

Noble Energy

Weld County, CO (NAD 83)

Sec. 35-T6N-R63W

Wells Ranch USX AA35-65HN

Design: MWD Survey

Sperry Drilling Services

Final Survey Report

26 December, 2012

Well Coordinates: 1,406,159.65 N, 3,302,832.45 E (40° 26' 35.56" N, 104° 24' 43.02" W)

Ground Level: 4,792.00 ft

Local Coordinate Origin: Centered on Well Wells Ranch USX AA35-65HN

Viewing Datum: KB @ 4816.00ft (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 Wells Ranch USX AA35-65HN - 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
633.00	0.00	0.00	633.00	0.00	0.00	0.00	0.00
Surface Casing Assumed Vertical at 633.00ft							
645.00	0.97	282.54	645.00	0.02	-0.10	-0.10	8.08
First MWD Survey							
892.00	0.83	275.85	891.97	0.66	-3.92	-3.92	0.07
1,169.00	0.96	252.06	1,168.94	0.15	-8.12	-8.12	0.14
1,455.00	1.03	274.74	1,454.89	-0.38	-12.96	-12.96	0.14
1,741.00	0.77	319.54	1,740.86	1.30	-16.77	-16.78	0.25
1,932.00	0.98	315.13	1,931.84	3.43	-18.76	-18.77	0.12
2,027.00	2.28	260.05	2,026.80	3.68	-21.19	-21.21	2.00
2,122.00	4.74	259.37	2,121.62	2.63	-26.91	-26.92	2.59
2,217.00	5.93	263.43	2,216.21	1.34	-35.65	-35.65	1.31
2,313.00	7.01	262.00	2,311.59	-0.04	-46.37	-46.37	1.14
2,408.00	6.13	256.00	2,405.97	-2.07	-57.04	-57.03	1.17
2,503.00	7.81	269.14	2,500.27	-3.40	-68.41	-68.40	2.43
2,599.00	9.40	269.44	2,595.19	-3.57	-82.78	-82.76	1.66
2,693.00	9.31	261.83	2,687.94	-4.73	-97.98	-97.96	1.32
2,789.00	10.55	259.59	2,782.50	-7.42	-114.31	-114.28	1.35
2,884.00	12.27	261.89	2,875.62	-10.41	-132.86	-132.82	1.87
2,979.00	14.67	264.37	2,968.00	-13.02	-154.83	-154.78	2.60
3,074.00	14.19	265.77	3,060.00	-15.06	-178.41	-178.35	0.62
3,169.00	14.40	265.15	3,152.06	-16.92	-201.79	-201.73	0.27
3,265.00	13.01	265.35	3,245.33	-18.80	-224.46	-224.39	1.45
3,360.00	12.69	266.71	3,337.95	-20.27	-245.54	-245.45	0.46
3,455.00	12.15	262.17	3,430.73	-22.23	-265.86	-265.77	1.17
3,551.00	11.74	256.84	3,524.65	-25.83	-285.38	-285.27	1.23
3,646.00	12.29	257.12	3,617.57	-30.28	-304.64	-304.52	0.58
3,741.00	13.80	259.41	3,710.11	-34.62	-325.64	-325.50	1.68
3,836.00	14.85	259.91	3,802.16	-38.83	-348.76	-348.61	1.11
3,932.00	13.44	263.50	3,895.25	-42.25	-371.96	-371.79	1.73
4,027.00	10.78	267.82	3,988.13	-43.84	-391.81	-391.64	2.96
4,122.00	8.37	268.39	4,081.80	-44.37	-407.60	-407.43	2.54
4,217.00	5.89	270.85	4,176.06	-44.49	-419.39	-419.22	2.63
4,313.00	3.00	244.60	4,271.77	-45.50	-426.59	-426.41	3.61
4,408.00	0.64	161.58	4,366.72	-47.07	-428.67	-428.48	3.15
4,503.00	1.11	65.86	4,461.71	-47.20	-427.66	-427.47	1.41
4,789.00	1.33	268.46	4,747.69	-46.15	-428.45	-428.27	0.84
5,075.00	0.71	37.38	5,033.66	-44.83	-430.69	-430.51	0.65
5,361.00	1.18	57.27	5,319.62	-41.83	-427.14	-426.97	0.20
5,646.00	0.99	95.27	5,604.58	-40.47	-422.22	-422.06	0.26
5,812.00	0.90	79.39	5,770.55	-40.36	-419.51	-419.35	0.17
5,873.00	0.71	93.91	5,831.55	-40.30	-418.66	-418.50	0.45
5,976.00	8.24	91.60	5,934.16	-40.55	-410.63	-410.47	7.31
6,023.00	13.62	93.52	5,980.29	-40.99	-401.74	-401.58	11.47
6,071.00	17.70	90.95	6,026.50	-41.45	-388.80	-388.63	8.62
6,119.00	20.26	90.71	6,071.89	-41.68	-373.19	-373.02	5.34
6,167.00	22.49	90.84	6,116.58	-41.92	-355.70	-355.53	4.65
6,214.00	25.61	91.87	6,159.50	-42.38	-336.55	-336.38	6.70
6,262.00	26.72	94.48	6,202.58	-43.56	-315.42	-315.25	3.33

Design Report for Wells Ranch USX AA35-65HN - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6,309.00	30.32	93.98	6,243.87	-45.21	-293.05	-292.87	7.68
6,357.00	35.51	91.86	6,284.15	-46.50	-267.01	-266.83	11.07
6,404.00	40.42	91.35	6,321.19	-47.31	-238.11	-237.93	10.47
6,452.00	44.56	91.34	6,356.58	-48.07	-205.71	-205.52	8.63
6,500.00	47.16	91.81	6,390.01	-49.02	-171.28	-171.09	5.46
6,548.00	50.22	91.32	6,421.69	-50.00	-135.24	-135.05	6.42
6,595.00	54.73	90.35	6,450.31	-50.53	-97.98	-97.78	9.73
6,643.00	57.51	89.56	6,477.07	-50.50	-58.13	-57.94	5.95
6,690.00	59.97	89.52	6,501.45	-50.17	-17.96	-17.77	5.23
6,738.00	61.72	90.29	6,524.84	-50.11	23.96	24.15	3.91
6,786.00	66.98	90.90	6,545.61	-50.56	67.21	67.40	11.02
6,834.00	72.31	91.07	6,562.30	-51.33	112.19	112.38	11.11
6,881.00	75.46	91.56	6,575.34	-52.37	157.32	157.52	6.78
6,896.00	77.08	92.13	6,578.90	-52.84	171.89	172.09	11.41
6,963.00	82.01	90.00	6,591.06	-54.06	237.74	237.95	7.99
7,028.00	86.11	90.67	6,597.78	-54.44	302.37	302.58	6.39
7,124.00	87.90	90.31	6,602.80	-55.26	398.23	398.45	1.90
7,219.00	89.81	90.44	6,604.70	-55.88	493.21	493.42	2.02
7,314.00	89.14	88.68	6,605.57	-55.15	588.20	588.41	1.98
7,409.00	90.52	90.30	6,605.85	-54.30	683.19	683.39	2.24
7,504.00	88.71	90.28	6,606.49	-54.78	778.18	778.39	1.91
7,600.00	91.85	90.90	6,606.02	-55.77	874.16	874.37	3.33
7,695.00	89.44	88.75	6,604.95	-55.48	969.14	969.35	3.40
7,790.00	92.78	89.17	6,603.11	-53.76	1,064.10	1,064.30	3.54
7,885.00	89.78	87.58	6,600.99	-51.06	1,159.02	1,159.21	3.57
7,981.00	90.09	87.82	6,601.10	-47.21	1,254.94	1,255.12	0.41
8,076.00	89.54	88.23	6,601.40	-43.94	1,349.89	1,350.05	0.72
8,171.00	88.06	88.42	6,603.39	-41.16	1,444.82	1,444.97	1.57
8,267.00	90.74	89.03	6,604.40	-39.02	1,540.78	1,540.92	2.86
8,362.00	90.40	88.41	6,603.45	-36.90	1,635.75	1,635.88	0.74
8,457.00	88.27	88.18	6,604.55	-34.08	1,730.70	1,730.82	2.26
8,552.00	90.28	89.31	6,605.76	-32.00	1,825.66	1,825.77	2.43
8,648.00	88.27	90.73	6,606.97	-32.03	1,921.65	1,921.76	2.56
8,743.00	89.29	90.52	6,608.99	-33.07	2,016.62	2,016.73	1.10
8,838.00	90.83	91.73	6,608.89	-34.93	2,111.60	2,111.72	2.06
8,933.00	87.47	90.78	6,610.30	-37.01	2,206.55	2,206.68	3.68
9,029.00	88.43	90.70	6,613.74	-38.25	2,302.48	2,302.61	1.00
9,124.00	91.20	91.29	6,614.04	-39.90	2,397.45	2,397.59	2.98
9,219.00	89.75	89.75	6,613.26	-40.76	2,492.44	2,492.58	2.23
9,314.00	90.22	90.84	6,613.28	-41.25	2,587.44	2,587.58	1.25
9,410.00	90.03	90.85	6,613.07	-42.67	2,683.43	2,683.57	0.20
9,505.00	90.09	90.96	6,612.97	-44.17	2,778.42	2,778.57	0.13
9,600.00	90.15	91.69	6,612.77	-46.36	2,873.39	2,873.55	0.77
9,696.00	89.94	90.95	6,612.70	-48.57	2,969.36	2,969.53	0.80
9,791.00	88.80	90.00	6,613.74	-49.36	3,064.35	3,064.52	1.56
9,886.00	89.57	90.13	6,615.09	-49.47	3,159.34	3,159.51	0.82
9,982.00	90.22	90.22	6,615.27	-49.76	3,255.34	3,255.51	0.68
10,077.00	88.06	87.65	6,616.70	-48.00	3,350.30	3,350.46	3.53
10,172.00	88.89	87.86	6,619.22	-44.28	3,445.19	3,445.34	0.90
10,267.00	88.98	87.64	6,620.99	-40.55	3,540.10	3,540.23	0.25
10,363.00	89.44	86.57	6,622.31	-35.70	3,635.97	3,636.08	1.21

Design Report for Wells Ranch USX AA35-65HN - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
10,458.00	89.51	84.80	6,623.18	-28.55	3,730.69	3,730.77	1.86
10,553.00	90.34	85.41	6,623.31	-20.45	3,825.34	3,825.39	1.08
10,649.00	90.86	85.90	6,622.30	-13.18	3,921.06	3,921.08	0.74
10,744.00	89.44	86.54	6,622.05	-6.91	4,015.85	4,015.85	1.64
10,839.00	90.52	89.16	6,622.09	-3.35	4,110.78	4,110.76	2.98
10,934.00	89.78	89.64	6,621.84	-2.35	4,205.77	4,205.75	0.93

Final MWD Survey

10,987.00	89.78	89.64	6,622.04	-2.02	4,258.77	4,258.74	0.00
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Survey Projection to TD - Estimated BHL: 2586' FNL, 529' FEL

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
633.00	633.00	0.00	0.00	Surface Casing Assumed Vertical at 633.00ft
645.00	645.00	0.02	-0.10	First MWD Survey
10,934.00	6,621.84	-2.35	4,205.77	Final MWD Survey
10,987.00	6,622.04	-2.02	4,258.77	Survey Projection to TD
10,987.00	6,622.04	-2.02	4,258.77	Estimated BHL: 2586' FNL, 529' FEL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Wells Ranch USX AA35-65HN_PlanA - Rev1_BH L Tgt	90.22	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
633.00	10,987.00	Sperry MWD Surveys	MWD

Design Report for Wells Ranch USX AA35-65HN - 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	1,406,159.65	3,302,832.45	40° 26' 35.556 N	104° 24' 43.020 W
- actual wellpath hits target center									
- Polygon									
Point 1				-518.00	2,555.00	1,408,714.56	3,302,314.47		
Point 2				4,778.00	2,588.00	1,408,747.56	3,307,610.27		
Point 3				4,822.00	-2,706.00	1,403,453.75	3,307,654.27		
Point 4				-439.00	-2,763.00	1,403,396.76	3,302,393.46		
Point 5				-518.00	2,555.00	1,408,714.56	3,302,314.47		
Wells Ranch USX	0.00	0.00	0.00	0.00	0.00	1,406,159.65	3,302,832.45	40° 26' 35.556 N	104° 24' 43.020 W
- actual wellpath hits target center									
- Polygon									
Point 1				-58.00	2,095.00	1,408,254.57	3,302,774.45		
Point 2				4,318.00	2,128.00	1,408,287.57	3,307,150.28		
Point 3				4,362.00	-2,246.00	1,403,913.74	3,307,194.28		
Point 4				21.00	-2,303.00	1,403,856.74	3,302,853.45		
Point 5				-58.00	2,095.00	1,408,254.57	3,302,774.45		
Wells Ranch USX	0.00	0.00	6,605.00	-16.52	4,264.75	1,406,143.13	3,307,097.04	40° 26' 34.872 N	104° 23' 47.868 W
- actual wellpath misses target center by 23.17ft at 10987.00ft MD (6622.04 TVD, -2.02 N, 4258.77 E)									
- Point									

North Reference Sheet for Sec. 35-T6N-R63W - Wells Ranch USX AA35-65HN

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

Vertical Depths are relative to KB @ 4816.00ft (H&P 315). Northing and Easting are relative to Wells Ranch USX AA35-65HN

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: 0.99996247

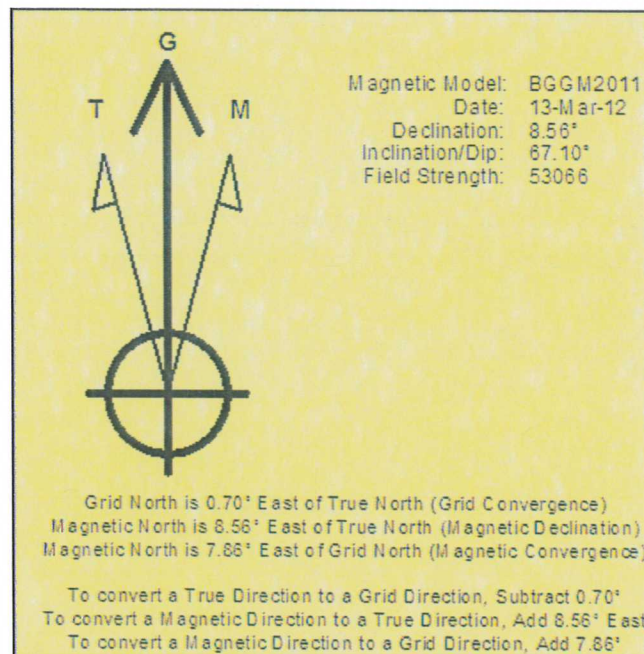
Grid Coordinates of Well: 1,406,159.65 ft N, 3,302,832.45 ft E

Geographical Coordinates of Well: 40° 26' 35.56" N, 104° 24' 43.02" W

Grid Convergence at Surface is: 0.70°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,987.00ft
the Bottom Hole Displacement is 4,258.77ft in the Direction of 90.03° (Grid).

Magnetic Convergence at surface is: -7.86° (13 March 2012, , BGGM2011)



Project: Weld County, CO (NAD 83)
 Site: Sec. 35-T6N-R63W
 Well: Wells Ranch USX AA35-65HN

Noble Energy

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Sperry Drilling



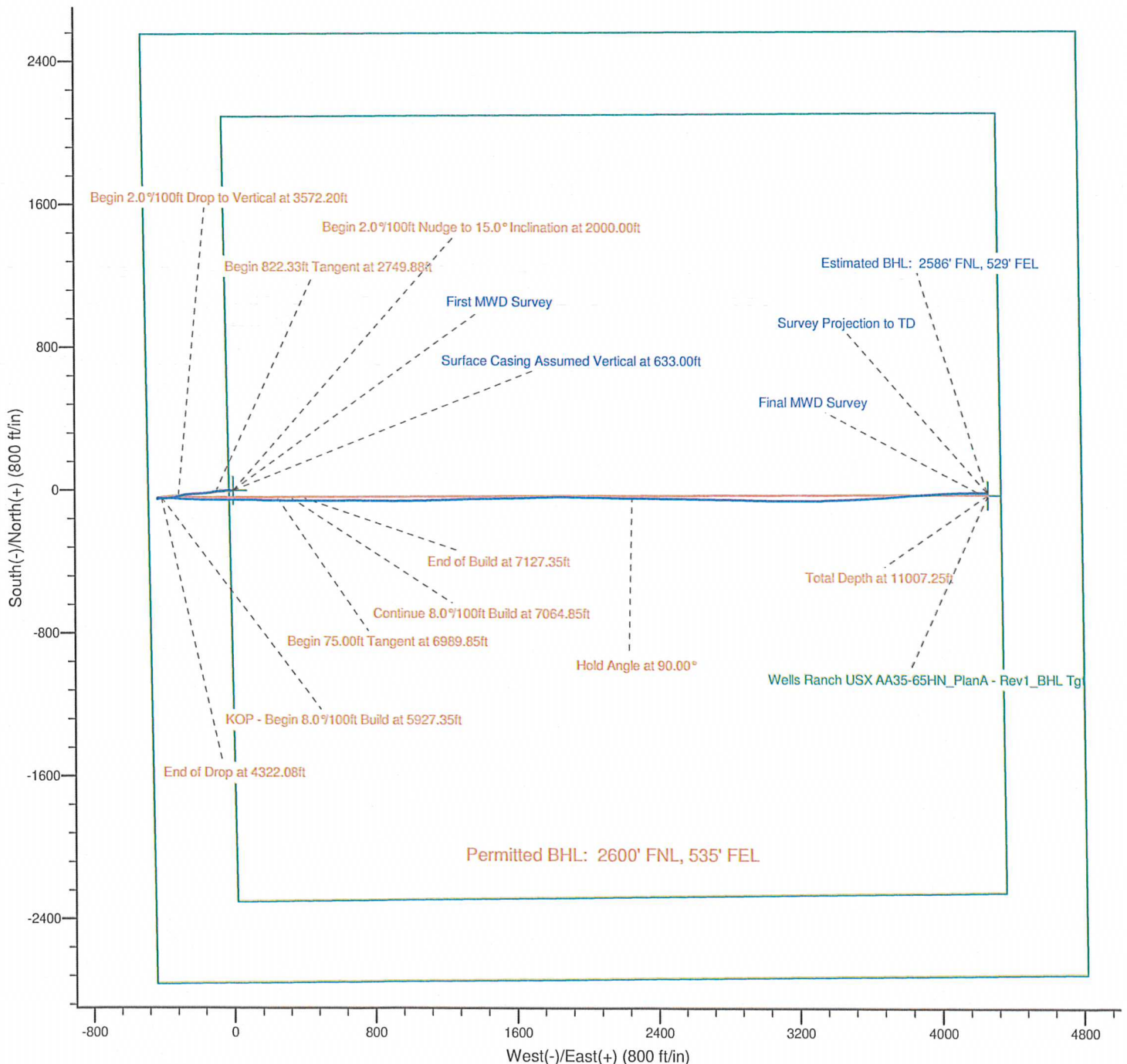
Azimuths to Grid North
 True North: -0.70°
 Magnetic North: 7.86°

Magnetic Field
 Strength: 53065.8snT
 Dip Angle: 67.10°
 Date: 3/13/2012
 Model: BGGM2011

LEGEND

- Wells Ranch USX AA35-65HN, 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 AA35-65HN 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. 35-T6N-R63W
 Well: Wells Ranch USX AA35-65HN

Noble Energy

HALLIBURTON
 Sperry Drilling



Azimuths to Grid North
 True North: -0.70°
 Magnetic North: 7.86°

Magnetic Field
 Strength: 53065.8snT
 Dip Angle: 67.10°
 Date: 3/13/2012
 Model: BGGM2011

LEGEND

- Wells Ranch USX AA35-65HN, 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 AA35-65HN 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.

