

Company: Noble Energy

Lease/Well: Schissler / 4-14

API: 05-123-16831

Rig Name: Production / Lightning Wireline

State/County: Colorado / Weld County

Latitude: 40.343, Longitude: -104.660

GRID North is 0.540 Degrees East of True North

VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-02_ed.ut

Minimum Curvature Method

Report Date/Time: 10/13/2011 / 16:08

Vaughn Energy Services

Henderson Colorado

866-835-8333

RKB = Ground Level

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	0.421	185.607	99.999	-0.365	-0.036	-0.365	0.367	185.607	0.421
200.000	0.306	181.559	199.997	-0.997	-0.079	-0.997	1.000	184.528	0.118
300.000	0.243	174.965	299.996	-1.475	-0.068	-1.475	1.477	182.624	0.070
400.000	0.446	112.373	399.994	-1.835	0.311	-1.835	1.861	170.388	0.398
500.000	0.715	110.569	499.989	-2.202	1.255	-2.202	2.535	150.326	0.270
600.000	0.994	113.422	599.978	-2.766	2.635	-2.766	3.821	136.390	0.282
700.000	1.545	112.457	699.953	-3.626	4.678	-3.626	5.919	127.785	0.551
800.000	1.899	118.000	799.908	-4.919	7.386	-4.919	8.874	123.663	0.390
900.000	2.313	123.158	899.840	-6.800	10.538	-6.800	12.542	122.835	0.455
1000.000	2.900	126.365	999.736	-9.404	14.265	-9.404	17.086	123.395	0.605
1100.000	3.693	130.342	1099.570	-12.989	18.756	-12.989	22.815	124.703	0.824
1200.000	3.786	134.870	1199.357	-17.403	23.550	-17.403	29.283	126.462	0.309
1300.000	4.874	133.379	1299.071	-22.649	28.978	-22.649	36.779	128.011	1.094
1400.000	4.853	133.856	1398.711	-28.497	35.115	-28.497	45.223	129.061	0.046
1500.000	4.582	136.888	1498.372	-34.343	40.895	-34.343	53.403	130.024	0.368
1600.000	4.361	145.021	1598.069	-40.375	45.804	-40.375	61.058	131.395	0.671
1700.000	3.702	143.342	1697.821	-46.080	49.911	-46.080	67.930	132.714	0.670
1800.000	2.993	143.819	1797.649	-50.777	53.380	-50.777	73.673	133.568	0.709
1900.000	2.080	137.141	1897.551	-54.215	56.155	-54.215	78.055	133.993	0.959
2000.000	1.561	121.064	1997.500	-56.247	58.556	-56.247	81.195	133.848	0.723
2100.000	1.386	140.130	2097.468	-57.878	60.498	-57.878	83.725	133.732	0.518
2200.000	1.379	150.522	2197.439	-59.854	61.865	-59.854	86.080	134.053	0.250
2300.000	1.278	150.878	2297.412	-61.875	63.000	-61.875	88.304	134.484	0.101
2400.000	1.098	151.149	2397.390	-63.689	64.006	-63.689	90.294	134.858	0.180
2500.000	0.699	151.853	2497.378	-65.067	64.756	-65.067	91.799	135.137	0.399
2600.000	0.579	151.384	2597.372	-66.048	65.286	-66.048	92.869	135.333	0.120
2700.000	0.495	141.527	2697.367	-66.830	65.797	-66.830	93.784	135.446	0.124
2800.000	0.425	167.847	2797.364	-67.531	66.144	-67.531	94.527	135.595	0.220
2900.000	0.385	196.429	2897.362	-68.216	66.127	-68.216	95.006	135.891	0.204
3000.000	0.689	192.478	2997.357	-69.126	65.902	-69.126	95.506	136.368	0.307
3100.000	1.030	200.381	3097.346	-70.556	65.459	-70.556	96.244	137.146	0.360
3200.000	1.318	230.882	3197.326	-72.124	64.253	-72.124	96.594	138.303	0.677
3300.000	1.022	231.068	3297.305	-73.411	62.667	-73.411	96.521	139.514	0.296
3400.000	1.202	254.613	3397.286	-74.249	60.962	-74.249	96.069	140.613	0.487

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	1.162	242.974	3497.265	-74.989	59.046	-74.989	95.445	141.783	0.243
3600.000	1.441	261.419	3597.240	-75.637	56.899	-75.637	94.649	143.047	0.500
3700.000	1.192	266.343	3697.213	-75.891	54.617	-75.891	93.502	144.258	0.273
3800.000	1.291	259.282	3797.190	-76.167	52.472	-76.167	92.492	145.437	0.182
3900.000	1.353	263.797	3897.163	-76.504	50.191	-76.504	91.499	146.733	0.121
4000.000	1.319	260.671	3997.136	-76.818	47.881	-76.818	90.519	148.065	0.080
4100.000	1.704	257.459	4097.101	-77.328	45.293	-77.328	89.616	149.641	0.394
4200.000	2.009	265.860	4197.049	-77.777	42.094	-77.777	88.438	151.577	0.408
4300.000	2.034	268.517	4296.987	-77.950	38.572	-77.950	86.971	153.673	0.097
4400.000	2.170	274.622	4396.919	-77.843	34.910	-77.843	85.313	155.845	0.262
4500.000	2.175	287.585	4496.848	-77.117	31.214	-77.117	83.195	157.964	0.490
4600.000	1.632	295.961	4596.793	-75.920	28.124	-75.920	80.962	159.673	0.609
4700.000	1.218	312.289	4696.762	-74.582	26.058	-74.582	79.003	160.741	0.576
4800.000	1.047	345.551	4796.743	-72.982	25.044	-72.982	77.160	161.061	0.669
4900.000	1.160	357.218	4896.725	-71.087	24.767	-71.087	75.278	160.792	0.251
5000.000	1.159	6.798	4996.705	-69.072	24.837	-69.072	73.402	160.222	0.194
5100.000	0.998	12.250	5096.687	-67.217	25.142	-67.217	71.765	159.492	0.190
5200.000	1.016	12.504	5196.671	-65.500	25.518	-65.500	70.296	158.715	0.018
5300.000	1.028	18.497	5296.656	-63.784	25.995	-63.784	68.878	157.827	0.108
5400.000	0.823	27.248	5396.643	-62.295	26.608	-62.295	67.740	156.871	0.248
5500.000	1.004	33.531	5496.630	-60.926	27.421	-60.926	66.813	155.769	0.206
5600.000	1.022	43.010	5596.614	-59.544	28.513	-59.544	66.019	154.412	0.168
5700.000	1.070	40.278	5696.598	-58.179	29.725	-58.179	65.333	152.936	0.069
5800.000	1.117	24.937	5796.580	-56.583	30.740	-56.583	64.394	151.486	0.296
5900.000	1.172	37.352	5896.560	-54.886	31.771	-54.886	63.418	149.935	0.253
6000.000	1.185	57.401	5996.539	-53.516	33.263	-53.516	63.011	148.137	0.410
6100.000	1.617	61.816	6096.509	-52.292	35.379	-52.292	63.136	145.920	0.445
6200.000	2.029	60.112	6196.458	-50.744	38.157	-50.744	63.489	143.058	0.415
6300.000	1.937	77.905	6296.399	-49.507	41.344	-49.507	64.501	140.134	0.620
6400.000	1.233	85.658	6396.360	-49.072	44.069	-49.072	65.956	138.074	0.734
6500.000	0.616	138.455	6496.348	-49.393	45.499	-49.393	67.155	137.350	0.990
6600.000	0.655	182.231	6596.343	-50.367	45.833	-50.367	68.099	137.698	0.475
6700.000	1.216	224.005	6696.330	-51.701	45.074	-51.701	68.590	138.917	0.848
6800.000	1.241	243.520	6796.308	-52.946	43.368	-52.946	68.441	140.679	0.417
6900.000	1.080	195.549	6896.289	-54.337	42.146	-54.337	68.766	142.201	0.955
6975.000	0.574	208.855	6971.281	-55.347	41.776	-55.347	69.343	142.955	0.717
HORIZONTAL DISPLACEMENT IS 69.343 FEET AT 142.955 DEGREES									