

Noble Energy

Weld County, CO (NAD 83)

Sec. 1-T5N-R64W (SLW Ranch 1 North PAD)

SLW Ranch B01-68-1HN

Design: Survey Management Corrected MWD Survey

Sperry Drilling Services

Final Survey Report

25 March, 2013

Well Coordinates: 1,401,809.91 N, 3,281,307.04 E (40° 25' 55.09" N, 104° 29' 22.06" W)

Ground Level: 4,613.00 ft

Local Coordinate Origin: Centered on Well SLW Ranch B01-68-1HN - Slot A2

Viewing Datum: KB=24' @ 4637.00ft (H&P 315)

TVDs to System: N

North Reference: Grid

Unit System: API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Design Report for SLW Ranch B01-68-1HN - Survey Management Corrected MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
621.00	0.00	0.00	621.00	0.00	0.00	0.00	0.00
Surface Casing Assumed Vertical at 621.00ft							
718.00	0.06	28.33	718.00	0.04	0.02	-0.02	0.06
First MWD Survey							
811.00	0.15	338.00	811.00	0.20	0.00	0.01	0.13
903.00	1.48	134.13	902.99	-0.52	0.81	-0.84	1.76
996.00	0.42	60.20	995.98	-1.18	1.97	-2.04	1.53
1,089.00	1.20	70.89	1,088.97	-0.69	3.18	-3.22	0.85
1,182.00	0.96	60.95	1,181.95	0.00	4.78	-4.77	0.33
1,275.00	0.74	80.80	1,274.94	0.48	6.06	-6.01	0.39
1,368.00	1.05	81.44	1,367.93	0.70	7.49	-7.43	0.33
1,463.00	1.20	82.25	1,462.91	0.96	9.34	-9.26	0.16
1,558.00	2.90	65.83	1,557.85	2.08	12.52	-12.35	1.88
1,653.00	4.54	81.67	1,652.65	3.61	18.43	-18.15	2.02
1,748.00	5.69	76.28	1,747.27	5.27	26.73	-26.32	1.31
1,843.00	6.62	53.61	1,841.73	9.64	35.71	-34.99	2.72
1,938.00	7.66	48.06	1,936.00	17.12	44.83	-43.60	1.31
2,033.00	8.64	41.09	2,030.04	26.73	54.23	-52.34	1.46
2,128.00	9.14	32.65	2,123.90	38.46	62.99	-60.30	1.47
2,223.00	9.41	30.85	2,217.66	51.48	71.04	-67.47	0.42
2,318.00	10.23	19.46	2,311.28	66.11	77.84	-73.28	2.21
2,413.00	10.06	11.48	2,404.79	82.19	82.30	-76.67	1.49
2,508.00	9.71	9.06	2,498.38	98.23	85.21	-78.51	0.57
2,603.00	10.40	11.44	2,591.93	114.55	88.18	-80.39	0.85
2,698.00	12.16	11.46	2,685.09	132.76	91.86	-82.86	1.85
2,793.00	12.33	11.27	2,777.92	152.52	95.83	-85.51	0.18
2,887.00	12.38	14.03	2,869.75	172.13	100.24	-88.60	0.63
2,983.00	12.33	12.13	2,963.53	192.14	104.89	-91.92	0.43
3,078.00	11.86	13.53	3,056.42	211.55	109.30	-95.03	0.58
3,173.00	10.81	11.38	3,149.56	229.77	113.34	-97.86	1.19
3,268.00	10.24	12.57	3,242.96	246.75	116.94	-100.32	0.64
3,363.00	10.03	18.84	3,336.48	262.82	121.45	-103.75	1.18
3,458.00	9.59	19.54	3,430.10	278.11	126.77	-108.05	0.48
3,553.00	9.35	20.54	3,523.80	292.79	132.12	-112.42	0.31
3,648.00	9.68	11.99	3,617.50	307.83	136.49	-115.78	1.53
3,743.00	10.42	14.08	3,711.04	323.98	140.24	-118.45	0.87
3,838.00	9.25	11.28	3,804.64	339.80	143.82	-120.97	1.33
3,933.00	8.98	11.89	3,898.44	354.54	146.84	-123.01	0.30
4,028.00	6.02	7.83	3,992.62	366.74	149.05	-124.40	3.16
4,123.00	4.87	7.87	4,087.19	375.67	150.28	-125.04	1.21
4,218.00	3.59	2.18	4,181.93	382.63	150.95	-125.24	1.42
4,313.00	0.19	171.33	4,276.87	385.45	151.08	-125.19	3.98
4,408.00	0.44	265.31	4,371.87	385.26	150.74	-124.86	0.52
4,693.00	0.26	146.76	4,656.87	384.63	150.01	-124.17	0.21
4,978.00	0.74	19.80	4,941.86	385.83	150.99	-125.07	0.32
5,262.00	0.99	333.52	5,225.83	389.75	150.51	-124.34	0.25
5,357.00	0.70	72.00	5,320.82	390.66	150.70	-124.46	1.36
5,452.00	0.34	136.69	5,415.82	390.63	151.44	-125.21	0.67
5,737.00	0.10	73.77	5,700.82	390.09	152.26	-126.06	0.11

Design Report for SLW Ranch B01-68-1HN - Survey Management Corrected MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,927.00	0.23	282.46	5,890.82	390.22	152.05	-125.84	0.17
6,000.00	0.71	249.08	5,963.82	390.09	151.48	-125.28	0.73
6,063.00	1.17	278.00	6,026.81	390.04	150.48	-124.29	1.03
6,162.00	7.61	271.96	6,125.47	390.40	142.92	-116.72	6.51
6,208.00	11.01	263.92	6,170.85	390.04	135.51	-109.34	7.90
6,256.00	15.47	264.12	6,217.57	388.90	124.58	-98.51	9.29
6,303.00	19.65	265.03	6,262.37	387.57	110.46	-84.52	8.91
6,351.00	21.65	262.99	6,307.28	385.79	93.63	-67.84	4.43
6,398.00	24.67	263.38	6,350.49	383.60	75.28	-49.68	6.43
6,446.00	30.26	264.90	6,393.06	381.37	53.26	-27.86	11.74
6,493.00	34.70	263.73	6,432.70	378.86	28.16	-2.97	9.54
6,541.00	40.83	264.92	6,470.63	375.97	-1.08	26.01	12.86
6,588.00	44.27	266.75	6,505.25	373.68	-32.77	57.48	7.78
6,636.00	47.81	265.90	6,538.56	371.46	-67.25	91.73	7.48
6,683.00	51.89	268.75	6,568.87	369.81	-103.12	127.42	9.84
6,731.00	57.47	269.49	6,596.61	369.22	-142.26	166.44	11.69
6,778.00	61.62	270.35	6,620.42	369.17	-182.77	206.85	8.97
6,826.00	64.65	271.49	6,642.11	369.86	-225.58	249.61	6.66
6,873.00	66.87	272.58	6,661.41	371.39	-268.40	292.44	5.18
6,921.00	69.28	272.42	6,679.33	373.33	-312.89	336.95	5.03
6,968.00	74.95	272.02	6,693.76	375.06	-357.56	381.65	12.09
7,030.00	80.83	272.07	6,706.76	377.22	-418.12	442.21	9.48
7,085.00	84.28	272.99	6,713.89	379.63	-472.59	496.73	6.48
Estimated 7" Casing Point: 988' FNL, 666' FEL (Not a Survey Point)							
7,105.00	85.53	273.32	6,715.66	380.72	-492.48	516.65	6.48
7,236.00	88.18	268.46	6,722.85	382.75	-623.22	647.23	4.22
7,331.00	90.09	268.26	6,724.29	380.03	-718.16	741.78	2.02
7,426.00	90.96	267.36	6,723.42	376.40	-813.09	836.26	1.32
7,521.00	92.53	267.34	6,720.52	372.01	-907.94	930.61	1.65
7,616.00	92.72	267.94	6,716.17	368.10	-1,002.76	1,024.96	0.66
7,711.00	90.92	268.07	6,713.16	364.80	-1,097.65	1,119.43	1.90
7,806.00	91.54	269.15	6,711.12	362.49	-1,192.60	1,214.01	1.31
7,901.00	89.94	269.02	6,709.89	360.98	-1,287.58	1,308.68	1.69
7,996.00	90.06	269.24	6,709.89	359.53	-1,382.57	1,403.36	0.26
8,090.00	91.57	269.40	6,708.55	358.42	-1,476.55	1,497.06	1.62
8,185.00	91.97	270.10	6,705.62	358.00	-1,571.50	1,591.78	0.85
8,280.00	92.10	269.33	6,702.25	357.53	-1,666.44	1,686.48	0.82
8,375.00	90.93	268.73	6,699.73	355.92	-1,761.39	1,781.11	1.38
8,470.00	90.49	267.87	6,698.56	353.10	-1,856.34	1,875.67	1.02
8,565.00	91.05	269.91	6,697.28	351.26	-1,951.31	1,970.30	2.23
8,660.00	90.83	269.57	6,695.72	350.83	-2,046.29	2,065.05	0.43
8,755.00	90.43	270.21	6,694.68	350.65	-2,141.29	2,159.83	0.79
8,849.00	91.94	269.29	6,692.73	350.24	-2,235.26	2,253.57	1.88
8,944.00	90.43	268.44	6,690.77	348.36	-2,330.22	2,348.19	1.82
9,039.00	91.23	267.11	6,689.39	344.67	-2,425.13	2,442.65	1.63
9,134.00	92.19	267.55	6,686.56	340.25	-2,519.99	2,537.00	1.11
9,229.00	91.33	269.16	6,683.64	337.52	-2,614.90	2,631.53	1.92
9,324.00	92.59	269.18	6,680.39	336.15	-2,709.83	2,726.16	1.33
9,419.00	92.74	268.61	6,675.97	334.32	-2,804.71	2,820.71	0.62
9,514.00	91.14	268.11	6,672.76	331.60	-2,899.61	2,915.22	1.76
9,609.00	88.21	265.30	6,673.30	326.14	-2,994.44	3,009.47	4.27

Design Report for SLW Ranch B01-68-1HN - Survey Management Corrected MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
9,704.00	90.71	269.03	6,674.19	321.45	-3,089.29	3,103.81	4.73
9,798.00	92.28	268.97	6,671.74	319.81	-3,183.24	3,197.44	1.67
9,893.00	92.53	269.55	6,667.75	318.58	-3,278.15	3,292.06	0.66
9,988.00	91.76	270.56	6,664.20	318.67	-3,373.08	3,386.79	1.34
10,083.00	90.19	271.34	6,662.58	320.25	-3,468.05	3,481.65	1.85
10,178.00	91.11	271.33	6,661.50	322.46	-3,563.02	3,576.56	0.97
10,273.00	90.96	270.88	6,659.79	324.29	-3,657.98	3,671.44	0.50
10,368.00	91.05	269.77	6,658.12	324.83	-3,752.97	3,766.25	1.17
10,463.00	91.72	268.78	6,655.82	323.63	-3,847.93	3,860.92	1.26
10,558.00	93.24	268.24	6,651.71	321.16	-3,942.81	3,955.42	1.70
10,653.00	90.25	268.74	6,648.82	318.66	-4,037.72	4,049.96	3.19
10,747.00	91.39	270.05	6,647.48	317.67	-4,131.70	4,143.67	1.85
10,842.00	90.28	270.60	6,646.09	318.20	-4,226.69	4,238.48	1.30
10,937.00	90.71	271.43	6,645.27	319.89	-4,321.67	4,333.37	0.98
11,032.00	89.97	270.37	6,644.71	321.38	-4,416.65	4,428.24	1.36
11,142.00	90.43	269.68	6,644.32	321.43	-4,526.65	4,538.00	0.75
Final MWD Survey							
11,204.00	90.43	269.68	6,643.86	321.08	-4,588.65	4,599.84	0.00
Estimated BHL: 974' FNL, 538' FWL - Survey Projection to TD							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
621.00	621.00	0.00	0.00	Surface Casing Assumed Vertical at 621.00ft
718.00	718.00	0.04	0.02	First MWD Survey
7,085.00	6,713.89	379.63	-472.59	Estimated 7" Casing Point: 988' FNL, 666' FEL (Not a Survey Point)
11,142.00	6,644.32	321.43	-4,526.65	Final MWD Survey
11,204.00	6,643.86	321.08	-4,588.65	Estimated BHL: 974' FNL, 538' FWL
11,204.00	6,643.86	321.08	-4,588.65	Survey Projection to TD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	SLW Ranch B01-68-1HN_PlanA - Rev0_B HL Tgt	273.80	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
621.00	7,085.00	Sperry Management MWD Survey MWD+IFR+MS+SAG	MWD+IFR1+MS+sag
7,085.00	11,204.00	Sperry Management MWD Survey MWD+IFR+MS+SAG	MWD+IFR1+MS+sag

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,085.00	6,713.89	7"	7	8-3/4

Design Report for SLW Ranch B01-68-1HN - Survey Management Corrected MWD Survey

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
SLW Ranch			6,722.00	370.16	-631.27	1,402,180.06	3,280,675.79	40° 25' 58.820 N	104° 29' 30.164 W
- actual wellpath misses target center by 12.42ft at 7244.39ft MD (6723.11 TVD, 382.52 N, -631.61 E)									
- Rectangle (sides W65.00 H16.00 D3,961.06)									
SLW Ranch State	0.00	0.00	0.00	21.86	-0.25	1,401,831.77	3,281,306.79	40° 25' 55.308 N	104° 29' 22.056 W
- actual wellpath misses target center by 21.86ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				181.75	1,378.86	1,403,188.72	3,281,488.79		
Point 2				244.75	-3,885.14	1,397,924.92	3,281,551.78		
Point 3				-5,142.25	-3,996.14	1,397,813.92	3,276,164.99		
Point 4				-5,126.25	1,286.86	1,403,096.72	3,276,180.99		
Point 5				181.75	1,378.86	1,403,188.72	3,281,488.79		
SLW Ranch State	0.00	0.00	0.00	21.86	-0.25	1,401,831.77	3,281,306.79	40° 25' 55.308 N	104° 29' 22.056 W
- actual wellpath misses target center by 21.86ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-278.25	918.86	1,402,728.73	3,281,028.80		
Point 2				-215.25	-3,425.14	1,398,384.90	3,281,091.80		
Point 3				-4,682.25	-3,536.14	1,398,273.90	3,276,624.97		
Point 4				-4,666.25	826.86	1,402,636.74	3,276,640.97		
Point 5				-278.25	918.86	1,402,728.73	3,281,028.80		
SLW Ranch	0.00	0.00	6,679.13	305.15	-4,591.57	1,402,115.05	3,276,715.65	40° 25' 58.620 N	104° 30' 21.384 W
- actual wellpath misses target center by 38.81ft at 11204.00ft MD (6643.86 TVD, 321.08 N, -4588.65 E)									
- Point									
SLW Ranch	0.00	0.00	6,078.29	383.01	151.07	1,402,192.91	3,281,458.10	40° 25' 58.859 N	104° 29' 20.046 W
- actual wellpath misses target center by 7.85ft at 6114.29ft MD (6078.03 TVD, 390.21 N, 147.95 E)									
- Circle (radius 25.00)									

North Reference Sheet for Sec. 1-T5N-R64W (SLW Ranch 1 North PAD) - SLW Ranch B01-68-1HN

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to KB=24' @ 4637.00ft (H&P 315). Northing and Easting are relative to SLW Ranch B01-68-1HN - Slot A2

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 105° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996183

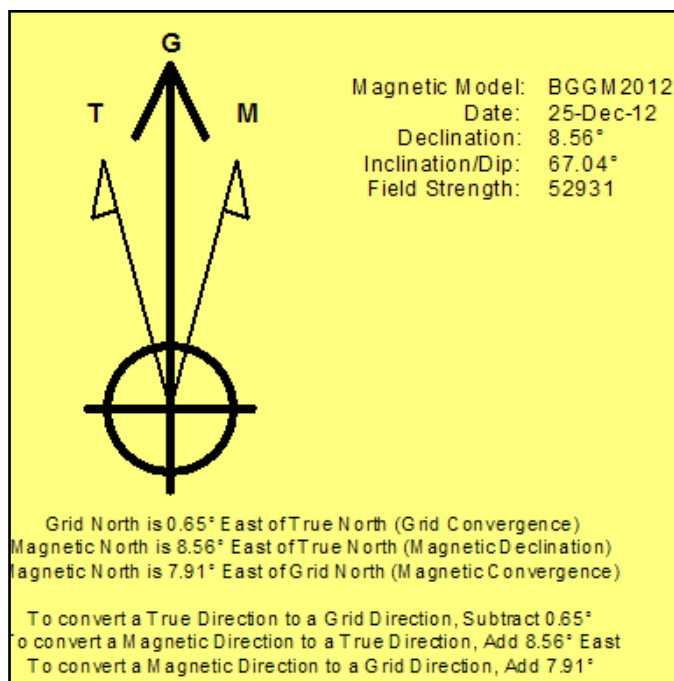
Grid Coordinates of Well: 1,401,809.91 ft N, 3,281,307.04 ft E

Geographical Coordinates of Well: 40° 25' 55.09" N, 104° 29' 22.06" W

Grid Convergence at Surface is: 0.65°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,204.00ft the Bottom Hole Displacement is 4,599.87ft in the Direction of 274.00° (Grid).

Magnetic Convergence at surface is: -7.91° (25 December 2012, , BGGM2012)

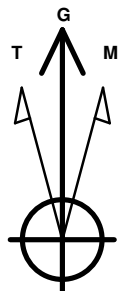


Project: Weld County, CO (NAD 83)
Site: Sec. 1-T5N-R64W (SLW Ranch 1 North PAD)
Well: SLW Ranch B01-68-1HN

Noble Energy

HALLIBURTON

Sperry Drilling



Azimuths to Grid North
True North: -0.65°
Magnetic North: 7.91°

Magnetic Field
Strength: 52930.5snT
Dip Angle: 67.04°
Date: 12/25/2012
Model: BGGM2012

LEGEND

- SLW Ranch B01-68-1HN, Plan A, Plan A - Rev 0 Proposal V0
- Survey Management Corrected MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the SLW Ranch B01-68-1HN well located at Weld County, CO. At the conclusion of the job Halliburton performed a final survey on the well. Noble Energy has requested that Halliburton provide them the distances from BHL to section lines from that final survey to allow Noble Energy to meet its requirements under Colorado law. These distances are generated by a mathematical algorithm based on rough data collected after the well is drilled. Halliburton considers it to be a rough estimate only and it is not to be relied upon in any application where accurate data is required. In consideration for Halliburton releasing this data to Noble Energy, Noble Energy agrees to release Halliburton from any consequences of it or anyone else relying on such data.

