

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy

Lease/Well: Happy Talk / 2

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

Rig Name: Production

State/County: Colorado / Weld County

Latitude: 40.34, Longitude: -104.50

GRID North is 0.65 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 / 08:57

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	0.49	321.48	100.00	0.33	-0.26	0.33	0.42	321.48	0.49
200.00	0.70	315.82	199.99	1.10	-0.95	1.10	1.45	319.12	0.22
300.00	0.74	318.31	299.99	2.02	-1.80	2.02	2.71	318.18	0.05
400.00	0.54	296.89	399.98	2.71	-2.65	2.71	3.79	315.62	0.31
500.00	0.59	301.73	499.97	3.19	-3.51	3.19	4.74	312.30	0.07
600.00	0.65	297.26	599.97	3.72	-4.45	3.72	5.80	309.92	0.08
700.00	0.65	309.03	699.96	4.34	-5.39	4.34	6.92	308.82	0.13
800.00	0.72	302.14	799.96	5.03	-6.36	5.03	8.11	308.32	0.11
900.00	0.67	319.98	899.95	5.81	-7.27	5.81	9.30	308.63	0.22
1000.00	0.58	310.85	999.94	6.59	-8.02	6.59	10.38	309.38	0.14
1100.00	0.60	313.79	1099.94	7.28	-8.78	7.28	11.40	309.64	0.04
1200.00	0.22	21.01	1199.93	7.81	-9.09	7.81	11.99	310.69	0.55
1300.00	0.25	347.78	1299.93	8.20	-9.06	8.20	12.23	312.15	0.14
1400.00	0.14	4.08	1399.93	8.54	-9.10	8.54	12.48	313.17	0.12
1500.00	0.04	73.25	1499.93	8.67	-9.06	8.67	12.54	313.73	0.13
1600.00	0.15	184.63	1599.93	8.55	-9.04	8.55	12.44	313.39	0.17
1700.00	0.17	148.66	1699.93	8.29	-8.97	8.29	12.22	312.72	0.10
1800.00	0.23	170.72	1799.93	7.96	-8.86	7.96	11.92	311.93	0.09
1900.00	0.50	155.05	1899.93	7.37	-8.65	7.37	11.37	310.45	0.28
2000.00	0.78	165.77	1999.92	6.32	-8.30	6.32	10.43	307.28	0.31
2100.00	1.27	164.24	2099.91	4.59	-7.83	4.59	9.08	300.38	0.49
2200.00	1.71	158.25	2199.87	2.14	-6.98	2.14	7.30	287.05	0.47
2300.00	2.03	166.10	2299.82	-0.97	-6.00	-0.97	6.08	260.82	0.41
2400.00	2.22	170.08	2399.75	-4.60	-5.24	-4.60	6.97	228.73	0.23
2500.00	2.10	180.62	2499.68	-8.33	-4.92	-8.33	9.68	210.58	0.41
2600.00	1.97	187.96	2599.62	-11.88	-5.18	-11.88	12.96	203.58	0.29
2700.00	1.75	175.42	2699.57	-15.11	-5.30	-15.11	16.01	199.33	0.46
2800.00	1.55	167.05	2799.52	-17.94	-4.88	-17.94	18.59	195.20	0.32
2900.00	1.49	167.99	2899.49	-20.53	-4.30	-20.53	20.98	191.84	0.06
3000.00	1.39	166.50	2999.46	-22.98	-3.75	-22.98	23.29	189.26	0.11
3100.00	1.45	157.14	3099.43	-25.33	-2.97	-25.33	25.51	186.69	0.24
3200.00	1.55	168.86	3199.39	-27.83	-2.22	-27.83	27.91	184.56	0.32
3300.00	1.64	173.82	3299.35	-30.58	-1.80	-30.58	30.63	183.38	0.16
3400.00	1.26	161.68	3399.32	-33.05	-1.30	-33.05	33.08	182.26	0.49

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	1.01	162.81	3499.30	-34.94	-0.70	-34.94	34.94	181.14	0.26
3600.00	1.15	167.35	3599.28	-36.76	-0.22	-36.76	36.76	180.34	0.17
3700.00	0.67	153.12	3699.27	-38.26	0.27	-38.26	38.26	179.60	0.53
3800.00	0.61	177.85	3799.27	-39.31	0.55	-39.31	39.31	179.20	0.28
3900.00	0.48	153.68	3899.26	-40.21	0.75	-40.21	40.22	178.93	0.26
4000.00	0.29	165.59	3999.26	-40.83	1.00	-40.83	40.84	178.59	0.20
4100.00	0.38	79.39	4099.26	-41.02	1.39	-41.02	41.04	178.06	0.46
4200.00	0.55	17.99	4199.25	-40.50	1.86	-40.50	40.54	177.37	0.50
4300.00	0.74	11.37	4299.25	-39.42	2.14	-39.42	39.47	176.90	0.20
4400.00	0.77	31.08	4399.24	-38.21	2.61	-38.21	38.30	176.09	0.26
4500.00	0.72	30.15	4499.23	-37.08	3.28	-37.08	37.23	174.95	0.05
4600.00	0.29	71.21	4599.23	-36.46	3.83	-36.46	36.66	174.00	0.54
4700.00	0.11	244.73	4699.23	-36.42	3.99	-36.42	36.63	173.75	0.40
4800.00	0.35	283.44	4799.23	-36.39	3.60	-36.39	36.56	174.35	0.28
4900.00	0.16	302.11	4899.23	-36.24	3.18	-36.24	36.38	174.99	0.21
5000.00	0.10	346.69	4999.22	-36.08	3.04	-36.08	36.20	175.19	0.12
5100.00	0.78	246.91	5099.22	-36.26	2.39	-36.26	36.34	176.23	0.81
5200.00	1.10	280.70	5199.21	-36.35	0.81	-36.35	36.36	178.72	0.63
5300.00	1.18	283.21	5299.19	-35.93	-1.14	-35.93	35.95	181.82	0.09
5400.00	1.56	298.67	5399.16	-35.05	-3.34	-35.05	35.21	185.44	0.52
5500.00	1.58	311.08	5499.12	-33.49	-5.57	-33.49	33.95	189.44	0.34
5600.00	1.72	324.49	5599.08	-31.36	-7.48	-31.36	32.24	193.41	0.41
5700.00	1.94	332.66	5699.03	-28.63	-9.13	-28.63	30.05	197.69	0.34
5800.00	2.09	349.08	5798.97	-25.34	-10.26	-25.34	27.34	202.03	0.59
5900.00	1.77	2.42	5898.91	-22.01	-10.53	-22.01	24.40	205.58	0.55
6000.00	1.32	7.51	5998.88	-19.32	-10.32	-19.32	21.90	208.11	0.47
6100.00	1.35	23.49	6098.85	-17.09	-9.70	-17.09	19.65	209.57	0.37
6200.00	1.02	32.12	6198.83	-15.26	-8.75	-15.26	17.59	209.85	0.37
6300.00	0.96	20.05	6298.81	-13.71	-7.99	-13.71	15.87	210.24	0.22
6400.00	1.20	18.68	6398.80	-11.93	-7.37	-11.93	14.02	211.70	0.24
6500.00	1.01	14.64	6498.78	-10.08	-6.81	-10.08	12.17	214.03	0.21
6600.00	0.68	7.98	6598.77	-8.64	-6.50	-8.64	10.81	216.97	0.34

HORIZONTAL DISPLACEMENT IS 10.81 FEET AT 216.97 DEGREES									
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