

Company: Anadarko Petroleum Corp.
 Well/API: East Rinn #1/05-123-07653
 Tool Type: North Seeking Rate Gyro
 Rig Name: Production/Warrior
 County/State: Weld/Colorado
 Latitude: 40.133, Longitude: -104.987
 Directions are relative to True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = GL Elevation 4899 = Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ha gyro-de_01.ut

Minimum Curvature Method

Report Date/Time: 9/26/2014 / 18:21

Lat/Long & Elevation Obtained By Handheld GPS At Wellhead

Handheld GPS Reference: NAD83/Device Error: ±9 Feet

VES Survey International - Henderson CO

Jason Kinchelow

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	0.155	307.457	100.000	0.082	-0.107	0.082	0.135	307.457	0.155
200.000	0.311	301.425	199.999	0.306	-0.446	0.306	0.541	304.435	0.158
300.000	0.486	245.159	299.997	0.269	-1.063	0.269	1.096	284.196	0.407
400.000	0.476	239.285	399.993	-0.122	-1.805	-0.122	1.809	266.140	0.050
500.000	0.516	243.891	499.990	-0.532	-2.566	-0.532	2.621	258.287	0.056
600.000	0.517	265.710	599.986	-0.764	-3.421	-0.764	3.505	257.410	0.195
700.000	0.525	264.115	699.982	-0.845	-4.326	-0.845	4.408	258.952	0.017
800.000	0.424	261.769	799.978	-0.945	-5.148	-0.945	5.234	259.603	0.103
900.000	0.300	265.863	899.976	-1.016	-5.775	-1.016	5.864	260.018	0.126
1000.000	0.337	263.422	999.975	-1.069	-6.328	-1.069	6.418	260.412	0.040
1100.000	0.347	276.469	1099.973	-1.069	-6.921	-1.069	7.003	261.223	0.078
1200.000	0.457	278.076	1199.970	-0.979	-7.617	-0.979	7.679	262.679	0.111
1300.000	0.530	243.434	1299.967	-1.130	-8.425	-1.130	8.500	262.364	0.302
1400.000	0.290	239.142	1399.964	-1.466	-9.056	-1.466	9.174	260.804	0.242
1500.000	0.300	250.042	1499.963	-1.685	-9.519	-1.685	9.668	259.960	0.057
1600.000	0.447	276.198	1599.961	-1.733	-10.154	-1.733	10.301	260.316	0.222
1700.000	0.331	247.173	1699.959	-1.803	-10.808	-1.803	10.958	260.532	0.225
1800.000	0.520	296.589	1799.956	-1.712	-11.480	-1.712	11.607	261.520	0.395
1900.000	0.421	271.051	1899.953	-1.502	-12.253	-1.502	12.345	263.012	0.229
2000.000	0.484	302.377	1999.950	-1.269	-12.977	-1.269	13.039	264.415	0.252
2100.000	0.354	304.776	2099.947	-0.867	-13.587	-0.867	13.615	266.350	0.131
2200.000	0.698	313.704	2199.943	-0.270	-14.281	-0.270	14.283	268.918	0.353
2300.000	0.600	324.233	2299.936	0.576	-15.027	0.576	15.038	272.195	0.154
2400.000	0.790	326.325	2399.929	1.575	-15.716	1.575	15.794	275.722	0.191
2500.000	0.690	327.728	2499.921	2.657	-16.419	2.657	16.633	279.193	0.101
2600.000	0.610	322.068	2599.914	3.587	-17.068	3.587	17.441	281.867	0.102
2700.000	0.847	325.867	2699.906	4.618	-17.810	4.618	18.399	284.536	0.241
2800.000	0.842	329.149	2799.895	5.861	-18.602	5.861	19.503	287.488	0.049
2900.000	0.836	324.426	2899.884	7.085	-19.403	7.085	20.656	290.060	0.069
3000.000	0.648	337.866	2999.876	8.202	-20.040	8.202	21.654	292.258	0.255
3100.000	0.580	334.155	3099.870	9.182	-20.474	9.182	22.439	294.154	0.079
3200.000	0.478	328.500	3199.866	9.993	-20.913	9.993	23.178	295.541	0.114
3300.000	0.399	301.683	3299.863	10.532	-21.427	10.532	23.875	296.175	0.218
3400.000	0.451	265.415	3399.861	10.683	-22.115	10.683	24.560	295.783	0.269

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	0.501	270.319	3499.857	10.654	-22.945	10.654	25.298	294.906	0.065
3600.000	0.785	272.522	3599.851	10.686	-24.066	10.686	26.332	293.943	0.284
3700.000	1.090	285.872	3699.837	10.977	-25.666	10.977	27.914	293.156	0.374
3800.000	1.243	295.847	3799.817	11.710	-27.557	11.710	29.942	293.022	0.254
3900.000	1.273	287.444	3899.793	12.516	-29.593	12.516	32.130	292.925	0.187
4000.000	1.244	292.406	3999.769	13.262	-31.656	13.262	34.321	292.731	0.113
4100.000	1.194	301.254	4099.746	14.217	-33.550	14.217	36.438	292.965	0.194
4200.000	1.135	305.504	4199.725	15.333	-35.248	15.333	38.438	293.509	0.105
4300.000	1.175	291.102	4299.705	16.278	-37.011	16.278	40.433	293.740	0.292
4400.000	1.116	308.044	4399.686	17.247	-38.735	17.247	42.401	294.001	0.343
4500.000	0.838	295.031	4499.671	18.156	-40.164	18.156	44.078	294.325	0.354
4600.000	0.726	309.319	4599.662	18.867	-41.317	18.867	45.422	294.544	0.224
4700.000	0.408	310.899	4699.657	19.502	-42.077	19.502	46.377	294.867	0.319
4800.000	0.369	312.475	4799.655	19.953	-42.584	19.953	47.026	295.106	0.040
4900.000	0.707	294.998	4899.650	20.431	-43.381	20.431	47.951	295.219	0.372
5000.000	0.709	308.735	4999.643	21.079	-44.423	21.079	49.170	295.385	0.169
5100.000	0.626	308.999	5099.636	21.810	-45.330	21.810	50.304	295.694	0.083
5200.000	0.654	306.685	5199.629	22.495	-46.212	22.495	51.396	295.956	0.038
5300.000	0.798	307.635	5299.621	23.261	-47.221	23.261	52.639	296.225	0.145
5400.000	0.742	324.267	5399.613	24.211	-48.150	24.211	53.895	296.695	0.230
5500.000	0.762	337.144	5499.604	25.349	-48.787	25.349	54.979	297.456	0.170
5600.000	0.874	336.067	5599.594	26.659	-49.354	26.659	56.094	298.376	0.114
5700.000	1.003	344.567	5699.580	28.200	-49.897	28.200	57.315	299.474	0.189
5800.000	1.019	346.915	5799.565	29.910	-50.331	29.910	58.547	300.721	0.044
5900.000	0.949	347.342	5899.550	31.584	-50.714	31.584	59.745	301.914	0.070
6000.000	0.875	353.348	5999.537	33.151	-50.984	33.151	60.814	303.033	0.121
6100.000	0.968	354.688	6099.524	34.750	-51.150	34.750	61.838	304.191	0.095
6200.000	0.847	346.637	6199.512	36.310	-51.399	36.310	62.931	305.238	0.175
6300.000	0.640	349.625	6299.503	37.579	-51.671	37.579	63.891	306.027	0.211
6400.000	0.797	341.711	6399.496	38.789	-51.990	38.789	64.866	306.726	0.186
6500.000	0.688	340.175	6499.487	40.015	-52.412	40.015	65.941	307.360	0.111
6600.000	0.422	338.744	6599.482	40.923	-52.749	40.923	66.762	307.804	0.266
6700.000	0.162	338.761	6699.481	41.398	-52.934	41.398	67.200	308.028	0.260
6800.000	0.366	326.231	6799.480	41.795	-53.163	41.795	67.624	308.173	0.210
6900.000	0.303	311.191	6899.478	42.234	-53.539	42.234	68.192	308.268	0.107
7000.000	0.595	326.473	6999.475	42.841	-54.024	42.841	68.949	308.414	0.314
7100.000	0.627	294.863	7099.470	43.504	-54.807	43.504	69.975	308.441	0.334
7200.000	0.895	332.190	7199.461	44.425	-55.668	44.425	71.221	308.591	0.549
7300.000	0.747	290.378	7299.452	45.343	-56.643	45.343	72.556	308.677	0.602
7400.000	1.229	342.696	7399.439	46.593	-57.573	46.593	74.065	308.983	0.972
7500.000	0.641	19.100	7499.426	48.146	-57.709	48.146	75.155	309.838	0.808
7600.000	0.645	23.220	7599.419	49.192	-57.304	49.192	75.522	310.644	0.046
7700.000	0.552	6.664	7699.414	50.187	-57.026	50.187	75.965	311.350	0.195
7750.000	0.418	29.863	7749.412	50.585	-56.907	50.585	76.140	311.634	0.470

HORIZONTAL DISPLACEMENT IS
76.140 FEET AT 311.634 DEGREES