

Noble Energy

Weld County, CO (NAD 83)

Sec. 15-T5N-R63W (Wells Ranch PAD)

Wells Ranch USX BB15-67HN - A2

Design: MWD Survey

Sperry Drilling Services

Final Survey Report

03 November, 2011

Well Coordinates: 1,390,922.52 N, 3,297,655.03 E (40° 24' 05.62" N, 104° 25' 52.36" W)

Ground Level: 4,665.00 ft

Local Coordinate Origin: Centered on Well Wells Ranch USX BB15-67HN - SI

Viewing Datum: KB @ 4689.00ft (Rig KB)

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 BB15-67HN - 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
709.00	0.13	208.98	709.00	-0.70	-0.39	-0.48	0.02
First MWD Survey							
801.00	0.43	210.10	801.00	-1.09	-0.61	-0.75	0.33
893.00	0.72	213.84	892.99	-1.87	-1.11	-1.34	0.32
986.00	0.45	198.67	985.99	-2.70	-1.55	-1.89	0.33
1,078.00	1.81	301.35	1,077.97	-2.29	-2.91	-3.18	2.13
1,173.00	4.02	318.16	1,172.85	0.97	-6.41	-6.23	2.47
1,267.00	5.55	325.46	1,266.52	7.17	-11.19	-10.17	1.75
1,362.00	7.28	326.92	1,360.92	16.00	-17.08	-14.87	1.83
1,457.00	8.72	333.96	1,454.99	27.51	-23.52	-19.78	1.83
1,551.00	8.87	337.23	1,547.89	40.60	-29.46	-23.98	0.56
1,646.00	7.54	334.36	1,641.91	52.97	-34.99	-27.87	1.46
1,741.00	9.11	339.68	1,735.91	65.64	-40.30	-31.50	1.84
1,835.00	7.92	336.00	1,828.87	78.54	-45.52	-35.02	1.39
1,930.00	8.55	335.42	1,922.89	90.94	-51.12	-38.97	0.67
2,025.00	7.62	332.49	2,016.95	102.95	-56.96	-43.23	1.07
2,119.00	9.36	340.34	2,109.92	115.68	-62.41	-46.99	2.22
2,218.00	8.08	339.88	2,207.77	129.79	-67.52	-50.23	1.29
2,313.00	8.17	343.89	2,301.82	142.55	-71.69	-52.72	0.60
2,409.00	7.04	337.05	2,396.98	154.52	-75.87	-55.33	1.51
2,505.00	7.62	337.10	2,492.19	165.80	-80.64	-58.61	0.60
2,600.00	8.36	336.95	2,586.27	177.96	-85.80	-62.16	0.78
2,696.00	9.25	335.91	2,681.14	191.42	-91.68	-66.26	0.94
2,791.00	9.55	335.38	2,774.86	205.56	-98.08	-70.78	0.33
2,887.00	9.40	335.06	2,869.55	219.90	-104.70	-75.50	0.17
2,982.00	8.92	333.07	2,963.34	233.51	-111.31	-80.30	0.61
3,078.00	9.02	338.37	3,058.17	247.14	-117.45	-84.64	0.87
3,173.00	5.66	336.59	3,152.37	258.36	-122.06	-87.76	3.54
3,269.00	6.19	337.48	3,247.86	267.49	-125.93	-90.42	0.56
3,364.00	7.49	338.12	3,342.18	277.96	-130.19	-93.30	1.37
3,459.00	8.15	340.26	3,436.30	290.05	-134.78	-96.29	0.76
3,555.00	9.82	340.09	3,531.12	304.15	-139.86	-99.52	1.74
3,650.00	11.24	339.52	3,624.52	320.44	-145.86	-103.37	1.50
3,746.00	12.31	339.52	3,718.49	338.79	-152.72	-107.80	1.11
3,841.00	11.26	343.58	3,811.49	357.18	-158.88	-111.54	1.41
3,937.00	8.29	339.60	3,906.09	372.66	-163.94	-114.57	3.17
4,032.00	6.83	341.64	4,000.26	384.44	-168.11	-117.18	1.56
4,128.00	6.81	329.30	4,095.59	394.75	-172.82	-120.52	1.52
4,223.00	6.89	328.18	4,189.91	404.44	-178.70	-125.10	0.16
4,319.00	7.72	338.44	4,285.13	415.33	-184.10	-129.06	1.61
4,414.00	8.70	334.66	4,379.16	427.76	-189.52	-132.84	1.18
4,510.00	8.09	340.80	4,474.13	440.70	-194.85	-136.45	1.13
4,605.00	8.89	339.85	4,568.09	453.90	-199.58	-139.44	0.85
4,701.00	9.73	338.67	4,662.82	468.42	-205.08	-143.03	0.90
4,796.00	7.51	340.30	4,756.75	481.75	-210.10	-146.28	2.35
4,892.00	7.08	339.03	4,851.97	493.18	-214.33	-149.01	0.48
4,987.00	6.27	340.30	4,946.32	503.53	-218.17	-151.49	0.87
5,082.00	4.09	337.64	5,040.93	511.55	-221.21	-153.47	2.31
5,178.00	2.56	334.70	5,136.77	516.65	-223.43	-155.01	1.60

Design Report for Wells Ranch USX BB15-67HN - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,273.00	1.28	351.47	5,231.71	519.62	-224.49	-155.68	1.46
5,368.00	1.45	353.49	5,326.68	521.86	-224.79	-155.68	0.19
5,464.00	1.30	348.43	5,422.66	524.14	-225.14	-155.75	0.20
5,560.00	1.17	345.65	5,518.63	526.15	-225.61	-155.94	0.15
5,655.00	1.11	345.42	5,613.62	527.98	-226.08	-156.18	0.06
5,739.00	1.28	342.70	5,697.60	529.67	-226.56	-156.44	0.21
5,792.00	0.87	330.89	5,750.59	530.58	-226.93	-156.69	0.88
5,887.00	3.85	79.51	5,845.52	531.80	-224.15	-153.77	4.43
5,935.00	9.06	86.55	5,893.20	532.32	-218.79	-148.39	10.96
5,983.00	11.84	88.08	5,940.40	532.71	-210.09	-139.71	5.82
6,031.00	14.44	86.22	5,987.14	533.27	-199.19	-128.84	5.49
6,078.00	17.99	86.16	6,032.26	534.14	-186.10	-115.74	7.55
6,127.00	21.35	89.99	6,078.40	534.65	-169.63	-99.34	7.34
6,174.00	24.54	91.05	6,121.67	534.47	-151.31	-81.19	6.84
6,222.00	28.03	87.90	6,164.70	534.70	-130.06	-60.10	7.83
6,270.00	30.28	84.86	6,206.62	536.20	-106.74	-36.77	5.61
6,318.00	33.56	86.23	6,247.36	538.16	-81.44	-11.43	7.00
6,365.00	37.68	87.69	6,285.56	539.59	-54.11	15.86	8.95
6,413.00	42.89	88.12	6,322.16	540.72	-23.10	46.75	10.87
6,461.00	47.66	89.40	6,355.93	541.44	10.98	80.64	10.12
6,509.00	52.94	91.16	6,386.58	541.24	47.90	117.22	11.36
6,556.00	58.09	91.72	6,413.18	540.26	86.61	155.49	11.00
6,604.00	62.45	92.57	6,436.98	538.69	128.25	196.58	9.21
6,651.00	67.14	90.54	6,456.99	537.55	170.75	238.58	10.72
6,699.00	71.90	86.84	6,473.79	538.60	215.68	283.27	12.27
6,747.00	73.52	85.55	6,488.05	541.65	261.41	329.01	4.24
6,795.00	76.53	84.96	6,500.46	545.49	307.61	375.32	6.38
6,842.00	77.55	85.37	6,511.00	549.35	353.25	421.08	2.33
6,890.00	82.01	87.54	6,519.51	552.26	400.38	468.19	10.30
7,019.00	86.61	87.83	6,532.30	557.44	528.61	596.02	3.57
7,114.00	86.95	89.21	6,537.63	559.89	623.43	690.36	1.49
7,210.00	88.00	90.24	6,541.86	560.35	719.33	785.52	1.53
7,306.00	88.24	91.73	6,545.01	558.70	815.26	880.44	1.57
7,401.00	90.71	92.34	6,545.88	555.33	910.19	974.14	2.68
7,497.00	90.83	90.98	6,544.59	552.55	1,006.14	1,068.94	1.42
7,592.00	90.37	90.64	6,543.60	551.20	1,101.12	1,162.96	0.60
7,688.00	91.20	91.27	6,542.28	549.61	1,197.10	1,257.93	1.09
7,783.00	90.59	90.31	6,540.80	548.30	1,292.08	1,351.94	1.20
7,878.00	89.81	88.93	6,540.47	548.93	1,387.07	1,446.23	1.67
7,974.00	90.71	89.39	6,540.03	550.33	1,483.06	1,541.60	1.05
8,069.00	91.26	88.50	6,538.40	552.08	1,578.03	1,636.00	1.10
8,164.00	91.42	87.92	6,536.18	555.05	1,672.95	1,730.52	0.63
8,260.00	90.34	88.44	6,534.70	558.10	1,768.89	1,826.05	1.25
8,355.00	90.34	88.51	6,534.14	560.62	1,863.86	1,920.55	0.07
8,451.00	89.26	88.92	6,534.47	562.78	1,959.83	2,016.00	1.20
8,546.00	89.91	89.04	6,535.16	564.47	2,054.81	2,110.41	0.70
8,642.00	90.96	89.57	6,534.43	565.63	2,150.80	2,205.75	1.23
8,737.00	89.97	88.05	6,533.66	567.61	2,245.77	2,300.18	1.91
8,833.00	91.85	88.48	6,532.14	570.51	2,341.71	2,395.70	2.01
8,928.00	91.97	88.01	6,528.97	573.42	2,436.61	2,490.18	0.51
9,024.00	90.49	88.21	6,526.91	576.59	2,532.54	2,585.71	1.56

Design Report for Wells Ranch USX BB15-67HN - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
9,119.00	89.51	88.50	6,526.91	579.31	2,627.50	2,680.23	1.08
9,214.00	91.36	89.43	6,526.19	581.03	2,722.47	2,774.64	2.18
9,310.00	91.30	90.22	6,523.96	581.32	2,818.45	2,869.85	0.83
9,405.00	90.28	89.62	6,522.65	581.45	2,913.44	2,964.07	1.25
9,501.00	89.75	89.05	6,522.63	582.57	3,009.43	3,059.40	0.81
9,596.00	89.88	90.12	6,522.93	583.26	3,104.42	3,153.69	1.13
9,691.00	89.88	89.45	6,523.13	583.61	3,199.42	3,247.95	0.71
9,787.00	90.80	90.83	6,522.56	583.38	3,295.42	3,343.11	1.73
9,882.00	90.99	90.94	6,521.08	581.91	3,390.39	3,437.11	0.23
9,978.00	90.99	91.23	6,519.42	580.09	3,486.36	3,532.04	0.30
10,073.00	90.22	89.71	6,518.42	579.31	3,581.35	3,626.14	1.79
10,169.00	88.03	88.66	6,519.88	580.68	3,677.32	3,721.49	2.53
10,264.00	88.12	89.06	6,523.07	582.57	3,772.25	3,815.87	0.43
10,360.00	89.29	88.84	6,525.24	584.33	3,868.21	3,911.25	1.24
10,456.00	90.37	89.42	6,525.53	585.79	3,964.19	4,006.63	1.28
10,551.00	90.77	89.10	6,524.58	587.01	4,059.18	4,100.98	0.54
10,646.00	92.22	88.67	6,522.11	588.86	4,154.13	4,195.37	1.59
10,742.00	93.37	87.68	6,517.42	591.91	4,249.96	4,290.80	1.58
10,871.00	95.49	87.03	6,507.46	597.85	4,378.43	4,418.97	1.72
Final MWD Survey							
10,931.00	95.49	87.03	6,501.72	600.94	4,438.08	4,478.51	0.00

Survey Projection to TD - Estimated BHL: 1298' FNL, 552' FEL

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
709.00	709.00	-0.70	-0.39	First MWD Survey
10,871.00	6,507.46	597.85	4,378.43	Final MWD Survey
10,931.00	6,501.72	600.94	4,438.08	Survey Projection to TD
10,931.00	6,501.72	600.94	4,438.08	Estimated BHL: 1298' FNL, 552' FEL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Wells Ranch USX BB15-67HN_PlanB - Rev0_BHL Tgt	82.60	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
709.00	10,931.00	Sperry MWD Surveys	MWD

Design Report for Wells Ranch USX BB15-67HN - 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	-25.50	0.30	1,390,897.02	3,297,655.33	40° 24' 5.364 N	104° 25' 52.356 W
- actual wellpath misses target center by 25.50ft at 0.03ft MD (0.03 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-367.70	1,846.50	1,392,768.95	3,297,287.35		
Point 2				4,926.30	1,903.50	1,392,825.95	3,302,581.14		
Point 3				5,183.30	-3,398.50	1,387,524.16	3,302,838.13		
Point 4				60.30	-3,420.50	1,387,502.16	3,297,715.33		
Point 5				-367.70	1,846.50	1,392,768.95	3,297,287.35		
Wells Ranch USX	0.00	0.00	0.00	-25.50	0.30	1,390,897.02	3,297,655.33	40° 24' 5.364 N	104° 25' 52.356 W
- actual wellpath misses target center by 25.50ft at 0.03ft MD (0.03 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				92.30	1,386.50	1,392,308.97	3,297,747.33		
Point 2				4,466.30	1,443.50	1,392,365.96	3,302,121.16		
Point 3				4,723.30	-2,938.50	1,387,984.14	3,302,378.15		
Point 4				520.30	-2,958.50	1,387,964.14	3,298,175.31		
Point 5				92.30	1,386.50	1,392,308.97	3,297,747.33		
Wells Ranch USX	0.00	0.00	6,512.44	578.75	4,455.06	1,391,501.25	3,302,109.91	40° 24' 10.800 N	104° 24' 54.684 W
- actual wellpath misses target center by 29.93ft at 10931.00ft MD (6501.72 TVD, 600.94 N, 4438.08 E)									
- Point									

North Reference Sheet for Sec. 15-T5N-R63W (Wells Ranch PAD) - Wells Ranch USX BB15-67HN - Plan B

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

Vertical Depths are relative to KB @ 4689.00ft (Rig KB). Northing and Easting are relative to Wells Ranch USX BB15-67HN - 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: 0.99996030

Grid Coordinates of Well: 1,390,922.52 ft N, 3,297,655.03 ft E

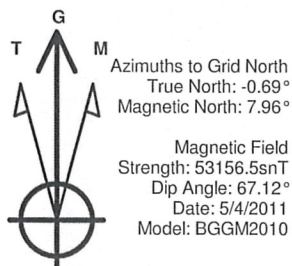
Geographical Coordinates of Well: 40° 24' 05.62" N, 104° 25' 52.36" W

Grid Convergence at Surface is: 0.69°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,931.00ft
the Bottom Hole Displacement is 4,478.58ft in the Direction of 82.29° (Grid).

Magnetic Convergence at surface is: -7.96° (4 May 2011, , BGGM2010)

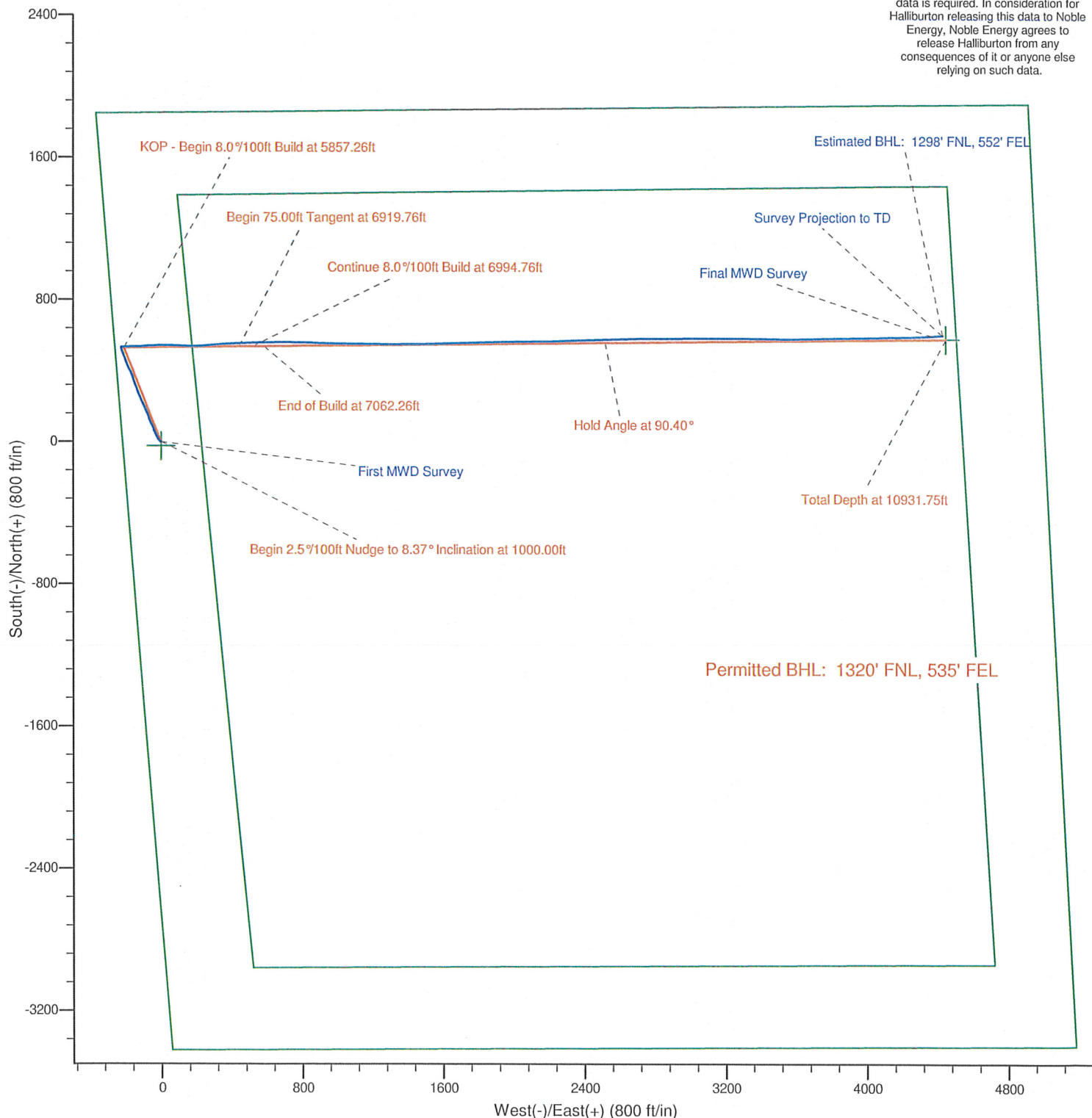




LEGEND

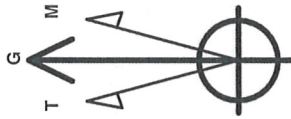
- Wells Ranch USX BB15-67HN, Plan B, Plan B - Rev 1 Proposal
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch USX BB15-67HN 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. 15-T5N-R63W (Wells Ranch PAD)
 Well: Wells Ranch USX BB15-67HN



Azimuths to Grid North
 True North: -0.69°
 Magnetic North: 7.96°
 Magnetic Field
 Strength: 53156.5nT
 Dip Angle: 67.12°
 Date: 5/4/2011
 Model: BGGM2010

LEGEND

- Wells Ranch USX BB15-67HN, Plan B, Plan B - Rev 1 Proposal V0
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch USX BB15-67HN 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.

