

Company: Anadarko Petroleum Corp.
 Well/API: Fort Saint Vrain 17/05-123-10807
 Tool Type: North Seeking Rate Gyro
 Rig Name: Production/Core-Tech
 County/State: Weld/Colorado
 Latitude: 40.265, Longitude: -104.871
 Directions are relative to True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = GL Relevation = 4753'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 8/15/2014 / 17:02

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	0.195	288.170	100.000	0.053	-0.162	0.053	0.170	288.170	0.195
200.000	0.147	336.233	199.999	0.223	-0.375	0.223	0.436	300.800	0.146
300.000	0.254	211.686	299.999	0.152	-0.543	0.152	0.564	285.683	0.358
400.000	0.319	243.429	399.998	-0.161	-0.908	-0.161	0.922	259.977	0.169
500.000	0.105	312.111	499.997	-0.223	-1.225	-0.223	1.246	259.674	0.297
600.000	0.100	215.703	599.997	-0.233	-1.345	-0.233	1.365	260.186	0.153
700.000	0.065	233.977	699.997	-0.337	-1.442	-0.337	1.481	256.841	0.044
800.000	0.125	222.068	799.997	-0.451	-1.561	-0.451	1.625	253.870	0.063
900.000	0.269	217.396	899.996	-0.719	-1.777	-0.719	1.917	247.963	0.145
1000.000	0.208	215.465	999.995	-1.054	-2.025	-1.054	2.283	242.503	0.062
1100.000	0.209	218.802	1099.995	-1.344	-2.244	-1.344	2.616	239.088	0.012
1200.000	0.277	267.693	1199.994	-1.496	-2.600	-1.496	3.000	240.093	0.211
1300.000	0.209	248.800	1299.993	-1.571	-3.012	-1.571	3.398	242.450	0.104
1400.000	0.257	243.645	1399.992	-1.737	-3.384	-1.737	3.804	242.825	0.052
1500.000	0.325	244.484	1499.991	-1.959	-3.841	-1.959	4.312	242.977	0.068
1600.000	0.230	238.060	1599.990	-2.187	-4.267	-2.187	4.795	242.861	0.100
1700.000	0.229	189.085	1699.989	-2.491	-4.469	-2.491	5.116	240.866	0.190
1800.000	0.359	133.895	1799.988	-2.905	-4.274	-2.905	5.168	235.796	0.296
1900.000	0.456	130.566	1899.985	-3.381	-3.746	-3.381	5.047	227.932	0.100
2000.000	0.485	162.989	1999.982	-4.044	-3.320	-4.044	5.233	219.386	0.264
2100.000	0.548	157.955	2099.978	-4.892	-3.017	-4.892	5.748	211.664	0.078
2200.000	0.444	178.263	2199.974	-5.722	-2.826	-5.722	6.382	206.282	0.203
2300.000	0.484	183.717	2299.971	-6.530	-2.842	-6.530	7.122	203.516	0.060
2400.000	0.484	175.992	2399.968	-7.372	-2.839	-7.372	7.900	201.064	0.065
2500.000	0.499	181.051	2499.964	-8.229	-2.818	-8.229	8.698	198.903	0.046
2600.000	0.480	186.817	2599.960	-9.080	-2.876	-9.080	9.525	197.572	0.053
2700.000	0.299	239.312	2699.958	-9.630	-3.150	-9.630	10.132	198.112	0.381
2800.000	0.118	217.776	2799.958	-9.844	-3.437	-9.844	10.427	199.247	0.194
2900.000	0.458	215.927	2899.956	-10.250	-3.735	-10.250	10.909	200.022	0.340
3000.000	0.461	231.980	2999.953	-10.821	-4.287	-10.821	11.639	201.610	0.128
3100.000	0.558	278.584	3099.949	-10.997	-5.085	-10.997	12.116	204.818	0.413
3200.000	0.814	285.258	3199.942	-10.737	-6.252	-10.737	12.425	210.212	0.268
3300.000	0.955	282.676	3299.930	-10.367	-7.750	-10.367	12.944	216.781	0.146

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	0.883	297.052	3399.917	-9.834	-9.249	-9.834	13.500	223.246	0.241
3500.000	1.132	281.608	3499.902	-9.285	-10.903	-9.285	14.321	229.585	0.366
3600.000	1.085	281.927	3599.883	-8.890	-12.797	-8.890	15.582	235.212	0.048
3700.000	1.200	273.370	3699.864	-8.633	-14.768	-8.633	17.106	239.690	0.205
3800.000	1.192	268.584	3799.842	-8.597	-16.853	-8.597	18.919	242.972	0.100
3900.000	1.079	273.990	3899.822	-8.557	-18.832	-8.557	20.685	245.562	0.155
4000.000	1.291	266.596	3999.801	-8.559	-20.896	-8.559	22.581	247.726	0.261
4100.000	1.334	260.170	4099.775	-8.825	-23.168	-8.825	24.792	249.149	0.153
4200.000	1.138	252.319	4199.751	-9.325	-25.261	-9.325	26.927	249.739	0.259
4300.000	1.255	265.360	4299.730	-9.715	-27.298	-9.715	28.975	250.410	0.295
4400.000	1.125	257.253	4399.708	-10.020	-29.347	-10.020	31.010	251.148	0.212
4500.000	0.965	270.764	4499.692	-10.225	-31.146	-10.225	32.782	251.825	0.293
4600.000	0.981	296.757	4599.678	-9.829	-32.753	-9.829	34.196	253.296	0.438
4700.000	0.626	299.149	4699.668	-9.178	-33.994	-9.178	35.211	254.892	0.357
4800.000	0.839	309.596	4799.660	-8.445	-35.035	-8.445	36.039	256.448	0.251
4900.000	0.494	287.953	4899.653	-7.845	-36.010	-7.845	36.855	257.710	0.421
5000.000	0.411	309.625	4999.650	-7.483	-36.697	-7.483	37.452	258.474	0.189
5100.000	0.814	324.380	5099.644	-6.678	-37.386	-6.678	37.978	259.873	0.430
5200.000	0.525	330.963	5199.637	-5.700	-38.022	-5.700	38.447	261.474	0.298
5300.000	0.663	331.191	5299.632	-4.792	-38.523	-4.792	38.820	262.909	0.138
5400.000	0.404	21.452	5399.628	-3.958	-38.673	-3.958	38.875	264.157	0.510
5500.000	0.313	21.959	5499.626	-3.376	-38.442	-3.376	38.590	264.981	0.090
5600.000	0.010	260.276	5599.625	-3.124	-38.348	-3.124	38.475	265.343	0.319
5700.000	0.209	285.315	5699.625	-3.077	-38.533	-3.077	38.655	265.434	0.200
5800.000	0.127	285.268	5799.625	-3.000	-38.816	-3.000	38.932	265.581	0.082
5900.000	0.106	213.702	5899.624	-3.047	-38.974	-3.047	39.093	265.529	0.137
6000.000	0.398	191.892	5999.623	-3.464	-39.097	-3.464	39.250	264.937	0.302
6100.000	0.415	233.957	6099.621	-4.017	-39.462	-4.017	39.665	264.188	0.292
6200.000	0.318	229.530	6199.619	-4.410	-39.966	-4.410	40.208	263.703	0.101
6300.000	0.485	227.725	6299.616	-4.875	-40.490	-4.875	40.782	263.134	0.167
6400.000	0.495	212.159	6399.613	-5.525	-41.033	-5.525	41.403	262.331	0.133
6500.000	0.800	222.588	6499.606	-6.405	-41.736	-6.405	42.224	261.275	0.326
6600.000	0.611	275.243	6599.600	-6.871	-42.739	-6.871	43.288	260.867	0.649
6700.000	0.095	262.480	6699.598	-6.833	-43.352	-6.833	43.887	261.043	0.519
6800.000	0.380	225.911	6799.597	-7.074	-43.673	-7.074	44.242	260.799	0.309
6900.000	0.338	337.895	6899.596	-7.032	-44.022	-7.032	44.580	260.925	0.596

<div> HORIZONTAL DISPLACEMENT IS 44.580 FEET AT 260.925 DEGREES </div>
