

**VES**

VAUGHN ENERGY SERVICES

Company: Noble Energy  
 Lease/Well: Latham / 2-43  
 Location: S-2 T-4N R-65W

Rig Name: Production  
 State/County: Colorado / Weld County

Latitude: 40.34, Longitude: -104.63  
 GRID North is 0.56 Degrees East of True North  
 VS-Azi: 0.00 Degrees

**GTI**

GYRO TECHNOLOGIES, INC

**FIELD COPY ONLY (NOT DEFINITIVE)**

Depth Reference : RKB = Ground Level

**DRILLOG MS GYRO SURVEY CALCULATIONS**

Filename: inrun\_ed.ut  
 Minimum Curvature Method  
 Report Date/Time: 3/11/2011 / 13:38

Vaughn Energy Services  
 Denver, CO  
 720-215-1841  
 Robert Davis

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N-S FT	+E-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.37	300.50	100.00	0.16	-0.28	0.16	0.32	300.50	0.37
200.00	0.38	322.71	200.00	0.59	-0.75	0.59	0.96	308.05	0.14
300.00	0.39	330.48	300.00	1.15	-1.12	1.15	1.60	315.67	0.05
400.00	0.82	325.65	399.99	2.03	-1.69	2.03	2.64	320.24	0.44
500.00	1.61	321.91	499.97	3.73	-2.96	3.73	4.76	321.55	0.79
600.00	2.54	327.89	599.90	6.71	-5.01	6.71	8.37	323.28	0.95
700.00	3.39	335.58	699.77	11.28	-7.40	11.28	13.49	326.71	0.94
800.00	4.17	335.41	799.55	17.27	-10.14	17.27	20.03	329.59	0.79
900.00	4.95	339.40	899.23	24.62	-13.17	24.62	27.92	331.85	0.84
1000.00	5.42	339.13	998.82	33.07	-16.37	33.07	36.90	333.66	0.47
1100.00	5.97	338.28	1098.33	42.32	-19.98	42.32	46.79	334.73	0.56
1200.00	6.74	342.21	1197.71	52.73	-23.70	52.73	57.81	335.80	0.88
1300.00	7.18	344.92	1296.98	64.35	-27.11	64.35	69.83	337.15	0.55
1400.00	7.38	343.19	1396.17	76.53	-30.59	76.53	82.42	338.21	0.30
1500.00	7.16	346.66	1495.37	88.74	-33.89	88.74	94.99	339.10	0.49
1600.00	6.30	348.26	1594.68	100.17	-36.44	100.17	106.59	340.01	0.88
1700.00	5.73	350.42	1694.13	110.46	-38.39	110.46	116.94	340.84	0.61
1800.00	5.25	349.47	1793.67	119.88	-40.06	119.88	126.39	341.52	0.48
1900.00	4.94	346.71	1893.27	128.57	-41.88	128.57	135.22	341.96	0.39
2000.00	4.95	342.38	1992.90	136.88	-44.18	136.88	143.83	342.11	0.37
2100.00	4.01	338.66	2092.59	144.25	-46.76	144.25	151.64	342.04	0.98
2200.00	3.27	328.43	2192.39	149.94	-49.53	149.94	157.91	341.72	0.98
2300.00	2.40	328.35	2292.27	154.15	-52.12	154.15	162.73	341.32	0.87
2400.00	1.45	326.00	2392.21	156.99	-53.93	156.99	165.99	341.04	0.95
2500.00	1.08	339.73	2492.19	158.93	-54.97	158.93	168.16	340.92	0.48
2600.00	0.90	341.27	2592.17	160.56	-55.54	160.56	169.89	340.92	0.19
2700.00	1.29	351.11	2692.15	162.41	-55.97	162.41	171.78	340.98	0.43
2800.00	1.06	352.95	2792.13	164.44	-56.26	164.44	173.79	341.11	0.23
2900.00	1.02	348.15	2892.12	166.22	-56.55	166.22	175.58	341.21	0.09
3000.00	1.00	343.57	2992.10	167.94	-56.98	167.94	177.34	341.26	0.08
3100.00	0.64	324.19	3092.09	169.23	-57.56	169.23	178.75	341.22	0.46
3200.00	0.11	341.41	3192.09	169.77	-57.91	169.77	179.38	341.16	0.53
3300.00	0.41	169.90	3292.09	169.50	-57.88	169.50	179.11	341.15	0.52
3400.00	0.94	175.95	3392.08	168.33	-57.76	168.33	177.97	341.06	0.53

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
3500.00	0.78	176.30	3492.07	166.84	-57.66	166.84	176.52	340.94	0.16
3600.00	0.74	200.47	3592.06	165.55	-57.84	165.55	175.36	340.74	0.32
3700.00	0.97	218.10	3692.05	164.28	-58.59	164.28	174.41	340.37	0.34
3800.00	1.21	206.12	3792.03	162.67	-59.57	162.67	173.24	339.89	0.33
3900.00	1.22	214.93	3892.01	160.85	-60.64	160.85	171.91	339.34	0.19
4000.00	1.28	210.81	3991.98	159.02	-61.83	159.02	170.62	338.75	0.11
4100.00	1.29	218.00	4091.96	157.17	-63.09	157.17	169.36	338.13	0.16
4200.00	1.26	216.69	4191.93	155.40	-64.45	155.40	168.23	337.48	0.04
4300.00	1.26	205.79	4291.91	153.53	-65.58	153.53	166.95	336.87	0.24
4400.00	1.33	231.32	4391.89	151.81	-66.96	151.81	165.93	336.20	0.58
4500.00	1.20	217.30	4491.86	150.25	-68.51	150.25	165.13	335.49	0.33
4600.00	1.77	201.41	4591.83	147.98	-69.71	147.98	163.58	334.78	0.69
4700.00	1.99	198.20	4691.77	144.90	-70.81	144.90	161.27	333.95	0.25
4800.00	1.85	214.82	4791.72	141.92	-72.27	141.92	159.26	333.01	0.57
4900.00	1.59	202.89	4891.67	139.32	-73.73	139.32	157.63	332.11	0.44
5000.00	0.82	226.49	4991.65	137.55	-74.79	137.55	156.57	331.47	0.90
5100.00	0.19	337.74	5091.65	137.21	-75.37	137.21	156.55	331.22	0.91
5200.00	0.20	288.95	5191.65	137.42	-75.60	137.42	156.85	331.18	0.16
5300.00	0.64	4.42	5291.65	138.04	-75.73	138.04	157.45	331.25	0.62
5400.00	0.78	36.41	5391.64	139.14	-75.28	139.14	158.20	331.59	0.41
5500.00	0.87	34.78	5491.63	140.31	-74.44	140.31	158.84	332.05	0.09
5600.00	1.15	39.56	5591.61	141.71	-73.37	141.71	159.58	332.63	0.29
5700.00	1.37	42.42	5691.59	143.36	-71.93	143.36	160.40	333.36	0.23
5800.00	0.51	53.19	5791.57	144.51	-70.77	144.51	160.91	333.91	0.87
5900.00	0.65	16.25	5891.57	145.32	-70.25	145.32	161.41	334.20	0.39
6000.00	0.66	339.15	5991.56	146.41	-70.30	146.41	162.41	334.35	0.42
6100.00	0.43	274.59	6091.56	146.97	-70.87	146.97	163.17	334.26	0.61
6200.00	0.88	262.64	6191.55	146.91	-72.01	146.91	163.61	333.89	0.47
6300.00	0.56	259.16	6291.54	146.72	-73.25	146.72	163.99	333.47	0.33
6400.00	1.30	238.21	6391.53	146.03	-74.70	146.03	164.02	332.91	0.80
6500.00	1.60	266.93	6491.50	145.35	-77.06	145.35	164.52	332.07	0.78
6600.00	2.14	278.01	6591.45	145.54	-80.31	145.54	166.23	331.11	0.65
6700.00	2.90	277.61	6691.35	146.14	-84.67	146.14	168.89	329.91	0.75
6800.00	2.20	287.85	6791.25	147.06	-89.00	147.06	171.89	328.82	0.83
6900.00	1.41	304.20	6891.20	148.34	-91.84	148.34	174.47	328.24	0.94

<div> HORIZONTAL DISPLACEMENT IS  174.47 FEET AT 328.24 DEGREES </div>
--