



Company/Rig: NOBLE ENERGY / PRODUCTION
WELL/API#: CANNON H 35-21 / 05-123-31878
DECLINATION: 8.34 DEGREES
TD AS DRILLED: 7760 FEET
COUNTY/STATE: WELD COUNTY / COLORADO
Latitude: 40.181, Longitude: -104.631
GRID North is 0.560 Degrees East of True North
VS-Azi: 0.000 Degrees



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4850 FEET

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 10/15/2014 / 09:55

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

SURVEYOR: 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	0.732	129.710	99.997	-0.408	0.492	-0.408	0.639	129.710	0.732
200.000	0.763	138.824	199.989	-1.318	1.422	-1.318	1.938	132.827	0.123
300.000	0.583	143.881	299.982	-2.230	2.160	-2.230	3.104	135.913	0.189
400.000	0.394	136.443	399.978	-2.890	2.697	-2.890	3.952	136.981	0.199
500.000	0.361	140.529	499.976	-3.382	3.134	-3.382	4.611	137.183	0.043
600.000	1.076	99.343	599.968	-3.778	4.261	-3.778	5.694	131.562	0.839
700.000	1.130	98.005	699.949	-4.067	6.164	-4.067	7.385	123.421	0.060
800.000	0.979	141.556	799.934	-4.874	7.671	-4.874	9.089	122.430	0.795
900.000	1.048	137.829	899.918	-6.221	8.816	-6.221	10.790	125.207	0.095
1000.000	0.928	145.028	999.904	-7.562	9.894	-7.562	12.453	127.389	0.172
1100.000	0.897	152.048	1099.891	-8.916	10.725	-8.916	13.947	129.739	0.116
1200.000	0.965	158.632	1199.878	-10.392	11.398	-10.392	15.424	132.354	0.127
1300.000	0.991	169.589	1299.863	-12.026	11.861	-12.026	16.891	135.395	0.189
1400.000	1.017	176.199	1399.848	-13.762	12.076	-13.762	18.309	138.732	0.119
1500.000	1.053	189.714	1499.832	-15.553	11.980	-15.553	19.632	142.394	0.246
1600.000	0.800	192.910	1599.819	-17.140	11.669	-17.140	20.735	145.752	0.258
1700.000	0.794	206.061	1699.809	-18.443	11.209	-18.443	21.582	148.710	0.183
1800.000	0.594	211.461	1799.802	-19.507	10.634	-19.507	22.217	151.403	0.210
1900.000	0.587	211.488	1899.796	-20.386	10.096	-20.386	22.749	153.653	0.007

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
2000.000	0.871	239.199	1999.788	-21.212	9.176	-21.212	23.111	156.607	0.445
2100.000	0.935	237.196	2099.776	-22.043	7.838	-22.043	23.395	160.426	0.072
2200.000	0.971	232.282	2199.762	-23.003	6.482	-23.003	23.899	164.263	0.089
2300.000	0.810	222.638	2299.750	-24.041	5.333	-24.041	24.625	167.493	0.220
2400.000	0.648	195.548	2399.742	-25.105	4.703	-25.105	25.542	169.390	0.376
2500.000	0.543	164.769	2499.737	-26.107	4.676	-26.107	26.523	169.846	0.332
2600.000	0.503	157.152	2599.733	-26.969	4.971	-26.969	27.424	169.556	0.080
2700.000	0.383	184.508	2699.730	-27.708	5.115	-27.708	28.176	169.540	0.240
2800.000	0.301	251.291	2799.729	-28.126	4.840	-28.126	28.539	170.235	0.383
2900.000	0.326	267.349	2899.727	-28.223	4.307	-28.223	28.550	171.323	0.091
3000.000	0.401	283.644	2999.725	-28.154	3.683	-28.154	28.394	172.548	0.127
3100.000	0.448	295.572	3099.723	-27.903	2.990	-27.903	28.062	173.883	0.100
3200.000	0.081	278.690	3199.721	-27.723	2.568	-27.723	27.842	174.708	0.371
3300.000	0.176	71.655	3299.721	-27.664	2.644	-27.664	27.790	174.540	0.251
3400.000	0.340	68.479	3399.720	-27.507	3.066	-27.507	27.677	173.639	0.165
3500.000	0.322	279.894	3499.719	-27.350	3.066	-27.350	27.521	173.604	0.638
3600.000	1.199	295.943	3599.710	-26.844	1.848	-26.844	26.908	176.061	0.894
3700.000	1.056	307.101	3699.691	-25.831	0.173	-25.831	25.831	179.616	0.261
3800.000	0.872	333.242	3799.677	-24.595	-0.904	-24.595	24.612	182.105	0.471
3900.000	0.686	17.639	3899.668	-23.345	-1.065	-23.345	23.369	182.613	0.614
4000.000	1.088	35.690	3999.656	-22.003	-0.330	-22.003	22.005	180.859	0.485
4100.000	1.354	53.818	4099.634	-20.534	1.177	-20.534	20.568	176.718	0.465
4200.000	1.922	71.478	4199.593	-19.304	3.721	-19.304	19.659	169.090	0.754
4300.000	2.281	75.826	4299.526	-18.284	7.240	-18.284	19.666	158.397	0.393
4400.000	2.890	78.357	4399.424	-17.288	11.639	-17.288	20.841	146.051	0.619
4500.000	3.718	79.802	4499.257	-16.205	17.298	-16.205	23.703	133.132	0.832
4600.000	4.215	82.704	4599.017	-15.165	24.135	-15.165	28.504	122.143	0.536
4700.000	4.731	84.499	4698.712	-14.303	31.885	-14.303	34.946	114.160	0.534
4800.000	3.990	86.417	4798.422	-13.690	39.462	-13.690	41.769	109.133	0.755
4900.000	3.070	84.839	4898.231	-13.232	45.600	-13.232	47.481	106.181	0.925
5000.000	2.352	83.120	4998.119	-12.745	50.305	-12.745	51.894	104.217	0.722
5100.000	2.201	82.138	5098.040	-12.236	54.244	-12.236	55.607	102.712	0.156
5200.000	1.644	88.399	5197.983	-11.934	57.580	-11.934	58.804	101.709	0.595
5300.000	1.117	98.244	5297.954	-12.033	59.979	-12.033	61.174	101.344	0.576
5400.000	0.635	123.202	5397.942	-12.477	61.408	-12.477	62.662	101.485	0.604
5500.000	0.457	104.945	5497.938	-12.883	62.257	-12.883	63.576	101.692	0.247
5600.000	0.441	219.349	5597.936	-13.284	62.398	-13.284	63.796	102.018	0.755
5700.000	0.794	208.364	5697.930	-14.191	61.825	-14.191	63.432	102.927	0.371
5800.000	0.633	197.515	5797.922	-15.327	61.329	-15.327	63.216	104.031	0.210
5900.000	0.682	209.738	5897.916	-16.370	60.868	-16.370	63.031	105.053	0.148

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
6000.000	0.805	201.376	5997.908	-17.541	60.317	-17.541	62.816	106.215	0.164
6100.000	0.881	199.247	6097.897	-18.921	59.807	-18.921	62.729	107.556	0.082
6200.000	1.316	219.418	6197.878	-20.535	58.824	-20.535	62.306	109.243	0.576
6300.000	1.500	221.465	6297.848	-22.403	57.228	-22.403	61.457	111.379	0.191
6400.000	1.405	235.029	6397.816	-24.086	55.357	-24.086	60.370	113.514	0.356
6500.000	0.580	262.615	6497.801	-24.854	53.851	-24.854	59.309	114.775	0.930
6600.000	0.372	28.266	6597.799	-24.633	53.502	-24.633	58.901	114.722	0.852
6700.000	0.602	18.715	6697.796	-23.850	53.824	-23.850	58.872	113.899	0.243
6800.000	0.699	39.092	6797.789	-22.880	54.377	-22.880	58.995	112.819	0.249
6900.000	0.745	60.937	6897.781	-22.090	55.330	-22.090	59.577	111.764	0.277
7000.000	0.511	126.384	6997.777	-22.039	56.257	-22.039	60.420	111.393	0.707
7100.000	0.613	85.555	7097.772	-22.262	57.149	-22.262	61.332	111.283	0.403
7200.000	0.347	128.296	7197.769	-22.408	57.920	-22.408	62.103	111.151	0.428
7300.000	0.108	154.718	7297.768	-22.681	58.197	-22.681	62.461	111.292	0.255
7400.000	0.340	119.611	7397.767	-22.913	58.495	-22.913	62.823	111.390	0.259
7500.000	0.425	122.935	7497.765	-23.261	59.065	-23.261	63.480	111.496	0.088