

Company: Anadarko Petroleum Corp.

Well: HSR-Palmer #14-8

API: 05-123-17651

Rig Name: Production / CoreTech

State/County: Colorado/Weld

Latitude: 40.235, Longitude: -104.917

Directions are relative to True North

VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run01-01-de\_01.ut

Minimum Curvature Method

Report Date/Time: 12/20/2013 / 17:20

Vaughn Energy Services

Henderson, CO

303-853-4976

Charles Hines

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	0.371	101.229	99.999	-0.063	0.318	-0.063	0.324	101.229	0.371
200.000	0.305	26.662	199.998	0.112	0.754	0.112	0.763	81.571	0.413
300.000	0.338	34.044	299.996	0.594	1.039	0.594	1.197	60.232	0.053
400.000	0.724	27.211	399.992	1.401	1.493	1.401	2.048	46.832	0.390
500.000	0.650	23.882	499.985	2.481	2.012	2.481	3.194	39.039	0.084
600.000	0.550	357.451	599.979	3.478	2.220	3.478	4.126	32.546	0.291
700.000	0.762	332.512	699.973	4.548	1.891	4.548	4.925	22.584	0.351
800.000	0.823	322.672	799.964	5.709	1.149	5.709	5.823	11.380	0.149
900.000	0.943	318.687	899.952	6.898	0.170	6.898	6.900	1.414	0.135
1000.000	0.647	318.105	999.942	7.936	-0.750	7.936	7.972	354.601	0.296
1100.000	0.879	305.240	1099.933	8.799	-1.754	8.799	8.973	348.727	0.287
1200.000	0.805	287.157	1199.922	9.449	-3.052	9.449	9.930	342.102	0.275
1300.000	0.781	286.064	1299.913	9.845	-4.378	9.845	10.775	336.027	0.028
1400.000	0.810	285.425	1399.903	10.222	-5.714	10.222	11.711	330.793	0.031
1500.000	0.865	271.397	1499.893	10.428	-7.150	10.428	12.644	325.563	0.211
1600.000	0.861	296.312	1599.882	10.780	-8.578	10.780	13.776	321.489	0.372
1700.000	0.992	301.391	1699.869	11.564	-9.990	11.564	15.281	319.175	0.155
1800.000	0.797	323.812	1799.857	12.576	-11.140	12.576	16.800	318.465	0.397
1900.000	0.719	351.735	1899.848	13.758	-11.640	13.758	18.022	319.766	0.373
2000.000	0.671	7.237	1999.841	14.960	-11.657	14.960	18.965	322.074	0.193
2100.000	1.258	355.095	2099.826	16.635	-11.677	16.635	20.324	324.933	0.618
2200.000	1.684	0.225	2199.793	19.198	-11.765	19.198	22.516	328.498	0.445
2300.000	1.707	1.469	2299.749	22.156	-11.721	22.156	25.065	332.120	0.044
2400.000	1.827	347.655	2399.702	25.202	-12.024	25.202	27.923	334.494	0.441
2500.000	1.483	337.269	2499.661	27.952	-12.864	27.952	30.770	335.287	0.455
2600.000	1.214	317.594	2599.634	29.927	-14.078	29.927	33.073	334.807	0.531
2700.000	1.081	297.864	2699.614	31.150	-15.627	31.150	34.850	333.359	0.414
2800.000	0.893	285.847	2799.599	31.804	-17.210	31.804	36.162	331.581	0.279
2900.000	0.840	262.755	2899.588	31.924	-18.687	31.924	36.991	329.657	0.351
3000.000	0.874	269.550	2999.577	31.825	-20.177	31.825	37.682	327.626	0.107
3100.000	0.915	234.048	3099.565	31.351	-21.585	31.351	38.063	325.453	0.547
3200.000	0.756	237.642	3199.555	30.529	-22.788	30.529	38.097	323.261	0.167
3300.000	0.904	231.208	3299.544	29.682	-23.960	29.682	38.146	321.089	0.175
3400.000	0.723	229.854	3399.534	28.781	-25.057	28.781	38.161	318.957	0.182

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	0.461	244.303	3499.529	28.200	-25.902	28.200	38.290	317.432	0.299
3600.000	0.352	260.025	3599.526	27.973	-26.567	27.973	38.578	316.476	0.155
3700.000	0.446	280.949	3699.524	27.993	-27.252	27.993	39.068	315.769	0.172
3800.000	0.743	289.244	3799.518	28.281	-28.246	28.281	39.971	315.035	0.309
3900.000	0.863	292.329	3899.508	28.781	-29.555	28.781	41.253	314.239	0.127
4000.000	1.204	308.481	3999.492	29.720	-31.074	29.720	42.999	313.725	0.445
4100.000	1.227	316.920	4099.470	31.156	-32.627	31.156	45.113	313.678	0.180
4200.000	1.313	311.497	4199.445	32.697	-34.217	32.697	47.327	313.699	0.148
4300.000	1.257	309.969	4299.420	34.161	-35.916	34.161	49.567	313.566	0.066
4400.000	1.705	286.836	4399.387	35.297	-38.180	35.297	51.996	312.752	0.738
4500.000	1.939	285.173	4499.337	36.170	-41.237	36.170	54.852	311.255	0.240
4600.000	1.980	282.948	4599.278	37.000	-44.553	37.000	57.913	309.709	0.087
4700.000	1.607	288.544	4699.229	37.833	-47.567	37.833	60.778	308.498	0.411
4800.000	1.302	274.276	4799.197	38.364	-50.029	38.364	63.045	307.482	0.472
4900.000	1.408	284.391	4899.169	38.754	-52.352	38.754	65.135	306.511	0.261
5000.000	0.768	279.174	4999.151	39.166	-54.203	39.166	66.873	305.851	0.647
5100.000	0.921	264.567	5099.140	39.197	-55.664	39.197	68.080	305.152	0.263
5200.000	0.462	257.917	5199.133	39.036	-56.858	39.036	68.969	304.472	0.465
5300.000	0.390	248.584	5299.130	38.828	-57.569	38.828	69.439	303.998	0.100
5400.000	0.219	324.431	5399.129	38.859	-57.997	38.859	69.811	303.823	0.398
5500.000	1.042	25.109	5499.122	39.838	-57.722	39.838	70.135	304.612	0.954
5600.000	0.925	77.148	5599.110	40.841	-56.549	40.841	69.755	305.838	0.869
5700.000	0.170	161.966	5699.105	40.879	-55.716	40.879	69.104	306.268	0.925
5800.000	0.280	171.919	5799.104	40.496	-55.635	40.496	68.813	306.050	0.116
5900.000	0.253	135.518	5899.103	40.096	-55.446	40.096	68.425	305.872	0.169
6000.000	0.339	138.924	5999.102	39.715	-55.097	39.715	67.919	305.785	0.087
6100.000	0.456	155.392	6099.099	39.131	-54.737	39.131	67.286	305.560	0.162
6200.000	0.345	93.812	6199.097	38.749	-54.271	38.749	66.685	305.527	0.421
6300.000	0.661	175.550	6299.094	38.154	-53.926	38.154	66.059	305.280	0.700
6400.000	0.677	154.680	6399.088	37.045	-53.628	37.045	65.179	304.636	0.243
6500.000	0.482	159.413	6499.083	36.117	-53.228	36.117	64.324	304.158	0.201
6600.000	0.849	183.628	6599.076	34.983	-53.127	34.983	63.610	303.365	0.455
6700.000	1.017	171.211	6699.063	33.367	-53.038	33.367	62.661	302.175	0.262
6800.000	0.802	148.234	6799.050	31.895	-52.534	31.895	61.458	301.264	0.419
6900.000	0.988	146.710	6899.038	30.579	-51.692	30.579	60.059	300.607	0.187
7000.000	0.981	165.105	6999.024	29.031	-50.998	29.031	58.683	299.651	0.315
HORIZONTAL DISPLACEMENT IS 58.683 FEET AT 299.651 DEGREES									