



Company: Anadarko
 Well: HSR-Niall 13-7A
 API #: 05-123-15044
 Rig Name: Production/Coretech
 State/County: Colorado/Weld
 Latitude: 40.235, Longitude: -104.713
 GRID North is 0.000 Degrees West of True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: survey_7350-de_01.ut
 Minimum Curvature Method
 Report Date/Time: 1/17/2014 / 14:39

Vaughn Energy Services
 Henderson, Colorado
 866-835-8333
 Randy Holcomb
 RKB=Ground Level

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	0.475	265.130	99.999	-0.035	-0.413	-0.035	0.414	265.130	0.475
200.000	0.227	279.806	199.997	-0.037	-1.020	-0.037	1.021	267.946	0.262
300.000	0.498	294.070	299.995	0.174	-1.612	0.174	1.621	276.169	0.283
400.000	0.293	8.297	399.993	0.604	-1.972	0.604	2.062	287.041	0.504
500.000	0.225	129.435	499.992	0.733	-1.783	0.733	1.928	292.338	0.452
600.000	0.372	196.674	599.991	0.297	-1.725	0.297	1.750	279.782	0.352
700.000	0.497	259.950	699.989	-0.089	-2.245	-0.089	2.247	267.727	0.468
800.000	0.273	284.577	799.987	-0.105	-2.903	-0.105	2.905	267.930	0.274
900.000	0.383	296.242	899.985	0.103	-3.434	0.103	3.435	271.717	0.128
1000.000	0.404	293.294	999.983	0.390	-4.057	0.390	4.076	275.494	0.029
1100.000	0.442	298.257	1099.980	0.712	-4.721	0.712	4.775	278.581	0.053
1200.000	0.675	299.265	1199.975	1.183	-5.575	1.183	5.700	281.982	0.233
1300.000	0.723	295.986	1299.968	1.748	-6.657	1.748	6.882	284.712	0.062
1400.000	1.124	312.338	1399.955	2.685	-7.949	2.685	8.390	288.664	0.476
1500.000	1.336	323.358	1499.932	4.281	-9.370	4.281	10.301	294.555	0.317
1600.000	1.515	325.429	1599.901	6.305	-10.816	6.305	12.519	300.240	0.187
1700.000	1.881	336.713	1699.857	8.902	-12.215	8.902	15.114	306.083	0.494
1800.000	1.899	342.482	1799.803	11.989	-13.363	11.989	17.953	311.899	0.191
1900.000	2.146	353.215	1899.741	15.429	-14.082	15.429	20.889	317.612	0.451
2000.000	2.090	354.954	1999.672	19.105	-14.464	19.105	23.962	322.871	0.085
2100.000	2.176	356.437	2099.603	22.816	-14.743	22.816	27.165	327.132	0.102
2200.000	2.304	358.991	2199.526	26.721	-14.896	26.721	30.593	330.862	0.163
2300.000	2.079	11.086	2299.454	30.512	-14.582	30.512	33.817	334.455	0.513
2400.000	2.016	15.604	2399.390	33.986	-13.760	33.986	36.666	337.958	0.173
2500.000	2.033	25.327	2499.328	37.284	-12.528	37.284	39.333	341.427	0.344
2600.000	2.027	44.950	2599.266	40.140	-10.520	40.140	41.495	345.314	0.692
2700.000	2.071	52.810	2699.203	42.483	-7.831	42.483	43.199	349.556	0.284
2800.000	2.227	59.200	2799.132	44.571	-4.722	44.571	44.820	353.952	0.286
2900.000	2.197	58.731	2899.058	46.561	-1.415	46.561	46.582	358.260	0.035

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
3000.000	2.275	64.150	2998.982	48.421	2.010	48.421	48.463	2.377	0.225
3100.000	2.285	61.892	3098.903	50.226	5.555	50.226	50.532	6.312	0.090
3200.000	1.975	75.316	3198.834	51.602	8.981	51.602	52.378	9.873	0.585
3300.000	1.906	81.035	3298.777	52.298	12.291	52.298	53.723	13.226	0.206
3400.000	1.701	97.923	3398.728	52.353	15.404	52.353	54.572	16.396	0.567
3500.000	1.469	119.953	3498.690	51.508	17.985	51.508	54.558	19.248	0.647
3600.000	1.096	143.929	3598.666	50.095	19.659	50.095	53.815	21.426	0.646
3700.000	0.670	195.939	3698.655	48.760	20.061	48.760	52.726	22.364	0.864
3800.000	0.800	258.947	3798.648	48.064	19.215	48.064	51.763	21.791	0.776
3900.000	1.316	301.375	3898.632	48.528	17.549	48.528	51.604	19.881	0.904
4000.000	1.794	315.709	3998.596	50.247	15.475	50.247	52.576	17.118	0.613
4100.000	1.844	322.268	4098.545	52.640	13.397	52.640	54.318	14.279	0.214
4200.000	1.878	326.674	4198.493	55.282	11.513	55.282	56.468	11.764	0.147
4300.000	1.747	329.120	4298.443	57.959	9.830	57.959	58.786	9.626	0.152
4400.000	1.342	330.640	4398.406	60.287	8.474	60.287	60.880	8.001	0.407
4500.000	1.329	330.985	4498.379	62.321	7.338	62.321	62.751	6.715	0.015
4600.000	1.173	334.410	4598.355	64.258	6.334	64.258	64.569	5.629	0.173
4700.000	1.104	337.490	4698.335	66.070	5.523	66.070	66.301	4.778	0.092
4800.000	0.963	338.432	4798.319	67.741	4.845	67.741	67.914	4.091	0.142
4900.000	0.655	341.687	4898.309	69.065	4.357	69.065	69.203	3.610	0.310
5000.000	0.580	337.468	4998.303	70.076	3.983	70.076	70.189	3.253	0.088
5100.000	0.794	345.782	5098.296	71.215	3.619	71.215	71.307	2.909	0.235
5200.000	0.684	355.498	5198.288	72.481	3.402	72.481	72.561	2.687	0.166
5300.000	0.505	349.896	5298.282	73.510	3.278	73.510	73.583	2.553	0.188
5400.000	0.411	339.344	5398.279	74.279	3.074	74.279	74.343	2.370	0.126
5500.000	0.389	328.720	5498.277	74.905	2.772	74.905	74.956	2.119	0.077
5600.000	0.176	288.796	5598.276	75.244	2.450	75.244	75.284	1.865	0.278
5700.000	0.234	271.012	5698.275	75.297	2.101	75.297	75.326	1.598	0.086
5800.000	0.345	263.463	5798.274	75.266	1.597	75.266	75.283	1.216	0.117
5900.000	0.498	253.822	5898.271	75.111	0.881	75.111	75.116	0.672	0.168
6000.000	0.694	259.320	5998.265	74.877	-0.132	74.877	74.878	359.899	0.204
6100.000	0.707	265.126	6098.258	74.713	-1.342	74.713	74.725	358.971	0.072
6200.000	1.181	262.264	6198.244	74.522	-2.977	74.522	74.581	357.712	0.476
6300.000	0.903	257.226	6298.228	74.209	-4.767	74.209	74.362	356.325	0.292
6400.000	0.795	242.709	6398.217	73.716	-6.152	73.716	73.973	355.230	0.240
6500.000	0.751	219.523	6498.208	72.893	-7.185	72.893	73.246	354.370	0.314
6600.000	0.748	232.511	6598.199	71.990	-8.120	71.990	72.446	353.564	0.170
6700.000	0.723	233.326	6698.191	71.216	-9.144	71.216	71.801	352.683	0.027
6800.000	0.777	224.077	6798.183	70.352	-10.121	70.352	71.077	351.813	0.132
6900.000	0.633	229.519	6898.175	69.507	-11.013	69.507	70.374	350.997	0.158
7000.000	0.452	227.019	6998.170	68.879	-11.722	68.879	69.870	350.342	0.183
7100.000	0.387	230.472	7098.168	68.396	-12.270	68.396	69.488	349.829	0.070
7200.000	0.239	217.511	7198.166	68.016	-12.657	68.016	69.184	349.458	0.163
7300.000	0.207	222.845	7298.166	67.718	-12.907	67.718	68.937	349.209	0.038
7350.000	0.195	217.704	7348.165	67.585	-13.020	67.585	68.828	349.096	0.043

HORIZONTAL DISPLACEMENT IS
68.828 FEET AT 349.096 DEGREES