

Chevron USA, Inc.

Rustler Bluff 33 24 29 Fed #1

Eddy County, New Mexico

Ensign 767

API# 30-015-42670-0000

December 1, 2014 – December 28, 2014

MO-MJ-0901886528

Sperry Drilling Services MWD Survey Report

Submitted by K. Stolarski

3950 Interwood South Parkway

Houston, TX 77032

Ph: 281.986.4400

HALLIBURTON

**Drilling and Formation
Evaluation**

[REDACTED]



Survey Report for Chevron USA, Inc.

Rig	:	Ensign 767
Well Name	:	Rustler bluff 33 24 29 Fed #1
Field Name	:	Willow Lake
Country	:	USA
Job Number	:	MO-XX-0901886528
Job Start Date	:	01-Dec-14
API Number	:	30-015-42670-0000



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')
168.00	0.32	27.11	168.00	0.42 N	0.21 E	0.42	0.19
589.00	0.31	259.67	589.00	1.26 N	0.38 W	1.27	0.14
770.00	0.22	313.58	769.99	1.42 N	1.13 W	1.42	0.14
953.00	0.54	349.12	952.99	2.51 N	1.55 W	2.52	0.21
1144.00	0.22	342.35	1,143.99	3.74 N	1.83 W	3.75	0.17
1332.00	0.34	76.51	1,331.98	4.21 N	1.39 W	4.22	0.22
1521.00	1.19	154.49	1,520.97	2.58 N	0.01 E	2.58	0.62
1709.00	2.65	171.40	1,708.86	3.47 S	1.50 E	-3.48	0.83
1804.00	1.86	150.85	1,803.79	6.99 S	2.57 E	-7.00	1.18
1899.00	2.14	106.13	1,898.73	8.83 S	5.03 E	-8.86	1.62
2088.00	2.59	70.03	2,087.58	8.35 S	12.43 E	-8.42	0.81
2278.00	2.87	83.75	2,277.37	6.36 S	21.20 E	-6.49	0.37
2372.00	2.99	78.85	2,371.25	5.63 S	25.95 E	-5.79	0.30
2466.00	2.90	63.22	2,465.12	4.09 S	30.48 E	-4.27	0.86
2560.00	2.14	87.40	2,559.03	2.94 S	34.35 E	-3.15	1.37
2655.00	1.69	107.83	2,653.98	3.28 S	37.46 E	-3.51	0.86
2750.00	2.30	106.89	2,748.92	4.26 S	40.61 E	-4.51	0.65
2827.00	1.00	112.77	2,825.89	4.97 S	42.71 E	-5.23	1.70
2932.00	0.34	168.73	2,930.88	5.64 S	43.62 E	-5.90	0.82
3120.00	0.48	153.42	3,118.88	6.90 S	44.08 E	-7.17	0.09
3309.00	0.77	115.30	3,307.87	8.15 S	45.58 E	-8.43	0.26
3497.00	0.79	148.66	3,495.85	9.80 S	47.40 E	-10.09	0.24
3686.00	0.54	304.62	3,684.85	10.41 S	47.34 E	-10.70	0.69
3874.00	0.36	304.26	3,872.84	9.58 S	46.13 E	-9.86	0.10
3968.00	1.57	275.13	3,966.83	9.30 S	44.60 E	-9.57	1.35
4157.00	1.36	284.64	4,155.77	8.50 S	39.86 E	-8.74	0.17
4346.00	1.57	268.68	4,344.70	7.99 S	35.09 E	-8.21	0.24
4534.00	1.93	270.83	4,532.62	8.00 S	29.35 E	-8.18	0.19
4722.00	1.68	259.22	4,720.52	8.47 S	23.48 E	-8.62	0.24
4911.00	1.90	280.19	4,909.43	8.44 S	17.68 E	-8.54	0.36
5100.00	1.77	243.64	5,098.34	9.18 S	11.99 E	-9.25	0.61
5289.00	1.03	203.05	5,287.29	12.04 S	8.70 E	-12.10	0.63
5478.00	1.80	211.83	5,476.23	16.13 S	6.47 E	-16.17	0.42
5667.00	0.41	219.38	5,665.19	19.18 S	4.48 E	-19.20	0.74
5855.00	0.82	207.16	5,853.18	20.89 S	3.44 E	-20.91	0.22
6044.00	0.68	171.06	6,042.16	23.20 S	3.00 E	-23.22	0.25
6234.00	1.08	160.42	6,232.14	26.00 S	3.77 E	-26.02	0.23
6423.00	0.72	107.49	6,421.12	28.04 S	5.51 E	-28.07	0.46
6611.00	0.57	40.83	6,609.11	27.69 S	7.25 E	-27.73	0.38
6800.00	1.05	105.37	6,798.09	27.44 S	9.52 E	-27.50	0.50
6988.00	0.94	83.88	6,986.07	27.73 S	12.72 E	-27.81	0.20



DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
7176.00	1.09	98.36	7,174.04	27.82 S	16.03 E	-27.92	0.16
7365.00	1.60	65.47	7,362.99	26.99 S	20.22 E	-27.11	0.48
7553.00	1.23	319.46	7,550.95	24.37 S	21.30 E	-24.50	1.21
7743.00	0.84	340.43	7,740.92	21.51 S	19.51 E	-21.63	0.28
7932.00	2.55	156.62	7,929.87	24.06 S	20.72 E	-24.19	1.79
8027.00	1.84	190.76	8,024.81	27.50 S	21.27 E	-27.63	1.53
8102.00	1.77	189.54	8,099.77	29.82 S	20.85 E	-29.95	0.11
8165.00	1.63	215.31	8,162.74	31.51 S	20.18 E	-31.63	1.22
8197.00	2.20	281.91	8,194.73	31.76 S	19.31 E	-31.87	6.73
8228.00	4.39	304.23	8,225.68	30.96 S	17.75 E	-31.07	8.08
8260.00	7.21	313.55	8,257.51	28.89 S	15.28 E	-28.98	9.24
8291.00	10.20	319.00	8,288.15	25.48 S	12.07 E	-25.55	9.99
8322.00	12.83	321.81	8,318.53	20.70 S	8.14 E	-20.75	8.69
8354.00	14.90	325.42	8,349.59	14.52 S	3.61 E	-14.55	7.00
8387.00	17.67	327.26	8,381.27	6.82 S	1.51 W	-6.81	8.53
8416.00	20.92	325.50	8,408.63	1.15 N	6.82 W	1.19	11.39
8447.00	23.70	323.81	8,437.31	10.74 N	13.64 W	10.83	9.20
8479.00	27.77	323.21	8,466.13	21.91 N	21.90 W	22.04	12.77
8510.00	32.61	323.92	8,492.92	34.45 N	31.15 W	34.64	15.63
8542.00	37.40	325.36	8,519.12	49.42 N	41.76 W	49.68	15.19
8573.00	40.96	330.60	8,543.16	66.03 N	52.10 W	66.34	15.68
8604.00	44.12	335.87	8,566.00	84.74 N	61.51 W	85.11	15.37
8636.00	48.48	339.17	8,588.11	106.11 N	70.33 W	106.54	15.52
8667.00	54.58	342.37	8,607.39	129.02 N	78.29 W	129.50	21.28
8698.00	59.94	345.01	8,624.15	154.04 N	85.59 W	154.56	18.71
8730.00	62.95	347.03	8,639.45	181.31 N	92.37 W	181.87	10.90
8761.00	66.88	349.41	8,652.59	208.79 N	98.09 W	209.39	14.48
8792.00	70.58	350.81	8,663.83	237.24 N	103.05 W	237.87	12.64
8824.00	73.89	351.53	8,673.60	267.35 N	107.72 W	268.01	10.57
8856.00	77.78	352.75	8,681.43	298.08 N	111.96 W	298.76	12.71
8875.00	80.16	353.88	8,685.06	316.60 N	114.13 W	317.29	13.81
8919.00	85.90	355.45	8,690.40	360.07 N	118.19 W	360.78	13.52
8950.00	88.92	355.50	8,691.80	390.94 N	120.63 W	391.67	9.75
9013.00	90.68	355.99	8,692.02	453.76 N	125.31 W	454.52	2.89
9107.00	93.43	356.73	8,688.66	547.50 N	131.28 W	548.29	3.03
9202.00	92.50	357.19	8,683.75	642.24 N	136.31 W	643.06	1.09
9296.00	89.97	358.81	8,681.72	736.15 N	139.59 W	736.99	3.19
9390.00	90.59	358.99	8,681.27	830.13 N	141.40 W	830.98	0.69
9485.00	90.65	0.34	8,680.24	925.12 N	141.95 W	925.97	1.43
9579.00	89.75	2.68	8,679.92	1,019.08 N	139.47 W	1019.91	2.66
9674.00	89.85	3.42	8,680.25	1,113.94 N	134.42 W	1114.74	0.79
9768.00	90.49	3.40	8,679.97	1,207.78 N	128.82 W	1208.54	0.69
9863.00	91.73	3.36	8,678.13	1,302.59 N	123.22 W	1303.32	1.30
9957.00	89.69	3.41	8,676.96	1,396.42 N	117.67 W	1397.11	2.17
10051.00	89.01	3.41	8,678.02	1,490.24 N	112.08 W	1490.90	0.72



DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
10146.00	89.32	3.22	8,679.40	1,585.07 N	106.59 W	1585.70	0.38
10240.00	90.25	3.44	8,679.76	1,678.91 N	101.12 W	1679.50	1.01
10335.00	91.36	3.06	8,678.43	1,773.75 N	95.74 W	1774.30	1.23
10430.00	91.36	4.33	8,676.18	1,868.52 N	89.62 W	1869.04	1.34
10524.00	88.30	4.49	8,676.46	1,962.23 N	82.39 W	1962.70	3.25
10618.00	87.88	3.97	8,679.59	2,055.92 N	75.46 W	2056.35	0.71
10712.00	89.04	4.78	8,682.12	2,149.61 N	68.28 W	2149.99	1.51
10807.00	89.69	4.17	8,683.17	2,244.32 N	60.88 W	2244.65	0.94
10901.00	90.31	4.36	8,683.17	2,338.06 N	53.89 W	2338.34	0.69
10995.00	89.35	2.49	8,683.44	2,431.88 N	48.28 W	2432.13	2.23
11090.00	89.91	2.67	8,684.06	2,526.79 N	44.00 W	2527.01	0.61
11184.00	90.96	2.85	8,683.35	2,620.67 N	39.47 W	2620.86	1.13
11279.00	88.09	2.03	8,684.14	2,715.57 N	35.42 W	2715.74	3.14
11373.00	88.77	2.04	8,686.72	2,809.48 N	32.08 W	2809.62	0.72
11467.00	89.44	2.38	8,688.18	2,903.39 N	28.46 W	2903.51	0.80
11561.00	90.49	2.03	8,688.24	2,997.32 N	24.84 W	2997.42	1.17
11655.00	91.73	2.27	8,686.41	3,091.24 N	21.31 W	3091.31	1.34
11750.00	91.33	2.23	8,683.88	3,186.13 N	17.58 W	3186.18	0.42
11844.00	89.82	2.04	8,682.95	3,280.06 N	14.08 W	3280.08	1.62
11938.00	90.80	1.48	8,682.44	3,374.01 N	11.19 W	3374.02	1.20
12032.00	90.09	1.12	8,681.71	3,467.98 N	9.05 W	3467.97	0.84
12127.00	90.68	1.05	8,681.07	3,562.96 N	7.26 W	3562.94	0.62
12222.00	88.80	0.15	8,681.51	3,657.95 N	6.26 W	3657.92	2.19
12317.00	89.97	0.18	8,682.53	3,752.94 N	5.99 W	3752.91	1.23
12411.00	91.20	0.63	8,681.57	3,846.93 N	5.34 W	3846.90	1.40
12505.00	89.91	0.78	8,680.66	3,940.92 N	4.18 W	3940.87	1.39
12599.00	88.46	0.12	8,682.00	4,034.91 N	3.45 W	4034.85	1.69
12694.00	88.86	359.94	8,684.22	4,129.88 N	3.39 W	4129.82	0.46
12788.00	89.54	0.12	8,685.54	4,223.87 N	3.35 W	4223.81	0.74
12883.00	87.44	358.12	8,688.04	4,318.82 N	4.81 W	4318.76	3.04
12978.00	87.54	357.70	8,692.19	4,413.66 N	8.27 W	4413.63	0.45
13072.00	88.30	357.51	8,695.60	4,507.52 N	12.19 W	4507.51	0.83
13167.00	89.60	357.08	8,697.34	4,602.39 N	16.68 W	4602.41	1.44
13261.00	90.99	357.39	8,696.86	4,696.28 N	21.22 W	4696.32	1.51
13356.00	92.25	357.04	8,694.18	4,791.13 N	25.84 W	4791.19	1.38
13451.00	91.26	356.74	8,691.27	4,885.94 N	30.99 W	4886.04	1.08
13546.00	90.19	357.14	8,690.06	4,980.80 N	36.06 W	4980.92	1.21
13640.00	90.22	358.05	8,689.74	5,074.71 N	40.00 W	5074.86	0.97
13734.00	90.68	357.43	8,689.00	5,168.64 N	43.71 W	5168.81	0.83
13829.00	90.74	356.81	8,687.83	5,263.51 N	48.49 W	5263.71	0.66
13883.00	90.46	356.89	8,687.26	5,317.42 N	51.46 W	5317.64	0.54
13942.00	90.46	356.89	8,686.79	5,376.33 N	54.66 W	5376.57	0.01

SURVEY FOOTER

SURVEYS CALCULATED USING SHORT COLLAR METHOD
TIE ON SURVEY ASSUMED VERTICAL AT SURFACE

**SURVEY FOOTER**

SURVEYS FROM 168' MD TO 13883' MD PROVIDED BY SPERRY DRILLING MWD
SURVEY AT 13883' MD HAS BEEN PROJECTED TO TD AT 13942' MD.
SPERRY ENGINEERS: K. Stolarski, A. Philbin

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 359.65 degrees (Grid)
- A total correction of 7.34 deg from Magnetic north to Grid north has been applied
- Horizontal displacement is relative to the well head.
- Horizontal displacement (closure) at 13,942.00 feet is 5,376.61 feet along 359.42 degrees (Grid)

WARRANTY

HALLIBURTON ENERGY SERVICES, INC. WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON ENERGY SERVICES, INC. CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION, AND PRODUCTION OPERATION. HALLIBURTON ENERGY SERVICES, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON ENERGY SERVICES, INC. SERVICES BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON ENERGY SERVICES, INC.

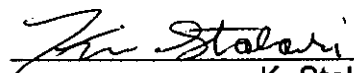
HALLIBURTON

3950 Interwood S. Pkwy • Houston, TX 77032

PHONE 281.986.4400 • FAX 281.986.4499

State of New Mexico, Eddy County

I, Kevin Stolarski certify that I am employed by Halliburton Energy Services, Inc. (aka Sperry Drilling) and that on the dates of 1-December-2014 through 28-December-2014, I did conduct or supervise the taking of MWD directional surveys for the well Rustler Bluff 33 24 29 Fed #1 from a depth of 168' MD to a depth of 13883' 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 Chevron USA, Inc. for the well Rustler Bluff 33 24 29 Fed #1, API No. 30-015-42670-0000 in Eddy County, New Mexico. I have reviewed this report and find that it conforms to the principles and procedures as set forth by Halliburton Energy Services, Inc. (aka Sperry Drilling).



K. Stolarski
Field Engineer