



Company: Anadarko Petroleum Corp.
 Well/API: HSR-Goldsmith 11-31/05-123-16696
 Tool Type: North Seeking Rate Gyro
 Rig Name: Summit
 County/State: Weld/Colorado
 VS-Azi: 0.000 Degrees
 Latitude: 40.26588, Longitude: -104.82231
 All Azimuths referenced to True North
 No Grid Convergence Applied



Depth Reference : RKB = GL Elevation = 4771

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut
 Minimum Curvature Method
 Report Date/Time: 1/7/2016 / 10:16

Lat/Long Obtained By Handheld GPS At Wellhead
 Handheld GPS Reference: NAD83/Device Error: ±9 Feet
 VES Survey International - Henderson CO
 Surveyor: 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	0.429	214.401	99.999	-0.309	-0.212	-0.309	0.374	214.401	0.429
200.000	0.468	240.604	199.996	-0.818	-0.779	-0.818	1.130	223.587	0.207
300.000	0.439	206.857	299.993	-1.360	-1.308	-1.360	1.887	223.869	0.265
400.000	0.431	214.636	399.990	-2.012	-1.695	-2.012	2.630	220.111	0.060
500.000	0.345	207.473	499.988	-2.589	-2.047	-2.589	3.300	218.343	0.099
600.000	0.365	207.617	599.986	-3.138	-2.334	-3.138	3.911	216.643	0.020
700.000	0.250	191.776	699.985	-3.634	-2.526	-3.634	4.425	214.807	0.142
800.000	0.452	230.415	799.983	-4.099	-2.875	-4.099	5.006	215.045	0.300
900.000	0.272	265.859	899.981	-4.367	-3.415	-4.367	5.544	218.028	0.279
1000.000	0.441	266.962	999.979	-4.405	-4.036	-4.405	5.974	222.499	0.169
1100.000	0.579	262.038	1099.975	-4.495	-4.920	-4.495	6.664	227.585	0.145
1200.000	0.749	267.291	1199.968	-4.596	-6.073	-4.596	7.616	232.883	0.180
1300.000	0.867	271.844	1299.958	-4.602	-7.481	-4.602	8.783	238.401	0.134
1400.000	0.979	283.533	1399.945	-4.378	-9.068	-4.378	10.069	244.229	0.219
1500.000	1.045	284.868	1499.930	-3.944	-10.780	-3.944	11.479	249.905	0.070
1600.000	1.093	285.955	1599.912	-3.448	-12.579	-3.448	13.043	254.672	0.052
1700.000	1.231	282.316	1699.892	-2.956	-14.545	-2.956	14.843	258.511	0.157
1800.000	1.355	275.107	1799.866	-2.622	-16.773	-2.622	16.976	261.115	0.204

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
1900.000	1.135	270.801	1899.843	-2.503	-18.940	-2.503	19.105	262.472	0.239
2000.000	1.125	282.672	1999.823	-2.274	-20.888	-2.274	21.011	263.787	0.234
2100.000	1.222	292.992	2099.803	-1.642	-22.827	-1.642	22.886	265.885	0.232
2200.000	1.269	304.338	2199.779	-0.601	-24.723	-0.601	24.730	268.608	0.251
2300.000	1.312	304.299	2299.754	0.669	-26.583	0.669	26.592	271.442	0.043
2400.000	1.381	304.555	2399.726	1.998	-28.522	1.998	28.592	274.007	0.069
2500.000	1.508	311.381	2499.694	3.551	-30.501	3.551	30.707	276.641	0.214
2600.000	1.641	312.719	2599.657	5.392	-32.541	5.392	32.984	279.409	0.138
2700.000	1.955	319.226	2699.607	7.656	-34.706	7.656	35.541	282.439	0.374
2800.000	1.883	317.829	2799.551	10.165	-36.924	10.165	38.297	285.392	0.085
2900.000	1.979	322.793	2899.494	12.759	-39.071	12.759	41.101	288.084	0.193
3000.000	1.931	321.430	2999.436	15.451	-41.166	15.451	43.970	290.573	0.067
3100.000	1.839	324.116	3099.382	18.068	-43.157	18.068	46.786	292.718	0.127
3200.000	1.808	330.571	3199.332	20.743	-44.872	20.743	49.435	294.809	0.208
3300.000	1.499	321.788	3299.290	23.145	-46.457	23.145	51.903	296.483	0.399
3400.000	1.141	304.179	3399.264	24.732	-48.090	24.732	54.077	297.216	0.537
3500.000	1.102	291.641	3499.245	25.646	-49.808	25.646	56.023	297.244	0.248
3600.000	1.255	287.214	3599.224	26.325	-51.747	26.325	58.058	296.963	0.178
3700.000	1.623	285.409	3699.192	27.025	-54.159	27.025	60.527	296.519	0.371
3800.000	2.067	288.257	3799.140	27.967	-57.237	27.967	63.704	296.041	0.453
3900.000	2.423	295.262	3899.063	29.434	-60.862	29.434	67.606	295.809	0.449
4000.000	2.609	305.915	3998.967	31.671	-64.617	31.671	71.962	296.111	0.502
4100.000	2.491	309.124	4098.868	34.378	-68.147	34.378	76.327	296.770	0.185
4200.000	1.818	305.230	4198.797	36.664	-71.128	36.664	80.021	297.269	0.688
4300.000	1.350	302.860	4298.758	38.218	-73.413	38.218	82.765	297.501	0.472
4400.000	1.036	291.769	4398.737	39.192	-75.242	39.192	84.838	297.514	0.388
4500.000	0.880	292.187	4498.723	39.818	-76.793	39.818	86.502	297.407	0.156
4600.000	0.902	293.036	4598.711	40.415	-78.228	40.415	88.051	297.323	0.025
4700.000	0.931	313.789	4698.698	41.285	-79.538	41.285	89.614	297.432	0.331
4800.000	0.904	301.928	4798.685	42.265	-80.794	42.265	91.181	297.615	0.191
4900.000	1.161	293.793	4898.669	43.091	-82.391	43.091	92.979	297.610	0.295
5000.000	0.670	300.350	4998.656	43.795	-83.823	43.795	94.574	297.586	0.501
5100.000	0.799	286.806	5098.648	44.292	-84.995	44.292	95.844	297.525	0.215
5200.000	0.752	284.776	5198.639	44.661	-86.297	44.661	97.169	297.363	0.055
5300.000	0.547	282.975	5298.632	44.936	-87.397	44.936	98.272	297.210	0.206
5400.000	0.704	269.349	5398.626	45.036	-88.477	45.036	99.279	296.977	0.215
5500.000	0.595	264.636	5498.620	44.981	-89.608	44.981	100.264	296.655	0.121
5600.000	0.735	252.172	5598.613	44.736	-90.736	44.736	101.165	296.245	0.200
5700.000	1.011	282.156	5698.602	44.725	-92.209	44.725	102.483	295.875	0.524
5800.000	1.136	272.279	5798.585	44.950	-94.061	44.950	104.250	295.542	0.223

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
5900.000	1.341	309.945	5898.563	45.741	-95.948	45.741	106.293	295.488	0.823
6000.000	1.297	327.269	5998.537	47.444	-97.457	47.444	108.392	295.958	0.400
6100.000	1.389	311.100	6098.510	49.193	-98.982	49.193	110.533	296.427	0.388
6200.000	1.083	344.889	6198.487	50.902	-100.142	50.902	112.336	296.944	0.776
6300.000	0.997	335.828	6298.471	52.608	-100.745	52.608	113.653	297.573	0.186
6400.000	1.213	338.316	6398.452	54.386	-101.492	54.386	115.145	298.185	0.221
6500.000	1.255	358.173	6498.430	56.464	-101.918	56.464	116.514	298.987	0.428
6600.000	1.939	8.394	6598.390	59.232	-101.706	59.232	117.697	300.216	0.738
6700.000	1.748	7.955	6698.339	62.416	-101.248	62.416	118.941	301.652	0.191
6800.000	0.355	337.300	6798.320	64.212	-101.156	64.212	119.815	302.407	1.454
6900.000	0.356	253.644	6898.318	64.410	-101.573	64.410	120.274	302.380	0.474
7000.000	0.366	269.357	6998.316	64.319	-102.190	64.319	120.747	302.187	0.099
7100.000	0.348	230.197	7098.315	64.121	-102.743	64.121	121.110	301.968	0.240