

# Noble Energy

Weld County, CO (NAD 83)

Sec. 25-T6N-R63W (Wells Ranch USX AA25 NORTH PAD)

Wells Ranch USX AA25-69HN - A1

Design: MWD Survey

## Sperry Drilling Services

### Final Survey Report

13 January, 2012

Well Coordinates: 1,413,064.14 N, 3,307,873.58 E (40° 27' 43.16" N, 104° 23' 36.71" W)

Ground Level: 4,815.00 ft

Local Coordinate Origin: Centered on Well Wells Ranch USX AA25-69HN - SI

Viewing Datum: KB @ 4839.00ft (H&P 343)

TVDs to System: N

North Reference: Grid

Unit System: API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

**HALLIBURTON**

## Design Report for Wells Ranch USX AA25-69HN - 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
564.00	0.00	0.00	564.00	0.00	0.00	0.00	0.00
Surface Casing Assumed Vertical at 564.00ft							
632.00	0.62	41.01	632.00	0.28	0.24	0.28	0.91
First MWD Survey							
726.00	0.71	37.83	725.99	1.12	0.93	1.11	0.10
821.00	0.53	33.03	820.99	1.95	1.53	1.84	0.20
1,011.00	0.26	46.12	1,010.98	2.99	2.32	2.79	0.15
1,103.00	0.04	56.76	1,102.98	3.15	2.50	2.99	0.24
1,195.00	0.28	2.82	1,194.98	3.39	2.54	3.07	0.28
1,287.00	2.88	356.54	1,286.94	5.93	2.41	3.36	2.83
1,380.00	4.76	353.01	1,379.73	12.09	1.80	3.78	2.04
1,472.00	7.03	349.49	1,471.24	21.41	0.31	3.85	2.50
1,564.00	9.95	350.42	1,562.22	34.79	-2.04	3.76	3.18
1,656.00	12.56	346.39	1,652.44	52.35	-5.72	3.04	2.96
1,749.00	14.85	346.41	1,742.79	73.77	-10.90	1.48	2.46
1,841.00	14.96	347.98	1,831.69	96.84	-16.14	0.14	0.45
1,933.00	15.72	348.98	1,920.41	120.69	-21.00	-0.69	0.87
2,033.00	15.96	349.09	2,016.62	147.49	-26.19	-1.37	0.24
2,128.00	15.21	345.39	2,108.13	172.37	-31.81	-2.78	1.31
2,223.00	15.90	341.23	2,199.65	196.75	-39.14	-5.96	1.38
2,319.00	16.33	338.67	2,291.88	221.78	-48.28	-10.83	0.87
2,414.00	14.04	338.58	2,383.55	244.95	-57.35	-15.93	2.41
2,510.00	12.66	345.22	2,476.96	265.96	-64.28	-19.28	2.15
2,605.00	12.50	351.49	2,569.69	286.20	-68.46	-20.05	1.45
2,701.00	12.64	353.91	2,663.39	306.92	-71.11	-19.23	0.57
2,797.00	13.08	359.78	2,756.98	328.22	-72.27	-16.83	1.44
2,892.00	14.04	358.25	2,849.33	350.49	-72.66	-13.53	1.08
2,987.00	14.69	358.14	2,941.36	374.05	-73.40	-10.35	0.68
3,083.00	15.66	355.33	3,034.02	399.13	-74.85	-7.62	1.27
3,178.00	15.48	349.13	3,125.54	424.36	-78.29	-6.83	1.76
3,274.00	15.62	348.97	3,218.02	449.63	-83.18	-7.46	0.15
3,369.00	14.91	349.14	3,309.67	474.18	-87.93	-8.07	0.75
3,465.00	15.33	343.05	3,402.35	498.45	-93.95	-9.99	1.71
3,560.00	14.16	340.79	3,494.22	521.44	-101.44	-13.55	1.37
3,656.00	15.39	344.47	3,587.05	544.80	-108.71	-16.85	1.61
3,751.00	16.46	344.11	3,678.40	569.89	-115.77	-19.66	1.13
3,847.00	17.99	345.38	3,770.09	597.32	-123.24	-22.47	1.64
3,942.00	16.20	349.31	3,860.90	624.54	-129.40	-24.03	2.24
4,038.00	14.92	346.04	3,953.38	649.70	-134.87	-25.25	1.62
4,133.00	11.32	339.34	4,045.89	670.30	-141.11	-27.99	4.11
4,229.00	7.17	327.17	4,140.63	684.16	-147.69	-32.18	4.76
4,324.00	3.81	338.27	4,235.18	692.07	-152.07	-35.19	3.69
4,420.00	2.86	309.70	4,331.02	696.56	-155.09	-37.42	1.96
4,515.00	1.12	336.01	4,425.97	698.93	-157.30	-39.20	2.02
4,611.00	0.29	74.81	4,521.96	699.85	-157.44	-39.19	1.25
4,706.00	0.50	164.83	4,616.96	699.51	-157.10	-38.91	0.61
4,802.00	0.74	143.98	4,712.95	698.61	-156.63	-38.60	0.34
4,897.00	0.78	129.95	4,807.94	697.69	-155.77	-37.90	0.20
4,992.00	0.76	86.68	4,902.94	697.32	-154.65	-36.86	0.60

## Design Report for Wells Ranch USX AA25-69HN - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,088.00	0.94	95.70	4,998.93	697.27	-153.23	-35.46	0.23
5,183.00	1.05	101.77	5,093.91	697.02	-151.60	-33.90	0.16
5,279.00	1.11	105.33	5,189.89	696.59	-149.84	-32.24	0.09
5,374.00	0.41	103.70	5,284.88	696.27	-148.62	-31.09	0.74
5,470.00	0.21	158.36	5,380.88	696.02	-148.23	-30.74	0.35
5,565.00	0.43	258.01	5,475.88	695.79	-148.51	-31.06	0.54
5,661.00	0.17	302.98	5,571.88	695.79	-148.98	-31.52	0.35
5,852.00	1.70	151.48	5,762.86	693.46	-147.87	-30.81	0.97
5,900.00	1.35	167.29	5,810.84	692.28	-147.40	-30.55	1.13
5,947.00	1.44	158.23	5,857.82	691.19	-147.06	-30.39	0.51
5,995.00	5.88	101.97	5,905.72	690.12	-144.43	-27.98	10.87
6,043.00	10.70	97.24	5,953.21	689.05	-137.60	-21.42	10.13
6,091.00	15.75	96.60	5,999.92	687.74	-126.70	-10.89	10.53
6,138.00	19.22	94.75	6,044.74	686.36	-112.65	2.74	7.48
6,186.00	19.49	92.14	6,090.03	685.41	-96.78	18.24	1.89
6,234.00	20.05	88.95	6,135.20	685.26	-80.55	34.22	2.53
6,282.00	23.06	87.05	6,179.84	685.90	-62.93	51.70	6.44
6,329.00	26.97	86.86	6,222.42	686.95	-43.09	71.44	8.32
6,377.00	31.40	87.05	6,264.32	688.19	-19.72	94.69	9.23
6,425.00	35.03	87.92	6,304.47	689.34	6.55	120.78	7.63
6,473.00	39.79	90.42	6,342.59	689.73	35.69	149.59	10.41
6,520.00	43.94	91.97	6,377.58	689.05	67.04	180.39	9.10
6,568.00	49.59	91.58	6,410.45	687.98	101.98	214.67	11.79
6,615.00	54.95	90.59	6,439.20	687.29	139.13	251.19	11.53
6,663.00	56.81	89.52	6,466.13	687.25	178.87	290.37	4.29
6,711.00	57.49	89.22	6,492.16	687.69	219.19	330.21	1.51
6,759.00	60.28	89.25	6,516.97	688.24	260.28	370.81	5.81
6,806.00	62.84	88.83	6,539.35	688.94	301.59	411.68	5.50
6,854.00	67.12	89.55	6,559.64	689.55	345.07	454.66	9.02
6,902.00	71.11	89.42	6,576.75	689.95	389.91	498.94	8.32
6,950.00	75.46	88.46	6,590.55	690.81	435.86	544.39	9.26
6,997.00	78.89	87.90	6,600.98	692.26	481.66	589.80	7.39
7,110.00	83.70	86.48	6,618.08	697.75	593.19	700.69	4.43
7,206.00	84.75	86.14	6,627.74	703.89	688.50	795.71	1.15
7,301.00	86.55	85.39	6,634.95	710.89	782.96	890.02	2.05
7,349.00	90.03	87.03	6,636.38	714.06	830.83	937.75	8.01
7,397.00	93.05	88.82	6,635.09	715.80	878.77	985.32	7.31
7,492.00	92.99	90.66	6,630.08	716.23	973.64	1,078.94	1.94
7,587.00	92.31	92.00	6,625.69	714.02	1,068.51	1,172.13	1.58
7,683.00	90.96	92.66	6,622.95	710.12	1,164.38	1,266.03	1.57
7,779.00	90.92	91.23	6,621.38	706.86	1,260.31	1,360.09	1.49
7,874.00	91.51	89.63	6,619.36	706.15	1,355.29	1,453.63	1.79
7,969.00	90.40	88.38	6,617.78	707.80	1,450.26	1,547.56	1.76
8,065.00	89.78	87.24	6,617.63	711.47	1,546.18	1,642.77	1.35
8,160.00	89.97	88.11	6,617.84	715.32	1,641.10	1,737.01	0.94
8,255.00	91.02	87.70	6,617.02	718.80	1,736.03	1,831.20	1.19
8,350.00	91.91	88.83	6,614.59	721.67	1,830.96	1,925.29	1.51
8,445.00	92.25	89.10	6,611.14	723.39	1,925.88	2,019.18	0.46
8,541.00	92.34	89.69	6,607.29	724.40	2,021.80	2,113.94	0.62
8,636.00	91.02	90.20	6,604.51	724.49	2,116.75	2,207.59	1.49
8,684.00	90.06	89.75	6,604.06	724.51	2,164.75	2,254.93	2.21

## Design Report for Wells Ranch USX AA25-69HN - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,732.00	89.78	88.95	6,604.12	725.06	2,212.75	2,302.35	1.77
8,827.00	90.74	89.09	6,603.69	726.68	2,307.73	2,396.29	1.02
8,923.00	89.97	89.06	6,603.10	728.23	2,403.72	2,491.20	0.80
9,018.00	90.12	88.96	6,603.02	729.87	2,498.70	2,585.15	0.19
9,114.00	89.78	89.06	6,603.11	731.53	2,594.69	2,680.08	0.37
9,209.00	88.68	89.83	6,604.38	732.45	2,689.67	2,773.90	1.41
9,304.00	89.78	89.76	6,605.66	732.79	2,784.66	2,867.63	1.16
9,400.00	90.49	89.20	6,605.43	733.66	2,880.66	2,962.44	0.94
9,495.00	89.35	87.83	6,605.57	736.12	2,975.62	3,056.50	1.88
9,591.00	90.06	86.95	6,606.06	740.50	3,071.52	3,151.79	1.18
9,686.00	88.98	87.92	6,606.86	744.75	3,166.42	3,246.08	1.53
9,782.00	90.92	89.17	6,606.94	747.18	3,262.38	3,341.12	2.40
9,877.00	92.13	89.02	6,604.41	748.68	3,357.33	3,435.01	1.28
9,973.00	91.11	89.00	6,601.70	750.34	3,453.28	3,529.90	1.06
10,068.00	91.11	89.19	6,599.86	751.84	3,548.25	3,623.80	0.20
10,164.00	89.75	90.74	6,599.14	751.90	3,644.24	3,718.47	2.15
10,259.00	87.57	91.13	6,601.36	750.35	3,739.20	3,811.86	2.33
10,355.00	87.96	92.07	6,605.10	747.67	3,835.08	3,905.97	1.06
10,450.00	88.71	91.72	6,607.86	744.53	3,929.99	3,999.05	0.87
10,545.00	88.46	90.87	6,610.21	742.39	4,024.94	4,092.32	0.93
10,641.00	89.01	90.29	6,612.33	741.41	4,120.91	4,186.80	0.83
10,736.00	89.60	90.04	6,613.48	741.14	4,215.90	4,280.43	0.67
10,832.00	91.20	89.76	6,612.81	741.31	4,311.89	4,375.12	1.69
10,911.00	91.42	89.00	6,611.01	742.16	4,390.87	4,453.15	1.00
Final MWD Survey							
10,969.00	91.42	89.00	6,609.57	743.18	4,448.84	4,510.49	0.00
Survey Projection to TD - Estimated BHL: 305' FNL, 535' FEL							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
564.00	564.00	0.00	0.00	Surface Casing Assumed Vertical at 564.00ft
632.00	632.00	0.28	0.24	First MWD Survey
10,911.00	6,611.01	742.16	4,390.87	Final MWD Survey
10,969.00	6,609.57	743.18	4,448.84	Survey Projection to TD
10,969.00	6,609.57	743.18	4,448.84	Estimated BHL: 305' FNL, 535' FEL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Wells Ranch USX AA25-69HN_PlanA - Rev1_BHL Tgt	80.45	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
564.00	10,969.00	Sperry MWD Surveys	MWD

**Design Report for Wells Ranch USX AA25-69HN - 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
Wells Ranch USX	0.00	0.00	0.00	0.00	0.00	1,413,064.14	3,307,873.58	40° 27' 43.164 N	104° 23' 36.708 W
- actual wellpath hits target center									
- Polygon									
Point 1				-310.00	998.00	1,414,062.10	3,307,563.59		
Point 2				4,982.00	1,054.00	1,414,118.10	3,312,855.40		
Point 3				5,010.00	-4,251.00	1,408,813.29	3,312,883.40		
Point 4				-263.00	-4,317.00	1,408,747.29	3,307,610.59		
Point 5				-310.00	998.00	1,414,062.10	3,307,563.59		
Wells Ranch USX	0.00	0.00	6,604.11	748.17	4,448.70	1,413,812.28	3,312,322.12	40° 27' 50.004 N	104° 22' 39.036 W
- actual wellpath misses target center by 7.40ft at 10969.00ft MD (6609.57 TVD, 743.18 N, 4448.84 E)									
- Point									
Wells Ranch USX	0.00	0.00	0.00	0.00	0.00	1,413,064.14	3,307,873.58	40° 27' 43.164 N	104° 23' 36.708 W
- actual wellpath hits target center									
- Polygon									
Point 1				150.00	538.00	1,413,602.12	3,308,023.57		
Point 2				4,522.00	594.00	1,413,658.11	3,312,395.41		
Point 3				4,550.00	-3,791.00	1,409,273.27	3,312,423.41		
Point 4				197.00	-3,857.00	1,409,207.28	3,308,070.57		
Point 5				150.00	538.00	1,413,602.12	3,308,023.57		

**North Reference Sheet for Sec. 25-T6N-R63W (Wells Ranch USX AA25 NORTH PAD) - Wells Ranch USX AA25-69HN**

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

Vertical Depths are relative to KB @ 4839.00ft (H&P 343). Northing and Easting are relative to Wells Ranch USX AA25-69HN - 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: 0.99996363

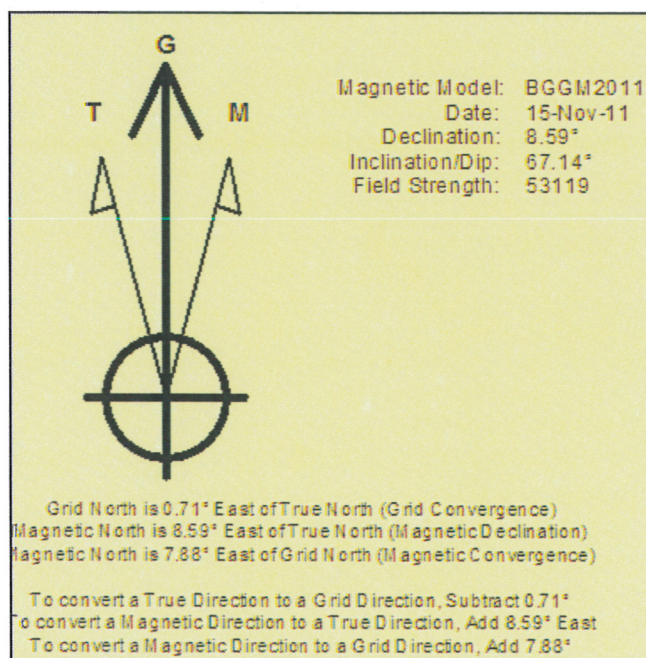
Grid Coordinates of Well: 1,413,064.14 ft N, 3,307,873.58 ft E

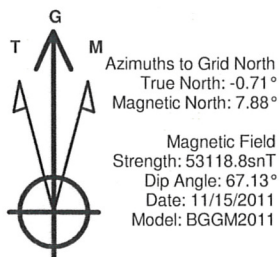
Geographical Coordinates of Well: 40° 27' 43.16" N, 104° 23' 36.71" W

Grid Convergence at Surface is: 0.71°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,969.00ft  
the Bottom Hole Displacement is 4,510.49ft in the Direction of 80.52° (Grid).

Magnetic Convergence at surface is: -7.88° (15 November 2011, , BGGM2011)

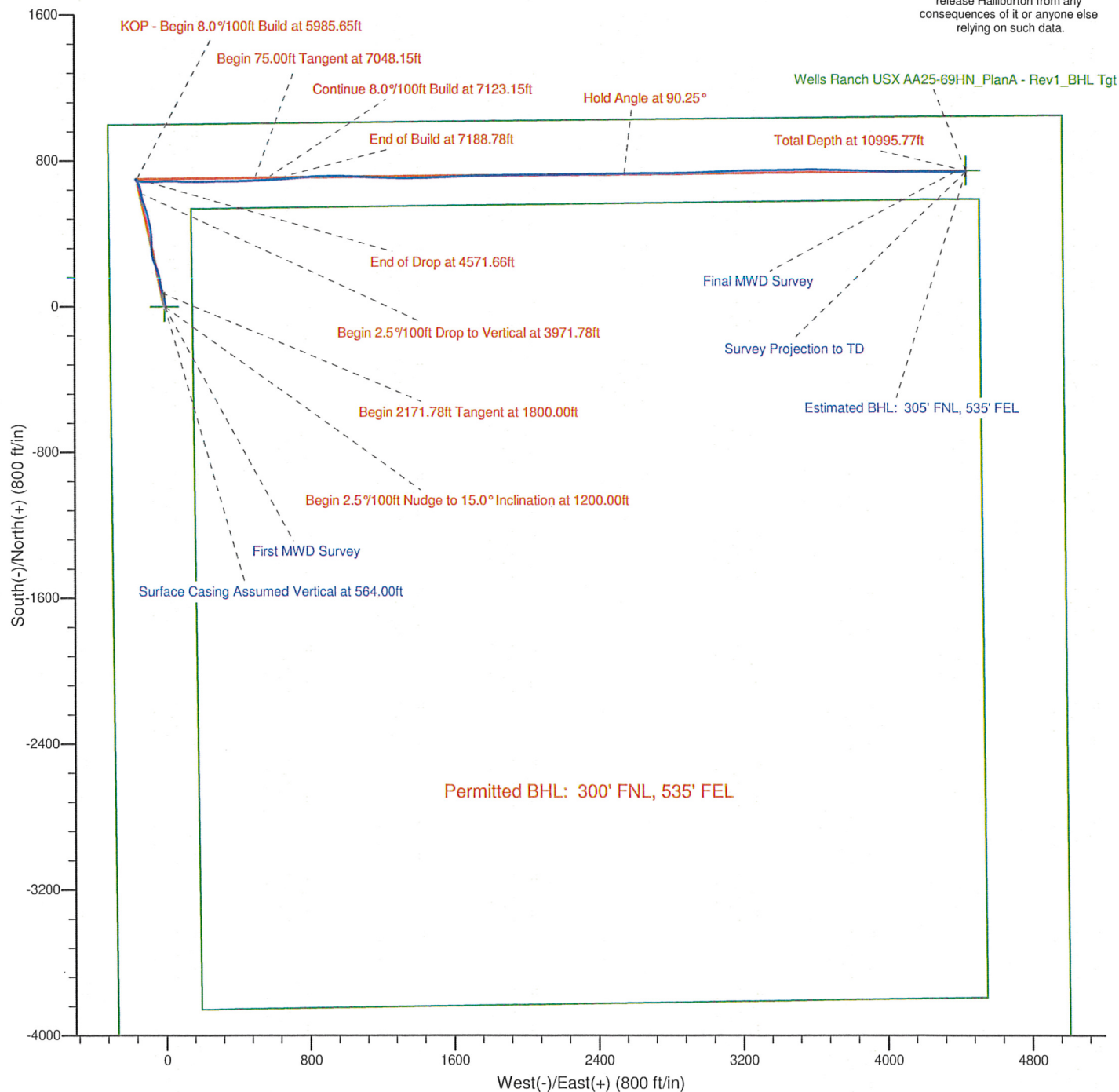




### LEGEND

- Wells Ranch USX AA25-69HN, Plan A, Plan A - Rev 1 Proposal
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch USX AA25-69HN 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.

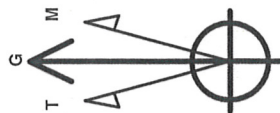


# Noble Energy

Project: Weld County, CO (NAD 83)  
 Site: Sec. 25-T6N-R63W (Wells Ranch USX AA25 NORTH PAD)  
 Well: Wells Ranch USX AA25-69HN

**HALLIBURTON**

Sperry Drilling



Azimuths to Grid North  
 True North: -0.71°  
 Magnetic North: 7.88°  
 Magnetic Field  
 Strength: 53118.8snT  
 Dip Angle: 67.13°  
 Date: 11/15/2011  
 Model: BGM2011

## LEGEND

- Wells Ranch USX AA25-69HN, Plan A, Plan A - Rev 1 Proposal V0
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch USX AA25-69HN 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.

