

CONTROL REPORT

EAST CENTRAL WISCONSIN REGIONAL PLANNING COMMISSION

AERO-METRIC PROJECT NO. 1-950334

GENERAL

The East Central Wisconsin Regional Planning Commission (ECWRPC) in cooperation with the eight counties of Calumet, Columbia, Green Lake, Marquette, Monominee, Waushara, and Winnebago contracted with AERO-METRIC on April 20, 1995 to perform Global Positioning System (GPS) control surveys. The project consisted of establishing GPS control on 304 control stations spread throughout the multi-county region.

Additional surveys were completed in Columbia, Green Lake, and Waushara Counties according to the contract. The additional work consisted of the following. Establish orthometric heights in addition to the ellipsoid heights for the control stations of Columbia, Green Lake and Waushara Counties; GPS control on three (3) 10ppm stations around the City of Portage; Transform Columbia County State Plane Coordinate data onto Columbia County's Coordinate System.

PERSONNEL

Field observations were collected by Craig Risner, Mike Bean, and Jeff Weber. Data processing was performed by Craig Risner and Rob Merry. The project manager was Brad Muecke.

WISCONSIN COUNTY COORDINATE SYSTEM - COLUMBIA COUNTY

The NAD 83/91 geographic positions were transformed to the Columbia County ground coordinate system according to the transformation parameters published in the Wisconsin Coordinate Systems document (1995). The Wisconsin Coordinate Systems document (1995) is distributed through the Wisconsin State Cartographer's Office.

HORIZONTAL CONTROL SURVEYS - CITY OF PORTAGE

The GPS control surveys were performed using First Order, Class I geometric accuracy standards as specified under Section 1.D.(6) of the RFP. A copy of the scope of work can be found in Book 1 Section 1 of the ECWRPC GPS Network report.

GPS observations were performed on October 2, 1995. GPS measurements were completed utilizing four (4) Leica/Wild GPS System 200 dual-frequency receivers, firmware version 2.30. Static GPS surveying was utilized, due to the accuracy requirements and the length of the baselines.

Field observations followed all requirements of the RFP under Section 1.G. A log was kept of tribrach and barometer adjustments. Meteorological information can be found on the GPS log sheets. The GPS log sheets, station photographs, and station rubbings are included.

DATA PROCESSING - CITY OF PORTAGE

GPS computations were done in two stages. Initial computations were done with Leica - Static Kinematic software (SKI), versions 1.09 and 2.00. SKI permits the conversion of raw satellite data collected by the receivers to meaningful coordinate differences between points (baseline solutions). Once the baseline solutions were determined they were entered into GEOSurv - GeoLab 2 series of programs (GeoLab version 2.4d and GPS Environment version 6.26), first for quality and closure analysis and eventually for the final weighted simultaneous least squares adjustments.

The SKI computations were performed with the "fixed orbit" technique and used the broadcast ephemeris.

All SKI computations were processed on the World Geodetic System of 1984 (WGS 84).

The Geolab network adjustments and base control used for all phases of this project follow the guidelines described in the RFP. All of the adjustments were performed on the Geodetic Reference System of 1980 (GRS 80). Coordinates were published on the North American Datum of 1983/1991 (NAD 83/91) in the Wisconsin State Plane Coordinate System, South Zone.

Scaling techniques were used for this project. The full matrix was multiplied by 1 and 1.0 PPMS were added to the diagonal of the matrix.

Scale and rotation was also applied in the scaled constrained adjustment. This option allows the constrained GPS networks to fit the control.

All computations and adjustments can be found in Section 7 of this report.

This adjustment and statistical analysis found no discrepancies. All facets of this survey fell within the requirements of the RFP.

CONTROL SURVEYS - ORTHOMETRIC HEIGHTS

Global Positioning Systems (GPS) observations were performed between October 10 and October 19, 1995. GPS measurements were completed utilizing six (6) Leica/Wild GPS System 200 dual-frequency receivers, firmware version 2.30. The "Rapid Static" method of GPS surveying was used for this project. The "Rapid Static" method of GPS uses two stationary receivers and one roving receiver per operator.

Vertical control was extended from fourteen (14) National Geodetic Survey (NGS) bench marks "C 96", "E 100", "E 109", "F 97", "H 107", "K 84", "K 98", "LOCK 1", "Q 98", "RRCW", "T 84", "T 96", "V 100", and "W 97" and one United States Geological Survey (USGS) bench mark "45 ADP".

Vertical control is based on the National Geodetic Vertical Datum 1929 (NGVD).

VERTICAL COMPUTATIONS - ORTHOMETRIC HEIGHTS

N600 68 ?

NGVD 29 elevations were computed from the GPS observations, using the NGS geoid height model "GEOID 1993".

A GeoLab minimally constrained vertical adjustment was performed in which the elevation for "W 97" was held fixed. The remaining bench mark elevation closures were computed on the following page.

ORTHOMETRIC HEIGHTS
(UNITS IN METERS)

STATION	PUBLISHED ELEVATION	COMPUTED ELEVATION	CLOSURE
45ADP	257.412	257.513	+0.101
C96OS	290.695	290.758	+0.063
E100	239.646	239.701	+0.055
E109	238.928	238.973	+0.045
F97	290.714	291.213	+0.499 *
H107	264.081	264.195	+0.114
K84	250.548	250.586	+0.038
K98	231.514	231.527	+0.013
LOCK1	236.402	236.350	-0.052
Q98	246.526	246.528	+0.002
RRCW	280.836	280.861	+0.025
T84OS	289.284	289.349	+0.065
T96	323.746	323.849	+0.103
V100	308.914	308.960	+0.046

The elevation of one bench mark F 97 could not be reconciled and was re-adjusted in the final fully constrained vertical adjustment.

The final fully constrained GPS adjustment held the published elevations for "45 ADP", "C 96", "E 100", "E 109", "F 97", "H 107", "K 84", "K 98", "LOCK 1", "Q 98", "RRCW", "T 84", "T 96", "V 100", and "W 97".

ECWRPC - GPSNET
COUNTY COORDINATE SYSTEM
COLUMBIA COUNTY
UNITED STATES SURVEY FOOT

STA#	STATION NAME	NORTHING	EASTING
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101A	CRYSTAL LAKE GPS AZ	297549.3171	493162.8983
101S	CRYSTAL LAKE GPS	298561.5271	490823.7141
102A	WEST POINT W GPS AZ	311882.0674	474981.7128
102S	WEST POINT W GPS	310208.2376	475046.5141
103A	WEST POINT N GPS AZ	324382.9614	495574.8241
103S	WEST POINT N GPS	324636.0772	499840.9983
104A	MERRIMAC GPS AZ	342501.9597	500118.2500
104S	MERRIMAC GPS	344699.7693	500132.1594
105A	FAIRFIELD E GPS AZ	369397.7760	490809.1664
105S	FAIRFIELD E GPS	369090.1016	489291.3838
106A	LAKE DELTON GPS AZ	403115.0716	469001.9491
106S	LAKE DELTON GPS	401857.2948	469021.0686
107A	NEWPORT E GPS AZ	420582.3739	480772.4538
107S	NEWPORT E GPS	421801.1179	480861.0289
108A	NEWPORT W GPS AZ	427241.7627	461751.4644
108S	NEWPORT W GPS	428430.0727	462979.5659
109A	WISCONSIN DELLS GPS AZ	434582.9432	478504.9374
109S	WISCONSIN DELLS GPS	434686.4709	476295.2645
110A	NEW HAVEN S GPS AZ	432060.3891	494439.7495
110S	NEW HAVEN S GPS	434841.7670	496411.9214
111A	LEWISTON W GPS AZ	408062.4258	495127.8998
111S	LEWISTON W GPS	408638.9994	493067.6981
112A	LEWISTON E GPS AZ	413243.4743	530596.5077
112S	LEWISTON E GPS	413807.6545	529020.8767

113A LEWISTON S GPS AZ	402538.6137	516125.2956
113S LEWISTON S GPS	403079.8713	513125.1349
114A BRIGGSVILLE GPS AZ	420637.2240	510099.1436
114S BRIGGSVILLE GPS	418033.2762	510112.4938
115A PINE ISLAND GPS AZ	392186.4491	515631.0417
115S PINE ISLAND GPS	390344.0645	515643.7401
116A DEKORRA GPS AZ	363836.4077	526330.2328
116S DEKORRA GPS	361864.6545	526295.7301
117A PORTAGE WEST GPS AZ	382814.7470	503737.7632
117S PORTAGE WEST GPS	382402.8468	501573.0390
118A CALEDONIA CENTRAL GPS AZ	374397.7985	517322.6630
118S CALEDONIA CENTRAL GPS	374469.2414	515076.8033
119A CALEDONIA N GPS AZ	382362.3149	530988.5014
119S CALEDONIA N GPS	378363.4129	531514.5980
120A CALEDONIA S GPS AZ	355637.6930	507346.9084
120S CALEDONIA S GPS	357456.6095	510484.0341
121A LODI N GPS AZ	331042.7489	523913.3111
121S LODI N GPS	329534.7788	525204.3474
122A LODI GPS AZ	315355.6977	522397.3345
122S LODI GPS 160	320697.3254	522488.0055
123A LODI W GPS AZ	320094.8267	513893.8002
123S LODI W GPS	312452.2851	506885.0320
124A DEFOREST GPS AZ	283214.1395	547764.2237
124S DEFOREST GPS	281182.7074	547706.1328
125A ARLINGTON S GPS AZ	305092.1361	536958.4998
125S ARLINGTON S GPS	309181.6324	536898.6999
126A ARLINGTON W GPS AZ	325866.6511	535442.4215
126S ARLINGTON W GPS	325882.3333	538132.4637
127A ARLINGTON E GPS AZ	325819.2719	553524.7730
127S ARLINGTON E GPS	325863.2081	555281.3724

128A POYNETTE GPS AZ	341766.8279	557501.3104
128S POYNETTE GPS	343513.3914	558558.5178
129A DEKORRA N GPS AZ	354845.7817	553491.4206
129S DEKORRA N GPS	352102.2866	545076.8303
130A DEKORRA W GPS AZ	349680.9476	525754.7231
130S DEKORRA W GPS	349648.6417	527621.6579
131A PACIFIC S GPS AZ	376088.4633	557409.6039
131S PACIFIC S GPS	376077.5524	555764.3666
132A PACIFIC N GPS AZ	390543.6549	562337.4875
132S PACIFIC N GPS	392945.0406	562918.7940
133A PORTAGE EAST GPS AZ	401190.0312	548667.8821
133S PORTAGE EAST GPS	401241.6621	550184.5008
134A FORT WINNEBAGO N GPS AZ	420361.5004	547479.0662
134S FORT WINNEBAGO N GPS	422030.9967	549601.7020
135A MOUNDVILLE S GPS AZ	432211.8803	535399.0230
135S MOUNDVILLE S GPS	434348.6376	535719.5947
136A DALTON GPS AZ	422392.1055	589982.3935
136S DALTON GPS	423782.1251	590218.7143
137A MARCELLON N GPS AZ	429413.2165	581132.9996
137S MARCELLON N GPS	431804.0528	581164.2837
138A MARCELLON E GPS AZ	410650.0920	589644.8318
138S MARCELLON E GPS	410693.6728	590862.2129
139A MARCELLON W GPS AZ	417917.7183	568339.3566
139S MARCELLON W GPS	417887.0599	566641.0735
140A PARDEEVILLE GPS AZ	384484.2839	578555.6540
140S PARDEEVILLE GPS	386663.6097	578559.7570
141A WYOCENA E GPS AZ	377735.9662	594243.8230
141S WYOCENA E GPS	379624.4155	594178.0243
142A LOWVILLE N GPS AZ	364063.6298	573466.1505
142S LOWVILLE N GPS	358423.1169	572092.1887

143A LOWVILLE E GPS AZ	358531.0376	590382.0301
143S LOWVILLE E GPS	358531.8982	592621.9731
144A LOWVILLE S GPS AZ	338437.4973	580472.5331
144S LOWVILLE S GPS	341408.8311	580389.2524
145A LEEDS CENTER GPS AZ	321199.7512	577565.0494
145S LEEDS CENTER GPS	321170.6333	575658.3383
146A LEEDS S GPS AZ	302175.5631	565662.7230
146S LEEDS S GPS	304503.3391	565572.2503
147A WINDSOR N GPS AZ	297390.7897	586872.0543
147S WINDSOR N GPS	295419.3147	586933.8813
148A HAMPDEN S GPS AZ	300478.8251	613592.0667
148S HAMPDEN S GPS	300536.8645	611685.9819
149A HAMPDEN W GPS AZ	323264.8027	602036.5021
149S HAMPDEN W GPS	317255.1541	601989.9534
150A OSTEGO S GPS AZ	334889.0980	614475.7766
150S OSTEGO S GPS	334834.0756	616541.5782
151A OSTEGO W GPS AZ	346090.5254	600050.3941
151S OSTEGO W GPS	348851.9180	599946.7864
152A RIO GPS AZ	361244.7905	608953.6277
152S RIO GPS	361295.4666	612199.4396
153A SPRINGVALE E GPS AZ	378254.7933	618171.4967
153S SPRINGVALE E GPS	380889.2793	618085.0110
154A SPRINGVALE N GPS AZ	391828.5955	608654.2388
154S SPRINGVALE N GPS	399811.4350	608532.5682
155A SCOTT N GPS AZ	416123.0278	613226.8826
155S SCOTT N GPS	416150.4600	615449.7242
156A RANDOLPH N GPS AZ	428163.3903	643813.1488
156S RANDOLPH N GPS	428099.0981	642055.4042
157A COURTLAND N GPS AZ	382674.2244	645156.6195
157S COURTLAND N GPS	381766.1698	643976.7375

158A FOUNTAIN PRIARIE N GPS AZ	364150.9155	630181.7407
158S FOUNTAIN PRIARIE N GPS	364266.9319	632970.7643
159A FOUNTAIN PRIARIE S GPS AZ	338964.2320	636203.1789
159S FOUNTAIN PRIARIE S GPS	338297.3975	637677.9848
160A FALL RIVER GPS AZ	320997.7836	630943.4881
160S FALL RIVER GPS	318563.8083	631021.5113
161A COLUMBUS CENTRAL GPS AZ	313811.3796	648310.3227
161S COLUMBUS CENTRAL GPS	315802.1490	646923.9992
162A YORK N GPS AZ	296725.0462	636517.0144
162S YORK N GPS	298864.4182	636479.0298
163S	390913.4713	543302.8332
164S	394737.7980	537513.4163
165S	406038.4033	535265.9906

COORDINATE LIST
ORTHOMETRIC HEIGHTS
COLUMBIA, GREEN LAKE, WAUSHARA COUNTIES

NORTH AMERICAN DATUM 1983/91
STATE PLANE COORDINATES
WISCONSIN SOUTH ZONE

UNITED STATES SURVEY FOOT

STATION #	STATION NAME	NORTHING	EASTING	ORTHO-HT
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101A	CRYSTAL LAKE GPS AZ	464705.206	2067935.359	1009.535
101S	CRYSTAL LAKE GPS	465700.289	2065589.130	974.499
102A	WEST POINT W GPS AZ	478903.990	2049652.439	857.525
102S	WEST POINT W GPS	477230.850	2049729.391	864.578
103A	WEST POINT N GPS AZ	491552.852	2070152.044	830.855
103S	WEST POINT N GPS	491836.926	2074415.825	942.902
104A	MERRIMAC GPS AZ	509702.498	2074563.262	860.635
104S	MERRIMAC GPS	511900.124	2074561.205	873.364
105A	FAIRFIELD E GPS AZ	536527.227	2065060.000	846.649
105S	FAIRFIELD E GPS	536208.567	2063544.649	840.960
106A	LAKE DELTON GPS AZ	570081.799	2043010.602	879.883
106S	LAKE DELTON GPS	568824.322	2043038.857	887.196
107A	NEWPORT E GPS AZ	587632.417	2054652.721	821.232
107S	NEWPORT E GPS	588851.650	2054732.429	843.187
108A	NEWPORT W GPS AZ	594152.775	2035585.729	986.678
108S	NEWPORT W GPS	595349.859	2036805.044	991.976
109A	WISCONSIN DELLS GPS AZ	601614.761	2052283.773	905.940
109S	WISCONSIN DELLS GPS	601702.222	2050073.623	952.062
110A	NEW HAVEN S GPS AZ	599208.283	2068234.922	828.292
110S	NEW HAVEN S GPS	602003.639	2070186.644	802.922
111A	LEWISTON W GPS AZ	575218.331	2069097.312	803.096
111S	LEWISTON W GPS	575779.866	2067033.182	805.044

112A LEWISTON E GPS AZ	580656.349	2104523.822	818.417
112S LEWISTON E GPS	581209.015	2102944.291	809.529
113A LEWISTON S GPS AZ	569847.735	2090132.181	795.340
113S LEWISTON S GPS	570367.134	2087128.470	796.626
114A BRIGGSVILLE GPS AZ	587900.297	2083975.333	801.754
114S BRIGGSVILLE GPS	585296.772	2084007.594	792.138
115A PINE ISLAND GPS AZ	559493.294	2089713.179	794.857
115S PINE ISLAND GPS	557651.237	2089739.259	796.990
116A DEKORRA GPS AZ	531224.581	2100616.911	812.088
116S DEKORRA GPS	529252.829	2100596.731	841.790
117A PORTAGE WEST GPS AZ	550036.397	2077889.486	841.206
117S PORTAGE WEST GPS	549608.825	2075728.027	848.200
118A CALEDONIA CENTRAL GPS AZ	541719.195	2091533.789	1060.431
118S CALEDONIA CENTRAL GPS	541774.317	2089287.698	1055.851
119A CALEDONIA N GPS AZ	549781.948	2105140.038	788.427
119S CALEDONIA N GPS	545787.376	2105695.109	807.931
120A CALEDONIA S GPS AZ	522889.043	2081695.574	880.047
120S CALEDONIA S GPS	524730.512	2084819.085	909.306
121A LODI N GPS AZ	498417.606	2098438.470	837.698
121S LODI N GPS	496919.210	2099740.289	854.539
122A LODI GPS AZ	482721.594	2097036.623	885.221
122S LODI GPS	488063.181	2097088.486	990.946
123A LODI W GPS AZ	487398.340	2088499.780	927.226
123S LODI W GPS	479705.891	2081547.438	984.929
124A DEFOREST GPS AZ	450768.485	2122633.589	975.582
124S DEFOREST GPS	448736.901	2122590.259	1059.522
125A ARLINGTON S GPS AZ	472565.128	2111670.419	1019.539
125S ARLINGTON S GPS	476653.653	2111580.928	1019.542
126A ARLINGTON W GPS AZ	493325.913	2110003.670	1047.691
126S ARLINGTON W GPS	493361.126	2112693.248	1044.227

127A ARLINGTON E GPS AZ	493409.847	2128084.012	1067.600
127S ARLINGTON E GPS	493466.533	2129840.064	1113.882
128A POYNETTE GPS AZ	509384.204	2131944.237	892.452
128S POYNETTE GPS	511138.220	2132988.624	937.823
129A DEKORRA N GPS AZ	522432.354	2127839.898	889.293
129S DEKORRA N GPS	519628.108	2119446.312	869.385
130A DEKORRA W GPS AZ	517066.764	2100144.281	834.851
130S DEKORRA W GPS	517048.021	2102011.209	810.300
131A PACIFIC S GPS AZ	543700.760	2131603.332	792.334
131S PACIFIC S GPS	543677.902	2129958.384	795.576
132A PACIFIC N GPS AZ	558189.888	2136425.629	810.031
132S PACIFIC N GPS	560595.191	2136989.427	877.876
133A PORTAGE EAST GPS AZ	568735.657	2122680.450	809.749
133S PORTAGE EAST GPS	568798.295	2124196.503	816.918
134A FORT WINNEBAGO N GPS AZ	587896.078	2121352.572	815.858
134S FORT WINNEBAGO N GPS	589580.779	2123462.817	826.796
X 135A MOUNDVILLE S GPS AZ	599657.252	2109187.983	782.659
135S MOUNDVILLE S GPS	601796.070	2109492.996	786.668
136A DALTON GPS AZ	590235.024	2163835.827	904.162
136S DALTON GPS	591626.586	2164062.027	886.019
137A MARCELLON N GPS AZ	597191.010	2154936.569	909.851
137S MARCELLON N GPS	599581.777	2154950.493	847.203
138A MARCELLON E GPS AZ	578492.035	2163583.547	908.725
138S MARCELLON E GPS	578544.450	2164800.460	919.942
139A MARCELLON W GPS AZ	585604.072	2142227.989	841.731
139S MARCELLON W GPS	585561.086	2140530.142	824.966
140A PARDEEVILLE GPS AZ	552249.040	2152685.727	823.053
140S PARDEEVILLE GPS	554428.117	2152674.008	824.047
141A WYOCENA E GPS AZ	545615.470	2168420.890	826.281
141S WYOCENA E GPS	547503.200	2168341.392	834.782

142A LOWVILLE N GPS AZ	531794.045	2147745.130	932.216
142S LOWVILLE N GPS	526144.282	2146412.298	957.216
143A LOWVILLE E GPS AZ	526384.971	2164699.004	919.916
143S LOWVILLE E GPS	526402.090	2166938.652	928.876
144A LOWVILLE S GPS AZ	506222.088	2154936.658	1038.118
144S LOWVILLE S GPS	509192.430	2154831.816	1001.287
145A LEEDS CENTER GPS AZ	488965.475	2152154.695	1020.805
145S LEEDS CENTER GPS	488922.520	2150248.446	1022.872
146A LEEDS S GPS AZ	469857.367	2140392.048	986.284
146S LEEDS S GPS	472184.180	2140284.686	1003.026
147A WINDSOR N GPS AZ	465227.206	2161633.328	1021.405
147S WINDSOR N GPS	463256.439	2161709.459	1039.460
148A HAMPDEN S GPS AZ	468508.791	2188327.408	934.066
148S HAMPDEN S GPS	468552.987	2186421.152	938.827
149A HAMPDEN W GPS AZ	491207.905	2176607.966	992.327
149S HAMPDEN W GPS	485198.705	2176605.046	986.232
150A OSTEGO S GPS AZ	502920.976	2188961.249	963.709
150S OSTEGO S GPS	502880.956	2191027.183	948.446
151A OSTEGO W GPS AZ	514016.246	2174456.429	971.747
151S OSTEGO W GPS	516776.529	2174332.790	1031.389
152A RIO GPS AZ	529233.184	2183248.517	971.166
152S RIO GPS	529307.413	2186493.544	944.263
153A SPRINGVALE E GPS AZ	546307.913	2192341.744	894.726
153S SPRINGVALE E GPS	548941.432	2192236.150	959.371
154A SPRINGVALE N GPS AZ	559810.908	2182727.177	824.890
154S SPRINGVALE N GPS	567791.853	2182547.577	999.214
155A SCOTT N GPS AZ	584135.459	2187122.906	859.493
155S SCOTT N GPS	584179.022	2189345.270	923.443
156A RANDOLPH N GPS AZ	596396.291	2217617.960	944.683
156S RANDOLPH N GPS	596319.250	2215860.900	937.531

157A COURTLAND N GPS AZ	550922.615	2219291.355	946.304
157S COURTLAND N GPS	550006.115	2218118.215	956.625
158A FOUNTAIN PRIARIE N GPS AZ	532293.004	2204452.812	930.517
158S FOUNTAIN PRIARIE N GPS	532429.247	2207240.638	943.929
159A FOUNTAIN PRIARIE S GPS AZ	507153.270	2210656.258	922.433
159S FOUNTAIN PRIARIE S GPS	506497.225	2212135.714	927.022
160A FALL RIVER GPS AZ	489150.990	2205527.636	903.945
160S FALL RIVER GPS	486717.898	2205623.315	909.818
161A COLUMBUS CENTRAL GPS AZ	482091.552	2222944.353	883.007
161S COLUMBUS CENTRAL GPS	484072.001	2221543.766	883.811
162A YORK N GPS AZ	464921.885	2211276.581	959.106
162S YORK N GPS	467060.700	2211223.078	961.284
163S	558421.442	2117390.706	788.076
164S	562203.242	2111574.251	814.008
165S	573486.097	2109245.043	800.655
202S BUFFALO GPS	609927.215	2129700.104	797.951
203S SHIELDS GPS	679319.084	2160305.394	812.823
204S WESTFIELD GPS	670742.530	2093036.372	905.123
205S MONTELO GPS	654962.115	2132039.450	802.452
206S DOUGLAS GPS	628353.871	2094498.806	823.525
207S PUCKAWAY GPS	623678.224	2165178.806	827.249
208S SPRINGFIELD GPS	722703.266	2075580.803	1125.054
301A KINGSTON NORTH GPS AZ	622044.301	2187543.109	790.484
301S KINGSTON NORTH GPS	623540.351	2188280.131	792.364
302A KINGSTON SOUTH GPS AZ	607145.062	2185562.640	872.958
302S KINGSTON SOUTH GPS	607690.225	2183705.334	849.569
303A MANCHESTER EAST GPS AZ	609194.398	2227171.008	895.897
303S MANCHESTER EAST GPS	612332.351	2224721.450	895.113
304A MANCHESTER WEST GPS AZ	616552.733	2210163.319	810.592
304S MANCHESTER WEST GPS	617268.592	2206964.848	866.402

305A MACKFORD WEST GPS AZ	607519.028	2239636.328	1007.258
305S MACKFORD WEST GPS	607610.675	2241696.445	1021.353
306A MARQUETTE EAST GPS AZ	635074.780	2201287.297	784.887
306S MARQUETTE EAST GPS	634468.718	2202760.647	825.920
307A GREEN LAKE WEST GPS AZ	633449.012	2219501.204	953.463
307S GREEN LAKE WEST GPS	633499.524	2220987.448	982.741
308A GREEN LAKE NORTH GPS AZ	654000.418	2241188.582	880.595
308S GREEN LAKE NORTH GPS	653969.010	2239105.177	885.720
309A GREEN LAKE EAST GPS AZ	654470.666	2257445.866	1051.015
309S GREEN LAKE EAST GPS	652535.903	2257480.931	1054.368
310A GREEN LAKE SOUTH GPS AZ	629127.679	2235396.425	949.821
310S GREEN LAKE SOUTH GPS	631039.548	2235359.335	964.283
311A PRINCETON WEST GPS AZ	669672.115	2188462.323	784.897
311S PRINCETON WEST GPS	668601.809	2186734.734	787.531
312A PRINCETON NORTH GPS AZ	683365.884	2193253.199	803.506
312S PRINCETON NORTH GPS	681821.048	2194545.562	804.375
313A PRINCETON EAST GPS AZ	668648.030	2211983.929	961.222
313S PRINCETON EAST GPS	671750.986	2211877.791	883.450
314A PRINCETON SOUTH GPS AZ	660212.075	2200658.456	857.876
314S PRINCETON SOUTH GPS AZ	658924.883	2202241.823	886.580
315A BROOKLYN NORTH GPS AZ	680911.506	2246765.798	811.613
315S BROOKLYN NORTH GPS	685470.657	2246351.629	957.446
316A BROOKLYN S STH 23 GPS AZ	673064.415	2237773.336	859.493
316S BROOKLYN S STH 23 GPS	671403.323	2236512.371	878.036
317A BROOKLYN S CTH A GPS AZ	668176.016	2251504.801	799.998
317S BROOKLYN S CTH A GPS	666990.169	2251731.481	800.038
318A SENECA NORTH GPS AZ	718452.513	2201609.547	792.115
318S SENECA NORTH GPS	718419.019	2199131.159	803.502
319A SENECA E CTH F GPS AZ	719968.366	2224105.647	771.426
319S SENECA E CTH F GPS	720045.177	2226897.078	762.433

320A SENECA E CTH D GPS AZ	709007.503	2213890.221	763.981
320S SENECA E CTH D GPS	708820.580	2215677.301	768.260
321A ST. MARIE WEST GPS AZ	691888.895	2203663.713	766.701
321S ST. MARIE WEST GPS	691892.566	2201988.575	767.790
322A ST. MARIE SOUTH GPS AZ	684108.510	2225013.542	842.177
322S ST. MARIE SOUTH GPS	683118.811	2224383.225	831.471
323A BERLIN SOUTH GPS AZ	694649.451	2238117.374	773.424
323S BERLIN SOUTH GPS	696135.074	2238976.037	783.657
401A MOUNT MORRIS GPS AZ	769469.928	2180740.986	907.958
401S MOUNT MORRIS GPS	772460.046	2180949.523	1062.055
402A SAXEVILLE GPS AZ	799548.841	2209171.238	883.909
402S SAXEVILLE GPS	797567.453	2208844.988	907.462
403A HEFRON GPS AZ	817655.373	2163209.158	1082.452
403S HEFRON GPS	815776.784	2164340.917	1095.401
404A ALMOND GPS AZ	815586.929	2124202.727	1168.236
404S ALMOND GPS	818406.765	2123786.143	1158.410
405A WAUTOMA GPS AZ	783001.987	2140129.890	1088.600
405S WAUTOMA GPS	779239.793	2141374.306	1101.819
406A POY SIPPI GPS AZ	782372.776	2240200.618	760.717
406S POY SIPPI GPS	783850.788	2243125.494	757.515
407A REDGRANITE GPS AZ	738730.088	2208862.219	786.937
407S REDGRANITE GPS	737141.403	2212017.505	782.758
408A DEKOTA GPS AZ	733923.745	2151478.089	850.989
408S DEKOTA GPS	734972.034	2152696.820	852.091
409A RICHFORD GPS AZ	741442.267	2106440.754	996.816
409S RICHFORD GPS	741584.314	2110304.861	1005.041
410A BLOOMFIELD C GPS AZ	803314.040	2244791.078	804.697
410S BLOOMFIELD C GPS	803345.273	2247973.719	786.944
411A SAXEVILLE N GPS AZ	817582.915	2225581.015	816.229
411S SAXEVILLE N GPS	817499.195	2222389.820	819.933

412A SAXEVILLE E GPS AZ	795504.590	2219777.020	856.130
412S SAXEVILLE E GPS	795167.980	2222744.262	832.702
413A SAXEVILLE W GPS AZ	788384.352	2200150.078	903.902
413S SAXEVILLE W GPS	790947.017	2200148.815	900.877
414A SPRINGWATER N GPS AZ	818674.029	2188838.158	909.604
414S SPRINGWATER N GPS	818610.394	2186522.851	907.836
415A SPRINGWATER W GPS AZ	797327.877	2175603.149	907.734
415S SPRINGWATER W GPS	797340.508	2172988.161	917.078
416A ROSE C GPS AZ	799732.324	2150360.053	1184.092
416S ROSE C GPS	799715.103	2155208.793	1104.906
417A OASIS E GPS AZ	802132.123	2130959.386	1167.183
417S OASIS E GPS	798468.853	2131534.087	1171.625
418A OASIS W GPS AZ	807304.389	2107807.320	1162.941
418S OASIS W GPS	807361.177	2111328.701	1121.783
419A PLAINFIELD N GPS AZ	807232.677	2081980.114	1079.558
419S PLAINFIELD N GPS	807306.040	2086867.791	1090.477
420A HANCOCK S GPS AZ	759538.809	2082996.933	1096.090
420S HANCOCK S GPS	754866.023	2080982.478	1092.458
421A HANCOCK E GPS AZ	763498.381	2100752.275	1145.431
421S HANCOCK E GPS	763555.149	2102292.331	1165.838
422A DEERFIELD N GPS AZ	786259.838	2119295.899	1137.386
422S DEERFIELD N GPS	786235.291	2116711.078	1127.547
423A DEERFIELD C GPS AZ	760596.727	2122102.760	1050.178
423S DEERFIELD C GPS	767417.087	2122140.329	1102.780
424A WAUTOMA S GPS AZ	754517.362	2142608.156	890.389
424S WAUTOMA S GPS	754658.720	2145233.748	893.007
425A WAUTOMA N GPS AZ	782454.806	2163114.880	963.194
425S WAUTOMA N GPS	782479.449	2160754.803	988.764
426A LEON N GPS AZ	777902.129	2209883.832	827.849
426S LEON N GPS	777810.141	2206638.871	822.252

427A LEON S GPS AZ	755650.828	2227157.596	810.172
427S LEON S GPS	755652.298	2224468.560	811.337
428A POY SIPPI C GPS AZ	767451.667	2250180.273	750.491
428S POY SIPPI C GPS	767136.366	2247963.424	750.254
429A AURORA S GPS AZ	724725.857	2258871.598	766.898
429S AURORA S GPS	724774.636	2256470.448	822.564
430A AURORA C GPS AZ	740500.579	2245278.026	775.418
430S AURORA C GPS	740506.826	2243527.645	785.294
431A MARION E GPS AZ	754110.700	2194057.292	814.067
431S MARION E GPS	751565.213	2194259.824	813.243
432A MARION S GPS AZ	735935.634	2187053.861	837.069
432S MARION S GPS	733552.227	2186299.282	832.039
433A MARION N GPS AZ	750025.268	2174618.170	880.874
433S MARION N GPS	749988.766	2177956.973	892.006
434A RICHFORD E GPS AZ	736667.267	2130096.245	868.089
434S RICHFORD E GPS	739501.254	2130131.261	882.846
435A COLOMA S GPS AZ	728025.253	2092666.573	1018.948
435S COLOMA S GPS	726763.163	2094224.696	1008.426
506S RUSHFORD GPS	748629.326	2268594.242	757.941
708S FREMONT GPS	156308.887	2249850.825	811.829
45ADP USGS "45 ADP 1956 844"	626186.376	2070449.730	844.526
BADGER BADGER GPS 1958	485881.755	2032564.491	845.008
BERLIN BERLIN GPS 1989	709894.916	2245986.866	932.905
C96OS NGS "C 96 1934" OFFSET	716165.293	2016554.244	953.722
CAMBRIA CAMBRIA GPS 1989	573344.227	2206325.689	997.091
COLUMBUS COLUMBUS GPS	497796.911	2238746.920	868.689
DRAKE DRAKE GPS 1980	791169.303	2091136.690	1082.672
E100 NGS "E 100 1934"	601522.806	2113527.456	786.239
E109 NGS "E 109 1934"	471963.613	2041844.332	783.883
ELBA W ELBA W GPS	474226.076	2234483.044	838.696

F97 NGS "F 97 1934" NOT HELD!	787545.413	2164185.737	955.343
FNT PRAIRE E FOUNTAIN PRAIRIE E GPS	514305.956	2229951.813	912.567
FOX LAKE W FOX LAKE W GPS	585310.168	2234115.775	917.255
H107 NGS "H 107 1934"	431897.184	2237315.870	866.406
K84 NGS "K 84 1934"	560774.134	2162519.710	822.006
K98 NGS "K 98 1934" RESET	759998.756	2234829.353	759.559
LOCK 1 NGS "LOCK 1"	651657.227	2146315.005	775.596
LOST LAKE LOST LAKE	534827.520	2232382.054	933.564
LYN SE LYN SE	604845.155	2014165.237	941.015
METOMEN W METOMEN W GPS	641063.639	2268264.443	987.272
Q98 NGS "Q 98 1934"	809486.527	2237874.612	808.811
RIPON RIPON GPS	679448.913	2263045.543	828.095
RRCW NGS "RRCW"	674678.136	2275938.283	921.376
T84OS NGS "T 84 1934" OFFSET	562044.256	2223824.896	949.093
T96 NGS "T 96 1934"	845870.116	2076079.601	1062.157
V100 NGS "V 100 1934"	477588.356	2134978.187	1013.495
W97 NGS "W 97 1934"	691760.956	2189296.750	783.794
WAUPACA WAUPACA GPS 1989	851232.297	2226436.085	807.525
WESTFORD N WESFORD N GPS	559597.418	2236843.171	939.129

ECWRPC - GPSNET
COUNTY COORDINATE SYSTEM
COLUMBIA COUNTY
METERS

STA#	STATION NAME	NORTHING	EASTING
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101A	CRYSTAL LAKE GPS AZ	90693.2132	150316.3520
101S	CRYSTAL LAKE GPS	91001.7355	149603.3673
102A	WEST POINT W GPS AZ	95061.8443	144774.7156
102S	WEST POINT W GPS	94551.6599	144794.4671
103A	WEST POINT N GPS AZ	98872.1244	151051.5085
103S	WEST POINT N GPS	98949.2742	152351.8410
104A	MERRIMAC GPS AZ	104394.8061	152436.3475
104S	MERRIMAC GPS	105064.6998	152440.5871
105A	FAIRFIELD E GPS AZ	112592.6673	149598.9331
105S	FAIRFIELD E GPS	112498.8880	149136.3121
106A	LAKE DELTON GPS AZ	122869.7196	142952.0800
106S	LAKE DELTON GPS	122486.3484	142957.9076
107A	NEWPORT E GPS AZ	128193.7639	146539.7370
107S	NEWPORT E GPS	128565.2379	146566.7348
108A	NEWPORT W GPS AZ	130223.5497	140742.1278
108S	NEWPORT W GPS	130585.7473	141116.4539
109A	WISCONSIN DELLS GPS AZ	132461.1460	145848.5966
109S	WISCONSIN DELLS GPS	132492.7013	145175.0870
110A	NEW HAVEN S GPS AZ	131692.2700	150705.5371
110S	NEW HAVEN S GPS	132540.0357	151306.6563
111A	LEWISTON W GPS AZ	124377.6761	150915.2857
111S	LEWISTON W GPS	124553.4161	150287.3349
112A	LEWISTON E GPS AZ	125956.8629	161726.1390
112S	LEWISTON E GPS	126128.8254	161245.8857

113A LEWISTON S GPS AZ	122694.0149	157315.3047
113S LEWISTON S GPS	122858.9905	156400.8539
114A BRIGGSVILLE GPS AZ	128210.4823	155478.5299
114S BRIGGSVILLE GPS	127416.7974	155482.5991
115A PINE ISLAND GPS AZ	119538.6688	157164.6558
115S PINE ISLAND GPS	118977.1088	157168.5263
116A DEKORRA GPS AZ	110897.5589	160425.7758
116S DEKORRA GPS	110296.5673	160415.2594
117A PORTAGE WEST GPS AZ	116682.1682	153539.5773
117S PORTAGE WEST GPS	116556.6208	152879.7680
118A CALEDONIA CENTRAL GPS AZ	114116.6772	157680.2630
118S CALEDONIA CENTRAL GPS	114138.4530	156995.7236
119A CALEDONIA N GPS AZ	116544.2667	161845.6189
119S CALEDONIA N GPS	115325.3989	162005.9735
120A CALEDONIA S GPS AZ	108398.5856	154639.6470
120S CALEDONIA S GPS	108952.9925	155595.8448
121A LODI N GPS AZ	100902.0317	159689.0966
121S LODI N GPS	100442.4014	160082.6053
122A LODI GPS AZ	96120.6089	159227.0260
122S LODI GPS	97748.7403	159254.6626
123A LODI W GPS AZ	97565.0983	156635.1436
123S LODI W GPS	95235.6470	154498.8668
124A DEFOREST GPS AZ	86323.8424	166958.8693
124S DEFOREST GPS	85704.6606	166941.1632
125A ARLINGTON S GPS AZ	92992.2691	163665.2781
125S ARLINGTON S GPS	94238.7500	163647.0510
126A ARLINGTON W GPS AZ	99324.3539	163203.1765
126S ARLINGTON W GPS	99329.1339	164023.1030
127A ARLINGTON E GPS AZ	99309.9127	168714.6882
127S ARLINGTON E GPS	99323.3045	169250.1008

III

PT 100

128A POYNETTE GPS AZ	104170.7375	169926.7393
128S POYNETTE GPS	104703.0911	170248.9767
129A DEKORRA N GPS AZ	108157.2106	168704.5224
129S DEKORRA N GPS	107320.9916	166139.7502
130A DEKORRA W GPS AZ	106582.9660	160250.3601
130S DEKORRA W GPS	106573.1191	160819.4030
131A PACIFIC S GPS AZ	114631.9929	169898.7871
131S PACIFIC S GPS	114628.6672	169397.3177
132A PACIFIC N GPS AZ	119037.9441	171400.8090
132S PACIFIC N GPS	119769.8879	171577.9916
133A PORTAGE EAST GPS AZ	122282.9661	167234.3049
133S PORTAGE EAST GPS	122298.7032	167696.5712
134A FORT WINNEBAGO N GPS AZ	128126.4416	166871.9531
134S FORT WINNEBAGO N GPS	128635.3051	167518.9338
135A MOUNDVILLE S GPS AZ	131738.4446	163189.9486
135S MOUNDVILLE S GPS	132389.7295	163287.6590
136A DALTON GPS AZ	128745.3712	179826.9932
136S DALTON GPS	129169.0501	179899.0239
137A MARCELLON N GPS AZ	130885.4102	177129.6925
137S MARCELLON N GPS	131614.1385	177139.2280
138A MARCELLON E GPS AZ	125166.3984	179724.1042
138S MARCELLON E GPS	125179.6818	180095.1627
139A MARCELLON W GPS AZ	127381.5753	173230.1824
139S MARCELLON W GPS	127372.2306	172712.5446
140A PARDEEVILLE GPS AZ	117191.0441	176344.1160
140S PARDEEVILLE GPS	117855.3040	176345.3666
141A WYOCENA E GPS AZ	115134.1528	181125.8795
141S WYOCENA E GPS	115709.7533	181105.8240
142A LOWVILLE N GPS AZ	110966.8163	174792.8323
142S LOWVILLE N GPS	109247.5845	174374.0479

143A LOWVILLE E GPS AZ	109280.4788	179948.8027
143S LOWVILLE E GPS	109280.7411	180631.5387
144A LOWVILLE S GPS AZ	103155.9555	176928.3819
144S LOWVILLE S GPS	104061.6199	176902.9980
145A LEEDS CENTER GPS AZ	97901.8800	176042.1791
145S LEEDS CENTER GPS	97893.0048	175461.0124
146A LEEDS S GPS AZ	92103.2958	172414.3428
146S LEEDS S GPS	92812.8034	172386.7667
147A WINDSOR N GPS AZ	90644.8940	178878.9599
147S WINDSOR N GPS	90043.9872	178897.8048
148A HAMPDEN S GPS AZ	91586.1291	187023.2360
148S HAMPDEN S GPS	91603.8195	186442.2602
149A HAMPDEN W GPS AZ	98531.3089	183501.0928
149S HAMPDEN W GPS	96699.5644	183486.9048
150A OSTEGO S GPS AZ	102074.4012	187292.5913
150S OSTEGO S GPS	102057.6304	187922.2489
151A OSTEGO W GPS AZ	105488.6031	182895.7259
151S OSTEGO W GPS	106330.2773	182864.1462
152A RIO GPS AZ	110107.6324	185609.4369
152S RIO GPS	110123.0785	186598.7624
153A SPRINGVALE E GPS AZ	115292.2916	188419.0490
153S SPRINGVALE E GPS	116095.2845	188392.6881
154A SPRINGVALE N GPS AZ	119429.5948	185518.1830
154S SPRINGVALE N GPS	121862.7691	185481.0977
155A SCOTT N GPS AZ	126834.5525	186911.9276
155S SCOTT N GPS	126842.9139	187589.4511
156A RANDOLPH N GPS AZ	130504.4624	196234.6402
156S RANDOLPH N GPS	130484.8661	195698.8786
157A COURTLAND N GPS AZ	116639.3369	196644.1309
157S COURTLAND N GPS	116362.5613	196284.5022

158A FOUNTAIN PRIARIE N GPS AZ	110993.4210	192079.7787
158S FOUNTAIN PRIARIE N GPS	111028.7829	192929.8748
159A FOUNTAIN PRIARIE S GPS AZ	103316.5046	193915.1168
159S FOUNTAIN PRIARIE S GPS	103113.2530	194364.6385
160A FALL RIVER GPS AZ	97840.3201	192311.9598
160S FALL RIVER GPS	97098.4430	192335.7413
161A COLUMBUS CENTRAL GPS AZ	95649.8998	197605.3816
161S COLUMBUS CENTRAL GPS	96256.6875	197182.8293
162A YORK N GPS AZ	90441.9750	194010.7740
162S YORK N GPS	91094.0568	193999.1963
163S	119150.6643	165599.0348
164S	120316.3215	163834.4170
165S	123760.7529	163149.4002

COORDINATE LIST
ORTHOMETRIC HEIGHTS
COLUMBIA, GREEN LAKE, AND WAUSHARA COUNTIES

NORTH AMERICAN DATUM 1983/91
STATE PLANE COORDINATES
WISCONSIN SOUTH ZONE

METERS

STATION #	STATION NAME	NORTHING	EASTING	ORTHO-HT
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101A	CRYSTAL LAKE GPS AZ	141642.430	630307.958	307.707
101S	CRYSTAL LAKE GPS	141945.732	629592.826	297.028
102A	WEST POINT W GPS AZ	145970.228	624735.313	261.374
102S	WEST POINT W GPS	145460.254	624758.768	263.524
103A	WEST POINT N GPS AZ	149825.609	630983.605	253.245
103S	WEST POINT N GPS	149912.195	632283.208	287.397
104A	MERRIMAC GPS AZ	155357.632	632328.147	262.322
104S	MERRIMAC GPS	156027.470	632327.520	266.202
105A	FAIRFIELD E GPS AZ	163533.826	629431.547	258.059
105S	FAIRFIELD E GPS	163436.698	628969.667	256.325
106A	LAKE DELTON GPS AZ	173761.280	622710.877	268.189
106S	LAKE DELTON GPS	173378.000	622719.489	270.418
107A	NEWPORT E GPS AZ	179110.719	626259.402	250.312
107S	NEWPORT E GPS	179482.342	626283.697	257.004
108A	NEWPORT W GPS AZ	181098.128	620447.771	300.740
108S	NEWPORT W GPS	181463.000	620819.419	302.355
109A	WISCONSIN DELLS GPS AZ	183372.546	625537.345	276.131
109S	WISCONSIN DELLS GPS	183399.204	624863.690	290.189
110A	NEW HAVEN S GPS AZ	182639.050	630399.265	252.464
110S	NEW HAVEN S GPS	183491.076	630994.151	244.731
111A	LEWISTON W GPS AZ	175326.898	630662.122	244.784
111S	LEWISTON W GPS	175498.054	630032.974	245.378

112A LEWISTON E GPS AZ	176984.409	641460.144	249.454
112S LEWISTON E GPS	177152.862	640978.702	246.745
113A LEWISTON S GPS AZ	173689.937	637073.563	242.420
113S LEWISTON S GPS	173848.250	636158.030	242.812
114A BRIGGSVILLE GPS AZ	179192.369	635196.952	244.375
114S BRIGGSVILLE GPS	178398.813	635206.785	241.444
115A PINE ISLAND GPS AZ	170533.897	636945.851	242.273
115S PINE ISLAND GPS	169972.437	636953.800	242.923
116A DEKORRA GPS AZ	161917.576	640269.315	247.525
116S DEKORRA GPS	161316.585	640263.164	256.578
117A PORTAGE WEST GPS AZ	167651.429	633341.982	256.400
117S PORTAGE WEST GPS	167521.105	632683.168	258.532
118A CALEDONIA CENTRAL GPS AZ	165116.341	637500.774	323.220
118S CALEDONIA CENTRAL GPS	165133.142	636816.164	321.824
119A CALEDONIA N GPS AZ	167573.873	641647.967	240.313
119S CALEDONIA N GPS	166356.325	641817.153	246.258
120A CALEDONIA S GPS AZ	159376.899	634502.080	268.239
120S CALEDONIA S GPS	159938.180	635454.128	277.157
121A LODI N GPS AZ	151917.990	639605.325	255.331
121S LODI N GPS	151461.278	640002.120	260.464
122A LODI GPS AZ	147133.836	639178.041	269.816
122S LODI GPS	148761.955	639193.849	302.041
123A LODI W GPS AZ	148559.311	636576.006	282.619
123S LODI W GPS	146214.648	634456.928	300.207
124A DEFOREST GPS AZ	137394.509	646980.012	297.358
124S DEFOREST GPS	136775.281	646966.805	322.943
125A ARLINGTON S GPS AZ	144038.139	643638.431	310.756
125S ARLINGTON S GPS	145284.324	643611.154	310.757
126A ARLINGTON W GPS AZ	150366.039	643130.405	319.337
126S ARLINGTON W GPS	150376.772	643950.190	318.281

127A ARLINGTON E GPS AZ	150391.622	648641.304	325.405
127S ARLINGTON E GPS	150408.900	649176.550	339.512
128A POYNETTE GPS AZ	155260.616	649817.903	272.020
128S POYNETTE GPS	155795.241	650136.233	285.849
129A DEKORRA N GPS AZ	159237.700	648566.898	271.057
129S DEKORRA N GPS	158382.964	646008.528	264.989
130A DEKORRA W GPS AZ	157602.265	640125.257	254.463
130S DEKORRA W GPS	157596.552	640694.298	246.980
131A PACIFIC S GPS AZ	165720.323	649713.995	241.504
131S PACIFIC S GPS	165713.356	649212.614	242.492
132A PACIFIC N GPS AZ	170136.618	651183.834	246.898
132S PACIFIC N GPS	170869.756	651355.680	267.577
133A PORTAGE EAST GPS AZ	173350.975	646994.295	246.812
133S PORTAGE EAST GPS	173370.067	647456.389	248.997
134A FORT WINNEBAGO N GPS AZ	179191.083	646589.557	248.674
134S FORT WINNEBAGO N GPS	179704.581	647232.761	252.008
135A MOUNDVILLE S GPS AZ	182775.896	642881.783	238.555
135S MOUNDVILLE S GPS	183427.809	642974.751	239.777
136A DALTON GPS AZ	179903.995	659538.479	275.589
136S DALTON GPS	180328.144	659607.425	270.059
137A MARCELLON N GPS AZ	182024.184	656825.980	277.323
137S MARCELLON N GPS	182752.891	656830.224	258.228
138A MARCELLON E GPS AZ	176324.725	659461.584	276.980
138S MARCELLON E GPS	176340.701	659832.500	280.399
139A MARCELLON W GPS AZ	178492.478	652952.397	256.560
139S MARCELLON W GPS	178479.376	652434.892	251.450
140A PARDEEVILLE GPS AZ	168325.844	656139.922	250.867
140S PARDEEVILLE GPS	168990.028	656136.350	251.170
141A WYOCENA E GPS AZ	166303.928	660936.009	251.851
141S WYOCENA E GPS	166879.309	660911.778	254.442

141A LOWVILLE N GPS AZ	162091.149	654634.025	284.140
142S LOWVILLE N GPS	160369.098	654227.777	291.760
143A LOWVILLE E GPS AZ	160442.460	659801.576	280.391
143S LOWVILLE E GPS	160447.678	660484.222	283.122
144A LOWVILLE S GPS AZ	154296.801	656826.007	316.419
144S LOWVILLE S GPS	155202.163	656794.051	305.193
145A LEEDS CENTER GPS AZ	149036.975	655978.063	311.142
145S LEEDS CENTER GPS	149023.882	655397.037	311.772
146A LEEDS S GPS AZ	143212.812	652392.801	300.620
146S LEEDS S GPS	143922.026	652360.077	305.723
147A WINDSOR N GPS AZ	141801.536	658867.156	311.325
147S WINDSOR N GPS	141200.845	658890.361	316.828
148A HAMPDEN S GPS AZ	142801.765	667003.528	284.704
148S HAMPDEN S GPS	142815.236	666422.500	286.155
149A HAMPDEN W GPS AZ	149720.469	663431.435	302.462
149S HAMPDEN W GPS	147888.861	663430.545	300.604
150A OSTEGO S GPS AZ	153290.620	667196.723	293.739
150S OSTEGO S GPS	153278.422	667826.421	289.087
151A OSTEGO W GPS AZ	156672.465	662775.645	296.189
151S OSTEGO W GPS	157513.801	662737.960	314.368
152A RIO GPS AZ	161310.597	665455.479	296.012
152S RIO GPS	161333.222	666444.565	287.812
153A SPRINGVALE E GPS AZ	166514.985	668227.100	272.713
153S SPRINGVALE E GPS	167317.683	668194.915	292.417
154A SPRINGVALE N GPS AZ	170630.706	665296.574	251.427
154S SPRINGVALE N GPS	173063.303	665241.832	304.561
155A SCOTT N GPS AZ	178044.844	666636.395	261.974
155S SCOTT N GPS	178058.122	667313.773	281.466
156A RANDOLPH N GPS AZ	181781.953	675931.306	287.940
156S RANDOLPH N GPS	181758.471	675395.753	285.760

157A COURTLAND N GPS AZ	167921.549	676441.358	288.434
157S COURTLAND N GPS	167642.199	676083.784	291.580
158A FOUNTAIN PRIARIE N GPS AZ	162243.232	671918.561	283.622
158S FOUNTAIN PRIARIE N GPS	162284.759	672768.292	287.710
159A FOUNTAIN PRIARIE S GPS AZ	154580.626	673809.375	281.158
159S FOUNTAIN PRIARIE S GPS	154380.663	674260.314	282.557
160A FALL RIVER GPS AZ	149093.520	672246.168	275.523
160S FALL RIVER GPS	148351.912	672275.331	277.313
161A COLUMBUS CENTRAL GPS AZ	146941.799	677554.794	269.141
161S COLUMBUS CENTRAL GPS	147545.441	677127.894	269.386
162A YORK N GPS AZ	141708.474	673998.450	292.336
162S YORK N GPS	142360.386	673982.142	293.000
163S	170207.196	645381.978	240.206
164S	171359.891	643609.119	248.110
165S	174798.912	642899.175	244.040
202S BUFFALO GPS	185906.187	649133.890	243.216
203S SHIELDS GPS	207056.871	658462.401	247.749
204S WESTFIELD GPS	204442.732	637958.762	275.882
205S MONTELLLO GPS	199632.852	649846.924	244.588
206S DOUGLAS GPS	191522.643	638404.513	251.011
207S PUCKAWAY GPS	190097.503	659947.820	252.146
208S SPRINGFIELD GPS	220280.396	632638.294	342.917
301A KINGSTON NORTH GPS AZ	189599.482	666764.473	240.940
301S KINGSTON NORTH GPS	190055.479	666989.118	241.513
302A KINGSTON SOUTH GPS AZ	185058.185	666160.825	266.078
302S KINGSTON SOUTH GPS	185224.351	665594.717	258.949
303A MANCHESTER EAST GPS AZ	185682.824	678843.081	273.070
303S MANCHESTER EAST GPS	186639.274	678096.454	272.831
304A MANCHESTER WEST GPS AZ	187925.649	673659.127	247.069
304S MANCHESTER WEST GPS	188143.843	672684.231	264.080

305A MACKFORD WEST GPS AZ	185172.170	682642.518	307.013
305S MACKFORD WEST GPS	185200.104	683270.443	311.309
306A MARQUETTE EAST GPS AZ	193571.180	670953.710	239.234
306S MARQUETTE EAST GPS	193386.452	671402.788	251.741
307A GREEN LAKE WEST GPS AZ	193075.645	676505.320	290.616
307S GREEN LAKE WEST GPS	193091.041	676958.328	299.540
308A GREEN LAKE NORTH GPS AZ	199339.726	683115.646	268.406
308S GREEN LAKE NORTH GPS	199330.153	682480.623	269.968
309A GREEN LAKE EAST GPS AZ	199483.058	688070.876	320.350
309S GREEN LAKE EAST GPS	198893.341	688081.564	321.372
310A GREEN LAKE SOUTH GPS AZ	191758.500	681350.193	289.506
310S GREEN LAKE SOUTH GPS	192341.239	681338.888	293.914
311A PRINCETON WEST GPS AZ	204116.469	667044.650	239.237
311S PRINCETON WEST GPS	203790.239	666518.080	240.040
312A PRINCETON NORTH GPS AZ	208290.338	668504.912	244.909
312S PRINCETON NORTH GPS	207819.471	668898.825	245.174
313A PRINCETON EAST GPS AZ	203804.327	674214.050	292.981
313S PRINCETON EAST GPS	204750.110	674181.699	269.276
314A PRINCETON SOUTH GPS AZ	201233.043	670762.039	261.481
314S PRINCETON SOUTH GPS AZ	200840.706	671244.650	270.230
315A BROOKLYN NORTH GPS AZ	207542.242	684815.585	247.380
315S BROOKLYN NORTH GPS	208931.874	684689.346	291.830
316A BROOKLYN S STH 23 GPS AZ	205150.444	682074.677	261.974
316S BROOKLYN S STH 23 GPS	204644.142	681690.334	267.626
317A BROOKLYN S CTH A GPS AZ	203660.457	686260.036	243.840
317S BROOKLYN S CTH A GPS	203299.010	686329.128	243.852
318A SENECA NORTH GPS AZ	218984.764	671051.932	241.437
318S SENECA NORTH GPS	218974.555	670296.518	244.908
319A SENECA E CTH F GPS AZ	219446.797	677908.757	235.131
319S SENECA E CTH F GPS	219470.209	678759.587	232.390

320A SENECA E CTH D GPS AZ	216105.919	674795.089	232.862
320S SENECA E CTH D GPS	216048.945	675339.792	234.166
321A ST. MARIE WEST GPS AZ	210888.157	671678.043	233.691
321S ST. MARIE WEST GPS	210889.276	671167.460	234.023
322A ST. MARIE SOUTH GPS AZ	208516.691	678185.484	256.696
322S ST. MARIE SOUTH GPS	208215.030	677993.363	253.433
323A BERLIN SOUTH GPS AZ	211729.576	682179.540	235.740
323S BERLIN SOUTH GPS	212182.395	682441.261	238.859
401A MOUNT MORRIS GPS AZ	234534.903	664691.182	276.746
401S MOUNT MORRIS GPS	235446.293	664754.744	323.715
402A SAXEVILLE GPS AZ	243702.974	673356.740	269.416
402S SAXEVILLE GPS	243099.046	673257.299	276.595
403A HEFRON GPS AZ	249221.856	659347.470	329.932
403S HEFRON GPS	248649.261	659692.431	333.879
404A ALMOND GPS AZ	248591.393	647458.286	356.079
404S ALMOND GPS	249450.881	647331.311	353.084
405A WAUTOMA GPS AZ	238659.483	652312.895	331.806
405S WAUTOMA GPS	237512.764	652692.194	335.835
406A POY SIPPI GPS AZ	238467.699	682814.514	231.867
406S POY SIPPI GPS	238918.198	683706.018	230.891
407A REDGRANITE GPS AZ	225165.381	673262.551	239.859
407S REDGRANITE GPS	224681.149	674224.284	238.585
408A DEKOTA GPS AZ	223700.405	655771.833	259.382
408S DEKOTA GPS	224019.924	656143.303	259.718
409A RICHFORD GPS AZ	225992.055	642044.426	303.830
409S RICHFORD GPS	226035.351	643222.208	306.337
410A BLOOMFIELD C GPS AZ	244850.609	684213.689	245.272
410S BLOOMFIELD C GPS	244860.129	685183.760	239.861
411A SAXEVILLE N GPS AZ	249199.771	678358.450	248.787
411S SAXEVILLE N GPS	249174.253	677385.772	249.916

412A SAXEVILLE E GPS AZ	242470.284	676589.389	260.949
412S SAXEVILLE E GPS	242367.685	677493.806	253.808
413A SAXEVILLE W GPS AZ	240300.031	670607.085	275.510
413S SAXEVILLE W GPS	241081.133	670606.700	274.588
414A SPRINGWATER N GPS AZ	249532.343	667159.205	277.248
414S SPRINGWATER N GPS	249512.947	666453.498	276.709
415A SPRINGWATER W GPS AZ	243026.023	663125.166	276.678
415S SPRINGWATER W GPS	243029.873	662328.116	279.526
416A ROSE C GPS AZ	243758.900	655431.055	360.912
416S ROSE C GPS	243753.651	656908.954	336.776
417A OASIS E GPS AZ	244490.360	649517.720	355.758
417S OASIS E GPS	243373.793	649692.889	357.112
418A OASIS W GPS AZ	246066.870	642460.956	354.465
418S OASIS W GPS	246084.179	643534.275	341.920
419A PLAINFIELD N GPS AZ	246045.012	634588.808	329.050
419S PLAINFIELD N GPS	246067.373	636078.575	332.378
420A HANCOCK S GPS AZ	231507.892	634898.735	334.089
420S HANCOCK S GPS	230083.624	634284.728	332.982
421A HANCOCK E GPS AZ	232714.772	640310.574	349.128
421S HANCOCK E GPS	232732.075	640779.984	355.348
422A DEERFIELD N GPS AZ	239652.478	645962.682	346.676
422S DEERFIELD N GPS	239644.996	645174.827	343.677
423A DEERFIELD C GPS AZ	231830.346	646818.215	320.095
423S DEERFIELD C GPS	233909.196	646829.666	336.128
424A WAUTOMA S GPS AZ	229977.352	653068.272	271.391
424S WAUTOMA S GPS	230020.438	653868.554	272.189
425A WAUTOMA N GPS AZ	238492.702	659318.734	293.582
425S WAUTOMA N GPS	238500.213	658599.381	301.376
426A LEON N GPS AZ	237105.043	673573.939	252.329
426S LEON N GPS	237077.005	672584.873	250.623

427S LEON S GPS	230323.281	678019.373	247.296
428A POY SIPPI C GPS AZ	233919.736	685856.319	228.750
428S POY SIPPI C GPS	233823.632	685180.622	228.678
429A AURORA S GPS AZ	220896.883	688505.440	233.751
429S AURORA S GPS	220911.751	687773.568	250.718
430A AURORA C GPS AZ	225705.028	684362.111	236.348
430S AURORA C GPS	225706.932	683828.594	239.358
431A MARION E GPS AZ	229853.401	668750.000	248.128
431S MARION E GPS	229077.535	668811.732	247.877
432A MARION S GPS AZ	224313.630	666615.350	255.139
432S MARION S GPS	223587.166	666385.354	253.606
433A MARION N GPS AZ	228608.159	662824.944	268.491
433S MARION N GPS	228597.033	663842.613	271.884
434A RICHFORD E GPS AZ	224536.632	649254.634	264.594
434S RICHFORD E GPS	225400.433	649265.307	269.092
435A COLOMA S GPS AZ	221902.541	637846.047	310.576
435S COLOMA S GPS	221517.855	638320.964	307.369
506S RUSHFORD GPS	228182.675	691468.908	231.021
708S FREMONT GPS	47643.044	685755.903	247.446
45ADP USGS "45 ADP 1956 844"	190861.989	631074.340	257.412
BADGER BADGER GPS 1958	148097.055	619526.896	257.559
BERLIN BERLIN GPS 1989	216376.403	684578.166	284.350
C960S NGS "C 96 1934" OFFSET	218287.618	614646.963	290.695
CAMBRIA CAMBRIA GPS 1989	174755.670	672489.415	303.914
COLUMBUS COLUMBUS GPS	151728.802	682371.426	264.777
DRAKE DRAKE GPS 1980	241148.886	637379.738	329.999
E100 NGS "E 100 1934"	183344.518	644204.457	239.646
E109 NGS "E 109 1934"	143854.797	622355.397	238.928
ELBA W ELBA W GPS	144544.397	681071.794	255.635

F97 NGS "F 97 1934" NOT HELD!	240044.322	659645.132	291.189
FNT PRAIRE E FOUNTAIN PRAIRIE E GPS	156760.769	679690.672	278.151
FOX LAKE W FOX LAKE W GPS	178402.896	680959.850	279.580
H107 NGS "H 107 1934"	131642.525	681935.241	264.081
K84 NGS "K 84 1934"	170924.298	659137.326	250.548
K98 NGS "K 98 1934" RESET	231648.084	681177.349	231.514
LOCK 1 NGS "LOCK 1"	198625.520	654198.122	236.402
LOST LAKE LOST LAKE	163015.754	680431.411	284.551
LYN SE LYN SE	184357.172	613918.792	286.822
METOMEN W METOMEN W GPS	195396.588	691368.385	300.921
Q98 NGS "Q 98 1934"	246731.987	682105.546	246.526
RIPON RIPON GPS	207096.443	689777.661	252.404
RRCW NGS "RRCW"	205642.307	693707.376	280.836
T84OS NGS "T 84 1934" OFFSET	171311.432	677823.184	289.284
T96 NGS "T 96 1934"	257821.727	632790.328	323.746
V100 NGS "V 100 1934"	145569.222	650742.653	308.914
W97 NGS "W 97 1934"	210849.161	667298.984	238.901
WAUPACA WAUPACA GPS 1989	259456.123	678619.076	246.134
WESTFORD N WESFORD N GPS	170565.634	681791.162	286.247

COORDINATE LIST

10 PPM - CITY OF PORTAGE

NORTH AMERICAN DATUM 1983/91
STATE PLANE COORDINATES
WISCONSIN SOUTH ZONE

US SURVEY FOOT

STATION #	STATION NAME	NORTHING STD DEV	EASTING STD DEV	ELLIP-HT STD DEV
112S	LEWISTON E GPS	581209.015 .000	2102944.291 .000	692.902 .000
119S	CALEDONIA N GPS	545787.376 .000	2105695.109 .000	692.105 .000
131S	PACIFIC S GPS	543677.902 .000	2129958.384 .000	679.720 .000
133S	PORTAGE EAST GPS	568798.295 .000	2124196.503 .000	700.376 .000
163S		558421.442 .007	2117390.706 .007	671.865 .007
164S		562203.242 .007	2111574.251 .007	697.728 .007
165S		573486.097 .007	2109245.043 .007	684.126 .007

GEOGRAPHIC POSITIONS

10 PPM - CITY OF PORTAGE

NORTH AMERICAN DATUM 1983/91

STATION #	STATION NAME	LATITUDE STD DEV	LONGITUDE STD DEV	ELLIP-HT STD DEV
112S	LEWISTON E GPS	N 43 35 36.75273 0.000	W 89 29 33.00015 0.000	211.197 0.000
119S	CALEDONIA N GPS	N 43 29 46.73777 0.000	W 89 28 58.60417 0.000	210.954 0.000
131S	PACIFIC S GPS	N 43 29 24.28577 0.000	W 89 23 29.63163 0.000	207.179 0.000
133S	PORTAGE EAST GPS	N 43 33 32.79923 0.000	W 89 24 45.39502 0.000	213.475 0.000
163S		N 43 31 50.77394 0.002	W 89 26 18.77456 0.002	204.785 0.002
164S		N 43 32 28.50479 0.002	W 89 27 37.39980 0.002	212.668 0.002
165S		N 43 34 20.08911 0.002	W 89 28 8.04823 0.002	208.522 0.002

COORDINATE LIST

10 PPM - CITY OF PORTAGE

NORTH AMERICAN DATUM 1983/91
STATE PLANE COORDINATES
WISCONSIN SOUTH ZONE

METERS

STATION #	STATION NAME	NORTHING STD DEV	EASTING STD DEV	ELLIP-HT STD DEV
112S	LEWISTON E GPS	177152.862 0.000	640978.702 0.000	211.197 0.000
119S	CALEDONIA N GPS	166356.325 0.000	641817.153 0.000	210.954 0.000
131S	PACIFIC S GPS	165713.356 0.000	649212.614 0.000	207.179 0.000
133S	PORTAGE EAST GPS	173370.067 0.000	647456.389 0.000	213.475 0.000
163S		170207.196 0.002	645381.978 0.002	204.785 0.002
164S		171359.891 0.002	643609.119 0.002	212.668 0.002
165S		174798.912 0.002	642899.175 0.002	208.522 0.002