



HALLIBURTON

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State of New Mexico, Lea County

I, STEPHEN HATCHER certify that I am employed by Halliburton Energy Services, Inc. (aka Sperry Drilling) and that on the dates of November 03, 2015 through December 13, 2015, I did conduct or supervise the taking of MWD directional surveys for the Yates 16 State #1H ST01 well from a depth of 8430' MD to a depth of 13453' MD. This data is true, correct, complete and within the limitations of the tools as set forth by Halliburton Energy Services, Inc. (aka Sperry Drilling). I am authorized and qualified to make this report and these surveys were conducted at the request of Endurance Resources, for the Yates 16 State #1H ST01 well in Lea County. I have reviewed this report and find that it confirms to the principles and procedures as set forth by Halliburton Energy Services, Inc. (aka Sperry Drilling.)

STEPHEN HATCHER
Field Engineer

FEB 15 2016

Endurance Resources

Yates 16 State #1H ST01

Lea County, New Mexico

H&P 490

API# 30-025-42757-0100

November 03, 2015 - December 13, 2015
MO-XX-0902874993

Sperry Drilling

MWD Survey Report

Submitted by: STEPHEN HATCHER

3950 Interwood South Parkway Houston, TX 77032

Ph: 281.986.4400

HALLIBURTON

Sperry Drilling



Survey Report for Endurance Resources, LLC.

Rig : H & P 490
Well Name : Yates 16 State 1H STO1
Field Name : Bone Spring
Country : USA
Job Number : MO-XX-0902874993
Job Start Date : 03-Nov-15
API Number : 30-025-42757-0100

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')
100.00	0.79	81.90	100.00	0.10 N	0.68 E	-0.04	0.79
200.00	0.82	77.42	199.99	0.35 N	2.06 E	-0.19	0.07
300.00	0.83	85.13	299.98	0.57 N	3.48 E	-0.30	0.11
400.00	0.54	66.88	399.97	0.81 N	4.64 E	-0.45	0.36
500.00	0.31	39.27	499.97	1.21 N	5.24 E	-0.80	0.30
600.00	0.26	356.34	599.97	1.64 N	5.40 E	-1.22	0.21
700.00	0.21	352.61	699.96	2.05 N	5.36 E	-1.63	0.05
800.00	0.66	308.02	799.96	2.59 N	4.88 E	-2.20	0.53
900.00	1.04	307.39	899.95	3.49 N	3.71 E	-3.20	0.38
1000.00	1.13	324.27	999.93	4.85 N	2.41 E	-4.65	0.33
1100.00	0.94	347.97	1,099.92	6.45 N	1.67 E	-6.30	0.46
1200.00	0.83	349.02	1,199.91	7.96 N	1.36 E	-7.83	0.11
1300.00	0.70	334.35	1,299.90	9.22 N	0.95 E	-9.12	0.23
1400.00	0.58	342.52	1,399.89	10.26 N	0.54 E	-10.19	0.15
1500.00	0.43	339.84	1,499.89	11.09 N	0.26 E	-11.04	0.15
1600.00	0.11	325.15	1,599.88	11.52 N	0.07 E	-11.48	0.32
1700.00	0.03	289.10	1,699.88	11.61 N	0.01 W	-11.58	0.09
1800.00	0.05	161.09	1,799.88	11.58 N	0.02 W	-11.55	0.07
1900.00	0.19	173.31	1,899.88	11.37 N	0.02 E	-11.34	0.14
2000.00	0.20	165.29	1,999.88	11.04 N	0.08 E	-11.00	0.03
2100.00	0.15	153.23	2,099.88	10.75 N	0.18 E	-10.71	0.06
2200.00	0.08	102.56	2,199.88	10.62 N	0.31 E	-10.57	0.12
2300.00	0.28	59.48	2,299.88	10.73 N	0.59 E	-10.65	0.23
2400.00	0.39	52.07	2,399.88	11.06 N	1.07 E	-10.95	0.12
2500.00	0.48	43.03	2,499.88	11.58 N	1.62 E	-11.42	0.11
2600.00	0.58	29.70	2,599.87	12.32 N	2.16 E	-12.12	0.16
2700.00	0.60	26.72	2,699.87	13.23 N	2.64 E	-12.99	0.04
2800.00	0.56	31.20	2,799.86	14.12 N	3.13 E	-13.83	0.06
2900.00	0.58	32.91	2,899.86	14.96 N	3.66 E	-14.63	0.03
3000.00	0.51	33.73	2,999.85	15.76 N	4.18 E	-15.39	0.07
3100.00	0.56	23.06	3,099.85	16.58 N	4.62 E	-16.17	0.11
3200.00	0.67	17.95	3,199.84	17.58 N	4.99 E	-17.14	0.12
3300.00	0.84	6.69	3,299.84	18.87 N	5.26 E	-18.40	0.22
3400.00	0.86	4.77	3,399.82	20.34 N	5.41 E	-19.86	0.03
3500.00	0.70	7.27	3,499.81	21.69 N	5.55 E	-21.20	0.16
3600.00	0.22	37.16	3,599.81	22.45 N	5.74 E	-21.94	0.52
3700.00	0.31	21.71	3,699.81	22.86 N	5.96 E	-22.33	0.11
3800.00	0.31	3.38	3,799.81	23.38 N	6.07 E	-22.84	0.10
3900.00	0.27	347.24	3,899.81	23.88 N	6.04 E	-23.34	0.09
4000.00	0.29	227.32	3,999.81	23.94 N	5.80 E	-23.42	0.48
4100.00	0.50	292.77	4,099.81	23.93 N	5.21 E	-23.46	0.46

DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
4200.00	0.85	304.27	4,199.80	24.52 N	4.19 E	-24.13	0.37
4300.00	0.89	305.04	4,299.79	25.39 N	2.95 E	-25.08	0.04
4400.00	0.55	331.65	4,399.78	26.25 N	2.08 E	-26.01	0.47
4500.00	0.86	59.34	4,499.77	27.06 N	2.50 E	-26.79	1.00
4600.00	1.30	64.89	4,599.76	27.92 N	4.17 E	-27.52	0.45
4700.00	1.74	70.81	4,699.72	28.90 N	6.63 E	-28.31	0.47
4800.00	1.78	106.14	4,799.68	28.97 N	9.56 E	-28.15	1.07
4900.00	1.47	141.30	4,899.64	27.54 N	11.85 E	-26.54	1.03
5000.00	0.88	186.34	4,999.62	25.77 N	12.57 E	-24.73	1.05
5100.00	0.69	186.31	5,099.61	24.41 N	12.42 E	-23.38	0.19
5200.00	0.68	188.75	5,199.60	23.23 N	12.26 E	-22.21	0.03
5300.00	0.74	191.33	5,299.59	22.01 N	12.05 E	-21.01	0.07
5400.00	0.49	196.36	5,399.59	20.96 N	11.80 E	-19.99	0.26
5500.00	0.43	176.63	5,499.58	20.18 N	11.70 E	-19.22	0.17
5600.00	0.47	188.68	5,599.58	19.40 N	11.66 E	-18.44	0.10
5700.00	0.34	201.93	5,699.58	18.72 N	11.49 E	-17.78	0.16
5800.00	0.30	192.14	5,799.58	18.19 N	11.32 E	-17.26	0.07
5900.00	0.39	169.56	5,899.58	17.60 N	11.33 E	-16.67	0.16
6000.00	0.52	177.41	5,999.57	16.81 N	11.41 E	-15.88	0.14
6100.00	0.51	183.97	6,099.57	15.91 N	11.40 E	-14.98	0.06
6200.00	0.34	193.11	6,199.57	15.18 N	11.30 E	-14.26	0.18
6300.00	0.20	188.41	6,299.56	14.72 N	11.21 E	-13.81	0.14
6400.00	0.17	178.10	6,399.56	14.40 N	11.19 E	-13.49	0.04
6500.00	0.20	150.90	6,499.56	14.09 N	11.28 E	-13.18	0.09
6600.00	0.19	154.92	6,599.56	13.79 N	11.43 E	-12.87	0.02
6700.00	0.25	148.86	6,699.56	13.45 N	11.62 E	-12.52	0.06
6800.00	0.22	148.37	6,799.56	13.10 N	11.83 E	-12.15	0.03
6900.00	0.31	162.00	6,899.56	12.68 N	12.01 E	-11.72	0.11
7000.00	0.29	166.64	6,999.56	12.18 N	12.16 E	-11.21	0.03
7100.00	0.31	163.39	7,099.56	11.67 N	12.29 E	-10.69	0.03
7200.00	0.35	151.22	7,199.56	11.15 N	12.52 E	-10.15	0.08
7300.00	0.30	142.60	7,299.55	10.67 N	12.82 E	-9.65	0.07
7400.00	0.22	157.22	7,399.55	10.29 N	13.06 E	-9.25	0.10
7500.00	0.33	173.21	7,499.55	9.82 N	13.16 E	-8.78	0.13
7600.00	0.44	144.58	7,599.55	9.23 N	13.42 E	-8.16	0.22
7700.00	0.26	132.62	7,699.55	8.76 N	13.81 E	-7.67	0.19
7800.00	0.40	119.88	7,799.55	8.43 N	14.28 E	-7.31	0.16
7900.00	0.59	104.11	7,899.54	8.13 N	15.08 E	-6.95	0.23
8000.00	0.82	109.12	7,999.54	7.77 N	16.26 E	-6.50	0.24
8100.00	1.08	107.03	8,099.52	7.26 N	17.83 E	-5.87	0.26
8200.00	1.30	100.53	8,199.50	6.78 N	19.85 E	-5.23	0.26
8275.93	1.41	99.79	8,275.41	6.46 N	21.62 E	-4.78	0.15
8341.00	4.29	164.23	8,340.40	3.98 N	23.07 E	-2.19	5.99
8430.00	10.13	171.66	8,428.66	6.97 S	25.11 E	8.89	6.63
8475.00	13.20	174.90	8,472.73	16.01 S	26.14 E	17.98	6.98

DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
8521.00	17.17	177.81	8,517.11	28.03 S	26.87 E	30.02	8.79
8565.00	21.68	180.07	8,558.60	42.66 S	27.11 E	44.62	10.39
8610.00	25.29	182.20	8,599.86	60.58 S	26.73 E	62.46	8.23
8656.00	28.11	181.41	8,640.96	81.24 S	26.08 E	83.00	6.18
8698.00	31.41	179.17	8,677.41	102.08 S	26.00 E	103.78	8.30
8743.00	36.68	179.78	8,714.69	127.26 S	26.22 E	128.90	11.73
8788.00	41.45	178.82	8,749.62	155.61 S	26.58 E	157.19	10.69
8833.00	45.78	177.81	8,782.19	186.63 S	27.50 E	188.19	9.74
8878.00	51.30	177.06	8,811.97	220.30 S	29.02 E	221.88	12.34
8923.00	59.37	175.49	8,837.55	257.20 S	31.44 E	258.86	18.16
8968.00	66.73	174.67	8,857.93	297.14 S	34.89 E	298.94	16.42
9013.00	70.59	174.10	8,874.30	338.84 S	38.99 E	340.84	8.67
9058.00	75.73	174.37	8,887.33	381.68 S	43.31 E	383.89	11.44
9103.00	81.09	175.45	8,896.37	425.58 S	47.22 E	427.95	12.15
9148.00	85.03	176.01	8,901.80	470.11 S	50.54 E	472.61	8.84
9193.00	87.26	175.04	8,904.83	514.87 S	54.04 E	517.51	5.38
9238.00	87.47	174.92	8,906.90	559.65 S	57.98 E	562.46	0.55
9328.00	88.80	177.58	8,909.83	649.40 S	63.86 E	652.39	3.30
9418.00	89.54	177.20	8,911.13	739.30 S	67.96 E	742.34	0.92
9507.00	88.34	176.44	8,912.78	828.14 S	72.89 E	831.30	1.60
9597.00	87.38	175.94	8,916.15	917.88 S	78.86 E	921.23	1.20
9687.00	86.24	174.08	8,921.16	1,007.40 S	86.68 E	1011.08	2.42
9777.00	87.07	173.92	8,926.40	1,096.75 S	96.07 E	1100.89	0.94
9867.00	87.50	174.37	8,930.66	1,186.18 S	105.23 E	1190.76	0.69
9956.00	88.67	174.28	8,933.63	1,274.69 S	114.03 E	1279.69	1.32
10046.00	89.51	175.73	8,935.06	1,364.34 S	121.87 E	1369.67	1.86
10136.00	88.92	175.50	8,936.29	1,454.06 S	128.76 E	1459.66	0.70
10226.00	88.80	176.64	8,938.08	1,543.83 S	134.93 E	1549.64	1.27
10315.00	89.23	176.91	8,939.61	1,632.68 S	139.94 E	1638.61	0.57
10405.00	87.66	176.94	8,942.06	1,722.51 S	144.77 E	1728.55	1.75
10495.00	87.50	176.80	8,945.86	1,812.30 S	149.67 E	1818.44	0.23
10585.00	88.46	176.40	8,949.03	1,902.08 S	155.01 E	1908.37	1.15
10675.00	89.35	175.59	8,950.75	1,991.84 S	161.29 E	1998.35	1.34
10765.00	88.24	175.70	8,952.64	2,081.56 S	168.13 E	2088.33	1.24
10855.00	88.40	175.70	8,955.27	2,171.27 S	174.87 E	2178.29	0.17
10945.00	88.43	175.72	8,957.77	2,260.98 S	181.60 E	2268.26	0.04
11034.00	89.97	177.64	8,959.01	2,349.82 S	186.76 E	2357.22	2.77
11125.00	88.71	177.63	8,960.06	2,440.73 S	190.51 E	2448.16	1.39
11215.00	87.84	177.72	8,962.77	2,530.62 S	194.16 E	2538.05	0.96
11304.00	87.69	175.31	8,966.25	2,619.38 S	199.56 E	2626.97	2.71
11395.00	87.84	175.52	8,969.79	2,710.02 S	206.83 E	2717.90	0.28
11484.00	89.54	175.96	8,971.83	2,798.75 S	213.44 E	2806.87	1.97
11574.00	90.31	176.17	8,971.95	2,888.53 S	219.61 E	2896.87	0.89
11664.00	88.89	175.92	8,972.58	2,978.32 S	225.82 E	2986.86	1.60
11754.00	87.60	176.27	8,975.34	3,068.06 S	231.95 E	3076.81	1.49

DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
11844.00	86.14	177.45	8,980.25	3,157.79 S	236.87 E	3166.65	2.08
11934.00	87.32	177.74	8,985.39	3,247.56 S	240.64 E	3256.45	1.34
12024.00	87.38	176.90	8,989.55	3,337.37 S	244.84 E	3346.31	0.94
12113.00	88.27	176.28	8,992.92	3,426.14 S	250.14 E	3435.23	1.22
12203.00	88.28	174.83	8,995.63	3,515.83 S	257.11 E	3525.19	1.61
12294.00	88.43	174.90	8,998.25	3,606.43 S	265.26 E	3616.14	0.18
12384.00	90.83	176.19	8,998.84	3,696.14 S	272.26 E	3706.13	3.03
12473.00	87.10	174.05	9,000.44	3,784.78 S	279.83 E	3795.09	4.83
12558.00	86.98	174.63	9,004.83	3,869.26 S	288.20 E	3879.96	0.70
12648.00	87.23	172.42	9,009.38	3,958.56 S	298.34 E	3969.78	2.47
12737.00	87.26	173.45	9,013.67	4,046.78 S	309.28 E	4058.58	1.16
12827.00	88.27	175.57	9,017.17	4,136.30 S	317.88 E	4148.49	2.61
12917.00	88.77	176.34	9,019.50	4,226.04 S	324.23 E	4238.46	1.01
13006.00	87.69	174.60	9,022.25	4,314.71 S	331.26 E	4327.41	2.30
13096.00	89.54	176.39	9,024.43	4,404.40 S	338.33 E	4417.38	2.86
13186.00	90.83	176.38	9,024.14	4,494.22 S	344.00 E	4507.37	1.44
13275.00	90.22	176.39	9,023.32	4,583.04 S	349.62 E	4596.35	0.69
13365.00	90.93	178.77	9,022.43	4,672.95 S	353.42 E	4686.29	2.76
13453.00	88.67	178.52	9,022.74	4,760.92 S	355.49 E	4774.15	2.57
13500.00	88.67	178.52	9,023.82	4,807.89 S	356.70 E	4821.08	0.01

SURVEY FOOTER

SURVEYS CALCULATED USING THE SHORT COLLAR METHOD.
 WELL ASSUMED VERTICAL AT SURFACE.
 SURVEYS FROM 100' MD TO 8341' MD PROVIDED BY SCIENTIFIC DRILLING.
 SURVEYS FROM 8430' MD TO 13453' MD PROVIDED BY SPERRY DRILLING
 SURVEY AT 13453' MD IS PROJECTED TO TD AT 13500' MD
 SPERRY DRILLING ENGINEERS: S. HATCHER AND J. CORN

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 175.58 degrees (Grid)
- A total correction of 6.61 deg from Magnetic north to Grid north has been applied
- Horizontal displacement is relative to the well head.
- Horizontal displacement (closure) at 13,500.00 feet is 4,821.10 feet along 175.76 degrees (Grid)

WARRANTY

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