



Company: Noble Energy
 Well: Robert Powers USX X 27-5
 API: 05-123-25822
 Rig Name: Production/Lightning
 Location: Weld County, Colorado
 Latitude: 40.112, Longitude: -104.657
 GRID North is 0.540 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: 8/28/2012 / 12:52

Vaughn Energy Services

Henderson, CO.

Justin Williams

303-853-4976

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	0.578	299.630	99.998	0.249	-0.438	0.249	0.504	299.630	0.578
200.000	0.428	267.629	199.995	0.483	-1.250	0.483	1.340	291.142	0.313
300.000	0.229	19.899	299.994	0.656	-1.554	0.656	1.687	292.882	0.557
400.000	0.350	12.175	399.992	1.143	-1.422	1.143	1.824	308.801	0.127
500.000	0.465	315.231	499.990	1.730	-1.643	1.730	2.386	316.480	0.402
600.000	0.179	218.103	599.989	1.896	-2.025	1.896	2.774	313.107	0.518
700.000	0.405	339.801	699.988	2.104	-2.243	2.104	3.076	313.167	0.521
800.000	0.269	340.021	799.986	2.656	-2.445	2.656	3.611	317.367	0.135
900.000	0.566	337.007	899.984	3.332	-2.719	3.332	4.300	320.786	0.297
1000.000	0.620	345.841	999.978	4.311	-3.044	4.311	5.278	324.776	0.106
1100.000	0.476	297.133	1099.974	5.026	-3.546	5.026	6.151	324.792	0.471
1200.000	0.437	316.455	1199.971	5.491	-4.179	5.491	6.901	322.731	0.158
1300.000	0.920	330.515	1299.964	6.467	-4.836	6.467	8.075	323.207	0.508
1400.000	0.949	328.676	1399.951	7.873	-5.662	7.873	9.697	324.277	0.041
1500.000	0.910	321.735	1499.937	9.204	-6.584	9.204	11.316	324.420	0.119
1600.000	0.748	336.162	1599.927	10.424	-7.340	10.424	12.749	324.849	0.263
1700.000	0.876	331.608	1699.917	11.693	-7.967	11.693	14.149	325.732	0.144
1800.000	1.163	340.442	1799.901	13.322	-8.670	13.322	15.895	326.943	0.326
1900.000	1.032	335.124	1899.883	15.096	-9.389	15.096	17.777	328.120	0.166
2000.000	1.180	320.712	1999.864	16.710	-10.420	16.710	19.692	328.053	0.314
2100.000	1.130	322.761	2099.844	18.291	-11.668	18.291	21.696	327.466	0.065
2200.000	1.184	296.934	2199.824	19.544	-13.186	19.544	23.576	325.993	0.520
2300.000	0.938	299.021	2299.807	20.409	-14.823	20.409	25.224	324.009	0.249
2400.000	0.604	280.194	2399.798	20.900	-16.058	20.900	26.356	322.463	0.415
2500.000	0.497	275.909	2499.793	21.038	-17.009	21.038	27.054	321.044	0.115
2600.000	0.137	344.184	2599.792	21.198	-17.473	21.198	27.471	320.501	0.464
2700.000	0.349	160.470	2699.791	21.026	-17.404	21.026	27.295	320.384	0.486
2800.000	0.264	166.965	2799.790	20.514	-17.251	20.514	26.803	319.940	0.091
2900.000	0.407	93.363	2899.789	20.269	-16.844	20.269	26.354	320.273	0.418
3000.000	0.280	50.289	2999.787	20.404	-16.301	20.404	26.116	321.379	0.279
3100.000	0.373	95.959	3099.785	20.527	-15.789	20.527	25.897	322.433	0.268
3200.000	0.264	79.109	3199.784	20.537	-15.239	20.537	25.573	323.423	0.143
3300.000	0.309	36.859	3299.783	20.796	-14.851	20.796	25.554	324.467	0.211
3400.000	0.373	61.633	3399.781	21.166	-14.403	21.166	25.602	325.765	0.159

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	0.325	68.984	3499.779	21.422	-13.852	21.422	25.511	327.113	0.065
3600.000	0.405	56.794	3599.777	21.718	-13.291	21.718	25.462	328.534	0.111
3700.000	0.363	45.920	3699.775	22.132	-12.767	22.132	25.551	330.020	0.084
3800.000	0.392	47.713	3799.773	22.582	-12.287	22.582	25.709	331.450	0.031
3900.000	0.243	31.694	3899.771	22.993	-11.922	22.993	25.900	332.593	0.171
4000.000	0.198	323.256	3999.771	23.312	-11.914	23.312	26.180	332.930	0.251
4100.000	0.322	273.486	4099.770	23.467	-12.297	23.467	26.494	332.345	0.246
4200.000	0.236	296.277	4199.769	23.576	-12.762	23.576	26.808	331.573	0.139
4300.000	0.632	253.167	4299.766	23.507	-13.474	23.507	27.095	330.178	0.488
4400.000	0.431	231.350	4399.761	23.112	-14.296	23.112	27.176	328.261	0.282
4500.000	0.561	225.692	4499.758	22.536	-14.940	22.536	27.038	326.458	0.139
4600.000	0.545	268.998	4599.753	22.185	-15.765	22.185	27.217	324.602	0.408
4700.000	0.645	261.484	4699.748	22.094	-16.797	22.094	27.754	322.755	0.127
4800.000	0.190	150.978	4799.746	21.865	-17.274	21.865	27.865	321.691	0.734
4900.000	0.286	106.575	4899.745	21.649	-16.954	21.649	27.497	321.935	0.201
5000.000	1.191	69.014	4999.736	21.950	-15.744	21.950	27.013	324.350	0.980
5100.000	1.790	50.681	5099.702	23.312	-13.565	23.312	26.971	329.804	0.758
5200.000	1.976	46.029	5199.648	25.498	-11.117	25.498	27.816	336.444	0.241
5300.000	1.733	53.890	5299.596	27.586	-8.654	27.586	28.912	342.582	0.352
5400.000	1.215	46.633	5399.563	29.205	-6.662	29.205	29.956	347.150	0.549
5500.000	0.998	40.149	5499.544	30.599	-5.330	30.599	31.060	350.120	0.250
5600.000	0.807	41.618	5599.532	31.792	-4.300	31.792	32.081	352.296	0.193
5700.000	0.716	42.045	5699.523	32.782	-3.414	32.782	32.959	354.054	0.090
5800.000	0.755	41.172	5799.515	33.742	-2.562	33.742	33.839	355.658	0.040
5900.000	0.519	51.244	5899.508	34.521	-1.775	34.521	34.567	357.056	0.260
6000.000	0.415	45.058	5999.505	35.060	-1.166	35.060	35.080	358.095	0.115
6100.000	0.349	258.482	6099.504	35.255	-1.208	35.255	35.276	358.038	0.732
6200.000	1.073	242.972	6199.496	34.769	-2.340	34.769	34.848	356.150	0.743
6300.000	1.018	248.477	6299.479	34.018	-4.001	34.018	34.252	353.293	0.115
6400.000	1.088	246.414	6399.462	33.312	-5.697	33.312	33.795	350.295	0.080
6500.000	1.447	251.553	6499.438	32.532	-7.765	32.532	33.446	346.576	0.376
6600.000	1.788	235.867	6599.398	31.258	-10.253	31.258	32.897	341.839	0.556
6700.000	1.769	247.268	6699.350	29.786	-12.968	29.786	32.487	336.472	0.354
6800.000	1.559	245.117	6799.308	28.617	-15.626	28.617	32.605	331.363	0.219
6900.000	1.147	228.200	6899.281	27.377	-17.607	27.377	32.550	327.254	0.570
7000.000	1.898	246.012	6999.245	26.037	-19.866	26.037	32.750	322.656	0.879
7100.000	2.753	235.414	7099.162	24.000	-23.356	24.000	33.489	315.779	0.954
7200.000	3.572	229.479	7199.009	20.613	-27.702	20.613	34.529	306.653	0.881

HORIZONTAL DISPLACEMENT IS
34.529 FEET AT 306.653 DEGREES