

Company: Anadarko Petroleum Corp.  
 Well/API: Wardell 20-45/05-123-23988  
 Tool Type: North Seeking Rate Gyro  
 Rig Name: Production/Core-Tech  
 County/State: Weld/Colorado  
 Latitude: 40.207, Longitude: -104.682  
 Directions are relative to True North  
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = GL Relevation = 4891'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run01-01-de\_01.ut  
 Minimum Curvature Method  
 Report Date/Time: 8/27/2014 / 14:38

Lat/Long & Elevation Obtained By Handheld GPS At Wellhead  
 Handheld GPS Reference: NAD83/Device Error: ±9 Feet  
 VES Survey International - Henderson CO  
 Nick Kula  
 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	0.239	301.773	100.000	0.110	-0.177	0.110	0.208	301.773	0.239
200.000	0.049	226.022	199.999	0.190	-0.385	0.190	0.429	296.219	0.232
300.000	0.218	14.183	299.999	0.344	-0.369	0.344	0.505	313.004	0.261
400.000	0.213	15.515	399.998	0.708	-0.273	0.708	0.759	338.925	0.007
500.000	0.071	225.367	499.998	0.844	-0.267	0.844	0.885	342.418	0.277
600.000	0.186	11.912	599.998	0.959	-0.278	0.959	0.999	343.833	0.249
700.000	0.168	248.568	699.998	1.065	-0.381	1.065	1.131	340.323	0.312
800.000	0.258	301.882	799.997	1.130	-0.708	1.130	1.333	327.935	0.207
900.000	0.304	276.995	899.996	1.281	-1.162	1.281	1.729	317.786	0.129
1000.000	0.465	266.589	999.994	1.289	-1.830	1.289	2.239	305.156	0.175
1100.000	0.511	283.939	1099.990	1.372	-2.668	1.372	3.000	297.219	0.154
1200.000	0.390	268.918	1199.987	1.473	-3.441	1.473	3.743	293.179	0.168
1300.000	0.478	287.798	1299.984	1.594	-4.179	1.594	4.472	290.886	0.167
1400.000	0.534	280.404	1399.980	1.806	-5.035	1.806	5.349	289.736	0.086
1500.000	0.533	280.308	1499.976	1.974	-5.951	1.974	6.270	288.349	0.002
1600.000	0.534	285.226	1599.972	2.179	-6.858	2.179	7.196	287.629	0.046
1700.000	0.465	266.561	1699.968	2.277	-7.713	2.277	8.042	286.450	0.176
1800.000	0.536	255.538	1799.964	2.136	-8.571	2.136	8.833	283.996	0.119
1900.000	0.699	256.651	1899.958	1.879	-9.617	1.879	9.799	281.054	0.164
2000.000	1.020	274.029	1999.947	1.800	-11.099	1.800	11.244	279.214	0.410
2100.000	1.058	273.897	2099.931	1.926	-12.908	1.926	13.051	278.485	0.038
2200.000	0.757	236.273	2199.919	1.622	-14.378	1.622	14.469	276.435	0.651
2300.000	0.436	195.415	2299.914	0.888	-15.029	0.888	15.055	273.381	0.513
2400.000	0.545	132.819	2399.911	0.198	-14.781	0.198	14.783	270.766	0.518
2500.000	0.728	109.981	2499.905	-0.342	-13.836	-0.342	13.840	268.582	0.310
2600.000	0.868	120.622	2599.895	-0.945	-12.587	-0.945	12.622	265.705	0.203
2700.000	1.061	140.913	2699.881	-2.050	-11.351	-2.050	11.535	259.765	0.390
2800.000	1.136	144.616	2799.863	-3.577	-10.194	-3.577	10.803	250.666	0.103
2900.000	0.819	143.818	2899.848	-4.962	-9.198	-4.962	10.451	241.654	0.317
3000.000	0.514	150.860	2999.841	-5.931	-8.557	-5.931	10.411	235.272	0.315
3100.000	0.534	181.837	3099.837	-6.789	-8.353	-6.789	10.764	230.896	0.281
3200.000	0.691	189.011	3199.831	-7.851	-8.462	-7.851	11.544	227.146	0.174
3300.000	0.639	186.792	3299.825	-9.000	-8.623	-9.000	12.464	223.774	0.058

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	0.503	217.425	3399.820	-9.902	-8.955	-9.902	13.351	222.127	0.329
3500.000	0.766	312.407	3499.816	-9.799	-9.716	-9.799	13.799	224.755	0.952
3600.000	1.594	337.644	3599.794	-8.062	-10.738	-8.062	13.428	233.103	0.958
3700.000	1.890	341.827	3699.748	-5.209	-11.782	-5.209	12.882	246.150	0.322
3800.000	1.651	334.169	3799.700	-2.345	-12.923	-2.345	13.135	259.713	0.336
3900.000	1.457	350.678	3899.664	0.206	-13.757	0.206	13.759	270.856	0.486
4000.000	1.516	351.714	3999.630	2.769	-14.154	2.769	14.422	281.071	0.065
4100.000	1.561	350.719	4099.594	5.423	-14.564	5.423	15.541	290.423	0.052
4200.000	1.397	355.091	4199.561	7.982	-14.888	7.982	16.893	298.198	0.199
4300.000	1.689	329.000	4299.526	10.460	-15.751	10.460	18.908	303.587	0.752
4400.000	2.066	313.909	4399.473	12.973	-17.809	12.973	22.033	306.072	0.618
4500.000	2.159	297.306	4499.406	15.087	-20.781	15.087	25.680	305.980	0.617
4600.000	2.231	300.832	4599.332	16.949	-24.126	16.949	29.484	305.089	0.153
4700.000	2.271	300.275	4699.255	18.945	-27.508	18.945	33.401	304.556	0.046
4800.000	2.039	298.363	4799.184	20.790	-30.785	20.790	37.148	304.031	0.243
4900.000	1.942	304.348	4899.124	22.591	-33.750	22.591	40.613	303.797	0.229
5000.000	1.756	309.005	4999.072	24.512	-36.340	24.512	43.834	304.000	0.239
5100.000	1.085	295.794	5099.041	25.888	-38.383	25.888	46.298	303.998	0.743
5200.000	0.766	303.446	5199.028	26.668	-39.793	26.668	47.903	303.829	0.342
5300.000	0.327	319.436	5299.023	27.253	-40.536	27.253	48.846	303.914	0.460
5400.000	0.078	215.298	5399.023	27.414	-40.761	27.414	49.122	303.923	0.354
5500.000	0.343	130.665	5499.022	27.163	-40.573	27.163	48.827	303.801	0.345
5600.000	0.685	105.610	5599.018	26.807	-39.771	26.807	47.962	303.982	0.402
5700.000	0.887	105.535	5699.008	26.439	-38.449	26.439	46.662	304.514	0.202
5800.000	1.023	115.424	5798.995	25.848	-36.897	25.848	45.050	305.013	0.213
5900.000	0.636	142.076	5898.984	25.027	-35.749	25.027	43.639	304.995	0.537
6000.000	0.520	221.212	5998.981	24.248	-35.707	24.248	43.162	304.179	0.742
6100.000	0.829	229.293	6098.973	23.434	-36.555	23.434	43.422	302.663	0.323
6200.000	0.600	179.899	6198.967	22.439	-37.103	22.439	43.360	301.165	0.632
6300.000	0.692	174.764	6298.960	21.315	-37.047	21.315	42.741	299.914	0.109
6400.000	0.649	151.384	6398.954	20.217	-36.721	20.217	41.918	298.836	0.275
6500.000	0.785	173.766	6498.946	19.039	-36.375	19.039	41.056	297.628	0.309
6600.000	0.995	174.566	6598.934	17.493	-36.218	17.493	40.222	295.780	0.210
6700.000	1.356	199.156	6698.913	15.512	-36.524	15.512	39.682	293.011	0.612
6800.000	1.538	232.947	6798.883	13.586	-37.983	13.586	40.340	289.681	0.859
6900.000	1.693	248.942	6898.844	12.247	-40.432	12.247	42.246	286.851	0.475
7000.000	1.146	274.598	6998.814	11.796	-42.808	11.796	44.404	285.406	0.825
7100.000	1.224	288.193	7098.792	12.210	-44.820	12.210	46.453	285.239	0.291

HORIZONTAL DISPLACEMENT IS  
46.453 FEET AT 285.239 DEGREES