



COMPANY/RIG: Noble Energy/Production/CoreTech
WELL/API: Weber PM K16-10/05-123-14156
DECLINATION: 8.28 Degrees
TD AS DRILLED: 7430 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.31029, Longitude: -104.78027
Grid North = True North -0.47 degs (NAD 27)
Grid Correction Applied = -0.47 degs



DEPTH REFERENCE : RKB = GL Elevation = 4737

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 10/12/2016 / 14:44

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS / Weber PM K 16-10

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	0.501	195.799	99.999	-0.421	-0.119	-0.421	0.437	195.799	0.501
200.000	0.170	187.103	199.997	-0.988	-0.256	-0.988	1.021	194.542	0.334
300.000	0.302	184.702	299.996	-1.398	-0.296	-1.398	1.429	191.965	0.133
400.000	0.213	206.261	399.995	-1.828	-0.400	-1.828	1.871	192.346	0.131
500.000	0.302	262.591	499.994	-2.028	-0.744	-2.028	2.160	200.139	0.256
600.000	0.314	259.115	599.993	-2.114	-1.274	-2.114	2.468	211.084	0.022
700.000	0.176	259.487	699.992	-2.193	-1.694	-2.193	2.771	217.679	0.138
800.000	0.444	243.563	799.990	-2.394	-2.191	-2.394	3.245	222.472	0.279
900.000	0.457	257.495	899.987	-2.652	-2.927	-2.652	3.950	227.817	0.110
1000.000	0.292	267.382	999.985	-2.750	-3.570	-2.750	4.507	232.392	0.176
1100.000	0.437	253.932	1099.983	-2.867	-4.191	-2.867	5.078	235.621	0.168
1200.000	0.334	249.765	1199.981	-3.074	-4.831	-3.074	5.726	237.534	0.107
1300.000	0.352	244.697	1299.979	-3.306	-5.382	-3.306	6.316	238.441	0.035
1400.000	0.437	234.274	1399.977	-3.660	-5.969	-3.660	7.002	238.489	0.111
1500.000	0.392	218.845	1499.974	-4.149	-6.493	-4.149	7.706	237.425	0.120
1600.000	0.414	224.278	1599.971	-4.674	-6.960	-4.674	8.384	236.119	0.044

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
1700.000	0.517	217.592	1699.968	-5.290	-7.488	-5.290	9.168	234.759	0.117
1800.000	0.605	214.922	1799.963	-6.081	-8.066	-6.081	10.101	232.986	0.092
1900.000	0.699	214.329	1899.957	-7.018	-8.712	-7.018	11.187	231.148	0.093
2000.000	0.801	213.162	1999.948	-8.107	-9.438	-8.107	12.442	229.340	0.104
2100.000	0.893	223.637	2099.937	-9.256	-10.358	-9.256	13.891	228.217	0.179
2200.000	0.715	212.396	2199.928	-10.346	-11.230	-10.346	15.269	227.346	0.237
2300.000	0.365	309.810	2299.925	-10.669	-11.809	-10.669	15.915	227.904	0.843
2400.000	1.199	337.419	2399.915	-9.499	-12.456	-9.499	15.664	232.671	0.892
2500.000	1.340	336.478	2499.890	-7.460	-13.324	-7.460	15.270	240.755	0.143
2600.000	1.500	333.419	2599.859	-5.218	-14.376	-5.218	15.294	250.053	0.177
2700.000	1.036	329.213	2699.835	-3.271	-15.425	-3.271	15.767	258.028	0.473
2800.000	0.831	334.663	2799.821	-1.839	-16.197	-1.839	16.301	263.523	0.223
2900.000	0.828	344.594	2899.811	-0.487	-16.700	-0.487	16.707	268.328	0.144
3000.000	0.806	328.671	2999.801	0.809	-17.257	0.809	17.276	272.685	0.227
3100.000	0.844	341.177	3099.790	2.107	-17.860	2.107	17.984	276.729	0.184
3200.000	0.853	331.101	3199.780	3.456	-18.458	3.456	18.778	280.606	0.149
3300.000	0.828	332.231	3299.769	4.748	-19.154	4.748	19.734	283.921	0.030
3400.000	0.795	331.383	3399.759	5.997	-19.823	5.997	20.711	286.830	0.035
3500.000	0.551	346.463	3499.752	7.073	-20.268	7.073	21.467	289.238	0.300
3600.000	0.260	0.391	3599.749	7.767	-20.379	7.767	21.809	290.864	0.305
3700.000	0.278	294.333	3699.748	8.094	-20.599	8.094	22.132	291.452	0.294
3800.000	0.272	354.696	3799.747	8.430	-20.842	8.430	22.482	292.023	0.276
3900.000	0.210	352.358	3899.747	8.848	-20.888	8.848	22.685	292.958	0.062
4000.000	0.358	80.711	3999.746	9.081	-20.604	9.081	22.516	293.785	0.410
4100.000	0.908	114.280	4099.739	8.805	-19.573	8.805	21.462	294.222	0.641
4200.000	0.714	117.521	4199.729	8.192	-18.298	8.192	20.048	294.117	0.199
4300.000	0.566	125.865	4299.723	7.615	-17.345	7.615	18.943	293.701	0.175
4400.000	0.411	155.303	4399.720	6.999	-16.795	6.999	18.195	292.623	0.290
4500.000	0.153	170.603	4499.718	6.541	-16.623	6.541	17.864	291.480	0.267
4600.000	0.383	105.821	4599.717	6.319	-16.280	6.319	17.464	291.212	0.346
4700.000	0.140	120.859	4699.716	6.165	-15.854	6.165	17.011	291.249	0.250
4800.000	0.272	148.210	4799.716	5.901	-15.624	5.901	16.702	290.689	0.161
4900.000	0.122	157.237	4899.715	5.601	-15.458	5.601	16.442	289.917	0.153
5000.000	0.166	109.573	4999.715	5.455	-15.281	5.455	16.226	289.645	0.123
5100.000	0.317	135.343	5099.714	5.210	-14.951	5.210	15.832	289.211	0.183
5200.000	0.124	165.034	5199.713	4.908	-14.728	4.908	15.524	288.432	0.219
5300.000	0.077	173.217	5299.713	4.737	-14.692	4.737	15.437	287.870	0.048
5400.000	0.303	235.775	5399.712	4.521	-14.903	4.521	15.574	286.877	0.276
5500.000	0.302	241.139	5499.711	4.245	-15.353	4.245	15.929	285.456	0.028

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
5600.000	0.118	251.802	5599.710	4.085	-15.682	4.085	16.205	284.602	0.187
5700.000	0.331	213.102	5699.709	3.811	-15.938	3.811	16.387	283.447	0.250
5800.000	0.660	196.697	5799.706	3.017	-16.262	3.017	16.539	280.510	0.355
5900.000	0.722	187.397	5899.698	1.840	-16.508	1.840	16.611	276.360	0.128
6000.000	0.683	194.439	5999.691	0.638	-16.738	0.638	16.750	272.183	0.095
6100.000	0.963	186.057	6099.680	-0.775	-16.975	-0.775	16.993	267.386	0.304
6200.000	0.762	200.097	6199.669	-2.235	-17.292	-2.235	17.436	262.635	0.291
6300.000	0.427	164.528	6299.664	-3.219	-17.421	-3.219	17.716	259.532	0.483
6400.000	0.601	165.013	6399.660	-4.085	-17.186	-4.085	17.665	256.630	0.174
6500.000	0.974	161.920	6499.650	-5.399	-16.787	-5.399	17.634	252.170	0.374
6600.000	1.191	146.096	6599.633	-7.069	-15.944	-7.069	17.441	246.088	0.367
6700.000	1.283	152.260	6699.609	-8.922	-14.843	-8.922	17.318	238.990	0.162
6800.000	1.462	164.608	6799.581	-11.143	-13.984	-11.143	17.880	231.451	0.345
6900.000	1.910	147.463	6899.538	-13.778	-12.749	-13.778	18.771	222.779	0.670
7000.000	1.924	156.903	6999.482	-16.727	-11.194	-16.727	20.127	213.791	0.316
7100.000	1.608	157.628	7099.435	-19.569	-10.001	-19.569	21.976	207.070	0.316
7150.000	1.557	151.130	7149.416	-20.812	-9.406	-20.812	22.839	204.320	0.373