

Noble Energy

Weld County, CO (NAD 83)

Sec. 4-T6N-R63W (NCLP AA04-04/05-B)

NCLP AA06-66-1HNC

05-123-39069

Plan A

Design: Actual Surveys

Sperry Drilling Services

Final Report

06 November, 2014

Well Coordinates: 1,432,825.44 N, 3,291,686.25 E (40° 31' 00.37" N, 104° 27' 03.10" W)

Ground Level: 4,709.00 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 AA06-66-1HNC

RKB=24ft @ 4733.00usft (H&P 343)

N

Grid

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

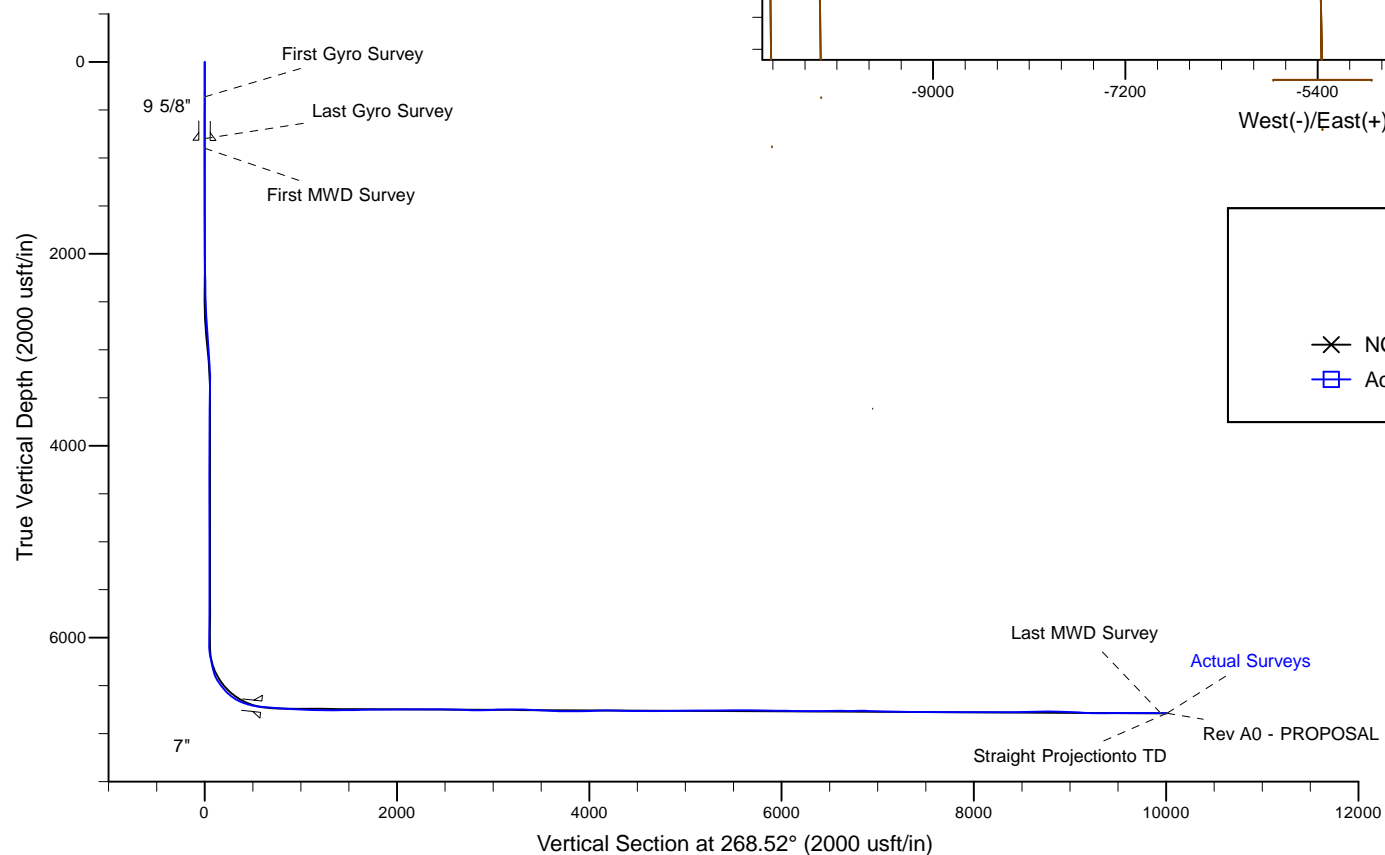
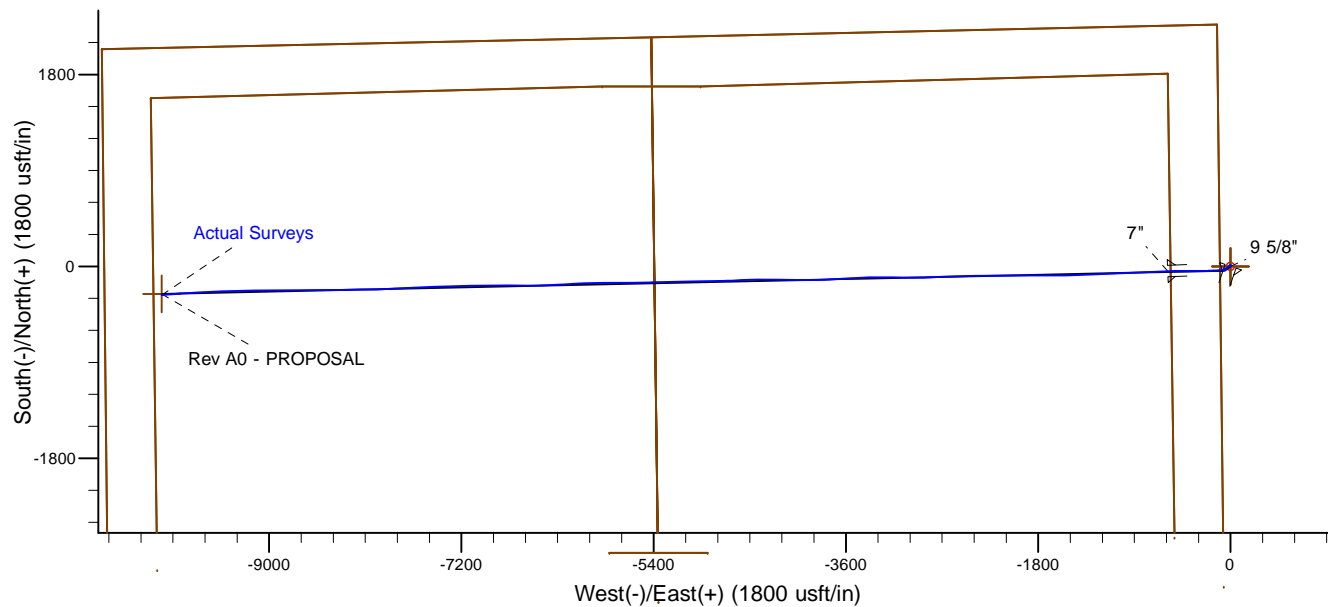
Project: Weld County, CO (NAD 83)
 Site: Sec. 4-T6N-R63W (NCLP AA04-04/05-B)
 Well: NCLP AA06-66-1HNC
 Wellbore: Plan A
 Design: Actual Surveys



Platted SHL: 2272' FNL, 100' FWL
 Platted Lat/Long: 40.51677 N, 104.45086W
 Location: Sec. 4-T6N-R63W

~7" Casing: 2315' FNL, 481' FEL
 Lat/Long: 40.516666 N, --104.452977 W
 State Planes - CO Northern: 1432780.75 N, 3291098.03 E
 Location: Sec. 5-T6N-R63W

Platted BHL: 2310' FNL, 535' FWL
 Lat/Long: 40.51638 N, 104.486860 W
 State Planes - CO Northern: 1432566.99 N, 3281679.45 E
 Location: Sec. 6-T6N-R63W



LEGEND	
	NCLP AA06-66-1HNC, Plan A, Rev A0 - PROPOSAL V0
	Actual Surveys

WELL DETAILS: NCLP AA06-66-1HNC	
Ground Level:	4709.00
RKB=24ft @ 4733.00usft (H&P 343)	
Created By:	Gordy Roth
Created On:	11/06/2014

Design Report for NCLP AA06-66-1HNC - Actual 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
365.00	0.20	347.07	365.00	0.62	-0.14	0.13	0.05
First Gyro Survey							
640.00	0.40	85.27	640.00	1.17	0.71	-0.74	0.17
800.00	0.20	34.17	799.99	1.44	1.42	-1.46	0.20
Last Gyro Survey							
899.00	0.90	4.16	898.99	2.36	1.57	-1.63	0.74
First MWD Survey							
991.00	1.07	17.47	990.98	3.90	1.88	-1.98	0.31
1,085.00	1.31	4.60	1,084.96	5.81	2.23	-2.38	0.38
1,178.00	1.55	323.32	1,177.93	7.88	1.57	-1.77	1.11
1,270.00	0.37	292.78	1,269.92	8.99	0.55	-0.78	1.35
1,364.00	0.26	280.23	1,363.91	9.15	0.06	-0.30	0.14
1,457.00	0.26	302.38	1,456.91	9.30	-0.33	0.09	0.11
1,551.00	0.31	265.29	1,550.91	9.39	-0.76	0.52	0.20
1,643.00	0.61	236.23	1,642.91	9.10	-1.41	1.18	0.40
1,734.00	0.53	231.31	1,733.90	8.57	-2.15	1.92	0.10
1,826.00	0.64	227.48	1,825.90	7.95	-2.86	2.65	0.13
1,921.00	0.54	257.33	1,920.89	7.50	-3.68	3.49	0.34
2,015.00	0.41	250.39	2,014.89	7.29	-4.43	4.24	0.15
2,109.00	0.48	282.41	2,108.89	7.26	-5.13	4.95	0.27
2,204.00	0.37	315.65	2,203.89	7.56	-5.74	5.54	0.28
2,299.00	1.03	315.01	2,298.88	8.39	-6.56	6.34	0.69
2,393.00	2.18	230.26	2,392.85	7.84	-8.53	8.32	2.47
2,487.00	2.53	226.70	2,486.77	5.28	-11.41	11.27	0.40
2,581.00	2.33	222.82	2,580.69	2.45	-14.22	14.15	0.28
2,676.00	3.88	231.91	2,675.54	-0.95	-18.06	18.08	1.71
2,770.00	4.69	227.07	2,769.28	-5.53	-23.38	23.52	0.94
2,865.00	6.24	223.99	2,863.85	-11.89	-29.81	30.11	1.66
2,959.00	6.23	222.96	2,957.29	-19.30	-36.83	37.32	0.12
3,054.00	5.94	222.34	3,051.75	-26.70	-43.66	44.33	0.31
3,149.00	4.55	229.33	3,146.36	-32.79	-49.83	50.66	1.61
3,244.00	2.16	240.59	3,241.19	-36.13	-54.25	55.16	2.60
3,339.00	0.44	15.56	3,336.17	-36.65	-55.71	56.64	2.62
3,434.00	1.55	39.41	3,431.15	-35.31	-54.79	55.69	1.22
3,528.00	1.21	53.03	3,525.12	-33.73	-53.19	54.05	0.50
3,623.00	1.19	23.10	3,620.10	-32.22	-52.01	52.82	0.65
3,717.00	0.50	48.41	3,714.09	-31.05	-51.32	52.10	0.82
3,812.00	0.80	48.45	3,809.09	-30.34	-50.51	51.28	0.32
3,907.00	0.98	41.76	3,904.08	-29.29	-49.47	50.21	0.22
4,002.00	0.96	54.44	3,999.06	-28.22	-48.28	49.00	0.23
4,096.00	0.31	69.12	4,093.06	-27.67	-47.41	48.10	0.71
4,191.00	0.07	3.61	4,188.06	-27.52	-47.16	47.86	0.30
4,285.00	0.57	224.45	4,282.05	-27.80	-47.49	48.19	0.66
4,379.00	0.58	305.22	4,376.05	-27.86	-48.20	48.90	0.79
4,473.00	0.57	341.69	4,470.05	-27.14	-48.74	49.42	0.38
4,568.00	0.54	357.66	4,565.04	-26.24	-48.90	49.56	0.17
4,662.00	0.41	223.83	4,659.04	-26.04	-49.15	49.81	0.93
4,757.00	0.22	209.73	4,754.04	-26.45	-49.48	50.15	0.21
4,852.00	0.13	132.66	4,849.04	-26.68	-49.49	50.16	0.24

Design Report for NCLP AA06-66-1HNC - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,946.00	0.03	122.19	4,943.04	-26.76	-49.39	50.07	0.11
5,041.00	0.14	74.47	5,038.04	-26.75	-49.26	49.93	0.13
5,136.00	0.47	307.33	5,133.04	-26.48	-49.46	50.12	0.60
5,231.00	0.57	273.44	5,228.03	-26.21	-50.24	50.90	0.33
5,326.00	0.33	289.30	5,323.03	-26.10	-50.97	51.63	0.28
5,421.00	0.41	238.25	5,418.03	-26.18	-51.52	52.18	0.34
5,515.00	0.41	110.85	5,512.03	-26.48	-51.49	52.15	0.78
5,610.00	0.98	88.41	5,607.02	-26.58	-50.36	51.03	0.65
5,705.00	0.86	89.95	5,702.01	-26.56	-48.83	49.50	0.13
5,799.00	0.68	90.74	5,796.00	-26.56	-47.57	48.24	0.19
5,894.00	0.26	111.28	5,891.00	-26.65	-46.81	47.48	0.47
5,989.00	0.17	45.15	5,986.00	-26.63	-46.50	47.18	0.26
6,083.00	0.13	175.67	6,080.00	-26.64	-46.40	47.07	0.29
6,178.00	9.76	256.13	6,174.54	-28.68	-54.23	54.95	10.25
6,273.00	12.28	265.61	6,267.78	-31.38	-72.12	72.91	3.26
6,368.00	15.20	260.76	6,360.06	-34.16	-94.49	95.34	3.30
6,463.00	32.79	266.30	6,446.52	-37.85	-132.76	133.69	18.65
6,557.00	38.45	267.78	6,522.90	-40.62	-187.41	188.40	6.09
6,652.00	48.66	269.96	6,591.66	-41.79	-252.76	253.76	10.86
6,746.00	59.80	269.25	6,646.52	-42.35	-328.91	329.89	11.87
6,841.00	72.02	270.07	6,685.23	-42.84	-415.47	416.44	12.89
6,936.00	77.73	269.91	6,710.00	-42.85	-507.14	508.08	6.01
6,977.00	82.90	268.43	6,716.90	-43.44	-547.54	548.48	13.10
7,124.00	85.90	267.11	6,731.24	-49.14	-693.71	694.74	2.23
7,219.00	86.73	267.46	6,737.35	-53.63	-788.40	789.52	0.95
7,314.00	86.24	266.42	6,743.17	-58.69	-883.09	884.31	1.21
7,409.00	86.64	267.88	6,749.07	-63.41	-977.78	979.09	1.59
7,504.00	87.81	268.44	6,753.67	-66.45	-1,072.62	1,073.98	1.37
7,599.00	88.77	266.77	6,756.51	-70.42	-1,167.49	1,168.92	2.03
7,694.00	90.18	267.51	6,757.38	-75.16	-1,262.37	1,263.88	1.68
7,788.00	91.11	268.99	6,756.32	-78.03	-1,356.31	1,357.87	1.86
7,883.00	90.22	267.46	6,755.22	-80.97	-1,451.26	1,452.86	1.86
7,978.00	90.55	268.14	6,754.58	-84.62	-1,546.18	1,547.85	0.80
8,073.00	91.48	270.51	6,752.89	-85.74	-1,641.15	1,642.82	2.68
8,167.00	89.88	270.21	6,751.78	-85.15	-1,735.14	1,736.76	1.73
8,262.00	90.00	269.12	6,751.88	-85.70	-1,830.14	1,831.74	1.15
8,356.00	91.08	270.00	6,750.99	-86.43	-1,924.13	1,925.72	1.48
8,451.00	91.63	270.28	6,748.75	-86.19	-2,019.10	2,020.65	0.65
8,545.00	89.91	270.08	6,747.48	-85.90	-2,113.09	2,114.60	1.84
8,639.00	90.34	269.47	6,747.28	-86.27	-2,207.09	2,208.58	0.79
8,734.00	89.23	269.61	6,747.63	-87.03	-2,302.08	2,303.56	1.18
8,829.00	90.37	268.46	6,747.97	-88.63	-2,397.07	2,398.56	1.70
8,923.00	88.80	269.40	6,748.65	-90.39	-2,491.04	2,492.55	1.95
9,018.00	89.11	267.86	6,750.38	-92.66	-2,586.00	2,587.53	1.65
9,112.00	87.38	266.77	6,753.26	-97.06	-2,679.84	2,681.46	2.17
9,207.00	87.94	267.05	6,757.14	-102.17	-2,774.63	2,776.34	0.66
9,301.00	91.26	269.18	6,757.79	-105.26	-2,868.56	2,870.32	4.20
9,395.00	92.34	270.32	6,754.84	-105.67	-2,962.51	2,964.25	1.67
9,490.00	92.10	271.11	6,751.16	-104.49	-3,057.43	3,059.10	0.87
9,584.00	89.66	270.02	6,749.72	-103.56	-3,151.40	3,153.02	2.84
9,679.00	90.86	271.04	6,749.29	-102.69	-3,246.39	3,247.96	1.66

Design Report for NCLP AA06-66-1HNC - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
9,774.00	88.06	269.23	6,750.18	-102.46	-3,341.38	3,342.91	3.51
9,868.00	87.23	267.97	6,754.04	-104.76	-3,435.27	3,436.82	1.60
9,963.00	86.67	266.32	6,759.10	-109.48	-3,530.01	3,531.66	1.83
10,058.00	87.38	266.30	6,764.03	-115.59	-3,624.68	3,626.46	0.75
10,152.00	89.41	266.71	6,766.66	-121.31	-3,718.47	3,720.36	2.20
10,247.00	90.15	268.44	6,767.03	-125.33	-3,813.38	3,815.34	1.98
10,341.00	91.08	269.00	6,766.02	-127.43	-3,907.35	3,909.33	1.15
10,433.00	91.36	270.32	6,764.06	-127.98	-3,999.32	4,001.29	1.47
10,525.00	91.76	271.00	6,761.55	-126.92	-4,091.28	4,093.19	0.86
10,618.00	90.28	271.42	6,759.90	-124.96	-4,184.24	4,186.07	1.65
10,711.00	89.38	270.89	6,760.17	-123.08	-4,277.22	4,278.97	1.12
10,804.00	88.98	269.92	6,761.51	-122.42	-4,370.21	4,371.91	1.13
10,896.00	88.27	268.02	6,763.71	-124.08	-4,462.16	4,463.88	2.20
10,989.00	89.72	268.11	6,765.34	-127.22	-4,555.09	4,556.86	1.56
11,081.00	89.23	266.33	6,766.19	-131.68	-4,646.98	4,648.83	2.01
11,173.00	90.68	269.22	6,766.26	-135.25	-4,738.90	4,740.81	3.51
11,266.00	91.79	268.34	6,764.26	-137.23	-4,831.85	4,833.78	1.52
11,359.00	90.71	268.93	6,762.23	-139.44	-4,924.80	4,926.76	1.32
11,453.00	90.25	269.83	6,761.44	-140.46	-5,018.79	5,020.74	1.08
11,544.00	90.49	268.77	6,760.85	-141.57	-5,109.78	5,111.73	1.19
11,638.00	91.36	268.31	6,759.33	-143.97	-5,203.74	5,205.72	1.05
11,732.00	89.78	268.86	6,758.40	-146.29	-5,297.70	5,299.71	1.78
11,825.00	90.37	267.63	6,758.28	-149.14	-5,390.65	5,392.71	1.47
11,917.00	91.08	268.88	6,757.11	-151.94	-5,482.60	5,484.70	1.56
12,009.00	90.03	269.47	6,756.22	-153.26	-5,574.59	5,576.68	1.31
12,101.00	89.57	269.89	6,756.54	-153.78	-5,666.58	5,668.66	0.68
12,196.00	87.97	270.19	6,758.58	-153.71	-5,761.56	5,763.61	1.71
12,291.00	89.41	269.49	6,760.75	-153.97	-5,856.53	5,858.55	1.69
12,385.00	88.80	268.25	6,762.22	-155.83	-5,950.50	5,952.54	1.47
12,480.00	89.51	268.01	6,763.62	-158.93	-6,045.44	6,047.52	0.79
12,575.00	89.14	267.33	6,764.74	-162.79	-6,140.35	6,142.51	0.81
12,669.00	89.38	266.54	6,765.96	-167.82	-6,234.21	6,236.46	0.88
12,764.00	90.49	267.39	6,766.06	-172.84	-6,329.07	6,331.42	1.47
12,864.00	91.73	267.83	6,764.13	-177.01	-6,428.96	6,431.39	1.32
12,959.00	89.94	268.77	6,762.74	-179.83	-6,523.91	6,526.38	2.13
13,054.00	89.38	269.92	6,763.31	-180.92	-6,618.90	6,621.36	1.35
13,148.00	89.48	269.93	6,764.24	-181.04	-6,712.89	6,715.33	0.11
13,243.00	90.89	270.45	6,763.93	-180.73	-6,807.89	6,810.29	1.58
13,338.00	88.67	270.25	6,764.30	-180.15	-6,902.88	6,905.23	2.35
13,433.00	88.27	269.68	6,766.84	-180.20	-6,997.85	7,000.17	0.73
13,528.00	88.15	269.08	6,769.80	-181.23	-7,092.79	7,095.11	0.64
13,623.00	88.34	268.91	6,772.71	-182.90	-7,187.73	7,190.06	0.27
13,717.00	88.98	268.42	6,774.91	-185.09	-7,281.68	7,284.03	0.86
13,812.00	90.18	268.13	6,775.61	-187.95	-7,376.63	7,379.03	1.30
13,907.00	90.25	268.62	6,775.25	-190.64	-7,471.60	7,474.03	0.52
14,002.00	90.06	267.02	6,774.99	-194.25	-7,566.52	7,569.02	1.70
14,097.00	89.75	265.62	6,775.15	-200.35	-7,661.32	7,663.94	1.51
14,192.00	89.38	266.77	6,775.87	-206.65	-7,756.11	7,758.86	1.27
14,287.00	89.20	267.81	6,777.05	-211.15	-7,851.00	7,853.83	1.11
14,382.00	89.35	267.83	6,778.25	-214.76	-7,945.92	7,948.82	0.16
14,477.00	91.11	270.62	6,777.87	-216.04	-8,040.90	8,043.79	3.47

Design Report for NCLP AA06-66-1HNC - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
14,572.00	90.56	269.67	6,776.49	-215.80	-8,135.89	8,138.75	1.16
14,666.00	89.78	268.54	6,776.21	-217.27	-8,229.87	8,232.74	1.46
14,762.00	90.00	267.73	6,776.39	-220.40	-8,325.82	8,328.73	0.87
14,856.00	90.22	269.86	6,776.21	-222.37	-8,419.79	8,422.73	2.28
14,951.00	90.74	270.00	6,775.42	-222.49	-8,514.79	8,517.70	0.57
15,046.00	91.17	270.32	6,773.83	-222.22	-8,609.78	8,612.64	0.56
15,141.00	91.30	270.28	6,771.78	-221.73	-8,704.75	8,707.57	0.14
15,236.00	89.57	270.07	6,771.06	-221.44	-8,799.75	8,802.53	1.83
15,330.00	88.92	269.51	6,772.30	-221.78	-8,893.74	8,896.50	0.91
15,425.00	87.97	268.92	6,774.88	-223.08	-8,988.69	8,991.45	1.18
15,520.00	86.98	268.12	6,779.07	-225.53	-9,083.56	9,086.36	1.34
15,615.00	86.85	268.56	6,784.18	-228.28	-9,178.39	9,181.22	0.48
15,710.00	88.46	268.23	6,788.06	-230.94	-9,273.27	9,276.14	1.73
15,805.00	91.94	269.03	6,787.73	-233.21	-9,368.22	9,371.12	3.76
15,900.00	90.31	268.15	6,785.87	-235.55	-9,463.17	9,466.10	1.95
15,995.00	90.31	268.23	6,785.35	-238.55	-9,558.12	9,561.10	0.08
16,089.00	89.91	266.94	6,785.17	-242.51	-9,652.04	9,655.08	1.44
16,184.00	89.91	265.83	6,785.32	-248.50	-9,746.85	9,750.01	1.17
16,279.00	89.32	265.97	6,785.96	-255.29	-9,841.60	9,844.91	0.64
16,380.00	89.32	264.73	6,787.16	-263.48	-9,942.26	9,945.75	1.23
Last MWD Survey							
16,445.00	89.32	264.73	6,787.93	-269.45	-10,006.98	10,010.60	0.00
Straight Projectionto TD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
365.00	365.00	0.62	-0.14	First Gyro Survey
800.00	799.99	1.44	1.42	Last Gyro Survey
899.00	898.99	2.36	1.57	First MWD Survey
16,380.00	6,787.16	-263.48	-9,942.26	Last MWD Survey
16,445.00	6,787.93	-269.45	-10,006.98	Straight Projectionto TD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	NCLP AA06-66-1HNC_BHL	268.52	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
365.00	800.00	Surface Surveys	Flexi-Shot
899.00	6,977.00	MWD Surveys- Intermediate	MWD+IFR1+MS_WY
7,124.00	16,445.00	MWD Survey - Production	MWD+IFR1+MS_WY

Design Report for NCLP AA06-66-1HNC - Actual Surveys

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
819.00	818.99	9 5/8"	9-5/8	13-3/4
7,018.00	6,721.67	7"	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 AA06-66-1HNC_	0.00	0.00	0.00	0.00	0.00	1,432,825.44	3,291,686.25	40.516770	-104.450860
- actual wellpath hits target center									
- Polygon									
Point 1				0.00	1,577.78	-10,107.17	1,434,403.17	3,281,579.41	
Point 2				0.00	-2,850.08	-10,048.97	1,429,975.46	3,281,637.61	
Point 3				0.00	-2,688.74	-5,815.00	1,430,136.79	3,285,871.44	
Point 4				0.00	-2,688.74	-4,894.97	1,430,136.79	3,286,791.44	
Point 5				0.00	-2,546.58	-524.56	1,430,278.95	3,291,161.71	
Point 6				0.00	1,808.35	-586.95	1,434,633.74	3,291,099.32	
Point 7				0.00	1,688.00	-4,962.04	1,434,513.39	3,286,724.37	
Point 8				0.00	1,688.00	-5,882.07	1,434,513.39	3,285,804.37	
Point 9				0.00	1,577.78	-10,107.17	1,434,403.17	3,281,579.41	
NCLP AA06-66-1HNC_	0.00	0.00	0.00	0.00	0.00	1,432,825.44	3,291,686.25	40.516770	-104.450860
- actual wellpath hits target center									
- Polygon									
Point 1				0.00	2,037.79	-10,567.18	1,434,863.17	3,281,119.41	
Point 2				0.00	-3,310.09	-10,508.98	1,429,515.46	3,281,177.61	
Point 3				0.00	-3,148.76	-5,354.99	1,429,676.79	3,286,331.44	
Point 4				0.00	2,148.02	-5,422.06	1,434,973.39	3,286,264.37	
Point 5				0.00	-3,148.76	-5,354.99	1,429,676.79	3,286,331.44	
Point 6				0.00	-3,006.59	-64.54	1,429,818.95	3,291,621.71	
Point 7				0.00	2,268.37	-126.94	1,435,093.74	3,291,559.32	
Point 8				0.00	2,148.02	-5,422.06	1,434,973.39	3,286,264.37	
Point 9				0.00	2,037.79	-10,567.18	1,434,863.17	3,281,119.41	
NCLP AA06-66-1HNC_	0.00	0.00	0.00	0.00	0.00	1,432,825.44	3,291,686.25	40.516770	-104.450860
- actual wellpath hits target center									
- Point									
NCLP AA06-66-1HNC_	0.00	0.00	6,789.42	-258.46	-10,007.13	1,432,566.99	3,281,679.45	40.516380	-104.486860
- actual wellpath misses target center by 11.06usft at 16444.15usft MD (6787.92 TVD, -269.37 N, -10006.14 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	1.55 °/100usft	Maximum Dogleg over Survey:	18.65 °/100usft at 6,463.00 usft
Net Tortousity applicable to Plans:	0.92 °/100usft	Directional Difficulty Index:	6.794

Audit Info

North Reference Sheet for Sec. 4-T6N-R63W (NCLP AA04-04/05-B) - NCLP AA06-66-1HNC - Plan A

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

Vertical Depths are relative to RKB=24ft @ 4733.00usft (H&P 343). Northing and Easting are relative to NCLP AA06-66-1HNC

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: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996760

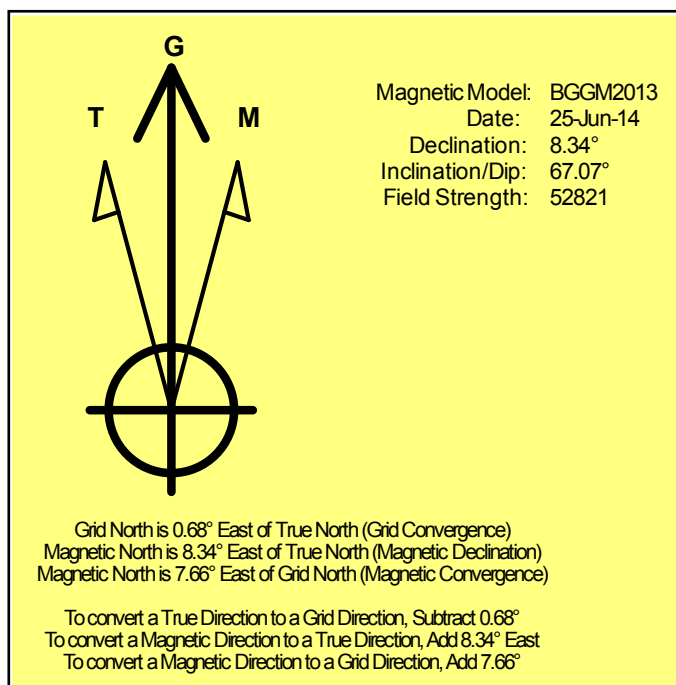
Grid Coordinates of Well: 1,432,825.44 usft N, 3,291,686.25 usft E

Geographical Coordinates of Well: 40° 31' 00.37" N, 104° 27' 03.10" W

Grid Convergence at Surface is: 0.68°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,445.00usft
the Bottom Hole Displacement is 10,010.61usft in the Direction of 268.46° (Grid).

Magnetic Convergence at surface is: -7.66° (25 June 2014, , BGGM2013)



Noble Energy

Weld County, CO (NAD 83)

Sec. 4-T6N-R63W (NCLP AA04-04/05-B)

NCLP AA06-66-1HNC

Plan A

Design: Actual Surveys

Sperry Drilling Services

Geodetic Report

06 November, 2014

Well Coordinates: 1,432,825.44 N, 3,291,686.25 E (40° 31' 00.37" N, 104° 27' 03.10" W)

Ground Level: 4,709.00 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 AA06-66-1HNC

RKB=24ft @ 4733.00usft (H&P 343)

N

Grid

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for NCLP AA06-66-1HNC - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	40.516770	-104.450860	1,432,825.44	3,291,686.25
365.00	0.20	347.07	365.00	0.62	-0.14	40.516772	-104.450861	1,432,826.06	3,291,686.11
640.00	0.40	85.27	640.00	1.17	0.71	40.516773	-104.450858	1,432,826.61	3,291,686.96
800.00	0.20	34.17	799.99	1.44	1.42	40.516774	-104.450855	1,432,826.88	3,291,687.67
899.00	0.90	4.16	898.99	2.36	1.57	40.516777	-104.450855	1,432,827.80	3,291,687.83
991.00	1.07	17.47	990.98	3.90	1.88	40.516781	-104.450853	1,432,829.34	3,291,688.14
1,085.00	1.31	4.60	1,084.96	5.81	2.23	40.516786	-104.450852	1,432,831.25	3,291,688.49
1,178.00	1.55	323.32	1,177.93	7.88	1.57	40.516792	-104.450854	1,432,833.32	3,291,687.82
1,270.00	0.37	292.78	1,269.92	8.99	0.55	40.516795	-104.450858	1,432,834.43	3,291,686.80
1,364.00	0.26	280.23	1,363.91	9.15	0.06	40.516795	-104.450860	1,432,834.59	3,291,686.31
1,457.00	0.26	302.38	1,456.91	9.30	-0.33	40.516796	-104.450861	1,432,834.74	3,291,685.93
1,551.00	0.31	265.29	1,550.91	9.39	-0.76	40.516796	-104.450863	1,432,834.83	3,291,685.49
1,643.00	0.61	236.23	1,642.91	9.10	-1.41	40.516795	-104.450865	1,432,834.54	3,291,684.84
1,734.00	0.53	231.31	1,733.90	8.57	-2.15	40.516794	-104.450868	1,432,834.01	3,291,684.11
1,826.00	0.64	227.48	1,825.90	7.95	-2.86	40.516792	-104.450870	1,432,833.39	3,291,683.40
1,921.00	0.54	257.33	1,920.89	7.50	-3.68	40.516791	-104.450873	1,432,832.94	3,291,682.57
2,015.00	0.41	250.39	2,014.89	7.29	-4.43	40.516790	-104.450876	1,432,832.73	3,291,681.82
2,109.00	0.48	282.41	2,108.89	7.26	-5.13	40.516790	-104.450878	1,432,832.70	3,291,681.12
2,204.00	0.37	315.65	2,203.89	7.56	-5.74	40.516791	-104.450881	1,432,833.00	3,291,680.51
2,299.00	1.03	315.01	2,298.88	8.39	-6.56	40.516793	-104.450883	1,432,833.83	3,291,679.70
2,393.00	2.18	230.26	2,392.85	7.84	-8.53	40.516792	-104.450891	1,432,833.28	3,291,677.72
2,487.00	2.53	226.70	2,486.77	5.28	-11.41	40.516785	-104.450901	1,432,830.72	3,291,674.84
2,581.00	2.33	222.82	2,580.69	2.45	-14.22	40.516777	-104.450911	1,432,827.89	3,291,672.03
2,676.00	3.88	231.91	2,675.54	-0.95	-18.06	40.516768	-104.450925	1,432,824.49	3,291,668.19
2,770.00	4.69	227.07	2,769.28	-5.53	-23.38	40.516756	-104.450945	1,432,819.91	3,291,662.87
2,865.00	6.24	223.99	2,863.85	-11.89	-29.81	40.516738	-104.450968	1,432,813.55	3,291,656.44
2,959.00	6.23	222.96	2,957.29	-19.30	-36.83	40.516718	-104.450994	1,432,806.14	3,291,649.42
3,054.00	5.94	222.34	3,051.75	-26.70	-43.66	40.516698	-104.451018	1,432,798.74	3,291,642.60
3,149.00	4.55	229.33	3,146.36	-32.79	-49.83	40.516682	-104.451041	1,432,792.65	3,291,636.43
3,244.00	2.16	240.59	3,241.19	-36.13	-54.25	40.516673	-104.451057	1,432,789.31	3,291,632.01
3,339.00	0.44	15.56	3,336.17	-36.65	-55.71	40.516671	-104.451062	1,432,788.79	3,291,630.55
3,434.00	1.55	39.41	3,431.15	-35.31	-54.79	40.516675	-104.451059	1,432,790.13	3,291,631.46
3,528.00	1.21	53.03	3,525.12	-33.73	-53.19	40.516679	-104.451053	1,432,791.71	3,291,633.06
3,623.00	1.19	23.10	3,620.10	-32.22	-52.01	40.516683	-104.451049	1,432,793.22	3,291,634.25
3,717.00	0.50	48.41	3,714.09	-31.05	-51.32	40.516687	-104.451046	1,432,794.39	3,291,634.94
3,812.00	0.80	48.45	3,809.09	-30.34	-50.51	40.516688	-104.451043	1,432,795.11	3,291,635.74
3,907.00	0.98	41.76	3,904.08	-29.29	-49.47	40.516691	-104.451039	1,432,796.15	3,291,636.78
4,002.00	0.96	54.44	3,999.06	-28.22	-48.28	40.516694	-104.451035	1,432,797.22	3,291,637.97
4,096.00	0.31	69.12	4,093.06	-27.67	-47.41	40.516696	-104.451032	1,432,797.77	3,291,638.85
4,191.00	0.07	3.61	4,188.06	-27.52	-47.16	40.516696	-104.451031	1,432,797.92	3,291,639.09
4,285.00	0.57	224.45	4,282.05	-27.80	-47.49	40.516695	-104.451032	1,432,797.64	3,291,638.77
4,379.00	0.58	305.22	4,376.05	-27.86	-48.20	40.516695	-104.451035	1,432,797.58	3,291,638.05

Design Report for NCLP AA06-66-1HNC - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
4,473.00	0.57	341.69	4,470.05	-27.14	-48.74	40.516697	-104.451037	1,432,798.30	3,291,637.52
4,568.00	0.54	357.66	4,565.04	-26.24	-48.90	40.516700	-104.451037	1,432,799.20	3,291,637.35
4,662.00	0.41	223.83	4,659.04	-26.04	-49.15	40.516700	-104.451038	1,432,799.40	3,291,637.10
4,757.00	0.22	209.73	4,754.04	-26.45	-49.48	40.516699	-104.451039	1,432,798.99	3,291,636.77
4,852.00	0.13	132.66	4,849.04	-26.68	-49.49	40.516698	-104.451039	1,432,798.76	3,291,636.76
4,946.00	0.03	122.19	4,943.04	-26.76	-49.39	40.516698	-104.451039	1,432,798.68	3,291,636.86
5,041.00	0.14	74.47	5,038.04	-26.75	-49.26	40.516698	-104.451039	1,432,798.69	3,291,636.99
5,136.00	0.47	307.33	5,133.04	-26.48	-49.46	40.516699	-104.451039	1,432,798.96	3,291,636.80
5,231.00	0.57	273.44	5,228.03	-26.21	-50.24	40.516700	-104.451042	1,432,799.23	3,291,636.01
5,326.00	0.33	289.30	5,323.03	-26.10	-50.97	40.516700	-104.451045	1,432,799.34	3,291,635.28
5,421.00	0.41	238.25	5,418.03	-26.18	-51.52	40.516700	-104.451047	1,432,799.26	3,291,634.74
5,515.00	0.41	110.85	5,512.03	-26.48	-51.49	40.516699	-104.451047	1,432,798.96	3,291,634.77
5,610.00	0.98	88.41	5,607.02	-26.58	-50.36	40.516699	-104.451043	1,432,798.86	3,291,635.90
5,705.00	0.86	89.95	5,702.01	-26.56	-48.83	40.516699	-104.451037	1,432,798.88	3,291,637.42
5,799.00	0.68	90.74	5,796.00	-26.56	-47.57	40.516699	-104.451032	1,432,798.88	3,291,638.68
5,894.00	0.26	111.28	5,891.00	-26.65	-46.81	40.516698	-104.451030	1,432,798.79	3,291,639.45
5,989.00	0.17	45.15	5,986.00	-26.63	-46.50	40.516698	-104.451029	1,432,798.81	3,291,639.75
6,083.00	0.13	175.67	6,080.00	-26.64	-46.40	40.516698	-104.451028	1,432,798.81	3,291,639.86
6,178.00	9.76	256.13	6,174.54	-28.68	-54.23	40.516693	-104.451056	1,432,796.76	3,291,632.03
6,273.00	12.28	265.61	6,267.78	-31.38	-72.12	40.516686	-104.451121	1,432,794.06	3,291,614.13
6,368.00	15.20	260.76	6,360.06	-34.16	-94.49	40.516679	-104.451202	1,432,791.29	3,291,591.76
6,463.00	32.79	266.30	6,446.52	-37.85	-132.76	40.516671	-104.451339	1,432,787.60	3,291,553.50
6,557.00	38.45	267.78	6,522.90	-40.62	-187.41	40.516665	-104.451536	1,432,784.82	3,291,498.85
6,652.00	48.66	269.96	6,591.66	-41.79	-252.76	40.516664	-104.451771	1,432,783.65	3,291,433.50
6,746.00	59.80	269.25	6,646.52	-42.35	-328.91	40.516665	-104.452045	1,432,783.09	3,291,357.35
6,841.00	72.02	270.07	6,685.23	-42.84	-415.47	40.516666	-104.452356	1,432,782.60	3,291,270.80
6,936.00	77.73	269.91	6,710.00	-42.85	-507.14	40.516669	-104.452686	1,432,782.59	3,291,179.13
6,977.00	82.90	268.43	6,716.90	-43.44	-547.54	40.516669	-104.452831	1,432,782.00	3,291,138.73
7,124.00	85.90	267.11	6,731.24	-49.14	-693.71	40.516658	-104.453357	1,432,776.30	3,290,992.57
7,219.00	86.73	267.46	6,737.35	-53.63	-788.40	40.516648	-104.453698	1,432,771.81	3,290,897.88
7,314.00	86.24	266.42	6,743.17	-58.69	-883.09	40.516638	-104.454039	1,432,766.75	3,290,803.19
7,409.00	86.64	267.88	6,749.07	-63.41	-977.78	40.516628	-104.454379	1,432,762.04	3,290,708.50
7,504.00	87.81	268.44	6,753.67	-66.45	-1,072.62	40.516622	-104.454721	1,432,758.99	3,290,613.67
7,599.00	88.77	266.77	6,756.51	-70.42	-1,167.49	40.516615	-104.455062	1,432,755.02	3,290,518.80
7,694.00	90.18	267.51	6,757.38	-75.16	-1,262.37	40.516605	-104.455403	1,432,750.28	3,290,423.93
7,788.00	91.11	268.99	6,756.32	-78.03	-1,356.31	40.516600	-104.455741	1,432,747.41	3,290,329.98
7,883.00	90.22	267.46	6,755.22	-80.97	-1,451.26	40.516595	-104.456083	1,432,744.47	3,290,235.04
7,978.00	90.55	268.14	6,754.58	-84.62	-1,546.18	40.516588	-104.456424	1,432,740.82	3,290,140.12
8,073.00	91.48	270.51	6,752.89	-85.74	-1,641.15	40.516588	-104.456766	1,432,739.70	3,290,045.15
8,167.00	89.88	270.21	6,751.78	-85.15	-1,735.14	40.516593	-104.457104	1,432,740.29	3,289,951.17
8,262.00	90.00	269.12	6,751.88	-85.70	-1,830.14	40.516594	-104.457446	1,432,739.74	3,289,856.17
8,356.00	91.08	270.00	6,750.99	-86.43	-1,924.13	40.516595	-104.457784	1,432,739.02	3,289,762.18

Design Report for NCLP AA06-66-1HNC - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
8,451.00	91.63	270.28	6,748.75	-86.19	-2,019.10	40.516599	-104.458125	1,432,739.25	3,289,667.21
8,545.00	89.91	270.08	6,747.48	-85.90	-2,113.09	40.516603	-104.458463	1,432,739.54	3,289,573.23
8,639.00	90.34	269.47	6,747.28	-86.27	-2,207.09	40.516605	-104.458801	1,432,739.18	3,289,479.24
8,734.00	89.23	269.61	6,747.63	-87.03	-2,302.08	40.516606	-104.459143	1,432,738.41	3,289,384.24
8,829.00	90.37	268.46	6,747.97	-88.63	-2,397.07	40.516604	-104.459485	1,432,736.81	3,289,289.26
8,923.00	88.80	269.40	6,748.65	-90.39	-2,491.04	40.516603	-104.459823	1,432,735.06	3,289,195.29
9,018.00	89.11	267.86	6,750.38	-92.66	-2,586.00	40.516599	-104.460164	1,432,732.79	3,289,100.34
9,112.00	87.38	266.77	6,753.26	-97.06	-2,679.84	40.516590	-104.460502	1,432,728.39	3,289,006.49
9,207.00	87.94	267.05	6,757.14	-102.17	-2,774.63	40.516579	-104.460843	1,432,723.27	3,288,911.71
9,301.00	91.26	269.18	6,757.79	-105.26	-2,868.56	40.516574	-104.461181	1,432,720.18	3,288,817.79
9,395.00	92.34	270.32	6,754.84	-105.67	-2,962.51	40.516576	-104.461519	1,432,719.77	3,288,723.84
9,490.00	92.10	271.11	6,751.16	-104.49	-3,057.43	40.516582	-104.461860	1,432,720.95	3,288,628.93
9,584.00	89.66	270.02	6,749.72	-103.56	-3,151.40	40.516588	-104.462198	1,432,721.88	3,288,534.95
9,679.00	90.86	271.04	6,749.29	-102.69	-3,246.39	40.516593	-104.462540	1,432,722.76	3,288,439.96
9,774.00	88.06	269.23	6,750.18	-102.46	-3,341.38	40.516597	-104.462881	1,432,722.98	3,288,344.98
9,868.00	87.23	267.97	6,754.04	-104.76	-3,435.27	40.516593	-104.463219	1,432,720.69	3,288,251.10
9,963.00	86.67	266.32	6,759.10	-109.48	-3,530.01	40.516584	-104.463560	1,432,715.96	3,288,156.36
10,058.00	87.38	266.30	6,764.03	-115.59	-3,624.68	40.516570	-104.463901	1,432,709.86	3,288,061.69
10,152.00	89.41	266.71	6,766.66	-121.31	-3,718.47	40.516557	-104.464238	1,432,704.13	3,287,967.90
10,247.00	90.15	268.44	6,767.03	-125.33	-3,813.38	40.516549	-104.464580	1,432,700.11	3,287,873.00
10,341.00	91.08	269.00	6,766.02	-127.43	-3,907.35	40.516546	-104.464918	1,432,698.01	3,287,779.03
10,433.00	91.36	270.32	6,764.06	-127.98	-3,999.32	40.516548	-104.465249	1,432,697.47	3,287,687.06
10,525.00	91.76	271.00	6,761.55	-126.92	-4,091.28	40.516554	-104.465579	1,432,698.53	3,287,595.10
10,618.00	90.28	271.42	6,759.90	-124.96	-4,184.24	40.516562	-104.465914	1,432,700.49	3,287,502.14
10,711.00	89.38	270.89	6,760.17	-123.08	-4,277.22	40.516570	-104.466248	1,432,702.36	3,287,409.17
10,804.00	88.98	269.92	6,761.51	-122.42	-4,370.21	40.516575	-104.466582	1,432,703.02	3,287,316.18
10,896.00	88.27	268.02	6,763.71	-124.08	-4,462.16	40.516573	-104.466913	1,432,701.37	3,287,224.23
10,989.00	89.72	268.11	6,765.34	-127.22	-4,555.09	40.516568	-104.467247	1,432,698.23	3,287,131.31
11,081.00	89.23	266.33	6,766.19	-131.68	-4,646.98	40.516558	-104.467578	1,432,693.77	3,287,039.42
11,173.00	90.68	269.22	6,766.26	-135.25	-4,738.90	40.516551	-104.467909	1,432,690.20	3,286,947.51
11,266.00	91.79	268.34	6,764.26	-137.23	-4,831.85	40.516549	-104.468243	1,432,688.22	3,286,854.56
11,359.00	90.71	268.93	6,762.23	-139.44	-4,924.80	40.516546	-104.468577	1,432,686.00	3,286,761.61
11,453.00	90.25	269.83	6,761.44	-140.46	-5,018.79	40.516546	-104.468916	1,432,684.98	3,286,667.62
11,544.00	90.49	268.77	6,760.85	-141.57	-5,109.78	40.516546	-104.469243	1,432,683.87	3,286,576.64
11,638.00	91.36	268.31	6,759.33	-143.97	-5,203.74	40.516542	-104.469581	1,432,681.48	3,286,482.68
11,732.00	89.78	268.86	6,758.40	-146.29	-5,297.70	40.516539	-104.469919	1,432,679.16	3,286,388.72
11,825.00	90.37	267.63	6,758.28	-149.14	-5,390.65	40.516534	-104.470253	1,432,676.31	3,286,295.77
11,917.00	91.08	268.88	6,757.11	-151.94	-5,482.60	40.516529	-104.470584	1,432,673.51	3,286,203.83
12,009.00	90.03	269.47	6,756.22	-153.26	-5,574.59	40.516529	-104.470915	1,432,672.18	3,286,111.85
12,101.00	89.57	269.89	6,756.54	-153.78	-5,666.58	40.516530	-104.471246	1,432,671.67	3,286,019.85
12,196.00	87.97	270.19	6,758.58	-153.71	-5,761.56	40.516533	-104.471587	1,432,671.74	3,285,924.88
12,291.00	89.41	269.49	6,760.75	-153.97	-5,856.53	40.516536	-104.471929	1,432,671.47	3,285,829.91

Design Report for NCLP AA06-66-1HNC - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
12,385.00	88.80	268.25	6,762.22	-155.83	-5,950.50	40.516534	-104.472267	1,432,669.62	3,285,735.95
12,480.00	89.51	268.01	6,763.62	-158.93	-6,045.44	40.516528	-104.472609	1,432,666.52	3,285,641.01
12,575.00	89.14	267.33	6,764.74	-162.79	-6,140.35	40.516521	-104.472950	1,432,662.66	3,285,546.10
12,669.00	89.38	266.54	6,765.96	-167.82	-6,234.21	40.516510	-104.473288	1,432,657.63	3,285,452.25
12,764.00	90.49	267.39	6,766.06	-172.84	-6,329.07	40.516499	-104.473629	1,432,652.60	3,285,357.38
12,864.00	91.73	267.83	6,764.13	-177.01	-6,428.96	40.516491	-104.473989	1,432,648.43	3,285,257.50
12,959.00	89.94	268.77	6,762.74	-179.83	-6,523.91	40.516486	-104.474330	1,432,645.61	3,285,162.56
13,054.00	89.38	269.92	6,763.31	-180.92	-6,618.90	40.516486	-104.474672	1,432,644.53	3,285,067.57
13,148.00	89.48	269.93	6,764.24	-181.04	-6,712.89	40.516489	-104.475010	1,432,644.41	3,284,973.58
13,243.00	90.89	270.45	6,763.93	-180.73	-6,807.89	40.516493	-104.475351	1,432,644.72	3,284,878.58
13,338.00	88.67	270.25	6,764.30	-180.15	-6,902.88	40.516497	-104.475693	1,432,645.30	3,284,783.60
13,433.00	88.27	269.68	6,766.84	-180.20	-6,997.85	40.516500	-104.476035	1,432,645.24	3,284,688.63
13,528.00	88.15	269.08	6,769.80	-181.23	-7,092.79	40.516500	-104.476376	1,432,644.21	3,284,593.69
13,623.00	88.34	268.91	6,772.71	-182.90	-7,187.73	40.516499	-104.476718	1,432,642.55	3,284,498.75
13,717.00	88.98	268.42	6,774.91	-185.09	-7,281.68	40.516496	-104.477056	1,432,640.36	3,284,404.81
13,812.00	90.18	268.13	6,775.61	-187.95	-7,376.63	40.516491	-104.477397	1,432,637.50	3,284,309.86
13,907.00	90.25	268.62	6,775.25	-190.64	-7,471.60	40.516486	-104.477739	1,432,634.81	3,284,214.90
14,002.00	90.06	267.02	6,774.99	-194.25	-7,566.52	40.516479	-104.478080	1,432,631.19	3,284,119.97
14,097.00	89.75	265.62	6,775.15	-200.35	-7,661.32	40.516466	-104.478422	1,432,625.10	3,284,025.18
14,192.00	89.38	266.77	6,775.87	-206.65	-7,756.11	40.516451	-104.478763	1,432,618.79	3,283,930.39
14,287.00	89.20	267.81	6,777.05	-211.15	-7,851.00	40.516442	-104.479104	1,432,614.30	3,283,835.51
14,382.00	89.35	267.83	6,778.25	-214.76	-7,945.92	40.516435	-104.479446	1,432,610.69	3,283,740.59
14,477.00	91.11	270.62	6,777.87	-216.04	-8,040.90	40.516435	-104.479787	1,432,609.40	3,283,645.62
14,572.00	90.56	269.67	6,776.49	-215.80	-8,135.89	40.516438	-104.480129	1,432,609.64	3,283,550.63
14,666.00	89.78	268.54	6,776.21	-217.27	-8,229.87	40.516437	-104.480467	1,432,608.18	3,283,456.65
14,762.00	90.00	267.73	6,776.39	-220.40	-8,325.82	40.516432	-104.480812	1,432,605.05	3,283,360.70
14,856.00	90.22	269.86	6,776.21	-222.37	-8,419.79	40.516429	-104.481150	1,432,603.07	3,283,266.73
14,951.00	90.74	270.00	6,775.42	-222.49	-8,514.79	40.516432	-104.481492	1,432,602.96	3,283,171.74
15,046.00	91.17	270.32	6,773.83	-222.22	-8,609.78	40.516436	-104.481833	1,432,603.22	3,283,076.76
15,141.00	91.30	270.28	6,771.78	-221.73	-8,704.75	40.516440	-104.482175	1,432,603.72	3,282,981.78
15,236.00	89.57	270.07	6,771.06	-221.44	-8,799.75	40.516444	-104.482517	1,432,604.01	3,282,886.79
15,330.00	88.92	269.51	6,772.30	-221.78	-8,893.74	40.516446	-104.482855	1,432,603.67	3,282,792.80
15,425.00	87.97	268.92	6,774.88	-223.08	-8,988.69	40.516445	-104.483196	1,432,602.37	3,282,697.85
15,520.00	86.98	268.12	6,779.07	-225.53	-9,083.56	40.516441	-104.483537	1,432,599.91	3,282,602.98
15,615.00	86.85	268.56	6,784.18	-228.28	-9,178.39	40.516437	-104.483879	1,432,597.17	3,282,508.16
15,710.00	88.46	268.23	6,788.06	-230.94	-9,273.27	40.516433	-104.484220	1,432,594.51	3,282,413.29
15,805.00	91.94	269.03	6,787.73	-233.21	-9,368.22	40.516429	-104.484562	1,432,592.24	3,282,318.33
15,900.00	90.31	268.15	6,785.87	-235.55	-9,463.17	40.516426	-104.484903	1,432,589.90	3,282,223.39
15,995.00	90.31	268.23	6,785.35	-238.55	-9,558.12	40.516421	-104.485245	1,432,586.90	3,282,128.44
16,089.00	89.91	266.94	6,785.17	-242.51	-9,652.04	40.516413	-104.485583	1,432,582.94	3,282,034.53
16,184.00	89.91	265.83	6,785.32	-248.50	-9,746.85	40.516399	-104.485924	1,432,576.95	3,281,939.72
16,279.00	89.32	265.97	6,785.96	-255.29	-9,841.60	40.516384	-104.486265	1,432,570.16	3,281,844.97

Design Report for NCLP AA06-66-1HNC - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Geographic Coordinates Latitude (usft)	Longitude (usft)	UTM Coordinates Northing (usft)	Easting (usft)
16,380.00	89.32	264.73	6,787.16	-263.48	-9,942.26	40.516364	-104.486627	1,432,561.97	3,281,744.31
16,445.00	89.32	264.73	6,787.93	-269.45	-10,006.98	40.516350	-104.486860	1,432,556.00	3,281,679.60

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
365.00	365.00	0.62	-0.14	First Gyro Survey
800.00	799.99	1.44	1.42	Last Gyro Survey
899.00	898.99	2.36	1.57	First MWD Survey
16,380.00	6,787.16	-263.48	-9,942.26	Last MWD Survey
16,445.00	6,787.93	-269.45	-10,006.98	Straight Projection to TD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	+E/-W (usft)	Start TVD (usft)
Target	NCLP AA06-66-1HNC_BHL	268.52	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
365.00	800.00	Surface Surveys	Flexi-Shot
899.00	6,977.00	MWD Surveys- Intermediate	MWD+IFR1+MS_WY
7,124.00	16,445.00	MWD Survey - Production	MWD+IFR1+MS_WY

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
819.00	818.99	9 5/8"	9-5/8	13-3/4
7,018.00	6,721.67	7"	7	8-3/4

Design Report for NCLP AA06-66-1HNC - Actual Surveys

Design Targets

Shape	Target Name	TVD ()	Northing ()	Easting ()	+N/-S	+E/-W	Created	Updated
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Directional Difficulty Index

Average Dogleg over Survey:	1.55 °/100usft	Maximum Dogleg over Survey:	18.65 °/100usft at 6,463.00 usft
Net Tortousity applicable to Plans:	0.92 °/100usft	Directional Difficulty Index:	6.794

Audit Info

North Reference Sheet for Sec. 4-T6N-R63W (NCLP AA04-04/05-B) - NCLP AA06-66-1HNC - Plan A

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

Vertical Depths are relative to RKB=24ft @ 4733.00usft (H&P 343). Northing and Easting are relative to NCLP AA06-66-1HNC

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: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996760

Grid Coordinates of Well: 1,432,825.44 usft N, 3,291,686.25 usft E

Geographical Coordinates of Well: 40° 31' 00.37" N, 104° 27' 03.10" W

Grid Convergence at Surface is: 0.68°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,445.00usft

the Bottom Hole Displacement is 10,010.61usft in the Direction of 268.46° (Grid).

Magnetic Convergence at surface is: -7.66° (25 June 2014, , BGGM2013)

