

# Noble Energy

Weld County, CO (NAD 83)

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

Wells Ranch State USX AA16-68-1HNL

Design: Vaughn Gyro and Sperry MWD Survey

## Sperry Drilling Services

### Final Survey Report

15 April, 2013

Well Coordinates: 1,424,036.26 N, 3,302,448.98 E (40° 29' 32.24" N, 104° 24' 45.14" W)

Ground Level: 4,779.00 ft

Local Coordinate Origin: Centered on Well Wells Ranch State USX AA16-68-1

Viewing Datum: KB=24' @ 4803.00ft (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 AA16-68-1HNL - Vaughn Gyro and Sperry 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
100.00	0.10	0.00	100.00	0.09	0.00	-0.01	0.10
Surveys from 100.00ft to 11000ft are Vaughn Gyro Surveys							
200.00	0.28	15.68	200.00	0.42	0.07	-0.09	0.18
300.00	0.12	30.50	300.00	0.74	0.18	-0.23	0.17
400.00	0.13	61.09	400.00	0.88	0.34	-0.40	0.07
500.00	0.29	30.60	500.00	1.16	0.57	-0.64	0.19
600.00	0.26	62.71	600.00	1.48	0.90	-1.00	0.16
700.00	0.20	333.41	700.00	1.74	1.02	-1.14	0.33
800.00	0.40	323.05	799.99	2.18	0.74	-0.88	0.20
900.00	0.62	345.51	899.99	2.98	0.39	-0.59	0.30
1,000.00	0.64	31.29	999.99	3.98	0.55	-0.81	0.49
1,100.00	0.84	233.08	1,099.98	4.02	0.25	-0.52	1.46
1,200.00	4.20	223.14	1,199.87	0.91	-2.84	2.77	3.38
1,300.00	7.26	222.83	1,299.36	-6.40	-9.64	10.04	3.06
1,400.00	9.08	219.65	1,398.34	-17.11	-18.97	20.07	1.87
1,500.00	11.98	217.13	1,496.65	-31.46	-30.26	32.31	2.93
1,600.00	14.21	214.58	1,594.04	-49.84	-43.49	46.74	2.30
1,700.00	15.87	210.91	1,690.62	-71.68	-57.49	62.17	1.92
1,800.00	15.06	211.16	1,787.00	-94.53	-71.23	77.42	0.82
1,900.00	15.36	208.66	1,883.49	-117.26	-84.31	91.99	0.72
2,000.00	16.88	206.37	1,979.56	-141.90	-97.11	106.42	1.65
2,100.00	15.73	203.45	2,075.54	-167.34	-108.96	119.95	1.42
2,200.00	15.75	205.68	2,171.79	-192.01	-120.24	132.86	0.60
2,300.00	16.76	205.66	2,267.79	-217.24	-132.36	146.65	1.01
2,400.00	15.67	206.13	2,363.81	-242.36	-144.55	160.50	1.09
2,500.00	13.68	205.19	2,460.54	-265.19	-155.54	172.99	2.00
2,600.00	14.79	209.31	2,557.47	-287.02	-166.82	185.71	1.50
2,700.00	14.99	210.70	2,654.11	-309.27	-179.67	200.03	0.41
2,800.00	14.43	215.53	2,750.84	-330.54	-193.52	215.28	1.35
2,900.00	15.85	216.65	2,847.36	-351.64	-208.91	232.05	1.45
3,000.00	15.86	215.89	2,943.56	-373.67	-225.08	249.66	0.21
3,100.00	16.09	214.03	3,039.70	-396.22	-240.85	266.91	0.56
3,200.00	15.19	212.88	3,135.99	-418.72	-255.72	283.25	0.95
3,300.00	14.72	209.88	3,232.61	-440.74	-269.16	298.14	0.91
3,400.00	11.04	210.23	3,330.07	-460.03	-280.31	310.56	3.68
3,500.00	7.20	211.80	3,428.79	-473.63	-288.43	319.58	3.85
3,600.00	6.49	210.79	3,528.08	-483.81	-294.63	326.44	0.72
3,700.00	4.01	205.34	3,627.65	-491.82	-299.01	331.36	2.52
3,800.00	3.61	202.36	3,727.43	-497.90	-301.71	334.46	0.45
3,900.00	2.36	207.68	3,827.29	-502.64	-303.87	336.93	1.28
4,000.00	1.68	206.72	3,927.23	-505.78	-305.49	338.76	0.68
4,100.00	1.66	206.51	4,027.19	-508.39	-306.79	340.23	0.02
4,200.00	1.26	179.21	4,127.16	-510.79	-307.42	341.03	0.79
4,300.00	1.33	111.38	4,227.14	-512.31	-306.33	340.03	1.45
4,400.00	2.57	118.37	4,327.08	-513.80	-303.27	337.08	1.25
4,500.00	1.84	82.01	4,427.01	-514.64	-299.71	333.59	1.54
4,600.00	1.15	85.09	4,526.97	-514.34	-297.12	330.98	0.69
4,700.00	1.07	91.81	4,626.95	-514.28	-295.18	329.05	0.15

## Design Report for Wells Ranch State USX AA16-68-1HNL - Vaughn Gyro and Sperry MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,800.00	1.24	144.37	4,726.93	-515.19	-293.61	327.54	1.04
4,900.00	1.60	133.40	4,826.90	-517.03	-291.97	326.02	0.45
5,000.00	1.15	326.54	4,926.89	-517.16	-291.50	325.57	2.74
5,100.00	0.85	326.44	5,026.88	-515.70	-292.47	326.43	0.30
5,200.00	1.18	356.18	5,126.86	-514.06	-292.94	326.80	0.61
5,300.00	1.34	328.23	5,226.84	-512.05	-293.63	327.34	0.63
5,400.00	0.97	311.04	5,326.82	-510.50	-294.88	328.49	0.50
5,500.00	0.91	303.33	5,426.81	-509.51	-296.17	329.72	0.14
5,600.00	0.28	259.61	5,526.80	-509.12	-297.08	330.59	0.73
5,700.00	0.27	246.56	5,626.80	-509.26	-297.53	331.05	0.06
5,800.00	0.32	40.42	5,726.80	-509.14	-297.57	331.09	0.57
5,900.00	1.56	351.22	5,826.78	-507.59	-297.60	331.01	1.37
6,000.00	1.20	329.31	5,926.76	-505.34	-298.34	331.60	0.64
6,050.00	0.90	332.47	5,976.75	-504.55	-298.79	331.99	0.59
6,100.00	0.91	320.20	6,026.74	-503.89	-299.22	332.38	0.39
6,150.00	5.63	261.48	6,076.65	-503.95	-301.91	335.06	10.44
6,200.00	10.50	252.70	6,126.14	-505.67	-308.69	341.94	10.01
6,250.00	17.00	258.97	6,174.69	-508.43	-320.23	353.64	13.33
6,300.00	20.58	263.40	6,222.02	-510.84	-336.14	369.68	7.69
6,350.00	25.47	268.31	6,268.03	-512.17	-355.62	389.21	10.50
6,400.00	29.02	268.59	6,312.47	-512.78	-378.50	412.08	7.11
6,450.00	30.65	267.60	6,355.84	-513.61	-403.36	436.93	3.40
6,500.00	33.55	267.77	6,398.20	-514.69	-429.90	463.49	5.82
6,550.00	36.77	270.56	6,439.07	-515.08	-458.69	492.23	7.19
6,600.00	41.33	271.97	6,477.89	-514.37	-490.17	523.60	9.29
6,650.00	46.54	273.12	6,513.88	-512.81	-524.81	558.06	10.54
6,700.00	49.62	273.58	6,547.28	-510.63	-561.95	594.96	6.18
6,750.00	53.42	270.29	6,578.40	-509.34	-601.05	633.89	9.19
6,800.00	58.07	269.27	6,606.53	-509.51	-642.36	675.12	9.46
6,850.00	63.86	269.83	6,630.79	-509.85	-686.06	718.74	11.61
6,900.00	69.41	268.53	6,650.62	-510.52	-731.93	764.56	11.36
6,950.00	73.07	269.85	6,666.69	-511.18	-779.26	811.83	7.74
7,000.00	76.23	269.20	6,679.92	-511.58	-827.47	859.96	6.44
7,050.00	78.00	269.71	6,691.07	-512.05	-876.21	908.61	3.67
7,100.00	80.45	271.06	6,700.42	-511.71	-925.32	957.59	5.58
7,150.00	84.03	270.98	6,707.17	-510.83	-974.85	1,006.95	7.16
7,193.00	87.70	271.28	6,710.27	-509.98	-1,017.72	1,049.67	8.58
<b>Estimated 7" Casing Point: 1074' FNL, 782' FEL (Not a Survey Station)</b>							
7,200.00	88.30	271.32	6,710.52	-509.82	-1,024.71	1,056.63	8.58
7,300.00	90.90	270.51	6,711.21	-508.23	-1,124.69	1,156.28	2.72
7,400.00	90.11	268.23	6,710.33	-509.33	-1,224.67	1,256.11	2.41
7,500.00	88.96	267.59	6,711.14	-512.97	-1,324.60	1,356.05	1.32
7,600.00	89.12	266.04	6,712.82	-518.53	-1,424.43	1,456.03	1.56
7,700.00	89.55	268.30	6,713.99	-523.46	-1,524.29	1,556.00	2.31
7,800.00	89.81	270.79	6,714.54	-524.26	-1,624.28	1,655.82	2.50
7,900.00	89.55	270.83	6,715.10	-522.85	-1,724.27	1,755.48	0.27
8,000.00	89.77	269.59	6,715.69	-522.48	-1,824.27	1,855.23	1.26
8,100.00	89.05	270.88	6,716.72	-522.08	-1,924.26	1,954.97	1.48
8,200.00	91.29	270.20	6,716.42	-521.13	-2,024.24	2,054.67	2.33
8,300.00	90.19	269.69	6,715.13	-521.22	-2,124.23	2,154.44	1.21

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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,400.00	89.23	269.89	6,715.64	-521.59	-2,224.23	2,254.23	0.98
8,500.00	90.00	270.08	6,716.31	-521.62	-2,324.23	2,354.01	0.79
8,600.00	89.68	270.25	6,716.59	-521.33	-2,424.23	2,453.76	0.37
8,700.00	89.99	269.46	6,716.88	-521.58	-2,524.23	2,553.55	0.86
8,800.00	90.08	270.38	6,716.83	-521.72	-2,624.22	2,653.33	0.93
8,900.00	88.58	269.95	6,718.00	-521.43	-2,724.21	2,753.08	1.56
9,000.00	90.89	270.66	6,718.46	-520.89	-2,824.20	2,852.80	2.42
9,100.00	91.05	268.51	6,716.77	-521.61	-2,924.18	2,952.60	2.16
9,200.00	88.95	268.44	6,716.77	-524.28	-3,024.14	3,052.52	2.10
9,300.00	89.66	268.08	6,717.97	-527.31	-3,124.09	3,152.44	0.80
9,400.00	89.40	267.73	6,718.79	-530.97	-3,224.01	3,252.39	0.43
9,500.00	89.12	268.57	6,720.07	-534.20	-3,323.95	3,352.32	0.88
9,600.00	87.73	268.94	6,722.82	-536.37	-3,423.89	3,452.18	1.44
9,700.00	86.81	269.14	6,727.58	-538.04	-3,523.76	3,551.93	0.94
9,800.00	86.49	268.20	6,733.42	-540.35	-3,623.56	3,651.67	1.00
9,900.00	88.46	268.36	6,737.83	-543.36	-3,723.42	3,751.49	1.98
10,000.00	88.89	268.60	6,740.14	-546.01	-3,823.35	3,851.39	0.50
10,100.00	88.42	267.22	6,742.49	-549.65	-3,923.26	3,951.31	1.46
10,200.00	89.11	268.70	6,744.64	-553.21	-4,023.17	4,051.23	1.63
10,300.00	90.81	269.36	6,744.71	-554.90	-4,123.15	4,151.10	1.82
10,400.00	89.00	269.45	6,744.87	-555.93	-4,223.14	4,250.93	1.81
10,500.00	89.79	269.38	6,745.92	-556.95	-4,323.13	4,350.77	0.79
10,600.00	89.32	270.42	6,746.70	-557.13	-4,423.12	4,450.55	1.14
10,700.00	88.44	269.92	6,748.65	-556.83	-4,523.10	4,550.28	1.01
10,800.00	89.49	269.45	6,750.45	-557.37	-4,623.08	4,650.07	1.15
10,900.00	88.28	269.00	6,752.40	-558.73	-4,723.05	4,749.91	1.30
11,000.00	89.22	269.36	6,754.59	-560.16	-4,823.02	4,849.74	1.01
<b>Tie-On to Vaughn Gyro Survey</b>							
11,103.00	90.37	268.90	6,754.96	-561.73	-4,926.00	4,952.60	1.20
<b>First Sperry MWD Survey</b>							
11,198.00	91.23	270.42	6,753.63	-562.29	-5,020.99	5,047.41	1.84
11,293.00	88.89	270.05	6,753.53	-561.90	-5,115.98	5,142.16	2.49
11,388.00	88.80	269.80	6,755.44	-562.03	-5,210.96	5,236.94	0.28
11,483.00	89.69	269.40	6,756.70	-562.69	-5,305.95	5,331.75	1.03
11,578.00	88.36	270.26	6,758.31	-562.97	-5,400.93	5,426.54	1.67
11,673.00	88.74	270.57	6,760.72	-562.28	-5,495.90	5,521.25	0.52
11,768.00	89.14	269.91	6,762.47	-561.89	-5,590.88	5,615.99	0.81
11,863.00	89.88	270.41	6,763.29	-561.62	-5,685.87	5,710.75	0.94
11,958.00	89.88	269.13	6,763.49	-562.00	-5,780.87	5,805.56	1.35
12,053.00	88.95	266.64	6,764.46	-565.51	-5,875.79	5,900.50	2.80
12,148.00	89.60	267.92	6,765.66	-570.02	-5,970.68	5,995.48	1.51
12,243.00	88.80	267.09	6,766.98	-574.15	-6,065.58	6,090.44	1.21
12,338.00	90.52	269.45	6,767.55	-577.02	-6,160.52	6,185.36	3.07
12,433.00	91.14	269.08	6,766.17	-578.24	-6,255.50	6,280.21	0.76
12,528.00	90.09	269.27	6,765.15	-579.60	-6,350.49	6,375.07	1.12
12,623.00	89.94	268.65	6,765.13	-581.33	-6,445.47	6,469.96	0.67
12,718.00	90.09	268.58	6,765.10	-583.62	-6,540.44	6,564.87	0.17
12,813.00	89.35	270.65	6,765.57	-584.26	-6,635.43	6,659.69	2.31
12,908.00	89.29	271.64	6,766.69	-582.36	-6,730.41	6,754.32	1.04
13,003.00	89.82	271.14	6,767.43	-580.06	-6,825.37	6,848.92	0.77

## Design Report for Wells Ranch State USX AA16-68-1HNL - Vaughn Gyro and Sperry MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
13,098.00	90.22	270.74	6,767.40	-578.50	-6,920.36	6,943.59	0.60
13,193.00	89.41	271.59	6,767.71	-576.57	-7,015.34	7,038.22	1.24
13,288.00	90.00	271.29	6,768.20	-574.18	-7,110.31	7,132.81	0.70
13,383.00	88.52	269.76	6,769.42	-573.31	-7,205.29	7,227.52	2.24
13,478.00	88.02	268.13	6,772.29	-575.06	-7,300.23	7,322.36	1.79
13,573.00	88.18	268.90	6,775.44	-577.52	-7,395.14	7,417.23	0.83
13,668.00	89.01	271.64	6,777.77	-577.07	-7,490.10	7,511.95	3.01
13,763.00	89.69	271.66	6,778.85	-574.34	-7,585.06	7,606.50	0.72
13,858.00	89.51	270.31	6,779.51	-572.70	-7,680.04	7,701.16	1.43
13,953.00	89.94	271.63	6,779.97	-571.10	-7,775.02	7,795.82	1.46
14,048.00	87.72	269.49	6,781.91	-570.17	-7,869.99	7,890.51	3.25
14,143.00	87.40	270.19	6,785.95	-570.43	-7,964.90	7,985.22	0.81
14,238.00	88.15	269.00	6,789.64	-571.10	-8,059.82	8,079.98	1.48
14,333.00	90.06	270.12	6,791.12	-571.83	-8,154.80	8,174.79	2.33
14,428.00	91.20	269.05	6,790.08	-572.52	-8,249.79	8,269.61	1.65
14,523.00	92.07	266.66	6,787.37	-576.07	-8,344.68	8,364.53	2.68
14,618.00	90.00	267.06	6,785.65	-581.28	-8,439.51	8,459.50	2.22
14,713.00	89.54	265.39	6,786.03	-587.53	-8,534.30	8,554.49	1.82
14,808.00	90.65	267.93	6,785.88	-593.07	-8,629.13	8,649.48	2.92
14,889.00	91.42	267.16	6,784.41	-596.53	-8,710.04	8,730.44	1.34
<b>Final Sperry MWD Survey</b>							
14,955.00	91.42	267.16	6,782.78	-599.80	-8,775.94	8,796.41	0.00
<b>Survey Projection to TD - Estimated BHL: 1099' FNL, 1902' FWL</b>							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
100.00	100.00	0.09	0.00	Surveys from 100.00ft to 11000ft are Vaughn Gyro Surveys
7,193.00	6,710.27	-509.98	-1,017.72	Estimated 7" Casing Point: 1074' FNL, 782' FEL (Not a Survey Station)
11,000.00	6,754.59	-560.16	-4,823.02	Tie-On to Vaughn Gyro Survey
11,103.00	6,754.96	-561.73	-4,926.00	First Sperry MWD Survey
14,889.00	6,784.41	-596.53	-8,710.04	Final Sperry MWD Survey
14,955.00	6,782.78	-599.80	-8,775.94	Survey Projection to TD
14,955.00	6,782.78	-599.80	-8,775.94	Estimated BHL: 1099' FNL, 1902' FWL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Wells Ranch AA16-68-1HNL_PlanD - Rev0_ BHL Tgt	266.15	Slot	0.00	0.00	0.00

**Design Report for Wells Ranch State USX AA16-68-1HNL - Vaughn Gyro and Sperry MWD Survey****Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
100.00	7,193.00	Vaughn Gyro Surveys	ISCWSA-GYRO-3
7,193.00	11,000.00	Vaughn Gyro Surveys	ISCWSA-GYRO-3
11,103.00	14,955.00	Sperry MWD Surveys	MWD

**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,193.00	6,710.27	7" Csg	7	8-3/4

## Design Report for Wells Ranch State USX AA16-68-1HNL - Vaughn Gyro and Sperry 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	2.00	-1,315.19	7.78	1,422,721.12	3,302,456.76	40.488680	-104.412570
- actual wellpath misses target center by 1315.21ft at 0.81ft MD (0.81 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-5,561.22	515.81	1,424,552.06	3,296,887.95		
Point 2				-5,555.22	-4,789.19	1,419,247.24	3,296,893.95		
Point 3				-10,783.22	-4,811.19	1,419,225.24	3,291,666.13		
Point 4				-10,637.22	490.81	1,424,527.06	3,291,812.13		
Point 5				-5,561.22	515.81	1,424,552.06	3,296,887.95		
Wells Ranch USX	0.00	0.00	2.00	-1,315.19	7.78	1,422,721.12	3,302,456.76	40.488680	-104.412570
- actual wellpath misses target center by 1315.21ft at 0.81ft MD (0.81 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-243.22	572.81	1,424,609.06	3,302,205.77		
Point 2				5,093.78	631.81	1,424,668.05	3,307,542.59		
Point 3				5,120.78	-4,673.19	1,419,363.24	3,307,569.59		
Point 4				-209.22	-4,728.19	1,419,308.24	3,302,239.77		
Point 5				-243.22	572.81	1,424,609.06	3,302,205.77		
Wells Ranch	0.00	0.00	6,783.00	-590.66	-8,777.27	1,423,445.62	3,293,672.00	40.490960	-104.444120
- actual wellpath misses target center by 9.24ft at 14955.00ft MD (6782.78 TVD, -599.80 N, -8775.94 E)									
- Point									
Wells Ranch USX	0.00	0.00	2.00	-1,315.19	7.78	1,422,721.12	3,302,456.76	40.488680	-104.412570
- actual wellpath misses target center by 1315.21ft at 0.81ft MD (0.81 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-703.22	111.81	1,424,148.07	3,301,745.79		
Point 2				-669.22	-4,268.19	1,419,768.22	3,301,779.78		
Point 3				-5,095.22	-4,329.19	1,419,707.22	3,297,353.94		
Point 4				-5,101.22	55.81	1,424,092.07	3,297,347.94		
Point 5				-703.22	111.81	1,424,148.07	3,301,745.79		
Wells Ranch USX	0.00	0.00	2.00	-1,315.19	7.78	1,422,721.12	3,302,456.76	40.488680	-104.412570
- actual wellpath misses target center by 1315.21ft at 0.81ft MD (0.81 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-6,021.22	55.81	1,424,092.07	3,296,427.97		
Point 2				-6,015.22	-4,329.19	1,419,707.22	3,296,433.97		
Point 3				-10,323.22	-4,351.19	1,419,685.22	3,292,126.12		
Point 4				-10,177.22	30.81	1,424,067.07	3,292,272.11		
Point 5				-6,021.22	55.81	1,424,092.07	3,296,427.97		
Wells Ranch USX	0.00	0.00	2.00	-1,315.19	7.78	1,422,721.12	3,302,456.76	40.488680	-104.412570
- actual wellpath misses target center by 1315.21ft at 0.81ft MD (0.81 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				216.78	112.81	1,424,149.07	3,302,665.75		
Point 2				4,633.78	171.81	1,424,208.07	3,307,082.60		
Point 3				4,660.78	-4,213.19	1,419,823.22	3,307,109.60		
Point 4				250.78	-4,268.19	1,419,768.22	3,302,699.75		
Point 5				216.78	112.81	1,424,149.07	3,302,665.75		
Wells Ranch USX	0.00	0.00	2.00	-1,315.19	7.78	1,422,721.12	3,302,456.76	40.488680	-104.412570
- actual wellpath misses target center by 1315.21ft at 0.81ft MD (0.81 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-243.22	571.81	1,424,608.06	3,302,205.77		
Point 2				-209.22	-4,728.19	1,419,308.24	3,302,239.77		
Point 3				-5,555.22	-4,789.19	1,419,247.24	3,296,893.95		
Point 4				-5,561.22	515.81	1,424,552.06	3,296,887.95		
Point 5				-243.22	571.81	1,424,608.06	3,302,205.77		

## North Reference Sheet for Sec. 14-T6N-R63W (Wells Ranch 16 North PAD) - Wells Ranch State USX AA16-68-1HNL

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' @ 4803.00ft (H&P 343). Northing and Easting are relative to Wells Ranch State USX AA16-68-1HNL - 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: 0.99996571

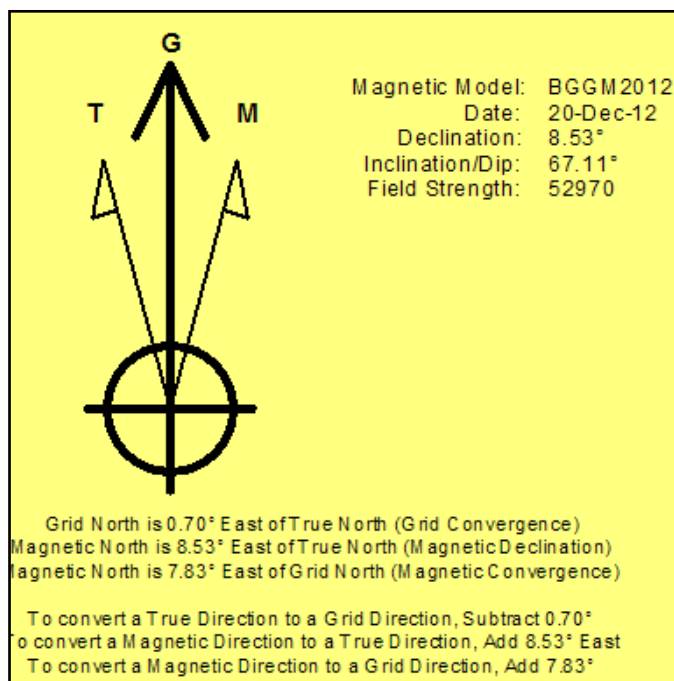
Grid Coordinates of Well: 1,424,036.26 ft N, 3,302,448.98 ft E

Geographical Coordinates of Well: 40° 29' 32.24" N, 104° 24' 45.14" W

Grid Convergence at Surface is: 0.70°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,955.00ft the Bottom Hole Displacement is 8,796.42ft in the Direction of 266.09° (Grid).

Magnetic Convergence at surface is: -7.83° (20 December 2012, , BGGM2012)



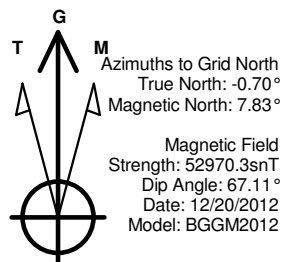


Project: Weld County, CO (NAD 83)  
Site: Sec. 14-T6N-R63W (Wells Ranch 16 North PAD)  
Well: Wells Ranch State USX AA16-68-1HNL

# Noble Energy

**HALLIBURTON**

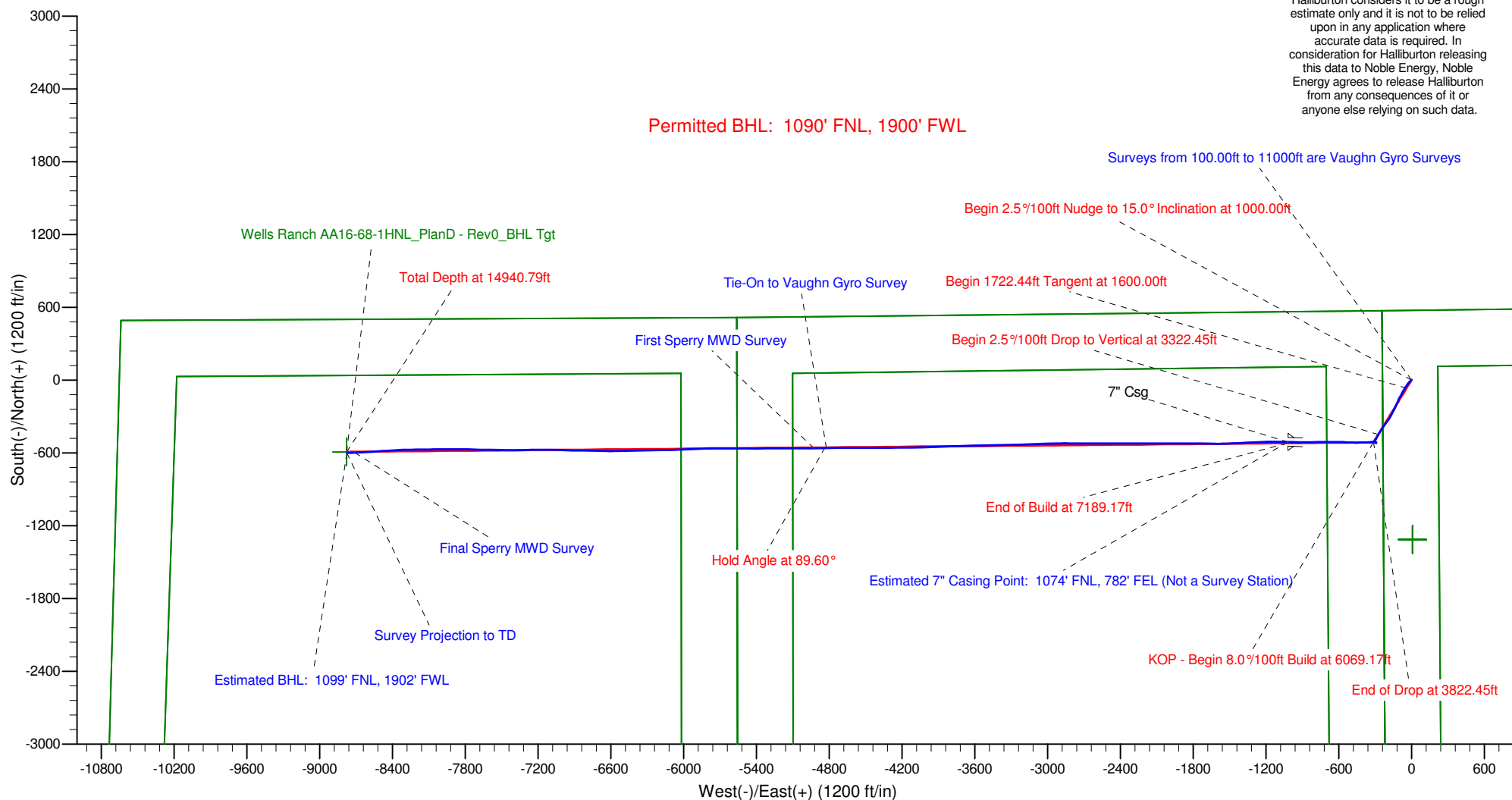
Sperry Drilling



## LEGEND

- Wells Ranch State USX AA16-68-1HNL, Plan C, Plan C - Rev 0 Proposal V0
- Vaughn Gyro and Sperry MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch State USX AA16-68-1HNL 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.

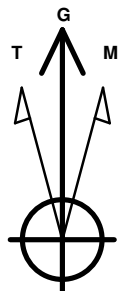


Project: Weld County, CO (NAD 83)  
Site: Sec. 14-T6N-R63W (Wells Ranch 16 North PAD)  
Well: Wells Ranch State USX AA16-68-1HNL

# Noble Energy

**HALLIBURTON**

Sperry Drilling



Azimuths to Grid North  
True North:  $-0.70^\circ$   
Magnetic North:  $7.83^\circ$

Magnetic Field  
Strength: 52970.3snT  
Dip Angle:  $67.11^\circ$   
Date: 12/20/2012  
Model: BGGM2012

## LEGEND

- Wells Ranch State USX AA16-68-1HNL, Plan C, Plan C - Rev 0 Proposal V0
- Vaughn Gyro and Sperry MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch State USX AA16-68-1HNL 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.

