



Company: Anadarko
 Well: Freedom One C19-5
 API: 05-123-14300
 Rig Name: Production / CoreTech
 State/County: Colorado/ Weld
 Latitude: 40.299, Longitude: -104.600
 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: 9/5/2013 / 15:41

Vaughn Energy Services
 Henderson, CO
 970-625-8041
 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	0.102	146.069	100.000	-0.074	0.050	-0.074	0.089	146.069	0.102
200.000	0.331	228.126	199.999	-0.341	-0.116	-0.341	0.360	198.723	0.333
300.000	0.319	269.588	299.998	-0.536	-0.609	-0.536	0.811	228.659	0.230
400.000	0.299	266.865	399.996	-0.552	-1.148	-0.552	1.273	244.314	0.025
500.000	0.695	248.229	499.992	-0.791	-1.971	-0.791	2.124	248.132	0.422
600.000	0.677	243.089	599.985	-1.283	-3.061	-1.283	3.319	247.253	0.064
700.000	1.108	240.993	699.973	-2.019	-4.433	-2.019	4.871	245.509	0.432
800.000	0.952	246.455	799.957	-2.820	-6.040	-2.820	6.666	244.973	0.184
900.000	1.198	243.536	899.939	-3.618	-7.738	-3.618	8.542	244.941	0.252
1000.000	0.946	248.628	999.922	-4.385	-9.443	-4.385	10.411	245.092	0.269
1100.000	1.036	239.672	1099.907	-5.142	-10.992	-5.142	12.136	244.930	0.179
1200.000	1.084	246.798	1199.890	-5.972	-12.642	-5.972	13.982	244.717	0.140
1300.000	1.032	248.955	1299.873	-6.668	-14.352	-6.668	15.826	245.082	0.066
1400.000	0.995	255.929	1399.857	-7.202	-16.035	-7.202	17.578	245.813	0.128
1500.000	1.001	243.133	1499.842	-7.808	-17.657	-7.808	19.306	246.144	0.222
1600.000	0.819	248.648	1599.829	-8.463	-19.101	-8.463	20.892	246.104	0.201
1700.000	0.855	242.599	1699.819	-9.066	-20.429	-9.066	22.350	246.069	0.095
1800.000	0.800	225.895	1799.808	-9.895	-21.592	-9.895	23.752	245.379	0.246
1900.000	0.439	211.916	1899.802	-10.706	-22.296	-10.706	24.733	244.350	0.389
2000.000	0.143	186.478	1999.801	-11.155	-22.513	-11.155	25.125	243.641	0.316
2100.000	0.331	168.977	2099.800	-11.562	-22.472	-11.562	25.272	242.773	0.199
2200.000	0.602	145.818	2199.797	-12.280	-22.121	-12.280	25.301	240.964	0.325
2300.000	0.546	149.558	2299.792	-13.126	-21.584	-13.126	25.262	238.695	0.068
2400.000	0.610	146.737	2399.787	-13.982	-21.051	-13.982	25.271	236.408	0.070
2500.000	0.820	154.566	2499.779	-15.073	-20.452	-15.073	25.406	233.610	0.231
2600.000	0.672	145.347	2599.770	-16.201	-19.811	-16.201	25.592	230.724	0.190
2700.000	0.371	160.010	2699.766	-16.988	-19.367	-16.988	25.762	228.745	0.327
2800.000	0.091	137.322	2799.765	-17.350	-19.203	-17.350	25.880	227.901	0.289
2900.000	0.375	136.249	2899.764	-17.645	-18.922	-17.645	25.873	227.001	0.284
3000.000	0.320	136.488	2999.762	-18.084	-18.504	-18.084	25.873	225.658	0.055
3100.000	0.121	141.957	3099.762	-18.369	-18.247	-18.369	25.892	224.808	0.200
3200.000	0.214	148.770	3199.761	-18.612	-18.085	-18.612	25.951	224.176	0.095
3300.000	0.338	147.331	3299.760	-19.020	-17.829	-19.020	26.070	223.148	0.124
3400.000	0.580	151.847	3399.757	-19.715	-17.431	-19.715	26.315	221.482	0.245
3500.000	0.965	158.148	3499.748	-20.942	-16.879	-20.942	26.897	218.867	0.394

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
3600.000	1.062	156.981	3599.732	-22.577	-16.203	-22.577	27.789	215.666	0.099
3700.000	1.856	158.268	3699.699	-24.934	-15.241	-24.934	29.223	211.435	0.795
3800.000	1.936	159.543	3799.644	-28.021	-14.051	-28.021	31.347	206.631	0.090
3900.000	1.915	163.868	3899.588	-31.208	-12.996	-31.208	33.806	202.609	0.147
4000.000	1.894	161.356	3999.532	-34.378	-12.004	-34.378	36.414	199.248	0.086
4100.000	1.478	184.283	4099.490	-37.230	-11.572	-37.230	38.987	197.267	0.784
4200.000	1.124	200.287	4199.464	-39.436	-12.008	-39.436	41.224	196.936	0.505
4300.000	0.470	249.015	4299.455	-40.502	-12.731	-40.502	42.456	197.450	0.887
4400.000	0.256	282.544	4399.453	-40.601	-13.332	-40.601	42.734	198.179	0.293
4500.000	1.005	290.091	4499.446	-40.251	-14.373	-40.251	42.741	199.651	0.752
4600.000	0.965	311.608	4599.432	-39.391	-15.826	-39.391	42.451	201.888	0.370
4700.000	1.083	327.979	4699.416	-38.031	-16.956	-38.031	41.640	204.030	0.314
4800.000	0.415	332.030	4799.407	-36.909	-17.627	-36.909	40.903	205.529	0.670
4900.000	0.602	316.606	4899.403	-36.208	-18.158	-36.208	40.506	206.634	0.230
5000.000	0.738	285.336	4999.397	-35.655	-19.141	-35.655	40.468	208.228	0.384
5100.000	0.782	256.371	5099.388	-35.646	-20.426	-35.646	41.083	209.814	0.383
5200.000	0.519	252.002	5199.382	-35.947	-21.520	-35.947	41.896	210.908	0.267
5300.000	0.459	231.822	5299.378	-36.334	-22.266	-36.334	42.614	211.501	0.181
5400.000	0.498	213.136	5399.375	-36.946	-22.818	-36.946	43.424	211.700	0.160
5500.000	0.727	167.736	5499.369	-37.930	-22.921	-37.930	44.318	211.145	0.518
5600.000	0.672	152.439	5599.362	-39.070	-22.515	-39.070	45.093	209.954	0.194
5700.000	0.771	150.532	5699.354	-40.175	-21.913	-40.175	45.763	208.610	0.102
5800.000	1.117	153.014	5799.340	-41.629	-21.140	-41.629	46.689	206.922	0.349
5900.000	1.230	144.677	5899.319	-43.373	-20.077	-43.373	47.795	204.839	0.205
6000.000	1.207	156.971	5999.297	-45.218	-19.045	-45.218	49.065	202.839	0.262
6100.000	1.243	153.769	6099.274	-47.160	-18.153	-47.160	50.533	201.053	0.077
6200.000	1.219	144.714	6199.251	-49.001	-17.060	-49.001	51.886	199.196	0.196
6300.000	1.360	151.669	6299.226	-50.914	-15.882	-50.914	53.333	197.325	0.211
6400.000	1.804	153.415	6399.188	-53.365	-14.615	-53.365	55.331	195.316	0.446
6500.000	3.518	169.781	6499.077	-57.793	-13.366	-57.793	59.318	193.022	1.858
6600.000	2.741	179.756	6598.928	-63.203	-12.811	-63.203	64.489	191.459	0.947
6700.000	2.226	208.510	6698.838	-67.301	-13.728	-67.301	68.687	191.529	1.330
6800.000	1.850	230.636	6798.776	-70.031	-15.903	-70.031	71.814	192.794	0.865
6900.000	2.473	234.446	6898.704	-72.309	-18.906	-72.309	74.740	194.653	0.639
7000.000	2.920	243.329	6998.594	-74.707	-22.938	-74.707	78.149	197.068	0.611
7100.000	2.389	248.653	7098.486	-76.609	-27.155	-76.609	81.280	199.517	0.585

HORIZONTAL DISPLACEMENT IS
81.280 FEET AT 199.517 DEGREES