

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 36-T3N-R66W

USA Fed 03N-36HZ

Plan D0

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

15 August, 2013

Well Coordinates: 1,308,063.26 N, 3,215,664.83 E (40° 10' 35.23" N, 104° 43' 41.46" W)

Ground Level: 5,003.00 ft

Local Coordinate Origin:

Centered on Well USA Fed 03N-36HZ

Viewing Datum:

RKB = 13 @ 5016.00ft (Ensign 132)

TVDs to System:

N

North Reference:

True

Unit System:

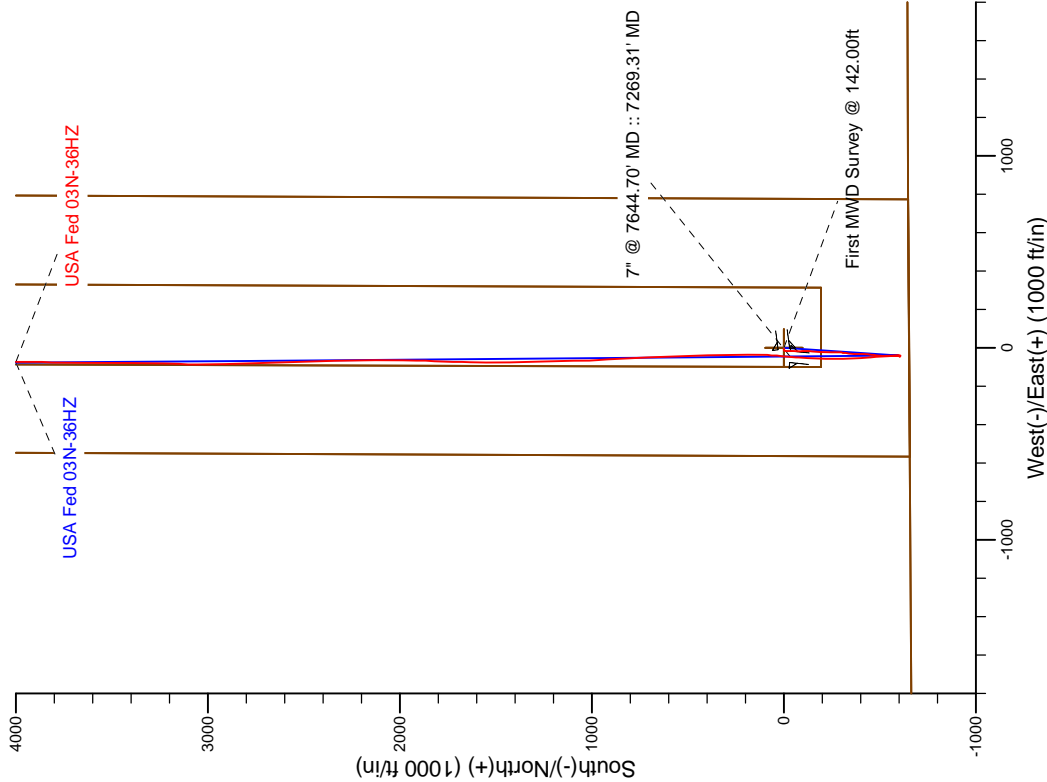
API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

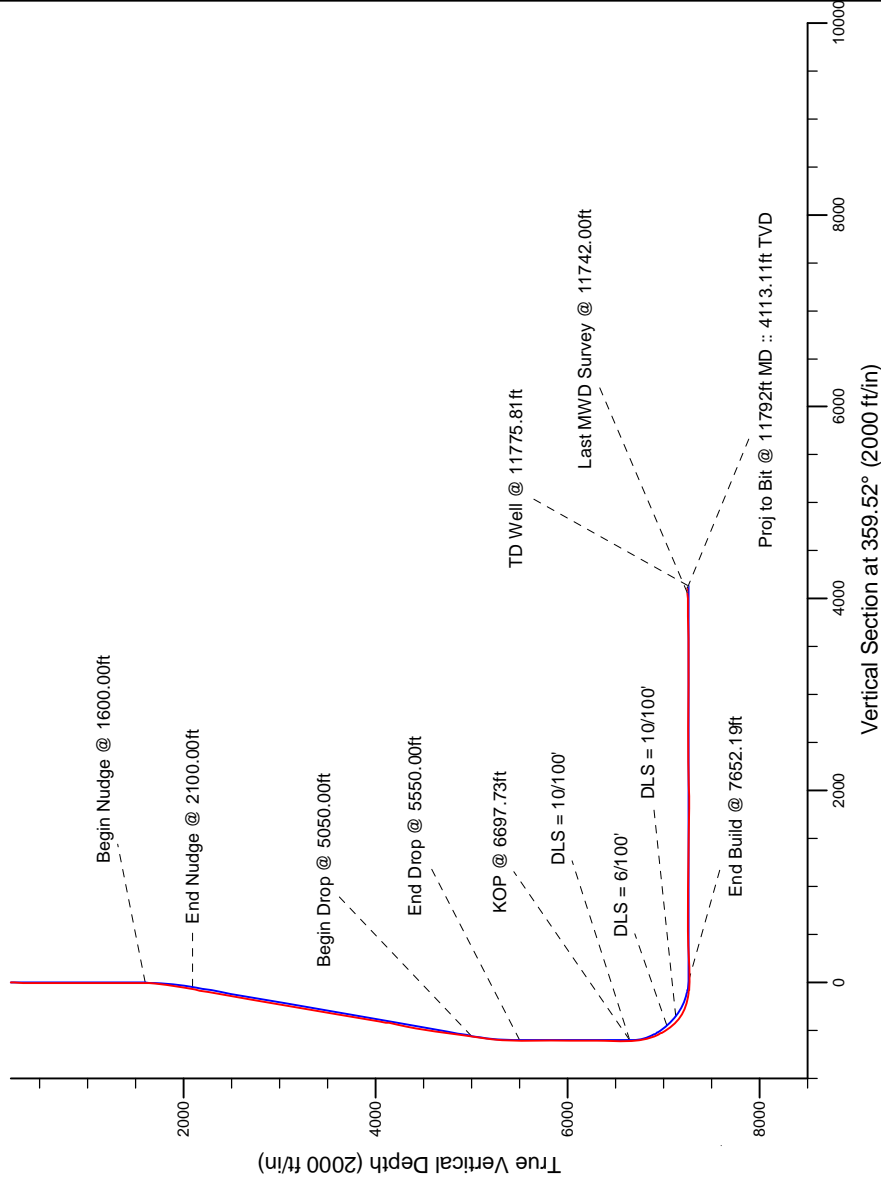
HALLIBURTON

Project: Weld County, CO (NAD 83)
Site: Sec. 36-T3N-R66W
Well: USA Fed 03N-36HZ
Wellbore: Plan D0
Design: Actual Field Surveys



LEGEND

- USA Fed 03N-36HZ, Plan D0, Plan D0 - Proposal V0
- Actual Field Surveys



7" Casing: ~620.84' FSL, ~1860.92' FWL
Lat/Long: 40.176365 N, -104.728347 E
State Planes - CO Northern: 1,308,030.66' N, 3,215,619.52' E
Location: Sec. 36-T3N-R66W

BHL: ~485.03' FNL, ~1813.98' FWL
Lat/Long: 40.187742 N, -104.728432 E
State Planes - CO Northern: 1,312,175.00' N, 3,215,559.68' E
Location: Sec. 36-T3N-R66W

WELL DETAILS: USA Fed 03N-36HZ
Ground Level: 5003.00
RKB = 13 @ 5016.00ft (Ersign 132)

Design: Actual Field Surveys (USA Fed 03N-36HZ/Plan D0)
Created By: Clint Eshelman
Reviewed: _____
Date: 08/15/2013
Date: _____

Design Report for USA Fed 03N-36HZ - 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
142.00	0.24	312.39	142.00	0.20	-0.22	0.20	0.17
First MWD Survey @ 142.00ft							
236.00	0.32	196.55	236.00	0.08	-0.44	0.09	0.51
329.00	0.17	304.20	329.00	-0.09	-0.63	-0.08	0.44
360.00	0.24	282.23	360.00	-0.05	-0.73	-0.04	0.34
451.00	0.62	250.29	451.00	-0.18	-1.38	-0.16	0.48
545.00	0.58	236.16	544.99	-0.61	-2.25	-0.59	0.16
638.00	0.36	256.24	637.99	-0.94	-2.93	-0.92	0.29
731.00	0.54	247.46	730.98	-1.18	-3.62	-1.15	0.21
825.00	0.56	244.05	824.98	-1.55	-4.44	-1.52	0.04
912.00	0.29	260.14	911.98	-1.78	-5.04	-1.73	0.34
961.00	0.49	262.76	960.98	-1.82	-5.37	-1.78	0.41
9 5/8"							
975.00	0.55	263.16	974.98	-1.84	-5.50	-1.79	0.41
1,066.00	0.55	270.51	1,065.97	-1.89	-6.37	-1.83	0.08
1,158.00	0.67	274.56	1,157.97	-1.84	-7.34	-1.78	0.14
1,250.00	0.68	267.28	1,249.96	-1.82	-8.42	-1.75	0.09
1,341.00	0.77	273.68	1,340.95	-1.81	-9.57	-1.73	0.13
1,433.00	0.88	271.47	1,432.94	-1.75	-10.90	-1.66	0.12
1,525.00	0.81	259.53	1,524.93	-1.85	-12.24	-1.75	0.21
1,617.00	2.22	202.22	1,616.90	-3.62	-13.56	-3.51	2.07
1,708.00	4.57	189.89	1,707.74	-8.82	-14.85	-8.70	2.69
1,800.00	6.68	178.03	1,799.29	-17.78	-15.29	-17.66	2.61
1,891.00	8.53	178.36	1,889.49	-29.82	-14.92	-29.69	2.03
1,986.00	10.67	182.83	1,983.15	-45.65	-15.15	-45.52	2.38
2,081.00	10.12	181.88	2,076.59	-62.78	-15.86	-62.64	0.61
2,176.00	11.18	179.98	2,169.96	-80.33	-16.13	-80.19	1.18
2,271.00	10.06	178.00	2,263.33	-97.83	-15.83	-97.69	1.24
2,366.00	9.77	182.22	2,356.91	-114.18	-15.86	-114.04	0.82
2,462.00	10.46	187.57	2,451.42	-130.96	-17.32	-130.81	1.21
2,557.00	8.65	187.51	2,545.10	-146.59	-19.39	-146.42	1.91
2,652.00	9.18	182.25	2,638.95	-161.24	-20.62	-161.06	1.02
2,747.00	10.17	181.18	2,732.60	-177.20	-21.09	-177.02	1.06
2,842.00	8.66	181.10	2,826.32	-192.74	-21.40	-192.55	1.59
2,937.00	10.64	180.68	2,919.97	-208.66	-21.64	-208.47	2.09
3,032.00	10.74	181.58	3,013.32	-226.28	-21.99	-226.09	0.20
3,127.00	10.24	181.43	3,106.73	-243.57	-22.45	-243.37	0.53
3,222.00	9.14	177.98	3,200.38	-259.55	-22.39	-259.35	1.31
3,318.00	9.02	176.52	3,295.17	-274.68	-21.67	-274.49	0.27
3,413.00	10.91	185.61	3,388.74	-291.06	-22.09	-290.87	2.58
3,508.00	9.56	188.86	3,482.23	-307.81	-24.19	-307.59	1.55
3,603.00	9.26	184.08	3,575.95	-323.23	-25.95	-323.00	0.88
3,698.00	9.02	189.83	3,669.75	-338.19	-27.76	-337.94	0.99
3,793.00	10.89	185.34	3,763.31	-354.46	-29.87	-354.20	2.13
3,888.00	10.37	180.60	3,856.68	-371.95	-30.79	-371.68	1.07
3,983.00	8.53	178.91	3,950.39	-387.54	-30.75	-387.27	1.96
4,079.00	9.20	181.40	4,045.24	-402.33	-30.80	-402.06	0.80
4,174.00	11.42	185.60	4,138.71	-419.29	-31.90	-419.01	2.47
4,269.00	11.83	186.35	4,231.76	-438.33	-33.90	-438.03	0.46

Design Report for USA Fed 03N-36HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,364.00	11.22	187.13	4,324.84	-457.18	-36.12	-456.86	0.66
4,459.00	9.92	185.99	4,418.23	-474.49	-38.12	-474.15	1.39
4,554.00	8.68	185.24	4,511.98	-489.76	-39.63	-489.41	1.31
4,650.00	7.76	187.20	4,606.99	-503.41	-41.11	-503.05	1.00
4,745.00	7.44	181.49	4,701.16	-515.92	-42.07	-515.55	0.86
4,840.00	8.34	173.51	4,795.26	-528.91	-41.45	-528.55	1.49
4,935.00	8.11	177.32	4,889.28	-542.45	-40.36	-542.10	0.62
5,030.00	7.38	180.51	4,983.42	-555.25	-40.10	-554.89	0.89
5,125.00	8.47	178.22	5,077.51	-568.34	-39.94	-567.99	1.19
5,220.00	7.40	184.53	5,171.60	-581.44	-40.20	-581.08	1.45
5,315.00	5.86	177.03	5,265.96	-592.38	-40.44	-592.02	1.86
5,410.00	2.34	177.90	5,360.70	-599.16	-40.11	-598.80	3.71
5,506.00	0.32	222.14	5,456.67	-601.32	-40.22	-600.96	2.21
5,696.00	0.54	263.05	5,646.67	-601.82	-41.47	-601.45	0.19
5,791.00	0.62	266.54	5,741.66	-601.91	-42.42	-601.53	0.09
5,981.00	0.28	266.08	5,931.66	-602.00	-43.91	-601.61	0.18
6,076.00	0.40	171.98	6,026.66	-602.34	-44.10	-601.95	0.53
6,171.00	0.37	178.11	6,121.65	-602.98	-44.04	-602.59	0.05
6,266.00	0.48	153.04	6,216.65	-603.64	-43.85	-603.25	0.22
6,361.00	0.72	149.41	6,311.65	-604.51	-43.37	-604.12	0.26
6,456.00	0.72	151.68	6,406.64	-605.55	-42.78	-605.17	0.03
6,552.00	1.00	158.65	6,502.63	-606.86	-42.19	-606.48	0.31
6,647.00	0.94	154.97	6,597.62	-608.34	-41.56	-607.97	0.09
6,695.00	0.58	109.01	6,645.61	-608.77	-41.16	-608.41	1.42
6,742.00	4.76	2.84	6,692.56	-606.90	-40.84	-606.54	10.54
6,790.00	9.71	357.48	6,740.16	-600.87	-40.92	-600.50	10.40
6,837.00	13.30	354.72	6,786.21	-591.52	-41.59	-591.15	7.73
6,885.00	17.21	357.35	6,832.51	-578.92	-42.43	-578.55	8.27
6,932.00	17.86	2.37	6,877.33	-564.78	-42.45	-564.40	3.50
6,980.00	21.63	359.73	6,922.50	-548.57	-42.19	-548.20	8.07
7,027.00	26.01	356.23	6,965.49	-529.61	-42.91	-529.23	9.79
7,075.00	30.71	355.28	7,007.72	-506.88	-44.61	-506.49	9.84
7,122.00	35.81	354.24	7,047.00	-481.22	-46.98	-480.81	10.92
7,170.00	39.90	353.83	7,084.89	-451.93	-50.04	-451.50	8.54
7,218.00	43.72	356.72	7,120.67	-420.05	-52.65	-419.60	8.91
7,266.00	50.16	357.59	7,153.42	-385.05	-54.37	-384.58	13.48
7,313.00	56.02	358.28	7,181.64	-347.51	-55.72	-347.03	12.52
7,361.00	62.98	358.31	7,205.99	-306.19	-56.95	-305.70	14.50
7,408.00	68.63	359.58	7,225.24	-263.35	-57.73	-262.85	12.27
7,456.00	74.06	1.58	7,240.59	-217.89	-57.25	-217.40	11.98
7,503.00	78.23	3.25	7,251.84	-172.31	-55.32	-171.84	9.52
7,551.00	81.18	3.23	7,260.42	-125.16	-52.66	-124.72	6.15
7,598.00	84.94	4.66	7,266.10	-78.63	-49.44	-78.21	8.55
7,612.00	85.43	4.75	7,267.27	-64.72	-48.30	-64.32	3.56
7,644.70	87.43	4.75	7,269.31	-32.20	-45.60	-31.82	6.10
7" @ 7644.70' MD :: 7269.31' MD							
7,691.00	90.25	4.76	7,270.25	13.92	-41.76	14.27	6.10
7,786.00	90.99	1.78	7,269.22	108.75	-36.34	109.05	3.23
7,881.00	91.73	359.14	7,266.97	203.71	-35.58	204.00	2.89
7,976.00	92.04	358.87	7,263.84	298.65	-37.23	298.95	0.43
8,071.00	92.47	358.70	7,260.10	393.55	-39.24	393.87	0.49

Design Report for USA Fed 03N-36HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,166.00	90.93	358.52	7,257.29	488.48	-41.54	488.81	1.63
8,261.00	89.75	358.47	7,256.72	583.44	-44.04	583.79	1.24
8,356.00	89.94	357.91	7,256.98	678.40	-47.04	678.77	0.62
8,452.00	90.19	357.18	7,256.87	774.31	-51.15	774.71	0.80
8,547.00	90.19	355.96	7,256.56	869.13	-56.83	869.58	1.28
8,642.00	90.25	357.11	7,256.19	963.96	-62.57	964.45	1.21
8,737.00	90.31	358.86	7,255.73	1,058.89	-65.91	1,059.41	1.84
8,832.00	89.07	359.87	7,256.24	1,153.88	-66.97	1,154.41	1.68
8,927.00	89.26	357.65	7,257.63	1,248.85	-69.02	1,249.38	2.35
9,022.00	89.01	357.95	7,259.06	1,343.77	-72.67	1,344.33	0.41
9,117.00	88.33	359.75	7,261.26	1,438.72	-74.58	1,439.29	2.02
9,212.00	89.07	1.16	7,263.42	1,533.69	-73.82	1,534.25	1.68
9,307.00	89.26	0.35	7,264.80	1,628.67	-72.57	1,629.22	0.88
9,402.00	89.38	1.51	7,265.93	1,723.65	-71.03	1,724.18	1.23
9,497.00	89.75	1.80	7,266.65	1,818.60	-68.28	1,819.11	0.49
9,592.00	88.70	0.67	7,267.94	1,913.57	-66.24	1,914.06	1.62
9,688.00	90.86	0.53	7,268.31	2,009.56	-65.23	2,010.03	2.25
9,783.00	92.47	0.56	7,265.55	2,104.51	-64.33	2,104.98	1.70
9,878.00	93.09	359.34	7,260.94	2,199.40	-64.41	2,199.86	1.44
9,973.00	91.05	359.35	7,257.51	2,294.32	-65.50	2,294.79	2.15
10,068.00	89.32	358.58	7,257.20	2,389.30	-67.21	2,389.78	1.99
10,163.00	89.69	358.31	7,258.02	2,484.26	-69.79	2,484.76	0.48
10,258.00	90.93	357.41	7,257.51	2,579.19	-73.34	2,579.72	1.61
10,353.00	90.56	358.14	7,256.27	2,674.11	-77.03	2,674.66	0.86
10,448.00	89.26	358.31	7,256.42	2,769.06	-79.97	2,769.64	1.38
10,543.00	88.02	359.26	7,258.68	2,864.01	-81.98	2,864.60	1.64
10,639.00	89.38	359.27	7,260.85	2,959.98	-83.21	2,960.57	1.42
10,734.00	89.81	359.74	7,261.53	3,054.97	-84.03	3,055.57	0.67
10,829.00	90.68	0.80	7,261.12	3,149.97	-83.59	3,150.56	1.44
10,924.00	89.81	2.18	7,260.71	3,244.93	-81.12	3,245.50	1.72
11,019.00	90.06	1.12	7,260.82	3,339.89	-78.38	3,340.43	1.15
11,114.00	89.32	359.63	7,261.34	3,434.88	-77.76	3,435.42	1.75
11,209.00	90.25	359.80	7,261.69	3,529.88	-78.23	3,530.41	1.00
11,304.00	91.05	1.56	7,260.61	3,624.86	-77.10	3,625.38	2.03
11,399.00	90.99	0.30	7,258.92	3,719.83	-75.56	3,720.34	1.33
11,494.00	90.93	1.40	7,257.33	3,814.81	-74.15	3,815.30	1.16
11,589.00	91.24	0.29	7,255.53	3,909.78	-72.75	3,910.25	1.21
11,684.00	91.73	1.75	7,253.07	4,004.73	-71.06	4,005.19	1.62
11,742.00	91.61	0.59	7,251.38	4,062.69	-69.88	4,063.14	2.01
Last MWD Survey @ 11742.00ft							
11,792.00	91.61	0.59	7,249.97	4,112.67	-69.36	4,113.11	0.00
Proj to Bit @ 11792ft MD :: 4113.11ft TVD							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
142.00	142.00	0.20	-0.22	First MWD Survey @ 142.00ft
11,742.00	7,251.38	4,062.69	-69.88	Last MWD Survey @ 11742.00ft
11,792.00	7,249.97	4,112.67	-69.36	Proj to Bit @ 11792ft MD :: 4113.11ft TVD

Design Report for USA Fed 03N-36HZ - Actual Field Surveys

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	359.52	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
142.00	7,612.00	Vertical/Build	MWD+IFR1+SC
7,691.00	11,742.00	MWD Surveys Lateral	MWD+IFR1+SC

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
961.00	960.98	9 5/8"	9-5/8	13-1/2
7,644.70	7,269.31	7" @ 7644.70' MD :: 7269.31' MD	7	8-3/4

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
USA Fed 03N-36HZ	0.00	0.00	0.00	0.01	0.00	1,308,063.27	3,215,664.83	40.176453	-104.728184
- actual wellpath hits target center									
- Polygon									
Point 1				-542.79	4,592.56	1,312,650.73	3,215,082.12		
Point 2				797.81	4,608.27	1,312,678.10	3,216,422.47		
Point 3				775.12	-648.92	1,307,421.14	3,216,445.54		
Point 4				-567.14	-655.30	1,307,403.07	3,215,103.44		
Point 5				-543.03	4,564.56	1,312,622.73	3,215,082.12		
USA Fed 03N-36HZ	0.00	0.00	0.00	0.01	0.00	1,308,063.27	3,215,664.83	40.176453	-104.728184
- actual wellpath hits target center									
- Polygon									
Point 1				-86.07	4,135.55	1,312,197.73	3,215,542.78		
Point 2				330.15	4,157.31	1,312,223.11	3,215,958.77		
Point 3				315.36	-192.88	1,307,873.14	3,215,981.85		
Point 4				-100.69	-194.32	1,307,868.08	3,215,565.84		
Point 5				-86.37	4,100.55	1,312,162.73	3,215,542.78		
USA Fed 03N-36HZ	0.00	0.00	0.00	0.01	0.00	1,308,063.27	3,215,664.83	40.176453	-104.728184
- actual wellpath hits target center									
- Point									
USA Fed 03N-36HZ	0.00	0.00	7,258.00	4,138.06	-78.23	1,312,200.31	3,215,550.59	40.187812	-104.728464
- actual wellpath misses target center by 28.07ft at 11792.00ft MD (7249.97 TVD, 4112.67 N, -69.36 E)									
- Point									
USA Fed 03N-36HZ	0.00	0.00	0.00	0.01	0.00	1,308,063.27	3,215,664.83	40.176453	-104.728184
- actual wellpath hits target center									
- Polygon									
Point 1				-1,883.38	4,576.23	1,312,622.73	3,213,741.78		
Point 2				797.24	4,608.28	1,312,678.11	3,216,421.90		
Point 3				3,477.86	4,640.35	1,312,733.51	3,219,102.03		
Point 4				3,463.18	2,002.60	1,310,095.84	3,219,110.31		
Point 5				3,447.56	-635.51	1,307,457.80	3,219,117.65		
Point 6				771.37	-648.88	1,307,421.14	3,216,441.79		
Point 7				-1,905.91	-662.64	1,307,384.08	3,213,764.84		
Point 8				-1,894.42	1,956.86	1,310,003.47	3,213,753.53		
Point 9				-1,883.38	4,576.23	1,312,622.73	3,213,741.78		

North Reference Sheet for Sec. 36-T3N-R66W - USA Fed 03N-36HZ - Plan D0

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

Vertical Depths are relative to RKB = 13 @ 5016.00ft (Ensign 132). Northing and Easting are relative to USA Fed 03N-36HZ

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: 0.99995768

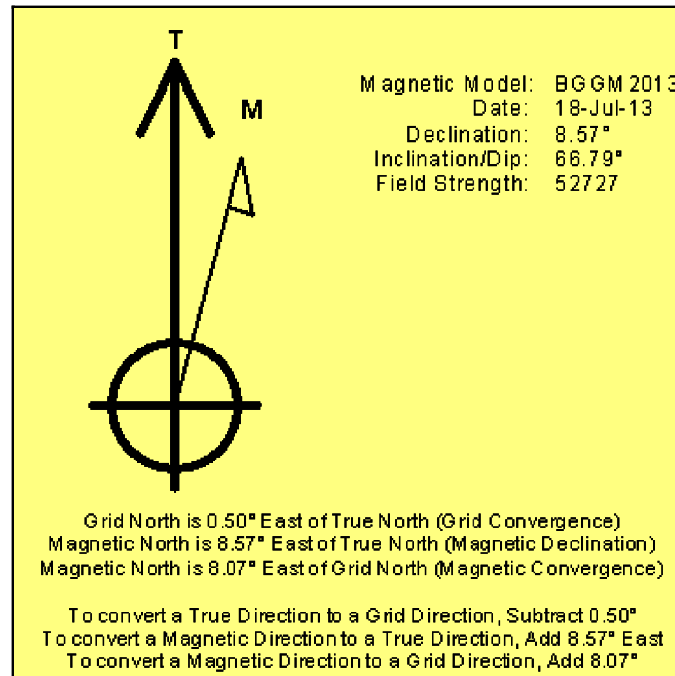
Grid Coordinates of Well: 1,308,063.26 ft N, 3,215,664.83 ft E

Geographical Coordinates of Well: 40° 10' 35.23" N, 104° 43' 41.46" W

Grid Convergence at Surface is: 0.50°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,792.00ft
the Bottom Hole Displacement is 4,113.26ft in the Direction of 359.03° (True).

Magnetic Convergence at surface is: -8.07° (18 July 2013, , BGGM2013)



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 36-T3N-R66W

USA Fed 03N-36HZ

Plan D0

Design: Actual Field Surveys

Sperry Drilling Services Geodetic Report

15 August, 2013

Well Coordinates: 1,308,063.26 N, 3,215,664.83 E (40° 10' 35.23" N, 104° 43' 41.46" W)
Ground Level: 5,003.00 ft

Local Coordinate Origin: Centered on Well USA Fed 03N-36HZ
Viewing Datum: RKB = 13 @ 5016.00ft (Ensign 132)
TVDs to System: N
North Reference: True
Unit System: API - US Survey Feet - Custom

Geodetic Scale Factor Applied
Version: 2003.16 Build: 431

HALLIBURTON

Design Report for USA Fed 03N-36HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (ft)	+E/-W (ft)	Latitude (ft)	Longitude (ft)	Northing (ft)	Easting (ft)
0.00	0.00	0.00	0.00	0.00	0.00	40.176453	-104.728184	1,308,063.26	3,215,664.83
142.00	0.24	312.39	142.00	0.20	-0.22	40.176454	-104.728185	1,308,063.46	3,215,664.61
236.00	0.32	196.55	236.00	0.08	-0.44	40.176453	-104.728186	1,308,063.34	3,215,664.39
329.00	0.17	304.20	329.00	-0.09	-0.63	40.176453	-104.728186	1,308,063.16	3,215,664.21
360.00	0.24	282.23	360.00	-0.05	-0.73	40.176453	-104.728187	1,308,063.20	3,215,664.10
451.00	0.62	250.29	451.00	-0.18	-1.38	40.176452	-104.728189	1,308,063.07	3,215,663.46
545.00	0.58	236.16	544.99	-0.61	-2.25	40.176451	-104.728192	1,308,062.63	3,215,662.59
638.00	0.36	256.24	637.99	-0.94	-2.93	40.176450	-104.728194	1,308,062.29	3,215,661.91
731.00	0.54	247.46	730.98	-1.18	-3.62	40.176450	-104.728197	1,308,062.05	3,215,661.23
825.00	0.56	244.05	824.98	-1.55	-4.44	40.176449	-104.728200	1,308,061.67	3,215,660.41
912.00	0.29	260.14	911.98	-1.78	-5.04	40.176448	-104.728202	1,308,061.44	3,215,659.81
961.00	0.49	262.76	960.98	-1.82	-5.37	40.176448	-104.728203	1,308,061.39	3,215,659.48
975.00	0.55	263.16	974.98	-1.84	-5.50	40.176448	-104.728204	1,308,061.37	3,215,659.36
1,066.00	0.55	270.51	1,065.97	-1.89	-6.37	40.176448	-104.728207	1,308,061.32	3,215,658.49
1,158.00	0.67	274.56	1,157.97	-1.84	-7.34	40.176448	-104.728210	1,308,061.36	3,215,657.51
1,250.00	0.68	267.28	1,249.96	-1.82	-8.42	40.176448	-104.728214	1,308,061.36	3,215,656.43
1,341.00	0.77	273.68	1,340.95	-1.81	-9.57	40.176448	-104.728218	1,308,061.37	3,215,655.28
1,433.00	0.88	271.47	1,432.94	-1.75	-10.90	40.176448	-104.728223	1,308,061.41	3,215,653.95
1,525.00	0.81	259.53	1,524.93	-1.85	-12.24	40.176448	-104.728228	1,308,061.30	3,215,652.61
1,617.00	2.22	202.22	1,616.90	-3.62	-13.56	40.176443	-104.728233	1,308,059.52	3,215,651.31
1,708.00	4.57	189.89	1,707.74	-8.82	-14.85	40.176429	-104.728237	1,308,054.31	3,215,650.07
1,800.00	6.68	178.03	1,799.29	-17.78	-15.29	40.176404	-104.728239	1,308,045.34	3,215,649.70
1,891.00	8.53	178.36	1,889.49	-29.82	-14.92	40.176371	-104.728237	1,308,033.31	3,215,650.18
1,986.00	10.67	182.83	1,983.15	-45.65	-15.15	40.176328	-104.728238	1,308,017.48	3,215,650.08
2,081.00	10.12	181.88	2,076.59	-62.78	-15.86	40.176281	-104.728241	1,308,000.35	3,215,649.52
2,176.00	11.18	179.98	2,169.96	-80.33	-16.13	40.176232	-104.728242	1,307,982.80	3,215,649.41
2,271.00	10.06	178.00	2,263.33	-97.83	-15.83	40.176184	-104.728241	1,307,965.30	3,215,649.85
2,366.00	9.77	182.22	2,356.91	-114.18	-15.86	40.176140	-104.728241	1,307,948.95	3,215,649.97
2,462.00	10.46	187.57	2,451.42	-130.96	-17.32	40.176093	-104.728246	1,307,932.16	3,215,648.65
2,557.00	8.65	187.51	2,545.10	-146.59	-19.39	40.176051	-104.728253	1,307,916.52	3,215,646.72
2,652.00	9.18	182.25	2,638.95	-161.24	-20.62	40.176010	-104.728258	1,307,901.85	3,215,645.62
2,747.00	10.17	181.18	2,732.60	-177.20	-21.09	40.175967	-104.728259	1,307,885.89	3,215,645.29
2,842.00	8.66	181.10	2,826.32	-192.74	-21.40	40.175924	-104.728261	1,307,870.35	3,215,645.11
2,937.00	10.64	180.68	2,919.97	-208.66	-21.64	40.175880	-104.728261	1,307,854.43	3,215,645.01
3,032.00	10.74	181.58	3,013.32	-226.28	-21.99	40.175832	-104.728263	1,307,836.81	3,215,644.81
3,127.00	10.24	181.43	3,106.73	-243.57	-22.45	40.175784	-104.728264	1,307,819.52	3,215,644.51
3,222.00	9.14	177.98	3,200.38	-259.55	-22.39	40.175740	-104.728264	1,307,803.54	3,215,644.70
3,318.00	9.02	176.52	3,295.17	-274.68	-21.67	40.175699	-104.728262	1,307,788.41	3,215,645.56
3,413.00	10.91	185.61	3,388.74	-291.06	-22.09	40.175654	-104.728263	1,307,772.03	3,215,645.28
3,508.00	9.56	188.86	3,482.23	-307.81	-24.19	40.175608	-104.728271	1,307,755.27	3,215,643.33
3,603.00	9.26	184.08	3,575.95	-323.23	-25.95	40.175566	-104.728277	1,307,739.83	3,215,641.70
3,698.00	9.02	189.83	3,669.75	-338.19	-27.76	40.175525	-104.728283	1,307,724.86	3,215,640.02

Design Report for USA Fed 03N-36HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (ft)	+E/-W (ft)	Latitude (ft)	Longitude (ft)	Northing (ft)	Easting (ft)
3,793.00	10.89	185.34	3,763.31	-354.46	-29.87	40.175480	-104.728291	1,307,708.57	3,215,638.05
3,888.00	10.37	180.60	3,856.68	-371.95	-30.79	40.175432	-104.728294	1,307,691.07	3,215,637.28
3,983.00	8.53	178.91	3,950.39	-387.54	-30.75	40.175389	-104.728294	1,307,675.48	3,215,637.46
4,079.00	9.20	181.40	4,045.24	-402.33	-30.80	40.175349	-104.728294	1,307,660.69	3,215,637.54
4,174.00	11.42	185.60	4,138.71	-419.29	-31.90	40.175302	-104.728298	1,307,643.73	3,215,636.58
4,269.00	11.83	186.35	4,231.76	-438.33	-33.90	40.175250	-104.728305	1,307,624.67	3,215,634.75
4,364.00	11.22	187.13	4,324.84	-457.18	-36.12	40.175198	-104.728313	1,307,605.81	3,215,632.69
4,459.00	9.92	185.99	4,418.23	-474.49	-38.12	40.175150	-104.728320	1,307,588.48	3,215,630.84
4,554.00	8.68	185.24	4,511.98	-489.76	-39.63	40.175109	-104.728326	1,307,573.19	3,215,629.47
4,650.00	7.76	187.20	4,606.99	-503.41	-41.11	40.175071	-104.728331	1,307,559.53	3,215,628.11
4,745.00	7.44	181.49	4,701.16	-515.92	-42.07	40.175037	-104.728335	1,307,547.02	3,215,627.26
4,840.00	8.34	173.51	4,795.26	-528.91	-41.45	40.175001	-104.728332	1,307,534.03	3,215,627.99
4,935.00	8.11	177.32	4,889.28	-542.45	-40.36	40.174964	-104.728328	1,307,520.50	3,215,629.20
5,030.00	7.38	180.51	4,983.42	-555.25	-40.10	40.174929	-104.728327	1,307,507.71	3,215,629.57
5,125.00	8.47	178.22	5,077.51	-568.34	-39.94	40.174893	-104.728327	1,307,494.61	3,215,629.85
5,220.00	7.40	184.53	5,171.60	-581.44	-40.20	40.174857	-104.728328	1,307,481.52	3,215,629.69
5,315.00	5.86	177.03	5,265.96	-592.38	-40.44	40.174827	-104.728329	1,307,470.58	3,215,629.56
5,410.00	2.34	177.90	5,360.70	-599.16	-40.11	40.174808	-104.728328	1,307,463.80	3,215,629.94
5,506.00	0.32	222.14	5,456.67	-601.32	-40.22	40.174802	-104.728328	1,307,461.64	3,215,629.85
5,696.00	0.54	263.05	5,646.67	-601.82	-41.47	40.174801	-104.728332	1,307,461.13	3,215,628.61
5,791.00	0.62	266.54	5,741.66	-601.91	-42.42	40.174801	-104.728336	1,307,461.03	3,215,627.65
5,981.00	0.28	266.08	5,931.66	-602.00	-43.91	40.174800	-104.728341	1,307,460.93	3,215,626.16
6,076.00	0.40	171.98	6,026.66	-602.34	-44.10	40.174800	-104.728342	1,307,460.58	3,215,625.98
6,171.00	0.37	178.11	6,121.65	-602.98	-44.04	40.174798	-104.728342	1,307,459.95	3,215,626.04
6,266.00	0.48	153.04	6,216.65	-603.64	-43.85	40.174796	-104.728341	1,307,459.29	3,215,626.24
6,361.00	0.72	149.41	6,311.65	-604.51	-43.37	40.174794	-104.728339	1,307,458.42	3,215,626.73
6,456.00	0.72	151.68	6,406.64	-605.55	-42.78	40.174791	-104.728337	1,307,457.39	3,215,627.33
6,552.00	1.00	158.65	6,502.63	-606.86	-42.19	40.174787	-104.728335	1,307,456.08	3,215,627.93
6,647.00	0.94	154.97	6,597.62	-608.34	-41.56	40.174783	-104.728333	1,307,454.61	3,215,628.57
6,695.00	0.58	109.01	6,645.61	-608.77	-41.16	40.174782	-104.728331	1,307,454.18	3,215,628.97
6,742.00	4.76	2.84	6,692.56	-606.90	-40.84	40.174787	-104.728330	1,307,456.05	3,215,629.28
6,790.00	9.71	357.48	6,740.16	-600.87	-40.92	40.174804	-104.728330	1,307,462.09	3,215,629.15
6,837.00	13.30	354.72	6,786.21	-591.52	-41.59	40.174829	-104.728333	1,307,471.43	3,215,628.39
6,885.00	17.21	357.35	6,832.51	-578.92	-42.43	40.174864	-104.728336	1,307,484.01	3,215,627.45
6,932.00	17.86	2.37	6,877.33	-564.78	-42.45	40.174903	-104.728336	1,307,498.16	3,215,627.30
6,980.00	21.63	359.73	6,922.50	-548.57	-42.19	40.174947	-104.728335	1,307,514.37	3,215,627.42
7,027.00	26.01	356.23	6,965.49	-529.61	-42.91	40.174999	-104.728338	1,307,533.32	3,215,626.54
7,075.00	30.71	355.28	7,007.72	-506.88	-44.61	40.175062	-104.728344	1,307,556.03	3,215,624.64
7,122.00	35.81	354.24	7,047.00	-481.22	-46.98	40.175132	-104.728352	1,307,581.66	3,215,622.05
7,170.00	39.90	353.83	7,084.89	-451.93	-50.04	40.175212	-104.728363	1,307,610.93	3,215,618.73
7,218.00	43.72	356.72	7,120.67	-420.05	-52.65	40.175300	-104.728372	1,307,642.78	3,215,615.85
7,266.00	50.16	357.59	7,153.42	-385.05	-54.37	40.175396	-104.728379	1,307,677.77	3,215,613.82

Design Report for USA Fed 03N-36HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (ft)	+E/-W (ft)	Latitude (ft)	Longitude (ft)	Northing (ft)	Easting (ft)
7,313.00	56.02	358.28	7,181.64	-347.51	-55.72	40.175499	-104.728383	1,307,715.30	3,215,612.14
7,361.00	62.98	358.31	7,205.99	-306.19	-56.95	40.175612	-104.728388	1,307,756.60	3,215,610.56
7,408.00	68.63	359.58	7,225.24	-263.35	-57.73	40.175730	-104.728391	1,307,799.43	3,215,609.40
7,456.00	74.06	1.58	7,240.59	-217.89	-57.25	40.175855	-104,728389	1,307,844.89	3,215,609.48
7,503.00	78.23	3.25	7,251.84	-172.31	-55.32	40.175980	-104.728382	1,307,890.48	3,215,611.01
7,551.00	81.18	3.23	7,260.42	-125.16	-52.66	40.176109	-104.728372	1,307,937.65	3,215,613.27
7,598.00	84.94	4.66	7,266.10	-78.63	-49.44	40.176237	-104.728361	1,307,984.21	3,215,616.08
7,612.00	85.43	4.75	7,267.27	-64.72	-48.30	40.176275	-104.728357	1,307,998.12	3,215,617.10
7,644.70	87.43	4.75	7,269.31	-32.20	-45.60	40.176365	-104.728347	1,308,030.66	3,215,619.52
7,691.00	90.25	4.76	7,270.25	13.92	-41.76	40.176491	-104.728333	1,308,076.82	3,215,622.96
7,786.00	90.99	1.78	7,269.22	108.75	-36.34	40.176751	-104.728314	1,308,171.69	3,215,627.55
7,881.00	91.73	359.14	7,266.97	203.71	-35.58	40.177012	-104.728311	1,308,266.65	3,215,627.49
7,976.00	92.04	358.87	7,263.84	298.65	-37.23	40.177273	-104.728317	1,308,361.56	3,215,625.01
8,071.00	92.47	358.70	7,260.10	393.55	-39.24	40.177533	-104.728324	1,308,456.44	3,215,622.17
8,166.00	90.93	358.52	7,257.29	488.48	-41.54	40.177794	-104.728333	1,308,551.34	3,215,619.04
8,261.00	89.75	358.47	7,256.72	583.44	-44.04	40.178055	-104.728342	1,308,646.27	3,215,615.72
8,356.00	89.94	357.91	7,256.98	678.40	-47.04	40.178315	-104.728352	1,308,741.19	3,215,611.90
8,452.00	90.19	357.18	7,256.87	774.31	-51.15	40.178578	-104.728367	1,308,837.06	3,215,606.95
8,547.00	90.19	355.96	7,256.56	869.13	-56.83	40.178839	-104.728387	1,308,931.83	3,215,600.44
8,642.00	90.25	357.11	7,256.19	963.96	-62.57	40.179099	-104.728408	1,309,026.60	3,215,593.87
8,737.00	90.31	358.86	7,255.73	1,058.89	-65.91	40.179360	-104.728420	1,309,121.50	3,215,589.71
8,832.00	89.07	359.87	7,256.24	1,153.88	-66.97	40.179620	-104.728424	1,309,216.47	3,215,587.83
8,927.00	89.26	357.65	7,257.63	1,248.85	-69.02	40.179881	-104.728431	1,309,311.41	3,215,584.95
9,022.00	89.01	357.95	7,259.06	1,343.77	-72.67	40.180142	-104.728444	1,309,406.28	3,215,580.47
9,117.00	88.33	359.75	7,261.26	1,438.72	-74.58	40.180402	-104.728451	1,309,501.21	3,215,577.74
9,212.00	89.07	1.16	7,263.42	1,533.69	-73.82	40.180663	-104.728448	1,309,596.18	3,215,577.67
9,307.00	89.26	0.35	7,264.80	1,628.67	-72.57	40.180924	-104.728444	1,309,691.16	3,215,578.09
9,402.00	89.38	1.51	7,265.93	1,723.65	-71.03	40.181184	-104.728438	1,309,786.15	3,215,578.81
9,497.00	89.75	1.80	7,266.65	1,818.60	-68.28	40.181445	-104.728428	1,309,881.12	3,215,580.73
9,592.00	88.70	0.67	7,267.94	1,913.57	-66.24	40.181706	-104.728421	1,309,976.10	3,215,581.95
9,688.00	90.86	0.53	7,268.31	2,009.56	-65.23	40.181969	-104.728417	1,310,072.09	3,215,582.12
9,783.00	92.47	0.56	7,265.55	2,104.51	-64.33	40.182230	-104.728414	1,310,167.04	3,215,582.19
9,878.00	93.09	359.34	7,260.94	2,199.40	-64.41	40.182490	-104.728415	1,310,261.92	3,215,581.29
9,973.00	91.05	359.35	7,257.51	2,294.32	-65.50	40.182751	-104.728418	1,310,356.83	3,215,579.37
10,068.00	89.32	358.58	7,257.20	2,389.30	-67.21	40.183012	-104.728425	1,310,451.79	3,215,576.83
10,163.00	89.69	358.31	7,258.02	2,484.26	-69.79	40.183272	-104.728434	1,310,546.72	3,215,573.43
10,258.00	90.93	357.41	7,257.51	2,579.19	-73.34	40.183533	-104.728446	1,310,641.61	3,215,569.05
10,353.00	90.56	358.14	7,256.27	2,674.11	-77.03	40.183793	-104.728460	1,310,736.49	3,215,564.54
10,448.00	89.26	358.31	7,256.42	2,769.06	-79.97	40.184054	-104.728470	1,310,831.41	3,215,560.77
10,543.00	88.02	359.26	7,258.68	2,864.01	-81.98	40.184315	-104.728477	1,310,926.33	3,215,557.93
10,639.00	89.38	359.27	7,260.85	2,959.98	-83.21	40.184578	-104.728482	1,311,022.28	3,215,555.87
10,734.00	89.81	359.74	7,261.53	3,054.97	-84.03	40.184839	-104.728485	1,311,117.26	3,215,554.22

Design Report for USA Fed 03N-36HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical		Local Coordinates		Geographic Coordinates		UTM Coordinates	
			Depth (ft)	+E/-W (ft)	+N/-S (ft)	+E/-W (ft)	Latitude (ft)	Longitude (ft)	Northing (ft)	Easting (ft)
10,829.00	90.68	0.80	7,261.12	-83.59	3,149.97	-83.59	40.185100	-104.728483	1,311,212.25	3,215,553.84
10,924.00	89.81	2.18	7,260.71	-81.12	3,244.93	-81.12	40.185360	-104.728474	1,311,307.23	3,215,555.48
11,019.00	90.06	1.12	7,260.82	-78.38	3,339.89	-78.38	40.185621	-104.728465	1,311,402.20	3,215,557.39
11,114.00	89.32	359.63	7,261.34	-77.76	3,434.88	-77.76	40.185882	-104.728462	1,311,497.19	3,215,557.19
11,209.00	90.25	359.80	7,261.69	-78.23	3,529.88	-78.23	40.186143	-104.728464	1,311,592.18	3,215,555.89
11,304.00	91.05	1.56	7,260.61	-77.10	3,624.86	-77.10	40.186403	-104.728460	1,311,687.16	3,215,556.19
11,399.00	90.99	0.30	7,258.92	-75.56	3,719.83	-75.56	40.186664	-104.728454	1,311,782.14	3,215,556.90
11,494.00	90.93	1.40	7,257.33	-74.15	3,814.81	-74.15	40.186925	-104.728449	1,311,877.12	3,215,557.48
11,589.00	91.24	0.29	7,255.53	-72.75	3,909.78	-72.75	40.187185	-104.728444	1,311,972.09	3,215,558.06
11,684.00	91.73	1.75	7,253.07	-71.06	4,004.73	-71.06	40.187446	-104.728438	1,312,067.05	3,215,558.92
11,742.00	91.61	0.59	7,251.38	-69.88	4,062.69	-69.88	40.187605	-104.728434	1,312,125.02	3,215,559.60
11,792.00	91.61	0.59	7,249.97	-69.36	4,112.67	-69.36	40.187742	-104.728432	1,312,175.00	3,215,559.68

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
142.00	142.00	0.20	-0.22	First MWD Survey @ 142.00ft
11,742.00	7,251.38	4,062.69	-69.88	Last MWD Survey @ 11742.00ft
11,792.00	7,249.97	4,112.67	-69.36	Proj to Bit @ 11792ft MD :: 4113.11ft TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
User	No Target (Freehand)	359.52	Slot	0.00	0.00	0.00

Survey tool program

From (ft)		To (ft)		Survey/Plan	Survey Tool
142.00	7,612.00	7,612.00	7,612.00		
7,691.00	11,742.00	11,742.00	11,742.00	Vertical/Build	MWD+IFR1+SC
				MWD Surveys Lateral	MWD+IFR1+SC

Design Report for USA Fed 03N-36HZ - Actual Field Surveys

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
961.00	960.98	9 5/8"	9-5/8	13-1/2
7,644.70	7,269.31	7" @ 7644.70' MD :: 7269.31' MD	7	8-3/4

Targets for Plan D0

Shape	Target Name	TVD (ft)	Northing (ft)	Easting (ft)	+N/-S ft	+E/-W ft	Created	Updated
Polygon	USA Fed	0.00	1,308,063.27	3,215,664.83	0.01	0.00	7/9/2013	7/10/2013
Polygon	03N-36HZ_HSU	0.00	1,308,063.27	3,215,664.83	0.01	0.00	7/1/2013	7/10/2013
Point	03N-36HZ_LD	0.00	1,308,063.27	3,215,664.83	0.01	0.00	7/1/2013	7/1/2013
Point	03N-36HZ_SHL	7,258.00	1,312,200.31	3,215,550.59	4,138.06	-78.23	7/1/2013	7/22/2013
Polygon	03N-36HZ_BHL							
	RELOC							
Polygon	USA Fed	0.00	1,308,063.27	3,215,664.83	0.01	0.00	7/1/2013	7/9/2013
	03N-36HZ_Sec							