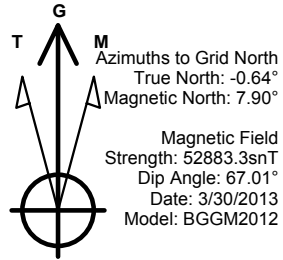


Project: Weld County, CO (NAD 83)  
Site: Sec. 12-T5N-R64W (SLW Ranch 12 PAD)  
Well: SLW Ranch State B12-67-1HN

# Noble Energy

**HALLIBURTON**

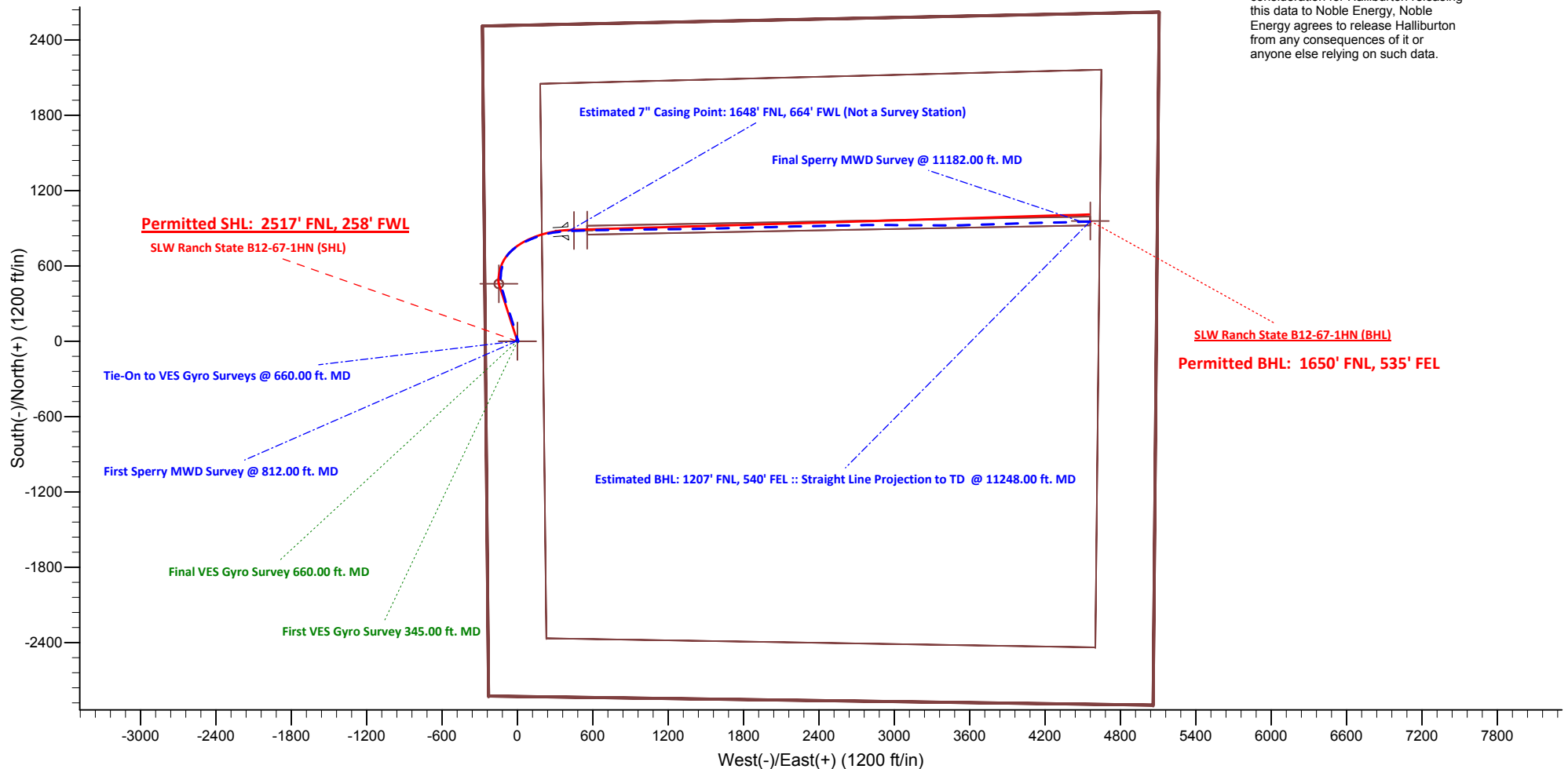
Sperry Drilling



## LEGEND

- SLW Ranch State B12-67-1HN, Plan A Rev 1 Proposal
- - Vaughn ESS and Sperry MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the "SLW Ranch State B12-67-1HN" 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.



Project: Weld County, CO (NAD 83)  
Site: Sec. 12-T5N-R64W (SLW Ranch 12 PAD)  
Well: SLW Ranch State B12-67-1HN

**HALLIBURTON**

Sperry Drilling

# Noble Energy



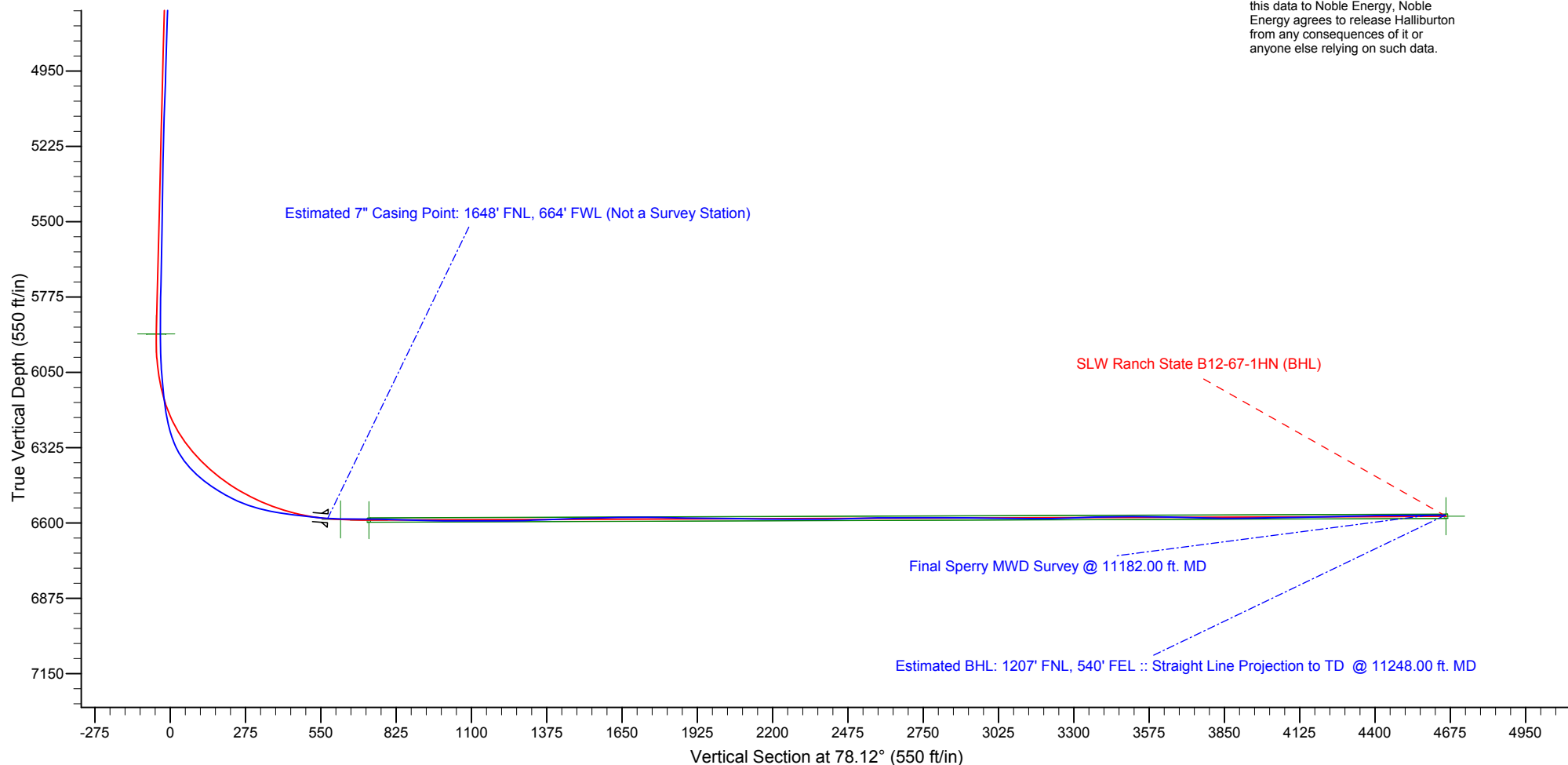
Azimuths to Grid North  
True North:  $-0.64^\circ$   
Magnetic North:  $7.90^\circ$

Magnetic Field  
Strength: 52883.3snT  
Dip Angle:  $67.01^\circ$   
Date: 3/30/2013  
Model: BGGM2012

## LEGEND

- SLW Ranch State B12-67-1HN, Plan A Rev 1 Proposal
- Vaughn ESS and Sperry MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the "SLW Ranch State B12-67-1HN" 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.



# Noble Energy

Weld County, CO (NAD 83)

Sec. 12-T5N-R64W (SLW Ranch 12 PAD)

SLW Ranch State B12-67-1HN

Design: Vaughn ESS and Sperry MWD Survey

## Sperry Drilling Services

### Final Survey Report

14 June, 2013

Well Coordinates: 1,395,302.82 N, 3,276,443.93 E (40° 24' 51.34" N, 104° 30' 25.88" W)

Ground Level: 4,603.00 ft

Local Coordinate Origin: Centered on Well SLW Ranch State B12-67-1HN

Viewing Datum: KB=24' @ 4627.00ft (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 State B12-67-1HN - Vaughn ESS and Sperry MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
345.00	0.30	311.35	345.00	0.00	0.00	0.00	0.00
<b>First VES Gyro Survey 345.00 ft. MD</b>							
660.00	0.30	358.05	660.00	1.37	-0.65	-0.35	0.08
<b>Final VES Gyro Survey 660.00 ft. MD - Tie-On to VES Gyro Surveys @ 660.00 ft. MD</b>							
812.00	1.06	331.41	811.98	3.00	-1.33	-0.69	0.53
<b>First Sperry MWD Survey @ 812.00 ft. MD</b>							
905.00	0.77	342.57	904.97	4.35	-1.93	-1.00	0.36
997.00	0.61	322.87	996.97	5.33	-2.41	-1.26	0.31
1,089.00	0.85	343.64	1,088.96	6.38	-2.90	-1.53	0.38
1,275.00	0.72	332.52	1,274.94	8.74	-3.83	-1.95	0.11
1,462.00	0.76	329.31	1,461.93	10.85	-5.00	-2.66	0.03
1,557.00	0.73	340.61	1,556.92	11.96	-5.53	-2.95	0.16
1,652.00	0.42	324.23	1,651.91	12.81	-5.93	-3.17	0.37
1,841.00	1.35	119.50	1,840.90	12.28	-4.40	-1.78	0.92
1,936.00	1.46	167.48	1,935.87	10.55	-3.16	-0.92	1.21
2,031.00	1.16	132.91	2,030.85	8.71	-2.19	-0.36	0.87
2,221.00	1.79	120.21	2,220.79	5.91	1.78	2.96	0.37
2,316.00	0.79	78.66	2,315.76	5.29	3.70	4.71	1.38
2,506.00	0.59	173.45	2,505.75	4.58	5.10	5.93	0.54
2,601.00	0.81	197.10	2,600.75	3.45	4.96	5.56	0.38
2,696.00	0.54	222.50	2,695.74	2.48	4.46	4.87	0.42
2,791.00	0.89	218.80	2,790.73	1.57	3.69	3.94	0.37
2,886.00	1.18	218.19	2,885.72	0.23	2.63	2.62	0.31
2,980.00	0.53	260.90	2,979.71	-0.60	1.60	1.44	0.92
3,075.00	1.33	249.48	3,074.69	-1.06	0.13	-0.09	0.86
3,170.00	1.28	167.66	3,169.68	-2.48	-0.67	-1.17	1.80
3,360.00	1.17	175.84	3,359.63	-6.49	-0.08	-1.41	0.11
3,455.00	1.40	63.91	3,454.62	-6.95	1.03	-0.42	2.25
3,550.00	2.15	28.65	3,549.58	-4.87	2.93	1.86	1.36
3,645.00	3.79	8.60	3,644.45	-0.20	4.25	4.12	2.02
3,740.00	6.08	352.08	3,739.09	7.89	4.03	5.57	2.81
3,834.00	7.54	339.23	3,832.43	18.58	1.16	4.96	2.24
3,929.00	7.70	337.24	3,926.59	30.28	-3.52	2.79	0.32
4,024.00	8.43	343.41	4,020.66	42.82	-7.97	1.02	1.19
4,119.00	9.98	345.17	4,114.43	57.46	-12.06	0.02	1.66
4,214.00	9.64	346.12	4,208.04	73.14	-16.08	-0.68	0.40
4,309.00	12.49	344.45	4,301.27	90.76	-20.74	-1.62	3.02
4,404.00	13.95	343.55	4,393.75	111.64	-26.74	-3.19	1.55
4,498.00	13.50	341.51	4,485.06	132.91	-33.43	-5.36	0.70
4,593.00	13.25	341.01	4,577.49	153.72	-40.49	-7.99	0.29
4,688.00	13.64	346.31	4,669.88	174.90	-46.68	-9.69	1.36
4,783.00	13.06	340.98	4,762.32	195.93	-52.83	-11.38	1.43
4,878.00	13.68	341.39	4,854.75	216.73	-59.91	-14.03	0.66
4,973.00	13.98	341.45	4,946.99	238.25	-67.15	-16.68	0.32
5,067.00	12.46	340.20	5,038.50	258.56	-74.20	-19.40	1.65
5,162.00	12.30	339.37	5,131.29	277.67	-81.23	-22.35	0.25
5,257.00	12.59	340.34	5,224.06	296.89	-88.28	-25.30	0.38
5,352.00	13.74	344.35	5,316.56	317.51	-94.81	-27.44	1.55
5,447.00	12.94	345.54	5,409.00	338.67	-100.51	-28.66	0.89
5,542.00	12.49	345.39	5,501.67	358.91	-105.75	-29.63	0.47

## Design Report for SLW Ranch State B12-67-1HN - Vaughn ESS and Sperry MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,636.00	12.88	342.85	5,593.37	378.76	-111.41	-31.08	0.72
5,732.00	13.70	341.51	5,686.80	399.76	-118.17	-33.37	0.91
5,826.00	11.99	344.54	5,778.45	419.73	-124.30	-35.27	1.95
5,908.00	11.15	345.38	5,858.78	435.61	-128.57	-36.18	1.04
6,014.00	13.92	353.14	5,962.25	458.20	-132.68	-35.56	3.05
6,062.00	16.56	356.14	6,008.56	470.76	-133.83	-34.10	5.74
6,109.00	18.31	1.05	6,053.40	484.82	-134.15	-31.51	4.86
6,157.00	21.49	1.95	6,098.53	501.15	-133.71	-27.72	6.66
6,204.00	23.89	3.38	6,141.89	519.26	-132.86	-23.16	5.24
6,251.00	26.73	4.86	6,184.37	539.30	-131.40	-17.61	6.19
6,298.00	28.61	9.35	6,226.00	560.94	-128.68	-10.49	5.97
6,346.00	33.32	14.91	6,267.16	585.03	-123.41	-0.38	11.47
6,392.00	38.57	17.40	6,304.39	610.95	-115.87	12.33	11.85
6,440.00	44.81	22.71	6,340.22	640.87	-104.85	29.27	14.93
6,487.00	47.44	31.51	6,372.83	670.94	-89.39	50.59	14.60
6,535.00	49.49	41.36	6,404.70	699.75	-68.06	77.39	15.93
6,582.00	53.59	48.22	6,433.95	725.79	-42.12	108.13	14.37
6,630.00	57.68	52.78	6,461.05	750.94	-11.55	143.23	11.58
6,677.00	59.92	60.53	6,485.42	772.99	22.01	180.61	14.88
6,725.00	63.45	65.42	6,508.19	792.15	59.65	221.38	11.60
6,772.00	68.47	66.75	6,527.33	809.54	98.88	263.35	10.99
6,820.00	73.79	68.98	6,542.85	826.63	140.94	308.03	11.92
6,867.00	77.65	72.05	6,554.45	841.81	183.87	353.16	10.37
6,915.00	81.00	76.30	6,563.34	854.66	229.23	400.20	11.15
6,962.00	82.97	80.20	6,569.90	864.13	274.79	446.73	9.22
7,010.00	83.73	84.26	6,575.46	870.57	322.02	494.27	8.55
7,048.00	83.97	85.87	6,579.53	873.82	359.66	531.78	4.26
7,092.00	86.36	86.48	6,583.24	876.75	403.40	575.18	5.60
<b>Estimated 7" Casing Point: 1648' FNL, 664' FWL (Not a Survey Station)</b>							
7,159.00	90.00	87.40	6,585.37	880.32	470.26	641.35	5.60
7,286.00	88.89	88.79	6,586.60	884.54	597.18	766.42	1.40
7,381.00	88.34	89.53	6,588.89	885.93	692.14	859.63	0.97
7,476.00	88.65	88.73	6,591.39	887.38	787.09	952.85	0.90
7,571.00	90.25	89.61	6,592.30	888.75	882.07	1,046.09	1.92
7,665.00	89.69	89.25	6,592.35	889.69	976.07	1,138.26	0.71
7,760.00	90.37	89.15	6,592.30	891.01	1,071.06	1,231.49	0.72
7,855.00	92.65	89.09	6,589.79	892.47	1,166.01	1,324.71	2.40
7,950.00	91.54	89.46	6,586.32	893.67	1,260.94	1,417.85	1.23
8,045.00	92.31	89.30	6,583.13	894.70	1,355.88	1,510.97	0.83
8,140.00	90.80	88.83	6,580.55	896.25	1,450.83	1,604.21	1.66
8,235.00	90.80	88.88	6,579.23	898.15	1,545.80	1,697.54	0.05
8,330.00	88.28	88.53	6,579.99	900.30	1,640.76	1,790.91	2.68
8,425.00	89.14	88.77	6,582.13	902.53	1,735.71	1,884.29	0.94
8,519.00	89.45	88.42	6,583.28	904.84	1,829.67	1,976.72	0.50
8,614.00	89.35	88.61	6,584.28	907.30	1,924.64	2,070.15	0.23
8,709.00	89.01	88.73	6,585.64	909.50	2,019.60	2,163.54	0.38
8,804.00	89.85	88.16	6,586.58	912.08	2,114.56	2,257.00	1.07
8,899.00	90.12	88.66	6,586.61	914.72	2,209.52	2,350.47	0.60
8,994.00	91.57	89.07	6,585.21	916.60	2,304.49	2,443.79	1.59
9,089.00	91.57	88.53	6,582.61	918.59	2,399.44	2,537.11	0.57
9,184.00	90.15	89.01	6,581.18	920.63	2,494.40	2,630.46	1.58

**Design Report for SLW Ranch State B12-67-1HN - Vaughn ESS and Sperry MWD Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
9,279.00	90.34	88.91	6,580.77	922.35	2,589.38	2,723.77	0.23
9,374.00	89.81	89.30	6,580.65	923.84	2,684.37	2,817.03	0.69
9,469.00	89.44	88.91	6,581.27	925.32	2,779.36	2,910.29	0.57
9,564.00	89.23	90.17	6,582.37	926.08	2,874.35	3,003.40	1.34
9,659.00	89.10	90.55	6,583.76	925.48	2,969.33	3,096.23	0.42
9,754.00	90.22	90.06	6,584.32	924.98	3,064.33	3,189.09	1.29
9,849.00	92.50	90.18	6,582.07	924.78	3,159.30	3,281.98	2.40
9,944.00	91.54	90.32	6,578.72	924.37	3,254.23	3,374.81	1.02
10,039.00	90.80	90.40	6,576.78	923.77	3,349.21	3,467.63	0.78
10,134.00	89.26	90.05	6,576.73	923.40	3,444.21	3,560.51	1.66
10,229.00	88.55	88.34	6,578.54	924.73	3,539.18	3,653.73	1.95
10,324.00	88.58	88.12	6,580.92	927.66	3,634.10	3,747.22	0.23
10,419.00	89.20	88.34	6,582.76	930.60	3,729.04	3,840.73	0.69
10,514.00	91.08	88.49	6,582.53	933.23	3,824.00	3,934.20	1.99
10,608.00	90.80	88.01	6,580.99	936.10	3,917.94	4,026.72	0.59
10,703.00	91.20	87.77	6,579.33	939.59	4,012.86	4,120.33	0.49
10,798.00	91.17	88.64	6,577.37	942.57	4,107.79	4,213.84	0.92
10,893.00	91.57	89.09	6,575.10	944.45	4,202.75	4,307.15	0.63
10,988.00	90.52	88.49	6,573.36	946.45	4,297.71	4,400.49	1.27
11,083.00	90.37	88.41	6,572.62	949.02	4,392.67	4,493.95	0.18
11,182.00	90.40	88.30	6,571.96	951.87	4,491.63	4,591.38	0.12
<b>Final Sperry MWD Survey @ 11182.00 ft. MD</b>							
11,248.00	90.40	88.30	6,571.50	953.82	4,557.60	4,656.34	0.00
<b>Estimated BHL: 1207' FNL, 540' FEL :: Straight Line Projection to TD @ 11248.00 ft. MD - Survey Projection</b>							

**Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
345.00	345.00	0.00	0.00	First VES Gyro Survey 345.00 ft. MD
660.00	660.00	1.37	-0.65	Final VES Gyro Survey 660.00 ft. MD
660.00	660.00	1.37	-0.65	Tie-On to VES Gyro Surveys @ 660.00 ft. MD
812.00	811.98	3.00	-1.33	First Sperry MWD Survey @ 812.00 ft. MD
7,092.00	6,583.24	876.75	403.40	Estimated 7" Casing Point: 1648' FNL, 664' FWL (Not a Survey Station)
11,182.00	6,571.96	951.87	4,491.63	Final Sperry MWD Survey @ 11182.00 ft. MD
11,248.00	6,571.50	953.82	4,557.60	Estimated BHL: 1207' FNL, 540' FEL :: Straight Line Projection to TD @ 11248.00 ft. MD
11,248.00	6,571.50	953.82	4,557.60	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 State B12-67-1HN_Plan A - Rev 0_BHL Tgt	78.12	Slot	0.00	0.00	0.00

## Design Report for SLW Ranch State B12-67-1HN - Vaughn ESS and Sperry MWD Survey

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
345.00	660.00	Vaughn ESS Surveys	Flexi-Shot
812.00	7,092.00	Sperry MWD Surveys	MWD
7,092.00	11,248.00	Sperry MWD Surveys	MWD

**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,092.00	6,583.24	7" Csg	7	8-3/4

**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	0.00	0.00	5,910.00	457.49	-148.65	1,395,760.29	3,276,295.29	40.415520	-104.507705
- actual wellpath misses target center by 20.90ft at 5963.45ft MD (5913.05 TVD, 446.74 N, -130.99 E)									
- Circle (radius 35.00)									
SLW Ranch State	0.00	0.00	0.00	0.01	0.00	1,395,302.83	3,276,443.93	40.414260	-104.507190
- actual wellpath misses target center by 345.00ft at 345.00ft MD (345.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-279.00	2,511.01	1,397,813.73	3,276,164.94		
Point 2				5,108.00	2,623.01	1,397,925.73	3,281,551.73		
Point 3				5,060.00	-2,897.99	1,392,404.95	3,281,503.73		
Point 4				-230.00	-2,825.99	1,392,476.94	3,276,213.94		
Point 5				-279.00	2,511.01	1,397,813.73	3,276,164.94		
SLW Ranch State	0.00	0.00	0.00	0.01	0.00	1,395,302.83	3,276,443.93	40.414260	-104.507190
- actual wellpath misses target center by 345.00ft at 345.00ft MD (345.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				181.00	2,051.01	1,397,353.75	3,276,624.92		
Point 2				4,648.00	2,163.01	1,397,465.75	3,281,091.75		
Point 3				4,600.00	-2,437.99	1,392,864.93	3,281,043.75		
Point 4				230.00	-2,365.99	1,392,936.93	3,276,673.92		
Point 5				181.00	2,051.01	1,397,353.75	3,276,624.92		
SLW Ranch State	0.00	0.00	6,575.49	958.67	4,558.96	1,396,261.46	3,281,002.71	40.416750	-104.490780
- actual wellpath misses target center by 6.43ft at 11248.00ft MD (6571.50 TVD, 953.82 N, 4557.60 E)									
- Point									
SLW Ranch State	0.00	0.00	6,586.86	882.50	450.00	1,396,185.29	3,276,893.91	40.416668	-104.505539
- actual wellpath misses target center by 3.57ft at 7138.94ft MD (6585.17 TVD, 879.36 N, 450.22 E)									
- Point									
SLW Ranch		88.94	6,589.47	884.45	554.94	1,396,187.24	3,276,998.85	40.416670	-104.505162
- actual wellpath misses target center by 3.69ft at 7243.81ft MD (6585.91 TVD, 883.48 N, 555.01 E)									
- Rectangle (sides W70.00 H16.00 D4,004.73)									

# North Reference Sheet for Sec. 12-T5N-R64W (SLW Ranch 12 PAD) - SLW Ranch State B12-67-1HN

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' @ 4627.00ft (H&P 315). Northing and Easting are relative to SLW Ranch State B12-67-1HN  
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 -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°  
False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996091

Grid Coordinates of Well: 1,395,302.82 ft N, 3,276,443.93 ft E  
Geographical Coordinates of Well: 40° 24' 51.34" N, 104° 30' 25.88" W  
Grid Convergence at Surface is: 0.64°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,248.00ft  
the Bottom Hole Displacement is 4,656.34ft in the Direction of 78.18° (Grid).

Magnetic Convergence at surface is: -7.90° (30 March 2013, , BGGM2012)

