



Company: Noble
 Lease/Well: Patriot B/# 16-6
 Location:
 Rig Name: Production
 State/County: Colorado/Weld County
 Latitude: 40.40
 GRID North is 0.61 Degrees East of True North
 VS-Azi: 0.00 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : GL

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: run1-01_ed.ut
 Minimum Curvature Method
 Report Date/Time: 2/19/2011 / 17:19

Vaughn Energy Services
 Rifle, Colorado
 970-456-2071
 Garry Fowler
 Patriot 16-6/05-123-15562

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	0.18	85.98	100.00	0.01	0.16	0.01	0.16	85.98	0.18
200.00	0.21	110.02	200.00	-0.04	0.48	-0.04	0.49	94.78	0.09
300.00	0.26	128.00	300.00	-0.24	0.84	-0.24	0.87	106.30	0.09
400.00	0.29	121.94	400.00	-0.52	1.23	-0.52	1.34	112.89	0.04
500.00	0.24	120.95	500.00	-0.76	1.63	-0.76	1.80	115.11	0.05
600.00	0.19	120.18	600.00	-0.96	1.96	-0.96	2.18	116.06	0.05
700.00	0.17	123.52	699.99	-1.12	2.23	-1.12	2.49	116.79	0.02
800.00	0.18	123.14	799.99	-1.29	2.49	-1.29	2.80	117.51	0.01
900.00	0.26	126.09	899.99	-1.52	2.80	-1.52	3.19	118.40	0.08
1000.00	0.25	239.02	999.99	-1.76	2.80	-1.76	3.31	122.25	0.43
1100.00	0.28	253.35	1099.99	-1.95	2.37	-1.95	3.07	129.38	0.07
1200.00	0.23	281.66	1199.99	-1.98	1.95	-1.98	2.77	135.45	0.13
1300.00	0.20	289.98	1299.99	-1.88	1.59	-1.88	2.46	139.76	0.04
1400.00	0.25	294.03	1399.99	-1.73	1.23	-1.73	2.12	144.65	0.05
1500.00	0.26	90.67	1499.99	-1.64	1.26	-1.64	2.07	142.62	0.50
1600.00	0.27	97.11	1599.99	-1.68	1.71	-1.68	2.40	134.35	0.03
1700.00	0.24	103.08	1699.99	-1.75	2.14	-1.75	2.77	129.23	0.04
1800.00	0.27	100.65	1799.99	-1.84	2.58	-1.84	3.17	125.52	0.04
1900.00	0.42	100.33	1899.98	-1.95	3.18	-1.95	3.73	121.54	0.15
2000.00	0.75	139.47	1999.98	-2.51	3.97	-2.51	4.70	122.35	0.50
2100.00	0.89	138.90	2099.97	-3.60	4.90	-3.60	6.08	126.26	0.15
2200.00	1.08	143.56	2199.95	-4.94	5.97	-4.94	7.75	129.59	0.20
2300.00	1.12	141.07	2299.94	-6.45	7.15	-6.45	9.63	132.09	0.06
2400.00	0.82	139.78	2399.92	-7.76	8.22	-7.76	11.31	133.35	0.30
2500.00	0.76	138.86	2499.91	-8.81	9.12	-8.81	12.68	134.00	0.07
2600.00	0.67	134.43	2599.90	-9.71	9.97	-9.71	13.92	134.25	0.10
2700.00	0.61	136.65	2699.90	-10.51	10.75	-10.51	15.04	134.34	0.06
2800.00	0.82	134.76	2799.89	-11.40	11.63	-11.40	16.29	134.44	0.21
2900.00	0.86	114.14	2899.88	-12.22	12.83	-12.22	17.71	133.60	0.30
3000.00	0.93	109.69	2999.87	-12.80	14.28	-12.80	19.18	131.87	0.10
3100.00	1.05	116.25	3099.85	-13.48	15.87	-13.48	20.82	130.35	0.16

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
3200.00	1.23	121.41	3199.83	-14.44	17.60	-14.44	22.77	129.37	0.21
3300.00	0.95	132.07	3299.81	-15.56	19.13	-15.56	24.66	129.11	0.34
3400.00	0.73	131.31	3399.80	-16.53	20.23	-16.53	26.13	129.26	0.22
3500.00	0.47	129.73	3499.80	-17.22	21.02	-17.22	27.18	129.32	0.26
3600.00	0.57	127.12	3599.79	-17.78	21.74	-17.78	28.09	129.28	0.10
3700.00	0.95	137.91	3699.79	-18.70	22.69	-18.70	29.41	129.49	0.40
3800.00	0.96	156.51	3799.77	-20.08	23.58	-20.08	30.98	130.42	0.31
3900.00	0.99	166.86	3899.76	-21.69	24.11	-21.69	32.44	131.97	0.18
4000.00	1.06	186.03	3999.74	-23.45	24.21	-23.45	33.71	134.08	0.35
4100.00	1.20	206.91	4099.72	-25.30	23.64	-25.30	34.63	136.94	0.43
4200.00	1.03	205.84	4199.70	-27.04	22.78	-27.04	35.36	139.90	0.17
4300.00	0.99	201.94	4299.69	-28.66	22.06	-28.66	36.17	142.41	0.08
4400.00	0.89	208.23	4399.67	-30.14	21.37	-30.14	36.95	144.66	0.15
4500.00	0.81	210.71	4499.66	-31.43	20.65	-31.43	37.61	146.70	0.09
4600.00	0.68	216.09	4599.65	-32.52	19.94	-32.52	38.14	148.49	0.14
4700.00	0.50	182.09	4699.65	-33.44	19.57	-33.44	38.74	149.66	0.39
4800.00	0.42	179.20	4799.65	-34.24	19.56	-34.24	39.44	150.26	0.09
4900.00	0.36	158.35	4899.64	-34.90	19.68	-34.90	40.07	150.58	0.15
5000.00	0.32	155.28	4999.64	-35.45	19.92	-35.45	40.66	150.67	0.05
5100.00	0.30	191.79	5099.64	-35.96	19.98	-35.96	41.14	150.95	0.20
5200.00	0.38	224.10	5199.64	-36.46	19.69	-36.46	41.44	151.63	0.21
5300.00	0.41	272.64	5299.64	-36.68	19.10	-36.68	41.36	152.50	0.33
5400.00	0.45	148.18	5399.64	-37.00	18.94	-37.00	41.57	152.89	0.76
5500.00	0.52	132.48	5499.63	-37.64	19.49	-37.64	42.38	152.63	0.15
5600.00	0.61	137.12	5599.63	-38.34	20.18	-38.34	43.32	152.23	0.10
5700.00	0.87	135.74	5699.62	-39.27	21.07	-39.27	44.57	151.78	0.26
5800.00	0.73	134.17	5799.61	-40.26	22.06	-40.26	45.91	151.28	0.14
5900.00	0.62	127.05	5899.60	-41.03	22.95	-41.03	47.01	150.78	0.14
6000.00	0.20	123.51	5999.60	-41.45	23.53	-41.45	47.67	150.42	0.43
6100.00	0.16	110.17	6099.60	-41.60	23.81	-41.60	47.93	150.22	0.06
6200.00	0.14	86.31	6199.60	-41.64	24.06	-41.64	48.09	149.98	0.06
6300.00	0.20	62.61	6299.60	-41.55	24.35	-41.55	48.15	149.63	0.09
6400.00	0.37	64.09	6399.60	-41.32	24.80	-41.32	48.19	149.03	0.17
6500.00	0.37	68.17	6499.59	-41.06	25.39	-41.06	48.28	148.27	0.03
6600.00	0.29	128.64	6599.59	-41.10	25.89	-41.10	48.57	147.79	0.34
6700.00	0.13	130.95	6699.59	-41.33	26.17	-41.33	48.92	147.65	0.16
6800.00	0.12	134.15	6799.59	-41.48	26.34	-41.48	49.14	147.59	0.01

HORIZONTAL DISPLACEMENT IS 49.14 FEET AT 147.59 DEGREES									
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