

Company: Anadarko Petroleum Corp.
 Well/API: HSR-Randy 14-23/05-123-17809
 Tool Type: North Seeking Rate Gyro
 Rig Name: Production/Coretech
 County/State: Weld/Colorado
 Latitude: 40.205, Longitude: -104.860
 Directions are relative to True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = GL Elevation = 4,812 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 10/29/2014 / 17:07

Lat/Long Obtained By Handheld GPS At Wellhead

Handheld GPS Reference: NAD83/Device Error: +/- 9 Feet

VES Survey International - Henderson CO

Levi Sheldon

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	0.309	230.960	100.000	-0.170	-0.209	-0.170	0.269	230.960	0.309
200.000	0.034	81.997	199.999	-0.335	-0.389	-0.335	0.513	229.234	0.339
300.000	0.028	333.881	299.999	-0.309	-0.370	-0.309	0.482	230.150	0.051
400.000	0.067	326.673	399.999	-0.238	-0.413	-0.238	0.477	240.076	0.039
500.000	0.034	276.500	499.999	-0.185	-0.475	-0.185	0.510	248.662	0.052
600.000	0.101	310.856	599.999	-0.124	-0.571	-0.124	0.584	257.719	0.075
700.000	0.145	315.355	699.999	0.023	-0.727	0.023	0.727	271.839	0.045
800.000	0.742	231.768	799.996	-0.288	-1.324	-0.288	1.355	257.749	0.740
900.000	0.769	242.674	899.987	-0.996	-2.429	-0.996	2.626	247.697	0.146
1000.000	0.929	250.255	999.976	-1.578	-3.788	-1.578	4.104	247.382	0.195
1100.000	1.059	256.958	1099.961	-2.061	-5.452	-2.061	5.828	249.293	0.174
1200.000	1.408	266.810	1199.938	-2.338	-7.578	-2.338	7.930	252.857	0.407
1300.000	1.306	263.964	1299.910	-2.526	-9.938	-2.526	10.254	255.740	0.122
1400.000	1.289	268.053	1399.884	-2.684	-12.196	-2.684	12.488	257.589	0.094
1500.000	1.196	277.183	1499.861	-2.592	-14.355	-2.592	14.587	259.766	0.218
1600.000	1.414	268.526	1599.835	-2.493	-16.623	-2.493	16.809	261.471	0.293
1700.000	1.229	262.629	1699.808	-2.662	-18.919	-2.662	19.106	261.990	0.229
1800.000	1.342	261.192	1799.783	-2.979	-21.140	-2.979	21.349	261.979	0.117
1900.000	1.218	231.938	1899.759	-3.814	-23.134	-3.814	23.446	260.639	0.657
2000.000	1.304	225.658	1999.735	-5.264	-24.784	-5.264	25.337	258.009	0.163
2100.000	1.409	213.836	2099.707	-7.081	-26.282	-7.081	27.219	254.922	0.299
2200.000	1.443	204.818	2199.676	-9.245	-27.496	-9.245	29.008	251.416	0.227
2300.000	1.049	177.527	2299.653	-11.303	-27.985	-11.303	30.181	248.007	0.702
2400.000	0.851	134.594	2399.641	-12.738	-27.417	-12.738	30.231	245.080	0.719
2500.000	0.628	140.352	2499.632	-13.681	-26.539	-13.681	29.857	242.728	0.235
2600.000	0.498	139.672	2599.628	-14.434	-25.908	-14.434	29.657	240.876	0.129
2700.000	0.398	185.466	2699.625	-15.112	-25.659	-15.112	29.779	239.504	0.361
2800.000	0.516	187.722	2799.622	-15.904	-25.753	-15.904	30.268	238.302	0.119
2900.000	0.452	200.058	2899.618	-16.721	-25.949	-16.721	30.870	237.203	0.122
3000.000	0.418	253.142	2999.616	-17.198	-26.434	-17.198	31.536	236.952	0.390
3100.000	0.252	262.190	3099.614	-17.333	-27.001	-17.333	32.086	237.301	0.174
3200.000	0.124	220.860	3199.613	-17.445	-27.290	-17.445	32.389	237.411	0.179
3300.000	0.155	158.840	3299.613	-17.654	-27.312	-17.654	32.521	237.122	0.147
3400.000	0.659	88.317	3399.611	-17.764	-26.688	-17.764	32.059	236.352	0.624

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	0.954	83.107	3499.601	-17.647	-25.287	-17.647	30.835	235.090	0.304
3600.000	0.978	92.679	3599.586	-17.587	-23.607	-17.587	29.438	233.315	0.163
3700.000	0.057	78.393	3699.581	-17.616	-22.706	-17.616	28.738	232.194	0.923
3800.000	0.327	303.139	3799.581	-17.450	-22.896	-17.450	28.788	232.687	0.370
3900.000	0.378	256.447	3899.579	-17.371	-23.456	-17.371	29.188	233.477	0.283
4000.000	0.508	301.949	3999.576	-17.214	-24.153	-17.214	29.659	234.522	0.363
4100.000	0.354	36.815	4099.574	-16.732	-24.344	-16.732	29.540	235.498	0.643
4200.000	0.228	51.411	4199.573	-16.361	-24.003	-16.361	29.049	235.721	0.145
4300.000	0.231	36.673	4299.572	-16.076	-23.728	-16.076	28.661	235.882	0.059
4400.000	0.518	25.745	4399.570	-15.507	-23.411	-15.507	28.081	236.480	0.294
4500.000	0.567	23.914	4499.566	-14.648	-23.015	-14.648	27.281	237.524	0.052
4600.000	0.630	6.469	4599.560	-13.650	-22.752	-13.650	26.533	239.038	0.192
4700.000	0.649	347.073	4699.554	-12.552	-22.817	-12.552	26.042	241.184	0.216
4800.000	0.706	330.599	4799.547	-11.463	-23.246	-11.463	25.919	243.751	0.202
4900.000	0.555	292.949	4899.542	-10.737	-23.995	-10.737	26.288	245.892	0.431
5000.000	0.581	268.370	4999.537	-10.563	-24.948	-10.563	27.092	247.053	0.243
5100.000	0.513	232.811	5099.533	-10.848	-25.811	-10.848	27.998	247.205	0.340
5200.000	0.727	215.610	5199.527	-11.634	-26.537	-11.634	28.976	246.327	0.282
5300.000	0.554	197.991	5299.521	-12.610	-27.056	-12.610	29.850	245.012	0.260
5400.000	0.466	215.799	5399.517	-13.399	-27.443	-13.399	30.540	243.976	0.180
5500.000	0.442	159.788	5499.514	-14.091	-27.548	-14.091	30.943	242.910	0.427
5600.000	0.790	194.469	5599.508	-15.120	-27.587	-15.120	31.459	241.273	0.495
5700.000	1.145	231.967	5699.495	-16.403	-28.547	-16.403	32.924	240.117	0.707
5800.000	0.931	237.166	5799.478	-17.459	-30.016	-17.459	34.725	239.815	0.234
5900.000	0.717	236.083	5899.468	-18.249	-31.218	-18.249	36.161	239.691	0.214
6000.000	0.507	266.643	5999.463	-18.624	-32.179	-18.624	37.180	239.939	0.381
6100.000	0.177	9.857	6099.461	-18.498	-32.595	-18.498	37.478	240.424	0.574
6200.000	0.353	128.534	6199.461	-18.538	-32.327	-18.538	37.266	240.167	0.465
6300.000	0.453	138.576	6299.458	-19.027	-31.825	-19.027	37.079	239.126	0.122
6400.000	0.537	102.880	6399.455	-19.428	-31.106	-19.428	36.675	238.013	0.314
6500.000	0.718	118.854	6499.449	-19.835	-30.100	-19.835	36.048	236.617	0.250
6600.000	0.108	143.436	6599.446	-20.213	-29.495	-20.213	35.756	235.577	0.621
6700.000	0.340	251.988	6699.445	-20.381	-29.720	-20.381	36.037	235.560	0.388
6800.000	0.419	277.674	6799.443	-20.423	-30.365	-20.423	36.594	236.075	0.186
6900.000	0.315	277.476	6899.441	-20.339	-31.000	-20.339	37.076	236.732	0.104
7000.000	0.330	306.596	6999.439	-20.131	-31.504	-20.131	37.387	237.421	0.163
7100.000	0.356	16.091	7099.438	-19.661	-31.648	-19.661	37.258	238.150	0.392
7200.000	0.180	74.035	7199.437	-19.319	-31.411	-19.319	36.877	238.407	0.302
HORIZONTAL DISPLACEMENT IS 36.877 FEET AT 238.407 DEGREES									