



Company/Rig: Noble Energy/Production/CoreTech
WELL/API#: KESSLER 19-22/05-123-22380
DECLINATION: 8.26 Degrees
TD AS DRILLED: 7300'
COUNTY/STATE: WELD/COLORADO
VS-Azi: 0.000 Degrees
Latitude: 40.47809, Longitude: -104.82977
Grid North = True North -0.43 degs (NAD 27)
Grid Correction Applied = -0.43 degs



Depth Reference : RKB=SURFACE ELEVATION=4790'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: run1-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 6/5/2017 / 09:45

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

COMMERCE CITY, COLORADO

303-853-4976

Surveyor: JAY HINMAN / Kessler 19-22

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	0.385	70.785	99.999	0.111	0.318	0.111	0.336	70.785	0.385
200.000	0.142	289.738	199.999	0.263	0.518	0.263	0.581	63.064	0.504
300.000	0.150	258.173	299.998	0.278	0.273	0.278	0.390	44.427	0.080
400.000	0.211	246.545	399.998	0.178	-0.024	0.178	0.180	352.275	0.070
500.000	0.284	229.505	499.997	-0.056	-0.381	-0.056	0.385	261.672	0.103
600.000	0.282	244.467	599.996	-0.323	-0.792	-0.323	0.855	247.818	0.074
700.000	0.263	281.185	699.995	-0.384	-1.239	-0.384	1.297	252.774	0.173
800.000	0.258	311.934	799.994	-0.189	-1.632	-0.189	1.643	263.400	0.138
900.000	0.287	85.862	899.993	-0.020	-1.550	-0.020	1.551	269.256	0.502
1000.000	0.471	317.558	999.992	0.301	-1.578	0.301	1.607	280.803	0.687
1100.000	0.303	269.255	1099.990	0.601	-2.120	0.601	2.203	285.825	0.352
1200.000	0.409	287.036	1199.988	0.702	-2.725	0.702	2.814	284.442	0.151
1300.000	0.409	290.198	1299.985	0.930	-3.402	0.930	3.526	285.286	0.023
1400.000	0.442	282.437	1399.983	1.136	-4.114	1.136	4.268	285.440	0.066
1500.000	0.567	298.463	1499.979	1.455	-4.926	1.455	5.136	286.459	0.188
1600.000	0.538	290.217	1599.974	1.853	-5.801	1.853	6.090	287.717	0.085
1700.000	1.083	267.083	1699.964	1.967	-7.186	1.967	7.450	285.311	0.626
1800.000	1.246	268.295	1799.943	1.887	-9.217	1.887	9.408	281.570	0.164

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	1.601	274.571	1899.912	1.966	-11.696	1.966	11.860	279.541	0.387
2000.000	1.332	267.271	1999.880	2.022	-14.249	2.022	14.392	278.076	0.326
2100.000	1.156	286.686	2099.857	2.256	-16.377	2.256	16.531	277.844	0.454
2200.000	1.560	294.221	2199.828	3.104	-18.584	3.104	18.842	279.483	0.441
2300.000	1.089	278.500	2299.802	3.803	-20.765	3.803	21.111	280.378	0.591
2400.000	1.148	277.489	2399.783	4.074	-22.698	4.074	23.061	280.175	0.063
2500.000	0.989	272.653	2499.765	4.245	-24.554	4.245	24.918	279.808	0.183
2600.000	0.918	276.483	2599.751	4.375	-26.212	4.375	26.575	279.476	0.095
2700.000	0.778	282.114	2699.740	4.608	-27.671	4.608	28.052	279.454	0.163
2800.000	0.876	278.625	2799.730	4.865	-29.091	4.865	29.495	279.494	0.111
2900.000	0.875	277.544	2899.718	5.080	-30.604	5.080	31.023	279.424	0.017
3000.000	0.912	279.244	2999.706	5.308	-32.147	5.308	32.582	279.376	0.045
3100.000	0.980	281.586	3099.692	5.608	-33.770	5.608	34.232	279.428	0.078
3200.000	1.019	282.452	3199.677	5.971	-35.476	5.971	35.975	279.554	0.042
3300.000	0.698	286.662	3299.666	6.337	-36.927	6.337	37.467	279.738	0.327
3400.000	0.372	328.933	3399.662	6.790	-37.678	6.790	38.285	280.216	0.491
3500.000	0.661	345.522	3499.658	7.627	-37.990	7.627	38.748	281.352	0.322
3600.000	0.693	344.733	3599.651	8.770	-38.294	8.770	39.285	282.899	0.034
3700.000	0.703	332.963	3699.643	9.900	-38.732	9.900	39.977	284.338	0.143
3800.000	0.751	334.823	3799.635	11.039	-39.289	11.039	40.811	285.694	0.054
3900.000	0.609	322.150	3899.628	12.052	-39.894	12.052	41.675	286.810	0.206
4000.000	0.401	237.447	3999.625	12.284	-40.515	12.284	42.337	286.867	0.697
4100.000	0.172	186.967	4099.624	11.946	-40.828	11.946	42.540	286.309	0.320
4200.000	0.273	57.089	4199.624	11.926	-40.647	11.926	42.360	286.352	0.406
4300.000	0.090	308.579	4299.623	12.105	-40.508	12.105	42.278	286.637	0.313
4400.000	0.297	229.472	4399.623	11.985	-40.767	11.985	42.492	286.383	0.294
4500.000	0.702	232.799	4499.619	11.446	-41.452	11.446	43.003	285.437	0.406
4600.000	0.436	203.548	4599.614	10.727	-42.092	10.727	43.437	284.298	0.386
4700.000	0.380	251.289	4699.612	10.272	-42.558	10.272	43.780	283.570	0.334
4800.000	0.366	246.865	4799.610	10.040	-43.166	10.040	44.318	283.094	0.032
4900.000	0.466	216.744	4899.607	9.589	-43.703	9.589	44.743	282.375	0.237
5000.000	0.486	257.207	4999.604	9.169	-44.360	9.169	45.298	281.679	0.330
5100.000	0.567	226.665	5099.600	8.736	-45.134	8.736	45.971	280.954	0.288
5200.000	0.852	233.993	5199.592	7.959	-46.095	7.959	46.778	279.796	0.299
5300.000	1.072	257.316	5299.578	7.316	-47.610	7.316	48.169	278.736	0.444
5400.000	1.714	256.237	5399.548	6.755	-49.975	6.755	50.429	277.698	0.642
5500.000	2.059	245.772	5499.494	5.662	-53.066	5.662	53.367	276.090	0.486
5600.000	1.560	228.706	5599.445	4.026	-55.727	4.026	55.872	274.132	0.729
5700.000	1.177	205.260	5699.417	2.199	-57.188	2.199	57.231	272.202	0.671
5800.000	0.898	206.318	5799.400	0.567	-57.974	0.567	57.977	270.560	0.280

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	0.828	193.167	5899.389	-0.839	-58.486	-0.839	58.492	269.178	0.209
6000.000	1.074	172.570	5999.376	-2.472	-58.530	-2.472	58.582	267.581	0.417
6100.000	0.989	179.882	6099.359	-4.265	-58.407	-4.265	58.562	265.823	0.157
6200.000	1.130	187.216	6199.342	-6.106	-58.529	-6.106	58.846	264.044	0.195
6300.000	1.128	165.975	6299.323	-8.039	-58.414	-8.039	58.964	262.164	0.416
6400.000	1.221	184.578	6399.303	-10.057	-58.260	-10.057	59.122	260.206	0.391
6500.000	1.669	164.887	6499.271	-12.525	-57.966	-12.525	59.303	257.807	0.663
6600.000	1.969	180.621	6599.221	-15.650	-57.604	-15.650	59.692	254.801	0.580
6700.000	2.626	171.275	6699.141	-19.632	-57.275	-19.632	60.547	251.080	0.754
6800.000	2.197	154.481	6799.053	-23.626	-56.102	-23.626	60.874	247.163	0.822
6900.000	2.014	136.355	6898.987	-26.628	-54.063	-26.628	60.265	243.778	0.687
7000.000	1.296	116.074	6998.945	-28.397	-51.834	-28.397	59.103	241.284	0.916
7100.000	0.502	112.563	7098.932	-29.062	-50.414	-29.062	58.191	240.037	0.796