



Company: PDC Energy

Well: Andy 29-2

API: 05-123-19343

Rig Name: Production / V.E.S.

State/County: Colorado / Weld

Latitude: 40.459, Longitude: -104.581

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: 11/8/2014 / 10:13

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	0.461	348.729	99.999	0.394	-0.079	0.394	0.402	348.729	0.461
200.000	0.525	325.646	199.995	1.167	-0.416	1.167	1.239	340.386	0.207
300.000	0.257	333.892	299.993	1.747	-0.773	1.747	1.910	336.122	0.273
400.000	0.264	331.416	399.992	2.150	-0.982	2.150	2.364	335.453	0.013
500.000	0.321	315.282	499.991	2.551	-1.289	2.551	2.859	333.192	0.100
600.000	0.403	301.808	599.989	2.936	-1.785	2.936	3.436	328.696	0.118
700.000	0.212	252.552	699.987	3.066	-2.261	3.066	3.809	323.590	0.310
800.000	0.234	205.155	799.987	2.825	-2.525	2.825	3.789	318.216	0.181
900.000	0.321	193.926	899.985	2.368	-2.679	2.368	3.576	311.478	0.102
1000.000	0.436	186.902	999.983	1.719	-2.792	1.719	3.279	301.616	0.124
1100.000	0.177	238.871	1099.982	1.262	-2.970	1.262	3.227	293.015	0.355
1200.000	0.273	248.045	1199.981	1.093	-3.322	1.093	3.497	288.210	0.102
1300.000	0.309	230.513	1299.980	0.832	-3.751	0.832	3.842	282.511	0.096
1400.000	0.286	314.995	1399.979	0.837	-4.136	0.837	4.220	281.440	0.400
1500.000	0.295	271.443	1499.978	1.020	-4.569	1.020	4.681	282.580	0.215
1600.000	0.087	142.104	1599.977	0.967	-4.780	0.967	4.877	281.432	0.356
1700.000	0.627	97.390	1699.975	0.837	-4.191	0.837	4.274	281.288	0.568
1800.000	0.788	144.266	1799.968	0.208	-3.247	0.208	3.254	273.668	0.582
1900.000	1.291	161.829	1899.952	-1.420	-2.495	-1.420	2.871	240.352	0.590
2000.000	1.712	172.269	1999.917	-3.970	-1.943	-3.970	4.420	206.072	0.500
2100.000	1.508	174.785	2099.878	-6.761	-1.622	-6.761	6.953	193.492	0.216
2200.000	1.542	174.067	2199.842	-9.410	-1.363	-9.410	9.508	188.245	0.039
2300.000	1.888	176.362	2299.797	-12.392	-1.120	-12.392	12.442	185.164	0.352
2400.000	0.971	175.738	2399.765	-14.880	-0.952	-14.880	14.910	183.662	0.917
2500.000	0.779	192.510	2499.754	-16.388	-1.037	-16.388	16.421	183.619	0.318
2600.000	0.678	219.811	2599.746	-17.506	-1.563	-17.506	17.576	185.101	0.357
2700.000	0.880	286.798	2699.738	-17.739	-2.677	-17.739	17.940	188.583	0.876
2800.000	1.485	303.554	2799.717	-16.801	-4.492	-16.801	17.391	194.970	0.690
2900.000	0.980	298.373	2899.694	-15.678	-6.324	-15.678	16.906	201.967	0.516
3000.000	1.056	306.321	2999.678	-14.726	-7.819	-14.726	16.673	207.967	0.160
3100.000	0.583	308.171	3099.667	-13.865	-8.962	-13.865	16.510	212.877	0.474
3200.000	0.711	327.549	3199.661	-13.027	-9.695	-13.027	16.239	216.658	0.252
3300.000	0.868	6.717	3299.652	-11.751	-9.940	-11.751	15.391	220.227	0.550
3400.000	1.170	30.345	3399.637	-10.118	-9.335	-10.118	13.766	222.697	0.511

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	0.846	34.534	3499.621	-8.628	-8.401	-8.628	12.043	224.235	0.332
3600.000	0.767	37.114	3599.611	-7.486	-7.578	-7.486	10.652	225.351	0.087
3700.000	0.970	48.887	3699.600	-6.395	-6.536	-6.395	9.145	225.625	0.269
3800.000	1.176	50.634	3799.582	-5.188	-5.106	-5.188	7.279	224.541	0.208
3900.000	1.199	56.204	3899.561	-3.955	-3.443	-3.955	5.244	221.040	0.118
4000.000	1.180	51.442	3999.539	-2.732	-1.769	-2.732	3.254	212.922	0.101
4100.000	1.028	49.508	4099.521	-1.507	-0.281	-1.507	1.533	190.563	0.156
4200.000	1.487	44.279	4199.496	0.005	1.307	0.005	1.307	89.798	0.473
4300.000	1.663	41.988	4299.458	2.013	3.184	2.013	3.767	57.707	0.187
4400.000	1.813	33.110	4399.413	4.417	5.020	4.417	6.686	48.656	0.308
4500.000	1.897	19.641	4499.361	7.301	6.440	7.301	9.736	41.416	0.443
4600.000	2.460	359.709	4599.289	11.006	6.986	11.006	13.036	32.404	0.936
4700.000	2.580	352.625	4699.193	15.385	6.686	15.385	16.775	23.489	0.334
4800.000	2.032	346.191	4799.112	19.339	5.974	19.339	20.241	17.166	0.606
4900.000	1.569	352.828	4899.062	22.419	5.380	22.419	23.056	13.494	0.507
5000.000	1.444	344.143	4999.028	24.990	4.865	24.990	25.459	11.015	0.260
5100.000	1.276	336.925	5099.000	27.226	4.084	27.226	27.531	8.530	0.240
5200.000	0.595	338.540	5198.986	28.734	3.457	28.734	28.941	6.861	0.682
5300.000	0.545	328.882	5298.981	29.624	3.022	29.624	29.778	5.824	0.108
5400.000	0.802	290.176	5398.974	30.273	2.118	30.273	30.347	4.003	0.508
5500.000	0.737	310.403	5498.965	30.932	0.972	30.932	30.947	1.799	0.278
5600.000	0.775	338.319	5598.957	31.977	0.232	31.977	31.978	0.416	0.367
5700.000	0.600	4.710	5698.950	33.127	0.025	33.127	33.127	0.044	0.357
5800.000	0.274	3.480	5798.947	33.888	0.083	33.888	33.888	0.140	0.326
5900.000	0.361	16.324	5898.945	34.430	0.186	34.430	34.430	0.309	0.112
6000.000	0.684	37.379	5998.941	35.206	0.637	35.206	35.212	1.036	0.370
6100.000	0.608	40.026	6098.935	36.087	1.341	36.087	36.112	2.128	0.081
6200.000	0.655	15.947	6198.929	37.043	1.839	37.043	37.089	2.842	0.267
6300.000	0.206	17.250	6298.926	37.765	2.050	37.765	37.820	3.107	0.448
6400.000	0.322	350.536	6398.925	38.214	2.057	38.214	38.270	3.081	0.166
6450.000	0.334	35.146	6448.924	38.472	2.118	38.472	38.530	3.151	0.499
HORIZONTAL DISPLACEMENT IS 38.530 FEET AT 3.151 DEGREES									