



Company: PDC Energy

Well: Seeley Lake 4

API: 05-123-16520

Rig Name: Production / Nabors

State/County: Colorado / Weld

Latitude: 40.468, Longitude: -104.727

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: 8/19/2014 / 12:58

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	0.166	345.670	100.000	0.140	-0.036	0.140	0.145	345.670	0.166
200.000	0.207	296.876	199.999	0.362	-0.233	0.362	0.431	327.287	0.158
300.000	0.182	283.640	299.999	0.482	-0.549	0.482	0.730	311.279	0.051
400.000	0.327	257.428	399.998	0.457	-0.982	0.457	1.083	294.960	0.182
500.000	0.440	261.912	499.996	0.341	-1.640	0.341	1.675	281.743	0.116
600.000	0.407	272.122	599.993	0.300	-2.375	0.300	2.394	277.203	0.082
700.000	0.343	257.010	699.991	0.246	-3.022	0.246	3.032	274.653	0.117
800.000	0.318	258.017	799.989	0.121	-3.585	0.121	3.587	271.933	0.026
900.000	0.354	279.873	899.987	0.116	-4.161	0.116	4.162	271.602	0.132
1000.000	0.303	302.306	999.986	0.311	-4.689	0.311	4.699	273.790	0.137
1100.000	0.276	290.576	1099.985	0.536	-5.137	0.536	5.165	275.960	0.065
1200.000	0.306	334.129	1199.983	0.861	-5.479	0.861	5.546	278.933	0.218
1300.000	0.382	353.567	1299.982	1.433	-5.633	1.433	5.812	284.273	0.138
1400.000	0.443	356.197	1399.979	2.150	-5.696	2.150	6.088	290.681	0.064
1500.000	0.423	348.476	1499.976	2.897	-5.795	2.897	6.479	296.563	0.062
1600.000	0.499	17.525	1599.973	3.674	-5.738	3.674	6.813	302.630	0.242
1700.000	0.403	8.600	1699.970	4.437	-5.554	4.437	7.109	308.618	0.118
1800.000	0.316	22.713	1799.968	5.039	-5.395	5.039	7.382	313.045	0.124
1900.000	0.364	67.992	1899.966	5.412	-4.994	5.412	7.364	317.301	0.266
2000.000	0.365	106.050	1999.965	5.443	-4.394	5.443	6.995	321.091	0.238
2100.000	0.602	144.282	2099.961	4.929	-3.782	4.929	6.213	322.506	0.388
2200.000	0.653	142.077	2199.955	4.054	-3.125	4.054	5.119	322.372	0.056
2300.000	0.658	170.636	2299.949	3.038	-2.682	3.038	4.052	318.566	0.323
2400.000	0.779	187.897	2399.941	1.798	-2.682	1.798	3.229	303.844	0.247
2500.000	0.640	177.675	2499.933	0.567	-2.752	0.567	2.810	281.639	0.188
2600.000	0.617	178.142	2599.927	-0.529	-2.712	-0.529	2.763	258.960	0.023
2700.000	0.737	176.850	2699.920	-1.710	-2.659	-1.710	3.162	237.261	0.121
2800.000	0.739	183.119	2799.912	-2.996	-2.659	-2.996	4.006	221.593	0.081
2900.000	0.764	197.373	2899.904	-4.276	-2.893	-4.276	5.163	214.085	0.188
3000.000	0.940	202.520	2999.893	-5.670	-3.407	-5.670	6.615	210.998	0.192
3100.000	0.892	198.535	3099.880	-7.166	-3.968	-7.166	8.191	208.977	0.080
3200.000	1.371	173.138	3199.861	-9.091	-4.073	-9.091	9.962	204.131	0.683
3300.000	1.467	161.639	3299.830	-11.494	-3.526	-11.494	12.023	197.056	0.300
3400.000	1.067	164.072	3399.805	-13.605	-2.868	-13.605	13.903	191.903	0.403

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	0.648	166.917	3499.794	-15.051	-2.484	-15.051	15.254	189.372	0.421
3600.000	0.499	184.939	3599.789	-16.035	-2.394	-16.035	16.213	188.490	0.232
3700.000	0.529	193.365	3699.785	-16.919	-2.538	-16.919	17.108	188.531	0.081
3800.000	0.730	203.431	3799.779	-17.952	-2.898	-17.952	18.185	189.170	0.228
3900.000	0.805	213.355	3899.770	-19.124	-3.538	-19.124	19.448	190.480	0.153
4000.000	0.699	217.340	3999.761	-20.196	-4.294	-20.196	20.647	192.003	0.118
4100.000	0.895	265.657	4099.753	-20.740	-5.442	-20.740	21.442	194.703	0.676
4200.000	1.236	277.005	4199.735	-20.667	-7.291	-20.667	21.916	199.431	0.399
4300.000	1.281	291.490	4299.712	-20.126	-9.401	-20.126	22.214	205.037	0.320
4400.000	1.477	289.484	4399.683	-19.287	-11.656	-19.287	22.536	211.147	0.202
4500.000	1.734	290.283	4499.643	-18.333	-14.290	-18.333	23.244	217.936	0.258
4600.000	1.777	289.214	4599.596	-17.298	-17.173	-17.298	24.375	224.792	0.054
4700.000	1.893	277.443	4699.545	-16.574	-20.275	-16.574	26.187	230.735	0.394
4800.000	1.842	278.358	4799.492	-16.126	-23.503	-16.126	28.503	235.544	0.059
4900.000	1.624	285.083	4899.447	-15.524	-26.461	-15.524	30.678	239.600	0.298
5000.000	1.710	283.166	4999.404	-14.816	-29.282	-14.816	32.817	243.162	0.103
5100.000	1.644	293.280	5099.362	-13.909	-32.053	-13.909	34.940	246.543	0.303
5200.000	1.618	298.408	5199.321	-12.670	-34.612	-12.670	36.858	249.895	0.148
5300.000	1.382	310.512	5299.287	-11.215	-36.771	-11.215	38.443	253.039	0.394
5400.000	1.606	327.806	5399.254	-9.246	-38.434	-9.246	39.531	256.474	0.501
5500.000	1.601	325.552	5499.214	-6.908	-39.971	-6.908	40.564	260.195	0.063
5600.000	1.647	324.847	5599.174	-4.581	-41.589	-4.581	41.840	263.715	0.051
5700.000	1.949	328.037	5699.125	-1.963	-43.317	-1.963	43.361	267.406	0.318
5800.000	2.080	324.542	5799.063	0.958	-45.270	0.958	45.280	271.213	0.179
5900.000	1.488	342.664	5899.015	3.676	-46.709	3.676	46.853	274.499	0.810
6000.000	1.308	354.494	5998.985	6.051	-47.206	6.051	47.592	277.305	0.339
6100.000	1.572	359.278	6098.954	8.558	-47.332	8.558	48.100	280.249	0.290
6200.000	1.047	35.680	6198.929	10.671	-46.817	10.671	48.018	282.841	0.958
6300.000	1.108	358.515	6298.912	12.380	-46.309	12.380	47.935	284.967	0.689
6400.000	0.963	357.770	6398.896	14.186	-46.367	14.186	48.488	287.012	0.145
6500.000	0.846	9.081	6498.884	15.756	-46.283	15.756	48.891	288.800	0.213
6600.000	0.339	49.938	6598.878	16.675	-45.940	16.675	48.873	289.950	0.630
6700.000	0.173	41.064	6698.877	16.979	-45.615	16.979	48.672	290.417	0.169
6800.000	0.298	171.463	6798.877	16.836	-45.477	16.836	48.493	290.316	0.431
6900.000	0.485	140.320	6898.875	16.253	-45.168	16.253	48.003	289.791	0.277
6950.000	0.278	183.421	6948.874	15.969	-45.040	15.969	47.787	289.522	0.681
<div> <div>HORIZONTAL DISPLACEMENT IS</div> <div>47.787 FEET AT 289.522 DEGREES</div> </div>									