

Noble Energy

Weld County, CO (NAD 83)
Sec. 5-T9N-R58W (Heston PAD)
Heston LD06-630
05-123-40815
Plan A

Design: Actual Surveys

Sperry Drilling Services

Final Survey Report

09 August, 2016

Surface UWI : 05-123-40815

Well Coordinates: 1,529,548.95 N, 3,448,605.57 E (40° 46' 32.70" N, 103° 52' 48.72" W)
Ground Level: 4,802.00 usft

Local Coordinate Origin:

Centered on Well Heston LD06-630

Viewing Datum:

KB=30' @ 4832.00usft (H&P 517)

TVDs to System:

N

North Reference:

Grid

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 81

HALLIBURTON

Design Report for Heston LD06-630 - 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
81.00	0.33	174.96	81.00	-0.23	0.02	-0.03	0.41
First Gyro Data Survey at 81.00ft							
176.00	0.49	189.25	176.00	-0.91	-0.02	-0.01	0.20
271.00	0.68	192.69	270.99	-1.86	-0.21	0.15	0.20
365.00	0.62	200.60	364.99	-2.88	-0.51	0.42	0.11
460.00	0.15	223.23	459.98	-3.45	-0.78	0.66	0.51
554.00	0.08	53.04	553.98	-3.50	-0.81	0.69	0.24
649.00	0.07	294.42	648.98	-3.44	-0.81	0.70	0.14
743.00	0.04	296.11	742.98	-3.40	-0.89	0.78	0.03
838.00	0.05	97.47	837.98	-3.39	-0.88	0.77	0.09
932.00	0.42	83.28	931.98	-3.35	-0.50	0.39	0.40
1,027.00	0.16	149.07	1,026.98	-3.43	-0.08	-0.03	0.40
1,121.00	0.06	21.15	1,120.98	-3.49	0.00	-0.12	0.22
1,216.00	0.19	59.95	1,215.98	-3.37	0.16	-0.27	0.16
1,310.00	0.30	96.88	1,309.98	-3.32	0.54	-0.64	0.20
1,405.00	0.31	103.92	1,404.98	-3.41	1.03	-1.14	0.04
1,499.00	0.59	140.64	1,498.98	-3.85	1.59	-1.71	0.41
1,594.00	0.60	146.09	1,593.97	-4.64	2.17	-2.32	0.06
1,688.00	0.35	146.77	1,687.97	-5.29	2.61	-2.78	0.27
1,783.00	0.39	94.63	1,782.97	-5.55	3.09	-3.27	0.34
1,877.00	0.54	101.17	1,876.96	-5.67	3.84	-4.02	0.17
1,906.00	0.41	94.90	1,905.96	-5.70	4.08	-4.26	0.48
Final Gyro Data Survey at 1906.00ft							
1,983.00	0.21	321.47	1,982.96	-5.61	4.26	-4.45	0.75
First Intermediate Sperry MWD Survey Corrected by Surcon at 1983.00ft							
2,078.00	1.64	58.53	2,077.95	-4.77	5.32	-5.47	1.77
2,173.00	4.32	51.71	2,172.81	-1.84	9.28	-9.34	2.84
2,267.00	6.33	53.93	2,266.40	3.40	16.25	-16.13	2.15
2,362.00	7.32	54.95	2,360.73	9.96	25.44	-25.10	1.05
2,456.00	9.43	55.08	2,453.72	17.81	36.66	-36.06	2.24
2,551.00	11.92	53.15	2,547.07	28.15	50.89	-49.95	2.65
2,645.00	13.42	49.74	2,638.78	41.02	66.99	-65.61	1.78
2,740.00	14.94	47.70	2,730.88	56.39	84.46	-82.57	1.68
2,835.00	14.90	47.12	2,822.68	72.94	102.46	-100.03	0.16
2,929.00	14.27	46.44	2,913.65	89.15	119.72	-116.75	0.69
3,024.00	15.62	51.54	3,005.44	105.18	138.22	-134.72	1.98
3,118.00	14.34	50.21	3,096.24	120.50	157.07	-153.06	1.41
3,213.00	15.76	54.60	3,187.98	135.50	176.63	-172.12	1.92
3,307.00	17.69	57.96	3,278.00	150.47	199.14	-194.14	2.30
3,402.00	18.02	57.83	3,368.43	165.96	223.82	-218.29	0.35
3,591.00	17.63	49.98	3,548.38	199.93	270.49	-263.83	1.29
3,686.00	17.51	49.52	3,638.95	218.46	292.38	-285.10	0.19
3,780.00	16.70	48.30	3,728.79	236.62	313.22	-305.34	0.94
3,875.00	15.91	48.18	3,819.97	254.39	333.11	-324.65	0.83
3,969.00	15.29	50.91	3,910.51	270.79	352.33	-343.32	1.02
4,064.00	14.57	52.81	4,002.30	285.91	371.58	-362.06	0.92
4,159.00	13.81	53.64	4,094.40	299.86	390.23	-380.25	0.83
4,253.00	15.77	51.40	4,185.28	314.48	409.25	-398.78	2.17
4,348.00	15.35	49.60	4,276.80	330.69	428.91	-417.91	0.67

Design Report for Heston LD06-630 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,442.00	13.96	49.05	4,367.74	346.18	446.95	-435.43	1.49
4,537.00	14.87	51.33	4,459.75	361.31	465.12	-453.10	1.13
4,631.00	14.17	51.29	4,550.75	376.04	483.52	-471.01	0.74
4,726.00	14.93	46.56	4,642.70	391.73	501.48	-488.45	1.48
4,820.00	14.08	45.97	4,733.71	408.00	518.49	-504.92	0.92
4,915.00	14.99	49.89	4,825.67	423.95	536.20	-522.10	1.41
5,009.00	16.02	52.02	4,916.25	439.76	555.72	-541.10	1.25
5,104.00	13.77	51.33	5,008.05	454.90	574.88	-559.76	2.38
5,198.00	12.09	47.51	5,099.66	468.54	590.88	-575.30	2.00
5,293.00	23.00	12.25	5,190.34	493.53	602.21	-585.81	15.56
5,387.00	28.67	352.12	5,275.07	533.93	603.02	-585.31	11.04
5,482.00	29.93	324.86	5,358.29	576.07	586.18	-567.10	14.00
5,577.00	27.54	294.78	5,442.02	604.81	552.42	-532.42	15.28
5,672.00	26.34	265.00	5,527.09	612.21	511.29	-491.08	14.13
5,766.00	40.12	268.15	5,605.54	609.40	460.00	-439.90	14.77
5,861.00	41.42	270.18	5,677.49	608.51	397.97	-377.94	1.95
5,955.00	47.28	267.75	5,744.68	607.25	332.32	-312.35	6.49
6,050.00	55.25	262.98	5,804.10	601.10	258.56	-238.84	9.25
6,145.00	68.41	262.47	5,848.85	590.50	175.68	-156.35	13.86
6,239.00	78.39	265.62	5,875.67	581.23	86.20	-67.22	11.09
6,334.00	86.88	269.60	5,887.85	577.33	-7.83	26.63	9.85
Final Intermediate Sperry MWD Survey Corrected by Surcon at 6334.00ft							
6,429.00	86.60	270.30	5,893.25	577.25	-102.67	121.43	0.79
First Production Sperry MWD Survey at 6429.00ft							
6,523.00	91.88	269.83	5,894.49	577.36	-196.63	215.34	5.64
6,618.00	90.00	269.81	5,892.94	577.06	-291.62	310.26	1.98
6,712.00	89.81	269.45	5,893.09	576.45	-385.61	404.19	0.43
6,810.00	89.86	269.12	5,893.37	575.23	-483.60	502.09	0.34
6,904.00	90.02	269.32	5,893.47	573.95	-577.60	595.99	0.27
6,999.00	90.41	268.73	5,893.12	572.33	-672.58	690.87	0.74
7,093.00	90.41	268.48	5,892.44	570.05	-766.55	784.72	0.27
7,188.00	90.62	268.00	5,891.59	567.13	-861.50	879.52	0.55
7,282.00	90.93	268.27	5,890.32	564.07	-955.44	973.31	0.44
7,376.00	91.02	267.59	5,888.72	560.67	-1,049.37	1,067.08	0.73
7,471.00	88.89	267.63	5,888.79	556.71	-1,144.28	1,161.81	2.24
7,566.00	88.61	268.22	5,890.87	553.27	-1,239.19	1,256.56	0.69
7,660.00	90.06	269.51	5,891.96	551.41	-1,333.16	1,350.42	2.06
7,754.00	90.15	269.75	5,891.78	550.81	-1,427.16	1,444.35	0.27
7,849.00	90.15	269.74	5,891.54	550.38	-1,522.16	1,539.28	0.01
7,944.00	90.64	270.54	5,890.88	550.61	-1,617.16	1,634.24	0.99
8,038.00	90.83	269.80	5,889.67	550.89	-1,711.15	1,728.19	0.81
8,133.00	91.53	268.81	5,887.72	549.74	-1,806.12	1,823.07	1.28
8,227.00	90.70	267.53	5,885.89	546.74	-1,900.05	1,916.86	1.62
8,322.00	91.01	267.22	5,884.47	542.39	-1,994.94	2,011.55	0.46
8,417.00	91.26	266.21	5,882.59	536.95	-2,089.76	2,106.15	1.10
8,511.00	91.53	266.51	5,880.30	530.98	-2,183.55	2,199.69	0.43
8,606.00	90.30	267.76	5,878.78	526.23	-2,278.41	2,294.35	1.85
8,700.00	90.27	267.17	5,878.32	522.08	-2,372.32	2,388.07	0.63
8,795.00	90.09	267.55	5,878.02	517.70	-2,467.22	2,482.77	0.44
8,889.00	89.96	266.90	5,877.98	513.15	-2,561.11	2,576.47	0.71
8,984.00	89.84	267.16	5,878.14	508.23	-2,655.98	2,671.13	0.30

Design Report for Heston LD06-630 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
9,079.00	89.40	266.13	5,878.77	502.67	-2,750.81	2,765.73	1.18
9,173.00	89.80	268.27	5,879.43	498.08	-2,844.69	2,859.41	2.32
9,268.00	90.42	269.74	5,879.25	496.43	-2,939.67	2,954.29	1.68
9,362.00	90.45	269.97	5,878.53	496.19	-3,033.67	3,048.23	0.25
9,456.00	90.42	270.80	5,877.82	496.82	-3,127.67	3,142.19	0.88
9,551.00	90.76	270.36	5,876.84	497.78	-3,222.66	3,237.16	0.59
9,646.00	90.73	270.31	5,875.61	498.34	-3,317.65	3,332.12	0.06
9,740.00	90.17	269.96	5,874.87	498.56	-3,411.64	3,426.07	0.70
9,835.00	91.19	269.80	5,873.74	498.36	-3,506.63	3,521.01	1.09
9,929.00	92.02	270.35	5,871.11	498.48	-3,600.60	3,614.93	1.06
10,024.00	91.53	269.54	5,868.16	498.39	-3,695.55	3,709.83	1.00
10,118.00	91.72	270.02	5,865.50	498.03	-3,789.51	3,803.72	0.55
10,213.00	90.76	269.00	5,863.44	497.22	-3,884.48	3,898.62	1.47
10,307.00	90.91	268.57	5,862.07	495.23	-3,978.45	3,992.47	0.48
10,402.00	90.45	268.00	5,860.95	492.38	-4,073.40	4,087.28	0.77
10,497.00	88.32	267.32	5,861.97	488.50	-4,168.31	4,182.01	2.35
10,591.00	87.98	267.43	5,865.00	484.20	-4,262.16	4,275.68	0.38
10,686.00	88.85	267.50	5,867.63	480.00	-4,357.03	4,370.36	0.92
10,780.00	90.17	268.17	5,868.43	476.45	-4,450.96	4,464.12	1.57
10,875.00	90.69	268.72	5,867.72	473.87	-4,545.92	4,558.95	0.80
10,970.00	90.08	267.73	5,867.08	470.93	-4,640.87	4,653.75	1.22
11,064.00	91.62	268.80	5,865.69	468.08	-4,734.81	4,747.55	1.99
11,159.00	92.97	270.33	5,861.88	467.36	-4,829.73	4,842.39	2.15
11,253.00	89.77	268.69	5,859.63	466.56	-4,923.68	4,936.27	3.82
11,348.00	91.47	269.07	5,858.61	464.70	-5,018.66	5,031.13	1.83
11,442.00	92.02	268.64	5,855.74	462.82	-5,112.59	5,124.96	0.74
11,537.00	92.23	267.45	5,852.22	459.59	-5,207.47	5,219.68	1.27
11,631.00	91.47	266.44	5,849.19	454.58	-5,301.29	5,313.28	1.34
11,726.00	90.33	267.04	5,847.69	449.18	-5,396.12	5,407.89	1.36
11,821.00	90.23	267.97	5,847.23	445.04	-5,491.03	5,502.61	0.98
11,915.00	90.60	268.39	5,846.55	442.06	-5,584.98	5,596.41	0.60
12,010.00	90.78	267.80	5,845.41	438.90	-5,679.92	5,691.20	0.65
12,104.00	90.91	267.82	5,844.02	435.31	-5,773.84	5,784.96	0.14
12,293.00	90.76	268.20	5,841.26	428.75	-5,962.70	5,973.51	0.22
12,388.00	90.60	267.60	5,840.14	425.26	-6,057.63	6,068.27	0.65
12,483.00	91.09	267.97	5,838.74	421.59	-6,152.55	6,163.02	0.65
12,577.00	91.22	267.56	5,836.84	417.93	-6,246.46	6,256.76	0.46
12,672.00	90.42	267.54	5,835.48	413.87	-6,341.36	6,351.48	0.84
12,766.00	90.23	267.71	5,834.95	409.97	-6,435.28	6,445.22	0.27
12,861.00	89.95	266.73	5,834.80	405.36	-6,530.17	6,539.91	1.07
12,956.00	90.48	267.26	5,834.44	400.38	-6,625.04	6,634.56	0.79
13,051.00	90.08	267.01	5,833.98	395.64	-6,719.92	6,729.24	0.50
13,145.00	90.33	268.68	5,833.64	392.10	-6,813.85	6,823.00	1.80
13,240.00	90.17	268.78	5,833.23	390.00	-6,908.82	6,917.86	0.20
13,334.00	90.63	269.07	5,832.57	388.23	-7,002.80	7,011.73	0.58
13,429.00	90.73	268.51	5,831.44	386.23	-7,097.77	7,106.59	0.60
13,524.00	90.57	268.14	5,830.37	383.45	-7,192.73	7,201.40	0.42
13,618.00	90.39	268.06	5,829.58	380.33	-7,286.67	7,295.19	0.21
13,713.00	89.86	266.90	5,829.37	376.16	-7,381.58	7,389.91	1.34
13,807.00	89.49	266.66	5,829.90	370.88	-7,475.43	7,483.54	0.47
13,901.00	89.59	267.24	5,830.66	365.88	-7,569.29	7,577.19	0.63

Design Report for Heston LD06-630 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
13,996.00	89.40	267.00	5,831.50	361.10	-7,664.17	7,671.86	0.32
14,090.00	89.86	268.37	5,832.10	357.31	-7,758.09	7,765.61	1.54
14,185.00	90.04	268.28	5,832.19	354.53	-7,853.05	7,860.43	0.21
14,280.00	90.63	268.45	5,831.63	351.82	-7,948.00	7,955.25	0.65
14,374.00	91.03	268.23	5,830.27	349.10	-8,041.95	8,049.06	0.49
14,469.00	89.43	270.04	5,829.89	347.66	-8,136.94	8,143.94	2.54
14,563.00	89.34	269.82	5,830.90	347.55	-8,230.93	8,237.88	0.25
14,657.00	89.43	269.60	5,831.91	347.07	-8,324.92	8,331.81	0.25
14,752.00	90.39	269.83	5,832.06	346.60	-8,419.92	8,426.74	1.04
14,846.00	90.69	269.58	5,831.17	346.11	-8,513.92	8,520.67	0.42
14,941.00	91.09	269.56	5,829.69	345.40	-8,608.90	8,615.58	0.42
15,035.00	91.37	269.42	5,827.68	344.57	-8,702.88	8,709.48	0.33
15,130.00	91.74	269.33	5,825.10	343.53	-8,797.84	8,804.36	0.40
15,225.00	90.04	269.13	5,823.62	342.25	-8,892.81	8,899.24	1.80
15,319.00	90.11	269.38	5,823.50	341.03	-8,986.80	8,993.14	0.28
15,414.00	89.83	268.81	5,823.55	339.53	-9,081.79	9,088.03	0.67
15,509.00	89.61	269.63	5,824.01	338.24	-9,176.78	9,182.93	0.89
15,603.00	89.18	269.42	5,825.01	337.46	-9,270.77	9,276.84	0.51
15,698.00	89.99	269.82	5,825.69	336.83	-9,365.77	9,371.77	0.95
15,793.00	91.31	270.03	5,824.62	336.70	-9,460.76	9,466.71	1.41
15,887.00	91.56	269.57	5,822.26	336.38	-9,554.73	9,560.61	0.56
15,982.00	91.71	269.66	5,819.55	335.74	-9,649.69	9,655.50	0.18
16,076.00	91.65	269.51	5,816.80	335.06	-9,743.64	9,749.39	0.17
16,176.00	91.58	269.38	5,813.98	334.09	-9,843.60	9,849.26	0.15
Final Production Sperry MWD Survey at 16176.00ft							
16,240.00	91.58	269.38	5,812.21	333.40	-9,907.57	9,913.17	0.00
Straight Line Production to TD at 16240.00ft							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,334.00	5,887.85	577.33	-7.83	Final Intermediate Sperry MWD Survey Corrected by Surcon at 6334.00ft
6,429.00	5,893.25	577.25	-102.67	First Production Sperry MWD Survey at 6429.00ft
16,176.00	5,813.98	334.09	-9,843.60	Final Production Sperry MWD Survey at 16176.00ft
16,240.00	5,812.21	333.40	-9,907.57	Straight Line Production to TD at 16240.00ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Heston LD06-630_Rev A1_BHL	271.87	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
81.00	1,906.00	Gyro Data Surveys	NS-GYRO-MS
1,983.00	6,334.00	Intermediate Sperry MWD Surveys	MWD+IFR1+MS_WY
6,429.00	16,240.00	Production Sperry MWD Surveys	MWD+IFR1+MS_WY

Design Report for Heston LD06-630 - Actual Surveys

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
Heston LD06-630_Rev - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,529,548.95	3,448,605.57	40.775750	-103.880200
Heston LD06-630_Rev - actual wellpath misses target center by 20.54usft at 16240.00usft MD (5812.21 TVD, 333.40 N, -9907.57 E) - Point	0.00	0.00	5,811.00	323.55	-9,925.55	1,529,872.49	3,438,680.03	40.777130	-103.916010
Heston LD06-630_Rev - actual wellpath misses target center by 20.54usft at 16240.00usft MD (5812.21 TVD, 333.40 N, -9907.57 E) - Point	0.00	0.00	5,811.00	323.55	-9,925.55	1,529,872.49	3,438,680.03	40.777130	-103.916010
Heston LD06-630_Rev - actual wellpath misses target center by 8.93usft at 6327.29usft MD (5887.45 TVD, 577.40 N, -1.13 E) - Point	0.00	0.00	5,896.28	578.00	0.00	1,530,126.95	3,448,605.57	40.777336	-103.880162
Heston LD06-630_Rev - actual wellpath misses target center by 8.93usft at 6327.29usft MD (5887.45 TVD, 577.40 N, -1.13 E) - Point	0.00	0.00	5,896.28	578.00	0.00	1,530,126.95	3,448,605.57	40.777336	-103.880162

Directional Difficulty Index

Average Dogleg over Survey:	1.66 °/100usft	Maximum Dogleg over Survey:	15.56 °/100usft at 5,293.00 usft
Net Tortousity applicable to Plans:	0.93 °/100usft	Directional Difficulty Index:	6.928

Audit Info

North Reference Sheet for Sec. 5-T9N-R58W (Heston PAD) - Heston LD06-630 - 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 KB=30' @ 4832.00usft (H&P 517). Northing and Easting are relative to Heston LD06-630

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: 0.99999878

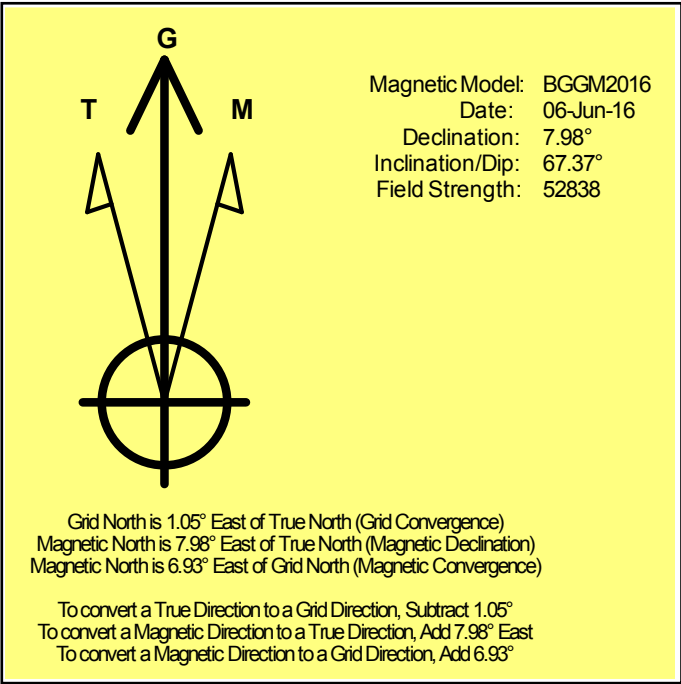
Grid Coordinates of Well: 1,529,548.95 usft N, 3,448,605.57 usft E

Geographical Coordinates of Well: 40° 46' 32.70" N, 103° 52' 48.72" W

Grid Convergence at Surface is: 1.05°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,240.00usft the Bottom Hole Displacement is 9,913.18usft in the Direction of 271.93° (Grid).

Magnetic Convergence at surface is: -6.93° (6 June 2016, , BGGM2016)



Noble Energy

Weld County, CO (NAD 83)

Sec. 5-T9N-R58W (Heston PAD)

Heston LD06-630

05-123-40815

Plan A

Design: Actual Surveys

Sperry Drilling Services

Geodetic Report

09 August, 2016

Well Coordinates: 1,529,548.95 N, 3,448,605.57 E (40° 46' 32.70" N, 103° 52' 48.72" W)

Ground Level: 4,802.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 81

Centered on Well Heston LD06-630

KB=30' @ 4832.00usft (H&P 517)

N

Grid

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for Heston LD06-630 - Actual Surveys

Measured			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	40.775750	-103.880200	1,529,548.95	3,448,605.57
81.00	0.33	174.96	81.00	-0.23	0.02	40.775749	-103.880200	1,529,548.72	3,448,605.59
176.00	0.49	189.25	176.00	-0.91	-0.02	40.775748	-103.880200	1,529,548.04	3,448,605.55
271.00	0.68	192.69	270.99	-1.86	-0.21	40.775745	-103.880201	1,529,547.09	3,448,605.36
365.00	0.62	200.60	364.99	-2.88	-0.51	40.775742	-103.880202	1,529,546.07	3,448,605.06
460.00	0.15	223.23	459.98	-3.45	-0.78	40.775741	-103.880203	1,529,545.50	3,448,604.79
554.00	0.08	53.04	553.98	-3.50	-0.81	40.775741	-103.880203	1,529,545.45	3,448,604.76
649.00	0.07	294.42	648.98	-3.44	-0.81	40.775741	-103.880203	1,529,545.51	3,448,604.76
743.00	0.04	296.11	742.98	-3.40	-0.89	40.775741	-103.880204	1,529,545.55	3,448,604.68
838.00	0.05	97.47	837.98	-3.39	-0.88	40.775741	-103.880204	1,529,545.56	3,448,604.69
932.00	0.42	83.28	931.98	-3.35	-0.50	40.775741	-103.880202	1,529,545.60	3,448,605.07
1,027.00	0.16	149.07	1,026.98	-3.43	-0.08	40.775741	-103.880201	1,529,545.52	3,448,605.49
1,121.00	0.06	21.15	1,120.98	-3.49	0.00	40.775740	-103.880200	1,529,545.46	3,448,605.57
1,216.00	0.19	59.95	1,215.98	-3.37	0.16	40.775741	-103.880200	1,529,545.58	3,448,605.73
1,310.00	0.30	96.88	1,309.98	-3.32	0.54	40.775741	-103.880199	1,529,545.63	3,448,606.11
1,405.00	0.31	103.92	1,404.98	-3.41	1.03	40.775741	-103.880197	1,529,545.54	3,448,606.60
1,499.00	0.59	140.64	1,498.98	-3.85	1.59	40.775739	-103.880195	1,529,545.10	3,448,607.16
1,594.00	0.60	146.09	1,593.97	-4.64	2.17	40.775737	-103.880193	1,529,544.31	3,448,607.75
1,688.00	0.35	146.77	1,687.97	-5.29	2.61	40.775735	-103.880191	1,529,543.66	3,448,608.18
1,783.00	0.39	94.63	1,782.97	-5.55	3.09	40.775735	-103.880189	1,529,543.40	3,448,608.66
1,877.00	0.54	101.17	1,876.96	-5.67	3.84	40.775734	-103.880187	1,529,543.28	3,448,609.41
1,906.00	0.41	94.90	1,905.96	-5.70	4.08	40.775734	-103.880186	1,529,543.25	3,448,609.65
1,983.00	0.21	321.47	1,982.96	-5.61	4.26	40.775734	-103.880185	1,529,543.33	3,448,609.84
2,078.00	1.64	58.53	2,077.95	-4.77	5.32	40.775737	-103.880181	1,529,544.18	3,448,610.89
2,173.00	4.32	51.71	2,172.81	-1.84	9.28	40.775745	-103.880167	1,529,547.11	3,448,614.86
2,267.00	6.33	53.93	2,266.40	3.40	16.25	40.775759	-103.880141	1,529,552.35	3,448,621.82
2,362.00	7.32	54.95	2,360.73	9.96	25.44	40.775776	-103.880108	1,529,558.91	3,448,631.01
2,456.00	9.43	55.08	2,453.72	17.81	36.66	40.775797	-103.880067	1,529,566.76	3,448,642.23
2,551.00	11.92	53.15	2,547.07	28.15	50.89	40.775825	-103.880015	1,529,577.10	3,448,656.46
2,645.00	13.42	49.74	2,638.78	41.02	66.99	40.775859	-103.879956	1,529,589.97	3,448,672.56
2,740.00	14.94	47.70	2,730.88	56.39	84.46	40.775901	-103.879892	1,529,605.34	3,448,690.03
2,835.00	14.90	47.12	2,822.68	72.94	102.46	40.775945	-103.879826	1,529,621.89	3,448,708.04
2,929.00	14.27	46.44	2,913.65	89.15	119.72	40.775989	-103.879762	1,529,638.10	3,448,725.29
3,024.00	15.62	51.54	3,005.44	105.18	138.22	40.776032	-103.879694	1,529,654.12	3,448,743.79
3,118.00	14.34	50.21	3,096.24	120.50	157.07	40.776073	-103.879625	1,529,669.45	3,448,762.64
3,213.00	15.76	54.60	3,187.98	135.50	176.63	40.776113	-103.879554	1,529,684.45	3,448,782.20
3,307.00	17.69	57.96	3,278.00	150.47	199.14	40.776153	-103.879471	1,529,699.42	3,448,804.71
3,402.00	18.02	57.83	3,368.43	165.96	223.82	40.776194	-103.879381	1,529,714.90	3,448,829.39
3,591.00	17.63	49.98	3,548.38	199.93	270.49	40.776285	-103.879211	1,529,748.88	3,448,876.06
3,686.00	17.51	49.52	3,638.95	218.46	292.38	40.776335	-103.879130	1,529,767.41	3,448,897.95
3,780.00	16.70	48.30	3,728.79	236.62	313.22	40.776384	-103.879054	1,529,785.57	3,448,918.79
3,875.00	15.91	48.18	3,819.97	254.39	333.11	40.776431	-103.878981	1,529,803.34	3,448,938.68

Design Report for Heston LD06-630 - 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)
3,969.00	15.29	50.91	3,910.51	270.79	352.33	40.776476	-103.878910	1,529,819.74	3,448,957.90
4,064.00	14.57	52.81	4,002.30	285.91	371.58	40.776516	-103.878840	1,529,834.86	3,448,977.15
4,159.00	13.81	53.64	4,094.40	299.86	390.23	40.776553	-103.878772	1,529,848.81	3,448,995.80
4,253.00	15.77	51.40	4,185.28	314.48	409.25	40.776593	-103.878702	1,529,863.43	3,449,014.82
4,348.00	15.35	49.60	4,276.80	330.69	428.91	40.776636	-103.878630	1,529,879.63	3,449,034.48
4,442.00	13.96	49.05	4,367.74	346.18	446.95	40.776678	-103.878564	1,529,895.13	3,449,052.52
4,537.00	14.87	51.33	4,459.75	361.31	465.12	40.776718	-103.878497	1,529,910.26	3,449,070.69
4,631.00	14.17	51.29	4,550.75	376.04	483.52	40.776758	-103.878430	1,529,924.99	3,449,089.09
4,726.00	14.93	46.56	4,642.70	391.73	501.48	40.776800	-103.878364	1,529,940.68	3,449,107.05
4,820.00	14.08	45.97	4,733.71	408.00	518.49	40.776844	-103.878302	1,529,956.95	3,449,124.06
4,915.00	14.99	49.89	4,825.67	423.95	536.20	40.776887	-103.878237	1,529,972.90	3,449,141.77
5,009.00	16.02	52.02	4,916.25	439.76	555.72	40.776929	-103.878165	1,529,988.71	3,449,161.29
5,104.00	13.77	51.33	5,008.05	454.90	574.88	40.776970	-103.878095	1,530,003.84	3,449,180.45
5,198.00	12.09	47.51	5,099.66	468.54	590.88	40.777006	-103.878036	1,530,017.49	3,449,196.45
5,293.00	23.00	12.25	5,190.34	493.53	602.21	40.777074	-103.877994	1,530,042.48	3,449,207.78
5,387.00	28.67	352.12	5,275.07	533.93	603.02	40.777185	-103.877988	1,530,082.87	3,449,208.59
5,482.00	29.93	324.86	5,358.29	576.07	586.18	40.777302	-103.878046	1,530,125.02	3,449,191.75
5,577.00	27.54	294.78	5,442.02	604.81	552.42	40.777382	-103.878166	1,530,153.76	3,449,157.99
5,672.00	26.34	265.00	5,527.09	612.21	511.29	40.777405	-103.878314	1,530,161.16	3,449,116.86
5,766.00	40.12	268.15	5,605.54	609.40	460.00	40.777399	-103.878499	1,530,158.35	3,449,065.57
5,861.00	41.42	270.18	5,677.49	608.51	397.97	40.777400	-103.878723	1,530,157.46	3,449,003.55
5,955.00	47.28	267.75	5,744.68	607.25	332.32	40.777400	-103.878961	1,530,156.20	3,448,937.89
6,050.00	55.25	262.98	5,804.10	601.10	258.56	40.777387	-103.879227	1,530,150.05	3,448,864.14
6,145.00	68.41	262.47	5,848.85	590.50	175.68	40.777362	-103.879527	1,530,139.44	3,448,781.25
6,239.00	78.39	265.62	5,875.67	581.23	86.20	40.777341	-103.879851	1,530,130.18	3,448,691.77
6,334.00	86.88	269.60	5,887.85	577.33	-7.83	40.777335	-103.880190	1,530,126.28	3,448,597.74
6,429.00	86.60	270.30	5,893.25	577.25	-102.67	40.777339	-103.880533	1,530,126.20	3,448,502.90
6,523.00	91.88	269.83	5,894.49	577.36	-196.63	40.777344	-103.880872	1,530,126.31	3,448,408.94
6,618.00	90.00	269.81	5,892.94	577.06	-291.62	40.777348	-103.881215	1,530,126.01	3,448,313.96
6,712.00	89.81	269.45	5,893.09	576.45	-385.61	40.777351	-103.881554	1,530,125.40	3,448,219.96
6,810.00	89.86	269.12	5,893.37	575.23	-483.60	40.777353	-103.881908	1,530,124.18	3,448,121.97
6,904.00	90.02	269.32	5,893.47	573.95	-577.60	40.777354	-103.882248	1,530,122.90	3,448,027.98
6,999.00	90.41	268.73	5,893.12	572.33	-672.58	40.777354	-103.882591	1,530,121.28	3,447,932.99
7,093.00	90.41	268.48	5,892.44	570.05	-766.55	40.777353	-103.882930	1,530,118.99	3,447,839.02
7,188.00	90.62	268.00	5,891.59	567.13	-861.50	40.777350	-103.883273	1,530,116.08	3,447,744.07
7,282.00	90.93	268.27	5,890.32	564.07	-955.44	40.777346	-103.883612	1,530,113.02	3,447,650.13
7,376.00	91.02	267.59	5,888.72	560.67	-1,049.37	40.777341	-103.883952	1,530,109.62	3,447,556.20
7,471.00	88.89	267.63	5,888.79	556.71	-1,144.28	40.777335	-103.884294	1,530,105.66	3,447,461.29
7,566.00	88.61	268.22	5,890.87	553.27	-1,239.19	40.777330	-103.884637	1,530,102.22	3,447,366.38
7,660.00	90.06	269.51	5,891.96	551.41	-1,333.16	40.777330	-103.884977	1,530,100.36	3,447,272.41
7,754.00	90.15	269.75	5,891.78	550.81	-1,427.16	40.777333	-103.885316	1,530,099.75	3,447,178.41
7,849.00	90.15	269.74	5,891.54	550.38	-1,522.16	40.777337	-103.885659	1,530,099.33	3,447,083.41

Design Report for Heston LD06-630 - 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)
7,944.00	90.64	270.54	5,890.88	550.61	-1,617.16	40.777342	-103.886002	1,530,099.56	3,446,988.42
8,038.00	90.83	269.80	5,889.67	550.89	-1,711.15	40.777348	-103.886341	1,530,099.84	3,446,894.42
8,133.00	91.53	268.81	5,887.72	549.74	-1,806.12	40.777349	-103.886684	1,530,098.69	3,446,799.45
8,227.00	90.70	267.53	5,885.89	546.74	-1,900.05	40.777346	-103.887023	1,530,095.69	3,446,705.52
8,322.00	91.01	267.22	5,884.47	542.39	-1,994.94	40.777338	-103.887366	1,530,091.34	3,446,610.63
8,417.00	91.26	266.21	5,882.59	536.95	-2,089.76	40.777328	-103.887709	1,530,085.90	3,446,515.81
8,511.00	91.53	266.51	5,880.30	530.98	-2,183.55	40.777316	-103.888048	1,530,079.93	3,446,422.03
8,606.00	90.30	267.76	5,878.78	526.23	-2,278.41	40.777308	-103.888391	1,530,075.18	3,446,327.16
8,700.00	90.27	267.17	5,878.32	522.08	-2,372.32	40.777301	-103.888730	1,530,071.02	3,446,233.25
8,795.00	90.09	267.55	5,878.02	517.70	-2,467.22	40.777294	-103.889073	1,530,066.65	3,446,138.36
8,889.00	89.96	266.90	5,877.98	513.15	-2,561.11	40.777286	-103.889412	1,530,062.10	3,446,044.47
8,984.00	89.84	267.16	5,878.14	508.23	-2,655.98	40.777278	-103.889755	1,530,057.18	3,445,949.60
9,079.00	89.40	266.13	5,878.77	502.67	-2,750.81	40.777267	-103.890098	1,530,051.62	3,445,854.76
9,173.00	89.80	268.27	5,879.43	498.08	-2,844.69	40.777259	-103.890437	1,530,047.03	3,445,760.88
9,268.00	90.42	269.74	5,879.25	496.43	-2,939.67	40.777259	-103.890780	1,530,045.38	3,445,665.90
9,362.00	90.45	269.97	5,878.53	496.19	-3,033.67	40.777263	-103.891119	1,530,045.14	3,445,571.90
9,456.00	90.42	270.80	5,877.82	496.82	-3,127.67	40.777270	-103.891458	1,530,045.77	3,445,477.91
9,551.00	90.76	270.36	5,876.84	497.78	-3,222.66	40.777277	-103.891801	1,530,046.73	3,445,382.92
9,646.00	90.73	270.31	5,875.61	498.34	-3,317.65	40.777283	-103.892144	1,530,047.29	3,445,287.93
9,740.00	90.17	269.96	5,874.87	498.56	-3,411.64	40.777289	-103.892483	1,530,047.51	3,445,193.93
9,835.00	91.19	269.80	5,873.74	498.36	-3,506.63	40.777293	-103.892826	1,530,047.31	3,445,098.94
9,929.00	92.02	270.35	5,871.11	498.48	-3,600.60	40.777298	-103.893166	1,530,047.43	3,445,004.98
10,024.00	91.53	269.54	5,868.16	498.39	-3,695.55	40.777302	-103.893508	1,530,047.34	3,444,910.03
10,118.00	91.72	270.02	5,865.50	498.03	-3,789.51	40.777306	-103.893848	1,530,046.98	3,444,816.07
10,213.00	90.76	269.00	5,863.44	497.22	-3,884.48	40.777308	-103.894191	1,530,046.17	3,444,721.09
10,307.00	90.91	268.57	5,862.07	495.23	-3,978.45	40.777308	-103.894530	1,530,044.17	3,444,627.12
10,402.00	90.45	268.00	5,860.95	492.38	-4,073.40	40.777305	-103.894873	1,530,041.33	3,444,532.17
10,497.00	88.32	267.32	5,861.97	488.50	-4,168.31	40.777299	-103.895216	1,530,037.45	3,444,437.27
10,591.00	87.98	267.43	5,865.00	484.20	-4,262.16	40.777292	-103.895555	1,530,033.15	3,444,343.41
10,686.00	88.85	267.50	5,867.63	480.00	-4,357.03	40.777285	-103.895898	1,530,028.95	3,444,248.54
10,780.00	90.17	268.17	5,868.43	476.45	-4,450.96	40.777280	-103.896237	1,530,025.40	3,444,154.62
10,875.00	90.69	268.72	5,867.72	473.87	-4,545.92	40.777277	-103.896580	1,530,022.82	3,444,059.66
10,970.00	90.08	267.73	5,867.08	470.93	-4,640.87	40.777274	-103.896923	1,530,019.88	3,443,964.70
11,064.00	91.62	268.80	5,865.69	468.08	-4,734.81	40.777271	-103.897262	1,530,017.03	3,443,870.76
11,159.00	92.97	270.33	5,861.88	467.36	-4,829.73	40.777273	-103.897605	1,530,016.31	3,443,775.85
11,253.00	89.77	268.69	5,859.63	466.56	-4,923.68	40.777276	-103.897944	1,530,015.51	3,443,681.89
11,348.00	91.47	269.07	5,858.61	464.70	-5,018.66	40.777276	-103.898287	1,530,013.65	3,443,586.92
11,442.00	92.02	268.64	5,855.74	462.82	-5,112.59	40.777275	-103.898626	1,530,011.77	3,443,492.98
11,537.00	92.23	267.45	5,852.22	459.59	-5,207.47	40.777271	-103.898969	1,530,008.53	3,443,398.11
11,631.00	91.47	266.44	5,849.19	454.58	-5,301.29	40.777262	-103.899308	1,530,003.53	3,443,304.29
11,726.00	90.33	267.04	5,847.69	449.18	-5,396.12	40.777252	-103.899651	1,529,998.13	3,443,209.46
11,821.00	90.23	267.97	5,847.23	445.04	-5,491.03	40.777245	-103.899994	1,529,993.99	3,443,114.55

Design Report for Heston LD06-630 - 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)
11,915.00	90.60	268.39	5,846.55	442.06	-5,584.98	40.777241	-103.900333	1,529,991.01	3,443,020.60
12,010.00	90.78	267.80	5,845.41	438.90	-5,679.92	40.777237	-103.900676	1,529,987.85	3,442,925.66
12,104.00	90.91	267.82	5,844.02	435.31	-5,773.84	40.777232	-103.901015	1,529,984.26	3,442,831.74
12,293.00	90.76	268.20	5,841.26	428.75	-5,962.70	40.777224	-103.901697	1,529,977.69	3,442,642.87
12,388.00	90.60	267.60	5,840.14	425.26	-6,057.63	40.777219	-103.902040	1,529,974.21	3,442,547.95
12,483.00	91.09	267.97	5,838.74	421.59	-6,152.55	40.777213	-103.902383	1,529,970.54	3,442,453.03
12,577.00	91.22	267.56	5,836.84	417.93	-6,246.46	40.777208	-103.902723	1,529,966.88	3,442,359.12
12,672.00	90.42	267.54	5,835.48	413.87	-6,341.36	40.777202	-103.903065	1,529,962.82	3,442,264.22
12,766.00	90.23	267.71	5,834.95	409.97	-6,435.28	40.777195	-103.903405	1,529,958.92	3,442,170.30
12,861.00	89.95	266.73	5,834.80	405.36	-6,530.17	40.777188	-103.903748	1,529,954.31	3,442,075.41
12,956.00	90.48	267.26	5,834.44	400.38	-6,625.04	40.777179	-103.904090	1,529,949.33	3,441,980.54
13,051.00	90.08	267.01	5,833.98	395.64	-6,719.92	40.777170	-103.904433	1,529,944.58	3,441,885.66
13,145.00	90.33	268.68	5,833.64	392.10	-6,813.85	40.777165	-103.904772	1,529,941.05	3,441,791.73
13,240.00	90.17	268.78	5,833.23	390.00	-6,908.82	40.777164	-103.905115	1,529,938.94	3,441,696.76
13,334.00	90.63	269.07	5,832.57	388.23	-7,002.80	40.777164	-103.905455	1,529,937.18	3,441,602.78
13,429.00	90.73	268.51	5,831.44	386.23	-7,097.77	40.777163	-103.905798	1,529,935.18	3,441,507.81
13,524.00	90.57	268.14	5,830.37	383.45	-7,192.73	40.777160	-103.906141	1,529,932.40	3,441,412.85
13,618.00	90.39	268.06	5,829.58	380.33	-7,286.67	40.777156	-103.906480	1,529,929.28	3,441,318.91
13,713.00	89.86	266.90	5,829.37	376.16	-7,381.58	40.777149	-103.906823	1,529,925.10	3,441,224.00
13,807.00	89.49	266.66	5,829.90	370.88	-7,475.43	40.777140	-103.907162	1,529,919.83	3,441,130.15
13,901.00	89.59	267.24	5,830.66	365.88	-7,569.29	40.777130	-103.907501	1,529,914.82	3,441,036.29
13,996.00	89.40	267.00	5,831.50	361.10	-7,664.17	40.777122	-103.907844	1,529,910.05	3,440,941.41
14,090.00	89.86	268.37	5,832.10	357.31	-7,758.09	40.777116	-103.908183	1,529,906.25	3,440,847.49
14,185.00	90.04	268.28	5,832.19	354.53	-7,853.05	40.777113	-103.908526	1,529,903.48	3,440,752.54
14,280.00	90.63	268.45	5,831.63	351.82	-7,948.00	40.777111	-103.908869	1,529,900.77	3,440,657.58
14,374.00	91.03	268.23	5,830.27	349.10	-8,041.95	40.777108	-103.909209	1,529,898.04	3,440,563.63
14,469.00	89.43	270.04	5,829.89	347.66	-8,136.94	40.777108	-103.909552	1,529,896.61	3,440,468.64
14,563.00	89.34	269.82	5,830.90	347.55	-8,230.93	40.777113	-103.909891	1,529,896.50	3,440,374.65
14,657.00	89.43	269.60	5,831.91	347.07	-8,324.92	40.777116	-103.910230	1,529,896.02	3,440,280.66
14,752.00	90.39	269.83	5,832.06	346.60	-8,419.92	40.777119	-103.910573	1,529,895.55	3,440,185.66
14,846.00	90.69	269.58	5,831.17	346.11	-8,513.92	40.777123	-103.910913	1,529,895.06	3,440,091.67
14,941.00	91.09	269.56	5,829.69	345.40	-8,608.90	40.777125	-103.911256	1,529,894.35	3,439,996.68
15,035.00	91.37	269.42	5,827.68	344.57	-8,702.88	40.777128	-103.911595	1,529,893.51	3,439,902.71
15,130.00	91.74	269.33	5,825.10	343.53	-8,797.84	40.777130	-103.911938	1,529,892.48	3,439,807.75
15,225.00	90.04	269.13	5,823.62	342.25	-8,892.81	40.777131	-103.912281	1,529,891.20	3,439,712.77
15,319.00	90.11	269.38	5,823.50	341.03	-8,986.80	40.777132	-103.912620	1,529,889.98	3,439,618.78
15,414.00	89.83	268.81	5,823.55	339.53	-9,081.79	40.777133	-103.912963	1,529,888.48	3,439,523.79
15,509.00	89.61	269.63	5,824.01	338.24	-9,176.78	40.777134	-103.913306	1,529,887.19	3,439,428.80
15,603.00	89.18	269.42	5,825.01	337.46	-9,270.77	40.777136	-103.913646	1,529,886.41	3,439,334.81
15,698.00	89.99	269.82	5,825.69	336.83	-9,365.77	40.777139	-103.913989	1,529,885.78	3,439,239.82
15,793.00	91.31	270.03	5,824.62	336.70	-9,460.76	40.777143	-103.914332	1,529,885.65	3,439,144.82
15,887.00	91.56	269.57	5,822.26	336.38	-9,554.73	40.777147	-103.914671	1,529,885.32	3,439,050.86

Design Report for Heston LD06-630 - 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)
15,982.00	91.71	269.66	5,819.55	335.74	-9,649.69	40.777150	-103.915014	1,529,884.69	3,438,955.90
16,076.00	91.65	269.51	5,816.80	335.06	-9,743.64	40.777153	-103.915353	1,529,884.00	3,438,861.94
16,176.00	91.58	269.38	5,813.98	334.09	-9,843.60	40.777155	-103.915714	1,529,883.04	3,438,761.98
16,240.00	91.58	269.38	5,812.21	333.40	-9,907.57	40.777156	-103.915945	1,529,882.34	3,438,698.01

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
81.00	81.00	-0.23	0.02	First Gyro Data Survey at 81.00ft
1,906.00	1,905.96	-5.70	4.08	Final Gyro Data Survey at 1906.00ft
1,983.00	1,982.96	-5.61	4.26	First Intermediate Sperry MWD Survey Corrected by Surcon at 1983.00ft
6,334.00	5,887.85	577.33	-7.83	Final Intermediate Sperry MWD Survey Corrected by Surcon at 6334.00ft
6,429.00	5,893.25	577.25	-102.67	First Production Sperry MWD Survey at 6429.00ft
16,176.00	5,813.98	334.09	-9,843.60	Final Production Sperry MWD Survey at 16176.00ft
16,240.00	5,812.21	333.40	-9,907.57	Straight Line Production to TD at 16240.00ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Heston LD06-630_Rev A1_BHL	271.87	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
81.00	1,906.00	Gyro Data Surveys	NS-GYRO-MS
1,983.00	6,334.00	Intermediate Sperry MWD Surveys	MWD+IFR1+MS_WY
6,429.00	16,240.00	Production Sperry MWD Surveys	MWD+IFR1+MS_WY

Design Report for Heston LD06-630 - 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:	1.66 °/100usft	Maximum Dogleg over Survey:	15.56 °/100usft at 5,293.00 usft
Net Tortousity applicable to Plans:	0.93 °/100usft	Directional Difficulty Index:	6.928

Audit Info

North Reference Sheet for Sec. 5-T9N-R58W (Heston PAD) - Heston LD06-630 - 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 KB=30' @ 4832.00usft (H&P 517). Northing and Easting are relative to Heston LD06-630

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: 0.99999878

Grid Coordinates of Well: 1,529,548.95 usft N, 3,448,605.57 usft E

Geographical Coordinates of Well: 40° 46' 32.70" N, 103° 52' 48.72" W

Grid Convergence at Surface is: 1.05°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,240.00usft

the Bottom Hole Displacement is 9,913.18usft in the Direction of 271.93° (Grid).

Magnetic Convergence at surface is: -6.93° (6 June 2016, , BGGM2016)

