

VES

VAUGHN ENERGY SERVICES

Company: NOBLE ENERGY

Lease/Well: 70 RANCH/ #44-9

Location:

Rig Name: PRODUCTION

State/County: COLORADO/WELD COUNTY

Latitude: 40.40

GRID North is 0.69 Degrees East of True North

VS-Azi: 0.00 Degrees

GTI

GYRO TECHNOLOGIES INC

FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : GL

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run02-01_ed.ut

Minimum Curvature Method

Report Date/Time: 5/18/2011 / 21:33

Vaughn Energy Services

Rifle, Colorado

303-489-9231

Jay Hinman

70 Ranch 44-9/05-123-23999

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	0.62	33.26	100.00	0.45	0.30	0.45	0.54	33.26	0.62
200.00	0.41	37.51	199.99	1.20	0.82	1.20	1.45	34.32	0.21
300.00	0.25	40.59	299.99	1.65	1.18	1.65	2.03	35.57	0.16
400.00	0.49	59.43	399.99	2.03	1.69	2.03	2.64	39.71	0.26
500.00	0.64	45.43	499.99	2.64	2.45	2.64	3.60	42.87	0.21
600.00	0.56	36.11	599.98	3.43	3.14	3.43	4.64	42.47	0.13
700.00	0.38	26.24	699.98	4.11	3.57	4.11	5.44	40.94	0.20
800.00	0.44	359.12	799.97	4.79	3.71	4.79	6.06	37.74	0.20
900.00	0.55	356.03	899.97	5.65	3.67	5.65	6.74	32.97	0.12
1000.00	0.60	354.32	999.97	6.66	3.58	6.66	7.56	28.29	0.05
1100.00	0.69	359.34	1099.96	7.78	3.52	7.78	8.54	24.37	0.11
1200.00	0.56	359.99	1199.95	8.87	3.52	8.87	9.54	21.64	0.14
1300.00	0.51	346.41	1299.95	9.78	3.41	9.78	10.36	19.24	0.13
1400.00	0.33	327.23	1399.95	10.45	3.15	10.45	10.92	16.78	0.22
1500.00	0.35	314.38	1499.94	10.91	2.78	10.91	11.26	14.29	0.08
1600.00	0.42	300.71	1599.94	11.31	2.25	11.31	11.53	11.23	0.12
1700.00	0.21	298.38	1699.94	11.59	1.76	11.59	11.72	8.66	0.21
1800.00	0.39	279.74	1799.94	11.73	1.27	11.73	11.80	6.16	0.20
1900.00	0.52	130.53	1899.94	11.50	1.28	11.50	11.57	6.34	0.87
2000.00	1.03	119.47	1999.93	10.76	2.40	10.76	11.03	12.57	0.53
2100.00	0.95	104.33	2099.91	10.12	3.98	10.12	10.87	21.47	0.27
2200.00	0.99	103.02	2199.90	9.72	5.62	9.72	11.23	30.05	0.05
2300.00	0.87	95.31	2299.89	9.45	7.22	9.45	11.89	37.36	0.17
2400.00	0.81	89.52	2399.88	9.39	8.68	9.39	12.78	42.74	0.10
2500.00	0.67	85.81	2499.87	9.44	9.96	9.44	13.72	46.56	0.15
2600.00	0.82	82.18	2599.86	9.58	11.25	9.58	14.78	49.60	0.16
2700.00	0.46	95.82	2699.85	9.63	12.36	9.63	15.67	52.06	0.39
2800.00	0.36	49.80	2799.85	9.80	13.00	9.80	16.28	52.99	0.33
2900.00	0.30	82.24	2899.85	10.04	13.50	10.04	16.82	53.36	0.20
3000.00	0.14	242.95	2999.85	10.02	13.64	10.02	16.93	53.71	0.43
3100.00	0.33	261.45	3099.85	9.92	13.25	9.92	16.55	53.18	0.20
3200.00	0.94	252.18	3199.84	9.63	12.19	9.63	15.53	51.70	0.61
3300.00	0.55	238.18	3299.83	9.13	11.01	9.13	14.30	50.34	0.43
3400.00	0.45	48.08	3399.83	9.14	10.90	9.14	14.22	50.01	0.99

<i>Measured Depth FT</i>	<i>Incl Angle Deg</i>	<i>Drift Direction Deg</i>	<i>TVD FT</i>	<i>+N-S FT</i>	<i>+E-W FT</i>	<i>Vertical Section FT</i>	<i>Closure Distance FT</i>	<i>Closure Direction Deg</i>	<i>Dogleg Severity Deg/100</i>
3500.00	0.60	36.95	3499.83	9.82	11.50	9.82	15.13	49.52	0.17
3600.00	0.48	32.55	3599.82	10.59	12.04	10.59	16.04	48.68	0.12
3700.00	0.64	21.43	3699.82	11.46	12.47	11.46	16.94	47.42	0.20
3800.00	0.67	19.14	3799.81	12.54	12.87	12.54	17.97	45.75	0.04
3900.00	0.68	2.53	3899.80	13.68	13.09	13.68	18.93	43.73	0.20
4000.00	0.55	350.46	3999.80	14.75	13.03	14.75	19.68	41.47	0.18
4100.00	0.33	346.44	4099.80	15.50	12.88	15.50	20.16	39.73	0.23
4200.00	0.47	349.19	4199.79	16.18	12.74	16.18	20.60	38.21	0.14
4300.00	0.73	338.54	4299.79	17.18	12.43	17.18	21.20	35.90	0.28
4400.00	0.90	327.31	4399.78	18.43	11.78	18.43	21.87	32.58	0.23
4500.00	1.15	304.23	4499.76	19.65	10.53	19.65	22.29	28.18	0.48
4600.00	1.89	301.82	4599.73	21.08	8.30	21.08	22.66	21.49	0.75
4700.00	2.69	302.66	4699.65	23.21	4.93	23.21	23.73	11.98	0.80
4800.00	2.65	302.42	4799.54	25.72	1.00	25.72	25.74	2.24	0.04
4900.00	2.36	309.46	4899.44	28.27	-2.54	28.27	28.38	354.87	0.42
5000.00	1.71	306.07	4999.38	30.46	-5.34	30.46	30.92	350.06	0.66
5100.00	1.04	298.37	5099.35	31.77	-7.34	31.77	32.61	346.98	0.70
5200.00	0.76	302.38	5199.34	32.55	-8.70	32.55	33.70	345.03	0.29
5300.00	0.29	319.07	5299.33	33.10	-9.43	33.10	34.42	344.10	0.49
5400.00	0.10	30.32	5399.33	33.37	-9.55	33.37	34.71	344.03	0.27
5500.00	0.20	79.03	5499.33	33.48	-9.34	33.48	34.76	344.42	0.15
5600.00	0.31	90.01	5599.33	33.51	-8.89	33.51	34.67	345.14	0.13
5700.00	0.40	94.88	5699.33	33.48	-8.28	33.48	34.49	346.12	0.09
5800.00	0.43	100.30	5799.33	33.38	-7.56	33.38	34.23	347.23	0.05
5900.00	0.64	104.28	5899.32	33.18	-6.66	33.18	33.84	348.65	0.21
6000.00	0.67	100.68	5999.31	32.94	-5.55	32.94	33.40	350.44	0.05
6100.00	0.76	93.01	6099.31	32.79	-4.31	32.79	33.07	352.52	0.13
6200.00	0.94	85.79	6199.30	32.82	-2.82	32.82	32.94	355.09	0.21
6300.00	1.06	79.92	6299.28	33.04	-1.08	33.04	33.06	358.12	0.15
6400.00	1.15	74.09	6399.26	33.48	0.79	33.48	33.49	1.36	0.14
6500.00	1.36	78.11	6499.24	34.00	2.92	34.00	34.12	4.91	0.23
6600.00	1.69	79.61	6599.20	34.51	5.54	34.51	34.95	9.12	0.33
6650.00	1.49	88.13	6649.18	34.66	6.92	34.66	35.35	11.28	0.61

HORIZONTAL DISPLACEMENT IS
35.35 FEET AT 11.28 DEGREES