

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy
 Lease/Well: Weld / 3-28
 Location: S-28 T-11N R-61W

Rig Name: Production
 State/County: Colorado / Weld County

Latitude: 40.90, Longitude: -104.21
 GRID North is 0.83 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: 1/26/2011 / 14:12

Vaughn Energy Services
 Fort Worth, Texas
 817-741-3610
 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	0.31	166.84	100.00	-0.26	0.06	-0.26	0.27	166.84	0.31
200.00	0.06	286.51	200.00	-0.51	0.07	-0.51	0.52	172.26	0.35
300.00	0.20	237.22	300.00	-0.59	-0.13	-0.59	0.61	192.46	0.17
400.00	0.30	176.77	400.00	-0.95	-0.26	-0.95	0.99	195.42	0.27
500.00	0.38	134.05	500.00	-1.45	-0.01	-1.45	1.45	180.25	0.26
600.00	0.33	167.09	599.99	-1.96	0.30	-1.96	1.98	171.34	0.21
700.00	0.34	126.48	699.99	-2.41	0.60	-2.41	2.49	166.05	0.23
800.00	0.19	240.84	799.99	-2.67	0.69	-2.67	2.76	165.54	0.45
900.00	0.29	124.70	899.99	-2.90	0.75	-2.90	3.00	165.46	0.42
1000.00	0.24	208.14	999.99	-3.23	0.87	-3.23	3.34	164.97	0.35
1100.00	0.38	146.32	1099.99	-3.69	0.95	-3.69	3.81	165.47	0.34
1200.00	0.52	187.69	1199.99	-4.41	1.08	-4.41	4.54	166.23	0.34
1300.00	0.36	217.85	1299.98	-5.10	0.83	-5.10	5.17	170.77	0.27
1400.00	0.39	212.68	1399.98	-5.64	0.45	-5.64	5.65	175.41	0.05
1500.00	0.08	103.45	1499.98	-5.94	0.34	-5.94	5.95	176.76	0.42
1600.00	0.35	137.19	1599.98	-6.18	0.61	-6.18	6.21	174.33	0.29
1700.00	0.33	142.13	1699.98	-6.64	1.00	-6.64	6.71	171.42	0.03
1800.00	0.39	202.93	1799.98	-7.18	1.05	-7.18	7.25	171.69	0.37
1900.00	0.53	176.98	1899.97	-7.95	0.94	-7.95	8.01	173.25	0.25
2000.00	0.36	153.52	1999.97	-8.70	1.11	-8.70	8.77	172.75	0.25
2100.00	0.07	109.34	2099.97	-9.01	1.31	-9.01	9.10	171.72	0.32
2200.00	0.19	132.29	2199.97	-9.14	1.50	-9.14	9.27	170.71	0.13
2300.00	0.21	143.70	2299.97	-9.41	1.73	-9.41	9.57	169.57	0.05
2400.00	0.21	132.18	2399.97	-9.68	1.98	-9.68	9.88	168.45	0.04
2500.00	0.30	143.19	2499.97	-10.02	2.27	-10.02	10.27	167.21	0.10
2600.00	0.74	130.58	2599.96	-10.65	2.92	-10.65	11.04	164.64	0.45
2700.00	0.97	129.48	2699.95	-11.61	4.07	-11.61	12.30	160.69	0.22
2800.00	0.97	111.94	2799.94	-12.46	5.51	-12.46	13.63	156.16	0.30
2900.00	0.95	124.36	2899.92	-13.25	6.98	-13.25	14.98	152.21	0.21
3000.00	0.61	136.23	2999.91	-14.10	8.04	-14.10	16.23	150.32	0.37
3100.00	0.55	129.44	3099.91	-14.80	8.78	-14.80	17.21	149.31	0.09
3200.00	0.18	183.04	3199.91	-15.26	9.15	-15.26	17.79	149.06	0.47
3300.00	0.23	164.13	3299.91	-15.61	9.19	-15.61	18.11	149.50	0.09
3400.00	0.10	0.03	3399.91	-15.72	9.25	-15.72	18.24	149.52	0.33

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	0.15	7.15	3499.91	-15.50	9.27	-15.50	18.06	149.13	0.05
3600.00	0.21	38.07	3599.91	-15.22	9.40	-15.22	17.89	148.32	0.11
3700.00	0.29	57.16	3699.90	-14.94	9.72	-14.94	17.83	146.96	0.11
3800.00	1.15	81.55	3799.90	-14.66	10.92	-14.66	18.28	143.31	0.90
3900.00	1.18	119.86	3899.88	-15.03	12.81	-15.03	19.75	139.55	0.77
4000.00	1.77	128.08	3999.84	-16.49	14.92	-16.49	22.24	137.86	0.62
4100.00	2.50	115.55	4099.77	-18.38	18.10	-18.38	25.80	135.44	0.87
4200.00	3.24	112.15	4199.65	-20.39	22.70	-20.39	30.51	131.94	0.76
4300.00	3.55	116.63	4299.47	-22.85	28.09	-22.85	36.21	129.13	0.41
4400.00	2.73	117.31	4399.32	-25.33	32.97	-25.33	41.57	127.53	0.83
4500.00	2.10	126.62	4499.23	-27.51	36.55	-27.51	45.74	126.97	0.74
4600.00	1.63	140.24	4599.18	-29.69	38.92	-29.69	48.96	127.34	0.64
4700.00	1.58	148.27	4699.14	-31.96	40.56	-31.96	51.63	128.24	0.23
4800.00	1.95	164.80	4799.09	-34.76	41.73	-34.76	54.31	129.80	0.62
4900.00	2.66	171.15	4899.01	-38.70	42.53	-38.70	57.50	132.30	0.76
5000.00	3.45	173.40	4998.87	-43.98	43.23	-43.98	61.67	135.49	0.79
5100.00	3.70	187.37	5098.68	-50.17	43.16	-50.17	66.18	139.29	0.90
5200.00	2.96	185.80	5198.51	-55.94	42.49	-55.94	70.24	142.78	0.74
5300.00	2.15	189.30	5298.41	-60.36	41.92	-60.36	73.49	145.22	0.83
5400.00	1.25	188.02	5398.36	-63.30	41.47	-63.30	75.67	146.77	0.90
5500.00	0.67	177.68	5498.35	-64.96	41.34	-64.96	77.00	147.53	0.61
5600.00	0.46	147.85	5598.34	-65.88	41.57	-65.88	77.90	147.75	0.35
5700.00	0.40	137.56	5698.34	-66.47	42.02	-66.47	78.64	147.70	0.10
5800.00	0.37	133.59	5798.34	-66.95	42.49	-66.95	79.30	147.60	0.04
5900.00	0.49	140.83	5898.33	-67.51	42.99	-67.51	80.04	147.51	0.13
6000.00	0.34	144.64	5998.33	-68.08	43.43	-68.08	80.75	147.46	0.15
6100.00	0.37	133.66	6098.33	-68.54	43.84	-68.54	81.36	147.40	0.07
6200.00	0.31	153.43	6198.33	-69.01	44.19	-69.01	81.94	147.36	0.13
6300.00	0.32	150.78	6298.33	-69.49	44.45	-69.49	82.49	147.40	0.02
6400.00	0.54	159.37	6398.32	-70.18	44.75	-70.18	83.23	147.47	0.23
6500.00	0.77	124.29	6498.32	-71.00	45.48	-71.00	84.31	147.36	0.45
6600.00	0.70	123.83	6598.31	-71.72	46.54	-71.72	85.50	147.02	0.07
6700.00	0.58	125.48	6698.30	-72.36	47.47	-72.36	86.54	146.73	0.12
6800.00	0.52	137.86	6798.30	-72.99	48.19	-72.99	87.46	146.57	0.13
6900.00	0.51	131.13	6898.29	-73.62	48.83	-73.62	88.34	146.45	0.06
7000.00	0.45	124.93	6998.29	-74.14	49.49	-74.14	89.15	146.28	0.08
7100.00	0.49	148.45	7098.29	-74.73	50.04	-74.73	89.94	146.19	0.19
7200.00	0.55	162.23	7198.28	-75.55	50.41	-75.55	90.83	146.29	0.14
7300.00	0.83	161.84	7298.28	-76.70	50.78	-76.70	91.99	146.49	0.29
7400.00	0.81	150.12	7398.27	-78.00	51.36	-78.00	93.39	146.64	0.17
7500.00	0.53	162.04	7498.26	-79.05	51.85	-79.05	94.53	146.74	0.31
7600.00	0.84	156.57	7598.25	-80.16	52.28	-80.16	95.70	146.88	0.32
HORIZONTAL DISPLACEMENT IS 95.70 FEET AT 146.88 DEGREES									