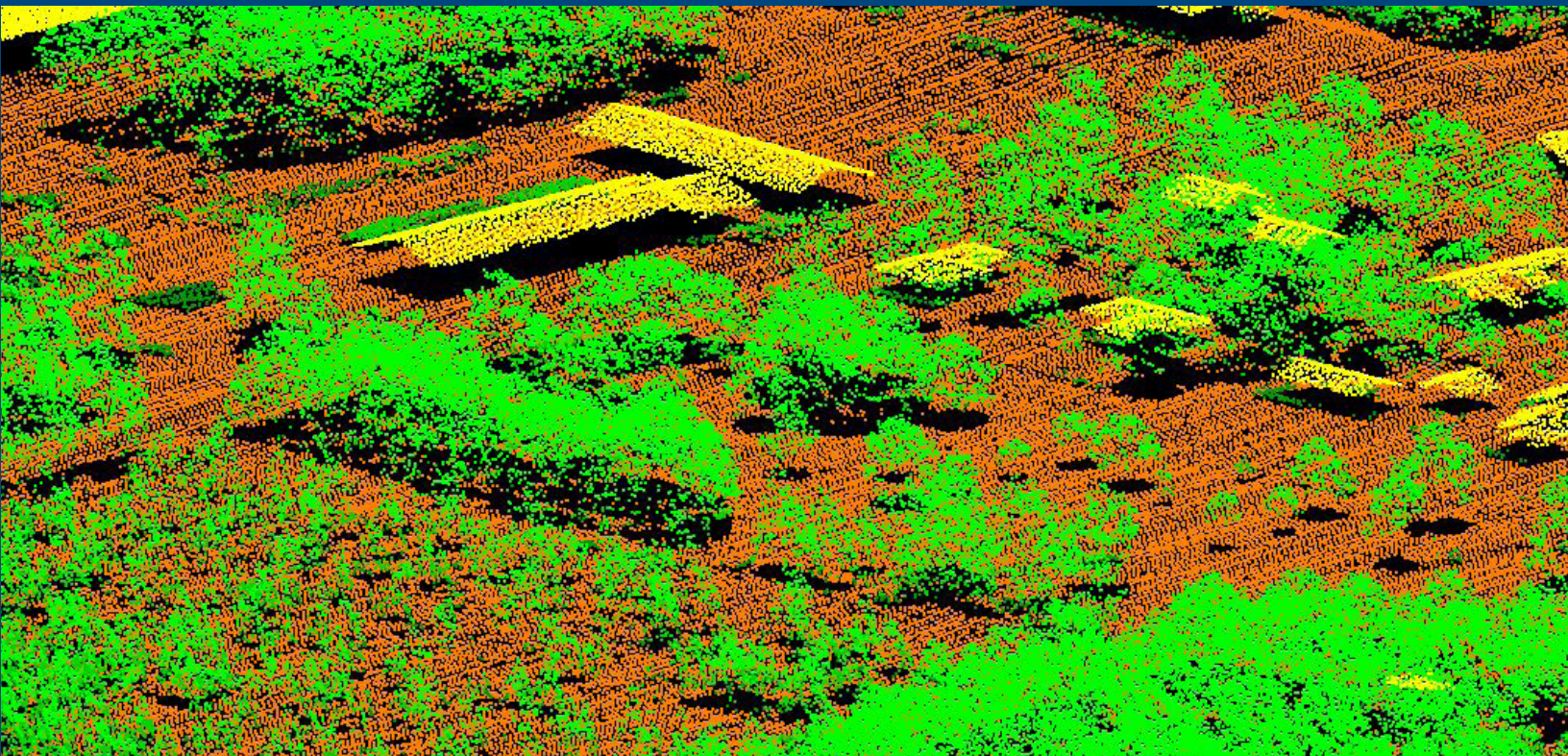


LIDAR GROUND CONTROL REPORT



NSSDA Ground Truth Survey Results: 2014 Trempealeau County LiDAR Project

Geospatial services provided by Ayres Associates

Report date: January 19, 2015

AYRES
ASSOCIATES

Abstract

This report documents the GPS ground surveys conducted in support of FEMA accuracy testing of the lidar data collection for Trempealeau County in 2014. Surveys were conducted at various sites utilizing the base stations established in the static network. These surveys established “ground truth” data at each site on different surface types, including low grass, high grass, low trees, high trees 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.

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.

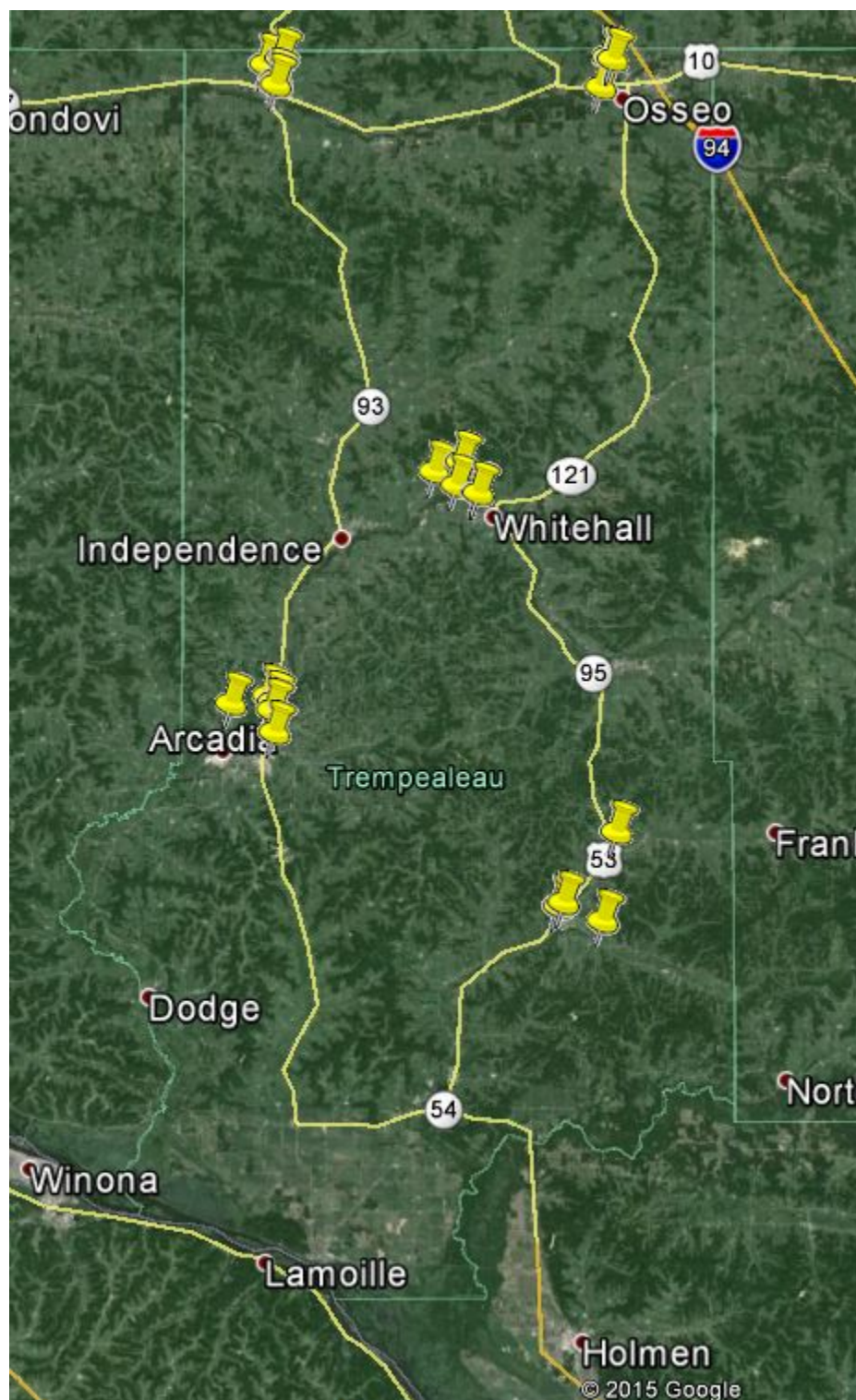
The elevation was then appended as a field to the PointZ shapefile; the attributes for each point were exported to a database and then statistical analysis was performed. The results can be seen on the following pages.

Overall Accuracy

A comparison of the ground survey versus lidar model values indicates a vertical root mean square error (RMSEz) of 0.344 feet. This is within the FEMA specified vertical accuracy tolerance of 0.61 feet. This RMSEz equates to a tested 0.675 feet vertical accuracy at 95% confidence level.

Ground Truth Survey Locations

The ground survey test points were distributed and categorized into sites as shown in the map below:



Ground Truth Analysis Reference Information

Coordinate System – Wisconsin Coordinate Reference System (WISCRS) – Trempealeau County

Horizontal Datum – NAD83 (11)

Vertical Datum – NAVD88 (Geoid 12A), survey feet

Field Definitions

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

Easting, Northing and KnownZ – The coordinates that describe the point's horizontal and vertical location within the Trempealeau County WISCRS Coordinate System. The Easting and Northing values are shared between the ground control points and lidar comparison points. The KnownZ 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.

Laser Z – The elevation at a horizontal location as determined by the lidar dataset.

Landcover Types – The predominant land cover category at the location of the survey point.

<i>Land Cover Type</i>	<i>Description</i>
Low Grass	Lawns, golf courses, plowed fields
Tall Grass	High grass, weeds, crop fields
Low Trees	Brush, shrubs
Tall Trees	Fully forested (hardwood, evergreens, mixed forests)
Urban	Asphalt, concrete

Statistical Definitions

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

Average Delta Z – The average of the Delta Z squared values.

Minimum Delta Z – The minimum of the Delta Z squared values.

Maximum Delta Z – The maximum of the Delta Z squared values.

Accuracy Z – The product of multiplying the RMSEz with 1.96.

Statistical Results

Summary of Results – Overall	
Number of Points	625
RMSEz	0.344 US Survey Feet
Average Delta Z	-0.247 US Survey Feet
Minimum Delta Z	-1.223 US Survey Feet
Maximum Delta Z	0.313 US Survey Feet
Accuracy Z	0.674 US Survey Feet

Summary of Results – Urban	
Number of Points	125
RMSEz	0.169 US Survey Feet
Average Delta Z	-0.060 US Survey Feet
Minimum Delta Z	-0.421 US Survey Feet
Maximum Delta Z	0.313 US Survey Feet
Accuracy Z	0.331 US Survey Feet

Summary of Results – Low Grass	
Number of Points	125
RMSEz	0.150 US Survey Feet
Average Delta Z	-0.107 US Survey Feet
Minimum Delta Z	-0.323 US Survey Feet
Maximum Delta Z	0.216 US Survey Feet
Accuracy Z	0.294 US Survey Feet

Summary of Results – Tall Grass	
Number of Points	125
RMSEz	0.489 US Survey Feet
Average Delta Z	-0.414 US Survey Feet
Minimum Delta Z	-1.226 US Survey Feet
Maximum Delta Z	0.115 US Survey Feet
Accuracy Z	0.958 US Survey Feet

Summary of Results – Low Trees	
Number of Points	125
RMSEz	0.432 US Survey Feet
Average Delta Z	-0.400 US Survey Feet
Minimum Delta Z	-1.121 US Survey Feet
Maximum Delta Z	-0.125 US Survey Feet
Accuracy Z	0.847 US Survey Feet

Summary of Results – Tall Trees	
Number of Points	125
RMSEz	0.342 US Survey Feet
Average Delta Z	-0.251 US Survey Feet
Minimum Delta Z	-0.996 US Survey Feet
Maximum Delta Z	0.255 US Survey Feet
Accuracy Z	0.670 US Survey Feet

Number	Easting	Northing	Known Z	Laser Z	Delta Z	Landcover Type
1000	439715.3	851940.1	831.357	831.354	0.003	Urban
1001	439715.5	851936.8	831.354	831.35	0.004	Urban
1002	439715.4	851933.8	831.343	831.282	0.061	Urban
1003	439715.4	851930.5	831.387	831.531	-0.144	Urban
1004	439715.3	851927.1	831.353	831.319	0.034	Urban
1005	439719.5	851927.6	831.432	831.395	0.037	Urban
1006	439719.3	851931.6	831.429	831.446	-0.017	Urban
1007	439719.3	851934.7	831.39	831.355	0.035	Urban
1008	439719	851938.3	831.406	831.377	0.029	Urban
1009	439718.7	851941.7	831.393	831.333	0.06	Urban
1010	439722.9	851942.3	831.393	831.347	0.046	Urban
1011	439722.4	851938.1	831.406	831.308	0.098	Urban
1012	439722.4	851934.6	831.446	831.384	0.062	Urban
1013	439722.6	851931	831.461	831.518	-0.057	Urban
1014	439722.8	851927.8	831.464	831.547	-0.083	Urban
1015	439727.4	851927.9	831.488	831.474	0.014	Urban

<i>Number</i>	<i>Easting</i>	<i>Northing</i>	<i>Known Z</i>	<i>Laser Z</i>	<i>Delta Z</i>	<i>Landcover Type</i>
1016	439727.4	851932.1	831.506	831.628	-0.122	Urban
1017	439727.6	851935.3	831.505	831.665	-0.16	Urban
1018	439727.6	851938.7	831.468	831.585	-0.117	Urban
1019	439727.5	851942.3	831.439	831.485	-0.046	Urban
1020	439731.7	851942.6	831.491	831.69	-0.199	Urban
1021	439731.7	851938.2	831.507	831.554	-0.047	Urban
1022	439732.1	851934.6	831.537	831.63	-0.093	Urban
1023	439732.1	851931.1	831.551	831.672	-0.121	Urban
1024	439732.4	851927.4	831.52	831.532	-0.012	Urban
1025	439672.4	852100.2	828.563	828.572	-0.009	Low Grass
1026	439672.2	852103.4	828.474	828.628	-0.154	Low Grass
1027	439672	852106.6	828.486	828.631	-0.145	Low Grass
1028	439672.1	852109.6	828.495	828.512	-0.017	Low Grass
1029	439672	852113.1	828.628	828.412	0.216	Low Grass
1030	439667.9	852113.5	828.448	828.593	-0.145	Low Grass
1031	439668.4	852108.9	828.462	828.63	-0.168	Low Grass
1032	439668.4	852105.8	828.487	828.662	-0.175	Low Grass
1033	439668.4	852102.3	828.621	828.66	-0.039	Low Grass
1034	439668.8	852099.2	828.65	828.787	-0.137	Low Grass
1035	439665.1	852098.7	828.758	828.751	0.007	Low Grass
1036	439664.6	852103.3	828.602	828.775	-0.173	Low Grass
1037	439664.2	852106.5	828.542	828.733	-0.191	Low Grass
1038	439663.8	852109.5	828.476	828.622	-0.146	Low Grass
1039	439663.1	852112.8	828.504	828.573	-0.069	Low Grass
1040	439658.8	852112.4	828.546	828.55	-0.004	Low Grass
1041	439658.9	852108.5	828.635	828.72	-0.085	Low Grass
1042	439659.5	852105.5	828.787	828.841	-0.054	Low Grass
1043	439659.3	852102.3	828.89	829.007	-0.117	Low Grass
1044	439659.3	852099	828.913	829.092	-0.179	Low Grass
1045	439655.4	852099	828.99	829.079	-0.089	Low Grass
1046	439654.8	852102.9	828.956	829.037	-0.081	Low Grass
1047	439654.4	852106.1	828.871	828.877	-0.006	Low Grass
1048	439653.9	852109.4	828.656	828.748	-0.092	Low Grass
1049	439653.2	852112.9	828.64	828.865	-0.225	Low Grass
1050	443481.4	844253.4	799.491	799.918	-0.427	Tall Grass
1051	443481.1	844250.6	799.453	799.984	-0.531	Tall Grass
1052	443481.4	844247.3	799.556	799.951	-0.395	Tall Grass
1053	443481.4	844244.5	799.424	800.066	-0.642	Tall Grass
1054	443481.5	844241.5	799.53	800.292	-0.762	Tall Grass
1055	443477.6	844240.8	799.075	799.655	-0.58	Tall Grass
1056	443478.3	844245.3	799.216	799.756	-0.54	Tall Grass
1057	443478.1	844248.2	799.264	799.884	-0.62	Tall Grass
1058	443478.1	844251.1	799.346	799.942	-0.596	Tall Grass

<i>Number</i>	<i>Easting</i>	<i>Northing</i>	<i>Known Z</i>	<i>Laser Z</i>	<i>Delta Z</i>	<i>Landcover Type</i>
1059	443478.1	844254	799.445	799.884	-0.439	Tall Grass
1060	443473.9	844253.8	799.722	800.096	-0.374	Tall Grass
1061	443474.1	844250.1	799.487	799.953	-0.466	Tall Grass
1062	443474.1	844247	799.285	799.756	-0.471	Tall Grass
1063	443474	844243.8	799.274	799.464	-0.19	Tall Grass
1064	443473.4	844240.7	799.107	799.771	-0.664	Tall Grass
1065	443469.3	844240.4	799.118	799.595	-0.477	Tall Grass
1066	443470	844245.2	799.319	799.828	-0.509	Tall Grass
1067	443470.4	844248	799.471	799.698	-0.227	Tall Grass
1068	443470.3	844250.8	799.615	799.972	-0.357	Tall Grass
1069	443470.3	844253.6	799.835	800.339	-0.504	Tall Grass
1070	443465.4	844253.4	800.374	800.645	-0.271	Tall Grass
1071	443465.5	844248.6	800.249	800.134	0.115	Tall Grass
1072	443464.9	844245.3	799.227	799.86	-0.633	Tall Grass
1073	443464	844242	799.082	799.417	-0.335	Tall Grass
1074	443464.1	844238.6	799.017	799.459	-0.442	Tall Grass
1075	445221.2	849026.1	802.054	802.181	-0.127	Tall Trees
1076	445220.1	849022.4	801.803	801.945	-0.142	Tall Trees
1077	445219.4	849018.5	801.742	802.214	-0.472	Tall Trees
1078	445219.2	849015.1	801.812	801.833	-0.021	Tall Trees
1079	445218.1	849013.1	801.748	801.978	-0.23	Tall Trees
1080	445214.5	849013.6	801.638	801.893	-0.255	Tall Trees
1081	445214.1	849016.9	801.667	801.72	-0.053	Tall Trees
1082	445214.4	849020	801.922	802.099	-0.177	Tall Trees
1083	445214.2	849024	801.889	802.356	-0.467	Tall Trees
1084	445216.7	849027.7	801.971	802.345	-0.374	Tall Trees
1085	445211.6	849028.4	802.5	802.743	-0.243	Tall Trees
1086	445211.3	849024.9	802.135	802.702	-0.567	Tall Trees
1087	445211.2	849021.8	802.109	802.5	-0.391	Tall Trees
1088	445210.7	849018.2	802.071	802.261	-0.19	Tall Trees
1089	445209.7	849013.9	801.962	802.109	-0.147	Tall Trees
1090	445206.1	849014.5	802.259	802.611	-0.352	Tall Trees
1091	445205.3	849017.8	802.223	802.796	-0.573	Tall Trees
1092	445205.5	849020	802.363	802.838	-0.475	Tall Trees
1093	445205	849023.3	802.257	802.793	-0.536	Tall Trees
1094	445204.6	849028.4	802.198	802.691	-0.493	Tall Trees
1095	445201.2	849027.6	802.137	802.627	-0.49	Tall Trees
1096	445201.4	849023.8	802.044	802.713	-0.669	Tall Trees
1097	445199.7	849020.1	802.01	802.745	-0.735	Tall Trees
1098	445198.9	849016.4	802.038	802.838	-0.8	Tall Trees
1099	445198.7	849014.2	802.115	802.877	-0.762	Tall Trees
1100	441043.5	848175	834.305	834.59	-0.285	Low Trees
1101	441042.9	848172	834.458	834.699	-0.241	Low Trees
1102	441042.5	848168.9	834.666	834.979	-0.313	Low Trees

<i>Number</i>	<i>Easting</i>	<i>Northing</i>	<i>Known Z</i>	<i>Laser Z</i>	<i>Delta Z</i>	<i>Landcover Type</i>
1103	441042	848165.6	834.773	835.093	-0.32	Low Trees
1104	441041.7	848162.5	834.76	835.068	-0.308	Low Trees
1105	441046.8	848161.6	834.835	835.13	-0.295	Low Trees
1106	441047.9	848164.9	834.723	835.04	-0.317	Low Trees
1107	441048.8	848168.7	834.685	834.876	-0.191	Low Trees
1108	441049.1	848172.5	834.436	834.686	-0.25	Low Trees
1109	441049	848176.3	834.281	834.484	-0.203	Low Trees
1110	441052.1	848177.2	833.971	834.357	-0.386	Low Trees
1111	441051.6	848172.2	834.475	834.652	-0.177	Low Trees
1112	441051.4	848167.9	834.516	834.84	-0.324	Low Trees
1113	441050.5	848162.9	834.605	834.871	-0.266	Low Trees
1114	441050.8	848159.1	834.742	835.061	-0.319	Low Trees
1115	441055.2	848158.7	834.494	835.144	-0.65	Low Trees
1116	441054.8	848163.6	834.446	834.825	-0.379	Low Trees
1117	441055.2	848167.1	834.41	834.95	-0.54	Low Trees
1118	441055.1	848171.8	834.327	834.733	-0.406	Low Trees
1119	441055.1	848175.3	834.025	834.499	-0.474	Low Trees
1120	441059.1	848175	834.269	834.738	-0.469	Low Trees
1121	441058.8	848170.1	834.517	835.052	-0.535	Low Trees
1122	441058.8	848165.4	834.297	834.763	-0.466	Low Trees
1123	441058.8	848162.1	834.263	834.65	-0.387	Low Trees
1124	441059.2	848158.7	834.397	835.197	-0.8	Low Trees
1125	517141.2	876197.3	946.87	947.158	-0.288	Urban
1126	517138.8	876197.5	946.913	947.226	-0.313	Urban
1127	517136	876197.5	946.905	947.278	-0.373	Urban
1128	517133.3	876197.8	946.895	947.213	-0.318	Urban
1129	517130.5	876197.8	946.864	947.147	-0.283	Urban
1130	517130.8	876193.4	946.891	947.149	-0.258	Urban
1131	517134.7	876193.8	946.933	947.265	-0.332	Urban
1132	517137.5	876193.9	946.925	947.177	-0.252	Urban
1133	517140.6	876193.9	946.943	947.187	-0.244	Urban
1134	517143.3	876193.9	946.878	947.205	-0.327	Urban
1135	517143.8	876190.4	946.852	947.273	-0.421	Urban
1136	517139.9	876190.7	946.916	947.224	-0.308	Urban
1137	517137.2	876190.5	946.935	947.282	-0.347	Urban
1138	517134.5	876190.5	946.892	947.296	-0.404	Urban
1139	517131.4	876190.4	946.872	947.245	-0.373	Urban
1140	517131.5	876186.2	946.883	947.203	-0.32	Urban
1141	517135.2	876186.1	946.912	947.289	-0.377	Urban
1142	517138	876186	946.88	947.232	-0.352	Urban
1143	517141	876186.1	946.878	947.237	-0.359	Urban
1144	517143.7	876185.8	946.895	947.19	-0.295	Urban
1145	517143.9	876182.2	946.897	947.216	-0.319	Urban

<i>Number</i>	<i>Easting</i>	<i>Northing</i>	<i>Known Z</i>	<i>Laser Z</i>	<i>Delta Z</i>	<i>Landcover Type</i>
1146	517140.5	876182.3	946.924	947.077	-0.153	Urban
1147	517137.4	876182.3	946.914	947.237	-0.323	Urban
1148	517134.6	876182.2	946.945	947.286	-0.341	Urban
1149	517131.6	876182.1	946.885	947.185	-0.3	Urban
1150	517143.1	875914.7	941.174	941.862	-0.688	Tall Grass
1151	517146.2	875915.6	940.988	941.655	-0.667	Tall Grass
1152	517149.6	875915.1	940.903	941.358	-0.455	Tall Grass
1153	517153.6	875914.9	940.634	941.429	-0.795	Tall Grass
1154	517156.6	875914.9	940.524	941.519	-0.995	Tall Grass
1155	517156.8	875911.5	940.288	941.002	-0.714	Tall Grass
1156	517152.6	875912.3	940.477	941.064	-0.587	Tall Grass
1157	517149.4	875912	940.555	941.197	-0.642	Tall Grass
1158	517146.4	875912.2	940.809	941.482	-0.673	Tall Grass
1159	517143.4	875912	940.907	941.621	-0.714	Tall Grass
1160	517143.8	875907.9	940.766	941.629	-0.863	Tall Grass
1161	517147.8	875908.6	940.684	941.385	-0.701	Tall Grass
1162	517151.1	875908.4	940.436	941.111	-0.675	Tall Grass
1163	517154.3	875908.8	940.229	940.882	-0.653	Tall Grass
1164	517157.3	875908.7	940.247	940.912	-0.665	Tall Grass
1165	517157.3	875905.3	940.083	941.113	-1.03	Tall Grass
1166	517153.5	875906	940.129	941.084	-0.955	Tall Grass
1167	517149.1	875905.7	940.444	941.285	-0.841	Tall Grass
1168	517146.1	875905.7	940.602	941.566	-0.964	Tall Grass
1169	517142.9	875905.7	940.784	942.01	-1.226	Tall Grass
1170	517143.3	875901.7	940.737	941.887	-1.15	Tall Grass
1171	517147	875901.7	940.519	941.438	-0.919	Tall Grass
1172	517150.6	875903.1	940.245	941.226	-0.981	Tall Grass
1173	517153.9	875902.7	940.173	941.066	-0.893	Tall Grass
1174	517157	875902.4	940.144	940.986	-0.842	Tall Grass
1175	517500.4	875281.7	946.294	946.394	-0.1	Low Grass
1176	517497.5	875281.3	946.299	946.398	-0.099	Low Grass
1177	517494.7	875280.7	946.321	946.439	-0.118	Low Grass
1178	517491.8	875280.4	946.186	946.293	-0.107	Low Grass
1179	517488.9	875280	946.201	946.288	-0.087	Low Grass
1180	517489.1	875275.9	946.173	946.341	-0.168	Low Grass
1181	517493	875276	946.189	946.254	-0.065	Low Grass
1182	517495.8	875276.1	946.278	946.332	-0.054	Low Grass
1183	517499	875276.4	946.224	946.446	-0.222	Low Grass
1184	517502	875276.6	946.319	946.503	-0.184	Low Grass
1185	517502.5	875273.2	946.328	946.511	-0.183	Low Grass
1186	517498.9	875272.4	946.208	946.403	-0.195	Low Grass
1187	517496.3	875271.7	946.205	946.405	-0.2	Low Grass
1188	517493.3	875270.9	946.166	946.368	-0.202	Low Grass
1189	517490.4	875269.9	946.159	946.212	-0.053	Low Grass

<i>Number</i>	<i>Easting</i>	<i>Northing</i>	<i>Known Z</i>	<i>Laser Z</i>	<i>Delta Z</i>	<i>Landcover Type</i>
1190	517490.6	875266	946.167	946.247	-0.08	Low Grass
1191	517494.5	875265.9	946.239	946.427	-0.188	Low Grass
1192	517497.4	875266	946.177	946.443	-0.266	Low Grass
1193	517500.5	875265.9	946.277	946.322	-0.045	Low Grass
1194	517503.4	875265.8	946.298	946.402	-0.104	Low Grass
1195	517503.7	875262.3	946.313	946.454	-0.141	Low Grass
1196	517500.6	875262.2	946.291	946.404	-0.113	Low Grass
1197	517497.3	875261.3	946.203	946.361	-0.158	Low Grass
1198	517494.6	875260.7	946.26	946.374	-0.114	Low Grass
1199	517491.5	875260	946.244	946.378	-0.134	Low Grass
1200	517205.6	875271.1	946.31	946.678	-0.368	Low Trees
1201	517206.7	875274.7	946.245	946.66	-0.415	Low Trees
1202	517207.8	875277.6	946.277	946.521	-0.244	Low Trees
1203	517208.7	875281	946.233	946.456	-0.223	Low Trees
1204	517209.4	875284.1	946.153	946.489	-0.336	Low Trees
1205	517206.3	875284.7	946.138	946.511	-0.373	Low Trees
1206	517205.6	875281.2	946.357	946.615	-0.258	Low Trees
1207	517204.5	875278	946.207	946.577	-0.37	Low Trees
1208	517203.4	875275.2	946.228	946.68	-0.452	Low Trees
1209	517202.7	875272.3	946.278	946.601	-0.323	Low Trees
1210	517199.1	875273.4	946.24	946.574	-0.334	Low Trees
1211	517199.5	875276.6	946.35	946.622	-0.272	Low Trees
1212	517200	875279.3	946.276	946.679	-0.403	Low Trees
1213	517200.6	875281.5	946.229	946.733	-0.504	Low Trees
1214	517201.7	875284.2	946.22	946.638	-0.418	Low Trees
1215	517198.5	875287.1	945.908	946.394	-0.486	Low Trees
1216	517195.9	875283.9	946.063	946.409	-0.346	Low Trees
1217	517193.9	875281.8	946.1	946.452	-0.352	Low Trees
1218	517192	875279.9	946.186	946.536	-0.35	Low Trees
1219	517190.5	875277.8	946.2	946.456	-0.256	Low Trees
1220	517188.2	875281.1	946.089	946.398	-0.309	Low Trees
1221	517190.9	875284.1	945.944	946.301	-0.357	Low Trees
1222	517192.7	875286.3	945.802	946.251	-0.449	Low Trees
1223	517194.7	875288.3	945.753	946.164	-0.411	Low Trees
1224	517196.5	875290.5	945.715	946.075	-0.36	Low Trees
1225	512184.9	874056.2	998.517	998.262	0.255	Tall Trees
1226	512184.5	874051.9	997.982	997.962	0.02	Tall Trees
1227	512184.1	874048.6	997.8	997.736	0.064	Tall Trees
1228	512184.2	874046	997.495	997.628	-0.133	Tall Trees
1229	512184.4	874043.8	997.413	997.653	-0.24	Tall Trees
1230	512181	874043.3	997.431	997.454	-0.023	Tall Trees
1231	512180.9	874046.3	997.642	997.727	-0.085	Tall Trees
1232	512180.8	874048.7	997.932	997.885	0.047	Tall Trees

<i>Number</i>	<i>Easting</i>	<i>Northing</i>	<i>Known Z</i>	<i>Laser Z</i>	<i>Delta Z</i>	<i>Landcover Type</i>
1233	512180.7	874051	998.09	998.098	-0.008	Tall Trees
1234	512181.2	874053.6	998.429	998.293	0.136	Tall Trees
1235	512176.8	874053.3	998.668	998.872	-0.204	Tall Trees
1236	512177.1	874051	998.227	998.619	-0.392	Tall Trees
1237	512177.2	874048.7	997.981	998.303	-0.322	Tall Trees
1238	512177.6	874046.2	997.809	997.949	-0.14	Tall Trees
1239	512177.5	874044.1	997.614	997.695	-0.081	Tall Trees
1240	512173	874043.8	997.655	997.838	-0.183	Tall Trees
1241	512173.3	874046	997.856	998.156	-0.3	Tall Trees
1242	512173.7	874049.7	998.296	998.725	-0.429	Tall Trees
1243	512173.4	874052.9	998.49	999.177	-0.687	Tall Trees
1244	512173.8	874055.9	998.867	999.433	-0.566	Tall Trees
1245	512171.3	874056.4	998.669	999.665	-0.996	Tall Trees
1246	512170.5	874053.9	998.608	999.546	-0.938	Tall Trees
1247	512170.1	874050.8	998.457	999.162	-0.705	Tall Trees
1248	512170.3	874048.2	998.22	998.725	-0.505	Tall Trees
1249	512169.3	874044.4	997.799	998.004	-0.205	Tall Trees
1250	516275.4	813869.2	870.837	871.063	-0.226	Urban
1251	516275.6	813872	870.881	870.826	0.055	Urban
1252	516275.5	813874.7	870.806	870.758	0.048	Urban
1253	516275.4	813877.6	870.796	870.817	-0.021	Urban
1254	516275.3	813880.5	870.77	870.775	-0.005	Urban
1255	516271.2	813880.8	870.72	870.739	-0.019	Urban
1256	516271.9	813876.7	870.718	870.904	-0.186	Urban
1257	516271.7	813873.6	870.771	870.866	-0.095	Urban
1258	516271.8	813870.4	870.788	870.823	-0.035	Urban
1259	516272	813868.2	870.891	870.863	0.028	Urban
1260	516268.1	813868.7	870.815	870.818	-0.003	Urban
1261	516268.3	813872.3	870.795	870.811	-0.016	Urban
1262	516268	813875.2	870.765	870.78	-0.015	Urban
1263	516268.2	813878.5	870.727	870.838	-0.111	Urban
1264	516268	813881.7	870.692	870.763	-0.071	Urban
1265	516262.8	813881.5	870.694	870.734	-0.04	Urban
1266	516263.3	813877.6	870.766	870.675	0.091	Urban
1267	516263.1	813874.4	870.769	870.679	0.09	Urban
1268	516263.2	813871.2	870.767	870.756	0.011	Urban
1269	516263.3	813868.4	870.833	870.925	-0.092	Urban
1270	516259.3	813868.5	870.793	870.884	-0.091	Urban
1271	516259.5	813872.2	870.773	870.691	0.082	Urban
1272	516259	813875.5	870.675	870.681	-0.006	Urban
1273	516259	813878.6	870.684	870.604	0.08	Urban
1274	516258.9	813882.2	870.652	870.605	0.047	Urban
1275	512693.2	815393.1	865.473	865.791	-0.318	Low Trees
1276	512693.5	815396.5	865.434	865.726	-0.292	Low Trees

<i>Number</i>	<i>Easting</i>	<i>Northing</i>	<i>Known Z</i>	<i>Laser Z</i>	<i>Delta Z</i>	<i>Landcover Type</i>
1277	512693.6	815399.5	865.55	865.749	-0.199	Low Trees
1278	512694.1	815402.9	865.187	865.789	-0.602	Low Trees
1279	512694.1	815406.3	865.423	865.781	-0.358	Low Trees
1280	512697.6	815406.9	865.554	865.814	-0.26	Low Trees
1281	512698.3	815403.4	865.365	865.781	-0.416	Low Trees
1282	512698.1	815399.2	865.363	865.807	-0.444	Low Trees
1283	512697.9	815396.3	865.381	865.69	-0.309	Low Trees
1284	512697.5	815392.7	865.247	865.664	-0.417	Low Trees
1285	512702.9	815393.1	865.314	865.818	-0.504	Low Trees
1286	512703.4	815396.8	865.285	865.524	-0.239	Low Trees
1287	512703.8	815400.1	865.447	865.72	-0.273	Low Trees
1288	512703.8	815403.5	865.419	865.948	-0.529	Low Trees
1289	512703.8	815406	865.531	865.705	-0.174	Low Trees
1290	512707.9	815406.1	865.441	865.626	-0.185	Low Trees
1291	512708.8	815402.9	865.427	865.81	-0.383	Low Trees
1292	512709.2	815399.1	865.231	865.446	-0.215	Low Trees
1293	512708.6	815395.9	865.19	865.544	-0.354	Low Trees
1294	512708.1	815393.4	865.22	865.795	-0.575	Low Trees
1295	512712.8	815393.7	865.157	865.552	-0.395	Low Trees
1296	512713.5	815398.8	865.258	865.445	-0.187	Low Trees
1297	512713.5	815403.4	865.32	865.477	-0.157	Low Trees
1298	512713.8	815405.9	865.333	865.519	-0.186	Low Trees
1299	512714.5	815408.6	865.463	865.89	-0.427	Low Trees
1300	513603.2	815815.9	855.102	855.432	-0.33	Tall Grass
1301	513603.2	815818.8	854.913	855.062	-0.149	Tall Grass
1302	513602.9	815822.2	854.91	855.18	-0.27	Tall Grass
1303	513602.6	815825	854.878	855.042	-0.164	Tall Grass
1304	513602.3	815828.1	854.643	854.752	-0.109	Tall Grass
1305	513606.4	815829.2	854.655	854.921	-0.266	Tall Grass
1306	513607.1	815824.5	854.878	854.96	-0.082	Tall Grass
1307	513607.1	815821.2	854.965	855.107	-0.142	Tall Grass
1308	513607	815818.2	854.889	855.11	-0.221	Tall Grass
1309	513607.1	815814.6	855.062	855.306	-0.244	Tall Grass
1310	513612	815815.1	854.997	855.16	-0.163	Tall Grass
1311	513612.3	815819.7	854.793	854.972	-0.179	Tall Grass
1312	513612.5	815822.7	854.785	854.933	-0.148	Tall Grass
1313	513612.6	815825.5	854.791	854.906	-0.115	Tall Grass
1314	513612.7	815828.4	854.585	854.84	-0.255	Tall Grass
1315	513616.5	815829.3	854.639	854.737	-0.098	Tall Grass
1316	513616.5	815824.6	854.663	854.889	-0.226	Tall Grass
1317	513616.6	815821.7	854.713	855.014	-0.301	Tall Grass
1318	513616.7	815819.2	854.679	855.048	-0.369	Tall Grass
1319	513617	815816	854.896	855.189	-0.293	Tall Grass

<i>Number</i>	<i>Easting</i>	<i>Northing</i>	<i>Known Z</i>	<i>Laser Z</i>	<i>Delta Z</i>	<i>Landcover Type</i>
1320	513621	815816	854.921	855.193	-0.272	Tall Grass
1321	513620.8	815819.6	854.639	854.878	-0.239	Tall Grass
1322	513620.5	815822.3	854.674	854.821	-0.147	Tall Grass
1323	513620.4	815825.1	854.634	854.884	-0.25	Tall Grass
1324	513620.3	815828.2	854.612	854.898	-0.286	Tall Grass
1325	517320.1	816618.4	871.533	871.59	-0.057	Low Grass
1326	517322.9	816618.3	871.541	871.617	-0.076	Low Grass
1327	517325.8	816618.3	871.526	871.596	-0.07	Low Grass
1328	517328.6	816618.2	871.564	871.52	0.044	Low Grass
1329	517331.7	816618.3	871.6	871.572	0.028	Low Grass
1330	517331.7	816622.4	871.481	871.509	-0.028	Low Grass
1331	517327.6	816622.6	871.438	871.46	-0.022	Low Grass
1332	517324.7	816622.8	871.448	871.416	0.032	Low Grass
1333	517321.8	816623	871.479	871.458	0.021	Low Grass
1334	517318.7	816623.3	871.465	871.437	0.028	Low Grass
1335	517318.7	816626.8	871.262	871.433	-0.171	Low Grass
1336	517322.2	816626.7	871.335	871.351	-0.016	Low Grass
1337	517325.1	816627.2	871.36	871.299	0.061	Low Grass
1338	517328	816627.5	871.302	871.302	0	Low Grass
1339	517330.9	816627.6	871.252	871.325	-0.073	Low Grass
1340	517331	816632	871.067	871.098	-0.031	Low Grass
1341	517327.4	816632.2	871.232	871.159	0.073	Low Grass
1342	517324.7	816632.4	871.423	871.389	0.034	Low Grass
1343	517321.8	816632.3	871.437	871.408	0.029	Low Grass
1344	517319.1	816632.4	871.356	871.447	-0.091	Low Grass
1345	517318.6	816635.8	871.3	871.405	-0.105	Low Grass
1346	517322.9	816636.2	871.403	871.343	0.06	Low Grass
1347	517325.7	816636.3	871.348	871.308	0.04	Low Grass
1348	517328.6	816636.5	871.207	871.157	0.05	Low Grass
1349	517331.6	816636.8	871.155	871.158	-0.003	Low Grass
1350	512649.5	815758.1	865.395	865.657	-0.262	Tall Trees
1351	512649.7	815760.6	865.492	865.544	-0.052	Tall Trees
1352	512649.8	815763.3	865.83	865.921	-0.091	Tall Trees
1353	512649.7	815765.3	865.736	866.055	-0.319	Tall Trees
1354	512649.4	815769.8	865.782	866.061	-0.279	Tall Trees
1355	512652.8	815770.2	865.704	866.047	-0.343	Tall Trees
1356	512652.6	815766.9	865.661	866.066	-0.405	Tall Trees
1357	512652.7	815764.5	865.573	865.723	-0.15	Tall Trees
1358	512652.4	815761	865.391	865.573	-0.182	Tall Trees
1359	512652.4	815757.7	865.193	865.46	-0.267	Tall Trees
1360	512656.2	815757.7	865.255	865.341	-0.086	Tall Trees
1361	512656	815759.9	865.377	865.472	-0.095	Tall Trees
1362	512656.6	815763.8	865.4	866.056	-0.656	Tall Trees
1363	512656.4	815767.7	865.786	866.11	-0.324	Tall Trees

<i>Number</i>	<i>Easting</i>	<i>Northing</i>	<i>Known Z</i>	<i>Laser Z</i>	<i>Delta Z</i>	<i>Landcover Type</i>
1364	512655.9	815770.4	865.646	866.167	-0.521	Tall Trees
1365	512659.5	815772	865.595	866.385	-0.79	Tall Trees
1366	512661.1	815769.7	865.726	866.235	-0.509	Tall Trees
1367	512661.1	815764.7	865.343	865.919	-0.576	Tall Trees
1368	512661.2	815761.1	865.242	865.433	-0.191	Tall Trees
1369	512661.4	815758.3	865.018	865	0.018	Tall Trees
1370	512665.2	815758.5	864.94	865.218	-0.278	Tall Trees
1371	512665.1	815761.8	865.19	865.127	0.063	Tall Trees
1372	512665.2	815764.6	865.174	865.219	-0.045	Tall Trees
1373	512667	815769.5	865.412	865.669	-0.257	Tall Trees
1374	512667.9	815773.6	865.623	865.787	-0.164	Tall Trees
1375	379203.5	876834.5	800.701	801.014	-0.313	Low Grass
1376	379201.2	876836.6	800.87	801.097	-0.227	Low Grass
1377	379198.8	876838.6	800.933	801.211	-0.278	Low Grass
1378	379196.4	876840.4	801.007	801.245	-0.238	Low Grass
1379	379193.6	876842.2	801.192	801.352	-0.16	Low Grass
1380	379196.9	876845.5	801.12	801.29	-0.17	Low Grass
1381	379199.7	876842.2	801.003	801.225	-0.222	Low Grass
1382	379201.5	876840.1	800.894	801.217	-0.323	Low Grass
1383	379203.6	876838	800.838	801.069	-0.231	Low Grass
1384	379206	876835.6	800.713	800.978	-0.265	Low Grass
1385	379209.2	876838.7	800.717	800.993	-0.276	Low Grass
1386	379206.5	876841.2	800.898	801.01	-0.112	Low Grass
1387	379204.2	876843.2	800.932	801.188	-0.256	Low Grass
1388	379201.3	876845.3	801.019	801.197	-0.178	Low Grass
1389	379198.8	876847.1	801.12	801.278	-0.158	Low Grass
1390	379201.4	876850.7	801.133	801.339	-0.206	Low Grass
1391	379203.9	876848.3	801.052	801.255	-0.203	Low Grass
1392	379206.1	876846	800.914	801.098	-0.184	Low Grass
1393	379208.1	876843.6	800.857	801.003	-0.146	Low Grass
1394	379210.1	876841.2	800.701	800.872	-0.171	Low Grass
1395	379213.9	876844.3	800.752	800.966	-0.214	Low Grass
1396	379211	876847.2	800.868	801.156	-0.288	Low Grass
1397	379209	876850	800.991	801.266	-0.275	Low Grass
1398	379206.7	876852.4	801.082	801.365	-0.283	Low Grass
1399	379204.6	876854.8	801.104	801.424	-0.32	Low Grass
1400	366621.5	867390.1	775.233	775.199	0.034	Urban
1401	366619.3	867388.3	775.277	775.313	-0.036	Urban
1402	366617.3	867386	775.27	775.231	0.039	Urban
1403	366615.2	867384.2	775.328	775.393	-0.065	Urban
1404	366613.2	867381.6	775.389	775.427	-0.038	Urban
1405	366616.4	867378.4	775.402	775.464	-0.062	Urban
1406	366618.8	867381.2	775.423	775.428	-0.005	Urban

<i>Number</i>	<i>Easting</i>	<i>Northing</i>	<i>Known Z</i>	<i>Laser Z</i>	<i>Delta Z</i>	<i>Landcover Type</i>
1407	366620.9	867383	775.372	775.459	-0.087	Urban
1408	366622.9	867384.9	775.361	775.36	0.001	Urban
1409	366625	867387.1	775.353	775.379	-0.026	Urban
1410	366627.7	867384.4	775.343	775.211	0.132	Urban
1411	366624.6	867381.8	775.398	775.365	0.033	Urban
1412	366622.6	867379.7	775.448	775.351	0.097	Urban
1413	366620.3	867377.6	775.484	775.302	0.182	Urban
1414	366618.1	867375	775.476	775.3	0.176	Urban
1415	366620.9	867372.1	775.512	775.446	0.066	Urban
1416	366623.7	867375.1	775.455	775.142	0.313	Urban
1417	366625.9	867377.1	775.446	775.385	0.061	Urban
1418	366628	867379.2	775.408	775.244	0.164	Urban
1419	366630.2	867381.5	775.4	775.282	0.118	Urban
1420	366633.1	867379	775.423	775.255	0.168	Urban
1421	366630	867376	775.492	775.447	0.045	Urban
1422	366628.1	867373.8	775.502	775.308	0.194	Urban
1423	366626.1	867371.6	775.516	775.368	0.148	Urban
1424	366623.9	867369.1	775.536	775.596	-0.06	Urban
1425	363339.8	874352.4	792.203	792.473	-0.27	Low Trees
1426	363339.6	874355.4	792.011	792.624	-0.613	Low Trees
1427	363339.6	874358.6	791.577	792.142	-0.565	Low Trees
1428	363339.4	874361.7	791.267	791.741	-0.474	Low Trees
1429	363339.5	874364.6	791.052	791.601	-0.549	Low Trees
1430	363335	874363.4	791.664	792.023	-0.359	Low Trees
1431	363334.7	874360.3	791.744	792.262	-0.518	Low Trees
1432	363334	874357.5	791.831	792.952	-1.121	Low Trees
1433	363333.4	874355.1	792.23	792.715	-0.485	Low Trees
1434	363333.5	874352.2	792.603	792.938	-0.335	Low Trees
1435	363331.1	874352.3	792.803	793.266	-0.463	Low Trees
1436	363330.5	874356	792.583	793.162	-0.579	Low Trees
1437	363330.6	874359.7	792.317	792.768	-0.451	Low Trees
1438	363330	874362.4	792.218	792.752	-0.534	Low Trees
1439	363329.7	874365.2	792.166	792.436	-0.27	Low Trees
1440	363324.5	874366	792.744	793.154	-0.41	Low Trees
1441	363323.8	874361.9	792.839	793.334	-0.495	Low Trees
1442	363323.4	874358.5	793.296	793.811	-0.515	Low Trees
1443	363323.2	874355.8	793.331	793.772	-0.441	Low Trees
1444	363323	874352.9	793.637	793.903	-0.266	Low Trees
1445	363342.2	874366	790.569	791.263	-0.694	Low Trees
1446	363343.2	874360.6	790.877	791.427	-0.55	Low Trees
1447	363343.3	874357.6	791.058	791.892	-0.834	Low Trees
1448	363343.5	874354.4	791.635	792.241	-0.606	Low Trees
1449	363343.5	874350.7	792.082	792.622	-0.54	Low Trees

<i>Number</i>	<i>Easting</i>	<i>Northing</i>	<i>Known Z</i>	<i>Laser Z</i>	<i>Delta Z</i>	<i>Landcover Type</i>
1450	366075.2	866598	775.054	775.624	-0.57	Tall Grass
1451	366073.5	866600.8	774.977	775.325	-0.348	Tall Grass
1452	366071.5	866603	774.956	775.367	-0.411	Tall Grass
1453	366068.8	866605.4	774.931	775.365	-0.434	Tall Grass
1454	366066.7	866607.7	774.951	775.142	-0.191	Tall Grass
1455	366063.5	866604.7	774.958	775.247	-0.289	Tall Grass
1456	366066	866602.2	774.863	775.277	-0.414	Tall Grass
1457	366068.4	866599.9	774.974	775.281	-0.307	Tall Grass
1458	366071	866597.9	775.024	775.41	-0.386	Tall Grass
1459	366073	866595.6	775.09	775.399	-0.309	Tall Grass
1460	366069.3	866593.4	775.048	775.415	-0.367	Tall Grass
1461	366066.3	866596.8	774.957	775.386	-0.429	Tall Grass
1462	366064.4	866599.1	774.884	775.363	-0.479	Tall Grass
1463	366061.8	866601.3	774.965	775.395	-0.43	Tall Grass
1464	366059.4	866603.6	774.934	775.28	-0.346	Tall Grass
1465	366056	866600.9	774.921	775.493	-0.572	Tall Grass
1466	366058.8	866598	774.9	775.074	-0.174	Tall Grass
1467	366060.9	866595.6	774.866	775.208	-0.342	Tall Grass
1468	366063.2	866593.2	774.971	775.22	-0.249	Tall Grass
1469	366065.5	866591	774.979	775.47	-0.491	Tall Grass
1470	366062.9	866587.9	775.032	775.479	-0.447	Tall Grass
1471	366059.7	866590.6	774.918	775.334	-0.416	Tall Grass
1472	366057.1	866592.8	774.834	775.374	-0.54	Tall Grass
1473	366054.2	866594.8	774.873	775.25	-0.377	Tall Grass
1474	366051.5	866596.7	774.892	775.277	-0.385	Tall Grass
1475	365981.3	866529.9	774.49	774.895	-0.405	Tall Trees
1476	365979.1	866532.5	774.415	774.782	-0.367	Tall Trees
1477	365977.1	866534.5	774.419	774.672	-0.253	Tall Trees
1478	365975	866536.6	774.379	774.513	-0.134	Tall Trees
1479	365972.9	866538.5	774.325	774.532	-0.207	Tall Trees
1480	365970.3	866536.3	774.272	774.478	-0.206	Tall Trees
1481	365972.8	866533.6	774.395	774.548	-0.153	Tall Trees
1482	365974.9	866531.4	774.454	774.451	0.003	Tall Trees
1483	365977.3	866529.2	774.415	774.638	-0.223	Tall Trees
1484	365979.2	866527.2	774.493	774.773	-0.28	Tall Trees
1485	365976.9	866524.8	774.634	774.435	0.199	Tall Trees
1486	365974.1	866527	774.635	774.712	-0.077	Tall Trees
1487	365971.9	866528.7	774.566	774.621	-0.055	Tall Trees
1488	365969.4	866530.3	774.519	774.525	-0.006	Tall Trees
1489	365966.3	866531.6	774.393	774.418	-0.025	Tall Trees
1490	365963.3	866528.2	774.177	774.495	-0.318	Tall Trees
1491	365964.8	866525.7	774.326	774.853	-0.527	Tall Trees
1492	365966.4	866523.9	774.496	775.032	-0.536	Tall Trees

<i>Number</i>	<i>Easting</i>	<i>Northing</i>	<i>Known Z</i>	<i>Laser Z</i>	<i>Delta Z</i>	<i>Landcover Type</i>
1493	365968.6	866521.9	774.528	774.839	-0.311	Tall Trees
1494	365970.3	866519.9	774.596	774.582	0.014	Tall Trees
1495	365968.5	866516.6	774.293	774.544	-0.251	Tall Trees
1496	365966.1	866518.7	774.478	774.428	0.05	Tall Trees
1497	365963.5	866520.4	774.308	774.427	-0.119	Tall Trees
1498	365960.6	866523	774.153	774.353	-0.2	Tall Trees
1499	365958.3	866524.6	774.063	774.298	-0.235	Tall Trees
1500	396989.8	815536.5	784.841	784.8	0.041	Urban
1501	396992.4	815536.2	784.851	784.86	-0.009	Urban
1502	396995.4	815536.2	784.853	784.667	0.186	Urban
1503	396998.3	815535.9	784.875	784.85	0.025	Urban
1504	397001.4	815535.7	784.887	784.809	0.078	Urban
1505	397001.8	815540.1	784.916	784.907	0.009	Urban
1506	396998	815540.3	784.899	785.044	-0.145	Urban
1507	396995.1	815540.3	784.913	784.894	0.019	Urban
1508	396992.2	815540.1	784.867	784.8	0.067	Urban
1509	396989.4	815539.8	784.826	784.915	-0.089	Urban
1510	396989	815543.4	784.823	784.958	-0.135	Urban
1511	396992.3	815543.1	784.9	784.904	-0.004	Urban
1512	396995.4	815543.2	784.901	784.948	-0.047	Urban
1513	396998.2	815543	784.923	784.975	-0.052	Urban
1514	397001.3	815543	784.907	784.982	-0.075	Urban
1515	397001.8	815547.2	784.942	784.95	-0.008	Urban
1516	396998	815547.2	784.953	784.882	0.071	Urban
1517	396995.5	815547.2	784.913	784.871	0.042	Urban
1518	396992.5	815547.3	784.904	784.911	-0.007	Urban
1519	396989.7	815547.3	784.901	784.825	0.076	Urban
1520	396989.2	815550.6	784.894	785.148	-0.254	Urban
1521	396992.7	815550.8	784.917	784.728	0.189	Urban
1522	396995.5	815551.2	784.942	784.929	0.013	Urban
1523	396998.2	815551.6	784.932	784.854	0.078	Urban
1524	397001.2	815552.1	784.956	784.936	0.02	Urban
1525	400969	815172.1	798.939	799.143	-0.204	Low Grass
1526	400968.6	815176.3	799.026	799.189	-0.163	Low Grass
1527	400968.6	815179.9	799.103	799.29	-0.187	Low Grass
1528	400968.6	815183.9	799.201	799.398	-0.197	Low Grass
1529	400968.1	815188	799.346	799.433	-0.087	Low Grass
1530	400971.8	815188.4	799.465	799.516	-0.051	Low Grass
1531	400972	815185	799.314	799.45	-0.136	Low Grass
1532	400972.3	815181.6	799.22	799.33	-0.11	Low Grass
1533	400972.7	815177.5	799.16	799.281	-0.121	Low Grass
1534	400972.7	815173.3	798.966	799.119	-0.153	Low Grass
1535	400976.5	815173.2	799.026	799.192	-0.166	Low Grass

<i>Number</i>	<i>Easting</i>	<i>Northing</i>	<i>Known Z</i>	<i>Laser Z</i>	<i>Delta Z</i>	<i>Landcover Type</i>
1536	400976.3	815176.9	799.257	799.218	0.039	Low Grass
1537	400976.3	815180.7	799.315	799.455	-0.14	Low Grass
1538	400976.2	815184.7	799.411	799.526	-0.115	Low Grass
1539	400975.9	815188.7	799.561	799.516	0.045	Low Grass
1540	400979.2	815189.1	799.631	799.643	-0.012	Low Grass
1541	400979.3	815186	799.489	799.359	0.13	Low Grass
1542	400979.2	815182.2	799.389	799.308	0.081	Low Grass
1543	400979.3	815178.3	799.377	799.262	0.115	Low Grass
1544	400979.3	815174.2	799.143	799.159	-0.016	Low Grass
1545	400982.7	815174	799.185	799.367	-0.182	Low Grass
1546	400982.8	815177.6	799.336	799.285	0.051	Low Grass
1547	400983	815181.5	799.414	799.489	-0.075	Low Grass
1548	400983.1	815185.4	799.506	799.579	-0.073	Low Grass
1549	400983.2	815188.9	799.558	799.613	-0.055	Low Grass
1550	402384.3	815329	781.73	781.892	-0.162	Tall Trees
1551	402381.8	815326.9	781.752	781.903	-0.151	Tall Trees
1552	402379.4	815324.8	782.044	782.106	-0.062	Tall Trees
1553	402376.5	815322.4	782.243	782.36	-0.117	Tall Trees
1554	402373.8	815320.1	782.516	782.642	-0.126	Tall Trees
1555	402371.5	815321.7	782.595	782.615	-0.02	Tall Trees
1556	402373.5	815323.8	782.421	782.433	-0.012	Tall Trees
1557	402375.8	815325.9	782.192	782.358	-0.166	Tall Trees
1558	402377.9	815327.9	782.083	782.22	-0.137	Tall Trees
1559	402381.1	815330.5	781.801	782.109	-0.308	Tall Trees
1560	402378	815333.3	781.999	782.116	-0.117	Tall Trees
1561	402375.9	815331.3	782.154	782.507	-0.353	Tall Trees
1562	402373.4	815329.4	782.312	782.627	-0.315	Tall Trees
1563	402370.6	815326.7	782.515	782.732	-0.217	Tall Trees
1564	402367.6	815324.3	782.684	782.98	-0.296	Tall Trees
1565	402364.7	815327.2	782.773	782.952	-0.179	Tall Trees
1566	402366.7	815329.1	782.615	782.833	-0.218	Tall Trees
1567	402369.6	815331.6	782.437	782.599	-0.162	Tall Trees
1568	402371.9	815333.8	782.312	782.306	0.006	Tall Trees
1569	402375.1	815336.4	782.087	782.124	-0.037	Tall Trees
1570	402372.6	815339.6	782.207	782.41	-0.203	Tall Trees
1571	402369.3	815337.2	782.373	782.501	-0.128	Tall Trees
1572	402366.3	815335	782.46	782.565	-0.105	Tall Trees
1573	402363	815333.6	782.711	782.633	0.078	Tall Trees
1574	402360.3	815332.1	782.913	783.061	-0.148	Tall Trees
1575	403532.5	814423.8	732.939	733.279	-0.34	Low Trees
1576	403534.1	814427.2	732.872	733.136	-0.264	Low Trees
1577	403535.6	814430.9	732.386	732.845	-0.459	Low Trees
1578	403537.2	814434.6	732.334	732.906	-0.572	Low Trees

<i>Number</i>	<i>Easting</i>	<i>Northing</i>	<i>Known Z</i>	<i>Laser Z</i>	<i>Delta Z</i>	<i>Landcover Type</i>
1579	403538.8	814437.1	732.472	732.739	-0.267	Low Trees
1580	403541.9	814435.5	732.287	732.739	-0.452	Low Trees
1581	403540.6	814432.2	732.281	732.67	-0.389	Low Trees
1582	403538.9	814429.2	732.587	732.872	-0.285	Low Trees
1583	403538.5	814425.5	732.435	732.901	-0.466	Low Trees
1584	403536.6	814422.1	732.642	732.981	-0.339	Low Trees
1585	403540.2	814420.8	732.687	732.823	-0.136	Low Trees
1586	403540.9	814424.2	732.523	732.708	-0.185	Low Trees
1587	403541.3	814428.4	732.422	732.808	-0.386	Low Trees
1588	403542.1	814432.2	732.347	732.616	-0.269	Low Trees
1589	403542.9	814434.8	732.249	732.688	-0.439	Low Trees
1590	403545.7	814434.6	732.306	732.642	-0.336	Low Trees
1591	403545.1	814430.9	732.377	732.823	-0.446	Low Trees
1592	403545	814427.9	732.241	732.932	-0.691	Low Trees
1593	403544.7	814424.5	732.581	732.906	-0.325	Low Trees
1594	403543.7	814421	732.159	732.721	-0.562	Low Trees
1595	403546.5	814420.4	732.361	732.59	-0.229	Low Trees
1596	403547.1	814423	732.45	732.575	-0.125	Low Trees
1597	403547.5	814426	732.142	733.069	-0.927	Low Trees
1598	403547.6	814429.4	732.187	732.915	-0.728	Low Trees
1599	403547.9	814433.3	732.101	732.879	-0.778	Low Trees
1600	402155.5	807751.9	729.855	729.958	-0.103	Tall Grass
1601	402152.7	807753.3	729.811	729.899	-0.088	Tall Grass
1602	402149.4	807754.9	729.656	729.969	-0.313	Tall Grass
1603	402146	807756.2	729.615	730.051	-0.436	Tall Grass
1604	402143.1	807757.4	729.507	729.824	-0.317	Tall Grass
1605	402144.6	807760.5	729.611	729.813	-0.202	Tall Grass
1606	402147.4	807759.3	729.613	729.826	-0.213	Tall Grass
1607	402150.2	807758	729.67	729.935	-0.265	Tall Grass
1608	402153.1	807757.1	729.748	729.974	-0.226	Tall Grass
1609	402156.6	807755.7	729.87	729.915	-0.045	Tall Grass
1610	402158.7	807758.9	729.899	730.169	-0.27	Tall Grass
1611	402156	807761.1	729.923	730.152	-0.229	Tall Grass
1612	402152.6	807762.9	729.99	730.087	-0.097	Tall Grass
1613	402148.5	807764.1	729.74	729.951	-0.211	Tall Grass
1614	402144.7	807765.3	729.604	729.824	-0.22	Tall Grass
1615	402145.6	807769.4	729.595	729.892	-0.297	Tall Grass
1616	402148.9	807768.4	729.69	729.873	-0.183	Tall Grass
1617	402152.2	807767.2	729.81	729.965	-0.155	Tall Grass
1618	402155.6	807765.6	729.852	729.978	-0.126	Tall Grass
1619	402159.6	807763.7	729.99	730.128	-0.138	Tall Grass
1620	402161.6	807766.7	729.961	730.054	-0.093	Tall Grass
1621	402158.3	807768.1	729.653	730.118	-0.465	Tall Grass
1622	402155.4	807769.3	729.753	729.927	-0.174	Tall Grass
1623	402151.7	807770.9	729.685	729.823	-0.138	Tall Grass
1624	402148.5	807772.6	729.648	729.749	-0.101	Tall Grass

Field Notes

Project FEMA ground survey notes

- Contains point number and descriptions
- Includes Control and Check Points not included in statistical analysis

FEMA SITES			
FEMA 1			
1000-1024-	ASPHALT PARKING LOT		
1025-1049-	MOWED GRASS		
1050-1074-	TALL GRASS/WEEDS		
1075-1099-	TALL PINES		
1100-1124-	BRUSH		
SET	CONTROL	POINTS	500 & 501
NE	SITE	HT	TH
500	501	4.34	6.0
CHECKED INTO NGS MON. "LINCOLN C GPS"			

FEMA 2

1250-1274 - ASPHALT PARKING LOT

1275-1299 - BRUSH / LOW TREES

1300-1324 - TALL GRASS / WEEDS

1325-1349 - MOWED GRASS

1350-1374 - TALL TREES (PINES)

CHECKED INTO NGS MON "ALBION NE GPS"

SET CONTROL POINTS 506 & 507

NO	SITE	IF	TH
506	507	4.71	6

FEMA 3

1125-1149- ASPHALT PARKING AREA

1150-1174- TALL GRASS/WEEDS

1175-1199- MOWED GRASS

1200-1224- BRUSH / LOW TREES

1225-1249- TALL TREES (PINES)

SET CONTROL POINTS 502 & 503, 504 & 505

NO	SITE	I.H	T.H
503	502	4.70	6.0

NO	SITE	I.H	T.H
504	505	4.80	6.0

CHECKED INTO NGS MON "OSSEO GPS"

FEMA 4

1500 - 1524 - Asphalt Parking lot

1525 - 1549 - mowed Grass

1550 - 1574 - TALL TREES (PINES)

1575 - 1599 - BRUSH / Low TREES

1600 - 1624 - TALL GRASS / WEEDS

checked into NGS Mon "Arcadia W GPS"

	<u>Site</u>	<u>IH</u>	<u>TH</u>
510	511	4.78	6.0

FEMA 5

1375 - 1399 - MOWED GRASS

1400 - 1424 - Asphalt

1425 - 1449 - Low trees/Brush

1450 - 1474 - WEEDS/TALL GRASS

1475 - 1499 - TALL TREES (PINES)

SET CONTROL POINTS 508 & 509

<u>No</u>	<u>Site</u>	<u>LH</u>	<u>TH</u>
508	509	4.48	6.0

Field Photos

Identify land cover types present at each survey location

















FEMA Location #3 – Tall Trees



FEMA Location #4 - Urban



FEMA Location #4 – Low Grass



FEMA Location #4 – Tall Grass



