

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy
 Lease/Well: Fortenberry USX AB / 19-5 P
 Location: S-19 T-7N R-64W
 Rig Name: Production
 State/County: Colorado / Weld County
 Latitude: 40.56, Longitude: -104.60
 GRID North is 0.58 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: 1/29/2011 / 14:28

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	0.88	331.76	100.00	0.67	-0.36	0.67	0.76	331.76	0.88
200.00	0.71	319.53	199.99	1.82	-1.13	1.82	2.14	328.23	0.23
300.00	0.44	328.25	299.98	2.62	-1.73	2.62	3.14	326.52	0.28
400.00	0.31	328.43	399.98	3.18	-2.08	3.18	3.80	326.83	0.14
500.00	0.43	291.44	499.98	3.54	-2.56	3.54	4.37	324.11	0.26
600.00	0.16	150.86	599.98	3.56	-2.84	3.56	4.55	321.38	0.56
700.00	0.12	163.87	699.98	3.34	-2.75	3.34	4.32	320.57	0.05
800.00	0.43	200.56	799.98	2.89	-2.85	2.89	4.06	315.37	0.35
900.00	0.38	97.16	899.97	2.49	-2.65	2.49	3.64	313.22	0.64
1000.00	0.26	245.68	999.97	2.36	-2.53	2.36	3.46	313.02	0.62
1100.00	0.27	82.79	1099.97	2.29	-2.50	2.29	3.39	312.54	0.52
1200.00	0.90	107.77	1199.97	2.08	-1.52	2.08	2.58	323.87	0.67
1300.00	1.03	120.31	1299.95	1.39	0.00	1.39	1.39	0.19	0.25
1400.00	1.17	106.18	1399.93	0.65	1.77	0.65	1.88	69.83	0.31
1500.00	1.34	131.23	1499.91	-0.41	3.63	-0.41	3.65	96.42	0.57
1600.00	1.37	128.43	1599.88	-1.93	5.45	-1.93	5.78	109.45	0.07
1700.00	1.53	142.57	1699.85	-3.73	7.20	-3.73	8.11	117.39	0.39
1800.00	1.38	131.32	1799.82	-5.59	8.92	-5.59	10.53	122.07	0.32
1900.00	1.13	137.37	1899.79	-7.12	10.50	-7.12	12.68	124.13	0.28
2000.00	0.70	139.51	1999.78	-8.31	11.57	-8.31	14.24	125.69	0.43
2100.00	0.52	133.97	2099.78	-9.09	12.29	-9.09	15.29	126.49	0.19
2200.00	0.35	62.33	2199.77	-9.27	12.89	-9.27	15.88	125.71	0.53
2300.00	0.41	335.06	2299.77	-8.80	13.01	-8.80	15.71	124.08	0.52
2400.00	0.88	309.76	2399.77	-7.99	12.27	-7.99	14.64	123.06	0.54
2500.00	1.22	294.44	2499.75	-7.06	10.71	-7.06	12.83	123.38	0.44
2600.00	1.83	307.94	2599.71	-5.63	8.48	-5.63	10.18	123.59	0.70
2700.00	1.71	318.47	2699.67	-3.53	6.23	-3.53	7.16	119.55	0.34
2800.00	1.58	319.76	2799.62	-1.36	4.35	-1.36	4.55	107.37	0.14
2900.00	1.68	315.74	2899.58	0.74	2.43	0.74	2.54	73.02	0.15
3000.00	1.52	316.34	2999.54	2.75	0.49	2.75	2.80	10.17	0.16
3100.00	1.67	309.55	3099.51	4.64	-1.55	4.64	4.89	341.58	0.24
3200.00	1.34	303.85	3199.47	6.22	-3.64	6.22	7.21	329.66	0.36
3300.00	1.42	295.46	3299.44	7.41	-5.73	7.41	9.37	322.25	0.22
3400.00	1.40	255.10	3399.41	7.63	-8.03	7.63	11.08	313.51	0.97

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	0.97	212.56	3499.39	6.60	-9.67	6.60	11.70	304.31	0.95
3600.00	1.72	184.30	3599.37	4.38	-10.24	4.38	11.14	293.18	0.98
3700.00	2.15	158.04	3699.31	1.15	-9.65	1.15	9.72	276.79	0.97
3800.00	1.58	133.38	3799.26	-1.54	-7.95	-1.54	8.09	259.07	0.97
3900.00	1.55	103.31	3899.22	-2.79	-5.63	-2.79	6.28	243.61	0.81
4000.00	1.26	81.40	3999.20	-2.94	-3.23	-2.94	4.37	227.68	0.61
4100.00	1.15	81.54	4099.17	-2.63	-1.15	-2.63	2.87	203.65	0.11
4200.00	1.44	94.44	4199.15	-2.58	1.09	-2.58	2.80	157.03	0.41
4300.00	1.24	136.53	4299.12	-3.46	3.09	-3.46	4.64	138.25	0.98
4400.00	1.12	181.28	4399.10	-5.23	3.82	-5.23	6.47	143.86	0.91
4500.00	1.16	186.45	4499.08	-7.20	3.68	-7.20	8.09	152.92	0.11
4600.00	0.89	190.72	4599.07	-8.96	3.42	-8.96	9.59	159.09	0.28
4700.00	0.55	120.24	4699.06	-9.96	3.69	-9.96	10.63	159.66	0.87
4800.00	1.36	83.43	4799.05	-10.07	5.29	-10.07	11.37	152.29	0.98
4900.00	2.28	71.59	4899.00	-9.30	8.36	-9.30	12.51	138.07	0.98
5000.00	3.15	70.00	4998.88	-7.74	12.82	-7.74	14.98	121.11	0.87
5100.00	3.73	62.49	5098.70	-5.30	18.28	-5.30	19.04	106.16	0.73
5200.00	2.99	73.18	5198.53	-3.04	23.66	-3.04	23.86	97.32	0.96
5300.00	2.14	74.48	5298.43	-1.79	27.96	-1.79	28.02	93.65	0.85
5400.00	1.21	82.15	5398.39	-1.14	30.81	-1.14	30.83	92.12	0.96
5500.00	0.62	76.73	5498.37	-0.87	32.37	-0.87	32.39	91.55	0.59
5600.00	0.54	78.03	5598.37	-0.65	33.36	-0.65	33.37	91.12	0.08
5700.00	0.20	48.31	5698.37	-0.44	33.95	-0.44	33.96	90.74	0.38
5800.00	0.06	79.90	5798.37	-0.31	34.14	-0.31	34.14	90.52	0.15
5900.00	0.15	4.05	5898.37	-0.18	34.20	-0.18	34.20	90.29	0.14
6000.00	0.23	289.46	5998.37	0.02	34.02	0.02	34.02	89.97	0.24
6100.00	0.22	272.11	6098.37	0.09	33.64	0.09	33.64	89.84	0.07
6200.00	0.28	213.31	6198.36	-0.10	33.31	-0.10	33.31	90.18	0.25
6300.00	0.32	263.96	6298.36	-0.34	32.90	-0.34	32.90	90.59	0.26
6400.00	0.31	257.70	6398.36	-0.43	32.36	-0.43	32.37	90.76	0.03
6500.00	0.29	223.78	6498.36	-0.67	31.92	-0.67	31.93	91.20	0.18
6600.00	0.53	197.98	6598.36	-1.29	31.60	-1.29	31.63	92.35	0.29
6700.00	1.24	207.63	6698.35	-2.69	30.96	-2.69	31.07	94.97	0.72
6800.00	1.57	196.53	6798.32	-4.96	30.06	-4.96	30.47	99.38	0.43
6900.00	2.12	184.92	6898.26	-8.13	29.52	-8.13	30.61	105.39	0.66
7000.00	1.79	205.42	6998.21	-11.38	28.69	-11.38	30.86	111.63	0.77
7100.00	1.43	237.54	7098.17	-13.45	26.97	-13.45	30.14	116.52	0.95
7200.00	1.28	275.02	7198.14	-14.03	24.80	-14.03	28.49	119.49	0.88

HORIZONTAL DISPLACEMENT IS 28.49 FEET AT 119.49 DEGREES									
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