



Company: Noble Energy
Lease/Well: UPRC 17-/12 Q
API#: 05-123-17325
Rig Name: Production/Lightning
State/County: Colorado/Weld
Latitude: 40.137, Longitude: -104.581
GRID North is 0.590 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_ed.ut

Minimum Curvature Method

Report Date/Time: 3/21/2012 / 11:29

Vaughn Energy Services
Henderson, Colorado
303-853-4976
Troy Hardin

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	0.236	126.959	100.000	-0.124	0.164	-0.124	0.206	126.959	0.236
200.000	0.286	124.822	199.999	-0.390	0.533	-0.390	0.661	126.152	0.051
300.000	0.244	129.417	299.998	-0.668	0.903	-0.668	1.123	126.475	0.047
400.000	0.133	124.272	399.997	-0.868	1.164	-0.868	1.452	126.730	0.112
500.000	0.065	105.416	499.997	-0.949	1.314	-0.949	1.621	125.829	0.075
600.000	0.203	202.527	599.997	-1.128	1.301	-1.128	1.722	130.933	0.221
700.000	0.772	294.016	699.993	-1.018	0.617	-1.018	1.190	148.775	0.804
800.000	1.002	288.504	799.981	-0.466	-0.828	-0.466	0.950	240.642	0.245
900.000	0.773	300.623	899.969	0.155	-2.238	0.155	2.243	273.972	0.295
1000.000	0.865	286.592	999.959	0.715	-3.542	0.715	3.613	281.406	0.220
1100.000	1.088	289.232	1099.945	1.243	-5.161	1.243	5.309	283.538	0.228
1200.000	1.020	298.595	1199.928	1.981	-6.839	1.981	7.120	286.157	0.185
1300.000	0.988	297.253	1299.913	2.802	-8.387	2.802	8.842	288.475	0.039
1400.000	0.953	292.747	1399.898	3.519	-9.920	3.519	10.526	289.528	0.084
1500.000	0.857	295.063	1499.886	4.157	-11.365	4.157	12.102	290.091	0.103
1600.000	0.882	309.090	1599.874	4.959	-12.640	4.959	13.578	291.422	0.214
1700.000	0.771	305.499	1699.864	5.835	-13.785	5.835	14.969	292.942	0.122
1800.000	0.753	288.793	1799.855	6.437	-14.955	6.437	16.281	293.289	0.222
1900.000	0.558	287.209	1899.849	6.793	-16.042	6.793	17.421	292.950	0.197
2000.000	0.645	289.237	1999.843	7.122	-17.038	7.122	18.467	292.686	0.090
2100.000	0.487	295.590	2099.838	7.491	-17.953	7.491	19.453	292.650	0.171
2200.000	0.523	305.013	2199.834	7.937	-18.710	7.937	20.324	292.987	0.091
2300.000	0.616	312.872	2299.829	8.565	-19.478	8.565	21.278	293.735	0.121
2400.000	0.808	337.189	2399.822	9.581	-20.146	9.581	22.308	295.434	0.354
2500.000	0.989	343.484	2499.809	11.058	-20.664	11.058	23.437	298.153	0.206
2600.000	1.234	343.926	2599.791	12.921	-21.208	12.921	24.834	301.352	0.245
2700.000	1.227	358.328	2699.768	15.026	-21.537	15.026	26.261	304.903	0.309
2800.000	1.322	11.881	2799.743	17.226	-21.331	17.226	27.418	308.923	0.315
2900.000	1.301	31.979	2899.718	19.318	-20.492	19.318	28.162	313.310	0.458
3000.000	1.462	33.803	2999.688	21.341	-19.181	21.341	28.694	318.051	0.167
3100.000	1.504	37.439	3099.655	23.443	-17.674	23.443	29.359	322.987	0.103
3200.000	1.391	39.667	3199.623	25.419	-16.101	25.419	30.090	327.649	0.126
3300.000	1.425	46.306	3299.593	27.213	-14.428	27.213	30.801	332.068	0.166
3400.000	1.362	48.344	3399.563	28.862	-12.640	28.862	31.508	336.348	0.080

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	1.234	51.944	3499.538	30.316	-10.904	30.316	32.217	340.217	0.152
3600.000	1.199	55.774	3599.515	31.568	-9.191	31.568	32.879	343.767	0.089
3700.000	0.769	27.132	3699.501	32.753	-8.020	32.753	33.721	346.241	0.641
3800.000	0.858	0.596	3799.491	34.099	-7.707	34.099	34.959	347.265	0.383
3900.000	0.720	13.894	3899.482	35.457	-7.548	35.457	36.252	347.983	0.228
4000.000	0.676	59.793	3999.475	36.364	-6.887	36.364	37.011	349.275	0.546
4100.000	0.645	67.774	4099.468	36.874	-5.856	36.874	37.336	350.976	0.097
4200.000	0.495	97.374	4199.464	37.032	-4.907	37.032	37.355	352.452	0.326
4300.000	0.458	151.015	4299.461	36.626	-4.285	36.626	36.876	353.327	0.431
4400.000	0.561	151.573	4399.457	35.846	-3.858	35.846	36.053	353.857	0.103
4500.000	0.516	142.684	4499.452	35.057	-3.352	35.057	35.217	354.538	0.095
4600.000	0.674	137.050	4599.447	34.269	-2.679	34.269	34.374	355.531	0.168
4700.000	0.800	148.454	4699.439	33.244	-1.913	33.244	33.299	356.707	0.193
4800.000	1.238	160.477	4799.423	31.632	-1.187	31.632	31.654	357.851	0.485
4900.000	1.709	175.173	4899.390	29.128	-0.701	29.128	29.136	358.622	0.601
5000.000	2.231	181.149	4999.330	25.696	-0.614	25.696	25.703	358.631	0.560
5100.000	2.394	193.419	5099.249	21.718	-1.138	21.718	21.748	357.001	0.520
5200.000	2.144	196.530	5199.171	17.894	-2.155	17.894	18.023	353.134	0.278
5300.000	2.249	197.596	5299.098	14.230	-3.280	14.230	14.603	347.020	0.112
5400.000	1.925	192.474	5399.031	10.720	-4.236	10.720	11.527	338.439	0.374
5500.000	1.202	195.660	5498.993	8.070	-4.882	8.070	9.432	328.829	0.727
5600.000	0.997	176.792	5598.975	6.191	-5.116	6.191	8.032	320.429	0.413
5700.000	0.766	165.151	5698.963	4.676	-4.896	4.676	6.770	313.680	0.291
5800.000	0.800	169.418	5798.954	3.343	-4.597	3.343	5.684	306.029	0.067
5900.000	1.084	188.195	5898.941	1.721	-4.603	1.721	4.915	290.503	0.416
6000.000	1.007	198.625	5998.924	-0.047	-5.019	-0.047	5.019	269.461	0.205
6100.000	0.479	185.126	6098.915	-1.296	-5.337	-1.296	5.492	256.348	0.553
6200.000	0.067	188.179	6198.914	-1.771	-5.383	-1.771	5.666	251.791	0.412
6300.000	0.347	305.311	6298.913	-1.654	-5.638	-1.654	5.876	253.653	0.382
6400.000	0.680	25.284	6398.910	-0.942	-5.632	-0.942	5.710	260.501	0.707
6500.000	0.958	22.156	6498.900	0.368	-5.063	0.368	5.077	274.162	0.282
6600.000	1.284	63.228	6598.882	1.647	-3.748	1.647	4.094	293.730	0.843
6700.000	1.763	75.196	6698.847	2.545	-1.260	2.545	2.840	333.659	0.573
6800.000	1.771	62.749	6798.800	3.646	1.601	3.646	3.982	23.708	0.383
6900.000	1.809	87.476	6898.752	4.423	4.552	4.423	6.347	45.824	0.767
7000.000	1.447	78.023	6998.712	4.755	7.365	4.755	8.766	57.154	0.450
7100.000	1.160	47.946	7098.687	5.695	9.351	5.695	10.949	58.660	0.731
7200.000	0.999	40.099	7198.669	7.039	10.664	7.039	12.778	56.572	0.218
7300.000	0.752	34.330	7298.658	8.247	11.595	8.247	14.229	54.577	0.262
7400.000	0.862	38.637	7398.648	9.377	12.435	9.377	15.574	52.982	0.126
7500.000	0.977	22.055	7498.635	10.754	13.225	10.754	17.045	50.883	0.288
HORIZONTAL DISPLACEMENT IS 17.045 FEET AT 50.883 DEGREES									