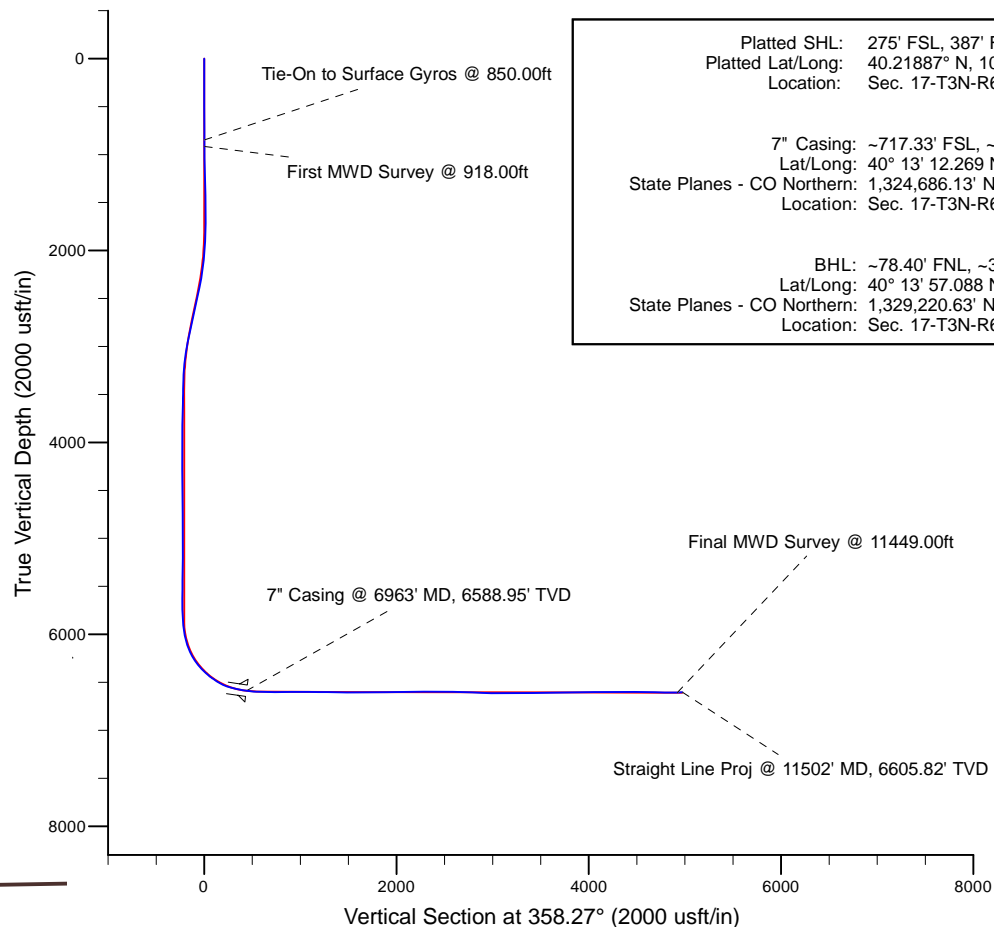
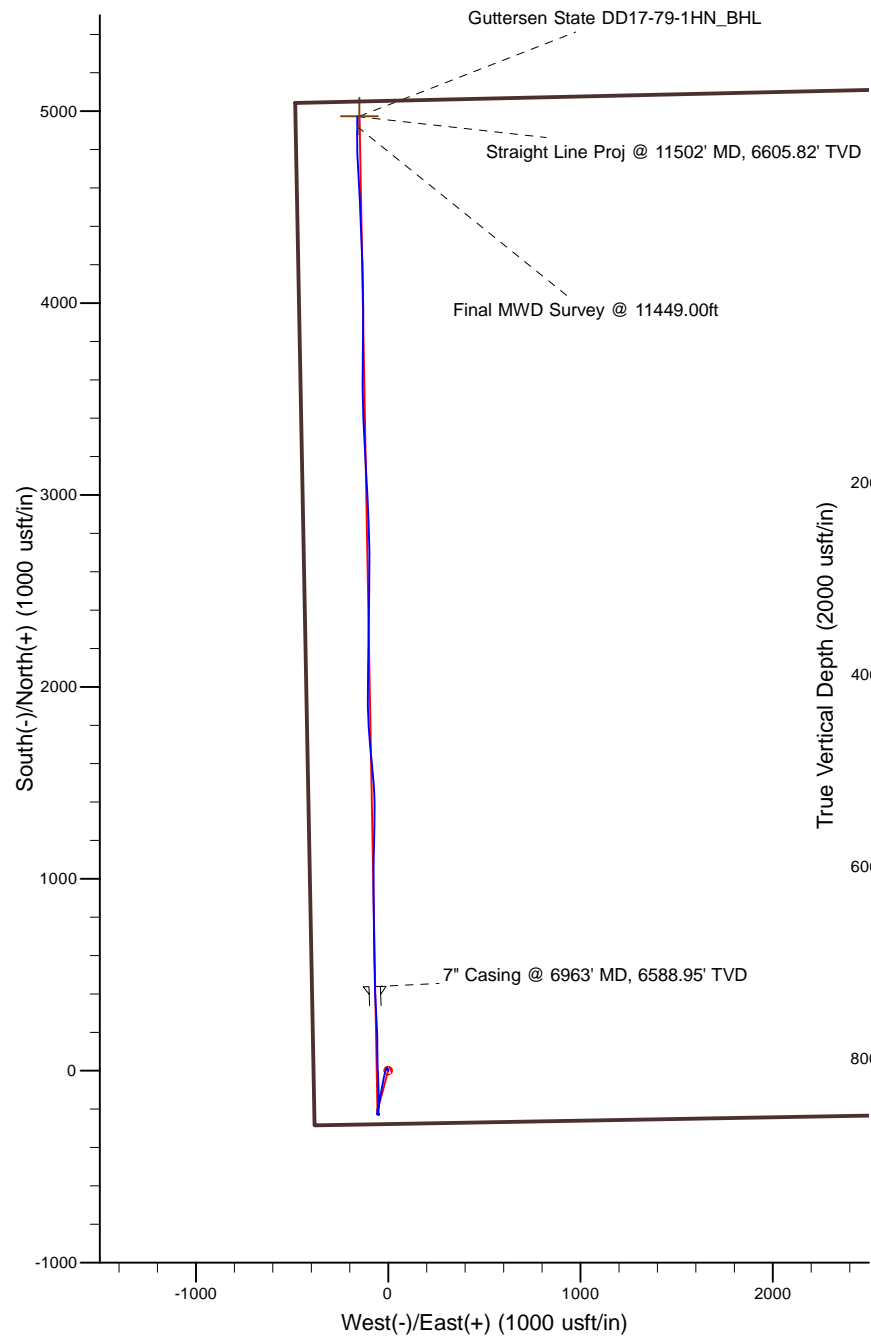


Project: Weld County, CO (NAD 83)
 Site: Sec. 17-T3N-R63W (Guttersen State DD17)
 Well: Guttersen State DD17-79-1HN
 Wellbore: Plan A
 Design: Final Surveys

Noble Energy

HALLIBURTON
 Sperry Drilling



LEGEND

- +— Guttersen State DD17-79-1HN, Plan A, Rev A1 - PROPOSAL V0
- Final Surveys

Platted SHL: 275' FSL, 387' FWL
 Platted Lat/Long: 40.21887° N, 104.46967° W
 Location: Sec. 17-T3N-R63W

7" Casing: ~717.33' FSL, ~326.73' FWL
 Lat/Long: 40° 13' 12.269 N, 104° 28' 11.636 W
 State Planes - CO Northern: 1,324,686.13' N, 3,287,648.78' E
 Location: Sec. 17-T3N-R63W

BHL: ~78.40' FNL, ~320.86' FWL
 Lat/Long: 40° 13' 57.088 N, 104° 28' 12.140 W
 State Planes - CO Northern: 1,329,220.63' N, 3,287,557.03' E
 Location: Sec. 17-T3N-R63W

WELL DETAILS: Guttersen State DD17-79-1HN

Ground Level: 4820.00
 RKB=24 @ 4844.00usft (H&P 322)

Created By: Fred Hartmann
 Created On: 12/16/2013

Noble Energy

Weld County, CO (NAD 83)

Sec. 17-T3N-R63W (Guttersen State DD17)

Guttersen State DD17-79-1HN

Design: Final Surveys

Sperry Drilling Services

Final Survey Report

16 December, 2013

Well Coordinates: 1,324,248.03 N, 3,287,717.78 E (40° 13' 07.93" N, 104° 28' 10.81" W)

Ground Level: 4,820.00 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 Guttersen State DD17-79-1HN

RKB=24 @ 4844.00usft (H&P 322)

N

Grid

API - US Survey Feet - Custom

HALLIBURTON

Design Report for Guttersen State DD17-79-1HN - 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
240.00	0.60	318.30	240.00	0.94	-0.84	0.96	0.25
502.00	0.10	186.70	501.99	1.74	-1.78	1.79	0.26
750.00	0.50	15.60	749.99	2.56	-1.51	2.61	0.24
850.00	0.80	0.90	849.98	3.68	-1.38	3.72	0.34
Tie-On to Surface Gyros @ 850.00ft							
918.00	0.64	18.04	917.98	4.52	-1.26	4.55	0.39
First MWD Survey @ 918.00ft							
1,104.00	0.72	10.70	1,103.96	6.65	-0.72	6.67	0.06
1,197.00	1.03	339.82	1,196.95	8.01	-0.90	8.03	0.60
1,290.00	0.94	340.26	1,289.94	9.51	-1.44	9.55	0.10
1,383.00	1.19	343.00	1,382.92	11.16	-1.98	11.21	0.27
1,476.00	1.63	346.78	1,475.89	13.37	-2.57	13.44	0.48
1,571.00	1.78	294.53	1,570.86	15.29	-4.22	15.42	1.59
1,665.00	0.96	237.76	1,664.83	15.48	-6.21	15.66	1.58
1,760.00	0.25	209.93	1,759.83	14.88	-6.99	15.08	0.79
1,855.00	2.21	210.28	1,854.80	13.12	-8.02	13.35	2.06
1,949.00	3.69	205.97	1,948.67	8.83	-10.26	9.14	1.59
2,044.00	6.19	196.84	2,043.32	1.18	-13.08	1.57	2.75
2,139.00	7.26	195.08	2,137.66	-9.52	-16.12	-9.03	1.15
2,234.00	8.64	190.87	2,231.75	-22.32	-19.03	-21.74	1.58
2,329.00	10.54	193.01	2,325.41	-37.80	-22.33	-37.11	2.03
2,423.00	13.02	192.55	2,417.43	-56.51	-26.57	-55.69	2.64
2,518.00	11.53	190.61	2,510.25	-76.29	-30.64	-75.34	1.63
2,613.00	11.85	189.34	2,603.28	-95.25	-33.98	-94.18	0.43
2,708.00	13.28	190.90	2,696.01	-115.59	-37.62	-114.40	1.55
2,803.00	12.87	190.20	2,788.54	-136.72	-41.56	-135.40	0.46
2,898.00	12.36	187.32	2,881.25	-157.22	-44.73	-155.80	0.85
2,993.00	10.60	186.51	2,974.35	-175.98	-47.01	-174.49	1.86
3,088.00	8.53	183.99	3,068.02	-191.69	-48.50	-190.15	2.22
3,183.00	6.29	183.18	3,162.22	-203.92	-49.27	-202.34	2.36
3,277.00	4.21	184.26	3,255.82	-212.50	-49.82	-210.91	2.22
3,372.00	1.91	186.36	3,350.68	-217.56	-50.25	-215.94	2.42
3,467.00	2.17	229.39	3,445.63	-220.30	-51.79	-218.64	1.60
3,562.00	0.63	178.48	3,540.60	-221.99	-53.14	-220.29	1.94
3,657.00	1.91	198.18	3,635.57	-224.02	-53.62	-222.30	1.40
3,752.00	1.36	158.41	3,730.54	-226.57	-53.70	-224.85	1.29
3,847.00	0.44	104.09	3,825.52	-227.71	-52.93	-226.01	1.22
3,941.00	0.25	130.38	3,919.52	-227.93	-52.43	-226.25	0.26
4,036.00	0.71	169.91	4,014.52	-228.64	-52.17	-226.97	0.57
4,131.00	1.36	85.86	4,109.51	-229.14	-50.94	-227.50	1.54
4,226.00	0.64	47.04	4,204.49	-228.70	-49.43	-227.11	1.00
4,321.00	0.22	97.55	4,299.49	-228.36	-48.86	-226.79	0.56
4,415.00	0.62	350.34	4,393.49	-227.88	-48.76	-226.31	0.76
4,510.00	0.60	14.67	4,488.48	-226.90	-48.72	-225.32	0.27
4,605.00	0.13	262.13	4,583.48	-226.43	-48.70	-224.86	0.70
4,700.00	0.70	178.81	4,678.48	-227.02	-48.80	-225.45	0.73
4,795.00	1.28	355.28	4,773.47	-226.55	-48.87	-224.97	2.08
4,890.00	1.47	350.82	4,868.45	-224.29	-49.16	-222.70	0.23
4,984.00	1.91	312.23	4,962.41	-222.04	-50.51	-220.42	1.27

Design Report for Guttersen State DD17-79-1HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
5,079.00	0.89	225.34	5,057.39	-221.50	-52.21	-219.82	2.17
5,174.00	1.82	219.66	5,152.36	-223.18	-53.69	-221.46	0.99
5,269.00	0.96	292.01	5,247.33	-224.04	-55.39	-222.27	1.88
5,364.00	1.10	223.60	5,342.32	-224.40	-56.76	-222.59	1.23
5,459.00	1.13	195.63	5,437.31	-225.97	-57.64	-224.13	0.57
5,554.00	0.66	170.35	5,532.29	-227.41	-57.80	-225.56	0.63
5,649.00	0.57	84.95	5,627.29	-227.90	-57.24	-226.08	0.88
5,744.00	1.51	355.96	5,722.28	-226.61	-56.86	-224.80	1.69
5,774.00	1.51	358.58	5,752.27	-225.82	-56.90	-224.01	0.23
5,832.00	1.90	357.82	5,810.24	-224.10	-56.95	-222.28	0.67
5,879.00	2.56	350.21	5,857.21	-222.29	-57.16	-220.46	1.54
5,927.00	5.14	6.75	5,905.09	-219.09	-57.09	-217.28	5.80
5,974.00	8.16	11.20	5,951.77	-213.73	-56.19	-211.94	6.51
6,022.00	9.20	11.76	5,999.22	-206.63	-54.75	-204.89	2.17
6,069.00	13.16	10.15	6,045.32	-197.68	-53.04	-196.00	8.45
6,117.00	18.74	6.14	6,091.46	-184.63	-51.25	-183.00	11.84
6,164.00	23.19	3.51	6,135.34	-167.88	-49.88	-166.30	9.68
6,212.00	24.65	0.41	6,179.21	-148.43	-49.23	-146.88	4.01
6,259.00	26.39	358.88	6,221.63	-128.19	-49.36	-126.64	3.96
6,306.00	31.50	358.78	6,262.74	-105.45	-49.83	-103.90	10.87
6,353.00	36.72	358.66	6,301.64	-79.11	-50.42	-77.56	11.11
6,401.00	41.63	358.27	6,338.84	-48.81	-51.23	-47.24	10.24
6,448.00	44.62	357.41	6,373.14	-16.71	-52.45	-15.12	6.48
6,496.00	47.65	356.71	6,406.40	17.85	-54.23	19.47	6.40
6,543.00	51.99	358.79	6,436.72	53.72	-55.62	55.37	9.83
6,591.00	55.49	0.09	6,465.11	92.41	-55.99	94.06	7.61
6,638.00	56.39	359.43	6,491.43	131.35	-56.15	132.98	2.24
6,686.00	61.78	358.78	6,516.08	172.51	-56.80	174.14	11.29
6,733.00	67.98	357.71	6,536.02	215.02	-58.12	216.68	13.35
6,781.00	73.88	356.93	6,551.70	260.32	-60.24	262.01	12.39
6,828.00	76.91	356.86	6,563.55	305.73	-62.70	307.48	6.45
6,876.00	78.51	356.92	6,573.77	352.56	-65.25	354.36	3.34
6,917.00	79.66	357.38	6,581.53	392.76	-67.25	394.61	3.01
6,963.00	81.77	358.19	6,588.95	438.12	-69.00	440.00	4.90
7" Casing @ 6963' MD, 6588.95' TVD							
7,045.00	85.53	359.62	6,598.02	519.59	-70.55	521.48	4.90
7,140.00	89.26	358.99	6,602.34	614.47	-71.71	616.35	3.98
7,235.00	90.99	359.45	6,602.13	709.45	-73.00	711.33	1.88
7,331.00	90.12	358.83	6,601.20	805.44	-74.44	807.31	1.11
7,425.00	89.97	358.81	6,601.13	899.42	-76.38	901.31	0.16
7,520.00	89.66	0.68	6,601.43	994.41	-76.80	996.27	2.00
7,615.00	89.66	1.03	6,602.00	1,089.40	-75.38	1,091.18	0.37
7,710.00	89.44	1.22	6,602.74	1,184.38	-73.52	1,186.06	0.31
7,805.00	89.88	1.24	6,603.31	1,279.35	-71.48	1,280.93	0.46
7,900.00	89.85	359.86	6,603.53	1,374.35	-70.56	1,375.85	1.45
7,995.00	88.95	356.54	6,604.53	1,469.28	-73.55	1,470.83	3.62
8,090.00	89.11	354.36	6,606.16	1,563.96	-81.08	1,565.70	2.30
8,184.00	89.29	354.13	6,607.45	1,657.48	-90.51	1,659.45	0.31
8,279.00	91.63	356.52	6,606.68	1,752.15	-98.25	1,754.31	3.52
8,374.00	92.01	357.47	6,603.67	1,846.97	-103.23	1,849.24	1.08
8,469.00	90.93	359.70	6,601.23	1,941.90	-105.57	1,944.20	2.61

Design Report for Guttersen State DD17-79-1HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,564.00	90.15	1.57	6,600.33	2,036.88	-104.52	2,039.11	2.13
8,659.00	90.06	359.82	6,600.16	2,131.87	-103.37	2,134.02	1.84
8,753.00	90.46	0.84	6,599.73	2,225.87	-102.83	2,227.96	1.17
8,848.00	90.56	1.09	6,598.89	2,320.85	-101.23	2,322.85	0.28
8,943.00	89.41	0.32	6,598.91	2,415.84	-100.06	2,417.76	1.46
9,037.00	89.75	1.09	6,599.60	2,509.83	-98.90	2,511.67	0.90
9,132.00	88.61	0.58	6,600.96	2,604.81	-97.52	2,606.57	1.31
9,227.00	89.41	358.91	6,602.60	2,699.79	-97.94	2,701.52	1.95
9,322.00	87.10	358.66	6,605.50	2,794.72	-99.95	2,796.46	2.45
9,417.00	86.88	357.38	6,610.48	2,889.53	-103.23	2,891.33	1.37
9,512.00	88.43	357.31	6,614.37	2,984.35	-107.63	2,986.23	1.63
9,607.00	89.94	356.32	6,615.72	3,079.19	-112.90	3,081.19	1.90
9,702.00	90.62	357.29	6,615.26	3,174.03	-118.20	3,176.15	1.25
9,797.00	90.55	356.95	6,614.29	3,268.91	-122.97	3,271.13	0.37
9,891.00	90.49	357.61	6,613.44	3,362.80	-127.43	3,365.11	0.70
9,986.00	89.11	358.15	6,613.77	3,457.73	-130.95	3,460.11	1.56
10,081.00	92.68	359.62	6,612.28	3,552.68	-132.79	3,555.07	4.06
10,176.00	92.59	0.27	6,607.92	3,647.58	-132.89	3,649.93	0.69
10,271.00	90.09	0.94	6,605.69	3,742.54	-131.88	3,744.82	2.72
10,366.00	91.30	0.37	6,604.54	3,837.53	-130.80	3,839.73	1.41
10,460.00	90.83	359.64	6,602.79	3,931.51	-130.79	3,933.67	0.92
10,555.00	90.62	359.50	6,601.59	4,026.50	-131.50	4,028.63	0.27
10,650.00	89.44	359.59	6,601.54	4,121.50	-132.26	4,123.61	1.25
10,746.00	89.01	358.34	6,602.84	4,217.47	-133.99	4,219.59	1.38
10,840.00	89.78	357.85	6,603.83	4,311.41	-137.11	4,313.58	0.97
10,935.00	89.23	357.40	6,604.65	4,406.32	-141.05	4,408.57	0.75
11,030.00	90.18	356.78	6,605.14	4,501.20	-145.87	4,503.55	1.19
11,125.00	89.78	356.66	6,605.18	4,596.04	-151.31	4,598.52	0.44
11,220.00	89.51	357.41	6,605.77	4,690.91	-156.22	4,693.49	0.84
11,315.00	89.54	357.99	6,606.55	4,785.83	-160.04	4,788.48	0.61
11,410.00	90.12	0.60	6,606.84	4,880.82	-161.20	4,883.46	2.81
11,449.00	90.77	0.19	6,606.53	4,919.82	-160.94	4,922.43	1.97
Final MWD Survey @ 11449.00ft							
11,502.00	90.77	0.19	6,605.82	4,972.81	-160.76	4,975.40	0.00
Straight Line Proj @ 11502' MD, 6605.82' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
850.00	849.98	3.68	-1.38	Tie-On to Surface Gyros @ 850.00ft
918.00	917.98	4.52	-1.26	First MWD Survey @ 918.00ft
11,449.00	6,606.53	4,919.82	-160.94	Final MWD Survey @ 11449.00ft
11,502.00	6,605.82	4,972.81	-160.76	Straight Line Proj @ 11502' MD, 6605.82' TVD

Design Report for Gutttersen State DD17-79-1HN - Final Surveys

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	Gutttersen State DD17-79-1HN_BHL	358.27	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
240.00	850.00	Surface Gyros	Flexi-Shot
918.00	6,917.00	MWD Surveys - Vert/Build	MWD+SC
7,045.00	11,449.00	MWD Surveys - Lateral	MWD+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
6,963.00	6,588.95	7" Casing @ 6963' MD, 6588.95' 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
Gutttersen State DD17- - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,324,248.03	3,287,717.78	40° 13' 7.932 N	104° 28' 10.812 W
Gutttersen State DD17- - actual wellpath misses target center by 13.41usft at 11502.00usft MD (6605.82 TVD, 4972.81 N, -160.76 E) - Point	0.00	0.00	6,613.46	4,974.94	-149.95	1,329,222.76	3,287,567.83	40° 13' 57.108 N	104° 28' 12.000 W

Directional Difficulty Index

Average Dogleg over Survey:	1.86 °/100usft	Maximum Dogleg over Survey:	13.35 °/100usft at 6,733.00 usft
Net Tortousity applicable to Plans:	0.87 °/100usft	Directional Difficulty Index:	6.311

Audit Info

North Reference Sheet for Sec. 17-T3N-R63W (Guttersen State DD17) - Guttersen State DD17-79-1HN

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

Vertical Depths are relative to RKB=24 @ 4844.00usft (H&P 322). Northing and Easting are relative to Guttersen State DD17-79-1HN

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: 0.99995700

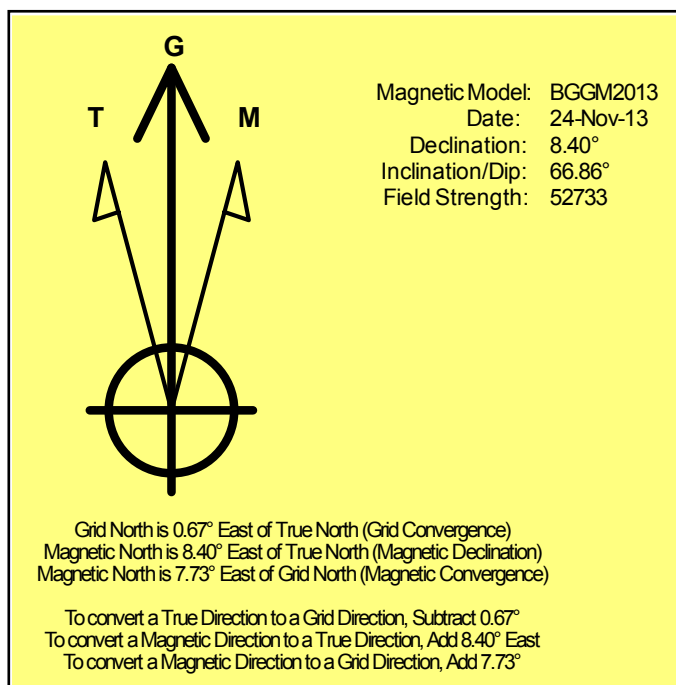
Grid Coordinates of Well: 1,324,248.03 usft N, 3,287,717.78 usft E

Geographical Coordinates of Well: 40° 13' 07.93" N, 104° 28' 10.81" W

Grid Convergence at Surface is: 0.67°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,502.00usft the Bottom Hole Displacement is 4,975.41usft in the Direction of 358.15° (Grid).

Magnetic Convergence at surface is: -7.73° (24 November 2013, , BGGM2013)



Noble Energy

Weld County, CO (NAD 83)

Sec. 17-T3N-R63W (Guttersen State DD17)

Guttersen State DD17-79-1HN

Design: Final Surveys

Sperry Drilling Services

Geodetic Report

16 December, 2013

Well Coordinates: 1,324,248.03 N, 3,287,717.78 E (40° 13' 07.93" N, 104° 28' 10.81" W)

Ground Level: 4,820.00 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 Guttersen State DD17-79-1HN

RKB=24 @ 4844.00usft (H&P 322)

N

Grid

API - US Survey Feet - Custom

HALLIBURTON

Design Report for Guttersen State DD17-79-1HN - 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° 13' 7.932 N	104° 28' 10.812 W	1,324,248.03	3,287,717.78
240.00	0.60	318.30	240.00	0.94	-0.84	40° 13' 7.941 N	104° 28' 10.823 W	1,324,248.97	3,287,716.95
502.00	0.10	186.70	501.99	1.74	-1.78	40° 13' 7.949 N	104° 28' 10.835 W	1,324,249.76	3,287,716.01
750.00	0.50	15.60	749.99	2.56	-1.51	40° 13' 7.957 N	104° 28' 10.831 W	1,324,250.59	3,287,716.27
850.00	0.80	0.90	849.98	3.68	-1.38	40° 13' 7.968 N	104° 28' 10.829 W	1,324,251.71	3,287,716.40
918.00	0.64	18.04	917.98	4.52	-1.26	40° 13' 7.977 N	104° 28' 10.828 W	1,324,252.55	3,287,716.53
1,104.00	0.72	10.70	1,103.96	6.65	-0.72	40° 13' 7.998 N	104° 28' 10.820 W	1,324,254.68	3,287,717.06
1,197.00	1.03	339.82	1,196.95	8.01	-0.90	40° 13' 8.011 N	104° 28' 10.822 W	1,324,256.04	3,287,716.88
1,290.00	0.94	340.26	1,289.94	9.51	-1.44	40° 13' 8.026 N	104° 28' 10.829 W	1,324,257.54	3,287,716.34
1,383.00	1.19	343.00	1,382.92	11.16	-1.98	40° 13' 8.042 N	104° 28' 10.836 W	1,324,259.18	3,287,715.80
1,476.00	1.63	346.78	1,475.89	13.37	-2.57	40° 13' 8.064 N	104° 28' 10.843 W	1,324,261.40	3,287,715.21
1,571.00	1.78	294.53	1,570.86	15.29	-4.22	40° 13' 8.083 N	104° 28' 10.864 W	1,324,263.32	3,287,713.56
1,665.00	0.96	237.76	1,664.83	15.48	-6.21	40° 13' 8.086 N	104° 28' 10.890 W	1,324,263.51	3,287,711.57
1,760.00	0.25	209.93	1,759.83	14.88	-6.99	40° 13' 8.080 N	104° 28' 10.900 W	1,324,262.91	3,287,710.79
1,855.00	2.21	210.28	1,854.80	13.12	-8.02	40° 13' 8.062 N	104° 28' 10.913 W	1,324,261.14	3,287,709.76
1,949.00	3.69	205.97	1,948.67	8.83	-10.26	40° 13' 8.020 N	104° 28' 10.943 W	1,324,256.86	3,287,707.53
2,044.00	6.19	196.84	2,043.32	1.18	-13.08	40° 13' 7.945 N	104° 28' 10.980 W	1,324,249.21	3,287,704.70
2,139.00	7.26	195.08	2,137.66	-9.52	-16.12	40° 13' 7.840 N	104° 28' 11.021 W	1,324,238.51	3,287,701.66
2,234.00	8.64	190.87	2,231.75	-22.32	-19.03	40° 13' 7.713 N	104° 28' 11.061 W	1,324,225.71	3,287,698.75
2,329.00	10.54	193.01	2,325.41	-37.80	-22.33	40° 13' 7.561 N	104° 28' 11.106 W	1,324,210.23	3,287,695.45
2,423.00	13.02	192.55	2,417.43	-56.51	-26.57	40° 13' 7.376 N	104° 28' 11.163 W	1,324,191.52	3,287,691.21
2,518.00	11.53	190.61	2,510.25	-76.29	-30.64	40° 13' 7.182 N	104° 28' 11.218 W	1,324,171.74	3,287,687.14
2,613.00	11.85	189.34	2,603.28	-95.25	-33.98	40° 13' 6.995 N	104° 28' 11.264 W	1,324,152.78	3,287,683.81
2,708.00	13.28	190.90	2,696.01	-115.59	-37.62	40° 13' 6.794 N	104° 28' 11.314 W	1,324,132.44	3,287,680.16
2,803.00	12.87	190.20	2,788.54	-136.72	-41.56	40° 13' 6.586 N	104° 28' 11.368 W	1,324,111.32	3,287,676.22
2,898.00	12.36	187.32	2,881.25	-157.22	-44.73	40° 13' 6.384 N	104° 28' 11.412 W	1,324,090.82	3,287,673.05
2,993.00	10.60	186.51	2,974.35	-175.98	-47.01	40° 13' 6.198 N	104° 28' 11.444 W	1,324,072.05	3,287,670.77
3,088.00	8.53	183.99	3,068.02	-191.69	-48.50	40° 13' 6.043 N	104° 28' 11.466 W	1,324,056.34	3,287,669.29
3,183.00	6.29	183.18	3,162.22	-203.92	-49.27	40° 13' 5.923 N	104° 28' 11.478 W	1,324,044.12	3,287,668.51
3,277.00	4.21	184.26	3,255.82	-212.50	-49.82	40° 13' 5.838 N	104° 28' 11.486 W	1,324,035.53	3,287,667.97
3,372.00	1.91	186.36	3,350.68	-217.56	-50.25	40° 13' 5.788 N	104° 28' 11.492 W	1,324,030.48	3,287,667.53
3,467.00	2.17	229.39	3,445.63	-220.30	-51.79	40° 13' 5.761 N	104° 28' 11.513 W	1,324,027.74	3,287,665.99
3,562.00	0.63	178.48	3,540.60	-221.99	-53.14	40° 13' 5.744 N	104° 28' 11.530 W	1,324,026.05	3,287,664.64
3,657.00	1.91	198.18	3,635.57	-224.02	-53.62	40° 13' 5.724 N	104° 28' 11.537 W	1,324,024.02	3,287,664.16
3,752.00	1.36	158.41	3,730.54	-226.57	-53.70	40° 13' 5.699 N	104° 28' 11.538 W	1,324,021.47	3,287,664.08
3,847.00	0.44	104.09	3,825.52	-227.71	-52.93	40° 13' 5.688 N	104° 28' 11.528 W	1,324,020.33	3,287,664.85
3,941.00	0.25	130.38	3,919.52	-227.93	-52.43	40° 13' 5.686 N	104° 28' 11.522 W	1,324,020.11	3,287,665.36
4,036.00	0.71	169.91	4,014.52	-228.64	-52.17	40° 13' 5.679 N	104° 28' 11.519 W	1,324,019.40	3,287,665.62
4,131.00	1.36	85.86	4,109.51	-229.14	-50.94	40° 13' 5.674 N	104° 28' 11.503 W	1,324,018.90	3,287,666.84
4,226.00	0.64	47.04	4,204.49	-228.70	-49.43	40° 13' 5.678 N	104° 28' 11.483 W	1,324,019.34	3,287,668.36
4,321.00	0.22	97.55	4,299.49	-228.36	-48.86	40° 13' 5.681 N	104° 28' 11.476 W	1,324,019.68	3,287,668.93
4,415.00	0.62	350.34	4,393.49	-227.88	-48.76	40° 13' 5.686 N	104° 28' 11.475 W	1,324,020.16	3,287,669.02

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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)
4,510.00	0.60	14.67	4,488.48	-226.90	-48.72	40° 13' 5.695 N	104° 28' 11.474 W	1,324,021.14	3,287,669.06
4,605.00	0.13	262.13	4,583.48	-226.43	-48.70	40° 13' 5.700 N	104° 28' 11.474 W	1,324,021.61	3,287,669.08
4,700.00	0.70	178.81	4,678.48	-227.02	-48.80	40° 13' 5.694 N	104° 28' 11.475 W	1,324,021.01	3,287,668.98
4,795.00	1.28	355.28	4,773.47	-226.55	-48.87	40° 13' 5.699 N	104° 28' 11.476 W	1,324,021.49	3,287,668.91
4,890.00	1.47	350.82	4,868.45	-224.29	-49.16	40° 13' 5.721 N	104° 28' 11.479 W	1,324,023.75	3,287,668.63
4,984.00	1.91	312.23	4,962.41	-222.04	-50.51	40° 13' 5.744 N	104° 28' 11.496 W	1,324,026.00	3,287,667.27
5,079.00	0.89	225.34	5,057.39	-221.50	-52.21	40° 13' 5.749 N	104° 28' 11.518 W	1,324,026.54	3,287,665.58
5,174.00	1.82	219.66	5,152.36	-223.18	-53.69	40° 13' 5.733 N	104° 28' 11.538 W	1,324,024.86	3,287,664.09
5,269.00	0.96	292.01	5,247.33	-224.04	-55.39	40° 13' 5.724 N	104° 28' 11.560 W	1,324,024.00	3,287,662.39
5,364.00	1.10	223.60	5,342.32	-224.40	-56.76	40° 13' 5.721 N	104° 28' 11.577 W	1,324,023.64	3,287,661.02
5,459.00	1.13	195.63	5,437.31	-225.97	-57.64	40° 13' 5.706 N	104° 28' 11.589 W	1,324,022.07	3,287,660.14
5,554.00	0.66	170.35	5,532.29	-227.41	-57.80	40° 13' 5.691 N	104° 28' 11.591 W	1,324,020.63	3,287,659.98
5,649.00	0.57	84.95	5,627.29	-227.90	-57.24	40° 13' 5.686 N	104° 28' 11.584 W	1,324,020.13	3,287,660.54
5,744.00	1.51	355.96	5,722.28	-226.61	-56.86	40° 13' 5.699 N	104° 28' 11.579 W	1,324,021.42	3,287,660.93
5,774.00	1.51	358.58	5,752.27	-225.82	-56.90	40° 13' 5.707 N	104° 28' 11.579 W	1,324,022.21	3,287,660.89
5,832.00	1.90	357.82	5,810.24	-224.10	-56.95	40° 13' 5.724 N	104° 28' 11.580 W	1,324,023.94	3,287,660.83
5,879.00	2.56	350.21	5,857.21	-222.29	-57.16	40° 13' 5.742 N	104° 28' 11.582 W	1,324,025.75	3,287,660.62
5,927.00	5.14	6.75	5,905.09	-219.09	-57.09	40° 13' 5.773 N	104° 28' 11.581 W	1,324,028.94	3,287,660.69
5,974.00	8.16	11.20	5,951.77	-213.73	-56.19	40° 13' 5.826 N	104° 28' 11.568 W	1,324,034.31	3,287,661.59
6,022.00	9.20	11.76	5,999.22	-206.63	-54.75	40° 13' 5.896 N	104° 28' 11.549 W	1,324,041.41	3,287,663.03
6,069.00	13.16	10.15	6,045.32	-197.68	-53.04	40° 13' 5.985 N	104° 28' 11.525 W	1,324,050.35	3,287,664.74
6,117.00	18.74	6.14	6,091.46	-184.63	-51.25	40° 13' 6.113 N	104° 28' 11.500 W	1,324,063.41	3,287,666.53
6,164.00	23.19	3.51	6,135.34	-167.88	-49.88	40° 13' 6.279 N	104° 28' 11.480 W	1,324,080.16	3,287,667.91
6,212.00	24.65	0.41	6,179.21	-148.43	-49.23	40° 13' 6.471 N	104° 28' 11.469 W	1,324,099.60	3,287,668.56
6,259.00	26.39	358.88	6,221.63	-128.19	-49.36	40° 13' 6.671 N	104° 28' 11.467 W	1,324,119.85	3,287,668.42
6,306.00	31.50	358.78	6,262.74	-105.45	-49.83	40° 13' 6.896 N	104° 28' 11.470 W	1,324,142.58	3,287,667.96
6,353.00	36.72	358.66	6,301.64	-79.11	-50.42	40° 13' 7.156 N	104° 28' 11.474 W	1,324,168.92	3,287,667.37
6,401.00	41.63	358.27	6,338.84	-48.81	-51.23	40° 13' 7.455 N	104° 28' 11.480 W	1,324,199.22	3,287,666.55
6,448.00	44.62	357.41	6,373.14	-16.71	-52.45	40° 13' 7.773 N	104° 28' 11.491 W	1,324,231.32	3,287,665.33
6,496.00	47.65	356.71	6,406.40	17.85	-54.23	40° 13' 8.114 N	104° 28' 11.508 W	1,324,265.88	3,287,663.55
6,543.00	51.99	358.79	6,436.72	53.72	-55.62	40° 13' 8.469 N	104° 28' 11.521 W	1,324,301.74	3,287,662.16
6,591.00	55.49	0.09	6,465.11	92.41	-55.99	40° 13' 8.851 N	104° 28' 11.520 W	1,324,340.44	3,287,661.80
6,638.00	56.39	359.43	6,491.43	131.35	-56.15	40° 13' 9.236 N	104° 28' 11.516 W	1,324,379.37	3,287,661.63
6,686.00	61.78	358.78	6,516.08	172.51	-56.80	40° 13' 9.643 N	104° 28' 11.518 W	1,324,420.53	3,287,660.98
6,733.00	67.98	357.71	6,536.02	215.02	-58.12	40° 13' 10.063 N	104° 28' 11.529 W	1,324,463.04	3,287,659.67
6,781.00	73.88	356.93	6,551.70	260.32	-60.24	40° 13' 10.511 N	104° 28' 11.550 W	1,324,508.34	3,287,657.54
6,828.00	76.91	356.86	6,563.55	305.73	-62.70	40° 13' 10.960 N	104° 28' 11.574 W	1,324,553.74	3,287,655.08
6,876.00	78.51	356.92	6,573.77	352.56	-65.25	40° 13' 11.423 N	104° 28' 11.600 W	1,324,600.57	3,287,652.54
6,917.00	79.66	357.38	6,581.53	392.76	-67.25	40° 13' 11.821 N	104° 28' 11.620 W	1,324,640.78	3,287,650.53
6,963.00	81.77	358.19	6,588.95	438.12	-69.00	40° 13' 12.269 N	104° 28' 11.636 W	1,324,686.13	3,287,648.78
7,045.00	85.53	359.62	6,598.02	519.59	-70.55	40° 13' 13.074 N	104° 28' 11.644 W	1,324,767.60	3,287,647.23
7,140.00	89.26	358.99	6,602.34	614.47	-71.71	40° 13' 14.012 N	104° 28' 11.644 W	1,324,862.47	3,287,646.08

Design Report for Guttarsen State DD17-79-1HN - 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)
7,235.00	90.99	359.45	6,602.13	709.45	-73.00	40° 13' 14.951 N	104° 28' 11.647 W	1,324,957.45	3,287,644.79
7,331.00	90.12	358.83	6,601.20	805.44	-74.44	40° 13' 15.899 N	104° 28' 11.651 W	1,325,053.43	3,287,643.34
7,425.00	89.97	358.81	6,601.13	899.42	-76.38	40° 13' 16.828 N	104° 28' 11.662 W	1,325,147.41	3,287,641.41
7,520.00	89.66	0.68	6,601.43	994.41	-76.80	40° 13' 17.767 N	104° 28' 11.653 W	1,325,242.40	3,287,640.99
7,615.00	89.66	1.03	6,602.00	1,089.40	-75.38	40° 13' 18.705 N	104° 28' 11.621 W	1,325,337.38	3,287,642.40
7,710.00	89.44	1.22	6,602.74	1,184.38	-73.52	40° 13' 19.644 N	104° 28' 11.582 W	1,325,432.36	3,287,644.27
7,805.00	89.88	1.24	6,603.31	1,279.35	-71.48	40° 13' 20.582 N	104° 28' 11.542 W	1,325,527.33	3,287,646.31
7,900.00	89.85	359.86	6,603.53	1,374.35	-70.56	40° 13' 21.520 N	104° 28' 11.516 W	1,325,622.32	3,287,647.22
7,995.00	88.95	356.54	6,604.53	1,469.28	-73.55	40° 13' 22.459 N	104° 28' 11.540 W	1,325,717.25	3,287,644.24
8,090.00	89.11	354.36	6,606.13	1,563.96	-81.08	40° 13' 23.395 N	104° 28' 11.623 W	1,325,811.92	3,287,636.70
8,184.00	89.29	354.13	6,607.45	1,657.48	-90.51	40° 13' 24.320 N	104° 28' 11.730 W	1,325,905.44	3,287,627.28
8,279.00	91.63	356.52	6,606.68	1,752.15	-98.25	40° 13' 25.257 N	104° 28' 11.816 W	1,326,000.10	3,287,619.54
8,374.00	92.01	357.47	6,603.67	1,846.97	-103.23	40° 13' 26.194 N	104° 28' 11.866 W	1,326,094.92	3,287,614.56
8,469.00	90.93	359.70	6,601.23	1,941.90	-105.57	40° 13' 27.132 N	104° 28' 11.882 W	1,326,189.84	3,287,612.21
8,564.00	90.15	1.57	6,600.33	2,036.88	-104.52	40° 13' 28.071 N	104° 28' 11.854 W	1,326,284.83	3,287,613.27
8,659.00	90.06	359.82	6,600.16	2,131.87	-103.37	40° 13' 29.009 N	104° 28' 11.825 W	1,326,379.81	3,287,614.42
8,753.00	90.46	0.84	6,599.73	2,225.87	-102.83	40° 13' 29.938 N	104° 28' 11.804 W	1,326,473.80	3,287,614.96
8,848.00	90.56	1.09	6,598.89	2,320.85	-101.23	40° 13' 30.877 N	104° 28' 11.769 W	1,326,568.78	3,287,616.56
8,943.00	89.41	0.32	6,598.91	2,415.84	-100.06	40° 13' 31.815 N	104° 28' 11.740 W	1,326,663.77	3,287,617.73
9,037.00	89.75	1.09	6,599.60	2,509.83	-98.90	40° 13' 32.744 N	104° 28' 11.711 W	1,326,757.75	3,287,618.89
9,132.00	88.61	0.58	6,600.96	2,604.81	-97.52	40° 13' 33.682 N	104° 28' 11.679 W	1,326,852.73	3,287,620.27
9,227.00	89.41	358.91	6,602.60	2,699.79	-97.94	40° 13' 34.621 N	104° 28' 11.670 W	1,326,947.70	3,287,619.85
9,322.00	87.10	358.66	6,605.50	2,794.72	-99.95	40° 13' 35.559 N	104° 28' 11.682 W	1,327,042.63	3,287,617.83
9,417.00	86.88	357.38	6,610.48	2,889.53	-103.23	40° 13' 36.496 N	104° 28' 11.710 W	1,327,137.43	3,287,614.56
9,512.00	88.43	357.31	6,614.37	2,984.35	-107.63	40° 13' 37.433 N	104° 28' 11.752 W	1,327,232.25	3,287,610.16
9,607.00	89.94	356.32	6,615.72	3,079.19	-112.90	40° 13' 38.371 N	104° 28' 11.806 W	1,327,327.08	3,287,604.88
9,702.00	90.62	357.29	6,615.26	3,174.03	-118.20	40° 13' 39.309 N	104° 28' 11.860 W	1,327,421.93	3,287,599.59
9,797.00	90.55	356.95	6,614.29	3,268.91	-122.97	40° 13' 40.247 N	104° 28' 11.908 W	1,327,516.80	3,287,594.82
9,891.00	90.49	357.61	6,613.44	3,362.80	-127.43	40° 13' 41.175 N	104° 28' 11.951 W	1,327,610.68	3,287,590.35
9,986.00	89.11	358.15	6,613.77	3,457.73	-130.95	40° 13' 42.114 N	104° 28' 11.982 W	1,327,705.61	3,287,586.84
10,081.00	92.68	359.62	6,612.28	3,552.68	-132.79	40° 13' 43.052 N	104° 28' 11.992 W	1,327,800.56	3,287,584.99
10,176.00	92.59	0.27	6,607.92	3,647.58	-132.89	40° 13' 43.990 N	104° 28' 11.979 W	1,327,895.45	3,287,584.90
10,271.00	90.09	0.94	6,605.69	3,742.54	-131.88	40° 13' 44.928 N	104° 28' 11.952 W	1,327,990.41	3,287,585.90
10,366.00	91.30	0.37	6,604.54	3,837.53	-130.80	40° 13' 45.867 N	104° 28' 11.923 W	1,328,085.39	3,287,586.99
10,460.00	90.83	359.64	6,602.79	3,931.51	-130.79	40° 13' 46.795 N	104° 28' 11.909 W	1,328,179.37	3,287,587.00
10,555.00	90.62	359.50	6,601.59	4,026.50	-131.50	40° 13' 47.734 N	104° 28' 11.904 W	1,328,274.36	3,287,586.29
10,650.00	89.44	359.59	6,601.54	4,121.50	-132.26	40° 13' 48.673 N	104° 28' 11.900 W	1,328,369.35	3,287,585.53
10,746.00	89.01	358.34	6,602.84	4,217.47	-133.99	40° 13' 49.621 N	104° 28' 11.908 W	1,328,465.32	3,287,583.80
10,840.00	89.78	357.85	6,603.83	4,311.41	-137.11	40° 13' 50.550 N	104° 28' 11.934 W	1,328,559.25	3,287,580.67
10,935.00	89.23	357.40	6,604.65	4,406.32	-141.05	40° 13' 51.488 N	104° 28' 11.970 W	1,328,654.16	3,287,576.74
11,030.00	90.18	356.78	6,605.14	4,501.20	-145.87	40° 13' 52.426 N	104° 28' 12.018 W	1,328,749.04	3,287,571.91
11,125.00	89.78	356.66	6,605.18	4,596.04	-151.31	40° 13' 53.364 N	104° 28' 12.074 W	1,328,843.88	3,287,566.48

Design Report for Guttersen State DD17-79-1HN - 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)
11,220.00	89.51	357.41	6,605.77	4,690.91	-156.22	40° 13' 54.302 N	104° 28' 12.123 W	1,328,938.74	3,287,561.56
11,315.00	89.54	357.99	6,606.55	4,785.83	-160.04	40° 13' 55.240 N	104° 28' 12.158 W	1,329,033.66	3,287,557.75
11,410.00	90.12	0.60	6,606.84	4,880.82	-161.20	40° 13' 56.179 N	104° 28' 12.159 W	1,329,128.64	3,287,556.58
11,449.00	90.77	0.19	6,606.53	4,919.82	-160.94	40° 13' 56.564 N	104° 28' 12.150 W	1,329,167.63	3,287,556.85
11,502.00	90.77	0.19	6,605.82	4,972.81	-160.76	40° 13' 57.088 N	104° 28' 12.140 W	1,329,220.63	3,287,557.03

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
850.00	849.98	3.68	-1.38	Tie-On to Surface Gyros @ 850.00ft
918.00	917.98	4.52	-1.26	First MWD Survey @ 918.00ft
11,449.00	6,606.53	4,919.82	-160.94	Final MWD Survey @ 11449.00ft
11,502.00	6,605.82	4,972.81	-160.76	Straight Line Proj @ 11502' MD, 6605.82' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Guttersen State DD17-79-1HN_BHL	358.27	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
240.00	850.00	Surface Gyros	Flexi-Shot
918.00	6,917.00	MWD Surveys - Vert/Build	MWD+SC
7,045.00	11,449.00	MWD Surveys - Lateral	MWD+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
6,963.00	6,588.95	7" Casing @ 6963' MD, 6588.95' TVD	7	8-3/4

Design Report for Guttersen State DD17-79-1HN - Final Surveys

Design Targets

Shape	Target Name	TVD (usft)	Northing (usft)	Easting (usft)	+N/-S usft	+E/-W usft	Created	Updated
Point	Guttersen State DD17-79-	6,613.46	1,329,222.76	3,287,567.83	4,974.94	-149.95	11/5/2013	11/7/2013

Directional Difficulty Index

Average Dogleg over Survey:	1.86 °/100usft	Maximum Dogleg over Survey:	13.35 °/100usft at 6,733.00 usft
Net Tortousity applicable to Plans:	0.87 °/100usft	Directional Difficulty Index:	6.311

Audit Info

North Reference Sheet for Sec. 17-T3N-R63W (Guttersen State DD17) - Guttersen State DD17-79-1HN

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

Vertical Depths are relative to RKB=24 @ 4844.00usft (H&P 322). Northing and Easting are relative to Guttersen State DD17-79-1HN

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: 0.99995700

Grid Coordinates of Well: 1,324,248.03 usft N, 3,287,717.78 usft E

Geographical Coordinates of Well: 40° 13' 07.93" N, 104° 28' 10.81" W

Grid Convergence at Surface is: 0.67°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,502.00usft

the Bottom Hole Displacement is 4,975.41usft in the Direction of 358.15° (Grid).

Magnetic Convergence at surface is: -7.73° (24 November 2013, , BGGM2013)

