

**HALLIBURTON**  
**Sperry Drilling Services**

**LWD End of Well Report**  
**for**  
**Nexus Energy Ltd**

**Culverin-1**

**Rig:** Ocean Patriot  
**Field:** Exploration  
**Country:** Australia  
**Job No:** AU-FE-0003951414  
**Date:** 16<sup>th</sup> December 2005

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## General Information

Company:	Nexus Energy Ltd	
Rig:	Ocean Patriot	
Well:	Culverin-1	
Field:	Exploration	
Country:	Australia	
API Number:		
Sperry-Sun Job Number:	AU-FE-0003951414	
Job start date:	16-Dec-05	
Job end date:	07-Jan-06	
North reference:	Grid	
Declination:	13.402	deg
Dip angle:	-68.823	deg
Total magnetic field:	59972	nT
Date of magnetic data:	17-Dec-05	
Wellhead coordinates N:	38 deg. 24 min 8.140 sec South	
Wellhead coordinates E:	148 deg. 39 min 14.920 sec East	
Vertical section direction:	Closure	
MWD Engineers:	A. Oraekwuotu	S. Willis
	A. Rule	B. Haren
Company Representatives:	W. Westman	R. King
Company Geologist:	M. Woodmansee	R. Blackmore
Lease Name:	VIC/P56	
Unit Number:	182	
State:	Victoria	
County:		

## Operational Overview

Sperry Drilling Services (Halliburton) were contracted by Nexus Energy Ltd to provide Logging While Drilling (LWD) services for the drilling of exploration well Culverin-1, in permit VIC/P-56, from the semi-submersible drilling rig Ocean Patriot.

### 445mm (17 1/2") Hole Section:

This hole section was drilled in one bit run using Sperry's Directional Gamma While Drilling (DGWD) tool suite, comprising of a Gamma Module (GM) for Formation Evaluation and a Directional Monitor (DM) for directional control. This section was drilled to 1525.0 mMDRT.

### 311mm (12 1/4") Hole Section:

This hole section was drilled in four bit runs using Sperry's Formation Evaluation While Drilling (FEWD) tool suite, comprising of a Dual Gamma Ray (DGR), Electromagnetic Wave Resistivity (EWR-P4), Stabilized Litho Density (SLD), and Compensated Thermal Neutron Porosity (CTN) for reservoir evaluation. A Drillstring Dynamics Sensor (DDS) was used for drilling optimisation and a Directional Monitor (DM) for directional control. Culverin-1 was drilled to a well TD of 3758.0 mMDRT.

## Summary of MMDruns

[illegible]

TOTALS ==>	3108.00	399.74	399.74	270.43	2	2
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## Bitrun Summary

Run Time Data		Drilling Data			Mud Data			
MWD Run :	0100	Start Depth :	650.00	m	Mud Type :	Seawater		
Rig Bit No:	2	End Depth :	650.00	m	Weight / Visc :	1.04	sg /	N/A spqt
Hole Size :	445.00 mm	Footage :	0.00	m	Chlorides :	N/A	ppm	
Run Start :	18-Dec-05 00:54	Avg. Flow Rate :	1150	gpm	PV / YP :		cp /	lhf2
Run End :	18-Dec-05 03:54	Avg. RPM :	N/A	rpm	Solids/Sand :		% /	%
BRT Hrs :	3.00	Avg. WOB :	N/A	klb	%Oil / O:W:		% /	
Circ. Hrs :	0.42	Avg. ROP :	N/A	m/hr	pH/Fluid Loss:	N/A	pH /	N/A mptm
Oper. Hrs :	3.00	Avg. SPP :	N/A	psig	Max. Temp. :	18.00	degC	
MWD Schematics		BHA Schematics						
		<div> <div>Component</div> <div>Length</div> <div>O.D.</div> <div>I.D.</div> </div>						
		<div> <div>(m)</div> <div>(mm)</div> <div>(mm)</div> </div>						
		(14)						
		(13)						
		(12)						
		(11)						
		(10)						
		(9)						
		(8)						
		(7)						
		(6)						
		(5)						
		(4)						
		(3)						
		(2)						
		(1)						
<div> <div>5. Positive Pulser</div> <div>SN : 10608129</div> </div> <div> <div>4. TM</div> <div>SN : 10505184</div> </div> <div> <div>3. GM</div> <div>SN : 189039</div> <div>15.18 m From Bit</div> </div> <div> <div>2. DM</div> <div>SN : 149865</div> <div>13.36 m From Bit</div> </div> <div> <div>1. Battery Module</div> <div>SN : 115234</div> </div>		(14)	14. Drill Pipe (E)	2000.00	139.700	121.361		
		(13)	13. HWDP	138.22	161.000	76.000		
		(12)	12. Cross Over Sub	1.16	200.000	74.000		
		(11)	11. Drill Collar	17.71	203.200	71.438		
		(10)	10. Drilling Jars	9.31	205.000	78.000		
		(9)	09. Drill Collar	26.63	203.200	71.438		
		(8)	08. Cross Over Sub	1.16	241.000	71.000		
		(7)	07. Drill Collar	27.18	241.300	76.200		
		(6)	06. Integral Blade Stabilizer	2.51	196.000	76.000		
		(5)	05. MWD	9.87	241.000	74.000		
		(4)	04. Integral Blade Stabilizer	2.51	192.000	76.000		
		(3)	03. Pony collar	3.06	241.000	78.000		
		(2)	02. Integral Blade Stabilizer	2.65	192.900	70.000		
		(1)	01. Tricone Reed T-11	0.60	443.000	300.000		
Comments					MWD Performance			
Ran into hole and performed a shallow pulse test at 95.0 mMDRT. Could not get valid surveys. POOH and picked up backup tool. See Service Interrupt Report.					Tool OD / Type :	241.00	mm /	D/GWD
					MWD Real-time%:	0.00	%	
					MWD Recorded%:	N/A	%	
					Min. Inc. :	N/A	deg /	N/A m
					Max. Inc. :	N/A	deg /	N/A m
					Final Az. :	N/A	deg	
					Max Op. Press. :	N/A	psig	



## Bitrun Summary

Run Time Data		Drilling Data		Mud Data				
MWD Run :	0300	Start Depth :	1525.00 m	Mud Type :	MixSalt-Glydrill			
Rig Bit No:	3	End Depth :	3402.00 m	Weight / Visc :	1.22 sg /	57.00 spqt		
Hole Size :	311.00 mm	Footage :	1877.00 m	Chlorides :	82000 ppm			
Run Start :	24-Dec-05 00:20	Avg. Flow Rate :	900 gpm	PV / YP :	17.00 cp /	30.00 lhf2		
Run End :	30-Dec-05 19:04	Avg. RPM :	150 rpm	Solids/Sand :	10.5 % /	1.25 %		
BRT Hrs :	162.72	Avg. WOB :	15.00 klb	%Oil / O:W :	% /			
Circ. Hrs :	127.83	Avg. ROP :	33.93 m/hr	pH/Fluid Loss:	9.00 pH /	4.00 mptm		
Oper. Hrs :	162.72	Avg. SPP :	3005 psig	Max. Temp. :	56.00 degC			
MWD Schematics		BHA Schematics						
<div><div><div>(9)</div><div>(8)</div><div>(7)</div><div>(6)</div><div>(5)</div><div>(4)</div><div>(3)</div><div>(2)</div><div>(1)</div></div><div><div>9. Positive Pulser SN: 10608129</div><div>8. TM SN: 093281</div><div>7. CTN SN: 10507211 30.97 m FromBit</div><div>6. ACAL SN: 10507211 29.93 m FromBit</div><div>5. SLD SN: 157942 25.66 m FromBit</div><div>4. HCIM SN: 093281</div><div>3. EWR-P4 SN: 121609 18.04 m FromBit</div><div>2. DGR SN: 172498 15.73 m FromBit</div><div>1. DM SN: 185534 13.13 m FromBit</div></div></div>		<div><div><div>(13)</div><div>(12)</div><div>(11)</div><div>(10)</div><div>(9)</div><div>(8)</div><div>(7)</div><div>(6)</div><div>(5)</div><div>(4)</div><div>(3)</div><div>(2)</div><div>(1)</div></div><div><div>Component</div><div>Length</div><div>O.D.</div><div>I.D.</div><div>(m)</div><div>(mm)</div><div>(mm)</div></div><div><div>13. Drill Pipe (E)</div><div>3000.00</div><div>139.700</div><div>121.361</div></div><div><div>12. HWDP</div><div>192.98</div><div>122.500</div><div>71.440</div></div><div><div>11. Cross Over Sub</div><div>1.16</div><div>208.250</div><div>71.440</div></div><div><div>10. Drill Collar</div><div>8.81</div><div>203.200</div><div>71.438</div></div><div><div>09. Drilling Jars</div><div>9.31</div><div>200.400</div><div>73.600</div></div><div><div>08. Drill Collar</div><div>8.68</div><div>196.850</div><div>71.440</div></div><div><div>07. Integral Blade Stabilizer</div><div>2.10</div><div>202.000</div><div>71.440</div></div><div><div>06. Drill Collar</div><div>9.06</div><div>203.200</div><div>71.438</div></div><div><div>05. MWD</div><div>24.39</div><div>203.000</div><div>1.920</div></div><div><div>04. Integral Blade Stabilizer</div><div>1.81</div><div>202.000</div><div>7.300</div></div><div><div>03. Cross Over Sub</div><div>1.22</div><div>238.700</div><div>73.000</div></div><div><div>02. 9-5/8" SperryDrill Lobe 3/4 - 5 stage</div><div>8.58</div><div>244.602</div><div>154.000</div></div><div><div>01. PDC Hycalog RSX-616M</div><div>0.25</div><div>311.150</div><div>73.000</div></div></div>						
Comments				MWD Performance				
Drilled out cement, shoe and 3m of formation. Perform a FIT. Drilled 12 1/4" hole from 1528.0 to 3402.0 mMDRT. POOH to change bit/BHA. All recorded data recovered at surface.				Tool OD / Type :	203.00 mm /	P4M		
				MWD Real-time%:	96.25 %			
				MWD Recorded%:	100.00 %			
				Min. Inc. :	0.33 deg /	1540.46 m		
				Max. Inc. :	4.30 deg /	2457.14 m		
				Final Az. :	54.03 deg			
				Max Op. Press. :	5920 psig			



## Bitrun Summary

Run Time Data		Drilling Data		Mud Data				
MWD Run :	0400	Start Depth :	3402.00 m	Mud Type :	MixSalt-Glydrill			
Rig Bit No:	4	End Depth :	3571.00 m	Weight / Visc :	1.22 sg / 62.00 spqt			
Hole Size :	311.00 mm	Footage :	169.00 m	Chlorides :	84000 ppm			
Run Start :	30-Dec-05 23:36	Avg. Flow Rate :	850 gpm	PV / YP :	17.00 cp / 33.00 lhf2			
Run End :	02-Jan-06 05:19	Avg. RPM :	220 rpm	Solids/Sand :	10.5 % / 1.5 %			
BRT Hrs :	53.72	Avg. WOB :	21.00 klb	%Oil / O:W :	0 % / N/A			
Circ. Hrs :	32.66	Avg. ROP :	0.00 m/hr	pH/Fluid Loss:	6.00 pH / 3.60 mptm			
Oper. Hrs :	53.72	Avg. SPP :	3723 psig	Max. Temp. :	75.00 degC			
MWD Schematics		BHA Schematics						
<div><div><div>(9)</div><div>(8)</div><div>(7)</div><div>(6)</div><div>(5)</div><div>(4)</div><div>(3)</div><div>(2)</div><div>(1)</div></div><div><div>9. Positive Pulser SN: 8483</div><div>8. TM SN: 093281</div><div>7. CTN SN: 10507211 30.93 m FromBit</div><div>6. ACAL SN: 10507211 29.89 m FromBit</div><div>5. SLD SN: 157942 25.62 m FromBit</div><div>4. HCIM SN: 093281</div><div>3. EWR-P4 SN: 121609 18.00 m FromBit</div><div>2. DGR SN: 172498 15.70 m FromBit</div><div>1. DM SN: 185534 13.09 m FromBit</div></div></div>		<div><div><div>(13)</div><div>(12)</div><div>(11)</div><div>(10)</div><div>(9)</div><div>(8)</div><div>(7)</div><div>(6)</div><div>(5)</div><div>(4)</div><div>(3)</div><div>(2)</div><div>(1)</div></div><div><div>Component</div><div>Length</div><div>O.D.</div><div>I.D.</div><div>(m)</div><div>(mm)</div><div>(mm)</div></div><div><div>13. Drill Pipe (E)</div><div>12. HWDP</div><div>11. Cross Over Sub</div><div>10. Drill Collar</div><div>09. Drilling Jars</div><div>08. Drill Collar</div><div>07. Integral Blade Stabilizer</div><div>06. Drill Collar</div><div>05. MWD</div><div>04. Integral Blade Stabilizer</div><div>03. Cross Over Sub</div><div>02. 9-5/8" SperryDrill Lobe 3/4 - 4 stage</div><div>01. PDC Hycalog RSX-616M</div></div><div><div>3000.00</div><div>192.98</div><div>1.16</div><div>8.81</div><div>9.31</div><div>8.68</div><div>2.10</div><div>9.06</div><div>24.39</div><div>1.81</div><div>1.22</div><div>8.58</div><div>0.25</div></div><div><div>139.700</div><div>122.500</div><div>208.250</div><div>203.200</div><div>200.400</div><div>196.850</div><div>202.000</div><div>203.200</div><div>203.000</div><div>202.000</div><div>238.700</div><div>244.602</div><div>311.150</div></div><div><div>121.361</div><div>71.440</div><div>71.440</div><div>71.438</div><div>73.600</div><div>71.440</div><div>71.440</div><div>71.438</div><div>1.920</div><div>7.300</div><div>73.000</div><div>154.000</div><div>73.000</div></div></div>						
Comments				MWD Performance				
Wiped from 3320.0 to 3360.0 mMDRT with LWD. Drilled ahead 12 1/4" hole from 3402.0 to 3571.0 mMDRT. POOH due to pressure loss in drillstring. All recorded data recovered at surface.				Tool OD / Type :	203.00 mm / P4M			
				MWD Real-time%:	100.00 %			
				MWD Recorded%:	100.00 %			
				Min. Inc. :	3.32 deg / 3547.59 m			
				Max. Inc. :	3.59 deg / 3432.80 m			
				Final Az. :	49.95 deg			
				Max Op. Press. :	6184 psig			

## Bitrun Summary

Run Time Data		Drilling Data		Mud Data				
MWD Run :	0500	Start Depth :	3571.00 m	Mud Type :	MixSalt-Glydrill			
Rig Bit No:	5	End Depth :	3571.00 m	Weight / Visc :	1.22 sg / 62.00 spqt			
Hole Size :	311.00 mm	Footage :	0.00 m	Chlorides :	82000 ppm			
Run Start :	02-Jan-06 09:36	Avg. Flow Rate :	900 gpm	PV / YP :	18.00 cp / 27.00 lhf2			
Run End :	03-Jan-06 09:18	Avg. RPM :	18 rpm	Solids/Sand :	10.5 % / 1.25 %			
BRT Hrs :	23.70	Avg. WOB :	N/A klb	%Oil / O:W :	% /			
Circ. Hrs :	4.66	Avg. ROP :	N/A m/hr	pH/Fluid Loss:	9.00 pH / 3.60 mptm			
Oper. Hrs :	23.70	Avg. SPP :	3608 psig	Max. Temp. :	55.00 degC			
MWD Schematics		BHA Schematics						
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## Bitrun Summary

Run Time Data		Drilling Data		Mud Data			
MWD Run :	0600	Start Depth :	3571.00 m	Mud Type :	MixSalt-Glydrill		
Rig Bit No:	6	End Depth :	3758.00 m	Weight / Visc :	1.22 sg /	59.00 spqt	
Hole Size :	311.00 mm	Footage :	187.00 m	Chlorides :	79000 ppm		
Run Start :	03-Jan-06 12:52	Avg. Flow Rate :	795 gpm	PV / YP :	15.00 cp /	30.00 lhf2	
Run End :	07-Jan-06 17:22	Avg. RPM :	106 rpm	Solids/Sand :	10.5 % /	0.7 %	
BRT Hrs :	100.50	Avg. WOB :	34.00 klb	%Oil / O:W :	0 % /	N/A	
Circ. Hrs :	63.22	Avg. ROP :	3.40 m/hr	pH/Fluid Loss:	9.00 pH /	3.80 mptm	
Oper. Hrs :	100.50	Avg. SPP :	4021 psig	Max. Temp. :	58.00 degC		
MWD Schematics		BHA Schematics					
<div><div><div>(9)</div><div>(8)</div><div>(7)</div><div>(6)</div><div>(5)</div><div>(4)</div><div>(3)</div><div>(2)</div><div>(1)</div></div><div><div>9. Positive Pulser SN: 8483</div><div>8. TM SN: 160772</div><div>7. CTN SN: 194156 31.43 m From Bit</div><div>6. ACAL SN: 194156 30.39 m From Bit</div><div>5. SLD SN: 133722 26.13 m From Bit</div><div>4. HCIM SN: 160772</div><div>3. EWR-P4 SN: 205859 18.53 m From Bit</div><div>2. DGR SN: 151081 16.17 m From Bit</div><div>1. DM SN: 149865 13.55 m From Bit</div></div></div>		<div><div><div>(13)</div><div>(12)</div><div>(11)</div><div>(10)</div><div>(9)</div><div>(8)</div><div>(7)</div><div>(6)</div><div>(5)</div><div>(4)</div><div>(3)</div><div>(2)</div><div>(1)</div></div><div><div>Component</div><div>Length</div><div>O.D.</div><div>I.D.</div><div>(m)</div><div>(mm)</div><div>(mm)</div></div><div><div>13. Drill Pipe (E)</div><div>12. HWDP</div><div>11. Cross Over Sub</div><div>10. Drill Collar</div><div>09. Drilling Jars</div><div>08. Drill Collar</div><div>07. Integral Blade Stabilizer</div><div>06. Drill Collar</div><div>05. MWD</div><div>04. Integral Blade Stabilizer</div><div>03. Drill Collar</div><div>02. Bit Sub</div><div>01. Tricone Smith GF30BODVCP</div></div><div><div>3000.00</div><div>138.22</div><div>1.16</div><div>8.81</div><div>9.66</div><div>70.57</div><div>2.10</div><div>9.06</div><div>24.38</div><div>1.81</div><div>9.04</div><div>1.10</div><div>0.33</div></div><div><div>139.700</div><div>122.500</div><div>208.250</div><div>203.200</div><div>200.400</div><div>196.850</div><div>202.000</div><div>203.200</div><div>203.000</div><div>203.000</div><div>203.200</div><div>216.000</div><div>311.000</div></div><div><div>121.361</div><div>71.440</div><div>71.440</div><div>71.438</div><div>73.600</div><div>71.440</div><div>71.440</div><div>71.438</div><div>1.920</div><div>73.000</div><div>71.438</div><div>71.440</div><div>73.000</div></div></div>					
Comments				MWD Performance			
Drilled 12¼" hole with rotary assembly. High vibration, tool stopped pulsing at 3714.0 mMDRT. Drilled to TD, 3758.0 mMDRT, without LWD. All recorded data recovered at surface (except Gamma Ray and Resistivity data over the failed interval). See Service Interrupt Report.				Tool OD / Type :	203.20 mm /	P4M	
				MWD Real-time%:	76.00 %		
				MWD Recorded%:	84.00 %		
				Min. Inc. :	2.98 deg /	3641.38 m	
				Max. Inc. :	3.36 deg /	3555.34 m	
				Final Az. :	50.16 deg		
				Max Op. Press. :	6500 psig		

## Directional Survey Data

Measured Depth (metres)	Inclination (degrees)	Direction (degrees)	Vertical Depth (metres)	Latitude (metres)	Departure (metres)	Vertical Section (metres)	Dogleg (deg/30m)
681.95	1.26	227.00	681.90	5.10 S	5.47 W	-5.10	TIE-IN
767.68	0.81	263.55	767.61	5.81 S	6.76 W	-8.73	0.27
825.04	0.93	254.57	824.97	5.98 S	7.62 W	-9.38	0.09
911.19	1.09	257.49	911.10	6.34 S	9.09 W	-10.57	0.06
1027.78	0.85	252.60	1027.68	6.84 S	11.00 W	-12.13	0.06
1056.46	0.79	254.04	1056.35	6.96 S	11.39 W	-12.46	0.07
1085.16	0.77	260.55	1085.05	7.05 S	11.77 W	-12.76	0.09
1113.81	0.62	255.11	1113.70	7.12 S	12.11 W	-13.02	0.18
1142.54	0.51	257.73	1142.43	7.19 S	12.38 W	-13.24	0.11
1171.11	0.43	257.64	1171.00	7.24 S	12.61 W	-13.42	0.08
1228.35	0.22	250.90	1228.23	7.32 S	12.93 W	-13.68	0.12
1257.08	0.17	244.39	1256.96	7.35 S	13.02 W	-13.76	0.05
1342.79	0.06	257.65	1342.67	7.42 S	13.18 W	-13.92	0.04
1371.46	0.03	247.14	1371.34	7.43 S	13.20 W	-13.93	0.03
1428.75	0.11	336.43	1428.63	7.38 S	13.24 W	-13.92	0.06
1486.03	0.16	21.18	1485.91	7.26 S	13.23 W	-13.82	0.06
1509.77	0.09	0.70	1509.65	7.21 S	13.22 W	-13.77	0.10
1525.00	0.09	0.70	1524.88	7.17 S	13.22 W	-13.74	0.24
1540.46	0.33	354.58	1540.34	7.10 S	13.23 W	-13.69	0.24
1569.11	0.36	350.12	1568.99	6.93 S	13.25 W	-13.57	0.04
1597.73	0.50	2.93	1597.61	6.71 S	13.26 W	-13.40	0.18
1626.44	0.63	1.96	1626.32	6.43 S	13.25 W	-13.17	0.14
1655.17	0.86	9.39	1655.05	6.06 S	13.21 W	-12.85	0.26
1683.81	1.15	21.61	1683.68	5.58 S	13.07 W	-12.39	0.38
1712.56	1.54	24.62	1712.43	4.96 S	12.80 W	-11.74	0.42
1741.12	1.85	23.41	1740.97	4.19 S	12.46 W	-10.91	0.33
1769.90	2.12	24.21	1769.74	3.28 S	12.05 W	-9.94	0.28
1798.49	2.39	23.17	1798.30	2.25 S	11.60 W	-8.85	0.28
1827.17	2.73	24.42	1826.96	1.08 S	11.09 W	-7.61	0.36
1855.78	2.98	24.43	1855.53	0.22 N	10.50 W	-6.22	0.27
1884.43	3.09	24.80	1884.14	1.60 N	9.87 W	-4.74	0.12
1913.08	3.07	24.58	1912.75	3.00 N	9.22 W	-3.24	0.02
1941.89	3.12	23.61	1941.52	4.42 N	8.59 W	-1.73	0.08
1970.98	3.18	24.11	1970.56	5.88 N	7.94 W	-0.17	0.07
1999.06	3.22	24.85	1998.60	7.31 N	7.29 W	1.36	0.06
2027.82	3.27	25.23	2027.31	8.79 N	6.60 W	2.95	0.06
2056.65	3.24	27.04	2056.09	10.26 N	5.88 W	4.56	0.11
2085.12	3.33	26.59	2084.52	11.72 N	5.14 W	6.16	0.10
2113.64	3.40	27.83	2112.99	13.21 N	4.37 W	7.81	0.10
2142.04	3.46	29.61	2141.34	14.70 N	3.56 W	9.49	0.13

## Directional Survey Data

Measured Depth (metres)	Inclination (degrees)	Direction (degrees)	Vertical Depth (metres)	Latitude (metres)	Departure (metres)	Vertical Section (metres)	Dogleg (deg/30m)
2170.63	3.60	30.30	2169.87	16.22 N	2.68 W	11.23	0.15
2199.17	3.77	30.65	2198.35	17.80 N	1.75 W	13.05	0.18
2227.87	3.85	36.05	2226.99	19.39 N	0.70 W	14.95	0.38
2256.54	3.99	35.43	2255.59	20.98 N	0.44 E	16.91	0.16
2285.35	4.14	37.21	2284.33	22.63 N	1.65 E	18.95	0.20
2314.02	4.15	34.69	2312.93	24.31 N	2.87 E	21.02	0.19
2342.60	4.24	35.48	2341.43	26.02 N	4.07 E	23.11	0.11
2371.30	4.20	37.23	2370.05	27.72 N	5.32 E	25.22	0.14
2399.91	4.28	37.96	2398.58	29.39 N	6.61 E	27.34	0.10
2428.46	4.30	38.32	2427.05	31.07 N	7.93 E	29.47	0.04
2457.14	4.30	37.54	2455.65	32.77 N	9.25 E	31.62	0.06
2514.65	4.09	38.40	2513.01	36.09 N	11.84 E	35.83	0.11
2543.24	4.05	40.48	2541.53	37.66 N	13.13 E	37.86	0.16
2572.00	4.01	40.97	2570.22	39.19 N	14.45 E	39.88	0.05
2600.65	3.91	40.54	2598.80	40.69 N	15.74 E	41.85	0.11
2629.39	3.86	40.58	2627.47	42.17 N	17.01 E	43.80	0.05
2658.02	3.89	41.30	2656.04	43.63 N	18.28 E	45.73	0.06
2686.60	3.77	41.46	2684.55	45.06 N	19.54 E	47.63	0.12
2715.15	3.77	40.42	2713.04	46.48 N	20.77 E	49.51	0.07
2743.83	3.80	42.10	2741.66	47.90 N	22.02 E	51.40	0.12
2772.65	3.83	43.73	2770.41	49.30 N	23.32 E	53.31	0.12
2801.66	3.84	42.76	2799.36	50.72 N	24.65 E	55.24	0.07
2830.44	3.89	43.81	2828.07	52.13 N	25.98 E	57.17	0.09
2859.14	3.95	44.31	2856.71	53.54 N	27.35 E	59.12	0.08
2887.70	3.86	45.65	2885.20	54.92 N	28.72 E	61.05	0.14
2916.43	3.87	45.26	2913.86	56.27 N	30.10 E	62.96	0.03
2944.96	3.83	45.79	2942.33	57.61 N	31.47 E	64.86	0.06
2973.53	3.73	46.71	2970.84	58.92 N	32.83 E	66.72	0.12
3002.19	3.72	46.75	2999.44	60.19 N	34.18 E	68.56	0.01
3059.49	3.72	46.57	3056.62	62.74 N	36.89 E	72.23	0.01
3088.21	3.81	46.46	3085.28	64.04 N	38.25 E	74.09	0.10
3116.08	3.75	45.37	3113.08	65.32 N	39.57 E	75.91	0.10
3145.07	3.74	48.33	3142.01	66.61 N	40.95 E	77.77	0.20
3173.79	3.67	49.59	3170.67	67.83 N	42.35 E	79.59	0.11
3202.65	3.71	48.97	3199.47	69.04 N	43.76 E	81.41	0.06
3231.77	3.53	48.20	3228.54	70.26 N	45.14 E	83.22	0.20
3260.37	3.66	49.86	3257.08	71.43 N	46.49 E	84.97	0.17
3317.48	3.72	47.74	3314.07	73.86 N	49.26 E	88.58	0.08
3346.36	3.65	50.41	3342.89	75.07 N	50.66 E	90.40	0.19
3375.03	3.69	54.03	3371.50	76.20 N	52.11 E	92.17	0.25

## Directional Survey Data

Measured Depth (metres)	Inclination (degrees)	Direction (degrees)	Vertical Depth (metres)	Latitude (metres)	Departure (metres)	Vertical Section (metres)	Dogleg (deg/30m)
3404.40	3.54	54.90	3400.81	77.27 N	53.62 E	93.95	0.17
3432.80	3.59	51.96	3429.16	78.33 N	55.04 E	95.64	0.20
3461.32	3.48	51.53	3457.62	79.41 N	56.42 E	97.35	0.12
3490.24	3.38	50.31	3486.49	80.50 N	57.76 E	99.03	0.13
3519.26	3.32	50.11	3515.46	81.59 N	59.06 E	100.68	0.06
3547.59	3.32	49.95	3543.75	82.64 N	60.32 E	102.29	0.01
3555.34	3.36	53.74	3551.48	82.92 N	60.68 E	102.72	0.87
3583.83	3.00	50.85	3579.93	83.89 N	61.93 E	104.25	0.41
3641.38	2.98	50.16	3637.40	85.80 N	64.24 E	107.18	0.02
3758.00	2.98	50.16	3753.86	89.68 N	68.90 E	113.09	0.00

## Directional Survey Data

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 CLOSURE OF 37.53 DEGREES (GRID)

A TOTAL CORRECTION OF 14.43 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.

HORIZONTAL DISPLACEMENT(CLOSURE) AT 3758.00 METRES

IS 113.09 METRES ALONG 37.53 DEGREES (GRID)

RT - LAT = 21.5m

Final Survey projected to TD.

## Service Interrupt Report

MWD run number :	0100	Time/Date of Failure :	18-Dec-05 03:54
Rig Bit Number :	2	Depth at time of Failure :	95.00 m
MWD Run start time/date :	18-Dec-05 00:54	Lost Rig Hours :	3.00
MWD Run end time/date :	18-Dec-05 03:54		

### Rig Activity

During MWD Shallow Pulse Test while running into hole to drill 17 1/2" hole.

### Description of Failure

Could not get a valid survey during shallow pulse test.

### Action Taken

Tried a few times to get a valid survey, but could not. POOH and picked up backup tool.

### Operation Impact

Tripped for LWD tool failure.

### Reason for Failure

Suspect the Battery Module would not function at low temperatures (less than 15 deg C). Post-Run confidence test also points to a suspect Directional Tool (DM). See Equipment Failure Report.



## Service Interrupt Report

MWD run number :	0500	Time/Date of Failure :	02-Jan-06 21:00
Rig Bit Number :	5	Depth at time of Failure :	2400.00 m
MWD Run start time/date :	02-Jan-06 09:36	Lost Rig Hours :	21.00
MWD Run end time/date :	03-Jan-06 09:18		

### Rig Activity

Running / reaming down to bottom after a bit trip.

### Description of Failure

No pulses observed on surface while reaming down to bottom after bit trip.

### Action Taken

Mode-switched tool using rig pumps, in a bid to reset tool but this did not help. Pulled out of hole and picked up back up tool.

### Operation Impact

Tripped for LWD tool failure

### Reason for Failure

Pulser failure. See Equipment Failure Report.

## Service Interrupt Report

MWD run number :	0600	Time/Date of Failure :	06-Jan-06 03:32
Rig Bit Number :	6	Depth at time of Failure :	3714.00 m
MWD Run start time/date :	03-Jan-06 12:52	Lost Rig Hours :	0.00
MWD Run end time/date :	07-Jan-06 17:22		

### Rig Activity

While drilling 12 1/4" hole.

### Description of Failure

Lost communication with downhole tool while drilling. Observed extreme drillstring vibration.

### Action Taken

Tried mode-switching tool to reset it, but this did not help.

### Operation Impact

Could not obtain real time LWD data from 3714.0m to 3758.0mMDRT, could not recover recorded Gamma Ray and Resistivity data over same interval when the tool memory was read when out of hole.

### Reason for Failure

Extreme drillstring vibration caused the HCIM (Downhole processor) failure. The non-magnetic stabilizer below the LWD tool in the BHA showed extreme wear. See Equipment Failure Report.

