



Company: Anadarko Petroleum
 Well: Hart A Gas Unit 1
 API: 05-123-07327
 Rig Name: Production/ Warrior
 State/County: Colorado/Weld
 Latitude: 40.105, Longitude: -104.871
 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: hagyar-de_01.ut
 Minimum Curvature Method
 Report Date/Time: 1/28/2014 / 15:11

VAUGHN ENERGY SERVICES
 HENDERSON, COLORADO
 303-853-4976
 SEAN BRATT

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	0.214	45.105	100.000	0.132	0.132	0.132	0.186	45.105	0.214
200.000	0.218	315.675	199.999	0.399	0.131	0.399	0.420	18.126	0.304
300.000	0.147	289.759	299.999	0.579	-0.123	0.579	0.592	347.977	0.107
400.000	0.220	267.179	399.998	0.613	-0.436	0.613	0.752	324.581	0.101
500.000	0.157	307.387	499.998	0.687	-0.737	0.687	1.008	312.992	0.142
600.000	0.227	307.000	599.997	0.890	-1.004	0.890	1.342	311.537	0.069
700.000	0.305	287.224	699.996	1.087	-1.416	1.087	1.786	307.519	0.119
800.000	0.144	312.214	799.995	1.251	-1.763	1.251	2.162	305.346	0.185
900.000	0.099	154.563	899.995	1.257	-1.819	1.257	2.211	304.638	0.239
1000.000	0.362	114.231	999.994	1.048	-1.493	1.048	1.825	305.072	0.294
1100.000	0.328	101.010	1099.993	0.864	-0.924	0.864	1.265	313.084	0.086
1200.000	0.456	94.117	1199.990	0.781	-0.245	0.781	0.818	342.553	0.136
1300.000	0.677	194.288	1299.987	0.180	0.006	0.180	0.180	1.955	0.880
1400.000	0.712	164.005	1399.980	-0.990	0.032	-0.990	0.990	178.166	0.364
1500.000	0.882	187.748	1499.971	-2.350	0.099	-2.350	2.352	177.583	0.368
1600.000	0.578	188.550	1599.962	-3.612	-0.080	-3.612	3.613	181.262	0.304
1700.000	0.929	211.946	1699.954	-4.799	-0.584	-4.799	4.834	186.933	0.460
1800.000	1.013	249.351	1799.940	-5.798	-1.839	-5.798	6.083	197.599	0.628
1900.000	0.740	274.335	1899.929	-6.061	-3.310	-6.061	6.906	208.639	0.463
2000.000	0.867	240.868	1999.920	-6.381	-4.615	-6.381	7.874	215.875	0.478
2100.000	0.774	249.175	2099.910	-6.989	-5.906	-6.989	9.150	220.201	0.151
2200.000	0.680	247.897	2199.901	-7.452	-7.087	-7.452	10.283	223.561	0.095
2300.000	0.612	226.415	2299.895	-8.043	-8.023	-8.043	11.360	224.928	0.250
2400.000	0.711	239.578	2399.889	-8.725	-8.945	-8.725	12.496	225.711	0.181
2500.000	0.750	229.926	2499.881	-9.461	-9.981	-9.461	13.753	226.532	0.129
2600.000	0.881	227.096	2599.870	-10.406	-11.045	-10.406	15.175	226.706	0.137
2700.000	0.896	231.925	2699.858	-11.412	-12.224	-11.412	16.723	226.968	0.076
2800.000	0.932	231.239	2799.846	-12.403	-13.474	-12.403	18.314	227.369	0.037
2900.000	1.166	223.735	2899.829	-13.648	-14.811	-13.648	20.140	227.342	0.270
3000.000	1.555	228.909	2999.801	-15.274	-16.537	-15.274	22.512	227.274	0.408
3100.000	1.753	233.473	3099.759	-17.077	-18.789	-17.077	25.390	227.734	0.238
3200.000	2.022	239.942	3199.705	-18.871	-21.545	-18.871	28.641	228.786	0.342
3300.000	2.140	236.989	3299.639	-20.771	-24.638	-20.771	32.225	229.867	0.160
3400.000	2.079	247.856	3399.571	-22.472	-27.884	-22.472	35.812	231.133	0.404
3500.000	2.154	264.381	3499.504	-23.340	-31.434	-23.340	39.152	233.406	0.613

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
3600.000	1.939	267.930	3599.440	-23.585	-34.996	-23.585	42.201	236.022	0.250
3700.000	1.709	267.263	3699.389	-23.718	-38.176	-23.718	44.943	238.148	0.231
3800.000	1.502	270.030	3799.350	-23.788	-40.976	-23.788	47.380	239.863	0.221
3900.000	1.552	264.983	3899.315	-23.906	-43.636	-23.906	49.755	241.284	0.143
4000.000	1.452	266.830	3999.280	-24.094	-46.250	-24.094	52.150	242.482	0.111
4100.000	1.427	280.397	4099.249	-23.940	-48.739	-23.940	54.301	243.841	0.341
4200.000	1.777	296.334	4199.210	-23.027	-51.354	-23.027	56.280	245.848	0.564
4300.000	2.184	319.240	4299.152	-20.896	-53.988	-20.896	57.890	248.841	0.882
4400.000	2.988	325.604	4399.049	-17.302	-56.704	-17.302	59.285	253.032	0.853
4500.000	3.027	339.366	4498.913	-12.680	-59.107	-12.680	60.452	257.892	0.721
4600.000	2.633	341.265	4598.791	-8.034	-60.775	-8.034	61.304	262.470	0.406
4700.000	2.383	347.207	4698.695	-3.832	-61.973	-3.832	62.092	266.462	0.360
4800.000	2.348	343.181	4798.610	0.157	-63.026	0.157	63.026	270.142	0.170
4900.000	2.131	355.407	4898.534	3.971	-63.768	3.971	63.891	273.563	0.523
5000.000	2.048	14.671	4998.469	7.553	-63.464	7.553	63.912	276.787	0.704
5100.000	2.206	16.903	5098.400	11.123	-62.452	11.123	63.435	280.099	0.178
5200.000	1.901	16.935	5198.336	14.552	-61.409	14.552	63.110	283.331	0.305
5300.000	1.892	17.106	5298.281	17.716	-60.440	17.716	62.983	286.337	0.011
5400.000	1.848	17.317	5398.228	20.834	-59.475	20.834	63.018	289.305	0.045
5500.000	1.807	15.943	5498.177	23.889	-58.562	23.889	63.247	292.192	0.060
5600.000	1.713	15.137	5598.130	26.847	-57.738	26.847	63.675	294.937	0.097
5700.000	1.709	17.388	5698.085	29.713	-56.903	29.713	64.193	297.572	0.067
5800.000	1.497	4.292	5798.046	32.438	-56.359	32.438	65.028	299.923	0.422
5900.000	1.403	4.114	5898.014	34.961	-56.174	34.961	66.165	301.897	0.094
6000.000	1.411	3.133	5997.984	37.411	-56.019	37.411	67.362	303.736	0.025
6100.000	1.422	5.521	6097.953	39.875	-55.832	39.875	68.609	305.535	0.060
6200.000	1.240	353.093	6197.927	42.185	-55.843	42.185	69.985	307.068	0.340
6300.000	1.177	352.148	6297.904	44.277	-56.113	44.277	71.478	308.276	0.066
6400.000	1.144	352.542	6397.884	46.284	-56.383	46.284	72.947	309.382	0.034
6500.000	1.064	351.337	6497.865	48.192	-56.652	48.192	74.377	310.387	0.084
6600.000	0.959	348.855	6597.850	49.931	-56.954	49.931	75.742	311.241	0.113
6700.000	0.824	343.464	6697.838	51.442	-57.321	51.442	77.019	311.906	0.159
6800.000	0.695	343.781	6797.829	52.714	-57.695	52.714	78.150	312.417	0.129
6900.000	0.585	345.777	6897.823	53.791	-57.990	53.791	79.096	312.849	0.112
7000.000	0.620	331.966	6997.817	54.763	-58.369	54.763	80.037	313.174	0.149
7100.000	0.804	328.884	7097.809	55.842	-58.986	55.842	81.226	313.431	0.188
7200.000	0.533	339.680	7197.802	56.878	-59.510	56.878	82.320	313.705	0.298
7300.000	0.641	338.233	7297.797	57.833	-59.879	57.833	83.248	314.004	0.109
7400.000	0.531	338.495	7397.792	58.783	-60.256	58.783	84.180	314.291	0.110
7500.000	0.311	8.102	7497.789	59.483	-60.388	59.483	84.764	314.568	0.302
7600.000	0.347	9.554	7597.788	60.050	-60.299	60.050	85.100	314.881	0.037
7700.000	0.257	12.585	7697.786	60.567	-60.200	60.567	85.396	315.174	0.092
7800.000	0.359	30.965	7797.785	61.055	-59.990	61.055	85.595	315.504	0.141
7900.000	0.521	44.575	7897.782	61.647	-59.509	61.647	85.684	316.011	0.192

HORIZONTAL DISPLACEMENT IS
85.684 FEET AT 316.011 DEGREES