

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 25-T3N-R66W

Camp 2C-25HZ

Plan A Rev 2

Survey: Sperry MWD Surveys

## Sperry Drilling Services

### Standard Report

28 January, 2012

Well Coordinates: 1,313,446.81 N, 3,217,097.24 E (40° 11' 28.31" N, 104° 43' 22.40" W)

Ground Level: 4,980.00 ft

Local Coordinate Origin:

Centered on Well Camp 2C-25HZ

Viewing Datum:

RKB 25' @ 5005.00ft (H&P 308)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

**HALLIBURTON**

**Survey Report for Camp 2C-25HZ - Sperry MWD Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
669.00	0.29	244.37	669.00	-0.19	0.14	-0.18	0.00
951.00	0.32	330.38	951.00	0.19	-0.89	0.14	0.15
1,014.00	0.47	303.18	1,013.99	0.48	-1.20	0.42	0.37
1,109.00	0.42	330.64	1,108.99	1.00	-1.69	0.92	0.23
1,200.00	0.45	305.49	1,199.99	1.50	-2.15	1.39	0.21
1,292.00	0.46	296.16	1,291.99	1.87	-2.77	1.73	0.08
1,384.00	0.66	316.76	1,383.98	2.42	-3.47	2.25	0.31
1,476.00	0.40	287.95	1,475.98	2.90	-4.14	2.70	0.40
1,568.00	0.53	310.83	1,567.97	3.28	-4.76	3.05	0.24
1,659.00	0.15	346.46	1,658.97	3.67	-5.11	3.42	0.46
1,751.00	0.34	311.35	1,750.97	3.97	-5.34	3.71	0.25
1,843.00	0.06	182.43	1,842.97	4.10	-5.55	3.83	0.41
1,935.00	0.43	68.42	1,934.97	4.18	-5.23	3.92	0.50
2,026.00	2.10	135.83	2,025.95	3.11	-3.75	2.92	2.17
2,118.00	3.23	139.06	2,117.85	-0.06	-0.88	-0.10	1.24
2,210.00	4.40	137.11	2,209.64	-4.60	3.22	-4.44	1.28
2,302.00	5.67	129.45	2,301.29	-10.08	9.13	-9.62	1.56
2,394.00	4.16	150.76	2,392.95	-15.88	14.27	-15.17	2.55
2,489.00	5.42	134.95	2,487.62	-22.05	19.13	-21.11	1.91
2,585.00	6.64	133.90	2,583.09	-29.10	26.34	-27.80	1.28
2,680.00	8.09	124.91	2,677.31	-36.74	35.78	-34.97	1.95
2,775.00	10.42	132.96	2,771.07	-46.42	47.55	-44.08	2.80
2,870.00	13.31	136.80	2,864.03	-60.25	61.33	-57.23	3.15
2,966.00	13.04	144.77	2,957.51	-77.15	75.14	-73.44	1.91
3,061.00	13.37	143.61	3,050.00	-94.75	87.84	-90.41	0.45
3,156.00	12.23	145.72	3,142.64	-111.91	100.02	-106.96	1.30
3,252.00	10.62	151.25	3,236.73	-128.07	110.01	-122.62	2.03
3,347.00	10.36	158.61	3,330.15	-143.70	117.33	-137.88	1.44
3,442.00	8.93	177.96	3,423.83	-159.02	120.71	-153.02	3.71
3,538.00	9.79	178.04	3,518.55	-174.63	121.26	-168.58	0.90
3,633.00	8.63	175.79	3,612.32	-189.81	122.06	-183.71	1.28
3,729.00	9.76	179.13	3,707.09	-205.13	122.71	-198.98	1.30
3,824.00	10.35	178.21	3,800.63	-221.71	123.10	-215.52	0.64
3,919.00	9.02	180.50	3,894.28	-237.69	123.30	-231.47	1.46
4,014.00	10.45	175.92	3,987.91	-253.73	123.85	-247.46	1.71
4,110.00	11.14	176.33	4,082.21	-271.67	125.06	-265.32	0.72
4,205.00	11.58	176.69	4,175.35	-290.34	126.20	-283.93	0.47
4,300.00	9.90	173.28	4,268.68	-307.98	127.70	-301.46	1.89
4,396.00	9.52	171.87	4,363.30	-324.03	129.79	-317.40	0.47
4,491.00	8.88	172.41	4,457.08	-339.08	131.87	-332.33	0.68
4,587.00	9.96	181.62	4,551.79	-354.72	132.62	-347.92	1.93
4,682.00	10.29	179.29	4,645.31	-371.42	132.49	-364.60	0.55
4,777.00	11.05	172.98	4,738.67	-388.94	133.71	-382.04	1.47
4,872.00	11.04	176.71	4,831.91	-407.06	135.34	-400.06	0.75
4,967.00	9.71	179.62	4,925.36	-424.15	135.92	-417.11	1.50
5,062.00	9.08	170.16	5,019.09	-439.55	137.25	-432.42	1.75
5,158.00	8.16	165.26	5,114.00	-453.60	140.28	-446.31	1.23
5,254.00	9.98	169.41	5,208.80	-468.37	143.54	-460.91	2.01
5,350.00	9.65	174.81	5,303.40	-484.56	145.80	-476.97	1.02
5,445.00	9.39	184.56	5,397.10	-500.21	145.90	-492.60	1.72

**Survey Report for Camp 2C-25HZ - Sperry MWD Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,540.00	11.18	181.33	5,490.57	-517.15	145.07	-509.56	1.98
5,634.00	9.99	184.86	5,582.97	-534.38	144.17	-526.81	1.44
5,729.00	8.83	177.27	5,676.69	-549.88	143.82	-542.31	1.79
5,824.00	9.44	171.70	5,770.49	-564.87	145.29	-557.21	1.13
5,919.00	9.94	171.12	5,864.13	-580.68	147.68	-572.89	0.54
6,015.00	7.72	170.18	5,958.99	-595.22	150.06	-587.30	2.32
6,110.00	8.63	173.45	6,053.02	-608.59	151.96	-600.56	1.08
6,205.00	9.53	174.56	6,146.83	-623.50	153.52	-615.38	0.97
6,300.00	9.94	169.84	6,240.46	-639.40	155.71	-631.15	0.94
6,395.00	8.34	170.60	6,334.25	-654.27	158.28	-645.88	1.69
6,490.00	5.17	166.39	6,428.58	-665.23	160.42	-656.73	3.38
6,586.00	3.58	161.33	6,524.30	-672.27	162.40	-663.67	1.70
6,681.00	1.31	179.23	6,619.21	-676.17	163.36	-667.51	2.49
6,777.00	1.54	185.11	6,715.18	-678.55	163.26	-669.90	0.28
6,800.00	0.77	213.15	6,738.17	-678.99	163.15	-670.34	4.06
<b>Kickoff Point @ 6800</b>							
6,808.00	0.62	237.11	6,746.17	-679.06	163.08	-670.41	4.06
6,840.00	1.49	334.69	6,778.17	-678.78	162.76	-670.14	5.27
6,872.00	3.15	349.97	6,810.14	-677.53	162.43	-668.92	5.49
6,903.00	5.29	354.45	6,841.06	-675.27	162.14	-666.67	6.98
6,935.00	6.58	2.23	6,872.89	-671.97	162.07	-663.38	4.74
6,967.00	8.43	3.98	6,904.61	-667.80	162.30	-659.20	5.82
6,999.00	9.49	2.25	6,936.22	-662.82	162.57	-654.22	3.42
7,030.00	11.31	358.58	6,966.71	-657.23	162.59	-648.63	6.24
7,062.00	13.10	355.33	6,997.99	-650.48	162.22	-641.91	5.99
7,094.00	14.65	354.85	7,029.05	-642.83	161.56	-634.30	4.86
7,126.00	19.36	358.45	7,059.64	-633.50	161.06	-625.00	15.08
7,157.00	23.06	3.67	7,088.54	-622.30	161.31	-613.80	13.39
7,189.00	27.81	8.71	7,117.43	-608.65	162.84	-600.10	16.30
7,221.00	31.83	9.69	7,145.19	-592.95	165.39	-584.29	12.65
7,252.00	36.03	9.87	7,170.91	-575.90	168.33	-567.12	13.55
7,284.00	40.98	7.88	7,195.94	-556.22	171.38	-547.32	15.94
7,315.00	45.69	6.69	7,218.48	-535.13	174.07	-526.12	15.42
7,347.00	50.51	6.13	7,239.85	-511.46	176.73	-502.35	15.12
7,379.00	55.78	5.10	7,259.04	-485.99	179.22	-476.79	16.67
7,411.00	60.90	4.36	7,275.83	-458.85	181.46	-449.58	16.12
7,442.00	65.10	2.04	7,289.90	-431.28	182.99	-421.97	15.10
7,474.00	69.77	0.66	7,302.18	-401.75	183.68	-392.43	15.13
7,506.00	73.68	0.15	7,312.21	-371.37	183.90	-362.08	12.31
7,537.00	77.26	0.44	7,319.98	-341.37	184.05	-332.10	11.58
7,569.00	79.20	2.35	7,326.51	-310.05	184.82	-300.79	8.42
7,601.00	80.53	1.86	7,332.14	-278.58	185.97	-269.29	4.42
7,611.00	81.68	2.07	7,333.69	-268.70	186.31	-259.41	11.69
7,645.00	83.60	2.90	7,338.04	-235.02	187.77	-225.69	6.15
<b>7" Casing @ 7645</b>							
7,675.00	85.30	3.63	7,340.94	-205.21	189.48	-195.84	6.15
7,770.00	87.47	2.33	7,346.93	-110.53	194.40	-101.03	2.66
7,866.00	89.14	0.97	7,349.77	-14.62	197.17	-5.10	2.24
7,961.00	89.94	0.28	7,350.54	80.37	198.20	89.83	1.11
8,057.00	90.56	359.61	7,350.12	176.37	198.11	185.71	0.95
8,152.00	90.93	359.60	7,348.88	271.36	197.45	280.56	0.39

**Survey Report for Camp 2C-25HZ - Sperry MWD Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,247.00	90.37	359.42	7,347.80	366.35	196.64	375.40	0.62
8,343.00	88.70	358.10	7,348.58	462.32	194.56	471.16	2.22
8,438.00	89.75	358.39	7,349.87	557.26	191.66	565.85	1.15
8,534.00	90.06	358.24	7,350.03	653.22	188.83	661.56	0.36
8,629.00	89.88	359.08	7,350.08	748.19	186.61	756.32	0.90
8,725.00	90.99	359.06	7,349.35	844.18	185.05	852.11	1.16
8,820.00	90.06	358.49	7,348.48	939.15	183.02	946.88	1.15
8,915.00	90.56	357.74	7,347.96	1,034.10	179.90	1,041.56	0.95
9,011.00	91.61	357.44	7,346.15	1,129.99	175.86	1,137.15	1.14
9,106.00	89.01	357.56	7,345.63	1,224.89	171.72	1,231.74	2.74
9,201.00	89.75	357.53	7,346.66	1,319.80	167.65	1,326.35	0.78
9,296.00	90.86	357.24	7,346.15	1,414.70	163.31	1,420.92	1.21
9,392.00	90.00	358.34	7,345.43	1,510.62	159.61	1,516.56	1.45
9,487.00	90.49	358.12	7,345.03	1,605.57	156.68	1,611.26	0.57
9,582.00	89.01	359.40	7,345.44	1,700.55	154.62	1,706.02	2.06
9,677.00	88.64	1.18	7,347.39	1,795.52	155.10	1,800.91	1.91
9,773.00	89.26	0.78	7,349.15	1,891.49	156.75	1,896.85	0.77
9,868.00	87.22	0.86	7,352.07	1,986.43	158.10	1,991.74	2.15
9,963.00	87.34	0.29	7,356.58	2,081.32	159.06	2,086.57	0.61
10,058.00	89.88	1.33	7,358.88	2,176.27	160.40	2,181.47	2.89
10,154.00	86.17	1.04	7,362.19	2,272.18	162.38	2,277.36	3.88
10,249.00	86.29	1.36	7,368.43	2,366.95	164.37	2,372.12	0.36
10,344.00	87.65	1.50	7,373.46	2,461.79	166.74	2,466.96	1.44
10,440.00	85.93	1.18	7,378.83	2,557.61	168.98	2,562.78	1.82
10,535.00	86.17	1.37	7,385.38	2,652.36	171.09	2,657.52	0.32
10,630.00	88.21	1.49	7,390.03	2,747.21	173.45	2,752.38	2.15
10,725.00	90.68	1.35	7,390.95	2,842.17	175.81	2,847.34	2.60
10,820.00	90.68	1.41	7,389.83	2,937.13	178.10	2,942.30	0.06
10,915.00	86.60	0.77	7,392.08	3,032.07	179.90	3,037.22	4.35
11,011.00	87.28	0.34	7,397.20	3,127.93	180.83	3,133.01	0.84
11,106.00	86.78	0.33	7,402.13	3,222.80	181.39	3,227.79	0.53
11,201.00	86.79	0.46	7,407.45	3,317.65	182.04	3,322.56	0.14
11,296.00	86.66	0.33	7,412.88	3,412.49	182.69	3,417.33	0.19
11,391.00	88.21	1.63	7,417.13	3,507.37	184.32	3,512.18	2.13
11,486.00	89.88	1.93	7,418.72	3,602.31	187.27	3,607.15	1.79
11,581.00	89.63	1.85	7,419.12	3,697.26	190.40	3,702.14	0.28
11,677.00	91.05	1.27	7,418.55	3,793.22	193.01	3,798.11	1.60
11,772.00	90.37	2.41	7,417.38	3,888.16	196.06	3,893.09	1.40
11,867.00	90.37	1.99	7,416.76	3,983.09	199.71	3,988.08	0.44
11,882.00	90.25	1.82	7,416.68	3,998.08	200.21	4,003.08	1.39
11,925.00	90.25	1.82	7,416.49	4,041.06	201.58	4,046.08	0.00
Projection to Bit @ 11925							

**Survey Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6,800.00	6,738.17	-678.99	163.15	Kickoff Point @ 6800
7,645.00	7,338.04	-235.02	187.77	7" Casing @ 7645
11,925.00	7,416.49	4,041.06	201.58	Projection to Bit @ 11925

## Survey Report for Camp 2C-25HZ - Sperry MWD Surveys

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	Camp 2C-25HZ_Plan A-2 BHL Tgt	2.76	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
125.00	669.00	Surface Casing Gyro Surveys	NS-GYRO-MS
669.00	11,925.00	Sperry MWD Surveys	MWD

**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
Camp 2C-25HZ_Plan / - survey misses target center by 10.78ft at 11925.00ft MD (7416.49 TVD, 4041.06 N, 201.58 E) - Point	0.00	0.00	7,408.00	4,042.00	195.00	1,317,490.19	3,217,256.80	40° 12' 8.251 N	104° 43' 19.888 W
Camp 2C-25HZ_Plat E - survey misses target center by 96.02ft at 11923.06ft MD (7416.50 TVD, 4039.12 N, 201.51 E) - Point	0.00	0.00	7,408.00	4,042.12	105.91	1,317,489.53	3,217,167.72	40° 12' 8.252 N	104° 43' 21.036 W
Camp 2C-25HZ_SHL - survey misses target center by 669.00ft at 669.00ft MD (669.00 TVD, -0.19 N, 0.14 E) - Point	0.00	0.00	0.00	0.02	0.00	1,313,446.84	3,217,097.24	40° 11' 28.308 N	104° 43' 22.401 W
Camp 2 Pad_Section L - survey misses target center by 2963.59ft at 669.00ft MD (669.00 TVD, -0.19 N, 0.14 E) - Polygon	0.00	0.00	-63.00	-293.07	-2,856.65	1,313,128.73	3,214,243.39	40° 11' 25.410 N	104° 43' 59.210 W
Camp 2 Pad_Setback - survey misses target center by 2963.59ft at 669.00ft MD (669.00 TVD, -0.19 N, 0.14 E) - Polygon	0.00	0.00	-63.00	-293.07	-2,856.65	1,313,128.73	3,214,243.39	40° 11' 25.410 N	104° 43' 59.210 W
Camp 31-25_Typ Devi - survey misses target center by 3907.68ft at 669.00ft MD (669.00 TVD, -0.19 N, 0.14 E) - Circle (radius 137.00)	0.00	0.00	-54.00	3,839.85	-35.99	1,317,286.04	3,217,027.60	40° 12' 6.253 N	104° 43' 22.865 W
Camp 2C-25HZ_Landi - survey misses target center by 29.48ft at 7751.15ft MD (7346.03 TVD, -129.34 N, 193.59 E) - Point		0.00	7,335.00	-127.23	166.34	1,313,321.05	3,217,264.68	40° 11' 27.050 N	104° 43' 20.258 W
Camp 2C-25HZ_Plan / - survey misses target center by 10.78ft at 11925.00ft MD (7416.49 TVD, 4041.06 N, 201.58 E) - Point	0.00	0.00	7,408.00	4,042.00	195.00	1,317,490.19	3,217,256.80	40° 12' 8.251 N	104° 43' 19.888 W

North Reference Sheet for Sec. 25-T3N-R66W - Camp 2C-25HZ - Plan A Rev 2

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.  
Vertical Depths are relative to RKB 25' @ 5005.00ft (H&P 308). Northing and Easting are relative to Camp 2C-25HZ  
Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980  
Projection method is Lambert Conformal Conic (2 parallel)  
Central Meridian is 105° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°  
False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99995738

Grid Coordinates of Well: 1,313,446.81 ft N, 3,217,097.24 ft E  
Geographical Coordinates of Well: 40° 11' 28.31" N, 104° 43' 22.40" W  
Grid Convergence at Surface is: 0.50°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,925.00ft  
the Bottom Hole Displacement is 4,046.08ft in the Direction of 2.86° (True).

Magnetic Convergence at surface is: -8.23° (20 January 2012, , BGGM2011)

