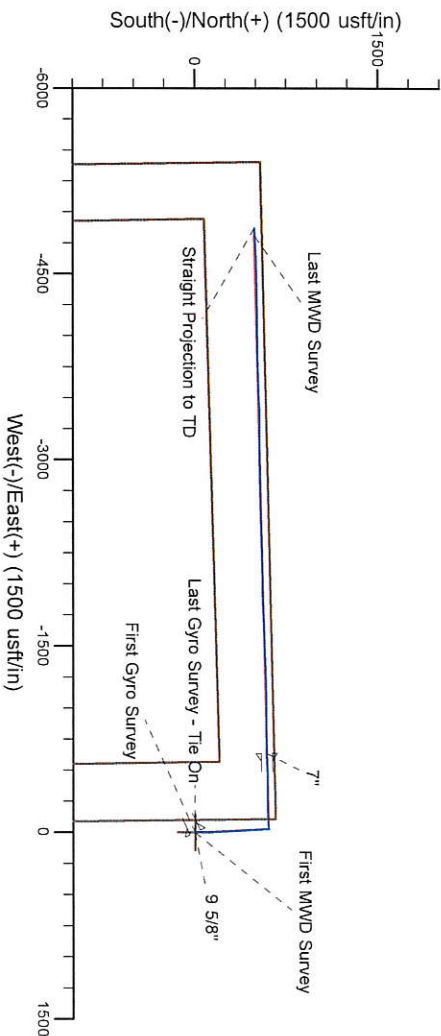
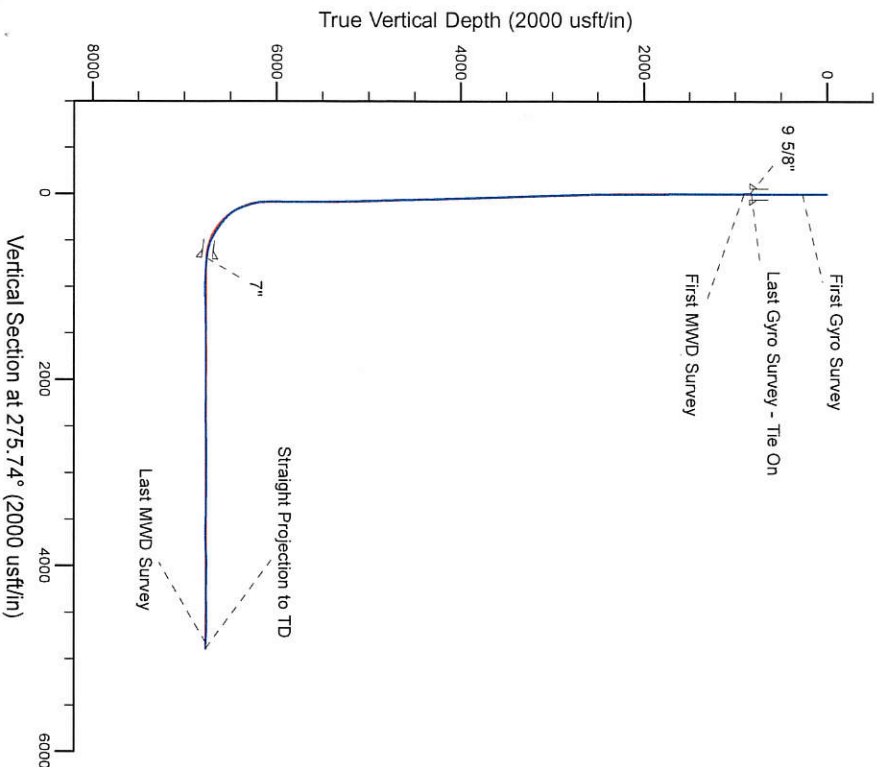


Project: Weld County, CO (NAD 83)
Site: Sec. 4-T6N-R63W (NCLP AA04-04/05-B)
Well: NCLP AA06-69HNC
Wellbore: Plan A
Design: Actual Surveys

Noble Energy



- LEGEND
- NCLP AA06-69HNC, Plan A, Rev A0 - PROPOSAL V0
 - Actual Surveys



Platted SHL: 660 FNL, 100 FWL
Platted Lat/Long: 40.52119 N, 104.45086 W
Location: Sec. 4-T6N-R63W

~7" Casing: 66" FNL, 526.5' FEL
Lat/Long: 40.522814N, 104.453128W
State Planes - CO Northern: 1435019.70N, 3291029.75E
Location: Sec. 5-T6N-R63W

Platted BHL: 60" FNL, 535' FWL
Lat/Long: 40.52269 N, 104.46835 W
State Planes - CO Northern: 1434924.95 N, 3286798.74 E
Location: Sec. 5-T6N-R63W

WELL DETAILS: NCLP AA06-69HNC	
Ground Level:	4711.00
RKB=30ft @ 4741.00usft (H&P 32.1)	
Created By:	Gordy Roth
Created On:	08/21/2014

Noble Energy

Weld County, CO (NAD 83)

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

NCLP AA06-69HNC

Plan A

Design: Actual Surveys

Sperry Drilling Services

Final Survey Report

23 September, 2014

Well Coordinates: 1,434,435.56 N, 3,291,667.20 E (40° 31' 16.28" N, 104° 27' 03.10" 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 AA06-69HNC

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

N

Grid

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for NCLP AA06-69HNC - 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
269.00	0.40	255.46	269.00	-0.24	-0.91	0.88	0.15
First Gyro Survey							
545.00	0.40	137.16	544.99	-1.18	-1.19	1.06	0.25
823.00	0.60	57.36	822.99	-1.11	0.70	-0.81	0.24
Last Gyro Survey - Tie On							
905.00	0.29	195.38	904.99	-1.08	1.01	-1.11	1.02
First MWD Survey							
996.00	0.23	187.02	995.98	-1.48	0.92	-1.07	0.08
1,089.00	0.15	254.81	1,088.98	-1.70	0.78	-0.95	0.24
1,182.00	0.11	247.61	1,181.98	-1.77	0.58	-0.76	0.05
1,274.00	0.24	221.13	1,273.98	-1.94	0.37	-0.57	0.16
1,365.00	0.22	211.39	1,364.98	-2.24	0.16	-0.38	0.05
1,457.00	0.00	190.12	1,456.98	-2.39	0.07	-0.30	0.24
1,549.00	0.10	228.99	1,548.98	-2.44	0.00	-0.25	0.11
1,641.00	0.18	237.25	1,640.98	-2.57	-0.18	-0.08	0.09
1,736.00	0.37	229.97	1,735.98	-2.85	-0.54	0.25	0.20
1,831.00	0.36	214.78	1,830.98	-3.29	-0.94	0.61	0.10
1,926.00	0.46	210.06	1,925.98	-3.87	-1.30	0.91	0.11
2,020.00	0.56	311.59	2,019.97	-3.89	-1.84	1.44	0.84
2,115.00	2.50	358.18	2,114.94	-1.51	-2.25	2.09	2.27
2,209.00	4.51	356.89	2,208.76	4.23	-2.52	2.93	2.14
2,304.00	5.84	1.58	2,303.37	12.79	-2.58	3.85	1.47
2,399.00	7.70	6.12	2,397.70	23.95	-1.77	4.16	2.04
2,494.00	9.87	2.79	2,491.58	38.41	-0.70	4.54	2.35
2,589.00	11.98	358.70	2,584.86	56.41	-0.53	6.16	2.36
2,683.00	12.27	358.57	2,676.76	76.15	-1.00	8.61	0.31
2,778.00	11.60	357.88	2,769.71	95.78	-1.60	11.17	0.72
2,873.00	12.10	357.30	2,862.68	115.27	-2.42	13.94	0.54
2,968.00	12.29	357.10	2,955.54	135.32	-3.40	16.92	0.20
3,062.00	11.80	355.87	3,047.47	154.89	-4.60	20.07	0.59
3,157.00	11.32	356.66	3,140.54	173.89	-5.85	23.21	0.53
3,252.00	9.97	354.00	3,233.90	191.38	-7.25	26.35	1.51
3,346.00	10.03	354.65	3,326.48	207.62	-8.86	29.58	0.14
3,441.00	10.19	357.52	3,420.00	224.25	-10.00	32.38	0.56
3,536.00	11.53	1.16	3,513.30	242.14	-10.17	34.34	1.58
3,631.00	12.95	359.60	3,606.14	262.28	-10.05	36.23	1.53
3,725.00	13.91	359.33	3,697.57	284.11	-10.26	38.62	1.02
3,820.00	14.66	0.15	3,789.63	307.55	-10.36	41.07	0.82
3,915.00	14.41	356.89	3,881.59	331.38	-10.97	44.06	0.90
4,010.00	11.80	356.47	3,974.11	352.88	-12.21	47.44	2.75
4,105.00	11.01	357.32	4,067.23	371.64	-13.23	50.33	0.85
4,199.00	9.12	356.52	4,159.78	388.04	-14.10	52.84	2.02
4,294.00	8.71	353.94	4,253.63	402.71	-15.32	55.52	0.60
4,389.00	9.05	355.02	4,347.49	417.30	-16.73	58.38	0.40
4,484.00	9.29	353.63	4,441.28	432.37	-18.23	61.38	0.34
4,579.00	10.11	355.55	4,534.92	448.30	-19.72	64.46	0.93
4,674.00	9.88	357.70	4,628.48	464.76	-20.70	67.08	0.46
4,769.00	10.61	357.43	4,721.96	481.64	-21.42	69.48	0.77
4,863.00	11.91	356.90	4,814.15	499.97	-22.33	72.22	1.39

Design Report for NCLP AA06-69HNC - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,958.00	10.05	355.45	4,907.41	518.02	-23.52	75.21	1.98
5,053.00	9.38	357.77	5,001.05	534.02	-24.48	77.77	0.82
5,148.00	8.13	358.36	5,094.94	548.47	-24.97	79.70	1.32
5,243.00	7.79	359.70	5,189.02	561.63	-25.20	81.24	0.41
5,338.00	6.97	358.84	5,283.23	573.83	-25.35	82.61	0.87
5,432.00	5.16	357.63	5,376.70	583.75	-25.64	83.89	1.93
5,527.00	4.30	356.26	5,471.38	591.58	-26.05	85.08	0.91
5,622.00	3.30	349.34	5,566.17	597.82	-26.78	86.44	1.16
5,717.00	1.18	17.32	5,661.09	601.44	-27.00	87.02	2.45
5,811.00	0.28	121.10	5,755.09	602.24	-26.51	86.62	1.36
5,906.00	0.34	148.07	5,850.09	601.89	-26.17	86.23	0.16
6,001.00	0.40	134.00	5,945.09	601.42	-25.78	85.80	0.11
6,062.00	0.51	107.93	6,006.08	601.18	-25.37	85.37	0.38
6,124.00	0.66	115.83	6,068.08	600.94	-24.78	84.76	0.27
6,191.00	2.49	253.20	6,135.06	600.36	-25.83	85.75	4.49
6,285.00	13.87	264.48	6,227.96	598.68	-39.04	98.72	12.17
6,380.00	17.53	264.08	6,319.40	596.10	-64.62	123.91	3.85
6,475.00	23.62	266.42	6,408.30	593.44	-97.87	156.74	6.47
6,569.00	37.89	268.90	6,488.87	591.70	-145.78	204.23	15.24
6,664.00	50.08	269.76	6,557.10	590.98	-211.62	269.67	12.85
6,759.00	55.53	270.73	6,614.51	591.33	-287.27	344.97	5.79
6,854.00	58.45	270.76	6,666.25	592.37	-366.92	424.32	3.07
6,902.00	61.51	269.63	6,690.27	592.50	-408.47	465.68	6.69
6,948.00	64.77	268.17	6,711.05	591.71	-449.49	506.42	7.63
6,996.00	73.58	266.80	6,728.10	589.72	-494.27	550.77	18.55
7,043.00	78.04	267.16	6,739.62	587.32	-539.76	595.80	9.52
7,098.00	81.80	268.20	6,749.24	585.14	-593.85	649.40	7.09
7,175.00	84.60	270.00	6,758.36	583.94	-670.29	725.34	4.31
7,270.00	85.56	269.33	6,766.51	583.38	-764.94	819.45	1.23
7,365.00	87.35	270.08	6,772.38	582.90	-859.75	913.74	2.04
7,460.00	90.43	269.91	6,774.22	582.89	-954.72	1,008.24	3.25
7,555.00	91.29	269.60	6,772.79	582.48	-1,049.71	1,102.71	0.96
7,649.00	91.05	268.07	6,770.87	580.57	-1,143.67	1,196.00	1.65
7,744.00	91.79	267.97	6,768.52	577.29	-1,238.58	1,290.11	0.79
7,839.00	91.02	268.26	6,766.19	574.17	-1,333.50	1,384.24	0.87
7,934.00	90.71	268.56	6,764.76	571.53	-1,428.45	1,478.45	0.45
8,029.00	89.45	268.21	6,764.62	568.85	-1,523.41	1,572.67	1.38
8,124.00	87.90	266.96	6,766.82	564.85	-1,618.30	1,666.68	2.10
8,219.00	89.97	266.70	6,768.59	559.60	-1,713.13	1,760.51	2.20
8,313.00	90.93	268.08	6,767.85	555.32	-1,807.03	1,853.51	1.79
8,408.00	90.83	269.05	6,766.39	552.94	-1,901.99	1,947.75	1.03
8,503.00	89.69	269.09	6,765.96	551.40	-1,996.97	2,042.11	1.20
8,598.00	90.68	269.68	6,765.65	550.38	-2,091.96	2,136.52	1.21
8,692.00	88.30	268.03	6,766.49	548.50	-2,185.93	2,229.83	3.08
8,787.00	90.34	268.46	6,767.61	545.59	-2,280.87	2,324.01	2.19
8,881.00	90.40	268.06	6,767.01	542.74	-2,374.83	2,417.20	0.43
8,976.00	91.73	269.02	6,765.24	540.32	-2,469.78	2,511.44	1.73
9,071.00	92.00	269.14	6,762.15	538.79	-2,564.72	2,605.74	0.31
9,165.00	91.08	268.45	6,759.62	536.82	-2,658.66	2,699.02	1.22
9,260.00	88.92	269.10	6,759.62	534.79	-2,753.63	2,793.31	2.37
9,355.00	88.77	267.73	6,761.54	532.16	-2,848.57	2,887.52	1.45

Design Report for NCLP AA06-69HNC - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
9,450.00	90.03	269.43	6,762.53	529.81	-2,943.53	2,981.76	2.23
9,545.00	91.02	268.72	6,761.66	528.27	-3,038.52	3,076.12	1.28
9,640.00	90.06	270.27	6,760.77	527.43	-3,133.50	3,170.54	1.92
9,735.00	88.46	269.54	6,761.99	527.28	-3,228.49	3,265.04	1.85
9,829.00	91.42	270.54	6,762.09	527.34	-3,322.48	3,358.56	3.32
9,924.00	85.96	267.61	6,764.26	525.81	-3,417.40	3,452.85	6.52
10,019.00	87.41	267.44	6,769.76	521.72	-3,512.15	3,546.72	1.54
10,113.00	88.52	267.87	6,773.10	517.87	-3,606.01	3,639.72	1.27
10,208.00	94.14	269.35	6,770.89	515.57	-3,700.91	3,733.92	6.12
10,303.00	93.83	269.08	6,764.29	514.27	-3,795.67	3,828.08	0.43
10,398.00	92.22	268.46	6,759.28	512.23	-3,890.52	3,922.24	1.82
10,493.00	88.06	269.94	6,759.04	510.91	-3,985.48	4,016.60	4.65
10,588.00	89.07	270.05	6,761.42	510.90	-4,080.45	4,111.09	1.07
10,682.00	88.21	268.89	6,763.65	510.03	-4,174.42	4,204.50	1.54
10,777.00	90.52	269.67	6,764.71	508.84	-4,269.40	4,298.88	2.57
10,872.00	91.54	269.30	6,763.00	507.98	-4,364.38	4,393.30	1.14
10,967.00	90.99	268.88	6,760.90	506.48	-4,459.34	4,487.64	0.73
11,062.00	90.31	268.10	6,759.82	503.97	-4,554.30	4,581.87	1.09
11,157.00	88.09	267.79	6,761.15	500.57	-4,649.23	4,675.98	2.36
11,251.00	86.88	267.11	6,765.28	496.39	-4,743.04	4,768.90	1.48
11,311.00	86.21	266.71	6,768.89	493.16	-4,802.84	4,828.09	1.30
Last MWD Survey							
11,376.00	86.21	266.71	6,773.19	489.44	-4,867.59	4,892.14	0.00
Straight Projection to TD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
269.00	269.00	-0.24	-0.91	First Gyro Survey
823.00	822.99	-1.11	0.70	Last Gyro Survey - Tie On
905.00	904.99	-1.08	1.01	First MWD Survey
11,311.00	6,768.89	493.16	-4,802.84	Last MWD Survey
11,376.00	6,773.19	489.44	-4,867.59	Straight Projection to TD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	NCLP AA06-69HNC_BHL	275.74	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
269.00	823.00	Surface Surveys	Flexi-Shot
905.00	7,098.00	Intermediate Surveys	MWD+IFR1+MS_WY
7,175.00	11,376.00	Production Surveys	MWD+IFR1+MS_WY

Design Report for NCLP AA06-69HNC - Actual Surveys

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
844.00		9 5/8"	9-5/8	13-3/4
7,142.00	6,754.91	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 AA06-69HNC_Σ	0.00	0.00	0.00	0.00	0.00	1,434,435.56	3,291,667.20	40.521190	-104.450860
- actual wellpath hits target center									
- Point									
NCLP AA06-69HNC_Σ	0.00	0.00	0.00	0.00	0.00	1,434,435.56	3,291,667.20	40.521190	-104.450860
- actual wellpath hits target center									
- Polygon									
Point 1				0.00	537.84	-5,403.00	1,434,973.38	3,286,264.37	
Point 2				0.00	-4,758.93	-5,335.93	1,429,676.78	3,286,331.44	
Point 3				0.00	-4,616.76	-45.49	1,429,818.94	3,291,621.71	
Point 4				0.00	658.20	-107.88	1,435,093.74	3,291,559.32	
Point 5				0.00	537.84	-5,403.00	1,434,973.38	3,286,264.37	
NCLP AA06-69HNC_4	0.00	0.00	0.00	0.00	0.00	1,434,435.56	3,291,667.20	40.521190	-104.450860
- actual wellpath hits target center									
- Polygon									
Point 1				0.00	77.83	-4,942.99	1,434,513.38	3,286,724.37	
Point 2				0.00	-4,298.91	-4,875.92	1,430,136.78	3,286,791.44	
Point 3				0.00	-4,156.75	-505.51	1,430,278.94	3,291,161.71	
Point 4				0.00	198.18	-567.90	1,434,633.73	3,291,099.32	
Point 5				0.00	77.83	-4,942.99	1,434,513.38	3,286,724.37	
NCLP AA06-69HNC_E	0.00	0.00	6,768.54	489.41	-4,868.62	1,434,924.95	3,286,798.74	40.522690	-104.468350
- actual wellpath misses target center by 4.76usft at 11376.00usft MD (6773.19 TVD, 489.44 N, -4867.59 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	1.87 °/100usft	Maximum Dogleg over Survey:	18.55 °/100usft at 6,996.00 usft
Net Tortousity applicable to Plans:	0.88 °/100usft	Directional Difficulty Index:	6.292

Audit Info

**North Reference Sheet for Sec. 4-T6N-R63W (NCLP AA04-04/05-B) - NCLP
AA06-69HNC - 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=30ft @ 4741.00usft (H&P 321). Northing and Easting are relative to NCLP AA06-69HNC

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: 0.99996796

Grid Coordinates of Well: 1,434,435.56 usft N, 3,291,667.20 usft E

Geographical Coordinates of Well: 40° 31' 16.28" N, 104° 27' 03.10" W

Grid Convergence at Surface is: 0.68°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,376.00usft
the Bottom Hole Displacement is 4,892.14usft in the Direction of 275.74° (Grid).

Magnetic Convergence at surface is: -7.66° (28 June 2014, , BGGM2013)

