



COMPANY/RIG: Noble Energy/Production/VES
WELL/API: Spike St GWS C 24-02/05-123-15806
DECLINATION: 7.93 Degrees
TD AS DRILLED: 6935 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.30316, Longitude: -104.49664
Grid North = True North -0.65 degs (NAD 27)
Grid Correction Applied = -0.65 degs



DEPTH REFERENCE : RKB = GL Elevation = 4687

DRILLOG GYRO SURVEY CALCULATIONS

Filename: gyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 9/4/2018 / 13:56

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS/Spike ST GWS C 24-02/05-123-15806

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	0.183	189.245	100.000	-0.158	-0.026	-0.158	0.160	189.245	0.183
200.000	0.192	192.729	199.999	-0.479	-0.088	-0.479	0.487	190.443	0.014
300.000	0.228	164.734	299.999	-0.835	-0.073	-0.835	0.838	184.976	0.108
400.000	0.087	183.647	399.998	-1.103	-0.025	-1.103	1.103	181.299	0.149
500.000	0.130	265.536	499.998	-1.187	-0.143	-1.187	1.196	186.868	0.146
600.000	0.186	308.034	599.998	-1.096	-0.384	-1.096	1.161	199.290	0.126
700.000	0.196	248.724	699.997	-1.059	-0.671	-1.059	1.253	212.365	0.189
800.000	0.132	237.458	799.997	-1.183	-0.928	-1.183	1.504	218.115	0.071
900.000	0.137	245.993	899.997	-1.294	-1.135	-1.294	1.721	221.249	0.021
1000.000	0.170	249.167	999.996	-1.395	-1.383	-1.395	1.964	224.738	0.034
1100.000	0.160	253.999	1099.996	-1.487	-1.656	-1.487	2.225	228.083	0.017
1200.000	0.189	210.430	1199.995	-1.668	-1.874	-1.668	2.509	228.336	0.133
1300.000	0.238	251.216	1299.995	-1.877	-2.155	-1.877	2.858	228.936	0.156
1400.000	0.242	225.401	1399.994	-2.093	-2.502	-2.093	3.262	230.090	0.107
1500.000	0.300	237.313	1499.993	-2.382	-2.873	-2.382	3.732	230.330	0.080
1600.000	0.365	252.879	1599.991	-2.617	-3.397	-2.617	4.288	232.385	0.110
1700.000	0.493	247.501	1699.988	-2.876	-4.098	-2.876	5.007	234.945	0.135
1800.000	0.321	235.579	1799.986	-3.199	-4.727	-3.199	5.707	235.915	0.191

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	0.258	227.757	1899.984	-3.508	-5.124	-3.508	6.210	235.606	0.074
2000.000	0.067	235.516	1999.984	-3.692	-5.339	-3.692	6.492	235.334	0.191
2100.000	0.088	94.267	2099.984	-3.731	-5.311	-3.731	6.491	234.910	0.147
2200.000	0.232	121.553	2199.984	-3.843	-5.062	-3.843	6.355	232.792	0.159
2300.000	0.466	107.917	2299.982	-4.074	-4.502	-4.074	6.072	227.853	0.246
2400.000	0.545	86.173	2399.978	-4.168	-3.641	-4.168	5.534	221.137	0.206
2500.000	0.638	125.945	2499.973	-4.463	-2.716	-4.463	5.224	211.320	0.412
2600.000	0.541	100.926	2599.968	-4.879	-1.801	-4.879	5.201	200.259	0.272
2700.000	0.426	100.238	2699.964	-5.035	-0.972	-5.035	5.128	190.922	0.116
2800.000	0.455	126.660	2799.961	-5.338	-0.287	-5.338	5.346	183.083	0.203
2900.000	0.381	98.094	2899.959	-5.622	0.360	-5.622	5.633	176.338	0.218
3000.000	0.368	119.626	2999.957	-5.828	0.968	-5.828	5.908	170.568	0.140
3100.000	0.359	103.038	3099.955	-6.057	1.553	-6.057	6.253	165.623	0.105
3200.000	0.479	85.458	3199.952	-6.095	2.274	-6.095	6.505	159.537	0.175
3300.000	0.912	60.193	3299.945	-5.666	3.382	-5.666	6.598	149.170	0.521
3400.000	1.451	66.459	3399.923	-4.765	5.233	-4.765	7.077	132.317	0.553
3500.000	1.679	83.709	3499.886	-4.098	7.850	-4.098	8.855	117.570	0.521
3600.000	1.951	109.808	3599.838	-4.515	10.908	-4.515	11.805	112.485	0.861
3700.000	2.081	115.567	3699.776	-5.875	14.148	-5.875	15.319	112.553	0.241
3800.000	2.188	125.369	3799.707	-7.764	17.342	-7.764	19.001	114.118	0.380
3900.000	2.251	102.230	3899.634	-9.285	20.818	-9.285	22.795	114.037	0.892
4000.000	2.338	85.710	3999.555	-9.548	24.771	-9.548	26.547	111.080	0.665
4100.000	2.487	106.630	4099.468	-10.017	28.884	-10.017	30.571	109.126	0.888
4200.000	1.729	97.471	4199.400	-10.834	32.458	-10.834	34.219	108.458	0.828
4300.000	1.536	113.883	4299.360	-11.573	35.180	-11.573	37.034	108.209	0.503
4400.000	1.881	144.299	4399.317	-13.449	37.364	-13.449	39.710	109.796	0.956
4500.000	2.097	154.646	4499.257	-16.435	39.105	-16.435	42.418	112.796	0.418
4600.000	2.091	140.352	4599.191	-19.493	41.052	-19.493	45.445	115.400	0.521
4700.000	1.546	148.948	4699.141	-22.053	42.912	-22.053	48.247	117.199	0.608
4800.000	1.296	133.743	4799.110	-23.990	44.424	-23.990	50.488	118.370	0.450
4900.000	1.144	141.056	4899.088	-25.548	45.868	-25.548	52.503	119.117	0.217
5000.000	0.699	126.333	4999.074	-26.686	46.987	-26.686	54.036	119.594	0.501
5100.000	0.268	110.850	5099.071	-27.130	47.697	-27.130	54.873	119.631	0.446
5200.000	0.152	122.459	5199.070	-27.285	48.027	-27.285	55.236	119.601	0.123
5300.000	0.082	27.720	5299.070	-27.292	48.172	-27.292	55.367	119.534	0.179
5400.000	0.119	341.918	5399.070	-27.131	48.174	-27.131	55.288	119.388	0.085
5500.000	0.229	35.101	5499.069	-26.869	48.256	-26.869	55.232	119.109	0.184
5600.000	0.400	60.268	5599.068	-26.533	48.674	-26.533	55.436	118.595	0.216
5700.000	0.452	42.500	5699.065	-26.069	49.244	-26.069	55.718	117.896	0.141
5800.000	0.378	351.241	5799.063	-25.452	49.460	-25.452	55.625	117.230	0.365

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	0.242	329.722	5899.061	-24.944	49.303	-24.944	55.254	116.836	0.176
6000.000	0.202	231.487	5999.061	-24.871	49.059	-24.871	55.003	116.884	0.337
6100.000	0.242	329.056	6099.060	-24.800	48.812	-24.800	54.751	116.934	0.335
6200.000	0.246	317.443	6199.060	-24.461	48.558	-24.461	54.372	116.736	0.049
6300.000	0.235	344.688	6299.059	-24.106	48.359	-24.106	54.034	116.495	0.114
6400.000	0.027	73.184	6399.058	-23.901	48.328	-23.901	53.915	116.316	0.235
6500.000	0.091	47.797	6499.058	-23.841	48.409	-23.841	53.962	116.220	0.067
6600.000	0.100	69.666	6599.058	-23.758	48.549	-23.758	54.051	116.075	0.037
6700.000	0.066	323.861	6699.058	-23.681	48.597	-23.681	54.060	115.980	0.134