

United States Department of Agriculture



Natural Resources Conservation Service
National Centers Servicing Unit
501 W. Felix, Bldg 23
Ft. Worth, TX 76115

September 27, 2010

Mr. Lawrence Hansen:
AMEC Earth & Environmental, INC.
1405 West Auto Drive
Tempe, AZ 85284-1016

Dear Mr. Hansen:

Enclosed is your signed copy of task order, AG-7482-D-10-0048 for LiDAR and Derivative Products for Watershed sites in Kentucky and Arkansas. Performance period for this Task Order is from September 27, 2010 through April 30th, 2011. Steve Nechero has been assigned as the Point of Contact (POC) on this task order. He can be reached at (817) 509-3366.

We look forward to establishing a successful relationship with your firm in the effort to perform LiDAR and Derivative Products as outlined in the Statement of Work.

Please call Barbara Bardin at (817) 509-3519 if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Judith A. Weber".

JUDITH A. WEBER
Contracting Officer

Enclosures

cc: Tommie Parham, Director, NRCS, NGMC, Ft. Worth, TX
Steve Nechero, POC, NRCS, NGMC, Ft. Worth, TX
Barbara Bardin, Contract Specialist, NRCS, NCSU, Ft. Worth, TX

**Statement of Work
LiDAR and Derivative Products for the L'Anguille
Cache, & Lake Conway-Point Remove Watersheds For
USDA Natural Resources Conservation Service (NRCS) in Arkansas**

I. PROGRAM SCOPE AND DESCRIPTION

Light Detection and Ranging (LiDAR) elevation data is to be collected for an area generally encompassing the L'Anguille (955 sq. mi.), Cache (2007 sq. mi.) & Lake Conway-Point Remove (1,140 sq.mi.) watersheds in the northeast and north central areas of Arkansas (total of 4,102 sq. mi.), as shown on Attachment A. The actual project area of interest (AOI) will be provided as an ArcGIS shapefile. Derivative products will be processed from the LiDAR elevation data. The LiDAR and derivative product requirements, standards and specifications are provided in Section III (below).

II. PERIOD OF PERFORMANCE

The LiDAR must be collected during leaf-off, snow-free conditions in late fall 2010 or early winter 2011, and delivered by April 30, 2011.

III. DELIVERABLES, DATA ACCESS and DELIVERY

Deliverables include:

- Classified full point cloud data at:
 - 0.5 m Nominal Pulse Spacing (NPS) and 9.25 cm Vertical RMSE accuracy
- Bare earth hydro-enforced 1.0 m DTM
- DSM
- Breaklines compiled from intensity images
- LiDAR intensity image

The minimum standards that will be used are the USGS NGP Base Lidar Specification v13. Deliverable specifications are as follows:

Requirement	Specifications
Nominal Pulse Spacing (NPS)	Shall be no greater than 0.5 NPS
Collection Conditions	Leaf off, snow-free, less than 0.25 inches of precipitation in previous 3 days
Vertical Accuracy (in open terrain)	9.25 cm Vertical RMSE accuracy
Point Cloud Data	Full point cloud classified per ASPRS v.13 Point Record Format 1 or 3, 4, or 5 Classification Scheme (minimum): (01) Code 1 - Processed, but unclassified (02) Code 2 - Bare-earth ground (03) Code 7 - Noise (low or high, manually Identified, if needed) (04) Code 9 - Water (05) Code 10 - Ignored Ground (Breakline Proximity) <i>Note: Class 7 Noise, is included as a convenience for the data producer. It is not required that all "noise" be assigned to Class 7.</i> <i>Note: Class 10. Ignored Ground is for points previously classified as bare-earth but whose proximity to a subsequently added Breakline requires that it be excluded during Digital Elevation Model (DEM) generation.</i>
Datum	Vertical: NAVD 88 Horizontal: NAD 83

Requirement	Specifications
Coordinate System	UTM Zone 15N
Units	Vertical: Feet Horizontal: Meters to two decimal places
Metadata	Project level metadata, including data accuracy and collection specifications, will accompany each product delivered. In the metadata documentation, specific reference will be made to funding sources.
Break Lines	Break lines (created from the intensity image) shall be collected for all rivers, streams, lakes ponds, and reservoirs at the minimum necessary for 0.5 NPS - to support 1 foot contours (Hydro Flattened breaklines shall be delivered in geodatabase format.)
Surface Models (DEM's)	1.0-m hydro-enforced DTM/DEM, to be delivered as a ESRI Terrain Object - File Geodatabase for Bare Earth return 1.0-m DSM/DEM, to be delivered as a ESRI Terrain Object - File Geodatabase for First return DEM tiles will show no edge artifacts or mismatch. (Georeference information shall be included in raster files. Tiled delivery, without overlap & DEM tiles will show no edge artifacts or mismatch)
Intensity Image	Intensity image in grayscale GeoTiff format (Shall match the referenced tiling scheme)
Tile Size	Mass Points: 1500m x 1500m filled to project shapefile, using USGS base lidar spec v13 for overlap on incomplete tiles. Tiled deliverables shall conform to the tiling scheme, without added overlap. Tiling scheme will be used for all tiled deliverables. Tiled deliverables shall edge-match seamlessly in both the horizontal and vertical. NOTE: Tile Coverage: Tiles which lie completely within the project area shall be complete to the tile edges. Tiles which lie partially outside the project boundary shall be complete to the project boundary with enough overlap beyond the project boundary to ensure that no parts of the project are omitted.
Data Delivery Method	On portable hard drive

Notification of Data Collection

The contractor shall notify the NRCS project coordinator of the scheduled LiDAR collection date at least one (1) week prior to, and again one (1) day prior to the scheduled collection. The contractor shall provide the NRCS project coordinator confirmation of the commencement of the LiDAR collection on the day the collection commences. The purpose of the notifications is to provide NRCS the opportunity to collect ground-based data concomitant with LiDAR data collection.

IV. QUALITY ASSURANCE REVIEWS AND ACCEPTANCE OF DATA

All QA/QC reviews of the data will be evaluated on the National Standard of 95% of the points meeting the standard over the entire dataset. If the inspection reveals deficiencies or defects, the data or issues will be required to be resolved at no additional cost to NRCS. Initial acceptance of the deliverables by NRCS does not relieve the LiDAR provider from the responsibility to correct defective work with no further cost to NRCS for a period of one year following initial acceptance.

Preliminary Review of Data

Within 14 days of the LiDAR data collection, the contractor shall deliver a partial data set to the USDA-NRCS National Geospatial Management Center (NGMC) for a preliminary review of the data. The partial data set shall include data for both cropland and forest cover types.

Cursory Review of Completed Deliverables

Upon completion of the deliverables identified in Section III of this document, the contractor shall deliver a copy of the deliverables to the NGMC for review. NRCS shall have 90 days to inspect the data for quality and completeness, and return the data to the contractor. Should deficiencies in the data be discovered, the NGMC POC will provide documentation of deficient data to the Contractor. The Contractor will evaluate what action to take to correct the data, or provide technical support in order for users to correct the data. Resolution of data deficiencies will be based on the mutual consent of NRCS and the contractor.

Independent QA/QC Review

NRCS, at its option, may elect to contract the services of an independent contractor for QA/QC review of all deliverables to ensure conformance to the specifications identified in Section III of this document. If the independent QA/QC review reveals any defect or deviation in the manufacture of the items that would make them unfit for the purpose intended, the Contractor will be required to satisfactorily remedy such conditions at no additional cost to NRCS. The independent QA/QC review will be completed within one year of the initial acceptance of the deliverables by NRCS.

V. USE AND DISTRIBUTION RIGHTS: All deliverable data and documentation shall be free from restrictions regarding use and distribution. Data and documentation provided under this Task Order shall be freely distributable by government agencies.

VI. NRCS POINTS OF CONTACT

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