



Company/Rig: Noble Energy/ VES
WELL/API#: Connell 04-0314/05-123-17975
DECLINATION: 8.18 Degrees
TD AS DRILLED: 7064 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.34665, Longitude: -104.55735
Grid North = True North -0.61 degs (NAD 27)
Grid Correction Applied = -0.61 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4692 Feet

DRILLOG GYRO SURVEY CALCULATIONS

Filename: gyro-de_01.ut

Minimum Curvature Method

Report Date/Time: 8/18/2016 / 09:16

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Connell 04-0314

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	0.209	267.644	100.000	-0.007	-0.182	-0.007	0.182	267.644	0.209
200.000	0.366	347.327	199.999	0.297	-0.434	0.297	0.526	304.372	0.388
300.000	0.273	37.625	299.997	0.798	-0.359	0.798	0.874	335.794	0.284
400.000	0.287	161.977	399.997	0.748	-0.135	0.748	0.760	349.742	0.496
500.000	0.443	184.901	499.995	0.125	-0.091	0.125	0.154	323.925	0.210
600.000	0.252	263.812	599.993	-0.284	-0.342	-0.284	0.445	230.308	0.465
700.000	0.417	135.345	699.993	-0.566	-0.305	-0.566	0.643	208.276	0.606
800.000	0.439	196.387	799.990	-1.193	-0.157	-1.193	1.203	187.499	0.435
900.000	0.192	116.233	899.989	-1.634	-0.115	-1.634	1.638	184.019	0.448
1000.000	0.254	171.946	999.988	-1.928	0.067	-1.928	1.929	178.024	0.216
1100.000	0.567	228.877	1099.986	-2.473	-0.275	-2.473	2.489	186.350	0.478
1200.000	0.575	230.379	1199.981	-3.119	-1.035	-3.119	3.286	198.354	0.017
1300.000	0.594	241.975	1299.976	-3.683	-1.880	-3.683	4.135	207.036	0.120
1400.000	0.598	273.261	1399.971	-3.897	-2.859	-3.897	4.833	216.262	0.322
1500.000	0.741	288.777	1499.964	-3.659	-3.992	-3.659	5.416	227.491	0.229
1600.000	0.963	337.996	1599.954	-2.672	-4.919	-2.672	5.598	241.490	0.738

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	1.102	333.782	1699.938	-1.030	-5.659	-1.030	5.752	259.681	0.158
1800.000	1.027	311.036	1799.921	0.420	-6.759	0.420	6.772	273.560	0.426
1900.000	1.137	349.381	1899.904	1.984	-7.618	1.984	7.872	284.598	0.718
2000.000	1.508	342.960	1999.878	4.217	-8.186	4.217	9.209	297.256	0.398
2100.000	1.405	344.235	2099.845	6.655	-8.905	6.655	11.117	306.773	0.107
2200.000	1.481	3.000	2199.814	9.126	-9.171	9.126	12.938	314.861	0.476
2300.000	1.477	6.780	2299.781	11.697	-8.951	11.697	14.729	322.577	0.098
2400.000	1.501	1.997	2399.747	14.286	-8.753	14.286	16.754	328.505	0.126
2500.000	1.676	22.753	2499.709	16.943	-8.142	16.943	18.798	334.334	0.598
2600.000	1.971	14.525	2599.659	19.957	-7.145	19.957	21.197	340.301	0.394
2700.000	2.058	3.699	2699.597	23.413	-6.598	23.413	24.325	344.262	0.390
2800.000	1.742	349.543	2799.543	26.699	-6.758	26.699	27.541	345.796	0.563
2900.000	1.885	356.854	2899.493	29.836	-7.124	29.836	30.675	346.571	0.272
3000.000	1.713	6.962	2999.444	32.962	-7.033	32.962	33.704	347.956	0.360
3100.000	2.004	27.768	3099.392	35.994	-6.037	35.994	36.496	350.479	0.730
3200.000	2.181	40.642	3199.326	38.985	-3.983	38.985	39.188	354.166	0.501
3300.000	1.834	21.887	3299.266	41.913	-2.147	41.913	41.968	357.067	0.738
3400.000	1.713	359.365	3399.219	44.893	-1.567	44.893	44.920	358.001	0.703
3500.000	1.411	344.800	3499.182	47.575	-1.906	47.575	47.613	357.705	0.497
3600.000	1.773	351.101	3599.143	50.292	-2.469	50.292	50.352	357.190	0.402
3700.000	1.428	317.663	3699.106	52.741	-3.547	52.741	52.860	356.152	0.978
3800.000	1.833	319.875	3799.066	54.885	-5.417	54.885	55.152	354.363	0.409
3900.000	1.441	343.904	3899.026	57.316	-6.796	57.316	57.717	353.238	0.782
4000.000	1.627	347.498	3998.990	59.909	-7.452	59.909	60.371	352.910	0.210
4100.000	1.835	324.174	4098.946	62.593	-8.696	62.593	63.195	352.090	0.729
4200.000	1.976	343.936	4198.891	65.548	-10.111	65.548	66.324	351.231	0.668
4300.000	1.481	321.474	4298.847	68.216	-11.393	68.216	69.161	350.518	0.830
4400.000	1.901	336.003	4398.803	70.742	-12.872	70.742	71.904	349.687	0.597
4500.000	1.867	322.472	4498.750	73.549	-14.539	73.549	74.973	348.818	0.445
4600.000	1.721	307.093	4598.701	75.746	-16.729	75.746	77.572	347.546	0.501
4700.000	1.051	324.887	4698.672	77.403	-18.454	77.403	79.572	346.590	0.788
4800.000	1.537	337.202	4798.646	79.390	-19.502	79.390	81.750	346.199	0.557
4900.000	1.508	7.936	4898.613	81.930	-19.840	81.930	84.298	346.387	0.807
5000.000	1.507	349.622	4998.579	84.526	-19.895	84.526	86.836	346.755	0.480
5100.000	0.956	337.289	5098.555	86.590	-20.454	86.590	88.973	346.709	0.609
5200.000	1.180	330.818	5198.538	88.259	-21.279	88.259	90.788	346.445	0.254
5300.000	1.202	14.742	5298.518	90.173	-21.514	90.173	92.704	346.581	0.891
5400.000	1.037	16.010	5398.499	92.057	-20.997	92.057	94.422	347.151	0.167
5500.000	1.030	336.501	5498.484	93.751	-21.106	93.751	96.098	347.313	0.699

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	0.256	14.667	5598.477	94.791	-21.408	94.791	97.179	347.274	0.843
5700.000	0.627	286.091	5698.475	95.159	-21.877	95.159	97.641	347.053	0.671
5800.000	0.523	248.843	5798.470	95.146	-22.828	95.146	97.846	346.508	0.380
5900.000	0.459	274.618	5898.467	95.014	-23.652	95.014	97.913	346.021	0.228
6000.000	0.458	181.091	5998.465	94.646	-24.058	94.646	97.656	345.738	0.668
6100.000	0.174	25.225	6098.464	94.385	-24.001	94.385	97.388	345.733	0.621
6200.000	0.490	230.596	6198.463	94.251	-24.267	94.251	97.325	345.562	0.652
6300.000	0.767	134.611	6298.459	93.509	-24.121	93.509	96.570	345.536	0.952
6400.000	1.345	121.684	6398.442	92.423	-22.646	92.423	95.157	346.232	0.622
6500.000	1.778	153.071	6498.406	90.424	-20.945	90.424	92.818	346.959	0.942
6600.000	2.197	133.890	6598.347	87.712	-18.860	87.712	89.716	347.865	0.781
6700.000	1.733	128.875	6698.288	85.434	-16.302	85.434	86.975	349.197	0.495
6750.000	1.785	121.108	6748.264	84.557	-15.047	84.557	85.885	349.910	0.488