

Company: Anadarko Petroleum Corp.
 Well: Investment-USX VV #7-17
 API: 05-123-09524
 Rig Name: Production / VES
 State/County: Colorado/Weld
 Latitude: 40.069, Longitude: -104.929
 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: ha gyro-de_01.ut
 Minimum Curvature Method
 Report Date/Time: 4/10/2014 / 16:37

Vaughn Energy Services
 Henderson, CO
 303-853-4976
 Charles Hines

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	0.960	292.825	99.995	0.325	-0.772	0.325	0.838	292.825	0.960
200.000	1.169	280.167	199.978	0.830	-2.549	0.830	2.680	288.040	0.314
300.000	0.785	271.052	299.963	1.023	-4.238	1.023	4.360	283.568	0.413
400.000	0.732	279.733	399.955	1.143	-5.553	1.143	5.669	281.635	0.127
500.000	0.305	280.368	499.950	1.299	-6.444	1.299	6.573	281.399	0.427
600.000	0.460	30.123	599.949	1.694	-6.504	1.694	6.721	284.600	0.632
700.000	1.240	53.316	699.938	2.688	-5.435	2.688	6.063	296.315	0.837
800.000	1.747	42.904	799.903	4.451	-3.529	4.451	5.680	321.590	0.573
900.000	2.592	43.451	899.831	7.209	-0.936	7.209	7.270	352.602	0.845
1000.000	3.060	46.731	999.709	10.680	2.562	10.680	10.983	13.492	0.495
1100.000	3.110	39.453	1099.565	14.604	6.229	14.604	15.877	23.101	0.395
1200.000	3.073	42.670	1199.419	18.669	9.770	18.669	21.071	27.623	0.177
1300.000	2.603	52.151	1299.297	22.034	13.380	22.034	25.778	31.268	0.663
1400.000	2.454	45.464	1399.199	24.929	16.700	24.929	30.006	33.817	0.330
1500.000	2.297	43.430	1499.114	27.886	19.603	27.886	34.087	35.106	0.179
1600.000	1.783	52.492	1599.050	30.288	22.215	30.288	37.562	36.258	0.605
1700.000	1.688	53.403	1699.004	32.114	24.631	32.114	40.472	37.489	0.098
1800.000	1.288	60.376	1798.970	33.548	26.792	33.548	42.933	38.611	0.438
1900.000	1.177	67.213	1898.947	34.501	28.716	34.501	44.888	39.771	0.184
2000.000	1.091	61.386	1998.928	35.355	30.499	35.355	46.693	40.783	0.144
2100.000	0.986	78.589	2098.911	35.982	32.179	35.982	48.272	41.807	0.328
2200.000	0.578	60.741	2198.902	36.398	33.463	36.398	49.443	42.594	0.471
2300.000	0.737	64.307	2298.895	36.924	34.482	36.924	50.521	43.042	0.164
2400.000	0.711	39.225	2398.888	37.683	35.454	37.683	51.740	43.254	0.315
2500.000	0.704	49.817	2498.880	38.560	36.316	38.560	52.969	43.283	0.131
2600.000	0.486	38.104	2598.875	39.291	37.047	39.291	54.002	43.317	0.249
2700.000	0.520	48.692	2698.871	39.924	37.650	39.924	54.877	43.321	0.099
2800.000	0.647	51.901	2798.866	40.572	38.435	40.572	55.887	43.451	0.131
2900.000	0.542	14.012	2898.861	41.379	38.994	41.379	56.857	43.300	0.399
3000.000	0.340	22.945	2998.858	42.112	39.224	42.112	57.549	42.967	0.213
3100.000	0.359	1.388	3098.856	42.698	39.347	42.698	58.063	42.661	0.132
3200.000	0.475	330.813	3198.853	43.373	39.153	43.373	58.431	42.073	0.247
3300.000	0.355	323.403	3298.851	43.983	38.766	43.983	58.629	41.393	0.131
3400.000	0.411	323.690	3398.848	44.521	38.369	44.521	58.773	40.756	0.057

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	0.434	317.887	3498.846	45.091	37.903	45.091	58.905	40.050	0.049
3600.000	0.278	310.394	3598.844	45.529	37.464	45.529	58.962	39.450	0.163
3700.000	0.153	298.362	3698.843	45.749	37.163	45.749	58.941	39.088	0.132
3800.000	0.152	269.021	3798.843	45.810	36.913	45.810	58.831	38.861	0.077
3900.000	0.278	213.138	3898.842	45.605	36.647	45.605	58.505	38.784	0.230
4000.000	0.443	204.150	3998.840	45.049	36.356	45.049	57.890	38.905	0.175
4100.000	0.396	212.211	4098.837	44.404	36.014	44.404	57.172	39.044	0.075
4200.000	0.282	225.832	4198.836	43.940	35.653	43.940	56.585	39.056	0.139
4300.000	0.514	277.442	4298.833	43.827	35.032	43.827	56.107	38.636	0.405
4400.000	0.693	306.620	4398.828	44.245	34.102	44.245	55.862	37.623	0.350
4500.000	0.905	275.690	4498.819	44.684	32.831	44.684	55.449	36.306	0.473
4600.000	0.765	304.712	4598.809	45.143	31.496	45.143	55.044	34.903	0.440
4700.000	0.884	294.050	4698.798	45.838	30.243	45.838	54.915	33.416	0.194
4800.000	0.832	276.040	4798.787	46.228	28.816	46.228	54.474	31.937	0.274
4900.000	0.994	300.747	4898.775	46.748	27.348	46.748	54.160	30.328	0.421
5000.000	0.824	309.355	4998.762	47.648	26.047	47.648	54.302	28.664	0.218
5100.000	0.800	313.666	5098.752	48.586	24.986	48.586	54.634	27.215	0.065
5200.000	0.686	327.582	5198.744	49.573	24.160	49.573	55.147	25.982	0.213
5300.000	0.857	333.591	5298.735	50.748	23.506	50.748	55.928	24.853	0.189
5400.000	1.029	344.780	5398.721	52.285	22.938	52.285	57.095	23.688	0.251
5500.000	1.034	4.240	5498.705	54.051	22.769	54.051	58.651	22.843	0.349
5600.000	0.957	21.825	5598.691	55.727	23.146	55.727	60.342	22.555	0.314
5700.000	0.983	14.505	5698.676	57.332	23.671	57.332	62.027	22.435	0.126
5800.000	0.946	16.761	5798.662	58.953	24.124	58.953	63.697	22.255	0.053
5900.000	0.882	20.733	5898.649	60.462	24.634	60.462	65.288	22.168	0.090
6000.000	0.926	33.263	5998.637	61.857	25.350	61.857	66.850	22.284	0.202
6100.000	0.737	36.512	6098.626	63.050	26.176	63.050	68.268	22.546	0.195
6200.000	1.183	67.132	6198.613	63.968	27.510	63.968	69.633	23.270	0.665
6300.000	1.200	64.562	6298.591	64.819	29.407	64.819	71.178	24.402	0.056
6400.000	1.362	67.854	6398.566	65.717	31.453	65.717	72.856	25.576	0.178
6500.000	1.019	48.873	6498.545	66.750	33.224	66.750	74.561	26.461	0.519
6600.000	1.386	47.537	6598.523	68.151	34.785	68.151	76.515	27.040	0.368
6700.000	1.179	32.309	6698.498	69.836	36.227	69.836	78.673	27.418	0.397
6800.000	1.079	42.335	6798.478	71.401	37.410	71.401	80.608	27.652	0.221
6900.000	1.355	41.152	6898.456	72.987	38.822	72.987	82.670	28.009	0.278
7000.000	1.225	41.820	6998.430	74.674	40.313	74.674	84.861	28.363	0.131
7100.000	1.156	15.402	7098.410	76.443	41.294	76.443	86.883	28.378	0.548
7200.000	1.045	50.878	7198.392	77.991	42.269	77.991	88.709	28.457	0.679
7300.000	1.191	41.780	7298.373	79.341	43.669	79.341	90.565	28.828	0.230
7400.000	1.346	42.380	7398.349	80.984	45.154	80.984	92.722	29.142	0.155
7500.000	1.273	34.119	7498.323	82.771	46.569	82.771	94.972	29.363	0.202
7600.000	1.067	19.502	7598.302	84.569	47.503	84.569	96.997	29.323	0.361
7700.000	1.428	44.522	7698.279	86.335	48.687	86.335	99.117	29.420	0.645
7800.000	1.385	30.346	7798.249	88.266	50.171	88.266	101.528	29.614	0.350
7900.000	1.014	26.062	7898.227	90.104	51.170	90.104	103.620	29.592	0.381
8000.000	1.145	44.401	7998.210	91.612	52.258	91.612	105.469	29.701	0.367
8100.000	0.859	43.932	8098.194	92.866	53.477	92.866	107.162	29.935	0.286
HORIZONTAL DISPLACEMENT IS 107.162 FEET AT 29.935 DEGREES									