



Company: Noble Energy
Well: J Alles 1
API: 05-123-10996
Rig Name: Production/Lighting Wireline
State/County: Colorado/Weld
Latitude: 40.361, Longitude: -104.675
GRID North is 0.530 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_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 1/29/2013 / 11:35

Vaughn Energy Services
Henderson, CO
303-853-4976
Levi Sheldon

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	0.162	127.571	100.000	-0.086	0.112	-0.086	0.141	127.571	0.162
200.000	0.290	163.978	199.999	-0.416	0.294	-0.416	0.509	144.742	0.186
300.000	0.270	117.226	299.998	-0.767	0.574	-0.767	0.958	143.208	0.223
400.000	0.311	137.699	399.997	-1.075	0.966	-1.075	1.445	138.071	0.111
500.000	0.048	172.259	499.996	-1.317	1.154	-1.317	1.751	138.785	0.272
600.000	0.059	201.674	599.996	-1.407	1.140	-1.407	1.811	140.977	0.029
700.000	0.048	152.443	699.996	-1.493	1.141	-1.493	1.879	142.611	0.046
800.000	0.165	1.045	799.996	-1.386	1.163	-1.386	1.809	140.002	0.209
900.000	0.206	343.224	899.996	-1.070	1.114	-1.070	1.545	133.854	0.070
1000.000	0.290	312.959	999.995	-0.726	0.877	-0.726	1.138	129.615	0.153
1100.000	0.304	346.892	1099.993	-0.295	0.632	-0.295	0.697	115.037	0.174
1200.000	0.331	284.304	1199.992	0.035	0.291	0.035	0.293	83.176	0.331
1300.000	0.429	312.521	1299.990	0.359	-0.265	0.359	0.446	323.604	0.208
1400.000	0.434	312.160	1399.987	0.866	-0.821	0.866	1.193	316.527	0.006
1500.000	0.170	322.157	1499.986	1.237	-1.192	1.237	1.718	316.050	0.268
1600.000	0.450	311.534	1599.984	1.614	-1.577	1.614	2.257	315.665	0.285
1700.000	0.141	276.018	1699.983	1.887	-1.993	1.887	2.745	313.433	0.345
1800.000	0.327	237.558	1799.982	1.747	-2.357	1.747	2.934	306.547	0.234
1900.000	0.519	248.680	1899.979	1.429	-3.019	1.429	3.340	295.330	0.208
2000.000	0.316	252.849	1999.976	1.183	-3.705	1.183	3.889	287.710	0.204
2100.000	0.429	227.120	2099.974	0.847	-4.243	0.847	4.327	281.290	0.199
2200.000	0.611	205.747	2199.970	0.112	-4.749	0.112	4.750	271.353	0.263
2300.000	0.676	210.916	2299.964	-0.874	-5.284	-0.874	5.355	260.604	0.087
2400.000	0.824	209.277	2399.955	-2.008	-5.938	-2.008	6.269	251.320	0.150
2500.000	0.856	196.951	2499.945	-3.350	-6.508	-3.350	7.320	242.764	0.183
2600.000	0.943	194.553	2599.932	-4.861	-6.933	-4.861	8.467	234.963	0.094
2700.000	0.794	204.295	2699.921	-6.289	-7.424	-6.289	9.730	229.734	0.209
2800.000	0.706	193.451	2799.912	-7.519	-7.853	-7.519	10.872	226.242	0.167
2900.000	0.719	184.080	2899.905	-8.745	-8.041	-8.745	11.879	222.599	0.117
3000.000	0.762	176.781	2999.896	-10.035	-8.048	-10.035	12.863	218.730	0.104
3100.000	0.719	183.373	3099.888	-11.326	-8.048	-11.326	13.894	215.396	0.095
3200.000	0.385	168.370	3199.883	-12.281	-8.017	-12.281	14.666	213.136	0.362
3300.000	0.447	252.332	3299.881	-12.728	-8.321	-12.728	15.207	213.175	0.558
3400.000	0.687	310.252	3399.877	-12.459	-9.151	-12.459	15.459	216.295	0.588

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
3500.000	0.726	316.175	3499.870	-11.615	-10.047	-11.615	15.357	220.859	0.083
3600.000	0.854	309.091	3599.860	-10.688	-11.064	-10.688	15.383	225.991	0.161
3700.000	1.018	307.661	3699.847	-9.675	-12.346	-9.675	15.685	231.914	0.165
3800.000	0.880	312.626	3799.833	-8.613	-13.614	-8.613	16.109	237.680	0.161
3900.000	1.052	296.852	3899.819	-7.678	-14.997	-7.678	16.849	242.888	0.315
4000.000	0.977	308.774	3999.803	-6.730	-16.481	-6.730	17.802	247.788	0.223
4100.000	1.143	284.884	4099.787	-5.939	-18.110	-5.939	19.059	251.842	0.468
4200.000	1.631	286.004	4199.757	-5.291	-20.442	-5.291	21.116	255.489	0.488
4300.000	1.647	276.649	4299.716	-4.732	-23.237	-4.732	23.714	258.489	0.268
4400.000	1.650	298.638	4399.676	-3.876	-25.928	-3.876	26.216	261.498	0.629
4500.000	1.690	315.668	4499.634	-2.131	-28.223	-2.131	28.303	265.682	0.496
4600.000	1.818	326.860	4599.588	0.252	-30.120	0.252	30.121	270.480	0.365
4700.000	1.203	318.952	4699.552	2.372	-31.677	2.372	31.765	274.282	0.648
4800.000	1.250	326.009	4799.530	4.067	-32.975	4.067	33.225	277.032	0.158
4900.000	1.181	326.482	4899.507	5.831	-34.154	5.831	34.648	279.688	0.070
5000.000	0.494	308.654	4999.496	6.959	-35.060	6.959	35.744	281.227	0.727
5100.000	0.338	151.490	5099.495	6.969	-35.255	6.969	35.937	281.181	0.816
5200.000	0.283	141.202	5199.493	6.516	-34.959	6.516	35.562	280.559	0.078
5300.000	0.646	227.983	5299.491	5.946	-35.223	5.946	35.721	279.583	0.690
5400.000	0.640	184.024	5399.485	5.012	-35.681	5.012	36.031	277.996	0.481
5500.000	0.400	137.584	5499.481	4.196	-35.484	4.196	35.732	276.745	0.466
5600.000	0.437	103.629	5599.479	3.849	-34.878	3.849	35.089	276.297	0.247
5700.000	0.772	106.159	5699.473	3.571	-33.860	3.571	34.047	276.021	0.336
5800.000	0.762	106.337	5799.464	3.196	-32.574	3.196	32.731	275.604	0.010
5900.000	0.392	92.012	5899.459	2.997	-31.594	2.997	31.736	275.420	0.394
6000.000	0.599	82.200	5999.455	3.056	-30.733	3.056	30.885	275.679	0.223
6100.000	0.443	88.631	6099.451	3.137	-29.828	3.137	29.993	276.003	0.166
6200.000	0.424	98.689	6199.448	3.090	-29.076	3.090	29.240	276.066	0.078
6300.000	0.556	82.951	6299.445	3.093	-28.229	3.093	28.398	276.254	0.187
6400.000	0.580	81.311	6399.440	3.229	-27.247	3.229	27.438	276.759	0.030
6500.000	0.714	105.826	6499.433	3.136	-26.147	3.136	26.334	276.839	0.305
6600.000	0.584	99.088	6599.427	2.885	-25.044	2.885	25.209	276.572	0.151
6700.000	0.545	90.220	6699.422	2.803	-24.065	2.803	24.227	276.644	0.096
6800.000	0.594	89.096	6799.417	2.809	-23.070	2.809	23.241	276.943	0.050
6900.000	0.733	50.219	6899.411	3.227	-22.061	3.227	22.295	278.321	0.460
7000.000	0.553	70.074	6999.405	3.800	-21.116	3.800	21.455	280.202	0.284
HORIZONTAL DISPLACEMENT IS 21.455 FEET AT 280.202 DEGREES									