

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

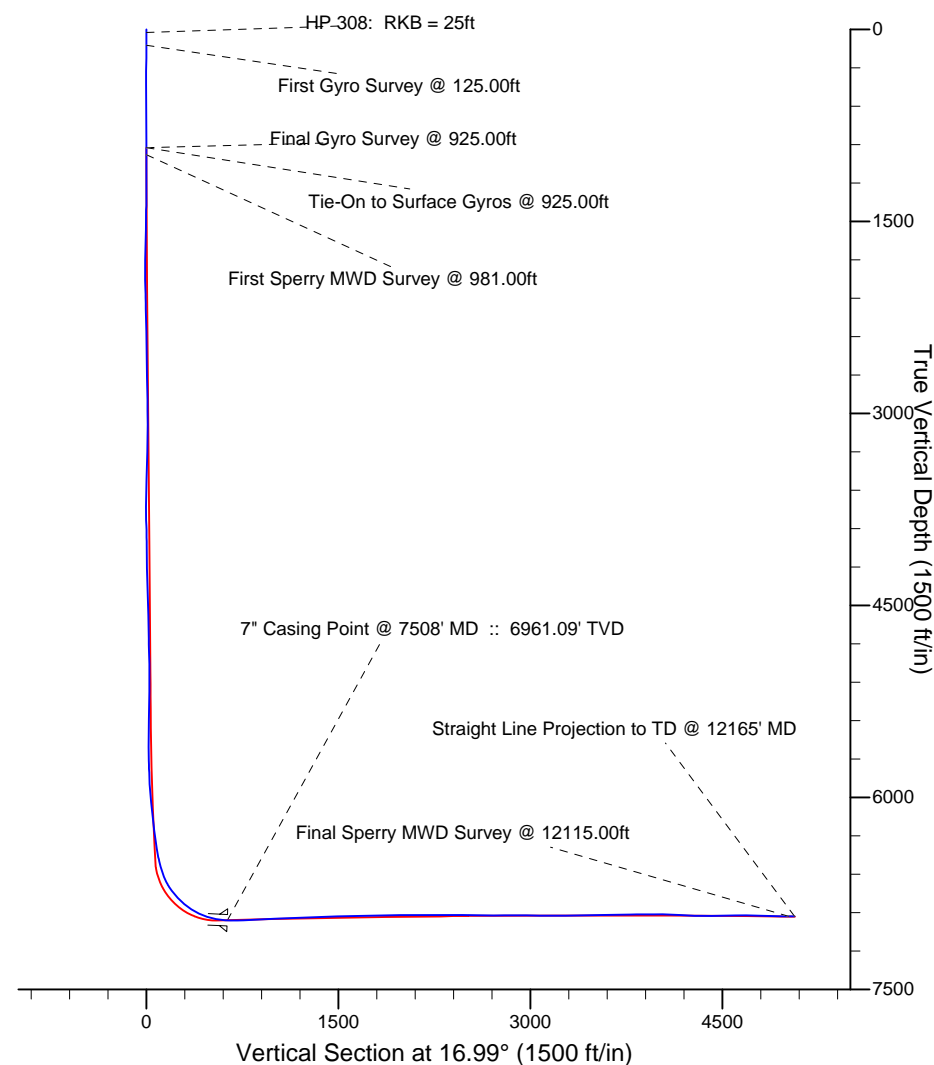
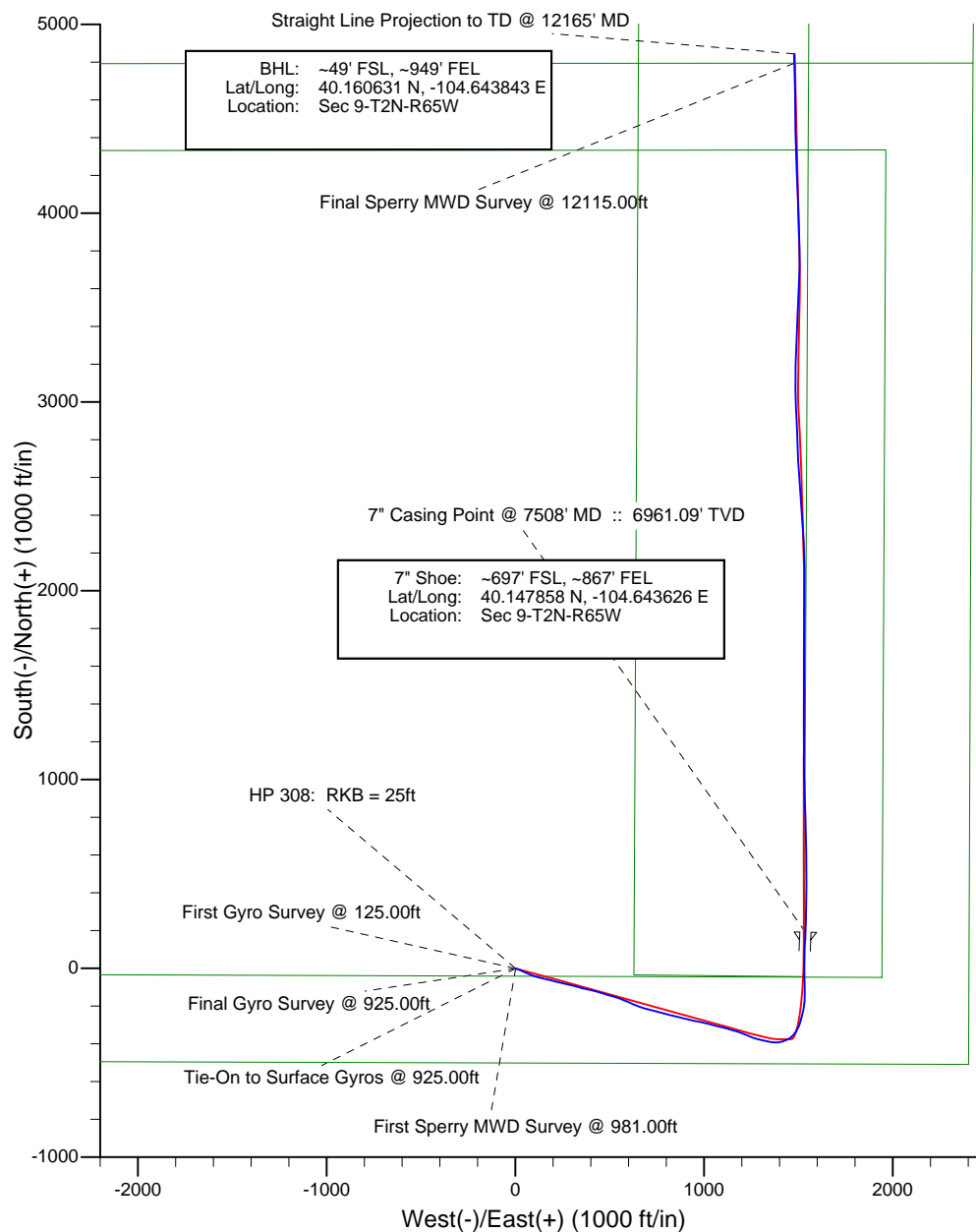
Project: Weld County, CO (NAD 83)
Site: Sec. 10-T2N-R65W
Well: Cook 37N-E3HZ



HALLIBURTON
Sperry Drilling

LEGEND

- Cook 37N-E3HZ, Plan F Rev 0, Plan F Rev 0 Proposal V0
- Actual Field Surveys



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
HP 308: RKB = 25ft							
125.00	0.41	163.79	125.00	-0.34	0.10	-0.30	0.41
First Gyro Survey @ 125.00ft							
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
Final Gyro Survey @ 925.00ft - Tie-On to Surface Gyros @ 925.00ft							
981.00	0.28	24.00	980.99	-0.03	1.14	0.31	0.33
First Sperry MWD Survey @ 981.00ft							
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
7" Casing Point @ 7508' MD :: 6961.09' TVD							
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
Final Sperry MWD Survey @ 12115.00ft							
12,165.00	89.69	357.65	6,929.77	4,844.15	1,476.78	5,064.25	0.00
Straight Line Projection to TD @ 12165' MD							

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

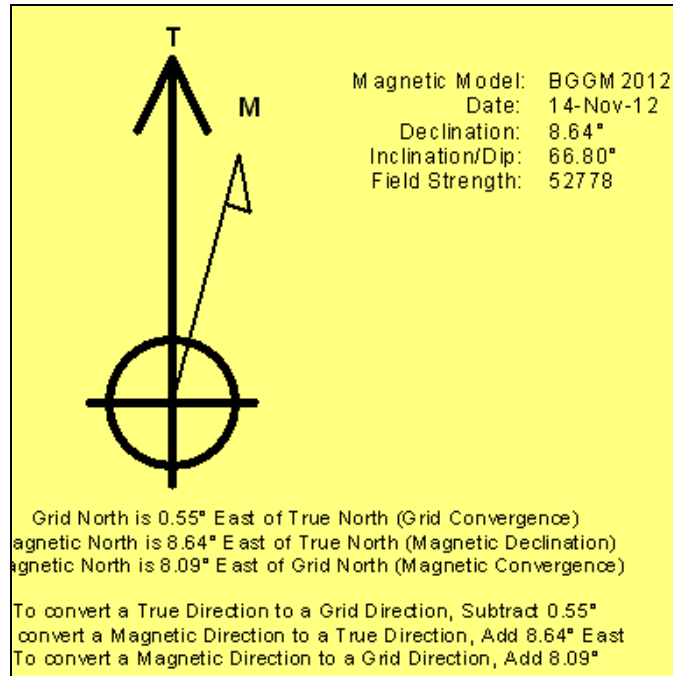
Grid Coordinates of Well: 1,297,658.37 ft N, 3,237,856.49 ft E

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)



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 10-T2N-R65W

Cook 37N-E3HZ

Plan F Rev 0

Design: Actual Field Surveys

Survey Report - Geographic

26 November, 2012

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Cook 37N-E3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Site:	Sec. 10-T2N-R65W	MD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Well:	Cook 37N-E3HZ	North Reference:	True
Wellbore:	Plan F Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

Project	Weld County, CO (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Sec. 10-T2N-R65W				
Site Position:		Northing:	1,297,730.72 ft	Latitude:	40.147534
From:	Lat/Long	Easting:	3,237,802.96 ft	Longitude:	-104.649316
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	0.55 °

Well	Cook 37N-E3HZ					
Well Position	+N-S	0.00 ft	Northing:	1,297,658.37 ft	Latitude:	40.147334
	+E-W	0.00 ft	Easting:	3,237,856.49 ft	Longitude:	-104.649127
Position Uncertainty		3.28 ft	Wellhead Elevation:	ft	Ground Level:	4,869.00 ft

Wellbore	Plan F Rev 0				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2012	2012-11-14	8.64	66.80	52,778

Design	Actual Field Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N-S (ft)	+E-W (ft)	Direction (°)	
	0.00	0.00	0.00	16.99	

Survey Program	Date	2012-11-26			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
25.00	925.00	Surface Gyros (Plan F Rev 0)	NS-GYRO-MS	North sensing gyrocompassing m/s	
981.00	7,462.00	Sperry MWD Surveys - Vert/Build (Plan F	MWD+SC	Fixed:v2:standard dec & axial correction	
7,462.00	12,115.00	Sperry MWD Surveys - Lateral (Plan F Re	MWD+SC	Fixed:v2:standard dec & axial correction	

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Cook 37N-E3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Site:	Sec. 10-T2N-R65W	MD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Well:	Cook 37N-E3HZ	North Reference:	True
Wellbore:	Plan F Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	1,297,658.37	3,237,856.49	40.147334	-104.649127
25.00	0.00	0.00	25.00	0.00	0.00	1,297,658.37	3,237,856.49	40.147334	-104.649127
HP 308: RKB = 25ft									
125.00	0.41	163.79	125.00	-0.34	0.10	1,297,658.03	3,237,856.59	40.147333	-104.649127
First Gyro Survey @ 125.00ft									
225.00	0.28	153.39	225.00	-0.91	0.31	1,297,657.47	3,237,856.80	40.147331	-104.649126
325.00	0.34	142.39	325.00	-1.36	0.60	1,297,657.02	3,237,857.10	40.147330	-104.649125
425.00	0.18	142.28	424.99	-1.72	0.88	1,297,656.66	3,237,857.38	40.147329	-104.649124
525.00	0.16	5.42	524.99	-1.70	0.99	1,297,656.67	3,237,857.49	40.147329	-104.649123
625.00	0.20	348.22	624.99	-1.39	0.96	1,297,656.98	3,237,857.46	40.147330	-104.649124
725.00	0.26	356.28	724.99	-1.00	0.91	1,297,657.38	3,237,857.41	40.147331	-104.649124
825.00	0.28	25.59	824.99	-0.55	1.00	1,297,657.83	3,237,857.50	40.147332	-104.649123
925.00	0.13	351.61	924.99	-0.22	1.09	1,297,658.16	3,237,857.58	40.147333	-104.649123
Final Gyro Survey @ 925.00ft - Tie-On to Surface Gyros @ 925.00ft									
981.00	0.28	24.00	980.99	-0.03	1.14	1,297,658.35	3,237,857.63	40.147334	-104.649123
First Sperry MWD Survey @ 981.00ft									
1,012.00	0.39	286.50	1,011.99	0.07	1.07	1,297,658.45	3,237,857.55	40.147334	-104.649123
1,103.00	0.76	108.80	1,102.99	-0.04	1.34	1,297,658.34	3,237,857.83	40.147334	-104.649122
1,195.00	3.85	109.87	1,194.90	-1.28	4.83	1,297,657.13	3,237,861.33	40.147330	-104.649110
1,287.00	4.44	113.45	1,286.66	-3.75	11.00	1,297,654.72	3,237,867.52	40.147324	-104.649088
1,380.00	5.51	109.69	1,379.31	-6.69	18.51	1,297,651.86	3,237,875.05	40.147316	-104.649061
1,472.00	7.95	111.60	1,470.67	-10.52	28.58	1,297,648.13	3,237,885.17	40.147305	-104.649025
1,565.00	10.08	115.56	1,562.52	-16.40	41.90	1,297,642.37	3,237,898.54	40.147289	-104.648977
1,657.00	12.94	114.59	1,652.66	-24.16	58.54	1,297,634.77	3,237,915.25	40.147268	-104.648918
1,749.00	13.57	111.38	1,742.21	-32.38	77.95	1,297,626.74	3,237,934.75	40.147245	-104.648848
1,841.00	14.99	108.52	1,831.36	-40.10	99.29	1,297,619.23	3,237,956.15	40.147224	-104.648772
1,934.00	16.28	105.01	1,920.92	-47.29	123.29	1,297,612.26	3,237,980.21	40.147204	-104.648686
2,026.00	17.19	103.48	2,009.03	-53.80	148.96	1,297,606.00	3,238,005.95	40.147186	-104.648594
2,118.00	19.21	102.76	2,096.42	-60.31	176.95	1,297,599.76	3,238,034.00	40.147168	-104.648494
2,210.00	17.77	104.25	2,183.67	-67.11	205.32	1,297,593.23	3,238,062.43	40.147150	-104.648393
2,303.00	19.11	104.29	2,271.89	-74.36	233.83	1,297,586.25	3,238,091.00	40.147130	-104.648291
2,395.00	17.95	102.18	2,359.12	-81.07	262.28	1,297,579.82	3,238,119.52	40.147111	-104.648189
2,487.00	19.12	102.30	2,446.35	-87.27	290.86	1,297,573.89	3,238,148.16	40.147094	-104.648087
2,580.00	17.63	107.25	2,534.61	-94.70	319.19	1,297,566.74	3,238,176.56	40.147074	-104.647985
2,672.00	18.59	105.79	2,622.05	-102.82	346.61	1,297,558.89	3,238,204.05	40.147052	-104.647887
2,767.00	17.35	101.96	2,712.42	-109.87	375.04	1,297,552.10	3,238,232.55	40.147032	-104.647785
2,862.00	17.58	102.37	2,803.04	-115.88	402.91	1,297,546.36	3,238,260.47	40.147016	-104.647686
2,957.00	19.13	104.95	2,893.20	-122.97	431.97	1,297,539.55	3,238,289.60	40.146996	-104.647582
3,051.00	20.15	107.28	2,981.73	-131.76	462.31	1,297,531.06	3,238,320.02	40.146972	-104.647473
3,146.00	19.10	106.49	3,071.22	-141.03	492.84	1,297,522.08	3,238,350.63	40.146947	-104.647364
3,240.00	17.48	104.84	3,160.46	-149.01	521.23	1,297,514.37	3,238,379.10	40.146925	-104.647263
3,335.00	17.82	110.91	3,251.00	-157.85	548.61	1,297,505.79	3,238,406.56	40.146901	-104.647165
3,429.00	17.62	112.31	3,340.54	-168.39	575.20	1,297,495.52	3,238,433.26	40.146872	-104.647069
3,524.00	18.02	114.38	3,430.98	-179.91	601.89	1,297,484.25	3,238,460.05	40.146840	-104.646974
3,618.00	17.89	112.66	3,520.41	-191.47	628.46	1,297,472.94	3,238,486.73	40.146808	-104.646879
3,713.00	19.12	108.52	3,610.50	-202.04	656.68	1,297,462.65	3,238,515.05	40.146779	-104.646778
3,808.00	16.53	109.16	3,700.93	-211.42	684.20	1,297,453.53	3,238,542.66	40.146754	-104.646680
3,903.00	16.53	104.25	3,792.01	-219.18	710.07	1,297,446.02	3,238,568.59	40.146732	-104.646587
3,997.00	18.07	101.68	3,881.75	-225.42	737.31	1,297,440.04	3,238,595.89	40.146715	-104.646490
4,092.00	20.58	105.23	3,971.40	-232.79	767.85	1,297,432.96	3,238,626.50	40.146695	-104.646380
4,187.00	22.90	105.49	4,059.63	-242.12	801.78	1,297,423.96	3,238,660.52	40.146669	-104.646259
4,282.00	22.30	104.50	4,147.34	-251.57	837.04	1,297,414.85	3,238,695.87	40.146643	-104.646133
4,377.00	20.61	103.10	4,235.75	-259.87	870.78	1,297,406.87	3,238,729.68	40.146621	-104.646012
4,472.00	19.26	103.60	4,325.06	-267.35	902.29	1,297,399.70	3,238,761.27	40.146600	-104.645899
4,566.00	18.49	103.11	4,414.00	-274.37	931.88	1,297,392.96	3,238,790.92	40.146581	-104.645794

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Cook 37N-E3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Site:	Sec. 10-T2N-R65W	MD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Well:	Cook 37N-E3HZ	North Reference:	True
Wellbore:	Plan F Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
4,661.00	17.38	101.41	4,504.39	-280.60	960.46	1,297,387.01	3,238,819.56	40.146564	-104.645691
4,756.00	16.61	99.27	4,595.24	-285.59	987.77	1,297,382.28	3,238,846.91	40.146550	-104.645594
4,851.00	17.93	103.92	4,685.96	-291.30	1,015.37	1,297,376.84	3,238,874.56	40.146534	-104.645495
4,881.00	17.80	105.00	4,714.51	-293.59	1,024.28	1,297,374.63	3,238,883.49	40.146528	-104.645463
4,976.00	19.03	104.20	4,804.64	-301.15	1,053.32	1,297,367.35	3,238,912.60	40.146507	-104.645359
5,072.00	17.83	104.14	4,895.72	-308.58	1,082.75	1,297,360.20	3,238,942.10	40.146487	-104.645254
5,167.00	18.61	106.01	4,985.96	-316.32	1,111.42	1,297,352.74	3,238,970.85	40.146466	-104.645151
5,262.00	16.96	104.60	5,076.41	-323.99	1,139.40	1,297,345.34	3,238,998.90	40.146445	-104.645051
5,357.00	15.64	104.79	5,167.59	-330.75	1,165.19	1,297,338.83	3,239,024.75	40.146426	-104.644959
5,452.00	15.29	112.12	5,259.16	-338.74	1,189.18	1,297,331.07	3,239,048.81	40.146404	-104.644873
5,547.00	16.72	112.60	5,350.48	-348.71	1,213.40	1,297,321.33	3,239,073.13	40.146377	-104.644787
5,642.00	17.66	113.97	5,441.23	-359.81	1,239.19	1,297,310.48	3,239,099.02	40.146346	-104.644694
5,737.00	18.51	105.38	5,531.55	-369.67	1,266.90	1,297,300.89	3,239,126.82	40.146319	-104.644595
5,833.00	15.95	104.06	5,623.24	-376.92	1,294.39	1,297,293.91	3,239,154.38	40.146299	-104.644497
5,928.00	16.87	102.29	5,714.37	-383.02	1,320.52	1,297,288.05	3,239,180.57	40.146282	-104.644403
6,023.00	14.78	101.41	5,805.76	-388.35	1,345.87	1,297,282.96	3,239,205.97	40.146268	-104.644313
6,118.00	14.66	94.53	5,897.65	-391.70	1,369.74	1,297,279.85	3,239,229.86	40.146259	-104.644227
6,213.00	12.94	84.49	5,989.92	-391.63	1,392.31	1,297,280.13	3,239,252.44	40.146259	-104.644147
6,308.00	10.93	74.22	6,082.87	-388.16	1,411.57	1,297,283.79	3,239,271.66	40.146268	-104.644078
6,403.00	10.85	65.19	6,176.17	-381.95	1,428.36	1,297,290.15	3,239,288.38	40.146285	-104.644018
6,498.00	9.72	67.03	6,269.64	-375.07	1,443.86	1,297,297.18	3,239,303.82	40.146304	-104.643962
6,594.00	9.96	54.95	6,364.24	-367.14	1,458.12	1,297,305.25	3,239,318.00	40.146326	-104.643911
6,668.00	11.46	41.70	6,436.96	-357.98	1,468.25	1,297,314.51	3,239,328.04	40.146351	-104.643875
6,700.00	13.32	38.90	6,468.21	-352.73	1,472.68	1,297,319.80	3,239,332.42	40.146366	-104.643859
6,732.00	15.14	40.69	6,499.23	-346.70	1,477.72	1,297,325.88	3,239,337.40	40.146382	-104.643841
6,764.00	16.32	39.42	6,530.03	-340.05	1,483.30	1,297,332.58	3,239,342.92	40.146400	-104.643821
6,795.00	17.29	33.39	6,559.71	-332.84	1,488.60	1,297,339.84	3,239,348.15	40.146420	-104.643802
6,827.00	18.96	26.52	6,590.12	-324.22	1,493.54	1,297,348.51	3,239,353.00	40.146444	-104.643785
6,859.00	21.54	24.33	6,620.14	-314.21	1,498.28	1,297,358.56	3,239,357.65	40.146471	-104.643768
6,891.00	25.10	21.43	6,649.52	-302.54	1,503.18	1,297,370.28	3,239,362.44	40.146503	-104.643750
6,923.00	29.21	18.85	6,677.99	-288.82	1,508.19	1,297,384.04	3,239,367.31	40.146541	-104.643732
6,954.00	32.84	16.37	6,704.55	-273.59	1,513.00	1,297,399.32	3,239,371.98	40.146583	-104.643715
6,986.00	36.71	13.98	6,730.84	-255.98	1,517.76	1,297,416.97	3,239,376.57	40.146631	-104.643698
7,018.00	39.80	13.58	6,755.96	-236.74	1,522.48	1,297,436.26	3,239,381.10	40.146684	-104.643681
7,050.00	43.55	10.47	6,779.86	-215.93	1,526.89	1,297,457.10	3,239,385.31	40.146741	-104.643665
7,081.00	46.63	7.31	6,801.75	-194.25	1,530.26	1,297,478.82	3,239,388.48	40.146801	-104.643653
7,113.00	49.42	4.24	6,823.15	-170.59	1,532.64	1,297,502.50	3,239,390.63	40.146866	-104.643645
7,145.00	51.91	1.25	6,843.43	-145.87	1,533.81	1,297,527.23	3,239,391.57	40.146933	-104.643641
7,176.00	54.74	359.08	6,861.95	-121.01	1,533.88	1,297,552.08	3,239,391.39	40.147002	-104.643640
7,208.00	58.14	358.72	6,879.64	-94.36	1,533.36	1,297,578.73	3,239,390.62	40.147075	-104.643642
7,240.00	62.55	358.41	6,895.47	-66.56	1,532.67	1,297,606.52	3,239,389.66	40.147151	-104.643645
7,272.00	66.32	358.53	6,909.27	-37.71	1,531.90	1,297,635.36	3,239,388.61	40.147230	-104.643647
7,303.00	69.87	359.64	6,920.84	-8.96	1,531.44	1,297,664.11	3,239,387.88	40.147309	-104.643649
7,335.00	72.46	0.43	6,931.17	21.33	1,531.46	1,297,694.39	3,239,387.61	40.147392	-104.643649
7,367.00	74.82	0.94	6,940.18	52.03	1,531.83	1,297,725.09	3,239,387.68	40.147477	-104.643648
7,398.00	78.09	1.93	6,947.44	82.15	1,532.58	1,297,755.22	3,239,388.15	40.147559	-104.643645
7,430.00	80.69	3.22	6,953.33	113.57	1,534.00	1,297,786.64	3,239,389.26	40.147646	-104.643640
7,462.00	83.97	3.05	6,957.60	145.23	1,535.73	1,297,818.32	3,239,390.69	40.147732	-104.643634
7,508.00	87.34	1.91	6,961.09	191.05	1,537.72	1,297,864.15	3,239,392.23	40.147858	-104.643626
7" Casing Point @ 7508' MD :: 6961.09' TVD									
7,544.00	89.97	1.02	6,961.93	227.02	1,538.63	1,297,900.13	3,239,392.81	40.147957	-104.643623
7,639.00	91.67	1.34	6,960.57	321.99	1,540.59	1,297,995.11	3,239,393.85	40.148218	-104.643616
7,733.00	92.60	0.44	6,957.07	415.91	1,542.05	1,298,089.04	3,239,394.41	40.148476	-104.643611
7,828.00	93.27	359.94	6,952.21	510.78	1,542.36	1,298,183.91	3,239,393.82	40.148736	-104.643610
7,922.00	92.53	358.73	6,947.45	604.65	1,541.28	1,298,277.76	3,239,391.82	40.148994	-104.643614

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Cook 37N-E3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Site:	Sec. 10-T2N-R65W	MD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Well:	Cook 37N-E3HZ	North Reference:	True
Wellbore:	Plan F Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
8,017.00	91.67	358.55	6,943.97	699.56	1,539.02	1,298,372.64	3,239,388.66	40.149254	-104.643622
8,112.00	92.53	358.60	6,940.49	794.47	1,536.66	1,298,467.51	3,239,385.39	40.149515	-104.643630
8,206.00	91.30	358.61	6,937.35	888.39	1,534.37	1,298,561.40	3,239,382.20	40.149772	-104.643638
8,301.00	93.40	358.13	6,933.45	983.26	1,531.67	1,298,656.24	3,239,378.59	40.150033	-104.643648
8,396.00	91.60	359.45	6,929.31	1,078.14	1,529.67	1,298,751.10	3,239,375.68	40.150293	-104.643655
8,490.00	90.74	0.13	6,927.39	1,172.12	1,529.33	1,298,845.06	3,239,374.43	40.150551	-104.643656
8,585.00	90.00	0.31	6,926.78	1,267.12	1,529.69	1,298,940.05	3,239,373.89	40.150812	-104.643655
8,678.00	91.54	359.91	6,925.53	1,360.11	1,529.87	1,299,033.04	3,239,373.17	40.151067	-104.643654
8,770.00	91.55	359.97	6,923.05	1,452.07	1,529.77	1,299,124.99	3,239,372.19	40.151320	-104.643655
8,863.00	90.12	0.17	6,921.69	1,545.06	1,529.89	1,299,217.97	3,239,371.42	40.151575	-104.643654
8,953.00	91.73	0.75	6,920.24	1,635.04	1,530.61	1,299,307.96	3,239,371.27	40.151822	-104.643652
9,045.00	89.51	359.95	6,919.24	1,727.03	1,531.17	1,299,399.94	3,239,370.95	40.152075	-104.643650
9,137.00	90.31	0.35	6,919.39	1,819.03	1,531.41	1,299,491.93	3,239,370.31	40.152327	-104.643649
9,230.00	90.00	0.38	6,919.14	1,912.03	1,532.00	1,299,584.93	3,239,370.01	40.152582	-104.643647
9,322.00	89.75	0.17	6,919.34	2,004.03	1,532.45	1,299,676.92	3,239,369.57	40.152835	-104.643645
9,414.00	88.83	359.09	6,920.48	2,096.01	1,531.85	1,299,768.90	3,239,368.09	40.153087	-104.643647
9,507.00	88.77	358.93	6,922.42	2,188.98	1,530.25	1,299,861.84	3,239,365.60	40.153343	-104.643653
9,599.00	90.37	357.17	6,923.11	2,280.92	1,527.12	1,299,953.74	3,239,361.58	40.153595	-104.643664
9,691.00	90.19	355.92	6,922.66	2,372.75	1,521.57	1,300,045.51	3,239,355.16	40.153847	-104.643684
9,781.00	90.19	354.91	6,922.37	2,462.46	1,514.38	1,300,135.14	3,239,347.10	40.154093	-104.643709
9,873.00	90.37	355.92	6,921.92	2,554.16	1,507.02	1,300,226.77	3,239,338.87	40.154345	-104.643736
9,966.00	89.63	356.73	6,921.92	2,646.97	1,501.06	1,300,319.51	3,239,332.02	40.154600	-104.643757
10,060.00	89.81	358.15	6,922.38	2,740.87	1,496.86	1,300,413.36	3,239,326.92	40.154858	-104.643772
10,155.00	89.44	357.62	6,923.00	2,835.80	1,493.36	1,300,508.25	3,239,322.50	40.155118	-104.643785
10,250.00	89.44	357.20	6,923.93	2,930.70	1,489.06	1,300,603.10	3,239,317.30	40.155379	-104.643800
10,344.00	89.20	358.27	6,925.04	3,024.62	1,485.35	1,300,696.98	3,239,312.69	40.155636	-104.643813
10,439.00	91.85	1.19	6,924.17	3,119.60	1,484.90	1,300,791.94	3,239,311.33	40.155897	-104.643815
10,534.00	92.72	1.20	6,920.38	3,214.50	1,486.88	1,300,886.85	3,239,312.40	40.156158	-104.643808
10,628.00	90.25	1.85	6,917.95	3,308.43	1,489.38	1,300,980.80	3,239,313.99	40.156416	-104.643799
10,723.00	90.43	2.46	6,917.38	3,403.36	1,492.95	1,301,075.75	3,239,316.66	40.156676	-104.643786
10,817.00	91.79	2.47	6,915.56	3,497.25	1,497.00	1,301,169.68	3,239,319.80	40.156934	-104.643771
10,912.00	90.49	2.98	6,913.67	3,592.12	1,501.51	1,301,264.58	3,239,323.40	40.157194	-104.643755
11,007.00	89.57	1.65	6,913.62	3,687.04	1,505.35	1,301,359.53	3,239,326.33	40.157455	-104.643741
11,102.00	88.95	359.63	6,914.85	3,782.02	1,506.41	1,301,454.51	3,239,326.48	40.157716	-104.643738
11,198.00	86.67	357.87	6,918.52	3,877.92	1,504.32	1,301,550.38	3,239,323.47	40.157979	-104.643745
11,293.00	87.16	357.66	6,923.63	3,972.71	1,500.62	1,301,645.13	3,239,318.86	40.158239	-104.643758
11,388.00	89.14	357.92	6,926.70	4,067.58	1,496.96	1,301,739.96	3,239,314.29	40.158499	-104.643771
11,483.00	91.11	357.79	6,926.49	4,162.51	1,493.40	1,301,834.85	3,239,309.82	40.158760	-104.643784
11,578.00	90.68	358.47	6,925.01	4,257.45	1,490.30	1,301,929.74	3,239,305.81	40.159021	-104.643795
11,673.00	91.48	358.03	6,923.22	4,352.39	1,487.40	1,302,024.65	3,239,302.00	40.159281	-104.643806
11,768.00	89.63	358.71	6,922.30	4,447.34	1,484.70	1,302,119.56	3,239,298.39	40.159542	-104.643815
11,863.00	88.08	359.76	6,924.19	4,542.31	1,483.43	1,302,214.51	3,239,296.21	40.159803	-104.643820
11,958.00	88.52	359.21	6,927.01	4,637.26	1,482.58	1,302,309.45	3,239,294.44	40.160063	-104.643823
12,053.00	89.20	358.67	6,928.90	4,732.23	1,480.82	1,302,404.39	3,239,291.77	40.160324	-104.643829
12,115.00	89.69	357.65	6,929.50	4,794.19	1,478.83	1,302,466.33	3,239,289.19	40.160494	-104.643836
Final Sperry MWD Survey @ 12115.00ft									
12,165.00	89.69	357.65	6,929.77	4,844.15	1,476.78	1,302,516.26	3,239,286.66	40.160631	-104.643843
Straight Line Projection to TD @ 12165' MD									

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Cook 37N-E3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Site:	Sec. 10-T2N-R65W	MD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Well:	Cook 37N-E3HZ	North Reference:	True
Wellbore:	Plan F Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

Targets

Target Name	Dip Angle	Dip Dir.	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
Cook 37N-E3HZ_SHL	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									
- Point									
Cook 37N-E3HZ - VS	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
- actual wellpath misses target center by 3.93ft at 11569.11ft MD (6925.12 TVD, 4248.56 N, 1490.55 E)									
- Point									
Cook 37N-E3HZ_Sec	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			0.00	4,792.28	-2,849.28	1,302,422.89	3,234,961.47		
Point 2			0.00	4,795.44	2,425.79	1,302,476.66	3,240,236.05		
Cook 37N-E3HZ_Setl	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			0.00	-47.34	1,942.48	1,297,629.67	3,239,799.25		
Point 2			0.00	2,142.08	1,952.81	1,299,819.00	3,239,788.57		
Point 3			0.00	4,335.14	1,963.16	1,302,011.97	3,239,777.88		
Point 4			0.00	4,333.84	-216.86	1,301,989.75	3,237,598.06		
Point 5			0.00	4,332.54	-2,396.14	1,301,967.54	3,235,418.99		
Point 6			0.00	2,137.32	-2,429.21	1,299,772.19	3,235,406.98		
Point 7			0.00	-32.93	-2,473.27	1,297,601.71	3,235,383.75		
Point 8			0.00	-40.10	-265.54	1,297,615.72	3,237,591.35		
Cook 37N-E3HZ - VS	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
- actual wellpath misses target center by 3.65ft at 12096.08ft MD (6929.38 TVD, 4775.28 N, 1479.56 E)									
- Point									
Cook 37N-E3HZ_BHL	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
- actual wellpath misses target center by 4.37ft at 12165.00ft MD (6929.77 TVD, 4844.15 N, 1476.78 E)									
- Point									
Cook 37N-E3HZ_Sec	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			0.00	-508.87	2,401.64	1,297,172.59	3,240,262.80		
Point 2			0.00	2,142.58	2,412.84	1,299,823.91	3,240,248.56		
Point 3			0.00	4,795.44	2,425.79	1,302,476.66	3,240,236.05		
Point 4			0.00	7,442.33	2,452.62	1,305,123.58	3,240,237.48		
Point 5			0.00	9,921.64	2,495.19	1,307,603.08	3,240,256.26		
Point 6			0.00	9,938.63	-151.89	1,307,594.67	3,237,609.25		
Point 7			0.00	9,955.35	-2,798.92	1,307,585.99	3,234,962.29		
Point 8			0.00	7,447.63	-2,823.37	1,305,078.26	3,234,961.90		
Point 9			0.00	4,792.28	-2,849.28	1,302,422.89	3,234,961.47		
Point 10			0.00	2,136.82	-2,889.29	1,299,767.28	3,234,946.95		
Point 11			0.00	-491.43	-2,942.70	1,297,138.75	3,234,918.76		
Point 12			0.00	-500.10	-270.66	1,297,155.72	3,237,590.65		
Cook 37N-E3HZ - VS	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
- actual wellpath misses target center by 13.93ft at 10516.44ft MD (6921.19 TVD, 3196.97 N, 1486.51 E)									
- Point									
Cook 37N-E3HZ - VS	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
- actual wellpath misses target center by 10.82ft at 8442.47ft MD (6928.18 TVD, 1124.60 N, 1529.36 E)									
- Point									
Cook 37N-E3HZ - VS	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
- actual wellpath misses target center by 11.07ft at 11042.17ft MD (6913.96 TVD, 3722.20 N, 1506.13 E)									
- Point									
Cook 37N-E3HZ - VS	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
- actual wellpath misses target center by 15.08ft at 8960.65ft MD (6920.02 TVD, 1642.69 N, 1530.71 E)									

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Cook 37N-E3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Site:	Sec. 10-T2N-R65W	MD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Well:	Cook 37N-E3HZ	North Reference:	True
Wellbore:	Plan F Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

- Point									
Dowdy #2	0.00	0.00	6,936.72	550.50	1,377.36	1,298,222.03	3,239,228.45	40.148845	-104.644200
- actual wellpath misses target center by 165.31ft at 7870.36ft MD (6949.91 TVD, 553.08 N, 1542.12 E)									
- Circle (radius 150.00)									
Cook 37N-E3HZ_WPI	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_Set	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			0.00	5,255.19	1,970.43	1,302,932.00	3,239,776.32		
Point 2			0.00	7,442.72	1,992.67	1,305,119.56	3,239,777.57		
Point 3			0.00	9,464.52	2,027.30	1,307,141.51	3,239,792.80		
Point 4			0.00	9,478.47	-157.14	1,307,134.50	3,237,608.42		
Point 5			0.00	9,492.43	-2,343.25	1,307,127.48	3,235,422.36		
Point 6			0.00	7,447.33	-2,363.22	1,305,082.37	3,235,422.02		
Point 7			0.00	5,252.58	-2,384.73	1,302,887.61	3,235,421.57		
Point 8			0.00	5,253.88	-206.38	1,302,909.81	3,237,599.71		
Cook 37N-E3HZ - VS	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_Lan	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			0.00	5,673.50	656.06	1,303,337.67	3,238,458.05		
Point 2			0.00	-34.73	628.04	1,297,629.67	3,238,484.80		
Point 3			0.00	-43.39	1,530.03	1,297,629.66	3,239,386.80		
Point 4			0.00	5,664.84	1,558.06	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 - VS	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 - VS	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									

Casing Points					
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 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	

Halliburton Company
Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Cook 37N-E3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Site:	Sec. 10-T2N-R65W	MD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Well:	Cook 37N-E3HZ	North Reference:	True
Wellbore:	Plan F Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

Checked By: _____ Approved By: _____ Date: _____