



Company/Rig: Noble Energy / CoreTech  
WELL/API#: Hoffner 13-35/05-123-22813  
DECLINATION: 8.23 Degrees  
TD AS DRILLED: 7000'  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.44160, Longitude: -104.52515  
Grid North = True North -0.63 degs (NAD 27)  
Grid Correction Applied = -0.63 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4667'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run01-de\_01.ut

Minimum Curvature Method

Report Date/Time: 2/4/2016 / 13:14

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

DENVER, COLORADO

303-853-4976

Surveyor: JASON KINCHELOW / API 05-123-22813

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	0.371	238.479	99.999	-0.169	-0.276	-0.169	0.324	238.479	0.371
200.000	0.295	211.758	199.998	-0.558	-0.688	-0.558	0.886	230.959	0.171
300.000	0.674	182.940	299.994	-1.364	-0.854	-1.364	1.610	212.039	0.439
400.000	0.889	187.565	399.985	-2.721	-0.986	-2.721	2.894	199.923	0.224
500.000	1.033	189.718	499.971	-4.379	-1.241	-4.379	4.551	195.817	0.149
600.000	1.249	191.840	599.951	-6.335	-1.616	-6.335	6.537	194.315	0.220
700.000	1.385	186.256	699.924	-8.602	-1.972	-8.602	8.825	192.909	0.187
800.000	1.353	193.449	799.896	-10.952	-2.378	-10.952	11.207	192.250	0.175
900.000	1.422	193.130	899.866	-13.308	-2.934	-13.308	13.628	192.434	0.069
1000.000	1.382	199.094	999.837	-15.656	-3.611	-15.656	16.067	192.987	0.151
1100.000	1.379	201.037	1099.808	-17.919	-4.437	-17.919	18.460	193.908	0.047
1200.000	1.306	201.154	1199.780	-20.105	-5.280	-20.105	20.787	194.716	0.074
1300.000	1.296	197.361	1299.754	-22.246	-6.029	-22.246	23.049	195.163	0.087
1400.000	1.325	201.309	1399.728	-24.403	-6.787	-24.403	25.329	195.542	0.095
1500.000	0.849	181.202	1499.710	-26.221	-7.222	-26.221	27.198	195.400	0.603
1600.000	0.793	209.807	1599.700	-27.562	-7.582	-27.562	28.586	195.381	0.409
1700.000	0.717	222.584	1699.692	-28.623	-8.349	-28.623	29.816	196.261	0.184
1800.000	1.132	233.484	1799.679	-29.671	-9.566	-29.671	31.175	197.869	0.449

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
1900.000	1.670	236.847	1899.648	-31.056	-11.580	-31.056	33.145	200.449	0.545
2000.000	1.760	237.523	1999.604	-32.678	-14.095	-32.678	35.588	203.333	0.092
2100.000	1.867	241.707	2099.554	-34.274	-16.825	-34.274	38.181	206.146	0.170
2200.000	1.972	246.568	2199.498	-35.730	-19.838	-35.730	40.868	209.039	0.194
2300.000	2.167	254.736	2299.433	-36.912	-23.240	-36.912	43.619	212.194	0.353
2400.000	2.302	257.963	2399.356	-37.829	-27.028	-37.829	46.492	215.545	0.185
2500.000	1.863	266.889	2499.290	-38.336	-30.615	-38.336	49.060	218.611	0.545
2600.000	1.882	267.997	2599.237	-38.481	-33.879	-38.481	51.270	221.361	0.041
2700.000	1.883	266.540	2699.183	-38.638	-37.160	-38.638	53.607	223.883	0.048
2800.000	1.796	268.842	2799.132	-38.769	-40.366	-38.769	55.968	226.157	0.114
2900.000	1.697	289.198	2899.086	-38.313	-43.331	-38.313	57.840	228.517	0.625
3000.000	1.754	290.470	2999.041	-37.291	-46.163	-37.291	59.344	231.068	0.068
3100.000	1.576	270.848	3098.999	-36.736	-48.971	-36.736	61.219	233.125	0.594
3200.000	1.604	241.705	3198.962	-37.379	-51.579	-37.379	63.699	234.069	0.800
3300.000	1.378	206.047	3298.931	-39.123	-53.339	-39.123	66.149	233.741	0.938
3400.000	1.197	180.624	3398.906	-41.248	-53.879	-41.248	67.855	232.564	0.594
3500.000	1.179	165.262	3498.885	-43.287	-53.628	-43.287	68.919	231.091	0.318
3600.000	1.300	167.196	3598.861	-45.389	-53.115	-45.389	69.867	229.485	0.127
3700.000	1.931	191.256	3698.822	-48.147	-53.193	-48.147	71.747	227.850	0.914
3800.000	1.585	189.071	3798.775	-51.166	-53.740	-51.166	74.202	226.406	0.352
3900.000	1.703	194.870	3898.734	-53.968	-54.339	-53.968	76.585	225.197	0.204
4000.000	1.989	193.325	3998.682	-57.093	-55.121	-57.093	79.359	223.993	0.291
4100.000	2.094	179.020	4098.619	-60.608	-55.489	-60.608	82.173	222.475	0.519
4200.000	1.983	170.611	4198.556	-64.142	-55.176	-64.142	84.608	220.702	0.319
4300.000	1.853	166.485	4298.500	-67.422	-54.516	-67.422	86.704	218.958	0.190
4400.000	1.366	172.628	4398.460	-70.176	-53.985	-70.176	88.538	217.570	0.516
4500.000	0.556	178.672	4498.445	-71.843	-53.821	-71.843	89.767	216.838	0.815
4600.000	0.548	301.715	4598.443	-72.077	-54.216	-72.077	90.191	216.950	0.970
4700.000	1.190	332.280	4698.432	-70.907	-55.105	-70.907	89.802	217.853	0.770
4800.000	1.726	340.794	4798.399	-68.565	-56.084	-68.565	88.581	219.282	0.577
4900.000	1.771	338.982	4898.352	-65.700	-57.134	-65.700	87.067	221.011	0.071
5000.000	1.762	318.636	4998.306	-63.103	-58.704	-63.103	86.187	222.932	0.624
5100.000	0.840	313.289	5098.279	-61.447	-60.254	-61.447	86.059	224.438	0.929
5200.000	0.566	320.884	5198.272	-60.561	-61.099	-60.561	86.027	225.253	0.288
5300.000	0.410	189.122	5298.270	-60.531	-61.467	-60.531	86.268	225.440	0.894
5400.000	0.557	163.220	5398.266	-61.350	-61.384	-61.350	86.786	225.016	0.260
5500.000	0.956	158.764	5498.257	-62.593	-60.941	-62.593	87.360	224.234	0.403
5600.000	1.236	180.342	5598.239	-64.450	-60.645	-64.450	88.496	223.258	0.494
5700.000	1.697	180.152	5698.206	-67.009	-60.656	-67.009	90.384	222.151	0.460
5800.000	2.120	167.886	5798.151	-70.297	-60.271	-70.297	92.598	220.609	0.586

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
5900.000	2.701	184.565	5898.063	-74.454	-60.071	-74.454	95.666	218.897	0.905
6000.000	3.241	177.999	5997.929	-79.628	-60.160	-79.628	99.799	217.071	0.638
6100.000	3.315	167.569	6097.766	-85.278	-59.439	-85.278	103.948	214.877	0.600
6200.000	3.568	170.425	6197.586	-91.169	-58.299	-91.169	108.215	212.597	0.305
6300.000	3.827	171.120	6297.378	-97.535	-57.266	-97.535	113.104	210.418	0.264
6400.000	4.322	176.764	6397.125	-104.595	-56.538	-104.595	118.898	208.393	0.636
6500.000	4.728	169.023	6496.814	-112.403	-55.540	-112.403	125.376	206.295	0.733
6600.000	4.747	178.904	6596.474	-120.586	-54.676	-120.586	132.403	204.390	0.815
6700.000	3.904	174.892	6696.188	-128.114	-54.294	-128.114	139.144	202.967	0.894