

Noble Energy

Weld County, CO (NAD 83)

Sec. 22-T7N-R64W (Furrow 22 PAD)

Furrow USX AB16-62-1HNL

Design: MWD Surveys

Sperry Drilling Services

Final Survey Report

06 May, 2013

Well Coordinates: 1,450,360.54 N, 3,270,253.85 E (40° 33' 56.05" N, 104° 31' 38.10" W)

Ground Level: 4,830.00 ft

Local Coordinate Origin: Centered on Well Furrow USX AB16-62-1HNL - Slot A

Viewing Datum: KB=24' @ 4854.00ft (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 Furrow USX AB16-62-1HNL - 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
704.00	0.00	0.00	704.00	0.00	0.00	0.00	0.00
Surface Casing Assumed Vertical at 704.00 ft. MD							
809.00	0.57	31.45	809.00	0.45	0.27	-0.26	0.54
First Sperry MWD Survey @ 809.00 ft. MD							
1,087.00	0.98	47.91	1,086.97	3.22	2.76	-2.65	0.17
1,366.00	1.19	36.77	1,365.92	7.14	6.26	-6.02	0.11
1,650.00	0.89	176.34	1,649.90	7.30	8.17	-7.92	0.69
1,935.00	1.09	188.33	1,934.86	2.41	7.92	-7.83	0.10
2,219.00	0.94	230.41	2,218.82	-1.75	5.73	-5.79	0.26
2,504.00	0.64	285.55	2,503.80	-2.81	2.40	-2.49	0.27
2,788.00	0.22	303.94	2,787.79	-2.08	0.42	-0.48	0.15
3,073.00	0.28	279.69	3,072.78	-1.66	-0.72	0.67	0.04
3,357.00	0.56	320.89	3,356.78	-0.47	-2.28	2.27	0.14
3,642.00	1.16	257.34	3,641.75	-0.02	-5.98	5.97	0.36
3,926.00	0.81	280.86	3,925.71	-0.27	-10.75	10.74	0.19
4,211.00	0.85	11.94	4,210.69	2.18	-12.29	12.36	0.42
4,496.00	0.87	79.81	4,495.66	4.63	-9.73	9.88	0.34
4,686.00	1.03	26.72	4,685.64	6.41	-7.54	7.75	0.45
4,781.00	2.35	37.85	4,780.60	8.71	-5.96	6.25	1.43
4,876.00	4.54	12.29	4,875.42	13.92	-3.97	4.42	2.76
4,971.00	6.46	8.52	4,969.98	22.88	-2.37	3.13	2.06
5,065.00	6.24	7.50	5,063.41	33.18	-0.92	2.02	0.26
5,160.00	7.36	5.17	5,157.74	44.36	0.30	1.17	1.21
5,255.00	8.34	8.46	5,251.85	57.23	1.86	0.03	1.13
5,350.00	8.70	8.90	5,345.80	71.15	3.99	-1.63	0.39
5,445.00	8.72	5.53	5,439.70	85.41	5.79	-2.96	0.54
5,540.00	9.23	353.70	5,533.55	100.15	5.65	-2.33	2.01
5,634.00	9.89	353.04	5,626.24	115.66	3.84	-0.01	0.71
5,729.00	10.01	350.63	5,719.81	131.91	1.51	2.85	0.46
5,824.00	11.17	351.36	5,813.19	149.15	-1.22	6.15	1.23
5,919.00	11.94	358.02	5,906.27	168.07	-2.94	8.50	1.62
6,014.00	12.54	357.44	5,999.11	188.19	-3.74	9.96	0.64
6,108.00	11.49	356.42	6,091.05	207.73	-4.78	11.65	1.14
6,215.00	11.12	356.10	6,195.97	228.66	-6.14	13.71	0.35
6,296.00	13.66	349.46	6,275.08	245.86	-8.43	16.56	3.59
6,344.00	17.00	341.79	6,321.38	258.11	-11.66	20.19	8.13
6,391.00	19.81	336.77	6,365.97	271.95	-16.95	25.94	6.86
6,439.00	21.81	333.43	6,410.84	287.41	-24.14	33.64	4.84
6,485.00	25.14	331.73	6,453.02	303.66	-32.60	42.63	7.39
6,533.00	29.25	326.90	6,495.71	322.47	-43.84	54.48	9.71
6,580.00	30.52	316.85	6,536.49	340.81	-58.28	69.53	10.98
6,628.00	33.09	308.61	6,577.30	357.89	-76.86	88.67	10.50
6,675.00	35.49	307.90	6,616.13	374.28	-97.66	109.99	5.18
6,723.00	38.18	302.75	6,654.55	390.87	-121.14	134.01	8.53
6,770.00	41.80	297.85	6,690.56	406.06	-147.22	160.58	10.20
6,818.00	46.45	293.75	6,725.02	420.55	-177.31	191.13	11.36
6,865.00	50.46	289.72	6,756.19	433.53	-209.98	224.21	10.67
6,913.00	53.31	286.32	6,785.82	445.19	-245.89	260.49	8.14
6,959.00	56.75	282.52	6,812.19	454.54	-282.38	297.27	10.09

Design Report for Furrow USX AB16-62-1HNL - MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
7,007.00	60.30	281.08	6,837.24	462.90	-322.45	337.59	7.83
7,054.00	65.18	279.58	6,858.77	470.38	-363.54	378.91	10.76
7,102.00	70.04	277.40	6,877.05	476.92	-407.42	422.98	10.96
7,149.00	73.80	276.40	6,891.63	482.28	-451.77	467.48	8.25
7,197.00	76.20	275.55	6,904.05	487.10	-497.88	513.73	5.28
7,244.00	79.33	275.45	6,914.01	491.50	-543.59	559.56	6.66
7,298.00	82.60	274.32	6,922.49	496.04	-596.72	612.81	6.40
7,340.00	84.34	273.39	6,927.27	498.85	-638.35	654.51	4.68
Estimated 7" Casing Point: 2279' FNL, 971' FEL (Not a Survey Station)							
7,407.00	87.11	271.92	6,932.26	501.94	-705.09	721.31	4.68
7,502.00	88.12	270.70	6,936.22	504.11	-799.98	816.22	1.67
7,596.00	89.14	269.32	6,938.47	504.13	-893.95	910.14	1.83
7,691.00	89.17	267.85	6,939.87	501.78	-988.90	1,004.97	1.55
7,786.00	91.35	267.77	6,939.44	498.15	-1,083.83	1,099.72	2.30
7,881.00	91.97	266.85	6,936.68	493.70	-1,178.68	1,194.38	1.17
7,976.00	92.28	267.93	6,933.16	489.37	-1,273.52	1,289.02	1.18
8,071.00	91.08	269.60	6,930.38	487.33	-1,368.45	1,383.83	2.16
8,166.00	89.54	268.37	6,929.86	485.64	-1,463.43	1,478.70	2.07
8,261.00	89.94	267.97	6,930.29	482.61	-1,558.38	1,573.50	0.60
8,356.00	90.77	268.86	6,929.70	479.98	-1,653.34	1,668.32	1.28
8,451.00	91.17	269.55	6,928.10	478.66	-1,748.32	1,763.20	0.84
8,546.00	90.55	269.91	6,926.67	478.22	-1,843.30	1,858.12	0.75
8,641.00	90.46	270.42	6,925.83	478.49	-1,938.30	1,953.07	0.55
8,736.00	89.04	269.24	6,926.25	478.21	-2,033.29	2,048.01	1.94
8,831.00	88.12	269.21	6,928.60	476.92	-2,128.25	2,142.87	0.97
8,926.00	89.04	269.38	6,930.96	475.76	-2,223.22	2,237.74	0.98
9,020.00	89.39	268.79	6,932.24	474.25	-2,317.20	2,331.62	0.73
9,115.00	90.00	268.95	6,932.75	472.38	-2,412.17	2,426.49	0.66
9,210.00	89.97	269.20	6,932.77	470.85	-2,507.16	2,521.37	0.27
9,305.00	89.20	267.55	6,933.46	468.15	-2,602.12	2,616.19	1.92
9,400.00	90.22	267.76	6,933.94	464.27	-2,697.04	2,710.92	1.10
9,495.00	90.80	267.98	6,933.10	460.74	-2,791.97	2,805.68	0.65
9,590.00	90.71	267.39	6,931.85	456.90	-2,886.88	2,900.42	0.63
9,685.00	90.19	267.92	6,931.10	453.01	-2,981.80	2,995.16	0.78
9,780.00	89.23	268.68	6,931.58	450.19	-3,076.75	3,089.97	1.29
9,875.00	89.29	268.14	6,932.81	447.56	-3,171.71	3,184.78	0.57
9,970.00	90.31	268.68	6,933.14	444.92	-3,266.67	3,279.60	1.21
10,065.00	90.56	269.42	6,932.42	443.35	-3,361.65	3,374.48	0.82
10,160.00	90.06	269.74	6,931.90	442.65	-3,456.65	3,469.40	0.62
10,252.00	88.40	269.28	6,933.14	441.86	-3,548.63	3,561.31	1.87
10,345.00	89.75	269.39	6,934.64	440.78	-3,641.61	3,654.20	1.46
10,438.00	89.72	269.58	6,935.07	439.95	-3,734.61	3,747.12	0.21
10,531.00	90.03	269.51	6,935.27	439.21	-3,827.60	3,840.04	0.34
10,624.00	90.62	269.97	6,934.75	438.79	-3,920.60	3,932.97	0.80
10,716.00	89.75	269.60	6,934.45	438.44	-4,012.60	4,024.91	1.03
10,808.00	89.72	267.23	6,934.87	435.90	-4,104.56	4,116.73	2.58
10,901.00	89.78	266.85	6,935.28	431.10	-4,197.43	4,209.40	0.41
10,994.00	90.00	266.92	6,935.46	426.04	-4,290.29	4,302.04	0.25
11,086.00	90.77	269.53	6,934.84	423.19	-4,382.24	4,393.84	2.96
11,180.00	90.59	270.48	6,933.73	423.20	-4,476.23	4,487.78	1.03
11,273.00	89.14	269.82	6,933.94	423.44	-4,569.23	4,580.74	1.71

Design Report for Furrow USX AB16-62-1HNL - MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
11,365.00	88.86	269.64	6,935.55	423.01	-4,661.21	4,672.66	0.36
11,458.00	89.72	268.25	6,936.70	421.30	-4,754.19	4,765.52	1.76
11,550.00	90.56	267.73	6,936.48	418.07	-4,846.13	4,857.31	1.07
11,643.00	90.22	267.82	6,935.84	414.46	-4,939.05	4,950.07	0.38
11,736.00	89.47	268.59	6,936.10	411.55	-5,032.01	5,042.87	1.16
11,831.00	90.09	268.61	6,936.46	409.23	-5,126.98	5,137.71	0.65
11,926.00	90.59	268.05	6,935.90	406.46	-5,221.94	5,232.53	0.79
12,020.00	91.91	268.62	6,933.85	403.73	-5,315.87	5,326.32	1.53
12,115.00	91.70	268.10	6,930.85	401.01	-5,410.78	5,421.09	0.59
12,210.00	89.97	264.95	6,929.47	395.25	-5,505.58	5,515.65	3.78
12,305.00	89.78	266.56	6,929.68	388.22	-5,600.32	5,610.10	1.71
12,400.00	91.17	268.57	6,928.89	384.19	-5,695.22	5,704.82	2.57
12,495.00	90.71	268.42	6,927.33	381.69	-5,790.18	5,799.64	0.51
12,590.00	90.52	269.49	6,926.31	379.96	-5,885.16	5,894.51	1.14
12,685.00	88.89	269.08	6,926.80	378.77	-5,980.14	5,989.40	1.77
12,780.00	89.11	269.69	6,928.46	377.75	-6,075.12	6,084.30	0.68
12,875.00	89.82	270.13	6,929.35	377.60	-6,170.12	6,179.23	0.88
12,970.00	90.22	270.60	6,929.31	378.21	-6,265.12	6,274.20	0.65
13,064.00	89.69	270.24	6,929.39	378.90	-6,359.11	6,368.17	0.68
13,159.00	89.91	271.04	6,929.72	379.96	-6,454.10	6,463.14	0.87
13,254.00	90.00	270.11	6,929.79	380.91	-6,549.10	6,558.12	0.98
13,349.00	90.06	268.40	6,929.74	379.68	-6,644.09	6,653.01	1.80
13,444.00	90.71	268.63	6,929.10	377.22	-6,739.05	6,747.85	0.73
13,539.00	90.09	269.92	6,928.44	376.01	-6,834.04	6,842.74	1.51
13,634.00	91.14	268.86	6,927.42	375.00	-6,929.03	6,937.64	1.57
13,728.00	89.35	269.03	6,927.02	373.27	-7,023.01	7,031.51	1.91
13,823.00	89.08	268.19	6,928.32	370.97	-7,117.97	7,126.35	0.93
13,918.00	87.65	267.51	6,931.03	367.41	-7,212.86	7,221.07	1.67
14,013.00	88.77	267.34	6,934.00	363.14	-7,307.72	7,315.73	1.19
14,108.00	89.57	266.68	6,935.37	358.19	-7,402.58	7,410.37	1.09
14,203.00	90.09	267.91	6,935.66	353.70	-7,497.47	7,505.07	1.41
14,298.00	89.48	268.87	6,936.01	351.03	-7,592.43	7,599.89	1.20
14,393.00	88.83	269.23	6,937.41	349.46	-7,687.40	7,694.76	0.78
14,488.00	90.22	268.75	6,938.20	347.78	-7,782.38	7,789.63	1.55
14,583.00	89.88	269.36	6,938.12	346.22	-7,877.37	7,884.51	0.74
14,678.00	89.85	269.39	6,938.34	345.18	-7,972.36	7,979.42	0.04
14,773.00	91.39	268.67	6,937.31	343.57	-8,067.34	8,074.29	1.79
14,868.00	89.66	268.86	6,936.44	341.53	-8,162.31	8,169.14	1.83
14,962.00	90.25	267.71	6,936.52	338.71	-8,256.27	8,262.95	1.38
15,057.00	91.17	267.62	6,935.34	334.84	-8,351.18	8,357.69	0.97
15,152.00	91.60	269.21	6,933.04	332.22	-8,446.11	8,452.48	1.73
15,247.00	90.92	269.65	6,930.96	331.27	-8,541.08	8,547.37	0.85
15,342.00	89.63	269.05	6,930.50	330.19	-8,636.07	8,642.27	1.50
15,437.00	89.85	268.44	6,930.93	328.11	-8,731.05	8,737.13	0.68
15,532.00	92.22	268.61	6,929.21	325.67	-8,826.00	8,831.94	2.50
15,626.00	90.68	269.07	6,926.84	323.76	-8,919.94	8,925.77	1.71
15,721.00	90.12	268.91	6,926.17	322.09	-9,014.93	9,020.65	0.61
15,816.00	90.34	269.15	6,925.79	320.48	-9,109.91	9,115.53	0.34
15,911.00	90.09	269.14	6,925.44	319.06	-9,204.90	9,210.42	0.26
16,006.00	89.32	271.80	6,925.92	319.84	-9,299.89	9,305.38	2.91
16,101.00	88.12	270.80	6,928.05	322.00	-9,394.84	9,400.35	1.64

Design Report for Furrow USX AB16-62-1HNL - MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Final Sperry MWD Survey @ 16101.00 ft. MD							
16,367.00	91.84	270.00	6,928.14	323.86	-9,660.78	9,666.21	1.43
Estimated BHL: 2256' FNL, 539' FWL :: Straight Line Projection to TD @ 16367.00 ft. MD							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
704.00	704.00	0.00	0.00	Surface Casing Assumed Vertical at 704.00 ft. MD
809.00	809.00	0.45	0.27	First Sperry MWD Survey @ 809.00 ft. MD
7,340.00	6,927.27	498.85	-638.35	Estimated 7" Casing Point: 2279' FNL, 971' FEL (Not a Survey Station)
7,340.00	6,927.27	498.85	-638.35	Estimated 7" Casing Point: 2279' FNL, 971' FEL (Not a Survey Station)
16,101.00	6,928.05	322.00	-9,394.84	Final Sperry MWD Survey @ 16101.00 ft. MD
16,367.00	6,928.14	323.86	-9,660.78	Estimated BHL: 2256' FNL, 539' FWL :: Straight Line Projection to TD @ 16367.00 ft. MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Furrow USX AB16-62-1HNL_PlanA - Rev0_ BHL Tgt	271.90	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
704.00	7,340.00	MWD Surveys	MWD
7,340.00	16,367.00	MWD Surveys	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,340.00	6,927.27	7" Casing PT	7	8-3/4

Design Report for Furrow USX AB16-62-1HNL - MWD Surveys

Targets

Target Name - hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shane									
Furrow USX	0.00	0.00	0.00	0.00	0.00	1,450,360.54	3,270,253.85	40° 33' 56.052 N	104° 31' 38.100 W
- actual wellpath hits target center									
- Polygon									
Point 1			-5,374.00	560.00		1,450,920.53	3,264,880.00		
Point 2			-7,552.00	451.00		1,450,811.53	3,262,702.06		
Point 3			-9,734.00	376.00		1,450,736.53	3,260,520.12		
Point 4			-9,775.00	2,564.00		1,452,924.47	3,260,479.13		
Point 5			-7,616.00	2,643.00		1,453,003.47	3,262,638.07		
Point 6			-5,463.00	2,718.00		1,453,078.46	3,264,791.00		
Point 7			-5,374.00	560.00		1,450,920.53	3,264,880.00		
Furrow USX	0.00	0.00	0.00	0.00	0.00	1,450,360.54	3,270,253.85	40° 33' 56.052 N	104° 31' 38.100 W
- actual wellpath hits target center									
- Polygon									
Point 1			-154.00	2,791.00		1,453,151.46	3,270,099.86		
Point 2			-123.00	620.00		1,450,980.52	3,270,130.85		
Point 3			-4,454.00	560.00		1,450,920.53	3,265,799.98		
Point 4			-4,543.00	2,718.00		1,453,078.46	3,265,710.98		
Point 5			-154.00	2,791.00		1,453,151.46	3,270,099.86		
Furrow USX	0.00	0.00	0.00	0.00	0.00	1,450,360.54	3,270,253.85	40° 33' 56.052 N	104° 31' 38.100 W
- actual wellpath hits target center									
- Polygon									
Point 1			337.00	160.00		1,450,520.54	3,270,590.84		
Point 2			-4,914.00	100.00		1,450,460.54	3,265,339.99		
Point 3			-5,003.00	2,718.00		1,453,078.46	3,265,250.99		
Point 4			306.00	2,791.00		1,453,151.46	3,270,559.84		
Point 5			337.00	160.00		1,450,520.54	3,270,590.84		
Furrow USX	0.00	0.00	0.00	0.00	0.00	1,450,360.54	3,270,253.85	40° 33' 56.052 N	104° 31' 38.100 W
- actual wellpath hits target center									
- Polygon									
Point 1			-4,914.00	100.00		1,450,460.54	3,265,339.99		
Point 2			-4,935.00	-2,571.00		1,447,789.61	3,265,318.99		
Point 3			-7,552.00	-2,599.00		1,447,761.61	3,262,702.06		
Point 4			-10,189.00	-2,627.00		1,447,733.62	3,260,065.14		
Point 5			-10,194.00	-84.00		1,450,276.54	3,260,060.14		
Point 6			-7,552.00	-9.00		1,450,351.54	3,262,702.06		
Point 7			-4,914.00	100.00		1,450,460.54	3,265,339.99		
Furrow USX	0.00	0.00	0.00	0.00	0.00	1,450,360.54	3,270,253.85	40° 33' 56.052 N	104° 31' 38.100 W
- actual wellpath hits target center									
- Polygon									
Point 1			337.00	160.00		1,450,520.54	3,270,590.84		
Point 2			338.00	-2,477.00		1,447,883.61	3,270,591.84		
Point 3			-4,935.00	-2,571.00		1,447,789.61	3,265,318.99		
Point 4			-4,914.00	100.00		1,450,460.54	3,265,339.99		
Point 5			337.00	160.00		1,450,520.54	3,270,590.84		
Furrow USX	0.00	0.00	0.00	0.00	0.00	1,450,360.54	3,270,253.85	40° 33' 56.052 N	104° 31' 38.100 W
- actual wellpath hits target center									
- Polygon									
Point 1			-5,374.00	-360.00		1,450,000.55	3,264,880.00		
Point 2			-5,395.00	-2,571.00		1,447,789.61	3,264,859.00		
Point 3			-7,552.00	-2,599.00		1,447,761.61	3,262,702.06		
Point 4			-9,729.00	-2,627.00		1,447,733.62	3,260,525.12		
Point 5			-9,734.00	-544.00		1,449,816.56	3,260,520.12		
Point 6			-7,552.00	-469.00		1,449,891.55	3,262,702.06		
Point 7			-5,374.00	-360.00		1,450,000.55	3,264,880.00		
Furrow USX	0.00	0.00	6,932.00	320.00	-9,663.72	1,450,680.53	3,260,590.40	40° 34' 0.243 N	104° 33' 43.264 W
- actual wellpath misses target center by 6.20ft at 16367.00ft MD (6928.14 TVD, 323.86 N, -9660.78 E)									
- Point									
Furrow USX			6,932.00	504.97	-669.98	1,450,865.50	3,269,583.89	40° 34' 1.114 N	104° 31' 46.709 W
- actual wellpath misses target center by 4.84ft at 7372.14ft MD (6930.07 TVD, 500.54 N, -670.33 E)									
- Rectangle (sides W85.00 H16.00 D8,995.64)									

Design Report for Furrow USX AB16-62-1HNL - MWD Surveys

Furrow USX	0.00	0.00	6,250.00	229.11	0.00	1,450,589.64	3,270,253.85	40° 33' 58.316 N	104° 31' 38.067 W
- actual wellpath misses target center by 12.96ft at 6267.70ft MD (6247.53 TVD, 239.49 N, -7.35 E)									
- Circle (radius 35.00)									
Furrow USX	0.00	0.00	0.00	0.00	0.00	1,450,360.54	3,270,253.85	40° 33' 56.052 N	104° 31' 38.100 W
- actual wellpath hits target center									
- Polygon									
Point 1				-123.00	-300.00	1,450,060.55	3,270,130.85		
Point 2				-122.00	-2,477.00	1,447,883.61	3,270,131.85		
Point 3				-4,475.00	-2,571.00	1,447,789.61	3,265,778.98		
Point 4				-4,454.00	-360.00	1,450,000.55	3,265,799.98		
Point 5				-123.00	-300.00	1,450,060.55	3,270,130.85		
Furrow USX	0.00	0.00	0.00	0.00	0.00	1,450,360.54	3,270,253.85	40° 33' 56.052 N	104° 31' 38.100 W
- actual wellpath hits target center									
- Polygon									
Point 1				-4,914.00	100.00	1,450,460.54	3,265,339.99		
Point 2				-7,552.00	-9.00	1,450,351.54	3,262,702.06		
Point 3				-10,194.00	-84.00	1,450,276.54	3,260,060.14		
Point 4				-10,235.00	2,564.00	1,452,924.47	3,260,019.14		
Point 5				-7,616.00	2,643.00	1,453,003.47	3,262,638.07		
Point 6				-5,003.00	2,718.00	1,453,078.46	3,265,250.99		
Point 7				-4,914.00	100.00	1,450,460.54	3,265,339.99		

North Reference Sheet for Sec. 22-T7N-R64W (Furrow 22 PAD) - Furrow USX AB16-62-1HNL

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

Vertical Depths are relative to KB=24' @ 4854.00ft (H&P 315). Northing and Easting are relative to Furrow USX AB16-62-1HNL - 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: 0.99997191

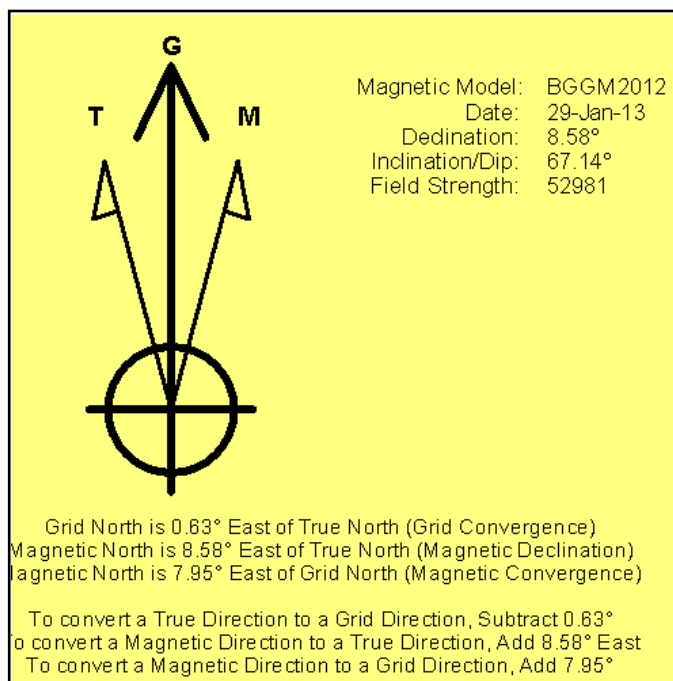
Grid Coordinates of Well: 1,450,360.54 ft N, 3,270,253.85 ft E

Geographical Coordinates of Well: 40° 33' 56.05" N, 104° 31' 38.10" W

Grid Convergence at Surface is: 0.63°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,367.00ft the Bottom Hole Displacement is 9,666.21ft in the Direction of 271.92° (Grid).

Magnetic Convergence at surface is: -7.95° (29 January 2013, , BGGM2012)

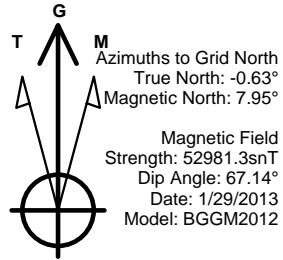


Noble Energy

Project: Weld County, CO (NAD 83)
Site: Sec. 22-T7N-R64W (Furrow 22 PAD)
Well: Furrow USX AB16-62-1HNL

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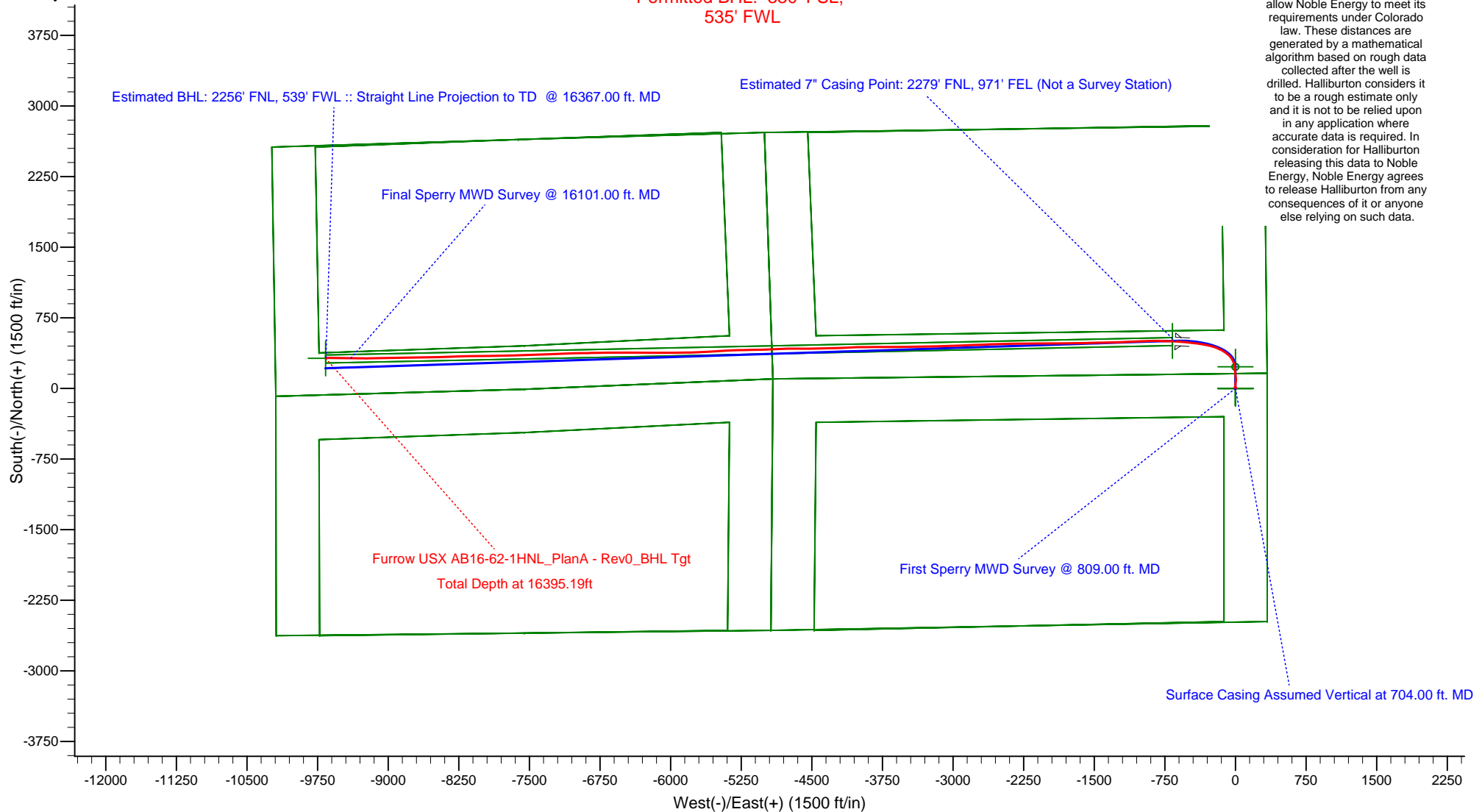
Sperry Drilling



LEGEND

- Furrow USX AB16-62-1HNL, Plan A, Plan A - Rev 0 Proposal V0
- MWD Surveys

Permitted BHL: 330' FSL,
535' FWL



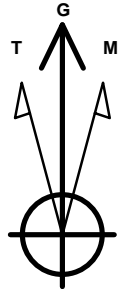
Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Furrow USX AB16-62-1HNL well located at Weld County, CO. At the conclusion of the job Halliburton performed a final survey on the well. Noble Energy has requested that Halliburton 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. 22-T7N-R64W (Furrow 22 PAD)
Well: Furrow USX AB16-62-1HNL

Noble Energy

HALLIBURTON

Sperry Drilling



Azimuths to Grid North
True North: -0.63°
Magnetic North: 7.95°

Magnetic Field
Strength: 52981.3snT
Dip Angle: 67.14°
Date: 1/29/2013
Model: BGGM2012

LEGEND

- Furrow USX AB16-62-1HNL, Plan A, Plan A - Rev 0 Proposal V0
- MWD Surveys

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Furrow USX AB16-62-1HNL 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.

