



Company: Anadarko Petroleum Corp.  
 Well/API: Kern L 4-12 / 05-123-14846  
 Tool Type: North Seeking Rate Gyro  
 Rig Name: Production / VES  
 County/State: Weld County / Colorado  
 Latitude: 40.253, Longitude: -104.790  
 Directions are relative to True North  
 VS-Azi: 0.000 Degrees



**FIELD COPY ONLY (NOT DEFINITIVE)**

Depth Reference : RKB = GL Elevation = 4808 Feet

**DRILLOG GYRO SURVEY CALCULATIONS**

Filename: survey.ut

Minimum Curvature Method

Report Date/Time: 11/19/2014 / 17:58

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	0.731	218.400	99.997	-0.500	-0.396	-0.500	0.638	218.400	0.731
200.000	0.680	180.639	199.990	-1.593	-0.799	-1.593	1.782	206.640	0.459
300.000	0.173	106.635	299.988	-2.229	-0.661	-2.229	2.325	196.513	0.653
400.000	0.694	279.538	399.986	-2.172	-1.113	-2.172	2.441	207.136	0.866
500.000	1.300	250.109	499.971	-2.458	-2.777	-2.458	3.709	228.493	0.775
600.000	0.973	279.414	599.952	-2.705	-4.681	-2.705	5.407	239.980	0.657
700.000	1.133	245.691	699.936	-2.973	-6.420	-2.973	7.075	245.150	0.630
800.000	0.628	220.863	799.924	-3.795	-7.680	-3.795	8.566	243.704	0.622
900.000	1.052	258.306	899.914	-4.395	-8.937	-4.395	9.959	243.811	0.672
1000.000	1.473	238.519	999.889	-5.253	-10.932	-5.253	12.129	244.336	0.601
1100.000	1.365	228.790	1099.859	-6.709	-12.925	-6.709	14.562	242.567	0.264
1200.000	1.402	253.847	1199.831	-7.834	-14.996	-7.834	16.919	242.416	0.601
1300.000	1.653	236.962	1299.796	-8.961	-17.380	-8.961	19.554	242.725	0.513
1400.000	1.302	247.565	1399.762	-10.181	-19.639	-10.181	22.121	242.598	0.444
1500.000	1.548	262.490	1499.732	-10.791	-22.028	-10.791	24.530	243.901	0.443
1600.000	1.411	251.280	1599.699	-11.363	-24.534	-11.363	27.037	245.149	0.320
1700.000	1.188	253.764	1699.673	-12.048	-26.695	-12.048	29.287	245.710	0.230
1800.000	1.750	247.707	1799.640	-12.917	-29.103	-12.917	31.840	246.067	0.582
1900.000	1.665	253.471	1899.595	-13.909	-31.908	-13.909	34.808	246.447	0.191
2000.000	1.724	276.247	1999.553	-14.159	-34.797	-14.159	37.567	247.859	0.672
2100.000	2.123	300.845	2099.498	-13.045	-37.883	-13.045	40.066	250.998	0.907
2200.000	2.484	320.697	2199.418	-10.419	-40.846	-10.419	42.154	255.690	0.870
2300.000	2.598	323.297	2299.320	-6.925	-43.573	-6.925	44.120	260.970	0.162
2400.000	2.768	334.564	2399.211	-2.927	-45.965	-2.927	46.058	266.357	0.553
2500.000	2.526	349.997	2499.106	1.424	-47.385	1.424	47.406	271.721	0.750
2600.000	2.517	340.236	2599.009	5.660	-48.510	5.660	48.839	276.655	0.429
2700.000	2.377	1.879	2698.920	9.798	-49.184	9.798	50.151	281.267	0.929
2800.000	2.942	354.389	2798.812	14.425	-49.367	14.425	51.432	286.288	0.663
2900.000	2.995	344.534	2898.679	19.497	-50.315	19.497	53.961	291.181	0.513
3000.000	2.846	341.909	2998.549	24.375	-51.783	24.375	57.233	295.207	0.200
3100.000	2.606	345.247	3098.436	28.934	-53.133	28.934	60.500	298.571	0.288
3200.000	2.212	2.436	3198.349	33.060	-53.629	33.060	63.000	301.652	0.818
3300.000	2.018	355.083	3298.281	36.742	-53.698	36.742	65.065	304.381	0.333

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	1.729	17.292	3398.228	39.936	-53.401	39.936	66.683	306.791	0.775
3500.000	2.033	26.641	3498.175	42.962	-52.157	42.962	67.573	309.478	0.431
3600.000	1.300	29.316	3598.132	45.536	-50.807	45.536	68.226	311.869	0.737
3700.000	1.488	1.701	3698.103	47.823	-50.213	47.823	69.343	313.604	0.690
3800.000	1.578	34.020	3798.069	50.263	-49.404	50.263	70.478	315.494	0.858
3900.000	0.958	50.385	3898.044	51.938	-47.989	51.938	70.714	317.263	0.712
4000.000	0.729	60.136	3998.034	52.787	-46.793	52.787	70.542	318.445	0.270
4100.000	0.383	352.593	4098.030	53.435	-46.285	53.435	70.694	319.101	0.681
4200.000	0.517	326.008	4198.027	54.141	-46.580	54.141	71.421	319.293	0.245
4300.000	0.387	190.506	4298.025	54.183	-46.894	54.183	71.658	319.125	0.838
4400.000	0.883	221.392	4398.019	53.273	-47.465	53.273	71.351	318.300	0.586
4500.000	1.798	234.228	4497.991	51.778	-49.247	51.778	71.458	316.435	0.957
4600.000	2.054	240.718	4597.934	49.985	-52.083	49.985	72.188	313.822	0.336
4700.000	2.098	252.544	4697.869	48.559	-55.392	48.559	73.663	311.239	0.430
4800.000	3.070	249.303	4797.766	47.064	-59.643	47.064	75.976	308.276	0.982
4900.000	2.554	265.264	4897.647	45.933	-64.369	45.933	79.077	305.512	0.933
5000.000	3.073	257.123	4997.527	45.152	-69.202	45.152	82.630	303.123	0.654
5100.000	2.669	257.626	5097.401	44.056	-74.089	44.056	86.198	300.737	0.404
5200.000	2.737	263.859	5197.290	43.301	-78.738	43.301	89.859	298.808	0.302
5300.000	2.383	264.759	5297.190	42.856	-83.182	42.856	93.573	297.258	0.357
5400.000	1.963	280.978	5397.119	42.992	-86.933	42.992	96.983	296.315	0.741
5500.000	2.048	287.968	5497.058	43.870	-90.314	43.870	100.405	295.908	0.259
5600.000	1.691	312.310	5597.006	45.414	-93.105	45.414	103.590	296.002	0.862
5700.000	0.826	330.242	5696.981	47.033	-94.553	47.033	105.605	296.447	0.941
5800.000	0.697	15.144	5796.973	48.245	-94.752	48.245	106.328	296.984	0.593
5900.000	0.581	31.230	5896.967	49.265	-94.330	49.265	106.420	297.576	0.212
6000.000	0.890	60.716	5996.959	50.079	-93.390	50.079	105.970	298.202	0.479
6100.000	0.951	120.613	6096.948	50.036	-91.998	50.036	104.725	298.541	0.921
6200.000	0.609	132.363	6196.939	49.256	-90.892	49.256	103.380	298.454	0.376
6300.000	0.562	164.156	6296.934	48.426	-90.365	48.426	102.523	298.187	0.324
6400.000	0.410	183.354	6396.930	47.598	-90.252	47.598	102.035	297.806	0.221
6500.000	0.672	163.660	6496.926	46.678	-90.109	46.678	101.481	297.385	0.317
6600.000	0.620	167.653	6596.920	45.588	-89.828	45.588	100.734	296.908	0.069
6700.000	0.678	158.404	6696.913	44.509	-89.495	44.509	99.952	296.443	0.120
6800.000	0.308	203.304	6796.910	43.712	-89.383	43.712	99.499	296.060	0.509
6900.000	0.872	157.560	6896.904	42.762	-89.199	42.762	98.919	295.613	0.693
7000.000	0.639	158.136	6996.896	41.541	-88.701	41.541	97.947	295.095	0.233
7100.000	0.617	179.495	7096.890	40.485	-88.489	40.485	97.310	294.585	0.234
7150.000	0.424	185.598	7146.888	40.032	-88.504	40.032	97.137	294.338	0.402
HORIZONTAL DISPLACEMENT IS 97.137 FEET AT 294.338 DEGREES									