

HALLIBURTON

15-41848

3950 Interwood South Parkway • Houston, TX 77032

PHONE 281.986.4400 • FAX 281.986.4499

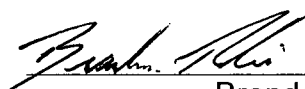
NM OIL CONSERVATION  
ARTESIA DISTRICT

AUG 15 2014

State of New Mexico, Eddy County

RECEIVED

I, Brandon Roberie, certify that I am employed by Halliburton Energy Services, Inc. (aka Sperry Drilling) and that on the dates of **26-January-14** through **4-February-14**. I did conduct or supervise the taking of DGWD directional surveys for the well from a depth of **512' MD** to a depth of **7392' 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 **Hayhurst 18 Fed 1H** well, API No. **30-015-41848-0000** in **Eddy County, NM**. 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).



Brandon Roberie  
Field Engineer

**Chevron USA, Inc**  
**Hayhurst 18 Fed 1H**  
**Eddy County, NM**  
**Ensign 767**  
**API# 30-015-41848-0000**

**NM OIL CONSERVATION**  
ARTESIA DISTRICT

**AUG 15 2014**

**RECEIVED**

**January 26, 2014 – February 04, 2014**  
**HD-MJ-0901037354**

**Sperry Drilling**  
**Survey Report**

**Submitted by Brandon Roberie**  
3950 Interwood Parkway South  
Houston, TX 77032  
Ph: 281.986.4400

**HALLIBURTON**

**Drilling and Formation**  
**Evaluation**

# Survey Report for Chevron USA, Inc

**Rig** : Ensign 767  
**Well Name** : Hayhurst 18 Fed 1H  
**Field Name** :  
**Country** : USA  
**Job Number** : HD-XX-0901037354  
**Job Start Date** : 26-Jan-14  
**API Number** : 30-015-41848-0000

## 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)
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	0.00
100.00	0.55	223.21	100.00	0.35 S	0.33 W	0.34	0.55
200.00	1.29	257.82	199.99	0.94 S	1.76 W	0.90	0.89
300.00	2.20	269.98	299.94	1.18 S	4.78 W	1.09	0.98
400.00	3.34	283.61	399.82	0.49 S	9.53 W	0.31	1.31
512.00	3.61	285.52	511.61	1.22 N	16.10 W	-1.52	0.26
596.00	2.36	276.29	595.50	2.12 N	20.37 W	-2.50	1.59
689.00	1.96	269.12	688.43	2.30 N	23.86 W	-2.75	0.52
811.00	1.67	283.56	810.37	2.69 N	27.67 W	-3.21	0.44
999.00	1.18	313.16	998.32	4.66 N	31.74 W	-5.25	0.46
1126.00	1.21	330.97	1,125.29	6.72 N	33.35 W	-7.35	0.29
1316.00	2.22	50.23	1,315.22	10.83 N	31.49 W	-11.42	1.22
1506.00	3.45	61.43	1,504.99	15.92 N	23.64 W	-16.36	0.70
1696.00	4.03	75.89	1,694.59	20.28 N	12.16 W	-20.50	0.58
1789.00	3.76	86.14	1,787.38	21.28 N	5.95 W	-21.39	0.80
1881.00	2.81	88.86	1,879.22	21.53 N	0.68 W	-21.54	1.04
1967.00	2.28	86.49	1,965.14	21.67 N	3.13 E	-21.61	0.64
2067.00	2.11	95.09	2,065.06	21.63 N	6.95 E	-21.50	0.37
2258.00	1.96	94.27	2,255.94	21.08 N	13.70 E	-20.81	0.08
2449.00	2.17	88.60	2,446.82	20.92 N	20.57 E	-20.53	0.15
2639.00	2.16	89.47	2,636.69	21.04 N	27.73 E	-20.52	0.02
2829.00	1.94	94.88	2,826.56	20.80 N	34.51 E	-20.15	0.15
3019.00	1.82	92.32	3,016.46	20.41 N	40.73 E	-19.64	0.08
3210.00	2.01	90.82	3,207.35	20.24 N	47.12 E	-19.34	0.10
3400.00	1.90	94.77	3,397.24	19.93 N	53.59 E	-18.91	0.09
3591.00	1.86	93.57	3,588.14	19.47 N	59.83 E	-18.34	0.03
3780.00	2.07	90.86	3,777.03	19.23 N	66.30 E	-17.97	0.12
3969.00	2.16	86.55	3,965.90	19.39 N	73.27 E	-18.01	0.10
4159.00	1.70	83.46	4,155.79	19.93 N	79.64 E	-18.42	0.25
4349.00	1.28	94.41	4,345.73	20.08 N	84.55 E	-18.49	0.26
4540.00	1.42	91.07	4,536.68	19.88 N	89.06 E	-18.19	0.08
4730.00	1.23	87.11	4,726.63	19.93 N	93.45 E	-18.17	0.11
4920.00	1.31	89.67	4,916.58	20.05 N	97.65 E	-18.21	0.05
5108.00	1.13	95.57	5,104.54	19.88 N	101.63 E	-17.96	0.11
5298.00	1.17	119.91	5,294.50	18.73 N	105.18 E	-16.75	0.26
5488.00	0.93	135.07	5,484.47	16.68 N	107.95 E	-14.64	0.19
5678.00	0.57	199.18	5,674.45	14.70 N	108.73 E	-12.65	0.45
5868.00	0.68	273.01	5,864.45	13.87 N	107.29 E	-11.85	0.40
6058.00	0.63	254.36	6,054.43	13.65 N	105.16 E	-11.66	0.11
6249.00	0.12	267.99	6,245.43	13.35 N	103.93 E	-11.39	0.27
6440.00	0.75	195.20	6,436.42	12.15 N	103.40 E	-10.20	0.38

**DIRECTIONAL SURVEY DATA**

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (%/100')
6630.00	1.15	175.51	6,626.40	9.04' N	103.23' E	7.10	0.27
6820.00	1.32	207.73	6,816.35	5.19' N	102.36' E	3.26	0.37
7011.00	2.19	203.35	7,007.26	0.10' S	99.88' E	1.99	0.46
7201.00	1.63	233.60	7,197.16	5.04' S	96.28' E	6.85	0.60
7392.00	1.60	240.93	7,388.09	7.94' S	91.77' E	9.66	0.11
7500.00	1.60	240.93	7,496.04	9.40' S	89.14' E	11.08	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 178.92 degrees (Grid)
- A total correction of 7.62 deg from Magnetic north to Grid north has been applied
- Horizontal displacement is relative to the well head.
- Horizontal displacement (closure) at 7,500.00 feet is 89.63 feet along 96.02 degrees (Grid)

**SURVEYS CALCULATED USING SHORT COLLAR METHOD**

WELL ASSUMED VERTICAL AT SURFACE

SURVEYS FROM 100' MD TO 400' MD PROVIDED BY SCIENTIFIC DRILLING

SURVEYS FROM 512' MD TO 7392' MD PROVIDED BY SPERRY DRILLING

SURVEY AT 7392' MD HAS BEEN PROJECTED TO TD AT 7500' MD

SPERRY DRILLING ENGINEERS: BRANDON ROBERIE & KHOA TRAN

**WARRANTY**

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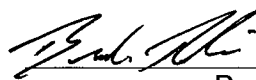
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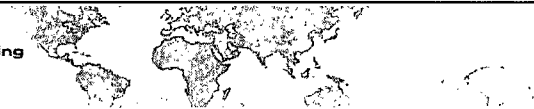
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**Submitted by Brandon Roberie**  
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**Drilling and Formation  
Evaluation**





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