



Company: Noble Energy
Well: Lucci B 1-23
API: 05-123-21508
Rig Name: Production/Lightning Wireline
State/County: Colorado/Weld
Latitude: 40.425, Longitude: -104.494
GRID North is 0.650 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_run02-01_ed_mrg.ut

Minimum Curvature Method

Report Date/Time: 11/17/2012 / 01:07

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	0.419	102.692	99.999	-0.080	0.357	-0.080	0.366	102.692	0.419
200.000	0.327	135.528	199.997	-0.364	0.913	-0.364	0.983	111.741	0.229
300.000	0.287	139.417	299.996	-0.758	1.276	-0.758	1.484	120.711	0.045
400.000	0.546	113.724	399.993	-1.140	1.875	-1.140	2.194	121.298	0.313
500.000	0.333	84.638	499.990	-1.304	2.600	-1.304	2.909	116.638	0.302
600.000	1.149	136.304	599.982	-2.002	3.582	-2.002	4.104	119.200	0.978
700.000	1.073	121.639	699.963	-3.218	5.072	-3.218	6.007	122.395	0.294
800.000	1.201	127.162	799.943	-4.342	6.704	-4.342	7.987	122.931	0.168
900.000	1.509	140.685	899.916	-5.994	8.373	-5.994	10.297	125.596	0.442
1000.000	1.147	141.327	999.889	-7.794	9.832	-7.794	12.547	128.402	0.363
1100.000	1.170	137.065	1099.868	-9.322	11.153	-9.322	14.536	129.890	0.089
1200.000	1.125	148.072	1199.848	-10.902	12.367	-10.902	16.487	131.398	0.224
1300.000	1.045	144.519	1299.830	-12.478	13.416	-12.478	18.322	132.926	0.104
1400.000	1.220	146.837	1399.811	-14.112	14.528	-14.112	20.254	134.169	0.181
1500.000	0.979	132.912	1499.792	-15.585	15.736	-15.585	22.148	134.725	0.359
1600.000	0.614	119.868	1599.783	-16.434	16.826	-16.434	23.520	134.324	0.405
1700.000	0.877	104.877	1699.774	-16.897	18.030	-16.897	24.710	133.142	0.326
1800.000	0.932	82.751	1799.762	-16.991	19.577	-16.991	25.922	130.955	0.351
1900.000	0.779	43.816	1899.752	-16.398	20.854	-16.398	26.529	128.179	0.588
2000.000	0.837	39.811	1999.742	-15.346	21.792	-15.346	26.653	125.154	0.081
2100.000	0.670	58.420	2099.733	-14.479	22.758	-14.479	26.973	122.466	0.294
2200.000	0.798	50.601	2199.725	-13.731	23.794	-13.731	27.472	119.987	0.162
2300.000	0.679	58.060	2299.717	-12.975	24.836	-12.975	28.021	117.583	0.153
2400.000	0.682	59.798	2399.710	-12.362	25.853	-12.362	28.657	115.555	0.021
2500.000	0.771	53.333	2499.702	-11.661	26.907	-11.661	29.325	113.430	0.121
2600.000	0.779	44.225	2599.692	-10.771	27.921	-10.771	29.927	111.095	0.123
2700.000	0.898	57.384	2699.682	-9.861	29.056	-9.861	30.684	108.747	0.226
2800.000	0.976	74.346	2799.669	-9.209	30.536	-9.209	31.895	106.782	0.287
2900.000	1.046	91.661	2899.653	-9.006	32.268	-9.006	33.501	105.594	0.312
3000.000	0.672	79.184	2999.642	-8.922	33.756	-8.922	34.915	104.806	0.416
3100.000	0.729	94.718	3099.635	-8.865	34.966	-8.865	36.072	104.226	0.198
3200.000	0.533	97.577	3199.629	-8.978	36.060	-8.978	37.161	103.981	0.199
3300.000	0.123	154.256	3299.627	-9.137	36.568	-9.137	37.692	104.028	0.476
3400.000	0.475	170.151	3399.625	-9.642	36.686	-9.642	37.932	104.726	0.358

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	0.539	163.406	3499.621	-10.501	36.891	-10.501	38.357	105.890	0.088
3600.000	0.387	199.980	3599.618	-11.270	36.910	-11.270	38.592	106.979	0.325
3700.000	0.560	130.907	3699.616	-11.907	37.164	-11.907	39.025	107.765	0.555
3800.000	0.787	69.477	3799.610	-11.986	38.176	-11.986	40.014	107.430	0.715
3900.000	1.130	38.487	3899.596	-10.974	39.433	-10.974	40.931	105.551	0.609
4000.000	1.300	47.148	3999.574	-9.431	40.878	-9.431	41.952	102.991	0.250
4100.000	1.362	28.787	4099.547	-7.618	42.282	-7.618	42.962	100.213	0.429
4200.000	1.276	39.234	4199.521	-5.713	43.558	-5.713	43.932	97.472	0.255
4300.000	1.054	47.067	4299.500	-4.224	44.937	-4.224	45.135	95.370	0.273
4400.000	0.759	70.817	4399.488	-3.380	46.236	-3.380	46.359	94.181	0.472
4500.000	0.904	129.753	4499.479	-3.666	47.468	-3.666	47.609	94.417	0.828
4600.000	0.981	131.623	4599.466	-4.740	48.714	-4.740	48.944	95.557	0.083
4700.000	0.802	139.100	4699.453	-5.837	49.812	-5.837	50.153	96.683	0.213
4800.000	0.730	150.810	4799.445	-6.922	50.581	-6.922	51.053	97.793	0.172
4900.000	1.101	305.774	4899.439	-6.916	50.112	-6.916	50.587	97.858	1.789
5000.000	2.583	330.777	4999.386	-4.388	48.233	-4.388	48.432	95.199	1.652
5100.000	2.806	335.775	5099.276	-0.190	46.128	-0.190	46.129	90.236	0.324
5200.000	2.888	344.540	5199.153	4.470	44.453	4.470	44.677	84.258	0.442
5300.000	3.346	335.376	5299.005	9.550	42.565	9.550	43.624	77.354	0.676
5400.000	3.661	326.595	5398.819	14.869	39.592	14.869	42.292	69.416	0.621
5500.000	3.688	317.861	5498.614	19.919	35.676	19.919	40.860	60.825	0.560
5600.000	2.744	316.664	5598.456	24.044	31.876	24.044	39.927	52.972	0.946
5700.000	1.787	321.438	5698.376	27.004	29.261	27.004	39.818	47.297	0.975
5800.000	1.375	336.608	5798.339	29.324	27.813	29.324	40.417	43.485	0.584
5900.000	0.897	349.963	5898.319	31.196	27.201	31.196	41.389	41.086	0.543
6000.000	0.595	352.798	5998.310	32.482	26.999	32.482	42.238	39.733	0.304
6100.000	0.521	349.383	6098.306	33.444	26.850	33.444	42.889	38.759	0.081
6200.000	0.358	27.603	6198.303	34.168	26.911	34.168	43.493	38.225	0.326
6300.000	0.652	26.989	6298.299	34.952	27.315	34.952	44.359	38.007	0.294
6316.000	0.645	26.350	6314.298	35.114	27.396	35.114	44.537	37.961	0.064

HORIZONTAL DISPLACEMENT IS
44.537 FEET AT 37.961 DEGREES