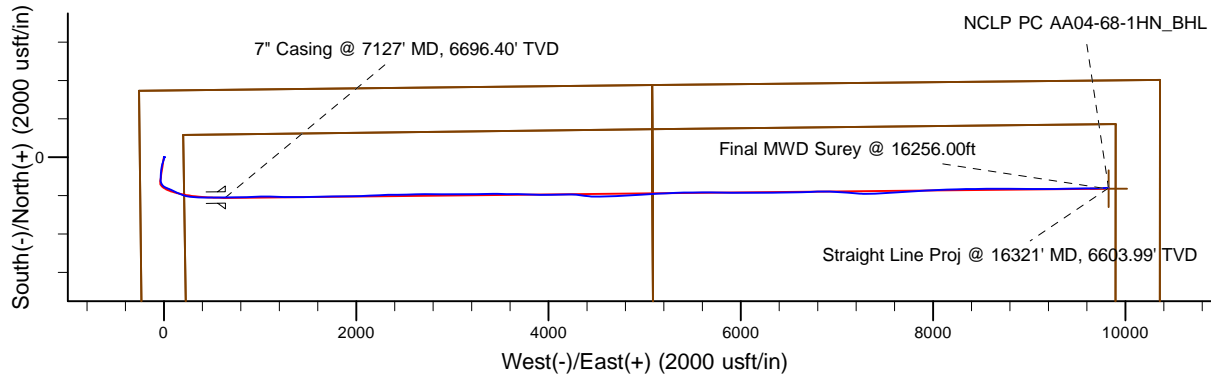


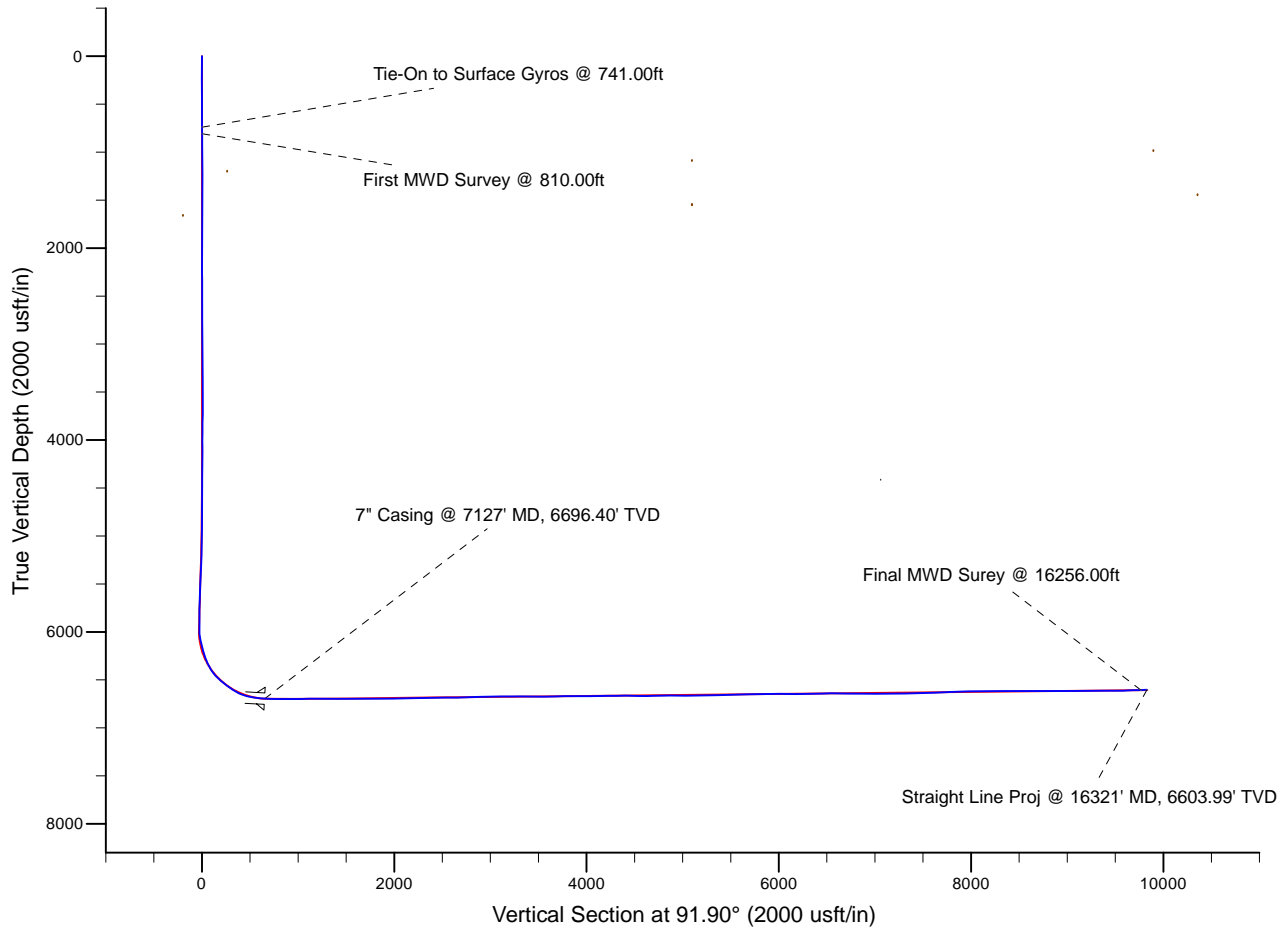
Project: Weld County, CO (NAD 83)  
 Site: Sec. 4-T6N-R63W (NCLP PC AA04 Pads)  
 Well: NCLP PC AA04-68-1HN  
 Wellbore: Plan A  
 Design: Final Surveys

# Noble Energy



**LEGEND**

+ NCLP PC AA04-68-1HN, Plan A, A0 - PROPOSAL V0  
+ Final Surveys



Platted SHL: 698' FNL, 250' FWL  
 Platted Lat/Long: 40° 52' 10.9" N, 104° 45' 03.2" W  
 Location: Sec. 4-T6N-R63W

7" Casing: ~1121.85' FNL, ~885.35' FWL  
 Lat/Long: 40° 31' 11.709" N, 104° 26' 52.928" W  
 State Planes - CO Northern: 1,433,981.93' N, 3,292,457.88' E  
 Location: Sec. 4-T6N-R63W

BHL: ~1119.58' FNL, ~534.11' FEL  
 Lat/Long: 40° 31' 11.604" N, 104° 24' 53.975" W  
 State Planes - CO Northern: 1,434,082.03' N, 3,301,643.70' E  
 Location: Sec. 3-T6N-R63W

WELL DETAILS: NCLP PC AA04-68-1HN	
Ground Level: 4711.00	
RKB=30 @ 4741.00usft (H&P 321)	
Created By: Fred Hartmann	Created On: 12/04/2013

# Noble Energy

Weld County, CO (NAD 83)

Sec. 4-T6N-R63W (NCLP PC AA04 Pads)

NCLP PC AA04-68-1HN

Design: Final Surveys

## Sperry Drilling Services

### Final Survey Report

04 December, 2013

Well Coordinates: 1,434,400.91 N, 3,291,817.75 E (40° 31' 15.92" N, 104° 27' 01.15" W)

Ground Level: 4,711.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well NCLP PC AA04-68-1HN

RKB=30 @ 4741.00usft (H&P 321)

N

Grid

API - US Survey Feet - Custom

**HALLIBURTON**



Design Report for NCLP PC AA04-68-1HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
243.00	0.20	196.23	243.00	-0.41	-0.12	-0.10	0.08
486.00	0.40	157.73	486.00	-1.60	0.08	0.14	0.11
741.00	0.60	68.53	740.99	-1.93	1.66	1.73	0.28
<b>Tie-On to Surface Gyros @ 741.00ft</b>							
810.00	0.29	34.63	809.99	-1.66	2.10	2.15	0.57
<b>First MWD Survey @ 810.00ft</b>							
902.00	0.55	79.45	901.99	-1.39	2.67	2.71	0.44
995.00	0.47	38.25	994.98	-1.00	3.34	3.37	0.39
1,180.00	0.72	67.93	1,179.97	0.03	4.89	4.88	0.21
1,272.00	0.63	75.66	1,271.97	0.37	5.91	5.90	0.14
1,364.00	0.81	89.33	1,363.96	0.50	7.05	7.03	0.27
1,457.00	0.53	279.63	1,456.96	0.58	7.29	7.26	1.44
1,552.00	0.71	284.14	1,551.95	0.80	6.28	6.25	0.20
1,647.00	0.93	261.24	1,646.94	0.83	4.95	4.92	0.41
1,742.00	0.32	227.58	1,741.93	0.53	3.99	3.97	0.72
1,837.00	0.43	210.60	1,836.93	0.04	3.62	3.61	0.16
1,932.00	1.29	207.50	1,931.92	-1.21	2.94	2.98	0.91
2,026.00	0.40	241.31	2,025.91	-2.31	2.16	2.24	1.05
2,121.00	0.28	235.64	2,120.91	-2.60	1.68	1.77	0.13
2,216.00	0.14	131.46	2,215.91	-2.81	1.58	1.67	0.36
2,311.00	1.34	164.59	2,310.90	-3.95	1.96	2.09	1.29
2,406.00	0.65	135.31	2,405.88	-5.41	2.63	2.81	0.88
2,500.00	1.17	175.09	2,499.87	-6.74	3.09	3.31	0.84
2,595.00	0.94	25.13	2,594.87	-7.00	3.50	3.73	2.15
2,690.00	1.10	7.01	2,689.85	-5.39	3.95	4.12	0.38
2,785.00	0.59	15.02	2,784.84	-4.02	4.18	4.32	0.55
2,879.00	0.72	16.22	2,878.84	-2.98	4.47	4.57	0.14
2,974.00	0.71	25.48	2,973.83	-1.88	4.89	4.95	0.12
3,069.00	1.03	46.76	3,068.82	-0.76	5.77	5.79	0.47
3,163.00	0.93	49.52	3,162.80	0.31	6.97	6.95	0.12
3,258.00	0.55	82.81	3,257.80	0.87	8.00	7.97	0.59
3,353.00	0.30	161.41	3,352.79	0.69	8.54	8.51	0.60
3,448.00	0.42	356.47	3,447.79	0.80	8.59	8.56	0.75
3,543.00	0.94	1.91	3,542.79	1.93	8.60	8.53	0.55
3,637.00	0.25	329.12	3,636.78	2.88	8.52	8.42	0.79
3,732.00	0.31	319.41	3,731.78	3.25	8.25	8.13	0.08
3,827.00	0.75	238.33	3,826.78	3.12	7.55	7.44	0.81
3,921.00	0.92	217.17	3,920.77	2.20	6.57	6.49	0.37
4,016.00	1.16	186.78	4,015.75	0.63	5.99	5.97	0.62
4,111.00	1.01	158.64	4,110.73	-1.10	6.19	6.22	0.58
4,206.00	0.68	258.76	4,205.73	-1.99	5.94	6.00	1.38
4,300.00	0.58	161.55	4,299.72	-2.55	5.54	5.62	1.01
4,395.00	0.72	244.61	4,394.72	-3.26	5.15	5.26	0.91
4,490.00	1.27	250.27	4,489.71	-3.88	3.62	3.75	0.59
4,585.00	1.41	229.00	4,584.68	-5.00	1.75	1.92	0.54
4,680.00	1.05	200.64	4,679.66	-6.58	0.56	0.78	0.73
4,775.00	1.02	155.57	4,774.65	-8.16	0.61	0.88	0.84
4,869.00	2.57	183.10	4,868.60	-11.03	0.84	1.20	1.84
4,964.00	3.48	192.43	4,963.46	-15.97	0.10	0.63	1.09

**Design Report for NCLP PC AA04-68-1HN - Final Surveys**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
5,059.00	4.09	192.62	5,058.26	-22.09	-1.26	-0.53	0.64
5,153.00	5.95	194.73	5,151.89	-30.08	-3.23	-2.23	1.99
5,248.00	7.32	199.69	5,246.25	-40.54	-6.52	-5.17	1.56
5,343.00	8.61	198.76	5,340.34	-52.97	-10.85	-9.08	1.36
5,437.00	12.68	194.82	5,432.70	-69.61	-15.75	-13.43	4.40
5,531.00	13.59	189.51	5,524.24	-90.48	-20.22	-17.20	1.61
5,626.00	15.83	190.33	5,616.12	-114.24	-24.38	-20.58	2.37
5,721.00	17.03	188.15	5,707.24	-140.76	-28.68	-23.99	1.42
5,816.00	19.26	182.11	5,797.52	-170.19	-31.23	-25.57	3.07
5,911.00	21.15	182.46	5,886.67	-202.98	-32.54	-25.79	1.99
5,949.00	20.11	181.16	5,922.24	-216.36	-32.97	-25.77	2.99
6,005.00	18.93	181.60	5,975.02	-235.06	-33.42	-25.60	2.12
6,053.00	19.21	171.03	6,020.39	-250.65	-32.40	-24.07	7.21
6,100.00	21.54	158.60	6,064.47	-266.33	-28.05	-19.20	10.43
6,148.00	23.07	145.99	6,108.91	-282.34	-19.57	-10.19	10.45
6,195.00	20.63	137.06	6,152.54	-296.04	-8.77	1.06	8.76
6,243.00	18.47	125.43	6,197.78	-306.64	3.19	13.36	9.25
6,289.00	18.82	115.55	6,241.38	-314.07	15.83	26.24	6.90
6,337.00	22.58	112.44	6,286.28	-320.93	31.34	41.97	8.16
6,384.00	26.40	112.38	6,329.04	-328.36	49.34	60.21	8.13
6,432.00	31.17	115.19	6,371.10	-337.71	70.47	81.63	10.33
6,479.00	36.26	114.87	6,410.18	-348.74	94.10	105.62	10.84
6,527.00	42.63	115.05	6,447.23	-361.61	121.73	133.66	13.27
6,574.00	48.56	114.87	6,480.10	-375.77	152.16	164.54	12.62
6,622.00	50.84	110.52	6,511.15	-389.86	185.92	198.76	8.38
6,669.00	52.16	104.14	6,540.43	-400.79	221.01	234.18	10.99
6,717.00	54.05	99.69	6,569.25	-408.69	258.56	271.97	8.39
6,764.00	56.17	94.66	6,596.15	-413.49	296.79	310.34	9.87
6,812.00	59.77	93.10	6,621.60	-416.23	337.38	351.00	7.99
6,858.00	65.35	91.83	6,642.79	-417.97	378.15	391.81	12.38
6,906.00	71.31	90.56	6,660.51	-418.89	422.73	436.39	12.66
6,953.00	76.58	89.77	6,673.50	-419.02	467.88	481.52	11.33
7,001.00	80.82	89.78	6,682.91	-418.83	514.93	528.55	8.83
7,048.00	83.27	90.51	6,689.41	-418.95	561.48	575.07	5.43
7,084.00	84.64	90.33	6,693.20	-419.21	597.28	610.85	3.84
7,127.00	86.82	89.09	6,696.40	-419.00	640.15	653.70	5.83
<b>7" Casing @ 7127' MD, 6696.40' TVD</b>							
7,157.00	88.34	88.23	6,697.67	-418.29	670.12	683.62	5.83
7,212.00	88.03	88.47	6,699.41	-416.71	725.07	738.49	0.71
7,307.00	89.57	89.01	6,701.40	-414.62	820.02	833.32	1.72
7,401.00	89.72	88.21	6,701.99	-412.34	913.99	927.16	0.87
7,496.00	91.82	88.85	6,700.71	-409.91	1,008.94	1,021.99	2.31
7,591.00	91.97	90.69	6,697.57	-409.53	1,103.89	1,116.86	1.94
7,686.00	90.74	91.74	6,695.32	-411.54	1,198.83	1,211.83	1.70
7,780.00	88.12	91.66	6,696.26	-414.33	1,292.78	1,305.81	2.79
7,875.00	88.15	89.63	6,699.35	-415.40	1,387.72	1,400.74	2.14
7,970.00	88.77	87.89	6,701.90	-413.34	1,482.66	1,495.56	1.94
8,064.00	92.37	88.10	6,700.97	-410.05	1,576.58	1,589.32	3.84
8,159.00	90.92	89.69	6,698.24	-408.22	1,671.52	1,684.14	2.26
8,253.00	90.34	90.39	6,697.21	-408.29	1,765.51	1,778.09	0.97
8,348.00	90.92	89.08	6,696.16	-407.85	1,860.50	1,873.01	1.51

## Design Report for NCLP PC AA04-68-1HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,443.00	91.14	88.52	6,694.45	-405.86	1,955.47	1,967.85	0.63
8,538.00	91.11	88.51	6,692.59	-403.40	2,050.42	2,062.67	0.03
8,632.00	90.15	87.24	6,691.55	-399.91	2,144.34	2,156.43	1.69
8,727.00	91.32	87.05	6,690.34	-395.18	2,239.21	2,251.09	1.25
8,822.00	90.93	88.57	6,688.47	-391.55	2,334.12	2,345.83	1.65
8,917.00	91.69	90.01	6,686.30	-390.38	2,429.09	2,440.70	1.71
9,012.00	89.14	87.23	6,685.61	-388.09	2,524.04	2,535.53	3.97
9,107.00	90.77	88.36	6,685.68	-384.43	2,618.97	2,630.28	2.09
9,201.00	91.94	89.86	6,683.46	-382.97	2,712.92	2,724.14	2.02
9,296.00	91.33	90.86	6,680.75	-383.57	2,807.88	2,819.06	1.23
9,391.00	92.04	90.53	6,677.96	-384.72	2,902.83	2,914.00	0.82
9,485.00	91.63	90.12	6,674.95	-385.25	2,996.78	3,007.91	0.62
9,580.00	90.06	89.22	6,673.55	-384.71	3,091.77	3,102.83	1.90
9,675.00	90.09	89.52	6,673.42	-383.66	3,186.76	3,197.74	0.32
9,770.00	90.00	88.90	6,673.35	-382.35	3,281.75	3,292.63	0.66
9,865.00	89.35	89.54	6,673.89	-381.06	3,376.74	3,387.52	0.96
9,960.00	89.69	90.74	6,674.68	-381.29	3,471.74	3,482.47	1.31
10,054.00	90.22	90.63	6,674.76	-382.42	3,565.73	3,576.45	0.58
10,149.00	91.63	91.12	6,673.22	-383.87	3,660.70	3,671.42	1.57
10,244.00	89.97	90.86	6,671.90	-385.51	3,755.68	3,766.40	1.77
10,335.00	91.05	93.53	6,671.09	-388.99	3,846.60	3,857.38	3.16
10,427.00	89.57	89.82	6,670.59	-391.68	3,938.54	3,949.36	4.34
10,519.00	91.02	89.45	6,670.11	-391.09	4,030.53	4,041.29	1.63
10,610.00	90.86	88.39	6,668.62	-389.38	4,121.50	4,132.15	1.18
10,703.00	90.71	89.38	6,667.35	-387.57	4,214.47	4,225.01	1.08
10,794.00	90.83	96.19	6,666.12	-391.99	4,305.30	4,315.94	7.48
10,886.00	89.94	97.43	6,665.51	-402.90	4,396.65	4,407.60	1.66
10,978.00	87.66	91.67	6,667.43	-410.19	4,488.30	4,499.43	6.73
11,070.00	89.69	87.41	6,669.56	-409.45	4,580.24	4,591.30	5.13
11,162.00	92.28	86.32	6,667.98	-404.42	4,672.08	4,682.93	3.05
11,254.00	91.30	87.75	6,665.11	-399.67	4,763.91	4,774.55	1.88
11,347.00	90.37	87.77	6,663.75	-396.03	4,856.83	4,867.29	1.00
11,439.00	89.94	86.89	6,663.50	-391.75	4,948.73	4,959.00	1.06
11,532.00	90.28	85.79	6,663.32	-385.81	5,041.54	5,051.56	1.24
11,625.00	90.34	86.48	6,662.82	-379.54	5,134.32	5,144.09	0.74
11,716.00	90.68	87.53	6,662.01	-374.79	5,225.19	5,234.75	1.21
11,808.00	89.97	87.28	6,661.49	-370.62	5,317.10	5,326.46	0.82
11,900.00	90.71	89.20	6,660.94	-367.80	5,409.05	5,418.27	2.24
11,993.00	92.78	89.38	6,658.11	-366.64	5,501.99	5,511.13	2.23
12,086.00	93.27	88.46	6,653.20	-364.89	5,594.84	5,603.87	1.12
12,180.00	91.85	91.76	6,649.00	-365.08	5,688.73	5,697.71	3.82
12,273.00	90.55	91.29	6,647.06	-367.55	5,781.68	5,790.69	1.49
12,367.00	89.97	91.33	6,646.63	-369.70	5,875.65	5,884.68	0.62
12,462.00	89.04	89.04	6,647.45	-370.01	5,970.64	5,979.63	2.60
12,557.00	89.29	89.74	6,648.83	-368.99	6,065.62	6,074.53	0.78
12,652.00	90.99	89.96	6,648.60	-368.75	6,160.62	6,169.46	1.80
12,747.00	89.91	89.56	6,647.86	-368.35	6,255.62	6,264.39	1.21
12,841.00	92.44	90.30	6,645.93	-368.23	6,349.59	6,358.31	2.80
12,936.00	92.10	88.35	6,642.17	-367.11	6,444.50	6,453.13	2.08
13,031.00	89.60	88.51	6,640.76	-364.51	6,539.45	6,547.94	2.64
13,126.00	88.37	88.58	6,642.44	-362.10	6,634.40	6,642.76	1.30

## Design Report for NCLP PC AA04-68-1HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
13,225.00	88.37	89.21	6,645.26	-360.19	6,733.34	6,741.58	0.64
13,320.00	91.26	88.11	6,645.56	-357.97	6,828.30	6,836.42	3.25
13,415.00	90.43	91.28	6,644.16	-357.46	6,923.28	6,931.33	3.45
13,510.00	90.37	92.99	6,643.50	-361.00	7,018.21	7,026.32	1.80
13,605.00	90.77	95.63	6,642.55	-368.14	7,112.92	7,121.22	2.81
13,700.00	89.88	94.98	6,642.01	-376.93	7,207.51	7,216.05	1.16
13,795.00	89.85	89.33	6,642.24	-380.50	7,302.41	7,311.01	5.95
13,890.00	91.54	87.68	6,641.08	-378.02	7,397.36	7,405.83	2.49
13,984.00	90.62	86.38	6,639.31	-373.15	7,491.22	7,499.47	1.69
14,080.00	93.33	86.24	6,636.00	-366.97	7,586.95	7,594.95	2.83
14,174.00	92.53	86.33	6,631.20	-360.89	7,680.63	7,688.38	0.86
14,270.00	91.94	87.64	6,627.46	-355.85	7,776.42	7,783.95	1.50
14,365.00	92.34	86.46	6,623.91	-350.96	7,871.23	7,878.54	1.31
14,460.00	90.22	86.72	6,621.79	-345.31	7,966.03	7,973.10	2.25
14,554.00	91.42	86.36	6,620.44	-339.64	8,059.85	8,066.68	1.33
14,649.00	90.46	88.87	6,618.88	-335.69	8,154.75	8,161.39	2.83
14,744.00	90.06	88.05	6,618.45	-333.13	8,249.71	8,256.22	0.96
14,839.00	90.31	90.06	6,618.14	-331.57	8,344.69	8,351.10	2.13
14,934.00	90.99	89.35	6,617.07	-331.08	8,439.68	8,446.02	1.03
15,028.00	90.62	88.66	6,615.75	-329.45	8,533.66	8,539.89	0.83
15,123.00	89.66	89.04	6,615.51	-327.54	8,628.64	8,634.75	1.09
15,218.00	88.74	90.87	6,616.84	-327.47	8,723.62	8,729.68	2.16
15,313.00	89.41	90.66	6,618.37	-328.73	8,818.60	8,824.65	0.74
15,408.00	90.59	90.84	6,618.37	-329.98	8,913.59	8,919.63	1.26
15,503.00	90.25	89.41	6,617.68	-330.18	9,008.59	9,014.58	1.55
15,598.00	91.82	90.68	6,615.96	-330.26	9,103.57	9,109.51	2.13
15,693.00	91.20	89.34	6,613.46	-330.28	9,198.53	9,204.42	1.55
15,787.00	89.94	88.54	6,612.52	-328.54	9,292.51	9,298.29	1.59
15,882.00	90.46	89.24	6,612.19	-326.70	9,387.49	9,393.16	0.92
15,977.00	89.60	88.61	6,612.14	-324.91	9,482.47	9,488.03	1.12
16,072.00	90.43	89.20	6,612.12	-323.10	9,577.45	9,582.90	1.07
16,167.00	92.34	89.48	6,609.82	-322.00	9,672.41	9,677.77	2.03
16,256.00	92.10	88.58	6,606.37	-320.50	9,761.33	9,766.59	1.05
<b>Final MWD Surey @ 16256.00ft</b>							
16,321.00	92.10	88.58	6,603.99	-318.89	9,826.27	9,831.44	0.00
<b>Straight Line Proj @ 16321' MD, 6603.99' TVD</b>							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
741.00	740.99	-1.93	1.66	Tie-On to Surface Gyros @ 741.00ft
810.00	809.99	-1.66	2.10	First MWD Survey @ 810.00ft
16,256.00	6,606.37	-320.50	9,761.33	Final MWD Surey @ 16256.00ft
16,321.00	6,603.99	-318.89	9,826.27	Straight Line Proj @ 16321' MD, 6603.99' TVD

**Design Report for NCLP PC AA04-68-1HN - Final Surveys**

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	NCLP PC AA04-68-1HN_BHL	91.90	Slot	0.00	0.00	0.00

**Survey tool program**

From (usft)	To (usft)	Survey/Plan	Survey Tool
243.00	741.00	Surface Gyros	Flexi-Shot
810.00	7,084.00	MWD Surveys - Vert/Build	MWD+IFR1+MS_WY
7,157.00	16,256.00	MWD Surveys - Lateral	MWD+IFR1+MS_WY

**Casing Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
7,127.00	6,696.40	7" Casing @ 7127' MD, 6696.40' TVD	7	8-3/4

**Wellbore Targets**

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
NCLP PC AA04-68-1H - actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	0.00	0.01	0.00	1,434,400.92	3,291,817.75	40° 31' 15.924 N	104° 27' 1.152 W
Sec. 4-T6N-R63W_46l - actual wellpath misses target center by 3978.36usft at 7.64usft MD (7.64 TVD, 0.00 N, 0.00 E) - Polygon	0.00	0.00	1.00	-3,978.07	47.09	1,430,422.97	3,291,864.84	40° 30' 36.612 N	104° 27' 1.152 W
Point 1			1.00	4,210.91	154.49	1,434,633.74	3,292,019.32		
Point 2			1.00	-144.02	216.88	1,430,278.95	3,292,081.71		
Point 3			1.00	-33.48	5,050.45	1,430,389.49	3,296,915.13		
Point 4			1.00	70.50	9,850.70	1,430,493.47	3,301,715.22		
Point 5			1.00	4,324.23	9,854.02	1,434,747.06	3,301,718.54		
Point 6			1.00	4,270.97	5,032.02	1,434,693.80	3,296,896.70		
Point 7			1.00	4,210.91	154.49	1,434,633.74	3,292,019.32		
Sec. 4-T6N-R63W_SL - actual wellpath misses target center by 3978.36usft at 7.64usft MD (7.64 TVD, 0.00 N, 0.00 E) - Polygon	0.00	0.00	1.00	-3,978.07	47.09	1,430,422.97	3,291,864.84	40° 30' 36.612 N	104° 27' 1.152 W
Point 1			1.00	4,670.92	-305.53	1,435,093.74	3,291,559.32		
Point 2			1.00	-604.04	-243.14	1,429,818.95	3,291,621.71		
Point 3			1.00	-493.50	5,050.45	1,429,929.49	3,296,915.13		
Point 4			1.00	4,730.99	5,032.02	1,435,153.81	3,296,896.70		
Point 5			1.00	-493.50	5,050.45	1,429,929.49	3,296,915.13		
Point 6			1.00	-389.51	10,310.71	1,430,033.47	3,302,175.22		
Point 7			1.00	4,784.25	10,314.03	1,435,207.07	3,302,178.54		
Point 8			1.00	4,730.99	5,032.02	1,435,153.81	3,296,896.70		
Point 9			1.00	4,670.92	-305.53	1,435,093.74	3,291,559.32		
NCLP PC AA04-68-1H - actual wellpath misses target center by 7.94usft at 16321.00usft MD (6603.99 TVD, -318.89 N, 9826.27 E) - Point	0.00	0.00	6,606.94	-326.20	9,827.24	1,434,074.72	3,301,644.67	40° 31' 11.532 N	104° 24' 53.964 W
NCLP PC AA04-68-1H - actual wellpath misses target center by 3.43usft at 7140.84usft MD (6697.09 TVD, -418.73 N, 653.97 E) - Point	0.00	0.00	6,698.13	-422.00	654.00	1,433,978.93	3,292,471.73	40° 31' 11.678 N	104° 26' 52.749 W

---

**Design Report for NCLP PC AA04-68-1HN - Final Surveys**

---

**Directional Difficulty Index**

Average Dogleg over Survey:	2.00 °/100usft	Maximum Dogleg over Survey:	13.27 °/100usft at 6,527.00 usft
Net Tortosity applicable to Plans:	1.35 °/100usft	Directional Difficulty Index:	6.910

**Audit Info**

**North Reference Sheet for Sec. 4-T6N-R63W (NCLP PC AA04 Pads) - NCLP PC AA04-68-1HN**

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

Vertical Depths are relative to RKB=30 @ 4741.00usft (H&P 321). Northing and Easting are relative to NCLP PC AA04-68-1HN

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: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996795

Grid Coordinates of Well: 1,434,400.91 usft N, 3,291,817.75 usft E

Geographical Coordinates of Well: 40° 31' 15.92" N, 104° 27' 01.15" W

Grid Convergence at Surface is: 0.68°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,321.00usft the Bottom Hole Displacement is 9,831.44usft in the Direction of 91.86° (Grid).

Magnetic Convergence at surface is: -7.73° (15 November 2013, , BGGM2013)

Magnetic Model: BGGM2013  
 Date: 15-Nov-13  
 Declination: 8.41°  
 Inclination/Dip: 67.10°  
 Field Strength: 52899

Grid North is 0.68° East of True North (Grid Convergence)  
 Magnetic North is 8.41° East of True North (Magnetic Declination)  
 Magnetic North is 7.73° East of Grid North (Magnetic Convergence)

To convert a True Direction to a Grid Direction, Subtract 0.68°  
 To convert a Magnetic Direction to a True Direction, Add 8.41° East  
 To convert a Magnetic Direction to a Grid Direction, Add 7.73°