

WISCONSIN WROC – 3DEP
WASHBURN COUNTY
LIDAR 2016-17

Vertical Accuracy Report

April 28, 2017

Project Information

Prepared By: Ayres Associates

Project Name: Wisconsin WROC - 3DEP | Washburn County LiDAR 2016-17

Sensor Info: Optech Orion H300

Required Nominal Pulse Spacing: 0.7

Contractor Name: Ayres Associates

Units: US Survey Feet

Date of Acquisition: Start: 4/12/2016 Finish: 4/14/2016

Report Information

This report documents the absolute vertical accuracy of the LiDAR data collected for the Washburn County, WI, QL2 LiDAR project. Independent ground control checkpoints were collected by land surveyors using Trimble GNSS equipment connected to WISCORS base stations. The checkpoints were collected in April-May 2016. The checkpoints were collected under various land cover types that are predominant in the County. Each land cover type falls into either the Non-vegetated Vertical Accuracy (NVA) or the Vegetated Vertical Accuracy (VVA) group. For this project, 56 NVA points and 54 VVA points were collected throughout the County.

The following report shows the final statistics for the NVA checkpoints compared against the raw swath point cloud and the bare earth DEM, and the VVA statistics compared against the DEM. Statistics are reported for LAS and DEM by NVA and VVA categories and by land cover type.

Vertical Accuracy Specifications per USGS QL2 level:

LAS:

NVA equates to 10 cm RMSEz, or 19.6 cm (0.64 ft) at the 95% confidence level.

DEM:

NVA equates to 10 cm RMSEz, or 19.6 cm (0.64 ft) at the 95% confidence level.

VVA equates to 29.4 cm (0.96 ft) at the 95th percentile.

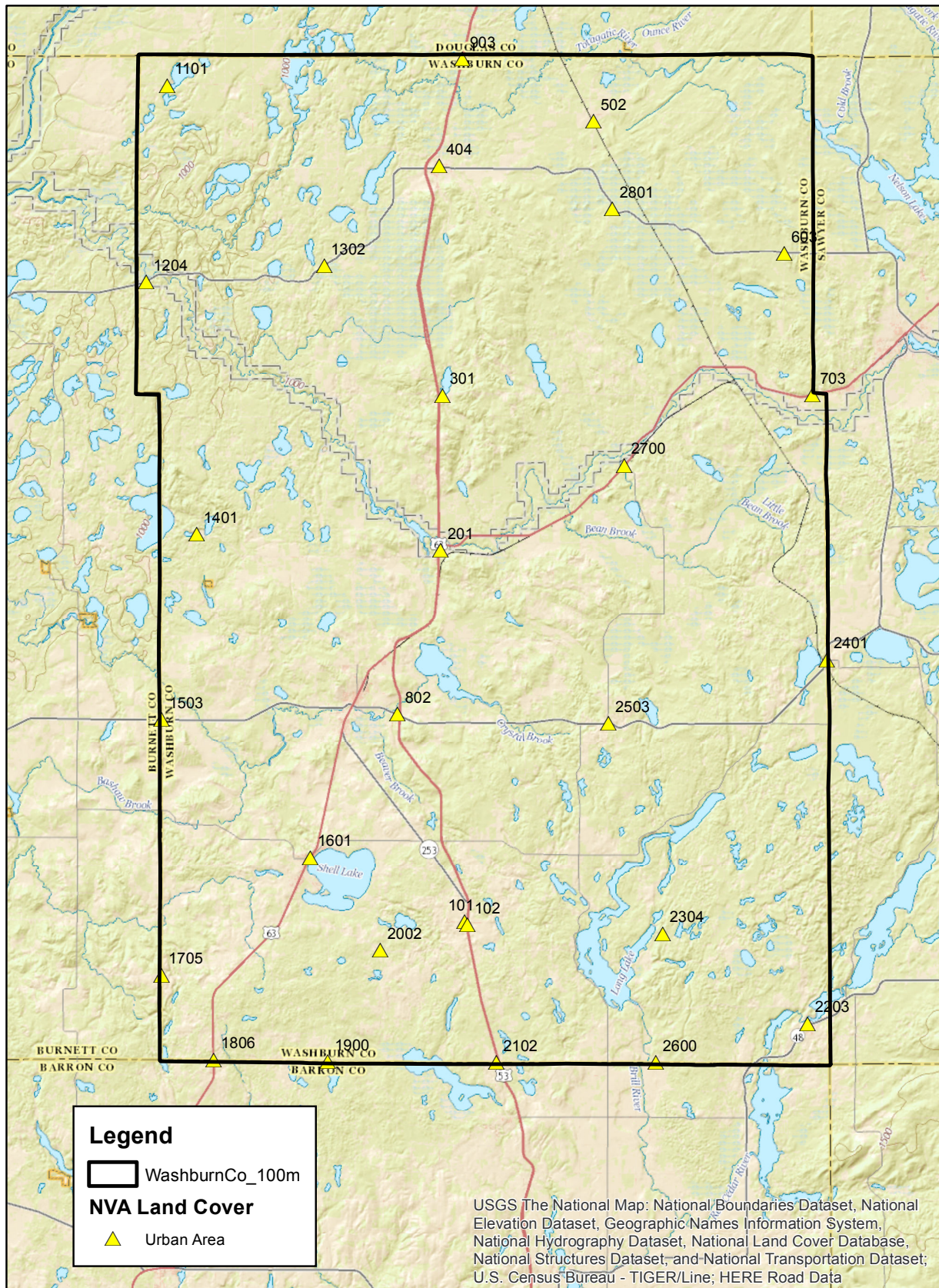
The NVA and VVA statistics for this project are within the above stated specifications.

LiDAR Accuracy Assessment Summary

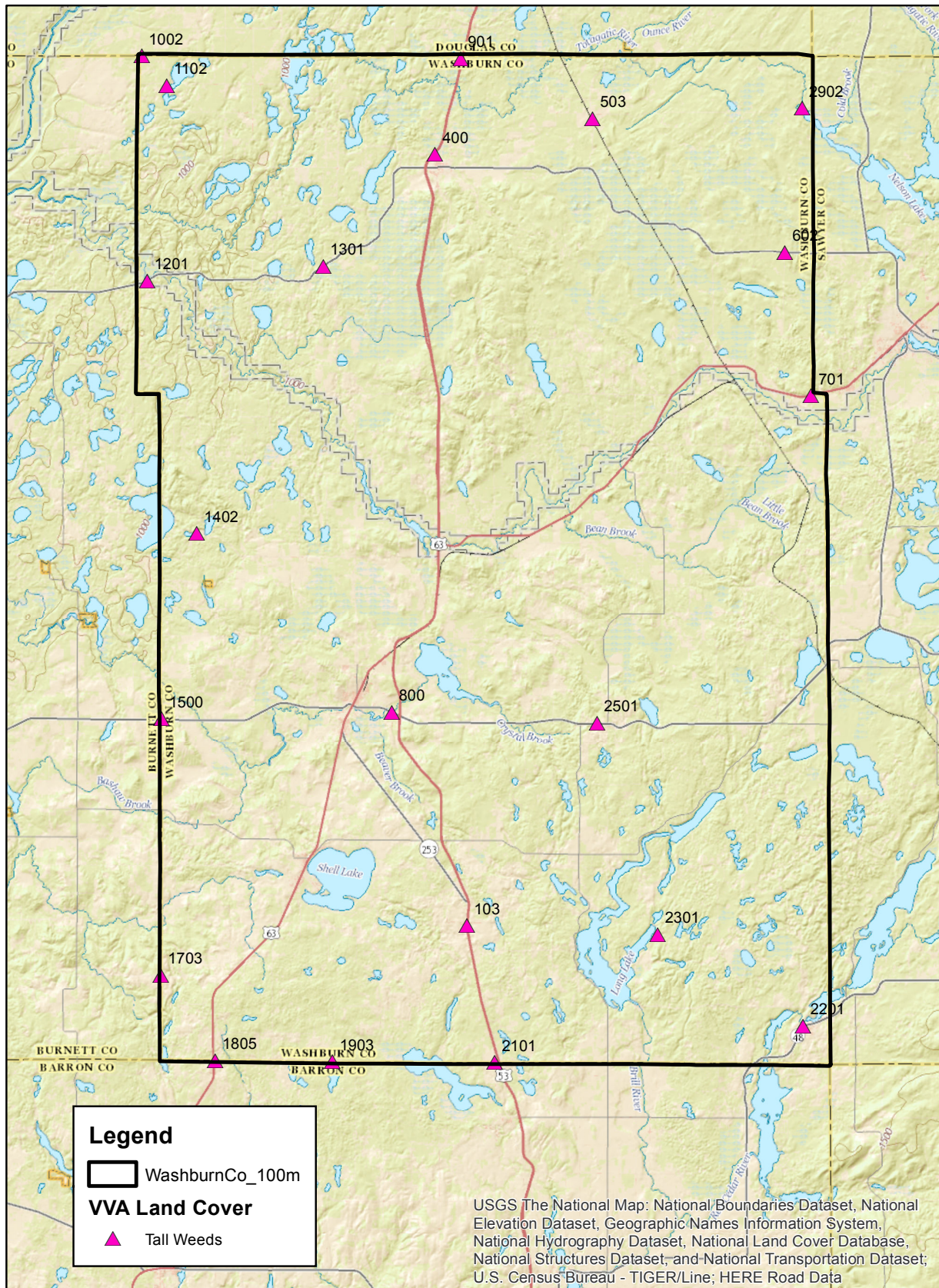
LAND COVER TYPE	# OF POINTS	NVA	VVA
LAS		95% confidence level	N/A
1. Bare Earth	28	0.383	N/A
2. Urban Areas	28	0.413	N/A
3. Tall Weeds	21	N/A	N/A
5. Forest	29	N/A	N/A
7. Swamp	4	N/A	N/A
TOTAL	110	0.398	N/A
DEM		95% confidence level	95th percentile
1. Bare Earth	28	0.385	N/A
2. Urban Areas	28	0.435	N/A
3. Tall Weeds	21	N/A	0.618
5. Forest	29	N/A	0.559
7. Swamp	4	N/A	0.584
TOTAL	110	0.411	0.584

Units: US Survey Feet

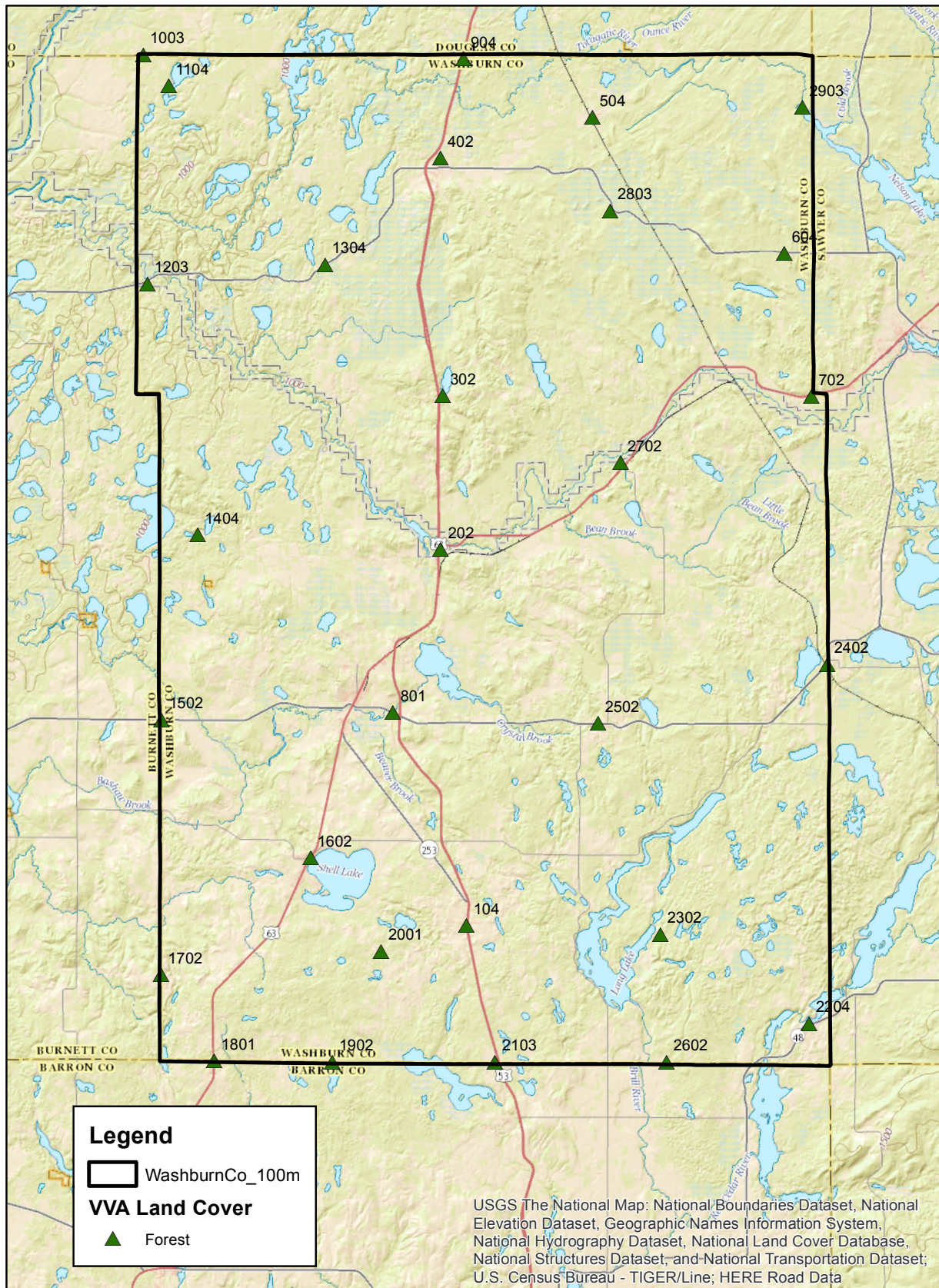
Map of NVA Checkpoint Locations - 2. Urban Area



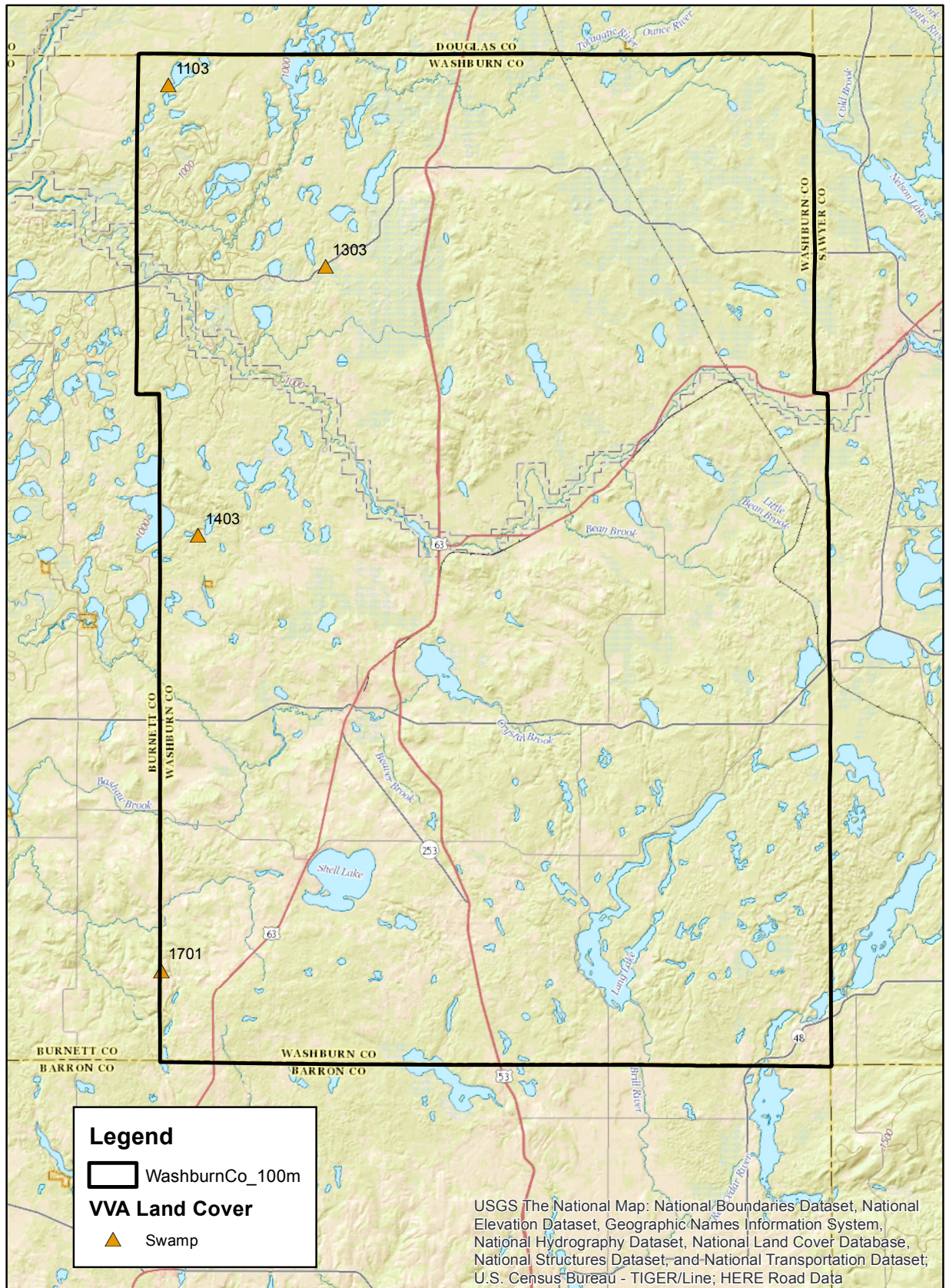
Map of NVA Checkpoint Locations - 3. Tall Weeds



Map of NVA Checkpoint Locations - 5. Forested Areas



Map of NVA Checkpoint Locations - 7. Swamp



LAS

NONVEGETATED VERTICAL ACCURACY – OVERALL	
Land Cover Type	1. Bare Earth, 2 Urban Areas
Minimum DZ	-0.039
Maximum DZ	0.442
Mean DZ	0.171
Mean Magnitude DZ	0.417
Number Observations	56
Standard Deviation DZ	0.111
RMSE Z	0.203
95% Confidence Level Z	0.398
Units	US Survey Feet

DEM

NONVEGETATED VERTICAL ACCURACY – OVERALL	
Land Cover Type	1. Bare Earth, 2. Urban Area
Minimum DZ	-0.071
Maximum DZ	0.459
Mean DZ	0.175
Mean Magnitude DZ	0.424
Number Observations	56
Standard Deviation DZ	0.117
RMSE Z	0.21
95% Confidence Level Z	0.411
Units	US Survey Feet

DEM (Continued)

VEGETATED VERTICAL ACCURACY	
Land Cover Type	3. Tall Weeds
Minimum DZ	0.157
Maximum DZ	0.637
Mean DZ	0.398
Mean Magnitude DZ	0.631
Number Observations	21
Standard Deviation DZ	0.133
RMSE Z	0.419
95th Percentile	0.618
Units	US Survey Feet

DEM (Continued)

VEGETATED VERTICAL ACCURACY	
Land Cover Type	5. Forest
Minimum DZ	0.005
Maximum DZ	0.637
Mean DZ	0.311
Mean Magnitude DZ	0.558
Number Observations	29
Standard Deviation DZ	0.155
RMSE Z	0.347
95th Percentile	0.559
Units	US Survey Feet

DEM (Continued)

VEGETATED VERTICAL ACCURACY	
Land Cover Type	7. Swamp
Minimum DZ	0.149
Maximum DZ	0.584
Mean DZ	0.397
Mean Magnitude DZ	0.63
Number Observations	4
Standard Deviation DZ	0.219
RMSE Z	0.44
95th Percentile	0.584
Units	US Survey Feet

Point: 100 Bare Earth

Survey X: 761647.79, Survey Y: 526799.99, Z1: 1292.95, Z DEM: 1293.07, Z LAS: 1293.11, LC Type: 1, ΔZ DEM: 0.12, ΔZ LAS: 0.16



North



South



East

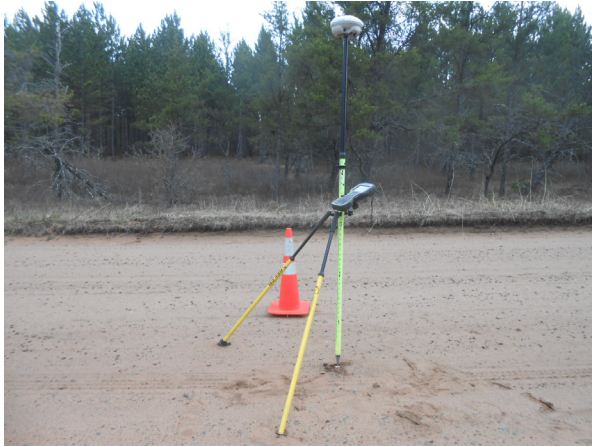


West



Point: 1001 Bare Earth

Survey X: 701207.57, Survey Y: 689700.13, Z1: 1044.74, Z DEM: 1044.9, Z LAS: 1044.85, LC Type: 1, ΔZ DEM: 0.16, ΔZ LAS: 0.11



North



South



East



West

Point: 1002 Tall Weeds

Survey X: 700925.56, Survey Y: 689597.4, Z1: 1045.71, Z DEM: 1045.87, Z LAS: 1045.78, LC Type: 3, ΔZ DEM: 0.16, ΔZ LAS: 0.07



North



South



East



West

Point: 1003 Forest

Survey X: 701179.66, Survey Y: 689861.67, Z1: 1048, Z DEM: 1048.2, Z LAS: 1048.23, LC Type: 5, ΔZ DEM: 0.2, ΔZ LAS: 0.23



North



South



East



West



Point: 101 Urban

Survey X: 761612.03, Survey Y: 526750.89, Z1: 1293.27, Z DEM: 1293.36, Z LAS: 1293.39, LC Type: 2, ΔZ DEM: 0.09, ΔZ LAS: 0.12



North



South



East



West



Point: 102 Urban

Survey X: 762097.52, Survey Y: 526217.66, Z1: 1294.51, Z DEM: 1294.66, Z LAS: 1294.68, LC Type: 2, ΔZ DEM: 0.15, ΔZ LAS: 0.17



North



South



East



West



Point: 103 Tall Weeds

Survey X: 761988.94, Survey Y: 526128.18, Z1: 1288.25, Z DEM: 1288.63, Z LAS: 1288.48, LC Type: 3, ΔZ DEM: 0.38, ΔZ LAS: 0.23



North



South



East



West



Point: 104 Forest

Survey X: 761947.54, Survey Y: 526074.5, Z1: 1285.37, Z DEM: 1285.56, Z LAS: 1285.6, LC Type: 5, ΔZ DEM: 0.19, ΔZ LAS: 0.23



North



South



East



West



Point: 1100 Bare Earth

Survey X: 705861.11, Survey Y: 684260.96, Z1: 1029.87, Z DEM: 1030.02, Z LAS: 1030.02, LC Type: 1, ΔZ DEM: 0.15, ΔZ LAS: 0.15



North



South



East



West



Point: 1101 Urban

Survey X: 705726.890, Survey Y: 684079.420, Z1: 1027.000, Z DEM: 1027.164, Z LAS: 1027.149, LC Type: 2, ΔZ DEM: 0.164, ΔZ LAS: 0.149



North



South



East



West

(Photos of field set-ups not available at this location)

Point: 1102 Tall Weeds

Survey X: 705625.52, Survey Y: 684085.11, Z1: 1029.48, Z DEM: 1029.79, Z LAS: 1029.83, LC Type: 3, ΔZ DEM: 0.31, ΔZ LAS: 0.35



North



South



East



West



Point: 1103 Swamp

Survey X: 705836.28, Survey Y: 684054.86, Z1: 1020.02, Z DEM: 1020.17, Z LAS: 1020.2, LC Type: 7, ΔZ DEM: 0.15, ΔZ LAS: 0.18



North



South



East



West



Point: 1104 Forest

Survey X: 705950.91, Survey Y: 683938.8, Z1: 1020.84, Z DEM: 1021.04, Z LAS: 1021.16, LC Type: 5, ΔZ DEM: 0.2, ΔZ LAS: 0.32



North



South



East



West



Point: 1200 Bare Earth

Survey X: 701004.55, Survey Y: 646892.27, Z1: 952.29, Z DEM: 952.25, Z LAS: 952.25, LC Type: 1, ΔZ DEM: -0.04, ΔZ LAS: -0.04



North



South



East



West



Point: 1201 Tall Weeds

Survey X: 701924.19, Survey Y: 647305.3, Z1: 945.89, Z DEM: 946.05, Z LAS: 946.06, LC Type: 3, ΔZ DEM: 0.16, ΔZ LAS: 0.17



North



South



East



West

Point: 1203 Forest

Survey X: 701969.27, Survey Y: 646762.07, Z1: 965.52, Z DEM: 965.53, Z LAS: 965.55, LC Type: 5, ΔZ DEM: 0.01, ΔZ LAS: 0.03



North



South



East



West



Point: 1204 Urban

Survey X: 701723.9, Survey Y: 647102.51, Z1: 951.75, Z DEM: 951.68, Z LAS: 951.72, LC Type: 2, ΔZ DEM: -0.07, ΔZ LAS: -0.03



North



South



East



West



Point: 1300 Bare Earth

Survey X: 735466.51, Survey Y: 650374.31, Z1: 1028.82, Z DEM: 1028.87, Z LAS: 1028.87, LC Type: 1, ΔZ DEM: 0.05, ΔZ LAS: 0.05



North



South



East



West



Point: 1301 Tall Weeds

Survey X: 735042.18, Survey Y: 650035.81, Z1: 1025.45, Z DEM: 1025.75, Z LAS: 1025.77, LC Type: 3, ΔZ DEM: 0.3, ΔZ LAS: 0.32



North



South



East



West



Point: 1302 Urban

Survey X: 735192.86, Survey Y: 650095.62, Z1: 1029.39, Z DEM: 1029.46, Z LAS: 1029.43, LC Type: 2, ΔZ DEM: 0.07, ΔZ LAS: 0.04



North



South



East



West



Point: 1303 Swamp

Survey X: 735378.65, Survey Y: 650067.87, Z1: 1016.88, Z DEM: 1017.46, Z LAS: 1017.44, LC Type: 7, ΔZ DEM: 0.58, ΔZ LAS: 0.56



North



South



East



West



Point: 1304 Forest

Survey X: 735397.23, Survey Y: 650394.77, Z1: 1029.62, Z DEM: 1029.63, Z LAS: 1029.88, LC Type: 5, ΔZ DEM: 0.01, ΔZ LAS: 0.26



North



South



East



West



Point: 1400 Bare Earth

Survey X: 711299.54, Survey Y: 599668.76, Z1: 1019, Z DEM: 1019.23, Z LAS: 1019.3, LC Type: 1, ΔZ DEM: 0.23, ΔZ LAS: 0.3



North



South



East



West



Point: 1401 Urban

Survey X: 711227.74, Survey Y: 599714.08, Z1: 1018.91, Z DEM: 1019.05, Z LAS: 1019.03, LC Type: 2, ΔZ DEM: 0.14, ΔZ LAS: 0.12



North



South



East



West



Point: 1402 Tall Weeds

Survey X: 711281.21, Survey Y: 599796.32, Z1: 1026.84, Z DEM: 1027.24, Z LAS: 1027.22, LC Type: 3, ΔZ DEM: 0.4, ΔZ LAS: 0.38



North



South



East



West



Point: 1403 Swamp

Survey X: 711427.47, Survey Y: 599532.59, Z1: 1002.94, Z DEM: 1003.22, Z LAS: 1003.37, LC Type: 7, ΔZ DEM: 0.28, ΔZ LAS: 0.43



North



South



East



West



Point: 1404 Forest

Survey X: 711451.8, Survey Y: 599499.81, Z1: 1006.45, Z DEM: 1006.64, Z LAS: 1006.68, LC Type: 5, ΔZ DEM: 0.19, ΔZ LAS: 0.23



North



South



East



West

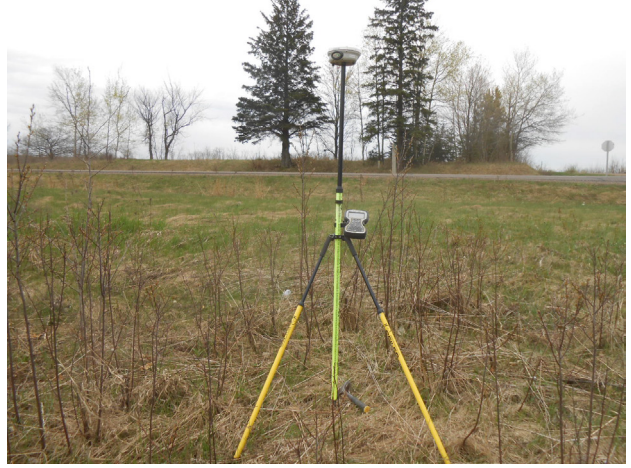


Point: 1500 Tall Weeds

Survey X: 704654.87, Survey Y: 564945.34, Z1: 1130.54, Z DEM: 1130.88, Z LAS: 1130.84, LC Type: 3, ΔZ DEM: 0.34, ΔZ LAS: 0.3



North



South



East



West



Point: 1501 Bare Earth

Survey X: 704613.53, Survey Y: 564707.83, Z1: 1139.1, Z DEM: 1139.21, Z LAS: 1139.25, LC Type: 1, ΔZ DEM: 0.11, ΔZ LAS: 0.15



North



South



East



West



Point: 1502 Forest

Survey X: 704652.87, Survey Y: 564800.1, Z1: 1139.55, Z DEM: 1139.84, Z LAS: 1139.89, LC Type: 5, ΔZ DEM: 0.29, ΔZ LAS: 0.34



North



South



East



West



Point: 1503 Urban

Survey X: 704636.63, Survey Y: 564881.97, Z1: 1135.91, Z DEM: 1136.04, Z LAS: 1136.01, LC Type: 2, ΔZ DEM: 0.13, ΔZ LAS: 0.1



North



South



East



West



Point: 1600 Bare Earth

Survey X: 732375.84, Survey Y: 538568.32, Z1: 1237.56, Z DEM: 1237.79, Z LAS: 1237.8, LC Type: 1, ΔZ DEM: 0.23, ΔZ LAS: 0.24



North



South



East



West



Point: 1601 Urban

Survey X: 732578.89, Survey Y: 538833.73, Z1: 1237.16, Z DEM: 1237.44, Z LAS: 1237.43, LC Type: 2, ΔZ DEM: 0.28, ΔZ LAS: 0.27



North



South



East



West



Point: 1602 Forest

Survey X: 732645.82, Survey Y: 538789.27, Z1: 1232, Z DEM: 1232.36, Z LAS: 1232.33, LC Type: 5, ΔZ DEM: 0.36, ΔZ LAS: 0.33



North



South



East



West



Point: 1700 Bare Earth

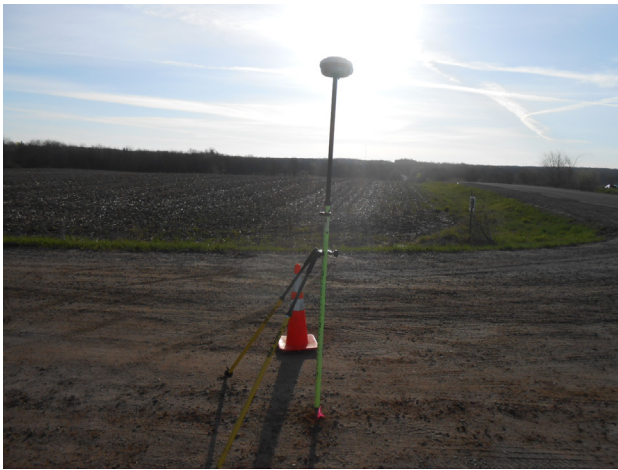
Survey X: 704571.45, Survey Y: 516764.17, Z1: 1361.37, Z DEM: 1361.34, Z LAS: 1361.36, LC Type: 1, ΔZ DEM: -0.03, ΔZ LAS: -0.01



North



South



East



West



Point: 1701 Swamp

Survey X: 704545.42, Survey Y: 517700.96, Z1: 1339.8, Z DEM: 1340.38, Z LAS: 1340.4, LC Type: 7, ΔZ DEM: 0.58, ΔZ LAS: 0.6



North



South



East



West



Point: 1702 Forest

Survey X: 704511.71, Survey Y: 516823.71, Z1: 1355.69, Z DEM: 1355.93, Z LAS: 1355.91, LC Type: 5, ΔZ DEM: 0.24, ΔZ LAS: 0.22



North



South



East



West

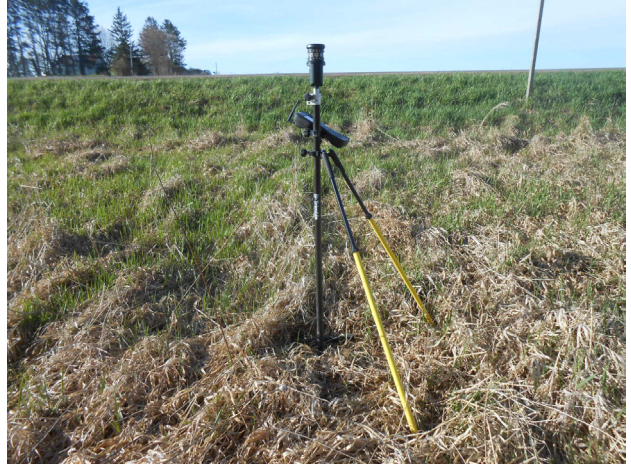


Point: 1703 Tall Weeds

Survey X: 704473.07, Survey Y: 516777.57, Z1: 1357.73, Z DEM: 1358.15, Z LAS: 1358.13, LC Type: 3, ΔZ DEM: 0.42, ΔZ LAS: 0.4



North



South



East



West



Point: 1705 Urban

Survey X: 704619.38, Survey Y: 516729.6, Z1: 1362.43, Z DEM: 1362.45, Z LAS: 1362.42, LC Type: 2, ΔZ DEM: 0.02, ΔZ LAS: -0.01



North



South



East



West



Point: 1800 Bare Earth

Survey X: 714826.17, Survey Y: 500775.34, Z1: 1371.66, Z DEM: 1371.92, Z LAS: 1371.87, LC Type: 1, ΔZ DEM: 0.26, ΔZ LAS: 0.21



North



South



East



West



Point: 1801 Forest

Survey X: 714541.09, Survey Y: 500606.95, Z1: 1371.6, Z DEM: 1371.84, Z LAS: 1371.81, LC Type: 5, ΔZ DEM: 0.24, ΔZ LAS: 0.21



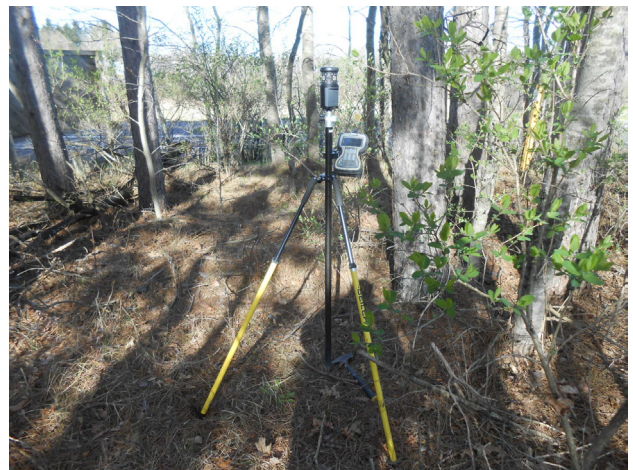
North



South



East



West

Point: 1805 Tall Weeds

Survey X: 714703.38, Survey Y: 500671.89, Z1: 1370.69, Z DEM: 1371.33, Z LAS: 1371.23, LC Type: 3, ΔZ DEM: 0.64, ΔZ LAS: 0.54



North



South



East



West



Point: 1806 Urban

Survey X: 714431.48, Survey Y: 500821.59, Z1: 1363.03, Z DEM: 1363.08, Z LAS: 1363.1, LC Type: 2, ΔZ DEM: 0.05, ΔZ LAS: 0.07



North



South



East



West



Point: 1900 Urban

Survey X: 735870.72, Survey Y: 500462.36, Z1: 1323.72, Z DEM: 1323.72, Z LAS: 1323.72, LC Type: 2, ΔZ DEM: 0, ΔZ LAS: 0



North



South



East



West



Point: 1901 Bare Earth

Survey X: 736753, Survey Y: 500464.04, Z1: 1317.04, Z DEM: 1317.16, Z LAS: 1317.21, LC Type: 1, ΔZ DEM: 0.12, ΔZ LAS: 0.17



North



South



East



West



Point: 1902 Forest

Survey X: 736693.84, Survey Y: 500404.9, Z1: 1319.73, Z DEM: 1319.91, Z LAS: 1319.95, LC Type: 5, ΔZ DEM: 0.18, ΔZ LAS: 0.22



North



South



East



West



Point: 1903 Tall Weeds

Survey X: 736725.47, Survey Y: 500503.04, Z1: 1317.91, Z DEM: 1318.31, Z LAS: 1318.33, LC Type: 3, ΔZ DEM: 0.4, ΔZ LAS: 0.42



North



South



East



West



Point: 2000 Bare Earth

Survey X: 745727.04, Survey Y: 521431.77, Z1: 1288.62, Z DEM: 1288.79, Z LAS: 1288.77, LC Type: 1, AZ DEM: 0.17, AZ LAS: 0.15



North



South



East



West



Point: 2001 Forest

Survey X: 745903.77, Survey Y: 521278.58, Z1: 1286.13, Z DEM: 1286.36, Z LAS: 1286.3, LC Type: 5, ΔZ DEM: 0.23, ΔZ LAS: 0.17



North



South



East



West



Point: 2002 Urban

Survey X: 745759.71, Survey Y: 521383.71, Z1: 1291.33, Z DEM: 1291.47, Z LAS: 1291.46, LC Type: 2, ΔZ DEM: 0.14, ΔZ LAS: 0.13



North



South



East



West



Point: 201 Urban

Survey X: 757075.28, Survey Y: 596683.33, Z1: 1091.05, Z DEM: 1091.35, Z LAS: 1091.33, LC Type: 2, ΔZ DEM: 0.3, ΔZ LAS: 0.28



North



South



East



West



Point: 202 Forest

Survey X: 757122.86, Survey Y: 596821.93, Z1: 1085.99, Z DEM: 1086.48, Z LAS: 1086.44, LC Type: 5, ΔZ DEM: 0.49, ΔZ LAS: 0.44



North



South



East



West



Point: 2100 Bare Earth

Survey X: 766696.35, Survey Y: 500336.96, Z1: 1286.38, Z DEM: 1286.49, Z LAS: 1286.44, LC Type: 1, ΔZ DEM: 0.11, ΔZ LAS: 0.06



North



South



East



West



Point: 2101 Tall Weeds

Survey X: 767251.27, Survey Y: 500318.29, Z1: 1282.53, Z DEM: 1283, Z LAS: 1283.03, LC Type: 3, ΔZ DEM: 0.47, ΔZ LAS: 0.5



North



South



East



West



Point: 2102 Urban

Survey X: 767554.31, Survey Y: 500354.61, Z1: 1284.7, Z DEM: 1284.88, Z LAS: 1284.88, LC Type: 2, ΔZ DEM: 0.18, ΔZ LAS: 0.18



North



South



East



West



Point: 2103 Forest

Survey X: 767337.43, Survey Y: 500439.19, Z1: 1284.23, Z DEM: 1284.68, Z LAS: 1284.65, LC Type: 5, ΔZ DEM: 0.45, ΔZ LAS: 0.42



North



South



East



West



Point: 2200 Bare Earth

Survey X: 826190.85, Survey Y: 507612.53, Z1: 1259.28, Z DEM: 1259.52, Z LAS: 1259.54, LC Type: 1, ΔZ DEM: 0.24, ΔZ LAS: 0.26



North



South



East



West



Point: 2201 Tall Weeds

Survey X: 825278.06, Survey Y: 507238.74, Z1: 1261.51, Z DEM: 1262.03, Z LAS: 1262.03, LC Type: 3, ΔZ DEM: 0.52, ΔZ LAS: 0.51



North



South



East



West



Point: 2203 Urban

Survey X: 826165.24, Survey Y: 507682, Z1: 1260.83, Z DEM: 1261.09, Z LAS: 1261.07, LC Type: 2, ΔZ DEM: 0.26, ΔZ LAS: 0.24



North



South



East



West



Point: 2204 Forest

Survey X: 826341.13, Survey Y: 507697.3, Z1: 1258.9, Z DEM: 1259.29, Z LAS: 1259.36, LC Type: 5, ΔZ DEM: 0.39, ΔZ LAS: 0.46



North



South



East



West



Point: 2300 Bare Earth

Survey X: 798861.75, Survey Y: 524576.33, Z1: 1274.67, Z DEM: 1275.04, Z LAS: 1275.05, LC Type: 1, ΔZ DEM: 0.37, ΔZ LAS: 0.38



North



South



East



West



Point: 2301 Tall Weeds

Survey X: 797914.91, Survey Y: 524387.42, Z1: 1245.48, Z DEM: 1245.82, Z LAS: 1245.81, LC Type: 3, ΔZ DEM: 0.34, ΔZ LAS: 0.33



North



South



East



West



Point: 2302 Forest

Survey X: 798395.39, Survey Y: 524407.99, Z1: 1258.53, Z DEM: 1258.85, Z LAS: 1258.98, LC Type: 5, ΔZ DEM: 0.32, ΔZ LAS: 0.45



North



South



East



West



Point: 2304 Urban

Survey X: 798876.81, Survey Y: 524560.2, Z1: 1275.67, Z DEM: 1276, Z LAS: 1275.98, LC Type: 2, ΔZ DEM: 0.33, ΔZ LAS: 0.31



North



South



East



West



Point: 2400 Bare Earth

Survey X: 829704.9, Survey Y: 576258.92, Z1: 1307.92, Z DEM: 1308.03, Z LAS: 1308.04, LC Type: 1, ΔZ DEM: 0.11, ΔZ LAS: 0.12



North



South



East



West



Point: 2401 Urban

Survey X: 829724.82, Survey Y: 576067.63, Z1: 1307.7, Z DEM: 1307.74, Z LAS: 1307.72, LC Type: 2, ΔZ DEM: 0.04, ΔZ LAS: 0.02



North



South



East



West



Point: 2402 Forest

Survey X: 829798.03, Survey Y: 575159.71, Z1: 1323.78, Z DEM: 1324.25, Z LAS: 1324.07, LC Type: 5, ΔZ DEM: 0.47, ΔZ LAS: 0.29



North



South



East



West



Point: 2500 Bare Earth

Survey X: 788041.32, Survey Y: 564122.44, Z1: 1301.13, Z DEM: 1301.47, Z LAS: 1301.48, LC Type: 1, ΔZ DEM: 0.34, ΔZ LAS: 0.35



North



South



East



West



Point: 2501 Tall Weeds

Survey X: 786495.28, Survey Y: 564181.33, Z1: 1280.63, Z DEM: 1281.14, Z LAS: 1281.17, LC Type: 3, ΔZ DEM: 0.51, ΔZ LAS: 0.54



North



South



East



West



Point: 2502 Forest

Survey X: 786695.74, Survey Y: 564048.13, Z1: 1280.17, Z DEM: 1280.73, Z LAS: 1280.75, LC Type: 5, ΔZ DEM: 0.56, ΔZ LAS: 0.58



North



South



East



West



Point: 2503 Urban

Survey X: 788623.29, Survey Y: 564105.58, Z1: 1302.09, Z DEM: 1302.45, Z LAS: 1302.43, LC Type: 2, ΔZ DEM: 0.36, ΔZ LAS: 0.34



North



South



East



West



Point: 2600 Urban

Survey X: 797540.73, Survey Y: 500317.3, Z1: 1222.35, Z DEM: 1222.6, Z LAS: 1222.58, LC Type: 2, ΔZ DEM: 0.25, ΔZ LAS: 0.24



North



South



East



West



Point: 2601 Bare Earth

Survey X: 797629.9, Survey Y: 500330.17, Z1: 1221.96, Z DEM: 1222.09, Z LAS: 1222.1, LC Type: 1, ΔZ DEM: 0.13, ΔZ LAS: 0.14



North



South



East



West



Point: 2602 Forest

Survey X: 799542.05, Survey Y: 500392.29, Z1: 1234.03, Z DEM: 1234.36, Z LAS: 1234.33, LC Type: 5, ΔZ DEM: 0.34, ΔZ LAS: 0.3



North



South



East



West



Point: 2700 Urban

Survey X: 791618.84, Survey Y: 612663.06, Z1: 1092.16, Z DEM: 1092.3, Z LAS: 1092.24, LC Type: 2, ΔZ DEM: 0.14, ΔZ LAS: 0.08



North



South



East



West



Point: 2701 Bare Earth

Survey X: 791562.14, Survey Y: 612599.35, Z1: 1092.5, Z DEM: 1092.65, Z LAS: 1092.63, LC Type: 1, ΔZ DEM: 0.15, ΔZ LAS: 0.13



North



South



East



West



Point: 2702 Forest

Survey X: 790911.19, Survey Y: 613139.21, Z1: 1088.81, Z DEM: 1088.88, Z LAS: 1088.93, LC Type: 5, ΔZ DEM: 0.07, ΔZ LAS: 0.12



North



South



East



West



Point: 2801 Urban

Survey X: 789384.41, Survey Y: 660918.47, Z1: 1169.86, Z DEM: 1170.26, Z LAS: 1170.23, LC Type: 2, ΔZ DEM: 0.39, ΔZ LAS: 0.37



North



South



East



West



Point: 2802 Bare Earth

Survey X: 789332.37, Survey Y: 660886.84, Z1: 1167.77, Z DEM: 1167.94, Z LAS: 1167.94, LC Type: 1, AZ DEM: 0.17, AZ LAS: 0.17



North



South



East



West



Point: 2803 Forest

Survey X: 788999.05, Survey Y: 660555.23, Z1: 1179.28, Z DEM: 1179.61, Z LAS: 1179.51, LC Type: 5, ΔZ DEM: 0.33, ΔZ LAS: 0.23



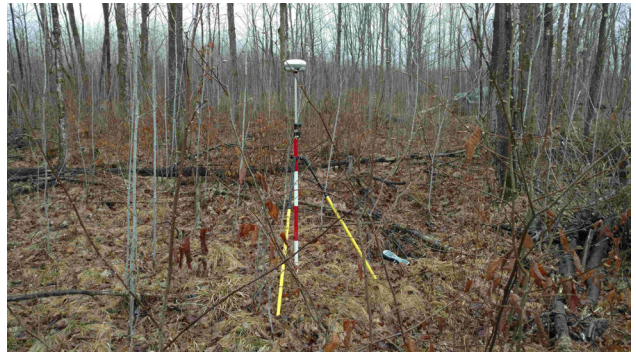
North



South



East



West



Point: 2901 Bare Earth

Survey X: 825124.99, Survey Y: 679724.36, Z1: 1250.72, Z DEM: 1250.9, Z LAS: 1250.9, LC Type: 1, ΔZ DEM: 0.18, ΔZ LAS: 0.18



North



South



East

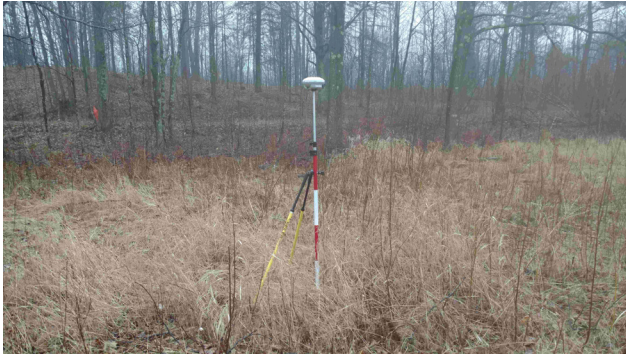


West



Point: 2902 Tall Weeds

Survey X: 825038.33, Survey Y: 679763.29, Z1: 1247.2, Z DEM: 1247.57, Z LAS: 1247.52, LC Type: 3, ΔZ DEM: 0.37, ΔZ LAS: 0.32



North



South



East



West



Point: 2903 Forest

Survey X: 825118, Survey Y: 679918.13, Z1: 1256.06, Z DEM: 1256.46, Z LAS: 1256.4, LC Type: 5, ΔZ DEM: 0.4, ΔZ LAS: 0.34



North



South



East



West



Point: 300 Bare Earth

Survey X: 757113.79, Survey Y: 625983.85, Z1: 1124.5, Z DEM: 1124.83, Z LAS: 1124.77, LC Type: 1, ΔZ DEM: 0.33, ΔZ LAS: 0.27



North



South



East



West



Point: 301 Urban

Survey X: 757460.66, Survey Y: 625760.12, Z1: 1114.08, Z DEM: 1114.12, Z LAS: 1114.18, LC Type: 2, ΔZ DEM: 0.04, ΔZ LAS: 0.1



North



South



East



West



Point: 302 Forest

Survey X: 757535.13, Survey Y: 625666.69, Z1: 1111.37, Z DEM: 1111.87, Z LAS: 1111.84, LC Type: 5, ΔZ DEM: 0.5, ΔZ LAS: 0.47



North



South



East



West



Point: 400 Tall Weeds

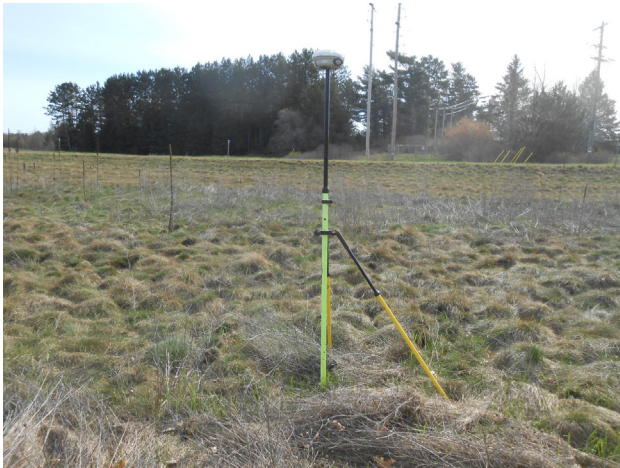
Survey X: 756072.27, Survey Y: 671104.49, Z1: 1049.7, Z DEM: 1050.09, Z LAS: 1050.12, LC Type: 3, ΔZ DEM: 0.39, ΔZ LAS: 0.42



North



South



East



West



Point: 401 Bare Earth

Survey X: 756631.62, Survey Y: 670546.95, Z1: 1050.78, Z DEM: 1050.92, Z LAS: 1050.91, LC Type: 1, ΔZ DEM: 0.14, ΔZ LAS: 0.13



North



South



East



West



Point: 402 Forest

Survey X: 757104.38, Survey Y: 670381.82, Z1: 1045.9, Z DEM: 1046.33, Z LAS: 1046.16, LC Type: 5, ΔZ DEM: 0.43, ΔZ LAS: 0.26



North



South



East



West



Point: 404 Urban

Survey X: 756799.44, Survey Y: 669038.87, Z1: 1060.91, Z DEM: 1061.1, Z LAS: 1061.1, LC Type: 2, ΔZ DEM: 0.19, ΔZ LAS: 0.19



North



South



East



West



Point: 500 Bare Earth

Survey X: 786294.16, Survey Y: 676398.48, Z1: 1098.14, Z DEM: 1098.3, Z LAS: 1098.32, LC Type: 1, ΔZ DEM: 0.16, ΔZ LAS: 0.18



North



South



East



West



Point: 502 Urban

Survey X: 785824.37, Survey Y: 677368.15, Z1: 1091.32, Z DEM: 1091.67, Z LAS: 1091.65, LC Type: 2, ΔZ DEM: 0.35, ΔZ LAS: 0.33



North



South



East



West



Point: 503 Tall Weeds

Survey X: 785679.79, Survey Y: 677825.14, Z1: 1089.74, Z DEM: 1090.32, Z LAS: 1090.24, LC Type: 3, ΔZ DEM: 0.58, ΔZ LAS: 0.5



North



South



East



West



Point: 504 Forest

Survey X: 785655.65, Survey Y: 678069.82, Z1: 1102.25, Z DEM: 1102.64, Z LAS: 1102.71, LC Type: 5, ΔZ DEM: 0.39, ΔZ LAS: 0.46



North



South



East



West



Point: 600 Bare Earth

Survey X: 822826.83, Survey Y: 652618.31, Z1: 1235.48, Z DEM: 1235.83, Z LAS: 1235.81, LC Type: 1, ΔZ DEM: 0.35, ΔZ LAS: 0.33



North



South



East



West



Point: 602 Tall Weeds

Survey X: 821836.59, Survey Y: 652645.06, Z1: 1213.91, Z DEM: 1214.51, Z LAS: 1214.52, LC Type: 3, ΔZ DEM: 0.6, ΔZ LAS: 0.61



North



South



East



West



Point: 603 Urban

Survey X: 821708.74, Survey Y: 652555.97, Z1: 1214.57, Z DEM: 1215.03, Z LAS: 1215.01, LC Type: 2, ΔZ DEM: 0.46, ΔZ LAS: 0.44



North



South



East



West



Point: 604 Forest

Survey X: 821748.06, Survey Y: 652480.89, Z1: 1213.36, Z DEM: 1214, Z LAS: 1213.95, LC Type: 5, AZ DEM: 0.64, AZ LAS: 0.59



North



South



East



West



Point: 700 Bare Earth

Survey X: 825855.36, Survey Y: 625458.59, Z1: 1168.7, Z DEM: 1168.8, Z LAS: 1168.8, LC Type: 1, ΔZ DEM: 0.1, ΔZ LAS: 0.1



North



South



East



West



Point: 701 Tall Weeds

Survey X: 826757.5, Survey Y: 625690.87, Z1: 1177.77, Z DEM: 1178.31, Z LAS: 1178.32, LC Type: 3, AZ DEM: 0.54, AZ LAS: 0.55



North



South



East



West



Point: 702 Forest

Survey X: 826809.05, Survey Y: 625637.07, Z1: 1174.55, Z DEM: 1174.82, Z LAS: 1174.77, LC Type: 5, ΔZ DEM: 0.27, ΔZ LAS: 0.22



North



South



East



West



Point: 703 Urban

Survey X: 827049.62, Survey Y: 625848.56, Z1: 1180.78, Z DEM: 1181.1, Z LAS: 1181.05, LC Type: 2, ΔZ DEM: 0.32, ΔZ LAS: 0.27



North



South



East



West



Point: 800 Tall Weeds

Survey X: 747937.54, Survey Y: 566188, Z1: 1078.88, Z DEM: 1079.16, Z LAS: 1079.31, LC Type: 3, AZ DEM: 0.28, AZ LAS: 0.43



North



South



East



West



Point: 801 Forest

Survey X: 748137.28, Survey Y: 566093.53, Z1: 1078.72, Z DEM: 1079.13, Z LAS: 1079.21, LC Type: 5, ΔZ DEM: 0.41, ΔZ LAS: 0.48



North



South



East



West



Point: 802 Urban

Survey X: 749023.97, Survey Y: 565851.14, Z1: 1103.33, Z DEM: 1103.51, Z LAS: 1103.55, LC Type: 2, ΔZ DEM: 0.18, ΔZ LAS: 0.22



North



South



East



West



Point: 803 Bare Earth

Survey X: 748866.91, Survey Y: 565896.47, Z1: 1099.86, Z DEM: 1100.01, Z LAS: 1100.03, LC Type: 1, ΔZ DEM: 0.15, ΔZ LAS: 0.17



North



South



East



West



Point: 900 Bare Earth

Survey X: 761148.33, Survey Y: 689076.43, Z1: 1072.38, Z DEM: 1072.59, Z LAS: 1072.52, LC Type: 1, ΔZ DEM: 0.21, ΔZ LAS: 0.14



North



South



East



West



Point: 901 Tall Weeds

Survey X: 760885.41, Survey Y: 689075.67, Z1: 1066.74, Z DEM: 1067, Z LAS: 1066.96, LC Type: 3, ΔZ DEM: 0.26, ΔZ LAS: 0.22



North



South



East



West



Point: 903 Urban

Survey X: 761185.96, Survey Y: 689106.5, Z1: 1073.36, Z DEM: 1073.43, Z LAS: 1073.44, LC Type: 2, ΔZ DEM: 0.07, ΔZ LAS: 0.08



North



South



East



West



Point: 904 Forest

Survey X: 761389.14, Survey Y: 689056.93, Z1: 1075.88, Z DEM: 1076.11, Z LAS: 1076.12, LC Type: 5, ΔZ DEM: 0.23, ΔZ LAS: 0.23



North



South



East



West

