



Company/Rig: Noble Energy/Production
Well/API#: HUWA 11-2/05-123-14717
Declination: 8.32
TD As Drilled: 7128 Feet
County/State: Weld/Colorado
Latitude: 40.525, Longitude: -104.633
GRID North is 0.560 Degrees East of True North
VS-Azi: 0.000 Degrees



Depth Reference : RKB = GL Elevation = 4685 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 1/22/2015 / 09:55

Lat & Long Verified by Handheld GPS At Wellhead

North Reference : Grid

Henderson, CO

303-853-4976

Surveyor: Jordan Rolando

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	0.521	172.319	99.999	-0.451	0.061	-0.451	0.455	172.319	0.521
200.000	0.450	141.712	199.995	-1.210	0.365	-1.210	1.264	163.217	0.265
300.000	0.328	119.689	299.993	-1.660	0.857	-1.660	1.868	152.702	0.191
400.000	0.395	129.761	399.991	-2.021	1.370	-2.021	2.442	145.882	0.092
500.000	0.399	134.105	499.989	-2.484	1.884	-2.484	3.118	142.817	0.030
600.000	0.458	131.787	599.986	-2.993	2.433	-2.993	3.857	140.896	0.062
700.000	0.478	126.732	699.982	-3.509	3.065	-3.509	4.659	138.862	0.046
800.000	0.343	155.896	799.980	-4.032	3.522	-4.032	5.353	138.863	0.244
900.000	0.339	180.044	899.978	-4.601	3.644	-4.601	5.869	141.621	0.143
1000.000	0.277	199.630	999.977	-5.124	3.562	-5.124	6.241	145.195	0.121
1100.000	0.236	189.312	1099.976	-5.555	3.448	-5.555	6.538	148.176	0.062
1200.000	0.157	183.383	1199.975	-5.895	3.406	-5.895	6.808	149.981	0.081
1300.000	0.105	199.924	1299.975	-6.118	3.367	-6.118	6.983	151.177	0.063
1400.000	0.154	237.788	1399.975	-6.276	3.222	-6.276	7.055	152.825	0.096
1500.000	0.264	203.837	1499.974	-6.558	3.016	-6.558	7.218	155.307	0.161
1600.000	0.169	176.568	1599.973	-6.916	2.931	-6.916	7.512	157.031	0.138
1700.000	0.136	178.904	1699.973	-7.182	2.942	-7.182	7.761	157.721	0.034
1800.000	0.121	179.875	1799.973	-7.406	2.945	-7.406	7.970	158.315	0.015
1900.000	0.231	157.554	1899.972	-7.698	3.022	-7.698	8.270	158.565	0.128

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
2000.000	0.255	153.900	1999.971	-8.083	3.197	-8.083	8.693	158.422	0.028
2100.000	0.307	146.265	2099.970	-8.506	3.443	-8.506	9.176	157.961	0.064
2200.000	0.311	114.340	2199.969	-8.840	3.839	-8.840	9.638	156.524	0.170
2300.000	0.478	44.523	2299.967	-8.655	4.379	-8.655	9.699	153.159	0.472
2400.000	0.606	30.136	2399.962	-7.900	4.937	-7.900	9.316	147.994	0.185
2500.000	0.614	36.391	2499.957	-7.011	5.521	-7.011	8.924	141.782	0.067
2600.000	0.419	38.495	2599.953	-6.293	6.067	-6.293	8.741	136.051	0.196
2700.000	0.319	79.362	2699.951	-5.956	6.568	-5.956	8.866	132.201	0.274
2800.000	0.268	92.420	2799.949	-5.914	7.076	-5.914	9.222	129.890	0.084
2900.000	0.300	69.517	2899.948	-5.832	7.555	-5.832	9.545	127.667	0.117
3000.000	0.316	91.742	2999.947	-5.749	8.077	-5.749	9.914	125.444	0.120
3100.000	0.379	94.363	3099.945	-5.783	8.682	-5.783	10.431	123.666	0.064
3200.000	0.388	85.507	3199.943	-5.781	9.349	-5.781	10.992	121.733	0.060
3300.000	0.783	94.404	3299.937	-5.807	10.367	-5.807	11.883	119.256	0.405
3400.000	1.314	95.345	3399.920	-5.967	12.190	-5.967	13.572	116.080	0.531
3500.000	1.794	112.013	3499.884	-6.660	14.783	-6.660	16.214	114.253	0.654
3600.000	1.826	111.002	3599.834	-7.818	17.722	-7.818	19.369	113.805	0.046
3700.000	1.903	107.537	3699.781	-8.889	20.793	-8.889	22.613	113.148	0.136
3800.000	1.979	105.202	3799.723	-9.842	24.042	-9.842	25.979	112.263	0.110
3900.000	2.009	111.577	3899.663	-10.940	27.338	-10.940	29.446	111.809	0.224
4000.000	1.761	109.519	3999.609	-12.098	30.417	-12.098	32.734	111.689	0.256
4100.000	1.728	118.537	4099.563	-13.331	33.190	-13.331	35.767	111.884	0.276
4200.000	1.729	115.520	4199.517	-14.701	35.875	-14.701	38.771	112.284	0.091
4300.000	1.720	124.315	4299.472	-16.198	38.476	-16.198	41.747	112.830	0.265
4400.000	1.818	131.625	4399.425	-18.098	40.902	-18.098	44.727	113.868	0.246
4500.000	1.947	140.092	4499.371	-20.454	43.178	-20.454	47.778	115.348	0.306
4600.000	1.991	135.024	4599.312	-22.986	45.495	-22.986	50.973	116.805	0.179
4700.000	2.034	146.209	4699.250	-25.690	47.710	-25.690	54.187	118.301	0.395
4800.000	1.113	139.991	4799.212	-27.909	49.322	-27.909	56.671	119.504	0.935
4900.000	0.206	126.162	4899.204	-28.759	50.092	-28.759	57.760	119.862	0.915
5000.000	0.301	74.523	4999.203	-28.795	50.490	-28.795	58.124	119.697	0.237
5100.000	0.523	87.496	5099.201	-28.705	51.199	-28.705	58.697	119.278	0.239
5200.000	0.685	102.691	5199.195	-28.817	52.238	-28.817	59.659	118.883	0.227
5300.000	0.788	106.842	5299.187	-29.147	53.480	-29.147	60.907	118.591	0.116
5400.000	0.801	106.767	5399.177	-29.548	54.808	-29.548	62.265	118.330	0.013
5500.000	0.658	116.811	5499.169	-30.009	55.989	-30.009	63.524	118.190	0.192
5600.000	0.668	120.777	5599.162	-30.566	57.002	-30.566	64.680	118.201	0.047
5700.000	0.945	110.538	5699.152	-31.153	58.275	-31.153	66.079	118.129	0.311
5800.000	1.266	108.870	5799.134	-31.799	60.092	-31.799	67.987	117.887	0.322
5900.000	0.822	59.549	5899.119	-31.793	61.755	-31.793	69.459	117.240	0.960

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
6000.000	0.891	40.878	5999.108	-30.842	62.883	-30.842	70.039	116.126	0.286
6100.000	0.775	37.201	6099.097	-29.716	63.800	-29.716	70.381	114.974	0.128
6200.000	0.630	35.789	6199.090	-28.731	64.530	-28.731	70.637	114.000	0.145
6300.000	0.610	23.636	6299.084	-27.797	65.065	-27.797	70.754	113.133	0.133
6400.000	0.554	19.047	6399.079	-26.852	65.437	-26.852	70.732	112.311	0.073
6500.000	0.596	16.025	6499.074	-25.895	65.738	-25.895	70.654	111.500	0.052
6600.000	0.557	34.618	6599.069	-24.995	66.158	-24.995	70.722	110.697	0.190
6700.000	0.625	35.879	6699.063	-24.153	66.754	-24.153	70.989	109.891	0.069
6800.000	0.703	41.872	6799.057	-23.254	67.483	-23.254	71.377	109.013	0.105
6900.000	0.955	39.911	6899.046	-22.158	68.427	-22.158	71.926	107.943	0.253