

# Noble Energy

Weld County, CO (NAD 83)

Sec. 14-T6N-R63W (Wells Ranch 16 South PAD)

Wells Ranch State USX AA16-63-1HNL

Design: MWD Survey

## Sperry Drilling Services

# Final Survey Report

12 June, 2013

Well Coordinates: 1,420,010.83 N, 3,302,484.44 E (40° 28' 52.46" N, 104° 24' 45.32" W)

Ground Level: 4,744.00 ft

Local Coordinate Origin: Centered on Well Wells Ranch State USX AA16-63-1

Viewing Datum: KB=24' @ 4768.00ft (H&P 343)

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 State USX AA16-63-1HNL - 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
670.00	0.00	0.00	670.00	0.00	0.00	0.00	0.00
<b>Surface Casing Assumed Vertical at 670.00ft</b>							
811.00	0.22	86.99	811.00	0.01	0.27	-0.27	0.16
<b>First MWD Survey</b>							
904.00	0.37	42.90	904.00	0.24	0.65	-0.65	0.28
998.00	0.72	44.26	997.99	0.89	1.27	-1.25	0.37
1,091.00	0.65	79.04	1,090.99	1.41	2.20	-2.17	0.45
1,184.00	0.09	126.82	1,183.99	1.46	2.77	-2.74	0.64
1,278.00	0.68	47.13	1,277.98	1.80	3.24	-3.21	0.71
1,372.00	0.71	16.12	1,371.98	2.74	3.81	-3.76	0.40
1,465.00	0.62	44.69	1,464.97	3.65	4.33	-4.25	0.37
1,560.00	2.33	5.90	1,559.94	5.94	4.89	-4.77	1.99
1,655.00	4.92	342.51	1,654.74	11.74	3.86	-3.63	3.09
1,750.00	5.58	338.07	1,749.34	19.91	0.91	-0.51	0.82
1,845.00	8.11	336.83	1,843.66	30.36	-3.45	4.05	2.67
1,940.00	11.30	330.73	1,937.29	44.64	-10.64	11.53	3.52
2,035.00	11.59	319.14	2,030.41	59.98	-21.44	22.62	2.44
2,130.00	13.04	321.59	2,123.23	75.60	-34.34	35.84	1.62
2,225.00	13.68	320.75	2,215.66	92.70	-48.11	49.94	0.70
2,320.00	13.09	321.64	2,308.07	109.83	-61.89	64.06	0.66
2,415.00	13.43	318.96	2,400.54	126.59	-75.81	78.31	0.74
2,510.00	13.29	323.26	2,492.97	143.66	-89.58	92.42	1.06
2,605.00	13.55	323.71	2,585.38	161.38	-102.70	105.89	0.29
2,700.00	13.49	321.10	2,677.75	178.98	-116.25	119.78	0.65
2,795.00	13.51	318.25	2,770.12	195.88	-130.60	134.47	0.70
2,890.00	12.80	318.32	2,862.63	212.02	-144.98	149.17	0.75
2,985.00	14.07	318.69	2,955.03	228.55	-159.60	164.12	1.34
3,080.00	13.85	318.83	3,047.22	245.78	-174.71	179.57	0.23
3,175.00	14.15	318.51	3,139.40	263.04	-189.89	195.08	0.33
3,270.00	13.90	316.79	3,231.57	280.06	-205.40	210.92	0.51
3,365.00	13.25	319.21	3,323.92	296.62	-220.32	226.18	0.91
3,460.00	10.87	318.65	3,416.81	311.59	-233.35	239.50	2.51
3,555.00	10.90	320.66	3,510.10	325.26	-244.97	251.38	0.40
3,650.00	12.13	322.11	3,603.19	340.08	-256.79	263.50	1.33
3,745.00	13.89	324.68	3,695.75	357.26	-269.51	276.56	1.95
3,840.00	13.14	321.81	3,788.12	375.05	-282.78	290.18	1.06
3,935.00	12.05	320.21	3,880.83	391.16	-295.81	303.52	1.20
4,030.00	9.43	312.99	3,974.16	404.09	-307.85	315.82	3.10
4,125.00	6.48	315.79	4,068.24	413.24	-317.28	325.43	3.13
4,220.00	4.69	311.28	4,162.78	419.65	-323.94	332.22	1.94
4,315.00	3.00	305.42	4,257.57	423.65	-328.88	337.24	1.82
4,410.00	2.84	304.60	4,352.44	426.43	-332.85	341.26	0.17
4,505.00	1.52	340.92	4,447.38	428.96	-335.19	343.66	1.95
4,600.00	0.82	266.23	4,542.36	430.10	-336.28	344.77	1.60
4,695.00	1.02	183.68	4,637.35	429.21	-337.02	345.49	1.29
4,790.00	0.65	186.24	4,732.34	427.83	-337.13	345.57	0.39
4,885.00	0.40	348.39	4,827.34	427.62	-337.26	345.69	1.09
4,980.00	0.31	41.50	4,922.34	428.14	-337.15	345.60	0.34
5,075.00	1.57	4.80	5,017.32	429.63	-336.87	345.35	1.40

## Design Report for Wells Ranch State USX AA16-63-1HNL - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,170.00	1.65	31.76	5,112.29	432.09	-336.04	344.57	0.79
5,265.00	2.19	63.73	5,207.24	434.06	-333.70	342.26	1.24
5,360.00	1.34	89.95	5,302.19	434.86	-330.96	339.54	1.21
5,455.00	1.26	70.92	5,397.17	435.20	-328.86	337.45	0.46
5,550.00	1.33	41.63	5,492.15	436.37	-327.14	335.75	0.69
5,645.00	1.04	13.53	5,587.13	438.03	-326.21	334.85	0.67
5,740.00	0.45	8.71	5,682.12	439.24	-325.95	334.62	0.62
5,835.00	0.56	341.92	5,777.11	440.05	-326.04	334.72	0.27
5,916.00	0.81	297.60	5,858.11	440.69	-326.67	335.36	0.70
5,926.00	0.85	343.41	5,868.11	440.79	-326.75	335.45	6.47
6,021.00	1.39	275.06	5,963.09	441.57	-328.10	336.81	1.41
6,069.00	7.02	253.81	6,010.95	440.80	-331.50	340.20	11.97
6,116.00	11.06	245.62	6,057.35	438.14	-338.37	347.01	9.00
6,164.00	12.32	244.01	6,104.36	434.00	-347.16	355.72	2.71
6,211.00	11.28	242.49	6,150.36	429.67	-355.75	364.22	2.31
6,259.00	14.86	248.61	6,197.12	425.26	-365.65	374.03	7.99
6,306.00	19.40	255.13	6,242.02	421.06	-378.81	387.11	10.47
6,354.00	24.95	259.31	6,286.46	417.13	-396.48	404.69	12.01
6,401.00	31.11	259.73	6,327.92	413.12	-418.19	426.32	13.11
6,449.00	36.03	261.81	6,367.91	408.90	-444.38	452.42	10.53
6,496.00	39.41	264.90	6,405.08	405.60	-472.93	480.90	8.24
6,544.00	41.69	265.48	6,441.55	402.99	-504.02	511.94	4.81
6,591.00	45.17	267.20	6,475.68	400.94	-536.26	544.13	7.82
6,639.00	49.03	269.13	6,508.35	399.83	-571.40	579.24	8.56
6,686.00	51.24	269.44	6,538.48	399.38	-607.47	615.29	4.73
6,734.00	53.72	268.03	6,567.71	398.54	-645.53	653.32	5.67
6,781.00	55.14	270.78	6,595.05	398.15	-683.75	691.53	5.64
6,829.00	60.43	271.54	6,620.63	398.98	-724.33	732.12	11.10
6,876.00	68.07	270.66	6,641.04	399.78	-766.63	774.42	16.34
6,924.00	75.65	268.83	6,655.97	399.56	-812.20	819.99	16.20
6,971.00	77.84	268.11	6,666.75	398.34	-857.93	865.68	4.89
7,019.00	81.08	266.91	6,675.52	396.29	-905.07	912.77	7.18
7,066.00	84.25	266.31	6,681.52	393.53	-951.60	959.24	6.86
7,106.00	86.42	266.62	6,684.78	391.07	-991.39	998.97	5.48
7,150.00	87.00	267.20	6,687.30	388.70	-1,035.25	1,042.78	1.85
<b>Estimated 7" Casing Point: 1100' FSL, 784' FEL (Not a Survey Station)</b>							
7,240.00	88.18	268.37	6,691.09	385.22	-1,125.10	1,132.54	1.85
7,335.00	87.44	268.16	6,694.72	382.35	-1,219.99	1,227.35	0.81
7,430.00	87.01	269.76	6,699.32	380.63	-1,314.86	1,322.17	1.74
7,525.00	89.48	269.87	6,702.23	380.32	-1,409.80	1,417.09	2.60
7,620.00	91.29	270.00	6,701.59	380.21	-1,504.80	1,512.06	1.91
7,715.00	90.40	269.12	6,700.19	379.48	-1,599.78	1,607.01	1.32
7,810.00	89.08	269.33	6,700.62	378.20	-1,694.77	1,701.96	1.41
7,905.00	90.18	269.67	6,701.23	377.37	-1,789.76	1,796.91	1.21
8,000.00	88.86	268.69	6,702.03	376.01	-1,884.75	1,891.85	1.73
8,095.00	90.09	268.90	6,702.90	374.01	-1,979.72	1,986.77	1.31
8,190.00	91.17	268.79	6,701.86	372.10	-2,074.69	2,081.68	1.14
8,285.00	89.85	267.76	6,701.01	369.24	-2,169.64	2,176.56	1.76
8,380.00	89.51	268.22	6,701.54	365.90	-2,264.58	2,271.41	0.60
8,475.00	89.20	268.47	6,702.61	363.16	-2,359.54	2,366.29	0.42
8,570.00	88.86	266.95	6,704.22	359.37	-2,454.45	2,461.11	1.64

## Design Report for Wells Ranch State USX AA16-63-1HNL - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,665.00	89.35	266.66	6,705.70	354.07	-2,549.29	2,555.82	0.60
8,760.00	89.88	270.30	6,706.34	351.55	-2,644.23	2,650.70	3.87
8,855.00	90.96	270.99	6,705.65	352.62	-2,739.22	2,745.69	1.35
8,950.00	90.03	271.29	6,704.82	354.51	-2,834.20	2,840.69	1.03
9,045.00	89.20	270.89	6,705.46	356.32	-2,929.18	2,935.69	0.97
9,140.00	90.71	270.39	6,705.54	357.38	-3,024.17	3,030.68	1.67
9,235.00	90.15	269.08	6,704.82	356.94	-3,119.17	3,125.65	1.50
9,330.00	86.61	268.06	6,707.51	354.57	-3,214.08	3,220.50	3.88
9,425.00	87.29	269.50	6,712.56	352.55	-3,308.92	3,315.28	1.67
9,520.00	89.11	267.60	6,715.55	350.15	-3,403.84	3,410.13	2.77
9,615.00	88.74	267.51	6,717.33	346.10	-3,498.73	3,504.92	0.40
9,710.00	91.20	271.87	6,717.38	345.58	-3,593.70	3,599.86	5.27
9,805.00	92.65	271.81	6,714.19	348.63	-3,688.60	3,694.80	1.53
9,900.00	92.22	270.34	6,710.15	350.41	-3,783.49	3,789.71	1.61
9,995.00	92.37	268.53	6,706.35	349.48	-3,878.41	3,884.59	1.91
10,090.00	89.60	269.43	6,704.72	347.79	-3,973.37	3,979.50	3.07
10,185.00	89.45	268.85	6,705.50	346.36	-4,068.35	4,074.44	0.63
10,280.00	87.07	268.20	6,708.39	343.92	-4,163.27	4,169.29	2.60
10,375.00	86.52	268.38	6,713.70	341.09	-4,258.08	4,264.02	0.61
10,468.00	86.89	268.79	6,719.04	338.79	-4,350.90	4,356.77	0.59
10,560.00	88.33	268.08	6,722.88	336.28	-4,442.78	4,448.59	1.74
10,654.00	90.03	267.79	6,724.23	332.90	-4,536.70	4,542.43	1.83
10,747.00	89.32	267.04	6,724.75	328.70	-4,629.61	4,635.23	1.11
10,840.00	89.78	267.94	6,725.48	324.63	-4,722.51	4,728.04	1.09
10,933.00	90.65	267.38	6,725.14	320.83	-4,815.43	4,820.86	1.11
11,027.00	91.45	266.99	6,723.41	316.22	-4,909.30	4,914.62	0.95
11,120.00	90.06	268.83	6,722.19	312.83	-5,002.23	5,007.46	2.48
11,213.00	90.46	268.33	6,721.77	310.52	-5,095.20	5,100.37	0.69
11,307.00	89.01	267.99	6,722.20	307.50	-5,189.15	5,194.23	1.58
11,400.00	89.63	268.41	6,723.30	304.58	-5,282.09	5,287.10	0.81
11,493.00	91.51	268.01	6,722.38	301.68	-5,375.04	5,379.97	2.07
11,587.00	90.62	269.37	6,720.63	299.53	-5,468.99	5,473.87	1.73
11,681.00	91.17	268.86	6,719.16	298.08	-5,562.97	5,567.80	0.80
11,774.00	89.66	269.48	6,718.49	296.73	-5,655.96	5,660.74	1.76
11,867.00	88.31	270.90	6,720.14	297.04	-5,748.94	5,753.71	2.11
11,961.00	90.28	270.40	6,721.29	298.10	-5,842.92	5,847.69	2.16
12,052.00	88.03	269.99	6,722.64	298.41	-5,933.90	5,938.66	2.51
12,146.00	88.18	269.86	6,725.74	298.29	-6,027.85	6,032.59	0.21
12,239.00	88.67	269.18	6,728.30	297.51	-6,120.81	6,125.52	0.90
12,333.00	89.20	268.36	6,730.05	295.49	-6,214.77	6,219.42	1.04
12,427.00	90.43	269.75	6,730.35	293.94	-6,308.75	6,313.35	1.97
12,522.00	87.41	269.00	6,732.14	292.91	-6,403.72	6,408.28	3.28
12,617.00	86.05	269.07	6,737.56	291.31	-6,498.55	6,503.06	1.43
12,712.00	87.04	269.30	6,743.28	289.96	-6,593.37	6,597.83	1.07
12,807.00	88.64	268.39	6,746.87	288.05	-6,688.28	6,692.68	1.94
12,902.00	92.69	268.50	6,745.76	285.47	-6,783.21	6,787.55	4.26
12,997.00	93.48	266.86	6,740.65	281.63	-6,878.00	6,882.24	1.91
13,092.00	90.49	266.71	6,737.36	276.31	-6,972.78	6,976.89	3.15
13,187.00	90.80	268.69	6,736.29	272.50	-7,067.69	7,071.71	2.11
13,282.00	89.44	269.32	6,736.09	270.85	-7,162.67	7,166.64	1.58
13,377.00	89.66	268.58	6,736.84	269.11	-7,257.65	7,261.57	0.81

**Design Report for Wells Ranch State USX AA16-63-1HNL - MWD Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
13,472.00	89.94	267.86	6,737.17	266.15	-7,352.61	7,356.45	0.81
13,567.00	90.55	267.74	6,736.76	262.51	-7,447.54	7,451.28	0.65
13,661.00	88.27	267.32	6,737.73	258.46	-7,541.44	7,545.08	2.47
13,756.00	88.21	266.33	6,740.65	253.20	-7,636.24	7,639.77	1.04
13,851.00	90.03	267.00	6,742.11	247.67	-7,731.07	7,734.46	2.04
13,946.00	89.14	265.91	6,742.80	241.80	-7,825.88	7,829.14	1.48
14,041.00	89.11	267.03	6,744.25	235.95	-7,920.69	7,923.81	1.18
14,136.00	89.38	266.78	6,745.50	230.82	-8,015.54	8,018.55	0.39
14,231.00	90.49	268.15	6,745.61	226.62	-8,110.44	8,113.35	1.86
14,326.00	91.02	268.61	6,744.35	223.93	-8,205.40	8,208.23	0.74
14,421.00	90.52	269.83	6,743.08	222.64	-8,300.38	8,303.16	1.39
14,516.00	90.99	270.33	6,741.83	222.77	-8,395.37	8,398.14	0.72
14,611.00	90.31	270.14	6,740.75	223.16	-8,490.36	8,493.12	0.74
14,706.00	89.32	269.81	6,741.05	223.12	-8,585.36	8,588.10	1.10
14,801.00	90.00	269.50	6,741.62	222.55	-8,680.36	8,683.07	0.79
14,896.00	89.66	269.31	6,741.90	221.56	-8,775.35	8,778.02	0.41
14,991.00	90.74	269.12	6,741.57	220.26	-8,870.34	8,872.97	1.15
15,086.00	89.94	269.76	6,741.00	219.33	-8,965.33	8,967.92	1.08
15,181.00	87.90	270.07	6,742.80	219.19	-9,060.31	9,062.88	2.17
15,276.00	88.24	269.83	6,745.99	219.11	-9,155.26	9,157.80	0.44
15,371.00	88.89	269.43	6,748.37	218.50	-9,250.22	9,252.74	0.80
15,466.00	90.65	269.78	6,748.76	217.84	-9,345.22	9,347.70	1.89
15,561.00	92.00	269.12	6,746.56	216.93	-9,440.18	9,442.63	1.58
15,656.00	89.35	269.83	6,745.44	216.06	-9,535.16	9,537.58	2.89
15,751.00	89.38	270.61	6,746.49	216.43	-9,630.16	9,632.56	0.82
15,846.00	89.38	272.13	6,747.52	218.70	-9,725.12	9,727.55	1.60
15,941.00	89.41	273.13	6,748.52	223.06	-9,820.02	9,822.51	1.05
16,036.00	89.88	273.78	6,749.11	228.78	-9,914.84	9,917.43	0.84
16,131.00	89.72	273.94	6,749.44	235.18	-10,009.62	10,012.32	0.24
16,226.00	90.09	275.65	6,749.60	243.12	-10,104.29	10,107.12	1.84
16,321.00	89.82	276.41	6,749.68	253.10	-10,198.76	10,201.78	0.85
<b>Final MWD Survey</b>							
16,387.00	89.82	276.41	6,749.88	260.46	-10,264.35	10,267.50	0.00
<b>Estimated BHL: 1046' FSL, 536' FWL - Survey Projection to TD</b>							

**Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N-S (ft)	+E-W (ft)	
670.00	670.00	0.00	0.00	Surface Casing Assumed Vertical at 670.00ft
811.00	811.00	0.01	0.27	First MWD Survey
7,150.00	6,687.30	388.70	-1,035.25	Estimated 7" Casing Point: 1100' FSL, 784' FEL (Not a Survey Station)
16,321.00	6,749.68	253.10	-10,198.76	Final MWD Survey
16,387.00	6,749.88	260.46	-10,264.35	Estimated BHL: 1046' FSL, 536' FWL
16,387.00	6,749.88	260.46	-10,264.35	Survey Projection to TD

**Design Report for Wells Ranch State USX AA16-63-1HNL - MWD Survey**

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	Wells Ranch AA16-63-1HNL_PlanB - Rev0_ BHL Tgt	271.14	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
670.00	7,150.00	Sperry MWD Surveys	MWD+IFR1+MS+sag
7,150.00	16,387.00	Sperry MWD Surveys	MWD+IFR1+MS+sag

**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,150.00	6,687.30	7" Csg	7	8-3/4

**Design Report for Wells Ranch State USX AA16-63-1HNL - 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	-33.00	2,710.38	-27.68	1,422,721.12	3,302,456.76	40.488680	-104.412570
- actual wellpath misses target center by 2710.72ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-5,596.68	4,541.38	1,424,552.06	3,296,887.96		
Point 2				-5,590.68	-763.62	1,419,247.24	3,296,893.96		
Point 3				-10,818.68	-785.62	1,419,225.24	3,291,666.14		
Point 4				-10,672.68	4,516.38	1,424,527.06	3,291,812.14		
Point 5				-5,596.68	4,541.38	1,424,552.06	3,296,887.96		
Wells Ranch USX	0.00	0.00	-33.00	2,710.38	-27.68	1,422,721.12	3,302,456.76	40.488680	-104.412570
- actual wellpath misses target center by 2710.72ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-278.68	4,598.38	1,424,609.05	3,302,205.77		
Point 2				5,058.32	4,657.38	1,424,668.05	3,307,542.58		
Point 3				5,085.32	-647.62	1,419,363.24	3,307,569.58		
Point 4				-244.68	-702.62	1,419,308.24	3,302,239.77		
Point 5				-278.68	4,598.38	1,424,609.05	3,302,205.77		
Wells Ranch USX	0.00	0.00	-33.00	2,710.38	-27.68	1,422,721.12	3,302,456.76	40.488680	-104.412570
- actual wellpath misses target center by 2710.72ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-738.68	4,137.38	1,424,148.07	3,301,745.79		
Point 2				-704.68	-242.62	1,419,768.22	3,301,779.79		
Point 3				-5,130.68	-303.62	1,419,707.23	3,297,353.94		
Point 4				-5,136.68	4,081.38	1,424,092.07	3,297,347.94		
Point 5				-738.68	4,137.38	1,424,148.07	3,301,745.79		
Wells Ranch	0.00	0.00	6,754.74	204.15	-10,265.43	1,420,214.98	3,292,219.36	40.482140	-104.449480
- actual wellpath misses target center by 56.29ft at 16381.81ft MD (6749.87 TVD, 259.88 N, -10259.19 E)									
- Point									
Wells Ranch USX	0.00	0.00	-33.00	2,710.38	-27.68	1,422,721.12	3,302,456.76	40.488680	-104.412570
- actual wellpath misses target center by 2710.72ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-6,056.68	4,081.38	1,424,092.07	3,296,427.97		
Point 2				-6,050.68	-303.62	1,419,707.23	3,296,433.97		
Point 3				-10,358.68	-325.62	1,419,685.23	3,292,126.12		
Point 4				-10,212.68	4,056.38	1,424,067.07	3,292,272.12		
Point 5				-6,056.68	4,081.38	1,424,092.07	3,296,427.97		
Wells Ranch USX	0.00	0.00	-33.00	2,710.38	-27.68	1,422,721.12	3,302,456.76	40.488680	-104.412570
- actual wellpath misses target center by 2710.72ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				181.32	4,138.38	1,424,149.07	3,302,665.75		
Point 2				4,598.32	4,197.38	1,424,208.07	3,307,082.60		
Point 3				4,625.32	-187.62	1,419,823.22	3,307,109.60		
Point 4				215.32	-242.62	1,419,768.22	3,302,699.75		
Point 5				181.32	4,138.38	1,424,149.07	3,302,665.75		
Wells Ranch USX	0.00	0.00	-33.00	2,710.38	-27.68	1,422,721.12	3,302,456.76	40.488680	-104.412570
- actual wellpath misses target center by 2710.72ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-278.68	4,597.38	1,424,608.05	3,302,205.77		
Point 2				-244.68	-702.62	1,419,308.24	3,302,239.77		
Point 3				-5,590.68	-763.62	1,419,247.24	3,296,893.96		
Point 4				-5,596.68	4,541.38	1,424,552.06	3,296,887.96		
Point 5				-278.68	4,597.38	1,424,608.05	3,302,205.77		

**North Reference Sheet for Sec. 14-T6N-R63W (Wells Ranch 16 South PAD) - Wells Ranch State USX AA16-63-1HNL**

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' @ 4768.00ft (H&P 343). Northing and Easting are relative to Wells Ranch State USX AA16-63-1HNL - 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 -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996492

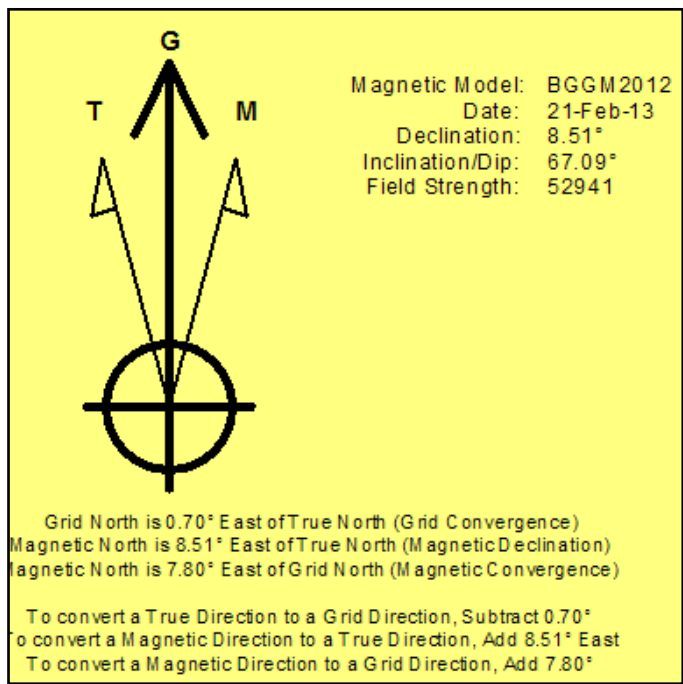
Grid Coordinates of Well: 1,420,010.83 ft N, 3,302,484.44 ft E

Geographical Coordinates of Well: 40° 28' 52.46" N, 104° 24' 45.32" W

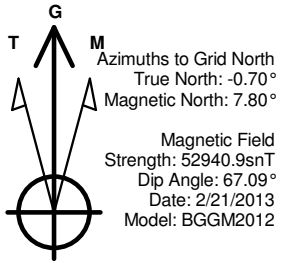
Grid Convergence at Surface is: 0.70°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,387.00ft the Bottom Hole Displacement is 10,267.65ft in the Direction of 271.45° (Grid).

Magnetic Convergence at surface is: -7.80° (21 February 2013, BGGM2012)



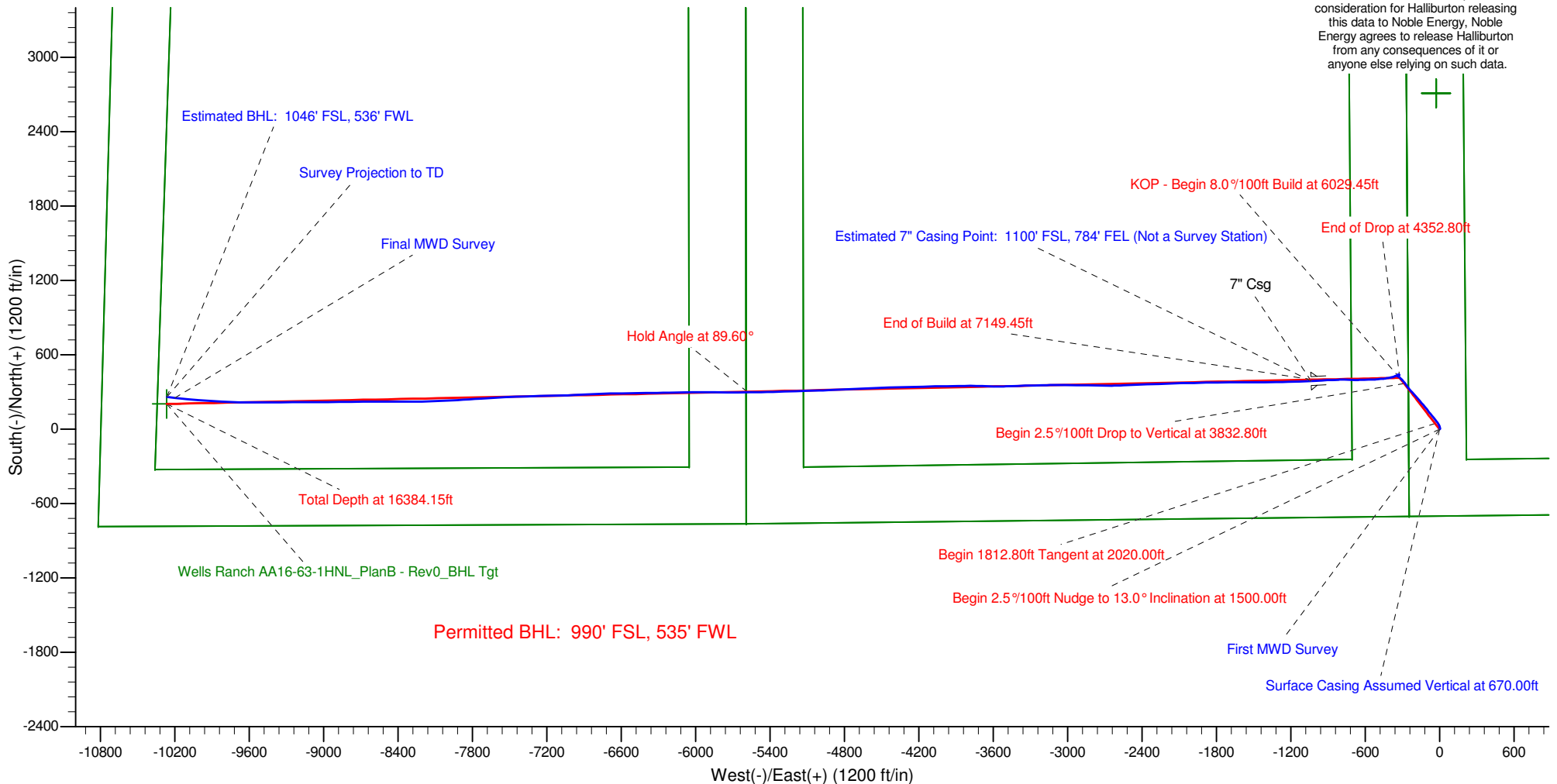
# Noble Energy

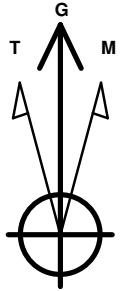


## LEGEND

- Wells Ranch State USX AA16-63-1HNL, Plan B, Plan B - Rev 0 Proposal V0
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch State USX AA16-63-1HNL 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.





Azimuths to Grid North  
 True North:  $-0.70^\circ$   
 Magnetic North:  $7.80^\circ$

Magnetic Field  
 Strength: 52940.9snT  
 Dip Angle:  $67.09^\circ$   
 Date: 2/21/2013  
 Model: BGGM2012

### LEGEND

- Wells Ranch State USX AA16-63-1HNL, Plan B, Plan B - Rev 0 Proposal V0
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch State USX AA16-63-1HNL 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.

