



Company: Anadarko Petroleum
 Well: HSR-Young 8-36
 API #: 05-123-15437
 Rig Name: Production / VES
 State/County: Colorado/Weld
 Latitude: 40.271, Longitude: -104.718
 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: hagro_7150-de_01.ut

Minimum Curvature Method

Report Date/Time: 2/15/2014 / 09:47

Vaughn Energy Services
 Henderson, Colorado
 303-853-4976
 Brian Brewbaker

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	0.371	308.963	99.999	0.203	-0.252	0.203	0.324	308.963	0.371
200.000	0.285	3.882	199.998	0.655	-0.486	0.655	0.816	323.404	0.312
300.000	0.273	18.808	299.997	1.128	-0.393	1.128	1.195	340.805	0.073
400.000	0.329	14.884	399.995	1.631	-0.242	1.631	1.649	351.546	0.060
500.000	0.279	18.391	499.994	2.139	-0.092	2.139	2.141	357.542	0.053
600.000	0.348	342.379	599.993	2.660	-0.107	2.660	2.662	357.701	0.204
700.000	0.228	323.121	699.991	3.108	-0.318	3.108	3.124	354.159	0.152
800.000	0.190	68.397	799.991	3.328	-0.283	3.328	3.340	355.144	0.333
900.000	0.337	40.156	899.990	3.615	0.062	3.615	3.615	0.975	0.192
1000.000	0.237	63.537	999.989	3.932	0.436	3.932	3.956	6.332	0.152
1100.000	0.189	46.758	1099.988	4.136	0.741	4.136	4.202	10.159	0.078
1200.000	0.091	117.341	1199.988	4.213	0.932	4.213	4.315	12.473	0.180
1300.000	0.114	260.871	1299.988	4.161	0.905	4.161	4.258	12.268	0.195
1400.000	0.315	291.547	1399.987	4.246	0.551	4.246	4.281	7.394	0.225
1500.000	0.584	295.709	1499.984	4.568	-0.164	4.568	4.571	357.943	0.271
1600.000	0.624	270.034	1599.978	4.789	-1.167	4.789	4.930	346.300	0.271
1700.000	0.542	271.927	1699.973	4.806	-2.185	4.806	5.279	335.553	0.084
1800.000	0.536	280.257	1799.969	4.905	-3.118	4.905	5.812	327.555	0.079
1900.000	0.458	266.282	1899.965	4.962	-3.978	4.962	6.360	321.286	0.144
2000.000	0.298	266.832	1999.963	4.922	-4.636	4.922	6.762	316.711	0.160
2100.000	0.233	221.368	2099.962	4.755	-5.031	4.755	6.922	313.385	0.214
2200.000	0.270	181.660	2199.961	4.367	-5.172	4.367	6.769	310.176	0.174
2300.000	0.658	170.520	2299.957	3.566	-5.084	3.566	6.210	305.041	0.397
2400.000	0.628	167.861	2399.951	2.463	-4.874	2.463	5.461	296.808	0.042
2500.000	0.828	166.096	2499.943	1.226	-4.586	1.226	4.747	284.968	0.201
2600.000	0.912	157.553	2599.932	-0.210	-4.108	-0.210	4.114	267.068	0.154
2700.000	0.896	161.684	2699.919	-1.688	-3.559	-1.688	3.939	244.621	0.067
2800.000	0.949	170.373	2799.906	-3.247	-3.174	-3.247	4.541	224.353	0.149
2900.000	0.908	166.673	2899.893	-4.834	-2.853	-4.834	5.614	210.551	0.073
3000.000	0.903	178.884	2999.881	-6.393	-2.655	-6.393	6.923	202.555	0.193
3100.000	0.999	186.938	3099.867	-8.047	-2.745	-8.047	8.502	198.838	0.164
3200.000	1.219	198.384	3199.848	-9.921	-3.186	-9.921	10.420	197.804	0.311
3300.000	1.297	201.501	3299.824	-11.983	-3.936	-11.983	12.613	198.184	0.104
3400.000	1.307	232.530	3399.800	-13.730	-5.256	-13.730	14.701	200.948	0.697

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	1.310	258.458	3499.774	-14.652	-7.281	-14.652	16.361	206.423	0.587
3600.000	1.091	273.813	3599.753	-14.817	-9.350	-14.817	17.521	212.253	0.387
3700.000	0.972	288.726	3699.737	-14.482	-11.103	-14.482	18.248	217.476	0.293
3800.000	1.016	292.275	3799.722	-13.874	-12.726	-13.874	18.826	222.530	0.076
3900.000	0.984	289.891	3899.706	-13.245	-14.354	-13.245	19.532	227.301	0.053
4000.000	1.058	284.085	3999.691	-12.729	-16.057	-12.729	20.490	231.596	0.127
4100.000	1.149	279.743	4099.672	-12.334	-17.941	-12.334	21.772	235.493	0.124
4200.000	1.306	269.727	4199.649	-12.170	-20.069	-12.170	23.471	238.768	0.265
4300.000	1.445	261.690	4299.620	-12.358	-22.457	-12.358	25.632	241.177	0.238
4400.000	1.361	263.335	4399.590	-12.678	-24.885	-12.678	27.928	243.003	0.093
4500.000	1.390	260.055	4499.562	-13.025	-27.259	-13.025	30.211	244.461	0.084
4600.000	1.340	262.317	4599.533	-13.391	-29.613	-13.391	32.500	245.668	0.074
4700.000	1.297	250.653	4699.507	-13.922	-31.839	-13.922	34.750	246.382	0.271
4800.000	1.144	259.259	4799.484	-14.483	-33.887	-14.483	36.852	246.859	0.238
4900.000	1.192	250.833	4899.464	-15.010	-35.850	-15.010	38.865	247.281	0.178
5000.000	0.957	282.076	4999.447	-15.177	-37.649	-15.177	40.593	248.045	0.621
5100.000	1.020	254.086	5099.432	-15.246	-39.321	-15.246	42.173	248.807	0.482
5200.000	0.524	223.799	5199.423	-15.821	-40.493	-15.821	43.474	248.660	0.625
5300.000	1.060	241.745	5299.414	-16.589	-41.625	-16.589	44.808	248.271	0.583
5400.000	1.197	226.919	5399.394	-17.740	-43.202	-17.740	46.703	247.676	0.322
5500.000	1.607	263.765	5499.366	-18.606	-45.359	-18.606	49.027	247.697	0.967
5600.000	1.144	284.383	5599.338	-18.510	-47.720	-18.510	51.184	248.799	0.670
5700.000	1.316	297.545	5699.315	-17.731	-49.705	-17.731	52.773	250.368	0.329
5800.000	1.557	305.026	5799.283	-16.420	-51.835	-16.420	54.374	252.423	0.305
5900.000	1.422	305.777	5899.250	-14.916	-53.954	-14.916	55.978	254.547	0.136
6000.000	1.341	313.888	5999.221	-13.379	-55.804	-13.379	57.386	256.518	0.211
6100.000	1.465	327.346	6099.191	-11.492	-57.337	-11.492	58.477	258.667	0.351
6200.000	1.369	10.735	6199.163	-9.242	-57.804	-9.242	58.538	260.916	1.051
6300.000	1.033	3.503	6299.141	-7.168	-57.527	-7.168	57.972	262.897	0.368
6400.000	0.208	31.802	6399.134	-6.113	-57.376	-6.113	57.701	263.918	0.856
6500.000	0.466	68.082	6499.133	-5.807	-56.903	-5.807	57.198	264.173	0.323
6600.000	0.797	50.338	6599.127	-5.211	-55.990	-5.211	56.232	264.682	0.380
6700.000	0.440	108.351	6699.122	-4.889	-55.091	-4.889	55.307	264.929	0.676
6800.000	0.618	142.133	6799.117	-5.436	-54.395	-5.436	54.666	264.293	0.352
6900.000	0.551	114.312	6899.112	-6.059	-53.626	-6.059	53.967	263.553	0.289
7000.000	0.679	114.558	6999.107	-6.503	-52.649	-6.503	53.049	262.958	0.128
7100.000	0.407	187.426	7099.103	-7.102	-52.156	-7.102	52.638	262.246	0.681
7150.000	0.520	160.291	7149.101	-7.492	-52.103	-7.492	52.638	261.818	0.488

HORIZONTAL DISPLACEMENT IS
52.638 FEET AT 261.818 DEGREES