End of Well Report for Devon Energy

Rig	:	H&P223
Well Name	:	Onyx PWU 29 8H
Field Name	:	Permian Basin
Country	:	USA
Job Number	:	OK-XX-0900496812
Job Start Date	:	13-Oct-13
API Number	:	30-015-40515

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GENERAL INFORMATION	
Company	: Devon Energy
Rig	: H&P223
Well	: Onyx PWU 29 8H
Field	: Permian Basin
State	: New Mexico
County	: Eddy
Country	: USA
API Number	: 30-015-40515
Sperry Drilling Job Number	: OK-XX-0900496812
Job Start Date	: 13-Oct-13
Job End Date	: 25-Oct-13
North Reference	: Grid
Total Correction (deg)	: 7.557
Dip Angle (deg)	: 60.400
Total Magnetic Field (nT)	: 48576
Date of Magnetic Data	: 13 October, 2013
Well Head coordinates N	: 32 deg. 37 min 36.57 sec North
Well Head coordinates E	: 104 deg. 5 min 22.12 sec West
Vertical section direction (deg)	: 269.70
Unit Number	: PP40
MWD Engineers	: Mark Mendez, Eiron Ledesma
Company Representatives	: John Holmquist
Company Geologist:	: Taylor Troiani,

OPERATIONAL OVERVIEW
SPERRY DRILLING WAS CONTRACTED TO DRILL THE ONYX PWU 29 8H WELL FOR DEVON ENERGY PROVIDED WERE REAL TIME AND RECORDED GAMMA AS WELL AS DIRECTIONAL DRILLING SERVICES. CREWS ARRIVED ON 10/12/13 AND RIGGED UP ACCORDINGLY. RUN 100: GOOD MWD RUN FROM 6500'MD TO 6834'MD. POOH TO DIAL UP MOTOR DUE TO LACK OF BUILD RATE. RUN 200: GOOD MWD RUN FROM 6834'MD TO 7025'MD. POOH TO CHANGE BEND ON MOTOR DUE TO LACK OF BUILD RATE. RUN 300: GOOD MWD RUN FROM 7025'MD TO 7223'MD. POOH TO RUN GYRO AND PICK NEW MOTOR AND BIT RUN 400: GOOD MWD RUN FROM 7223'MD TO 9914'MD. POOH TO PICK UP NEW MOTOR AND BIT RUN 500: DRILLED FROM 9914'MD TO A DEPTH OF 10549'MD. POOH DUE TO MWD FAILURE, NO PULSES WERE BEING DETECTED ON THE SURFACE COMPUTER. RUN 600: DRILLED FROM 10549'MD TO A TD DEPTH OF 11400'MD. POOH TO LAY DOWN DIRECTIONAL TOOLS.

SUMMARY OF MWD RUNS

Run No.	Rig Run No.	Hole Size (in)	MWD Service	Start Depth (ft)	End Depth (ft)	Drill/Wipe Distance (ft)	Run Start Date Time	Run End Date Time	BRT Hrs	Oper. Hrs	Circ. Hrs	Max Temp. (degF)	Serv Int.	Trip for MWD	Failure Type
100	100	8.75	D/GWD	6500.00	6834.00	334.00	13-Oct-13 19:00	15-Oct-13 00:00	29.00	29.000	17.000	116.00	No	No	
200	200	8.75	D/GWD	6834.00	7025.00	191.00	15-Oct-13 02:00	15-Oct-13 21:00	19.00	19.000	9.500	116.00	No	No	
300	300	8.75	D/GWD	7025.00	7223.00	198.00	15-Oct-13 22:30	16-Oct-13 21:00	22.50	22.500	11.000	112.00	No	No	
400	400	8.75	D/GWD	7223.00	9914.00	2691.00	18-Oct-13 01:30	21-Oct-13 06:00	76.50	76.500	56.000	154.00	No	No	
500	500	8.75	D/GWD	9914.00	10549.00	635.00	21-Oct-13 08:30	22-Oct-13 22:30	38.00	38.000	16.000	142.00	Yes	Yes	Run MWD-1
600	600	8.75	D/GWD	10549.00	11400.00	851.00	23-Oct-13 00:30	25-Oct-13 03:00	50.50	50.500	23.000	141.00	No	No	

BIT RUN SUMMARY

RUN TIME DATA

MWD Run : 100	**Run Start** : 13-Oct-13 19:00	**BRT Hrs** : 29.00	**Circ. Hrs** : 17.00
Rig Run No. : 100	**Run End** : 15-Oct-13 00:00	**Hole Size (in)** : 8.75	**Oper. Hrs** : 29.00

DRILLING DATA

Start Depth (ft) : 6500.00	**Footage (ft)** : 334.00	**Avg WOB (klb)** : 8.0	**Avg ROP (fph)** : 40.00
End Depth (ft) : 6834.00	**Avg Flow Rate(gpm)** : 600	**Avg TOB (ft-lb)** : 0	**Avg SPP (psig)** : 1600
Drilling Hrs (hr) : 10.000	**Avg RPM (rpm)** : 0	**Avg Bend (ft-lb)** : NA	

MUD DATA

Mud Type : Native/Spud Mud			
Weight (ppg) : 8.40	**Viscosity (spqt)** : 28.00	**PV (cP)** : 1	**YP (lhf2** : 1.00
Chlorides (ppm) : 6500	**Max Temp (degF)** : 116.00	**% Solids (%)** : 0.20	**% Sand (%)** : 0.01
pH (pH) : 8.00	**Fluid Loss(mptm)** : 3	**% Oil (%)** :	**O:W** :

MWD PERFORMANCE

Tool OD (in) : 6.75	**Type** : D/GWD	**Min. Inc. (deg)**: 0.04	**Min. Inc. Depth (ft)** : 2307.78
Final Az. (deg) : 278.37	**Max Op. Press. (psig)** 2947	**Max. Inc. (deg)**: 24.44	**Max. Inc. Depth (ft)** : 6758.00
MWD Real Time % : 100		**MWD Recorded %** : 100	

COMMENTS

RUN 100: GOOD MWD RUN FROM 6500'MD TO 6834'MD. POOH TO DIAL UP MOTOR DUE TO LACK OF BUILD RATE.

	Length (ft)	Cumulative Length (ft)
(1) Heavy Weight 5.00 in OD / 3.00 in ID	(1) 0.01	4883.15
(2) Drill Pipe 5.00 in OD / 4.28 in ID	(2) 4728.14	4883.14
(3) Sub 6.60 in OD / 2.38 in ID SN : 675-119	(3) 7.55	155.00
(4) MWD	(4) 65.19	147.45
(5) NMDC 6.48 in OD / 2.81 in ID SN : 11474448	(5) 29.06	82.26
(6) Pony Collar 6.79 in OD / 2.81 in ID SN : 11176246	(6) 15.04	53.20
(7) Integral Blade 8.38 in OD / 2.88 in ID SN : DR15243	(7) 6.76	38.16
(8) 7" GeoForce Lobe 6/7 - 4.5 stg 7.00 in OD / 4.95 in ID	(8) 30.40	31.40
(9) PDC 8.75 in OD / 2.81 in ID SN : 12127371	(9) 1.00	1.00

	Length (ft)	Sensor Dist From Bit (ft)
Non Mag Flex Collar 6.79 in OD / 2.81 in ID SN : 11801321	29.54	
Non Mag Flex Collar 6.77 in OD / 2.88 in ID SN : 1167238	29.92	
HOS 6.44 in OD / 2.88 in ID *[1]Positive Pulser - SN : 10451200 *[2]PCG Sonde - SN : 11061994 *[3]PCD Sonde - SN : 10455899	5.73	[2] 78.10 [3] 72.60

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BIT RUN SUMMARY

RUN TIME DATA

MWD Run : 200	**Run Start** : 15-Oct-13 02:00	**BRT Hrs** : 19.00	**Circ. Hrs** : 9.50
Rig Run No. : 200	**Run End** : 15-Oct-13 21:00	**Hole Size (in)** : 8.75	**Oper. Hrs** : 19.00

DRILLING DATA

Start Depth (ft) : 6834.00	**Footage (ft)** : 191.00	**Avg WOB (klb)** : 36.0	**Avg ROP (fph)** : 30.00
End Depth (ft) : 7025.00	**Avg Flow Rate(gpm)** : 600	**Avg TOB (ft-lb)** : 0	**Avg SPP (psig)** : 1600
Drilling Hrs (hr) : 6.000	**Avg RPM (rpm)** : 0	**Avg Bend (ft-lb)** : NA	

MUD DATA

Mud Type : Native/Spud Mud			
Weight (ppg) : 8.40	**Viscosity (spqt)** : 28.00	**PV (cP)** : 1	**YP (lhf2** : 1.00
Chlorides (ppm) : 6500	**Max Temp (degF)** : 116.00	**% Solids (%)** : 0.20	**% Sand (%)** : 0.10
pH (pH) : 8.00	**Fluid Loss(mptm)** : 3	**% Oil (%)** :	**O:W** :

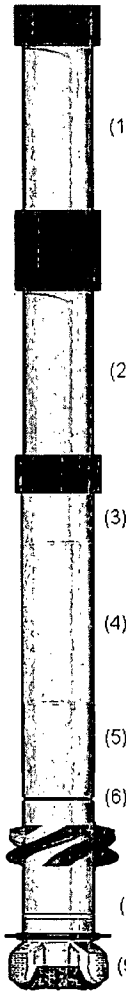
MWD PERFORMANCE

Tool OD (in) : 6.75	**Type** : D/GWD	**Min. Inc. (deg)**: 26.26	**Min. Inc. Depth (ft)** : 6790.00
Final Az. (deg) : 272.19	**Max Op. Press. (psig)** 3016	**Max. Inc. (deg)**: 44.91	**Max. Inc. Depth (ft)** : 6948.00
MWD Real Time % : 100		**MWD Recorded %** : 100	

COMMENTS

RUN 200: GOOD MWD RUN FROM 6834'MD TO 7025'MD. POOH TO CHANGE BEND ON MOTOR DUE TO LACK OF BUILD RATE.

	Length (ft)	Cumulative Length (ft)
(1) Heavy Weight 5.00 in OD / 3.00 in ID		
(2) Drill Pipe 5.00 in OD / 4.28 in ID		6171.78
(3) Sub 6.60 in OD / 2.38 in ID SN : 675-119		
(4) MWD	(1) 1289.95	
(5) NMDC 6.48 in OD / 2.81 in ID SN : 11474448		
(6) Pony Collar 6.79 in OD / 2.81 in ID SN : 11176246		4881.83
(7) Integral Blade 8.38 in OD / 2.88 in ID SN : DR15243	(2) 4728.14	
(8) Mud Motor 6.75 in OD / 4.50 in ID SN : 11590616		
(9) Tricone 4.50 in OD / 2.81 in ID SN : 5231255	(3) 7.55	153.69
		146.14
	(4) 65.36	
		80.78
	(5) 29.06	
		51.72
	(6) 15.04	
		36.68
	(7) 6.76	
		29.92
	(8) 28.92	
		1.00
	(9) 1.00	



	Length (ft)	Sensor Dist From Bit (ft)
Non Mag Flex Collar 6.79 in OD / 2.81 in ID SN : 11801321	29.54	
Non Mag Flex Collar 6.77 in OD / 2.88 in ID SN : 1167238	29.92	
		[2] 76.79
HOS 6.44 in OD / 2.88 in ID *[1]Positive Pulser - SN : 10482193 *[2]PCG Sonde - SN : 11145725 *[3]PCD Sonde - SN : 11163051	5.90	[3] 71.29

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BIT RUN SUMMARY

RUN TIME DATA

MWD Run : 300	**Run Start** : 15-Oct-13 22:30	**BRT Hrs** : 22.50	**Circ. Hrs** : 11.00
Rig Run No. : 300	**Run End** : 16-Oct-13 21:00	**Hole Size (in)** : 8.75	**Oper. Hrs** : 22.50

DRILLING DATA

Start Depth (ft) : 7025.00	**Footage (ft)** : 198.00	**Avg WOB (klb)** : 20.0	**Avg ROP (fph)** : 21.00
End Depth (ft) : 7223.00	**Avg Flow Rate (gpm)** : 600	**Avg TOB (ft-lb)** : 0	**Avg SPP (psig)** : 1900
Drilling Hrs (hr) : 6.000	**Avg RPM (rpm)** : 0	**Avg Bend (ft-lb)** : NA	

MUD DATA

Mud Type : Native/Spud Mud			
Weight (ppg) : 8.40	**Viscosity (spqt)** : 28.00	**PV (cP)** : 1	**YP (lhf2** : 1.00
Chlorides (ppm) : 6500	**Max Temp (degF)** : 112.00	**% Solids (%)** : 0.20	**% Sand (%)** : 0.10
pH (pH) : 8.00	**Fluid Loss(mptm)** : 3	**% Oil (%)** :	**O:W** :

MWD PERFORMANCE

Tool OD (in) : 6.75	**Type** : D/GWD	**Min. Inc. (deg)**: 47.78	**Min. Inc. Depth (ft)** : 6980.00
Final Az. (deg) : 265.66	**Max Op. Press. (psig)** 3061	**Max. Inc. (deg)**: 72.74	**Max. Inc. Depth (ft)** : 7137.00
MWD Real Time % : 100		**MWD Recorded %** : 100	

COMMENTS

RUN 300: GOOD MWD RUN FROM 7025'MD TO 7223'MD. POOH TO RUN GYRO AND PICK NEW MOTOR AND BIT

	Length (ft)	Cumulative Length (ft)
(1) Heavy Weight 5.00 in OD / 3.00 in ID		
(2) Drill Pipe 5.00 in OD / 4.28 in ID		6167.38
(3) Sub 6.60 in OD / 2.38 in ID SN : 675-119		
(4) MWD	(1) 1289.95	
(5) NMDC 6.48 in OD / 2.81 in ID SN : 11474448		
(6) Pony Collar 6.79 in OD / 2.81 in ID SN : 11176246		4877.43
(7) Float Sub 6.75 in OD / 4.50 in ID SN : 11598876	(2) 4728.14	
(8) Mud Motor 6.75 in OD / 4.50 in ID SN : 11590616		
(9) Tricone 4.50 in OD / 2.81 in ID SN : 5231255	(3) 7.55	149.29
		141.74
	(4) 65.36	
		76.38
	(5) 29.06	
		47.32
	(6) 15.04	
		32.28
	(7) 2.36	
		29.92
	(8) 28.92	
		1.00
	(9) 1.00	

	Length (ft)	Sensor Dist From Bit (ft)
Non Mag Flex Collar 6.79 in OD / 2.81 in ID SN : 11801321	29.54	
Non Mag Flex Collar 6.77 in OD / 2.88 in ID SN : 1167238	29.92	
		[2] 72.39
HOS 6.44 in OD / 2.88 in ID *[1]Positive Pulser - SN : 10451200 *[2]PCG Sonde - SN : 11061994 *[3]PCD Sonde - SN : 10455899	5.90	[3] 66.89

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BIT RUN SUMMARY

RUN TIME DATA

MWD Run	: 400	**Run Start**	: 18-Oct-13 01:30	**BRT Hrs**	: 76.50	**Circ. Hrs**	: 56.00
Rig Run No.	: 400	**Run End**	: 21-Oct-13 06:00	**Hole Size (in)**	: 8.75	**Oper. Hrs**	: 76.50

DRILLING DATA

Start Depth (ft)	: 7223.00	**Footage (ft)**	: 2691.00	**Avg WOB (klb)**	: 20.0	**Avg ROP (fph)**	: 105.00
End Depth (ft)	: 9914.00	**Avg Flow Rate(gpm)**	: 545	**Avg TOB (ft-lb)**	: 9000	**Avg SPP (psig)**	: 3100
Drilling Hrs (hr)	: 48.000	**Avg RPM (rpm)**	: 74	**Avg Bend (ft-lb)**	: NA		

MUD DATA

Mud Type	: Native/Spud Mud						
Weight (ppg)	: 8.50	**Viscosity (spqt)**	: 28.00	**PV (cP)**	: 1	**YP (lhf2**	: 1.00
Chlorides (ppm)	: 19000	**Max Temp (degF)**	: 154.00	**% Solids (%)**	: 0.30	**% Sand (%)**	: 0.01
pH (pH)	: 9.00	**Fluid Loss(mptm)**	: 2	**% Oil (%)**	:	**O:W**	:

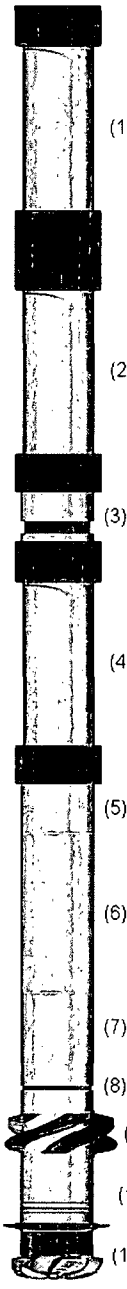
MWD PERFORMANCE

Tool OD (in)	: 6.75	**Type**	: D/GWD	**Min. Inc. (deg)**	: 83.61	**Min. Inc. Depth (ft)**	: 7188.00
Final Az. (deg)	: 267.74	**Max Op. Press. (psig)**	3063	**Max. Inc. (deg)**	: 94.01	**Max. Inc. Depth (ft)**	: 7629.00
		MWD Real Time %	: 100	**MWD Recorded %**	: 100		

COMMENTS

RUN 400: GOOD MWD RUN FROM 7223'MD TO 9914'MD. POOH TO PICK UP NEW MOTOR AND BIT

	Length (ft)	Cumulative Length (ft)
(1) 42 Joints 5" HWDP 5.00 in OD / 3.00 in ID		6192.90
(2) 84 Jnts (28 Stabds) -5" Drill pipe 5.00 in OD / 4.28 in ID	(1) 1289.95	
(3) Agitator 6.50 in OD / 2.88 in ID SN : 70527		4902.95
(4) Drill Pipe 5.00 in OD / 4.28 in ID	(2) 2648.75	
(5) Sub 6.60 in OD / 2.38 in ID SN : 675-119		2254.20
(6) MWD	(3) 19.64	
(7) NMDC 6.48 in OD / 2.81 in ID SN : 11474448		2234.56
(8) Pony Collar 6.79 in OD / 2.81 in ID SN : 11176246	(4) 2079.39	
(9) Integral Blade 8.38 in OD / 2.88 in ID SN : DR15243		155.17
(10) 7" GeoForce Lobe 6/7 - 4.5 stg. 7.00 in OD / 4.95 in ID	(5) 7.55	
(11) PDC 5.90 in OD / 2.81 in ID SN : 12252170		147.62
	(6) 65.36	
		82.26
	(7) 29.06	
		53.20
	(8) 15.04	
		38.16
	(9) 6.76	
		31.40
	(10) 30.40	
		1.00
	(11) 1.00	



	Length (ft)	Sensor Dist From Bit (ft)
Non Mag Flex Collar 6.79 in OD / 2.81 in ID SN : 11801321	29.54	
Non Mag Flex Collar 6.77 in OD / 2.88 in ID SN : 1167238	29.92	
HOS 6.44 in OD / 2.88 in ID SN : 11106331 *[1]Positive Pulser - SN : 10482193 *[2]PCG Sonde - SN : 10504801 *[3]PCD Sonde - SN : 10863708	5.90	[2] 78.27 [3] 72.77

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BIT RUN SUMMARY

RUN TIME DATA

MWD Run : 500	Run Start : 21-Oct-13 08:30	BRT Hrs : 38.00	Circ. Hrs : 16.00
Rig Run No. : 500	Run End : 22-Oct-13 22:30	Hole Size (in) : 8.75	Oper. Hrs : 38.00

DRILLING DATA

Start Depth (ft) : 9914.00	Footage (ft) : 635.00	Avg WOB (klb) : 25.0	Avg ROP (fph) : 100.00
End Depth (ft) : 10549.00	Avg Flow Rate(gpm) : 568	Avg TOB (ft-lb) : 19000	Avg SPP (psig) : 4000
Drilling Hrs (hr) : 11.000	Avg RPM (rpm) : 64	Avg Bend (ft-lb) : NA	

MUD DATA

Mud Type : Native/Spud Mud			
Weight (ppg) : 8.58	Viscosity (spqt) : 28.00	PV (cP) : 1	YP (lhf2 : 1.00
Chlorides (ppm) : 20000	Max Temp (degF) : 142.00	% Solids (%) : 0.30	% Sand (%) : 0.01
pH (pH) : 7.50	Fluid Loss(mptm) : 14	% Oil (%) :	O:W :

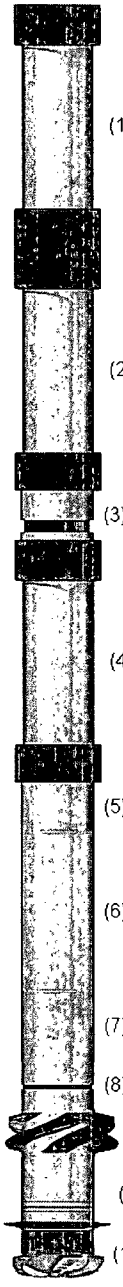
MWD PERFORMANCE

Tool OD (in) : 6.75	Type : D/GWD	Min. Inc. (deg): 89.94	Min. Inc. Depth (ft) : 10186.00
Final Az. (deg) : 268.67	Max Op. Press. (psig) 3059	Max. Inc. (deg): 92.34	Max. Inc. Depth (ft) : 9997.00
MWD Real Time % : 80		MWD Recorded % : 100	

COMMENTS

RUN 500: DRILLED FROM 9914'MD TO A DEPTH OF 10549'MD. POOH DUE TO MWD FAILURE, NO PULSES WERE BEING DETECTED ON THE SURFACE COMPUTER.

	Length (ft)	Cumulative Length (ft)
(1) 42 Joints 5" HWDP 5.00 in OD / 3.00 in ID		
(2) 84 Jnts (28 Stabds) -5" Drill pipe 5.00 in OD / 4.28 in ID		6192.91
(3) Agitator 6.50 in OD / 2.88 in ID SN : 70527		
(4) Drill Pipe 5.00 in OD / 4.28 in ID	(1) 1289.95	
(5) Sub 6.60 in OD / 2.38 in ID SN : 675-119		
(6) MWD		4902.96
(7) NMDC 6.48 in OD / 2.81 in ID SN : 11474448		
(8) Pony Collar 6.79 in OD / 2.81 in ID SN : 11176246	(2) 2648.75	
(9) Integral Blade 8.38 in OD / 2.88 in ID SN : DR15243		
(10) 7" GeoForce Lobe 6/7 - 4.5 stg 7.00 in OD / 4.95 in ID SN : 11574318	(3) 19.64	2254.21
		2234.57
(11) PDC 5.90 in OD / 2.81 in ID SN : 7142837	(4) 2079.39	
	(5) 7.55	155.18
		147.63
	(6) 65.36	
	(7) 29.06	82.27
	(8) 15.04	53.21
	(9) 6.76	38.17
	(10) 30.41	31.41
	(11) 1.00	1.00



	Length (ft)	Sensor Dist From Bit (ft)
Non Mag Flex Collar 6.79 in OD / 2.81 in ID SN : 11801321	29.54	
Non Mag Flex Collar 6.77 in OD / 2.88 in ID SN : 1167238	29.92	
HOS 6.44 in OD / 2.88 in ID SN : 11106331 *[1]Positive Pulser - SN : 10451200 *[2]PCG Sonde - SN : 11061994 *[3]PCD Sonde - SN : 10455894	5.90	[2] 78.28 [3] 72.78

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BIT RUN SUMMARY

RUN TIME DATA

MWD Run : 600	Run Start : 23-Oct-13 00:30	BRT Hrs : 50.50	Circ. Hrs : 23.00
Rig Run No. : 600	Run End : 25-Oct-13 03:00	Hole Size (in) : 8.75	Oper. Hrs : 50.50

DRILLING DATA

Start Depth (ft) : 10549.00	Footage (ft) : 851.00	Avg WOB (klb) : 33.0	Avg ROP (fph) : 100.00
End Depth (ft) : 11400.00	Avg Flow Rate(gpm) : 550	Avg TOB (ft-lb) : 19000	Avg SPP (psig) : 2500
Drilling Hrs (hr) : 11.000	Avg RPM (rpm) : 75	Avg Bend (ft-lb) : NA	

MUD DATA

Mud Type : Native/Spud Mud			
Weight (ppg) : 8.50	Viscosity (spqt) : 28.00	PV (cP) : 1	YP (lhf2 : 1.00
Chlorides (ppm) : 20000	Max Temp (degF) : 141.00	% Solids (%) : 0.30	% Sand (%) : 0.01
pH (pH) : 10.00	Fluid Loss(mptm) : 6	% Oil (%) :	O:W :

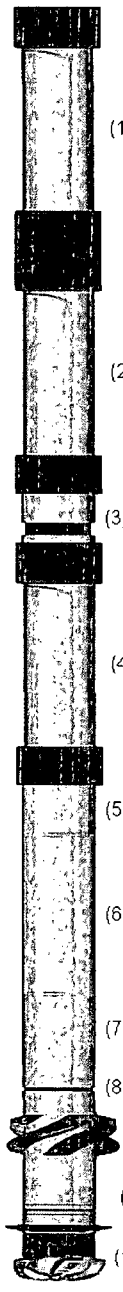
MWD PERFORMANCE

Tool OD (in) : 6.75	Type : D/GWD	Min. Inc. (deg): 89.97	Min. Inc. Depth (ft) : 10943.00
Final Az. (deg) : 270.64	Max Op. Press. (psig) 3008	Max. Inc. (deg): 92.87	Max. Inc. Depth (ft) : 10754.00
MWD Real Time % : 100		MWD Recorded % : 100	

COMMENTS

RUN 600: DRILLED FROM 10549'MD TO A TD DEPTH OF 11400'MD. POOH TO LAY DOWN DIRECTIONAL TOOLS.

	Length (ft)	Cumulative Length (ft)
(1) 42 Joints 5" HWDP 5.00 in OD / 3.00 in ID		6192.91
(2) 84 Jnts (28 Stabds) -5" Drill pipe 5.00 in OD / 4.28 in ID	(1) 1289.95	
(3) Agitator 6.50 in OD / 2.88 in ID SN : 70527		4902.96
(4) Drill Pipe 5.00 in OD / 4.28 in ID	(2) 2648.75	
(5) Sub 6.60 in OD / 2.38 in ID SN : 675-119		2254.21
(6) MWD (7) NMDC 6.48 in OD / 2.81 in ID SN : 11474448	(3) 19.64	2234.57
(8) Pony Collar 6.79 in OD / 2.81 in ID SN : 11176246	(4) 2079.39	
(9) Integral Blade 8.38 in OD / 2.88 in ID SN : DR15243	(5) 7.55	155.18
(10) 7" GeoForce Lobe 6/7 - 4.5 stg 7.00 in OD / 4.95 in ID SN : 11574318	(6) 65.36	147.63
(11) PDC 5.90 in OD / 2.81 in ID SN : 7142837	(7) 29.06	82.27
	(8) 15.04	53.21
	(9) 6.76	38.17
	(10) 30.41	31.41
	(11) 1.00	1.00



	Length (ft)	Sensor Dist From Bit (ft)
Non Mag Flex Collar 6.79 in OD / 2.81 in ID SN : 11801321	29.54	
Non Mag Flex Collar 6.77 in OD / 2.88 in ID SN : 1167238	29.92	
HOS 6.44 in OD / 2.88 in ID SN : 11106331 *[1]Positive Pulser - SN : 10475010 *[2]PCG Sonde - SN : 11145725 *[3]PCD Sonde - SN : 11163051	5.90	[2] 78.28 [3] 72.78

SURVEY HEADER

SURVEYS FROM 129.91 'MD TO 5811' MD PROVIDED BY VAUGN ENERGY SERVICES. HALLIBURTON SPERRY SERVICES PROVIDED SURVEYS FROM 5902'MD TO 11324'MD. SURVEY AT 11400' MD IS A STRAIGHT LINE PROJECTION TO THE BIT.

DIRECTIONAL SURVEY DATA

Tie-in

0.00	0.00	0.00	0.00	0.00 N	0.00 E

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
129.91	0.55	327.96	129.91	0.53 N	0.33 W	0.33	0.42
224.60	0.98	309.72	224.59	1.43 N	1.19 W	1.19	0.52
319.29	0.89	302.16	319.27	2.34 N	2.44 W	2.43	0.16
413.98	0.75	308.25	413.95	3.12 N	3.55 W	3.53	0.17
508.67	0.61	327.98	508.63	3.93 N	4.30 W	4.28	0.29
603.36	0.76	333.40	603.31	4.92 N	4.85 W	4.83	0.17
698.05	0.52	8.00	698.00	5.90 N	5.07 W	5.04	0.47
792.74	0.87	40.90	792.68	6.87 N	4.54 W	4.51	0.55
887.43	1.47	68.26	887.35	7.86 N	2.94 W	2.90	0.85
982.12	1.68	88.12	982.01	8.36 N	0.43 W	0.38	0.61
1076.81	1.86	90.04	1,076.65	8.40 N	2.50 E	-2.54	0.20
1171.50	1.52	92.25	1,171.30	8.35 N	5.29 E	-5.33	0.37
1266.19	1.28	93.33	1,265.96	8.24 N	7.60 E	-7.64	0.25
1360.88	0.90	103.87	1,360.64	8.00 N	9.38 E	-9.42	0.45
1455.57	0.85	113.22	1,455.31	7.55 N	10.74 E	-10.78	0.16
1550.26	0.83	127.78	1,549.99	6.85 N	11.93 E	-11.97	0.23
1644.95	0.82	128.26	1,644.67	6.01 N	13.00 E	-13.04	0.01
1739.64	0.62	131.79	1,739.36	5.25 N	13.92 E	-13.95	0.22
1834.33	0.45	129.60	1,834.04	4.67 N	14.59 E	-14.61	0.18
1929.02	0.51	125.57	1,928.73	4.19 N	15.22 E	-15.24	0.07
2023.71	0.34	114.43	2,023.42	3.83 N	15.82 E	-15.84	0.20
2118.40	0.23	104.75	2,118.11	3.66 N	16.25 E	-16.27	0.13
2213.09	0.17	57.38	2,212.79	3.69 N	16.56 E	-16.58	0.18
2307.78	0.04	315.01	2,307.48	3.79 N	16.65 E	-16.67	0.19
2402.47	0.04	288.58	2,402.17	3.82 N	16.60 E	-16.62	0.02
2497.16	0.16	263.16	2,496.86	3.82 N	16.43 E	-16.45	0.13
2591.85	0.22	254.28	2,591.55	3.75 N	16.13 E	-16.15	0.07
2686.54	0.38	289.80	2,686.24	3.81 N	15.66 E	-15.68	0.25
2781.23	0.48	291.78	2,780.93	4.06 N	14.99 E	-15.02	0.11
2875.92	0.34	311.69	2,875.62	4.40 N	14.42 E	-14.44	0.21
2970.61	0.36	314.14	2,970.31	4.79 N	13.99 E	-14.02	0.03
3065.30	0.20	331.79	3,064.99	5.15 N	13.70 E	-13.73	0.19
3159.99	0.21	334.74	3,159.68	5.45 N	13.55 E	-13.58	0.02
3254.68	0.33	339.53	3,254.37	5.86 N	13.38 E	-13.41	0.13
3349.37	0.36	351.15	3,349.06	6.41 N	13.24 E	-13.27	0.08
3444.06	0.29	344.13	3,443.75	6.93 N	13.13 E	-13.16	0.08
3538.75	0.23	329.44	3,538.44	7.33 N	12.96 E	-13.00	0.09
3633.44	0.29	324.82	3,633.13	7.69 N	12.73 E	-12.77	0.07

DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
3728.13	0.36	321.01	3,727.82	8.12 N	12.41 E	-12.45	0.08
3822.82	0.49	319.92	3,822.50	8.66 N	11.96 E	-12.00	0.14
3917.51	0.55	316.58	3,917.19	9.30 N	11.38 E	-11.43	0.07
4012.20	0.63	310.15	4,011.88	9.96 N	10.67 E	-10.73	0.11
4106.89	0.84	309.59	4,106.56	10.74 N	9.74 E	-9.80	0.22
4201.58	1.07	309.87	4,201.23	11.75 N	8.53 E	-8.59	0.24
4296.27	1.28	302.22	4,295.90	12.88 N	6.95 E	-7.02	0.28
4390.96	1.62	300.05	4,390.56	14.11 N	4.90 E	-4.97	0.36
4485.65	1.69	301.64	4,485.21	15.52 N	2.55 E	-2.63	0.09
4580.34	1.83	308.05	4,579.86	17.18 N	0.17 E	-0.26	0.25
4675.03	1.95	312.88	4,674.50	19.21 N	2.20 W	2.10	0.21
4769.72	2.18	313.32	4,769.13	21.54 N	4.69 W	4.57	0.24
4864.41	2.29	308.45	4,863.74	23.95 N	7.48 W	7.35	0.23
4959.10	2.10	310.41	4,958.37	26.25 N	10.28 W	10.14	0.22
5053.79	1.54	305.65	5,053.01	28.12 N	12.64 W	12.49	0.61
5148.48	1.17	308.56	5,147.67	29.46 N	14.43 W	14.27	0.40
5243.17	1.29	306.60	5,242.34	30.70 N	16.04 W	15.88	0.13
5337.86	1.47	307.45	5,337.00	32.08 N	17.86 W	17.69	0.19
5432.55	1.66	315.57	5,431.66	33.79 N	19.78 W	19.61	0.31
5527.24	2.31	313.30	5,526.29	36.08 N	22.13 W	21.94	0.69
5621.93	2.47	309.70	5,620.90	38.69 N	25.09 W	24.89	0.23
5716.62	2.71	312.73	5,715.49	41.52 N	28.30 W	28.09	0.29
5811.31	2.63	313.29	5,810.08	44.53 N	31.53 W	31.30	0.09
5902.00	2.70	310.36	5,900.67	47.33 N	34.67 W	34.42	0.17
5994.00	2.41	313.06	5,992.58	50.06 N	37.73 W	37.47	0.34
6085.00	1.65	311.21	6,083.52	52.22 N	40.12 W	39.84	0.84
6181.00	1.59	319.73	6,179.48	54.15 N	42.02 W	41.73	0.26
6280.00	1.40	322.24	6,278.45	56.15 N	43.64 W	43.35	0.21
6375.00	0.57	351.45	6,373.43	57.54 N	44.42 W	44.12	0.99
6403.00	0.78	356.93	6,401.43	57.86 N	44.45 W	44.15	0.78
6475.00	0.96	350.85	6,473.42	58.95 N	44.58 W	44.27	0.28
6506.00	2.44	303.57	6,504.41	59.57 N	45.17 W	44.85	6.21
6538.00	4.90	293.66	6,536.34	60.49 N	46.99 W	46.67	7.91
6569.00	7.64	288.24	6,567.15	61.67 N	50.16 W	49.83	9.02
6601.00	10.61	285.60	6,598.75	63.13 N	55.01 W	54.68	9.36
6632.00	13.47	285.34	6,629.06	64.85 N	61.24 W	60.90	9.25
6664.00	16.58	285.21	6,659.96	67.04 N	69.25 W	68.90	9.72
6696.00	19.22	282.99	6,690.41	69.42 N	78.79 W	78.42	8.50
6727.00	21.86	280.82	6,719.44	71.65 N	89.43 W	89.05	8.86
6758.00	24.44	278.37	6,747.94	73.66 N	101.44 W	101.06	8.89
6790.00	26.26	275.50	6,776.86	75.31 N	115.04 W	114.65	6.85
6822.00	28.71	275.27	6,805.25	76.69 N	129.74 W	129.34	7.69
6854.00	33.02	274.96	6,832.71	78.15 N	146.09 W	145.68	13.46
6885.00	37.26	274.15	6,858.05	79.56 N	163.87 W	163.46	13.76
6917.00	41.35	273.10	6,882.81	80.84 N	184.10 W	183.67	12.94

DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
6948.00	44.91	272.19	6,905.43	81.81 N	205.27 W	204.83	11.65
6980.00	47.78	270.39	6,927.52	82.32 N	228.41 W	227.97	9.87
7011.00	51.09	267.37	6,947.68	81.84 N	251.94 W	251.51	12.96
7043.00	54.87	265.63	6,966.94	80.27 N	277.44 W	277.02	12.61
7074.00	61.07	265.14	6,983.38	78.16 N	303.62 W	303.21	20.02
7105.00	66.74	265.02	6,997.01	75.77 N	331.35 W	330.95	18.31
7137.00	72.74	265.17	7,008.08	73.21 N	361.24 W	360.86	18.74
7152.00	76.06	265.66	7,012.12	72.05 N	375.64 W	375.26	22.37
7188.00	83.61	267.33	7,018.46	69.90 N	410.99 W	410.61	21.46
7220.00	87.87	268.42	7,020.84	68.71 N	442.87 W	442.50	13.74
7251.00	88.49	268.83	7,021.83	67.97 N	473.84 W	473.48	2.40
7314.00	90.80	268.94	7,022.22	66.74 N	536.83 W	536.47	3.67
7346.00	92.01	269.21	7,021.43	66.23 N	568.81 W	568.46	3.87
7440.00	93.74	269.12	7,016.72	64.86 N	662.68 W	662.33	1.84
7535.00	93.89	269.17	7,010.40	63.45 N	757.46 W	757.12	0.17
7629.00	94.01	268.01	7,003.92	61.14 N	851.21 W	850.87	1.24
7724.00	92.81	267.04	6,998.27	57.04 N	945.95 W	945.63	1.62
7819.00	93.89	266.86	6,992.72	52.00 N	1,040.65 W	1040.36	1.15
7913.00	92.71	266.85	6,987.31	46.85 N	1,134.35 W	1134.09	1.26
8008.00	91.39	267.02	6,983.91	41.77 N	1,229.15 W	1228.91	1.40
8102.00	91.97	266.77	6,981.15	36.68 N	1,322.97 W	1322.76	0.67
8197.00	91.23	267.74	6,978.50	32.13 N	1,417.82 W	1417.64	1.28
8292.00	92.87	268.84	6,975.10	29.30 N	1,512.72 W	1512.54	2.08
8387.00	91.14	268.11	6,971.78	26.77 N	1,607.62 W	1607.46	1.98
8481.00	92.06	268.61	6,969.16	24.08 N	1,701.54 W	1701.39	1.11
8576.00	91.05	268.88	6,966.58	22.00 N	1,796.48 W	1796.34	1.10
8670.00	91.82	268.32	6,964.22	19.71 N	1,890.43 W	1890.30	1.01
8765.00	90.98	269.05	6,961.90	17.53 N	1,985.37 W	1985.25	1.17
8859.00	91.79	269.36	6,959.63	16.23 N	2,079.33 W	2079.22	0.92
8954.00	92.56	269.88	6,956.02	15.60 N	2,174.26 W	2174.15	0.98
9048.00	91.02	269.81	6,953.09	15.34 N	2,268.21 W	2268.10	1.64
9143.00	91.48	269.95	6,951.02	15.14 N	2,363.19 W	2363.08	0.51
9237.00	92.47	270.56	6,947.78	15.56 N	2,457.13 W	2457.02	1.24
9331.00	91.02	269.73	6,944.91	15.80 N	2,551.08 W	2550.97	1.78
9426.00	92.03	269.91	6,942.39	15.50 N	2,646.05 W	2645.93	1.08
9521.00	91.48	268.97	6,939.48	14.57 N	2,741.00 W	2740.88	1.15
9615.00	92.62	269.60	6,936.11	13.40 N	2,834.93 W	2834.82	1.39
9710.00	91.36	269.05	6,932.82	12.28 N	2,929.86 W	2929.76	1.45
9805.00	89.94	267.74	6,931.74	9.62 N	3,024.81 W	3024.72	2.03
9902.00	90.89	267.86	6,931.04	5.90 N	3,121.74 W	3121.67	0.99
9997.00	92.34	267.69	6,928.36	2.21 N	3,216.63 W	3216.57	1.54
10092.00	91.20	266.73	6,925.42	2.41 S	3,311.47 W	3311.43	1.57
10186.00	89.94	267.06	6,924.49	7.50 S	3,405.32 W	3405.31	1.39
10281.00	91.42	267.41	6,923.36	12.09 S	3,500.20 W	3500.22	1.60
10376.00	90.95	268.67	6,921.40	15.34 S	3,595.12 W	3595.16	1.42

DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
10470.00	92.38	269.30	6,918.67	17.00 S	3,689.07 W	3689.11	1.66
10565.00	92.87	270.05	6,914.32	17.54 S	3,783.96 W	3784.00	0.95
10659.00	91.42	269.25	6,910.80	18.11 S	3,877.89 W	3877.94	1.76
10754.00	92.87	269.25	6,907.25	19.36 S	3,972.82 W	3972.86	1.52
10848.00	91.76	269.57	6,903.45	20.32 S	4,066.73 W	4066.78	1.23
10943.00	89.97	269.78	6,902.02	20.86 S	4,161.72 W	4161.77	1.90
11037.00	91.23	270.30	6,901.04	20.80 S	4,255.71 W	4255.76	1.45
11132.00	92.47	270.32	6,897.97	20.29 S	4,350.66 W	4350.70	1.30
11226.00	91.11	269.57	6,895.04	20.38 S	4,444.61 W	4444.65	1.65
11324.00	92.81	270.64	6,891.68	20.21 S	4,542.55 W	4542.59	2.05
11400.00	92.81	270.64	6,887.96	19.36 S	4,618.45 W	4618.49	0.00

DIRECTIONAL SURVEY DATA NOTES

- 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 269.70 degrees (Grid)
- A total correction of 7.56 deg from Magnetic north to Grid north has been applied
- Horizontal displacement is relative to the well head.
- Horizontal displacement (closure) at 11,400.00 feet is 4,618.49 feet along 269.76 degrees (Grid)

WARRANTY

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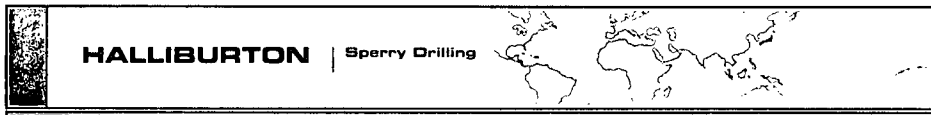

SERVICE INTERRUPT REPORT

MWD Run Number	:500	**Time / Date of Failure**	:22-Oct-13 02:30
Rig Bit Number	:500	**Depth at Time of Failure (ft)**	:10549
MWD Run Start Time / Date	:21-Oct-13 08:30	**Lost Rig Hours**	:
MWD Run End Time / Date	:22-Oct-13 10:30		

RIG ACTIVITY

While drilling lataral at a depth of 10549'MD.

DESCRIPTION OF FAILURE

OK-XX-0900496812r500: At survey point 10186'MD detection was near flatline MWD was able to trouble shoot and collect survey data and keep drilling. At survey point 10376'MD the MWD tool would no longer pulse up any data again trouble shooting was tried but with no success. Decision was made to trip out of the hole.

ACTION TAKEN

Recycled pumps, isolated pump 1 then pump 2, flow at the low and high end of the tool, drilled five feet and then tried to retake the survey, and pumped a sweep.
Post Run 500 results: probes were surface tested and worked fine, pulser failed poppet extension test. Poppet was fully extended and unable to retract.

OPERATION IMPACT

REASON FOR FAILURE

Halliburton/Sperry Drilling
9800 West Reno
Oklahoma City, OK
73127
(405) 324-2222