

**VES**

VAUGHN ENERGY SERVICES

Company: Noble Energy  
 Lease/Well: Ocoma C / 17-9  
 Location: S-17 T-4N R-64W  
 Rig Name: Production  
 State/County: Colorado / Weld County  
 Latitude: 40.31, Longitude: -104.57  
 GRID North is 0.60 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: 2/18/2011 / 09:51

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	0.39	357.84	100.00	0.34	-0.01	0.34	0.34	357.84	0.39
200.00	0.25	29.07	200.00	0.87	0.08	0.87	0.87	5.38	0.22
300.00	0.20	46.23	300.00	1.18	0.31	1.18	1.22	14.87	0.09
400.00	0.43	174.05	400.00	0.92	0.48	0.92	1.04	27.27	0.57
500.00	0.33	198.24	499.99	0.27	0.42	0.27	0.50	57.14	0.19
600.00	0.28	195.02	599.99	-0.23	0.27	-0.23	0.36	130.74	0.06
700.00	0.33	220.35	699.99	-0.69	0.02	-0.69	0.69	178.10	0.14
800.00	0.37	152.95	799.99	-1.19	-0.02	-1.19	1.19	180.75	0.39
900.00	0.16	227.39	899.99	-1.57	0.03	-1.57	1.58	178.87	0.36
1000.00	0.22	157.52	999.99	-1.84	0.00	-1.84	1.84	179.90	0.22
1100.00	0.15	197.55	1099.99	-2.14	0.04	-2.14	2.14	178.99	0.14
1200.00	0.22	162.98	1199.99	-2.45	0.05	-2.45	2.45	178.73	0.13
1300.00	0.07	158.39	1299.99	-2.69	0.13	-2.69	2.69	177.17	0.15
1400.00	0.30	123.60	1399.99	-2.89	0.38	-2.89	2.92	172.58	0.25
1500.00	0.07	219.98	1499.99	-3.09	0.56	-3.09	3.14	169.74	0.32
1600.00	0.38	142.22	1599.99	-3.40	0.72	-3.40	3.47	167.97	0.38
1700.00	0.39	141.27	1699.98	-3.93	1.14	-3.93	4.09	163.78	0.01
1800.00	0.09	178.78	1799.98	-4.27	1.36	-4.27	4.48	162.37	0.33
1900.00	0.23	51.67	1899.98	-4.22	1.52	-4.22	4.49	160.22	0.29
2000.00	0.30	317.38	1999.98	-3.90	1.50	-3.90	4.18	158.99	0.40
2100.00	0.67	327.78	2099.98	-3.21	1.01	-3.21	3.36	162.59	0.38
2200.00	0.70	318.31	2199.97	-2.26	0.29	-2.26	2.27	172.78	0.12
2300.00	0.41	349.58	2299.97	-1.44	-0.19	-1.44	1.46	187.38	0.41
2400.00	0.54	51.75	2399.96	-0.80	0.12	-0.80	0.81	171.72	0.50
2500.00	0.37	18.40	2499.96	-0.21	0.59	-0.21	0.62	109.35	0.31
2600.00	0.43	1.97	2599.96	0.48	0.70	0.48	0.85	55.72	0.13
2700.00	0.58	353.16	2699.95	1.36	0.65	1.36	1.51	25.59	0.17
2800.00	0.61	294.96	2799.95	2.09	0.11	2.09	2.09	2.93	0.58
2900.00	0.51	329.18	2899.94	2.70	-0.61	2.70	2.77	347.34	0.34
3000.00	0.37	241.08	2999.94	2.93	-1.12	2.93	3.14	339.11	0.62
3100.00	0.39	289.16	3099.94	2.89	-1.72	2.89	3.36	329.21	0.31
3200.00	0.44	261.88	3199.94	2.94	-2.42	2.94	3.81	320.55	0.20
3300.00	0.57	255.97	3299.93	2.77	-3.29	2.77	4.30	310.10	0.14
3400.00	0.88	245.66	3399.93	2.33	-4.47	2.33	5.04	297.57	0.33

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	1.21	241.42	3499.91	1.51	-6.09	1.51	6.28	283.92	0.34
3600.00	1.64	234.43	3599.88	0.17	-8.19	0.17	8.19	271.21	0.46
3700.00	1.52	231.80	3699.84	-1.48	-10.39	-1.48	10.49	261.90	0.14
3800.00	1.55	233.02	3799.80	-3.11	-12.51	-3.11	12.89	256.04	0.04
3900.00	1.36	233.62	3899.77	-4.63	-14.54	-4.63	15.26	252.35	0.19
4000.00	1.13	211.34	3999.75	-6.17	-16.01	-6.17	17.16	248.92	0.53
4100.00	0.77	223.10	4099.73	-7.51	-16.98	-7.51	18.57	246.16	0.41
4200.00	0.65	197.94	4199.73	-8.53	-17.61	-8.53	19.57	244.15	0.33
4300.00	0.04	303.41	4299.73	-9.06	-17.82	-9.06	19.99	243.06	0.66
4400.00	0.24	121.33	4399.72	-9.15	-17.66	-9.15	19.89	242.63	0.28
4500.00	0.53	99.56	4499.72	-9.33	-17.03	-9.33	19.42	241.27	0.32
4600.00	0.47	250.79	4599.72	-9.54	-16.96	-9.54	19.46	240.62	0.97
4700.00	0.41	240.32	4699.72	-9.86	-17.65	-9.86	20.22	240.82	0.10
4800.00	0.61	205.99	4799.71	-10.52	-18.20	-10.52	21.02	239.98	0.36
4900.00	0.40	199.13	4899.71	-11.33	-18.55	-11.33	21.73	238.59	0.22
5000.00	0.36	210.72	4999.71	-11.93	-18.82	-11.93	22.29	237.64	0.09
5100.00	0.47	235.63	5099.71	-12.43	-19.32	-12.43	22.97	237.25	0.21
5200.00	0.46	203.18	5199.70	-13.03	-19.82	-13.03	23.71	236.68	0.26
5300.00	0.67	222.29	5299.70	-13.83	-20.37	-13.83	24.62	235.82	0.28
5400.00	0.19	288.32	5399.70	-14.21	-20.92	-14.21	25.29	235.82	0.62
5500.00	0.30	324.76	5499.69	-13.95	-21.23	-13.95	25.40	236.71	0.18
5600.00	0.50	6.00	5599.69	-13.30	-21.34	-13.30	25.15	238.07	0.34
5700.00	0.67	11.25	5699.69	-12.29	-21.18	-12.29	24.49	239.87	0.18
5800.00	0.67	11.55	5799.68	-11.14	-20.95	-11.14	23.73	241.99	0.00
5900.00	0.56	84.20	5899.68	-10.52	-20.34	-10.52	22.90	242.66	0.74
6000.00	0.68	91.50	5999.67	-10.49	-19.26	-10.49	21.93	241.44	0.14
6100.00	0.41	47.42	6099.67	-10.26	-18.41	-10.26	21.07	240.86	0.48
6200.00	0.24	71.25	6199.66	-9.95	-17.95	-9.95	20.52	240.99	0.21
6300.00	0.25	347.48	6299.66	-9.67	-17.80	-9.67	20.26	241.48	0.33
6400.00	0.39	276.87	6399.66	-9.42	-18.19	-9.42	20.48	242.63	0.39
6500.00	0.22	271.04	6499.66	-9.37	-18.72	-9.37	20.93	243.41	0.17
6600.00	0.41	323.66	6599.66	-9.08	-19.13	-9.08	21.17	244.61	0.33
6700.00	0.45	301.94	6699.66	-8.58	-19.68	-8.58	21.46	246.44	0.17
6800.00	0.33	287.12	6799.65	-8.29	-20.29	-8.29	21.91	247.78	0.15
HORIZONTAL DISPLACEMENT IS 21.91 FEET AT 247.78 DEGREES									