DELIVERY REPORT

For the

U.S. Corp of Engineers High Resolution LiDAR Data Acquisition & Processing for portions of Connecticut

USACE Contract:

W912P9-10-D-0534

Task Order Number:

0002

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USDA NRCS

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U.S. Corp of Engineers Connecticut LiDAR –Deliverables Overview Checklist

☒ Classified Point Cloud Data

- ☒ LAS Version 1.2
- ☒ Correct Georeference Information
- ☒ Contains GPS Times
- ☒ Contains Intensity Values
- ☒ Tile to 1000 m x 1000 m Tile Grid
- ☒ Classified with class 1 – unclassified, class 2 – Bare-earth Ground, 7 – Noise, 9 – Water

☒ Bare Earth LiDAR Data

- ☒ LAS Version 1.2
- ☒ Correct Georeference Information
- ☒ Contains GPS Times
- ☒ Contains Intensity Values
- ☒ Tile to 1000 m x 1000 m Tile Grid
- ☒ Classified with class 2- Bare-earth Ground

☒ First Return LiDAR Data

- ☒ LAS Version 1.2
- ☒ Correct Georeference Information
- ☒ Contains GPS Times
- ☒ Contains Intensity Values
- ☒ Tile to 1000 m x 1000 m Tile Grid
- ☒ Classified with class 1 – First returns from all point classes

☒ Last Return LiDAR Data

- ☒ LAS Version 1.2
- ☒ Correct Georeference Information
- ☒ Contains GPS Times
- ☒ Contains Intensity Values
- ☒ Tile to 1000 m x 1000 m Tile Grid
- ☒ Classified with class 1 – Last returns from all point classes

☒ Model Key Point LiDAR Data

- ☒ LAS Version 1.2
- ☒ Correct Georeference Information
- ☒ Contains GPS Times
- ☒ Contains Intensity Values
- ☒ Tile to 1000 m x 1000 m Tile Grid
- ☒ Classified with class 8 – Intelligently thinned bare-earth ground points

☒ Bare Earth Surface (Raster DEM)

- ☒ Cell size of 1 m
- ☒ ESRI GRID File format
- ☒ Tiled with no overlap
- ☒ Reviewed for edge-matching and artifacts
- ☒ Free of void areas
- ☒ Hydrographic features have been flattened according to SOW

☒ Survey Data

- ☒ Surveyed Quality Check point report, photos, and coordinate listing
- ☒ Check points in Shapefile format
- ☒ Check points in ASCII format (X, Y, Z)
- ☒ RMSE error report in Microsoft Excel format

☐ **Metadata**
- ☐ FGDC Compliant metadata for:
  - ☐ Deliverables (LAS, First Return, Last Return, Bare Earth, Model Key Points, DEM, Breakline,)
- ☐ Shapefile of flight lines, as flown, including dates for each flight line in the attribute table

☐ **Project Reports**
- ☐ Collection Report detailing mission planning and flight logs.
- ☐ Survey Report
- ☐ Processing report
- ☐ QA/QC Reports

☒ **Extents**
- ☒ Tile grid in Shapefile format derived from the LiDAR Deliverable
- ☒ Project Boundary delivered as shapefile
- ☒ Tile grid according to USNG format, 1000 m x 1000 m, and in Shapefile format

☒ **Breakline Data**
- ☒ Breakline Data in GDB
- ☒ Breakline Data as Shapefiles

☒ **Intensity Imagery**
- ☒ Intensity imagery in GeoTIFF format and 0.3 m (1FT) pixel size

1.0 Classified Point Cloud

Classified point cloud data has been delivered tiled to 1000 m x 1000 m tiles that are named according to US National Grid format. The final delivery consists of 4,840 LiDAR tiles that meet the project specified requirement.

2.0 Bare Earth LiDAR Data

The bare earth ground data is delivered as its own tile, containing only bare earth ground points. This data is tiled to 1000 m x 1000 m tiles that are named to according to US National Grid format. The final delivery consists of 4,839 tiles that meet the project specified requirement. One tile had too few bare earth points to be created.

3.0 First Return LiDAR Data

First returns from all point classes are delivered tiled to 1000 m x 1000 m tiles that are named to according to US National Grid format. First return points are defined as class 1. The final delivery consists of 4,839 tiles that meet the project specified requirement. One tile had too few first return points to be created.

4.0 Last Return LiDAR Data

Last returns from all point classes are delivered tiled to 1000 m x 1000 m tiles that are named to according to US National Grid format. Last return points are defined as class 1. The final delivery consists of 4,839 tiles that meet the project specified requirement. One tile had too few last return points to be created.

5.0 Model Key Points

The bare earth ground points were intelligently thinned to create model key points. Model key points are defined as class 8 and are delivered tiled to 1000 m x 1000 m tiles that are named to according to US National Grid format. The final delivery consists of 4,837 tiles that meet the project specified requirement. Three tiles had too few model key points to be created.

6.0 Bare Earth Surface (Raster DEM)

A total of 4,840 1000 m x 1000 m tiled bare earth raster DEMs in ESRI GRID format have been delivered for this project. All tiles have a cell size of 1 m and have been reviewed to ensure that they meet the project required specifications.

7.0 Survey Data

All survey control data, reports and photos are included in this delivery. Accuracy assessment points are in both ESRI shapefile and ASCII (X, Y, Z) format. The RMSE error report is included as a Microsoft Excel spreadsheet.

8.0 Metadata

Project level metadata for each of the deliverables (Fully classified LiDAR, bare-earth LiDAR, first return LiDAR, last return LiDAR, model key points, breaklines, and DEM) will be delivered in XML format as part of a separate delivery. Metadata will be reviewed through the USGS metaparser tool to ensure that it is FGDC compliant. Flight lines (as flown) will be delivered in ESRI shapefile format as part of a separate delivery. This shapefile will include flight dates in the attribute table.

9.0 Project Report

A comprehensive project report will be delivered in PDF format as part of a separate delivery. The report will include the LiDAR acquisition and processing information along with detailed information on the production and quality control process used for the development of all deliverables.

10.0 Extents

Three ESRI shapefiles are include with this delivery. One shapefile is the boundary of the project area. The second shapefile is the tile grid, created and named according to US National Grid format. The third shapefile is derived from the extents of the actual LAS deliverable to ensure that all delivered LiDAR has been accounted for. The extents have been verified against the project boundary to ensure that there is full coverage for the project.

11.0 Breakline Data

Breaklines have been delivered in an ESRI file geodatabase and as shapefiles. Breaklines were derived to meet the project specifications as outlined in the SOW.

12.0 Intensity Imagery

Intensity imagery is delivered tiled to 1000 m x 1000 m tiles that are named to according to US National Grid format. The imagery is in GeoTIFF format with 0.3 m or 1 ft pixel size, which exceeds project requirements. The intensity imagery is created from the full point cloud LiDAR data. The final delivery consists of 4,840 GeoTIFF tiles.

13.0 Other Comments

Data for the Connecticut LiDAR Project is delivered on three (3) hard drives due to the size of the project. The Intensity Data is located on one hard drive (Western Digital S/N WXNX08LX6583), the first return, last return and model key point data is located on a second hard drive (Western Digital S/N WCAV5S519931) while all other submitted data in this delivery is delivered on a third hard drive (Western Digital S/N WCAV5S351584).