

Company: Noble Energy

Lease/Well: UPRC / #23-10 I7

API: 05-123-18311

Rig Name: Production / Lightning Wireline

State/County: Colorado / Weld

Latitude: 40.293, Longitude: -104.859

GRID North is 0.410 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_recal_01_ed.ut

Minimum Curvature Method

Report Date/Time: 9/25/2012 / 00:44

Vaughn Energy Services

Henderson Colorado

866-835-8333

Norman Cowan

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	0.587	79.968	99.998	0.089	0.505	0.089	0.513	79.968	0.587
200.000	0.446	135.198	199.995	-0.097	1.284	-0.097	1.287	94.340	0.495
300.000	0.091	214.954	299.994	-0.438	1.513	-0.438	1.575	106.163	0.439
400.000	0.273	287.827	399.993	-0.430	1.240	-0.430	1.313	109.134	0.261
500.000	0.293	307.896	499.992	-0.200	0.811	-0.200	0.836	103.857	0.101
600.000	0.433	304.685	599.990	0.172	0.299	0.172	0.345	60.122	0.141
700.000	0.368	313.159	699.988	0.606	-0.246	0.606	0.654	337.947	0.087
800.000	0.378	271.033	799.986	0.832	-0.810	0.832	1.161	315.765	0.268
900.000	0.494	261.653	899.983	0.775	-1.567	0.775	1.749	296.323	0.136
1000.000	0.682	210.041	999.978	0.197	-2.292	0.197	2.301	274.916	0.540
1100.000	0.775	260.560	1099.971	-0.429	-3.257	-0.429	3.285	262.493	0.627
1200.000	0.805	238.371	1199.962	-0.908	-4.522	-0.908	4.613	258.642	0.305
1300.000	0.951	258.077	1299.950	-1.448	-5.932	-1.448	6.107	256.282	0.333
1400.000	0.673	228.920	1399.940	-2.005	-7.187	-2.005	7.462	254.409	0.490
1500.000	0.851	274.115	1499.932	-2.338	-8.370	-2.338	8.691	254.394	0.608
1600.000	0.554	284.588	1599.925	-2.163	-9.578	-2.163	9.819	257.274	0.323
1700.000	0.715	262.173	1699.919	-2.126	-10.664	-2.126	10.874	258.723	0.293
1800.000	1.084	281.620	1799.906	-2.021	-12.209	-2.021	12.375	260.602	0.474
1900.000	1.039	280.831	1899.889	-1.660	-14.026	-1.660	14.124	263.251	0.047
2000.000	1.046	286.507	1999.873	-1.230	-15.792	-1.230	15.840	265.546	0.103
2100.000	0.523	267.131	2099.863	-0.994	-17.124	-0.994	17.152	266.679	0.579
2200.000	0.925	334.887	2199.857	-0.286	-17.922	-0.286	17.924	269.087	0.873
2300.000	0.726	301.911	2299.847	0.780	-18.802	0.780	18.818	272.375	0.506
2400.000	0.557	253.616	2399.841	0.977	-19.806	0.977	19.830	272.825	0.547
2500.000	1.089	232.144	2499.831	0.257	-21.022	0.257	21.023	270.701	0.606
2600.000	0.746	243.476	2599.818	-0.617	-22.354	-0.617	22.363	268.420	0.386
2700.000	0.702	217.056	2699.810	-1.396	-23.306	-1.396	23.348	266.572	0.334
2800.000	0.714	242.559	2799.803	-2.172	-24.228	-2.172	24.325	264.877	0.313
2900.000	0.754	198.097	2899.795	-3.084	-24.985	-3.084	25.175	262.963	0.556
3000.000	0.434	219.921	2999.790	-4.000	-25.433	-4.000	25.745	261.062	0.386
3100.000	0.550	209.917	3099.786	-4.706	-25.915	-4.706	26.339	259.708	0.144
3200.000	0.601	267.207	3199.782	-5.147	-26.678	-5.147	27.170	259.080	0.553
3300.000	0.786	339.345	3299.776	-4.531	-27.444	-4.531	27.815	260.625	0.830
3400.000	1.292	353.133	3399.760	-2.770	-27.820	-2.770	27.958	264.315	0.560

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	1.592	351.331	3499.728	-0.277	-28.165	-0.277	28.166	269.436	0.304
3600.000	1.354	356.505	3599.695	2.276	-28.446	2.276	28.537	274.574	0.273
3700.000	1.341	336.916	3699.668	4.531	-28.977	4.531	29.329	278.887	0.459
3800.000	1.415	339.963	3799.639	6.767	-29.858	6.767	30.616	282.770	0.105
3900.000	1.393	337.638	3899.609	9.052	-30.744	9.052	32.049	286.406	0.061
4000.000	0.988	298.165	3999.588	10.583	-31.967	10.583	33.673	288.317	0.890
4100.000	0.874	279.824	4099.575	11.120	-33.479	11.120	35.277	288.374	0.317
4200.000	0.793	186.330	4199.569	10.562	-34.307	10.562	35.896	287.112	1.216
4300.000	1.257	227.415	4299.554	9.132	-35.191	9.132	36.356	284.548	0.841
4400.000	1.659	349.985	4399.537	9.815	-36.250	9.815	37.555	285.150	2.564
4500.000	7.019	9.663	4499.218	17.269	-35.476	17.269	39.456	295.955	5.485
4600.000	12.708	11.319	4597.699	34.090	-32.289	34.090	46.955	316.555	5.696
4700.000	15.525	14.577	4694.671	57.833	-26.761	57.833	63.724	335.169	2.926
4800.000	20.970	17.846	4789.609	87.841	-17.901	87.841	89.647	348.481	5.539
4900.000	25.474	19.727	4881.486	125.136	-5.152	125.136	125.243	357.642	4.563
5000.000	29.720	30.098	4970.140	166.868	14.557	166.868	167.502	4.986	6.398
5100.000	31.951	39.246	5056.047	208.834	43.748	208.834	213.367	11.832	5.187
5200.000	33.915	47.124	5140.013	248.330	80.953	248.330	261.191	18.055	4.708
5300.000	35.554	57.082	5222.257	283.142	125.843	283.142	309.848	23.963	5.900
5400.000	34.879	63.270	5303.980	311.812	175.803	311.812	357.957	29.415	3.630
5500.000	33.509	62.824	5386.692	337.281	225.899	337.281	405.942	33.813	1.393
5600.000	29.968	61.947	5471.724	361.642	272.512	361.642	452.822	36.999	3.571
5700.000	25.546	62.841	5560.196	383.241	313.759	383.241	495.296	39.307	4.442
5800.000	23.863	58.702	5651.047	403.594	350.233	403.594	534.370	40.951	2.413
5900.000	24.360	50.657	5742.347	427.184	383.475	427.184	574.055	41.914	3.321
6000.000	26.486	51.767	5832.659	454.061	416.944	454.061	616.452	42.560	2.178
6100.000	26.992	54.292	5921.968	481.107	452.887	481.107	660.735	43.269	1.243
6200.000	26.756	55.054	6011.169	507.245	489.765	507.245	705.101	43.996	0.417
6300.000	29.480	53.776	6099.359	534.685	528.074	534.685	751.499	44.644	2.790
6400.000	32.794	53.798	6184.940	565.230	569.789	565.230	802.586	45.230	3.314
6500.000	32.824	53.353	6268.989	597.402	613.387	597.402	856.232	45.756	0.243
6600.000	34.153	53.371	6352.387	630.328	657.661	630.328	910.951	46.216	1.329
6700.000	34.899	51.575	6434.775	664.855	702.601	664.855	967.306	46.581	1.262
6800.000	35.641	50.006	6516.420	701.361	747.334	701.361	1024.898	46.818	1.171
6900.000	36.475	50.751	6597.262	738.893	792.674	738.893	1083.649	47.011	0.942
7000.000	32.831	52.346	6679.511	774.272	837.170	774.272	1140.329	47.235	3.754
7100.000	27.191	52.244	6766.069	804.847	876.728	804.847	1190.139	47.448	5.641
7200.000	23.416	52.900	6856.458	830.833	910.653	830.833	1232.709	47.624	3.785
7300.000	18.999	53.854	6949.663	852.431	939.661	852.431	1268.700	47.787	4.430
7400.000	11.924	52.383	7045.983	868.358	961.015	868.358	1295.221	47.900	7.085
7500.000	6.043	52.269	7144.713	877.893	973.372	877.893	1310.782	47.952	5.882
7600.000	3.637	52.939	7244.349	883.027	980.067	883.027	1319.192	47.982	2.406
HORIZONTAL DISPLACEMENT IS 1319.192 FEET AT 47.982 DEGREES									