

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 29 T3N-R65W

Wardell 1N-29HZ

Plan A Rev 1

Design: Actual Field Surveys

Sperry Drilling Services Standard Report

25 July, 2012

Well Coordinates: 1,313,179.50 N, 3,228,397.60 E (40° 11' 24.66" N, 104° 40' 56.82" W)

Ground Level: 4,869.00 ft

Local Coordinate Origin:

Centered on Well Wardell 1N-29HZ

Viewing Datum:

RKB=16ft @ 4885.00ft (Xtreme 22)

TVDs to System:

N

North Reference:

True

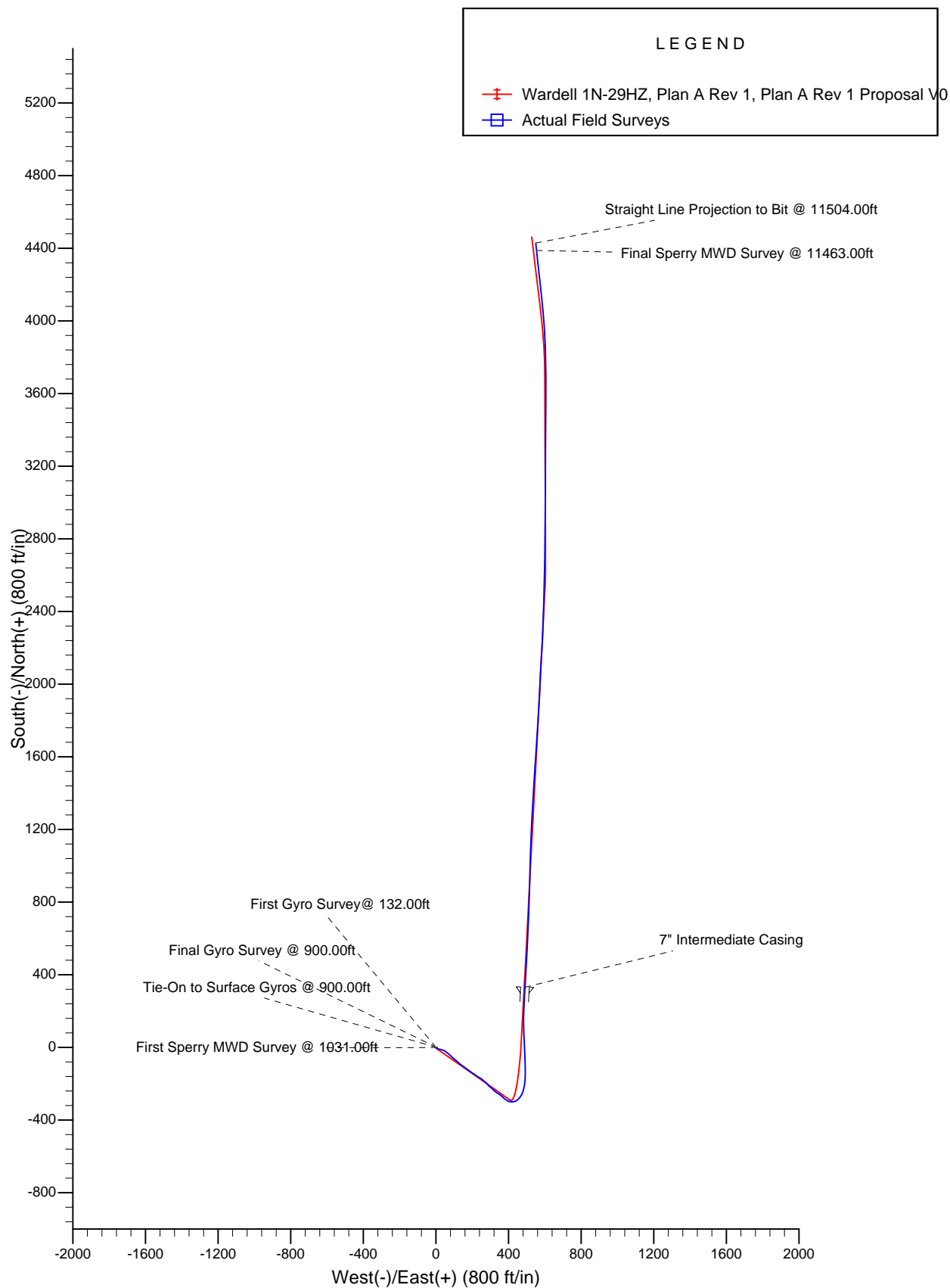
Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

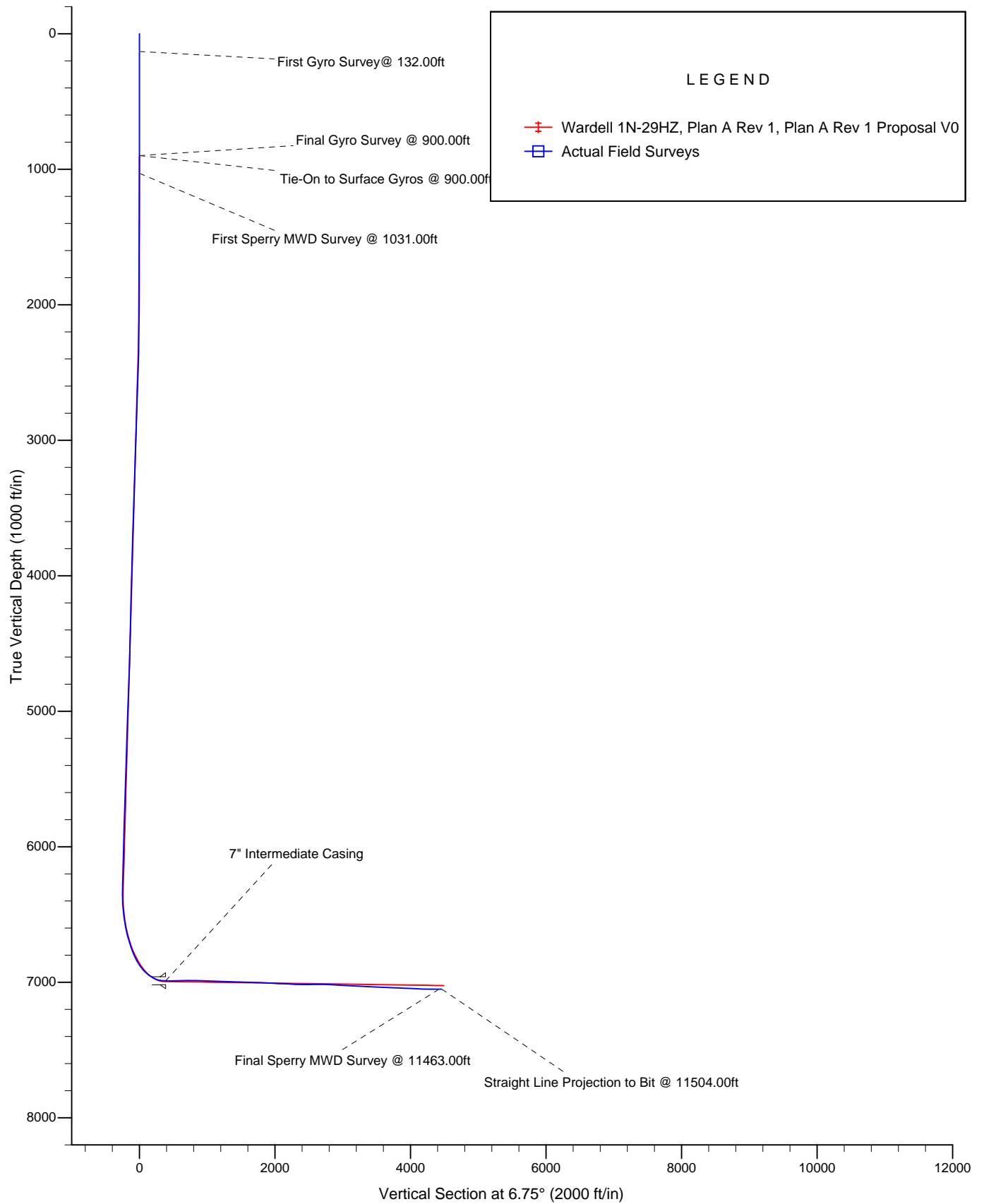
HALLIBURTON



Project: Weld County, CO (NAD 83)
Site: Sec. 29 T3N-R65W
Well: Wardell 1N-29HZ

Anadarko Petroleum Corp.

HALLIBURTON
Sperry Drilling



Design Report for Wardell 1N-29HZ - 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
132.00	0.87	81.51	131.99	0.15	0.99	0.26	0.66
First Gyro Survey @ 132.00ft							
232.00	0.78	83.54	231.98	0.34	2.42	0.62	0.09
332.00	0.31	81.92	331.98	0.45	3.36	0.84	0.47
432.00	0.41	92.65	431.98	0.47	3.99	0.94	0.12
532.00	0.36	54.67	531.98	0.64	4.60	1.17	0.25
632.00	0.35	98.31	631.97	0.78	5.16	1.38	0.26
732.00	0.15	163.19	731.97	0.61	5.50	1.25	0.32
832.00	0.21	81.97	831.97	0.51	5.72	1.17	0.24
900.00	0.45	261.51	899.97	0.48	5.58	1.14	0.97
Final Gyro Survey @ 900.00ft - Tie-On to Surface Gyros @ 900.00ft							
1,031.00	0.80	170.21	1,030.97	-0.49	5.23	0.12	0.71
First Sperry MWD Survey @ 1031.00ft							
1,122.00	0.66	186.91	1,121.96	-1.64	5.27	-1.01	0.28
1,215.00	0.24	195.50	1,214.96	-2.36	5.15	-1.74	0.46
1,307.00	0.57	174.98	1,306.95	-3.00	5.14	-2.38	0.39
1,399.00	0.50	169.48	1,398.95	-3.85	5.26	-3.21	0.09
1,492.00	0.52	135.44	1,491.95	-4.55	5.63	-3.86	0.32
1,582.00	0.52	172.61	1,581.94	-5.25	5.97	-4.51	0.37
1,676.00	0.60	128.23	1,675.94	-5.97	6.41	-5.18	0.46
1,767.00	0.69	158.35	1,766.93	-6.78	6.98	-5.91	0.38
1,859.00	0.28	72.49	1,858.93	-7.23	7.40	-6.31	0.79
1,951.00	2.50	98.45	1,950.90	-7.45	9.60	-6.27	2.45
2,037.00	4.08	103.76	2,036.75	-8.46	14.43	-6.70	1.87
2,118.00	6.07	107.05	2,117.43	-10.40	21.32	-7.82	2.48
2,211.00	4.57	100.12	2,210.03	-12.49	29.67	-8.92	1.75
2,297.00	5.43	101.43	2,295.70	-13.90	37.03	-9.45	1.01
2,382.00	7.27	123.24	2,380.19	-17.64	45.47	-12.18	3.53
2,468.00	6.88	120.85	2,465.53	-23.27	54.45	-16.71	0.57
2,554.00	6.27	128.99	2,550.97	-28.86	62.52	-21.32	1.29
2,640.00	7.21	133.40	2,636.38	-35.53	70.09	-27.05	1.25
2,725.00	6.42	135.77	2,720.77	-42.60	77.28	-33.22	0.99
2,811.00	7.56	130.54	2,806.13	-49.72	84.94	-39.40	1.52
2,896.00	7.62	129.54	2,890.39	-56.94	93.53	-45.56	0.17
2,982.00	7.13	129.66	2,975.68	-63.98	102.04	-51.55	0.57
3,068.00	6.45	132.28	3,061.07	-70.64	109.72	-57.25	0.87
3,154.00	7.25	131.63	3,146.46	-77.49	117.35	-63.16	0.93
3,240.00	6.87	132.63	3,231.81	-84.58	125.19	-69.28	0.46
3,325.00	7.25	126.52	3,316.16	-91.21	133.24	-74.93	0.99
3,411.00	6.36	126.66	3,401.56	-97.29	141.42	-80.00	1.04
3,497.00	6.23	130.47	3,487.04	-103.16	148.79	-84.96	0.51
3,583.00	7.68	124.52	3,572.41	-109.45	157.08	-90.23	1.88
3,668.00	6.56	122.32	3,656.75	-115.26	165.86	-94.97	1.36
3,754.00	6.08	127.19	3,742.23	-120.64	173.64	-99.40	0.84
3,840.00	5.70	130.62	3,827.77	-126.17	180.51	-104.09	0.60
3,926.00	7.27	124.61	3,913.22	-132.04	188.23	-109.01	1.99
4,012.00	6.84	124.67	3,998.57	-138.05	196.92	-113.95	0.50
4,098.00	6.86	122.40	4,083.96	-143.71	205.47	-118.58	0.32
4,186.00	6.21	123.95	4,171.38	-149.19	213.86	-123.03	0.77

Design Report for Wardell 1N-29HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,271.00	4.80	133.39	4,255.99	-154.20	220.26	-127.25	1.97
4,357.00	5.68	124.79	4,341.63	-159.10	226.37	-131.40	1.37
4,443.00	6.70	116.01	4,427.13	-163.73	234.37	-135.05	1.61
4,530.00	5.60	118.47	4,513.63	-167.98	242.66	-138.30	1.30
4,615.00	6.59	125.25	4,598.15	-172.77	250.29	-142.16	1.44
4,695.00	6.21	130.95	4,677.65	-178.25	257.31	-146.79	0.92
4,780.00	8.31	129.92	4,761.97	-185.21	265.49	-152.73	2.48
4,867.00	7.94	135.13	4,848.09	-193.50	274.56	-159.90	0.95
4,952.00	6.44	139.48	4,932.42	-201.29	281.79	-166.78	1.88
5,038.00	6.04	134.22	5,017.91	-208.11	288.17	-172.81	0.81
5,123.00	7.24	127.40	5,102.34	-214.48	295.63	-178.26	1.69
5,211.00	6.45	135.20	5,189.72	-221.36	303.52	-184.16	1.38
5,296.00	6.07	134.59	5,274.21	-227.90	310.08	-189.89	0.45
5,383.00	6.22	137.05	5,360.71	-234.58	316.57	-195.76	0.35
5,469.00	6.70	123.39	5,446.17	-240.75	323.93	-201.02	1.87
5,554.00	7.32	125.08	5,530.53	-246.59	332.51	-205.81	0.77
5,640.00	5.68	124.01	5,615.98	-252.12	340.52	-210.36	1.91
5,726.00	6.68	119.88	5,701.48	-256.99	348.38	-214.28	1.27
5,812.00	7.01	131.09	5,786.87	-262.94	356.68	-219.20	1.60
5,898.00	7.10	133.83	5,872.22	-270.06	364.47	-225.37	0.41
5,983.00	6.06	134.79	5,956.66	-276.86	371.44	-231.30	1.23
6,069.00	5.70	131.38	6,042.20	-282.89	377.87	-236.53	0.58
6,155.00	6.10	116.52	6,127.75	-287.75	385.16	-240.50	1.83
6,241.00	5.78	125.24	6,213.29	-292.29	392.78	-244.11	1.11
6,285.00	5.45	118.81	6,257.08	-294.57	396.43	-245.95	1.61
6,326.00	9.22	106.59	6,297.74	-296.45	401.28	-247.25	9.90
6,370.00	13.66	102.41	6,340.86	-298.57	409.74	-248.36	10.26
6,411.00	13.99	90.31	6,380.68	-299.64	419.42	-248.28	7.09
6,457.00	15.87	76.20	6,425.14	-298.17	431.10	-245.45	8.87
6,498.00	17.86	57.94	6,464.40	-293.49	441.88	-239.54	13.74
6,543.00	18.84	49.24	6,507.12	-285.08	453.23	-229.85	6.46
6,583.00	19.24	37.40	6,544.95	-275.63	462.13	-219.42	9.69
6,627.00	21.36	30.79	6,586.22	-262.98	470.64	-205.86	7.09
6,667.00	24.63	21.16	6,623.05	-248.94	477.38	-191.13	12.44
6,709.00	28.48	14.79	6,660.62	-231.09	483.10	-172.72	11.39
6,756.00	31.08	8.46	6,701.42	-208.24	487.75	-149.49	8.67
6,799.00	34.33	5.20	6,737.60	-185.18	490.48	-126.27	8.59
6,841.00	36.95	2.60	6,771.73	-160.77	492.12	-101.83	7.20
6,885.00	42.54	359.23	6,805.55	-132.66	492.53	-73.87	13.61
6,927.00	47.28	357.52	6,835.29	-103.03	491.67	-44.55	11.65
6,970.00	50.45	358.95	6,863.57	-70.67	490.68	-12.52	7.79
7,013.00	56.50	357.79	6,889.15	-36.15	489.68	21.64	14.24
7,057.00	62.84	357.24	6,911.36	1.78	488.03	59.11	14.45
7,097.00	65.41	357.92	6,928.82	37.73	486.51	94.63	6.60
7,141.00	68.78	356.88	6,945.94	78.21	484.67	134.62	7.96
7,184.00	73.01	358.51	6,960.01	118.80	483.04	174.74	10.47
7,227.00	75.92	1.43	6,971.53	160.22	483.03	215.87	9.41
7,270.00	79.74	2.40	6,980.59	202.22	484.44	257.74	9.15
7,312.00	84.59	2.52	6,986.32	243.78	486.22	299.22	11.55
7,355.00	87.87	3.18	6,989.14	286.63	488.36	342.02	7.78
7,400.00	90.05	2.86	6,989.96	331.55	490.73	386.92	4.90

Design Report for Wardell 1N-29HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
7" Intermediate Casing							
7,413.00	90.68	2.77	6,989.88	344.54	491.37	399.89	4.90
7,432.00	90.49	3.19	6,989.68	363.51	492.35	418.85	2.43
7,517.00	89.88	3.21	6,989.41	448.38	497.10	503.68	0.72
7,603.00	90.49	3.15	6,989.13	534.25	501.87	589.51	0.71
7,689.00	90.68	3.39	6,988.25	620.10	506.77	675.35	0.36
7,774.00	89.57	1.75	6,988.07	705.01	510.59	760.12	2.33
7,860.00	89.44	1.22	6,988.81	790.98	512.81	845.75	0.63
7,946.00	89.07	1.85	6,989.93	876.94	515.12	931.39	0.85
8,032.00	89.63	1.40	6,990.90	962.90	517.56	1,017.04	0.84
8,117.00	88.70	2.56	6,992.14	1,047.84	520.49	1,101.74	1.75
8,204.00	88.58	1.84	6,994.21	1,134.75	523.83	1,188.44	0.84
8,290.00	89.75	2.69	6,995.46	1,220.67	527.23	1,274.16	1.68
8,376.00	88.45	3.38	6,996.81	1,306.54	531.78	1,359.97	1.71
8,461.00	89.69	2.89	6,998.19	1,391.39	536.43	1,444.79	1.57
8,547.00	88.77	3.89	6,999.35	1,477.23	541.51	1,530.63	1.58
8,633.00	88.95	3.95	7,001.06	1,563.02	547.39	1,616.51	0.22
8,719.00	89.07	3.52	7,002.54	1,648.82	552.99	1,702.38	0.52
8,804.00	89.01	3.83	7,003.97	1,733.63	558.44	1,787.24	0.37
8,890.00	88.70	3.60	7,005.69	1,819.44	564.01	1,873.10	0.45
8,973.00	88.40	2.75	7,007.79	1,902.28	568.61	1,955.92	1.09
9,062.00	88.64	2.30	7,010.09	1,991.16	572.53	2,044.64	0.57
9,147.00	88.89	3.52	7,011.92	2,076.03	576.84	2,129.43	1.46
9,233.00	88.40	3.46	7,013.95	2,161.85	582.08	2,215.27	0.57
9,319.00	88.77	2.62	7,016.08	2,247.70	586.64	2,301.06	1.07
9,405.00	89.88	1.65	7,017.09	2,333.63	589.84	2,386.77	1.71
9,491.00	89.75	1.40	7,017.37	2,419.60	592.13	2,472.42	0.33
9,576.00	90.99	2.35	7,016.82	2,504.55	594.91	2,557.11	1.84
9,662.00	90.06	1.81	7,016.03	2,590.49	598.03	2,642.82	1.25
9,747.00	88.89	1.18	7,016.81	2,675.46	600.25	2,727.45	1.56
9,833.00	88.95	0.56	7,018.43	2,761.43	601.55	2,812.99	0.72
9,919.00	88.33	359.93	7,020.47	2,847.41	601.92	2,898.41	1.03
10,005.00	88.02	0.41	7,023.21	2,933.36	602.18	2,983.80	0.66
10,091.00	88.76	0.37	7,025.63	3,019.32	602.76	3,069.23	0.86
10,176.00	88.58	0.10	7,027.60	3,104.30	603.11	3,153.66	0.38
10,262.00	88.76	0.48	7,029.59	3,190.28	603.54	3,239.09	0.49
10,348.00	88.76	0.00	7,031.46	3,276.26	603.90	3,324.52	0.56
10,434.00	88.64	0.67	7,033.41	3,362.23	604.41	3,409.96	0.79
10,519.00	88.52	0.06	7,035.51	3,447.20	604.95	3,494.41	0.73
10,605.00	88.45	0.35	7,037.79	3,533.17	605.26	3,579.82	0.35
10,691.00	88.82	0.32	7,039.84	3,619.15	605.76	3,665.25	0.43
10,776.00	88.95	359.77	7,041.49	3,704.13	605.83	3,749.66	0.66
10,862.00	89.14	358.21	7,042.92	3,790.10	604.31	3,834.85	1.83
10,948.00	88.39	358.44	7,044.78	3,876.04	601.80	3,919.91	0.91
11,033.00	88.77	355.26	7,046.88	3,960.88	597.13	4,003.60	3.77
11,120.00	88.89	355.35	7,048.66	4,047.57	590.01	4,088.86	0.17
11,206.00	88.99	354.02	7,050.25	4,133.18	582.04	4,172.94	1.55
11,292.00	89.87	353.67	7,051.11	4,218.68	572.82	4,256.76	1.10
11,377.00	89.87	353.67	7,051.30	4,303.16	563.45	4,339.56	0.00
11,463.00	89.96	353.85	7,051.43	4,388.65	554.10	4,423.36	0.23
Final Sperry MWD Survey @ 11463.00ft							

Design Report for Wardell 1N-29HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
11,504.00	89.96	353.85	7,051.46	4,429.42	549.71	4,463.33	0.00
Straight Line Projection to Bit @ 11504.00ft							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
132.00	131.99	0.15	0.99	First Gyro Survey @ 132.00ft
900.00	899.97	0.48	5.58	Final Gyro Survey @ 900.00ft
900.00	899.97	0.48	5.58	Tie-On to Surface Gyros @ 900.00ft
1,031.00	1,030.97	-0.49	5.23	First Sperry MWD Survey @ 1031.00ft
11,463.00	7,051.43	4,388.65	554.10	Final Sperry MWD Survey @ 11463.00ft
11,504.00	7,051.46	4,429.42	549.71	Straight Line Projection to Bit @ 11504.00ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Wardell 1N-29HZ_BHL ReLoc	6.75	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
132.00	900.00	Surface Gyros	NS-GYRO-MS
1,031.00	11,504.00	Sperry MWD Surveys	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,400.00		7" Intermediate Casing	7	8-3/4

Design Report for Wardell 1N-29HZ - 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
Wardell 1N-29HZ_B - actual wellpath misses target center by 47.26ft at 11504.00ft MD (7051.46 TVD, 4429.42 N, 549.71 E) - Point	0.00	0.00	7,025.00	4,461.97	527.94	,645.957415	,884.357798	40.202432	-104.680560
Wardell 1N-29HZ_S - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	,179.501663	,8,397.598127	40.190184	-104.682450
Point 1			807.48	88.77	1,313,275.71	3,229,204.19			
Point 2			807.36	2,271.91	1,315,458.66	3,229,183.94			
Point 3			808.08	4,464.63	1,317,651.20	3,229,164.45			
Point 4			-1,364.16	4,448.86	1,317,615.41	3,226,992.54			
Point 5			-3,541.79	4,432.92	1,317,579.39	3,224,815.24			
Point 6			-3,534.73	2,253.27	1,315,399.99	3,224,842.40			
Point 7			-3,527.72	96.68	1,313,243.65	3,224,869.29			
Point 8			-1,358.78	92.17	1,313,259.14	3,227,038.08			
Point 9			807.48	88.77	1,313,275.71	3,229,204.19			
Wardell 1N-29HZ_S - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	,179.501663	,8,397.598127	40.190184	-104.682450
Point 1			1,267.52	-371.98	1,312,819.24	3,229,668.44			
Point 2			1,267.38	2,271.85	1,315,462.84	3,229,643.93			
Point 3			1,268.26	4,928.01	1,318,118.78	3,229,620.32			
Point 4			-1,367.51	4,908.87	1,318,075.35	3,226,984.95			
Point 5			-4,003.29	4,889.57	1,318,031.75	3,224,349.57			
Point 6			-3,994.75	2,251.78	1,315,394.26	3,224,382.43			
Point 7			-3,986.25	-362.39	1,312,780.39	3,224,415.03			
Point 8			-1,359.62	-367.85	1,312,799.15	3,227,041.49			
Point 9			1,267.52	-371.98	1,312,819.24	3,229,668.44			
Wardell 1N-29HZ_W - actual wellpath misses target center by 22.68ft at 10771.44ft MD (7041.41 TVD, 3699.57 N, 605.84 E) - Point	0.00	0.00	7,019.50	3,700.00	600.00	,884.718273	,8,963.436340	40.200340	-104.680302
Wardell 1N-29HZ_S - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	,179.501663	,8,397.598127	40.190184	-104.682450
Wardell 1N-29HZ_B - actual wellpath misses target center by 128.79ft at 11504.00ft MD (7051.46 TVD, 4429.42 N, 549.71 E) - Point	0.00	0.00	7,025.00	4,461.97	427.94	,645.035955	,8,784.365830	40.202432	-104.680918
Wardell 1N-29HZ_L: - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	,179.501663	,8,397.598127	40.190184	-104.682450
Point 1			807.48	88.77	1,313,275.71	3,229,204.19			
Point 2			807.36	2,271.91	1,315,458.66	3,229,183.94			
Point 3			808.08	4,464.63	1,317,651.20	3,229,164.45			
Point 4			415.08	4,468.26	1,317,651.21	3,228,771.45			
Point 5			414.47	92.39	1,313,275.70	3,228,811.18			
Wardell 1N-29HZ_W - actual wellpath misses target center by 8.02ft at 9571.65ft MD (7016.89 TVD, 2500.21 N, 594.73 E) - Point	0.00	0.00	7,010.85	2,500.00	600.00	,684.820389	,8,974.499279	40.197046	-104.680302

North Reference Sheet for Sec. 29 T3N-R65W - Wardell 1N-29HZ - 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=16ft @ 4885.00ft (Xtreme 22). Northing and Easting are relative to Wardell 1N-29HZ

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: 3,000,000.000644ft, False Northing: 1,000,000.001308ft, Scale Reduction: 0.99995740

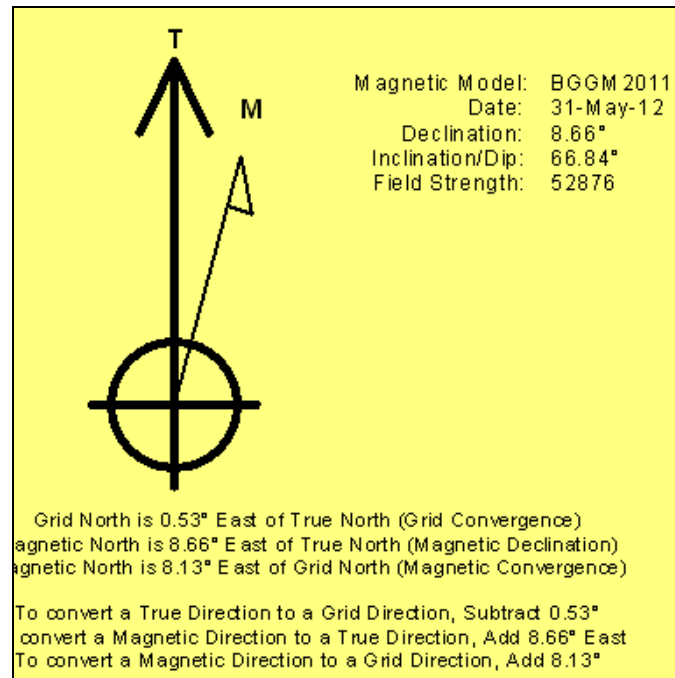
Grid Coordinates of Well: 1,313,179.501663 ft N, 3,228,397.598127 ft E

Geographical Coordinates of Well: 40° 11' 24.66" N, 104° 40' 56.82" W

Grid Convergence at Surface is: 0.53°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,504.00ft
the Bottom Hole Displacement is 4,463.40ft in the Direction of 7.07° (True).

Magnetic Convergence at surface is: -8.13° (31 May 2012, , BGGM2011)



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 29 T3N-R65W

Wardell 1N-29HZ

Plan A Rev 1

Design: Actual Field Surveys

Survey Report - Geographic

25 July, 2012

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Wardell 1N-29HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Site:	Sec. 29 T3N-R65W	MD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Well:	Wardell 1N-29HZ	North Reference:	True
Wellbore:	Plan A Rev 1	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. 29 T3N-R65W				
Site Position:		Northing:	1,313,179.460366ft	Latitude:	40.190185
From:	Lat/Long	Easting:	3,228,349.544428ft	Longitude:	-104.682622
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	0.53 °

Well	Wardell 1N-29HZ					
Well Position	+N/-S	0.00 ft	Northing:	1,313,179.501663 ft	Latitude:	40.190184
	+E/-W	0.00 ft	Easting:	3,228,397.598127 ft	Longitude:	-104.682450
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,869.00 ft

Wellbore	Plan A Rev 1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2011	2012-05-31	8.66	66.84	52,876

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	6.75	

Survey Program	Date	2012-07-25			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
132.00	900.00	Surface Gyros (Plan A Rev 1)	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,031.00	11,504.00	Sperry MWD Surveys (Plan A Rev 1)	MWD	MWD - Standard	

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Wardell 1N-29HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Site:	Sec. 29 T3N-R65W	MD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Well:	Wardell 1N-29HZ	North Reference:	True
Wellbore:	Plan A Rev 1	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	13,179.501663	28,397.598127	40.190184	-104.682450
132.00	0.87	81.51	131.99	0.15	0.99	13,179.658742	28,398.587845	40.190184	-104.682446
First Gyro Survey @ 132.00ft									
232.00	0.78	83.54	231.98	0.34	2.42	13,179.860548	28,400.013190	40.190185	-104.682441
332.00	0.31	81.92	331.98	0.45	3.36	13,179.983848	28,400.956233	40.190185	-104.682438
432.00	0.41	92.65	431.98	0.47	3.99	13,180.011092	28,401.581228	40.190185	-104.682436
532.00	0.36	54.67	531.98	0.64	4.60	13,180.181866	28,402.193362	40.190186	-104.682434
632.00	0.35	98.31	631.97	0.78	5.16	13,180.324532	28,402.750572	40.190186	-104.682432
732.00	0.15	163.19	731.97	0.61	5.50	13,180.158232	28,403.092186	40.190186	-104.682430
832.00	0.21	81.97	831.97	0.51	5.72	13,180.060556	28,403.312405	40.190185	-104.682430
900.00	0.45	261.51	899.97	0.48	5.58	13,180.037244	28,403.171906	40.190185	-104.682430
Final Gyro Survey @ 900.00ft - Tie-On to Surface Gyros @ 900.00ft									
1,031.00	0.80	170.21	1,030.97	-0.49	5.23	13,179.056895	28,402.827647	40.190183	-104.682431
First Sperry MWD Survey @ 1031.00ft									
1,122.00	0.66	186.91	1,121.96	-1.64	5.27	13,177.911073	28,402.883177	40.190179	-104.682431
1,215.00	0.24	195.50	1,214.96	-2.36	5.15	13,177.190624	28,402.773325	40.190177	-104.682432
1,307.00	0.57	174.98	1,306.95	-3.00	5.14	13,176.549033	28,402.767791	40.190176	-104.682432
1,399.00	0.50	169.48	1,398.95	-3.85	5.26	13,175.699614	28,402.888957	40.190173	-104.682431
1,492.00	0.52	135.44	1,491.95	-4.55	5.63	13,175.003429	28,403.265573	40.190171	-104.682430
1,582.00	0.52	172.61	1,581.94	-5.25	5.97	13,174.310611	28,403.611049	40.190169	-104.682429
1,676.00	0.60	128.23	1,675.94	-5.97	6.41	13,173.587163	28,404.059204	40.190167	-104.682427
1,767.00	0.69	158.35	1,766.93	-6.78	6.98	13,172.788418	28,404.643002	40.190165	-104.682425
1,859.00	0.28	72.49	1,858.93	-7.23	7.40	13,172.345070	28,405.065850	40.190164	-104.682424
1,951.00	2.50	98.45	1,950.90	-7.45	9.60	13,172.138126	28,407.267132	40.190163	-104.682416
2,037.00	4.08	103.76	2,036.75	-8.46	14.43	13,171.179331	28,412.103176	40.190161	-104.682398
2,118.00	6.07	107.05	2,117.43	-10.40	21.32	13,169.301775	28,419.014425	40.190155	-104.682374
2,211.00	4.57	100.12	2,210.03	-12.49	29.67	13,167.286063	28,427.381870	40.190150	-104.682344
2,297.00	5.43	101.43	2,295.70	-13.90	37.03	13,165.945647	28,434.755548	40.190146	-104.682317
2,382.00	7.27	123.24	2,380.19	-17.64	45.47	13,162.277913	28,443.231496	40.190135	-104.682287
2,468.00	6.88	120.85	2,465.53	-23.27	54.45	13,156.736987	28,452.255947	40.190120	-104.682255
2,554.00	6.27	128.99	2,550.97	-28.86	62.52	13,151.215551	28,460.379436	40.190105	-104.682226
2,640.00	7.21	133.40	2,636.38	-35.53	70.09	13,144.622894	28,468.011745	40.190086	-104.682199
2,725.00	6.42	135.77	2,720.77	-42.60	77.28	13,137.619573	28,475.266840	40.190067	-104.682173
2,811.00	7.56	130.54	2,806.13	-49.72	84.94	13,130.568118	28,482.985267	40.190047	-104.682146
2,896.00	7.62	129.54	2,890.39	-56.94	93.53	13,123.425905	28,491.646449	40.190028	-104.682115
2,982.00	7.13	129.66	2,975.68	-63.98	102.04	13,116.468586	28,500.216663	40.190008	-104.682085
3,068.00	6.45	132.28	3,061.07	-70.64	109.72	13,109.883811	28,507.960192	40.189990	-104.682057
3,154.00	7.25	131.63	3,146.46	-77.49	117.35	13,103.099960	28,515.652832	40.189971	-104.682030
3,240.00	6.87	132.63	3,231.81	-84.58	125.19	13,096.084345	28,523.557942	40.189952	-104.682002
3,325.00	7.25	126.52	3,316.16	-91.21	133.24	13,089.524192	28,531.669218	40.189934	-104.681973
3,411.00	6.36	126.66	3,401.56	-97.29	141.42	13,083.526640	28,539.906835	40.189917	-104.681944
3,497.00	6.23	130.47	3,487.04	-103.16	148.79	13,077.722350	28,547.331404	40.189901	-104.681917
3,583.00	7.68	124.52	3,572.41	-109.45	157.08	13,071.513629	28,555.673837	40.189883	-104.681888
3,668.00	6.56	122.32	3,656.75	-115.26	165.86	13,065.780341	28,564.509808	40.189867	-104.681856
3,754.00	6.08	127.19	3,742.23	-120.64	173.64	13,060.473037	28,572.338474	40.189853	-104.681828
3,840.00	5.70	130.62	3,827.77	-126.17	180.51	13,055.003409	28,579.258857	40.189838	-104.681804
3,926.00	7.27	124.61	3,913.22	-132.04	188.23	13,049.203554	28,587.033101	40.189821	-104.681776
4,012.00	6.84	124.67	3,998.57	-138.05	196.92	13,043.280306	28,595.778136	40.189805	-104.681745
4,098.00	6.86	122.40	4,083.96	-143.71	205.47	13,037.694360	28,604.378062	40.189789	-104.681715
4,186.00	6.21	123.95	4,171.38	-149.19	213.86	13,032.297927	28,612.813511	40.189774	-104.681685
4,271.00	4.80	133.39	4,255.99	-154.20	220.26	13,027.346466	28,619.257581	40.189761	-104.681662
4,357.00	5.68	124.79	4,341.63	-159.10	226.37	13,022.503013	28,625.412288	40.189747	-104.681640
4,443.00	6.70	116.01	4,427.13	-163.73	234.37	13,017.948706	28,633.458474	40.189734	-104.681611
4,530.00	5.60	118.47	4,513.63	-167.98	242.66	13,013.776259	28,641.789875	40.189723	-104.681581
4,615.00	6.59	125.25	4,598.15	-172.77	250.29	13,009.054817	28,649.462562	40.189710	-104.681554

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Wardell 1N-29HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Site:	Sec. 29 T3N-R65W	MD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Well:	Wardell 1N-29HZ	North Reference:	True
Wellbore:	Plan A Rev 1	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
4,695.00	6.21	130.95	4,677.65	-178.25	257.31	13,003.634623	28,656.529507	40.189695	-104.681529
4,780.00	8.31	129.92	4,761.97	-185.21	265.49	12,996.755047	28,664.777067	40.189675	-104.681500
4,867.00	7.94	135.13	4,848.09	-193.50	274.56	12,988.546089	28,673.913967	40.189653	-104.681467
4,952.00	6.44	139.48	4,932.42	-201.29	281.79	12,980.828604	28,681.224556	40.189631	-104.681441
5,038.00	6.04	134.22	5,017.91	-208.11	288.17	12,974.066033	28,687.663166	40.189613	-104.681419
5,123.00	7.24	127.40	5,102.34	-214.48	295.63	12,967.763037	28,695.181542	40.189595	-104.681392
5,211.00	6.45	135.20	5,189.72	-221.36	303.52	12,960.960846	28,703.132550	40.189576	-104.681364
5,296.00	6.07	134.59	5,274.21	-227.90	310.08	12,954.479220	28,709.756922	40.189558	-104.681340
5,383.00	6.22	137.05	5,360.71	-234.58	316.57	12,947.860636	28,716.305023	40.189540	-104.681317
5,469.00	6.70	123.39	5,446.17	-240.75	323.93	12,941.757629	28,723.724938	40.189523	-104.681291
5,554.00	7.32	125.08	5,530.53	-246.59	332.51	12,935.996161	28,732.349560	40.189507	-104.681260
5,640.00	5.68	124.01	5,615.98	-252.12	340.52	12,930.540981	28,740.411688	40.189492	-104.681231
5,726.00	6.68	119.88	5,701.48	-256.99	348.38	12,925.741431	28,748.321021	40.189478	-104.681203
5,812.00	7.01	131.09	5,786.87	-262.94	356.68	12,919.877110	28,756.667692	40.189462	-104.681173
5,898.00	7.10	133.83	5,872.22	-270.06	364.47	12,912.819747	28,764.522089	40.189443	-104.681145
5,983.00	6.06	134.79	5,956.66	-276.86	371.44	12,906.085634	28,771.558113	40.189424	-104.681121
6,069.00	5.70	131.38	6,042.20	-282.89	377.87	12,900.124045	28,778.039299	40.189407	-104.681098
6,155.00	6.10	116.52	6,127.75	-287.75	385.16	12,895.327951	28,785.377059	40.189394	-104.681071
6,241.00	5.78	125.24	6,213.29	-292.29	392.78	12,890.859567	28,793.043887	40.189382	-104.681044
6,285.00	5.45	118.81	6,257.08	-294.57	396.43	12,888.607947	28,796.705128	40.189375	-104.681031
6,326.00	9.22	106.59	6,297.74	-296.45	401.28	12,886.775972	28,801.577978	40.189370	-104.681014
6,370.00	13.66	102.41	6,340.86	-298.57	409.74	12,884.730018	28,810.053568	40.189364	-104.680983
6,411.00	13.99	90.31	6,380.68	-299.64	419.42	12,883.751945	28,819.748673	40.189361	-104.680949
6,457.00	15.87	76.20	6,425.14	-298.17	431.10	12,885.330224	28,831.407206	40.189365	-104.680907
6,498.00	17.86	57.94	6,464.40	-293.49	441.88	12,890.107450	28,842.144212	40.189378	-104.680868
6,543.00	18.84	49.24	6,507.12	-285.08	453.23	12,898.619898	28,853.419870	40.189401	-104.680828
6,583.00	19.24	37.40	6,544.95	-275.63	462.13	12,908.157062	28,862.230274	40.189427	-104.680796
6,627.00	21.36	30.79	6,586.22	-262.98	470.64	12,920.880253	28,870.620074	40.189462	-104.680765
6,667.00	24.63	21.16	6,623.05	-248.94	477.38	12,934.980956	28,877.231968	40.189501	-104.680741
6,709.00	28.48	14.79	6,660.62	-231.09	483.10	12,952.886450	28,882.785721	40.189550	-104.680721
6,756.00	31.08	8.46	6,701.42	-208.24	487.75	12,975.771235	28,887.222100	40.189612	-104.680704
6,799.00	34.33	5.20	6,737.60	-185.18	490.48	12,998.855937	28,889.742017	40.189676	-104.680694
6,841.00	36.95	2.60	6,771.73	-160.77	492.12	13,023.279579	28,891.163228	40.189743	-104.680689
6,885.00	42.54	359.23	6,805.55	-132.66	492.53	13,051.390419	28,891.304430	40.189820	-104.680687
6,927.00	47.28	357.52	6,835.29	-103.03	491.67	13,081.008675	28,890.172437	40.189901	-104.680690
6,970.00	50.45	358.95	6,863.57	-70.67	490.68	13,113.362008	28,888.886587	40.189990	-104.680694
7,013.00	56.50	357.79	6,889.15	-36.15	489.68	13,147.873145	28,887.572295	40.190085	-104.680697
7,057.00	62.84	357.24	6,911.36	1.78	488.03	13,185.776922	28,885.571144	40.190189	-104.680703
7,097.00	65.41	357.92	6,928.82	37.73	486.51	13,221.714501	28,883.722610	40.190287	-104.680709
7,141.00	68.78	356.88	6,945.94	78.21	484.67	13,262.176239	28,881.506697	40.190399	-104.680715
7,184.00	73.01	358.51	6,960.01	118.80	483.04	13,302.745907	28,879.506311	40.190510	-104.680721
7,227.00	75.92	1.43	6,971.53	160.22	483.03	13,344.161753	28,879.110228	40.190624	-104.680721
7,270.00	79.74	2.40	6,980.59	202.22	484.44	13,386.172897	28,880.129799	40.190739	-104.680716
7,312.00	84.59	2.52	6,986.32	243.78	486.22	13,427.742969	28,881.532138	40.190853	-104.680710
7,355.00	87.87	3.18	6,989.14	286.63	488.36	13,470.606758	28,883.270493	40.190971	-104.680702
7,400.00	90.05	2.86	6,989.96	331.55	490.73	13,515.552091	28,885.227059	40.191094	-104.680694
7" Intermediate Casing									
7,413.00	90.68	2.77	6,989.88	344.54	491.37	13,528.540846	28,885.745946	40.191130	-104.680691
7,432.00	90.49	3.19	6,989.68	363.51	492.35	13,547.521604	28,886.558652	40.191182	-104.680688
7,517.00	89.88	3.21	6,989.41	448.38	497.10	13,632.424746	28,890.520634	40.191415	-104.680671
7,603.00	90.49	3.15	6,989.13	534.25	501.87	13,718.328139	28,894.499242	40.191650	-104.680654
7,689.00	90.68	3.39	6,988.25	620.10	506.77	13,804.221455	28,898.612600	40.191886	-104.680636
7,774.00	89.57	1.75	6,988.07	705.01	510.59	13,889.159443	28,901.640649	40.192119	-104.680622
7,860.00	89.44	1.22	6,988.81	790.98	512.81	13,975.140256	28,903.076537	40.192355	-104.680614
7,946.00	89.07	1.85	6,989.93	876.94	515.12	14,061.115467	28,904.587357	40.192591	-104.680606

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Wardell 1N-29HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Site:	Sec. 29 T3N-R65W	MD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Well:	Wardell 1N-29HZ	North Reference:	True
Wellbore:	Plan A Rev 1	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
8,032.00	89.63	1.40	6,990.90	962.90	517.56	14,147.089953	28,906.233260	40.192827	-104.680597
8,117.00	88.70	2.56	6,992.14	1,047.84	520.49	14,232.047645	28,908.386266	40.193060	-104.680587
8,204.00	88.58	1.84	6,994.21	1,134.75	523.83	14,318.981825	28,910.923531	40.193299	-104.680575
8,290.00	89.75	2.69	6,995.46	1,220.67	527.23	14,404.927244	28,913.529608	40.193535	-104.680563
8,376.00	88.45	3.38	6,996.81	1,306.54	531.78	14,490.828332	28,917.290183	40.193770	-104.680546
8,461.00	89.69	2.89	6,998.19	1,391.39	536.43	14,575.723660	28,921.155221	40.194003	-104.680530
8,547.00	88.77	3.89	6,999.35	1,477.23	541.51	14,661.602986	28,925.448127	40.194239	-104.680512
8,633.00	88.95	3.95	7,001.06	1,563.02	547.39	14,747.431657	28,930.534894	40.194474	-104.680491
8,719.00	89.07	3.52	7,002.54	1,648.82	552.99	14,833.280304	28,935.344724	40.194710	-104.680471
8,804.00	89.01	3.83	7,003.97	1,733.63	558.44	14,918.136507	28,940.009818	40.194943	-104.680451
8,890.00	88.70	3.60	7,005.69	1,819.44	564.01	15,003.982555	28,944.789458	40.195178	-104.680431
8,973.00	88.40	2.75	7,007.79	1,902.28	568.61	15,086.863074	28,948.620854	40.195406	-104.680415
9,062.00	88.64	2.30	7,010.09	1,991.16	572.53	15,175.775281	28,951.720674	40.195650	-104.680401
9,147.00	88.89	3.52	7,011.92	2,076.03	576.84	15,260.676831	28,955.252061	40.195883	-104.680385
9,233.00	88.40	3.46	7,013.95	2,161.85	582.08	15,346.534017	28,959.694183	40.196118	-104.680366
9,319.00	88.77	2.62	7,016.08	2,247.70	586.64	15,432.420617	28,963.461675	40.196354	-104.680350
9,405.00	89.88	1.65	7,017.09	2,333.63	589.84	15,518.374807	28,965.872649	40.196590	-104.680339
9,491.00	89.75	1.40	7,017.37	2,419.60	592.13	15,604.357596	28,967.368612	40.196826	-104.680330
9,576.00	90.99	2.35	7,016.82	2,504.55	594.91	15,689.326094	28,969.366139	40.197059	-104.680320
9,662.00	90.06	1.81	7,016.03	2,590.49	598.03	15,775.286023	28,971.694749	40.197295	-104.680309
9,747.00	88.89	1.18	7,016.81	2,675.46	600.25	15,860.264831	28,973.128779	40.197528	-104.680301
9,833.00	88.95	0.56	7,018.43	2,761.43	601.55	15,946.243937	28,973.641622	40.197764	-104.680297
9,919.00	88.33	359.93	7,020.47	2,847.41	601.92	16,032.214145	28,973.216679	40.198000	-104.680295
10,005.00	88.02	0.41	7,023.21	2,933.36	602.18	16,118.164824	28,972.679227	40.198236	-104.680294
10,091.00	88.76	0.37	7,025.63	3,019.32	602.76	16,204.126362	28,972.471809	40.198472	-104.680292
10,176.00	88.58	0.10	7,027.60	3,104.30	603.11	16,289.098616	28,972.036914	40.198705	-104.680291
10,262.00	88.76	0.48	7,029.59	3,190.28	603.54	16,375.070848	28,971.679434	40.198941	-104.680289
10,348.00	88.76	0.00	7,031.46	3,276.26	603.90	16,461.045706	28,971.246904	40.199177	-104.680288
10,434.00	88.64	0.67	7,033.41	3,362.23	604.41	16,547.018913	28,970.956922	40.199413	-104.680286
10,519.00	88.52	0.06	7,035.51	3,447.20	604.95	16,631.988428	28,970.714839	40.199646	-104.680284
10,605.00	88.45	0.35	7,037.79	3,533.17	605.26	16,717.953238	28,970.229841	40.199882	-104.680283
10,691.00	88.82	0.32	7,039.84	3,619.15	605.76	16,803.924532	28,969.939876	40.200118	-104.680281
10,776.00	88.95	359.77	7,041.49	3,704.13	605.83	16,888.901449	28,969.223134	40.200352	-104.680281
10,862.00	89.14	358.21	7,042.92	3,790.10	604.31	16,974.852158	28,966.914988	40.200588	-104.680287
10,948.00	88.39	358.44	7,044.78	3,876.04	601.80	17,060.764287	28,963.609678	40.200824	-104.680296
11,033.00	88.77	355.26	7,046.88	3,960.88	597.13	17,145.548464	28,958.159061	40.201056	-104.680312
11,120.00	88.89	355.35	7,048.66	4,047.57	590.01	17,232.165423	28,950.240866	40.201294	-104.680338
11,206.00	88.99	354.02	7,050.25	4,133.18	582.04	17,317.698361	28,941.487501	40.201529	-104.680366
11,292.00	89.87	353.67	7,051.11	4,218.68	572.82	17,403.105128	28,931.479808	40.201764	-104.680399
11,377.00	89.87	353.67	7,051.30	4,303.16	563.45	17,487.493109	28,921.330132	40.201996	-104.680433
11,463.00	89.96	353.85	7,051.43	4,388.65	554.10	17,572.889997	28,911.195167	40.202231	-104.680466
Final Sperry MWD Survey @ 11463.00ft									
11,504.00	89.96	353.85	7,051.46	4,429.42	549.71	17,613.610062	28,906.427332	40.202343	-104.680482
Straight Line Projection to Bit @ 11504.00ft									

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Wardell 1N-29HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Site:	Sec. 29 T3N-R65W	MD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Well:	Wardell 1N-29HZ	North Reference:	True
Wellbore:	Plan A Rev 1	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

Targets

Target Name	- hit/miss target	Dip Angle	Dip Dir.	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
- Shape		(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Wardell 1N-29HZ_BH		0.00	0.00	7,025.00	4,461.97	527.94	317,645.957415	28,884.357798	40.202432	-104.680560
- actual wellpath misses target center by 47.26ft at 11504.00ft MD (7051.46 TVD, 4429.42 N, 549.71 E)										
- Point										
Wardell 1N-29HZ_Set		0.00	0.00	0.00	0.00	0.00	313,179.501663	28,397.598127	40.190184	-104.682450
- actual wellpath hits target center										
- Polygon										
Point 1				0.00	88.77	807.48	1,313,275.71	3,229,204.19		
Point 2				0.00	2,271.91	807.36	1,315,458.66	3,229,183.94		
Point 3				0.00	4,464.63	808.08	1,317,651.20	3,229,164.45		
Point 4				0.00	4,448.86	-1,364.16	1,317,615.41	3,226,992.54		
Point 5				0.00	4,432.92	-3,541.79	1,317,579.39	3,224,815.24		
Point 6				0.00	2,253.27	-3,534.73	1,315,399.99	3,224,842.40		
Point 7				0.00	96.68	-3,527.72	1,313,243.65	3,224,869.29		
Point 8				0.00	92.17	-1,358.78	1,313,259.14	3,227,038.08		
Point 9				0.00	88.77	807.48	1,313,275.71	3,229,204.19		
Wardell 1N-29HZ_Ser		0.00	0.00	0.00	0.00	0.00	313,179.501663	28,397.598127	40.190184	-104.682450
- actual wellpath hits target center										
- Polygon										
Point 1				0.00	-371.98	1,267.52	1,312,819.24	3,229,668.44		
Point 2				0.00	2,271.85	1,267.38	1,315,462.84	3,229,643.93		
Point 3				0.00	4,928.01	1,268.26	1,318,118.78	3,229,620.32		
Point 4				0.00	4,908.87	-1,367.51	1,318,075.35	3,226,984.95		
Point 5				0.00	4,889.57	-4,003.29	1,318,031.75	3,224,349.57		
Point 6				0.00	2,251.78	-3,994.75	1,315,394.26	3,224,382.43		
Point 7				0.00	-362.39	-3,986.25	1,312,780.39	3,224,415.03		
Point 8				0.00	-367.85	-1,359.62	1,312,799.15	3,227,041.49		
Point 9				0.00	-371.98	1,267.52	1,312,819.24	3,229,668.44		
Wardell 1N-29HZ_WF		0.00	0.00	7,019.50	3,700.00	600.00	316,884.718273	28,963.436340	40.200340	-104.680302
- actual wellpath misses target center by 22.68ft at 10771.44ft MD (7041.41 TVD, 3699.57 N, 605.84 E)										
- Point										
Wardell 1N-29HZ_SH		0.00	0.00	0.00	0.00	0.00	313,179.501663	28,397.598127	40.190184	-104.682450
- actual wellpath hits target center										
- Point										
Wardell 1N-29HZ_BH		0.00	0.00	7,025.00	4,461.97	427.94	317,645.035955	28,784.365830	40.202432	-104.680918
- actual wellpath misses target center by 128.79ft at 11504.00ft MD (7051.46 TVD, 4429.42 N, 549.71 E)										
- Point										
Wardell 1N-29HZ_Lar		0.00	0.00	0.00	0.00	0.00	313,179.501663	28,397.598127	40.190184	-104.682450
- actual wellpath hits target center										
- Polygon										
Point 1				0.00	88.77	807.48	1,313,275.71	3,229,204.19		
Point 2				0.00	2,271.91	807.36	1,315,458.66	3,229,183.94		
Point 3				0.00	4,464.63	808.08	1,317,651.20	3,229,164.45		
Point 4				0.00	4,468.26	415.08	1,317,651.21	3,228,771.45		
Point 5				0.00	92.39	414.47	1,313,275.70	3,228,811.18		
Wardell 1N-29HZ_WF		0.00	0.00	7,010.85	2,500.00	600.00	315,684.820389	28,974.499279	40.197046	-104.680302
- actual wellpath misses target center by 8.02ft at 9571.65ft MD (7016.89 TVD, 2500.21 N, 594.73 E)										
- Point										

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Wardell 1N-29HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Site:	Sec. 29 T3N-R65W	MD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Well:	Wardell 1N-29HZ	North Reference:	True
Wellbore:	Plan A Rev 1	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

Targets

Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N-S (ft)	+E-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Wardell 1N-29HZ_BH	- actual wellpath misses target center by 47.26ft at 11504.00ft MD (7051.46 TVD, 4429.42 N, 549.71 E)	0.00	0.00	7,025.00	4,461.97	527.94	317,645.957415	28,884.357798	40.202432	-104.680560
Wardell 1N-29HZ_Set	- actual wellpath hits target center	0.00	0.00	0.00	0.00	0.00	313,179.501663	28,397.598127	40.190184	-104.682450
- Polygon										
Point 1				0.00	88.77	807.48	1,313,275.71	3,229,204.19		
Point 2				0.00	2,271.91	807.36	1,315,458.66	3,229,183.94		
Point 3				0.00	4,464.63	808.08	1,317,651.20	3,229,164.45		
Point 4				0.00	4,448.86	-1,364.16	1,317,615.41	3,226,992.54		
Point 5				0.00	4,432.92	-3,541.79	1,317,579.39	3,224,815.24		
Point 6				0.00	2,253.27	-3,534.73	1,315,399.99	3,224,842.40		
Point 7				0.00	96.68	-3,527.72	1,313,243.65	3,224,869.29		
Point 8				0.00	92.17	-1,358.78	1,313,259.14	3,227,038.08		
Point 9				0.00	88.77	807.48	1,313,275.71	3,229,204.19		
Wardell 1N-29HZ_Ser	- actual wellpath hits target center	0.00	0.00	0.00	0.00	0.00	313,179.501663	28,397.598127	40.190184	-104.682450
- Polygon										
Point 1				0.00	-371.98	1,267.52	1,312,819.24	3,229,668.44		
Point 2				0.00	2,271.85	1,267.38	1,315,462.84	3,229,643.93		
Point 3				0.00	4,928.01	1,268.26	1,318,118.78	3,229,620.32		
Point 4				0.00	4,908.87	-1,367.51	1,318,075.35	3,226,984.95		
Point 5				0.00	4,889.57	-4,003.29	1,318,031.75	3,224,349.57		
Point 6				0.00	2,251.78	-3,994.75	1,315,394.26	3,224,382.43		
Point 7				0.00	-362.39	-3,986.25	1,312,780.39	3,224,415.03		
Point 8				0.00	-367.85	-1,359.62	1,312,799.15	3,227,041.49		
Point 9				0.00	-371.98	1,267.52	1,312,819.24	3,229,668.44		
Wardell 1N-29HZ_WF	- actual wellpath misses target center by 22.68ft at 10771.44ft MD (7041.41 TVD, 3699.57 N, 605.84 E)	0.00	0.00	7,019.50	3,700.00	600.00	316,884.718273	28,963.436340	40.200340	-104.680302
Wardell 1N-29HZ_SH	- actual wellpath hits target center	0.00	0.00	0.00	0.00	0.00	313,179.501663	28,397.598127	40.190184	-104.682450
Wardell 1N-29HZ_BH	- actual wellpath misses target center by 128.79ft at 11504.00ft MD (7051.46 TVD, 4429.42 N, 549.71 E)	0.00	0.00	7,025.00	4,461.97	427.94	317,645.035955	28,784.365830	40.202432	-104.680918
Wardell 1N-29HZ_Lar	- actual wellpath hits target center	0.00	0.00	0.00	0.00	0.00	313,179.501663	28,397.598127	40.190184	-104.682450
- Polygon										
Point 1				0.00	88.77	807.48	1,313,275.71	3,229,204.19		
Point 2				0.00	2,271.91	807.36	1,315,458.66	3,229,183.94		
Point 3				0.00	4,464.63	808.08	1,317,651.20	3,229,164.45		
Point 4				0.00	4,468.26	415.08	1,317,651.21	3,228,771.45		
Point 5				0.00	92.39	414.47	1,313,275.70	3,228,811.18		
Wardell 1N-29HZ_WF	- actual wellpath misses target center by 8.02ft at 9571.65ft MD (7016.89 TVD, 2500.21 N, 594.73 E)	0.00	0.00	7,010.85	2,500.00	600.00	315,684.820389	28,974.499279	40.197046	-104.680302

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,400.00	6,989.96	7" Intermediate Casing	7	8-3/4

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Wardell 1N-29HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Site:	Sec. 29 T3N-R65W	MD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Well:	Wardell 1N-29HZ	North Reference:	True
Wellbore:	Plan A Rev 1	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

Targets

Target Name	- hit/miss target	Dip Angle	Dip Dir.	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
- Shape		(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Wardell 1N-29HZ_BH		0.00	0.00	7,025.00	4,461.97	527.94	317,645.957415	28,884.357798	40.202432	-104.680560
- actual wellpath misses target center by 47.26ft at 11504.00ft MD (7051.46 TVD, 4429.42 N, 549.71 E)										
- Point										
Wardell 1N-29HZ_Set		0.00	0.00	0.00	0.00	0.00	313,179.501663	28,397.598127	40.190184	-104.682450
- actual wellpath hits target center										
- Polygon										
Point 1				0.00	88.77	807.48	1,313,275.71	3,229,204.19		
Point 2				0.00	2,271.91	807.36	1,315,458.66	3,229,183.94		
Point 3				0.00	4,464.63	808.08	1,317,651.20	3,229,164.45		
Point 4				0.00	4,448.86	-1,364.16	1,317,615.41	3,226,992.54		
Point 5				0.00	4,432.92	-3,541.79	1,317,579.39	3,224,815.24		
Point 6				0.00	2,253.27	-3,534.73	1,315,399.99	3,224,842.40		
Point 7				0.00	96.68	-3,527.72	1,313,243.65	3,224,869.29		
Point 8				0.00	92.17	-1,358.78	1,313,259.14	3,227,038.08		
Point 9				0.00	88.77	807.48	1,313,275.71	3,229,204.19		
Wardell 1N-29HZ_Ser		0.00	0.00	0.00	0.00	0.00	313,179.501663	28,397.598127	40.190184	-104.682450
- actual wellpath hits target center										
- Polygon										
Point 1				0.00	-371.98	1,267.52	1,312,819.24	3,229,668.44		
Point 2				0.00	2,271.85	1,267.38	1,315,462.84	3,229,643.93		
Point 3				0.00	4,928.01	1,268.26	1,318,118.78	3,229,620.32		
Point 4				0.00	4,908.87	-1,367.51	1,318,075.35	3,226,984.95		
Point 5				0.00	4,889.57	-4,003.29	1,318,031.75	3,224,349.57		
Point 6				0.00	2,251.78	-3,994.75	1,315,394.26	3,224,382.43		
Point 7				0.00	-362.39	-3,986.25	1,312,780.39	3,224,415.03		
Point 8				0.00	-367.85	-1,359.62	1,312,799.15	3,227,041.49		
Point 9				0.00	-371.98	1,267.52	1,312,819.24	3,229,668.44		
Wardell 1N-29HZ_WF		0.00	0.00	7,019.50	3,700.00	600.00	316,884.718273	28,963.436340	40.200340	-104.680302
- actual wellpath misses target center by 22.68ft at 10771.44ft MD (7041.41 TVD, 3699.57 N, 605.84 E)										
- Point										
Wardell 1N-29HZ_SH		0.00	0.00	0.00	0.00	0.00	313,179.501663	28,397.598127	40.190184	-104.682450
- actual wellpath hits target center										
- Point										
Wardell 1N-29HZ_BH		0.00	0.00	7,025.00	4,461.97	427.94	317,645.035955	28,784.365830	40.202432	-104.680918
- actual wellpath misses target center by 128.79ft at 11504.00ft MD (7051.46 TVD, 4429.42 N, 549.71 E)										
- Point										
Wardell 1N-29HZ_Lar		0.00	0.00	0.00	0.00	0.00	313,179.501663	28,397.598127	40.190184	-104.682450
- actual wellpath hits target center										
- Polygon										
Point 1				0.00	88.77	807.48	1,313,275.71	3,229,204.19		
Point 2				0.00	2,271.91	807.36	1,315,458.66	3,229,183.94		
Point 3				0.00	4,464.63	808.08	1,317,651.20	3,229,164.45		
Point 4				0.00	4,468.26	415.08	1,317,651.21	3,228,771.45		
Point 5				0.00	92.39	414.47	1,313,275.70	3,228,811.18		
Wardell 1N-29HZ_WF		0.00	0.00	7,010.85	2,500.00	600.00	315,684.820389	28,974.499279	40.197046	-104.680302
- actual wellpath misses target center by 8.02ft at 9571.65ft MD (7016.89 TVD, 2500.21 N, 594.73 E)										
- Point										

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Wardell 1N-29HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Site:	Sec. 29 T3N-R65W	MD Reference:	RKB=16ft @ 4885.00ft (Xtreme 22)
Well:	Wardell 1N-29HZ	North Reference:	True
Wellbore:	Plan A Rev 1	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
132.00	131.99	0.15	0.99	First Gyro Survey@ 132.00ft
900.00	899.97	0.48	5.58	Final Gyro Survey @ 900.00ft
900.00	899.97	0.48	5.58	Tie-On to Surface Gyros @ 900.00ft
1,031.00	1,030.97	-0.49	5.23	First Sperry MWD Survey @ 1031.00ft
11,463.00	7,051.43	4,388.65	554.10	Final Sperry MWD Survey @ 11463.00ft
11,504.00	7,051.46	4,429.42	549.71	Straight Line Projection to Bit @ 11504.00ft

Checked By: _____	Approved By: _____	Date: _____
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