

Company: Anadarko Petroleum Corp.

Lease/Well: Schlagel / 13-4

API: 05-123-17871

Rig Name: Production / Coretech

State/County: Colorado / Weld County

Latitude: 40.252, Longitude: -104.902

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: 11/1/2013 / 17:42

Vaughn Energy Services

Henderson Colorado

303-853-4976

Norman Cowan

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	0.297	220.547	100.000	-0.197	-0.168	-0.197	0.259	220.547	0.297
200.000	0.440	184.603	199.998	-0.777	-0.368	-0.777	0.859	205.325	0.265
300.000	0.707	218.714	299.993	-1.642	-0.785	-1.642	1.819	205.543	0.422
400.000	0.788	221.057	399.984	-2.642	-1.622	-2.642	3.100	211.553	0.086
500.000	1.043	251.988	499.972	-3.441	-2.939	-3.441	4.526	220.497	0.546
600.000	1.071	252.838	599.955	-3.999	-4.697	-3.999	6.169	229.595	0.033
700.000	0.829	242.763	699.941	-4.606	-6.234	-4.606	7.751	233.544	0.293
800.000	1.149	260.683	799.926	-5.099	-7.867	-5.099	9.375	237.050	0.441
900.000	1.317	265.701	899.903	-5.348	-10.002	-5.348	11.342	241.868	0.199
1000.000	1.329	255.114	999.877	-5.732	-12.269	-5.732	13.541	244.958	0.244
1100.000	1.090	254.088	1099.854	-6.291	-14.305	-6.291	15.627	246.262	0.240
1200.000	1.386	267.514	1199.831	-6.604	-16.428	-6.604	17.706	248.100	0.412
1300.000	1.590	269.261	1299.797	-6.674	-19.024	-6.674	20.161	250.667	0.209
1400.000	1.744	274.177	1399.755	-6.581	-21.929	-6.581	22.895	253.294	0.210
1500.000	1.577	282.024	1499.713	-6.184	-24.792	-6.184	25.552	255.994	0.282
1600.000	1.802	287.553	1599.670	-5.423	-27.637	-5.423	28.164	258.898	0.278
1700.000	1.695	289.406	1699.623	-4.458	-30.531	-4.458	30.854	261.693	0.121
1800.000	1.453	288.647	1799.585	-3.561	-33.127	-3.561	33.318	263.865	0.243
1900.000	1.679	301.425	1899.548	-2.392	-35.578	-2.392	35.658	266.154	0.414
2000.000	1.813	311.484	1999.502	-0.580	-38.013	-0.580	38.018	269.126	0.334
2100.000	1.982	309.541	2099.447	1.569	-40.532	1.569	40.562	272.217	0.180
2200.000	1.856	318.148	2199.391	3.876	-42.946	3.876	43.120	275.157	0.314
2300.000	1.837	318.104	2299.339	6.275	-45.097	6.275	45.531	277.922	0.019
2400.000	2.218	329.870	2399.277	9.142	-47.138	9.142	48.017	280.976	0.563
2500.000	2.529	335.075	2499.191	12.817	-49.040	12.817	50.687	284.647	0.378
2600.000	2.879	333.477	2599.080	17.065	-51.091	17.065	53.866	288.470	0.358
2700.000	3.172	333.151	2698.940	21.780	-53.462	21.780	57.728	292.166	0.293
2800.000	3.098	319.513	2798.792	26.304	-56.466	26.304	62.292	294.978	0.748
2900.000	3.114	327.229	2898.645	30.643	-59.691	30.643	67.097	297.174	0.418
3000.000	3.220	328.405	2998.493	35.320	-62.633	35.320	71.905	299.419	0.124
3100.000	3.155	333.485	3098.338	40.175	-65.333	40.175	76.697	301.588	0.290
3200.000	2.738	342.275	3198.206	44.912	-67.289	44.912	80.901	303.721	0.613
3300.000	2.427	341.824	3298.105	49.199	-68.676	49.199	84.481	305.617	0.312
3400.000	2.136	345.206	3398.025	53.012	-69.813	53.012	87.659	307.211	0.320

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
3500.000	2.067	341.451	3497.958	56.524	-70.862	56.524	90.644	308.578	0.154
3600.000	1.784	345.454	3597.902	59.740	-71.827	59.740	93.424	309.751	0.313
3700.000	2.081	349.805	3697.845	63.034	-72.539	63.034	96.100	310.989	0.331
3800.000	1.686	344.998	3797.790	66.241	-73.241	66.241	98.753	312.127	0.426
3900.000	1.498	338.166	3897.752	68.875	-74.108	68.875	101.172	312.904	0.266
4000.000	1.300	329.692	3997.722	71.068	-75.167	71.068	103.444	313.395	0.286
4100.000	0.845	303.577	4097.705	72.455	-76.353	72.455	105.260	313.499	0.657
4200.000	1.191	279.747	4197.689	73.039	-77.992	73.039	106.852	313.122	0.540
4300.000	1.002	271.722	4297.671	73.241	-79.891	73.241	108.383	312.514	0.243
4400.000	0.954	269.500	4397.657	73.260	-81.598	73.260	109.660	311.918	0.061
4500.000	1.049	295.200	4497.642	73.643	-83.258	73.643	111.154	311.493	0.455
4600.000	0.817	278.750	4597.629	74.141	-84.791	74.141	112.634	311.166	0.352
4700.000	0.810	266.849	4697.619	74.210	-86.202	74.210	113.745	310.725	0.169
4800.000	0.863	301.872	4797.609	74.569	-87.547	74.569	115.001	310.423	0.506
4900.000	0.895	303.695	4897.597	75.400	-88.837	75.400	116.521	310.323	0.043
5000.000	0.875	292.624	4997.585	76.127	-90.192	76.127	118.025	310.166	0.172
5100.000	0.787	302.555	5097.574	76.791	-91.476	76.791	119.435	310.012	0.168
5200.000	0.566	295.580	5197.567	77.374	-92.501	77.374	120.595	309.911	0.236
5300.000	0.437	296.754	5297.564	77.759	-93.287	77.759	121.445	309.813	0.129
5400.000	0.438	287.320	5397.561	78.045	-93.993	78.045	122.170	309.704	0.072
5500.000	0.500	295.482	5497.557	78.346	-94.751	78.346	122.947	309.586	0.091
5600.000	0.570	339.665	5597.553	79.000	-95.318	79.000	123.800	309.652	0.408
5700.000	0.446	12.556	5697.550	79.847	-95.406	79.847	124.410	309.926	0.311
5800.000	0.584	357.416	5797.546	80.736	-95.345	80.736	124.935	310.257	0.192
5900.000	0.546	38.816	5897.541	81.616	-95.069	81.616	125.297	310.646	0.401
6000.000	0.771	46.901	5997.535	82.447	-94.279	82.447	125.244	311.170	0.243
6100.000	0.304	94.469	6097.530	82.886	-93.523	82.886	124.967	311.550	0.609
6200.000	0.143	23.466	6197.530	82.980	-93.209	82.980	124.794	311.677	0.291
6300.000	0.344	78.149	6297.529	83.156	-92.865	83.156	124.655	311.843	0.286
6400.000	0.374	102.795	6397.527	83.146	-92.253	83.146	124.193	312.028	0.156
6500.000	0.482	93.459	6497.524	83.048	-91.514	83.048	123.579	312.223	0.128
6600.000	0.713	128.333	6597.519	82.637	-90.606	82.637	122.631	312.366	0.420
6700.000	0.991	184.890	6697.509	81.390	-90.192	81.390	121.486	312.063	0.843
6800.000	1.245	137.987	6797.492	79.721	-89.539	79.721	119.886	311.680	0.920
6900.000	1.553	134.920	6897.462	77.957	-87.852	77.957	117.454	311.585	0.317
7000.000	1.852	110.321	6997.419	76.439	-85.378	76.439	114.596	311.838	0.782
7100.000	2.455	107.787	7097.348	75.224	-81.824	75.224	111.147	312.594	0.610

HORIZONTAL DISPLACEMENT IS
111.147 FEET AT 312.594 DEGREES