



Weatherford®

SURVEY REPORT

Report Date: **9/7/2013**
 Customer: **Anadarko**
 Job Name: **4030231**
 Well Name: **Howard 4N-28HZ**

Field: **Wattenberg**
 Rig: **Xtreme 23**
 Rig Loc: **Howard 14W-28HZ**

Survey Calculation Method: Minimum Curvature						
Magnetic Reference	Target Direction	Total Magnetic Field	Magnetic Dip Angle	Magnetic Declination	Grid Convergence	Total Correction
True North	359.65 deg	52617 nT	66.64 deg	8.65 deg	0.00 deg	8.65 deg
Survey Tie-On	Depth	INC	AZ	TVD	NS	EW
	966.00 ft	0.27 deg	292.29 deg	965.99 ft	1.68 ft	1.55 ft

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head			
				NS (ft)	EW (ft)	Vsect (ft)	Dogleg (deg/100ft)
1117.00	0.35	94.42	1116.99	1.78	1.68	1.77	0.41
1174.00	0.16	302.96	1173.99	1.81	1.79	1.80	0.87
1265.00	2.59	272.36	1264.96	1.96	-0.37	1.97	2.70
1356.00	3.91	267.89	1355.81	1.93	-5.53	1.97	1.48
1452.00	5.25	260.86	1451.50	1.12	-13.14	1.20	1.51
1545.00	6.09	252.00	1544.05	-1.09	-22.03	-0.95	1.30
1637.00	7.51	252.63	1635.40	-4.39	-32.41	-4.19	1.55
1730.00	10.48	255.66	1727.24	-8.30	-46.41	-8.01	3.23
1823.00	12.35	253.42	1818.40	-13.23	-64.14	-12.84	2.07
1916.00	14.53	251.32	1908.85	-19.81	-84.72	-19.29	2.40
2009.00	16.13	246.61	1998.54	-28.67	-107.63	-28.01	2.18
2193.00	18.44	245.34	2174.22	-50.96	-157.55	-50.00	1.27
2286.00	18.52	249.98	2262.43	-62.16	-184.79	-61.03	1.58
2471.00	15.89	250.22	2439.13	-80.79	-236.24	-79.35	1.42
2563.00	16.87	253.35	2527.40	-88.88	-260.88	-87.28	1.43
2656.00	17.90	255.16	2616.15	-96.41	-287.62	-94.65	1.25
2748.00	16.08	255.36	2704.13	-103.25	-313.62	-101.33	1.98
2842.00	15.47	258.03	2794.59	-109.14	-338.48	-107.07	1.01
2935.00	15.60	258.82	2884.20	-114.13	-362.88	-111.92	0.27
3027.00	15.80	254.96	2972.77	-119.78	-387.11	-117.42	1.16
3119.00	15.11	258.76	3061.44	-125.37	-410.97	-122.86	1.33
3211.00	15.36	253.52	3150.21	-131.17	-434.42	-128.51	1.52
3297.00	15.68	253.22	3233.08	-137.75	-456.47	-134.96	0.38
3382.00	15.95	252.86	3314.86	-144.51	-478.62	-141.58	0.34
3468.00	15.45	251.24	3397.65	-151.68	-500.76	-148.61	0.77
3553.00	15.25	251.42	3479.62	-158.88	-522.08	-155.69	0.24
3638.00	15.14	248.55	3561.65	-166.50	-543.01	-163.18	0.89
3724.00	15.21	250.45	3644.65	-174.38	-564.09	-170.93	0.58
3809.00	14.92	246.78	3726.73	-182.43	-584.65	-178.85	1.17
3895.00	15.29	244.93	3809.76	-191.60	-605.10	-187.90	0.71
3980.00	14.94	245.72	3891.82	-200.85	-625.24	-197.03	0.48
4065.00	14.82	249.35	3973.97	-209.19	-645.40	-205.24	1.11
4151.00	13.55	250.93	4057.35	-216.36	-665.21	-212.29	1.54
4236.00	12.19	253.97	4140.21	-222.09	-683.25	-217.92	1.79
4322.00	11.62	256.30	4224.36	-226.65	-700.39	-222.37	0.87

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
4407.00	10.33	262.04	4307.81	-229.74	-716.26	-225.36	1.99
4493.00	10.09	260.03	4392.44	-232.11	-731.31	-227.64	0.50
4578.00	9.10	258.33	4476.25	-234.76	-745.23	-230.20	1.21
4663.00	7.74	255.29	4560.34	-237.57	-757.35	-232.94	1.68
4749.00	6.23	256.72	4645.70	-240.11	-767.49	-235.42	1.77
4834.00	4.93	254.66	4730.29	-242.14	-775.51	-237.40	1.55
4920.00	4.33	256.56	4816.01	-243.87	-782.23	-239.09	0.72
5005.00	3.26	253.53	4900.82	-245.30	-787.67	-240.48	1.28
5090.00	2.29	249.94	4985.72	-246.57	-791.58	-241.73	1.16
5175.00	1.02	246.06	5070.68	-247.46	-793.87	-242.60	1.50
5261.00	1.04	266.03	5156.67	-247.82	-795.34	-242.96	0.42
5346.00	0.97	283.24	5241.66	-247.71	-796.81	-242.84	0.36
5432.00	1.24	314.23	5327.64	-246.90	-798.19	-242.02	0.75
5517.00	1.19	3.31	5412.63	-245.37	-798.80	-240.49	1.19
5602.00	0.98	19.04	5497.61	-243.80	-798.51	-238.92	0.43
5773.00	0.80	89.49	5668.59	-242.41	-796.84	-237.54	0.61
5858.00	0.56	191.29	5753.59	-242.81	-796.33	-237.94	1.25
5943.00	0.44	220.90	5838.59	-243.47	-796.62	-238.60	0.33
6114.00	0.25	310.38	6009.59	-243.72	-797.34	-238.85	0.29
6199.00	0.29	315.07	6094.58	-243.45	-797.63	-238.57	0.05
6285.00	0.16	120.27	6180.58	-243.36	-797.68	-238.48	0.52
6370.00	1.22	104.97	6265.58	-243.65	-796.70	-238.78	1.25
6456.00	0.84	80.16	6351.56	-243.78	-795.20	-238.92	0.67
6541.00	0.70	55.46	6436.56	-243.38	-794.15	-238.52	0.42
6626.00	0.80	28.26	6521.55	-242.56	-793.45	-237.71	0.43
6711.00	0.75	40.01	6606.54	-241.61	-792.81	-236.76	0.20
6797.00	0.66	121.88	6692.54	-241.44	-792.02	-236.60	1.08
6882.00	0.64	110.80	6777.53	-241.87	-791.17	-237.03	0.15
6966.00	0.44	96.93	6861.53	-242.07	-790.41	-237.24	0.28
7033.00	0.70	352.21	6928.53	-241.70	-790.21	-236.87	1.37
7118.00	7.34	6.08	7013.27	-235.78	-789.70	-230.95	7.84
7204.00	15.87	1.09	7097.44	-218.53	-788.89	-213.71	9.98
7289.00	23.51	359.04	7177.41	-189.92	-788.96	-185.09	9.02
7374.00	31.44	2.87	7252.77	-150.76	-788.13	-145.94	9.55
7459.00	39.94	3.40	7321.74	-101.29	-785.40	-96.49	10.01
7545.00	49.91	359.97	7382.56	-40.67	-783.77	-35.89	11.93
7630.00	58.28	355.37	7432.38	28.02	-786.71	32.82	10.77
7716.00	66.13	357.27	7472.46	103.88	-791.55	108.71	9.33
7801.00	73.70	359.92	7501.63	183.62	-793.46	188.46	9.37
7887.00	78.52	359.51	7522.27	267.08	-793.88	271.92	5.62
7972.00	78.69	0.46	7539.06	350.40	-793.90	355.24	1.11
8001.00	83.56	0.59	7543.54	379.04	-793.64	383.89	16.80
8083.00	95.43	1.51	7544.26	460.88	-792.14	465.71	14.52
8166.00	93.89	2.32	7537.51	543.56	-789.37	548.37	2.09
8207.00	93.89	2.30	7534.73	584.43	-787.72	589.23	0.05
8293.00	91.60	1.92	7530.61	670.27	-784.56	675.05	2.70
8378.00	89.81	1.44	7529.57	755.22	-782.07	759.98	2.18
8463.00	90.37	359.97	7529.43	840.21	-781.02	844.97	1.85
8549.00	90.56	359.78	7528.74	926.21	-781.21	930.96	0.31
8720.00	90.43	358.96	7527.26	1097.19	-783.09	1101.95	0.49

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		Vsect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
8805.00	91.05	0.44	7526.16	1182.18	-783.53	1186.94	1.89
8891.00	91.48	0.47	7524.26	1268.15	-782.85	1272.91	0.50
8976.00	90.49	359.51	7522.80	1353.14	-782.87	1357.90	1.62
9061.00	90.19	358.54	7522.30	1438.12	-784.31	1442.89	1.19
9146.00	89.01	358.58	7522.89	1523.09	-786.45	1527.87	1.39
9232.00	88.58	359.62	7524.70	1609.06	-787.80	1613.85	1.31
9317.00	89.01	359.30	7526.49	1694.04	-788.60	1698.83	0.63
9402.00	89.63	0.08	7527.50	1779.03	-789.06	1783.82	1.17
9488.00	89.75	0.03	7527.96	1865.03	-788.98	1869.82	0.15
9573.00	92.53	359.81	7526.27	1950.01	-789.10	1954.79	3.28
9659.00	92.28	0.91	7522.66	2035.93	-788.56	2040.71	1.31
9744.00	91.29	1.60	7520.01	2120.86	-786.70	2125.63	1.42
9829.00	90.71	1.60	7518.53	2205.82	-784.32	2210.57	0.68
9914.00	90.62	1.39	7517.54	2290.78	-782.11	2295.52	0.27
10000.00	90.99	1.70	7516.34	2376.74	-779.79	2381.46	0.56
10085.00	91.23	2.19	7514.69	2461.68	-776.90	2466.38	0.64
10171.00	92.22	2.30	7512.10	2547.57	-773.54	2552.25	1.16
10256.00	90.55	358.30	7510.04	2632.52	-773.09	2637.20	5.10
10341.00	88.58	356.95	7510.69	2717.44	-776.61	2722.14	2.81
10427.00	87.65	357.42	7513.52	2803.29	-780.83	2808.01	1.21
10512.00	89.45	358.25	7515.67	2888.20	-784.04	2892.93	2.33
10597.00	90.43	359.84	7515.76	2973.18	-785.46	2977.93	2.20
10683.00	91.11	0.11	7514.60	3059.18	-785.50	3063.92	0.85
10768.00	90.43	0.57	7513.46	3144.17	-784.99	3148.90	0.97
10854.00	90.62	0.84	7512.67	3230.16	-783.94	3234.88	0.38
10939.00	91.91	0.91	7510.80	3315.12	-782.64	3319.84	1.52
11024.00	91.42	359.31	7508.33	3400.08	-782.48	3404.80	1.97
11110.00	89.88	357.88	7507.35	3486.05	-784.58	3490.78	2.44
11195.00	92.28	358.45	7505.75	3570.98	-787.31	3575.72	2.90
11281.00	92.03	358.77	7502.51	3656.90	-789.39	3661.65	0.47
11366.00	91.98	358.99	7499.54	3741.83	-791.05	3746.59	0.27
11452.00	91.67	359.02	7496.80	3827.77	-792.54	3832.54	0.36
11537.00	91.36	358.50	7494.55	3912.72	-794.38	3917.50	0.71
11622.00	90.55	358.56	7493.14	3997.68	-796.56	4002.47	0.96
11708.00	90.06	358.65	7492.68	4083.65	-798.66	4088.46	0.58
11794.00	88.03	358.27	7494.11	4169.61	-800.97	4174.42	2.40
11879.00	87.23	359.32	7497.63	4254.51	-802.75	4259.34	1.55
11964.00	87.60	359.61	7501.46	4339.42	-803.55	4344.25	0.55
12050.00	87.72	359.90	7504.97	4425.35	-803.91	4430.18	0.36
12135.00	89.38	359.75	7507.12	4510.32	-804.17	4515.15	1.96
12220.00	89.94	359.48	7507.63	4595.31	-804.74	4600.14	0.73
12306.00	90.37	358.93	7507.40	4681.31	-805.94	4686.14	0.81
12391.00	90.49	357.91	7506.76	4766.27	-808.28	4771.12	1.21
12477.00	89.75	357.57	7506.58	4852.20	-811.67	4857.07	0.95
12529.00	88.83	357.36	7507.22	4904.15	-813.97	4909.03	1.81
12586.00	88.83	357.36	7508.39	4961.07	-816.60	4965.97	0.00

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		

Weatherford surveys from 1117 ft MD to 12529 ft MD.
TD well at 12586 ft MD.
The total correction is 8.65 deg relative to True North.