



Company/Rig: NOBLE ENERGY / PRODUCTION
WELL/API#: WELLS RANCH USX BB 3-4 / 05-123-26318
DECLINATION: 8.25 DEGREES
TD AS DRILLED: 6967 FEET
COUNTY/STATE: WELD / COLORADO
VS-Azi: 0.000 Degrees
Latitude: 40.43423, Longitude: -104.43036
Grid Convergence Applied = -0.69 degs (NAD 27)
Grid North = True North -0.69 degs

DEPTH REFERENCE : RKB=SURFACE ELEVATION=4780 FEET

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 5/14/2015 / 13:21

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	0.588	12.438	99.998	0.501	0.111	0.501	0.513	12.438	0.588
200.000	0.565	19.827	199.993	1.466	0.388	1.466	1.517	14.834	0.078
300.000	0.360	39.059	299.990	2.174	0.754	2.174	2.301	19.116	0.254
400.000	0.063	1.230	399.989	2.473	0.953	2.473	2.650	21.070	0.313
500.000	0.116	23.736	499.989	2.620	0.995	2.620	2.803	20.787	0.063
600.000	0.535	283.421	599.988	2.822	0.581	2.822	2.881	11.639	0.568
700.000	0.554	295.402	699.983	3.138	-0.310	3.138	3.153	354.360	0.115
800.000	0.619	291.771	799.978	3.545	-1.248	3.545	3.759	340.607	0.075
900.000	0.593	291.132	899.972	3.932	-2.232	3.932	4.521	330.419	0.027
1000.000	0.464	291.942	999.968	4.270	-3.090	4.270	5.270	324.109	0.129
1100.000	0.666	290.779	1099.963	4.627	-4.008	4.627	6.122	319.098	0.203
1200.000	0.699	284.446	1199.956	4.985	-5.142	4.985	7.162	314.113	0.082
1300.000	0.645	269.699	1299.949	5.135	-6.296	5.135	8.124	309.199	0.181
1400.000	0.545	267.142	1399.944	5.108	-7.334	5.108	8.937	304.858	0.104
1500.000	0.589	262.627	1499.939	5.018	-8.318	5.018	9.714	301.104	0.063
1600.000	0.641	262.220	1599.933	4.877	-9.381	4.877	10.573	297.467	0.052
1700.000	0.480	249.490	1699.928	4.654	-10.327	4.654	11.328	294.261	0.203
1800.000	0.426	233.610	1799.925	4.287	-11.018	4.287	11.823	291.261	0.136

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	0.403	223.227	1899.923	3.810	-11.559	3.810	12.171	288.244	0.078
2000.000	0.327	181.808	1999.921	3.269	-11.809	3.269	12.253	285.473	0.268
2100.000	0.662	133.767	2099.917	2.584	-11.401	2.584	11.690	282.772	0.506
2200.000	1.075	116.174	2199.906	1.771	-10.141	1.771	10.295	279.905	0.487
2300.000	1.103	110.574	2299.888	1.019	-8.398	1.019	8.460	276.916	0.110
2400.000	1.189	111.718	2399.868	0.297	-6.533	0.297	6.540	272.599	0.089
2500.000	1.334	106.354	2499.844	-0.415	-4.453	-0.415	4.472	264.675	0.187
2600.000	1.525	103.858	2599.812	-1.061	-2.044	-1.061	2.303	242.559	0.201
2700.000	1.699	102.376	2699.773	-1.698	0.696	-1.698	1.835	157.721	0.179
2800.000	1.773	98.392	2799.727	-2.241	3.673	-2.241	4.303	121.388	0.141
2900.000	1.800	100.151	2899.678	-2.744	6.749	-2.744	7.285	112.123	0.061
3000.000	1.338	98.929	2999.641	-3.202	9.448	-3.202	9.976	108.719	0.463
3100.000	1.309	94.409	3099.614	-3.471	11.741	-3.471	12.243	106.468	0.108
3200.000	0.977	66.179	3199.595	-3.214	13.659	-3.214	14.032	103.242	0.644
3300.000	1.464	34.679	3299.573	-1.819	15.166	-1.819	15.274	96.841	0.812
3400.000	1.974	9.787	3399.529	0.929	16.185	0.929	16.212	86.717	0.893
3500.000	2.136	5.753	3499.464	4.480	16.665	4.480	17.257	74.951	0.217
3600.000	2.119	6.317	3599.396	8.172	17.055	8.172	18.912	64.397	0.027
3700.000	2.222	9.320	3699.324	11.923	17.572	11.923	21.235	55.843	0.154
3800.000	2.759	2.919	3799.229	16.240	18.009	16.240	24.250	47.957	0.604
3900.000	2.798	0.855	3899.112	21.084	18.168	21.084	27.832	40.751	0.107
4000.000	2.483	359.326	3999.005	25.691	18.179	25.691	31.472	35.284	0.323
4100.000	2.083	356.951	4098.926	29.671	18.057	29.671	34.734	31.323	0.411
4200.000	1.352	342.261	4198.881	32.609	17.601	32.609	37.056	28.358	0.847
4300.000	1.214	311.768	4298.857	34.439	16.451	34.439	38.166	25.533	0.688
4400.000	1.179	312.591	4398.835	35.841	14.903	35.841	38.816	22.578	0.039
4500.000	0.881	312.982	4498.819	37.061	13.583	37.061	39.472	20.128	0.298
4600.000	0.810	320.694	4598.808	38.132	12.573	38.132	40.152	18.249	0.134
4700.000	0.435	358.904	4698.802	39.058	12.118	39.058	40.895	17.237	0.540
4800.000	0.603	121.035	4798.800	39.166	12.562	39.166	41.131	17.783	0.912
4900.000	1.074	132.763	4898.789	38.258	13.702	38.258	40.637	19.704	0.499
5000.000	1.036	144.115	4998.772	36.889	14.920	36.889	39.792	22.021	0.212
5100.000	0.710	166.686	5098.761	35.553	15.593	35.553	38.822	23.681	0.468
5200.000	0.511	201.862	5198.755	34.536	15.569	34.536	37.883	24.266	0.415
5300.000	0.463	213.859	5298.752	33.786	15.178	33.786	37.039	24.191	0.113
5400.000	0.442	214.944	5398.749	33.135	14.732	33.135	36.262	23.970	0.023
5500.000	0.286	222.576	5498.747	32.635	14.342	32.635	35.648	23.725	0.163
5600.000	0.329	256.830	5598.745	32.386	13.894	32.386	35.241	23.221	0.186
5700.000	0.302	251.191	5698.744	32.236	13.366	32.236	34.897	22.520	0.041
5800.000	0.271	192.452	5798.743	31.920	13.065	31.920	34.490	22.260	0.282

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	0.250	147.419	5898.742	31.505	13.132	31.505	34.132	22.627	0.201
6000.000	0.345	119.480	5998.740	31.172	13.512	31.172	33.975	23.434	0.171
6100.000	0.360	108.121	6098.739	30.926	14.073	30.926	33.978	24.468	0.071
6200.000	0.285	105.698	6198.737	30.761	14.611	30.761	34.055	25.407	0.077
6300.000	0.444	113.764	6298.735	30.538	15.205	30.538	34.114	26.470	0.167
6400.000	0.562	103.273	6398.731	30.269	16.037	30.269	34.255	27.916	0.149
6500.000	0.505	118.010	6498.727	29.949	16.904	29.949	34.391	29.441	0.148
6600.000	0.701	120.611	6598.721	29.431	17.820	29.431	34.405	31.194	0.198
6700.000	0.687	74.462	6698.715	29.280	18.924	29.280	34.863	32.875	0.544