

Company: Anadarko Petroleum Corp.  
 Well/API: Grant Brothers 31-11 #2 / 05-123-08716  
 Tool Type: North Seeking Rate Gyro  
 Rig Name: Production / Summit Slickline  
 County/State: Weld County / Colorado  
 VS-Azi: 0.000 Degrees  
 Latitude: 40.07126, Longitude: -104.96815  
 No Grid Convergence Applied  
 All Azimuths referenced to True North



**FIELD COPY ONLY (NOT DEFINITIVE)**

Depth Reference : RKB = GL Elevation = 5018 Feet

**DRILLOG MS GYRO SURVEY CALCULATIONS**

Filename: msgyro\_run01-01-de\_01.ut  
 Minimum Curvature Method  
 Report Date/Time: 8/3/2015 / 11:47

Lat/Long Obtained By Handheld GPS At Wellhead  
 Handheld GPS Reference: NAD83/Device Error: ±9 Feet  
 VES Survey International - Henderson CO  
 Norman Cowan  
 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	0.674	71.445	99.998	0.187	0.557	0.187	0.588	71.445	0.674
200.000	1.027	30.188	199.987	1.149	1.565	1.149	1.941	53.723	0.684
300.000	1.431	72.143	299.966	2.306	3.205	2.306	3.948	54.256	0.958
400.000	1.228	64.746	399.939	3.147	5.362	3.147	6.217	59.597	0.266
500.000	0.821	71.209	499.923	3.834	7.010	3.834	7.990	61.320	0.423
600.000	0.430	66.554	599.917	4.215	8.032	4.215	9.071	62.314	0.393
700.000	0.880	57.152	699.910	4.780	9.022	4.780	10.210	62.082	0.461
800.000	0.287	68.317	799.905	5.289	9.900	5.289	11.224	61.884	0.600
900.000	0.281	96.230	899.903	5.356	10.376	5.356	11.677	62.700	0.137
1000.000	0.541	114.445	999.901	5.134	11.049	5.134	12.183	65.079	0.288
1100.000	0.546	50.145	1099.897	5.244	11.844	5.244	12.953	66.120	0.578
1200.000	0.138	65.986	1199.895	5.598	12.319	5.598	13.531	65.564	0.415
1300.000	0.362	25.789	1299.894	5.931	12.566	5.931	13.896	64.734	0.272
1400.000	0.277	20.186	1399.893	6.442	12.787	6.442	14.318	63.261	0.091
1500.000	0.329	12.665	1499.891	6.949	12.934	6.949	14.682	61.750	0.066
1600.000	0.294	15.374	1599.890	7.477	13.065	7.477	15.053	60.216	0.038
1700.000	0.441	272.052	1699.888	7.739	12.748	7.739	14.913	58.741	0.584
1800.000	0.291	327.425	1799.887	7.967	12.227	7.967	14.593	56.912	0.365
1900.000	0.380	311.015	1899.885	8.398	11.840	8.398	14.516	54.650	0.130
2000.000	0.648	307.690	1999.881	8.962	11.142	8.962	14.299	51.191	0.270
2100.000	0.435	309.651	2099.876	9.549	10.403	9.549	14.121	47.449	0.214
2200.000	0.419	332.994	2199.874	10.117	9.944	10.117	14.186	44.506	0.173
2300.000	0.848	281.482	2299.868	10.591	9.053	10.591	13.933	40.524	0.672
2400.000	0.533	269.425	2399.861	10.733	7.863	10.733	13.306	36.227	0.345
2500.000	0.286	328.159	2499.858	10.941	7.267	10.941	13.134	33.593	0.455
2600.000	0.359	284.696	2599.857	11.232	6.832	11.232	13.147	31.312	0.248
2700.000	0.492	184.605	2699.855	10.884	6.495	10.884	12.674	30.828	0.658
2800.000	0.869	130.652	2799.849	9.961	7.036	9.961	12.196	35.235	0.703
2900.000	0.523	170.425	2899.842	9.017	7.688	9.017	11.849	40.451	0.575
3000.000	0.175	283.224	2999.840	8.601	7.615	8.601	11.488	41.521	0.613
3100.000	0.641	280.779	3099.838	8.741	6.918	8.741	11.147	38.360	0.466
3200.000	0.746	303.348	3199.831	9.203	5.825	9.203	10.892	32.330	0.290

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
3300.000	1.026	271.674	3299.819	9.587	4.386	9.587	10.543	24.583	0.554
3400.000	0.785	290.753	3399.807	9.856	2.850	9.856	10.260	16.127	0.383
3500.000	1.030	263.819	3499.794	10.002	1.315	10.002	10.088	7.490	0.485
3600.000	1.173	284.657	3599.776	10.164	-0.569	10.164	10.180	356.797	0.422
3700.000	1.131	322.420	3699.758	11.205	-2.160	11.205	11.412	349.087	0.746
3800.000	0.724	308.352	3799.744	12.379	-3.257	12.379	12.800	345.257	0.464
3900.000	0.945	322.448	3899.734	13.425	-4.255	13.425	14.083	342.413	0.301
4000.000	0.900	305.874	3999.721	14.539	-5.395	14.539	15.508	339.643	0.270
4100.000	0.941	349.355	4099.709	15.807	-6.183	15.807	16.973	338.637	0.683
4200.000	0.668	351.281	4199.699	17.190	-6.423	17.190	18.351	339.512	0.275
4300.000	0.669	326.369	4299.693	18.252	-6.835	18.252	19.490	339.471	0.288
4400.000	0.936	294.016	4399.683	19.071	-7.904	19.071	20.644	337.488	0.515
4500.000	1.457	270.535	4499.662	19.415	-9.921	19.415	21.803	332.932	0.706

HORIZONTAL DISPLACEMENT IS  
21.803 FEET AT 332.932 DEGREES