



Company: Noble Energy
Well: Trebor B11-17
API: 05-123-26658
Rig Name: Production / Lightning
State/County: Colorado/Weld
Latitude: 40.418, Longitude: -104.513
GRID North is 0.640 Degrees East of True North
VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Service Company : Vaughn Energy Services

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01.ut
Minimum Curvature Method
Report Date/Time: 2/14/2013 / 13:31

Vaughn Energy Services
Henderson, Colorado
(303) 853-4976
Robert Lampert

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	0.771	2.829	99.997	0.672	0.033	0.672	0.673	2.829	0.771
200.000	0.404	3.904	199.992	1.696	0.090	1.696	1.698	3.052	0.367
300.000	0.109	78.777	299.991	2.066	0.208	2.066	2.076	5.743	0.390
400.000	0.285	102.257	399.990	2.032	0.544	2.032	2.103	14.984	0.190
500.000	0.228	185.502	499.989	1.781	0.767	1.781	1.939	23.312	0.343
600.000	0.144	195.510	599.989	1.462	0.715	1.462	1.627	26.055	0.090
700.000	0.464	264.834	699.987	1.305	0.278	1.305	1.334	12.022	0.435
800.000	0.287	196.755	799.986	1.028	-0.198	1.028	1.047	349.113	0.445
900.000	0.033	67.805	899.985	0.799	-0.243	0.799	0.835	343.060	0.309
1000.000	0.395	205.853	999.985	0.500	-0.367	0.500	0.620	323.724	0.420
1100.000	0.326	168.086	1099.983	-0.088	-0.459	-0.088	0.467	259.103	0.242
1200.000	0.506	208.608	1199.980	-0.755	-0.611	-0.755	0.971	219.015	0.334
1300.000	0.504	211.784	1299.976	-1.517	-1.055	-1.517	1.847	214.818	0.028
1400.000	0.499	216.575	1399.972	-2.240	-1.546	-2.240	2.721	214.608	0.042
1500.000	0.264	238.919	1499.970	-2.708	-2.002	-2.708	3.368	216.476	0.273
1600.000	0.414	232.290	1599.968	-3.048	-2.485	-3.048	3.933	219.192	0.155
1700.000	0.492	206.572	1699.965	-3.653	-2.963	-3.653	4.704	219.047	0.215
1800.000	0.549	221.248	1799.961	-4.397	-3.471	-4.397	5.601	218.287	0.144
1900.000	0.542	215.281	1899.957	-5.143	-4.059	-5.143	6.552	218.286	0.057
2000.000	0.645	200.840	1999.952	-6.055	-4.533	-6.055	7.563	216.821	0.181
2100.000	0.970	221.749	2099.942	-7.212	-5.297	-7.212	8.948	216.295	0.434
2200.000	0.679	222.433	2199.931	-8.282	-6.261	-8.282	10.382	217.089	0.291
2300.000	0.340	220.865	2299.927	-8.944	-6.855	-8.944	11.269	217.469	0.339
2400.000	0.184	230.970	2399.926	-9.270	-7.174	-9.270	11.722	217.739	0.162
2500.000	0.185	163.333	2499.926	-9.526	-7.253	-9.526	11.973	217.286	0.206
2600.000	0.323	219.665	2599.925	-9.898	-7.387	-9.898	12.350	216.735	0.269
2700.000	0.591	149.167	2699.922	-10.558	-7.302	-10.558	12.837	214.670	0.571
2800.000	0.527	164.681	2799.917	-11.444	-6.916	-11.444	13.372	211.148	0.164
2900.000	0.209	179.943	2899.915	-12.070	-6.795	-12.070	13.851	209.378	0.330
3000.000	0.473	197.028	2999.913	-12.647	-6.916	-12.647	14.415	208.670	0.280
3100.000	0.176	216.947	3099.912	-13.165	-7.129	-13.165	14.971	208.436	0.313
3200.000	0.243	3.357	3199.911	-13.077	-7.209	-13.077	14.933	208.867	0.402
3300.000	0.381	235.151	3299.911	-13.056	-7.470	-13.056	15.042	209.776	0.565
3400.000	0.685	348.109	3399.908	-12.662	-7.866	-12.662	14.906	211.852	0.904

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	0.552	310.481	3499.903	-11.765	-8.356	-11.765	14.430	215.384	0.418
3600.000	0.991	299.453	3599.893	-11.027	-9.475	-11.027	14.538	220.671	0.462
3700.000	0.540	316.756	3699.884	-10.258	-10.551	-10.258	14.716	225.805	0.502
3800.000	0.728	349.354	3799.878	-9.290	-10.991	-9.290	14.391	229.793	0.399
3900.000	0.220	255.127	3899.876	-8.715	-11.294	-8.715	14.265	232.344	0.776
4000.000	0.359	125.437	3999.875	-8.946	-11.224	-8.946	14.353	231.444	0.527
4100.000	0.701	189.588	4099.871	-9.731	-11.071	-9.731	14.739	228.686	0.633
4200.000	1.117	156.173	4199.859	-11.226	-10.779	-11.226	15.563	223.837	0.657
4300.000	1.262	152.601	4299.838	-13.095	-9.878	-13.095	16.403	217.029	0.163
4400.000	1.777	158.447	4399.802	-15.515	-8.802	-15.515	17.838	209.566	0.537
4500.000	2.161	151.036	4499.743	-18.607	-7.319	-18.607	19.994	201.473	0.460
4600.000	2.070	153.226	4599.675	-21.869	-5.592	-21.869	22.572	194.345	0.121
4700.000	1.671	168.212	4699.622	-24.909	-4.481	-24.909	25.309	190.198	0.628
4800.000	1.450	153.578	4799.585	-27.469	-3.620	-27.469	27.707	187.507	0.454
4900.000	1.025	182.220	4899.563	-29.496	-3.092	-29.496	29.658	185.984	0.738
5000.000	0.857	170.908	4999.549	-31.128	-3.008	-31.128	31.273	185.520	0.250
5100.000	0.287	199.891	5099.544	-32.102	-2.975	-32.102	32.240	185.295	0.621
5200.000	0.361	221.891	5199.542	-32.573	-3.271	-32.573	32.736	185.735	0.143
5300.000	1.124	180.311	5299.534	-33.788	-3.487	-33.788	33.968	185.892	0.887
5400.000	1.102	209.238	5399.516	-35.609	-3.962	-35.609	35.829	186.349	0.557
5500.000	0.829	210.620	5499.501	-37.071	-4.800	-37.071	37.380	187.378	0.274
5600.000	1.054	194.229	5599.488	-38.585	-5.395	-38.585	38.960	187.959	0.349
5700.000	1.168	216.080	5699.470	-40.300	-6.221	-40.300	40.777	188.775	0.436
5800.000	0.981	196.328	5799.452	-41.945	-7.062	-41.945	42.535	189.557	0.412
5900.000	0.275	162.542	5899.446	-42.996	-7.230	-42.996	43.600	189.546	0.768
6000.000	0.604	226.623	5999.443	-43.587	-7.541	-43.587	44.235	189.816	0.543
6100.000	0.422	197.483	6099.439	-44.300	-8.035	-44.300	45.023	190.280	0.312
6200.000	0.281	100.963	6199.438	-44.698	-7.905	-44.698	45.392	190.029	0.533
6300.000	0.041	115.250	6299.438	-44.760	-7.632	-44.760	45.406	189.676	0.242
6400.000	0.325	160.309	6399.437	-45.042	-7.504	-45.042	45.663	189.459	0.297
6500.000	0.374	89.755	6499.436	-45.307	-7.082	-45.307	45.857	188.884	0.405
6600.000	0.347	173.349	6599.434	-45.607	-6.721	-45.607	46.100	188.383	0.481
6670.000	0.626	99.245	6669.432	-45.879	-6.319	-45.879	46.312	187.842	0.896
HORIZONTAL DISPLACEMENT IS 46.312 FEET AT 187.842 DEGREES									