

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy
 Lease/Well: UPRC / 31-5H
 Location: S-31 T-4N R-64W
 Rig Name: Production
 State/County: Colorado / Weld County
 Latitude: 40.27, Longitude: -104.60
 GRID North is 0.58 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: merged_ed.ut

Minimum Curvature Method

Report Date/Time: 4/20/2011 / 08:17

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	0.23	326.58	100.00	0.17	-0.11	0.17	0.20	326.58	0.23
200.00	0.16	248.97	200.00	0.28	-0.35	0.28	0.45	309.22	0.25
300.00	0.12	237.80	300.00	0.18	-0.57	0.18	0.60	287.32	0.04
400.00	0.18	18.40	400.00	0.27	-0.61	0.27	0.67	293.73	0.29
500.00	0.24	228.11	500.00	0.28	-0.72	0.28	0.77	291.03	0.41
600.00	0.52	322.52	600.00	0.50	-1.15	0.50	1.25	293.25	0.59
700.00	0.94	333.46	699.99	1.59	-1.79	1.59	2.40	311.49	0.44
800.00	1.24	331.53	799.97	3.27	-2.67	3.27	4.22	320.70	0.30
900.00	1.74	341.21	899.94	5.65	-3.68	5.65	6.74	326.95	0.56
1000.00	2.00	347.34	999.88	8.80	-4.55	8.80	9.90	332.65	0.33
1100.00	2.57	345.96	1099.80	12.67	-5.48	12.67	13.81	336.63	0.57
1200.00	2.82	351.15	1199.69	17.28	-6.40	17.28	18.43	339.68	0.35
1300.00	2.86	348.85	1299.57	22.16	-7.26	22.16	23.32	341.86	0.12
1400.00	2.81	339.59	1399.45	26.91	-8.60	26.91	28.25	342.28	0.46
1500.00	2.64	353.36	1499.34	31.50	-9.72	31.50	32.96	342.85	0.67
1600.00	2.13	348.20	1599.25	35.60	-10.37	35.60	37.08	343.77	0.56
1700.00	1.73	339.75	1699.19	38.84	-11.27	38.84	40.44	343.82	0.49
1800.00	1.59	338.93	1799.15	41.55	-12.29	41.55	43.33	343.52	0.14
1900.00	1.19	356.05	1899.12	43.88	-12.86	43.88	45.72	343.66	0.58
2000.00	1.00	350.24	1999.10	45.77	-13.08	45.77	47.60	344.05	0.22
2100.00	0.81	357.03	2099.09	47.33	-13.26	47.33	49.15	344.35	0.22
2200.00	0.64	349.19	2199.08	48.58	-13.40	48.58	50.40	344.58	0.20
2300.00	0.56	342.04	2299.08	49.59	-13.66	49.59	51.44	344.60	0.11
2400.00	0.81	11.08	2399.07	50.75	-13.67	50.75	52.56	344.92	0.42
2500.00	0.90	17.42	2499.06	52.20	-13.30	52.20	53.87	345.71	0.13
2600.00	1.11	24.96	2599.04	53.83	-12.65	53.83	55.30	346.77	0.24
2700.00	0.97	37.47	2699.03	55.38	-11.73	55.38	56.61	348.04	0.26
2800.00	0.82	45.05	2799.01	56.56	-10.71	56.56	57.56	349.28	0.19
2900.00	1.11	53.17	2899.00	57.64	-9.43	57.64	58.41	350.71	0.32
3000.00	0.82	61.46	2998.99	58.56	-8.03	58.56	59.11	352.19	0.32
3100.00	1.09	60.49	3098.97	59.37	-6.57	59.37	59.73	353.68	0.28
3200.00	1.05	64.12	3198.96	60.24	-4.92	60.24	60.44	355.33	0.08
3300.00	1.01	66.94	3298.94	60.98	-3.29	60.98	61.07	356.91	0.06
3400.00	0.26	92.65	3398.93	61.32	-2.26	61.32	61.36	357.89	0.78

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	1.02	159.64	3498.93	60.47	-1.72	60.47	60.49	358.37	0.95
3600.00	1.94	174.10	3598.89	57.95	-1.24	57.95	57.96	358.77	0.98
3700.00	1.36	172.04	3698.85	55.09	-0.90	55.09	55.10	359.06	0.58
3800.00	1.21	173.61	3798.83	52.87	-0.62	52.87	52.87	359.33	0.16
3900.00	1.05	190.64	3898.81	50.92	-0.67	50.92	50.93	359.24	0.37
4000.00	0.99	182.65	3998.79	49.16	-0.88	49.16	49.17	358.97	0.15
4100.00	1.26	198.72	4098.77	47.26	-1.27	47.26	47.27	358.46	0.41
4200.00	1.27	200.74	4198.75	45.18	-2.02	45.18	45.23	357.44	0.05
4300.00	1.28	207.08	4298.72	43.15	-2.92	43.15	43.25	356.13	0.14
4400.00	1.12	228.05	4398.70	41.51	-4.15	41.51	41.71	354.29	0.46
4500.00	0.58	197.27	4498.69	40.37	-5.03	40.37	40.68	352.90	0.69
4600.00	1.08	223.41	4598.68	39.20	-5.83	39.20	39.63	351.54	0.62
4700.00	0.29	267.05	4698.67	38.50	-6.73	38.50	39.08	350.08	0.90
4800.00	0.78	22.59	4798.67	39.11	-6.72	39.11	39.69	350.25	0.94
4900.00	1.69	29.84	4898.64	41.02	-5.72	41.02	41.42	352.06	0.92
5000.00	2.18	32.57	4998.59	43.90	-3.97	43.90	44.08	354.84	0.50
5100.00	1.49	47.38	5098.54	46.38	-1.99	46.38	46.42	357.54	0.83
5200.00	0.81	51.43	5198.52	47.70	-0.48	47.70	47.70	359.42	0.69
5300.00	0.37	31.56	5298.51	48.41	0.23	48.41	48.41	0.28	0.48
5400.00	0.33	84.39	5398.51	48.71	0.69	48.71	48.71	0.81	0.31
5500.00	0.35	62.43	5498.51	48.88	1.24	48.88	48.90	1.46	0.13
5600.00	0.78	75.22	5598.50	49.20	2.18	49.20	49.25	2.54	0.45
5700.00	1.51	87.35	5698.48	49.43	4.16	49.43	49.61	4.81	0.76
5800.00	0.65	67.25	5798.46	49.71	5.99	49.71	50.07	6.87	0.93
5900.00	0.08	149.15	5898.46	49.88	6.55	49.88	50.30	7.48	0.64
6000.00	0.44	117.58	5998.46	49.64	6.93	49.64	50.12	7.94	0.38
6100.00	0.28	213.51	6098.46	49.25	7.13	49.25	49.77	8.24	0.55
6200.00	0.16	329.89	6198.46	49.17	6.93	49.17	49.65	8.02	0.38
6300.00	0.83	234.15	6298.45	48.86	6.27	48.86	49.26	7.31	0.86
6400.00	0.35	316.81	6398.45	48.65	5.47	48.65	48.96	6.42	0.86
6500.00	1.15	10.15	6498.44	49.86	5.44	49.86	50.16	6.23	0.99
6600.00	1.61	20.24	6598.41	52.18	6.11	52.18	52.53	6.68	0.52
6700.00	2.18	3.14	6698.36	55.40	6.70	55.40	55.80	6.89	0.80
6800.00	1.31	347.48	6798.31	58.42	6.56	58.42	58.79	6.40	0.99
6900.00	0.46	330.69	6898.30	59.89	6.11	59.89	60.20	5.83	0.88
7000.00	0.29	114.86	6998.30	60.13	6.15	60.13	60.44	5.84	0.72
7100.00	0.72	156.28	7098.29	59.45	6.63	59.45	59.81	6.36	0.54
7150.00	0.58	134.23	7148.29	58.98	6.94	58.98	59.39	6.71	0.57

<div> HORIZONTAL DISPLACEMENT IS 59.39 FEET AT 6.71 DEGREES </div>
