



Weatherford®

SURVEY REPORT

Report Date: **8/15/2013**
 Customer: **Anadarko Petroleum Corp** Field: **Wattenberg**
 Job Name: **4029663** Rig: **H&P Flex #307**
 Well Name: **Griffiths 34N-20HZ** Rig Loc: **Weld County, CO**

Survey Calculation Method: Minimum Curvature						
Magnetic Reference	Target Direction	Total Magnetic Field	Magnetic Dip Angle	Magnetic Declination	Grid Convergence	Total Correction
True North	179.77 deg	52655 nT	66.67 deg	8.68 deg	0.00 deg	8.68 deg
Survey Tie-On	Depth	INC	AZ	TVD	NS	EW
	968.00 ft	0.55 deg	162.54 deg	967.98 ft	-0.24 ft	1.97 ft

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head			
				NS (ft)	EW (ft)	Vsect (ft)	Dogleg (deg/100ft)
1139.00	0.73	221.53	1138.97	-1.84	1.49	1.84	0.38
1231.00	0.64	231.14	1230.96	-2.60	0.71	2.60	0.16
1323.00	2.78	305.98	1322.92	-1.61	-1.50	1.60	2.92
1415.00	4.52	320.44	1414.74	2.50	-5.62	-2.52	2.13
1506.00	6.41	325.99	1505.32	9.47	-10.74	-9.51	2.15
1598.00	8.33	327.12	1596.55	19.33	-17.23	-19.39	2.09
1690.00	8.91	323.05	1687.52	30.62	-25.13	-30.72	0.91
1782.00	9.28	319.24	1778.36	41.93	-34.26	-42.07	0.77
1874.00	9.26	316.82	1869.16	52.95	-44.17	-53.12	0.42
1966.00	9.15	317.85	1959.97	63.77	-54.14	-63.98	0.22
2058.00	9.64	318.32	2050.74	74.94	-64.17	-75.20	0.54
2150.00	10.98	317.73	2141.25	87.18	-75.19	-87.48	1.46
2245.00	10.87	318.01	2234.53	100.53	-87.27	-100.88	0.13
2339.00	10.97	315.51	2326.83	113.50	-99.46	-113.90	0.51
2434.00	10.17	318.92	2420.22	126.27	-111.31	-126.72	1.07
2529.00	9.64	317.60	2513.80	138.47	-122.18	-138.96	0.61
2624.00	9.79	314.11	2607.44	149.96	-133.35	-150.50	0.64
2718.00	8.66	314.65	2700.22	160.50	-144.12	-161.08	1.21
2813.00	8.32	313.62	2794.18	170.27	-154.18	-170.88	0.39
2909.00	9.45	314.66	2889.03	180.60	-164.82	-181.26	1.19
3003.00	10.07	327.85	2981.68	192.98	-174.68	-193.68	2.46
3098.00	9.20	325.56	3075.34	206.28	-183.40	-207.01	1.00
3193.00	9.09	324.50	3169.13	218.65	-192.05	-219.42	0.21
3287.00	9.71	325.20	3261.87	231.20	-200.88	-232.01	0.67
3382.00	9.19	320.87	3355.58	243.67	-210.24	-244.51	0.93
3477.00	10.02	320.68	3449.25	255.95	-220.27	-256.83	0.87
3571.00	7.76	320.35	3542.11	267.16	-229.50	-268.08	2.40
3666.00	8.60	318.94	3636.14	277.45	-238.26	-278.41	0.91
3760.00	8.95	318.35	3729.04	288.22	-247.74	-289.21	0.38
3855.00	8.79	321.59	3822.91	299.43	-257.16	-300.46	0.55
3949.00	9.56	324.33	3915.70	311.40	-266.17	-312.46	0.94
4044.00	10.98	315.39	4009.19	324.25	-277.13	-325.36	2.24
4139.00	11.06	315.58	4102.43	337.20	-289.86	-338.36	0.09
4233.00	9.40	316.25	4194.94	349.18	-301.48	-350.39	1.77
4328.00	10.49	318.55	4288.51	361.27	-312.57	-362.52	1.22

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		Vsect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
4423.00	12.67	321.27	4381.57	375.88	-324.81	-377.18	2.36
4517.00	9.95	313.90	4473.74	389.56	-337.12	-390.91	3.27
4612.00	5.45	316.95	4567.86	398.55	-346.11	-399.94	4.75
4706.00	3.64	317.80	4661.56	404.02	-351.17	-405.43	1.93
4801.00	2.95	317.35	4756.40	408.05	-354.85	-409.48	0.73
4896.00	1.78	320.10	4851.32	410.98	-357.45	-412.42	1.24
4990.00	1.32	274.44	4945.29	412.19	-359.47	-413.63	1.36
5085.00	0.41	217.38	5040.28	412.00	-360.76	-413.45	1.21
5180.00	2.53	206.89	5135.24	409.86	-361.92	-411.31	2.24
5274.00	0.72	185.35	5229.20	407.42	-362.91	-408.88	2.00
5369.00	0.77	40.90	5324.20	407.31	-362.55	-408.76	1.49
5464.00	0.45	28.99	5419.19	408.12	-361.95	-409.57	0.36
5558.00	0.50	354.88	5513.19	408.85	-361.81	-410.30	0.30
5653.00	0.45	351.26	5608.19	409.63	-361.90	-411.08	0.06
5747.00	0.47	341.94	5702.18	410.36	-362.08	-411.82	0.08
5842.00	0.25	348.83	5797.18	410.94	-362.24	-412.39	0.24
5936.00	0.38	19.00	5891.18	411.43	-362.18	-412.89	0.22
6031.00	0.38	339.13	5986.18	412.03	-362.19	-413.48	0.27
6126.00	0.38	317.96	6081.18	412.56	-362.51	-414.01	0.15
6220.00	0.50	4.71	6175.17	413.20	-362.69	-414.65	0.39
6315.00	0.79	3.86	6270.17	414.26	-362.61	-415.71	0.31
6410.00	1.11	6.94	6365.15	415.83	-362.45	-417.28	0.34
6504.00	0.74	344.92	6459.14	417.32	-362.50	-418.77	0.54
6599.00	0.60	329.50	6554.13	418.34	-362.91	-419.79	0.24
6693.00	0.25	291.50	6648.13	418.84	-363.35	-420.29	0.46
6778.00	0.26	301.44	6733.13	419.01	-363.69	-420.46	0.05
6883.00	0.16	285.85	6838.13	419.17	-364.03	-420.63	0.11
6978.00	5.43	167.72	6932.99	414.81	-363.20	-416.27	5.80
7025.00	9.24	171.29	6979.60	408.91	-362.16	-410.36	8.16
7072.00	12.88	167.74	7025.72	400.06	-360.48	-401.50	7.88
7118.00	15.87	168.49	7070.27	388.88	-358.13	-390.31	6.51
7167.00	20.06	172.73	7116.87	373.97	-355.73	-375.40	8.95
7214.00	24.18	175.12	7160.41	356.38	-353.89	-357.80	8.97
7261.00	28.95	175.72	7202.43	335.43	-352.22	-336.84	10.16
7308.00	34.13	178.33	7242.48	310.89	-350.99	-312.30	11.40
7356.00	38.63	180.90	7281.12	282.43	-350.83	-283.84	9.90
7403.00	44.24	181.34	7316.34	251.35	-351.44	-252.76	11.95
7450.00	50.43	181.31	7348.17	216.81	-352.24	-218.23	13.17
7497.00	56.36	180.51	7376.19	179.11	-352.83	-180.52	12.69
7544.00	59.74	179.12	7401.06	139.23	-352.69	-140.65	7.62
7591.00	63.31	176.58	7423.46	97.96	-351.13	-99.37	8.96
7639.00	65.93	175.81	7444.04	54.69	-348.25	-56.09	5.65
7686.00	67.77	176.85	7462.51	11.57	-345.48	-12.96	4.41
7733.00	70.55	177.49	7479.23	-32.30	-343.32	30.92	6.05
7780.00	75.66	178.54	7492.89	-77.23	-341.77	75.85	11.08
7827.00	79.38	178.93	7503.04	-123.10	-340.76	121.73	7.96
7859.00	82.07	179.58	7508.20	-154.67	-340.35	153.31	8.64
7890.00	85.31	179.95	7511.61	-185.48	-340.22	184.11	10.52
8042.00	88.58	180.33	7519.71	-337.24	-340.59	335.87	2.17
8136.00	90.55	180.39	7520.42	-431.23	-341.18	429.86	2.10

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
8230.00	90.43	180.67	7519.62	-525.23	-342.05	523.85	0.32
8325.00	90.74	181.02	7518.65	-620.21	-343.45	618.83	0.49
8420.00	90.00	180.98	7518.03	-715.19	-345.11	713.80	0.78
8514.00	89.20	180.56	7518.69	-809.18	-346.37	807.79	0.96
8609.00	89.57	180.48	7519.71	-904.17	-347.23	902.77	0.40
8703.00	89.65	180.22	7520.35	-998.17	-347.81	996.76	0.29
8798.00	89.01	179.15	7521.46	-1093.16	-347.29	1091.76	1.31
8893.00	90.43	180.69	7521.92	-1188.15	-347.15	1186.75	2.20
8987.00	89.08	179.56	7522.33	-1282.15	-347.36	1280.74	1.87
9082.00	90.86	179.43	7522.38	-1377.14	-346.52	1375.74	1.88
9176.00	90.06	178.29	7521.62	-1471.12	-344.65	1469.72	1.48
9271.00	90.37	178.09	7521.26	-1566.07	-341.65	1564.68	0.39
9366.00	89.75	177.41	7521.16	-1660.99	-337.92	1659.62	0.97
9460.00	89.26	178.01	7521.98	-1754.91	-334.17	1753.56	0.82
9554.00	88.77	177.45	7523.59	-1848.83	-330.44	1847.48	0.79
9649.00	89.51	178.85	7525.02	-1943.76	-327.38	1942.43	1.67
9743.00	88.02	179.95	7527.04	-2037.73	-326.39	2036.41	1.97
9837.00	88.68	180.39	7529.75	-2131.69	-326.67	2130.36	0.84
9931.00	88.83	180.32	7531.79	-2225.67	-327.25	2224.34	0.18
10026.00	90.12	179.99	7532.66	-2320.66	-327.51	2319.33	1.40
10120.00	89.75	179.80	7532.77	-2414.66	-327.34	2413.33	0.44
10214.00	89.75	179.47	7533.18	-2508.66	-326.74	2507.33	0.35
10308.00	89.94	179.41	7533.44	-2602.65	-325.82	2601.32	0.21
10402.00	89.75	179.12	7533.69	-2696.64	-324.62	2695.32	0.37
10494.00	89.32	178.82	7534.44	-2788.63	-322.96	2787.31	0.57
10585.00	89.63	179.02	7535.27	-2879.61	-321.25	2878.29	0.41
10677.00	90.80	179.74	7534.92	-2971.60	-320.25	2970.29	1.49
10768.00	89.38	181.48	7534.78	-3062.59	-321.22	3061.27	2.47
10860.00	90.68	181.10	7534.73	-3154.56	-323.29	3153.24	1.47
10951.00	91.06	180.22	7533.35	-3245.54	-324.34	3244.22	1.05
11042.00	90.74	181.10	7531.92	-3336.53	-325.39	3335.19	1.03
11136.00	89.47	180.39	7531.75	-3430.52	-326.61	3429.18	1.55
11227.00	88.95	179.81	7533.00	-3521.51	-326.77	3520.17	0.86
11318.00	88.28	179.18	7535.20	-3612.47	-325.97	3611.14	1.01
11409.00	87.10	178.18	7538.87	-3703.37	-323.87	3702.04	1.70
11500.00	88.83	179.34	7542.10	-3794.29	-321.90	3792.97	2.29
11592.00	91.23	180.76	7542.06	-3886.28	-321.99	3884.96	3.03
11684.00	90.06	180.06	7541.02	-3978.27	-322.64	3976.94	1.48
11775.00	89.81	179.62	7541.12	-4069.27	-322.39	4067.94	0.56
11867.00	88.83	179.03	7542.21	-4161.26	-321.31	4159.93	1.24
11958.00	88.21	180.79	7544.57	-4252.22	-321.16	4250.90	2.05
12050.00	87.22	180.37	7548.23	-4344.14	-322.09	4342.81	1.17
12142.00	88.15	180.37	7551.95	-4436.06	-322.69	4434.73	1.01
12234.00	88.28	180.99	7554.82	-4528.01	-323.78	4526.68	0.69
12326.00	89.38	181.28	7556.69	-4619.97	-325.60	4618.63	1.24
12418.00	88.89	180.94	7558.08	-4711.95	-327.38	4710.59	0.65
12510.00	90.44	180.39	7558.62	-4803.93	-328.45	4802.58	1.79
12602.00	90.00	179.65	7558.27	-4895.93	-328.48	4894.57	0.94
12694.00	90.31	178.63	7558.02	-4987.92	-327.10	4986.57	1.16
12785.00	89.01	177.23	7558.56	-5078.86	-323.81	5077.51	2.10

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
12877.00	88.83	178.30	7560.29	-5170.77	-320.23	5169.44	1.18
12969.00	89.14	178.99	7561.92	-5262.73	-318.05	5261.41	0.82
13061.00	89.57	179.32	7562.96	-5354.71	-316.70	5353.40	0.59
13153.00	89.26	180.92	7563.90	-5446.70	-316.89	5445.39	1.77
13244.00	88.15	180.06	7565.95	-5537.67	-317.67	5536.35	1.54
13336.00	88.40	180.08	7568.72	-5629.63	-317.78	5628.31	0.27
13428.00	89.12	180.75	7570.71	-5721.61	-318.44	5720.28	1.07
13520.00	88.34	180.47	7572.75	-5813.58	-319.42	5812.25	0.90
13613.00	89.32	180.89	7574.65	-5906.55	-320.53	5905.22	1.15
13707.00	91.11	182.66	7574.30	-6000.50	-323.44	5999.15	2.68
13801.00	90.31	182.39	7573.13	-6094.40	-327.58	6093.03	0.90
13896.00	89.75	182.13	7573.09	-6189.32	-331.33	6187.94	0.65
13990.00	88.70	181.93	7574.36	-6283.25	-334.66	6281.86	1.14
14084.00	88.71	181.80	7576.48	-6377.18	-337.71	6375.77	0.14
14178.00	89.20	181.51	7578.20	-6471.13	-340.43	6469.71	0.61
14273.00	89.14	180.19	7579.57	-6566.10	-341.84	6564.68	1.39
14367.00	91.67	179.51	7578.91	-6660.09	-341.59	6658.67	2.79
14461.00	90.86	179.96	7576.83	-6754.07	-341.16	6752.64	0.99
14555.00	90.12	179.81	7576.03	-6848.06	-340.97	6846.64	0.80
14650.00	89.81	179.59	7576.09	-6943.06	-340.47	6941.64	0.40
14744.00	88.77	178.51	7577.25	-7037.04	-338.91	7035.62	1.59
14838.00	89.14	177.54	7578.97	-7130.97	-335.67	7129.56	1.10
14932.00	88.52	178.68	7580.88	-7224.89	-332.57	7223.50	1.38
15026.00	90.00	178.48	7582.10	-7318.85	-330.24	7317.47	1.59
15120.00	90.99	178.67	7581.29	-7412.82	-327.91	7411.44	1.07
15215.00	89.94	179.59	7580.52	-7507.80	-326.46	7506.43	1.47
15309.00	89.03	180.57	7581.36	-7601.80	-326.60	7600.43	1.42
15403.00	88.83	179.85	7583.12	-7695.78	-326.94	7694.41	0.79
15497.00	89.29	178.10	7584.66	-7789.75	-325.26	7788.38	1.92
15591.00	90.49	176.62	7584.84	-7883.64	-320.93	7882.29	2.03
15686.00	90.97	175.99	7583.63	-7978.44	-314.81	7977.11	0.83
15780.00	90.62	177.10	7582.32	-8072.26	-309.14	8070.95	1.24
15875.00	91.67	178.81	7580.43	-8167.17	-305.75	8165.88	2.11
15969.00	90.79	179.34	7578.41	-8261.14	-304.24	8259.85	1.09
16064.00	90.56	181.93	7577.29	-8356.12	-305.29	8354.82	2.74
16159.00	89.29	181.63	7577.41	-8451.07	-308.24	8449.76	1.37
16253.00	89.94	181.60	7578.04	-8545.03	-310.89	8543.71	0.69
16348.00	89.07	181.59	7578.86	-8639.99	-313.53	8638.66	0.92
16442.00	89.94	181.40	7579.68	-8733.95	-315.99	8732.61	0.95
16537.00	88.83	181.54	7580.70	-8828.91	-318.42	8827.56	1.18
16632.00	90.37	181.21	7581.36	-8923.88	-320.70	8922.52	1.66
16726.00	89.14	180.30	7581.76	-9017.87	-321.94	9016.50	1.63
16821.00	87.47	179.75	7584.57	-9112.82	-321.98	9111.46	1.85
16915.00	86.98	177.92	7589.12	-9206.69	-320.07	9205.33	2.01
17009.00	87.09	177.57	7593.99	-9300.49	-316.38	9299.15	0.39
17104.00	86.36	177.22	7599.41	-9395.24	-312.07	9393.91	0.85
17198.00	86.54	177.13	7605.23	-9488.94	-307.45	9487.63	0.21
17284.00	85.59	176.52	7611.13	-9574.61	-302.69	9573.31	1.31

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
Projected to Total Depth:							
17341.00	85.59	176.52	7615.52	-9633.33	-299.25	9630.06	0.00

Weatherford Surveys from 1139 ft MD to 17284 ft MD.

TD at 17341 ft MD.

The total correction is 8.68 deg relative to True North.