



Company: PDC Energy

Well: Victor Klein 20-1A

API: 05-123-13116

Rig Name: Production / V.E.S.

State/County: Colorado / Weld

Latitude: 40.387, Longitude: -104.571

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: gyro-de\_01.ut

Minimum Curvature Method

Report Date/Time: 7/17/2014 / 13:03

VES Survey International

Henderson Colorado

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	0.913	336.478	99.996	0.730	-0.318	0.730	0.796	336.478	0.913
200.000	1.036	0.211	199.982	2.365	-0.632	2.365	2.448	345.027	0.419
300.000	0.192	57.833	299.976	3.358	-0.487	3.358	3.393	351.745	0.947
400.000	0.938	49.415	399.970	3.980	0.276	3.980	3.989	3.971	0.749
500.000	0.178	92.766	499.965	4.505	1.053	4.505	4.626	13.156	0.818
600.000	0.947	72.123	599.959	4.751	1.995	4.751	5.153	22.776	0.783
700.000	0.224	30.791	699.954	5.172	2.881	5.172	5.921	29.121	0.793
800.000	0.751	20.545	799.950	5.953	3.211	5.953	6.764	28.342	0.532
900.000	0.890	53.257	899.940	7.031	4.063	7.031	8.121	30.023	0.481
1000.000	0.480	139.964	999.935	7.175	4.955	7.175	8.719	34.627	0.986
1100.000	0.680	132.675	1099.929	6.452	5.660	6.452	8.583	41.261	0.213
1200.000	0.759	60.366	1199.923	6.377	6.672	6.377	9.230	46.296	0.851
1300.000	0.864	118.342	1299.915	6.347	7.912	6.347	10.143	51.265	0.792
1400.000	0.816	67.350	1399.905	6.263	9.233	6.263	11.156	55.849	0.724
1500.000	0.084	173.959	1499.902	6.464	9.897	6.464	11.821	56.851	0.844
1600.000	0.427	196.508	1599.901	6.034	9.799	6.034	11.508	58.378	0.351
1700.000	0.570	202.454	1699.897	5.217	9.503	5.217	10.841	61.236	0.152
1800.000	1.155	158.911	1799.886	3.817	9.676	3.817	10.401	68.472	0.839
1900.000	0.511	105.810	1899.876	2.755	10.467	2.755	10.824	75.253	0.941
2000.000	0.745	95.002	1999.870	2.577	11.544	2.577	11.828	77.415	0.262
2100.000	0.422	186.931	2099.867	2.155	12.148	2.155	12.337	79.941	0.869
2200.000	0.151	69.980	2199.866	1.834	12.227	1.834	12.364	81.467	0.509
2300.000	0.909	131.661	2299.861	1.352	12.943	1.352	13.014	84.035	0.848
2400.000	0.918	160.665	2399.849	0.070	13.801	0.070	13.801	89.711	0.457
2500.000	0.296	233.125	2499.844	-0.841	13.859	-0.841	13.885	93.472	0.875
2600.000	0.353	100.016	2599.843	-1.050	13.957	-1.050	13.996	94.301	0.596
2700.000	0.818	184.393	2699.839	-1.815	14.206	-1.815	14.321	97.282	0.859
2800.000	0.922	240.048	2799.829	-2.929	13.453	-2.929	13.769	102.282	0.818
2900.000	0.891	199.931	2899.818	-4.062	12.491	-4.062	13.135	108.012	0.623
3000.000	1.010	173.562	2999.804	-5.668	12.325	-5.668	13.566	114.697	0.449
3100.000	0.751	137.746	3099.793	-7.029	12.864	-7.029	14.659	118.652	0.595
3200.000	0.789	193.682	3199.785	-8.183	13.142	-8.183	15.481	121.908	0.723
3300.000	1.091	132.825	3299.774	-9.499	13.677	-9.499	16.652	124.779	0.987
3400.000	0.480	194.919	3399.766	-10.551	14.268	-10.551	17.745	126.482	0.965

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	0.517	201.006	3499.762	-11.377	13.998	-11.377	18.038	129.102	0.065
3600.000	0.983	130.184	3599.755	-12.351	14.491	-12.351	19.041	130.442	0.948
3700.000	0.823	139.458	3699.742	-13.450	15.613	-13.450	20.608	130.744	0.216
3800.000	0.467	93.672	3799.736	-14.022	16.487	-14.022	21.643	130.381	0.599
3900.000	1.120	135.327	3899.727	-14.743	17.581	-14.743	22.945	129.983	0.831
4000.000	1.037	148.906	3999.709	-16.213	18.736	-16.213	24.777	130.872	0.268
4100.000	1.051	182.304	4099.694	-17.905	19.166	-17.905	26.228	133.051	0.600
4200.000	0.526	196.443	4199.684	-19.261	19.000	-19.261	27.055	135.392	0.556
4300.000	0.933	217.005	4299.676	-20.351	18.380	-20.351	27.422	137.914	0.478
4400.000	1.502	194.112	4399.653	-22.273	17.570	-22.273	28.368	141.731	0.738
4500.000	0.809	216.847	4499.633	-24.108	16.827	-24.108	29.400	145.085	0.818
4600.000	1.621	243.400	4599.610	-25.306	15.139	-25.306	29.489	149.111	0.968
4700.000	2.418	258.670	4699.548	-26.354	11.806	-26.354	28.878	155.869	0.955
4800.000	2.784	268.626	4799.445	-26.827	7.309	-26.827	27.805	164.759	0.580
4900.000	2.901	263.255	4899.323	-27.182	2.368	-27.182	27.285	175.022	0.291
5000.000	2.449	267.945	4999.213	-27.556	-2.281	-27.556	27.651	184.732	0.502
5100.000	1.614	256.232	5099.150	-27.968	-5.784	-27.968	28.560	191.685	0.929
5200.000	1.034	289.001	5199.124	-28.009	-8.005	-28.009	29.131	195.950	0.931
5300.000	0.638	312.181	5299.114	-27.342	-9.271	-27.342	28.871	198.731	0.513
5400.000	0.849	234.059	5399.107	-27.403	-10.283	-27.403	29.269	200.570	0.951
5500.000	0.617	197.309	5499.100	-28.352	-11.043	-28.352	30.426	201.282	0.512
5600.000	1.056	199.371	5599.089	-29.735	-11.509	-29.735	31.885	201.160	0.441
5700.000	1.735	221.146	5699.059	-31.744	-12.811	-31.744	34.232	201.977	0.850
5800.000	1.468	222.247	5799.020	-33.832	-14.668	-33.832	36.875	203.439	0.269
5900.000	1.523	247.714	5898.987	-35.284	-16.759	-35.284	39.062	205.406	0.661
6000.000	1.582	239.711	5998.951	-36.484	-19.180	-36.484	41.219	207.731	0.224
6100.000	2.139	246.265	6098.898	-37.932	-22.080	-37.932	43.890	210.204	0.596
6200.000	1.800	270.413	6198.840	-38.671	-25.359	-38.671	46.245	213.255	0.888
6300.000	0.921	288.484	6298.811	-38.405	-27.692	-38.405	47.348	215.794	0.968
6400.000	0.666	31.873	6398.805	-37.657	-28.147	-37.657	47.014	216.777	1.255
6500.000	1.612	48.810	6498.785	-36.237	-26.782	-36.237	45.060	216.467	0.994
6600.000	1.081	68.557	6598.757	-34.966	-24.846	-34.966	42.895	215.396	0.698
6650.000	1.556	63.430	6648.744	-34.490	-23.799	-34.490	41.904	214.607	0.979
HORIZONTAL DISPLACEMENT IS 41.904 FEET AT 214.607 DEGREES									