



COMPANY/RIG: Noble Energy/Production/CoreTech  
WELL/API: Opdyke Hinkle 1/05-123-11117  
DECLINATION: 8.2 Degrees  
TD AS DRILLED: 7040 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.33961, Longitude: -104.57191  
Grid North = True North -0.60 degs (NAD 27)  
Grid Correction Applied = -0.60 degs



DEPTH REFERENCE : RKB = GL Elevation = 4744

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 6/13/2016 / 14:53

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS / Opdyke Hinkle 1

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	0.931	259.968	99.996	-0.142	-0.800	-0.142	0.812	259.968	0.931
200.000	0.518	259.979	199.987	-0.362	-2.045	-0.362	2.077	259.971	0.413
300.000	0.312	242.614	299.985	-0.566	-2.732	-0.566	2.790	258.304	0.239
400.000	0.119	256.332	399.984	-0.715	-3.075	-0.715	3.157	256.903	0.198
500.000	0.219	243.514	499.984	-0.825	-3.347	-0.825	3.448	256.149	0.107
600.000	0.283	290.929	599.983	-0.823	-3.749	-0.823	3.838	257.625	0.210
700.000	0.405	273.419	699.981	-0.713	-4.333	-0.713	4.391	260.649	0.160
800.000	0.349	277.856	799.979	-0.651	-4.987	-0.651	5.030	262.567	0.063
900.000	0.424	276.253	899.976	-0.569	-5.657	-0.569	5.686	264.259	0.075
1000.000	0.155	245.345	999.975	-0.585	-6.147	-0.585	6.175	264.566	0.302
1100.000	0.110	334.663	1099.975	-0.555	-6.311	-0.555	6.335	264.977	0.189
1200.000	0.364	349.306	1199.974	-0.156	-6.411	-0.156	6.413	268.602	0.259
1300.000	0.396	40.423	1299.972	0.418	-6.246	0.418	6.260	273.832	0.329
1400.000	0.566	34.525	1399.969	1.088	-5.742	1.088	5.844	280.732	0.177
1500.000	0.676	75.868	1499.963	1.639	-4.890	1.639	5.157	288.534	0.451
1600.000	0.726	77.742	1599.956	1.918	-3.698	1.918	4.166	297.414	0.055
1700.000	1.039	86.696	1699.944	2.105	-2.173	2.105	3.025	314.081	0.341
1800.000	1.293	99.194	1799.923	1.977	-0.154	1.977	1.983	355.535	0.358

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	1.564	105.099	1899.892	1.441	2.277	1.441	2.695	57.670	0.308
2000.000	1.463	118.691	1999.857	0.473	4.714	0.473	4.738	84.274	0.372
2100.000	1.357	138.883	2099.828	-1.032	6.613	-1.032	6.693	98.872	0.505
2200.000	1.618	156.864	2199.794	-3.222	7.946	-3.222	8.575	112.075	0.532
2300.000	1.670	160.298	2299.753	-5.892	8.992	-5.892	10.750	123.236	0.111
2400.000	1.758	155.472	2399.709	-8.659	10.120	-8.659	13.318	130.552	0.169
2500.000	1.689	171.874	2499.664	-11.513	10.964	-11.513	15.898	136.397	0.496
2600.000	1.811	176.535	2599.617	-14.548	11.268	-14.548	18.402	142.241	0.188
2700.000	1.644	183.734	2699.572	-17.557	11.270	-17.557	20.863	147.302	0.274
2800.000	1.381	180.248	2799.537	-20.193	11.172	-20.193	23.077	151.047	0.278
2900.000	1.455	186.615	2899.507	-22.659	11.020	-22.659	25.197	154.064	0.174
3000.000	1.185	195.020	2999.480	-24.919	10.606	-24.919	27.082	156.944	0.332
3100.000	1.200	198.912	3099.458	-26.907	9.999	-26.907	28.705	159.615	0.082
3200.000	1.447	187.091	3199.432	-29.151	9.504	-29.151	30.661	161.943	0.367
3300.000	1.218	185.844	3299.405	-31.461	9.240	-31.461	32.790	163.633	0.231
3400.000	0.765	177.013	3399.390	-33.185	9.166	-33.185	34.428	164.559	0.477
3500.000	0.174	148.211	3499.386	-33.981	9.281	-33.981	35.226	164.724	0.618
3600.000	0.566	84.877	3599.384	-34.067	9.853	-34.067	35.463	163.869	0.512
3700.000	0.564	93.946	3699.379	-34.056	10.835	-34.056	35.739	162.351	0.089
3800.000	0.494	101.907	3799.375	-34.179	11.748	-34.179	36.142	161.032	0.101
3900.000	0.686	101.179	3899.369	-34.384	12.757	-34.384	36.674	159.645	0.192
4000.000	0.989	121.087	3999.359	-34.946	14.083	-34.946	37.677	158.051	0.416
4100.000	1.337	134.498	4099.338	-36.209	15.654	-36.209	39.448	156.620	0.440
4200.000	1.261	131.512	4199.313	-37.756	17.310	-37.756	41.535	155.370	0.101
4300.000	1.543	130.904	4299.283	-39.367	19.152	-39.367	43.779	154.057	0.282
4400.000	1.507	140.389	4399.247	-41.262	21.008	-41.262	46.302	153.017	0.255
4500.000	1.168	165.989	4499.221	-43.265	22.094	-43.265	48.579	152.948	0.679
4600.000	1.091	176.953	4599.201	-45.204	22.391	-45.204	50.446	153.649	0.229
4700.000	1.495	185.636	4699.176	-47.453	22.314	-47.453	52.438	154.816	0.447
4800.000	1.493	185.487	4799.142	-50.048	22.061	-50.048	54.695	156.212	0.004
4900.000	1.509	195.642	4899.108	-52.613	21.581	-52.613	56.868	157.697	0.266
5000.000	1.132	186.122	4999.081	-54.864	21.121	-54.864	58.789	158.945	0.435
5100.000	0.897	183.405	5099.065	-56.627	20.969	-56.627	60.385	159.680	0.240
5200.000	0.488	168.156	5199.058	-57.826	21.010	-57.826	61.525	160.032	0.445
5300.000	0.200	161.624	5299.056	-58.409	21.153	-58.409	62.121	160.092	0.290
5400.000	0.264	166.359	5399.055	-58.798	21.262	-58.798	62.524	160.120	0.066
5500.000	0.418	168.152	5499.053	-59.378	21.391	-59.378	63.114	160.189	0.154
5600.000	0.392	164.252	5599.051	-60.065	21.559	-60.065	63.816	160.256	0.037
5700.000	0.364	163.642	5699.049	-60.699	21.741	-60.699	64.475	160.294	0.028
5800.000	0.121	111.607	5799.048	-61.043	21.929	-61.043	64.862	160.240	0.305

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	0.157	152.811	5899.048	-61.204	22.090	-61.204	65.068	160.154	0.104
6000.000	0.172	46.019	5999.047	-61.222	22.261	-61.222	65.143	160.018	0.265
6100.000	0.456	66.488	6099.046	-60.959	22.734	-60.959	65.060	159.548	0.301
6200.000	0.591	73.588	6199.042	-60.654	23.593	-60.654	65.081	158.745	0.149
6300.000	0.349	93.322	6299.038	-60.526	24.392	-60.526	65.256	158.051	0.287
6400.000	0.481	108.513	6399.036	-60.677	25.094	-60.677	65.662	157.531	0.171
6500.000	0.609	97.323	6499.031	-60.879	26.020	-60.879	66.206	156.858	0.166
6600.000	0.927	96.649	6599.022	-61.040	27.351	-61.040	66.888	155.864	0.318