

Noble Energy

Weld County, CO (NAD 83)

Sec. 16-T6N-R62W (Degenhart 16 PAD)

Degenhart USX AE17-63HN - A2

Design: MWD Surveys

Sperry Drilling Services

Final Survey Report

31 October, 2011

Well Coordinates: 1,420,974.17 N, 3,323,559.40 E (40° 28' 59.34" N, 104° 20' 12.44" W)

Ground Level: 4,913.00 ft

Local Coordinate Origin: Centered on Well Degenhart USX AE17-63HN - Slot

Viewing Datum: KB @ 4937.00ft (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

Survey Report for Degenhart USX AE17-63HN - 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
797.00	2.15	194.01	796.81	-14.51	-3.62	3.80	0.27
First Sperry MWD Survey @ 797.00 ft							
888.00	2.02	197.48	887.75	-17.69	-4.51	4.73	0.20
980.00	0.92	268.98	979.73	-19.25	-5.74	5.98	2.10
1,071.00	1.38	292.94	1,070.71	-18.84	-7.48	7.71	0.72
1,161.00	1.17	275.83	1,160.69	-18.32	-9.39	9.62	0.48
1,255.00	1.06	279.01	1,254.67	-18.09	-11.21	11.43	0.13
1,444.00	0.60	280.37	1,443.65	-17.64	-13.91	14.12	0.24
1,538.00	0.54	284.88	1,537.64	-17.44	-14.82	15.03	0.08
1,727.00	0.80	277.19	1,726.63	-17.04	-16.99	17.20	0.15
1,916.00	1.35	289.75	1,915.60	-16.12	-20.39	20.59	0.31
2,011.00	3.54	283.20	2,010.51	-15.08	-24.30	24.48	2.32
2,106.00	5.34	278.68	2,105.22	-13.74	-31.53	31.69	1.93
2,200.00	4.72	278.66	2,198.85	-12.50	-39.67	39.82	0.66
2,299.00	4.95	256.32	2,297.51	-12.89	-47.85	48.01	1.90
2,394.00	7.03	260.74	2,391.99	-14.80	-57.57	57.75	2.24
2,490.00	8.06	270.96	2,487.16	-15.63	-70.10	70.29	1.76
2,585.00	7.12	266.96	2,581.33	-15.83	-82.64	82.83	1.13
2,681.00	6.60	267.19	2,676.64	-16.42	-94.09	94.29	0.54
2,777.00	4.23	281.27	2,772.21	-16.00	-103.08	103.26	2.81
2,872.00	1.88	281.48	2,867.07	-15.00	-108.04	108.22	2.47
2,968.00	0.16	153.76	2,963.05	-14.81	-109.52	109.70	2.06
3,063.00	0.29	152.00	3,058.05	-15.14	-109.35	109.53	0.14
3,159.00	0.23	201.86	3,154.05	-15.53	-109.31	109.49	0.24
3,255.00	0.66	211.80	3,250.04	-16.18	-109.67	109.86	0.45
3,541.00	1.01	204.41	3,536.01	-19.88	-111.58	111.82	0.13
3,636.00	1.04	79.56	3,631.01	-20.48	-111.08	111.32	1.91
3,922.00	2.07	68.57	3,916.90	-18.12	-103.72	103.93	0.37
4,209.00	1.65	91.88	4,203.75	-16.37	-94.77	94.96	0.30
4,305.00	1.61	107.18	4,299.71	-16.81	-92.10	92.29	0.45
4,401.00	0.22	212.90	4,395.70	-17.36	-90.91	91.11	1.75
4,689.00	1.73	158.32	4,683.65	-21.87	-89.60	89.86	0.56
4,975.00	4.29	165.26	4,969.23	-36.23	-85.28	85.72	0.90
5,071.00	3.04	179.55	5,065.04	-42.25	-84.35	84.86	1.60
5,166.00	1.39	227.72	5,159.97	-45.54	-85.18	85.74	2.48
5,262.00	1.06	309.41	5,255.95	-45.76	-86.73	87.29	1.69
5,359.00	1.10	301.68	5,352.94	-44.70	-88.22	88.76	0.16
5,645.00	1.05	295.90	5,638.89	-42.11	-92.91	93.42	0.04
5,860.00	1.43	284.61	5,853.84	-40.58	-97.28	97.77	0.21
5,921.00	1.32	282.29	5,914.82	-40.24	-98.70	99.19	0.20
6,001.00	4.02	272.00	5,994.73	-39.94	-102.40	102.89	3.41
6,032.00	6.72	271.92	6,025.59	-39.84	-105.30	105.78	8.71
6,080.00	10.28	274.15	6,073.05	-39.44	-112.38	112.86	7.45
6,128.00	13.07	271.01	6,120.05	-39.03	-122.09	122.55	5.96
6,176.00	16.25	269.58	6,166.49	-38.99	-134.23	134.70	6.67
6,223.00	19.39	267.83	6,211.23	-39.33	-148.61	149.08	6.78
6,271.00	23.28	270.23	6,255.93	-39.59	-166.06	166.53	8.30
6,319.00	27.33	271.61	6,299.31	-39.25	-186.57	187.04	8.53
6,367.00	31.42	270.71	6,341.13	-38.78	-210.10	210.56	8.57

Survey Report for Degenhart USX AE17-63HN - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6,415.00	35.84	269.96	6,381.09	-38.64	-236.68	237.14	9.25
6,463.00	41.09	270.38	6,418.66	-38.54	-266.53	266.98	10.95
6,510.00	45.52	272.40	6,452.86	-37.74	-298.74	299.18	9.87
6,558.00	50.94	273.15	6,484.82	-35.99	-334.49	334.90	11.35
6,606.00	55.10	272.69	6,513.69	-34.05	-372.77	373.16	8.70
6,654.00	57.23	272.30	6,540.41	-32.31	-412.60	412.97	4.49
6,702.00	58.25	271.72	6,566.03	-30.89	-453.17	453.51	2.36
6,750.00	61.41	271.86	6,590.15	-29.59	-494.64	494.97	6.59
6,797.00	64.26	271.60	6,611.61	-28.33	-536.43	536.74	6.08
6,845.00	66.12	271.79	6,631.75	-27.04	-579.98	580.27	3.89
6,893.00	70.57	271.61	6,649.46	-25.72	-624.56	624.83	9.28
6,941.00	74.48	271.85	6,663.87	-24.34	-670.32	670.57	8.16
6,989.00	79.77	271.44	6,674.56	-23.00	-717.07	717.30	11.05
7,065.00	84.54	270.03	6,684.93	-22.04	-792.33	792.54	6.54
7,104.00	84.92	269.71	6,688.51	-22.12	-831.17	831.38	1.27
7,199.00	86.84	269.99	6,695.34	-22.37	-925.92	926.12	2.04
7,295.00	90.93	271.23	6,697.21	-21.35	-1,021.87	1,022.06	4.45
7,391.00	92.29	271.42	6,694.51	-19.13	-1,117.81	1,117.96	1.43
7,487.00	90.68	269.17	6,692.02	-18.64	-1,213.76	1,213.90	2.88
7,582.00	87.71	266.73	6,693.36	-22.03	-1,308.68	1,308.85	4.05
7,677.00	89.26	266.39	6,695.87	-27.73	-1,403.47	1,403.70	1.67
7,773.00	90.43	264.97	6,696.13	-34.96	-1,499.19	1,499.51	1.92
7,869.00	90.93	267.64	6,694.99	-41.15	-1,594.98	1,595.36	2.83
7,964.00	86.66	265.65	6,696.99	-46.70	-1,689.77	1,690.21	4.96
8,060.00	86.91	267.04	6,702.37	-52.81	-1,785.42	1,785.93	1.47
8,155.00	91.05	268.41	6,704.06	-56.58	-1,880.30	1,880.86	4.59
8,251.00	91.11	268.53	6,702.25	-59.15	-1,976.25	1,976.83	0.14
8,347.00	89.69	269.72	6,701.58	-60.61	-2,072.24	2,072.82	1.93
8,442.00	90.80	271.06	6,701.17	-59.97	-2,167.23	2,167.80	1.83
8,538.00	90.43	271.20	6,700.14	-58.07	-2,263.20	2,263.75	0.41
8,634.00	88.64	271.59	6,700.92	-55.74	-2,359.17	2,359.67	1.91
8,730.00	89.81	270.79	6,702.22	-53.74	-2,455.14	2,455.61	1.48
8,825.00	88.89	271.27	6,703.30	-52.03	-2,550.11	2,550.56	1.09
8,921.00	84.35	266.69	6,708.96	-53.73	-2,645.88	2,646.34	6.71
9,017.00	87.03	264.46	6,716.18	-61.12	-2,741.31	2,741.85	3.63
9,112.00	89.51	264.27	6,719.04	-70.44	-2,835.80	2,836.45	2.62
9,208.00	90.99	267.53	6,718.62	-77.30	-2,931.54	2,932.26	3.73
9,303.00	93.28	269.84	6,715.08	-79.48	-3,026.43	3,027.18	3.42
9,399.00	92.23	270.16	6,710.47	-79.48	-3,122.32	3,123.06	1.14
9,494.00	90.31	271.48	6,708.37	-78.12	-3,217.28	3,218.00	2.45
9,591.00	89.57	271.31	6,708.47	-75.76	-3,314.25	3,314.93	0.78
9,686.00	88.89	271.30	6,709.74	-73.60	-3,409.22	3,409.86	0.72
9,781.00	86.29	270.49	6,713.74	-72.12	-3,504.11	3,504.73	2.87
9,876.00	88.15	270.23	6,718.35	-71.52	-3,599.00	3,599.60	1.98
9,971.00	90.68	270.47	6,719.32	-70.94	-3,693.98	3,694.57	2.68
10,067.00	89.81	269.76	6,718.90	-70.75	-3,789.98	3,790.56	1.17
10,163.00	90.62	268.72	6,718.54	-72.02	-3,885.97	3,886.56	1.37
10,258.00	92.97	268.44	6,715.57	-74.37	-3,980.88	3,981.50	2.49
10,354.00	91.24	268.86	6,712.04	-76.63	-4,076.79	4,077.42	1.85
10,449.00	90.25	270.58	6,710.81	-77.10	-4,171.78	4,172.41	2.09
10,546.00	88.08	269.66	6,712.22	-76.89	-4,268.76	4,269.38	2.43

Survey Report for Degenhart USX AE17-63HN - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
10,641.00	89.32	269.26	6,714.38	-77.79	-4,363.73	4,364.35	1.37
10,737.00	91.67	268.86	6,713.55	-79.36	-4,459.70	4,460.34	2.48
10,833.00	90.68	270.57	6,711.58	-79.84	-4,555.68	4,556.31	2.06
10,928.00	90.93	270.81	6,710.24	-78.70	-4,650.66	4,651.28	0.36
10,993.00	91.73	270.96	6,708.73	-77.69	-4,715.64	4,716.23	1.25
Final Sperry MWD Survey @ 10993.00 ft							
11,057.00	91.73	270.96	6,706.80	-76.62	-4,779.60	4,780.18	0.00
Straight Line Projection to TD @ 11057.00 ft - Estimated BHL: 1302' FSL, 538' FWL							

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
797.00	796.81	-14.51	-3.62	First Sperry MWD Survey @ 797.00 ft
10,993.00	6,708.73	-77.69	-4,715.64	Final Sperry MWD Survey @ 10993.00 ft
11,057.00	6,706.80	-76.62	-4,779.60	Straight Line Projection to TD @ 11057.00 ft
11,057.00	6,706.80	-76.62	-4,779.60	Estimated BHL:1302' FSL, 538' FWL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	Degenhart USX AE17-63HN_PlanA - Rev1_BH L Tgt	269.30	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
797.00	11,057.00	Sperry MWD Surveys	MWD

Survey Report for Degenhart USX AE17-63HN - Sperry MWD Surveys

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
Degenhart State - survey misses target center by 29.15ft at 0.53ft MD (0.53 TVD, 0.00 N, 0.00 E) - Polygon	0.00	0.00	0.00	-29.14	0.38	1,420,945.03	3,323,559.78	40° 28' 59.052 N	104° 20' 12.444 W
Degenhart State - survey misses target center by 29.15ft at 0.53ft MD (0.53 TVD, 0.00 N, 0.00 E) - Polygon	0.00	0.00	0.00	-29.14	0.38	1,420,945.03	3,323,559.78	40° 28' 59.052 N	104° 20' 12.444 W
Degenhart State - survey misses target center by 29.15ft at 0.53ft MD (0.53 TVD, 0.00 N, 0.00 E) - Polygon	0.00	0.00	0.00	-29.14	0.38	1,420,945.03	3,323,559.78	40° 28' 59.052 N	104° 20' 12.444 W
Degenhart USX - survey misses target center by 26.20ft at 11057.00ft MD (6706.80 TVD, -76.62 N, -4779.60 E) - Point	0.00	0.00	6,725.74	-58.62	-4,781.53	1,420,915.55	3,318,778.03	40° 28' 59.376 N	104° 21' 14.328 W
Degenhart State - survey misses target center by 29.15ft at 0.53ft MD (0.53 TVD, 0.00 N, 0.00 E) - Polygon	0.00	0.00	0.00	-29.14	0.38	1,420,945.03	3,323,559.78	40° 28' 59.052 N	104° 20' 12.444 W

North Reference Sheet for Sec. 16-T6N-R62W (Degenhart 16 PAD) - Degenhart USX AE17-63HN

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

Vertical Depths are relative to KB @ 4937.00ft (H&P 315). Northing and Easting are relative to Degenhart USX AE17-63HN - 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: 0.99996505

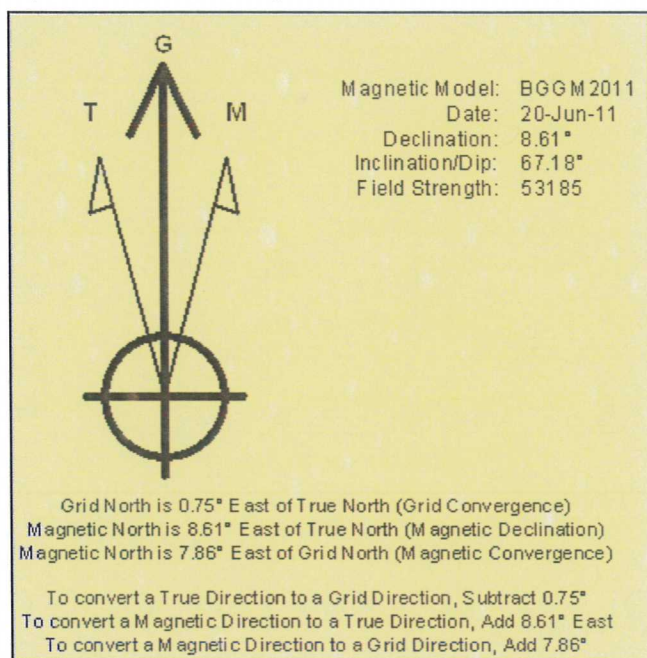
Grid Coordinates of Well: 1,420,974.17 ft N, 3,323,559.40 ft E

Geographical Coordinates of Well: 40° 28' 59.34" N, 104° 20' 12.44" W

Grid Convergence at Surface is: 0.75°

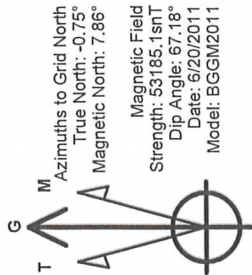
Based upon Minimum Curvature type calculations, at a Measured Depth of 11,057.00ft
the Bottom Hole Displacement is 4,780.21ft in the Direction of 269.08° (Grid).

Magnetic Convergence at surface is: -7.86° (20 June 2011, , BGGM2011)



Project: Weld County, CO (NAD 83)
 Site: Sec. 16-T6N-R62W (Degenhart 16 PAD)
 Well: Degenhart USX AE17-63HN

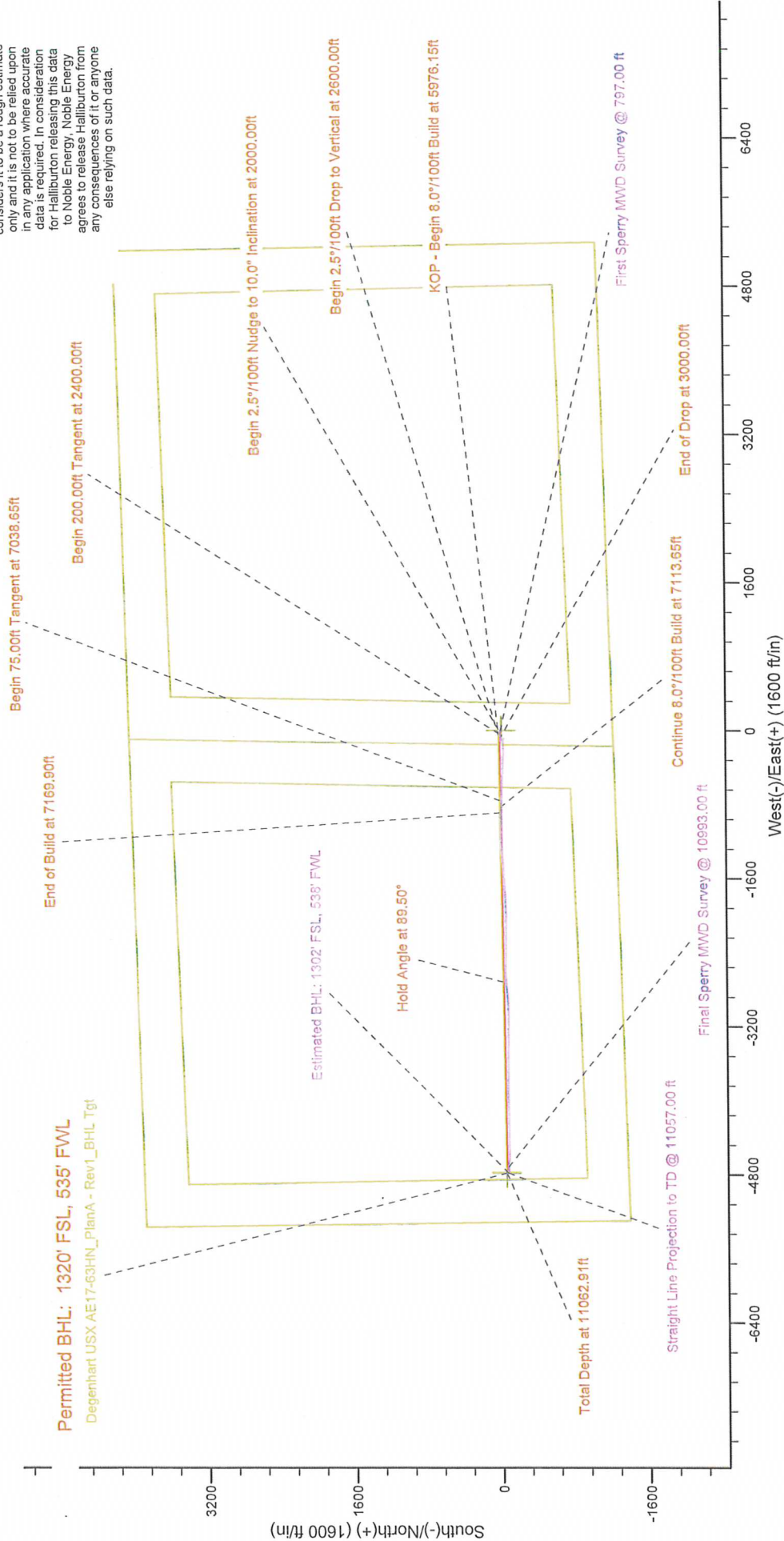
Noble Energy



LEGEND

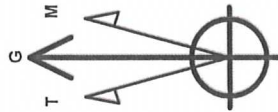
- Degenhart USX AE17-63HN, Plan A, Plan A - Rev 1 V0
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Degenhart USX AE17-63HN 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. 16-T6N-R62W (Degenhart 16 PAD)
 Well: Degenhart USX AE17-63HN

Noble Energy



Azimuths to Grid North
 True North: -0.75°
 Magnetic North: 7.86°
 Magnetic Field
 Strength: 53185.1nT
 Dip Angle: 67.18°
 Date: 6/20/2011
 Model: BGGM2011

LEGEND

- Degenhart USX AE17-63HN, Plan A, Plan A - Rev 1 VO
- MWD Survey

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