



Company/Rig: Noble Energy/CoreTech  
WELL/API#: Wells Ranch USX BB 11-1/05-123-30476  
DECLINATION: 8.22 Degrees  
TD AS DRILLED: 6829 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.41938, Longitude: -104.39724  
Grid North = True North -0.71 degs (NAD 27)  
Grid Convergence Applied = -0.71 degs



DEPTH REFERENCE : RKB=GL Elevation= 4685 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_survey.ut

Minimum Curvature Method

Report Date/Time: 7/16/2015 / 09:40

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Geof Davis

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	0.322	241.019	99.999	-0.136	-0.246	-0.136	0.281	241.019	0.322
200.000	0.076	297.946	199.999	-0.241	-0.551	-0.241	0.602	246.353	0.288
300.000	0.189	302.530	299.999	-0.121	-0.749	-0.121	0.759	260.793	0.113
400.000	0.171	23.209	399.998	0.105	-0.829	0.105	0.836	277.192	0.234
500.000	0.134	185.253	499.998	0.126	-0.781	0.126	0.791	279.146	0.301
600.000	0.293	71.994	599.998	0.088	-0.548	0.088	0.556	279.156	0.367
700.000	0.190	12.649	699.997	0.329	-0.269	0.329	0.425	320.730	0.255
800.000	0.322	69.901	799.996	0.587	0.031	0.587	0.588	2.989	0.271
900.000	0.295	93.590	899.995	0.668	0.551	0.668	0.865	39.517	0.129
1000.000	0.228	63.336	999.994	0.741	0.985	0.741	1.232	53.053	0.151
1100.000	0.132	12.421	1099.993	0.942	1.187	0.942	1.516	51.563	0.177
1200.000	0.196	283.965	1199.993	1.096	1.046	1.096	1.515	43.670	0.233
1300.000	0.225	233.704	1299.992	1.021	0.722	1.021	1.251	35.276	0.180
1400.000	0.236	296.295	1399.992	0.997	0.380	0.997	1.067	20.859	0.240
1500.000	0.486	274.022	1499.990	1.118	-0.228	1.118	1.141	348.466	0.282
1600.000	0.428	278.395	1599.986	1.202	-1.021	1.202	1.577	319.661	0.068
1700.000	0.412	301.782	1699.984	1.446	-1.696	1.446	2.229	310.448	0.171
1800.000	0.324	224.510	1799.982	1.434	-2.200	1.434	2.626	303.101	0.465

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	0.598	163.950	1899.979	0.731	-2.254	0.731	2.369	287.978	0.522
2000.000	0.829	228.649	1999.973	-0.248	-2.652	-0.248	2.664	264.654	0.788
2100.000	0.684	182.792	2099.965	-1.322	-3.224	-1.322	3.484	247.709	0.604
2200.000	0.905	184.305	2199.955	-2.705	-3.312	-2.705	4.276	230.765	0.222
2300.000	0.910	161.570	2299.943	-4.246	-3.121	-4.246	5.269	216.315	0.358
2400.000	1.571	190.098	2399.920	-6.349	-3.110	-6.349	7.069	206.097	0.885
2500.000	1.718	209.542	2499.880	-9.002	-4.089	-9.002	9.887	204.430	0.574
2600.000	1.261	175.387	2599.848	-11.402	-4.739	-11.402	12.348	202.570	0.977
2700.000	1.036	157.201	2699.828	-13.333	-4.301	-13.333	14.009	197.878	0.426
2800.000	1.488	193.322	2799.805	-15.429	-4.250	-15.429	16.004	195.398	0.893
2900.000	1.624	162.667	2899.770	-18.045	-4.127	-18.045	18.511	192.881	0.833
3000.000	1.333	177.543	2999.737	-20.559	-3.655	-20.559	20.881	190.080	0.479
3100.000	1.311	220.794	3099.712	-22.587	-4.352	-22.587	23.003	190.907	0.974
3200.000	1.229	262.417	3199.690	-23.595	-6.163	-23.595	24.386	194.638	0.906
3300.000	1.249	275.763	3299.667	-23.627	-8.310	-23.627	25.046	199.378	0.289
3400.000	1.417	295.410	3399.640	-22.987	-10.511	-22.987	25.276	204.574	0.484
3500.000	1.664	290.762	3499.604	-21.941	-12.986	-21.941	25.496	210.619	0.277
3600.000	1.498	281.323	3599.566	-21.170	-15.626	-21.170	26.312	216.431	0.308
3700.000	1.594	307.219	3699.531	-20.072	-18.015	-20.072	26.971	221.908	0.699
3800.000	1.546	294.728	3799.494	-18.667	-20.347	-18.667	27.613	227.466	0.345
3900.000	1.219	334.633	3899.467	-17.141	-22.028	-17.141	27.912	232.112	0.992
4000.000	0.731	330.774	3999.452	-15.624	-22.795	-15.624	27.635	235.574	0.493
4100.000	0.798	321.214	4099.443	-14.525	-23.543	-14.525	27.663	238.327	0.144
4200.000	1.201	308.285	4199.428	-13.333	-24.801	-13.333	28.158	241.738	0.459
4300.000	1.652	326.132	4299.397	-11.487	-26.427	-11.487	28.815	246.508	0.628
4400.000	2.025	329.768	4399.345	-8.763	-28.120	-8.763	29.454	252.692	0.391
4500.000	2.521	343.339	4499.267	-5.129	-29.640	-5.129	30.081	260.182	0.728
4600.000	2.736	347.255	4599.162	-0.694	-30.797	-0.694	30.805	268.708	0.280
4700.000	1.742	346.979	4699.084	3.114	-31.666	3.114	31.819	275.617	0.994
4800.000	1.007	338.143	4799.055	5.411	-32.336	5.411	32.786	279.499	0.763
4900.000	1.071	344.677	4899.038	7.127	-32.910	7.127	33.673	282.220	0.134
5000.000	0.834	287.074	4999.027	8.242	-33.853	8.242	34.842	283.683	0.941
5100.000	0.774	317.021	5099.017	8.950	-35.009	8.950	36.135	284.340	0.420
5200.000	0.363	327.949	5199.012	9.713	-35.638	9.713	36.938	285.245	0.424
5300.000	0.321	326.488	5299.010	10.215	-35.961	10.215	37.383	285.857	0.043
5400.000	0.317	341.875	5399.009	10.712	-36.201	10.712	37.753	286.483	0.086
5500.000	0.283	2.325	5499.007	11.222	-36.278	11.222	37.974	287.188	0.112
5600.000	0.159	329.179	5599.007	11.588	-36.339	11.588	38.142	287.687	0.173
5700.000	0.077	17.705	5699.007	11.771	-36.389	11.771	38.246	287.926	0.123
5800.000	0.298	357.465	5799.006	12.095	-36.380	12.095	38.338	288.390	0.227

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	0.193	23.825	5899.005	12.509	-36.324	12.509	38.417	289.002	0.151
6000.000	0.286	298.489	5999.004	12.782	-36.476	12.782	38.650	289.312	0.332
6100.000	0.434	347.162	6099.003	13.270	-36.779	13.270	39.100	289.840	0.326
6200.000	0.224	3.478	6199.001	13.835	-36.852	13.835	39.363	290.577	0.228
6300.000	0.512	37.643	6298.999	14.384	-36.567	14.384	39.294	291.473	0.350
6400.000	0.413	41.402	6398.996	15.008	-36.056	15.008	39.055	292.599	0.104
6500.000	0.561	24.097	6498.992	15.725	-35.618	15.725	38.935	293.821	0.207