

Noble Energy
Weld County, CO (NAD 83)
Sec. 29-T6N-R62W
Wells Ranch AE30-68HN

Design: MWD Surveys

Sperry Drilling Services

Final Survey Report

26 October, 2011

Well Coordinates: 1,413,684.34 N, 3,318,275.99 E (40° 27' 47.99" N, 104° 21' 22.03" W)
Ground Level: 4,771.00 ft

Local Coordinate Origin:	Centered on Well Wells Ranch AE30-68HN
Viewing Datum:	KB @ 4795.00ft (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	

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Survey Report for Wells Ranch AE30-68HN - Sperry MWD Surveys

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
705.00	1.24	5.80	704.94	7.59	0.77	-1.09	0.18
First Sperry MWD Survey @ 705.00 ft							
797.00	1.37	358.34	796.92	9.68	0.84	-1.25	0.23
888.00	1.36	9.89	887.90	11.83	0.99	-1.50	0.30
979.00	1.45	11.04	978.87	14.02	1.40	-1.99	0.10
1,161.00	2.33	290.02	1,160.79	17.55	-1.64	0.89	1.40
1,255.00	1.94	275.05	1,254.73	18.35	-5.02	4.23	0.72
1,350.00	1.60	288.30	1,349.68	18.90	-7.88	7.07	0.56
1,445.00	1.77	294.30	1,444.64	19.92	-10.47	9.62	0.26
1,539.00	3.47	266.54	1,538.54	20.35	-14.64	13.76	2.21
1,634.00	4.13	258.94	1,633.34	19.52	-20.86	20.02	0.87
1,728.00	3.54	259.85	1,727.12	18.36	-27.04	26.24	0.63
1,823.00	5.67	262.64	1,821.81	17.24	-34.58	33.82	2.25
1,917.00	5.52	261.98	1,915.37	16.02	-43.67	42.95	0.17
2,012.00	6.32	256.08	2,009.86	14.12	-53.27	52.62	1.06
2,106.00	5.08	252.66	2,103.39	11.63	-62.26	61.71	1.37
2,201.00	4.88	254.22	2,198.03	9.28	-70.17	69.71	0.25
2,297.00	4.44	252.92	2,293.72	7.08	-77.65	77.28	0.47
2,392.00	2.00	223.89	2,388.56	4.81	-82.31	82.03	3.01
2,491.00	0.62	218.50	2,487.54	3.14	-83.84	83.63	1.40
2,586.00	0.44	211.05	2,582.53	2.43	-84.35	84.17	0.20
2,872.00	0.31	12.82	2,868.53	2.24	-84.75	84.57	0.26
3,159.00	0.86	14.84	3,155.51	5.08	-84.02	83.73	0.19
3,446.00	0.37	341.21	3,442.50	8.04	-83.77	83.35	0.21
3,731.00	0.81	180.05	3,727.49	6.90	-84.07	83.70	0.41
4,019.00	1.05	172.85	4,015.45	2.24	-83.74	83.57	0.09
4,400.00	1.66	212.82	4,396.35	-5.86	-86.30	86.47	0.29
4,690.00	1.13	231.76	4,686.27	-11.16	-90.82	91.21	0.24
4,879.00	1.63	248.05	4,875.21	-13.32	-94.78	95.26	0.33
5,070.00	1.16	280.51	5,066.16	-13.98	-99.20	99.70	0.47
5,166.00	0.81	278.41	5,162.14	-13.71	-100.82	101.32	0.37
5,453.00	0.43	32.50	5,449.13	-12.50	-102.25	102.69	0.37
5,723.00	0.38	106.95	5,719.13	-11.91	-100.85	101.27	0.18
5,784.00	0.34	108.24	5,780.13	-12.02	-100.49	100.91	0.07
5,878.00	3.98	281.55	5,874.06	-11.46	-103.42	103.81	4.59
5,903.00	6.45	277.09	5,898.95	-11.11	-105.66	106.04	10.00
5,935.00	9.14	278.28	5,930.65	-10.52	-109.96	110.31	8.42
5,983.00	13.58	277.99	5,977.70	-9.19	-119.32	119.60	9.25
6,031.00	17.70	277.57	6,023.91	-7.44	-132.14	132.34	8.59
6,078.00	22.04	275.50	6,068.10	-5.66	-148.01	148.11	9.35
6,126.00	24.95	271.66	6,112.12	-4.50	-167.10	167.14	6.85
6,174.00	27.62	268.32	6,155.16	-4.53	-188.34	188.37	6.36
6,222.00	31.19	268.20	6,196.97	-5.25	-211.90	211.93	7.44
6,270.00	34.16	268.37	6,237.37	-6.02	-237.79	237.84	6.19
6,317.00	38.88	269.48	6,275.13	-6.53	-265.75	265.79	10.14
6,365.00	42.28	269.55	6,311.58	-6.80	-296.97	296.99	7.08
6,413.00	47.40	269.97	6,345.60	-6.93	-330.80	330.80	10.68
6,458.00	51.58	267.67	6,374.83	-7.66	-365.00	364.99	10.07
6,509.00	55.01	266.54	6,405.31	-9.73	-405.83	405.87	6.96

Survey Report for Wells Ranch AE30-68HN - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6,556.00	58.24	266.14	6,431.16	-12.24	-444.99	445.11	6.91
6,604.00	61.17	266.35	6,455.37	-14.95	-486.34	486.54	6.12
6,653.00	62.89	266.19	6,478.35	-17.77	-529.52	529.80	3.52
6,700.00	68.54	267.32	6,497.68	-20.18	-572.28	572.62	12.22
6,750.00	74.03	267.94	6,513.71	-22.14	-619.58	619.96	11.04
6,795.00	77.76	269.30	6,524.68	-23.18	-663.20	663.58	8.79
6,845.00	80.17	269.10	6,534.25	-23.87	-712.27	712.64	4.84
6,948.00	87.28	268.63	6,545.50	-25.90	-814.56	814.93	6.92
7,045.00	88.27	268.90	6,549.26	-27.99	-911.47	911.83	1.06
7,140.00	89.57	268.76	6,551.05	-29.93	-1,006.43	1,006.79	1.38
7,235.00	91.67	268.50	6,550.03	-32.20	-1,101.39	1,101.76	2.23
7,331.00	90.31	269.44	6,548.37	-33.92	-1,197.36	1,197.71	1.72
7,427.00	92.04	269.37	6,546.40	-34.92	-1,293.33	1,293.64	1.80
7,522.00	90.80	270.45	6,544.05	-35.07	-1,388.29	1,388.53	1.73
7,617.00	89.81	271.30	6,543.54	-33.62	-1,483.28	1,483.37	1.37
7,713.00	90.12	271.79	6,543.60	-31.03	-1,579.24	1,579.14	0.60
7,809.00	90.43	272.25	6,543.14	-27.64	-1,675.18	1,674.84	0.58
7,905.00	92.59	272.43	6,540.61	-23.73	-1,771.06	1,770.47	2.26
8,000.00	91.85	272.36	6,536.93	-19.76	-1,865.91	1,865.06	0.78
8,096.00	89.69	271.37	6,535.64	-16.64	-1,961.84	1,960.78	2.48
8,191.00	89.51	272.11	6,536.30	-13.75	-2,056.80	2,055.52	0.80
8,287.00	91.11	272.31	6,535.78	-10.05	-2,152.72	2,151.20	1.68
8,383.00	91.24	270.72	6,533.81	-7.51	-2,248.66	2,246.95	1.66
8,478.00	88.33	269.98	6,534.17	-6.93	-2,343.65	2,341.83	3.16
8,574.00	88.95	267.09	6,536.45	-9.39	-2,439.58	2,437.77	3.08
8,670.00	89.63	265.62	6,537.64	-15.49	-2,535.38	2,533.74	1.69
8,765.00	90.31	264.50	6,537.69	-23.67	-2,630.02	2,628.65	1.38
8,860.00	92.29	264.61	6,535.53	-32.68	-2,724.56	2,723.49	2.09
8,956.00	90.49	263.90	6,533.20	-42.29	-2,820.05	2,819.30	2.02
9,051.00	89.75	264.75	6,533.00	-51.68	-2,914.58	2,914.14	1.19
9,146.00	91.85	264.95	6,531.68	-60.21	-3,009.18	3,009.02	2.22
9,242.00	90.99	266.12	6,529.30	-67.68	-3,104.86	3,104.93	1.51
9,337.00	89.32	266.61	6,529.04	-73.70	-3,199.66	3,199.90	1.83
9,433.00	90.43	267.12	6,529.25	-78.95	-3,295.52	3,295.90	1.27
9,528.00	89.94	266.72	6,528.95	-84.06	-3,390.38	3,390.89	0.67
9,624.00	88.76	264.20	6,530.03	-91.65	-3,486.06	3,486.81	2.90
9,720.00	89.63	263.93	6,531.38	-101.58	-3,581.54	3,582.62	0.95
9,815.00	91.24	265.89	6,530.66	-110.01	-3,676.15	3,677.51	2.67
9,911.00	91.91	266.42	6,528.02	-116.44	-3,771.90	3,773.44	0.89
10,007.00	92.04	266.76	6,524.71	-122.15	-3,867.67	3,869.37	0.38
10,103.00	92.53	266.82	6,520.89	-127.52	-3,963.45	3,965.28	0.51
10,199.00	91.73	266.38	6,517.32	-133.21	-4,059.21	4,061.20	0.95
10,294.00	92.04	265.66	6,514.19	-139.80	-4,153.93	4,156.12	0.82
10,390.00	91.11	266.38	6,511.56	-146.46	-4,249.66	4,252.04	1.22
10,486.00	89.69	266.34	6,510.89	-152.55	-4,345.46	4,348.02	1.48
10,582.00	91.11	266.09	6,510.22	-158.89	-4,441.25	4,443.99	1.50
10,677.00	91.36	265.62	6,508.17	-165.76	-4,535.98	4,538.92	0.56
10,772.00	90.43	264.14	6,506.68	-174.23	-4,630.58	4,633.80	1.84
10,868.00	90.68	262.86	6,505.75	-185.10	-4,725.96	4,729.55	1.36
10,998.00	93.40	262.55	6,501.13	-201.59	-4,854.81	4,858.99	2.11

Final Sperry MWD Survey @ 10998.00 ft

Survey Report for Wells Ranch AE30-68HN - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
11,055.00	93.40	262.55	6,497.75	-208.97	-4,911.23	4,915.67	0.00
Straight Line Projection to TD - Estimated BHL: 657' FNL, 508' FWL							

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
705.00	704.94	7.59	0.77	First Sperry MWD Survey @ 705.00 ft
10,998.00	6,501.13	-201.59	-4,854.81	Final Sperry MWD Survey @ 10998.00 ft
11,055.00	6,497.75	-208.97	-4,911.23	Straight Line Projection to TD
11,055.00	6,497.75	-208.97	-4,911.23	Estimated BHL: 657' FNL, 508' FWL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	+N/-S (ft)	+E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	267.56	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
705.00	11,055.00	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
Wells Ranch USX	0.00	0.00	0.00	0.28	22.26	1,413,684.62	3,318,298.25	40° 27' 47.988 N	104° 21' 21.744 W
- survey misses target center by 22.26ft at 0.03ft MD (0.03 TVD, 0.00 N, 0.00 E)									
- Polygon									
Wells Ranch	0.00	0.00	0.00	0.00	0.00	1,413,684.34	3,318,275.99	40° 27' 47.988 N	104° 21' 22.032 W
- survey hits target center									
- Polygon									
Wells Ranch	0.00	0.00	0.00	0.00	0.00	1,413,684.34	3,318,275.99	40° 27' 47.988 N	104° 21' 22.032 W
- survey hits target center									
- Polygon									
Wells Ranch USX	0.00	0.00	0.00	0.28	22.26	1,413,684.62	3,318,298.25	40° 27' 47.988 N	104° 21' 21.744 W
- survey misses target center by 22.26ft at 0.03ft MD (0.03 TVD, 0.00 N, 0.00 E)									
- Polygon									
Wells Ranch	0.00	0.00	6,523.33	-211.90	-4,883.95	1,413,472.45	3,313,392.21	40° 27' 46.512 N	104° 22' 25.248 W
- survey misses target center by 24.81ft at 11026.86ft MD (6499.41 TVD, -205.33 N, -4883.38 E)									
- Point									

North Reference Sheet for Sec. 29-T6N-R62W - Wells Ranch AE30-68HN

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

Vertical Depths are relative to KB @ 4795.00ft (H&P 315). Northing and Easting are relative to Wells Ranch AE30-68HN

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: 0.99996371

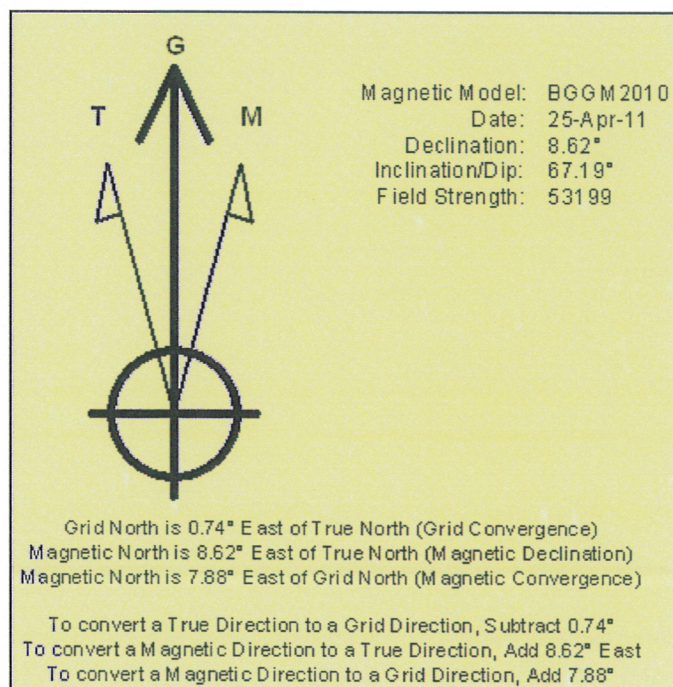
Grid Coordinates of Well: 1,413,684.34 ft N, 3,318,275.99 ft E

Geographical Coordinates of Well: 40° 27' 47.99" N, 104° 21' 22.03" W

Grid Convergence at Surface is: 0.74°

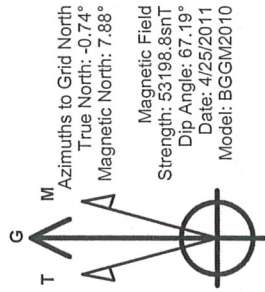
Based upon Minimum Curvature type calculations, at a Measured Depth of 11,055.00ft
the Bottom Hole Displacement is 4,915.67ft in the Direction of 267.56° (Grid).

Magnetic Convergence at surface is: -7.88° (25 April 2011, , BGGM2010)



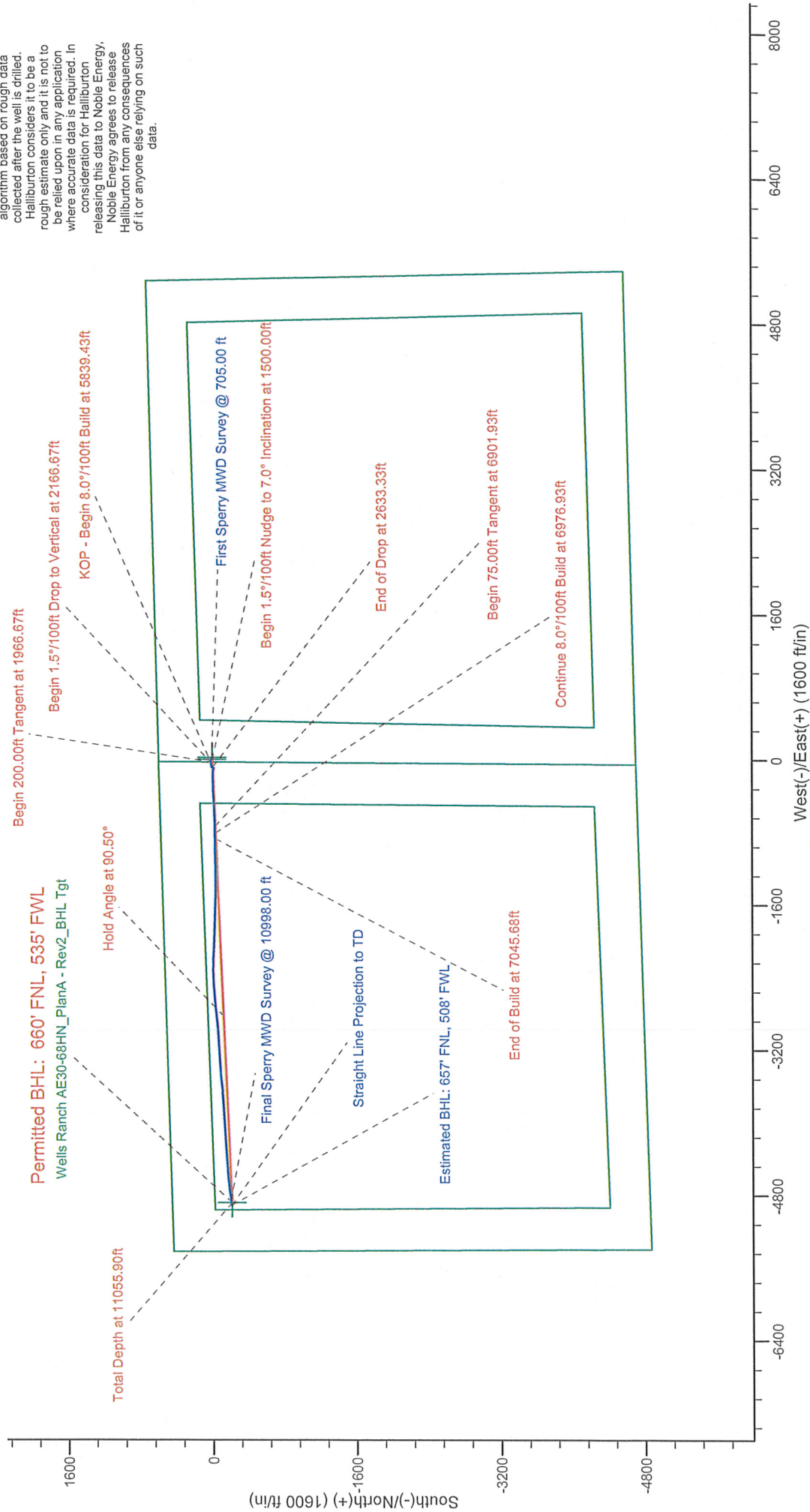
Project: Weld County, CO (NAD 83)
 Site: Sec. 29-T6N-R62W
 Well: Wells Ranch AE30-68HN

Noble Energy



LEGEND

- Wells Ranch AE30-68HN, Plan A, Plan A - Rev 2 Proposal V0
- MWD Survey

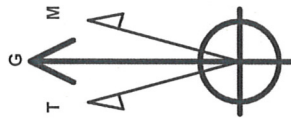


Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch AE30-68HN well located at Weld County, CO. At the conclusion of the job Halliburton performed a final survey on the well. Noble Energy has requested that Halliburton provide 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.

Project: Weld County, CO (NAD 83)
Site: Sec. 29-T6N-R62W
Well: Wells Ranch AE30-68HN

Noble Energy

HALLIBURTON
Sperry Drilling



Azimuths to Grid North
True North: -0.74°
Magnetic North: 7.88°
Magnetic Field
Strength: 53198.8snT
Dip Angle: 67.19°
Date: 4/25/2011
Model: BGGM2010

LEGEND

- Wells Ranch AE30-68HN, Plan A, Plan A - Rev 2 Proposal V0
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch AE30-68HN 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.

