

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 10-T2N-R65W

Cook 37N-E3HZ

Plan F Rev 0

Design: Actual Field Surveys

## Sperry Drilling Services Standard Report

26 November, 2012

Well Coordinates: 1,297,658.37 N, 3,237,856.49 E (40° 08' 50.40" N, 104° 38' 56.86" W)

Ground Level: 4,869.00 ft

Local Coordinate Origin:

Centered on Well Cook 37N-E3HZ

Viewing Datum:

RKB=25ft @ 4894.00ft (HP 308)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

**HALLIBURTON**

**Design Report for Cook 37N-E3HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00
<b>HP 308: RKB = 25ft</b>							
125.00	0.41	163.79	125.00	-0.34	0.10	-0.30	0.41
<b>First Gyro Survey @ 125.00ft</b>							
225.00	0.28	153.39	225.00	-0.91	0.31	-0.78	0.14
325.00	0.34	142.39	325.00	-1.36	0.60	-1.12	0.08
425.00	0.18	142.28	424.99	-1.72	0.88	-1.39	0.16
525.00	0.16	5.42	524.99	-1.70	0.99	-1.34	0.32
625.00	0.20	348.22	624.99	-1.39	0.96	-1.05	0.07
725.00	0.26	356.28	724.99	-1.00	0.91	-0.69	0.07
825.00	0.28	25.59	824.99	-0.55	1.00	-0.23	0.14
925.00	0.13	351.61	924.99	-0.22	1.09	0.11	0.19
<b>Final Gyro Survey @ 925.00ft - Tie-On to Surface Gyros @ 925.00ft</b>							
981.00	0.28	24.00	980.99	-0.03	1.14	0.31	0.33
<b>First Sperry MWD Survey @ 981.00ft</b>							
1,012.00	0.39	286.50	1,011.99	0.07	1.07	0.38	1.64
1,103.00	0.76	108.80	1,102.99	-0.04	1.34	0.36	1.26
1,195.00	3.85	109.87	1,194.90	-1.28	4.83	0.18	3.36
1,287.00	4.44	113.45	1,286.66	-3.75	11.00	-0.37	0.70
1,380.00	5.51	109.69	1,379.31	-6.69	18.51	-0.99	1.20
1,472.00	7.95	111.60	1,470.67	-10.52	28.58	-1.71	2.66
1,565.00	10.08	115.56	1,562.52	-16.40	41.90	-3.44	2.38
1,657.00	12.94	114.59	1,652.66	-24.16	58.54	-6.00	3.12
1,749.00	13.57	111.38	1,742.21	-32.38	77.95	-8.19	1.05
1,841.00	14.99	108.52	1,831.36	-40.10	99.29	-9.33	1.72
1,934.00	16.28	105.01	1,920.92	-47.29	123.29	-9.20	1.72
2,026.00	17.19	103.48	2,009.03	-53.80	148.96	-7.92	1.10
2,118.00	19.21	102.76	2,096.42	-60.31	176.95	-5.97	2.21
2,210.00	17.77	104.25	2,183.67	-67.11	205.32	-4.18	1.65
2,303.00	19.11	104.29	2,271.89	-74.36	233.83	-2.79	1.44
2,395.00	17.95	102.18	2,359.12	-81.07	262.28	-0.89	1.46
2,487.00	19.12	102.30	2,446.35	-87.27	290.86	1.53	1.27
2,580.00	17.63	107.25	2,534.61	-94.70	319.19	2.71	2.32
2,672.00	18.59	105.79	2,622.05	-102.82	346.61	2.96	1.15
2,767.00	17.35	101.96	2,712.42	-109.87	375.04	4.52	1.80
2,862.00	17.58	102.37	2,803.04	-115.88	402.91	6.92	0.27
2,957.00	19.13	104.95	2,893.20	-122.97	431.97	8.63	1.84
3,051.00	20.15	107.28	2,981.73	-131.76	462.31	9.09	1.37
3,146.00	19.10	106.49	3,071.22	-141.03	492.84	9.15	1.14
3,240.00	17.48	104.84	3,160.46	-149.01	521.23	9.81	1.81
3,335.00	17.82	110.91	3,251.00	-157.85	548.61	9.35	1.97
3,429.00	17.62	112.31	3,340.54	-168.39	575.20	7.05	0.50
3,524.00	18.02	114.38	3,430.98	-179.91	601.89	3.83	0.79
3,618.00	17.89	112.66	3,520.41	-191.47	628.46	0.53	0.58
3,713.00	19.12	108.52	3,610.50	-202.04	656.68	-1.32	1.89
3,808.00	16.53	109.16	3,700.93	-211.42	684.20	-2.25	2.73
3,903.00	16.53	104.25	3,792.01	-219.18	710.07	-2.11	1.47
3,997.00	18.07	101.68	3,881.75	-225.42	737.31	-0.13	1.83
4,092.00	20.58	105.23	3,971.40	-232.79	767.85	1.75	2.92

**Design Report for Cook 37N-E3HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,187.00	22.90	105.49	4,059.63	-242.12	801.78	2.75	2.44
4,282.00	22.30	104.50	4,147.34	-251.57	837.04	4.02	0.75
4,377.00	20.61	103.10	4,235.75	-259.87	870.78	5.94	1.86
4,472.00	19.26	103.60	4,325.06	-267.35	902.29	8.00	1.43
4,566.00	18.49	103.11	4,414.00	-274.37	931.88	9.92	0.84
4,661.00	17.38	101.41	4,504.39	-280.60	960.46	12.32	1.29
4,756.00	16.61	99.27	4,595.24	-285.59	987.77	15.53	1.04
4,851.00	17.93	103.92	4,685.96	-291.30	1,015.37	18.13	2.01
4,881.00	17.80	105.00	4,714.51	-293.59	1,024.28	18.54	1.19
4,976.00	19.03	104.20	4,804.64	-301.15	1,053.32	19.80	1.32
5,072.00	17.83	104.14	4,895.72	-308.58	1,082.75	21.29	1.25
5,167.00	18.61	106.01	4,985.96	-316.32	1,111.42	22.28	1.03
5,262.00	16.96	104.60	5,076.41	-323.99	1,139.40	23.11	1.79
5,357.00	15.64	104.79	5,167.59	-330.75	1,165.19	24.18	1.39
5,452.00	15.29	112.12	5,259.16	-338.74	1,189.18	23.56	2.09
5,547.00	16.72	112.60	5,350.48	-348.71	1,213.40	21.10	1.51
5,642.00	17.66	113.97	5,441.23	-359.81	1,239.19	18.01	1.08
5,737.00	18.51	105.38	5,531.55	-369.67	1,266.90	16.69	2.94
5,833.00	15.95	104.06	5,623.24	-376.92	1,294.39	17.79	2.70
5,928.00	16.87	102.29	5,714.37	-383.02	1,320.52	19.59	1.10
6,023.00	14.78	101.41	5,805.76	-388.35	1,345.87	21.90	2.21
6,118.00	14.66	94.53	5,897.65	-391.70	1,369.74	25.67	1.84
6,213.00	12.94	84.49	5,989.92	-391.63	1,392.31	32.33	3.10
6,308.00	10.93	74.22	6,082.87	-388.16	1,411.57	41.28	3.07
6,403.00	10.85	65.19	6,176.17	-381.95	1,428.36	52.12	1.80
6,498.00	9.72	67.03	6,269.64	-375.07	1,443.86	63.23	1.24
6,594.00	9.96	54.95	6,364.24	-367.14	1,458.12	74.98	2.16
6,688.00	11.46	41.70	6,436.96	-357.98	1,468.25	86.71	3.88
6,700.00	13.32	38.90	6,468.21	-352.73	1,472.68	93.02	6.11
6,732.00	15.14	40.69	6,499.23	-346.70	1,477.72	100.26	5.85
6,764.00	16.32	39.42	6,530.03	-340.05	1,483.30	108.25	3.84
6,795.00	17.29	33.39	6,559.71	-332.84	1,488.60	116.69	6.43
6,827.00	18.96	26.52	6,590.12	-324.22	1,493.54	126.38	8.47
6,859.00	21.54	24.33	6,620.14	-314.21	1,498.28	137.34	8.40
6,891.00	25.10	21.43	6,649.52	-302.54	1,503.18	149.94	11.69
6,923.00	29.21	18.85	6,677.99	-288.82	1,508.19	164.51	13.36
6,954.00	32.84	16.37	6,704.55	-273.59	1,513.00	180.48	12.41
6,986.00	36.71	13.98	6,730.84	-255.98	1,517.76	198.72	12.82
7,018.00	39.80	13.58	6,755.96	-236.74	1,522.48	218.50	9.69
7,050.00	43.55	10.47	6,779.86	-215.93	1,526.89	239.68	13.38
7,081.00	46.63	7.31	6,801.75	-194.25	1,530.26	261.41	12.28
7,113.00	49.42	4.24	6,823.15	-170.59	1,532.64	284.74	11.26
7,145.00	51.91	1.25	6,843.43	-145.87	1,533.81	308.72	10.62
7,176.00	54.74	359.08	6,861.95	-121.01	1,533.88	332.51	10.72
7,208.00	58.14	358.72	6,879.64	-94.36	1,533.36	357.85	10.67
7,240.00	62.55	358.41	6,895.47	-66.56	1,532.67	384.23	13.81
7,272.00	66.32	358.53	6,909.27	-37.71	1,531.90	411.59	11.79
7,303.00	69.87	359.64	6,920.84	-8.96	1,531.44	438.96	11.92
7,335.00	72.46	0.43	6,931.17	21.33	1,531.46	467.93	8.42
7,367.00	74.82	0.94	6,940.18	52.03	1,531.83	497.39	7.53
7,398.00	78.09	1.93	6,947.44	82.15	1,532.58	526.42	11.00

**Design Report for Cook 37N-E3HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
7,430.00	80.69	3.22	6,953.33	113.57	1,534.00	556.88	9.04
7,462.00	83.97	3.05	6,957.60	145.23	1,535.73	587.67	10.26
7,508.00	87.34	1.91	6,961.09	191.05	1,537.72	632.07	7.72
<b>7" Casing Point @ 7508' MD :: 6961.09' TVD</b>							
7,544.00	89.97	1.02	6,961.93	227.02	1,538.63	666.74	7.72
7,639.00	91.67	1.34	6,960.57	321.99	1,540.59	758.13	1.82
7,733.00	92.60	0.44	6,957.07	415.91	1,542.05	848.38	1.38
7,828.00	93.27	359.94	6,952.21	510.78	1,542.36	939.20	0.88
7,922.00	92.53	358.73	6,947.45	604.65	1,541.28	1,028.66	1.51
8,017.00	91.67	358.55	6,943.97	699.56	1,539.02	1,118.77	0.92
8,112.00	92.53	358.60	6,940.49	794.47	1,536.66	1,208.84	0.91
8,206.00	91.30	358.61	6,937.35	888.39	1,534.37	1,297.99	1.31
8,301.00	93.40	358.13	6,933.45	983.26	1,531.67	1,387.94	2.27
8,396.00	91.60	359.45	6,929.31	1,078.14	1,529.67	1,478.09	2.35
8,490.00	90.74	0.13	6,927.39	1,172.12	1,529.33	1,567.87	1.17
8,585.00	90.00	0.31	6,926.78	1,267.12	1,529.69	1,658.82	0.80
8,678.00	91.54	359.91	6,925.53	1,360.11	1,529.87	1,747.80	1.71
8,770.00	91.55	359.97	6,923.05	1,452.07	1,529.77	1,835.73	0.07
8,863.00	90.12	0.17	6,921.69	1,545.06	1,529.89	1,924.69	1.55
8,953.00	91.73	0.75	6,920.24	1,635.04	1,530.61	2,010.96	1.90
9,045.00	89.51	359.95	6,919.24	1,727.03	1,531.17	2,099.09	2.56
9,137.00	90.31	0.35	6,919.39	1,819.03	1,531.41	2,187.14	0.97
9,230.00	90.00	0.38	6,919.14	1,912.03	1,532.00	2,276.26	0.33
9,322.00	89.75	0.17	6,919.34	2,004.03	1,532.45	2,364.37	0.35
9,414.00	88.83	359.09	6,920.48	2,096.01	1,531.85	2,452.17	1.54
9,507.00	88.77	358.93	6,922.42	2,188.98	1,530.25	2,540.61	0.18
9,599.00	90.37	357.17	6,923.11	2,280.92	1,527.12	2,627.62	2.59
9,691.00	90.19	355.92	6,922.66	2,372.75	1,521.57	2,713.82	1.37
9,781.00	90.19	354.91	6,922.37	2,462.46	1,514.38	2,797.51	1.12
9,873.00	90.37	355.92	6,921.92	2,554.16	1,507.02	2,883.06	1.12
9,966.00	89.63	356.73	6,921.92	2,646.97	1,501.06	2,970.07	1.18
10,060.00	89.81	358.15	6,922.38	2,740.87	1,496.86	3,058.65	1.52
10,155.00	89.44	357.62	6,923.00	2,835.80	1,493.36	3,148.42	0.68
10,250.00	89.44	357.20	6,923.93	2,930.70	1,489.06	3,237.92	0.44
10,344.00	89.20	358.27	6,925.04	3,024.62	1,485.35	3,326.65	1.17
10,439.00	91.85	1.19	6,924.17	3,119.60	1,484.90	3,417.35	4.15
10,534.00	92.72	1.20	6,920.38	3,214.50	1,486.88	3,508.69	0.92
10,628.00	90.25	1.85	6,917.95	3,308.43	1,489.38	3,599.25	2.72
10,723.00	90.43	2.46	6,917.38	3,403.36	1,492.95	3,691.08	0.67
10,817.00	91.79	2.47	6,915.56	3,497.25	1,497.00	3,782.05	1.45
10,912.00	90.49	2.98	6,913.67	3,592.12	1,501.51	3,874.10	1.47
11,007.00	89.57	1.65	6,913.62	3,687.04	1,505.35	3,966.00	1.70
11,102.00	88.95	359.63	6,914.85	3,782.02	1,506.41	4,057.15	2.22
11,198.00	86.67	357.87	6,918.52	3,877.92	1,504.32	4,148.25	3.00
11,293.00	87.16	357.66	6,923.63	3,972.71	1,500.62	4,237.82	0.56
11,388.00	89.14	357.92	6,926.70	4,067.58	1,496.96	4,327.48	2.10
11,483.00	91.11	357.79	6,926.49	4,162.51	1,493.40	4,417.23	2.08
11,578.00	90.68	358.47	6,925.01	4,257.45	1,490.30	4,507.11	0.85
11,673.00	91.48	358.03	6,923.22	4,352.39	1,487.40	4,597.06	0.96
11,768.00	89.63	358.71	6,922.30	4,447.34	1,484.70	4,687.08	2.07
11,863.00	88.08	359.76	6,924.19	4,542.31	1,483.43	4,777.53	1.97

## Design Report for Cook 37N-E3HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
11,958.00	88.52	359.21	6,927.01	4,637.26	1,482.58	4,868.09	0.74
12,053.00	89.20	358.67	6,928.90	4,732.23	1,480.82	4,958.40	0.91
12,115.00	89.69	357.65	6,929.50	4,794.19	1,478.83	5,017.07	1.83
<b>Final Sperry MWD Survey @ 12115.00ft</b>							
12,165.00	89.69	357.65	6,929.77	4,844.15	1,476.78	5,064.25	0.00
<b>Straight Line Projection to TD @ 12165' MD</b>							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
25.00	25.00	0.00	0.00	HP 308: RKB = 25ft
125.00	125.00	-0.34	0.10	First Gyro Survey @ 125.00ft
925.00	924.99	-0.22	1.09	Final Gyro Survey @ 925.00ft
925.00	924.99	-0.22	1.09	Tie-On to Surface Gyros @ 925.00ft
981.00	980.99	-0.03	1.14	First Sperry MWD Survey @ 981.00ft
12,115.00	6,929.50	4,794.19	1,478.83	Final Sperry MWD Survey @ 12115.00ft
12,165.00	6,929.77	4,844.15	1,476.78	Straight Line Projection to TD @ 12165' MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
User	Cook 37N-E3HZ_BHL revised ReLoc	16.99	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
25.00	925.00	Surface Gyros	NS-GYRO-MS
981.00	7,462.00	Sperry MWD Surveys - Vert/Build	MWD+SC
7,462.00	12,115.00	Sperry MWD Surveys - Lateral	MWD+SC

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,508.00	6,961.09	7" Casing Point @ 7508' MD :: 6961.09' TVD	7	8-3/4

## Design Report for Cook 37N-E3HZ - Actual Field Surveys

### Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Cook 37N-E3HZ_SF - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,297,658.37	3,237,856.49	40.147334	-104.649127
Cook 37N-E3HZ - V: - actual wellpath misses target center by 3.93ft at 11569.11ft MD (6925.12 TVD, 4248.56 N, 1490.55 E) - Point	0.00	0.00	6,925.00	4,248.69	1,494.47	1,301,921.03	3,239,310.06	40.158997	-104.643780
Cook 37N-E3HZ_Se - actual wellpath hits target center - Polygon Point 1 Point 2	0.00	0.00	0.00	0.00	0.00	1,297,658.37	3,237,856.49	40.147334	-104.649127
				-2,849.28	4,792.28	1,302,422.89	3,234,961.47		
				2,425.79	4,795.44	1,302,476.66	3,240,236.05		
Cook 37N-E3HZ_Se - actual wellpath hits target center - Polygon Point 1 Point 2 Point 3 Point 4 Point 5 Point 6 Point 7 Point 8	0.00	0.00	0.00	0.00	0.00	1,297,658.37	3,237,856.49	40.147334	-104.649127
				1,942.48	-47.34	1,297,629.67	3,239,799.25		
				1,952.81	2,142.08	1,299,819.00	3,239,788.57		
				1,963.16	4,335.14	1,302,011.97	3,239,777.88		
				-216.86	4,333.84	1,301,989.75	3,237,598.06		
				-2,396.14	4,332.54	1,301,967.54	3,235,418.99		
				-2,429.21	2,137.32	1,299,772.19	3,235,406.98		
				-2,473.27	-32.93	1,297,601.71	3,235,383.75		
				-265.54	-40.10	1,297,615.72	3,237,591.35		
Cook 37N-E3HZ - V: - actual wellpath misses target center by 3.65ft at 12096.08ft MD (6929.38 TVD, 4775.28 N, 1479.56 E) - Point	0.00	0.00	6,932.00	4,775.34	1,482.09	1,302,447.51	3,239,292.63	40.160442	-104.643824
Cook 37N-E3HZ_BH - actual wellpath misses target center by 4.37ft at 12165.00ft MD (6929.77 TVD, 4844.15 N, 1476.78 E) - Point	0.00	0.00	6,932.00	4,845.00	1,480.45	1,302,517.15	3,239,290.32	40.160633	-104.643830
Cook 37N-E3HZ_Se - actual wellpath hits target center - Polygon Point 1 Point 2 Point 3 Point 4 Point 5 Point 6 Point 7 Point 8 Point 9 Point 10 Point 11 Point 12	0.00	0.00	0.00	0.00	0.00	1,297,658.37	3,237,856.49	40.147334	-104.649127
				2,401.64	-508.87	1,297,172.59	3,240,262.80		
				2,412.84	2,142.58	1,299,823.91	3,240,248.56		
				2,425.79	4,795.44	1,302,476.66	3,240,236.05		
				2,452.62	7,442.33	1,305,123.58	3,240,237.48		
				2,495.19	9,921.64	1,307,603.08	3,240,256.26		
				-151.89	9,938.63	1,307,594.67	3,237,609.25		
				-2,798.92	9,955.35	1,307,585.99	3,234,962.29		
				-2,823.37	7,447.63	1,305,078.26	3,234,961.90		
				-2,849.28	4,792.28	1,302,422.89	3,234,961.47		
				-2,889.29	2,136.82	1,299,767.28	3,234,946.95		
				-2,942.70	-491.43	1,297,138.75	3,234,918.76		
				-270.66	-500.10	1,297,155.72	3,237,590.65		
Cook 37N-E3HZ - V: - actual wellpath misses target center by 13.93ft at 10516.44ft MD (6921.19 TVD, 3196.97 N, 1486.51 E) - Point	0.00	0.00	6,923.00	3,196.75	1,500.33	1,300,869.23	3,239,326.01	40.156109	-104.643760
Cook 37N-E3HZ - V: - actual wellpath misses target center by 10.82ft at 8442.47ft MD (6928.18 TVD, 1124.60 N, 1529.36 E) - Point	0.00	0.00	6,939.00	1,124.82	1,529.00	1,298,797.76	3,239,374.56	40.150421	-104.643657
Cook 37N-E3HZ - V: - actual wellpath misses target center by 11.07ft at 11042.17ft MD (6913.96 TVD, 3722.20 N, 1506.13 E) - Point	0.00	0.00	6,925.00	3,722.05	1,506.85	1,301,394.55	3,239,327.49	40.157551	-104.643736
Cook 37N-E3HZ - V: - actual wellpath misses target center by 15.08ft at 8960.65ft MD (6920.02 TVD, 1642.69 N, 1530.71 E) - Point	0.00	0.00	6,935.00	1,642.86	1,529.00	1,299,315.76	3,239,369.59	40.151844	-104.643657
Dowdy #2 - actual wellpath misses target center by 165.31ft at 7870.36ft MD (6949.91 TVD, 553.08 N, 1542.12 E)	0.00	0.00	6,936.72	550.50	1,377.36	1,298,222.03	3,239,228.45	40.148845	-104.644200

**Design Report for Cook 37N-E3HZ - Actual Field Surveys**

- Circle (radius 150.00)									
Cook 37N-E3HZ_WI	0.00	0.00	6,922.90	3,116.75	1,499.00	1,300,789.23	3,239,325.45	40.155889	-104.643764
- actual wellpath misses target center by 14.22ft at 10436.10ft MD (6924.26 TVD, 3116.70 N, 1484.84 E)									
- Point									
Cook 37N-E3HZ_Se	0.00	0.00	0.00	0.00	0.00	1,297,658.37	3,237,856.49	40.147334	-104.649127
- actual wellpath hits target center									
- Polygon									
Point 1			1,970.43	5,255.19		1,302,932.00	3,239,776.32		
Point 2			1,992.67	7,442.72		1,305,119.56	3,239,777.57		
Point 3			2,027.30	9,464.52		1,307,141.51	3,239,792.80		
Point 4			-157.14	9,478.47		1,307,134.50	3,237,608.42		
Point 5			-2,343.25	9,492.43		1,307,127.48	3,235,422.36		
Point 6			-2,363.22	7,447.33		1,305,082.37	3,235,422.02		
Point 7			-2,384.73	5,252.58		1,302,887.61	3,235,421.57		
Point 8			-206.38	5,253.88		1,302,909.81	3,237,599.71		
Cook 37N-E3HZ - V:	0.00	0.00	6,925.00	2,678.94	1,514.00	1,300,351.60	3,239,344.65	40.154688	-104.643711
- actual wellpath misses target center by 14.90ft at 9997.38ft MD (6922.10 TVD, 2678.30 N, 1499.40 E)									
- Point									
Cook 37N-E3HZ_La	0.00	0.00	0.00	0.00	0.00	1,297,658.37	3,237,856.49	40.147334	-104.649127
- actual wellpath hits target center									
- Polygon									
Point 1			656.06	5,673.50		1,303,337.67	3,238,458.05		
Point 2			628.04	-34.73		1,297,629.67	3,238,484.80		
Point 3			1,530.03	-43.39		1,297,629.66	3,239,386.80		
Point 4			1,558.06	5,664.84		1,303,337.66	3,239,360.06		
Dowdy #42-10	0.00	0.00	6,922.90	3,114.43	1,660.66	1,300,788.46	3,239,487.12	40.155883	-104.643186
- actual wellpath misses target center by 175.88ft at 10433.01ft MD (6924.36 TVD, 3113.61 N, 1484.79 E)									
- Circle (radius 150.00)									
Cook 37N-E3HZ - V:	0.00	0.00	6,927.00	2,160.90	1,529.00	1,299,833.75	3,239,364.62	40.153266	-104.643657
- actual wellpath misses target center by 5.46ft at 9479.05ft MD (6921.83 TVD, 2161.04 N, 1530.76 E)									
- Point									
Cook 37N-E3HZ - V:	0.00	0.00	6,938.00	606.78	1,529.00	1,298,279.77	3,239,379.53	40.148999	-104.643658
- actual wellpath misses target center by 15.38ft at 7924.76ft MD (6947.33 TVD, 607.41 N, 1541.21 E)									
- Point									

## North Reference Sheet for Sec. 10-T2N-R65W - Cook 37N-E3HZ - Plan F Rev 0

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

Vertical Depths are relative to RKB=25ft @ 4894.00ft (HP 308). Northing and Easting are relative to Cook 37N-E3HZ

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: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99995847

Grid Coordinates of Well: 1,297,658.37 ft N, 3,237,856.49 ft E

Geographical Coordinates of Well: 40° 08' 50.40" N, 104° 38' 56.86" W

Grid Convergence at Surface is: 0.55°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,165.00ft  
the Bottom Hole Displacement is 5,064.25ft in the Direction of 16.95° (True).

Magnetic Convergence at surface is: -8.09° (14 November 2012, , BGGM2012)

