



Weatherford®

SURVEY REPORT

Report Date: **7/20/2013**
 Customer: **Anadarko**
 Job Name: **4029664**
 Well Name: **Griffiths 35N-20HZ**

Field: **Wattenberg**
 Rig: **H&P Flex # 307**
 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	180.17 deg	52903 nT	66.48 deg	8.56 deg	0.00 deg	8.56 deg
Survey Tie-On	Depth	INC	AZ	TVD	NS	EW
	1037.00 ft	0.09 deg	27.03 deg	1036.97 ft	6.72 ft	-2.89 ft

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head			
				NS (ft)	EW (ft)	Vsect (ft)	Dogleg (deg/100ft)
1144.00	0.30	71.85	1143.97	6.88	-2.59	-6.87	0.23
1235.00	1.94	76.91	1234.95	7.31	-0.86	-7.30	1.80
1327.00	1.69	73.55	1326.90	8.04	1.96	-8.05	0.30
1419.00	3.19	75.74	1418.82	9.06	5.74	-9.07	1.63
1511.00	4.87	66.61	1510.59	11.24	11.81	-11.27	1.95
1602.00	6.95	61.35	1601.10	15.41	20.18	-15.47	2.36
1694.00	7.63	67.64	1692.36	20.40	30.72	-20.49	1.14
1786.00	9.36	63.61	1783.34	26.05	43.07	-26.18	1.99
1878.00	10.35	61.90	1873.99	33.27	57.06	-33.44	1.12
1970.00	11.52	59.10	1964.31	41.88	72.24	-42.10	1.40
2062.00	12.71	56.91	2054.26	52.13	88.60	-52.39	1.39
2154.00	13.11	51.34	2143.94	64.17	105.23	-64.48	1.42
2249.00	11.24	46.34	2236.80	77.29	120.34	-77.65	2.26
2344.00	10.73	49.79	2330.06	89.40	133.79	-89.79	0.88
2438.00	11.08	53.87	2422.37	100.37	147.77	-100.81	0.90
2533.00	11.75	56.56	2515.49	111.08	163.21	-111.57	0.90
2628.00	12.33	57.56	2608.40	121.85	179.85	-122.39	0.65
2722.00	10.12	54.56	2700.60	132.03	195.05	-132.61	2.43
2818.00	10.28	58.65	2795.08	141.38	209.23	-142.00	0.77
2913.00	10.34	60.15	2888.55	150.03	223.87	-150.69	0.29
3008.00	11.42	60.31	2981.84	158.93	239.43	-159.64	1.14
3103.00	12.45	57.80	3074.78	169.05	256.27	-169.81	1.21
3197.00	9.51	52.10	3167.05	179.22	270.97	-180.02	3.33
3292.00	9.92	56.21	3260.69	188.59	283.97	-189.43	0.85
3387.00	10.10	55.68	3354.25	197.84	297.65	-198.72	0.21
3481.00	11.90	49.70	3446.52	208.76	311.85	-209.68	2.26
3576.00	11.72	46.09	3539.51	221.78	326.27	-222.75	0.80
3670.00	10.79	48.45	3631.70	234.24	339.73	-235.25	1.10
3765.00	10.63	54.48	3725.05	245.23	353.52	-246.28	1.19
3859.00	11.06	53.38	3817.37	255.64	367.81	-256.73	0.51
3954.00	11.10	50.98	3910.60	266.84	382.23	-267.97	0.49
4049.00	12.45	50.45	4003.60	279.12	397.23	-280.29	1.43
4143.00	12.67	48.27	4095.35	292.43	412.74	-293.65	0.56
4238.00	12.64	50.20	4188.04	306.02	428.50	-307.29	0.45
4332.00	12.30	50.40	4279.82	318.98	444.12	-320.30	0.36

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		Vsect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
4427.00	13.28	50.94	4372.47	332.31	460.39	-333.67	1.04
4522.00	12.62	52.07	4465.05	345.56	477.05	-346.98	0.74
4616.00	11.13	51.54	4557.03	357.52	492.25	-358.98	1.59
4711.00	9.51	53.82	4650.50	367.86	505.77	-369.36	1.76
4806.00	10.51	50.71	4744.05	377.98	518.81	-379.51	1.20
4900.00	12.23	53.77	4836.20	389.29	533.47	-390.87	1.94
4995.00	10.58	50.55	4929.32	400.78	548.33	-402.41	1.86
5089.00	8.62	48.22	5022.00	410.96	560.24	-412.62	2.13
5184.00	6.97	53.65	5116.12	419.12	570.20	-420.81	1.90
5279.00	5.62	50.02	5210.55	425.52	578.40	-427.24	1.48
5373.00	4.87	47.31	5304.15	431.19	584.86	-432.92	0.84
5468.00	3.20	51.10	5398.92	435.59	589.89	-437.34	1.78
5563.00	2.24	47.68	5493.81	438.50	593.33	-440.26	1.02
5657.00	0.22	9.51	5587.78	439.92	594.72	-441.68	2.20
5752.00	0.21	327.17	5682.78	440.24	594.65	-442.01	0.16
5846.00	0.29	290.93	5776.78	440.47	594.34	-442.23	0.18
5941.00	0.49	286.82	5871.78	440.68	593.72	-442.44	0.21
6035.00	0.51	277.35	5965.77	440.85	592.92	-442.60	0.09
6130.00	0.47	272.62	6060.77	440.92	592.11	-442.67	0.06
6225.00	0.44	264.84	6155.77	440.90	591.36	-442.66	0.07
6319.00	0.56	294.39	6249.76	441.06	590.58	-442.81	0.30
6414.00	0.63	305.58	6344.76	441.56	589.74	-443.30	0.14
6509.00	0.47	269.32	6439.75	441.86	588.92	-443.60	0.39
6603.00	0.38	141.92	6533.75	441.61	588.73	-443.35	0.81
6698.00	0.49	110.07	6628.75	441.22	589.31	-442.96	0.27
6792.00	0.41	69.41	6722.75	441.20	590.00	-442.95	0.34
6887.00	0.69	93.06	6817.74	441.29	590.89	-443.04	0.37
6919.00	0.51	100.58	6849.74	441.25	591.22	-443.00	0.61
6950.00	2.20	144.13	6880.73	440.74	591.70	-442.50	6.01
6982.00	5.75	155.29	6912.65	438.79	592.73	-440.55	11.30
7013.00	9.95	160.91	6943.35	434.85	594.26	-436.61	13.76
7045.00	13.42	161.59	6974.69	428.71	596.34	-430.47	10.85
7076.00	16.29	162.97	7004.65	421.14	598.75	-422.91	9.33
7108.00	18.27	164.64	7035.20	412.01	601.39	-413.79	6.38
7139.00	19.88	169.44	7064.50	402.14	603.64	-403.93	7.25
7171.00	22.41	169.62	7094.34	390.79	605.74	-392.58	7.91
7203.00	24.73	171.94	7123.67	378.16	607.78	-379.96	7.81
7234.00	27.03	174.86	7151.56	364.72	609.32	-366.53	8.48
7266.00	29.87	177.55	7179.70	349.51	610.31	-351.32	9.73
7297.00	32.58	180.99	7206.20	333.45	610.50	-335.26	10.46
7328.00	35.09	183.65	7231.95	316.21	609.79	-318.02	9.40
7360.00	37.41	184.60	7257.76	297.34	608.42	-299.14	7.46
7391.00	40.43	184.06	7281.87	277.92	606.95	-279.72	9.80
7423.00	43.64	184.10	7305.64	256.55	605.43	-258.35	10.03
7454.00	47.19	184.17	7327.40	234.53	603.84	-236.33	11.45
7501.00	52.94	183.38	7357.55	198.59	601.47	-200.37	12.30
7548.00	57.29	181.07	7384.43	160.08	600.00	-161.86	10.09
7595.00	61.09	179.76	7408.50	119.72	599.72	-121.50	8.43
7643.00	66.48	179.28	7429.70	76.67	600.08	-78.45	11.26
7690.00	71.42	180.17	7446.57	32.83	600.29	-34.61	10.66

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
7737.00	72.54	179.71	7461.11	-11.87	600.33	10.09	2.56
7768.00	75.37	179.18	7469.68	-41.66	600.62	39.87	9.28
7800.00	77.60	179.45	7477.16	-72.77	600.99	70.98	7.02
7831.00	79.81	179.29	7483.23	-103.16	601.33	101.38	7.15
7863.00	80.59	180.08	7488.68	-134.69	601.50	132.91	3.44
7894.00	82.07	180.16	7493.35	-165.34	601.44	163.55	4.78
7926.00	84.26	180.45	7497.16	-197.11	601.27	195.32	6.90
8121.00	89.01	180.60	7508.60	-391.71	599.48	389.93	2.44
8215.00	90.31	180.82	7509.16	-485.70	598.32	483.92	1.40
8309.00	91.61	180.59	7507.58	-579.67	597.16	577.90	1.40
8404.00	92.59	180.58	7504.10	-674.61	596.19	672.83	1.03
8498.00	91.48	179.42	7500.76	-768.54	596.19	766.77	1.71
8592.00	91.73	179.41	7498.13	-862.50	597.15	860.73	0.27
8686.00	90.43	178.23	7496.36	-956.46	599.09	954.68	1.87
8780.00	89.81	179.08	7496.16	-1050.43	601.30	1048.64	1.12
8874.00	88.77	178.70	7497.33	-1144.41	603.12	1142.61	1.18
8969.00	88.52	178.64	7499.57	-1239.35	605.32	1237.55	0.27
9063.00	87.90	179.13	7502.51	-1333.29	607.15	1331.48	0.84
9157.00	88.77	179.49	7505.24	-1427.24	608.28	1425.43	1.00
9252.00	89.63	179.28	7506.57	-1522.23	609.30	1520.41	0.93
9346.00	89.14	179.40	7507.58	-1616.21	610.38	1614.40	0.54
9440.00	90.25	179.73	7508.08	-1710.21	611.10	1708.39	1.23
9534.00	89.69	180.15	7508.13	-1804.21	611.19	1802.39	0.74
9629.00	90.00	180.26	7508.38	-1899.21	610.85	1897.39	0.35
9723.00	90.25	180.79	7508.18	-1993.20	609.99	1991.38	0.62
9818.00	89.88	180.14	7508.07	-2088.20	609.22	2086.38	0.79
9912.00	89.63	179.31	7508.47	-2182.20	609.67	2180.38	0.92
10007.00	88.83	179.42	7509.75	-2277.18	610.73	2275.36	0.85
10102.00	88.34	179.13	7512.09	-2372.14	611.93	2370.32	0.60
10197.00	88.58	179.74	7514.65	-2467.10	612.86	2465.28	0.69
10291.00	89.14	179.68	7516.52	-2561.08	613.34	2559.25	0.60
10386.00	89.26	179.90	7517.84	-2656.07	613.69	2654.24	0.26
10482.00	88.83	180.64	7519.44	-2752.06	613.24	2750.23	0.89
10577.00	89.01	181.03	7521.23	-2847.03	611.85	2845.20	0.45
10671.00	88.52	181.26	7523.26	-2940.99	609.97	2939.17	0.58
10766.00	89.20	181.23	7525.15	-3035.95	607.91	3034.13	0.72
10861.00	88.64	181.49	7526.94	-3130.91	605.66	3129.09	0.65
10955.00	89.38	181.34	7528.56	-3224.86	603.34	3223.06	0.80
11050.00	89.57	181.64	7529.44	-3319.83	600.86	3318.03	0.37
11144.00	90.25	181.62	7529.58	-3413.79	598.19	3412.00	0.72
11239.00	90.25	180.91	7529.17	-3508.76	596.09	3506.98	0.75
11334.00	89.57	180.07	7529.32	-3603.76	595.28	3601.98	1.14
11428.00	88.46	179.44	7530.93	-3697.74	595.68	3695.96	1.36
11523.00	89.57	179.69	7532.57	-3792.72	596.40	3790.94	1.20
11617.00	89.75	179.28	7533.12	-3886.72	597.25	3884.93	0.48
11712.00	89.07	179.63	7534.10	-3981.71	598.15	3979.91	0.81
11806.00	89.26	179.19	7535.47	-4075.69	599.12	4073.90	0.51
11901.00	90.18	178.69	7535.94	-4170.67	600.88	4168.87	1.10
11946.00	90.53	178.69	7535.66	-4215.66	601.91	4213.86	0.78
12040.00	89.14	180.99	7535.93	-4309.65	602.17	4307.84	2.86

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
12134.00	88.15	180.72	7538.15	-4403.61	600.77	4401.81	1.09
12229.00	87.22	180.58	7541.99	-4498.53	599.69	4496.73	0.99
12323.00	87.16	182.07	7546.60	-4592.39	597.52	4590.59	1.58
12418.00	88.71	181.52	7550.02	-4687.28	594.55	4685.49	1.73
12512.00	89.26	181.91	7551.69	-4781.22	591.73	4779.44	0.72
12607.00	89.14	181.26	7553.01	-4876.17	589.11	4874.40	0.70
12702.00	87.97	181.40	7555.41	-4971.11	586.90	4969.35	1.24
12775.00	88.02	181.85	7557.96	-5044.04	584.83	5042.28	0.62
12870.00	89.44	181.24	7560.07	-5138.98	582.27	5137.23	1.63
12964.00	90.12	180.18	7560.43	-5232.97	581.11	5231.22	1.34
13059.00	89.38	179.29	7560.84	-5327.97	581.55	5326.22	1.22
13153.00	89.88	177.03	7561.45	-5421.91	584.56	5420.15	2.46
13248.00	89.44	178.25	7562.01	-5516.82	588.48	5515.05	1.37
13343.00	89.94	178.46	7562.53	-5611.78	591.20	5610.01	0.57
13437.00	89.12	176.92	7563.30	-5705.70	594.99	5703.91	1.86
13532.00	89.88	176.95	7564.13	-5800.56	600.07	5798.75	0.80
13626.00	89.51	178.09	7564.63	-5894.47	604.14	5892.65	1.28
13721.00	88.83	179.56	7566.00	-5989.44	606.09	5987.61	1.70
13815.00	88.15	180.70	7568.48	-6083.40	605.87	6081.58	1.41
13910.00	88.70	180.25	7571.09	-6178.36	605.09	6176.54	0.75
14005.00	90.37	180.28	7571.86	-6273.35	604.65	6271.53	1.76
14099.00	90.25	179.78	7571.36	-6367.35	604.60	6365.53	0.55
14194.00	89.91	179.22	7571.22	-6462.35	605.43	6460.52	0.69
14289.00	90.53	180.45	7570.86	-6557.34	605.70	6555.52	1.45
14383.00	90.12	179.68	7570.32	-6651.34	605.59	6649.52	0.93
14478.00	89.69	179.20	7570.48	-6746.34	606.52	6744.51	0.68
14572.00	89.47	180.63	7571.17	-6840.33	606.66	6838.50	1.54
14667.00	89.51	180.64	7572.02	-6935.32	605.61	6933.50	0.04
14762.00	87.59	180.72	7574.42	-7030.28	604.48	7028.46	2.02
14856.00	85.99	180.98	7579.68	-7124.12	603.09	7122.30	1.72
14951.00	88.83	182.07	7583.98	-7218.98	600.56	7217.16	3.20
15045.00	89.82	181.41	7585.08	-7312.93	597.71	7311.12	1.27
15140.00	90.00	180.81	7585.23	-7407.91	595.87	7406.11	0.66
15234.00	89.75	180.68	7585.44	-7501.90	594.65	7500.10	0.30
15329.00	89.51	180.61	7586.05	-7596.89	593.58	7595.10	0.26
15423.00	90.26	182.04	7586.24	-7690.86	591.40	7689.07	1.72
15517.00	89.69	181.64	7586.28	-7784.81	588.39	7783.03	0.74
15612.00	89.32	181.04	7587.10	-7879.78	586.16	7878.01	0.74
15705.00	90.12	181.91	7587.56	-7972.75	583.77	7970.98	1.27
15800.00	90.55	184.07	7587.00	-8067.61	578.82	8065.86	2.32
15891.00	90.43	184.88	7586.22	-8158.33	571.72	8156.60	0.90
15985.00	90.62	186.34	7585.36	-8251.88	562.53	8250.17	1.57
16080.00	90.19	186.88	7584.69	-8346.24	551.59	8344.57	0.73
16175.00	90.19	185.62	7584.37	-8440.67	541.25	8439.03	1.33
16254.00	90.37	182.47	7583.99	-8519.47	535.68	8517.84	3.99
16349.00	89.69	181.67	7583.94	-8614.40	532.25	8612.79	1.11
16443.00	88.58	179.39	7585.36	-8708.38	531.38	8706.77	2.70
16538.00	88.64	178.49	7587.66	-8803.34	533.13	8801.71	0.95
16632.00	88.64	177.36	7589.89	-8897.25	536.54	8895.61	1.20
16727.00	88.89	176.92	7591.94	-8992.11	541.28	8990.46	0.53

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
16822.00	89.26	175.90	7593.48	-9086.90	547.22	9085.24	1.14
16916.00	88.58	176.63	7595.25	-9180.69	553.35	9179.01	1.06
17011.00	87.84	175.87	7598.21	-9275.44	559.56	9273.74	1.12
17105.00	86.73	175.76	7602.67	-9369.08	566.41	9367.36	1.19
17200.00	86.61	176.19	7608.19	-9463.68	573.06	9461.94	0.47
17294.00	86.92	175.80	7613.49	-9557.31	579.62	9555.54	0.53
17317.00	87.04	175.62	7614.70	-9580.21	581.34	9578.44	0.94
17370.00	87.04	175.62	7617.44	-9632.98	585.38	9631.20	0.00

Weatherford surveys from 1144 ft MD to 17317 ft MD.

Well TD at 17370 ft MD.

The total correction is 8.56 deg relative to True North.