

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 25-T3N-R66W

Camp 27C-25HZ

Plan A Rev 1

Design: Actual Field Surveys

Sperry Drilling Services Standard Report

28 March, 2012

Well Coordinates: 1,313,183.82 N, 3,218,087.78 E (40° 11' 25.62" N, 104° 43' 09.67" W)

Ground Level: 4,967.00 ft

Local Coordinate Origin:

Centered on Well Camp 27C-25HZ

Viewing Datum:

RKB - 25' @ 4992.00ft (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 Camp 27C-25HZ - 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
125.00	0.60	118.96	125.00	-0.32	0.57	-0.35	0.48
First Gyro Survey @ 125.00ft							
225.00	0.08	213.87	225.00	-0.63	0.99	-0.69	0.61
325.00	0.30	128.36	325.00	-0.85	1.16	-0.92	0.30
425.00	0.28	2.93	424.99	-0.77	1.38	-0.85	0.52
525.00	0.07	178.78	524.99	-0.58	1.39	-0.66	0.35
625.00	0.61	159.86	624.99	-1.15	1.57	-1.24	0.54
725.00	0.30	351.62	724.99	-1.39	1.72	-1.48	0.91
825.00	0.32	273.26	824.99	-1.11	1.40	-1.19	0.39
835.00	0.25	249.18	834.99	-1.12	1.35	-1.19	1.37
Final Gyro Survey @ 835.00ft - Tie-On to Gyro Surveys @ 835.00ft							
956.00	0.29	313.01	955.99	-1.00	0.88	-1.05	0.24
First Sperry MWD Survey @ 956.00ft							
1,050.00	0.66	274.04	1,049.99	-0.80	0.17	-0.81	0.50
1,142.00	0.77	291.18	1,141.98	-0.54	-0.94	-0.49	0.26
1,233.00	1.17	274.50	1,232.97	-0.25	-2.43	-0.10	0.53
1,325.00	0.59	288.18	1,324.95	-0.03	-3.82	0.20	0.67
1,417.00	0.23	276.68	1,416.95	0.14	-4.45	0.40	0.40
1,509.00	0.98	267.70	1,508.95	0.13	-5.42	0.45	0.82
1,601.00	0.82	263.25	1,600.93	0.02	-6.86	0.43	0.19
1,693.00	0.54	280.58	1,692.93	0.03	-7.94	0.49	0.37
1,784.00	0.83	287.27	1,783.92	0.30	-8.99	0.83	0.33
1,876.00	0.31	282.03	1,875.92	0.55	-9.87	1.13	0.57
1,968.00	2.70	213.21	1,967.88	-1.21	-11.30	-0.55	2.83
2,060.00	4.15	207.48	2,059.71	-5.98	-14.03	-5.14	1.62
2,152.00	4.85	200.27	2,151.43	-12.58	-16.91	-11.57	0.98
2,244.00	7.23	196.01	2,242.91	-21.79	-19.85	-20.59	2.63
2,336.00	6.37	193.30	2,334.27	-32.33	-22.62	-30.94	1.00
2,429.00	6.68	199.41	2,426.66	-42.45	-25.61	-40.87	0.82
2,524.00	5.41	196.85	2,521.13	-51.95	-28.74	-50.17	1.37
2,619.00	6.24	197.59	2,615.64	-61.15	-31.60	-59.20	0.88
2,714.00	5.07	208.12	2,710.18	-69.78	-35.14	-67.60	1.64
2,809.00	7.20	215.95	2,804.63	-78.30	-40.61	-75.78	2.40
2,904.00	6.11	214.75	2,898.99	-87.27	-46.99	-84.37	1.16
2,999.00	4.81	218.47	2,993.56	-94.55	-52.35	-91.32	1.42
3,095.00	7.67	211.49	3,088.98	-103.16	-58.20	-99.57	3.08
3,190.00	6.60	210.69	3,183.25	-113.26	-64.30	-109.30	1.13
3,285.00	5.60	215.22	3,277.71	-121.75	-69.76	-117.45	1.17
3,380.00	6.72	210.69	3,372.16	-130.31	-75.27	-125.68	1.28
3,475.00	5.55	209.74	3,466.61	-139.08	-80.39	-134.13	1.24
3,570.00	5.52	213.16	3,561.17	-146.90	-85.17	-141.65	0.35
3,666.00	6.75	215.47	3,656.62	-155.36	-90.97	-149.76	1.31
3,761.00	5.46	218.07	3,751.08	-163.46	-96.99	-157.49	1.39
3,856.00	7.13	219.14	3,845.50	-171.59	-103.50	-165.23	1.76
3,951.00	4.67	211.39	3,939.99	-179.47	-109.24	-172.76	2.72
4,046.00	7.37	218.69	4,034.46	-187.53	-115.06	-180.46	2.95
4,142.00	7.68	219.89	4,129.63	-197.26	-123.02	-189.70	0.36
4,237.00	7.87	217.18	4,223.76	-207.31	-131.03	-199.27	0.43
4,332.00	6.67	210.57	4,318.00	-217.24	-137.76	-208.79	1.54

Design Report for Camp 27C-25HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,427.00	5.78	201.62	4,412.44	-226.44	-142.33	-217.71	1.38
4,523.00	6.26	207.45	4,507.91	-235.58	-146.53	-226.58	0.81
4,618.00	5.78	202.38	4,602.39	-244.60	-150.73	-235.34	0.75
4,713.00	5.34	201.97	4,696.94	-253.12	-154.21	-243.64	0.47
4,809.00	5.96	215.80	4,792.48	-261.31	-158.80	-251.55	1.55
4,904.00	6.59	212.91	4,886.91	-269.88	-164.64	-259.77	0.74
5,000.00	5.87	211.25	4,982.34	-278.70	-170.18	-268.25	0.77
5,094.00	5.55	210.70	5,075.87	-286.72	-175.00	-275.97	0.35
5,189.00	5.27	210.08	5,170.45	-294.45	-179.53	-283.42	0.30
5,285.00	6.23	222.97	5,265.97	-302.07	-185.29	-290.69	1.67
5,380.00	4.60	218.96	5,360.54	-308.81	-191.20	-297.07	1.76
5,475.00	6.29	213.90	5,455.11	-316.09	-196.50	-304.03	1.85
5,571.00	5.26	210.60	5,550.62	-324.24	-201.67	-311.86	1.13
5,666.00	5.86	221.86	5,645.18	-331.60	-207.12	-318.89	1.31
5,761.00	3.95	214.95	5,739.83	-337.90	-212.24	-324.88	2.10
5,856.00	5.82	215.55	5,834.48	-344.50	-216.91	-331.19	1.97
5,952.00	5.06	207.88	5,930.05	-352.20	-221.72	-338.60	1.09
6,047.00	5.97	209.98	6,024.60	-360.19	-226.15	-346.31	0.98
6,142.00	4.94	210.20	6,119.17	-368.00	-230.68	-353.84	1.08
6,237.00	5.60	217.97	6,213.77	-375.19	-235.58	-360.73	1.02
6,332.00	4.94	221.18	6,308.37	-381.92	-241.13	-367.13	0.76
6,427.00	3.81	219.84	6,403.09	-387.42	-245.85	-372.35	1.19
6,522.00	2.61	229.52	6,497.94	-391.25	-249.51	-375.95	1.38
6,617.00	1.95	231.32	6,592.87	-393.67	-252.42	-378.19	0.70
6,713.00	1.20	239.74	6,688.83	-395.19	-254.56	-379.59	0.82
6,776.00	1.65	235.30	6,751.81	-396.04	-255.88	-380.36	0.73
6,808.00	1.37	246.44	6,783.80	-396.46	-256.61	-380.73	1.26
6,840.00	2.38	330.71	6,815.79	-396.03	-257.28	-380.27	8.20
6,871.00	4.55	12.62	6,846.73	-394.27	-257.33	-378.51	10.32
6,903.00	7.88	8.71	6,878.54	-390.86	-256.72	-375.14	10.48
6,935.00	10.56	7.89	6,910.12	-385.79	-255.99	-370.12	8.38
6,966.00	12.23	8.23	6,940.51	-379.72	-255.13	-364.12	5.39
6,998.00	14.73	10.27	6,971.63	-372.37	-253.91	-356.84	7.95
7,030.00	17.52	9.87	7,002.37	-363.62	-252.36	-348.20	8.73
7,061.00	19.40	8.41	7,031.77	-353.92	-250.81	-338.61	6.24
7,093.00	21.71	7.54	7,061.73	-342.80	-249.26	-327.60	7.28
7,124.00	24.39	6.50	7,090.25	-330.75	-247.78	-315.66	8.74
7,156.00	26.54	5.82	7,119.14	-317.07	-246.31	-302.09	6.78
7,188.00	29.24	5.08	7,147.42	-302.17	-244.89	-287.30	8.51
7,220.00	31.93	3.32	7,174.97	-285.94	-243.71	-271.16	8.86
7,251.00	32.70	3.95	7,201.17	-269.40	-242.66	-254.71	2.71
7,282.00	34.51	4.21	7,226.99	-252.29	-241.43	-237.70	5.86
7,314.00	38.23	3.87	7,252.75	-233.36	-240.10	-218.88	11.64
7,346.00	42.17	3.85	7,277.18	-212.76	-238.71	-198.40	12.31
7,377.00	47.80	4.69	7,299.10	-190.91	-237.07	-176.69	18.26
7,409.00	52.15	5.18	7,319.68	-166.51	-234.96	-152.45	13.64
7,441.00	58.26	4.98	7,337.93	-140.34	-232.64	-126.46	19.10
7,472.00	63.81	4.04	7,352.94	-113.32	-230.51	-99.61	18.10
7,504.00	68.73	2.79	7,365.81	-84.08	-228.77	-70.53	15.78
7,536.00	73.05	0.44	7,376.28	-53.87	-227.93	-40.41	15.18
7,568.00	78.72	0.32	7,384.09	-22.85	-227.72	-9.46	17.72

Design Report for Camp 27C-25HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
7,600.00	84.19	359.73	7,388.84	8.79	-227.71	22.12	17.19
7,644.60	89.70	358.64	7,391.21	53.30	-228.34	66.59	12.60
7" Casing Point @ 7644.60ft							
7,670.00	92.84	358.02	7,390.65	78.68	-229.08	91.97	12.60
7,765.00	94.33	358.00	7,384.71	173.43	-232.38	186.76	1.57
7,860.00	95.32	358.23	7,376.72	268.04	-235.49	281.39	1.07
7,955.00	93.21	356.53	7,369.65	362.67	-239.82	376.11	2.85
8,050.00	94.64	356.58	7,363.15	457.28	-245.52	470.88	1.51
8,145.00	93.34	356.84	7,356.54	551.89	-250.96	565.65	1.40
8,240.00	91.54	356.61	7,352.50	646.64	-256.38	660.56	1.91
8,335.00	92.41	355.55	7,349.22	741.36	-262.87	755.50	1.44
8,430.00	90.62	355.01	7,346.71	836.00	-270.68	850.43	1.97
8,525.00	91.85	358.13	7,344.66	930.80	-276.37	945.40	3.53
8,620.00	89.20	357.00	7,343.79	1,025.70	-280.40	1,040.37	3.03
8,715.00	88.95	355.12	7,345.33	1,120.46	-286.93	1,135.35	2.00
8,810.00	92.97	355.64	7,343.74	1,215.11	-294.58	1,230.29	4.27
8,905.00	90.56	353.91	7,340.81	1,309.66	-303.22	1,325.19	3.12
9,000.00	90.99	356.96	7,339.52	1,404.34	-310.78	1,420.15	3.24
9,095.00	91.67	358.59	7,337.32	1,499.24	-314.47	1,515.10	1.86
9,191.00	91.85	0.24	7,334.37	1,595.19	-315.45	1,610.94	1.73
9,286.00	92.47	2.14	7,330.79	1,690.10	-313.48	1,705.57	2.10
9,381.00	91.42	2.49	7,327.57	1,784.96	-309.64	1,800.04	1.16
9,476.00	92.72	2.50	7,324.13	1,879.81	-305.51	1,894.48	1.37
9,571.00	93.21	1.94	7,319.22	1,974.61	-301.84	1,988.91	0.78
9,666.00	91.98	2.02	7,314.92	2,069.45	-298.56	2,083.40	1.30
9,762.00	92.60	1.23	7,311.08	2,165.34	-295.84	2,178.96	1.05
9,857.00	93.65	0.82	7,305.90	2,260.18	-294.14	2,273.53	1.19
9,952.00	93.22	1.02	7,300.21	2,355.00	-292.62	2,368.10	0.50
10,048.00	91.30	0.48	7,296.43	2,450.91	-291.36	2,463.77	2.08
10,143.00	89.88	0.26	7,295.45	2,545.90	-290.75	2,558.56	1.51
10,238.00	91.54	2.12	7,294.27	2,640.86	-288.78	2,653.25	2.62
10,333.00	91.67	3.35	7,291.61	2,735.72	-284.25	2,747.67	1.30
10,428.00	88.08	2.09	7,291.82	2,830.59	-279.74	2,842.12	4.00
10,523.00	88.52	1.66	7,294.64	2,925.50	-276.63	2,936.68	0.65
10,619.00	90.31	1.58	7,295.62	3,021.45	-273.92	3,032.31	1.87
10,714.00	91.24	0.98	7,294.33	3,116.42	-271.80	3,126.99	1.16
10,809.00	91.61	1.37	7,291.97	3,211.37	-269.85	3,221.66	0.57
10,904.00	92.10	1.64	7,288.89	3,306.28	-267.35	3,316.27	0.59
10,999.00	92.84	1.71	7,284.80	3,401.15	-264.58	3,410.82	0.78
11,094.00	90.93	0.51	7,281.67	3,496.08	-262.74	3,505.47	2.37
11,189.00	90.99	0.23	7,280.08	3,591.06	-262.13	3,600.25	0.30
11,285.00	92.54	0.48	7,277.13	3,687.01	-261.53	3,696.00	1.64
11,380.00	93.46	0.55	7,272.15	3,781.88	-260.68	3,790.66	0.97
11,475.00	94.88	0.40	7,265.25	3,876.62	-259.90	3,885.19	1.50
11,570.00	93.83	359.95	7,258.03	3,971.34	-259.61	3,979.73	1.20
11,665.00	92.72	359.56	7,252.61	4,066.19	-260.01	4,074.44	1.24
11,761.00	92.84	358.83	7,247.95	4,162.06	-261.36	4,170.23	0.77
11,856.00	93.96	359.04	7,242.32	4,256.88	-263.12	4,264.98	1.20
11,885.00	94.39	359.02	7,240.20	4,285.80	-263.61	4,293.88	1.48
Final Sperry MWD Survey @ 11885.00ft							
11,925.00	94.39	359.02	7,237.14	4,325.67	-264.29	4,333.73	0.00

Design Report for Camp 27C-25HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Straight Line Projection to TD @ 11925.00ft							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
125.00	125.00	-0.32	0.57	First Gyro Survey @ 125.00ft
835.00	834.99	-1.12	1.35	Final Gyro Survey @ 835.00ft
835.00	834.99	-1.12	1.35	Tie-On to Gyro Surveys @ 835.00ft
956.00	955.99	-1.00	0.88	First Sperry MWD Survey @ 956.00ft
7,644.60	7,391.21	53.30	-228.34	7" Casing Point @ 7644.60ft
11,885.00	7,240.20	4,285.80	-263.61	Final Sperry MWD Survey @ 11885.00ft
11,925.00	7,237.14	4,325.67	-264.29	Straight Line Projection to TD @ 11925.00ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Camp 27C-25HZ Plan A Rev 1_BHL	356.64	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
125.00	11,925.00	Final Field Surveys	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,644.60	7,391.21	7" Intermediate Casing	7	8-3/4

Design Report for Camp 27C-25HZ - 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
Camp 27C-25HZ Plc	0.00	0.00	7,407.00	4,327.37	-254.12	1,317,508.61	3,217,795.59	40.202329	-104.720262
- actual wellpath misses target center by 169.78ft at 11913.52ft MD (7238.02 TVD, 4314.23 N, -264.10 E)									
- Point									
Camp 2 Pad_Section	0.00	0.00	-76.00	-21.24	-3,844.89	1,313,128.73	3,214,243.39	40.190392	-104.733114
- actual wellpath misses target center by 3845.70ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-4,352.14	4,739.83	1,317,884.95	3,213,694.27		
Point 2				-1,641.29	4,757.99	1,317,926.97	3,216,404.74		
Point 3				1,003.63	4,815.27	1,318,007.53	3,219,048.94		
Point 4				1,006.87	2,180.89	1,315,373.40	3,219,075.37		
Point 5				1,010.36	-458.49	1,312,734.26	3,219,102.09		
Point 6				-1,670.27	-490.71	1,312,678.45	3,216,421.97		
Point 7				-4,350.88	-522.91	1,312,622.65	3,213,741.86		
Point 8				-4,351.52	2,108.48	1,315,253.82	3,213,718.05		
Point 9				-4,352.14	4,739.83	1,317,884.95	3,213,694.27		
Camp 2 Pad_Setbac	0.00	0.00	-76.00	-21.24	-3,844.89	1,313,128.73	3,214,243.39	40.190392	-104.733114
- actual wellpath misses target center by 3845.70ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-3,896.12	4,275.85	1,317,425.02	3,214,154.34		
Point 2				-1,645.27	4,297.99	1,317,466.98	3,216,404.81		
Point 3				539.65	4,359.25	1,317,547.47	3,218,589.01		
Point 4				546.87	2,184.87	1,315,373.33	3,218,615.37		
Point 5				554.33	5.49	1,313,194.19	3,218,642.02		
Point 6				-1,666.29	-30.71	1,313,138.44	3,216,421.90		
Point 7				-3,886.90	-66.89	1,313,082.72	3,214,201.79		
Point 8				-3,891.52	2,104.50	1,315,253.89	3,214,178.05		
Point 9				-3,896.12	4,275.85	1,317,425.02	3,214,154.34		
Camp 31-25_Typ De	0.00	0.00	-67.00	4,111.56	-1,024.06	1,317,286.04	3,217,027.60	40.201737	-104.723018
- actual wellpath misses target center by 4237.70ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 137.00)									
Camp 27C-25HZ Plc	0.00	0.00	0.00	0.00	0.00	1,313,183.82	3,218,087.78	40.190451	-104.719352
- actual wellpath hits target center									
- Point									

North Reference Sheet for Sec. 25-T3N-R66W - Camp 27C-25HZ - Plan A Rev 1

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' @ 4992.00ft (HP 308). Northing and Easting are relative to Camp 27C-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 -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99995740

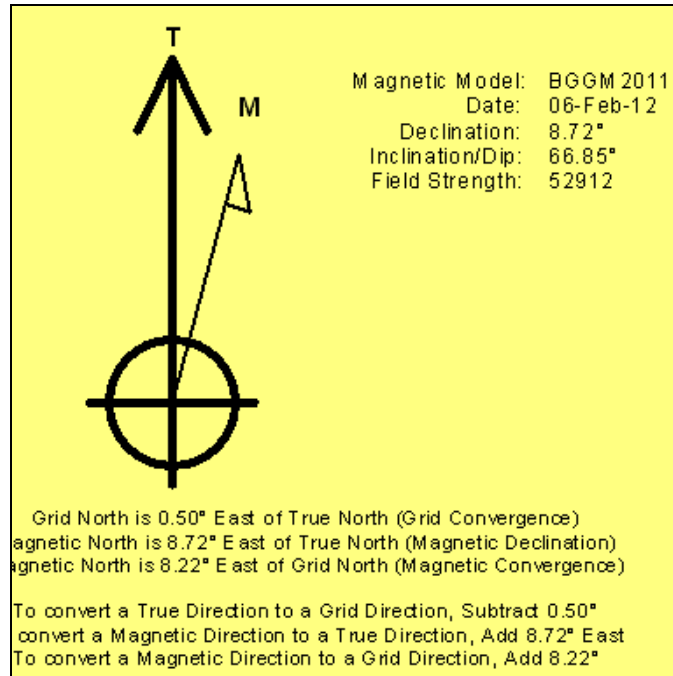
Grid Coordinates of Well: 1,313,183.82 ft N, 3,218,087.78 ft E

Geographical Coordinates of Well: 40° 11' 25.62" N, 104° 43' 09.67" W

Grid Convergence at Surface is: 0.50°

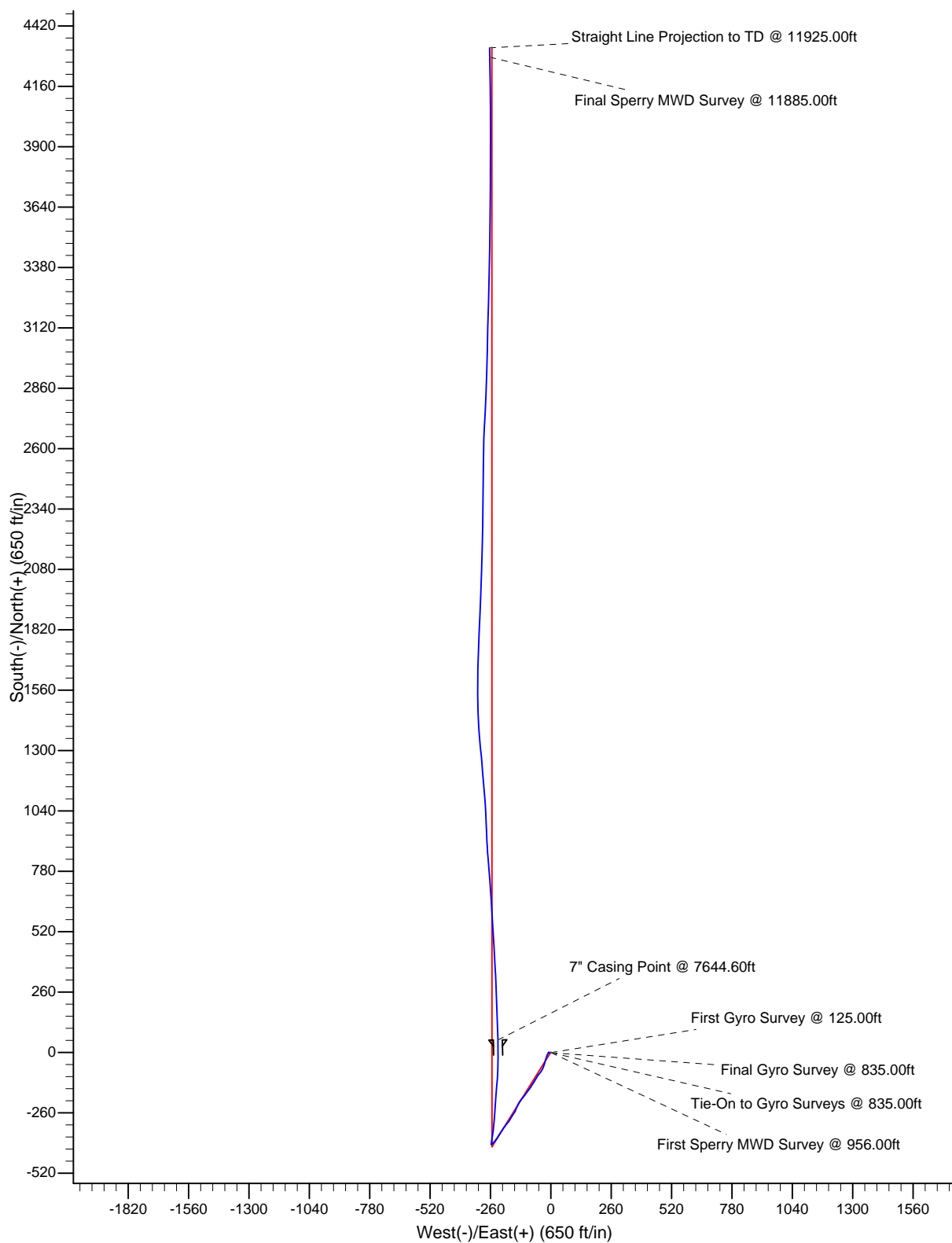
Based upon Minimum Curvature type calculations, at a Measured Depth of 11,925.00ft the Bottom Hole Displacement is 4,333.74ft in the Direction of 356.50° (True).

Magnetic Convergence at surface is: -8.22° (6 February 2012, , BGGM2011)



LEGEND

- Camp 27C-25HZ, Plan A Rev 1, Plan A Rev 1 Proposal V0
- Actual Field Surveys



Project: Weld County, CO (NAD 83)
Site: Sec. 25-T3N-R66W
Well: Camp 27C-25HZ

Anadarko Petroleum Corp.

HALLIBURTON
Sperry Drilling

LEGEND

- Camp 27C-25HZ, Plan A Rev 1, Plan A Rev 1 Proposal V0
- Actual Field Surveys

