

**VES**

VAUGHN ENERGY SERVICES

Company: Noble Energy  
 Lease/Well: Tania Blue D / 2-23  
 Location: S-2 T-3N R-64W

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

Latitude: 40.25, Longitude: -104.51  
 GRID North is 0.64 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: 5/5/2011 / 22:00

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	0.39	281.27	100.00	0.07	-0.33	0.07	0.34	281.27	0.39
200.00	0.27	287.58	200.00	0.20	-0.89	0.20	0.91	282.91	0.12
300.00	0.31	272.01	300.00	0.28	-1.38	0.28	1.41	281.64	0.09
400.00	0.28	274.92	400.00	0.31	-1.89	0.31	1.92	279.44	0.03
500.00	0.19	279.79	499.99	0.36	-2.30	0.36	2.33	278.99	0.09
600.00	0.26	286.06	599.99	0.46	-2.69	0.46	2.73	279.64	0.07
700.00	0.32	286.08	699.99	0.60	-3.18	0.60	3.24	280.64	0.05
800.00	0.43	277.71	799.99	0.72	-3.82	0.72	3.89	280.75	0.13
900.00	0.39	287.01	899.99	0.87	-4.52	0.87	4.60	280.96	0.08
1000.00	0.42	297.62	999.98	1.14	-5.16	1.14	5.29	282.48	0.08
1100.00	0.42	280.94	1099.98	1.38	-5.85	1.38	6.02	283.30	0.12
1200.00	0.52	286.58	1199.98	1.58	-6.65	1.58	6.84	283.39	0.11
1300.00	0.53	313.73	1299.97	2.03	-7.42	2.03	7.69	285.31	0.25
1400.00	0.42	319.88	1399.97	2.63	-7.99	2.63	8.41	288.20	0.12
1500.00	0.55	294.81	1499.97	3.11	-8.66	3.11	9.20	289.74	0.25
1600.00	0.40	307.13	1599.96	3.52	-9.37	3.52	10.01	290.58	0.18
1700.00	0.24	322.06	1699.96	3.90	-9.78	3.90	10.53	291.73	0.18
1800.00	0.32	343.41	1799.96	4.33	-9.99	4.33	10.89	293.43	0.13
1900.00	0.45	13.49	1899.96	4.98	-9.98	4.98	11.15	296.51	0.24
2000.00	0.39	20.41	1999.96	5.68	-9.77	5.68	11.30	300.17	0.08
2100.00	0.38	9.42	2099.95	6.32	-9.60	6.32	11.49	303.39	0.07
2200.00	0.40	297.08	2199.95	6.81	-9.85	6.81	11.97	304.65	0.46
2300.00	0.58	256.81	2299.95	6.85	-10.65	6.85	12.66	302.76	0.38
2400.00	0.43	258.33	2399.95	6.66	-11.51	6.66	13.29	300.06	0.14
2500.00	1.11	130.46	2499.94	5.96	-11.14	5.96	12.63	298.13	1.42
2600.00	1.11	143.01	2599.92	4.56	-9.82	4.56	10.83	294.88	0.24
2700.00	1.03	129.97	2699.90	3.21	-8.55	3.21	9.13	290.55	0.26
2800.00	1.13	128.77	2799.89	2.01	-7.09	2.01	7.37	285.82	0.11
2900.00	1.01	127.31	2899.87	0.86	-5.62	0.86	5.68	278.66	0.13
3000.00	0.92	142.01	2999.85	-0.31	-4.43	-0.31	4.44	266.02	0.26
3100.00	0.59	140.14	3099.85	-1.34	-3.60	-1.34	3.84	249.63	0.32
3200.00	0.54	144.87	3199.84	-2.12	-3.00	-2.12	3.67	234.77	0.07
3300.00	0.86	143.33	3299.83	-3.10	-2.28	-3.10	3.85	216.32	0.32
3400.00	0.99	155.71	3399.82	-4.49	-1.48	-4.49	4.73	198.24	0.23

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	0.39	168.87	3499.81	-5.61	-1.06	-5.61	5.71	190.71	0.61
3600.00	0.37	132.16	3599.81	-6.16	-0.75	-6.16	6.21	186.96	0.24
3700.00	0.50	135.06	3699.81	-6.69	-0.20	-6.69	6.69	181.74	0.12
3800.00	0.62	136.12	3799.80	-7.39	0.48	-7.39	7.40	176.30	0.12
3900.00	0.72	159.08	3899.80	-8.37	1.08	-8.37	8.44	172.65	0.29
4000.00	0.52	165.78	3999.79	-9.40	1.42	-9.40	9.51	171.43	0.21
4100.00	0.28	161.47	4099.79	-10.07	1.61	-10.07	10.20	170.94	0.25
4200.00	0.45	125.93	4199.79	-10.53	2.00	-10.53	10.72	169.25	0.27
4300.00	0.32	105.50	4299.78	-10.84	2.59	-10.84	11.14	166.58	0.18
4400.00	0.32	96.75	4399.78	-10.94	3.13	-10.94	11.38	164.04	0.05
4500.00	0.36	90.61	4499.78	-10.98	3.72	-10.98	11.59	161.28	0.06
4600.00	0.36	87.77	4599.78	-10.97	4.36	-10.97	11.80	158.35	0.02
4700.00	0.24	104.94	4699.78	-11.01	4.87	-11.01	12.04	156.12	0.15
4800.00	0.19	137.52	4799.78	-11.19	5.19	-11.19	12.33	155.12	0.13
4900.00	0.34	158.10	4899.78	-11.59	5.41	-11.59	12.79	154.96	0.17
5000.00	0.32	156.88	4999.77	-12.12	5.63	-12.12	13.37	155.07	0.02
5100.00	0.43	145.66	5099.77	-12.69	5.95	-12.69	14.01	154.86	0.13
5200.00	0.71	170.33	5199.77	-13.61	6.27	-13.61	14.98	155.27	0.37
5300.00	0.74	173.73	5299.76	-14.86	6.44	-14.86	16.20	156.56	0.05
5400.00	0.81	172.03	5399.75	-16.21	6.61	-16.21	17.50	157.81	0.07
5500.00	0.93	164.80	5499.74	-17.69	6.92	-17.69	18.99	158.63	0.16
5600.00	0.93	161.16	5599.72	-19.23	7.39	-19.23	20.61	158.97	0.06
5700.00	1.18	161.63	5699.71	-20.98	7.98	-20.98	22.45	159.17	0.26
5800.00	1.47	155.94	5799.68	-23.13	8.83	-23.13	24.76	159.10	0.32
5900.00	1.59	151.46	5899.65	-25.53	10.02	-25.53	27.42	158.57	0.17
6000.00	2.19	134.39	5999.59	-28.08	12.05	-28.08	30.56	156.78	0.82
6100.00	2.59	135.38	6099.50	-31.03	15.01	-31.03	34.47	154.19	0.40
6200.00	3.02	135.46	6199.38	-34.52	18.45	-34.52	39.14	151.88	0.43
6300.00	3.38	139.38	6299.23	-38.64	22.21	-38.64	44.57	150.11	0.42
6400.00	3.09	137.93	6399.07	-42.87	25.93	-42.87	50.10	148.83	0.30
6500.00	2.54	140.01	6498.95	-46.57	29.16	-46.57	54.95	147.94	0.55
6600.00	2.06	132.27	6598.87	-49.48	31.92	-49.48	58.88	147.17	0.57
6700.00	1.37	135.34	6698.82	-51.54	34.09	-51.54	61.79	146.52	0.70
6800.00	0.67	129.01	6798.80	-52.75	35.38	-52.75	63.52	146.15	0.70
HORIZONTAL DISPLACEMENT IS 63.52 FEET AT 146.15 DEGREES									