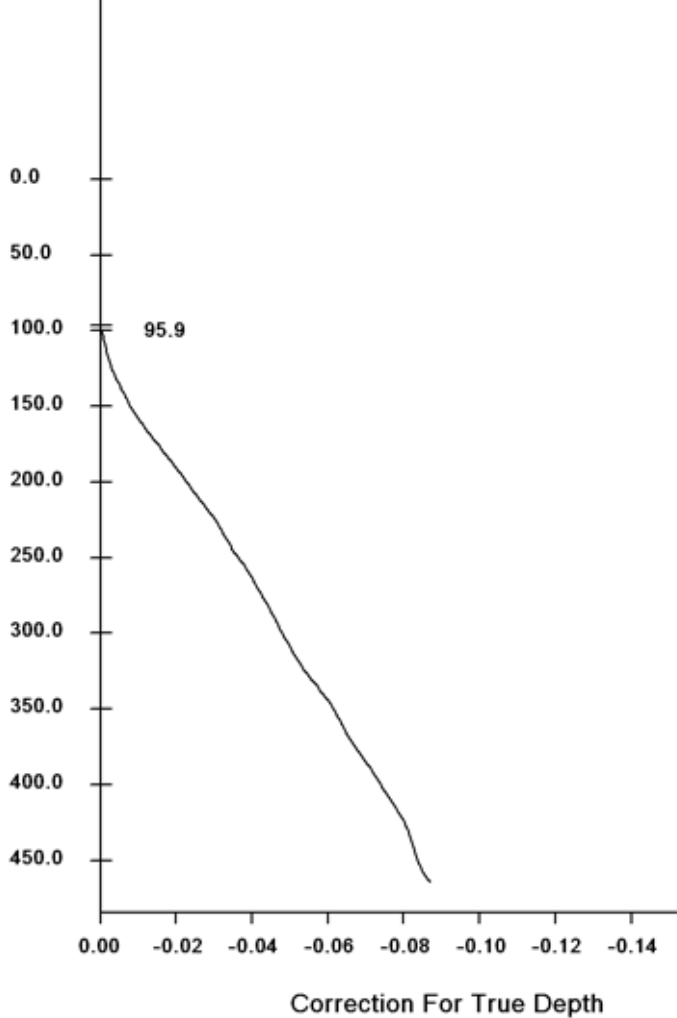


Depth Correction Analysis

Vertical Scale 1:5000
Horizontal Scale 1:2

Log
Depth

Depths Log	True	Depths Log	True	Depths Log	True
97.00	97.00	231.00	230.97	365.00	364.94
99.00	99.00	233.00	232.97	367.00	366.93
101.00	101.00	235.00	234.97	369.00	368.93
103.00	103.00	237.00	236.97	371.00	370.93
105.00	105.00	239.00	238.97	373.00	372.93
107.00	107.00	241.00	240.97	375.00	374.93
109.00	109.00	243.00	242.97	377.00	376.93
111.00	111.00	245.00	244.97	379.00	378.93
113.00	113.00	247.00	246.96	381.00	380.93
115.00	115.00	249.00	248.96	383.00	382.93
117.00	117.00	251.00	250.96	385.00	384.93
119.00	119.00	253.00	252.96	387.00	386.93
121.00	121.00	255.00	254.96	389.00	388.93
123.00	123.00	257.00	256.96	391.00	390.93
125.00	125.00	259.00	258.96	393.00	392.93
127.00	127.00	261.00	260.96	395.00	394.93
129.00	129.00	263.00	262.96	397.00	396.93
131.00	131.00	265.00	264.96	399.00	398.93
133.00	133.00	267.00	266.96	401.00	400.93
135.00	135.00	269.00	268.96	403.00	402.93
137.00	136.99	271.00	270.96	405.00	404.92
139.00	138.99	273.00	272.96	407.00	406.92
141.00	140.99	275.00	274.96	409.00	408.92
143.00	142.99	277.00	276.96	411.00	410.92
145.00	144.99	279.00	278.96	413.00	412.92
147.00	146.99	281.00	280.96	415.00	414.92
149.00	148.99	283.00	282.96	417.00	416.92
151.00	150.99	285.00	284.96	419.00	418.92
153.00	152.99	287.00	286.96	421.00	420.92
155.00	154.99	289.00	288.96	423.00	422.92
157.00	156.99	291.00	290.96	425.00	424.92
159.00	158.99	293.00	292.96	427.00	426.92
161.00	160.99	295.00	294.96	429.00	428.92
163.00	162.99	297.00	296.96	431.00	430.92
165.00	164.99	299.00	298.96	433.00	432.92
167.00	166.99	301.00	300.96	435.00	434.92
169.00	168.99	303.00	302.96	437.00	436.92
171.00	170.99	305.00	304.96	439.00	438.92
173.00	172.99	307.00	306.96	441.00	440.92
175.00	174.99	309.00	308.96	443.00	442.92
177.00	176.99	311.00	310.96	445.00	444.92
179.00	178.99	313.00	312.96	447.00	446.92
181.00	180.99	315.00	314.96	449.00	448.92
183.00	182.99	317.00	316.96	451.00	450.92
185.00	184.99	319.00	318.96	453.00	452.92
187.00	186.99	321.00	320.96	455.00	454.92
189.00	188.99	323.00	322.96	457.00	456.92
191.00	190.99	325.00	324.96	459.00	458.92
193.00	192.99	327.00	326.96	461.00	460.92
195.00	194.99	329.00	328.96	463.00	462.92
197.00	196.99	331.00	330.96	465.00	464.92
199.00	198.99	333.00	332.96	467.00	466.92
201.00	200.99	335.00	334.96	469.00	468.92
203.00	202.99	337.00	336.96	471.00	470.92
205.00	204.99	339.00	338.96	473.00	472.92
207.00	206.99	341.00	340.96	475.00	474.92
209.00	208.99	343.00	342.96	477.00	476.92
211.00	210.99	345.00	344.96	479.00	478.92
213.00	212.99	347.00	346.96	481.00	480.92
215.00	214.99	349.00	348.96	483.00	482.92
217.00	216.99	351.00	350.96	485.00	484.92
219.00	218.99	353.00	352.96	487.00	486.92
221.00	220.99	355.00	354.96	489.00	488.92
223.00	222.99	357.00	356.96	491.00	490.92
225.00	224.99	359.00	358.96	493.00	492.92
227.00	226.99	361.00	360.96	495.00	494.92
229.00	228.99	363.00	362.96	497.00	496.92
231.00	230.99	365.00	364.96	499.00	498.92
233.00	232.99	367.00	366.96	501.00	500.92
235.00	234.99	369.00	368.96	503.00	502.92
237.00	236.99	371.00	370.96	505.00	504.92
239.00	238.99	373.00	372.96	507.00	506.92
241.00	240.99	375.00	374.96	509.00	508.92
243.00	242.99	377.00	376.96	511.00	510.92
245.00	244.99	379.00	378.96	513.00	512.92
247.00	246.99	381.00	380.96	515.00	514.92
249.00	248.99	383.00	382.96	517.00	516.92
251.00	250.99	385.00	384.96	519.00	518.92
253.00	252.99	387.00	386.96	521.00	520.92
255.00	254.99	389.00	388.96	523.00	522.92
257.00	256.99	391.00	390.96	525.00	524.92
259.00	258.99	393.00	392.96	527.00	526.92
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263.00	262.99	397.00	396.96	531.00	530.92
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271.00	270.99	405.00	404.96	539.00	538.92
273.00	272.99	407.00	406.96	541.00	540.92
275.00	274.99	409.00	408.96	543.00	542.92
277.00	276.99	411.00	410.96	545.00	544.92
279.00	278.99	413.00	412.96	547.00	546.92
281.00	280.99	415.00	414.96	549.00	548.92
283.00	282.99	417.00	416.96	551.00	550.92
285.00	284.99	419.00	418.96	553.00	552.92
287.00	286.99	421.00	420.96	555.00	554.92
289.00	288.99	423.00	422.96	557.00	556.92
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303.00	302.99	437.00	436.96	571.00	570.92
305.00	304.99	439.00	438.96	573.00	572.92
307.00	306.99	441.00	440.96	575.00	574.92
309.00	308.99	443.00	442.96	577.00	576.92
311.00	310.99	445.00	444.96	579.00	578.92
313.00	312.99	447.00	446.96	581.00	580.92
315.00	314.99	449.00	448.96	583.00	582.92
317.00	316.99	451.00	450.96	585.00	584.92
319.00	318.99	453.00	452.96	587.00	586.92
321.00	320.99	455.00	454.96	589.00	588.92
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327.00	326.99	461.00	460.96	595.00	594.92
329.00	328.99	463.00	462.96	597.00	596.92
331.00	330.99	465.00	464.96	599.00	598.92
333.00	332.99	467.00	466.96	601.00	600.92
335.00	334.99	469.00	468.96	603.00	602.92
337.00	336.99	471.00	470.96	605.00	604.92
339.00	338.99	473.00	472.96	607.00	606.92
341.00	340.99	475.00	474.96	609.00	608.92
343.00	342.99	477.00	476.96	611.00	610.92
345.00	344.99	479.00	478.96	613.00	612.92
347.00	346.99	481.00	480.96	615.00	614.92
349.00	348.99	483.00	482.96	617.00	616.92
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403.00	402.99	537.00	536.96	671.00	670.92
405.00	404.99	539.00	538.96	673.00	672.92
407.00	406.99	541.00	540.96	675.00	674.92
409.00	408.99	543.00	542.96	677.00	676.92
411.00	410.99	545.00	544.96	679.00	678.92
413.00	412.99	547.00	546.96	681.00	680.92
415.00	414.99	549.00	548.96	683.00	682.92
417.00	416.99	551.00	550.96	685.00	684.92
419.00	418.99	553.00	552.96	687.00	686.92
421.00	420.99	555.00	554.96	689.00	688.92
423.00	422.99	557.00	556.96	691.00	690.92
425.00	424.99	559.00			

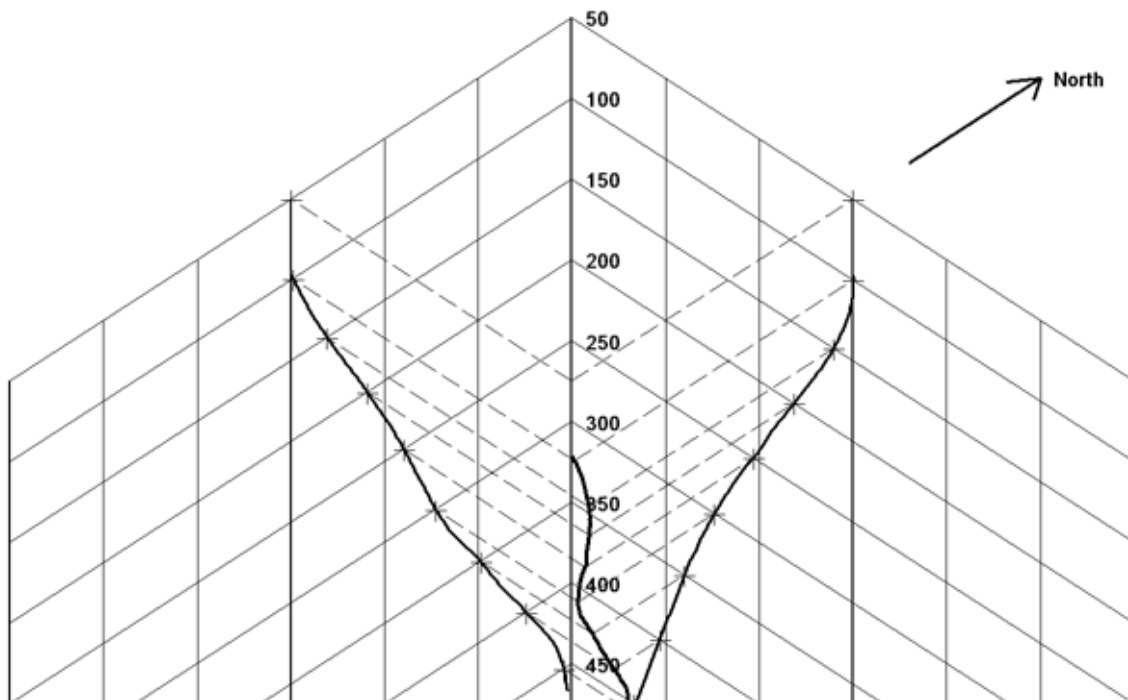


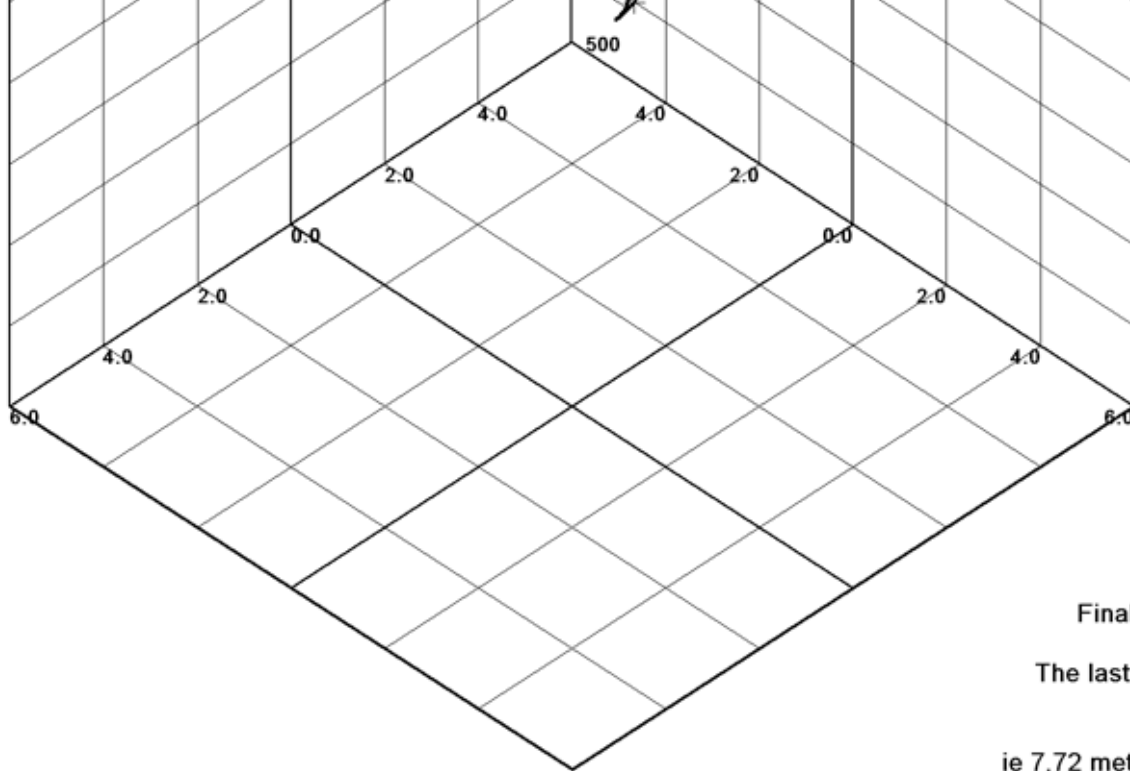
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149.00	150.99	285.00	284.96	417.00	416.92
151.00	152.99	287.00	286.95	419.00	418.92
153.00	154.99	289.00	288.95	421.00	420.92
155.00	156.99	291.00	290.95	423.00	422.92
157.00	158.99	293.00	292.95	425.00	424.92
159.00	160.99	295.00	294.95	427.00	426.92
161.00	162.99	297.00	296.95	429.00	428.92
163.00	164.99	299.00	298.95	431.00	430.92
165.00	166.99	301.00	300.95	433.00	432.92
167.00	168.99	303.00	302.95	435.00	434.92
169.00	170.99	305.00	304.95	437.00	436.92
171.00	172.99	307.00	306.95	439.00	438.92
173.00	174.99	309.00	308.95	441.00	440.92
175.00	176.98	311.00	310.95	443.00	442.92
177.00	178.98	313.00	312.95	445.00	444.92
179.00	180.98	315.00	314.95	447.00	446.92
181.00	182.98	317.00	316.95	449.00	448.92
183.00	184.98	319.00	318.95	451.00	450.92
185.00	186.98	321.00	320.95	453.00	452.92
187.00	188.98	323.00	322.95	455.00	454.92
189.00	190.98	325.00	324.95	457.00	456.92
191.00	192.98	327.00	326.95	459.00	458.91
193.00	194.98	329.00	328.94	461.00	460.91
195.00	196.98	331.00	330.94	463.00	462.91
197.00	198.98	333.00	332.94	484.50	484.41
199.00	200.98	335.00	334.94		
201.00	202.98	337.00	336.94		
203.00	204.98	339.00	338.94		
205.00	206.98	341.00	340.94		
207.00	208.97	343.00	342.94		
209.00	210.97	345.00	344.94		
211.00	212.97	347.00	346.94		
213.00	214.97	349.00	348.94		
215.00	216.97	351.00	350.94		
217.00	218.97	353.00	352.94		
219.00	220.97	355.00	354.94		
221.00	222.97	357.00	356.94		
223.00	224.97	359.00	358.94		
225.00	226.97	361.00	360.94		
227.00	228.97	363.00	362.94		

3D Borehole Deviation

All figures are True Depths / displacements in metres
 Origin Depth 95.90
 Last Plotted Depth 484.50

Plot With Respect to True North
 Declination 9.7 deg East





Final Borehole Position
 The last plotted depth is at
 5.91 metres North
 4.97 metres West
 ie 7.72 metres from the origin
 320 deg from True North

COMPANY	SANTOS LTD				
WELL	RM03-41-1				
FIELD	ROMA				
PROVINCE/COUNTY	QUEENSLAND				
COUNTRY/STATE	AUSTRALIA				
Elevation Kelly Bushing	373.80	metres	First Reading		metres
Elevation Drill Floor	373.80	metres	Depth Driller	489.70	metres
Elevation Ground Level	369.50	metres	Depth Logger	482.70	metres



Weatherford[®]

BOREHOLE NAVIGATION

Appendix 6

Well Evaluation Survey

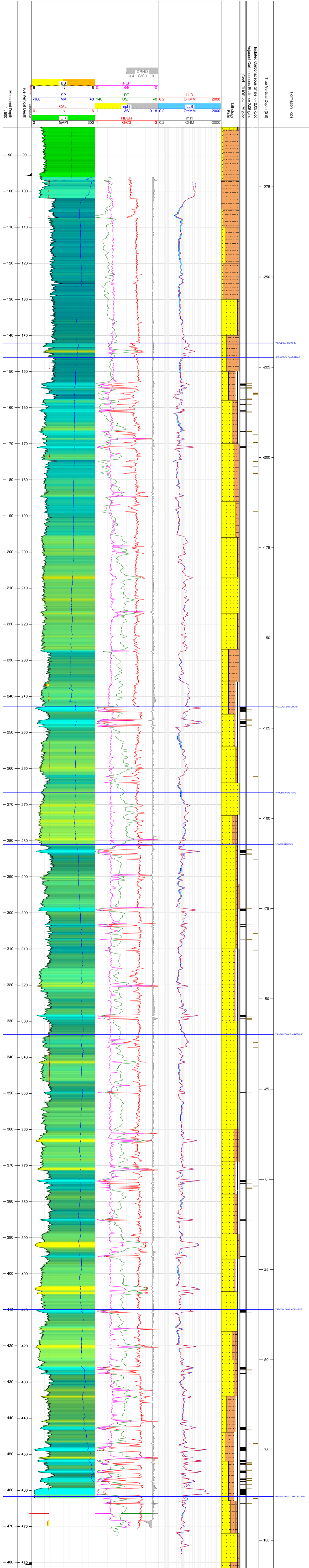
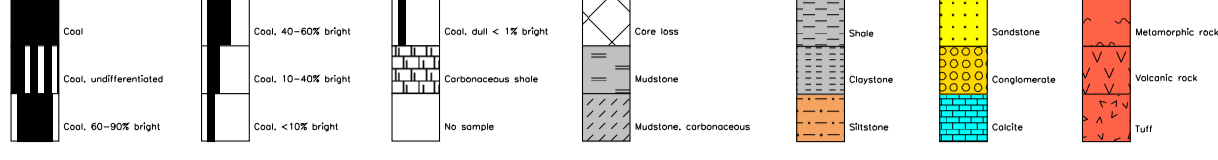
License: ATP 336P (Roma)
Total Depth: 489.7
Vertical Scale: 500
Vertical Units: METRES

Bit Size: 8.75 in
Mud Type: KCL POLYMER
DFD: 1,000,000 g/cc
BHT: 37 C

Rm: 14 @ 25 C
Rmf: @ 25 C
Rmc: @ 25 C
KCI: %

Conveyance Type: Wireline
Borehole Status: Open Hole

Plot Created by : p-mariz Date : 22-Oct-2013



Appendix 7

Lithology Logs

Field: Roma
 Permit: PL309
 State: QUEENSLAND
 Country: AUSTRALIA
 Scale: 1:500

Rotary Table: 373.76m AHD
 Ground Level: 369.46m AHD
 GDA 94 Co-ordinates:
 Lat: 26° 22' 09.3746"S
 Long: 149° 08' 20.2787"E

Rig: Ensign #950
 Spud Date: 10-05-2013
 TD Date: 11-05-2013
 Total Depth: 489.7m
 Final Status: SUG

Open Hole:
 17": 10.5m
 12 1/4" : 97.0m
 8 3/4" : 489.7m

Cased Hole:
 14": 10.5m
 9 5/8" : 95.9m
 7" : 482.7m

Geologist: Sam Fraser

LITHOLOGY



ACCESSORIES

- ◆ - Pyrite
- G - Glauconite
- F - Feldspar
- M - Mica
- ▶ - Carbonaceous
- Fe - Ferrous
- 9 - Fossils
- g - Chert
- ▲ - Siderite
- S

DRILLING DATA

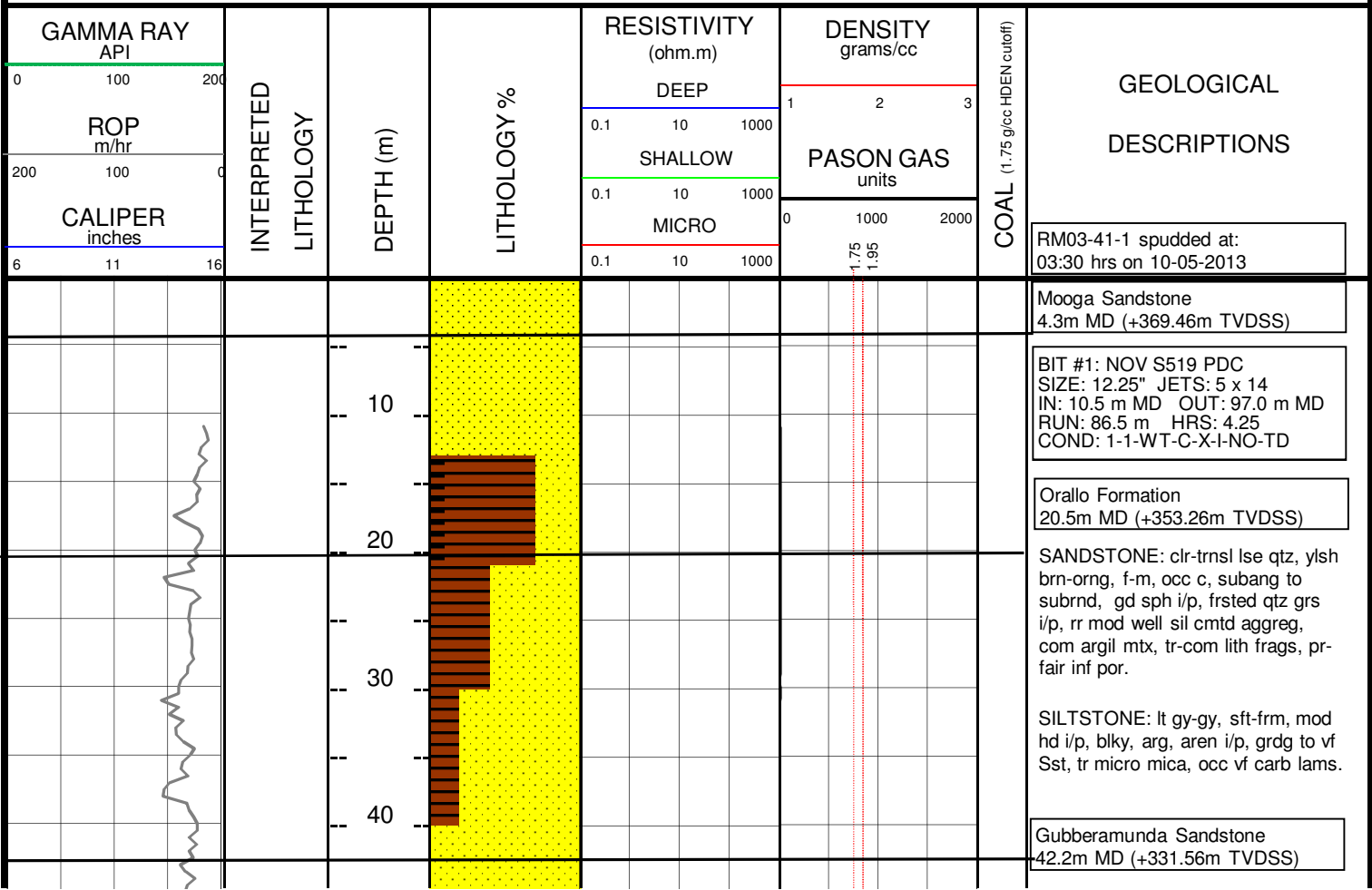
- ⌞ - Casing Shoe
- ▼ - Bit Trip
- ▲ - Wiper Trip
- || - Core
- ◆ - DST
- ↘ - Deviation Survey

MUD DATA

- MW - Mud Weight (ppg)
- FV - Funnel Viscosity (s/qt)
- PV - Plastic Viscosity (cps)
- YP - Yield Point (lb/100ftsq)
- Gel - Gel Strength (10sec)
- WL - Water Loss (cc/30min)
- pH - Acidity / Alkalinity
- Ck - Cake (32nd/inch)
- Sol - Solids (% vol)
- Cl - Chlorides (mg/l)

ABBREVIATIONS

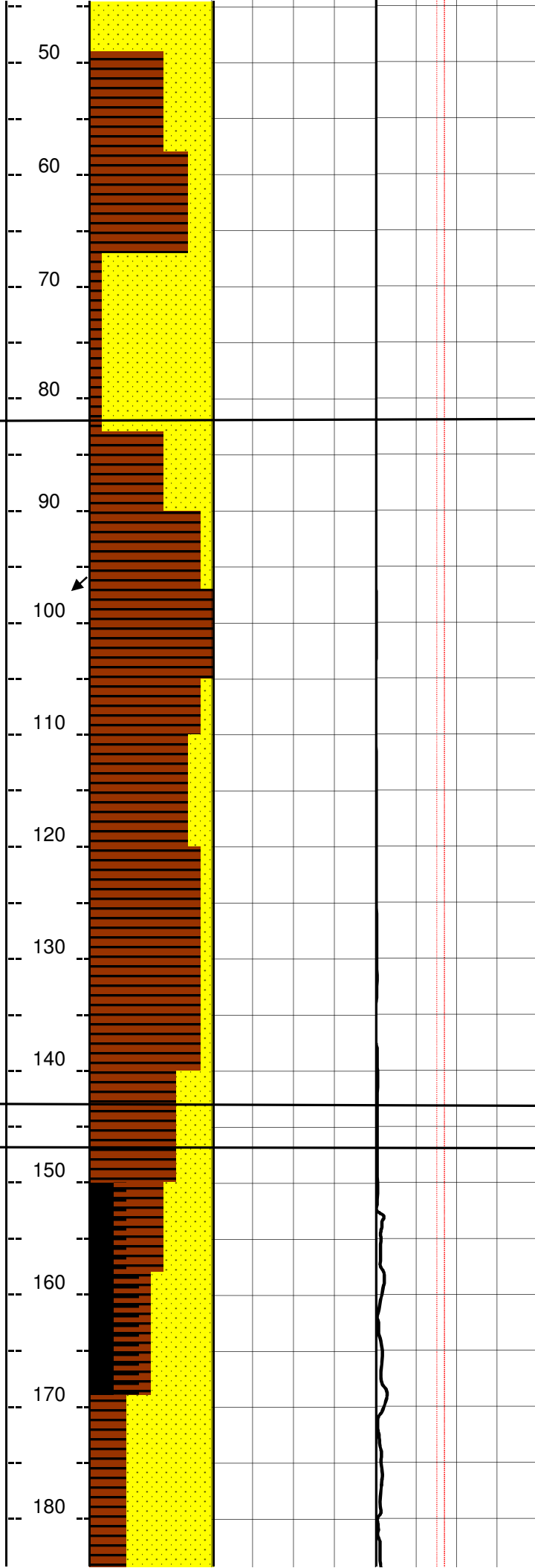
- BOPD - Barrels of Oil Per day
- BWPD - Barrels of Water Per Day
- DST - Drill Stem Test
- GCM - Gas Cut Mud
- GCW - Gas Cut Water
- GTS - Gas To Surface
- MMCFD - Million Cubic Feet / Day
- NGTS - No Gas To Surface
- NOTS - No Oil To Surface
- OCM - Oil Cut Mud
- OG - Over Gauge
- Q - Flow Rate
- REC - Recovery
- RTSTM - Rate Too Small To Measure
- SGCM - Slightly Gas Cut Mud



MW 8.9
FV 35
PV
YP
WL
pH

WOB 5.9
RPM 108
SPP 308
GPM 325

MW 9.2
FV 34
PV
YP
WL
pH



SANDSTONE: clr-trnsl lse qtz, lt brnsh gy-lt gy, m-c, occ vf-f, ang-subrnd, pr-mod well srt, grdg to Sltst i/p, sil cmt, rr calc, rr-com wh argil mtx, gd tr glauc, tr pyr, tr grnsh gy lith frags, rr pnk, rd mins, tr carb spks, tr FeO stns, pr-gd inf por

SILTSTONE: lt gy-gy, sft frm, mod hd i/p, blk, gen aren, grdg to vf Sst, tr micro mica, occ vf carb lams.

SANDSTONE: clr-trnsl, frosted i/p, f-vc, subang-subrnd, pr-well srt, tr trnsl red, pk minerals, tr smky qtz grs, rr coaly frags, rr lith, lse, gd inf por.

Westbourne Formation
82.1m MD (+291.66m TVDSS)

SILTSTONE: dk gry, gy-lt brnsh gy, mod hd-hd, subblky-subfis, tab i/p, noncalc, gen aren, tr bi spks, tr carb mat, rr lith, grdg to vf Sst i/p.

9.625" SURFACE CASING SHOE set at 95.9 m MD

FIT at 100.0 m MD. EMW = 34.27 ppg

BIT #2:NOV S519 PDC
SIZE: 8 3/4" JETS: 7 x 14
IN: 97.0 m MD OUT: 489.7m
RUN: 392.7 m HRS: 10.5
COND: 1-1-CT-N-X-I-CT-TD

SILTSTONE: dk gry, gy-lt brnsh gy, mod hd-hd, subblky-subfis, tab i/p, noncalc, gen aren, tr bi spks, tr carb mat, rr lith, grdg to vf Sst i/p.

SANDSTONE: gysh wh, fri-mod hd, vf-m, sbang-sbrnd, mod srt, n-calc, sil cmt, com kaol mtx, tr lith, tr glauc, tr mica, pr-fr inf por.

SILTSTONE: dk gry, gy-lt brnsh gy, mod hd-hd, subblky-subfis, tab i/p, noncalc, gen aren, tr bi spks, tr carb mat, rr lith, grdg to vf Sst i/p.

Weald Sandstone
142m MD (+231.76m TVDSS)

Springbok Sandstone
146.8m MD (+226.96m TVDSS)

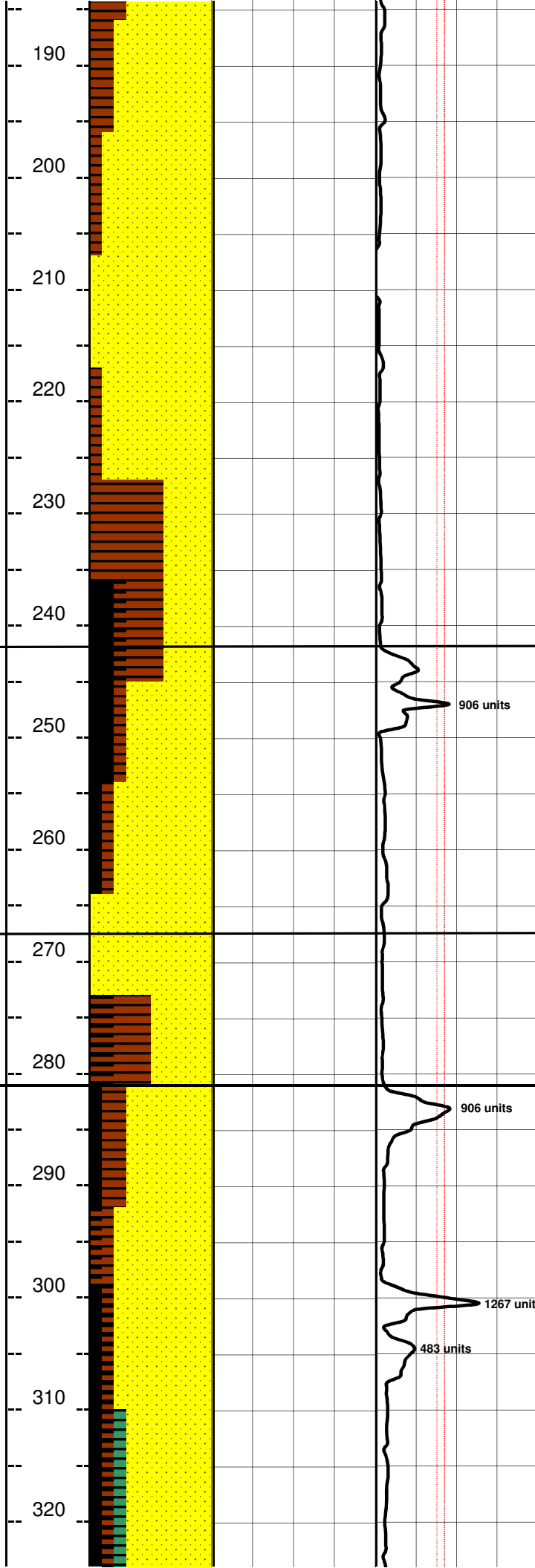
SANDSTONE: gysh wh, fri-mod hd, vf-m, sbang-sbrnd, mod srt, n-calc, sil cmt, com kaol mtx, tr lith, tr glauc, tr mica, pr-fr inf por.

CARBONACEOUS SILTSTONE: m brn to dk brn, soft to firm, rr-com coal spks and lams

SANDSTONE: lt gy-gysh wh, f, sbang-sbrnd, mod-wl srt, com-abund m-crs lith incl, tr-com coaly frag, tr mica flk, com-abund wh sil mtx, calc wl cmt, pr-fr inf por.

WOB 9.2
RPM 149
SPP 748
GPM 450

WOB 13
RPM 160
SPP 645
GPM 454



SILTSTONE: lt brnsh gy-m brnsh gy, occ lt gy, frm -mod hd, hd i/p, sbblky-tab, aren, tr carb spks, tr mica, grdg to vf Sst.

SANDSTONE: lt gy-gysh wh, f, sbang-sbrnd, mod-wl srt, com-abund m-crs lith incl, tr-com coal frag, tr mica flk, com-abund wh sil mtz, calc wl cmt, pr-fr inf por.

SILTSTONE: lt brnsh gy-m brnsh gy, occ lt gy, frm -mod hd, hd i/p,

Upper Juandah CM
242.1m MD (+131.66m TVDSS)

ECP set at 244.7 m MD

COAL: black, sub vit-vit, conch, hd-v hd.

SANDSTONE: gysh wh, occ clr-trnsl lse qtz, f-m, sbang-sbrnd, mod srt, com sil cmt, rr-loc com wh-gry argil mtz, com carb spks, tr glauc, tr lith, pr-fr vis por.

Proud Sandstone
269.6m MD (+104.16m TVDSS)

SILTSTONE: m gy-gy, frm-mod hd, hd i/p, sbblky-blky, tab i/p, n-calc, aren, tr cab lam & spks, tr mica flks, occ grdg to vf Sst.

Lower Juandah CM
281.2m MD (+92.56m TVDSS)

COAL: black, sub vit-vit, subfis, mod hd-hd.

SILTSTONE:lt-med gry brn,lt-med gry,arg,aren i/p,com carb spks &

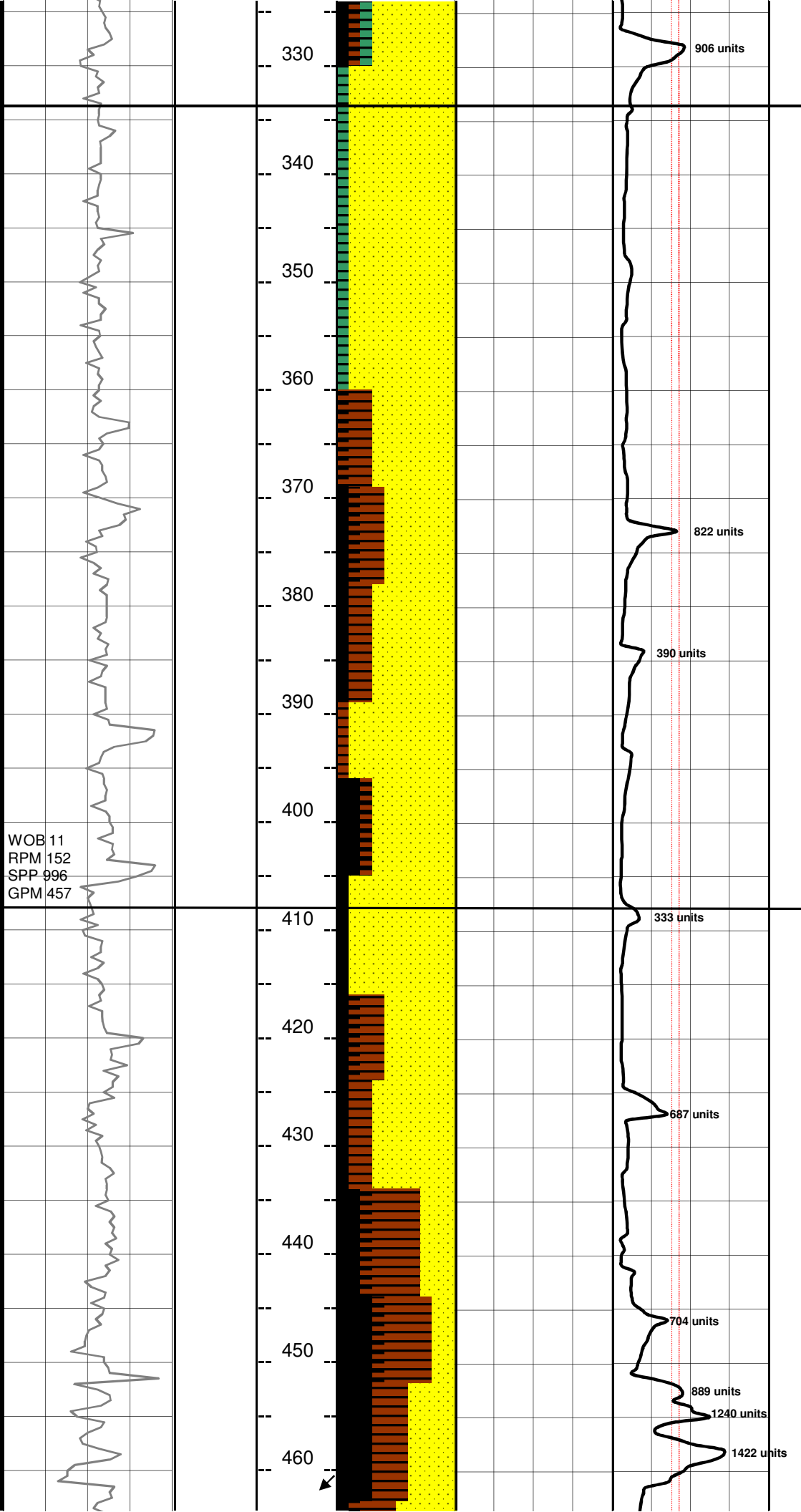
CARBONACEOUS SILTSTONE: m brn to dk brn, dk gy, soft to firm, gen firm, com-abund carb flks & mat.

COAL: black, sub vit-vit, subfis, mod hd-hd.

CLAYSTONE: lt gy, lt brn, plas-sft, n-fis, blk, wxy, arg, aren i/p, rr-tr

SANDSTONE:wh,lt gy,trnsl,vff, grad to Sltst,occ m,sbang,mod srt, calc cmt,com wh arg mtz,tr gy liths,tr carb spks,tr tuff,tr calc vns, fri,pr vis por.

WOB 11
RPM 152
SPP 996
GPM 457



Tangalooma Sst
334.2m MD (+39.56m TVDSS)

SANDSTONE:wh,lt gy,trnsl,vff, grad to sltst,occ m,sbang,mod srt, calc cmt,abun wh-lt gry arg mtx,tr gry liths, tr carb spks,tr tuff,tr calc vns,

CLAYSTONE: lt gy, lt brn, plas-sft, n-fis, blk, wxy, arg, aren i/p, rr-tr

SILTSTONE:lt brnsh gy-lt gy, frm-mod hd, sbblky-blky, aren,arg i/p,tr carb spks,tr lith.

CARBONACEOUS SILTSTONE: m brn to dk brn, dk gy, soft to firm, gen firm, com-abund carb flks & mat.

COAL:blk,dull-sbvit,brit,mod hd, unevn,sbfiss.

SILTSTONE:lt brnsh gy-lt gy, frm-mod hd, sbblky-blky, aren,arg i/p,tr carb spks,tr lith.

SANDSTONE:wh,trnsl,lt brn,f-med, sbang,wl srt,calc cmt,tr wh arg mtx, abdt calc vns,com sid,tr carb spks, com wh,off wh,gry,lt brn liths,frilse, fr inf por.

COAL: black, sub vit-vit, conch, hd-v hd.

CARBONACEOUS SILTSTONE: m brn to dk brn, dk gy, soft to firm, gen firm, com-abund carb flks & mat.

Taroom Coal Meas
409.9m MD (-36.14m TVDSS)

CARBONACEOUS SILTSTONE: m brn to dk brn, dk gy, soft to firm, gen firm, com-abund carb flks & mat.

SILTSTONE:lt brnsh gy-lt gy, frm-mod hd, sbblky-blky, aren,arg i/p,tr carb spks,tr lith.

COAL: black, sub vit-vit, conch, hd-v hd.

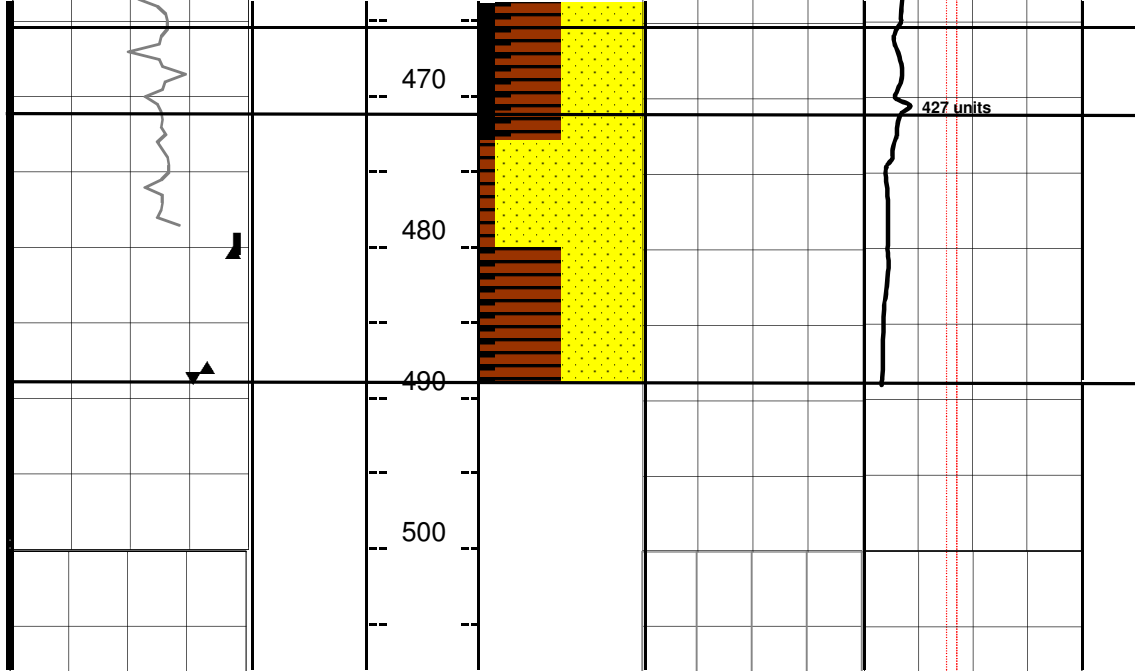
SANDSTONE:wh,trnsl,lt brn,f-med, sbang,wl srt,calc cmt,wh-lt gry brn arg mtx,com sid,tr carb spks,com wh,off wh,gry,lt brn liths,pr-fr inf por.

CARBONACEOUS SILTSTONE: m brn to dk brn, dk gy, soft to firm, gen firm, com-abund carb flks & mat.

SILTSTONE:lt brnsh gy-lt gy, frm-mod hd, sbblky-blky, aren,arg i/p,tr carb spks,tr lith.

COAL: black, sub vit-vit, conch, hd-v hd.

Base Lowest Taroom CM
466.7m MD (-92.94m TVDSS)



SANDSTONE:wh,tnsl,lt brn,f-med,
 sbang,wl srt,calc cmt,tr wh arg mtx,
 abdt calc vns,com sid,tr carb spks,
 com wh,off wh,gry,lt brn liths,frilse,
 fr inf por.

Eurombah Fm
 471.1m MD (-97.34m TVDSS)

7" SLOTTED CASING below ECP.
 7" Shoe set at 480.7 m MD

RM03-41-1
 at 18:00 hrs on 12th May 2013
 Driller's TD: 489.7 m MD
 Logger's TD: 482.7 m MD

WIRELINE LOGS: RUN 1:
 GR/SP/CALI/RHOB/DT/DLL/SLL/
 PE/SURVEY

Appendix 8

Photographs of Cuttings

RM03-41-1
Cuttings Photos 10.5- 489.7m MD

