

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy
Lease/Well: Fortenberry USX AB/19-6P

Rig Name: Production
State/County: Colorado/Weld

Latitude: 40.56
GRID North is 0.58 Degrees East of True North
VS-Azi: 0.00 Degrees

GTI

GYRO TECHNOLOGIES INC

FIELD COPY ONLY (NOT DEFINITIVE)

Elevation : 4878 feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: fortenberry-01_ed.ut
Minimum Curvature Method
Report Date/Time: 12/31/2010 / 18:22

Vaughn Energy Services
Fort Worth, Texas
817-741-3610
Ray Seago

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	0.57	260.54	100.00	-0.08	-0.49	-0.08	0.50	260.54	0.57
200.00	0.61	245.06	199.99	-0.39	-1.47	-0.39	1.52	255.17	0.16
300.00	0.73	209.23	299.99	-1.17	-2.26	-1.17	2.54	242.65	0.43
400.00	0.94	209.31	399.98	-2.44	-2.97	-2.44	3.85	230.62	0.21
500.00	0.92	197.60	499.96	-3.92	-3.61	-3.92	5.33	222.71	0.19
600.00	1.17	186.06	599.95	-5.69	-3.96	-5.69	6.94	214.85	0.33
700.00	1.35	180.75	699.92	-7.89	-4.09	-7.89	8.89	207.39	0.21
800.00	1.49	188.45	799.89	-10.36	-4.29	-10.36	11.21	202.52	0.24
900.00	1.54	179.37	899.86	-12.99	-4.47	-12.99	13.73	199.00	0.24
1000.00	1.61	157.07	999.82	-15.62	-3.91	-15.62	16.10	194.06	0.61
1100.00	1.64	168.95	1099.78	-18.31	-3.09	-18.31	18.57	189.58	0.34
1200.00	1.82	178.90	1199.73	-21.30	-2.78	-21.30	21.48	187.45	0.35
1300.00	1.86	187.02	1299.68	-24.50	-2.95	-24.50	24.68	186.87	0.26
1400.00	2.35	189.83	1399.62	-28.12	-3.50	-28.12	28.34	187.09	0.50
1500.00	2.79	185.24	1499.52	-32.56	-4.07	-32.56	32.82	187.13	0.49
1600.00	2.50	187.51	1599.41	-37.15	-4.58	-37.15	37.43	187.03	0.31
1700.00	2.01	189.50	1699.33	-41.04	-5.15	-41.04	41.36	187.16	0.49
1800.00	1.24	180.21	1799.29	-43.85	-5.45	-43.85	44.19	187.08	0.82
1900.00	1.04	158.15	1899.27	-45.77	-5.11	-45.77	46.06	186.38	0.48
2000.00	0.40	157.13	1999.26	-46.94	-4.64	-46.94	47.17	185.65	0.64
2100.00	0.57	202.13	2099.26	-47.72	-4.70	-47.72	47.95	185.62	0.41
2200.00	0.78	196.37	2199.25	-48.84	-5.08	-48.84	49.11	185.93	0.22
2300.00	0.83	181.15	2299.24	-50.22	-5.28	-50.22	50.50	186.01	0.22
2400.00	0.77	184.22	2399.23	-51.61	-5.35	-51.61	51.89	185.92	0.07
2500.00	0.59	166.08	2499.23	-52.78	-5.27	-52.78	53.04	185.71	0.28
2600.00	0.58	151.58	2599.22	-53.72	-4.91	-53.72	53.94	185.22	0.15
2700.00	0.81	99.92	2699.21	-54.28	-3.98	-54.28	54.43	184.19	0.64
2800.00	1.62	78.98	2799.19	-54.14	-1.90	-54.14	54.17	182.01	0.91
2900.00	1.11	67.72	2899.16	-53.50	0.38	-53.50	53.50	179.59	0.58
3000.00	0.82	27.27	2999.15	-52.50	1.60	-52.50	52.52	178.25	0.72
3100.00	1.16	353.86	3099.14	-50.86	1.82	-50.86	50.89	177.95	0.65
3200.00	1.77	331.08	3199.10	-48.50	0.97	-48.50	48.51	178.86	0.84
3300.00	2.59	319.15	3299.03	-45.43	-1.26	-45.43	45.45	181.59	0.93
3400.00	2.80	317.21	3398.92	-41.93	-4.40	-41.93	42.16	185.99	0.23

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	2.82	318.74	3498.80	-38.29	-7.68	-38.29	39.05	191.34	0.08
3600.00	2.57	322.66	3598.69	-34.66	-10.66	-34.66	36.26	197.10	0.31
3700.00	1.82	337.41	3698.62	-31.40	-12.63	-31.40	33.85	201.92	0.93
3800.00	1.74	338.39	3798.57	-28.52	-13.80	-28.52	31.69	205.82	0.09
3900.00	2.74	311.31	3898.49	-25.54	-16.16	-25.54	30.22	212.32	1.43
4000.00	4.06	304.50	3998.31	-21.96	-20.87	-21.96	30.29	223.54	1.38
4100.00	2.03	309.18	4098.17	-18.83	-25.15	-18.83	31.42	233.18	2.04
4200.00	0.26	328.20	4198.14	-17.52	-26.65	-17.52	31.89	236.67	1.78
4300.00	0.11	248.62	4298.14	-17.36	-26.85	-17.36	31.98	237.12	0.26
4400.00	0.13	31.59	4398.14	-17.30	-26.88	-17.30	31.97	237.24	0.23
4500.00	0.17	14.41	4498.14	-17.06	-26.79	-17.06	31.75	237.51	0.06
4600.00	0.26	4.26	4598.14	-16.68	-26.73	-16.68	31.51	238.03	0.10
4700.00	0.39	4.56	4698.14	-16.12	-26.69	-16.12	31.18	238.87	0.13
4800.00	0.37	3.05	4798.14	-15.46	-26.64	-15.46	30.80	239.88	0.02
4900.00	0.40	346.24	4898.14	-14.80	-26.71	-14.80	30.53	241.01	0.12
5000.00	0.42	304.52	4998.13	-14.25	-27.09	-14.25	30.61	242.25	0.29
5100.00	0.43	294.52	5098.13	-13.89	-27.74	-13.89	31.02	243.40	0.08
5200.00	0.22	250.39	5198.13	-13.80	-28.26	-13.80	31.45	243.98	0.32
5300.00	0.37	227.71	5298.13	-14.08	-28.68	-14.08	31.95	243.86	0.18
5400.00	0.48	221.72	5398.13	-14.60	-29.20	-14.60	32.65	243.43	0.12
5500.00	0.65	222.31	5498.12	-15.34	-29.86	-15.34	33.57	242.81	0.17
5600.00	0.93	200.18	5598.11	-16.52	-30.53	-16.52	34.71	241.57	0.41
5700.00	0.84	201.87	5698.10	-17.97	-31.08	-17.97	35.90	239.97	0.10
5800.00	1.02	201.26	5798.09	-19.47	-31.67	-19.47	37.18	238.42	0.18
5900.00	1.18	196.26	5898.07	-21.29	-32.28	-21.29	38.67	236.60	0.19
6000.00	1.31	186.94	5998.04	-23.42	-32.71	-23.42	40.23	234.40	0.24
6100.00	1.44	185.81	6098.02	-25.81	-32.98	-25.81	41.87	231.96	0.13
6200.00	1.40	175.00	6197.99	-28.27	-33.00	-28.27	43.45	229.41	0.27
6300.00	1.48	171.98	6297.95	-30.76	-32.71	-30.76	44.90	226.76	0.11
6400.00	1.41	161.48	6397.92	-33.21	-32.14	-33.21	46.22	224.06	0.27
6500.00	1.13	170.72	6497.90	-35.36	-31.59	-35.36	47.41	221.78	0.35
6600.00	1.14	160.37	6597.88	-37.27	-31.09	-37.27	48.54	219.84	0.21
6700.00	1.05	162.98	6697.86	-39.09	-30.49	-39.09	49.58	217.95	0.10
6800.00	1.09	167.51	6797.84	-40.90	-30.02	-40.90	50.73	216.28	0.09
6900.00	0.94	168.24	6897.83	-42.62	-29.64	-42.62	51.92	214.82	0.15
7000.00	0.87	167.79	6997.81	-44.16	-29.32	-44.16	53.01	213.58	0.07
7100.00	0.61	172.68	7097.81	-45.43	-29.09	-45.43	53.94	212.64	0.27
HORIZONTAL DISPLACEMENT IS 53.94 FEET AT 212.64 DEGREES									