



Company: Noble Energy
Well: Hagermeister USX AA 7-12
API #:
Rig Name: Production
State/County: Colorado/Weld
Latitude: 40.499, Longitude: -104.487
GRID North is 0.650 Degrees East of True North
VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: hagerusxaa7-1-01_ed.ut

Minimum Curvature Method

Report Date/Time: 11/15/2011 / 14:58

Vaughn Energy Services
Henderson, Colorado
866-835-8333
Randy Holcomb
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	0.835	356.946	99.996	0.728	-0.039	0.728	0.729	356.946	0.835
200.000	0.550	319.421	199.990	1.821	-0.390	1.821	1.862	347.911	0.521
300.000	0.372	341.055	299.986	2.492	-0.807	2.492	2.620	342.046	0.246
400.000	0.028	333.753	399.986	2.821	-0.924	2.821	2.968	341.868	0.344
500.000	0.121	82.434	499.985	2.857	-0.830	2.857	2.975	343.801	0.133
600.000	0.205	239.991	599.985	2.782	-0.880	2.782	2.918	342.448	0.320
700.000	0.156	123.029	699.985	2.618	-0.920	2.618	2.775	340.635	0.309
800.000	0.153	114.180	799.985	2.489	-0.684	2.489	2.582	344.634	0.024
900.000	0.337	150.775	899.984	2.178	-0.418	2.178	2.218	349.124	0.233
1000.000	0.168	137.557	999.983	1.812	-0.176	1.812	1.821	354.465	0.178
1100.000	0.406	127.818	1099.981	1.487	0.203	1.487	1.501	7.774	0.241
1200.000	0.346	143.129	1199.979	1.029	0.664	1.029	1.224	32.819	0.116
1300.000	0.453	140.809	1299.977	0.481	1.094	0.481	1.196	66.274	0.109
1400.000	0.439	140.937	1399.974	-0.123	1.586	-0.123	1.590	94.429	0.015
1500.000	0.572	142.529	1499.970	-0.816	2.130	-0.816	2.281	110.957	0.134
1600.000	0.527	136.682	1599.965	-1.546	2.749	-1.546	3.154	119.357	0.072
1700.000	0.583	145.646	1699.961	-2.301	3.352	-2.301	4.066	124.470	0.103
1800.000	0.671	136.301	1799.955	-3.145	4.044	-3.145	5.123	127.872	0.134
1900.000	0.278	131.789	1899.951	-3.730	4.630	-3.730	5.946	128.859	0.394
2000.000	0.193	201.073	1999.950	-4.050	4.750	-4.050	6.242	130.448	0.277
2100.000	0.271	181.918	2099.950	-4.444	4.682	-4.444	6.455	133.505	0.109
2200.000	0.446	214.547	2199.948	-5.001	4.453	-5.001	6.696	138.315	0.262
2300.000	0.448	215.458	2299.945	-5.640	4.006	-5.640	6.917	144.616	0.007
2400.000	0.355	208.019	2399.942	-6.232	3.633	-6.232	7.214	149.759	0.106
2500.000	0.184	149.047	2499.941	-6.644	3.570	-6.644	7.542	151.748	0.305
2600.000	0.488	106.338	2599.939	-6.901	4.061	-6.901	8.007	149.525	0.374
2700.000	0.572	116.212	2699.935	-7.241	4.917	-7.241	8.753	145.822	0.124
2800.000	0.566	126.994	2799.930	-7.759	5.759	-7.759	9.663	143.414	0.107
2900.000	0.290	155.988	2899.928	-8.287	6.256	-8.287	10.383	142.948	0.342
3000.000	0.363	157.665	2999.926	-8.811	6.480	-8.811	10.938	143.669	0.074
3100.000	0.208	35.431	3099.925	-8.957	6.706	-8.957	11.189	143.178	0.506
3200.000	0.591	359.119	3199.923	-8.293	6.803	-8.293	10.726	140.634	0.441
3300.000	1.449	353.200	3299.906	-6.521	6.646	-6.521	9.310	134.457	0.863
3400.000	2.257	349.593	3399.853	-3.328	6.140	-3.328	6.984	118.457	0.816

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	3.210	350.134	3499.738	1.367	5.305	1.367	5.478	75.546	0.953
3600.000	3.265	353.534	3599.578	6.955	4.504	6.955	8.286	32.930	0.200
3700.000	3.125	358.873	3699.423	12.509	4.130	12.509	13.173	18.272	0.329
3800.000	3.066	0.474	3799.277	17.908	4.099	17.908	18.371	12.891	0.104
3900.000	3.008	359.220	3899.137	23.207	4.085	23.207	23.564	9.983	0.088
4000.000	2.709	358.932	3999.012	28.193	4.005	28.193	28.476	8.086	0.300
4100.000	2.326	353.135	4098.916	32.570	3.719	32.570	32.782	6.514	0.459
4200.000	1.760	352.533	4198.852	36.108	3.277	36.108	36.256	5.185	0.566
4300.000	1.198	353.551	4298.818	38.669	2.960	38.669	38.782	4.377	0.563
4400.000	0.879	358.846	4398.802	40.475	2.827	40.475	40.574	3.995	0.332
4500.000	0.425	32.543	4498.795	41.555	3.011	41.555	41.664	4.144	0.576
4600.000	0.842	117.442	4598.790	41.529	3.863	41.529	41.708	5.314	0.909
4700.000	1.273	155.676	4698.774	40.178	4.972	40.178	40.485	7.055	0.804
4800.000	1.488	153.007	4798.745	38.008	6.019	38.008	38.482	8.999	0.224
4900.000	1.582	157.367	4898.709	35.577	7.140	35.577	36.286	11.348	0.150
5000.000	1.558	154.636	4998.672	33.074	8.254	33.074	34.089	14.012	0.079
5100.000	1.517	143.852	5098.636	30.777	9.617	30.777	32.245	17.352	0.292
5200.000	1.291	129.440	5198.606	28.993	11.267	28.993	31.106	21.237	0.417
5300.000	1.333	144.832	5298.580	27.327	12.807	27.327	30.179	25.111	0.354
5400.000	1.587	139.625	5398.548	25.321	14.374	25.321	29.116	29.583	0.286
5500.000	1.317	152.684	5498.516	23.245	15.799	23.245	28.105	34.203	0.425
5600.000	0.910	170.373	5598.497	21.441	16.459	21.441	27.030	37.511	0.528
5700.000	0.866	177.168	5698.485	19.904	16.629	19.904	25.936	39.877	0.114
5800.000	0.877	182.119	5798.474	18.385	16.638	18.385	24.796	42.144	0.076
5900.000	0.623	158.259	5898.465	17.116	16.811	17.116	23.990	44.485	0.397
6000.000	0.446	188.327	5998.461	16.226	16.956	16.226	23.468	46.261	0.326
6100.000	0.277	165.651	6098.459	15.606	16.959	15.606	23.047	47.380	0.218
6200.000	0.312	201.029	6198.458	15.118	16.922	15.118	22.691	48.223	0.182
6300.000	0.125	250.690	6298.457	14.828	16.721	14.828	22.349	48.435	0.250
6400.000	0.245	143.305	6398.457	14.620	16.746	14.620	22.230	48.878	0.307
6500.000	0.299	68.746	6498.456	14.543	17.118	14.543	22.462	49.649	0.333
6600.000	0.601	137.665	6598.453	14.250	17.715	14.250	22.735	51.186	0.567
6700.000	0.618	99.034	6698.448	13.778	18.600	13.778	23.147	53.472	0.403
6800.000	1.024	49.281	6798.439	14.276	19.810	14.276	24.418	54.222	0.783
HORIZONTAL DISPLACEMENT IS 24.418 FEET AT 54.222 DEGREES									