

Company: Anadarko Petroleum Corp.
 Well/API: HSR-Roeder 14-7A/05-123-15064
 Tool Type: North Seeking Rate Gyro
 Rig Name: Production/CoreTech
 County/State: Weld/Colorado
 Latitude: 40.235, Longitude: -104.709
 Directions are relative to True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = GL Elevation = 4992

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 11/13/2014 / 11:37

Lat/Long Obtained By Handheld GPS At Wellhead
 Handheld GPS Reference: NAD83/Device Error: ±9 Feet
 VES Survey International - Henderson CO
 Justin Williams
 303-853-4976

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	0.529	174.081	99.999	-0.459	0.048	-0.459	0.461	174.081	0.529
200.000	0.292	164.840	199.996	-1.164	0.162	-1.164	1.175	172.084	0.245
300.000	0.200	169.684	299.995	-1.582	0.260	-1.582	1.603	170.673	0.095
400.000	0.334	202.039	399.994	-2.023	0.182	-2.023	2.031	174.866	0.196
500.000	0.241	119.676	499.993	-2.397	0.255	-2.397	2.410	173.926	0.385
600.000	0.314	114.569	599.992	-2.615	0.687	-2.615	2.703	165.286	0.077
700.000	0.263	137.122	699.991	-2.897	1.092	-2.897	3.095	159.349	0.123
800.000	0.260	189.994	799.990	-3.288	1.208	-3.288	3.503	159.819	0.232
900.000	0.223	213.180	899.989	-3.674	1.062	-3.674	3.824	163.871	0.103
1000.000	0.198	231.384	999.988	-3.945	0.821	-3.945	4.029	168.247	0.071
1100.000	0.493	269.416	1099.986	-4.057	0.256	-4.057	4.065	176.391	0.358
1200.000	0.430	328.479	1199.984	-3.741	-0.370	-3.741	3.760	185.649	0.458
1300.000	0.242	156.268	1299.983	-3.615	-0.481	-3.615	3.646	187.586	0.670
1400.000	0.214	33.306	1399.983	-3.652	-0.294	-3.652	3.664	184.606	0.400
1500.000	0.127	92.152	1499.982	-3.500	-0.081	-3.500	3.501	181.328	0.184
1600.000	0.418	297.947	1599.981	-3.334	-0.292	-3.334	3.346	185.012	0.535
1700.000	0.135	356.036	1699.980	-3.046	-0.622	-3.046	3.109	191.548	0.365
1800.000	0.530	231.270	1799.979	-3.218	-0.991	-3.218	3.367	197.117	0.616
1900.000	0.611	235.135	1899.974	-3.811	-1.789	-3.811	4.210	205.139	0.090
2000.000	0.438	232.740	1999.970	-4.347	-2.530	-4.347	5.029	210.195	0.174
2100.000	0.579	212.531	2099.966	-5.004	-3.105	-5.004	5.889	211.820	0.226
2200.000	0.211	148.117	2199.964	-5.586	-3.280	-5.586	6.478	210.417	0.524
2300.000	0.334	192.116	2299.963	-6.027	-3.244	-6.027	6.844	208.288	0.234
2400.000	0.445	170.281	2399.960	-6.694	-3.239	-6.694	7.437	205.820	0.184
2500.000	0.695	198.549	2499.956	-7.652	-3.366	-7.652	8.360	203.747	0.369
2600.000	0.884	177.606	2599.946	-8.997	-3.527	-8.997	9.664	201.405	0.342
2700.000	0.831	177.735	2699.935	-10.493	-3.466	-10.493	11.050	198.280	0.053
2800.000	0.803	197.696	2799.925	-11.884	-3.650	-11.884	12.432	197.074	0.284
2900.000	0.735	168.458	2899.917	-13.180	-3.735	-13.180	13.699	195.822	0.394
3000.000	0.872	179.910	2999.907	-14.569	-3.605	-14.569	15.009	193.900	0.211
3100.000	0.860	187.977	3099.895	-16.073	-3.708	-16.073	16.496	192.992	0.122
3200.000	0.859	212.899	3199.884	-17.446	-4.220	-17.446	17.949	193.597	0.371
3300.000	0.671	232.504	3299.876	-18.431	-5.091	-18.431	19.121	195.441	0.319

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
3400.000	1.525	254.708	3399.857	-19.138	-6.839	-19.138	20.323	199.664	0.939
3500.000	1.513	241.700	3499.822	-20.115	-9.284	-20.115	22.154	204.776	0.344
3600.000	1.475	248.732	3599.788	-21.208	-11.646	-21.208	24.195	208.773	0.187
3700.000	1.009	238.058	3699.764	-22.140	-13.593	-22.140	25.980	211.548	0.518
3800.000	1.311	274.876	3799.745	-22.509	-15.481	-22.509	27.319	214.518	0.787
3900.000	1.321	268.913	3899.719	-22.434	-17.773	-22.434	28.621	218.388	0.137
4000.000	0.890	295.709	3999.701	-22.119	-19.625	-22.119	29.570	221.581	0.662
4100.000	1.341	284.951	4099.681	-21.480	-21.455	-21.480	30.360	224.967	0.495
4200.000	1.252	286.028	4199.656	-20.877	-23.635	-20.877	31.535	228.546	0.092
4300.000	1.530	303.461	4299.627	-19.839	-25.799	-19.839	32.544	232.440	0.504
4400.000	1.798	314.529	4399.585	-18.002	-28.031	-18.002	33.314	237.290	0.417
4500.000	1.975	317.476	4499.531	-15.632	-30.314	-15.632	34.107	242.720	0.202
4600.000	1.694	298.724	4599.480	-13.652	-32.775	-13.652	35.504	247.386	0.659
4700.000	1.658	292.912	4699.437	-12.378	-35.404	-12.378	37.505	250.728	0.174
4800.000	1.572	286.215	4799.398	-11.432	-38.053	-11.432	39.733	253.278	0.207
4900.000	1.680	283.970	4899.357	-10.695	-40.794	-10.695	42.172	255.309	0.125
5000.000	1.807	276.187	4999.311	-10.171	-43.784	-10.171	44.950	256.922	0.268
5100.000	2.429	270.358	5099.243	-9.988	-47.470	-9.988	48.510	258.118	0.658
5200.000	2.293	270.648	5199.158	-9.952	-51.590	-9.952	52.541	259.081	0.137
5300.000	1.627	268.299	5299.099	-9.972	-55.010	-9.972	55.906	259.725	0.670
5400.000	1.371	277.880	5399.064	-9.850	-57.614	-9.850	58.450	260.298	0.358
5500.000	1.511	279.381	5499.033	-9.471	-60.100	-9.471	60.842	261.045	0.145
5600.000	1.202	285.022	5599.005	-8.984	-62.414	-8.984	63.058	261.809	0.337
5700.000	0.950	277.430	5698.987	-8.605	-64.249	-8.605	64.822	262.371	0.289
5800.000	1.266	269.857	5798.968	-8.501	-66.175	-8.501	66.719	262.680	0.348
5900.000	0.830	222.742	5898.953	-9.036	-67.772	-9.036	68.372	262.406	0.928
6000.000	1.283	271.606	5998.938	-9.537	-69.383	-9.537	70.035	262.174	0.966
6100.000	1.415	267.321	6098.910	-9.563	-71.735	-9.563	72.370	262.407	0.166
6200.000	1.329	260.123	6198.881	-9.820	-74.112	-9.820	74.759	262.452	0.193
6300.000	0.826	242.624	6298.863	-10.350	-75.895	-10.350	76.597	262.234	0.596
6400.000	0.465	247.468	6398.857	-10.837	-76.909	-10.837	77.669	261.980	0.365
6500.000	0.621	261.020	6498.852	-11.077	-77.819	-11.077	78.603	261.899	0.201
6600.000	0.335	278.088	6598.849	-11.120	-78.644	-11.120	79.427	261.952	0.316
6700.000	0.399	278.581	6698.847	-11.027	-79.278	-11.027	80.041	262.081	0.063
6800.000	0.328	314.575	6798.845	-10.774	-79.826	-10.774	80.550	262.313	0.234
6900.000	0.163	287.514	6898.844	-10.531	-80.165	-10.531	80.854	262.516	0.197
6950.000	0.326	357.025	6948.844	-10.367	-80.241	-10.367	80.908	262.638	0.619
HORIZONTAL DISPLACEMENT IS 80.908 FEET AT 262.638 DEGREES									