

Company: Anadarko Petroleum Corp.
 Well/API: HSR-Deborah 7-5/05-123-16755
 Tool Type: North Seeking Rate Gyro
 Rig Name: Production/CoreTech
 County/State: Weld/Colorado
 Latitude: 40.255, Longitude: -104.799
 Directions are relative to True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB=GL Elevation= 4779 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 3/2/2015 / 15:56

Lat/Long Obtained By Handheld GPS At Wellhead

Handheld GPS Reference: NAD83/Device Error: ±9 Feet

VES Survey International - Henderson CO

Mark Simmons

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	0.487	50.450	99.999	0.270	0.327	0.270	0.425	50.450	0.487
200.000	0.447	59.543	199.995	0.739	0.991	0.739	1.236	53.309	0.084
300.000	0.418	59.618	299.993	1.121	1.643	1.121	1.989	55.686	0.029
400.000	0.795	100.306	399.987	1.182	2.640	1.182	2.892	65.884	0.550
500.000	1.037	103.611	499.974	0.845	4.201	0.845	4.286	78.630	0.248
600.000	1.064	106.148	599.958	0.374	5.972	0.374	5.984	86.418	0.054
700.000	1.087	101.620	699.940	-0.075	7.793	-0.075	7.793	90.554	0.088
800.000	1.016	104.757	799.923	-0.492	9.579	-0.492	9.592	92.941	0.092
900.000	0.749	99.691	899.911	-0.828	11.080	-0.828	11.111	94.273	0.278
1000.000	0.580	92.849	999.905	-0.963	12.230	-0.963	12.268	94.503	0.186
1100.000	0.426	83.857	1099.901	-0.949	13.105	-0.949	13.139	94.140	0.173
1200.000	0.449	73.706	1199.898	-0.799	13.850	-0.799	13.873	93.302	0.081
1300.000	0.399	67.822	1299.895	-0.558	14.548	-0.558	14.559	92.195	0.066
1400.000	0.433	38.622	1399.893	-0.131	15.107	-0.131	15.107	90.497	0.212
1500.000	0.565	19.955	1499.889	0.627	15.511	0.627	15.523	87.684	0.208
1600.000	0.565	343.909	1599.884	1.564	15.542	1.564	15.621	84.252	0.350
1700.000	0.672	347.246	1699.878	2.610	15.276	2.610	15.497	80.305	0.112
1800.000	0.768	33.366	1799.871	3.741	15.515	3.741	15.960	76.443	0.571
1900.000	0.938	7.789	1899.861	5.112	15.995	5.112	16.792	72.277	0.412
2000.000	1.443	10.867	1999.839	7.159	16.343	7.159	17.842	66.345	0.509
2100.000	1.621	8.661	2099.803	9.793	16.793	9.793	19.440	59.751	0.187
2200.000	1.761	23.256	2199.760	12.603	17.613	12.603	21.658	54.415	0.452
2300.000	1.836	36.017	2299.711	15.310	19.162	15.310	24.527	51.375	0.407
2400.000	2.025	42.718	2399.654	17.904	21.302	17.904	27.827	49.954	0.294
2500.000	2.177	47.705	2499.587	20.480	23.905	20.480	31.479	49.413	0.238
2600.000	2.113	48.038	2599.517	22.991	26.681	22.991	35.221	49.249	0.065
2700.000	1.772	37.986	2699.460	25.442	29.004	25.442	38.581	48.743	0.481
2800.000	1.480	29.075	2799.419	27.789	30.583	27.789	41.323	47.740	0.385
2900.000	1.108	6.822	2899.394	29.878	31.325	29.878	43.290	46.355	0.619
3000.000	0.869	356.773	2999.380	31.595	31.398	31.595	44.543	44.821	0.295
3100.000	0.638	357.162	3099.371	32.907	31.327	32.907	45.435	43.591	0.231
3200.000	0.279	343.085	3199.367	33.696	31.229	33.696	45.942	42.824	0.374
3300.000	0.095	91.724	3299.367	33.926	31.241	33.926	46.119	42.641	0.322

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
3400.000	0.155	137.420	3399.367	33.824	31.415	33.824	46.162	42.886	0.112
3500.000	0.498	131.140	3499.365	33.438	31.834	33.438	46.168	43.593	0.345
3600.000	0.656	115.779	3599.360	32.903	32.677	32.903	46.372	44.803	0.219
3700.000	0.592	131.752	3699.354	32.310	33.577	32.310	46.598	46.102	0.184
3800.000	0.610	129.880	3799.349	31.625	34.371	31.625	46.707	47.383	0.027
3900.000	0.427	74.811	3899.345	31.381	35.140	31.381	47.113	48.234	0.506
4000.000	0.625	358.180	3999.342	32.024	35.483	32.024	47.797	47.933	0.671
4100.000	1.005	348.078	4099.332	33.427	35.284	33.427	48.604	46.548	0.405
4200.000	0.975	339.263	4199.317	35.082	34.802	35.082	49.415	44.771	0.155
4300.000	0.928	337.541	4299.303	36.626	34.191	36.626	50.105	43.031	0.056
4400.000	0.948	337.306	4399.290	38.137	33.563	38.137	50.802	41.349	0.021
4500.000	0.835	328.977	4499.277	39.525	32.868	39.525	51.405	39.746	0.172
4600.000	0.688	355.047	4599.269	40.747	32.441	40.747	52.084	38.525	0.372
4700.000	0.748	1.504	4699.261	41.997	32.406	41.997	53.046	37.655	0.101
4800.000	0.841	2.142	4799.251	43.383	32.451	43.383	54.176	36.797	0.094
4900.000	0.882	358.593	4899.240	44.886	32.459	44.886	55.393	35.872	0.067
5000.000	0.463	11.457	4999.233	46.051	32.520	46.051	56.376	35.229	0.443
5100.000	0.235	44.020	5099.231	46.595	32.743	46.595	56.949	35.097	0.293
5200.000	0.126	154.125	5199.231	46.643	32.934	46.643	57.098	35.225	0.303
5300.000	0.379	98.878	5299.230	46.493	33.309	46.493	57.193	35.619	0.324
5400.000	0.402	100.364	5399.228	46.379	33.981	46.379	57.495	36.230	0.026
5500.000	0.355	105.881	5499.226	46.231	34.625	46.231	57.759	36.832	0.060
5600.000	0.339	118.140	5599.224	46.006	35.184	46.006	57.918	37.407	0.076
5700.000	0.296	120.248	5699.222	45.737	35.668	45.737	58.000	37.949	0.045
5800.000	0.573	126.563	5799.219	45.309	36.292	45.309	58.052	38.695	0.281
5900.000	1.002	128.898	5899.209	44.461	37.375	44.461	58.084	40.051	0.430
6000.000	1.078	127.363	5999.193	43.341	38.803	43.341	58.174	41.838	0.080
6100.000	1.055	152.610	6099.176	41.953	39.974	41.953	57.948	43.616	0.467
6200.000	0.945	151.015	6199.161	40.415	40.797	40.415	57.426	45.270	0.113
6300.000	1.167	133.508	6299.144	38.993	41.935	38.993	57.262	47.082	0.389
6400.000	1.296	135.416	6399.121	37.486	43.467	37.486	57.399	49.226	0.136
6500.000	1.417	150.398	6499.093	35.605	44.872	35.605	57.282	51.569	0.374
6600.000	1.667	133.466	6599.058	33.529	46.539	33.529	57.359	54.229	0.517
6700.000	1.696	133.736	6699.015	31.505	48.664	31.505	57.972	57.081	0.030
6800.000	2.105	138.718	6798.959	29.102	50.945	29.102	58.671	60.263	0.441
6900.000	1.886	140.719	6898.899	26.448	53.199	26.448	59.410	63.565	0.230
7000.000	1.973	128.583	6998.842	24.101	55.586	24.101	60.586	66.560	0.417
7100.000	2.760	126.053	7098.756	21.610	58.879	21.610	62.719	69.846	0.794
7150.000	2.455	122.760	7148.705	20.322	60.753	20.322	64.062	71.505	0.680
HORIZONTAL DISPLACEMENT IS 64.062 FEET AT 71.505 DEGREES									