

Noble Energy

Weld County, CO (NAD 83)

Sec. 25-T5N-R63W (70 Ranch 25 PAD)

70 Ranch USX BB25-68HN - A1

Design: MWD Survey

Sperry Drilling Services

Final Survey Report

31 December, 2012

Well Coordinates: 1,381,749.41 N, 3,308,682.29 E (40° 22' 33.64" N, 104° 23' 31.31" W)

Ground Level: 4,564.00 ft

Local Coordinate Origin: Centered on Well 70 Ranch USX BB25-68HN - Slot A

Viewing Datum: KB @ 4588.00ft (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 70 Ranch USX BB25-68HN - 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
591.00	0.00	0.00	591.00	0.00	0.00	0.00	0.00
Surface Casing Assumed Vertical at 591.00ft							
610.00	0.51	28.13	610.00	0.07	0.04	0.04	2.68
First MWD Survey							
976.00	0.83	337.78	975.98	3.97	-0.19	-0.22	0.17
1,351.00	0.32	35.18	1,350.96	7.34	-0.62	-0.66	0.19
1,635.00	0.97	357.45	1,634.94	10.39	-0.27	-0.32	0.26
1,918.00	0.79	46.44	1,917.91	14.12	1.04	0.96	0.26
2,013.00	3.14	94.49	2,012.85	14.37	4.11	4.03	2.82
2,107.00	5.31	90.70	2,106.59	14.12	11.02	10.95	2.33
2,205.00	5.50	99.82	2,204.16	13.26	20.19	20.12	0.90
2,300.00	7.50	103.00	2,298.54	11.09	30.71	30.65	2.14
2,395.00	9.35	107.41	2,392.51	7.38	44.12	44.08	2.06
2,490.00	8.56	107.62	2,486.36	2.93	58.22	58.21	0.83
2,586.00	9.04	100.67	2,581.23	-0.62	72.44	72.45	1.21
2,681.00	9.96	100.85	2,674.92	-3.55	87.85	87.87	0.97
2,776.00	6.82	100.53	2,768.90	-6.13	101.47	101.50	3.31
2,871.00	4.09	80.05	2,863.46	-6.58	110.35	110.38	3.49
2,966.00	1.52	99.35	2,958.34	-6.20	114.93	114.96	2.84
3,062.00	1.22	120.06	3,054.32	-6.91	117.07	117.11	0.60
3,157.00	0.46	123.60	3,149.31	-7.63	118.27	118.30	0.80
3,442.00	0.51	265.94	3,434.30	-8.36	117.95	118.00	0.32
3,728.00	0.77	276.16	3,720.28	-8.24	114.77	114.82	0.10
4,014.00	0.25	34.84	4,006.28	-7.52	113.22	113.26	0.32
4,300.00	0.55	34.45	4,292.27	-5.88	114.35	114.38	0.10
4,585.00	1.02	2.62	4,577.24	-2.21	115.24	115.25	0.22
4,871.00	0.98	322.53	4,863.20	2.27	113.87	113.86	0.24
5,156.00	1.18	312.20	5,148.15	6.18	110.21	110.18	0.10
5,442.00	0.99	346.06	5,434.10	10.55	107.44	107.38	0.23
5,516.00	1.11	341.68	5,508.09	11.85	107.06	106.99	0.19
5,578.00	0.96	329.53	5,570.08	12.87	106.60	106.53	0.43
5,681.00	6.75	88.30	5,672.85	13.79	112.23	112.15	7.05
5,728.00	12.67	90.55	5,719.16	13.83	120.15	120.07	12.62
5,776.00	16.88	94.30	5,765.56	13.25	132.37	132.29	8.99
5,823.00	18.50	95.31	5,810.34	12.05	146.60	146.53	3.51
5,871.00	20.23	94.79	5,855.62	10.65	162.45	162.39	3.62
5,918.00	23.61	95.79	5,899.22	9.03	179.92	179.87	7.23
5,966.00	28.58	95.73	5,942.31	6.91	200.92	200.88	10.35
6,014.00	33.00	92.08	5,983.54	5.29	225.42	225.39	9.99
6,062.00	35.98	91.25	6,023.10	4.50	252.58	252.56	6.28
6,109.00	40.00	91.51	6,060.13	3.80	281.50	281.47	8.56
6,157.00	42.71	92.02	6,096.16	2.82	313.20	313.18	5.69
6,204.00	45.16	91.47	6,130.00	1.83	345.79	345.77	5.28
6,252.00	48.00	90.58	6,162.99	1.22	380.64	380.63	6.07
6,299.00	52.53	89.37	6,193.03	1.25	416.78	416.76	9.84
6,347.00	55.92	89.50	6,221.09	1.63	455.71	455.70	7.07
6,395.00	59.02	90.56	6,246.90	1.60	496.17	496.16	6.72
6,443.00	61.72	92.08	6,270.63	0.63	537.88	537.87	6.26
6,490.00	66.81	92.19	6,291.03	-0.94	580.18	580.17	10.83

Design Report for 70 Ranch USX BB25-68HN - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6,538.00	71.91	92.45	6,307.94	-2.76	625.04	625.05	10.64
6,585.00	75.49	91.22	6,321.13	-4.20	670.12	670.14	8.02
6,657.00	81.31	90.97	6,335.60	-5.55	740.61	740.63	8.09
6,736.00	84.95	90.49	6,345.05	-6.55	819.02	819.05	4.65
6,799.00	87.32	90.51	6,349.30	-7.10	881.87	881.90	3.76
6,895.00	88.95	90.74	6,352.42	-8.14	977.81	977.84	1.71
6,990.00	90.83	91.39	6,352.60	-9.91	1,072.79	1,072.83	2.09
7,085.00	89.20	89.93	6,352.58	-11.00	1,167.78	1,167.82	2.30
7,180.00	91.45	89.84	6,352.04	-10.81	1,262.77	1,262.81	2.37
7,275.00	90.71	89.02	6,350.25	-9.87	1,357.75	1,357.78	1.16
7,371.00	91.11	90.75	6,348.72	-9.67	1,453.73	1,453.76	1.85
7,466.00	89.17	91.08	6,348.49	-11.19	1,548.71	1,548.75	2.07
7,561.00	91.85	91.60	6,347.65	-13.41	1,643.68	1,643.72	2.87
7,656.00	89.17	91.13	6,346.80	-15.68	1,738.64	1,738.70	2.86
7,751.00	90.15	91.40	6,347.36	-17.77	1,833.61	1,833.68	1.07
7,847.00	90.28	91.57	6,347.00	-20.26	1,929.58	1,929.66	0.22
7,942.00	90.03	91.21	6,346.75	-22.56	2,024.55	2,024.64	0.46
8,037.00	89.26	88.95	6,347.34	-22.70	2,119.54	2,119.63	2.51
8,132.00	91.02	88.32	6,347.10	-20.43	2,214.51	2,214.59	1.97
8,227.00	90.86	88.39	6,345.55	-17.71	2,309.46	2,309.52	0.18
8,322.00	89.47	87.88	6,345.27	-14.62	2,404.40	2,404.45	1.56
8,417.00	91.48	88.75	6,344.48	-11.82	2,499.35	2,499.38	2.31
8,512.00	90.83	88.55	6,342.57	-9.59	2,594.31	2,594.32	0.72
8,608.00	90.68	89.71	6,341.30	-8.13	2,690.29	2,690.29	1.22
8,703.00	90.46	91.04	6,340.36	-8.75	2,785.28	2,785.28	1.42
8,798.00	90.77	90.98	6,339.34	-10.42	2,880.26	2,880.27	0.33
8,893.00	90.58	90.35	6,338.22	-11.53	2,975.24	2,975.26	0.69
8,988.00	89.05	89.88	6,338.53	-11.72	3,070.24	3,070.26	1.68
9,083.00	88.98	90.85	6,340.16	-12.32	3,165.22	3,165.24	1.02
9,179.00	90.46	89.87	6,340.63	-12.93	3,261.21	3,261.24	1.85
9,274.00	89.44	89.66	6,340.71	-12.54	3,356.21	3,356.23	1.10
9,369.00	90.56	90.37	6,340.71	-12.56	3,451.21	3,451.23	1.40
9,464.00	90.06	91.35	6,340.20	-13.99	3,546.20	3,546.22	1.16
9,559.00	89.17	92.00	6,340.84	-16.76	3,641.15	3,641.19	1.16
9,655.00	88.06	91.91	6,343.16	-20.04	3,737.07	3,737.12	1.16
9,750.00	88.56	92.32	6,345.96	-23.54	3,831.96	3,832.03	0.68
9,845.00	90.74	92.62	6,346.54	-27.64	3,926.86	3,926.96	2.32
9,940.00	90.15	92.14	6,345.80	-31.58	4,021.78	4,021.89	0.80
10,036.00	91.79	92.20	6,344.18	-35.21	4,117.69	4,117.82	1.71
10,119.00	91.33	91.75	6,341.92	-38.07	4,200.61	4,200.76	0.78
Final MWD Survey							
10,177.00	91.33	91.75	6,340.57	-39.84	4,258.57	4,258.72	0.00
Survey Projection to TD - Estimated BHL: 617' FNL, 537' FEL							

Design Report for 70 Ranch USX BB25-68HN - MWD Survey

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
591.00	591.00	0.00	0.00	Surface Casing Assumed Vertical at 591.00ft
610.00	610.00	0.07	0.04	First MWD Survey
10,119.00	6,341.92	-38.07	4,200.61	Final MWD Survey
10,177.00	6,340.57	-39.84	4,258.57	Survey Projection to TD
10,177.00	6,340.57	-39.84	4,258.57	Estimated BHL: 617' FNL, 537' FEL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	70 Ranch USX BB25-68HN_PlanA - Rev0_BH L Tgt	90.31	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
591.00	10,177.00	Sperry MWD Surveys	MWD

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
70 Ranch USX	0.00	0.00	0.00	0.00	0.00	1,381,749.41	3,308,682.29	40° 22' 33.636 N	104° 23' 31.308 W
- actual wellpath hits target center									
- Polygon									
Point 1				-452.00	501.00	1,382,250.39	3,308,230.30		
Point 2				2,175.00	545.00	1,382,294.39	3,310,857.20		
Point 3				4,802.00	585.00	1,382,334.39	3,313,484.09		
Point 4				4,773.00	-1,998.00	1,379,751.49	3,313,455.09		
Point 5				4,745.00	-4,578.00	1,377,171.60	3,313,427.09		
Point 6				2,137.00	-4,629.00	1,377,120.60	3,310,819.20		
Point 7				-471.00	-4,684.00	1,377,065.60	3,308,211.30		
Point 8				-462.00	-2,090.00	1,379,659.50	3,308,220.30		
Point 9				-452.00	501.00	1,382,250.39	3,308,230.30		
70 Ranch USX	0.00	0.00	0.00	0.00	0.00	1,381,749.41	3,308,682.29	40° 22' 33.636 N	104° 23' 31.308 W
- actual wellpath hits target center									
- Polygon									
Point 1				8.00	41.00	1,381,790.41	3,308,690.28		
Point 2				2,175.00	85.00	1,381,834.41	3,310,857.20		
Point 3				4,342.00	125.00	1,381,874.41	3,313,024.11		
Point 4				4,313.00	-1,998.00	1,379,751.49	3,312,995.11		
Point 5				4,285.00	-4,118.00	1,377,631.58	3,312,967.11		
Point 6				2,137.00	-4,169.00	1,377,580.58	3,310,819.20		
Point 7				-11.00	-4,224.00	1,377,525.58	3,308,671.29		
Point 8				-2.00	-2,090.00	1,379,659.50	3,308,680.29		
Point 9				8.00	41.00	1,381,790.41	3,308,690.28		
70 Ranch USX	0.00	0.00	6,338.13	-22.90	4,260.74	1,381,726.51	3,312,942.85	40° 22' 32.880 N	104° 22' 36.264 W
- actual wellpath misses target center by 17.25ft at 10177.00ft MD (6340.57 TVD, -39.84 N, 4258.57 E)									
- Point									

**North Reference Sheet for Sec. 25-T5N-R63W (70 Ranch 25 PAD) - 70 Ranch USX
BB25-68HN**

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

Vertical Depths are relative to KB @ 4588.00ft (H&P 315). Northing and Easting are relative to 70 Ranch USX BB25-68HN - Slot A1

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: 0.99995923

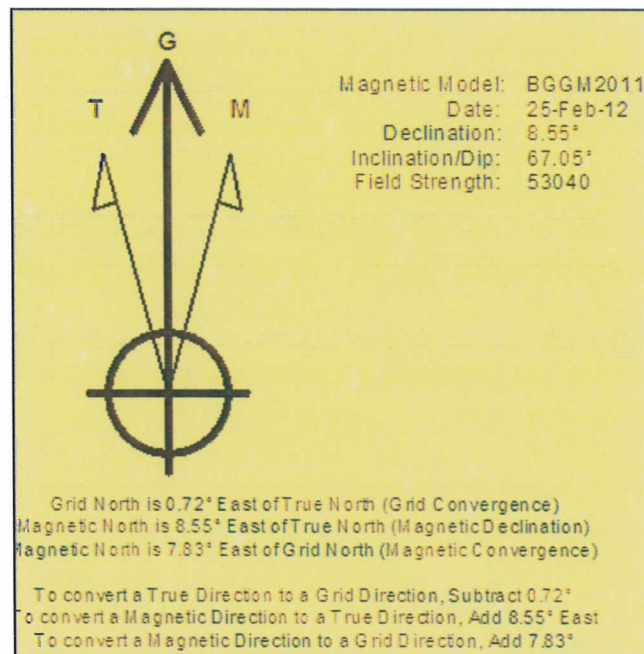
Grid Coordinates of Well: 1,381,749.41 ft N, 3,308,682.29 ft E

Geographical Coordinates of Well: 40° 22' 33.64" N, 104° 23' 31.31" W

Grid Convergence at Surface is: 0.72°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,177.00ft
the Bottom Hole Displacement is 4,258.76ft in the Direction of 90.54° (Grid).

Magnetic Convergence at surface is: -7.83° (25 February 2012, , BGGM2011)



Project: Weld County, CO (NAD 83)
 Site: Sec. 25-T5N-R63W (70 Ranch 25 PAD)
 Well: 70 Ranch USX BB25-68HN

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Sperry Drilling



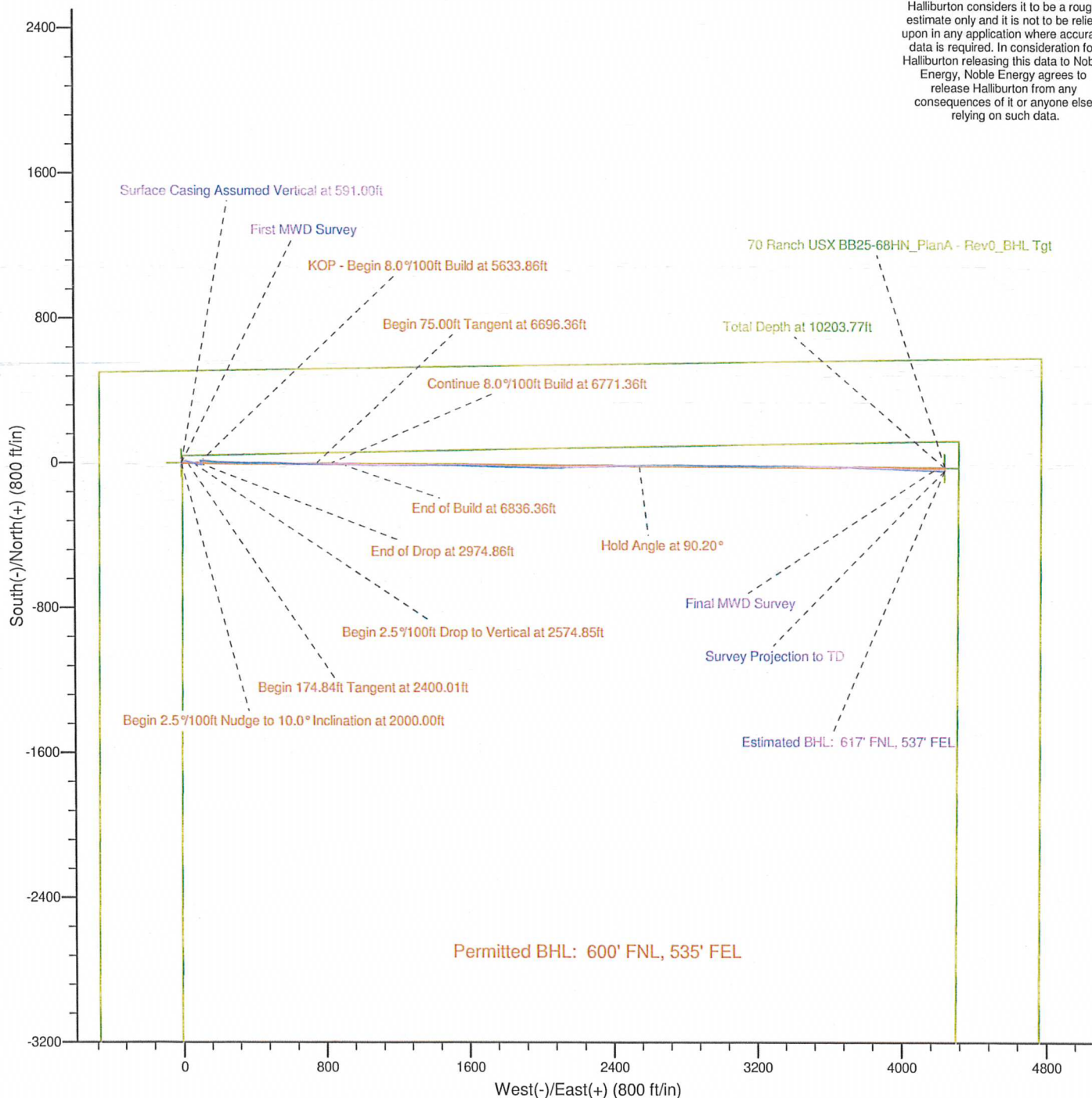
Azimuths to Grid North
 True North: -0.72°
 Magnetic North: 7.83°

Magnetic Field
 Strength: 53039.8snT
 Dip Angle: 67.05°
 Date: 2/25/2012
 Model: BGGM2011

LEGEND

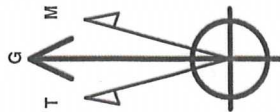
- 70 Ranch USX BB25-68HN, Plan A, Plan A - Rev 0 Proposal V0
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the 70 Ranch USX BB25-68HN 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

Project: Weld County, CO (NAD 83)
Site: Sec. 25-T5N-R63W (70 Ranch 25 PAD)
Well: 70 Ranch USX BB25-68HN



Azimuths to Grid North
True North: -0.72°
Magnetic North: 7.83°

Magnetic Field
Strength: 53039.8snT
Dip Angle: 67.05°
Date: 2/25/2012
Model: BGGM2011

LEGEND

- 70 Ranch USX BB25-68HN, Plan A, Plan A - Rev 0 Proposal V0
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