

Company: Anadarko Petroleum Corp.

Well: HSR-McHale 7-5A

API: 05-123-20569

Rig Name: Production/Warrior

Location: Weld County, Colorado

Latitude: 40.169, Longitude: -104.912

Directions are relative to True North

VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: hgyro-de\_01.ut

Minimum Curvature Method

Report Date/Time: 1/7/2014 / 12:23

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	0.276	81.931	100.000	0.034	0.238	0.034	0.241	81.931	0.276
200.000	0.074	86.145	199.999	0.072	0.541	0.072	0.546	82.426	0.203
300.000	0.165	21.355	299.999	0.210	0.657	0.210	0.690	72.280	0.149
400.000	0.166	56.079	399.999	0.425	0.830	0.425	0.932	62.897	0.099
500.000	0.153	97.271	499.998	0.489	1.083	0.489	1.188	65.693	0.113
600.000	0.077	237.549	599.998	0.436	1.158	0.436	1.238	69.362	0.217
700.000	0.226	113.665	699.998	0.321	1.282	0.321	1.322	75.929	0.276
800.000	0.062	96.059	799.997	0.237	1.516	0.237	1.535	81.130	0.167
900.000	0.059	75.842	899.997	0.243	1.620	0.243	1.638	81.454	0.021
1000.000	0.092	206.554	999.997	0.184	1.633	0.184	1.644	83.578	0.138
1100.000	0.127	335.062	1099.997	0.212	1.551	0.212	1.565	82.204	0.198
1200.000	0.096	217.342	1199.997	0.246	1.453	0.246	1.474	80.390	0.192
1300.000	0.240	265.430	1299.997	0.162	1.193	0.162	1.204	82.246	0.190
1400.000	0.466	281.386	1399.995	0.226	0.586	0.226	0.628	68.887	0.245
1500.000	0.858	263.111	1499.988	0.217	-0.556	0.217	0.597	291.289	0.440
1600.000	0.892	257.981	1599.976	-0.035	-2.060	-0.035	2.061	269.025	0.085
1700.000	0.842	236.376	1699.965	-0.604	-3.434	-0.604	3.486	260.020	0.329
1800.000	1.001	258.626	1799.953	-1.184	-4.902	-1.184	5.043	256.426	0.388
1900.000	1.138	264.308	1899.935	-1.454	-6.747	-1.454	6.902	257.836	0.173
2000.000	1.445	251.625	1999.910	-1.950	-8.932	-1.950	9.143	257.682	0.418
2100.000	1.370	249.167	2099.880	-2.773	-11.247	-2.773	11.584	256.148	0.096
2200.000	1.503	242.694	2199.848	-3.800	-13.530	-3.800	14.053	254.311	0.210
2300.000	1.445	241.116	2299.815	-5.011	-15.800	-5.011	16.575	252.402	0.071
2400.000	1.463	247.567	2399.783	-6.108	-18.084	-6.108	19.088	251.338	0.165
2500.000	1.644	233.012	2499.747	-7.458	-20.410	-7.458	21.730	249.927	0.433
2600.000	1.791	228.565	2599.702	-9.355	-22.728	-9.355	24.578	247.626	0.199
2700.000	1.836	230.315	2699.652	-11.413	-25.132	-11.413	27.602	245.577	0.071
2800.000	1.621	224.931	2799.606	-13.437	-27.364	-13.437	30.485	243.847	0.269
2900.000	1.823	236.048	2899.561	-15.327	-29.683	-15.327	33.406	242.690	0.389
3000.000	1.990	241.504	2999.506	-17.044	-32.528	-17.044	36.723	242.347	0.247
3100.000	1.857	265.029	3099.451	-18.013	-35.669	-18.013	39.959	243.206	0.795
3200.000	2.103	267.121	3199.391	-18.245	-39.116	-18.245	43.162	244.994	0.256
3300.000	2.689	250.830	3299.304	-19.108	-43.164	-19.108	47.204	246.122	0.893
3400.000	2.804	254.799	3399.190	-20.519	-47.741	-20.519	51.964	246.742	0.222

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	2.662	262.035	3499.076	-21.483	-52.401	-21.483	56.634	247.708	0.373
3600.000	2.287	263.012	3598.983	-22.047	-56.682	-22.047	60.819	248.746	0.377
3700.000	1.859	283.707	3698.918	-21.906	-60.239	-21.906	64.098	250.016	0.856
3800.000	1.592	263.142	3798.874	-21.687	-63.193	-21.687	66.811	251.058	0.669
3900.000	1.456	281.265	3898.839	-21.605	-65.819	-21.605	69.274	251.827	0.498
4000.000	1.455	290.538	3998.807	-20.911	-68.254	-20.911	71.385	252.966	0.235
4100.000	0.977	255.508	4098.786	-20.679	-70.269	-20.679	73.248	253.601	0.863
4200.000	0.566	184.016	4198.778	-21.385	-71.129	-21.385	74.274	253.266	0.961
4300.000	0.804	202.714	4298.771	-22.525	-71.434	-22.525	74.901	252.499	0.323
4400.000	0.885	214.022	4398.760	-23.812	-72.137	-23.812	75.966	251.732	0.185
4500.000	0.497	203.547	4498.753	-24.850	-72.742	-24.850	76.870	251.139	0.407
4600.000	0.722	188.819	4598.747	-25.870	-73.012	-25.870	77.460	250.490	0.272
4700.000	0.419	231.056	4698.743	-26.722	-73.393	-26.722	78.106	249.994	0.499
4800.000	0.144	203.106	4798.741	-27.067	-73.727	-27.067	78.538	249.841	0.300
4900.000	0.181	236.115	4898.741	-27.270	-73.907	-27.270	78.778	249.747	0.099
5000.000	0.192	282.056	4998.740	-27.323	-74.202	-27.323	79.073	249.785	0.146
5100.000	0.565	268.575	5098.738	-27.300	-74.859	-27.300	79.682	249.964	0.381
5200.000	0.648	282.738	5198.732	-27.188	-75.904	-27.188	80.626	250.293	0.171
5300.000	0.711	269.832	5298.726	-27.065	-77.075	-27.065	81.689	250.651	0.165
5400.000	0.724	276.590	5398.718	-26.994	-78.323	-26.994	82.844	250.983	0.086
5500.000	0.928	263.959	5498.707	-27.007	-79.755	-27.007	84.204	251.293	0.272
5600.000	0.794	264.354	5598.696	-27.160	-81.249	-27.160	85.669	251.516	0.134
5700.000	0.865	248.060	5698.686	-27.510	-82.638	-27.510	87.097	251.587	0.245
5800.000	0.777	233.520	5798.676	-28.196	-83.884	-28.196	88.496	251.421	0.225
5900.000	0.835	241.316	5898.666	-28.949	-85.068	-28.949	89.859	251.207	0.124
6000.000	0.891	266.633	5998.655	-29.344	-86.484	-29.344	91.327	251.258	0.382
6100.000	1.100	285.328	6098.640	-29.136	-88.186	-29.136	92.875	251.717	0.384
6200.000	0.765	286.886	6198.626	-28.688	-89.751	-28.688	94.225	252.274	0.336
6300.000	1.156	292.383	6298.612	-28.110	-91.322	-28.110	95.551	252.891	0.401
6400.000	0.607	275.408	6398.600	-27.676	-92.782	-27.676	96.822	253.390	0.602
6500.000	1.000	312.918	6498.591	-27.032	-93.949	-27.032	97.761	253.948	0.637
6600.000	0.700	270.816	6598.581	-26.429	-95.200	-26.429	98.800	254.485	0.672
6700.000	0.769	314.303	6698.573	-25.952	-96.291	-25.952	99.727	254.916	0.548
6800.000	0.420	245.879	6798.569	-25.633	-97.106	-25.633	100.432	255.213	0.728
6900.000	0.504	315.521	6898.566	-25.470	-97.748	-25.470	101.012	255.396	0.532
7000.000	0.316	293.255	6998.563	-25.047	-98.310	-25.047	101.450	255.706	0.243
7100.000	0.459	270.623	7098.561	-24.934	-98.964	-24.934	102.056	255.859	0.207
7200.000	0.783	225.681	7198.556	-25.407	-99.853	-25.407	103.035	255.724	0.562
7300.000	0.736	149.190	7298.549	-26.437	-100.013	-26.437	103.448	255.194	0.942
7400.000	0.517	119.278	7398.543	-27.209	-99.290	-27.209	102.951	254.675	0.387
7450.000	0.571	108.464	7448.541	-27.399	-98.857	-27.399	102.583	254.509	0.231
HORIZONTAL DISPLACEMENT IS 102.583 FEET AT 254.509 DEGREES									