

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy
Lease/Well: Riva White D / 31-1

Location: S-31 T-3N R-64W

Rig Name: Production

State/County: Colorado / Weld County

Latitude: 40.19, Longitude: -104.59

GRID North is 0.59 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: 4/14/2011 / 04:50

Vaughn Energy Services

Denver, CO

720-215-1841

Robert Davis

Riva White D 31-1/ 05-123-16587

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	0.48	270.86	100.00	0.01	-0.42	0.01	0.42	270.86	0.48
200.00	0.49	301.34	200.00	0.23	-1.20	0.23	1.23	281.05	0.26
300.00	0.53	287.50	299.99	0.60	-2.01	0.60	2.09	286.54	0.13
400.00	0.35	286.10	399.99	0.82	-2.74	0.82	2.86	286.65	0.18
500.00	0.52	305.87	499.99	1.17	-3.40	1.17	3.60	289.00	0.23
600.00	0.29	320.43	599.98	1.63	-3.94	1.63	4.26	292.54	0.26
700.00	0.50	310.66	699.98	2.11	-4.43	2.11	4.91	295.51	0.23
800.00	0.53	312.05	799.98	2.71	-5.10	2.71	5.78	297.95	0.03
900.00	0.50	318.72	899.97	3.35	-5.74	3.35	6.64	300.26	0.07
1000.00	0.59	291.36	999.97	3.86	-6.50	3.86	7.56	300.71	0.27
1100.00	0.31	284.76	1099.97	4.12	-7.24	4.12	8.33	299.62	0.28
1200.00	0.32	328.99	1199.96	4.43	-7.65	4.43	8.84	300.07	0.24
1300.00	0.54	298.99	1299.96	4.90	-8.21	4.90	9.56	300.84	0.30
1400.00	0.32	318.99	1399.96	5.34	-8.81	5.34	10.30	301.24	0.26
1500.00	0.76	308.67	1499.95	5.97	-9.51	5.97	11.23	302.12	0.45
1600.00	0.78	318.13	1599.94	6.90	-10.49	6.90	12.55	303.33	0.13
1700.00	0.79	327.32	1699.93	7.98	-11.31	7.98	13.85	305.21	0.13
1800.00	0.43	342.21	1799.93	8.93	-11.80	8.93	14.80	307.10	0.39
1900.00	0.57	316.07	1899.93	9.64	-12.26	9.64	15.60	308.18	0.26
2000.00	0.25	20.07	1999.92	10.20	-12.53	10.20	16.16	309.16	0.51
2100.00	0.40	330.01	2099.92	10.72	-12.63	10.72	16.56	310.32	0.31
2200.00	0.07	114.72	2199.92	10.99	-12.75	10.99	16.83	310.77	0.46
2300.00	0.07	314.16	2299.92	11.01	-12.73	11.01	16.83	310.84	0.14
2400.00	0.20	222.44	2399.92	10.93	-12.89	10.93	16.90	310.28	0.21
2500.00	0.55	189.47	2499.92	10.32	-13.09	10.32	16.67	308.27	0.40
2600.00	0.46	173.16	2599.91	9.45	-13.12	9.45	16.17	305.76	0.17
2700.00	0.39	190.09	2699.91	8.71	-13.13	8.71	15.76	303.57	0.15
2800.00	0.35	184.62	2799.91	8.08	-13.21	8.08	15.49	301.44	0.05
2900.00	0.26	191.67	2899.91	7.56	-13.28	7.56	15.28	299.63	0.10
3000.00	0.15	193.46	2999.91	7.21	-13.36	7.21	15.18	298.36	0.11
3100.00	0.14	171.27	3099.91	6.97	-13.37	6.97	15.08	297.52	0.06
3200.00	0.26	307.76	3199.91	6.98	-13.53	6.98	15.23	297.30	0.38
3300.00	0.31	309.45	3299.91	7.30	-13.92	7.30	15.72	297.66	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
3400.00	0.37	310.50	3399.90	7.68	-14.38	7.68	16.30	298.10	0.06
3500.00	0.58	332.23	3499.90	8.34	-14.86	8.34	17.04	299.29	0.27
3600.00	0.89	331.53	3599.89	9.47	-15.47	9.47	18.14	301.48	0.31
3700.00	1.15	324.70	3699.88	10.97	-16.42	10.97	19.75	303.76	0.28
3800.00	1.06	324.92	3799.86	12.54	-17.53	12.54	21.55	305.59	0.09
3900.00	1.11	328.15	3899.84	14.12	-18.57	14.12	23.33	307.26	0.08
4000.00	0.83	332.28	3999.83	15.59	-19.42	15.59	24.90	308.76	0.29
4100.00	0.66	340.60	4099.82	16.77	-19.95	16.77	26.06	310.06	0.20
4200.00	0.51	348.91	4199.81	17.74	-20.22	17.74	26.90	311.27	0.17
4300.00	0.26	178.41	4299.81	17.95	-20.30	17.95	27.10	311.49	0.76
4400.00	0.64	182.50	4399.81	17.17	-20.32	17.17	26.60	310.20	0.38
4500.00	0.71	196.72	4499.80	16.02	-20.52	16.02	26.04	307.99	0.18
4600.00	0.67	199.70	4599.79	14.88	-20.90	14.88	25.65	305.46	0.06
4700.00	0.93	169.19	4699.78	13.54	-20.94	13.54	24.93	302.88	0.49
4800.00	1.24	167.91	4799.77	11.68	-20.56	11.68	23.65	299.60	0.31
4900.00	0.77	175.73	4899.75	9.95	-20.28	9.95	22.59	296.14	0.49
5000.00	0.29	300.07	4999.75	9.41	-20.45	9.41	22.51	294.70	0.97
5100.00	0.61	325.71	5099.74	9.98	-20.97	9.98	23.22	295.44	0.37
5200.00	0.56	303.71	5199.74	10.68	-21.68	10.68	24.17	296.24	0.23
5300.00	0.59	335.31	5299.73	11.42	-22.30	11.42	25.06	297.12	0.31
5400.00	0.68	346.49	5399.73	12.47	-22.65	12.47	25.86	298.82	0.15
5500.00	0.71	348.27	5499.72	13.65	-22.92	13.65	26.68	300.78	0.04
5600.00	0.67	355.91	5599.71	14.84	-23.09	14.84	27.45	302.73	0.10
5700.00	0.64	325.10	5699.71	15.88	-23.45	15.88	28.32	304.11	0.35
5800.00	0.73	344.03	5799.70	16.95	-23.95	16.95	29.34	305.29	0.24
5900.00	0.99	315.32	5899.69	18.18	-24.73	18.18	30.69	306.32	0.50
6000.00	1.43	306.58	5999.67	19.54	-26.34	19.54	32.80	306.56	0.47
6100.00	2.24	299.24	6099.62	21.24	-29.05	21.24	35.99	306.17	0.84
6200.00	2.42	305.38	6199.53	23.41	-32.47	23.41	40.03	305.79	0.31
6300.00	2.07	322.52	6299.46	26.07	-35.29	26.07	43.87	306.45	0.75
6400.00	1.91	333.68	6399.40	28.99	-37.13	28.99	47.11	307.98	0.42
6500.00	1.77	352.44	6499.35	32.01	-38.07	32.01	49.74	310.06	0.61
6600.00	1.66	7.53	6599.30	34.98	-38.08	34.98	51.71	312.57	0.46
6700.00	1.67	19.93	6699.26	37.79	-37.40	37.79	53.16	315.30	0.36
6800.00	1.14	38.89	6799.23	39.94	-36.27	39.94	53.95	317.75	0.70
6900.00	1.08	34.45	6899.21	41.49	-35.11	41.49	54.35	319.76	0.11
7000.00	1.04	41.99	6999.19	42.94	-33.97	42.94	54.75	321.65	0.14
7070.00	1.06	49.11	7069.18	43.84	-33.06	43.84	54.90	322.98	0.19
HORIZONTAL DISPLACEMENT IS 54.90 FEET AT 322.98 DEGREES									