

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy
 Lease/Well: Wells Ranch USX BB / 15-7
 Location: S-15 T-5N R-63W
 Rig Name: Production
 State/County: Colorado / Weld County
 Latitude: 40.40, Longitude: -104.42
 GRID North is 0.70 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: 4/12/2011 / 06:09

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	0.09	344.02	100.00	0.08	-0.02	0.08	0.08	344.02	0.09
200.00	0.49	310.58	200.00	0.43	-0.37	0.43	0.57	319.42	0.42
300.00	0.43	338.85	300.00	1.06	-0.83	1.06	1.35	321.93	0.23
400.00	0.37	325.34	399.99	1.67	-1.15	1.67	2.03	325.56	0.11
500.00	0.86	2.39	499.99	2.69	-1.30	2.69	2.98	334.21	0.61
600.00	0.77	20.45	599.98	4.06	-1.03	4.06	4.19	345.75	0.27
700.00	0.73	355.63	699.97	5.33	-0.85	5.33	5.40	350.97	0.32
800.00	0.46	33.25	799.96	6.30	-0.68	6.30	6.34	353.89	0.46
900.00	0.37	329.25	899.96	6.92	-0.62	6.92	6.95	354.88	0.45
1000.00	0.80	353.70	999.96	7.89	-0.86	7.89	7.94	353.76	0.49
1100.00	0.90	8.87	1099.95	9.36	-0.82	9.36	9.39	355.00	0.24
1200.00	0.27	343.89	1199.94	10.36	-0.76	10.36	10.39	355.79	0.66
1300.00	0.53	11.13	1299.94	11.04	-0.74	11.04	11.07	356.17	0.32
1400.00	0.50	333.51	1399.93	11.89	-0.84	11.89	11.92	355.94	0.33
1500.00	0.45	11.53	1499.93	12.66	-0.96	12.66	12.70	355.68	0.31
1600.00	0.45	272.03	1599.93	13.06	-1.27	13.06	13.12	354.46	0.69
1700.00	0.54	256.45	1699.93	12.96	-2.12	12.96	13.14	350.73	0.16
1800.00	0.84	255.79	1799.92	12.67	-3.29	12.67	13.09	345.47	0.30
1900.00	0.96	250.36	1899.91	12.21	-4.78	12.21	13.12	338.61	0.14
2000.00	0.84	272.15	1999.89	11.96	-6.30	11.96	13.52	332.21	0.36
2100.00	1.06	269.79	2099.88	11.98	-7.96	11.98	14.39	326.40	0.22
2200.00	0.97	277.04	2199.86	12.08	-9.73	12.08	15.52	321.16	0.15
2300.00	0.88	290.95	2299.85	12.46	-11.30	12.46	16.82	317.82	0.24
2400.00	0.91	277.38	2399.84	12.84	-12.80	12.84	18.13	315.09	0.21
2500.00	0.87	275.73	2499.83	13.02	-14.35	13.02	19.38	312.22	0.04
2600.00	0.91	285.34	2599.81	13.31	-15.87	13.31	20.71	309.97	0.15
2700.00	1.26	319.16	2699.80	14.35	-17.36	14.35	22.52	309.58	0.71
2800.00	0.92	311.34	2799.78	15.71	-18.68	15.71	24.41	310.06	0.37
2900.00	0.69	323.02	2899.77	16.72	-19.65	16.72	25.80	310.40	0.28
3000.00	1.28	350.74	2999.75	18.30	-20.19	18.30	27.25	312.20	0.74
3100.00	0.85	0.25	3099.74	20.14	-20.37	20.14	28.64	314.68	0.47
3200.00	0.22	123.10	3199.73	20.77	-20.20	20.77	28.97	315.80	0.98
3300.00	1.07	121.52	3299.73	20.18	-19.24	20.18	27.88	316.37	0.85
3400.00	1.88	132.46	3399.69	18.58	-17.23	18.58	25.34	317.16	0.85

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	2.56	138.15	3499.62	15.81	-14.53	15.81	21.47	317.41	0.72
3600.00	2.95	140.48	3599.50	12.16	-11.40	12.16	16.67	316.84	0.40
3700.00	2.66	133.80	3699.38	8.57	-8.09	8.57	11.79	316.65	0.44
3800.00	2.35	126.42	3799.29	5.75	-4.77	5.75	7.47	320.33	0.44
3900.00	1.89	138.59	3899.22	3.29	-2.02	3.29	3.86	328.43	0.64
4000.00	1.04	142.98	3999.18	1.33	-0.38	1.33	1.38	343.90	0.86
4100.00	0.36	174.20	4099.18	0.29	0.19	0.29	0.35	33.89	0.75
4200.00	0.92	260.14	4199.17	-0.16	-0.56	-0.16	0.59	253.98	0.96
4300.00	1.62	267.18	4299.15	-0.37	-2.76	-0.37	2.79	262.41	0.72
4400.00	1.36	264.76	4399.11	-0.55	-5.36	-0.55	5.38	264.18	0.27
4500.00	1.19	235.76	4499.09	-1.24	-7.39	-1.24	7.49	260.51	0.66
4600.00	0.72	247.03	4599.07	-2.06	-8.82	-2.06	9.06	256.84	0.50
4700.00	1.18	226.39	4699.06	-3.02	-10.15	-3.02	10.59	253.43	0.57
4800.00	1.44	215.69	4799.03	-4.75	-11.63	-4.75	12.56	247.77	0.36
4900.00	0.96	189.79	4899.01	-6.60	-12.51	-6.60	14.14	242.16	0.72
5000.00	0.64	154.63	4999.00	-7.93	-12.41	-7.93	14.73	237.41	0.58
5100.00	1.25	122.46	5098.99	-9.02	-11.25	-9.02	14.42	231.27	0.79
5200.00	1.79	124.87	5198.95	-10.50	-9.05	-10.50	13.86	220.74	0.54
5300.00	2.04	134.89	5298.90	-12.65	-6.51	-12.65	14.22	207.22	0.41
5400.00	2.36	151.13	5398.83	-15.71	-4.25	-15.71	16.27	195.15	0.70
5500.00	2.86	164.22	5498.72	-19.91	-2.58	-19.91	20.08	187.38	0.77
5600.00	2.24	173.79	5598.62	-24.25	-1.69	-24.25	24.31	183.99	0.75
5700.00	1.37	174.23	5698.57	-27.38	-1.36	-27.38	27.42	182.84	0.87
5800.00	0.52	186.61	5798.56	-29.02	-1.29	-29.02	29.05	182.55	0.87
5900.00	0.05	192.60	5898.56	-29.51	-1.35	-29.51	29.54	182.62	0.47
6000.00	0.71	18.00	5998.56	-28.96	-1.17	-28.96	28.98	182.31	0.76
6100.00	0.79	13.81	6098.55	-27.70	-0.81	-27.70	27.71	181.68	0.10
6200.00	0.75	62.52	6198.54	-26.72	-0.06	-26.72	26.72	180.14	0.64
6300.00	0.39	22.92	6298.53	-26.11	0.65	-26.11	26.11	178.57	0.52
6400.00	0.73	24.64	6398.53	-25.21	1.05	-25.21	25.23	177.61	0.34
6500.00	1.07	33.82	6498.52	-23.85	1.84	-23.85	23.92	175.59	0.37
6600.00	0.86	38.17	6598.50	-22.49	2.82	-22.49	22.66	172.84	0.23

HORIZONTAL DISPLACEMENT IS 22.66 FEET AT 172.84 DEGREES									
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