

GROUND CONTROL SURVEY REPORT

**GPS SURVEY
FOR LIDAR CONTROL**

ROCK COUNTY, WI WROC LIDAR SURVEY

ROCK COUNTY, WISCONSIN

Services provided by:

AYRES

ASSOCIATES

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ABSTRACT

This report documents the GPS ground surveys conducted in support of FEMA accuracy testing of the lidar data collection for Rock County, Wisconsin, in 2010. Surveys were conducted at 5 sites utilizing the base stations established in the static network. These surveys established “ground truth” data at each site on different surface types, including bare earth, low grass, brush lands, low trees, forest, high grass, weeds, crops, and urban areas. Statistical comparisons were made between ground truth points collected from the ground survey and the elevation at the associated horizontal coordinates represented on the LiDAR-derived digital terrain model.

SAMPLE POINTS/TEST POINTS

The ground survey test points were distributed and categorized into sites as shown in the Test Survey Locations map on the next page.

DATA ANALYSIS

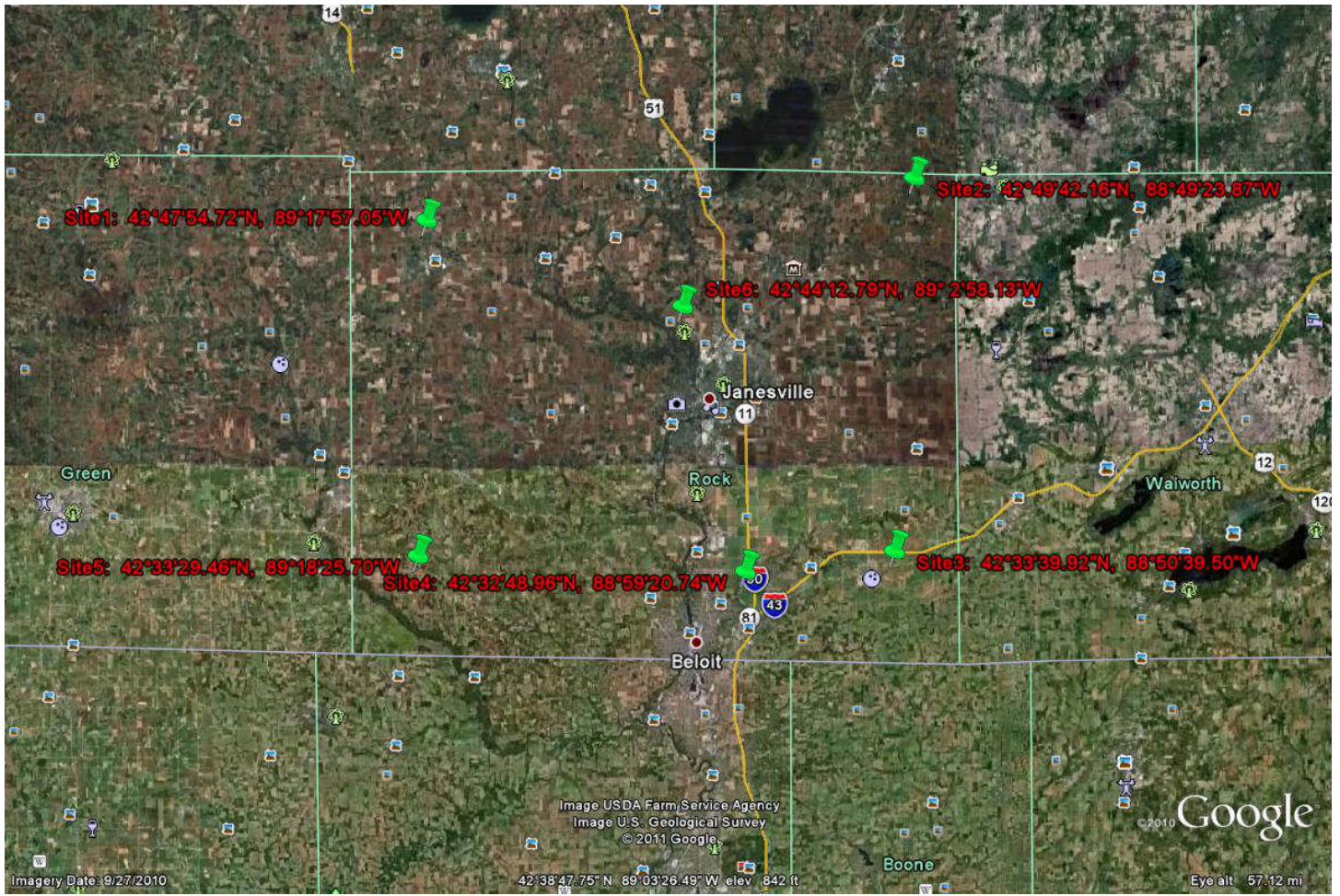
To qualify as an acceptable accuracy test, the lidar data must be compared with a dataset of higher accuracy – in this instance ground survey. To develop a comparable dataset of points from the lidar dataset, a utility from proprietary software was used.

The ground control survey results were imported into an ESRI Pointz shapefile with each point’s information as attributes. The utility then accessed the lidar and generated a triangulated irregular network (TIN), which is a continuous digital terrain surface, using the bare-earth lidar points and the compiled breaklines. The utility probed the TIN surface to determine its elevations at each of the survey point’s horizontal locations.

The elevation was then appended as a field to the Pointz shapefile; the attributes for each point were exported to a database; and then statistical analysis was performed. The results can be seen on the following pages.

OVERALL ACCURACY

A comparison of ground survey versus lidar model values indicates a vertical root mean square error (RMSE_z) of 0.451 feet. This is within the FEMA specified vertical accuracy tolerance of 0.6. This RMSE_z equates to a tested 0.8839 feet vertical accuracy at 95% confidence level.



GROUND TRUTH ANALYSIS
Comparison of Lidar Points to Ground-Truth Points
Rock County Coordinate System WISCRS
NAD 83 HARN / NAVD 88, survey feet

Field definitions

Name – The designation given to the ground survey point to identify it with its coordinates and land cover type

X, Y, and Z – The coordinates that describe the point's horizontal and vertical location within the Rock County WISCRS Coordinate System. The X and Y values are shared between the ground control points and lidar comparison points. The Z field shows the elevation of the survey number. The lidar comparison point's elevation is implicit in the analysis' delta Z

Delta Z – The error, the difference between the elevation at a horizontal location as determined by ground survey and as determined by the lidar dataset

Delta Z Squared – The value of squaring Delta Z

Land Cover – The predominant land cover category at the location of the survey point

Statistic definitions

Sum – The sum of the analysis' Delta Z Squared values

Average – The average of the analysis' Delta Z Squared values

RMSE – The root mean squared error, the square root of the average of the squared errors

Accuracyz – The product of multiplying the RMSE with 1.96, a conversion between the RMSE value and a value with a 95% confidence level

Name	X	Y	Z	Delta_Z	Delta_Z_Squared	TYPE
1000	466738.6120	279183.0300	967.797	-0.035000	0.001225	CK
1001	478114.7000	288219.1370	869.987	-0.175000	0.030625	BRUSH/LOW
1002	478117.9970	288219.4120	869.887	-0.122000	0.014884	BRUSH/LOW
1003	478121.6300	288219.3950	869.840	-0.059000	0.003481	BRUSH/LOW
1004	478124.4490	288219.5830	869.646	-0.128000	0.016384	BRUSH/LOW
1005	478127.3890	288219.9740	869.651	-0.125000	0.015625	BRUSH/LOW
1006	478128.2340	288216.8550	869.574	-0.271000	0.073441	BRUSH/LOW
1007	478123.1470	288215.6910	869.757	-0.202000	0.040804	BRUSH/LOW
1008	478119.8680	288215.9260	869.849	-0.396000	0.156816	BRUSH/LOW
1009	478116.7160	288215.4680	869.964	-0.261000	0.068121	BRUSH/LOW
1010	478113.8310	288214.6890	870.042	-0.258000	0.066564	BRUSH/LOW
1011	478114.6980	288211.6490	870.076	-0.046000	0.002116	BRUSH/LOW
1012	478117.5750	288212.5050	870.006	-0.113000	0.012769	BRUSH/LOW
1013	478120.2740	288213.1940	870.031	-0.029000	0.000841	BRUSH/LOW
1014	478122.8920	288213.4740	869.860	0.002000	0.000004	BRUSH/LOW
1015	478125.4530	288213.5510	869.716	-0.070000	0.004900	BRUSH/LOW
1016	478126.5220	288210.1190	869.740	-0.097000	0.009409	BRUSH/LOW
1017	478123.6790	288209.9170	869.833	-0.037000	0.001369	BRUSH/LOW
1018	478120.1740	288209.6030	869.967	-0.227000	0.051529	BRUSH/LOW
1019	478117.2620	288208.8220	870.123	-0.142000	0.020164	BRUSH/LOW
1020	478114.2820	288207.4520	870.143	-0.212000	0.044944	BRUSH/LOW
1021	478115.0670	288204.8460	870.100	-0.532000	0.283024	BRUSH/LOW
1022	478122.1700	288207.1050	869.881	-0.408000	0.166464	BRUSH/LOW
1023	478125.2380	288207.5540	869.776	-0.020000	0.000400	BRUSH/LOW
1024	478127.8090	288207.8190	869.770	-0.189000	0.035721	BRUSH/LOW
1025	478128.3330	288209.5600	869.736	-0.173000	0.029929	BRUSH/LOW
1026	477947.1780	288279.5580	872.476	0.049000	0.002401	MOWED
1027	477946.0090	288282.4680	872.499	-0.016000	0.000256	MOWED
1028	477944.6430	288285.0600	872.567	0.020000	0.000400	MOWED
1029	477943.3790	288287.5000	872.563	0.067000	0.004489	MOWED
1030	477942.4110	288290.2290	872.500	-0.090000	0.008100	MOWED
1031	477939.5780	288288.4510	872.615	0.104000	0.010816	MOWED
1032	477941.2300	288285.5060	872.522	0.063000	0.003969	MOWED
1033	477942.4570	288283.0920	872.517	-0.014000	0.000196	MOWED
1034	477943.5650	288280.7080	872.415	0.092000	0.008464	MOWED
1035	477944.9600	288278.4840	872.491	0.078000	0.006084	MOWED
1036	477941.9250	288277.4320	872.423	0.018000	0.000324	MOWED
1037	477940.6560	288280.3340	872.434	0.014000	0.000196	MOWED
1038	477939.3650	288283.0380	872.467	-0.038000	0.001444	MOWED
1039	477938.0140	288285.4430	872.511	0.137000	0.018769	MOWED
1040	477936.4830	288287.6170	872.531	0.070000	0.004900	MOWED
1041	477933.5130	288286.1560	872.367	0.107000	0.011449	MOWED
1042	477934.8480	288283.2730	872.286	-0.137000	0.018769	MOWED
1043	477936.3010	288280.7450	872.321	-0.048000	0.002304	MOWED
1044	477937.5400	288278.2780	872.320	0.094000	0.008836	MOWED
1045	477938.7810	288275.7580	872.270	0.068000	0.004624	MOWED
1046	477936.0660	288274.7760	872.155	-0.085000	0.007225	MOWED
1047	477934.5240	288277.7310	872.139	-0.154000	0.023716	MOWED
1048	477933.3470	288280.1940	872.213	-0.052000	0.002704	MOWED
1049	477931.9210	288282.5750	872.262	-0.119000	0.014161	MOWED
1050	477930.8660	288285.0920	872.251	-0.087000	0.007569	MOWED

1051	478010.4080	288429.7020	872.835	-0.061000	0.003721 TALL
1052	478013.1270	288430.5250	872.842	-0.068000	0.004624 TALL
1053	478015.8170	288430.9630	872.661	-0.185000	0.034225 TALL
1054	478018.5310	288432.0660	872.656	-0.124000	0.015376 TALL
1055	478021.4110	288432.7940	872.507	-0.099000	0.009801 TALL
1056	478020.0850	288435.6290	872.622	-0.130000	0.016900 TALL
1057	478017.0800	288434.5510	872.674	-0.186000	0.034596 TALL
1058	478014.5240	288433.5940	872.736	-0.151000	0.022801 TALL
1059	478011.6780	288432.8100	872.807	-0.081000	0.006561 TALL
1060	478008.4140	288432.8690	872.861	-0.199000	0.039601 TALL
1061	478008.3790	288436.1420	872.868	-0.078000	0.006084 TALL
1062	478011.8550	288436.2870	872.833	-0.235000	0.055225 TALL
1063	478014.6060	288437.2830	872.879	-0.036000	0.001296 TALL
1064	478017.5500	288437.7880	872.851	-0.130000	0.016900 TALL
1065	478019.8730	288438.4580	872.568	-0.269000	0.072361 TALL
1066	478019.0640	288441.0890	872.693	-0.176000	0.030976 TALL
1067	478016.0630	288440.0530	872.721	-0.243000	0.059049 TALL
1068	478013.2060	288440.0230	872.908	-0.012000	0.000144 TALL
1069	478010.1330	288440.3940	873.003	-0.085000	0.007225 TALL
1070	478006.9810	288440.5530	873.069	-0.123000	0.015129 TALL
1071	478006.7560	288443.6070	872.978	-0.140000	0.019600 TALL
1072	478009.9660	288443.2180	873.030	-0.248000	0.061504 TALL
1073	478012.3960	288443.9260	873.101	-0.071000	0.005041 TALL
1074	478015.6660	288444.6130	872.973	-0.019000	0.000361 TALL
1075	478018.3350	288445.3430	872.884	-0.081000	0.006561 TALL
1076	477909.3850	288268.6100	872.423	0.086000	0.007396 TREE
1077	477905.8090	288266.5250	872.363	0.010000	0.000100 TREE
1078	477901.6580	288263.8730	872.434	0.119000	0.014161 TREE
1079	477898.6800	288262.6270	872.393	-0.004000	0.000016 TREE
1080	477896.9140	288261.3660	872.288	-0.079000	0.006241 TREE
1081	477898.1930	288258.3500	872.497	0.081000	0.006561 TREE
1082	477902.1130	288259.5470	872.395	0.100000	0.010000 TREE
1083	477905.1820	288260.9670	872.322	0.028000	0.000784 TREE
1084	477908.3210	288262.8840	872.270	-0.063000	0.003969 TREE
1085	477910.9840	288263.8440	872.362	0.067000	0.004489 TREE
1086	477912.4970	288258.6110	872.447	0.215000	0.046225 TREE
1087	477909.4940	288256.5670	872.318	-0.037000	0.001369 TREE
1088	477905.7960	288253.9390	872.443	0.168000	0.028224 TREE
1089	477903.5220	288251.9710	872.534	0.388000	0.150544 TREE
1090	477902.3010	288251.0440	872.551	0.330000	0.108900 TREE
1091	477902.6980	288247.8760	871.919	-0.243000	0.059049 TREE
1092	477905.3080	288249.7090	872.319	0.209000	0.043681 TREE
1093	477909.1460	288251.3880	872.407	0.276000	0.076176 TREE
1094	477913.2420	288253.5140	872.850	0.755000	0.570025 TREE
1095	477915.5580	288255.8410	872.486	0.255000	0.065025 TREE
1096	477901.3910	288255.3850	872.116	-0.193000	0.037249 TREE
1097	477899.0810	288258.6890	872.479	0.087000	0.007569 TREE
1098	477897.2150	288261.1810	872.591	0.230000	0.052900 TREE
1099	477910.7890	288268.2750	872.393	-0.011000	0.000121 TREE
1100	477916.8810	288255.5180	872.247	0.015000	0.000225 TREE
1126	496049.2070	284641.8700	898.134	0.109000	0.011881 ASPH
1127	496045.8720	284641.3960	898.110	0.224000	0.050176 ASPH

1128	496042.8880	284641.1460	898.002	0.152000	0.023104 ASPH
1129	496039.9060	284640.6480	897.959	0.163000	0.026569 ASPH
1130	496037.0990	284640.3600	897.919	0.122000	0.014884 ASPH
1131	496037.2280	284637.1520	897.885	0.173000	0.029929 ASPH
1132	496040.4360	284637.4630	897.976	0.264000	0.069696 ASPH
1133	496043.4450	284638.5240	898.024	0.275000	0.075625 ASPH
1134	496046.4540	284639.4070	898.074	0.221000	0.048841 ASPH
1135	496049.2920	284640.1700	898.134	0.153000	0.023409 ASPH
1136	496049.7760	284637.0770	898.104	0.154000	0.023716 ASPH
1137	496046.8190	284636.3900	898.056	0.121000	0.014641 ASPH
1138	496043.8800	284635.7730	898.015	0.140000	0.019600 ASPH
1139	496041.0440	284635.2430	897.967	0.155000	0.024025 ASPH
1140	496038.2430	284634.9810	897.885	0.091000	0.008281 ASPH
1141	496038.5010	284631.4510	897.892	0.228000	0.051984 ASPH
1142	496042.6590	284631.4320	897.947	0.253000	0.064009 ASPH
1143	496045.6910	284632.5070	898.025	0.201000	0.040401 ASPH
1144	496048.1400	284633.6640	898.067	0.219000	0.047961 ASPH
1145	496051.1830	284634.0980	898.093	0.261000	0.068121 ASPH
1146	496051.5330	284630.8260	898.082	0.080000	0.006400 ASPH
1147	496048.7670	284630.1840	898.070	0.136000	0.018496 ASPH
1148	496046.1310	284629.6140	898.031	0.151000	0.022801 ASPH
1149	496043.2840	284629.3430	897.969	0.134000	0.017956 ASPH
1150	496040.9910	284628.4860	897.951	0.170000	0.028900 ASPH
1151	496102.6910	284712.7760	898.660	-0.094000	0.008836 CONC
1152	496105.8770	284712.7770	898.623	-0.153000	0.023409 CONC
1153	496108.8280	284713.0250	898.580	-0.160000	0.025600 CONC
1154	496111.9060	284712.6710	898.660	-0.029000	0.000841 CONC
1155	496115.0690	284712.5750	898.570	-0.067000	0.004489 CONC
1156	496115.0380	284708.8350	898.593	-0.056000	0.003136 CONC
1157	496111.6860	284709.0790	898.645	-0.074000	0.005476 CONC
1158	496108.3800	284709.4510	898.631	-0.168000	0.028224 CONC
1159	496105.3990	284709.7720	898.703	-0.155000	0.024025 CONC
1160	496102.1770	284709.5260	898.674	-0.114000	0.012996 CONC
1161	496102.1580	284706.5640	898.681	-0.080000	0.006400 CONC
1162	496105.2980	284706.3570	898.651	-0.036000	0.001296 CONC
1163	496107.9300	284706.4040	898.552	-0.099000	0.009801 CONC
1164	496111.3190	284705.9900	898.602	-0.152000	0.023104 CONC
1165	496114.0890	284705.8850	898.531	-0.148000	0.021904 CONC
1166	496114.0990	284702.7770	898.578	-0.150000	0.022500 CONC
1167	496111.3330	284702.9310	898.611	-0.160000	0.025600 CONC
1168	496108.2490	284702.9480	898.669	-0.102000	0.010404 CONC
1169	496105.6230	284703.2910	898.662	-0.119000	0.014161 CONC
1170	496102.7790	284703.2710	898.689	-0.130000	0.016900 CONC
1171	496102.4810	284699.1220	898.696	-0.145000	0.021025 CONC
1172	496105.8800	284699.1680	898.637	-0.056000	0.003136 CONC
1173	496108.8620	284698.9090	898.606	-0.048000	0.002304 CONC
1174	496111.9170	284698.7300	898.568	-0.082000	0.006724 CONC
1175	496114.3910	284698.3740	898.582	-0.138000	0.019044 CONC
1176	466738.5010	279183.1620	967.793	-0.047000	0.002209 CK
1200	537265.9340	226639.6440	969.007	-0.125000	0.015625 CK
1201	537355.8750	226146.5340	979.472	-0.152000	0.023104 MOWED
1202	537355.7950	226143.2250	979.462	-0.053000	0.002809 MOWED

1203	537356.1290	226140.2780	979.549	-0.197000	0.038809	MOWED
1204	537356.3430	226137.2790	979.491	-0.077000	0.005929	MOWED
1205	537356.1590	226134.1100	979.625	-0.164000	0.026896	MOWED
1206	537353.3830	226134.4830	979.674	-0.100000	0.010000	MOWED
1207	537353.6070	226137.6790	979.630	-0.013000	0.000169	MOWED
1208	537353.4850	226140.1950	979.604	-0.136000	0.018496	MOWED
1209	537353.6360	226142.9880	979.551	0.022000	0.000484	MOWED
1210	537353.1500	226145.7660	979.530	-0.188000	0.035344	MOWED
1211	537350.1010	226145.5260	979.625	-0.186000	0.034596	MOWED
1212	537349.9880	226142.7660	979.688	0.075000	0.005625	MOWED
1213	537350.1810	226139.8200	979.672	-0.024000	0.000576	MOWED
1214	537349.9040	226137.1450	979.755	-0.129000	0.016641	MOWED
1215	537349.9780	226134.2990	979.817	-0.134000	0.017956	MOWED
1216	537346.6700	226134.3280	979.930	0.045000	0.002025	MOWED
1217	537346.9410	226137.4450	979.820	-0.106000	0.011236	MOWED
1218	537347.1550	226140.4970	979.772	0.011000	0.000121	MOWED
1219	537346.8250	226143.0330	979.722	0.019000	0.000361	MOWED
1220	537346.9900	226145.7540	979.681	-0.085000	0.007225	MOWED
1221	537343.4000	226145.6000	979.760	-0.018000	0.000324	MOWED
1222	537343.1540	226142.6660	979.814	0.022000	0.000484	MOWED
1223	537343.2450	226139.8160	979.866	0.013000	0.000169	MOWED
1224	537343.1470	226137.0570	979.938	-0.127000	0.016129	MOWED
1225	537343.1580	226134.2780	979.972	0.014000	0.000196	MOWED
1226	537413.1410	226410.0430	967.566	0.322000	0.103684	ASPH
1227	537413.1600	226407.3110	967.495	0.192000	0.036864	ASPH
1228	537412.9590	226404.5310	967.469	0.352000	0.123904	ASPH
1229	537412.6350	226401.4530	967.398	0.316000	0.099856	ASPH
1230	537412.8090	226398.9560	967.385	0.345000	0.119025	ASPH
1231	537415.8760	226399.1310	967.306	0.654000	0.427716	ASPH
1232	537416.0420	226402.2390	967.396	0.287000	0.082369	ASPH
1233	537416.3100	226405.1530	967.408	0.238000	0.056644	ASPH
1234	537416.2480	226407.6420	967.493	0.397000	0.157609	ASPH
1235	537416.3680	226410.4640	967.494	0.507000	0.257049	ASPH
1236	537419.7510	226409.9210	967.470	0.510000	0.260100	ASPH
1237	537419.6040	226406.5660	967.430	0.347000	0.120409	ASPH
1238	537419.2200	226403.8000	967.385	0.109000	0.011881	ASPH
1239	537419.3940	226401.0610	967.330	0.144000	0.020736	ASPH
1240	537419.2690	226398.7260	967.311	0.370000	0.136900	ASPH
1241	537422.3440	226398.1530	967.272	0.548000	0.300304	ASPH
1242	537422.6180	226400.7500	967.312	0.469000	0.219961	ASPH
1243	537422.6880	226403.6360	967.368	0.406000	0.164836	ASPH
1244	537423.0120	226406.2590	967.403	0.398000	0.158404	ASPH
1245	537423.1010	226408.5560	967.423	0.574000	0.329476	ASPH
1246	537425.8660	226408.1480	967.412	0.702000	0.492804	ASPH
1247	537425.6800	226405.6260	967.359	0.280000	0.078400	ASPH
1248	537425.7530	226403.0160	967.310	0.323000	0.104329	ASPH
1249	537425.7020	226400.7810	967.280	0.272000	0.073984	ASPH
1250	537425.6790	226397.9150	967.233	0.432000	0.186624	ASPH
1251	536057.5850	226889.3320	960.196	0.012000	0.000144	GRAV
1252	536057.8110	226892.5850	960.253	0.078000	0.006084	GRAV
1253	536057.4870	226895.3090	960.204	0.039000	0.001521	GRAV
1254	536057.7300	226898.2600	960.113	-0.001000	0.000001	GRAV

1255	536057.9830	226900.9690	960.041	0.078000	0.006084	GRAV
1256	536054.9380	226901.4970	959.975	-0.020000	0.000400	GRAV
1257	536054.2760	226898.0790	960.102	0.067000	0.004489	GRAV
1258	536054.3060	226895.2210	960.166	0.012000	0.000144	GRAV
1259	536054.0660	226892.5170	960.208	-0.045000	0.002025	GRAV
1260	536053.9320	226889.8110	960.194	0.055000	0.003025	GRAV
1261	536050.8220	226890.2620	960.207	0.050000	0.002500	GRAV
1262	536051.1960	226893.3850	960.245	0.054000	0.002916	GRAV
1263	536052.0150	226897.0060	960.112	0.040000	0.001600	GRAV
1264	536051.7370	226900.2520	960.060	0.034000	0.001156	GRAV
1265	536051.8120	226903.9740	959.958	-0.047000	0.002209	GRAV
1266	536048.7920	226904.3690	959.970	-0.018000	0.000324	GRAV
1267	536047.9770	226901.1600	959.976	0.053000	0.002809	GRAV
1268	536047.9040	226897.5950	960.078	0.009000	0.000081	GRAV
1269	536047.7330	226894.4460	960.194	0.021000	0.000441	GRAV
1270	536047.3020	226891.2570	960.197	0.012000	0.000144	GRAV
1271	536043.8030	226891.3720	960.196	0.119000	0.014161	GRAV
1272	536043.8200	226894.6490	960.165	0.060000	0.003600	GRAV
1273	536043.7030	226898.1570	960.097	0.082000	0.006724	GRAV
1274	536044.0510	226900.6340	960.045	0.180000	0.032400	GRAV
1275	536044.1350	226903.3080	960.080	0.151000	0.022801	GRAV
1276	535757.8370	226518.2050	957.485	-0.087000	0.007569	TALL
1277	535758.1950	226521.2050	956.931	-0.766000	0.586756	TALL
1278	535758.5220	226524.3130	957.126	-0.571000	0.326041	TALL
1279	535758.3760	226526.7480	956.865	-0.788000	0.620944	TALL
1280	535758.4050	226529.6250	957.271	-0.372000	0.138384	TALL
1281	535762.4170	226529.6500	957.217	-0.331000	0.109561	TALL
1282	535762.2390	226525.9230	957.261	-0.322000	0.103684	TALL
1283	535762.2020	226522.7600	957.426	-0.184000	0.033856	TALL
1284	535762.0140	226519.6930	957.217	-0.347000	0.120409	TALL
1285	535761.1890	226516.2750	957.352	-0.175000	0.030625	TALL
1286	535754.3550	226519.3330	957.448	-0.299000	0.089401	TALL
1287	535755.3330	226523.0110	957.329	-0.308000	0.094864	TALL
1288	535755.4920	226526.2440	957.375	-0.380000	0.144400	TALL
1289	535755.0580	226528.0430	957.563	-0.214000	0.045796	TALL
1290	535754.8140	226531.1120	957.157	-0.512000	0.262144	TALL
1291	535751.2940	226530.5910	957.407	-0.404000	0.163216	TALL
1292	535751.6550	226526.7750	957.493	-0.318000	0.101124	TALL
1293	535750.8850	226524.1100	957.562	-0.253000	0.064009	TALL
1294	535750.9740	226520.7240	957.129	-0.609000	0.370881	TALL
1295	535750.3150	226517.2920	957.036	-0.709000	0.502681	TALL
1296	535750.9590	226513.7060	957.088	-0.771000	0.594441	TALL
1297	535753.8310	226515.0360	957.115	-0.717000	0.514089	TALL
1298	535757.2350	226514.5590	957.433	-0.297000	0.088209	TALL
1299	535761.9810	226514.7460	957.444	-0.074000	0.005476	TALL
1300	535765.4180	226514.3700	957.052	-0.417000	0.173889	TALL
1301	532021.1110	222665.7000	964.162	0.105000	0.011025	BRUSH/LOW
1302	532021.5420	222661.5350	964.279	0.094000	0.008836	BRUSH/LOW
1303	532022.1610	222659.6660	964.433	0.091000	0.008281	BRUSH/LOW
1304	532022.6420	222655.9580	964.429	-0.201000	0.040401	BRUSH/LOW
1305	532022.3600	222653.0560	964.768	0.128000	0.016384	BRUSH/LOW
1306	532019.1210	222653.0230	964.430	0.189000	0.035721	BRUSH/LOW

1307	532019.4480	222656.3070	964.237	0.000000	0.000000	BRUSH/LOW
1308	532018.4480	222659.7570	963.959	-0.086000	0.007396	BRUSH/LOW
1309	532018.5820	222663.4590	964.112	0.241000	0.058081	BRUSH/LOW
1310	532018.2080	222666.0920	964.044	0.069000	0.004761	BRUSH/LOW
1311	532015.4380	222665.4610	963.863	-0.038000	0.001444	BRUSH/LOW
1312	532015.7830	222663.0670	964.068	0.180000	0.032400	BRUSH/LOW
1313	532015.5900	222660.0300	964.043	0.013000	0.000169	BRUSH/LOW
1314	532015.2250	222655.4930	964.247	0.158000	0.024964	BRUSH/LOW
1315	532015.4260	222652.8490	964.101	0.042000	0.001764	BRUSH/LOW
1316	532012.5370	222652.9740	964.038	0.130000	0.016900	BRUSH/LOW
1317	532013.2050	222655.7820	963.976	0.005000	0.000025	BRUSH/LOW
1318	532013.7760	222658.5200	963.933	0.029000	0.000841	BRUSH/LOW
1319	532013.7360	222660.8460	963.970	0.180000	0.032400	BRUSH/LOW
1320	532013.8740	222664.3750	963.963	0.164000	0.026896	BRUSH/LOW
1321	532010.4240	222663.7730	964.034	0.116000	0.013456	BRUSH/LOW
1322	532009.9360	222661.1340	963.966	0.212000	0.044944	BRUSH/LOW
1323	532009.6170	222657.7150	964.187	0.045000	0.002025	BRUSH/LOW
1324	532011.1370	222655.1160	964.202	0.180000	0.032400	BRUSH/LOW
1325	532011.7040	222652.5210	963.951	0.092000	0.008464	BRUSH/LOW
1326	532162.1920	222766.4920	964.703	-0.157000	0.024649	TREE
1327	532165.4560	222766.1510	964.556	-0.192000	0.036864	TREE
1328	532168.8310	222766.3190	964.730	-0.307000	0.094249	TREE
1329	532172.4190	222766.4050	964.752	-0.210000	0.044100	TREE
1330	532175.8680	222766.2440	964.588	-0.472000	0.222784	TREE
1331	532164.3380	222761.0160	964.808	-0.056000	0.003136	TREE
1332	532167.8060	222762.0530	964.802	-0.106000	0.011236	TREE
1333	532171.3640	222762.7770	965.024	-0.021000	0.000441	TREE
1334	532174.6260	222763.0900	965.005	-0.118000	0.013924	TREE
1335	532177.5880	222763.7500	965.217	-0.149000	0.022201	TREE
1336	532180.9590	222760.7180	965.283	-0.066000	0.004356	TREE
1337	532177.4300	222759.8820	965.471	0.203000	0.041209	TREE
1338	532173.9870	222758.8010	965.227	0.022000	0.000484	TREE
1339	532170.8020	222758.4200	965.091	-0.246000	0.060516	TREE
1340	532167.2440	222758.0050	964.914	-0.207000	0.042849	TREE
1341	532167.1510	222754.4640	964.972	-0.199000	0.039601	TREE
1342	532170.5280	222755.2370	964.976	-0.174000	0.030276	TREE
1343	532173.2940	222756.1270	965.239	-0.005000	0.000025	TREE
1344	532176.8970	222756.8530	965.164	-0.062000	0.003844	TREE
1345	532179.7830	222757.7610	965.138	-0.081000	0.006561	TREE
1346	532181.0770	222754.1760	965.055	-0.060000	0.003600	TREE
1347	532178.0340	222753.5100	965.103	0.060000	0.003600	TREE
1348	532174.2480	222753.0150	965.072	-0.012000	0.000144	TREE
1349	532171.0620	222752.4740	965.062	0.004000	0.000016	TREE
1350	532168.0680	222752.2370	964.771	-0.242000	0.058564	TREE
1351	502443.1290	219060.2100	805.325	-0.380000	0.144400	MOWED
1352	502443.0190	219063.4600	805.374	-0.282000	0.079524	MOWED
1353	502443.0310	219066.1410	805.386	-0.286000	0.081796	MOWED
1354	502443.2920	219069.0400	805.341	-0.306000	0.093636	MOWED
1355	502443.2990	219071.8370	805.353	-0.256000	0.065536	MOWED
1356	502439.8580	219071.7990	805.353	-0.230000	0.052900	MOWED
1357	502439.8540	219068.4690	805.362	-0.229000	0.052441	MOWED
1358	502439.6770	219065.5270	805.361	-0.208000	0.043264	MOWED

1359	502439.7490	219062.5730	805.372	-0.335000	0.112225	MOWED
1360	502439.8220	219059.6140	805.403	-0.236000	0.055696	MOWED
1361	502436.6040	219060.5940	805.281	-0.327000	0.106929	MOWED
1362	502436.6840	219063.6870	805.365	-0.348000	0.121104	MOWED
1363	502436.6350	219066.5350	805.393	-0.216000	0.046656	MOWED
1364	502434.9840	219069.1910	805.411	-0.287000	0.082369	MOWED
1365	502434.9750	219072.8990	805.401	-0.333000	0.110889	MOWED
1366	502431.0700	219073.8420	805.456	-0.220000	0.048400	MOWED
1367	502430.9650	219070.6490	805.413	-0.242000	0.058564	MOWED
1368	502431.0520	219067.7790	805.394	-0.277000	0.076729	MOWED
1369	502430.6970	219065.1020	805.486	-0.244000	0.059536	MOWED
1370	502430.6490	219062.1580	805.472	-0.204000	0.041616	MOWED
1371	502427.3290	219063.4350	805.527	-0.214000	0.045796	MOWED
1372	502426.8270	219066.1680	805.464	-0.236000	0.055696	MOWED
1373	502426.9930	219069.3110	805.426	-0.316000	0.099856	MOWED
1374	502427.4860	219071.8540	805.496	-0.286000	0.081796	MOWED
1375	502427.5330	219075.3750	805.492	-0.344000	0.118336	MOWED
1376	502541.5320	219044.7270	805.221	0.220000	0.048400	ASPH
1377	502543.4020	219042.8540	805.201	0.188000	0.035344	ASPH
1378	502545.2980	219040.8840	805.242	0.192000	0.036864	ASPH
1379	502547.4720	219038.8620	805.223	0.142000	0.020164	ASPH
1380	502549.6340	219036.6120	805.185	0.166000	0.027556	ASPH
1381	502552.0180	219038.8650	805.215	0.050000	0.002500	ASPH
1382	502550.0380	219041.5160	805.221	0.058000	0.003364	ASPH
1383	502547.8260	219043.7210	805.194	0.089000	0.007921	ASPH
1384	502545.6660	219045.1380	805.174	0.112000	0.012544	ASPH
1385	502543.6370	219047.2640	805.233	0.223000	0.049729	ASPH
1386	502546.2020	219049.4220	805.183	0.113000	0.012769	ASPH
1387	502548.2010	219047.3990	805.196	0.076000	0.005776	ASPH
1388	502550.3910	219045.1510	805.273	0.080000	0.006400	ASPH
1389	502552.7550	219042.6860	805.241	0.015000	0.000225	ASPH
1390	502555.4350	219041.1100	805.261	0.007000	0.000049	ASPH
1391	502556.7600	219043.0510	805.228	-0.075000	0.005625	ASPH
1392	502555.3960	219045.2150	805.181	-0.122000	0.014884	ASPH
1393	502552.8380	219047.6570	805.200	-0.080000	0.006400	ASPH
1394	502550.2830	219050.0940	805.167	-0.097000	0.009409	ASPH
1395	502548.2330	219051.6080	805.214	0.089000	0.007921	ASPH
1396	502550.2770	219053.8170	805.202	0.077000	0.005929	ASPH
1397	502552.1750	219051.6470	805.125	0.070000	0.004900	ASPH
1398	502554.3840	219049.6760	805.188	0.021000	0.000441	ASPH
1399	502556.3020	219047.2880	805.194	-0.062000	0.003844	ASPH
1400	502558.5180	219044.8580	805.217	-0.126000	0.015876	ASPH
1401	502411.3580	219019.9260	805.143	-0.151000	0.022801	TREE
1402	502414.6340	219019.3640	805.122	-0.134000	0.017956	TREE
1403	502418.9560	219018.4550	805.065	-0.176000	0.030976	TREE
1404	502423.8270	219016.1950	805.054	-0.365000	0.133225	TREE
1405	502427.2120	219014.9060	805.259	-0.120000	0.014400	TREE
1406	502430.9600	219012.6690	805.309	-0.251000	0.063001	TREE
1407	502430.6280	219014.2110	805.066	-0.404000	0.163216	TREE
1408	502427.3800	219015.8660	805.121	-0.182000	0.033124	TREE
1409	502424.3380	219017.8120	805.064	-0.154000	0.023716	TREE
1410	502420.1060	219020.5530	805.129	-0.165000	0.027225	TREE

1411	502415.2780	219021.1520	805.204	-0.076000	0.005776	TREE
1412	502410.3300	219021.6820	804.771	-0.509000	0.259081	TREE
1413	502411.6420	219024.9740	805.238	-0.229000	0.052441	TREE
1414	502415.8560	219023.7320	805.224	-0.025000	0.000625	TREE
1415	502418.8780	219023.1130	805.103	-0.095000	0.009025	TREE
1416	502422.5870	219022.4370	805.156	-0.051000	0.002601	TREE
1417	502425.8000	219020.9700	805.105	-0.185000	0.034225	TREE
1418	502428.8390	219019.2930	805.143	-0.192000	0.036864	TREE
1419	502432.4740	219017.5000	805.113	-0.306000	0.093636	TREE
1420	502433.8100	219022.0970	805.121	-0.303000	0.091809	TREE
1421	502430.4090	219022.8860	805.090	-0.347000	0.120409	TREE
1422	502427.2130	219024.8430	805.060	-0.279000	0.077841	TREE
1423	502423.1170	219026.8290	805.019	-0.331000	0.109561	TREE
1424	502418.6680	219027.9960	805.115	-0.322000	0.103684	TREE
1425	502415.0980	219029.6420	805.282	-0.158000	0.024964	TREE
1426	505799.8480	224587.5900	828.663	-0.641000	0.410881	TALL
1427	505801.5010	224584.7380	828.674	-0.534000	0.285156	TALL
1428	505802.7340	224582.6190	828.636	-0.544000	0.295936	TALL
1429	505804.0750	224580.5510	828.610	-0.496000	0.246016	TALL
1430	505805.8600	224578.4460	828.749	-0.477000	0.227529	TALL
1431	505807.5670	224580.1750	828.761	-0.554000	0.306916	TALL
1432	505806.1510	224582.0950	828.750	-0.499000	0.249001	TALL
1433	505804.5700	224584.3490	828.691	-0.563000	0.316969	TALL
1434	505802.9180	224587.1900	828.728	-0.633000	0.400689	TALL
1435	505801.1480	224589.8450	828.818	-0.550000	0.302500	TALL
1436	505803.1670	224591.8160	828.809	-0.587000	0.344569	TALL
1437	505804.3690	224588.8530	828.713	-0.747000	0.558009	TALL
1438	505806.3780	224586.6990	828.790	-0.600000	0.360000	TALL
1439	505808.5170	224583.0780	828.810	-0.560000	0.313600	TALL
1440	505809.8000	224580.5520	828.753	-0.485000	0.235225	TALL
1441	505812.1470	224581.6810	828.761	-0.543000	0.294849	TALL
1442	505810.5410	224584.9560	828.800	-0.543000	0.294849	TALL
1443	505808.4190	224587.6490	828.978	-0.471000	0.221841	TALL
1444	505807.1520	224590.3110	829.040	-0.466000	0.217156	TALL
1445	505805.6450	224592.3170	829.155	-0.496000	0.246016	TALL
1446	505807.2920	224594.3490	829.107	-0.510000	0.260100	TALL
1447	505809.4700	224591.7970	828.994	-0.588000	0.345744	TALL
1448	505810.2670	224590.1590	828.980	-0.549000	0.301401	TALL
1449	505812.0650	224587.4750	828.916	-0.559000	0.312481	TALL
1450	505813.2140	224585.6540	828.789	-0.570000	0.324900	TALL
1451	505816.9300	224342.2340	825.348	-0.471000	0.221841	BRUSH/LOW
1452	505819.3540	224342.7440	825.542	-0.440000	0.193600	BRUSH/LOW
1453	505823.5590	224342.9460	825.698	-0.331000	0.109561	BRUSH/LOW
1454	505824.8370	224344.7390	825.683	-0.375000	0.140625	BRUSH/LOW
1455	505826.9570	224346.5900	825.785	-0.402000	0.161604	BRUSH/LOW
1456	505828.2450	224343.2850	825.568	-0.738000	0.544644	BRUSH/LOW
1457	505825.8250	224342.0350	825.720	-0.474000	0.224676	BRUSH/LOW
1458	505823.6630	224340.3280	825.543	-0.496000	0.246016	BRUSH/LOW
1459	505819.0570	224338.9760	825.442	-0.535000	0.286225	BRUSH/LOW
1460	505816.6910	224339.3280	825.232	-0.463000	0.214369	BRUSH/LOW
1461	505817.3190	224336.0170	825.305	-0.446000	0.198916	BRUSH/LOW
1462	505819.9270	224336.5460	825.447	-0.421000	0.177241	BRUSH/LOW

1463	505824.2220	224337.7880	825.659	-0.525000	0.275625	BRUSH/LOW
1464	505825.8680	224339.8690	825.644	-0.730000	0.532900	BRUSH/LOW
1465	505827.6010	224340.6800	825.659	-0.823000	0.677329	BRUSH/LOW
1466	505829.3910	224336.3600	825.609	-0.645000	0.416025	BRUSH/LOW
1467	505827.3110	224335.9000	825.664	-0.357000	0.127449	BRUSH/LOW
1468	505825.3010	224335.2690	825.607	-0.330000	0.108900	BRUSH/LOW
1469	505822.6900	224334.2560	825.486	-0.367000	0.134689	BRUSH/LOW
1470	505820.2810	224333.5130	825.318	-0.470000	0.220900	BRUSH/LOW
1471	505820.5360	224329.7550	825.296	-0.483000	0.233289	BRUSH/LOW
1472	505824.2520	224330.8240	825.432	-0.366000	0.133956	BRUSH/LOW
1473	505827.0690	224331.6370	825.461	-0.377000	0.142129	BRUSH/LOW
1474	505830.3360	224332.7740	825.670	-0.470000	0.220900	BRUSH/LOW
1475	505834.1520	224333.4280	825.857	-0.416000	0.173056	BRUSH/LOW
1476	503029.0720	211095.8180	810.599	-0.624000	0.389376	CONC
1477	503030.2920	211093.1090	810.599	-0.618000	0.381924	CONC
1478	503031.6650	211090.8260	810.573	-0.556000	0.309136	CONC
1479	503033.1640	211088.4270	810.590	-0.476000	0.226576	CONC
1480	503034.3510	211085.9530	810.614	-0.599000	0.358801	CONC
1481	503031.8800	211084.5210	810.567	-0.652000	0.425104	CONC
1482	503030.5430	211087.4600	810.596	-0.652000	0.425104	CONC
1483	503029.1880	211089.9020	810.618	-0.547000	0.299209	CONC
1484	503027.9070	211091.9980	810.562	-0.705000	0.497025	CONC
1485	503026.5130	211094.3920	810.549	-0.696000	0.484416	CONC
1486	503023.9640	211092.6380	810.463	-0.790000	0.624100	CONC
1487	503025.6540	211090.4940	810.547	-0.662000	0.438244	CONC
1488	503026.9780	211087.9000	810.557	-0.681000	0.463761	CONC
1489	503028.0790	211085.3830	810.511	-0.756000	0.571536	CONC
1490	503029.5910	211083.0750	810.560	-0.687000	0.471969	CONC
1491	503030.6080	211080.6400	810.543	-0.701000	0.491401	CONC
1492	503027.9480	211079.1380	810.514	-0.793000	0.628849	CONC
1493	503026.4380	211081.6000	810.507	-0.771000	0.594441	CONC
1494	503025.2950	211084.4300	810.516	-0.771000	0.594441	CONC
1495	503023.9110	211086.7940	810.493	-0.765000	0.585225	CONC
1496	503021.3620	211084.8570	810.429	-0.865000	0.748225	CONC
1497	503022.9770	211082.5040	810.478	-0.800000	0.640000	CONC
1498	503024.2450	211080.1190	810.501	-0.820000	0.672400	CONC
1499	503025.4710	211078.0010	810.506	-0.775000	0.600625	CONC
1500	503026.8520	211075.7130	810.509	-0.765000	0.585225	CONC
1501	503397.9050	210803.6410	808.320	-0.331000	0.109561	GRAV
1502	503394.8510	210802.6230	808.400	-0.278000	0.077284	GRAV
1503	503392.3970	210801.6260	808.485	-0.288000	0.082944	GRAV
1504	503389.9360	210800.0930	808.593	-0.245000	0.060025	GRAV
1505	503387.3650	210798.9040	808.668	-0.304000	0.092416	GRAV
1506	503388.8520	210796.3300	808.743	-0.224000	0.050176	GRAV
1507	503391.2120	210797.4850	808.585	-0.292000	0.085264	GRAV
1508	503393.5690	210798.8560	808.571	-0.201000	0.040401	GRAV
1509	503395.7740	210799.5910	808.491	-0.312000	0.097344	GRAV
1510	503397.7710	210800.9800	808.407	-0.436000	0.190096	GRAV
1511	503399.2550	210798.2250	808.469	-0.354000	0.125316	GRAV
1512	503396.7270	210796.9460	808.599	-0.221000	0.048841	GRAV
1513	503394.1880	210795.7480	808.675	-0.297000	0.088209	GRAV
1514	503391.7760	210794.6120	808.723	-0.168000	0.028224	GRAV

1515	503389.5200	210793.4750	808.740	-0.150000	0.022500	GRAV
1516	503390.8810	210790.7470	808.772	-0.113000	0.012769	GRAV
1517	503393.4270	210791.5090	808.742	-0.123000	0.015129	GRAV
1518	503395.6260	210792.8640	808.709	-0.154000	0.023716	GRAV
1519	503398.2280	210793.6910	808.578	-0.257000	0.066049	GRAV
1520	503400.5920	210794.7410	808.541	-0.271000	0.073441	GRAV
1521	503401.4890	210791.6460	808.566	-0.315000	0.099225	GRAV
1522	503398.9330	210790.5440	808.597	-0.273000	0.074529	GRAV
1523	503396.6740	210789.7720	808.730	-0.244000	0.059536	GRAV
1524	503394.1510	210788.6450	808.761	-0.235000	0.055225	GRAV
1525	503391.8060	210787.1340	808.769	-0.215000	0.046225	GRAV
1526	506339.2190	220863.9280	826.872	-0.452000	0.204304	CK
1550	546825.1050	301093.6340	948.587	0.392000	0.153664	CK
1551	547535.3470	322303.1830	868.513	-1.544000	2.383936	TREE
1552	547535.5340	322306.8740	868.592	-1.712000	2.930944	TREE
1553	547535.6630	322309.8750	868.512	-1.656000	2.742336	TREE
1554	547535.7650	322313.7660	868.651	-1.707000	2.913849	TREE
1555	547538.9960	322313.3160	868.518	-1.669000	2.785561	TREE
1556	547538.4420	322309.3130	868.811	-1.533000	2.350089	TREE
1557	547537.9650	322305.3020	868.623	-1.525000	2.325625	TREE
1558	547529.1940	322301.7230	868.331	-1.418000	2.010724	TREE
1559	547530.2780	322304.9040	868.558	-1.336000	1.784896	TREE
1560	547531.3800	322308.6560	868.593	-1.337000	1.787569	TREE
1561	547531.6180	322312.4800	868.372	-1.618000	2.617924	TREE
1562	547526.2430	322303.3620	868.510	-1.488000	2.214144	TREE
1563	547526.4350	322307.1870	868.417	-1.462000	2.137444	TREE
1564	547527.8380	322311.2300	868.634	-1.443000	2.082249	TREE
1565	547526.6650	322299.2190	868.570	-1.426000	2.033476	TREE
1566	547529.9390	322299.1630	868.542	-1.111000	1.234321	TREE
1567	547529.6870	322296.5560	868.723	-0.818000	0.669124	TREE
1568	547532.7050	322296.5270	868.627	-1.123000	1.261129	TREE
1569	547532.6040	322299.5530	868.679	-1.213000	1.471369	TREE
1570	547535.2880	322300.3720	868.668	-1.429000	2.042041	TREE
1571	547535.1640	322296.3940	868.541	-1.283000	1.646089	TREE
1572	547537.9950	322296.7350	868.510	-1.256000	1.577536	TREE
1573	547538.2680	322300.0030	868.880	-1.145000	1.311025	TREE
1576	547406.6880	322037.4560	869.286	-0.876000	0.767376	TALL
1577	547403.1880	322036.9870	869.462	-0.675000	0.455625	TALL
1578	547399.3170	322036.6640	869.405	-0.678000	0.459684	TALL
1579	547396.5010	322035.9240	869.574	-0.606000	0.367236	TALL
1580	547393.2700	322035.4910	869.705	-0.506000	0.256036	TALL
1581	547393.6180	322032.1040	869.525	-0.630000	0.396900	TALL
1582	547397.3550	322033.1400	869.617	-0.601000	0.361201	TALL
1583	547400.4580	322033.5730	869.441	-0.688000	0.473344	TALL
1584	547403.8650	322034.2220	869.546	-0.494000	0.244036	TALL
1585	547406.7270	322034.9500	869.460	-0.615000	0.378225	TALL
1586	547406.6380	322031.3180	869.428	-0.718000	0.515524	TALL
1587	547402.8240	322031.2030	869.454	-0.686000	0.470596	TALL
1588	547399.5250	322030.7030	869.565	-0.625000	0.390625	TALL
1589	547396.2540	322029.2500	869.681	-0.460000	0.211600	TALL
1590	547393.2190	322028.1430	869.582	-0.547000	0.299209	TALL
1591	547393.6480	322024.5510	869.609	-0.581000	0.337561	TALL

1592	547396.6780	322025.4670	869.572	-0.668000	0.446224 TALL
1593	547400.1410	322026.2960	869.565	-0.687000	0.471969 TALL
1594	547403.1600	322026.9650	869.493	-0.753000	0.567009 TALL
1595	547406.7030	322026.9600	869.449	-0.695000	0.483025 TALL
1596	547406.4010	322022.8200	869.495	-0.524000	0.274576 TALL
1597	547402.5940	322022.7680	869.486	-0.760000	0.577600 TALL
1598	547398.9420	322022.6430	869.523	-0.646000	0.417316 TALL
1599	547395.6830	322021.6270	869.566	-0.580000	0.336400 TALL
1600	547392.7850	322020.8430	869.652	-0.545000	0.297025 TALL
1601	547581.5360	321975.2940	868.834	-0.505000	0.255025 BRUSH/LOW
1602	547577.9800	321974.8410	869.107	-0.562000	0.315844 BRUSH/LOW
1603	547574.9930	321974.7310	869.489	-0.680000	0.462400 BRUSH/LOW
1604	547571.8060	321975.4010	869.383	-0.601000	0.361201 BRUSH/LOW
1605	547568.7860	321974.6790	869.274	-0.582000	0.338724 BRUSH/LOW
1606	547568.0660	321978.6350	869.374	-0.426000	0.181476 BRUSH/LOW
1607	547571.2440	321979.3490	869.461	-0.494000	0.244036 BRUSH/LOW
1608	547575.6230	321979.0100	869.363	-0.740000	0.547600 BRUSH/LOW
1609	547579.7920	321979.0380	868.898	-0.599000	0.358801 BRUSH/LOW
1610	547583.5570	321978.9040	868.798	-0.675000	0.455625 BRUSH/LOW
1611	547583.5520	321982.3760	869.076	-0.487000	0.237169 BRUSH/LOW
1612	547579.7050	321982.5680	868.946	-0.512000	0.262144 BRUSH/LOW
1613	547575.8220	321982.3740	869.245	-0.725000	0.525625 BRUSH/LOW
1614	547571.3990	321983.0690	869.520	-0.481000	0.231361 BRUSH/LOW
1615	547567.7100	321983.8560	869.472	-0.423000	0.178929 BRUSH/LOW
1616	547568.4550	321986.9780	869.312	-0.591000	0.349281 BRUSH/LOW
1617	547571.2040	321987.3810	869.550	-0.448000	0.200704 BRUSH/LOW
1618	547574.9230	321987.0080	869.315	-0.628000	0.394384 BRUSH/LOW
1619	547578.7460	321986.6110	868.979	-0.697000	0.485809 BRUSH/LOW
1620	547583.5480	321986.9300	868.972	-0.689000	0.474721 BRUSH/LOW
1621	547583.6970	321990.5200	869.014	-0.629000	0.395641 BRUSH/LOW
1622	547579.8290	321990.6870	869.119	-0.653000	0.426409 BRUSH/LOW
1623	547576.2430	321989.9230	869.525	-0.440000	0.193600 BRUSH/LOW
1624	547572.0620	321989.9320	869.644	-0.424000	0.179776 BRUSH/LOW
1625	547568.9730	321989.6820	869.328	-0.638000	0.407044 BRUSH/LOW
1626	550576.2980	323711.6790	882.985	-0.052000	0.002704 ASPH
1627	550576.6580	323708.4990	882.999	-0.237000	0.056169 ASPH
1628	550576.4790	323705.3850	883.013	-0.138000	0.019044 ASPH
1629	550576.3670	323702.7880	883.002	-0.117000	0.013689 ASPH
1630	550576.3870	323699.6390	883.022	-0.137000	0.018769 ASPH
1631	550572.9130	323700.0930	883.179	-0.071000	0.005041 ASPH
1632	550573.3550	323703.6010	883.156	-0.128000	0.016384 ASPH
1633	550573.6470	323706.4040	883.149	-0.146000	0.021316 ASPH
1634	550573.2840	323709.0300	883.139	-0.078000	0.006084 ASPH
1635	550573.5220	323711.8530	883.124	-0.072000	0.005184 ASPH
1636	550570.5340	323711.2410	883.177	-0.063000	0.003969 ASPH
1637	550570.2290	323708.3050	883.191	-0.103000	0.010609 ASPH
1638	550570.3830	323705.3320	883.188	-0.074000	0.005476 ASPH
1639	550570.3550	323702.6550	883.188	-0.097000	0.009409 ASPH
1640	550570.2440	323699.9670	883.210	-0.091000	0.008281 ASPH
1641	550566.9340	323700.1650	883.206	-0.153000	0.023409 ASPH
1642	550566.8540	323703.8460	883.190	-0.196000	0.038416 ASPH
1643	550567.1410	323706.7720	883.192	-0.165000	0.027225 ASPH

1644	550567.0890	323709.6790	883.187	-0.146000	0.021316 ASPH
1645	550567.1610	323712.3320	883.161	-0.178000	0.031684 ASPH
1646	550563.7960	323712.0710	883.124	-0.133000	0.017689 ASPH
1647	550563.7060	323708.8040	883.130	-0.267000	0.071289 ASPH
1648	550563.6440	323706.1710	883.144	-0.214000	0.045796 ASPH
1649	550563.4440	323703.4160	883.130	-0.207000	0.042849 ASPH
1650	550563.3580	323700.5430	883.154	-0.130000	0.016900 ASPH
1651	546271.6350	322209.5200	876.826	-0.048000	0.002304 GRAV
1652	546272.9320	322206.4050	876.892	0.013000	0.000169 GRAV
1653	546274.2370	322203.3930	876.937	0.055000	0.003025 GRAV
1654	546275.0760	322200.9490	876.950	0.030000	0.000900 GRAV
1655	546276.4560	322198.2010	876.934	0.050000	0.002500 GRAV
1656	546277.8380	322195.3580	877.031	-0.004000	0.000016 GRAV
1657	546274.8190	322193.9450	876.869	0.052000	0.002704 GRAV
1658	546273.6210	322196.9200	876.810	0.042000	0.001764 GRAV
1659	546272.2320	322199.3700	876.789	-0.026000	0.000676 GRAV
1660	546271.1470	322201.9770	876.708	-0.034000	0.001156 GRAV
1661	546270.0530	322204.6270	876.783	0.030000	0.000900 GRAV
1662	546269.1760	322207.1070	876.717	-0.045000	0.002025 GRAV
1663	546266.1870	322205.4430	876.643	-0.019000	0.000361 GRAV
1664	546267.2440	322202.5690	876.603	-0.082000	0.006724 GRAV
1665	546268.5830	322200.0360	876.707	0.019000	0.000361 GRAV
1666	546269.3720	322197.5980	876.717	-0.037000	0.001369 GRAV
1667	546270.7920	322195.1830	876.717	-0.094000	0.008836 GRAV
1668	546271.5050	322192.4160	876.758	0.062000	0.003844 GRAV
1669	546269.1230	322191.1910	876.703	0.009000	0.000081 GRAV
1670	546268.2340	322194.6550	876.655	-0.101000	0.010201 GRAV
1671	546267.0260	322197.2500	876.630	-0.027000	0.000729 GRAV
1672	546265.9630	322199.8400	876.584	-0.110000	0.012100 GRAV
1673	546264.6780	322202.1540	876.581	-0.094000	0.008836 GRAV
1674	546263.8980	322204.5640	876.558	-0.051000	0.002601 GRAV
1675	546266.9060	322209.3670	876.708	-0.006000	0.000036 GRAV
1676	546241.8910	322149.4860	876.042	-0.082000	0.006724 MOWED
1677	546241.8470	322146.2850	876.023	-0.148000	0.021904 MOWED
1678	546241.7140	322142.9890	876.070	-0.121000	0.014641 MOWED
1679	546241.5310	322140.2760	876.047	-0.090000	0.008100 MOWED
1680	546241.1080	322137.1260	875.968	-0.150000	0.022500 MOWED
1681	546238.1020	322137.4270	875.999	-0.051000	0.002601 MOWED
1682	546238.6410	322140.8910	876.012	-0.025000	0.000625 MOWED
1683	546239.2930	322143.6050	876.031	-0.022000	0.000484 MOWED
1684	546239.4290	322146.7560	875.994	-0.085000	0.007225 MOWED
1685	546239.6670	322149.1280	875.975	-0.070000	0.004900 MOWED
1686	546236.9390	322149.8330	875.851	-0.101000	0.010201 MOWED
1687	546236.3610	322146.7960	875.891	-0.091000	0.008281 MOWED
1688	546236.2960	322144.0410	875.869	-0.109000	0.011881 MOWED
1689	546236.2550	322141.2280	875.894	-0.017000	0.000289 MOWED
1690	546235.6620	322138.2860	875.868	-0.067000	0.004489 MOWED
1691	546232.7230	322138.5690	875.800	-0.115000	0.013225 MOWED
1692	546232.9050	322141.8120	875.794	-0.059000	0.003481 MOWED
1693	546233.2750	322144.5180	875.759	-0.159000	0.025281 MOWED
1694	546233.7670	322147.4370	875.787	-0.101000	0.010201 MOWED
1695	546234.0560	322150.1980	875.735	-0.121000	0.014641 MOWED

1696	546231.1010	322150.6050	875.713	-0.124000	0.015376	MOWED
1697	546230.4020	322147.3340	875.732	-0.168000	0.028224	MOWED
1698	546230.1540	322144.0470	875.726	-0.240000	0.057600	MOWED
1699	546229.7630	322141.0890	875.708	-0.220000	0.048400	MOWED
1700	546229.4950	322137.8800	875.771	-0.171000	0.029241	MOWED
1701	546825.1870	301093.7280	948.433	0.217000	0.047089	CK
1725	439046.0730	310104.7900	956.767	-0.667000	0.444889	CK
1726	418459.0880	303083.1590	907.525	0.054000	0.002916	ASPH
1727	418459.2910	303080.0360	907.498	0.057000	0.003249	ASPH
1728	418459.3780	303077.5470	907.485	0.033000	0.001089	ASPH
1729	418459.2380	303074.7380	907.566	0.134000	0.017956	ASPH
1730	418459.6340	303072.0490	907.416	0.011000	0.000121	ASPH
1731	418462.5820	303072.0680	907.304	-0.100000	0.010000	ASPH
1732	418462.4210	303075.4880	907.291	-0.070000	0.004900	ASPH
1733	418462.5370	303078.0240	907.304	-0.047000	0.002209	ASPH
1734	418462.3820	303080.9150	907.322	-0.109000	0.011881	ASPH
1735	418462.5010	303083.6420	907.360	-0.071000	0.005041	ASPH
1736	418465.5620	303083.1620	907.307	-0.081000	0.006561	ASPH
1737	418465.2130	303080.0390	907.241	-0.144000	0.020736	ASPH
1738	418465.3980	303077.7660	907.263	-0.035000	0.001225	ASPH
1739	418465.5030	303075.0600	907.283	-0.089000	0.007921	ASPH
1740	418465.5820	303072.4460	907.268	-0.088000	0.007744	ASPH
1741	418468.5350	303072.5640	907.208	-0.144000	0.020736	ASPH
1742	418468.5100	303075.6180	907.227	-0.114000	0.012996	ASPH
1743	418468.5890	303078.4170	907.262	-0.007000	0.000049	ASPH
1744	418468.2450	303081.0550	907.215	-0.025000	0.000625	ASPH
1745	418468.8340	303083.7040	907.213	0.016000	0.000256	ASPH
1746	418472.1720	303083.6590	907.148	-0.063000	0.003969	ASPH
1747	418472.0790	303080.4470	907.186	-0.044000	0.001936	ASPH
1748	418472.2380	303077.9390	907.222	-0.021000	0.000441	ASPH
1749	418472.2890	303075.0340	907.230	0.025000	0.000625	ASPH
1750	418472.5510	303072.4400	907.206	0.015000	0.000225	ASPH
1751	418374.5420	303086.9710	909.426	-0.092000	0.008464	MOWED
1752	418374.8060	303083.2540	909.314	-0.144000	0.020736	MOWED
1753	418375.2410	303080.7680	909.398	0.025000	0.000625	MOWED
1754	418375.5820	303077.9390	909.403	-0.101000	0.010201	MOWED
1755	418375.9570	303075.0930	909.454	-0.053000	0.002809	MOWED
1756	418372.3930	303074.7240	909.517	-0.089000	0.007921	MOWED
1757	418372.4230	303078.1210	909.436	-0.119000	0.014161	MOWED
1758	418372.3490	303080.9280	909.403	-0.097000	0.009409	MOWED
1759	418372.1170	303083.8690	909.459	-0.080000	0.006400	MOWED
1760	418371.9670	303086.6210	909.546	-0.069000	0.004761	MOWED
1761	418368.3360	303086.6050	909.652	-0.111000	0.012321	MOWED
1762	418368.5090	303083.2260	909.634	-0.118000	0.013924	MOWED
1763	418368.9510	303080.1410	909.556	-0.112000	0.012544	MOWED
1764	418368.8870	303077.0810	909.564	-0.086000	0.007396	MOWED
1765	418369.0030	303073.8180	909.542	-0.070000	0.004900	MOWED
1766	418365.4560	303073.6450	909.650	-0.107000	0.011449	MOWED
1767	418365.3300	303077.0890	909.646	-0.119000	0.014161	MOWED
1768	418365.2140	303080.2970	909.666	-0.078000	0.006084	MOWED
1769	418365.3240	303083.5050	909.701	-0.091000	0.008281	MOWED
1770	418365.1080	303086.3060	909.745	-0.151000	0.022801	MOWED

1771	418361.9730	303086.1040	909.983	-0.052000	0.002704	MOWED
1772	418362.1630	303082.7520	909.852	-0.096000	0.009216	MOWED
1773	418362.1540	303079.7830	909.794	-0.181000	0.032761	MOWED
1774	418362.4670	303077.0620	909.827	-0.117000	0.013689	MOWED
1775	418362.4470	303074.3550	909.837	-0.075000	0.005625	MOWED
1776	418468.3860	303161.4600	907.403	0.193000	0.037249	CONC
1777	418468.3680	303158.5840	907.499	0.218000	0.047524	CONC
1778	418468.5160	303155.7390	907.399	0.089000	0.007921	CONC
1779	418468.5230	303152.5150	907.551	0.212000	0.044944	CONC
1780	418468.8660	303149.9300	907.508	0.168000	0.028224	CONC
1781	418472.0280	303150.3590	907.401	0.170000	0.028900	CONC
1782	418471.5440	303153.8160	907.319	0.025000	0.000625	CONC
1783	418471.5370	303156.6510	907.311	0.034000	0.001156	CONC
1784	418471.3790	303159.8450	907.271	0.069000	0.004761	CONC
1785	418471.6540	303162.6930	907.251	0.095000	0.009025	CONC
1786	418475.0480	303162.5360	907.099	0.042000	0.001764	CONC
1787	418474.9160	303159.0750	907.089	0.033000	0.001089	CONC
1788	418474.9170	303156.4010	907.242	0.135000	0.018225	CONC
1789	418474.8200	303153.6530	907.232	0.035000	0.001225	CONC
1790	418475.2270	303150.7860	907.307	0.198000	0.039204	CONC
1791	418478.0550	303150.7620	907.108	0.142000	0.020164	CONC
1792	418478.1740	303153.7580	906.934	-0.082000	0.006724	CONC
1793	418477.7340	303156.4070	907.017	-0.061000	0.003721	CONC
1794	418477.7790	303159.5490	906.928	-0.067000	0.004489	CONC
1795	418477.9010	303162.6210	906.873	-0.092000	0.008464	CONC
1796	418481.1980	303162.2860	906.734	-0.062000	0.003844	CONC
1797	418480.7220	303158.8080	906.782	-0.085000	0.007225	CONC
1798	418480.5550	303156.0620	906.907	0.041000	0.001681	CONC
1799	418480.8270	303152.9360	906.807	-0.036000	0.001296	CONC
1800	418480.6680	303150.2000	907.002	0.143000	0.020449	CONC
1801	418864.3580	306316.1320	897.343	-0.333000	0.110889	TREE
1802	418860.8660	306316.0110	897.454	-0.138000	0.019044	TREE
1803	418857.1840	306315.4260	897.389	-0.235000	0.055225	TREE
1804	418853.9140	306314.7380	897.531	-0.172000	0.029584	TREE
1805	418851.1790	306315.1010	897.571	-0.237000	0.056169	TREE
1806	418851.1400	306318.1870	897.312	-0.450000	0.202500	TREE
1807	418855.1840	306317.3120	897.336	-0.287000	0.082369	TREE
1808	418858.9690	306316.7880	897.323	-0.215000	0.046225	TREE
1809	418862.4140	306316.4000	897.299	-0.357000	0.127449	TREE
1810	418865.8800	306315.0930	897.410	-0.189000	0.035721	TREE
1811	418866.0950	306318.6190	897.264	-0.212000	0.044944	TREE
1812	418863.0780	306319.0230	897.216	-0.268000	0.071824	TREE
1813	418859.8820	306319.0790	897.289	-0.168000	0.028224	TREE
1814	418855.8410	306318.7780	897.141	-0.382000	0.145924	TREE
1815	418852.3380	306319.1820	897.366	-0.265000	0.070225	TREE
1816	418852.5200	306322.9350	897.251	-0.255000	0.065025	TREE
1817	418855.9230	306322.0940	897.166	-0.272000	0.073984	TREE
1818	418859.4340	306321.3770	897.283	-0.135000	0.018225	TREE
1819	418863.7080	306321.1830	897.326	-0.085000	0.007225	TREE
1820	418863.7880	306324.6750	897.168	-0.286000	0.081796	TREE
1821	418860.4980	306324.3440	897.100	-0.331000	0.109561	TREE
1822	418856.8620	306324.4830	897.177	-0.253000	0.064009	TREE

1823	418853.0550	306325.3850	897.229	-0.274000	0.075076	TREE
1824	418849.1730	306325.3740	897.313	-0.253000	0.064009	TREE
1825	418845.2830	306325.9060	897.448	-0.216000	0.046656	TREE
1826	419782.6550	305786.8680	898.377	-0.096000	0.009216	GRAV
1827	419779.6770	305786.7040	898.376	-0.006000	0.000036	GRAV
1828	419776.5650	305786.3850	898.393	0.092000	0.008464	GRAV
1829	419773.8450	305786.2110	898.363	0.019000	0.000361	GRAV
1830	419771.0020	305786.1870	898.335	0.014000	0.000196	GRAV
1831	419770.8170	305789.2080	898.358	0.111000	0.012321	GRAV
1832	419773.8590	305789.6400	898.349	0.047000	0.002209	GRAV
1833	419776.7610	305789.3520	898.314	0.024000	0.000576	GRAV
1834	419779.4630	305789.5550	898.328	-0.010000	0.000100	GRAV
1835	419782.2290	305789.1920	898.331	-0.058000	0.003364	GRAV
1836	419782.4450	305792.7510	898.384	0.090000	0.008100	GRAV
1837	419779.3510	305792.5920	898.315	-0.009000	0.000081	GRAV
1838	419776.4800	305792.0760	898.350	0.051000	0.002601	GRAV
1839	419773.8270	305792.3330	898.322	-0.060000	0.003600	GRAV
1840	419770.9070	305792.0730	898.326	0.039000	0.001521	GRAV
1841	419770.5780	305795.2700	898.353	0.010000	0.000100	GRAV
1842	419773.6640	305795.4380	898.364	-0.060000	0.003600	GRAV
1843	419776.5810	305795.2400	898.368	-0.012000	0.000144	GRAV
1844	419779.5530	305795.4460	898.344	-0.039000	0.001521	GRAV
1845	419782.0480	305795.5210	898.390	0.024000	0.000576	GRAV
1846	419781.7280	305798.4710	898.392	-0.043000	0.001849	GRAV
1847	419778.5510	305798.2220	898.386	-0.049000	0.002401	GRAV
1848	419775.6890	305797.8340	898.362	-0.128000	0.016384	GRAV
1849	419772.8300	305797.8670	898.334	-0.051000	0.002601	GRAV
1850	419770.0560	305797.2900	898.289	-0.070000	0.004900	GRAV
1851	420272.0140	305526.4160	896.745	-0.765000	0.585225	TALL
1852	420274.0090	305523.6950	896.701	-0.832000	0.692224	TALL
1853	420275.8120	305521.2000	896.588	-0.957000	0.915849	TALL
1854	420278.2420	305518.9310	896.584	-0.846000	0.715716	TALL
1855	420280.5020	305516.4480	896.413	-1.166000	1.359556	TALL
1856	420278.2230	305514.2420	896.637	-0.779000	0.606841	TALL
1857	420276.2650	305516.0870	896.572	-1.038000	1.077444	TALL
1858	420274.3190	305517.8150	896.705	-1.112000	1.236544	TALL
1859	420272.4350	305519.6130	896.690	-1.039000	1.079521	TALL
1860	420270.9340	305522.0860	896.691	-0.852000	0.725904	TALL
1861	420268.3600	305519.8810	896.674	-0.789000	0.622521	TALL
1862	420270.6060	305517.8240	896.686	-0.921000	0.848241	TALL
1863	420273.1920	305516.2620	896.740	-0.924000	0.853776	TALL
1864	420275.0980	305513.7470	896.682	-0.860000	0.739600	TALL
1865	420276.6170	305512.1920	896.715	-0.945000	0.893025	TALL
1866	420282.2370	305519.3440	896.479	-1.080000	1.166400	TALL
1867	420280.4690	305521.3400	896.484	-1.278000	1.633284	TALL
1868	420278.7900	305523.1830	896.520	-1.090000	1.188100	TALL
1869	420277.1580	305524.7850	896.624	-0.724000	0.524176	TALL
1870	420275.6270	305526.4910	896.632	-0.725000	0.525625	TALL
1871	420278.5690	305528.6320	896.560	-0.947000	0.896809	TALL
1872	420279.9950	305525.5040	896.549	-1.127000	1.270129	TALL
1873	420281.6690	305523.1500	896.450	-1.332000	1.774224	TALL
1874	420283.7610	305520.8420	896.352	-1.383000	1.912689	TALL

1875	420276.0400	305530.7830	896.750	-1.011000	1.022121 TALL
1876	420315.1430	305533.8950	896.561	-1.104000	1.218816 BRUSH/LOW
1877	420317.2910	305532.5050	896.377	-1.303000	1.697809 BRUSH/LOW
1878	420319.9130	305531.6080	896.511	-0.983000	0.966289 BRUSH/LOW
1879	420322.9580	305530.5790	896.578	-0.938000	0.879844 BRUSH/LOW
1880	420325.6410	305529.2640	896.465	-1.047000	1.096209 BRUSH/LOW
1881	420327.6120	305530.4670	896.257	-1.274000	1.623076 BRUSH/LOW
1882	420325.8110	305532.5010	896.646	-0.844000	0.712336 BRUSH/LOW
1883	420322.7810	305533.9250	896.365	-1.072000	1.149184 BRUSH/LOW
1884	420320.0490	305535.9390	896.414	-1.315000	1.729225 BRUSH/LOW
1885	420318.1410	305537.6540	896.456	-1.016000	1.032256 BRUSH/LOW
1886	420319.8320	305540.3900	896.563	-0.914000	0.835396 BRUSH/LOW
1887	420321.7890	305538.2120	896.481	-0.819000	0.670761 BRUSH/LOW
1888	420324.0580	305536.1940	896.477	-0.998000	0.996004 BRUSH/LOW
1889	420326.5920	305533.9240	896.197	-1.278000	1.633284 BRUSH/LOW
1890	420329.8250	305531.0680	896.337	-1.326000	1.758276 BRUSH/LOW
1891	420331.4080	305533.7030	896.447	-1.291000	1.666681 BRUSH/LOW
1892	420329.7320	305536.1540	896.467	-1.180000	1.392400 BRUSH/LOW
1893	420327.1000	305537.8350	896.429	-1.099000	1.207801 BRUSH/LOW
1894	420323.7300	305539.6950	896.582	-0.847000	0.717409 BRUSH/LOW
1895	420321.3930	305541.2500	896.738	-0.959000	0.919681 BRUSH/LOW
1896	420322.6730	305543.5560	896.770	-0.939000	0.881721 BRUSH/LOW
1897	420325.6420	305541.5110	896.453	-0.902000	0.813604 BRUSH/LOW
1898	420329.3340	305539.9380	896.282	-0.954000	0.910116 BRUSH/LOW
1899	420332.5170	305538.0990	896.500	-0.996000	0.992016 BRUSH/LOW
1900	420335.2420	305536.8770	896.409	-1.125000	1.265625 BRUSH/LOW
1901	439046.2120	310104.8200	956.833	-0.604000	0.364816 CK
1926	420918.1450	223608.7630	923.900	-0.601000	0.361201 BRUSH/LOW
1927	420921.1120	223608.9980	924.346	-0.224000	0.050176 BRUSH/LOW
1928	420923.6290	223609.1980	924.224	-0.583000	0.339889 BRUSH/LOW
1929	420926.4290	223608.5510	924.260	-0.760000	0.577600 BRUSH/LOW
1930	420928.9400	223608.2170	924.249	-0.514000	0.264196 BRUSH/LOW
1931	420929.7240	223610.8820	924.166	-0.722000	0.521284 BRUSH/LOW
1932	420926.5170	223610.8400	924.122	-0.803000	0.644809 BRUSH/LOW
1933	420923.3510	223612.1540	923.715	-0.780000	0.608400 BRUSH/LOW
1934	420918.6270	223612.9860	923.861	-0.477000	0.227529 BRUSH/LOW
1935	420914.5010	223613.3600	923.606	-0.418000	0.174724 BRUSH/LOW
1936	420913.9400	223616.3730	923.305	-0.646000	0.417316 BRUSH/LOW
1937	420917.6480	223615.0790	923.577	-0.475000	0.225625 BRUSH/LOW
1938	420921.2560	223616.0190	923.519	-0.401000	0.160801 BRUSH/LOW
1939	420924.0680	223615.4070	923.400	-0.659000	0.434281 BRUSH/LOW
1940	420926.1930	223615.3140	923.577	-0.548000	0.300304 BRUSH/LOW
1941	420921.3950	223617.9820	923.244	-0.583000	0.339889 BRUSH/LOW
1942	420918.5790	223620.2800	922.896	-0.873000	0.762129 BRUSH/LOW
1943	420914.1330	223620.8630	923.005	-0.545000	0.297025 BRUSH/LOW
1944	420910.9420	223622.8160	922.756	-0.816000	0.665856 BRUSH/LOW
1945	420914.2600	223627.6090	922.163	-0.564000	0.318096 BRUSH/LOW
1946	420918.0940	223626.4520	922.313	-0.654000	0.427716 BRUSH/LOW
1947	420911.4300	223608.3740	924.012	-0.337000	0.113569 BRUSH/LOW
1948	420915.9370	223606.9720	924.048	-0.453000	0.205209 BRUSH/LOW
1949	420919.4720	223606.3250	924.349	-0.603000	0.363609 BRUSH/LOW
1950	420923.6130	223605.8390	924.668	-0.762000	0.580644 BRUSH/LOW

1951	420895.6740	223605.6150	924.615	-0.402000	0.161604	TREE
1952	420891.6300	223606.2600	923.911	-1.108000	1.227664	TREE
1953	420888.6790	223607.2160	924.394	-0.523000	0.273529	TREE
1954	420885.5540	223606.8880	926.416	1.429000	2.042041	TREE
1955	420887.3910	223611.5720	924.369	-0.296000	0.087616	TREE
1956	420877.2410	223616.4440	924.474	-0.278000	0.077284	TREE
1957	420879.8590	223615.1020	924.175	-0.544000	0.295936	TREE
1958	420882.7170	223613.5390	924.063	-0.763000	0.582169	TREE
1959	420879.3350	223618.8560	923.871	-0.376000	0.141376	TREE
1960	420882.1110	223617.0640	923.993	-0.413000	0.170569	TREE
1961	420884.5690	223614.9920	923.822	-0.748000	0.559504	TREE
1962	420885.9410	223612.2220	924.388	-0.429000	0.184041	TREE
1963	420887.8850	223616.0970	923.836	-0.538000	0.289444	TREE
1964	420879.7170	223622.4690	923.637	-0.395000	0.156025	TREE
1965	420883.5350	223619.6130	923.441	-0.462000	0.213444	TREE
1966	420882.6000	223623.7210	923.313	-0.510000	0.260100	TREE
1967	420878.8220	223623.7720	923.548	-0.268000	0.071824	TREE
1968	420876.1640	223619.6140	923.818	-0.573000	0.328329	TREE
1969	420874.3350	223615.8200	924.616	-0.374000	0.139876	TREE
1970	420872.9430	223612.8810	924.848	-0.387000	0.149769	TREE
1971	420870.3930	223615.4590	924.654	-0.394000	0.155236	TREE
1972	420872.1110	223618.7480	924.384	-0.573000	0.328329	TREE
1973	420874.3240	223622.1130	924.032	-0.202000	0.040804	TREE
1974	420876.5170	223624.5190	923.716	-0.135000	0.018225	TREE
1975	420869.1280	223615.6940	924.703	-0.178000	0.031684	TREE
1976	420819.5180	223449.4820	928.744	-0.120000	0.014400	MOWED
1977	420816.1630	223449.7560	928.802	-0.079000	0.006241	MOWED
1978	420813.0130	223449.6890	928.681	-0.179000	0.032041	MOWED
1979	420809.8020	223449.9560	928.738	-0.038000	0.001444	MOWED
1980	420806.5010	223450.0290	928.644	-0.089000	0.007921	MOWED
1981	420806.6510	223453.2630	928.538	-0.169000	0.028561	MOWED
1982	420810.1520	223453.0840	928.600	-0.170000	0.028900	MOWED
1983	420813.0310	223452.8010	928.628	-0.224000	0.050176	MOWED
1984	420816.3240	223452.8390	928.675	-0.170000	0.028900	MOWED
1985	420819.1880	223452.7820	928.680	-0.115000	0.013225	MOWED
1986	420819.3570	223456.2670	928.635	-0.199000	0.039601	MOWED
1987	420816.0360	223456.4120	928.741	-0.159000	0.025281	MOWED
1988	420813.1220	223456.8480	928.588	-0.196000	0.038416	MOWED
1989	420810.5890	223456.9420	928.524	-0.240000	0.057600	MOWED
1990	420807.6080	223457.1840	928.428	-0.260000	0.067600	MOWED
1991	420807.1540	223460.5180	928.401	-0.059000	0.003481	MOWED
1992	420810.4540	223460.0160	928.454	-0.111000	0.012321	MOWED
1993	420813.2800	223459.9290	928.493	-0.160000	0.025600	MOWED
1994	420816.3510	223459.4140	928.619	-0.131000	0.017161	MOWED
1995	420819.3390	223459.4660	928.582	-0.168000	0.028224	MOWED
1996	420819.4560	223462.5250	928.379	-0.234000	0.054756	MOWED
1997	420815.6910	223462.7280	928.418	-0.154000	0.023716	MOWED
1998	420812.6300	223462.8730	928.375	-0.080000	0.006400	MOWED
1999	420809.5920	223463.1400	928.343	-0.182000	0.033124	MOWED
2000	420806.7010	223463.8360	928.324	-0.123000	0.015129	MOWED
2001	419088.9890	223610.6080	937.748	-0.792000	0.627264	TALL
2002	419089.1750	223613.7930	937.604	-0.813000	0.660969	TALL

2003	419089.5400	223616.9790	937.501	-0.698000	0.487204 TALL
2004	419090.1440	223619.7350	937.376	-0.703000	0.494209 TALL
2005	419090.3960	223623.1010	937.259	-0.795000	0.632025 TALL
2006	419086.8620	223622.8430	937.428	-0.632000	0.399424 TALL
2007	419086.8100	223618.8860	937.450	-0.749000	0.561001 TALL
2008	419086.8470	223616.0640	937.710	-0.601000	0.361201 TALL
2009	419086.3520	223612.8230	937.694	-0.801000	0.641601 TALL
2010	419085.8250	223609.2290	937.928	-0.747000	0.558009 TALL
2011	419082.0820	223609.2390	938.062	-0.562000	0.315844 TALL
2012	419083.3870	223612.4120	937.874	-0.703000	0.494209 TALL
2013	419083.7030	223616.1770	937.756	-0.630000	0.396900 TALL
2014	419083.7260	223619.4970	937.571	-0.663000	0.439569 TALL
2015	419084.8210	223623.3730	937.449	-0.636000	0.404496 TALL
2016	419080.6540	223624.6930	937.427	-0.639000	0.408321 TALL
2017	419080.2890	223620.8200	937.542	-0.616000	0.379456 TALL
2018	419080.1570	223618.0370	937.702	-0.591000	0.349281 TALL
2019	419080.0980	223614.4900	937.804	-0.648000	0.419904 TALL
2020	419079.4910	223610.1200	937.945	-0.725000	0.525625 TALL
2021	419076.5710	223609.9950	938.000	-0.661000	0.436921 TALL
2022	419076.8670	223613.6630	937.937	-0.572000	0.327184 TALL
2023	419077.3950	223616.7610	937.701	-0.697000	0.485809 TALL
2024	419077.6060	223620.2740	937.576	-0.692000	0.478864 TALL
2025	419078.3220	223624.6790	937.502	-0.595000	0.354025 TALL
2026	419128.4890	223479.4550	947.183	-0.055000	0.003025 CONC
2027	419124.3230	223479.5810	947.234	0.012000	0.000144 CONC
2028	419120.4180	223480.1110	947.270	0.015000	0.000225 CONC
2029	419116.5940	223480.4860	947.301	-0.069000	0.004761 CONC
2030	419112.0310	223480.8770	947.383	-0.081000	0.006561 CONC
2031	419111.9390	223477.3940	947.419	-0.078000	0.006084 CONC
2032	419115.9820	223476.6500	947.375	-0.108000	0.011664 CONC
2033	419119.1850	223476.2530	947.317	-0.142000	0.020164 CONC
2034	419123.4690	223476.2510	947.282	0.012000	0.000144 CONC
2035	419127.9330	223476.2930	947.217	-0.150000	0.022500 CONC
2036	419128.9730	223473.1600	947.288	0.003000	0.000009 CONC
2037	419124.2650	223473.2600	947.317	-0.003000	0.000009 CONC
2038	419120.3880	223473.2470	947.371	-0.062000	0.003844 CONC
2039	419116.3520	223473.4430	947.414	-0.087000	0.007569 CONC
2040	419111.8450	223473.9670	947.467	-0.074000	0.005476 CONC
2041	419111.1690	223470.6810	947.450	-0.080000	0.006400 CONC
2042	419114.8260	223470.3370	947.387	-0.083000	0.006889 CONC
2043	419118.8030	223469.7840	947.350	-0.077000	0.005929 CONC
2044	419122.6570	223469.2870	947.293	-0.042000	0.001764 CONC
2045	419127.1660	223469.0680	947.251	0.089000	0.007921 CONC
2046	419127.2840	223464.9620	947.146	-0.106000	0.011236 CONC
2047	419122.8480	223464.8230	947.198	-0.201000	0.040401 CONC
2048	419119.6810	223465.2310	947.250	-0.044000	0.001936 CONC
2049	419114.7710	223466.1170	947.298	-0.124000	0.015376 CONC
2050	419110.8470	223465.9540	947.358	-0.158000	0.024964 CONC
2051	417802.6350	223569.1820	953.754	-0.039000	0.001521 GRAV
2052	417799.2610	223569.8190	953.793	-0.025000	0.000625 GRAV
2053	417796.2190	223570.4440	953.789	0.043000	0.001849 GRAV
2054	417793.3940	223570.5720	953.750	-0.070000	0.004900 GRAV

2055	417790.5530	223570.9790	953.723	-0.020000	0.000400	GRAV
2056	417790.7780	223574.1810	953.681	0.061000	0.003721	GRAV
2057	417793.9640	223573.7300	953.722	-0.074000	0.005476	GRAV
2058	417796.7760	223573.7750	953.698	-0.007000	0.000049	GRAV
2059	417799.8330	223573.3390	953.684	-0.081000	0.006561	GRAV
2060	417802.7230	223572.8010	953.675	-0.118000	0.013924	GRAV
2061	417803.3270	223576.1990	953.826	0.033000	0.001089	GRAV
2062	417800.1290	223576.6940	953.828	0.031000	0.000961	GRAV
2063	417797.3220	223577.4180	953.797	0.013000	0.000169	GRAV
2064	417794.1590	223577.6140	953.782	0.034000	0.001156	GRAV
2065	417791.2860	223578.2280	953.705	-0.043000	0.001849	GRAV
2066	417791.5150	223581.4730	953.783	-0.060000	0.003600	GRAV
2067	417794.3710	223581.3460	953.802	-0.070000	0.004900	GRAV
2068	417797.5820	223581.2660	953.963	0.017000	0.000289	GRAV
2069	417800.8460	223581.0220	953.968	-0.036000	0.001296	GRAV
2070	417803.5880	223580.5520	953.874	-0.038000	0.001444	GRAV
2071	417804.6420	223584.1560	953.931	-0.115000	0.013225	GRAV
2072	417801.6060	223584.8860	954.053	-0.040000	0.001600	GRAV
2073	417798.7960	223585.2430	954.114	-0.048000	0.002304	GRAV
2074	417795.9600	223585.8360	954.115	0.026000	0.000676	GRAV
2075	417793.1120	223586.6910	953.974	0.054000	0.002916	GRAV
2076	416698.1160	227122.1680	845.780	0.079000	0.006241	ASPH
2077	416698.1300	227119.2390	845.876	0.123000	0.015129	ASPH
2078	416698.1360	227116.0150	845.966	0.115000	0.013225	ASPH
2079	416698.2060	227113.2120	846.065	-0.070000	0.004900	ASPH
2080	416697.9680	227110.2720	846.117	0.084000	0.007056	ASPH
2081	416695.1370	227110.1870	846.155	0.067000	0.004489	ASPH
2082	416694.9970	227113.1570	846.091	-0.108000	0.011664	ASPH
2083	416695.3090	227116.0870	846.015	0.056000	0.003136	ASPH
2084	416695.2440	227118.7730	845.936	0.118000	0.013924	ASPH
2085	416695.0140	227123.1830	845.803	0.092000	0.008464	ASPH
2086	416692.2120	227122.8030	845.828	0.008000	0.000064	ASPH
2087	416691.9840	227119.0150	845.944	0.032000	0.001024	ASPH
2088	416692.1870	227116.3130	845.998	0.027000	0.000729	ASPH
2089	416692.0360	227113.0600	846.104	-0.068000	0.004624	ASPH
2090	416692.1560	227110.4740	846.172	-0.045000	0.002025	ASPH
2091	416689.0110	227110.5440	846.073	-0.017000	0.000289	ASPH
2092	416689.2990	227113.5050	846.007	0.013000	0.000169	ASPH
2093	416689.1480	227116.4570	845.943	0.093000	0.008649	ASPH
2094	416689.4670	227119.3970	845.851	0.023000	0.000529	ASPH
2095	416689.2890	227122.5770	845.781	0.001000	0.000001	ASPH
2096	416685.9510	227122.3000	845.618	-0.006000	0.000036	ASPH
2097	416685.5880	227119.0850	845.708	0.015000	0.000225	ASPH
2098	416685.4680	227115.8080	845.793	-0.020000	0.000400	ASPH
2099	416685.7680	227112.8310	845.901	0.010000	0.000100	ASPH
2100	416685.5710	227109.9890	845.980	-0.053000	0.002809	ASPH
2101	437807.3900	212843.8380	893.455	-0.513000	0.263169	CK
4822	437807.3860	212843.8440	893.520	-0.448000	0.200704	CP
4823	422085.7720	231051.5590	833.990	-0.708000	0.501264	CP
4823	422085.7710	231051.5590	833.988	-0.708000	0.501264	CP
4825	503811.9690	205418.6500	824.710	-0.649000	0.421201	CP
4845	537265.9010	226639.6240	969.100	-0.032000	0.001024	CP

4866	418062.8100	321333.3620	941.960	-0.346000	0.119716 CP
4874	473283.9580	301380.0440	878.220	-0.161000	0.025921 CP
4888	466738.5720	279183.0810	967.770	-0.065000	0.004225 CP
4896	527403.0290	328627.3760	878.000	0.507000	0.257049 CP
4906	544772.5750	322404.1700	874.410	-0.281000	0.078961 CP
4906	544772.5720	322404.1690	874.411	-0.281000	0.078961 CP
4933	443402.5100	232997.0590	848.390	-0.273000	0.074529 CP
4950	439046.0930	310104.8030	956.900	-0.534000	0.285156 CP
4960	519955.4480	225491.9110	971.820	-0.056000	0.003136 CP
4960	519955.4450	225491.9110	971.824	-0.056000	0.003136 CP
4973	506339.1560	220863.9160	826.970	-0.355000	0.126025 CP
9668	553136.0100	239489.3050	854.920	-0.038000	0.001444 CP
9789	419066.1860	297535.2440	878.680	-0.124000	0.015376 CP
9789	419066.1850	297535.2440	878.679	-0.124000	0.015376 CP
9887	546825.0940	301093.7150	948.520	0.313000	0.097969 CP

Sum	203.809549
Average	0.203403
RMSE	0.451002
Accuracyz	0.883964

FIELD NOTES

Project FEMA ground survey notes

Contains point number and descriptions

Includes Control and Check Points left out of statistical analysis

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Rock County
WRDC Ground-Truthing
/LIDAR checks, FEMA

2011



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CONTENTS

PAGE REFERENCE DATE

Work Performed:

- Ground Truthing / LIDAR checkshots for Rock Co, WI. Setup base station over NGS monuments & RTK'd various features in a grid pattern.

- All data was shot using WI State Plane Coord. System, GEOD09 (WI South). Then converted to county coord's ^{Rock} horiz. WISCRS for vertical.

Name _____

Address _____

Phone _____

Project _____

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7-6-11 Rock Co. LiDAR Checkshots
/ Ground-Truthing Trace
Vegeter

Base: Leica 1200 @ PID "DF9817", (Jonesville C GPS)

Rover: Leica 1200, Rover "B"

- Checked PID "DG4888" (Jonesville W GPS)

~~Pt. 1000~~ $\Delta H: 0.06' V$
@ Start
Pt. 1176 @ End $\Delta V: 0.02' V$

Site 6:

- 1. Mowed Grass: ~~1026-1050~~ 1051-1075
- 2. Tall Grass/Weeds: 1051-1075
- 3. Brush/Low Trees: 1001-1025
- 4. ~~Forest~~ Tree Cover: 1076-1100
- 5. Gravel: 1101-1125
- 6. Asphalt: 1126-1150
- 7. Concrete: 1151-1175

7-7-11 Rock Co. LiDAR Checkshots
/ Ground-Truthing Trace
Vegeter

Base: Leica 1200 @ PID "DG4960" (Shojiere GPS)

Rover: Leica 1200, Rover "B"

- Checked into PID "DG4845" (Clinton N GPS)

Pt. 1200 $\Delta H: 0.05' V$
@ Start
Pt. 1524 $\Delta V: 0.08' V$
@ End - Checked into PID "DG4973" (Futelle W GPS)

Site 3:

- 1. Mowed Grass: 1201-1225
- 2. Tall Grass/Weeds: 1276-1300
- 3. Brush/Low Trees: 1301-1325
- 4. Tree Cover: 1326-1350
- 5. Asphalt: ~~1226-1250~~
- 6. Gravel: 1251-1275

7-7-11

Rock Co. LIDAR Checkshots

Ground-Truthing continued
(Same Base setup)

Face register

Site 4:

- 1. Mowed Grass: 1351-1375
- 2. Tall Grass/Weeds: 1426-1450
- 3. Brush/Low Trees: 1451-1475
- 4. Tree Cover: 1401-1425
- 5. Gravel: 1501-1525
- 6. Asphalt: 1376-1400
- 7. Concrete: 1476-1500

7-11-11

Rock Co. LIDAR Checkshots

Ground-Truthing

Face register 5

Base: Leica 1200 @ PID "DA4906" (LIMA N GPS)
Rover: Leica 1200, Rover "B"

- Checked PID "DF9837" (LIMA C GPS)

Pt. 1550: SAH: 0.08' ✓
 O Start { ΔN: 0.06' ✓
 Pt. 1701
 Pt. ~~1676~~ 1701 end ✓

Site 2:

- 1. Mowed Grass: 1676-1700
- 2. Tall Grass/Weeds: 1576-1600
- 3. Brush/Low Trees: 1601-1625
- 4. Tree Cover: 1551-1573
- 5. Asphalt: 1626-1650
- 6. Gravel: 1651-1675

7-12-11

Rock Co. LIDAR Checkshots
/Ground-TruthingJace
Vegeter

Base: Leica 1200 @ P1D'DE9789' (Union S GPS)

Rover: Leica 1200, Rover "B"

- Checked P1D'DG4950' (Porter GPS)

Pt. 1725: AH - 0.05' ✓

@ Start

AV - 0.07' ✓

Pt. 1901 ✓

@ End

Site 1:

1. Mowed Grass: 1751-1775
2. Tall Grass/Weeds: 1851-1875
3. Brush/Low Trees: 1876-1900
4. Tree Cover: 1801-1825
5. Gravel: 1826-1850
6. Asphalt: 1726-1750
7. Concrete: 1776-1800

7-12-11

Rock Co. LIDAR Checkshots
/Ground-TruthingJace
Vegeter

Base: Leica 1200 @ P1D'DG4822' (AVON N GPS)

Rover: Leica 1200, Rover "B"

- Checked P1D'DG4822' (AVON GPS)

Pt. 2101: AH - 0.06' ✓

AV - 0.02' ✓

Site 5:

1. Mowed Grass: 1976-2000
2. Tall Grass/Weeds: 2000-2025
3. Brush/Low Trees: 1926-1950
4. Tree Cover: 1951-1975
5. Gravel: 2051-2075
6. Asphalt: 2076-2100
7. Concrete: 2026-2050