

**VES**

VAUGHN ENERGY SERVICES

Company: Noble  
Lease/Well: Franklin/28-9

Location:

Rig Name: Production  
State/County: Colorado/Weld

Latitude: 40.37

GRID North is 0.55 Degrees East of True North

VS-Azi: 0.00 Degrees

**GTI**

GYRO TECHNOLOGIES, INC

## FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : GL

## DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: run1-01\_ed.ut

Minimum Curvature Method

Report Date/Time: 3/15/2011 / 19:48

Vaughn Energy Services

Rifle, Colorado

970-456-2071

Garry Fowler

Franklin 28-9/05-123-17352

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	0.53	154.35	100.00	-0.42	0.20	-0.42	0.46	154.35	0.53
200.00	0.55	153.72	199.99	-1.27	0.62	-1.27	1.41	154.13	0.02
300.00	0.47	163.89	299.99	-2.10	0.94	-2.10	2.30	155.79	0.12
400.00	0.44	162.60	399.99	-2.87	1.18	-2.87	3.10	157.72	0.03
500.00	0.52	164.04	499.98	-3.67	1.42	-3.67	3.94	158.92	0.07
600.00	0.57	194.04	599.98	-4.59	1.42	-4.59	4.81	162.81	0.29
700.00	0.47	229.22	699.98	-5.34	0.99	-5.34	5.43	169.53	0.33
800.00	0.25	234.50	799.97	-5.74	0.50	-5.74	5.76	175.04	0.23
900.00	0.28	236.55	899.97	-6.00	0.12	-6.00	6.00	178.86	0.03
1000.00	0.65	243.55	999.97	-6.38	-0.59	-6.38	6.41	185.30	0.38
1100.00	0.71	261.27	1099.96	-6.73	-1.71	-6.73	6.95	194.27	0.22
1200.00	0.74	268.73	1199.95	-6.84	-2.97	-6.84	7.46	203.47	0.10
1300.00	0.75	271.90	1299.95	-6.83	-4.27	-6.83	8.06	212.01	0.04
1400.00	0.71	273.65	1399.94	-6.77	-5.54	-6.77	8.75	219.29	0.05
1500.00	0.67	262.90	1499.93	-6.80	-6.74	-6.80	9.58	224.72	0.13
1600.00	0.68	251.44	1599.92	-7.07	-7.89	-7.07	10.59	228.14	0.14
1700.00	0.68	224.47	1699.92	-7.68	-8.87	-7.68	11.73	229.10	0.32
1800.00	0.69	215.81	1799.91	-8.59	-9.63	-8.59	12.91	228.28	0.10
1900.00	0.82	170.43	1899.90	-9.78	-9.86	-9.78	13.89	225.24	0.60
2000.00	0.95	169.68	1999.89	-11.30	-9.60	-11.30	14.83	220.33	0.13
2100.00	0.93	158.50	2099.88	-12.87	-9.15	-12.87	15.79	215.41	0.18
2200.00	0.92	158.85	2199.86	-14.38	-8.56	-14.38	16.74	210.77	0.01
2300.00	0.94	155.50	2299.85	-15.88	-7.93	-15.88	17.75	206.54	0.06
2400.00	0.94	151.13	2399.84	-17.35	-7.19	-17.35	18.78	202.52	0.07
2500.00	0.99	149.23	2499.82	-18.81	-6.36	-18.81	19.85	198.67	0.06
2600.00	1.16	155.76	2599.80	-20.47	-5.50	-20.47	21.20	195.03	0.21
2700.00	1.03	153.89	2699.79	-22.20	-4.69	-22.20	22.69	191.92	0.14
2800.00	1.12	154.39	2799.77	-23.89	-3.87	-23.89	24.20	189.20	0.09
2900.00	1.13	145.75	2899.75	-25.59	-2.89	-25.59	25.75	186.45	0.17
3000.00	1.12	142.07	2999.73	-27.17	-1.74	-27.17	27.23	183.66	0.07
3100.00	1.33	145.58	3099.71	-28.90	-0.48	-28.90	28.90	180.96	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
3200.00	1.79	154.34	3199.67	-31.26	0.85	-31.26	31.27	178.45	0.51
3300.00	2.36	159.25	3299.60	-34.59	2.25	-34.59	34.66	176.27	0.60
3400.00	3.00	174.02	3399.50	-39.12	3.26	-39.12	39.26	175.24	0.94
3500.00	2.34	181.20	3499.39	-43.77	3.49	-43.77	43.91	175.45	0.74
3600.00	1.84	184.80	3599.32	-47.41	3.31	-47.41	47.53	176.01	0.52
3700.00	1.37	185.11	3699.28	-50.20	3.07	-50.20	50.30	176.50	0.47
3800.00	1.30	208.53	3799.25	-52.39	2.42	-52.39	52.44	177.35	0.55
3900.00	1.23	211.68	3899.23	-54.29	1.32	-54.29	54.31	178.61	0.10
4000.00	1.14	217.90	3999.21	-55.99	0.14	-55.99	55.99	179.85	0.16
4100.00	0.67	191.84	4099.20	-57.35	-0.59	-57.35	57.35	180.58	0.61
4200.00	0.53	185.40	4199.19	-58.37	-0.75	-58.37	58.38	180.73	0.16
4300.00	0.52	187.22	4299.19	-59.28	-0.85	-59.28	59.28	180.82	0.02
4400.00	0.47	190.85	4399.18	-60.13	-0.98	-60.13	60.14	180.94	0.06
4500.00	0.35	191.61	4499.18	-60.83	-1.12	-60.83	60.84	181.06	0.11
4600.00	0.29	185.36	4599.18	-61.38	-1.21	-61.38	61.39	181.13	0.08
4700.00	0.32	185.76	4699.18	-61.90	-1.26	-61.90	61.92	181.16	0.03
4800.00	0.45	196.56	4799.17	-62.55	-1.40	-62.55	62.57	181.28	0.15
4900.00	0.62	164.76	4899.17	-63.45	-1.37	-63.45	63.47	181.23	0.33
5000.00	0.69	152.72	4999.16	-64.51	-0.95	-64.51	64.52	180.84	0.16
5100.00	0.68	134.35	5099.16	-65.46	-0.25	-65.46	65.46	180.22	0.22
5200.00	0.69	86.05	5199.15	-65.83	0.78	-65.83	65.84	179.32	0.56
5300.00	1.39	67.93	5299.13	-65.34	2.51	-65.34	65.38	177.80	0.77
5400.00	1.66	61.38	5399.10	-64.19	4.91	-64.19	64.37	175.63	0.32
5500.00	1.69	94.47	5499.06	-63.61	7.65	-63.61	64.06	173.14	0.95
5600.00	1.76	118.55	5599.01	-64.45	10.46	-64.45	65.30	170.78	0.72
5700.00	1.96	139.07	5698.96	-66.48	12.93	-66.48	67.73	168.99	0.69
5800.00	2.13	159.12	5798.90	-69.50	14.71	-69.50	71.04	168.05	0.73
5900.00	2.22	179.37	5898.83	-73.17	15.40	-73.17	74.77	168.12	0.77
6000.00	2.08	203.57	5998.76	-76.77	14.69	-76.77	78.17	169.17	0.91
6100.00	1.79	204.30	6098.70	-79.86	13.32	-79.86	80.97	170.53	0.29
6200.00	1.54	207.96	6198.66	-82.47	12.05	-82.47	83.35	171.69	0.28
6300.00	1.84	201.49	6298.62	-85.15	10.83	-85.15	85.84	172.75	0.36
6400.00	2.17	186.27	6398.56	-88.53	10.04	-88.53	89.10	173.53	0.62
6500.00	2.48	170.23	6498.48	-92.54	10.20	-92.54	93.10	173.71	0.71
6600.00	3.01	155.48	6598.36	-97.06	11.65	-97.06	97.75	173.15	0.88
6700.00	2.82	140.95	6698.23	-101.36	14.29	-101.36	102.36	171.97	0.76
6800.00	2.19	141.32	6798.14	-104.76	17.04	-104.76	106.14	170.76	0.63
6875.00	2.12	140.32	6873.09	-106.95	18.82	-106.95	108.59	170.02	0.11

<div> HORIZONTAL DISPLACEMENT IS  108.59 FEET AT 170.02 DEGREES </div>
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