



Company: PDC Energy
Well: Berg 33-15
API#: 05-123-12966
Rig Name: Production / V.E.S.
State/County: Colorado / Weld County
Latitude: 40.486, Longitude: -104.761
Directions are relative to True North
VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: hgyro-de_01.ut
Minimum Curvature Method
Report Date/Time: 3/28/2014 / 09:07

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	0.197	175.196	100.000	-0.171	0.014	-0.171	0.171	175.196	0.197
200.000	0.252	215.976	199.999	-0.520	-0.101	-0.520	0.530	190.951	0.165
300.000	0.065	223.437	299.999	-0.739	-0.269	-0.739	0.787	199.992	0.188
400.000	0.068	178.436	399.999	-0.840	-0.306	-0.840	0.894	200.042	0.051
500.000	0.100	118.817	499.999	-0.941	-0.229	-0.941	0.968	193.651	0.088
600.000	0.315	165.201	599.998	-1.249	-0.082	-1.249	1.251	183.767	0.256
700.000	0.361	189.584	699.996	-1.824	-0.064	-1.824	1.826	182.024	0.150
800.000	0.431	233.974	799.994	-2.356	-0.421	-2.356	2.393	190.133	0.306
900.000	0.304	239.185	899.992	-2.713	-0.953	-2.713	2.876	199.356	0.131
1000.000	0.451	252.939	999.990	-2.965	-1.557	-2.965	3.349	207.708	0.171
1100.000	0.421	228.509	1099.987	-3.323	-2.208	-3.323	3.990	213.601	0.187
1200.000	0.465	234.123	1199.984	-3.805	-2.812	-3.805	4.731	216.469	0.061
1300.000	0.568	237.149	1299.980	-4.311	-3.557	-4.311	5.589	219.525	0.107
1400.000	0.493	248.522	1399.976	-4.737	-4.373	-4.737	6.447	222.713	0.129
1500.000	0.368	268.565	1499.973	-4.903	-5.095	-4.903	7.071	226.100	0.194
1600.000	0.675	267.773	1599.969	-4.934	-6.004	-4.934	7.771	230.590	0.307
1700.000	0.534	256.950	1699.963	-5.062	-7.047	-5.062	8.676	234.310	0.181
1800.000	0.594	247.898	1799.958	-5.362	-7.981	-5.362	9.615	236.104	0.107
1900.000	0.594	251.249	1899.953	-5.723	-8.951	-5.723	10.625	237.405	0.035
2000.000	0.795	243.845	1999.945	-6.196	-10.064	-6.196	11.819	238.383	0.220
2100.000	0.675	243.710	2099.937	-6.763	-11.216	-6.763	13.097	238.911	0.120
2200.000	0.444	228.569	2199.932	-7.280	-12.035	-7.280	14.065	238.828	0.272
2300.000	0.626	231.379	2299.928	-7.878	-12.752	-7.878	14.989	238.294	0.184
2400.000	0.622	255.502	2399.922	-8.355	-13.705	-8.355	16.051	238.632	0.261
2500.000	0.391	260.992	2499.918	-8.544	-14.568	-8.544	16.889	239.608	0.236
2600.000	0.297	273.957	2599.916	-8.580	-15.164	-8.580	17.423	240.498	0.122
2700.000	0.333	242.805	2699.915	-8.695	-15.681	-8.695	17.930	240.993	0.173
2800.000	0.358	240.775	2799.913	-8.980	-16.212	-8.980	18.533	241.017	0.028
2900.000	0.247	248.909	2899.912	-9.210	-16.686	-9.210	19.059	241.102	0.119
3000.000	0.356	231.297	2999.910	-9.482	-17.129	-9.482	19.578	241.033	0.142
3100.000	0.454	222.622	3099.908	-9.967	-17.639	-9.967	20.260	240.531	0.115
3200.000	0.118	195.555	3199.907	-10.357	-17.935	-10.357	20.711	239.994	0.353
3300.000	0.386	283.513	3299.906	-10.378	-18.290	-10.378	21.029	240.430	0.400
3400.000	0.487	313.591	3399.903	-10.006	-18.925	-10.006	21.408	242.135	0.247

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	0.477	282.900	3499.900	-9.620	-19.639	-9.620	21.868	243.903	0.255
3600.000	0.411	260.123	3599.897	-9.588	-20.398	-9.588	22.539	244.823	0.187
3700.000	0.706	223.916	3699.892	-10.094	-21.179	-10.094	23.461	244.517	0.447
3800.000	0.708	219.512	3799.884	-11.015	-22.000	-11.015	24.603	243.404	0.054
3900.000	0.485	230.804	3899.879	-11.759	-22.721	-11.759	25.584	242.636	0.251
4000.000	0.524	236.172	3999.875	-12.282	-23.429	-12.282	26.453	242.336	0.061
4100.000	0.571	238.379	4099.871	-12.798	-24.234	-12.798	27.406	242.162	0.051
4200.000	0.346	246.479	4199.867	-13.179	-24.935	-13.179	28.204	242.141	0.234
4300.000	0.707	310.256	4299.864	-12.901	-25.683	-12.901	28.741	243.329	0.635
4400.000	0.533	304.934	4399.858	-12.236	-26.535	-12.236	29.220	245.245	0.183
4500.000	0.688	299.142	4499.852	-11.677	-27.441	-11.677	29.822	246.949	0.167
4600.000	1.104	321.266	4599.840	-10.633	-28.569	-10.633	30.483	249.586	0.533
4700.000	0.791	21.422	4699.828	-9.239	-28.919	-9.239	30.359	252.283	0.988
4800.000	0.960	313.176	4799.819	-8.023	-29.278	-8.023	30.357	254.676	0.992
4900.000	0.847	250.161	4899.809	-7.700	-30.584	-7.700	31.538	255.868	0.949
5000.000	0.357	155.375	4999.805	-8.235	-31.149	-8.235	32.219	255.192	0.946
5100.000	0.522	13.840	5099.803	-8.076	-30.910	-8.076	31.948	255.358	0.832
5200.000	0.976	25.260	5199.795	-6.863	-30.438	-6.863	31.202	257.294	0.475
5300.000	1.048	32.582	5299.779	-5.322	-29.582	-5.322	30.057	259.801	0.148
5400.000	0.982	66.673	5399.764	-4.212	-28.302	-4.212	28.614	261.534	0.598
5500.000	0.409	115.793	5499.757	-4.028	-27.194	-4.028	27.491	261.574	0.779
5600.000	0.590	56.209	5599.754	-3.897	-26.445	-3.897	26.730	261.617	0.521
5700.000	0.931	71.671	5699.745	-3.355	-25.245	-3.355	25.467	262.430	0.395
5800.000	0.255	337.296	5799.740	-2.895	-24.560	-2.895	24.730	263.278	0.984
5900.000	0.388	64.903	5899.739	-2.546	-24.339	-2.546	24.472	264.028	0.455
6000.000	1.225	82.023	5999.729	-2.254	-22.974	-2.254	23.084	264.396	0.863
6100.000	1.223	105.240	6099.706	-2.386	-20.885	-2.386	21.021	263.482	0.493
6200.000	0.626	87.762	6199.693	-2.646	-19.310	-2.646	19.490	262.199	0.653
6300.000	1.265	80.712	6299.679	-2.446	-17.674	-2.446	17.842	262.120	0.648
6400.000	1.014	104.856	6399.660	-2.495	-15.729	-2.495	15.925	260.988	0.536
6500.000	1.674	133.610	6499.633	-3.729	-13.816	-3.729	14.311	254.896	0.924
6600.000	0.936	160.749	6599.607	-5.508	-12.489	-5.508	13.650	246.203	0.943
6700.000	0.356	238.814	6699.602	-6.440	-12.486	-6.440	14.049	242.716	0.930
6750.000	0.661	163.681	6749.600	-6.797	-12.538	-6.797	14.262	241.536	1.331
HORIZONTAL DISPLACEMENT IS 14.262 FEET AT 241.536 DEGREES									