

Company: ANADARKO PETROLEUM
 Well: HSR-CAMENISCH 16-33
 API: 05-123-20605
 Rig Name: PRODUCTION/PRIORITY
 State/County: COLORADO / WELD
 Latitude: 40.264, Longitude: -104.888
 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_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 10/30/2013 / 12:15

VAUGHN ENERGY SERVICES

HENDERSON, COLORADO

303-853-4976

NICK KULA

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	0.166	335.926	100.000	0.133	-0.059	0.133	0.145	335.926	0.166
200.000	0.125	162.677	200.000	0.161	-0.086	0.161	0.182	331.878	0.291
300.000	0.275	225.116	299.999	-0.113	-0.223	-0.113	0.250	243.121	0.244
400.000	0.363	194.730	399.998	-0.589	-0.474	-0.589	0.756	218.829	0.187
500.000	0.469	189.422	499.995	-1.299	-0.622	-1.299	1.440	205.575	0.112
600.000	0.376	175.644	599.992	-2.030	-0.664	-2.030	2.135	198.103	0.137
700.000	0.535	211.736	699.989	-2.754	-0.884	-2.754	2.893	197.798	0.320
800.000	0.675	220.745	799.984	-3.598	-1.514	-3.598	3.904	202.828	0.169
900.000	0.695	213.006	899.977	-4.553	-2.230	-4.553	5.070	206.090	0.095
1000.000	0.647	225.624	999.970	-5.457	-2.964	-5.457	6.210	208.507	0.155
1100.000	0.606	223.988	1099.964	-6.233	-3.735	-6.233	7.266	210.932	0.045
1200.000	0.501	205.004	1199.959	-7.009	-4.287	-7.009	8.216	211.451	0.210
1300.000	0.475	204.592	1299.956	-7.782	-4.644	-7.782	9.062	210.827	0.026
1400.000	0.070	280.813	1399.954	-8.147	-4.876	-8.147	9.495	210.901	0.463
1500.000	0.073	272.680	1499.954	-8.133	-5.000	-8.133	9.547	211.582	0.011
1600.000	0.291	201.309	1599.954	-8.367	-5.156	-8.367	9.828	211.643	0.277
1700.000	0.343	206.168	1699.952	-8.872	-5.380	-8.872	10.376	211.234	0.058
1800.000	0.531	247.263	1799.950	-9.320	-5.940	-9.320	11.052	212.510	0.354
1900.000	0.726	238.569	1899.944	-9.829	-6.908	-9.829	12.014	215.099	0.217
2000.000	0.788	236.508	1999.935	-10.539	-8.022	-10.539	13.245	217.278	0.067
2100.000	0.718	231.591	2099.926	-11.308	-9.087	-11.308	14.507	218.784	0.095
2200.000	0.725	211.397	2199.918	-12.238	-9.908	-12.238	15.745	218.994	0.253
2300.000	0.899	220.197	2299.908	-13.377	-10.744	-13.377	17.157	218.769	0.214
2400.000	0.911	227.302	2399.896	-14.516	-11.834	-14.516	18.729	219.190	0.113
2500.000	0.896	223.332	2499.883	-15.624	-12.955	-15.624	20.296	219.666	0.064
2600.000	0.923	220.676	2599.871	-16.803	-14.017	-16.803	21.882	219.834	0.050
2700.000	0.923	216.218	2699.858	-18.064	-15.018	-18.064	23.492	219.739	0.072
2800.000	0.947	221.062	2799.845	-19.337	-16.037	-19.337	25.122	219.670	0.082
2900.000	0.912	220.279	2899.831	-20.567	-17.094	-20.567	26.744	219.731	0.037

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
3000.000	0.681	229.902	2999.822	-21.557	-18.063	-21.557	28.125	219.960	0.266
3100.000	0.636	237.947	3099.815	-22.235	-18.988	-22.235	29.239	220.497	0.103
3200.000	0.690	253.686	3199.809	-22.698	-20.037	-22.698	30.277	221.436	0.189
3300.000	0.492	240.677	3299.803	-23.078	-20.989	-23.078	31.195	222.286	0.238
3400.000	0.951	248.731	3399.795	-23.590	-22.138	-23.590	32.350	223.181	0.469
3500.000	1.089	247.613	3499.779	-24.253	-23.790	-24.253	33.973	224.448	0.139
3600.000	0.971	237.365	3599.763	-25.071	-25.381	-25.071	35.676	225.352	0.218
3700.000	1.308	235.942	3699.743	-26.167	-27.040	-26.167	37.628	225.940	0.338
3800.000	1.101	233.920	3799.721	-27.372	-28.762	-27.372	39.705	226.419	0.211
3900.000	0.535	246.488	3899.711	-28.125	-29.967	-28.125	41.098	226.817	0.590
4000.000	0.435	43.919	3999.709	-28.037	-30.132	-28.037	41.159	227.063	0.952
4100.000	0.761	43.648	4099.704	-27.284	-29.411	-27.284	40.117	227.149	0.326
4200.000	0.941	71.067	4199.693	-26.537	-28.176	-26.537	38.705	226.716	0.440
4300.000	0.820	57.047	4299.681	-25.881	-26.799	-25.881	37.256	225.998	0.246
4400.000	0.995	74.898	4399.669	-25.265	-25.360	-25.265	35.798	225.107	0.331
4500.000	1.078	73.789	4499.652	-24.776	-23.618	-24.776	34.230	223.628	0.085
4600.000	1.069	74.641	4599.635	-24.267	-21.815	-24.267	32.631	221.954	0.019
4700.000	0.915	66.703	4699.620	-23.704	-20.182	-23.704	31.132	220.412	0.206
4800.000	0.738	57.208	4799.610	-23.039	-18.907	-23.039	29.804	219.374	0.223
4900.000	0.633	51.099	4899.602	-22.343	-17.936	-22.343	28.652	218.755	0.128
5000.000	0.716	49.659	4999.595	-21.593	-17.030	-21.593	27.500	218.263	0.085
5100.000	0.757	38.609	5099.587	-20.672	-16.142	-20.672	26.228	217.984	0.148
5200.000	0.598	13.837	5199.580	-19.650	-15.605	-19.650	25.093	218.455	0.329
5300.000	0.686	0.129	5299.574	-18.545	-15.479	-18.545	24.156	219.852	0.176
5400.000	0.841	24.359	5399.566	-17.277	-15.175	-17.277	22.995	221.293	0.354
5500.000	0.657	27.099	5499.557	-16.099	-14.611	-16.099	21.741	222.227	0.187
5600.000	1.036	51.310	5599.546	-15.023	-13.644	-15.023	20.294	222.246	0.514
5700.000	0.974	52.369	5699.531	-13.939	-12.265	-13.939	18.567	221.346	0.065
5800.000	1.133	35.248	5799.514	-12.612	-11.021	-12.612	16.749	221.149	0.351
5900.000	1.677	29.514	5899.484	-10.531	-9.730	-10.531	14.338	222.735	0.560
6000.000	2.555	28.360	5999.415	-7.297	-7.950	-7.297	10.791	227.454	0.879
6100.000	3.118	24.438	6099.292	-2.860	-5.767	-2.860	6.437	243.624	0.596
6200.000	2.342	19.784	6199.178	1.539	-3.950	1.539	4.239	291.291	0.807
6300.000	1.856	4.975	6299.111	5.075	-3.118	5.075	5.956	328.437	0.724
6400.000	1.518	348.363	6399.068	7.986	-3.245	7.986	8.620	337.889	0.591
6500.000	1.015	322.626	6499.044	9.988	-4.050	9.988	10.777	337.929	0.747
6600.000	0.935	290.473	6599.030	10.977	-5.352	10.977	12.212	334.009	0.546
6700.000	1.128	267.874	6699.014	11.226	-7.100	11.226	13.282	327.689	0.446
6800.000	1.177	252.595	6798.994	10.882	-9.063	10.882	14.162	320.210	0.310
6900.000	1.347	240.437	6898.970	9.995	-11.066	9.995	14.911	312.089	0.317
7000.000	1.456	227.503	6998.941	8.557	-13.025	8.557	15.584	303.302	0.334
7050.000	1.351	228.289	7048.926	7.735	-13.933	7.735	15.937	299.037	0.214
HORIZONTAL DISPLACEMENT IS 15.937 FEET AT 299.037 DEGREES									