



Company: Anadarko Petroleum Corp.
 Well/API: Kugel V 18-4/05-123-17257
 Tool Type: North Seeking Rate Gyro
 Rig Name: Production/CoreTech
 County/State: Weld/Colorado
 VS-Azi: 0.000 Degrees
 Latitude: 40.14407, Longitude: -104.94005
 All Azimuths referenced to True North
 No Grid Convergence Applied



Depth Reference : RKB= GL Elevation= 4908 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 5/10/2017 / 09:00

Lat/Long Obtained by Handheld GPS at Wellhead

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

VES Survey International- Henderson Co

Surveyor: Geof Davis / Kugel V 18-4

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	0.651	71.670	99.998	0.179	0.539	0.179	0.568	71.670	0.651
200.000	1.017	68.990	199.987	0.675	1.907	0.675	2.023	70.494	0.368
300.000	1.192	46.258	299.969	1.713	3.487	1.713	3.885	63.837	0.468
400.000	1.303	55.086	399.945	3.083	5.171	3.083	6.020	59.195	0.222
500.000	1.560	46.634	499.914	4.669	7.093	4.669	8.492	56.647	0.332
600.000	1.584	40.349	599.877	6.657	8.977	6.657	11.176	53.444	0.174
700.000	1.314	30.308	699.845	8.699	10.451	8.699	13.598	50.225	0.370
800.000	1.187	32.057	799.821	10.567	11.579	10.567	15.675	47.617	0.133
900.000	1.018	26.334	899.802	12.240	12.522	12.240	17.511	45.653	0.201
1000.000	0.951	22.715	999.788	13.801	13.236	13.801	19.123	43.804	0.091
1100.000	0.563	17.178	1099.779	15.036	13.702	15.036	20.343	42.342	0.394
1200.000	0.566	47.291	1199.774	15.840	14.210	15.840	21.280	41.894	0.293
1300.000	0.723	349.120	1299.769	16.795	14.453	16.795	22.158	40.715	0.641
1400.000	0.350	274.588	1399.765	17.439	14.030	17.439	22.382	38.819	0.714
1500.000	0.180	294.068	1499.764	17.527	13.583	17.527	22.174	37.775	0.190
1600.000	0.336	313.362	1599.763	17.792	13.227	17.792	22.170	36.628	0.177

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
1700.000	0.338	329.681	1699.761	18.248	12.865	18.248	22.327	35.185	0.096
1800.000	0.700	332.312	1799.757	19.043	12.433	19.043	22.742	33.139	0.363
1900.000	0.966	320.428	1899.746	20.233	11.612	20.233	23.329	29.852	0.316
2000.000	1.239	302.434	1999.728	21.463	10.163	21.463	23.747	25.338	0.438
2100.000	1.063	311.030	2099.708	22.652	8.550	22.652	24.212	20.680	0.246
2200.000	1.044	292.681	2199.691	23.612	7.010	23.612	24.630	16.535	0.336
2300.000	1.214	313.527	2299.672	24.693	5.402	24.693	25.277	12.339	0.441
2400.000	0.968	315.807	2399.654	26.028	4.045	26.028	26.340	8.834	0.250
2500.000	0.986	322.205	2499.640	27.313	2.929	27.313	27.469	6.122	0.110
2600.000	0.862	331.067	2599.627	28.650	2.038	28.650	28.723	4.070	0.189
2700.000	0.673	330.707	2699.618	29.821	1.387	29.821	29.853	2.663	0.189
2800.000	0.638	318.620	2799.611	30.752	0.731	30.752	30.760	1.362	0.142
2900.000	0.689	304.945	2899.604	31.514	-0.130	31.514	31.514	359.764	0.166
3000.000	0.925	273.929	2999.595	31.914	-1.428	31.914	31.946	357.437	0.488
3100.000	0.758	278.321	3099.584	32.065	-2.888	32.065	32.195	354.853	0.179
3200.000	0.643	246.627	3199.577	31.938	-4.058	31.938	32.195	352.759	0.398
3300.000	1.099	264.356	3299.565	31.621	-5.527	31.621	32.101	350.086	0.525
3400.000	0.420	215.088	3399.557	31.227	-6.692	31.227	31.936	347.904	0.884
3500.000	0.895	172.806	3499.550	30.152	-6.805	30.152	30.911	347.282	0.649
3600.000	1.283	199.346	3599.533	28.321	-7.078	28.321	29.192	345.968	0.627
3700.000	1.146	238.232	3699.512	26.737	-8.300	26.737	27.996	342.755	0.819
3800.000	1.226	248.774	3799.491	25.824	-10.147	25.824	27.746	338.548	0.232
3900.000	2.049	248.105	3899.449	24.770	-12.803	24.770	27.883	332.666	0.823
4000.000	1.503	256.764	3999.401	23.803	-15.738	23.803	28.535	326.528	0.607
4100.000	1.884	259.298	4099.357	23.197	-18.630	23.197	29.752	321.232	0.389
4200.000	1.803	252.552	4199.305	22.420	-21.746	22.420	31.234	315.874	0.232
4300.000	1.834	252.203	4299.255	21.459	-24.771	21.459	32.773	310.903	0.033
4400.000	1.865	256.182	4399.203	20.582	-27.875	20.582	34.650	306.441	0.132
4500.000	1.698	260.840	4499.154	19.957	-30.918	19.957	36.799	302.842	0.221
4600.000	1.492	261.818	4599.116	19.536	-33.669	19.536	38.927	300.123	0.207
4700.000	1.308	252.895	4699.086	19.015	-36.049	19.015	40.757	297.810	0.285
4800.000	0.876	252.876	4799.067	18.454	-37.871	18.454	42.128	295.980	0.432
4900.000	0.750	269.594	4899.058	18.224	-39.256	18.224	43.280	294.903	0.267
5000.000	0.743	280.966	4999.049	18.343	-40.547	18.343	44.503	294.342	0.148
5100.000	0.601	313.242	5099.043	18.826	-41.566	18.826	45.630	294.367	0.398
5200.000	0.887	311.055	5199.034	19.694	-42.532	19.694	46.870	294.846	0.287
5300.000	0.543	281.820	5299.026	20.300	-43.579	20.300	48.075	294.976	0.491
5400.000	0.308	314.903	5399.024	20.587	-44.234	20.587	48.790	294.957	0.331
5500.000	0.391	1.587	5499.022	21.117	-44.415	21.117	49.180	295.429	0.287

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
5600.000	0.938	22.643	5599.015	22.213	-44.091	22.213	49.370	296.739	0.590
5700.000	1.160	9.030	5698.998	23.968	-43.617	23.968	49.768	298.789	0.332
5800.000	0.753	321.435	5798.986	25.481	-43.868	25.481	50.731	300.151	0.857
5900.000	0.802	316.332	5898.976	26.501	-44.760	26.501	52.017	300.628	0.084
6000.000	1.260	325.672	5998.960	27.915	-45.863	27.915	53.691	301.327	0.487
6100.000	1.184	323.711	6098.937	29.656	-47.095	29.656	55.654	302.199	0.087
6200.000	1.569	349.127	6198.909	31.833	-47.965	31.833	57.567	303.572	0.713
6300.000	0.744	348.267	6298.888	33.814	-48.355	33.814	59.005	304.965	0.825
6400.000	1.650	354.523	6398.865	35.883	-48.624	35.883	60.431	306.426	0.913
6500.000	1.872	353.699	6498.818	38.940	-48.941	38.940	62.542	308.507	0.224
6600.000	1.281	353.400	6598.780	41.673	-49.249	41.673	64.515	310.237	0.592
6700.000	0.517	34.812	6698.767	43.154	-49.120	43.154	65.384	311.301	0.956
6800.000	0.561	10.728	6798.763	44.005	-48.771	44.005	65.689	312.059	0.229
6900.000	0.489	13.226	6898.759	44.901	-48.583	44.901	66.154	312.745	0.075
7000.000	0.739	11.841	6998.753	45.947	-48.353	45.947	66.702	313.539	0.250
7100.000	0.475	329.049	7098.748	46.934	-48.434	46.934	67.443	314.099	0.506
7200.000	0.562	289.785	7198.744	47.456	-49.109	47.456	68.291	314.019	0.358
7300.000	0.366	281.574	7298.741	47.686	-49.883	47.686	69.009	313.710	0.207
7400.000	0.619	305.760	7398.737	48.066	-50.634	48.066	69.815	313.509	0.323
7440.000	0.781	324.081	7438.734	48.413	-50.970	48.413	70.297	313.526	0.685