



HOBBS OGD

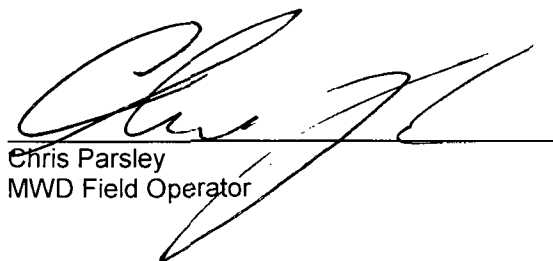
MAR 19 2015

RECEIVED

MWD Survey Certification

State of New Mexico
County of Lea

I, Chris Parsley, certify that; I am employed by MWD Services, LLC; that I did on the day(s) of 12/1/14 through 12/22/14 conduct or supervise the taking of MWD survey(s) from a depth of 159 feet to a depth of 15,642 feet; that the data is true, correct, complete and within the limitations of the tool set forth by MWD Services, LLC; that I am authorized and qualified to make this report; that this report was conducted at the request of EOG Resources, Inc., for the Jolly Roger 16 State # 502H Well, API # 30-025-42158 and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by MWD Services, LLC.



Chris Parsley
MWD Field Operator

MAR 26 2015





MWD SURVEY REPORT

MWD Services, LLC

HOBBS OCD

MAR 19 2015

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Survey End Date : December 22, 2014
 Job Number : 14293
 Operator : EOG Resources, Inc.
 Lease / Well : Jolly Roger 16 State # 502H
 API Number : 30-025-42158
 Location : Lea County, New Mexico
 Field / Formation : Bone Spring
 Contractor / Rig : Helmerich & Payne Intl Drilling Co. Rig 328
 Directional Company : EOG Resources, Inc.
 MWD Field Rep. : Chris Parsley, Jesse White
 Tie In Survey Reference : Surface, Assume Vertical
 Calculation Method : Minimum Curvature

Target +N / -S = -4895.0'
 Target +E / -W = 629.0'
 Target TVD = 10900.0'
 Magnetic Declination +E / -W = 7.16°
 Grid Convergence +E / -W = 0.46°
 Total Correction +E / -W = 6.70°
 North Reference = Grid
 Magnetic Reference Model = WMM2010
 Declination Date = 11/19/14
 RKB Height = 24.00'
 Ground Level Elevation = 3557'
 Vertical Section Azimuth = 172.68°

Comments :

SURVEY # 0 = TIE IN SURVEY

SURVEY # 124 = PROJECTED SURVEY TO BIT DEPTH

Srv. No.	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (deg/100 ')
							+N / -S (ft)	+E / -W (ft)	Distance (ft)	Azimuth (deg)	
0	0.00'	0.00°	0.00°	0'	0.00'		0.00'	0.00'	0.00'	0.00°	
1	159.00'	0.60°	0.70°	159'	159.00'	-0.82'	0.83'	0.01'	0.83'	0.70°	0.38°
2	281.00'	0.80°	24.50°	122'	280.99'	-2.18'	2.25'	0.37'	2.28'	9.38°	0.29°
3	468.00'	1.90°	69.20°	187'	467.94'	-4.01'	4.54'	3.81'	5.92'	40.04°	0.77°
4	650.00'	2.20°	57.80°	182'	649.82'	-6.19'	7.47'	9.59'	12.15'	52.08°	0.28°
5	831.00'	2.20°	38.70°	181'	830.69'	-10.06'	12.03'	14.70'	18.99'	50.70°	0.40°
6	1012.00'	2.60°	8.30°	181'	1011.54'	-16.43'	18.80'	17.46'	25.66'	42.88°	0.73°
7	1104.00'	2.00°	356.80°	92'	1103.46'	-20.04'	22.47'	17.68'	28.59'	38.19°	0.82°
8	1228.00'	2.10°	343.10°	124'	1227.39'	-24.44'	26.81'	16.89'	31.69'	32.22°	0.40°
9	1361.00'	1.40°	340.40°	133'	1360.32'	-28.43'	30.67'	15.64'	34.43'	27.02°	0.53°
10	1550.00'	0.90°	296.60°	189'	1549.29'	-31.51'	33.51'	13.54'	36.14'	22.00°	0.52°
11	1740.00'	0.50°	231.40°	190'	1739.28'	-31.91'	33.66'	11.56'	35.59'	18.95°	0.43°
12	1929.00'	0.40°	225.60°	189'	1928.27'	-31.09'	32.68'	10.44'	34.31'	17.72°	0.06°
13	2119.00'	1.00°	84.00°	190'	2118.26'	-30.65'	32.39'	11.62'	34.41'	19.73°	0.70°
14	2308.00'	3.00°	67.70°	189'	2307.14'	-31.89'	34.44'	17.83'	38.78'	27.37°	1.09°
15	2498.00'	4.10°	68.60°	190'	2496.77'	-34.83'	38.81'	28.76'	48.30'	36.54°	0.58°
16	2687.00'	5.30°	68.90°	189'	2685.13'	-38.55'	44.41'	43.19'	61.95'	44.20°	0.64°
17	2877.00'	5.90°	76.10°	190'	2874.23'	-41.76'	49.92'	60.86'	78.71'	50.64°	0.49°
18	3066.00'	5.70°	84.30°	189'	3062.26'	-42.61'	53.19'	79.63'	95.76'	56.26°	0.45°
19	3255.00'	5.70°	83.00°	189'	3250.33'	-42.29'	55.26'	98.28'	112.75'	60.65°	0.07°
20	3445.00'	5.80°	81.10°	190'	3439.37'	-42.50'	57.90'	117.13'	130.66'	63.70°	0.11°
21	3634.00'	6.10°	76.50°	189'	3627.35'	-43.85'	61.72'	136.33'	149.65'	65.64°	0.30°
22	3824.00'	6.60°	66.50°	190'	3816.19'	-47.98'	68.43'	156.16'	170.50'	66.34°	0.64°
23	4013.00'	5.70°	68.30°	189'	4004.10'	-53.33'	76.23'	174.84'	190.74'	66.44°	0.49°
24	4203.00'	5.50°	83.70°	190'	4193.21'	-55.51'	80.72'	192.66'	208.89'	67.27°	0.80°
25	4392.00'	5.80°	81.10°	189'	4381.29'	-55.62'	83.19'	211.10'	226.90'	68.49°	0.21°
26	4581.00'	6.30°	84.30°	189'	4569.24'	-55.59'	85.70'	230.85'	246.25'	69.63°	0.32°



Srv.	Survey Depth	Inclination	Azimuth	Course Length	True Vertical	Vertical Section	Coordinates		Closure		Dogleg Severity
							+N / -S	+E / -W	Distance	Azimuth	
27	4771.00'	5.80°	78.20°	190'	4758.18'	-56.04'	88.70'	250.62'	265.86'	70.51°	0.43°
28	4960.00'	6.80°	84.90°	189'	4946.04'	-56.35'	91.64'	271.12'	286.19'	71.32°	0.66°
29	5160.00'	6.50°	89.30°	200'	5144.70'	-54.59'	92.84'	294.23'	308.53'	72.49°	0.30°
30	5313.00'	5.80°	87.60°	153'	5296.81'	-52.93'	93.26'	310.62'	324.32'	73.29°	0.47°
31	5502.00'	5.30°	86.90°	189'	5484.93'	-51.47'	94.14'	328.87'	342.08'	74.03°	0.27°
32	5692.00'	5.20°	88.30°	190'	5674.13'	-49.98'	94.87'	346.24'	359.00'	74.68°	0.09°
33	5882.00'	5.40°	87.80°	190'	5863.32'	-48.34'	95.47'	363.78'	376.10'	75.30°	0.11°
34	6071.00'	5.80°	87.80°	189'	6051.42'	-46.69'	96.17'	382.21'	394.13'	75.88°	0.21°
35	6260.00'	5.10°	86.20°	189'	6239.56'	-45.32'	97.10'	400.14'	411.75'	76.36°	0.38°
36	6450.00'	4.70°	84.60°	190'	6428.87'	-44.54'	98.39'	416.31'	427.78'	76.70°	0.22°
37	6639.00'	4.60°	84.70°	189'	6617.24'	-44.02'	99.82'	431.57'	442.96'	76.98°	0.05°
38	6829.00'	4.60°	86.00°	190'	6806.63'	-43.31'	101.05'	446.75'	458.04'	77.25°	0.05°
39	7018.00'	4.30°	87.70°	189'	6995.06'	-42.25'	101.87'	461.39'	472.51'	77.55°	0.17°
40	7207.00'	3.70°	88.90°	189'	7183.60'	-40.97'	102.27'	474.57'	485.47'	77.84°	0.32°
41	7397.00'	3.50°	89.90°	190'	7373.23'	-39.58'	102.40'	486.50'	497.16'	78.11°	0.11°
42	7586.00'	3.40°	88.30°	189'	7561.88'	-38.30'	102.57'	497.87'	508.33'	78.36°	0.07°
43	7776.00'	2.50°	77.40°	190'	7751.63'	-38.13'	103.64'	507.55'	518.02'	78.46°	0.56°
44	7965.00'	1.00°	67.00°	189'	7940.54'	-38.96'	105.19'	513.09'	523.76'	78.41°	0.81°
45	8155.00'	1.00°	71.90°	190'	8130.51'	-39.71'	106.35'	516.19'	527.03'	78.36°	0.04°
46	8344.00'	0.70°	57.70°	189'	8319.49'	-40.51'	107.48'	518.73'	529.75'	78.29°	0.19°
47	8534.00'	0.60°	56.00°	190'	8509.48'	-41.45'	108.66'	520.54'	531.76'	78.21°	0.05°
48	8723.00'	0.40°	43.30°	189'	8698.47'	-42.31'	109.69'	521.81'	533.22'	78.13°	0.12°
49	8912.00'	0.60°	45.40°	189'	8887.46'	-43.33'	110.86'	522.97'	534.59'	78.03°	0.11°
50	9102.00'	0.80°	34.70°	190'	9077.45'	-44.92'	112.65'	524.43'	536.40'	77.88°	0.13°
51	9291.00'	0.90°	36.80°	189'	9266.43'	-46.96'	114.93'	526.07'	538.48'	77.68°	0.06°
52	9480.00'	0.80°	3.60°	189'	9455.41'	-49.32'	117.43'	527.05'	539.97'	77.44°	0.26°
53	9670.00'	0.80°	317.00°	190'	9645.39'	-51.70'	119.73'	526.22'	539.67'	77.18°	0.33°
54	9859.00'	1.40°	295.30°	189'	9834.35'	-54.02'	121.68'	523.24'	537.20'	76.91°	0.38°
55	10049.00'	1.30°	281.60°	190'	10024.30'	-55.97'	123.10'	519.03'	533.43'	76.66°	0.18°
56	10238.00'	1.90°	274.50°	189'	10213.23'	-57.31'	123.78'	513.80'	528.50'	76.46°	0.33°
57	10364.00'	2.20°	271.20°	126'	10339.15'	-58.09'	123.99'	509.30'	524.18'	76.32°	0.26°
58	10425.00'	2.40°	271.40°	61'	10400.10'	-58.46'	124.05'	506.86'	521.82'	76.25°	0.33°
59	10472.00'	3.90°	238.40°	47'	10447.03'	-57.95'	123.24'	504.51'	519.34'	76.27°	4.88°
60	10519.00'	7.20°	196.10°	47'	10493.82'	-54.59'	119.57'	502.33'	516.36'	76.61°	10.74°
61	10568.00'	10.80°	203.40°	49'	10542.21'	-47.82'	112.40'	499.66'	512.14'	77.32°	7.69°
62	10615.00'	12.30°	202.80°	47'	10588.26'	-39.71'	103.74'	495.97'	506.70'	78.19°	3.20°
63	10662.00'	17.40°	193.20°	47'	10633.68'	-28.79'	92.28'	492.42'	500.99'	79.39°	12.01°
64	10710.00'	24.50°	185.80°	48'	10678.48'	-12.35'	75.36'	489.77'	495.53'	81.25°	15.76°
65	10757.00'	32.10°	179.10°	47'	10719.85'	9.59'	53.14'	488.98'	491.86'	83.80°	17.50°
66	10804.00'	37.80°	171.00°	47'	10758.38'	36.43'	26.39'	491.43'	492.14'	86.93°	15.62°
67	10851.00'	42.70°	165.40°	47'	10794.25'	66.67'	-3.28'	497.71'	497.72'	90.38°	12.95°
68	10898.00'	49.60°	165.10°	47'	10826.79'	100.26'	-36.04'	506.34'	507.62'	94.07°	14.69°
69	10945.00'	56.10°	164.00°	47'	10855.16'	137.32'	-72.12'	516.33'	521.34'	97.95°	13.95°
70	10992.00'	64.20°	162.70°	47'	10878.53'	177.51'	-111.14'	528.02'	539.59'	101.89°	17.40°
71	11048.00'	72.10°	163.60°	56'	10899.36'	228.73'	-160.85'	543.06'	566.38'	106.50°	14.19°
72	11095.00'	75.70°	164.80°	47'	10912.39'	273.38'	-204.29'	555.35'	591.73'	110.20°	8.04°
73	11142.00'	81.20°	166.10°	47'	10921.80'	319.05'	-248.84'	566.91'	619.12'	113.70°	12.01°
74	11190.00'	84.70°	169.70°	48'	10927.69'	366.50'	-295.41'	576.88'	648.12'	117.12°	10.42°
75	11237.00'	86.60°	172.40°	47'	10931.26'	413.34'	-341.70'	584.17'	676.77'	120.32°	7.01°
76	11282.00'	88.10°	175.40°	45'	10933.34'	458.28'	-386.39'	588.95'	704.38'	123.27°	7.45°
77	11329.00'	87.90°	178.10°	47'	10934.98'	505.13'	-433.28'	591.61'	733.30'	126.22°	5.76°

Srv.	Survey Depth	Inclination	Azimuth	Course Length	True Vertical	Vertical Section	Coordinates		Closure		Dogleg Severity
							+N / -S	+E / -W	Distance	Azimuth	
78	11379.00'	88.50°	178.60°	50'	10936.55'	554.86'	-483.23'	593.05'	765.00'	129.17°	1.56°
79	11474.00'	89.40°	179.70°	95'	10938.29'	649.23'	-578.20'	594.46'	829.28'	134.21°	1.50°
80	11569.00'	89.40°	179.10°	95'	10939.28'	743.57'	-673.19'	595.45'	898.75'	138.51°	0.63°
81	11664.00'	88.30°	179.80°	95'	10941.19'	837.89'	-768.17'	596.36'	972.49'	142.18°	1.37°
82	11758.00'	87.50°	179.80°	94'	10944.63'	931.10'	-862.10'	596.69'	1048.46'	145.31°	0.85°
83	11853.00'	89.80°	179.90°	95'	10946.87'	1025.33'	-957.07'	596.94'	1127.97'	148.05°	2.42°
84	11948.00'	91.00°	180.40°	95'	10946.21'	1119.52'	-1052.07'	596.69'	1209.50'	150.44°	1.37°
85	12042.00'	90.20°	179.40°	94'	10945.23'	1212.76'	-1146.06'	596.86'	1292.16'	152.49°	1.36°
86	12137.00'	90.80°	179.70°	95'	10944.40'	1307.08'	-1241.05'	597.60'	1377.44'	154.29°	0.71°
87	12232.00'	92.10°	180.60°	95'	10941.99'	1401.24'	-1336.02'	597.35'	1463.48'	155.91°	1.66°
88	12326.00'	90.70°	179.90°	94'	10939.70'	1494.39'	-1429.99'	596.94'	1549.58'	157.34°	1.67°
89	12421.00'	91.40°	179.80°	95'	10937.96'	1588.63'	-1524.97'	597.19'	1637.73'	158.61°	0.74°
90	12516.00'	90.30°	178.20°	95'	10936.55'	1683.04'	-1619.94'	598.85'	1727.09'	159.71°	2.04°
91	12610.00'	91.70°	178.90°	94'	10934.91'	1776.53'	-1713.89'	601.23'	1816.29'	160.67°	1.67°
92	12705.00'	90.00°	179.30°	95'	10933.50'	1870.92'	-1808.87'	602.72'	1906.64'	161.57°	1.84°
93	12800.00'	90.50°	179.80°	95'	10933.08'	1965.23'	-1903.86'	603.47'	1997.21'	162.41°	0.74°
94	12894.00'	89.10°	179.20°	94'	10933.41'	2058.57'	-1997.86'	604.29'	2087.24'	163.17°	1.62°
95	12989.00'	90.20°	179.60°	95'	10933.99'	2152.91'	-2092.85'	605.28'	2178.62'	163.87°	1.23°
96	13084.00'	90.30°	179.30°	95'	10933.58'	2247.25'	-2187.84'	606.19'	2270.27'	164.51°	0.33°
97	13179.00'	87.80°	178.60°	95'	10935.15'	2341.66'	-2282.80'	607.93'	2362.37'	165.09°	2.73°
98	13273.00'	88.60°	178.90°	94'	10938.10'	2435.08'	-2376.73'	609.98'	2453.76'	165.61°	0.91°
99	13368.00'	89.80°	179.60°	95'	10939.43'	2529.45'	-2471.71'	611.23'	2546.17'	166.11°	1.46°
100	13462.00'	91.50°	180.30°	94'	10938.36'	2622.68'	-2565.70'	611.31'	2637.53'	166.60°	1.96°
101	13557.00'	91.90°	179.40°	95'	10935.54'	2716.90'	-2660.66'	611.56'	2730.04'	167.06°	1.04°
102	13652.00'	89.30°	180.40°	95'	10934.55'	2811.13'	-2755.65'	611.72'	2822.73'	167.48°	2.93°
103	13747.00'	89.50°	181.00°	95'	10935.54'	2905.19'	-2850.63'	610.56'	2915.29'	167.91°	0.67°
104	13841.00'	90.70°	181.50°	94'	10935.38'	2998.14'	-2944.61'	608.51'	3006.83'	168.32°	1.38°
105	13936.00'	88.50°	180.10°	95'	10936.04'	3092.18'	-3039.59'	607.19'	3099.64'	168.70°	2.74°
106	14031.00'	88.90°	179.90°	95'	10938.20'	3186.38'	-3134.56'	607.19'	3192.83'	169.04°	0.47°
107	14125.00'	90.40°	180.90°	94'	10938.77'	3279.52'	-3228.56'	606.53'	3285.04'	169.36°	1.92°
108	14220.00'	90.00°	179.80°	95'	10938.44'	3373.67'	-3323.55'	605.95'	3378.34'	169.67°	1.23°
109	14315.00'	88.50°	178.80°	95'	10939.69'	3468.03'	-3418.53'	607.11'	3472.02'	169.93°	1.90°
110	14409.00'	89.30°	179.80°	94'	10941.49'	3561.38'	-3512.51'	608.26'	3564.78'	170.18°	1.36°
111	14504.00'	88.50°	178.70°	95'	10943.31'	3655.74'	-3607.48'	609.50'	3658.61'	170.41°	1.43°
112	14599.00'	89.70°	178.60°	95'	10944.81'	3750.21'	-3702.44'	611.74'	3752.64'	170.62°	1.27°
113	14693.00'	90.00°	178.40°	94'	10945.05'	3843.72'	-3796.41'	614.20'	3845.77'	170.81°	0.38°
114	14788.00'	90.10°	177.60°	95'	10944.97'	3938.31'	-3891.35'	617.51'	3940.04'	170.98°	0.85°
115	14883.00'	88.30°	176.80°	95'	10946.30'	4033.00'	-3986.22'	622.15'	4034.48'	171.13°	2.07°
116	14978.00'	89.40°	177.10°	95'	10948.20'	4127.72'	-4081.07'	627.21'	4128.98'	171.26°	1.20°
117	15073.00'	88.90°	177.10°	95'	10949.61'	4222.43'	-4175.93'	632.01'	4223.49'	171.39°	0.53°
118	15168.00'	89.90°	176.50°	95'	10950.61'	4317.17'	-4270.78'	637.32'	4318.07'	171.51°	1.23°
119	15263.00'	93.20°	176.30°	95'	10948.04'	4411.92'	-4365.54'	643.28'	4412.68'	171.62°	3.48°
120	15357.00'	94.40°	176.90°	94'	10941.81'	4505.50'	-4459.17'	648.84'	4506.13'	171.72°	1.43°
121	15452.00'	92.20°	178.00°	95'	10936.34'	4600.00'	-4553.91'	653.06'	4600.50'	171.84°	2.59°
122	15547.00'	88.30°	182.70°	95'	10935.92'	4694.11'	-4648.86'	652.48'	4694.43'	172.01°	6.43°
123	15642.00'	91.40°	182.70°	95'	10936.17'	4787.65'	-4743.75'	648.00'	4787.80'	172.22°	3.26°
124	15790.00'	89.30°	182.70°	148'	10935.27'	4933.38'	-4891.57'	641.03'	4933.39'	172.53°	1.42°