

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy
 Lease/Well: USA/ 13-13J
 Location: S-13 T-3N R-65W
 Rig Name: Production
 State/County: Colorado / Weld
 Latitude: 40.22, Longitude: -104.62
 GRID North is 0.57 Degrees East of True North
 VS-Azi: 0.00 Degrees

GTI

GYRO TECHNOLOGIES, INC

FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : Weld County

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: inrun_ed.ut

Minimum Curvature Method

Report Date/Time: 5/10/2011 / 14:15

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	0.06	164.59	100.00	-0.05	0.01	-0.05	0.06	164.59	0.06
200.00	0.11	130.21	200.00	-0.17	0.10	-0.17	0.20	148.41	0.07
300.00	0.25	212.49	300.00	-0.41	0.06	-0.41	0.42	171.25	0.26
400.00	0.27	223.07	400.00	-0.77	-0.21	-0.77	0.80	195.47	0.05
500.00	0.20	289.99	500.00	-0.88	-0.54	-0.88	1.03	211.56	0.27
600.00	0.16	316.05	600.00	-0.71	-0.81	-0.71	1.08	228.45	0.09
700.00	0.28	237.81	700.00	-0.74	-1.11	-0.74	1.34	236.34	0.30
800.00	0.14	284.52	800.00	-0.84	-1.44	-0.84	1.67	239.71	0.21
900.00	0.16	135.38	900.00	-0.91	-1.46	-0.91	1.72	238.12	0.29
1000.00	0.19	281.59	1000.00	-0.97	-1.53	-0.97	1.81	237.47	0.34
1100.00	0.25	258.53	1100.00	-0.98	-1.90	-0.98	2.14	242.65	0.10
1200.00	0.13	213.64	1199.99	-1.12	-2.17	-1.12	2.44	242.76	0.18
1300.00	0.22	212.64	1299.99	-1.37	-2.34	-1.37	2.71	239.58	0.09
1400.00	0.38	210.36	1399.99	-1.82	-2.61	-1.82	3.19	235.06	0.16
1500.00	0.56	220.33	1499.99	-2.48	-3.10	-2.48	3.97	231.25	0.19
1600.00	0.66	232.30	1599.98	-3.21	-3.86	-3.21	5.02	230.32	0.16
1700.00	0.78	235.59	1699.98	-3.94	-4.88	-3.94	6.27	231.07	0.13
1800.00	1.02	240.57	1799.96	-4.76	-6.22	-4.76	7.83	232.54	0.26
1900.00	1.24	243.25	1899.94	-5.69	-7.96	-5.69	9.79	234.45	0.23
2000.00	1.32	246.82	1999.92	-6.63	-9.99	-6.63	11.99	236.42	0.11
2100.00	1.41	247.31	2099.89	-7.56	-12.19	-7.56	14.34	238.18	0.09
2200.00	1.25	244.38	2199.86	-8.51	-14.31	-8.51	16.64	239.26	0.17
2300.00	1.38	243.87	2299.84	-9.51	-16.37	-9.51	18.93	239.85	0.13
2400.00	1.06	228.23	2399.81	-10.66	-18.14	-10.66	21.04	239.57	0.46
2500.00	0.91	209.72	2499.80	-11.96	-19.22	-11.96	22.64	238.11	0.35
2600.00	0.89	197.11	2599.79	-13.39	-19.85	-13.39	23.94	235.99	0.20
2700.00	0.85	194.93	2699.78	-14.85	-20.27	-14.85	25.13	233.76	0.05
2800.00	0.69	226.14	2799.77	-15.99	-20.89	-15.99	26.31	232.57	0.44
2900.00	0.91	227.63	2899.76	-16.94	-21.91	-16.94	27.69	232.29	0.22
3000.00	0.91	238.57	2999.75	-17.89	-23.17	-17.89	29.27	232.34	0.17
3100.00	0.72	249.66	3099.74	-18.52	-24.43	-18.52	30.66	232.84	0.24
3200.00	0.92	234.10	3199.73	-19.20	-25.67	-19.20	32.06	233.20	0.30
3300.00	1.02	229.79	3299.71	-20.25	-27.00	-20.25	33.75	233.13	0.12
3400.00	1.06	231.99	3399.69	-21.39	-28.40	-21.39	35.55	233.02	0.05

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	1.07	235.87	3499.68	-22.48	-29.90	-22.48	37.41	233.06	0.07
3600.00	0.96	231.25	3599.66	-23.52	-31.32	-23.52	39.17	233.09	0.14
3700.00	0.56	228.95	3699.65	-24.37	-32.34	-24.37	40.49	233.00	0.40
3800.00	0.61	246.02	3799.65	-24.90	-33.19	-24.90	41.50	233.12	0.18
3900.00	0.58	258.25	3899.64	-25.22	-34.18	-25.22	42.48	233.58	0.13
4000.00	0.83	250.07	3999.63	-25.57	-35.36	-25.57	43.64	234.13	0.27
4100.00	0.92	252.25	4099.62	-26.07	-36.81	-26.07	45.11	234.70	0.09
4200.00	0.84	249.09	4199.61	-26.57	-38.26	-26.57	46.58	235.22	0.10
4300.00	1.21	270.65	4299.60	-26.82	-40.00	-26.82	48.16	236.16	0.53
4400.00	1.24	275.62	4399.57	-26.70	-42.13	-26.70	49.88	237.63	0.11
4500.00	1.41	280.08	4499.55	-26.38	-44.42	-26.38	51.66	239.29	0.20
4600.00	1.40	289.50	4599.52	-25.76	-46.78	-25.76	53.40	241.16	0.23
4700.00	0.72	286.96	4699.50	-25.17	-48.53	-25.17	54.67	242.58	0.68
4800.00	0.17	229.18	4799.50	-25.08	-49.24	-25.08	55.26	243.00	0.65
4900.00	0.57	226.22	4899.49	-25.52	-49.71	-25.52	55.88	242.82	0.40
5000.00	0.41	189.77	4999.49	-26.22	-50.13	-26.22	56.57	242.39	0.34
5100.00	0.73	222.24	5099.48	-27.04	-50.62	-27.04	57.39	241.88	0.44
5200.00	0.68	287.63	5199.48	-27.34	-51.61	-27.34	58.41	242.09	0.77
5300.00	0.86	292.14	5299.47	-26.87	-52.88	-26.87	59.32	243.06	0.19
5400.00	0.77	295.74	5399.46	-26.30	-54.18	-26.30	60.23	244.11	0.10
5500.00	0.46	271.11	5499.45	-26.00	-55.19	-26.00	61.01	244.78	0.40
5600.00	0.46	224.68	5599.45	-26.27	-55.88	-26.27	61.74	244.82	0.36
5700.00	0.66	297.66	5699.45	-26.29	-56.67	-26.29	62.47	245.11	0.69
5800.00	0.58	336.53	5799.44	-25.56	-57.39	-25.56	62.82	245.99	0.42
5900.00	0.57	296.80	5899.44	-24.87	-58.03	-24.87	63.14	246.80	0.39
6000.00	0.66	265.51	5999.43	-24.69	-59.06	-24.69	64.01	247.31	0.34
6100.00	0.44	302.13	6099.43	-24.53	-59.96	-24.53	64.78	247.75	0.40
6200.00	0.05	122.05	6199.43	-24.35	-60.24	-24.35	64.98	247.99	0.50
6300.00	0.52	171.04	6299.42	-24.82	-60.13	-24.82	65.05	247.57	0.49
6400.00	0.45	186.37	6399.42	-25.66	-60.11	-25.66	65.36	246.88	0.15
6500.00	0.27	178.07	6499.42	-26.30	-60.14	-26.30	65.64	246.38	0.18
6600.00	1.06	227.58	6599.41	-27.16	-60.82	-27.16	66.60	245.94	0.91
6700.00	1.84	230.30	6699.38	-28.81	-62.73	-28.81	69.03	245.34	0.78
6800.00	1.86	252.80	6799.33	-30.31	-65.52	-30.31	72.19	245.17	0.72
6900.00	1.79	239.10	6899.28	-31.59	-68.41	-31.59	75.36	245.21	0.44
7000.00	1.83	241.35	6999.23	-33.16	-71.16	-33.16	78.51	245.01	0.08
<div> <div>HORIZONTAL DISPLACEMENT IS</div> <div>78.51 FEET AT 245.01 DEGREES</div> </div>									