

Company: Anadarko Petroleum Corp.

Well: HSR Weld 3-2A

API: 05-123-20535

Rig Name: Production/Coretech

Location: Weld County, Colorado

Latitude: 40.173, Longitude: -104.972

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_run02-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 11/28/2013 / 18:37

Vaughn Energy Services
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	0.807	242.375	99.997	-0.327	-0.624	-0.327	0.704	242.375	0.807
200.000	0.812	258.156	199.987	-0.799	-1.942	-0.799	2.100	247.643	0.222
300.000	0.706	236.630	299.978	-1.283	-3.150	-1.283	3.401	247.839	0.302
400.000	0.798	242.396	399.970	-1.945	-4.282	-1.945	4.702	245.574	0.119
500.000	0.671	257.094	499.961	-2.398	-5.469	-2.398	5.972	246.326	0.226
600.000	0.934	258.238	599.952	-2.695	-6.838	-2.695	7.350	248.491	0.263
700.000	1.004	295.607	699.938	-2.482	-8.426	-2.482	8.784	253.584	0.624
800.000	1.012	294.893	799.923	-1.732	-10.016	-1.732	10.165	260.188	0.015
900.000	0.901	281.216	899.909	-1.208	-11.589	-1.208	11.651	264.051	0.253
1000.000	1.167	289.242	999.893	-0.719	-13.322	-0.719	13.341	266.911	0.303
1100.000	1.112	277.955	1099.873	-0.249	-15.244	-0.249	15.246	269.064	0.231
1200.000	1.160	289.213	1199.853	0.218	-17.160	0.218	17.162	270.729	0.228
1300.000	1.412	284.290	1299.828	0.855	-19.310	0.855	19.329	272.537	0.275
1400.000	1.392	281.023	1399.798	1.392	-21.697	1.392	21.741	273.671	0.082
1500.000	1.351	287.586	1499.770	1.980	-24.013	1.980	24.094	274.715	0.162
1600.000	1.312	284.696	1599.743	2.627	-26.244	2.627	26.376	275.716	0.078
1700.000	1.461	279.319	1699.713	3.124	-28.611	3.124	28.781	276.232	0.198
1800.000	1.579	276.546	1799.678	3.488	-31.237	3.488	31.431	276.371	0.138
1900.000	1.654	278.388	1899.638	3.855	-34.033	3.855	34.251	276.463	0.091
2000.000	1.589	275.675	1999.598	4.203	-36.840	4.203	37.079	276.508	0.101
2100.000	1.448	275.245	2099.563	4.455	-39.478	4.455	39.728	276.439	0.141
2200.000	1.274	280.683	2199.535	4.777	-41.828	4.777	42.100	276.515	0.216
2300.000	1.558	272.150	2299.505	5.034	-44.278	5.034	44.564	276.486	0.353
2400.000	1.352	284.976	2399.473	5.390	-46.776	5.390	47.086	276.573	0.384
2500.000	1.492	280.369	2499.442	5.929	-49.196	5.929	49.552	276.872	0.180
2600.000	1.478	284.009	2599.408	6.475	-51.727	6.475	52.131	277.135	0.095
2700.000	1.718	273.763	2699.370	6.886	-54.474	6.886	54.908	277.204	0.372
2800.000	1.749	277.023	2799.324	7.171	-57.484	7.171	57.930	277.110	0.104
2900.000	1.637	284.058	2899.280	7.704	-60.385	7.704	60.874	277.271	0.236
3000.000	1.757	291.975	2999.236	8.625	-63.193	8.625	63.778	277.772	0.263
3100.000	1.731	290.998	3099.190	9.740	-66.024	9.740	66.739	278.392	0.040
3200.000	1.474	292.941	3199.151	10.782	-68.618	10.782	69.460	278.930	0.263
3300.000	1.093	283.800	3299.126	11.511	-70.728	11.511	71.659	279.244	0.431
3400.000	0.938	280.704	3399.110	11.890	-72.458	11.890	73.427	279.319	0.164

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	0.917	256.740	3499.097	11.859	-74.040	11.859	74.984	279.100	0.385
3600.000	1.043	258.066	3599.083	11.487	-75.710	11.487	76.576	278.627	0.129
3700.000	0.889	248.409	3699.069	11.013	-77.322	11.013	78.103	278.106	0.224
3800.000	0.947	238.060	3799.056	10.290	-78.745	10.290	79.415	277.445	0.175
3900.000	0.995	239.270	3899.041	9.410	-80.192	9.410	80.742	276.693	0.052
4000.000	1.008	229.156	3999.026	8.391	-81.604	8.391	82.034	275.871	0.177
4100.000	0.942	235.300	4099.012	7.348	-82.945	7.348	83.269	275.063	0.124
4200.000	1.091	248.129	4198.996	6.526	-84.504	6.526	84.755	274.416	0.271
4300.000	0.835	225.434	4298.982	5.660	-85.906	5.660	86.092	273.770	0.455
4400.000	0.919	253.227	4398.971	4.918	-87.193	4.918	87.331	273.228	0.429
4500.000	1.009	285.317	4498.958	4.919	-88.810	4.919	88.946	273.170	0.540
4600.000	1.039	285.727	4598.942	5.397	-90.532	5.397	90.693	273.412	0.030
4700.000	1.027	288.772	4698.925	5.931	-92.253	5.931	92.443	273.679	0.056
4800.000	1.046	292.922	4798.909	6.575	-93.942	6.575	94.172	274.004	0.077
4900.000	0.801	301.211	4898.896	7.293	-95.381	7.293	95.659	274.372	0.278
5000.000	0.925	291.862	4998.885	7.956	-96.728	7.956	97.055	274.702	0.187
5100.000	1.039	306.997	5098.870	8.802	-98.201	8.802	98.595	275.122	0.282
5200.000	0.888	303.958	5198.856	9.780	-99.568	9.780	100.047	275.610	0.159
5300.000	0.952	318.461	5298.843	10.835	-100.762	10.835	101.343	276.138	0.241
5400.000	1.050	311.114	5398.828	12.060	-102.004	12.060	102.714	276.743	0.161
5500.000	1.030	312.934	5498.811	13.275	-103.352	13.275	104.201	277.319	0.039
5600.000	1.220	301.378	5598.792	14.442	-104.919	14.442	105.909	277.837	0.295
5700.000	1.193	306.026	5698.770	15.608	-106.670	15.608	107.806	278.324	0.102
5800.000	1.034	306.244	5798.751	16.754	-108.239	16.754	109.528	278.799	0.158
5900.000	1.065	315.574	5898.735	17.951	-109.618	17.951	111.078	279.300	0.173
6000.000	1.091	317.257	5998.717	19.314	-110.915	19.314	112.584	279.878	0.041
6100.000	1.094	310.976	6098.699	20.640	-112.282	20.640	114.163	280.416	0.120
6200.000	1.021	304.564	6198.682	21.771	-113.736	21.771	115.801	280.836	0.139
6300.000	1.498	303.290	6298.657	22.994	-115.562	22.994	117.828	281.253	0.478
6400.000	1.617	304.814	6398.620	24.516	-117.813	24.516	120.337	281.755	0.126
6500.000	1.432	305.317	6498.585	26.044	-119.991	26.044	122.785	282.246	0.185
6600.000	1.889	311.180	6598.543	27.852	-122.251	27.852	125.384	282.834	0.487
6700.000	1.703	312.709	6698.494	29.945	-124.583	29.945	128.132	283.515	0.193
6800.000	1.641	306.524	6798.451	31.805	-126.826	31.805	130.753	284.078	0.191
6900.000	1.840	299.871	6898.405	33.457	-129.368	33.457	133.625	284.500	0.283
7000.000	2.054	299.526	6998.347	35.139	-132.320	35.139	136.906	284.872	0.214
7100.000	1.943	308.331	7098.287	37.073	-135.208	37.073	140.199	285.333	0.326
7200.000	1.275	308.258	7198.247	38.814	-137.412	38.814	142.789	285.773	0.667

HORIZONTAL DISPLACEMENT IS
142.789 FEET AT 285.773 DEGREES