



Company: NOBLE ENERGY  
Well: Bashor State AA 16-7  
API: 05-123-29256  
Rig Name: PRODUCTION/LIGHTNING  
State/County: COLORADO/WELD  
Latitude: 40.488, Longitude: -104.440  
GRID North is 0.680 Degrees East of True North  
VS-Azi: 0.000 Degrees



**FIELD COPY ONLY (NOT DEFINITIVE)**

Depth Reference : RKB=GROUND LEVEL

**DRILLOG MS GYRO SURVEY CALCULATIONS**

Filename: msgyro\_run01-02-de\_01.ut

Minimum Curvature Method

Report Date/Time: 10/19/2012 / 16:34

VAUGHN ENERGY SERVICES

HENDERSON, COLORADO

866-835-8333

Nick Kula

RKB = Ground Level

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
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	****
100.000	0.310	6.754	100.000	0.268	0.032	0.268	0.270	6.754	0.310
200.000	0.291	19.330	199.998	0.777	0.148	0.777	0.791	10.771	0.068
300.000	0.322	47.999	299.997	1.205	0.441	1.205	1.283	20.100	0.155
400.000	0.335	344.242	399.995	1.675	0.570	1.675	1.769	18.813	0.347
500.000	0.213	340.768	499.994	2.132	0.430	2.132	2.174	11.400	0.123
600.000	0.258	313.086	599.993	2.461	0.204	2.461	2.470	4.736	0.121
700.000	0.205	343.554	699.993	2.786	-0.011	2.786	2.787	359.766	0.132
800.000	0.223	333.049	799.992	3.131	-0.150	3.131	3.135	357.254	0.043
900.000	0.161	5.063	899.991	3.445	-0.226	3.445	3.452	356.246	0.122
1000.000	0.169	336.449	999.991	3.720	-0.272	3.720	3.730	355.810	0.082
1100.000	0.091	285.781	1099.991	3.877	-0.408	3.877	3.898	353.991	0.132
1200.000	0.327	293.625	1199.990	4.013	-0.746	4.013	4.081	349.465	0.237
1300.000	0.290	311.795	1299.989	4.295	-1.196	4.295	4.459	344.440	0.104
1400.000	0.263	309.209	1399.987	4.609	-1.562	4.609	4.867	341.274	0.029
1500.000	0.034	157.116	1499.987	4.727	-1.729	4.727	5.033	339.910	0.293
1600.000	0.058	107.111	1599.987	4.685	-1.669	4.685	4.973	340.392	0.045
1700.000	0.248	59.688	1699.987	4.779	-1.434	4.779	4.990	343.301	0.213
1800.000	0.377	116.933	1799.985	4.739	-0.953	4.739	4.834	348.626	0.320
1900.000	0.353	80.669	1899.984	4.640	-0.356	4.640	4.654	355.618	0.229
2000.000	0.882	128.858	1999.978	4.207	0.548	4.207	4.243	7.420	0.698
2100.000	0.875	89.891	2099.967	3.726	1.911	3.726	4.187	27.153	0.586
2200.000	0.869	66.264	2199.956	4.033	3.369	4.033	5.254	39.874	0.357
2300.000	1.294	25.321	2299.939	5.358	4.545	5.358	7.026	40.309	0.855
2400.000	1.373	348.809	2399.914	7.554	4.796	7.554	8.948	32.411	0.839
2500.000	1.458	21.589	2499.885	9.912	5.031	9.912	11.116	26.912	0.803
2600.000	1.446	26.806	2599.853	12.221	6.069	12.221	13.645	26.407	0.133
2700.000	1.258	40.609	2699.825	14.181	7.352	14.181	15.974	27.405	0.375
2800.000	0.946	48.895	2799.807	15.557	8.689	15.557	17.819	29.184	0.350
2900.000	0.969	59.167	2899.793	16.533	10.037	16.533	19.341	31.260	0.173
3000.000	1.050	75.400	2999.777	17.198	11.649	17.198	20.772	34.113	0.296
3100.000	0.997	93.684	3099.762	17.373	13.404	17.373	21.943	37.653	0.329
3200.000	0.861	68.372	3199.749	17.594	14.971	17.594	23.101	40.395	0.428

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
3300.000	1.401	25.311	3299.731	18.975	16.192	18.975	24.945	40.474	0.970
3400.000	1.843	355.521	3399.692	21.683	16.588	21.683	27.301	37.417	0.937
3500.000	1.699	358.800	3499.644	24.768	16.432	24.768	29.723	33.561	0.176
3600.000	1.818	16.711	3599.598	27.769	16.857	27.769	32.485	31.259	0.560
3700.000	1.689	7.796	3699.551	30.749	17.513	30.749	35.386	29.664	0.301
3800.000	2.016	28.456	3799.500	33.755	18.551	33.755	38.517	28.792	0.738
3900.000	2.026	18.769	3899.438	36.975	19.958	36.975	42.018	28.358	0.341
4000.000	2.158	0.967	3999.373	40.532	20.558	40.532	45.448	26.895	0.660
4100.000	2.595	351.758	4099.287	44.655	20.265	44.655	49.038	24.410	0.579
4200.000	3.581	352.784	4199.140	49.993	19.549	49.993	53.680	21.357	0.987
4300.000	3.613	344.420	4298.944	56.127	18.310	56.127	59.038	18.068	0.525
4400.000	3.515	344.099	4398.751	62.110	16.624	62.110	64.296	14.984	0.100
4500.000	3.738	329.525	4498.553	67.867	14.131	67.867	69.323	11.762	0.946
4600.000	4.196	326.732	4598.313	73.736	10.471	73.736	74.475	8.082	0.498
4700.000	4.043	330.752	4698.055	79.870	6.741	79.870	80.154	4.825	0.327
4800.000	3.507	336.775	4797.838	85.756	3.813	85.756	85.841	2.546	0.666
4900.000	3.359	335.049	4897.658	91.223	1.371	91.223	91.234	0.861	0.180
5000.000	2.762	333.917	4997.515	96.044	-0.924	96.044	96.048	359.449	0.600
5100.000	2.205	348.035	5097.422	100.090	-2.382	100.090	100.118	358.637	0.823
5200.000	1.447	329.103	5197.371	103.055	-3.429	103.055	103.112	358.094	0.959
5300.000	1.003	289.991	5297.350	104.438	-4.900	104.438	104.553	357.314	0.920
5400.000	0.617	292.341	5397.339	104.942	-6.221	104.942	105.126	356.608	0.388
5500.000	0.401	238.750	5497.336	104.965	-7.017	104.965	105.199	356.175	0.498
5600.000	0.144	357.559	5597.335	104.909	-7.322	104.909	105.164	356.008	0.487
5700.000	0.142	32.402	5697.335	105.140	-7.261	105.140	105.390	356.050	0.086
5800.000	0.222	99.916	5797.335	105.211	-7.004	105.211	105.444	356.191	0.213
5900.000	0.508	146.809	5897.333	104.807	-6.571	104.807	105.013	356.413	0.391
6000.000	0.549	141.990	5997.328	104.059	-6.033	104.059	104.233	356.682	0.061
6100.000	0.155	203.047	6097.326	103.557	-5.791	103.557	103.719	356.799	0.493
6200.000	0.297	124.484	6197.326	103.286	-5.631	103.286	103.439	356.880	0.306
6300.000	0.330	70.601	6297.325	103.234	-5.146	103.234	103.363	357.146	0.285
6400.000	0.246	107.798	6397.323	103.264	-4.670	103.264	103.370	357.411	0.200
6500.000	0.590	99.397	6497.321	103.115	-3.957	103.115	103.191	357.802	0.349
6600.000	0.461	104.883	6597.316	102.927	-3.060	102.927	102.973	358.297	0.138
6700.000	0.508	100.513	6697.313	102.743	-2.235	102.743	102.767	358.754	0.060
HORIZONTAL DISPLACEMENT IS 102.767 FEET AT 358.754 DEGREES									