



Company/Rig: NOBLE ENERGY/ PRODUCTION
WELL/API#: WELLS RANCH BB 12-8/05-123-30127
DECLINATION: 8.2
TD AS DRILLED: 6734
COUNTY/STATE: WELD/COLORADO
VS-Azi: 0.000 Degrees
Latitude: 40.41547, Longitude: -104.37765
Grid North = True North -0.73 degs (NAD 27)
Grid Convergence Applied = -0.73 degs



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4626

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_6450ru-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 7/16/2015 / 10:02

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

SURVEYOR: BRIAN BREWBAKER

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	0.433	151.347	99.999	-0.332	0.181	-0.332	0.378	151.347	0.433
200.000	0.149	162.899	199.998	-0.788	0.401	-0.788	0.884	153.035	0.289
300.000	0.150	292.063	299.998	-0.863	0.318	-0.863	0.919	159.778	0.270
400.000	0.257	229.162	399.997	-0.960	0.027	-0.960	0.961	178.381	0.231
500.000	0.189	211.265	499.996	-1.248	-0.228	-1.248	1.268	190.352	0.097
600.000	0.069	80.359	599.996	-1.378	-0.254	-1.378	1.402	190.445	0.240
700.000	0.171	121.478	699.996	-1.446	-0.067	-1.446	1.448	182.661	0.128
800.000	0.141	52.114	799.996	-1.449	0.158	-1.449	1.457	173.795	0.180
900.000	0.211	85.902	899.995	-1.360	0.439	-1.360	1.429	162.125	0.123
1000.000	0.308	40.451	999.994	-1.143	0.797	-1.143	1.393	145.114	0.219
1100.000	0.227	18.281	1099.993	-0.751	1.033	-0.751	1.277	126.005	0.130
1200.000	0.360	351.815	1199.992	-0.252	1.050	-0.252	1.080	103.476	0.187
1300.000	0.239	28.254	1299.990	0.243	1.104	0.243	1.131	77.583	0.220
1400.000	0.547	357.135	1399.988	0.904	1.179	0.904	1.486	52.540	0.364
1500.000	0.484	351.789	1499.984	1.799	1.095	1.799	2.106	31.332	0.079
1600.000	0.342	349.706	1599.981	2.511	0.981	2.511	2.696	21.345	0.143
1700.000	0.192	79.779	1699.981	2.834	1.093	2.834	3.038	21.083	0.393
1800.000	0.260	112.716	1799.980	2.776	1.467	2.776	3.140	27.855	0.144

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	0.826	74.951	1899.975	2.876	2.373	2.876	3.728	39.529	0.640
2000.000	0.985	87.398	1999.963	3.102	3.928	3.102	5.005	51.702	0.252
2100.000	1.099	114.527	2099.947	2.743	5.660	2.743	6.289	64.145	0.501
2200.000	1.458	140.020	2199.923	1.370	7.350	1.370	7.476	79.444	0.664
2300.000	1.455	137.381	2299.890	-0.540	9.027	-0.540	9.043	93.422	0.067
2400.000	1.328	139.339	2399.861	-2.353	10.642	-2.353	10.899	102.470	0.136
2500.000	1.231	140.156	2499.836	-4.057	12.085	-4.057	12.748	108.558	0.099
2600.000	1.250	136.097	2599.812	-5.668	13.530	-5.668	14.669	112.729	0.090
2700.000	1.239	139.510	2699.789	-7.276	14.988	-7.276	16.661	115.894	0.075
2800.000	1.295	127.989	2799.765	-8.793	16.581	-8.793	18.768	117.939	0.260
2900.000	1.628	126.332	2899.732	-10.330	18.615	-10.330	21.290	119.027	0.335
3000.000	1.772	129.984	2999.688	-12.165	20.944	-12.165	24.221	120.150	0.181
3100.000	1.676	130.416	3099.643	-14.107	23.243	-14.107	27.189	121.256	0.097
3200.000	0.913	112.038	3199.617	-15.354	25.095	-15.354	29.420	121.461	0.859
3300.000	1.700	90.081	3299.591	-15.656	27.317	-15.656	31.485	119.817	0.919
3400.000	1.918	79.205	3399.541	-15.344	30.444	-15.344	34.092	116.749	0.405
3500.000	2.200	73.778	3499.476	-14.495	33.930	-14.495	36.897	113.132	0.343
3600.000	2.503	74.544	3599.392	-13.376	37.878	-13.376	40.171	109.450	0.304
3700.000	2.583	87.181	3699.294	-12.684	42.234	-12.684	44.097	106.716	0.565
3800.000	2.386	83.274	3799.200	-12.329	46.551	-12.329	48.156	104.834	0.260
3900.000	1.995	96.216	3899.128	-12.274	50.349	-12.274	51.823	103.700	0.628
4000.000	1.490	78.086	3999.082	-12.194	53.351	-12.194	54.727	102.874	0.741
4100.000	1.156	40.718	4099.057	-11.161	55.282	-11.161	56.397	101.414	0.905
4200.000	1.533	2.107	4199.031	-9.060	55.989	-9.060	56.717	99.191	0.958
4300.000	2.155	339.476	4298.980	-5.962	55.379	-5.962	55.699	96.145	0.946
4400.000	2.898	333.692	4398.882	-1.936	53.599	-1.936	53.634	92.068	0.785
4500.000	3.837	329.000	4498.709	3.198	50.756	3.198	50.857	86.395	0.978
4600.000	4.687	329.683	4598.431	9.593	46.970	9.593	47.940	78.457	0.851
4700.000	4.266	334.133	4698.127	16.466	43.286	16.466	46.312	69.173	0.545
4800.000	3.319	333.418	4797.906	22.402	40.368	22.402	46.167	60.972	0.948
4900.000	1.408	315.583	4897.818	25.868	38.212	25.868	46.145	55.904	2.025
5000.000	0.637	237.407	4997.805	26.446	36.884	26.446	45.385	54.359	1.421
5100.000	0.619	177.428	5097.800	25.607	36.439	25.607	44.537	54.903	0.628
5200.000	0.623	182.173	5197.794	24.524	36.443	24.524	43.926	56.062	0.052
5300.000	0.165	86.569	5297.792	23.989	36.566	23.989	43.733	56.733	0.660
5400.000	0.372	335.051	5397.791	24.292	36.573	24.292	43.905	56.408	0.459
5500.000	0.363	333.601	5497.789	24.870	36.295	24.870	43.998	55.581	0.012
5600.000	0.381	342.655	5597.787	25.471	36.055	25.471	44.145	54.761	0.061
5700.000	0.388	357.308	5697.785	26.127	35.940	26.127	44.434	53.984	0.098
5800.000	0.512	20.128	5797.782	26.886	36.078	26.886	44.994	53.306	0.216

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	0.557	20.577	5897.777	27.760	36.403	27.760	45.780	52.671	0.045
6000.000	0.838	15.773	5997.770	28.919	36.772	28.919	46.781	51.817	0.287
6100.000	0.778	33.047	6097.760	30.192	37.341	30.192	48.020	51.043	0.250
6200.000	0.925	52.976	6197.749	31.247	38.356	31.247	49.473	50.832	0.328
6300.000	0.949	50.998	6297.736	32.254	39.644	32.254	51.108	50.868	0.041
6400.000	1.242	56.472	6397.717	33.374	41.191	33.374	53.015	50.985	0.310
6450.000	1.522	57.101	6447.703	34.034	42.200	34.034	54.214	51.114	0.561