



Company: PDC Energy  
Lease/Well: Keiser / 22-28  
API#: 05-123-14776  
Rig Name: Production / V.E.S.  
State/County: Colorado / Weld County  
Latitude: 40.283, Longitude: -104.784  
Directions are relative to True North  
VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG GYRO SURVEY CALCULATIONS

Filename: survey.ut  
Minimum Curvature Method  
Report Date/Time: 2/17/2014 / 16:44

Vaughn Energy Services  
Henderson CO.  
303-853-4976  
Norman Cowan

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	0.259	197.296	100.000	-0.216	-0.067	-0.216	0.226	197.296	0.259
200.000	0.801	185.537	199.995	-1.127	-0.202	-1.127	1.145	190.148	0.550
300.000	0.394	181.663	299.989	-2.167	-0.279	-2.167	2.185	187.344	0.410
400.000	0.687	210.830	399.985	-3.025	-0.596	-3.025	3.083	191.154	0.393
500.000	0.630	187.746	499.979	-4.085	-0.978	-4.085	4.200	193.462	0.269
600.000	0.651	206.181	599.972	-5.140	-1.303	-5.140	5.302	194.222	0.206
700.000	0.303	346.808	699.971	-5.392	-1.614	-5.392	5.628	196.663	0.907
800.000	0.447	15.761	799.968	-4.758	-1.568	-4.758	5.010	198.241	0.234
900.000	0.494	86.421	899.966	-4.356	-1.032	-4.356	4.476	193.324	0.546
1000.000	0.640	116.959	999.961	-4.582	-0.103	-4.582	4.583	181.288	0.330
1100.000	0.428	141.981	1099.957	-5.130	0.625	-5.130	5.167	173.053	0.311
1200.000	0.381	133.095	1199.954	-5.651	1.098	-5.651	5.756	169.006	0.078
1300.000	0.736	120.131	1299.950	-6.200	1.896	-6.200	6.484	162.997	0.375
1400.000	0.711	113.435	1399.942	-6.769	3.021	-6.769	7.413	155.953	0.088
1500.000	0.640	94.649	1499.935	-7.061	4.146	-7.061	8.189	149.580	0.231
1600.000	0.757	145.156	1599.928	-7.648	5.080	-7.648	9.182	146.408	0.605
1700.000	0.788	127.745	1699.919	-8.611	6.001	-8.611	10.496	145.128	0.236
1800.000	0.948	124.440	1799.908	-9.500	7.227	-9.500	11.937	142.737	0.168
1900.000	0.650	105.019	1899.898	-10.115	8.458	-10.115	13.186	140.098	0.399
2000.000	0.431	99.587	1999.894	-10.325	9.377	-10.325	13.948	137.754	0.225
2100.000	0.467	96.449	2099.890	-10.434	10.153	-10.434	14.559	135.780	0.044
2200.000	0.841	41.737	2199.885	-9.932	11.047	-9.932	14.855	131.958	0.687
2300.000	0.847	17.189	2299.874	-8.678	11.754	-8.678	14.610	126.440	0.359
2400.000	1.348	50.389	2399.856	-7.222	12.878	-7.222	14.765	119.282	0.790
2500.000	0.939	75.112	2499.837	-6.261	14.577	-6.261	15.864	113.245	0.632
2600.000	1.101	58.131	2599.821	-5.544	16.184	-5.544	17.107	108.908	0.341
2700.000	0.663	95.868	2699.810	-5.096	17.575	-5.096	18.299	106.168	0.705
2800.000	0.740	157.660	2799.804	-5.752	18.396	-5.752	19.274	107.364	0.723
2900.000	0.733	230.675	2899.797	-6.755	18.146	-6.755	19.363	110.417	0.876
3000.000	0.148	235.707	2999.794	-7.233	17.545	-7.233	18.977	112.403	0.586
3100.000	0.563	282.435	3099.792	-7.200	16.959	-7.200	18.424	113.003	0.474
3200.000	0.243	260.029	3199.789	-7.130	16.270	-7.130	17.764	113.666	0.351
3300.000	1.095	301.342	3299.782	-6.670	15.245	-6.670	16.640	113.631	0.927
3400.000	1.478	318.441	3399.757	-5.208	13.573	-5.208	14.538	110.992	0.538

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
3500.000	1.512	320.587	3499.723	-3.224	11.880	-3.224	12.310	105.184	0.065
3600.000	1.579	301.188	3599.687	-1.492	9.864	-1.492	9.976	98.600	0.525
3700.000	1.698	315.326	3699.647	0.275	7.644	0.275	7.649	87.940	0.420
3800.000	1.888	314.042	3799.598	2.474	5.418	2.474	5.956	65.459	0.195
3900.000	1.917	319.162	3899.543	4.885	3.140	4.885	5.807	32.732	0.172
4000.000	1.587	295.948	3999.497	6.757	0.801	6.757	6.804	6.757	0.776
4100.000	1.150	263.155	4099.470	7.243	-1.441	7.243	7.385	348.748	0.879
4200.000	1.161	217.685	4199.451	6.321	-3.057	6.321	7.022	334.195	0.893
4300.000	1.673	207.743	4299.421	4.227	-4.356	4.227	6.070	314.141	0.566
4400.000	1.866	221.701	4399.373	1.720	-6.118	1.720	6.355	285.698	0.470
4500.000	1.661	237.663	4499.327	-0.271	-8.426	-0.271	8.430	268.158	0.530
4600.000	1.058	256.451	4599.299	-1.263	-10.548	-1.263	10.624	263.174	0.742
4700.000	1.338	302.998	4699.279	-0.843	-12.425	-0.843	12.453	266.117	0.981
4800.000	1.686	328.193	4799.245	1.043	-14.179	1.043	14.218	274.207	0.742
4900.000	1.157	344.895	4899.214	3.268	-15.218	3.268	15.565	282.119	0.667
5000.000	1.007	5.387	4999.197	5.117	-15.398	5.117	16.226	288.383	0.412
5100.000	0.674	49.867	5099.187	6.372	-14.866	6.372	16.174	293.201	0.707
5200.000	0.880	26.133	5199.178	7.440	-14.078	7.440	15.923	297.857	0.378
5300.000	0.919	77.298	5299.167	8.306	-12.957	8.306	15.391	302.661	0.778
5400.000	1.471	47.965	5399.146	9.342	-11.221	9.342	14.601	309.777	0.807
5500.000	1.205	66.934	5499.119	10.613	-9.301	10.613	14.112	318.769	0.513
5600.000	1.011	95.233	5599.101	10.944	-7.456	10.944	13.243	325.735	0.573
5700.000	1.850	97.068	5699.069	10.665	-4.976	10.665	11.769	334.989	0.840
5800.000	1.940	102.735	5799.014	10.094	-1.723	10.094	10.240	350.312	0.208
5900.000	2.012	129.406	5898.957	8.606	1.285	8.606	8.701	8.490	0.914
6000.000	1.830	132.894	5998.901	6.404	3.811	6.404	7.452	30.757	0.217
6100.000	2.110	119.537	6098.842	4.410	6.583	4.410	7.923	56.184	0.536
6200.000	2.964	129.747	6198.743	1.848	10.173	1.848	10.340	79.702	0.963
6300.000	3.354	142.414	6298.593	-2.123	13.946	-2.123	14.106	98.656	0.797
6400.000	1.676	143.922	6398.493	-5.623	16.591	-5.623	17.518	108.723	1.679
6500.000	1.422	217.392	6498.465	-7.792	16.699	-7.792	18.427	115.014	1.864
6600.000	0.978	256.502	6598.444	-8.977	15.115	-8.977	17.580	120.706	0.906
6700.000	1.479	265.356	6698.421	-9.281	12.999	-9.281	15.972	125.524	0.534
6800.000	1.592	268.359	6798.385	-9.425	10.325	-9.425	13.980	132.391	0.139
6900.000	0.949	286.057	6898.360	-9.236	8.140	-9.236	12.311	138.608	0.746
7000.000	1.304	238.106	6998.343	-9.607	6.378	-9.607	11.532	146.421	0.971
7100.000	2.008	242.349	7098.300	-11.022	3.860	-11.022	11.678	160.697	0.715
7150.000	1.284	244.297	7148.279	-11.671	2.580	-11.671	11.953	167.536	1.452

HORIZONTAL DISPLACEMENT IS  
11.953 FEET AT 167.536 DEGREES