

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy
 Lease/Well: Hanscome / C2
 Location: S-28 T-64W R-4N

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

Latitude: 40.28, Longitude: -104.56
 GRID North is 0.61 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: 2/5/2011 / 19:20

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	0.07	271.14	100.00	0.00	-0.06	0.00	0.06	271.14	0.07
200.00	0.23	169.92	200.00	-0.19	-0.08	-0.19	0.21	202.29	0.25
300.00	0.06	247.14	300.00	-0.41	-0.10	-0.41	0.42	193.09	0.22
400.00	0.31	332.65	400.00	-0.19	-0.27	-0.19	0.33	234.41	0.31
500.00	0.84	66.59	499.99	0.34	0.28	0.34	0.43	39.28	0.91
600.00	0.79	63.45	599.98	0.94	1.57	0.94	1.83	59.12	0.06
700.00	0.75	74.83	699.98	1.42	2.82	1.42	3.15	63.28	0.16
800.00	0.77	85.07	799.97	1.65	4.12	1.65	4.43	68.21	0.14
900.00	0.48	86.22	899.96	1.73	5.21	1.73	5.49	71.62	0.29
1000.00	0.68	81.49	999.96	1.85	6.22	1.85	6.49	73.46	0.20
1100.00	0.62	97.83	1099.95	1.86	7.34	1.86	7.57	75.77	0.20
1200.00	0.56	113.77	1199.94	1.59	8.32	1.59	8.47	79.17	0.17
1300.00	0.36	155.88	1299.94	1.11	8.90	1.11	8.97	82.90	0.38
1400.00	0.30	225.11	1399.94	0.63	8.84	0.63	8.86	85.90	0.38
1500.00	0.29	255.32	1499.94	0.38	8.40	0.38	8.41	87.40	0.16
1600.00	0.70	242.48	1599.93	0.04	7.62	0.04	7.62	89.73	0.42
1700.00	0.85	258.79	1699.93	-0.39	6.35	-0.39	6.36	93.50	0.27
1800.00	0.68	250.71	1799.92	-0.73	5.06	-0.73	5.12	98.19	0.20
1900.00	0.69	263.05	1899.91	-1.00	3.91	-1.00	4.03	104.32	0.15
2000.00	0.52	287.07	1999.90	-0.94	2.88	-0.94	3.03	108.04	0.30
2100.00	0.53	270.28	2099.90	-0.80	1.98	-0.80	2.14	112.03	0.15
2200.00	0.59	279.81	2199.90	-0.71	1.01	-0.71	1.24	125.14	0.11
2300.00	0.73	285.41	2299.89	-0.45	-0.11	-0.45	0.47	194.00	0.16
2400.00	0.73	290.26	2399.88	-0.06	-1.33	-0.06	1.33	267.30	0.06
2500.00	0.69	303.45	2499.87	0.49	-2.43	0.49	2.48	281.43	0.17
2600.00	0.66	317.79	2599.87	1.25	-3.33	1.25	3.55	290.67	0.17
2700.00	0.49	302.70	2699.86	1.92	-4.08	1.92	4.51	295.18	0.23
2800.00	0.70	329.47	2799.86	2.68	-4.75	2.68	5.45	299.40	0.34
2900.00	0.79	338.25	2899.85	3.85	-5.32	3.85	6.57	305.88	0.14
3000.00	0.56	335.58	2999.84	4.94	-5.78	4.94	7.60	310.52	0.23
3100.00	0.63	342.09	3099.83	5.91	-6.15	5.91	8.53	313.86	0.10
3200.00	0.60	329.75	3199.83	6.89	-6.59	6.89	9.53	316.29	0.14
3300.00	0.47	326.68	3299.82	7.68	-7.07	7.68	10.44	317.36	0.13
3400.00	0.75	315.40	3399.82	8.49	-7.76	8.49	11.50	317.58	0.30

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	0.69	336.15	3499.81	9.51	-8.46	9.51	12.73	318.33	0.27
3600.00	0.60	323.26	3599.80	10.47	-9.02	10.47	13.82	319.28	0.17
3700.00	0.64	341.56	3699.80	11.42	-9.50	11.42	14.85	320.23	0.20
3800.00	0.43	352.69	3799.79	12.32	-9.73	12.32	15.69	321.70	0.23
3900.00	0.30	347.13	3899.79	12.95	-9.83	12.95	16.26	322.79	0.13
4000.00	0.26	24.80	3999.79	13.41	-9.80	13.41	16.61	323.85	0.19
4100.00	0.26	64.62	4099.79	13.72	-9.49	13.72	16.68	325.31	0.18
4200.00	0.13	40.56	4199.79	13.90	-9.21	13.90	16.68	326.47	0.16
4300.00	0.36	41.87	4299.79	14.22	-8.93	14.22	16.79	327.89	0.23
4400.00	0.44	42.02	4399.79	14.74	-8.46	14.74	17.00	330.15	0.07
4500.00	0.33	25.70	4499.78	15.29	-8.08	15.29	17.29	332.14	0.15
4600.00	1.26	34.77	4599.77	16.46	-7.32	16.46	18.01	336.01	0.93
4700.00	1.86	33.73	4699.74	18.71	-5.79	18.71	19.59	342.80	0.60
4800.00	2.12	48.02	4799.68	21.30	-3.51	21.30	21.59	350.63	0.56
4900.00	2.19	64.29	4899.61	23.37	-0.41	23.37	23.37	358.99	0.61
5000.00	2.27	74.85	4999.53	24.72	3.22	24.72	24.93	7.42	0.42
5100.00	2.12	66.13	5099.46	25.98	6.82	25.98	26.86	14.71	0.37
5200.00	2.12	61.41	5199.39	27.61	10.13	27.61	29.41	20.15	0.17
5300.00	2.36	59.54	5299.31	29.54	13.53	29.54	32.49	24.61	0.26
5400.00	2.95	58.17	5399.21	31.94	17.49	31.94	36.42	28.70	0.59
5500.00	2.11	66.06	5499.11	34.04	21.36	34.04	40.19	32.10	0.90
5600.00	2.26	74.63	5599.03	35.31	24.94	35.31	43.23	35.23	0.36
5700.00	2.41	76.26	5698.95	36.33	28.88	36.33	46.41	38.48	0.16
5800.00	2.36	93.67	5798.87	36.70	32.97	36.70	49.34	41.94	0.72
5900.00	2.63	102.80	5898.77	36.06	37.26	36.06	51.86	45.94	0.48
6000.00	2.52	117.28	5998.67	34.55	41.45	34.55	53.96	50.19	0.66
6100.00	2.19	132.72	6098.59	32.24	44.80	32.24	55.20	54.26	0.71
6200.00	1.73	153.01	6198.53	29.60	46.89	29.60	55.46	57.73	0.83
6300.00	1.54	143.73	6298.49	27.18	48.37	27.18	55.48	60.67	0.32
6400.00	1.24	159.97	6398.46	25.08	49.54	25.08	55.52	63.15	0.49
6500.00	1.01	191.47	6498.44	23.20	49.73	23.20	54.88	64.99	0.65
6600.00	1.08	231.92	6598.43	21.75	48.81	21.75	53.44	65.98	0.73
6700.00	1.35	266.16	6698.41	21.09	46.89	21.09	51.41	65.78	0.76
6800.00	0.68	270.64	6798.39	21.02	45.11	21.02	49.77	65.02	0.68
6900.00	0.95	287.88	6898.38	21.28	43.73	21.28	48.63	64.05	0.36

<div> HORIZONTAL DISPLACEMENT IS 48.63 FEET AT 64.05 DEGREES </div>
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