

HALLIBURTON

Sperry Drilling Services

LWD End of Well Report

For

Origin Energy Resources Ltd

Rockhopper-1 ST1

Rig: Kan Tan IV
Field: Rockhopper-1 ST1
Country: Australia
Job No: AU-FE-0006791008
Date: 20 JAN 2010

HALLIBURTON

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General Information

Company:	Origin Energy Resources Ltd
Rig:	Kan Tan IV
Well:	Rockhopper-1 ST1
Field:	Rockhopper
Lease Name:	
State:	Tasmania
County:	
Country:	Australia
API Number:	
Sperry Job Number:	AU-FE-0006791008
Job start date:	20-Jan-10
Job end date:	03-Feb-10
North reference:	Grid
Declination:	12.495 deg
Dip angle:	-70.395 deg
Total magnetic field:	60970 nT
Date of magnetic data:	01 December, 2009
Wellhead coordinates N:	39 deg. 47 min 34.18 sec South
Wellhead coordinates E:	145 deg. 26 min 21.47 sec East
Vertical section direction:	179.28 deg
Unit Number:	SSH-40
MWD Engineers:	J. Lau, T. Osborne, M. George
Company Representatives:	B. Houston
Company Geologist:	D. Archer, C. Matthews

Operational Overview

Sperry Drilling was contracted by Origin Energy Resources Ltd to provide Logging While Drilling (LWD) services for the drilling of Rockhopper-1 ST1. The well was drilled in permit T/18P by the Maersk MODU Kan Tan IV.

8 1/2" (216mm) Hole Section:

This section was drilled in seven bit runs using a Geopilot rotary steerable system (RSS) BHA together with a motor BHA.

LWD tools used in the RSS BHA comprised of the following :

Drillstring Dynamics (DDSR-DGR) for drilling optimisation, Dual Gamma Ray (DGR), Electromagnetic wave resistivity (EWR-P4), Compensated Thermal Neutron (CTN), Azimuthal Litho-Density (ALD) and Bi-Modal Acoustic (BAT) for formation evaluation. Acoustic Caliper (ACAL) was run in recorded mode to determine hole size. Additionally a Pressure Case Directional (PCDC) was run for wellbore surveying.

MWD in the Motor BHA was directional only and consisted of PCDC for directional control.

In the first run, the motor BHA was picked and RIH but failed to find the cement plug. BHA was pulled to set another kick-off plug.

In the second run the motor BHA was picked up and drilled from 1990.0 to 2112.0 mMDRT. BHA was pulled to pickup the RSS BHA.

In the third run, while the RSS BHA was tested at the shallow depth, the PCDC inclination locked up and the BHA was tripped to change out PCDC.

The fourth run was RSS BHA with backup PCDC tool. The kick-off section was wiped from 1970.0m to 2112.0 mMDRT for logging data..

It was then drilled from 2112 mMDRT to 3158.0 mMDRT. POOH to due to RSS BHA LWD failure.

The fifth assembly was drilled from 3158.0m to 3196.0m MDRT. POOH for first coring run.

The sixth RSS assembly was wiped from 3169.0m to 3212.5 mMDRT to log the first core section. It was then drilled from 3212.5m to 3284.0m MDRT and POOH for second and third coring runs.

The seventh RSS assembly was wiped from 3212.5m to 3309.0m to log second and third core section. It was then drilled to TD at 3482.0m MDRT and pull out of hole for wireline logging.

Summary of MWD runs

[illegible]

Bitrun Summary

RUN TIME DATA

MWD Run	: 100	Run Start	: 07-Jan-10 22:30	BRT Hrs	: 14.00 hr	Circ. Hrs	: 2.33 hr
Rig Bit No	: 1	Run End	: 08-Jan-10 12:30	Hole Size	: 216.00 mm	Oper. Hrs	: 14.00 hr

DRILLING DATA

Start Depth	: 0.00 m	Footage	: 0.00 m	Avg RPM	: 0 rpm	Avg ROP	: 0.00 m/hr
End Depth	: 0.00 m	Avg Flow Rate	: 0.00 gpm	Avg WOB	: 0.0 klb	Avg SPP	: 0 psig
Drilling Hours	: 0.000 hr						

MUD DATA

Mud Type	:						
Weight	: 0.00 ppg	Viscosity	: 0.00 spqt	PV	: 0 cP	YP	: 0.00 lhf2
Chlorides	: 0.00 ppm	Max Temp.	: 0.00 degC	% Solids	: 0.00 %	% Sand	: 0.00 %
pH	: 0.00 pH	Fluid Loss	: 0 mptm	% Oil	: 0.00 %	O:W	:

MWD PERFORMANCE

Tool OD	: 8.00 in	Type	: DWD	Min. Inc.	: 0.00 deg	Min. Inc. Depth	: 0.000 m
Final Az.	: 0.00 deg	Max Op. Press.	: 0 psig	Max Inc.	: 0.00 deg	Max Inc. Depth	: 0.000 m
MWD Real-time %	: 0 %	MWD Recorded %	: 0 %				

	Length (m)	Dist From Bit (m)		Length (m)	Dist From Bit (m)
5" X 3" HWDP #49.3 - NC50(IF) 5.00 in OD / 3.00 in ID	47.18	216.73			
Jar 6.50 in OD / 2.75 in ID	9.84	169.55	6 3/4" HOC 6.75 in OD / 1.92 in ID * Positive Pulser - SN : 11050290 * PCM Sonde - SN : 11226946	3.03	14.70
5" X 3" HWDP #49.3 - NC50(IF) 5.00 in OD / 3.00 in ID	84.57	159.71			
6 3/4" X 3" - 97.6# Drill Collar 6.75 in OD / 2.88 in ID	56.16	75.14			
Integral Blade 6.75 in OD / 2.88 in ID	1.70	18.98	6 3/4" PM Sub 6.75 in OD / 1.92 in ID * PCDC Sonde - SN : 300351	2.78	11.77
Float Sub 6.75 in OD / 3.00 in ID	0.91	17.28			
MWD	5.81	16.37			
Integral Blade 6.75 in OD / 2.88 in ID	2.03	10.56			
Mud Motor 6.75 in OD / 4.50 in ID	8.29	8.53			
Mill 8.50 in OD / 2.50 in ID	0.24	0.24			

COMMENTS

Attempt to side track well, no cement plug found. POOH to set another kick-off plug.

Bitrun Summary

RUN TIME DATA

MWD Run	: 200	Run Start	: 19-Jan-10 18:40	BRT Hrs	: 44.58 hr	Circ. Hrs	: 24.80 hr
Rig Bit No	: 2	Run End	: 21-Jan-10 15:15	Hole Size	: 216.00 mm	Oper. Hrs	: 44.58 hr

DRILLING DATA

Start Depth	: 1990.00 m	Footage	: 122.00 m	Avg RPM	: 223 rpm	Avg ROP	: 6.70 m/hr
End Depth	: 2112.00 m	Avg Flow Rate	: 544.00 gpm	Avg WOB	: 13.3 klb	Avg SPP	: 1971 psig
Drilling Hours	: 18.200 hr						

MUD DATA

Mud Type	: Polymer						
Weight	: 9.30 ppg	Viscosity	: 68.00 spqt	PV	: 21 cP	YP	: 33.00 lbf/2
Chlorides	: 36000.00 ppm	Max Temp.	: 56.30 degC	% Solids	: 3.30 %	% Sand	: 0.25 %
pH	: 10.50 pH	Fluid Loss	: 4 mptm	% Oil	: 0.00 %	O:W	: 0:93.8

MWD PERFORMANCE

Tool OD	: 6.75 in	Type	: DWD	Min. Inc.	: 1.12 deg	Min. Inc. Depth	: 1995.260 m
Final Az.	: 180.78 deg	Max Op. Press.	: 3351 psig	Max Inc.	: 9.89 deg	Max Inc. Depth	: 2097.430 m
MWD Real-time %	: 100 %	MWD Recorded %	: 0 %				

	Length (m)	Dist From Bit (m)		Length (m)	Dist From Bit (m)
5" X 3" HWDP #49.3 - NC50(IF) 5.00 in OD / 3.00 in ID	47.18	216.73			
Jar 6.50 in OD / 2.75 in ID	9.84	169.55	6 3/4" HOC 6.75 in OD / 1.92 in ID * Positive Pulser - SN : 8443 * PCM Sonde - SN : 11226946	3.03	14.70
5" X 3" HWDP #49.3 - NC50(IF) 5.00 in OD / 3.00 in ID	84.57	159.71			
6 3/4" X 3" - 97.6# Drill Collar 6.75 in OD / 2.88 in ID	56.16	75.14	6 3/4" PM Sub 6.75 in OD / 1.92 in ID * PCDC Sonde - SN : 300351	2.78	11.68
Integral Blade 6.75 in OD / 2.88 in ID	1.70	18.98			
Float Sub 6.75 in OD / 3.00 in ID	0.91	17.28			
MWD	5.81	16.37			
Integral Blade 6.75 in OD / 2.88 in ID	2.03	10.56			
Mud Motor 6.75 in OD / 4.50 in ID	8.29	8.53			
Mill 8.50 in OD / 2.50 in ID	0.24	0.24			

COMMENTS

RIH and initiate kick off of Rockhopper-1ST1 from the well bore of Rockhopper-1 at 1990.0m MDRT and drill ahead steering as required.

Bitrun Summary

RUN TIME DATA

MWD Run	: 300	Run Start	: 21-Jan-10 18:02	BRT Hrs	: 3.97 hr	Circ. Hrs	: 0.83 hr
Rig Bit No	: 3	Run End	: 21-Jan-10 22:00	Hole Size	: 216.00 mm	Oper. Hrs	: 3.97 hr

DRILLING DATA

Start Depth	: 2112.00 m	Footage	: 0.00 m	Avg RPM	: 0 rpm	Avg ROP	: 0.00 m/hr
End Depth	: 2112.00 m	Avg Flow Rate	: 0.00 gpm	Avg WOB	: 0.0 klb	Avg SPP	: 0 psig
Drilling Hours	: 0.000 hr						

MUD DATA

Mud Type	: Polymer						
Weight	: 0.00 ppg	Viscosity	: 0.00 spqt	PV	: 0 cP	YP	: 0.00 lhf2
Chlorides	: 0.00 ppm	Max Temp.	: 0.00 degC	% Solids	: 0.00 %	% Sand	: 0.00 %
pH	: 0.00 pH	Fluid Loss	: 0 mptm	% Oil	: 0.00 %	O:W	:

MWD PERFORMANCE

Tool OD	: 6.75 in	Type	: Quad GP	Min. Inc.	: 0.00 deg	Min. Inc. Depth	: 0.000 m
Final Az.	: 0.00 deg	Max Op. Press.	: 0 psig	Max Inc.	: 0.00 deg	Max Inc. Depth	: 0.000 m
MWD Real-time %	: 0 %	MWD Recorded %	: 0 %				

	Length (m)	Dist From Bit (m)		Length (m)	Dist From Bit (m)
5 x 5" X 3" HWDP 5.00 in OD / 3.00 in ID	47.18	210.41	HOC 6.75 in OD / 1.92 in ID * Positive Pulser - SN : 10681262 * PCM Sonde - SN : 10921470	3.04	0.00
Jar 6.50 in OD / 2.75 in ID	9.84	163.23			
9 x 5" X 3" HWDP 5.00 in OD / 3.00 in ID	84.57	153.39	BAT 6.75 in OD / 1.92 in ID * BAT Insert - SN : 169877	6.68	24.20
3 x 6 3/4" X 2.8125" Drill Collar 6.75 in OD / 2.81 in ID	27.92	68.82			
Integral Blade 6.75 in OD / 2.88 in ID	1.70	40.90	PWD 6.75 in OD / 1.92 in ID * PWD Insert - SN : 11307667	2.54	0.00
Float Sub 6.75 in OD / 2.94 in ID	0.91	39.20			
MWD	27.34	38.29			
Stabilizer 6.75 in OD / 1.92 in ID	0.67	10.95	NUKE - ALD CTN ACAL 6.75 in OD / 1.92 in ID * ACAL Insert - SN : 123087 * CTN Insert - SN : 11211115 * ALD Insert - SN : 82792	8.54	31.02
Flex Sub 6.75 in OD / 1.92 in ID * PCDC Sonde	2.76	10.07			15.59
Geo-Pilot 7600 6.75 in OD / 1.63 in ID	7.08	7.52	RLL - DGR DDSr-DGR EWR-P4 HCIM 6.75 in OD / 1.92 in ID * HCIM Insert - SN : 222936 * EWR-P4 Insert - SN : 175801 * DDSr-DGR - SN : 218750 * DGR Insert - SN : 218750	6.54	5.17
PDC 8.50 in OD / 1.42 in ID	0.44	0.44			0.00
					2.83

COMMENTS

RIH to drill 8 1/2" section, during SPT, PCDC locked up giving error readings for Gy and Gtotal. POOH to pick up backup tools.

Bitrun Summary

RUN TIME DATA

MWD Run	: 400	Run Start	: 21-Jan-10 23:29	BRT Hrs	: 106.76 hr	Circ. Hrs	: 82.13 hr
Rig Bit No	: 4	Run End	: 26-Jan-10 10:15	Hole Size	: 216.00 mm	Oper. Hrs	: 106.76 hr

DRILLING DATA

Start Depth	: 2112.00 m	Footage	: 1046.00 m	Avg RPM	: 108 rpm	Avg ROP	: 18.62 m/hr
End Depth	: 3158.00 m	Avg Flow Rate	: 574.00 gpm	Avg WOB	: 13.2 klb	Avg SPP	: 2141 psig
Drilling Hours	: 56.180 hr						

MUD DATA

Mud Type	: Polymer						
Weight	: 9.40 ppg	Viscosity	: 65.00 spqt	PV	: 19 cP	YP	: 30.00 lbf/2
Chlorides	: 37000.00 ppm	Max Temp.	: 76.00 degC	% Solids	: 3.40 %	% Sand	: 0.20 %
pH	: 9.50 pH	Fluid Loss	: 4 mptm	% Oil	: 0.00 %	O:W	: 0:94

MWD PERFORMANCE

Tool OD	: 6.75 in	Type	: Quad GP	Min. Inc.	: 10.33 deg	Min. Inc. Depth	: 2101.740 m
Final Az.	: 177.66 deg	Max Op. Press.	: 4795 psig	Max Inc.	: 36.74 deg	Max Inc. Depth	: 2483.190 m
MWD Real-time %	: 100 %	MWD Recorded %	: 98 %				

	Length (m)	Dist From Bit (m)		Length (m)	Dist From Bit (m)
5 x 5" X 3" HWDP 5.00 in OD / 3.00 in ID	47.18	210.46	HOC 6.75 in OD / 1.92 in ID * Positive Pulser - SN : 10486716 * PCM Sonde - SN : 10921470	3.04	0.00
Jar 6.50 in OD / 2.75 in ID	9.84	163.28			
9 x 5" X 3" HWDP 5.00 in OD / 3.00 in ID	84.57	153.44	BAT 6.75 in OD / 1.92 in ID * BAT Insert - SN : 169877	6.68	31.88
3 x 6 3/4" X 2.8125" Drill Collar 6.75 in OD / 2.81 in ID	27.92	68.87			
Integral Blade 6.75 in OD / 2.88 in ID	1.70	40.95	PWD 6.75 in OD / 1.92 in ID * PWD Insert - SN : 11307667	2.54	27.58
Float Sub 6.75 in OD / 2.94 in ID	0.91	39.25			
MWD	27.34	38.34			
Stabilizer 6.75 in OD / 1.92 in ID	0.67	11.00	NUKE - ALD CTN ACAL 6.75 in OD / 1.92 in ID * ACAL Insert - SN : 123087 * CTN Insert - SN : 11211115 * ALD Insert - SN : 82792	8.54	23.78
Flex Sub 6.75 in OD / 1.92 in ID * PCDC Sonde	2.81	8.73			24.84
Geo-Pilot 7600 6.75 in OD / 1.63 in ID	7.08	7.52	RLL - DGR DDSr-DGR EWR-P4 HCIM 6.75 in OD / 1.92 in ID * HCIM Insert - SN : 222936 * EWR-P4 Insert - SN : 175801 * DDSr-DGR - SN : 218750 * DGR Insert - SN : 218750	6.54	20.76
Reed Hycalog RSX616M 8.50 in OD / 1.42 in ID	0.44	0.44			13.85
					0.00
					11.51

COMMENTS

RIH with Quad Combo and GP assembly. Wipe previously drilled directional only section from 2001m to 2112m MDRT.
Drill new formation to 3158.0mMDRT. POOH for LWD failure.

Bitrun Summary

RUN TIME DATA

MWD Run	: 500	Run Start	: 26-Jan-10 15:52	BRT Hrs	: 31.31 hr	Circ. Hrs	: 12.45 hr
Rig Bit No	: 5	Run End	: 27-Jan-10 23:11	Hole Size	: 216.00 mm	Oper. Hrs	: 31.34 hr

DRILLING DATA

Start Depth	: 3158.00 m	Footage	: 38.00 m	Avg RPM	: 77 rpm	Avg ROP	: 9.74 m/hr
End Depth	: 3196.00 m	Avg Flow Rate	: 604.00 gpm	Avg WOB	: 9.9 klb	Avg SPP	: 2468 psig
Drilling Hours	: 3.900 hr						

MUD DATA

Mud Type	: Polymer						
Weight	: 9.40 ppg	Viscosity	: 63.00 spqt	PV	: 20 cP	YP	: 37.00 lhf2
Chlorides	: 37500.00 ppm	Max Temp.	: 109.30 degC	% Solids	: 3.40 %	% Sand	: 0.20 %
pH	: 9.00 pH	Fluid Loss	: 4 mptm	% Oil	: 0.00 %	O:W	: 0:94.0

MWD PERFORMANCE

Tool OD	: 6.75 in	Type	: Quad GP	Min. Inc.	: 35.32 deg	Min. Inc. Depth	: 3145.400 m
Final Az.	: 178.52 deg	Max Op. Press.	: 4859 psig	Max Inc.	: 35.70 deg	Max Inc. Depth	: 3185.270 m
MWD Real-time %	: 100 %	MWD Recorded %	: 100 %				

	Length (m)	Dist From Bit (m)		Length (m)	Dist From Bit (m)
5 x 5" X 3" HWDP 5.00 in OD / 3.00 in ID	47.18	212.73	ACAL 6.75 in OD / 1.92 in ID * ACAL Insert - SN : 142854	1.81	39.17
Jar 6.50 in OD / 2.75 in ID	9.84	165.55	HOC 6.75 in OD / 1.92 in ID * Positive Pulser - SN : 10486716 * PCM Sonde - SN : 11145579	3.03	35.35
9 x 5" X 3" HWDP 5.00 in OD / 3.00 in ID	84.57	71.14	BAT 6.75 in OD / 1.92 in ID * BAT Insert - SN : 125780	6.72	32.36
3 x 6 3/4" X 2.8125" Drill Collar 6.75 in OD / 2.81 in ID	27.92	43.22	PWD 6.75 in OD / 1.92 in ID * PWD Insert - SN : 184467440737095	2.53	28.04
Integral Blade 6.75 in OD / 2.88 in ID	1.70	41.52	NUKE - ALD CTN ACAL 6.75 in OD / 1.92 in ID * CTN Insert - SN : 161970 * ALD Insert - SN : 10507525	9.14	25.31
Float Sub 6.75 in OD / 2.94 in ID	0.91	40.61	RLL - DGR DDSr-DGR EWR-P4 HCIM 6.75 in OD / 1.92 in ID * HCIM Insert - SN : 225649 * EWR-P4 Insert - SN : 94034 * DDSr-DGR - SN : 10909632 * DGR Insert - SN : 10909632	6.53	13.68
MWD	29.76	0.39			0.00
Stabilizer 6.75 in OD / 1.92 in ID	0.62	10.85			11.36
Flex Sub 6.75 in OD / 1.92 in ID * PCDC Sonde	2.76	8.69			
Geo-Pilot 7600 6.75 in OD / 1.63 in ID	7.08	7.47			
Security FMF3653Z 8.50 in OD / 1.42 in ID	0.39	0.39			

COMMENTS

Drill 8 1/2" Section from 3158.0 mMDRT to first core point at 3196.0 mMDRT. POOH to run core barrels.

Bitrun Summary

RUN TIME DATA

MWD Run	: 600	Run Start	: 29-Jan-10 11:36	BRT Hrs	: 30.66 hr	Circ. Hrs	: 12.26 hr
Rig Bit No	: 6	Run End	: 30-Jan-10 18:16	Hole Size	: 216.00 mm	Oper. Hrs	: 30.66 hr

DRILLING DATA

Start Depth	: 3212.50 m	Footage	: 70.50 m	Avg RPM	: 172 rpm	Avg ROP	: 11.79 m/hr
End Depth	: 3283.00 m	Avg Flow Rate	: 580.00 gpm	Avg WOB	: 12.1 klb	Avg SPP	: 2000 psig
Drilling Hours	: 5.980 hr						

MUD DATA

Mud Type	: Polymer						
Weight	: 9.35 ppg	Viscosity	: 62.00 spqt	PV	: 15 cP	YP	: 25.00 lbf/ft ²
Chlorides	: 38000.00 ppm	Max Temp.	: 86.00 degC	% Solids	: 2.90 %	% Sand	: 0.15 %
pH	: 9.00 pH	Fluid Loss	: 4 mptm	% Oil	: 0.00 %	O:W	: 0:94

MWD PERFORMANCE

Tool OD	: 6.75 in	Type	: Quad GP	Min. Inc.	: 35.56 deg	Min. Inc. Depth	: 3203.430 m
Final Az.	: 178.72 deg	Max Op. Press.	: 4940 psig	Max Inc.	: 35.91 deg	Max Inc. Depth	: 3234.730 m
MWD Real-time %	: 100 %	MWD Recorded %	: 100 %				

	Length (m)	Dist From Bit (m)		Length (m)	Dist From Bit (m)
5 x 5" X 3" HWDP 5.00 in OD / 3.00 in ID	47.18	212.69	ACAL 6.75 in OD / 1.92 in ID * ACAL Insert - SN : 142854	1.81	39.13
Jar 6.50 in OD / 2.75 in ID	9.84	165.51	HOC 6.75 in OD / 1.92 in ID * Positive Pulser - SN : 10486716 * PCM Sonde - SN : 11145579	3.03	35.35
9 x 5" X 3" HWDP 5.00 in OD / 3.00 in ID	84.57	71.10	BAT 6.75 in OD / 1.92 in ID * BAT Insert - SN : 169877	6.68	32.33
3 x 6 3/4" X 2.8125" Drill Collar 6.75 in OD / 2.81 in ID	27.92	43.18	Integral Blade 6.75 in OD / 2.88 in ID	1.70	41.48
Float Sub 6.75 in OD / 2.94 in ID	0.91	40.57	PWD 6.75 in OD / 1.92 in ID * PWD Insert - SN : 184467440737095	2.53	28.04
MWD	29.72	10.85	NUKE - ALD CTN ACAL 6.75 in OD / 1.92 in ID * CTN Insert - SN : 161970 * ALD Insert - SN : 10507525	9.14	25.31
Stabilizer 6.75 in OD / 1.92 in ID	0.62	8.69	RLL - DGR DDSr-DGR EWR-P4 HCIM 6.75 in OD / 1.92 in ID * HCIM Insert - SN : 225649 * EWR-P4 Insert - SN : 94034 * DDSr-DGR - SN : 10909632 * DGR Insert - SN : 10909632	6.53	13.68
Flex Sub 6.75 in OD / 1.92 in ID * PCDC Sonde	2.76	0.39			0.00
Geo-Pilot 7600 6.75 in OD / 1.63 in ID	7.08				11.36
Security FMP3653Z 8.50 in OD / 1.42 in ID	0.39				

COMMENTS

Change out BAT sonic tool and RIH with the previous assembly to wipe core section and drill ahead to second core point. POOH to core.

Bitrun Summary

RUN TIME DATA

MWD Run	: 700	Run Start	: 02-Feb-10 06:38	BRT Hrs	: 47.68 hr	Circ. Hrs	: 21.35 hr
Rig Bit No	: 7	Run End	: 04-Feb-10 06:19	Hole Size	: 216.00 mm	Oper. Hrs	: 47.68 hr

DRILLING DATA

Start Depth	: 3309.00 m	Footage	: 173.00 m	Avg RPM	: 160 rpm	Avg ROP	: 11.09 m/hr
End Depth	: 3482.00 m	Avg Flow Rate	: 594.00 gpm	Avg WOB	: 12.7 klb	Avg SPP	: 2230 psig
Drilling Hours	: 15.600 hr						

MUD DATA

Mud Type	: Polymer						
Weight	: 9.40 ppg	Viscosity	: 73.00 spqt	PV	: 18 cP	YP	: 28.00 lhf2
Chlorides	: 38000.00 ppm	Max Temp.	: 127.00 degC	% Solids	: 3.50 %	% Sand	: 0.20 %
pH	: 9.00 pH	Fluid Loss	: 4 mptm	% Oil	: 0.00 %	O:W	: 0:100

MWD PERFORMANCE

Tool OD	: 6.75 in	Type	: Quad GP	Min. Inc.	: 35.03 deg	Min. Inc. Depth	: 3293.650 m
Final Az.	: 179.36 deg	Max Op. Press.	: 5225 psig	Max Inc.	: 36.10 deg	Max Inc. Depth	: 3439.040 m
MWD Real-time %	: 100 %	MWD Recorded %	: 100 %				

	Length (m)	Dist From Bit (m)		Length (m)	Dist From Bit (m)
5 x 5" X 3" HWDP 5.00 in OD / 3.00 in ID	47.18	212.79	ACAL 6.75 in OD / 1.92 in ID * ACAL Insert - SN : 142854	1.81	39.13
Jar 6.50 in OD / 2.75 in ID	9.94	165.61	HOC 6.75 in OD / 1.92 in ID * Positive Pulser - SN : 11160907 * PCM Sonde - SN : 11145579	3.03	35.35
9 x 5" X 3" HWDP 5.00 in OD / 3.00 in ID	84.57	71.10	BAT 6.75 in OD / 1.92 in ID * BAT Insert - SN : 169877	6.68	32.33
3 x 6 3/4" X 2.8125" Drill Collar 6.75 in OD / 2.81 in ID	27.92	43.18	PWD 6.75 in OD / 1.92 in ID * PWD Insert - SN : 184467440737095	2.53	28.04
Integral Blade 6.75 in OD / 2.88 in ID	1.70	41.48			
Float Sub 6.75 in OD / 2.94 in ID	0.91	40.57			
MWD	29.72	10.85	NUKE - ALD CTN 6.75 in OD / 1.92 in ID * CTN Insert - SN : 161970 * ALD Insert - SN : 10507525	9.14	25.31
Stabilizer 6.75 in OD / 1.92 in ID	0.62	8.69	RLL - DGR DDSr-DGR EWR-P4 HCIM 6.75 in OD / 1.92 in ID * HCIM Insert - SN : 225649 * EWR-P4 Insert - SN : 94034 * DDSr-DGR - SN : 10909632 * DGR Insert - SN : 10909632	6.53	13.68
Flex Sub 6.75 in OD / 1.92 in ID * PCDC Sonde	2.76	7.08			0.00
Geo-Pilot 7600 6.75 in OD / 1.63 in ID	7.08	0.39			11.36
PDC 8.50 in OD / 1.42 in ID	0.39				

COMMENTS

RIH with the previous rotary and LWD assembly to wipe core section and drill ahead to TD. POOH to run wireline logs.

Directional Survey Data

RT- LAT=26.0m
Final survey projected to TD
All surveys are SAG corrected.

Tie-in

0.000 0.00 0.00 0.000 0.000 N 0.000 E ***

Measured Depth (m)	Inclination (deg)	Direction (deg)	Vertical Depth (m)	Latitude (m)	Departure (m)	Vertical Section (m)	Dogleg (°/30m)
100.300	0.00	0.00	100.300	0.000 N	0.000 E	0.000	0.00
242.360	0.22	278.10	242.360	0.040 N	0.270 W	-0.040	0.05
327.420	0.34	318.42	327.420	0.250 N	0.600 W	-0.260	0.08
356.380	0.16	310.14	356.380	0.340 N	0.690 W	-0.350	0.19
414.830	0.43	334.58	414.830	0.590 N	0.840 W	-0.600	0.15
502.130	0.25	356.62	502.130	1.080 N	1.000 W	-1.090	0.08
559.330	0.33	356.35	559.330	1.370 N	1.010 W	-1.380	0.04
645.930	0.22	77.08	645.920	1.650 N	0.870 W	-1.660	0.13
733.400	0.10	264.51	733.390	1.680 N	0.780 W	-1.690	0.11
819.330	0.13	204.11	819.320	1.590 N	0.890 W	-1.600	0.04
907.200	0.22	337.40	907.190	1.650 N	1.000 W	-1.660	0.11
956.770	0.15	112.45	956.760	1.710 N	0.980 W	-1.730	0.21
980.350	0.00	258.48	980.340	1.700 N	0.950 W	-1.710	0.19
1009.960	0.20	60.48	1009.950	1.730 N	0.900 W	-1.740	0.20
1039.180	0.22	57.43	1039.170	1.780 N	0.810 W	-1.790	0.02
1068.020	0.25	56.38	1068.010	1.850 N	0.710 W	-1.860	0.03
1096.690	0.09	334.71	1096.680	1.900 N	0.670 W	-1.910	0.26
1125.200	0.25	23.41	1125.190	1.980 N	0.650 W	-1.990	0.21
1153.520	0.31	18.55	1153.510	2.110 N	0.610 W	-2.120	0.07
1182.120	0.26	64.52	1182.110	2.210 N	0.520 W	-2.220	0.24
1210.690	0.31	28.33	1210.680	2.310 N	0.430 W	-2.310	0.19
1239.340	0.36	49.88	1239.330	2.430 N	0.320 W	-2.440	0.14
1298.150	0.40	29.51	1298.140	2.730 N	0.080 W	-2.730	0.07
1327.530	0.39	32.18	1327.520	2.900 N	0.020 E	-2.900	0.02
1356.770	0.31	47.29	1356.760	3.040 N	0.140 E	-3.040	0.12
1385.600	0.44	56.10	1385.590	3.160 N	0.290 E	-3.150	0.15
1412.810	0.48	46.30	1412.800	3.290 N	0.450 E	-3.290	0.10
1441.660	0.57	57.51	1441.650	3.450 N	0.660 E	-3.450	0.14
1470.690	0.57	43.73	1470.680	3.640 N	0.880 E	-3.630	0.14
1499.950	0.59	47.75	1499.930	3.840 N	1.100 E	-3.830	0.05
1529.470	0.61	56.99	1529.450	4.030 N	1.340 E	-4.010	0.10
1558.730	0.62	46.69	1558.710	4.220 N	1.590 E	-4.200	0.11
1587.900	0.64	49.02	1587.880	4.440 N	1.820 E	-4.420	0.03
1616.890	0.68	52.55	1616.870	4.650 N	2.080 E	-4.620	0.06
1645.390	0.64	67.47	1645.360	4.810 N	2.360 E	-4.780	0.19
1673.840	0.66	56.91	1673.810	4.960 N	2.650 E	-4.930	0.13
1702.240	0.67	57.55	1702.210	5.140 N	2.930 E	-5.110	0.01
1759.920	0.72	70.24	1759.890	5.450 N	3.550 E	-5.400	0.08
1789.630	0.84	75.16	1789.590	5.570 N	3.940 E	-5.520	0.14
1848.620	0.80	79.00	1848.580	5.750 N	4.760 E	-5.690	0.03
1876.780	0.90	76.63	1876.730	5.840 N	5.170 E	-5.780	0.11
1905.300	0.76	78.61	1905.250	5.930 N	5.570 E	-5.860	0.15

Directional Survey Data

Measured Depth (m)	Inclination (deg)	Direction (deg)	Vertical Depth (m)	Latitude (m)	Departure (m)	Vertical Section (m)	Dogleg (°/30m)
1934.760	0.91	50.85	1934.710	6.120 N	5.940 E	-6.040	0.43
1951.760	0.68	51.65	1951.710	6.270 N	6.130 E	-6.190	0.41
1968.420	0.69	57.75	1968.370	6.380 N	6.290 E	-6.300	0.13
1995.260	1.12	112.40	1995.200	6.370 N	6.670 E	-6.280	1.02
2020.270	4.56	164.56	2020.180	5.320 N	7.160 E	-5.230	4.77
2076.850	8.58	180.86	2076.380	1.080 S	7.700 E	1.170	2.33
2097.430	9.89	180.78	2096.700	4.380 S	7.650 E	4.470	1.91
2101.740	10.33	180.02	2100.940	5.130 S	7.640 E	5.230	3.20
2133.860	11.00	184.57	2132.500	11.070 S	7.400 E	11.160	1.00
2162.640	12.26	191.23	2160.690	16.800 S	6.580 E	16.890	1.92
2191.040	14.09	193.69	2188.350	23.120 S	5.180 E	23.180	2.02
2221.570	17.24	200.87	2217.740	30.960 S	2.690 E	30.990	3.63
2249.960	21.12	203.77	2244.550	39.580 S	0.870 W	39.560	4.22
2279.090	25.17	203.19	2271.330	50.080 S	5.430 W	50.010	4.18
2305.360	27.89	201.28	2294.830	60.940 S	9.860 W	60.810	3.26
2335.320	29.38	198.65	2321.130	74.430 S	14.760 W	74.240	1.95
2364.040	31.58	195.91	2345.880	88.340 S	19.070 W	88.100	2.72
2393.220	33.12	193.25	2370.530	103.450 S	22.990 W	103.160	2.16
2424.120	34.46	191.99	2396.210	120.220 S	26.740 W	119.880	1.47
2453.550	35.45	189.16	2420.330	136.790 S	29.830 W	136.410	1.94
2483.190	36.74	186.44	2444.280	154.090 S	32.200 W	153.680	2.08
2512.340	35.42	185.57	2467.840	171.160 S	33.990 W	170.720	1.46
2539.220	36.20	185.30	2489.640	186.820 S	35.480 W	186.360	0.89
2567.350	35.96	183.83	2512.380	203.330 S	36.800 W	202.850	0.96
2596.630	35.85	183.27	2536.090	220.470 S	37.870 W	219.980	0.35
2623.250	35.76	182.90	2557.680	236.020 S	38.700 W	235.520	0.26
2653.750	34.92	179.74	2582.560	253.650 S	39.110 W	253.140	1.98
2684.950	36.05	178.78	2607.970	271.760 S	38.880 W	271.250	1.21
2711.610	35.74	177.14	2629.570	287.380 S	38.320 W	286.880	1.14
2739.680	35.53	177.12	2652.380	303.720 S	37.500 W	303.220	0.22
2771.600	35.60	176.05	2678.350	322.250 S	36.400 W	321.760	0.59
2799.250	35.65	174.76	2700.820	338.300 S	35.110 W	337.830	0.82
2830.330	35.66	174.48	2726.070	356.340 S	33.410 W	355.890	0.16
2858.860	35.48	174.28	2749.280	372.850 S	31.780 W	372.420	0.23
2886.550	35.51	174.82	2771.830	388.860 S	30.260 W	388.450	0.34
2912.810	35.67	174.71	2793.180	404.080 S	28.860 W	403.680	0.20
2944.720	35.81	174.86	2819.080	422.640 S	27.170 W	422.260	0.16
2970.130	33.67	176.07	2839.960	437.070 S	26.020 W	436.710	2.65
3001.240	33.20	177.20	2865.920	454.180 S	25.010 W	453.830	0.75
3026.700	33.66	177.54	2887.170	468.190 S	24.370 W	467.850	0.59
3059.360	34.73	177.11	2914.180	486.530 S	23.510 W	486.200	1.01
3089.540	35.58	176.65	2938.860	503.880 S	22.570 W	503.560	0.88
3118.070	35.65	177.66	2962.050	520.470 S	21.740 W	520.160	0.62
3145.400	35.32	177.16	2984.310	536.320 S	21.020 W	536.020	0.48
3167.940	35.69	178.03	3002.660	549.400 S	20.480 W	549.100	0.83
3185.270	35.70	178.52	3016.730	559.510 S	20.170 W	559.210	0.50
3203.430	35.56	178.76	3031.490	570.080 S	19.920 W	569.790	0.33
3234.730	35.91	179.25	3056.900	588.360 S	19.600 W	588.070	0.43

Directional Survey Data

Measured Depth (m)	Inclination (deg)	Direction (deg)	Vertical Depth (m)	Latitude (m)	Departure (m)	Vertical Section (m)	Dogleg (°/30m)
3264.810	35.73	178.72	3081.290	605.960 S	19.290 W	605.670	0.36
3293.650	35.03	178.07	3104.800	622.650 S	18.820 W	622.370	0.83
3324.890	36.06	178.66	3130.220	640.810 S	18.310 W	640.530	1.04
3350.050	35.41	178.82	3150.640	655.500 S	17.980 W	655.220	0.78
3379.250	35.71	179.95	3174.400	672.480 S	17.800 W	672.200	0.74
3408.140	35.85	180.50	3197.840	689.370 S	17.870 W	689.090	0.36
3439.040	36.10	180.75	3222.840	707.520 S	18.070 W	707.240	0.28
3467.050	35.47	179.36	3245.560	723.900 S	18.080 W	723.610	1.10
3482.000	35.47	179.36	3257.740	732.570 S	17.990 W	732.290	0.00

CALCULATION BASED ON MINIMUM CURVATURE METHOD

**SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT**

**VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 179.28 DEGREES(GRID)
A TOTAL CORRECTION OF 11.50 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD
HORIZONTAL DISPLACEMENT(CLOSURE) AT 3482.00 METRES
IS 732.79 METRES ALONG 181.41 DEGREES (GRID)**

Service Interrupt Report

MWD Run Number	: 400	Time/Date of Failure	: 21-Jan-10 19:45
Rig Bit Number	: 3	Depth at time of Failure	: 360.000 m
MWD Run start time/date	: 21-Jan-10 23:29	Lost Rig Hours	: hr
MWD Run end time/date	: 26-Jan-10 10:15		

RIG ACTIVITY

Shallow Pulse Test

DESCRIPTION OF FAILURE

PCDC inclination locked and giving invalid Gy and Gtotal readings.

ACTION TAKEN

Cycle pumps, mode switch and send downlinks to reset sensor. PCDC failed to respond. POOH to pick up backup PCD-C

OPERATION IMPACT

POOH to pick up backup PCD-C.

REASON FOR FAILURE

To be investigated

Service Interrupt Report

MWD Run Number	: 400	Time/Date of Failure	: 25-Feb-10 16:24
Rig Bit Number	: 4	Depth at time of Failure	: 3156.000 m
MWD Run start time/date	: 21-Jan-10 23:29	Lost Rig Hours	: hr
MWD Run end time/date	: 26-Jan-10 10:15		

RIG ACTIVITY

Drilling ahead to core point.

DESCRIPTION OF FAILURE

Tool lost all sensors below EWR, No PCDC, ABG, DGR and Geo-pilot.

ACTION TAKEN

Try to revive tool by pump cycles, send downlink commands in an attempt to take surveys, mode switch and reset sensors. All attempts failed to revive tool.

OPERATION IMPACT

POOH to change tools.

REASON FOR FAILURE

Intermittent communication bus failure.

