

**VES**

VAUGHN ENERGY SERVICES

Company: Noble Energy  
 Lease/Well: State / 36-1114  
 Location: S-36 T-4N R-65W  
 Rig Name: Production  
 State/County: Colorado / Weld County  
 Latitude: 40.27, Longitude: -104.50  
 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 : Ground Level

## DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: inrun\_ed.ut

Minimum Curvature Method

Report Date/Time: 12/18/2010 / 10:08

Vaughn Energy Services  
 Fort Worth, Texas  
 817-741-3610  
 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	0.34	47.38	100.00	0.20	0.22	0.20	0.30	47.38	0.34
200.00	0.30	339.20	200.00	0.64	0.35	0.64	0.73	28.19	0.36
300.00	0.06	23.42	300.00	0.94	0.28	0.94	0.98	16.39	0.26
400.00	0.08	170.34	400.00	0.92	0.31	0.92	0.97	18.60	0.14
500.00	0.13	168.23	500.00	0.74	0.35	0.74	0.81	25.13	0.05
600.00	0.26	141.99	600.00	0.44	0.51	0.44	0.67	48.72	0.15
700.00	0.32	124.80	700.00	0.11	0.87	0.11	0.88	82.78	0.11
800.00	0.35	118.43	799.99	-0.19	1.36	-0.19	1.38	97.98	0.05
900.00	0.40	116.41	899.99	-0.49	1.94	-0.49	2.00	104.17	0.06
1100.00	0.41	117.65	1099.99	-1.13	3.20	-1.13	3.40	109.49	0.01
1200.00	0.45	117.35	1199.98	-1.48	3.86	-1.48	4.14	110.92	0.04
1300.00	0.54	113.54	1299.98	-1.85	4.65	-1.85	5.00	111.67	0.10
1400.00	0.51	106.91	1399.98	-2.16	5.51	-2.16	5.92	111.47	0.07
1500.00	0.58	99.71	1499.97	-2.38	6.43	-2.38	6.85	110.31	0.10
1600.00	0.58	96.67	1599.97	-2.52	7.43	-2.52	7.84	108.76	0.03
1700.00	0.62	71.99	1699.96	-2.41	8.44	-2.41	8.78	105.97	0.26
1800.00	0.67	62.26	1799.95	-1.98	9.47	-1.98	9.67	101.80	0.12
1900.00	0.86	94.46	1899.95	-1.76	10.73	-1.76	10.88	99.34	0.46
2000.00	0.93	88.43	1999.93	-1.80	12.30	-1.80	12.43	98.33	0.12
2100.00	0.99	82.89	2099.92	-1.67	13.97	-1.67	14.07	96.82	0.11
2200.00	0.69	54.60	2199.91	-1.22	15.32	-1.22	15.37	94.55	0.51
2300.00	0.30	356.89	2299.91	-0.61	15.79	-0.61	15.81	92.22	0.58
2400.00	0.96	276.54	2399.90	-0.26	14.95	-0.26	14.95	90.99	0.96
2500.00	1.73	289.75	2499.87	0.35	12.70	0.35	12.70	88.44	0.82
2600.00	2.29	300.83	2599.81	1.88	9.56	1.88	9.74	78.87	0.68
2700.00	2.69	318.80	2699.72	4.67	6.29	4.67	7.84	53.41	0.87
2800.00	2.67	310.38	2799.61	7.95	2.97	7.95	8.49	20.51	0.39
2900.00	2.41	300.66	2899.51	10.53	-0.61	10.53	10.55	356.69	0.50
3000.00	1.98	305.86	2999.44	12.62	-3.82	12.62	13.18	343.16	0.47
3100.00	1.53	305.25	3099.39	14.40	-6.31	14.40	15.72	336.34	0.46
3200.00	1.35	300.96	3199.36	15.77	-8.40	15.77	17.87	331.95	0.21
3300.00	0.89	337.75	3299.34	17.09	-9.71	17.09	19.65	330.41	0.83
3400.00	0.63	26.69	3399.33	18.30	-9.75	18.30	20.73	331.94	0.67
3500.00	0.65	19.63	3499.33	19.32	-9.31	19.32	21.45	334.27	0.08

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
3600.00	0.66	44.78	3599.32	20.27	-8.71	20.27	22.06	336.74	0.29
3700.00	0.44	91.89	3699.32	20.67	-7.92	20.67	22.14	339.02	0.49
3800.00	0.62	191.21	3799.31	20.13	-7.65	20.13	21.53	339.20	0.81
3900.00	1.53	205.07	3899.29	18.38	-8.32	18.38	20.18	335.65	0.94
4000.00	2.42	198.04	3999.23	15.16	-9.54	15.16	17.92	327.83	0.92
4100.00	2.90	180.48	4099.13	10.63	-10.21	10.63	14.74	316.15	0.94
4200.00	2.59	161.58	4199.02	5.96	-9.52	5.96	11.23	302.05	0.95
4300.00	1.95	145.25	4298.94	2.42	-7.84	2.42	8.21	287.16	0.90
4400.00	1.34	118.57	4398.90	0.47	-5.85	0.47	5.86	274.56	0.96
4500.00	1.19	124.35	4498.87	-0.68	-3.96	-0.68	4.02	260.27	0.19
4600.00	1.21	120.64	4598.85	-1.81	-2.19	-1.81	2.84	230.50	0.08
4700.00	0.93	125.51	4698.83	-2.82	-0.62	-2.82	2.88	192.40	0.30
4800.00	1.01	150.26	4798.82	-4.05	0.48	-4.05	4.08	173.27	0.42
4900.00	0.84	160.36	4898.81	-5.51	1.16	-5.51	5.63	168.10	0.23
5000.00	0.96	178.99	4998.79	-7.04	1.42	-7.04	7.18	168.58	0.32
5100.00	1.10	183.33	5098.78	-8.83	1.38	-8.83	8.94	171.11	0.15
5200.00	1.25	200.96	5198.76	-10.81	0.94	-10.81	10.85	175.05	0.39
5300.00	1.62	186.95	5298.73	-13.24	0.37	-13.24	13.24	178.38	0.51
5400.00	2.06	196.16	5398.67	-16.37	-0.30	-16.37	16.37	181.04	0.53
5500.00	1.49	202.89	5498.63	-19.30	-1.31	-19.30	19.34	183.87	0.61
5600.00	0.79	238.67	5598.61	-20.85	-2.40	-20.85	20.99	186.56	0.97
5700.00	0.92	288.30	5698.60	-20.96	-3.75	-20.96	21.29	190.15	0.73
5800.00	0.17	33.45	5798.59	-20.58	-4.43	-20.58	21.05	192.16	0.98
5900.00	0.78	196.96	5898.59	-21.11	-4.55	-21.11	21.59	192.17	0.94
6000.00	1.45	180.59	5998.57	-23.03	-4.76	-23.03	23.52	191.69	0.74
6100.00	1.28	146.28	6098.54	-25.23	-4.16	-25.23	25.57	189.35	0.82
6200.00	1.24	159.73	6198.52	-27.17	-3.16	-27.17	27.35	186.63	0.30
6300.00	1.41	144.82	6298.49	-29.18	-2.08	-29.18	29.26	184.07	0.38
6400.00	2.01	139.85	6398.45	-31.53	-0.24	-31.53	31.53	180.44	0.61
6500.00	2.05	137.68	6498.39	-34.19	2.09	-34.19	34.25	176.50	0.09
6600.00	2.21	146.45	6598.32	-37.11	4.36	-37.11	37.37	173.30	0.36
6700.00	1.44	131.33	6698.27	-39.55	6.36	-39.55	40.05	170.86	0.90

HORIZONTAL DISPLACEMENT IS 40.05 FEET AT 170.86 DEGREES									
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