

**VES**

VAUGHN ENERGY SERVICES

Company: Noble Energy

Lease/Well: Minor / 1

Location: S-1 T-4N R-64W

Rig Name: Production

State/County: Colorado / Weld County

Latitude: 40.34, 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: 3/23/2011 / 11:42

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	0.19	267.40	100.00	-0.01	-0.17	-0.01	0.17	267.40	0.19
200.00	0.25	22.54	200.00	0.19	-0.25	0.19	0.32	306.74	0.38
300.00	0.32	342.51	300.00	0.66	-0.25	0.66	0.71	339.08	0.21
400.00	0.55	302.63	400.00	1.19	-0.74	1.19	1.40	328.02	0.37
500.00	0.95	277.31	499.99	1.56	-1.97	1.56	2.51	308.27	0.51
600.00	0.67	271.53	599.98	1.68	-3.38	1.68	3.77	296.41	0.30
700.00	0.94	250.55	699.97	1.42	-4.73	1.42	4.94	286.72	0.39
800.00	1.00	254.69	799.95	0.92	-6.34	0.92	6.41	278.23	0.10
900.00	1.09	256.74	899.94	0.47	-8.12	0.47	8.13	273.30	0.10
1000.00	0.63	283.09	999.92	0.37	-9.58	0.37	9.59	272.24	0.60
1100.00	0.76	274.33	1099.92	0.55	-10.78	0.55	10.80	272.92	0.16
1200.00	0.10	328.13	1199.91	0.67	-11.49	0.67	11.51	273.35	0.70
1300.00	0.17	216.93	1299.91	0.63	-11.62	0.63	11.64	273.08	0.23
1400.00	0.36	47.79	1399.91	0.71	-11.48	0.71	11.50	273.56	0.53
1500.00	0.11	167.03	1499.91	0.83	-11.23	0.83	11.26	274.22	0.42
1600.00	0.10	218.59	1599.91	0.67	-11.26	0.67	11.28	273.38	0.09
1700.00	0.36	186.30	1699.91	0.28	-11.35	0.28	11.36	271.42	0.28
1800.00	0.68	171.82	1799.91	-0.62	-11.30	-0.62	11.32	266.86	0.34
1900.00	0.46	113.12	1899.90	-1.37	-10.85	-1.37	10.93	262.83	0.59
2000.00	0.82	119.18	1999.90	-1.87	-9.85	-1.87	10.03	259.23	0.36
2100.00	1.44	112.77	2099.88	-2.71	-8.07	-2.71	8.51	251.45	0.63
2200.00	1.70	125.50	2199.84	-4.05	-5.71	-4.05	7.00	234.62	0.43
2300.00	2.27	138.37	2299.78	-6.39	-3.18	-6.39	7.14	206.47	0.73
2400.00	2.44	151.29	2399.70	-9.74	-0.84	-9.74	9.78	184.95	0.55
2500.00	2.59	165.97	2499.60	-13.80	0.73	-13.80	13.82	176.99	0.66
2600.00	3.04	165.59	2599.48	-18.57	1.93	-18.57	18.67	174.05	0.45
2700.00	3.04	173.87	2699.34	-23.78	2.88	-23.78	23.95	173.10	0.44
2800.00	3.18	187.85	2799.19	-29.16	2.78	-29.16	29.29	174.55	0.77
2900.00	3.07	205.00	2899.05	-34.33	1.27	-34.33	34.36	177.88	0.94
3000.00	2.28	215.53	2998.94	-38.38	-1.02	-38.38	38.39	181.52	0.93
3100.00	1.76	231.18	3098.88	-40.97	-3.37	-40.97	41.10	184.71	0.75
3200.00	1.48	261.89	3198.84	-42.11	-5.85	-42.11	42.52	187.91	0.90
3300.00	1.39	273.39	3298.81	-42.22	-8.33	-42.22	43.04	191.17	0.30
3400.00	0.83	276.04	3398.79	-42.07	-10.27	-42.07	43.31	193.72	0.56

**HORIZONTAL DISPLACEMENT IS  
33.92 FEET AT 205.77 DEGREES**