

Project: Weld County, CO (NAD 83)
Site: Sec. 1-T4N-R66W (Loeffler 1 PAD)
Well: Loeffler K1-65HN
Wellbore: Plan A
Design: Final Surveys

Noble Energy

HALLIBURTON
Sperry Drilling

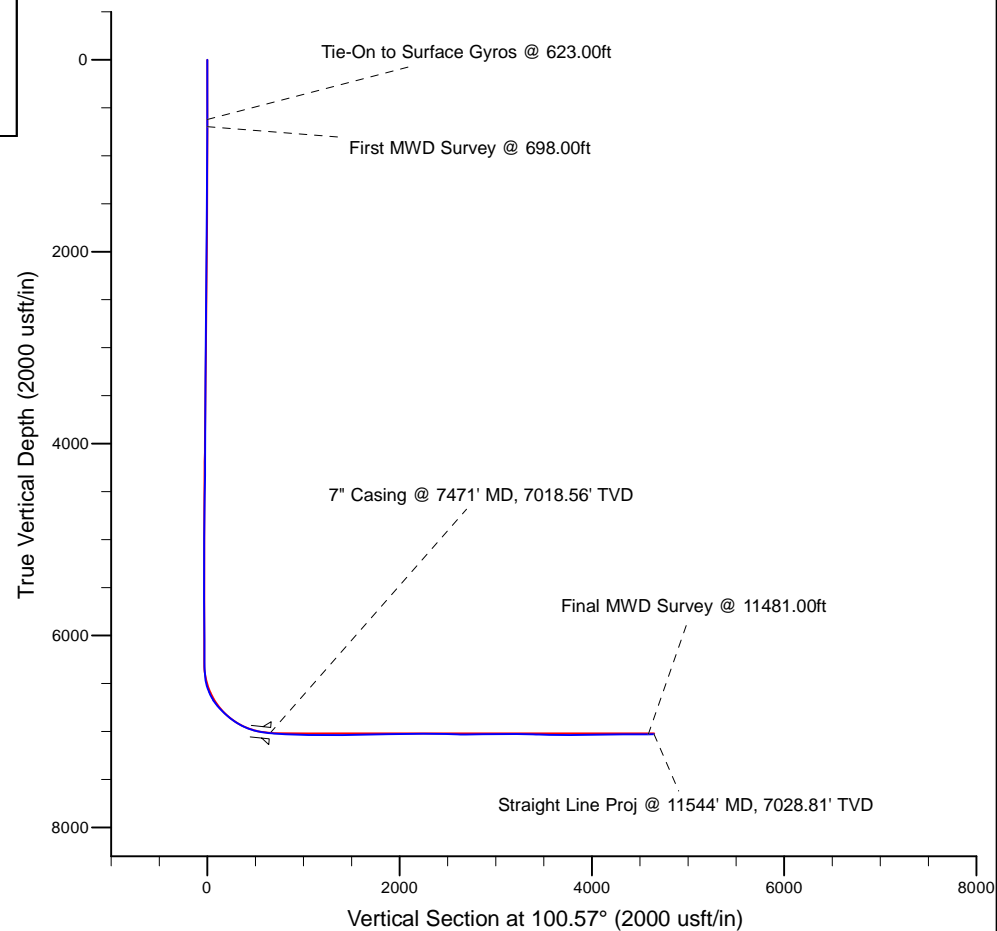
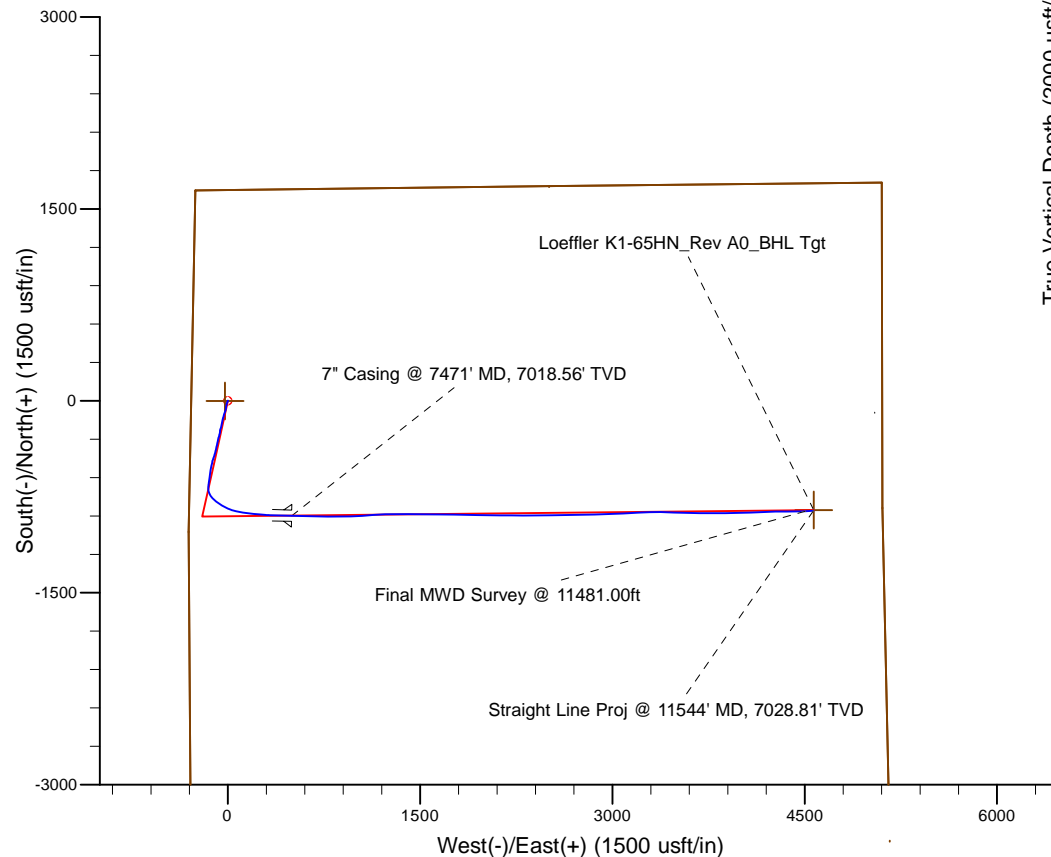
Platted SHL: 1650' FNL, 288' FWL
Platted Lat/Long: 40.34390° N, 104.73388° W
Location: Sec. 1-T4N-R66W

7" Casing: ~2551.85' FNL, ~767.92' FWL
Lat/Long: 40° 20' 29.126 N, 104° 43' 55.643 W
State Planes - CO Northern: 1,368,148.17' N, 3,214,043.81' E
Location: Sec. 1-T4N-R66W

BHL: ~2558.56' FNL, ~538.14' FEL
Lat/Long: 40° 20' 29.164 N, 104° 43' 3.079 W
State Planes - CO Northern: 1,368,187.65' N, 3,218,113.66' E
Location: Sec. 1-T4N-R66W

LEGEND

- Loeffler K1-65HN, Plan A, Rev A0 Proposal V0
- Final Surveys



WELL DETAILS: Loeffler K1-65HN

Ground Level: 4666.00
KB=16" @ 4682.00usft (Precision 829)

Created By: Fred Hartmann
Created On: 11/14/2013

Noble Energy

Weld County, CO (NAD 83)

Sec. 1-T4N-R66W (Loeffler 1 PAD)

Loeffler K1-65HN - A2

Design: Final Surveys

Sperry Drilling Services

Final Survey Report

14 November, 2013

Well Coordinates: 1,369,045.95 N, 3,213,546.27 E (40° 20' 38.04" N, 104° 44' 01.97" W)

Ground Level: 4,666.00 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 Loeffler K1-65HN - Slot A2

KB=16' @ 4682.00usft (Precision 829)

N

Grid

API - US Survey Feet - Custom

HALLIBURTON

Design Report for Loeffler K1-65HN - 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
306.00	0.40	54.17	306.00	0.63	0.87	0.74	0.13
623.00	0.40	315.67	622.99	2.06	0.99	0.59	0.19
Tie-On to Surface Gyros @ 623.00ft							
698.00	0.47	284.63	697.99	2.33	0.51	0.07	0.32
First MWD Survey @ 698.00ft							
832.00	0.68	280.06	831.98	2.61	-0.81	-1.27	0.16
966.00	1.28	190.85	965.97	1.28	-1.87	-2.07	1.08
1,101.00	0.65	185.90	1,100.95	-0.97	-2.23	-2.02	0.47
1,198.00	1.63	185.92	1,197.93	-2.89	-2.43	-1.86	1.01
1,292.00	3.59	199.94	1,291.83	-6.98	-3.57	-2.23	2.18
1,386.00	6.51	198.06	1,385.45	-14.82	-6.23	-3.41	3.11
1,481.00	7.08	198.47	1,479.79	-25.49	-9.75	-4.91	0.60
1,575.00	7.68	191.75	1,573.01	-37.13	-12.87	-5.84	1.12
1,669.00	6.89	182.55	1,666.25	-48.92	-14.40	-5.18	1.50
1,763.00	8.03	190.89	1,759.46	-61.00	-15.89	-4.43	1.67
1,857.00	7.22	196.98	1,852.63	-73.10	-18.86	-5.13	1.22
1,952.00	7.96	198.56	1,946.79	-85.04	-22.69	-6.71	0.81
2,046.00	6.46	197.62	2,040.05	-96.25	-26.36	-8.27	1.60
2,140.00	7.27	202.71	2,133.37	-106.78	-30.26	-10.17	1.08
2,234.00	4.73	191.91	2,226.85	-116.06	-33.36	-11.51	2.95
2,326.00	5.01	192.46	2,318.52	-123.69	-35.01	-11.73	0.31
2,418.00	6.79	199.19	2,410.03	-132.75	-37.66	-12.68	2.07
2,512.00	6.19	192.29	2,503.43	-142.95	-40.57	-13.67	1.05
2,601.00	7.80	190.19	2,591.77	-153.59	-42.66	-13.77	1.83
2,691.00	9.08	190.21	2,680.79	-166.59	-45.00	-13.69	1.42
2,781.00	10.26	192.47	2,769.51	-181.40	-47.99	-13.91	1.38
2,870.00	8.72	194.41	2,857.29	-195.68	-51.38	-14.62	1.77
2,960.00	8.96	192.78	2,946.22	-209.12	-54.63	-15.35	0.39
3,050.00	7.75	202.45	3,035.27	-221.56	-58.49	-16.87	2.06
3,139.00	6.38	184.82	3,123.60	-232.04	-61.20	-17.61	2.86
3,229.00	6.69	183.89	3,213.02	-242.25	-61.98	-16.50	0.36
3,318.00	8.46	194.53	3,301.24	-253.76	-63.97	-16.35	2.53
3,408.00	6.57	188.18	3,390.46	-265.27	-66.37	-16.59	2.29
3,498.00	7.81	198.82	3,479.76	-276.15	-69.07	-17.26	2.02
3,587.00	9.63	198.22	3,567.73	-288.95	-73.35	-19.12	2.05
3,677.00	8.36	192.06	3,656.62	-302.50	-77.07	-20.29	1.77
3,767.00	9.53	192.19	3,745.52	-316.18	-80.01	-20.67	1.30
3,857.00	9.91	190.94	3,834.23	-331.07	-83.05	-20.93	0.48
3,946.00	9.11	189.76	3,922.01	-345.53	-85.70	-20.88	0.93
4,036.00	9.08	197.21	4,010.88	-359.34	-89.01	-21.61	1.31
4,125.00	7.04	187.63	4,099.00	-371.45	-91.81	-22.14	2.74
4,215.00	7.91	197.35	4,188.24	-382.83	-94.39	-22.59	1.70
4,304.00	6.04	185.67	4,276.58	-393.34	-96.68	-22.91	2.63
4,394.00	7.10	202.11	4,365.99	-403.20	-99.24	-23.62	2.39
4,484.00	6.23	192.48	4,455.39	-413.12	-102.39	-24.90	1.57
4,573.00	9.09	197.39	4,543.59	-424.55	-105.54	-25.89	3.29
4,663.00	8.21	198.89	4,632.56	-437.42	-109.74	-27.67	1.01
4,752.00	7.30	199.01	4,720.75	-448.77	-113.64	-29.42	1.02
4,842.00	8.50	198.81	4,809.89	-460.48	-117.65	-31.21	1.33

Design Report for Loeffler K1-65HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,932.00	8.10	191.38	4,898.95	-472.99	-121.05	-32.25	1.27
5,021.00	7.86	191.88	4,987.09	-485.09	-123.53	-32.48	0.28
5,111.00	6.47	196.65	5,076.38	-495.97	-126.25	-33.16	1.68
5,201.00	7.91	191.06	5,165.68	-506.91	-128.90	-33.75	1.78
5,290.00	9.44	189.24	5,253.65	-520.12	-131.24	-33.64	1.75
5,380.00	8.20	191.97	5,342.59	-533.69	-133.76	-33.62	1.45
5,469.00	6.29	194.47	5,430.87	-544.62	-136.29	-34.11	2.17
5,559.00	7.18	185.53	5,520.25	-554.99	-138.07	-33.95	1.53
5,649.00	8.70	188.06	5,609.39	-567.33	-139.56	-33.16	1.73
5,738.00	7.44	187.85	5,697.51	-579.70	-141.30	-32.59	1.42
5,828.00	7.48	184.53	5,786.75	-591.32	-142.55	-31.70	0.48
5,917.00	8.79	186.82	5,874.85	-603.84	-143.82	-30.65	1.52
6,007.00	7.20	185.05	5,963.97	-616.29	-145.13	-29.65	1.79
6,097.00	8.54	191.10	6,053.12	-628.47	-146.92	-29.17	1.75
6,186.00	6.82	187.63	6,141.32	-640.19	-148.89	-28.97	2.00
6,276.00	7.48	193.65	6,230.62	-651.18	-150.98	-29.01	1.11
6,321.00	8.97	185.25	6,275.16	-657.52	-151.99	-28.84	4.25
6,366.00	11.95	183.22	6,319.41	-665.67	-152.58	-27.92	6.67
6,411.00	14.98	181.85	6,363.17	-676.13	-153.03	-26.44	6.77
6,455.00	18.11	180.68	6,405.34	-688.66	-153.29	-24.40	7.15
6,500.00	19.83	168.13	6,447.91	-703.13	-151.80	-20.29	9.82
6,545.00	21.21	158.07	6,490.07	-718.15	-147.19	-13.00	8.40
6,590.00	24.75	150.83	6,531.50	-733.94	-139.56	-2.60	10.05
6,635.00	27.32	142.67	6,571.94	-750.38	-128.70	11.09	9.78
6,679.00	29.16	133.86	6,610.72	-765.85	-114.84	27.55	10.35
6,724.00	32.38	130.75	6,649.38	-781.31	-97.80	47.14	7.98
6,769.00	36.71	124.93	6,686.45	-796.89	-77.63	69.82	12.09
6,814.00	40.73	122.56	6,721.55	-812.50	-54.22	95.70	9.52
6,859.00	43.63	119.06	6,754.90	-827.95	-28.26	124.05	8.29
6,903.00	45.31	113.10	6,786.31	-841.47	-0.59	153.72	10.23
6,948.00	48.12	107.99	6,817.17	-852.92	30.07	185.97	10.36
6,993.00	49.70	103.83	6,846.76	-862.20	62.67	219.72	7.80
7,038.00	52.27	99.26	6,875.09	-869.17	96.92	254.66	9.74
7,083.00	56.65	97.99	6,901.24	-874.65	133.11	291.25	10.00
7,127.00	60.77	96.86	6,924.09	-879.50	170.39	328.78	9.62
7,172.00	64.79	95.40	6,944.67	-883.76	210.17	368.67	9.39
7,217.00	67.49	94.90	6,962.87	-887.45	251.15	409.64	6.09
7,262.00	70.39	93.99	6,979.04	-890.70	293.02	451.39	6.71
7,307.00	74.93	92.41	6,992.45	-893.09	335.89	493.97	10.63
7,364.00	80.68	91.74	7,004.49	-895.11	391.54	549.05	10.15
7,471.00	84.20	91.20	7,018.56	-897.82	497.56	653.77	3.33
7" Casing @ 7471' MD, 7018.56' TVD							
7,484.00	84.63	91.13	7,019.83	-898.08	510.50	666.53	3.33
7,574.00	86.86	91.47	7,026.50	-900.12	600.22	755.11	2.51
7,663.00	87.53	91.09	7,030.86	-902.11	689.09	842.84	0.87
7,753.00	87.63	91.12	7,034.66	-903.84	778.99	931.53	0.12
7,842.00	88.67	89.58	7,037.53	-904.38	867.94	1,019.07	2.09
7,932.00	90.40	88.77	7,038.26	-903.09	957.93	1,107.29	2.12
8,022.00	90.65	84.50	7,037.44	-897.81	1,047.75	1,194.62	4.75
8,111.00	90.06	86.10	7,036.88	-890.51	1,136.44	1,280.47	1.92
8,201.00	90.00	87.21	7,036.84	-885.26	1,226.29	1,367.83	1.24

Design Report for Loeffler K1-65HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,291.00	90.68	90.48	7,036.30	-883.45	1,316.25	1,455.94	3.71
8,380.00	91.79	91.42	7,034.39	-884.92	1,405.22	1,543.67	1.63
8,470.00	90.55	90.90	7,032.55	-886.74	1,495.18	1,632.44	1.49
8,560.00	91.23	89.55	7,031.15	-887.10	1,585.17	1,720.96	1.68
8,649.00	90.25	90.44	7,030.00	-887.09	1,674.16	1,808.44	1.49
8,739.00	92.10	91.58	7,028.15	-888.68	1,764.12	1,897.17	2.41
8,829.00	91.14	90.78	7,025.61	-890.53	1,854.06	1,985.93	1.39
8,918.00	89.38	90.92	7,025.21	-891.85	1,943.05	2,073.65	1.98
9,008.00	89.85	91.03	7,025.81	-893.38	2,033.03	2,162.39	0.54
9,098.00	89.88	90.46	7,026.02	-894.55	2,123.02	2,251.07	0.63
9,187.00	90.52	90.72	7,025.71	-895.47	2,212.02	2,338.72	0.78
9,277.00	88.77	89.86	7,026.27	-895.92	2,302.01	2,427.27	2.17
9,366.00	88.46	88.90	7,028.42	-894.96	2,390.98	2,514.55	1.13
9,456.00	87.97	88.36	7,031.22	-892.81	2,480.91	2,602.56	0.81
9,546.00	89.97	89.76	7,032.84	-891.33	2,570.87	2,690.73	2.71
9,635.00	91.29	90.21	7,031.86	-891.31	2,659.87	2,778.21	1.57
9,725.00	91.64	89.67	7,029.56	-891.22	2,749.84	2,866.64	0.71
9,814.00	89.94	87.85	7,028.34	-889.29	2,838.80	2,953.74	2.80
9,904.00	91.33	87.46	7,027.34	-885.61	2,928.72	3,041.46	1.60
9,994.00	89.97	87.88	7,026.32	-881.95	3,018.64	3,129.18	1.58
10,083.00	88.83	87.55	7,027.25	-878.40	3,107.56	3,215.94	1.33
10,173.00	88.83	85.93	7,029.09	-873.28	3,197.39	3,303.31	1.80
10,263.00	87.72	88.47	7,031.80	-868.89	3,287.23	3,390.83	3.08
10,352.00	88.83	90.97	7,034.48	-868.46	3,376.18	3,478.19	3.07
10,442.00	88.80	92.15	7,036.34	-870.90	3,466.13	3,567.06	1.31
10,531.00	90.34	91.99	7,037.01	-874.12	3,555.07	3,655.08	1.74
10,621.00	90.31	91.42	7,036.50	-876.80	3,645.02	3,744.00	0.63
10,710.00	91.11	90.81	7,035.39	-878.53	3,734.00	3,831.78	1.13
10,800.00	89.57	89.23	7,034.86	-878.56	3,823.99	3,920.26	2.45
10,890.00	89.97	88.31	7,035.22	-876.63	3,913.97	4,008.35	1.11
10,979.00	90.19	88.36	7,035.10	-874.04	4,002.93	4,095.33	0.25
11,069.00	92.03	88.03	7,033.35	-871.21	4,092.87	4,183.22	2.08
11,158.00	90.68	87.50	7,031.25	-867.74	4,181.77	4,269.98	1.63
11,248.00	89.11	89.59	7,031.41	-865.45	4,271.74	4,358.00	2.90
11,337.00	90.52	89.64	7,031.70	-864.86	4,360.73	4,445.38	1.59
11,427.00	90.09	88.21	7,031.22	-863.17	4,450.71	4,533.52	1.66
11,481.00	91.51	87.46	7,030.47	-861.13	4,504.67	4,586.19	2.97
Final MWD Survey @ 11481.00ft							
11,544.00	91.51	87.46	7,028.81	-858.34	4,567.58	4,647.53	0.00
Straight Line Proj @ 11544' MD, 7028.81' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
623.00	622.99	2.06	0.99	Tie-On to Surface Gyros @ 623.00ft
698.00	697.99	2.33	0.51	First MWD Survey @ 698.00ft
11,481.00	7,030.47	-861.13	4,504.67	Final MWD Survey @ 11481.00ft
11,544.00	7,028.81	-858.34	4,567.58	Straight Line Proj @ 11544' MD, 7028.81' TVD

Design Report for Loeffler K1-65HN - Final Surveys

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	Loeffler K1-65HN_Rev A0_BHL Tgt	100.57	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
306.00	623.00	Surface Gyros	Flexi-Shot
698.00	7,574.00	MWD Surveys - Vert/Build	MWD+IFR1+MS_WY
7,663.00	11,481.00	MWD Surveys - Lateral	MWD+IFR1+MS_WY

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
7,471.00	7,018.56	7" Casing @ 7471' MD, 7018.56' 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
Loeffler K1-69-1HN_Sr	0.00	0.00	0.00	-0.20	-22.30	1,369,045.75	3,213,523.97	40° 20' 38.040 N	104° 44' 2.256 W
- actual wellpath misses target center by 22.30usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	1,185.00	228.00	1,370,230.70	3,213,751.96	
Point 2				0.00	1,220.00	2,528.00	1,370,265.70	3,216,051.86	
Point 3				0.00	1,246.00	4,663.00	1,370,291.70	3,218,186.77	
Point 4				0.00	-833.00	4,668.00	1,368,212.79	3,218,191.77	
Point 5				0.00	-2,978.00	4,725.00	1,366,067.88	3,218,248.77	
Point 6				0.00	-3,122.00	2,459.00	1,365,923.89	3,215,982.86	
Point 7				0.00	-3,262.00	194.00	1,365,783.89	3,213,717.96	
Point 8				0.00	-1,019.00	176.00	1,368,026.80	3,213,699.96	
Point 9				0.00	1,185.00	228.00	1,370,230.70	3,213,751.96	
Loeffler K1-69-1HN_Sr	0.00	0.00	0.00	-0.20	-22.30	1,369,045.75	3,213,523.97	40° 20' 38.040 N	104° 44' 2.256 W
- actual wellpath misses target center by 22.30usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	1,645.00	-232.00	1,370,690.69	3,213,291.98	
Point 2				0.00	1,680.00	2,528.00	1,370,725.68	3,216,051.86	
Point 3				0.00	1,706.00	5,123.00	1,370,751.68	3,218,646.75	
Point 4				0.00	-833.00	5,128.00	1,368,212.79	3,218,651.75	
Point 5				0.00	-3,438.00	5,185.00	1,365,607.90	3,218,708.75	
Point 6				0.00	-3,582.00	2,459.00	1,365,463.90	3,215,982.86	
Point 7				0.00	-3,722.00	-266.00	1,365,323.91	3,213,257.98	
Point 8				0.00	-1,019.00	-284.00	1,368,026.80	3,213,239.98	
Point 9				0.00	1,645.00	-232.00	1,370,690.69	3,213,291.98	
Loeffler K1-65HN_Rev	0.00	0.00	7,020.00	-852.68	4,570.88	1,368,193.31	3,218,116.95	40° 20' 29.220 N	104° 43' 3.036 W
- actual wellpath misses target center by 10.97usft at 11544.00usft MD (7028.81 TVD, -858.34 N, 4567.58 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	2.21 °/100usft	Maximum Dogleg over Survey:	12.09 °/100usft at 6,769.00 usft
Net Tortousity applicable to Plans:	1.14 °/100usft	Directional Difficulty Index:	6.364

Design Report for Loeffler K1-65HN - Final Surveys

Audit Info

North Reference Sheet for Sec. 1-T4N-R66W (Loeffler 1 PAD) - Loeffler K1-65HN -

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

Vertical Depths are relative to KB=16' @ 4682.00usft (Precision 829). Northing and Easting are relative to Loeffler K1-65HN - Slot A2

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: 0.99995816

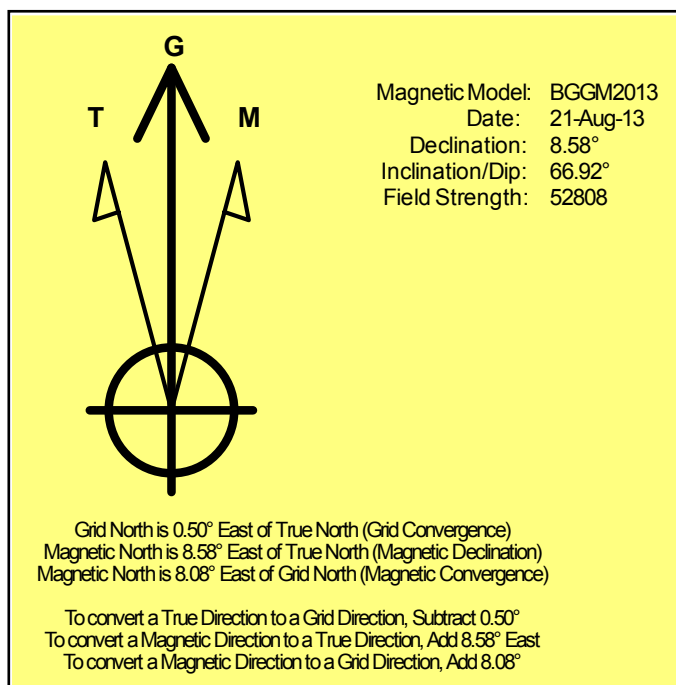
Grid Coordinates of Well: 1,369,045.95 usft N, 3,213,546.27 usft E

Geographical Coordinates of Well: 40° 20' 38.04" N, 104° 44' 01.97" W

Grid Convergence at Surface is: 0.50°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,544.00usft
the Bottom Hole Displacement is 4,647.53usft in the Direction of 100.64° (Grid).

Magnetic Convergence at surface is: -8.08° (21 August 2013, , BGGM2013)



Noble Energy

Weld County, CO (NAD 83)

Sec. 1-T4N-R66W (Loeffler 1 PAD)

Loeffler K1-65HN - A2

Design: Final Surveys

Sperry Drilling Services

Geodetic Report

14 November, 2013

Well Coordinates: 1,369,045.95 N, 3,213,546.27 E (40° 20' 38.04" N, 104° 44' 01.97" W)

Ground Level: 4,666.00 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 Loeffler K1-65HN - Slot A2

KB=16' @ 4682.00usft (Precision 829)

N

Grid

API - US Survey Feet - Custom

HALLIBURTON

Design Report for Loeffler K1-65HN - Final Surveys

Measured			Vertical	Local Coordinates		Geographic Coordinates		UTM Coordinates	
Depth (usft)	Inclination (°)	Azimuth (°)	Depth (usft)	+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° 20' 38.040 N	104° 44' 1.968 W	1,369,045.95	3,213,546.27
306.00	0.40	54.17	306.00	0.63	0.87	40° 20' 38.046 N	104° 44' 1.957 W	1,369,046.58	3,213,547.14
623.00	0.40	315.67	622.99	2.06	0.99	40° 20' 38.060 N	104° 44' 1.955 W	1,369,048.01	3,213,547.26
698.00	0.47	284.63	697.99	2.33	0.51	40° 20' 38.063 N	104° 44' 1.961 W	1,369,048.28	3,213,546.78
832.00	0.68	280.06	831.98	2.61	-0.81	40° 20' 38.066 N	104° 44' 1.978 W	1,369,048.56	3,213,545.46
966.00	1.28	190.85	965.97	1.28	-1.87	40° 20' 38.053 N	104° 44' 1.992 W	1,369,047.23	3,213,544.40
1,101.00	0.65	185.90	1,100.95	-0.97	-2.23	40° 20' 38.031 N	104° 44' 1.997 W	1,369,044.98	3,213,544.04
1,198.00	1.63	185.92	1,197.93	-2.89	-2.43	40° 20' 38.012 N	104° 44' 2.000 W	1,369,043.06	3,213,543.84
1,292.00	3.59	199.94	1,291.83	-6.98	-3.57	40° 20' 37.971 N	104° 44' 2.015 W	1,369,038.97	3,213,542.70
1,386.00	6.51	198.06	1,385.45	-14.82	-6.23	40° 20' 37.894 N	104° 44' 2.050 W	1,369,031.13	3,213,540.04
1,481.00	7.08	198.47	1,479.79	-25.49	-9.75	40° 20' 37.789 N	104° 44' 2.097 W	1,369,020.46	3,213,536.52
1,575.00	7.68	191.75	1,573.01	-37.13	-12.87	40° 20' 37.674 N	104° 44' 2.138 W	1,369,008.82	3,213,533.40
1,669.00	6.89	182.55	1,666.25	-48.92	-14.40	40° 20' 37.558 N	104° 44' 2.159 W	1,368,997.03	3,213,531.87
1,763.00	8.03	190.89	1,759.46	-61.00	-15.89	40° 20' 37.439 N	104° 44' 2.180 W	1,368,984.95	3,213,530.38
1,857.00	7.22	196.98	1,852.63	-73.10	-18.86	40° 20' 37.319 N	104° 44' 2.220 W	1,368,972.86	3,213,527.42
1,952.00	7.96	198.56	1,946.79	-85.04	-22.69	40° 20' 37.202 N	104° 44' 2.270 W	1,368,960.91	3,213,523.58
2,046.00	6.46	197.62	2,040.05	-96.25	-26.36	40° 20' 37.091 N	104° 44' 2.319 W	1,368,949.70	3,213,519.91
2,140.00	7.27	202.71	2,133.37	-106.78	-30.26	40° 20' 36.987 N	104° 44' 2.371 W	1,368,939.18	3,213,516.01
2,234.00	4.73	191.91	2,226.85	-116.06	-33.36	40° 20' 36.896 N	104° 44' 2.412 W	1,368,929.90	3,213,512.91
2,326.00	5.01	192.46	2,318.52	-123.69	-35.01	40° 20' 36.821 N	104° 44' 2.434 W	1,368,922.26	3,213,511.26
2,418.00	6.79	199.19	2,410.03	-132.75	-37.66	40° 20' 36.731 N	104° 44' 2.469 W	1,368,913.20	3,213,508.61
2,512.00	6.19	192.29	2,503.43	-142.95	-40.57	40° 20' 36.631 N	104° 44' 2.508 W	1,368,903.00	3,213,505.70
2,601.00	7.80	190.19	2,591.77	-153.59	-42.66	40° 20' 36.526 N	104° 44' 2.536 W	1,368,892.37	3,213,503.61
2,691.00	9.08	190.21	2,680.79	-166.59	-45.00	40° 20' 36.398 N	104° 44' 2.568 W	1,368,879.37	3,213,501.27
2,781.00	10.26	192.47	2,769.51	-181.40	-47.99	40° 20' 36.252 N	104° 44' 2.608 W	1,368,864.56	3,213,498.29
2,870.00	8.72	194.41	2,857.29	-195.68	-51.38	40° 20' 36.111 N	104° 44' 2.653 W	1,368,850.28	3,213,494.89
2,960.00	8.96	192.78	2,946.22	-209.12	-54.63	40° 20' 35.978 N	104° 44' 2.697 W	1,368,836.84	3,213,491.65
3,050.00	7.75	202.45	3,035.27	-221.56	-58.49	40° 20' 35.856 N	104° 44' 2.748 W	1,368,824.40	3,213,487.78
3,139.00	6.38	184.82	3,123.60	-232.04	-61.20	40° 20' 35.752 N	104° 44' 2.784 W	1,368,813.92	3,213,485.07
3,229.00	6.69	183.89	3,213.02	-242.25	-61.98	40° 20' 35.651 N	104° 44' 2.795 W	1,368,803.71	3,213,484.30
3,318.00	8.46	194.53	3,301.24	-253.76	-63.97	40° 20' 35.538 N	104° 44' 2.822 W	1,368,792.20	3,213,482.30
3,408.00	6.57	188.18	3,390.46	-265.27	-66.37	40° 20' 35.424 N	104° 44' 2.855 W	1,368,780.69	3,213,479.91
3,498.00	7.81	198.82	3,479.76	-276.15	-69.07	40° 20' 35.317 N	104° 44' 2.891 W	1,368,769.81	3,213,477.20
3,587.00	9.63	198.22	3,567.73	-288.95	-73.35	40° 20' 35.191 N	104° 44' 2.947 W	1,368,757.01	3,213,472.92
3,677.00	8.36	192.06	3,656.62	-302.50	-77.07	40° 20' 35.057 N	104° 44' 2.997 W	1,368,743.46	3,213,469.20
3,767.00	9.53	192.19	3,745.52	-316.18	-80.01	40° 20' 34.923 N	104° 44' 3.036 W	1,368,729.78	3,213,466.26
3,857.00	9.91	190.94	3,834.23	-331.07	-83.05	40° 20' 34.776 N	104° 44' 3.077 W	1,368,714.90	3,213,463.22
3,946.00	9.11	189.76	3,922.01	-345.53	-85.70	40° 20' 34.633 N	104° 44' 3.113 W	1,368,700.43	3,213,460.57
4,036.00	9.08	197.21	4,010.88	-359.34	-89.01	40° 20' 34.497 N	104° 44' 3.158 W	1,368,686.63	3,213,457.26
4,125.00	7.04	187.63	4,099.00	-371.45	-91.81	40° 20' 34.377 N	104° 44' 3.195 W	1,368,674.51	3,213,454.46
4,215.00	7.91	197.35	4,188.24	-382.83	-94.39	40° 20' 34.265 N	104° 44' 3.230 W	1,368,663.14	3,213,451.88
4,304.00	6.04	185.67	4,276.58	-393.34	-96.68	40° 20' 34.162 N	104° 44' 3.260 W	1,368,652.63	3,213,449.59

Design Report for Loeffler K1-65HN - Final 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)
4,394.00	7.10	202.11	4,365.99	-403.20	-99.24	40° 20' 34.064 N	104° 44' 3.295 W	1,368,642.76	3,213,447.03
4,484.00	6.23	192.48	4,455.39	-413.12	-102.39	40° 20' 33.966 N	104° 44' 3.336 W	1,368,632.84	3,213,443.88
4,573.00	9.09	197.39	4,543.59	-424.55	-105.54	40° 20' 33.854 N	104° 44' 3.378 W	1,368,621.42	3,213,440.74
4,663.00	8.21	198.89	4,632.56	-437.42	-109.74	40° 20' 33.727 N	104° 44' 3.434 W	1,368,608.55	3,213,436.53
4,752.00	7.30	199.01	4,720.75	-448.77	-113.64	40° 20' 33.615 N	104° 44' 3.486 W	1,368,597.19	3,213,432.63
4,842.00	8.50	198.81	4,809.89	-460.48	-117.65	40° 20' 33.500 N	104° 44' 3.539 W	1,368,585.49	3,213,428.63
4,932.00	8.10	191.38	4,898.95	-472.99	-121.05	40° 20' 33.377 N	104° 44' 3.584 W	1,368,572.98	3,213,425.23
5,021.00	7.86	191.88	4,987.09	-485.09	-123.53	40° 20' 33.257 N	104° 44' 3.617 W	1,368,560.88	3,213,422.74
5,111.00	6.47	196.65	5,076.38	-495.97	-126.25	40° 20' 33.150 N	104° 44' 3.654 W	1,368,550.00	3,213,420.02
5,201.00	7.91	191.06	5,165.68	-506.91	-128.90	40° 20' 33.042 N	104° 44' 3.689 W	1,368,539.06	3,213,417.38
5,290.00	9.44	189.24	5,253.65	-520.12	-131.24	40° 20' 32.912 N	104° 44' 3.721 W	1,368,525.85	3,213,415.03
5,380.00	8.20	191.97	5,342.59	-533.69	-133.76	40° 20' 32.778 N	104° 44' 3.755 W	1,368,512.28	3,213,412.52
5,469.00	6.29	194.47	5,430.87	-544.62	-136.29	40° 20' 32.670 N	104° 44' 3.789 W	1,368,501.35	3,213,409.98
5,559.00	7.18	185.53	5,520.25	-554.99	-138.07	40° 20' 32.568 N	104° 44' 3.813 W	1,368,490.98	3,213,408.21
5,649.00	8.70	188.06	5,609.39	-567.33	-139.56	40° 20' 32.446 N	104° 44' 3.834 W	1,368,478.64	3,213,406.71
5,738.00	7.44	187.85	5,697.51	-579.70	-141.30	40° 20' 32.324 N	104° 44' 3.857 W	1,368,466.27	3,213,404.98
5,828.00	7.48	184.53	5,786.75	-591.32	-142.55	40° 20' 32.209 N	104° 44' 3.875 W	1,368,454.66	3,213,403.72
5,917.00	8.79	186.82	5,874.85	-603.84	-143.82	40° 20' 32.085 N	104° 44' 3.893 W	1,368,442.13	3,213,402.46
6,007.00	7.20	185.05	5,963.97	-616.29	-145.13	40° 20' 31.963 N	104° 44' 3.911 W	1,368,429.69	3,213,401.14
6,097.00	8.54	191.10	6,053.12	-628.47	-146.92	40° 20' 31.842 N	104° 44' 3.935 W	1,368,417.51	3,213,399.36
6,186.00	6.82	187.63	6,141.32	-640.19	-148.89	40° 20' 31.727 N	104° 44' 3.962 W	1,368,405.79	3,213,397.39
6,276.00	7.48	193.65	6,230.62	-651.18	-150.98	40° 20' 31.618 N	104° 44' 3.990 W	1,368,394.80	3,213,395.29
6,321.00	8.97	185.25	6,275.16	-657.52	-151.99	40° 20' 31.556 N	104° 44' 4.004 W	1,368,388.46	3,213,394.28
6,366.00	11.95	183.22	6,319.41	-665.67	-152.58	40° 20' 31.475 N	104° 44' 4.013 W	1,368,380.31	3,213,393.70
6,411.00	14.98	181.85	6,363.17	-676.13	-153.03	40° 20' 31.372 N	104° 44' 4.020 W	1,368,369.85	3,213,393.25
6,455.00	18.11	180.68	6,405.34	-688.66	-153.29	40° 20' 31.248 N	104° 44' 4.024 W	1,368,357.32	3,213,392.99
6,500.00	19.83	168.13	6,447.91	-703.13	-151.80	40° 20' 31.105 N	104° 44' 4.007 W	1,368,342.85	3,213,394.47
6,545.00	21.21	158.07	6,490.07	-718.15	-147.19	40° 20' 30.956 N	104° 44' 3.949 W	1,368,327.83	3,213,399.08
6,590.00	24.75	150.83	6,531.50	-733.94	-139.56	40° 20' 30.800 N	104° 44' 3.852 W	1,368,312.04	3,213,406.72
6,635.00	27.32	142.67	6,571.94	-750.38	-128.70	40° 20' 30.636 N	104° 44' 3.714 W	1,368,295.60	3,213,417.58
6,679.00	29.16	133.86	6,610.72	-765.85	-114.84	40° 20' 30.482 N	104° 44' 3.536 W	1,368,280.14	3,213,431.44
6,724.00	32.38	130.75	6,649.38	-781.31	-97.80	40° 20' 30.328 N	104° 44' 3.318 W	1,368,264.67	3,213,448.47
6,769.00	36.71	124.93	6,686.45	-796.89	-77.63	40° 20' 30.172 N	104° 44' 3.059 W	1,368,249.09	3,213,468.64
6,814.00	40.73	122.56	6,721.55	-812.50	-54.22	40° 20' 30.016 N	104° 44' 2.759 W	1,368,233.48	3,213,492.05
6,859.00	43.63	119.06	6,754.90	-827.95	-28.26	40° 20' 29.861 N	104° 44' 2.425 W	1,368,218.04	3,213,518.01
6,903.00	45.31	113.10	6,786.31	-841.47	-0.59	40° 20' 29.725 N	104° 44' 2.070 W	1,368,204.52	3,213,545.68
6,948.00	48.12	107.99	6,817.17	-852.92	30.07	40° 20' 29.609 N	104° 44' 1.675 W	1,368,193.06	3,213,576.34
6,993.00	49.70	103.83	6,846.76	-862.20	62.67	40° 20' 29.515 N	104° 44' 1.255 W	1,368,183.79	3,213,608.94
7,038.00	52.27	99.26	6,875.09	-869.17	96.92	40° 20' 29.443 N	104° 44' 0.813 W	1,368,176.82	3,213,643.18
7,083.00	56.65	97.99	6,901.24	-874.65	133.11	40° 20' 29.386 N	104° 44' 0.347 W	1,368,171.34	3,213,679.38
7,127.00	60.77	96.86	6,924.09	-879.50	170.39	40° 20' 29.335 N	104° 43' 59.866 W	1,368,166.49	3,213,716.65
7,172.00	64.79	95.40	6,944.67	-883.76	210.17	40° 20' 29.289 N	104° 43' 59.352 W	1,368,162.23	3,213,756.43

Design Report for Loeffler K1-65HN - Final 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)
7,217.00	67.49	94.90	6,962.87	-887.45	251.15	40° 20' 29.249 N	104° 43' 58.824 W	1,368,158.53	3,213,797.41
7,262.00	70.39	93.99	6,979.04	-890.70	293.02	40° 20' 29.214 N	104° 43' 58.283 W	1,368,155.28	3,213,839.27
7,307.00	74.93	92.41	6,992.45	-893.09	335.89	40° 20' 29.186 N	104° 43' 57.730 W	1,368,152.89	3,213,882.15
7,364.00	80.68	91.74	7,004.49	-895.11	391.54	40° 20' 29.162 N	104° 43' 57.012 W	1,368,150.88	3,213,937.80
7,471.00	84.20	91.20	7,018.56	-897.82	497.56	40° 20' 29.126 N	104° 43' 55.643 W	1,368,148.17	3,214,043.81
7,484.00	84.63	91.13	7,019.83	-898.08	510.50	40° 20' 29.122 N	104° 43' 55.476 W	1,368,147.90	3,214,056.75
7,574.00	86.86	91.47	7,026.50	-900.12	600.22	40° 20' 29.094 N	104° 43' 54.317 W	1,368,145.87	3,214,146.47
7,663.00	87.53	91.09	7,030.86	-902.11	689.09	40° 20' 29.067 N	104° 43' 53.170 W	1,368,143.88	3,214,235.33
7,753.00	87.63	91.12	7,034.66	-903.84	778.99	40° 20' 29.042 N	104° 43' 52.009 W	1,368,142.15	3,214,325.23
7,842.00	88.67	89.58	7,037.53	-904.38	867.94	40° 20' 29.029 N	104° 43' 50.860 W	1,368,141.61	3,214,414.18
7,932.00	90.40	88.77	7,038.26	-903.09	957.93	40° 20' 29.034 N	104° 43' 49.698 W	1,368,142.90	3,214,504.16
8,022.00	90.65	84.50	7,037.44	-897.81	1,047.75	40° 20' 29.079 N	104° 43' 48.538 W	1,368,148.18	3,214,593.97
8,111.00	90.06	86.10	7,036.88	-890.51	1,136.44	40° 20' 29.143 N	104° 43' 47.392 W	1,368,155.47	3,214,682.66
8,201.00	90.00	87.21	7,036.84	-885.26	1,226.29	40° 20' 29.187 N	104° 43' 46.231 W	1,368,160.73	3,214,772.51
8,291.00	90.68	90.48	7,036.30	-883.45	1,316.25	40° 20' 29.198 N	104° 43' 45.069 W	1,368,162.54	3,214,862.47
8,380.00	91.79	91.42	7,034.39	-884.92	1,405.22	40° 20' 29.175 N	104° 43' 43.920 W	1,368,161.06	3,214,951.43
8,470.00	90.55	90.90	7,032.55	-886.74	1,495.18	40° 20' 29.150 N	104° 43' 42.759 W	1,368,159.24	3,215,041.39
8,560.00	91.23	89.55	7,031.15	-887.10	1,585.17	40° 20' 29.138 N	104° 43' 41.597 W	1,368,158.89	3,215,131.37
8,649.00	90.25	90.44	7,030.00	-887.09	1,674.16	40° 20' 29.131 N	104° 43' 40.447 W	1,368,158.90	3,215,220.36
8,739.00	92.10	91.58	7,028.15	-888.68	1,764.12	40° 20' 29.107 N	104° 43' 39.286 W	1,368,157.31	3,215,310.31
8,829.00	91.14	90.78	7,025.61	-890.53	1,854.06	40° 20' 29.081 N	104° 43' 38.124 W	1,368,155.46	3,215,400.25
8,918.00	89.38	90.92	7,025.21	-891.85	1,943.05	40° 20' 29.061 N	104° 43' 36.975 W	1,368,154.14	3,215,489.24
9,008.00	89.85	91.03	7,025.81	-893.38	2,033.03	40° 20' 29.038 N	104° 43' 35.814 W	1,368,152.61	3,215,579.22
9,098.00	89.88	90.46	7,026.02	-894.55	2,123.02	40° 20' 29.018 N	104° 43' 34.652 W	1,368,151.44	3,215,669.20
9,187.00	90.52	90.72	7,025.71	-895.47	2,212.02	40° 20' 29.002 N	104° 43' 33.502 W	1,368,150.52	3,215,758.20
9,277.00	88.77	89.86	7,026.27	-895.92	2,302.01	40° 20' 28.989 N	104° 43' 32.340 W	1,368,150.07	3,215,848.18
9,366.00	88.46	88.90	7,028.42	-894.96	2,390.98	40° 20' 28.991 N	104° 43' 31.191 W	1,368,151.03	3,215,937.15
9,456.00	87.97	88.36	7,031.22	-892.81	2,480.91	40° 20' 29.005 N	104° 43' 30.030 W	1,368,153.18	3,216,027.07
9,546.00	89.97	89.76	7,032.84	-891.33	2,570.87	40° 20' 29.012 N	104° 43' 28.868 W	1,368,154.65	3,216,117.04
9,635.00	91.29	90.21	7,031.86	-891.31	2,659.87	40° 20' 29.004 N	104° 43' 27.719 W	1,368,154.68	3,216,206.03
9,725.00	91.64	89.67	7,029.56	-891.22	2,749.84	40° 20' 28.997 N	104° 43' 26.557 W	1,368,154.77	3,216,295.99
9,814.00	89.94	87.85	7,028.34	-889.29	2,838.80	40° 20' 29.009 N	104° 43' 25.408 W	1,368,156.70	3,216,384.95
9,904.00	91.33	87.46	7,027.34	-885.61	2,928.72	40° 20' 29.037 N	104° 43' 24.246 W	1,368,160.38	3,216,474.87
9,994.00	89.97	87.88	7,026.32	-881.95	3,018.64	40° 20' 29.066 N	104° 43' 23.085 W	1,368,164.04	3,216,564.78
10,083.00	88.83	87.55	7,027.25	-878.40	3,107.56	40° 20' 29.093 N	104° 43' 21.936 W	1,368,167.59	3,216,653.70
10,173.00	88.83	85.93	7,029.09	-873.28	3,197.39	40° 20' 29.136 N	104° 43' 20.775 W	1,368,172.70	3,216,743.53
10,263.00	87.72	88.47	7,031.80	-868.89	3,287.23	40° 20' 29.171 N	104° 43' 19.614 W	1,368,177.10	3,216,833.37
10,352.00	88.83	90.97	7,034.48	-868.46	3,376.18	40° 20' 29.168 N	104° 43' 18.466 W	1,368,177.53	3,216,922.31
10,442.00	88.80	92.15	7,036.34	-870.90	3,466.13	40° 20' 29.136 N	104° 43' 17.304 W	1,368,175.08	3,217,012.25
10,531.00	90.34	91.99	7,037.01	-874.12	3,555.07	40° 20' 29.096 N	104° 43' 16.156 W	1,368,171.87	3,217,101.19
10,621.00	90.31	91.42	7,036.50	-876.80	3,645.02	40° 20' 29.062 N	104° 43' 14.995 W	1,368,169.19	3,217,191.14
10,710.00	91.11	90.81	7,035.39	-878.53	3,734.00	40° 20' 29.037 N	104° 43' 13.846 W	1,368,167.46	3,217,280.11

Design Report for Loeffler K1-65HN - Final 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)
10,800.00	89.57	89.23	7,034.86	-878.56	3,823.99	40° 20' 29.029 N	104° 43' 12.684 W	1,368,167.43	3,217,370.10
10,890.00	89.97	88.31	7,035.22	-876.63	3,913.97	40° 20' 29.040 N	104° 43' 11.522 W	1,368,169.36	3,217,460.08
10,979.00	90.19	88.36	7,035.10	-874.04	4,002.93	40° 20' 29.058 N	104° 43' 10.373 W	1,368,171.94	3,217,549.04
11,069.00	92.03	88.03	7,033.35	-871.21	4,092.87	40° 20' 29.078 N	104° 43' 9.211 W	1,368,174.78	3,217,638.97
11,158.00	90.68	87.50	7,031.25	-867.74	4,181.77	40° 20' 29.105 N	104° 43' 8.062 W	1,368,178.25	3,217,727.87
11,248.00	89.11	89.59	7,031.41	-865.45	4,271.74	40° 20' 29.120 N	104° 43' 6.900 W	1,368,180.53	3,217,817.83
11,337.00	90.52	89.64	7,031.70	-864.86	4,360.73	40° 20' 29.118 N	104° 43' 5.751 W	1,368,181.13	3,217,906.82
11,427.00	90.09	88.21	7,031.22	-863.17	4,450.71	40° 20' 29.127 N	104° 43' 4.589 W	1,368,182.82	3,217,996.79
11,481.00	91.51	87.46	7,030.47	-861.13	4,504.67	40° 20' 29.142 N	104° 43' 3.892 W	1,368,184.86	3,218,050.75
11,544.00	91.51	87.46	7,028.81	-858.34	4,567.58	40° 20' 29.164 N	104° 43' 3.079 W	1,368,187.65	3,218,113.66

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
623.00	622.99	2.06	0.99	Tie-On to Surface Gyros @ 623.00ft
698.00	697.99	2.33	0.51	First MWD Survey @ 698.00ft
11,481.00	7,030.47	-861.13	4,504.67	Final MWD Survey @ 11481.00ft
11,544.00	7,028.81	-858.34	4,567.58	Straight Line Proj @ 11544' MD, 7028.81' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Loeffler K1-65HN_Rev A0_BHL Tgt	100.57	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
306.00	623.00	Surface Gyros	Flexi-Shot
698.00	7,574.00	MWD Surveys - Vert/Build	MWD+IFR1+MS_WY
7,663.00	11,481.00	MWD Surveys - Lateral	MWD+IFR1+MS_WY

Design Report for Loeffler K1-65HN - Final Surveys

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
7,471.00	7,018.56	7" Casing @ 7471' MD, 7018.56' TVD	7	8-3/4

Design Targets

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

Directional Difficulty Index

Average Dogleg over Survey:	2.21 °/100usft	Maximum Dogleg over Survey:	12.09 °/100usft at 6,769.00 usft
Net Tortosity applicable to Plans:	1.14 °/100usft	Directional Difficulty Index:	6.364

Audit Info

North Reference Sheet for Sec. 1-T4N-R66W (Loeffler 1 PAD) - Loeffler K1-65HN

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

Vertical Depths are relative to KB=16' @ 4682.00usft (Precision 829). Northing and Easting are relative to Loeffler K1-65HN - Slot A2

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: 0.99995816

Grid Coordinates of Well: 1,369,045.95 usft N, 3,213,546.27 usft E

Geographical Coordinates of Well: 40° 20' 38.04" N, 104° 44' 01.97" W

Grid Convergence at Surface is: 0.50°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,544.00usft

the Bottom Hole Displacement is 4,647.53usft in the Direction of 100.64° (Grid).

Magnetic Convergence at surface is: -8.08° (21 August 2013, , BGGM2013)

