

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Geospatial Program

The National Map:

Imagery and Elevation Maps

Authorized by 43 USC 36d

Funded by the American Recovery and Reinvestment Act of 2009

GRANT PROGRAM ANNOUNCEMENT
No. 09HQPA0023
ATN: ARRA-NM0004
For Fiscal Year 2010

ISSUE DATE: XXXX

CLOSING DATE & TIME:

XXXX 4:00 PM
Eastern Daylight Time

PAPERWORK REDUCTION ACT STATEMENT: The Paperwork Reduction Act requires us to tell you why we are collecting this information, how we will use it, and whether or not you have to respond. We will use the information that we collect to evaluate proposals submitted to acquire funding for imagery and elevation maps. Your response is required to receive funding. A Federal agency may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number. We estimate that it will take an average of 60 hours to complete the application. The average estimated annual burden associated with writing and submitting required quarterly and final reports is 14 hours. You may send comments concerning the burden estimates or any aspect of this information collection to the Information Collection Clearance Officer, U.S. Geological Survey, 2150 Centre Avenue, Fort Collins, CO 80525.

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- Elevation Priority Area Maps, 1-15
- Orthoimagery Priority Area
- Base Lidar Specification
- Base Orthoimagery Specification

ANNOUNCEMENT OF FEDERAL FUNDING OPPORTUNITY
EXECUTIVE SUMMARY

- **Federal Agency Name:** United State Geological Survey, Department of Interior
- **Funding Opportunity Title:** The National Map: Imagery and Elevation Maps
- **Program Announcement:** 09HQPA0023
- **Catalogue of Federal Domestic Assistance (CFDA) Number:** 15.817
- **Application Submission Opening Date:**
- **Application Submission Closing Date:**
- **Electronic Application Requirement:** See 1. below
- **Authority:** U.S. Code Title 43, Chapter 2, Section 36d. (43 U.S.C. 36d)
American Recovery and Reinvestment Act of 2009
- **Funding Opportunity Description:** Through this program announcement, the United States Geological Survey (USGS) seeks to openly compete for assistance funding available for the collection of high resolution lidar and orthoimagery data under the American Recovery and Reinvestment Act (ARRA) of 2009.

The USGS collects archives and disseminates base layer geospatial data as part of *The National Map* and its products. Elevation (lidar) data and orthoimagery are two of the base geospatial layers which support a variety of applications including:

- o 3D visualization
- o High-accuracy land cover classification
- o Modeling (computer simulation) for hazardous spills
- o Wildland fire behavior
- o Soil erosion and slope stability assessments
- o Climate data analysis
- o Vegetation height estimation
- o Floodplain mapping
- o Cell phone tower placements
- o Modeling of landforms, habitat, vegetation, hydrology

Many organizations including state and local governments, private and non-profit firms, as well as many Federal government agencies use these data to support their applications and requirements planning, infrastructure improvements, resource assessments and scientific studies.

In order to meet requirements for a broad range of uses, both data types must meet or exceed respective minimum data specifications as outlined in the Base Lidar Specification (Attachment A) and Base Orthoimagery Specification (Attachment B). Highest priority will be given to proposals for collection of lidar data in coastal areas and for leaf-off orthoimagery data in selected high priority areas. The data will be provided to the USGS for inclusion in *The National Map*, thus making it available to the public and other government organizations.

Applications must be submitted for any project that is to be considered for this funding. Applications selected for funding through this program announcement will be implemented through a cooperative agreement, with awards dependent upon the amount of funds made available to USGS for this purpose by Congress. USGS estimates up to \$8,775,000.00 may be available for collection of lidar and orthoimagery in priority areas (see Figures 1 and 2).

Questions?

For Grants.gov issues, see:

http://www.grants.gov/applicants/app_help_reso.jsp

<http://www.usgs.gov/contracts/grants/grantsgov.html>

Contact Laura Mahoney, (703) 648-7344, lmahoney@usgs.gov

For Federal Assistance issues, contact Maggie Eastman, (703) 648-7366, mrussell@usgs.gov

For National Map Program Officer, Teresa Dean, call 703-648-5100 or [mailto: National Map ARRA@usgs.gov](mailto:National Map ARRA@usgs.gov)

APPLICATION INFORMATION AND INSTRUCTIONS

Applicants should note all requirements and stipulations described both in this Announcement and in the Special Terms and Conditions (Attachment E). There are many specific proposal requirements as well as reporting requirements and deadlines that are different from past USGS award requirements.

1. Electronic Application Requirement

All proposals shall be submitted electronically via Grants.gov (<http://www.grants.gov>). Hard/paper submissions will NOT be accepted. Electronic copies submitted via e-mail will NOT be accepted under any circumstances. All proposals must be submitted electronically through Grants.gov on or before:

TBD, 2009, at 4 pm, Eastern Daylight Time

Please be aware that the electronic submission process requires first time users to register using an e-Authentication process. This registration process can be somewhat complex and can take up to several days to complete. Be advised that it is virtually impossible to begin the process of electronic submission for the first time if you start just a few days before the due date. If you are from a university, contact your Office of Sponsored Programs. They may already have completed the registration process and should work with you to submit the application.

Once at the website, click “Get Registered” under the “For Applications” heading and follow the instructions provided. In order to complete the SF 424 forms, **everyone** must use the Adobe Reader version which is available for download from the grants.gov site at: http://www.grants.gov/help/download_software.jsp#adobe811. To ensure that you have the correct version of Adobe Reader, you can use the versioning test located at: <http://www.grants.gov/applicants/AdobeVersioningTestOnly.jsp>. Any and all edits made to the application package must be made with the Adobe Reader version specified on Grants.gov. Grants.gov does not guarantee to support other versions of Adobe Reader released prior to version 8.1.1. For more information on Adobe Reader, please see: http://www.grants.gov/applicants/applicant_faqs.jsp#adobe-reader-error. Please note that there is an underscore between “applicant” and “faqs” in the URL. If you have any questions regarding the registration process, please contact the Grants.gov help desk at 1-800-518-4726.

In the Grants.gov forms, floating your mouse over a field will provide instructions for completing that field. You can also click on the Check Package for Errors button to check the entire application for validation errors (incomplete fields, etc.)

There are several steps of the submission process that require careful attention by applicants in order to assure that the application has been fully accepted. It is suggested that applicants read the document available at <http://www.grants.gov/assets/TrackingYourApplicationPackage.pdf>

For more information on the Grants.gov registration and submission process, please see <http://www.usgs.gov/contracts/grants/grantsgov.html>

During the application period an applicant may submit a revised or corrected proposal through grants.gov. Include a cover letter as the first page of the proposal stating that the proposal is revised and indicating that the previous submittal is to be withdrawn from consideration. Such submissions must be completed by **TBD** at 4:00 pm Eastern Daylight Time.

See Section 8, Application Preparation Instructions, which describes requirements for the proposal and other application components.

Please allow sufficient time for the proposal to be submitted electronically through Grants.gov and allow time for possible computer delays. Applicants are strongly advised not to wait until the last minute for submission. A proposal received after the closing date and time will not be considered for award. If the USGS determines that a proposal will not be considered for award due to lateness, the applicant will be notified immediately.

2. Funds and Start Dates

The USGS estimates that up to \$5,850,000.00 may be available for lidar collection in priority areas along the coastal wetlands of the United States. Up to \$2,950,000.00 may be available for orthoimagery collection. Typical awards are expected to range from \$50,000 to \$500,000; however, higher funding amounts are possible. There is no guarantee that sufficient funds will be available to make awards for all applications. The number of awards to be made as a result of this announcement will depend on the number of eligible applications received, the amount of funds requested for data collections, the merit and ranking of the applications, and the amount of funding put toward American Reinvestment and Recovery Act projects outside this program announcement.

USGS will consider higher funding levels for projects that consolidate or incorporate multiple partners under a single application. For instance, if a consortium of localities, cities or States joined together in order to take advantage of lower costs as a result of economies of scale, USGS would consider funding a higher amount if the total for a partnership is less than the total for funding the partners individually. Consortia shall submit a proposal with a single set of requirements, i.e., multiple, custom data requirements within a consortium proposal will not be considered.

ARRA funds will be used to support only the base cost of lidar or orthoimagery at the level of specifications described in the Base Lidar Specification (Attachment A) and Base Orthoimagery Specification (Attachment B). Any requirements beyond the base level specifications due to specialized applications must be funded by the cooperating organization. The breakdown of these costs must be outlined in the budget information submitted with the application.

The earliest start date for new cooperative agreements will be: **TO BE ANNOUNCED**. However, the start dates and project periods are subject to negotiation. Most projects should be completed within 12-18 months, with a maximum period of performance of 18 months. Permission to extend the period of performance beyond that stated in award documentation is at the discretion of USGS and should be requested in writing at least 60 days in advance of an award's expiration date.

Awards under this Program Announcement will be made during Fiscal Year 2010 (FY10). The Federal fiscal year (FY) runs from October 1 to September 30 of the following calendar year.

3. Application Requirements

A. Only those applications that respond to and meet the criteria of this announcement will be considered for funding. Applications that do not meet the criteria of this announcement will be returned to the applicant.

B. Work under all awards must be completed no later than September 30, 2011. All funds must be drawn down from the Payment Management (PMS) system by September 30, 2011.

C. Proposed operations and developmental activities shall be conducted by the applicant. Proposed funding for activities other than those outlined in this Program Announcement will not be considered for funding.

D. The application shall be prepared in accordance with the Application and Submission information in Section 8.

4. Funding Opportunity Description

The USGS seeks to support cooperative projects that will result in the collection of high resolution (1 point per square meter (ppsm)) lidar **or** 1-ft ground sample distance (gsd) orthoimagery and meet objectives of the American Recovery and Reinvestment Act (ARRA). All data will be added to *The National Map*, a set of national geospatial datasets available to the public at no cost. More information on these datasets may be found at <http://nationalmap.gov>.

USGS will emphasize the selection of large area projects with partners identifying ARRA projects that will (1) yield significant amounts of new data that revise current elevation and orthoimagery holdings in the national databases and (2) stimulate local economies through the creation or retention of jobs. High priority will be given to applications for projects that:

1. Have the greatest potential to achieve large area collections of new lidar or imagery data in priority areas;
2. Leverage ARRA funds with applicant resources through multi-partnered agreements;
3. Can be completed within 12-18 months;
4. Identify specific goals, outcomes and economic performance metrics consistent with one or more of the following ARRA goals;
 1. To preserve and create jobs and promote economic recovery.
 2. To assist those most impacted by the recession.
 3. To provide investments needed to increase economic efficiency by spurring technological advances in science and health.
 4. To invest in transportation, environmental protection, and other infrastructure that will provide long-term economic benefits.
 5. To stabilize State and local government budgets, in order to minimize and avoid reductions in essential services and counterproductive state and local tax increases.

The USGS stimulus funding is far short of the funds needed to implement a national program but enough to complete, in concert with Federal and State programs and other partners, lidar elevation and high resolution orthoimagery data collections in selected areas for a focused set of requirements. The strategy is to use the stimulus funding to leverage other Federal and State funding through the USGS Geospatial Liaison Network, existing Federal affiliations and State programs to: 1) increase coverage of elevation data in coastal regions and areas prone to flooding and, 2) expand existing and new partnerships for leaf-off, high-resolution orthoimagery.

Priorities for lidar data collection include augmenting the narrow coastline elevation and near-shore bathymetric data currently being collected by Federal and State agencies by extending elevation data coverage inland to coastal communities and population centers. Coastal areas of the United States most susceptible to storm and hurricane flooding, earthquake damage, erosion and sea level rise are top priority collection areas. Substantial improvement will be achieved in the resolution of the National Elevation Dataset (NED) of *The National Map* through the addition of this lidar data. The full lidar data set will be collected and made available for use in other national applications such as infrastructure development, resource assessment and scientific studies.

These lidar priority collection areas of interest are identified in a light blue color in Figure 1 below. The outlines and shading highlight the coastal watersheds and counties in which they lie. Status of the 1/9 Arc-Second National Elevation Dataset (NED) is also shown to indicate current data holdings generated from lidar along with work in progress. ARRA funding will be used only to collect data in areas without coverage.

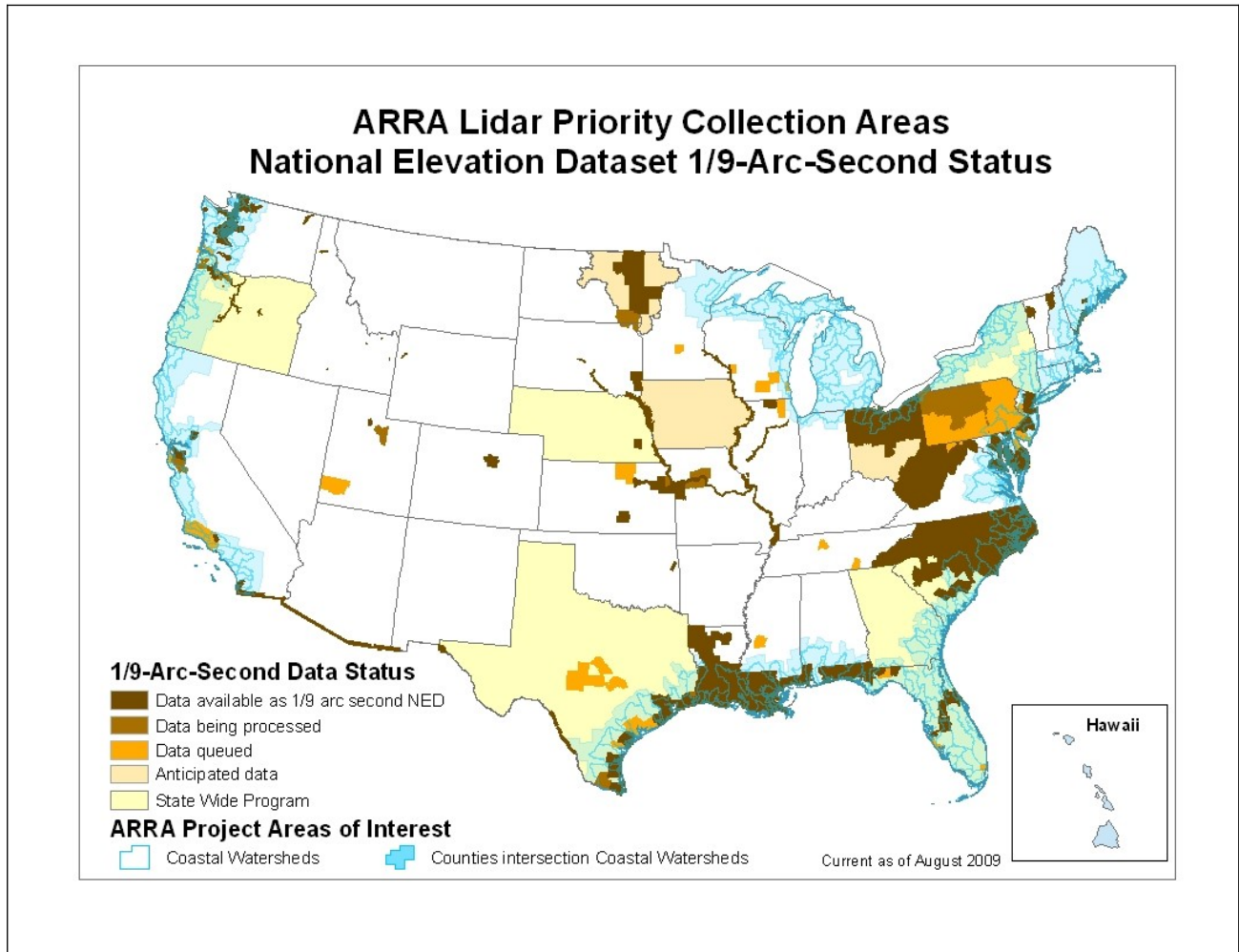


Figure 1. ARRA Lidar Priority Collection Areas include coastal watersheds extended to county boundaries (shown in light blue). Existing and in process data are shaded in other colors.

Orthoimagery data collection under this funding opportunity is intended to augment existing programs and build new partnerships for the collection of leaf-off, high resolution data. The focus is on collaborative efforts to increase data availability with an emphasis on large area collections that benefit from economies of scale. Additional priority areas of interest for the USGS include sensitive landscapes and environments designated as Priority Ecosystems in Figure 2 below, along with areas where Integrated Landscape Monitoring is in progress. More information about each of these areas can be found at:

- Integrated Landscape Monitoring <http://geography.wr.usgs.gov/science/ilm.html>
- Priority Ecosystems <http://access.usgs.gov/about.html>
- Hazards <http://www.usgs.gov/hazards/>

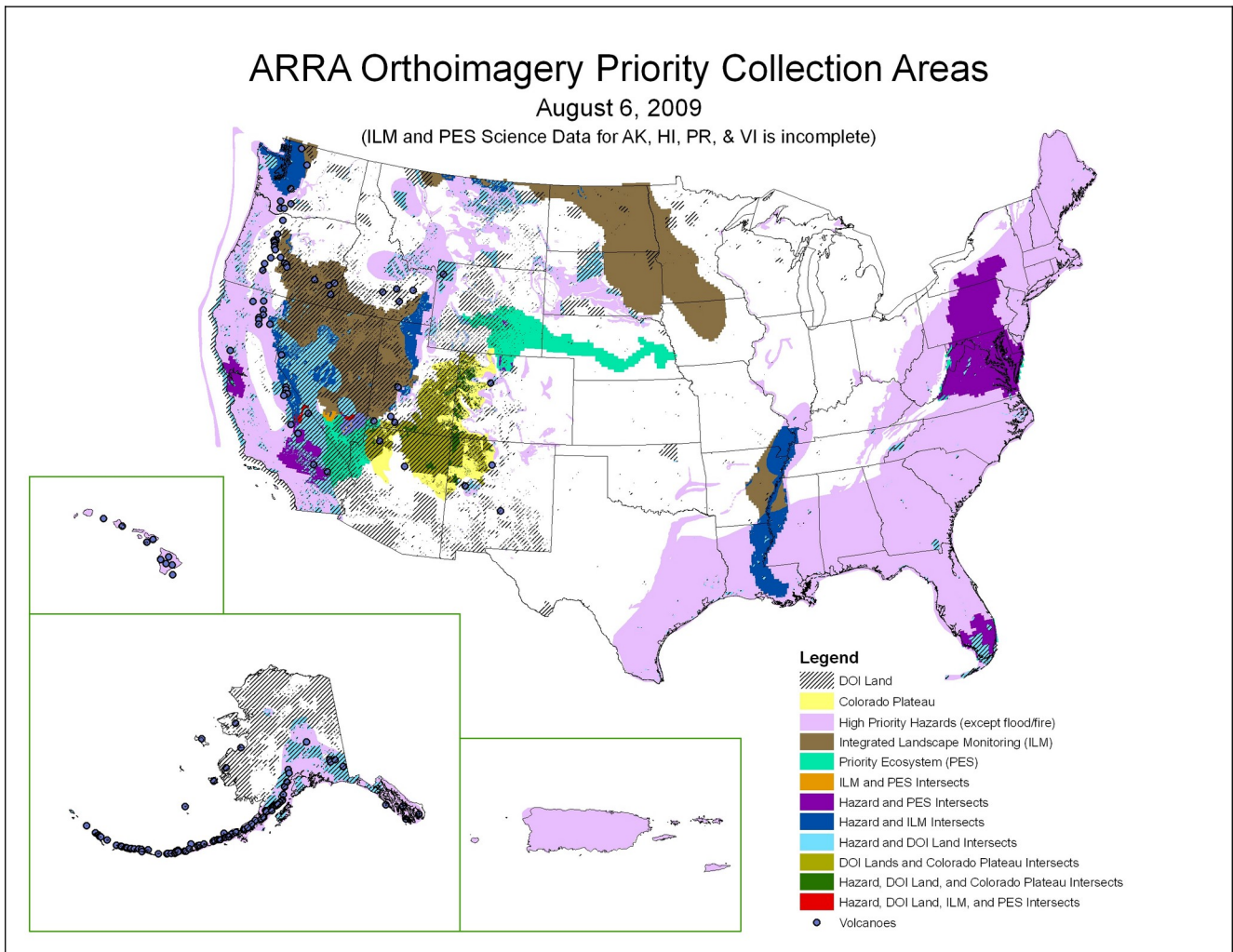


Figure 2. ARRA Orthoimagery Priority Collection Areas include those designated as Hazards, Integrated Landscape Monitoring, and Priority Ecosystems.

More detailed graphics of the ARRA Lidar Project Areas of Interest for both lidar and orthoimagery can be found at: www.xxx.gov

5. Type of Funding Instrument

Selected applications will be funded through a cooperative agreement with the USGS. USGS will be substantially involved with the Principal Investigator(s) (PI) and other institution staff throughout the course of the project. It is expected that there will be frequent contact between the USGS Geospatial Liaison for the State and the PI to discuss project progress and issues. Additional USGS staff will be involved in collaborative discussions regarding data specifications and validation, cost estimates, monitoring ARRA reporting, and data delivery schedules. USGS will perform quality control, data processing into national databases, data dissemination and archive of the final product. Teleconferences will be held on a monthly basis to discuss and review project status. Quarterly reports and a final report at the end of the project are required.

6. Eligible Applicants

Eligible applicants are institutions of higher education, U.S. Territories, and state, local and Indian tribal governments. Applications from Federal agencies or employees of Federal agencies will not be considered.

7. Cost Sharing or Matching Requirements

There is no statutory matching requirement for this funding. However, USGS typically leverages its Federal funding with matching contributions and/or partnerships from a broad range of sources in the public sector to implement cooperative agreements for geospatial collections. To this end, the USGS will give priority to applicants who contribute funds to the proposal. Cost sharing is an element considered in the Evaluation Criterion "Project Costs" (Section 10). **Federal sources cannot be considered for matching funds**, but must be described in the budget narrative to demonstrate additional leverage. Applications selected for funding will be bound by the percentage of cost sharing reflected in the award document signed by the USGS Grants Officer.

8. Application and Submission Information

Applicants may seek funding for lidar and/or orthoimagery collections, but not for both on the same proposal. Any proposal seeking awards for both products will be rejected. Separate proposals must be submitted for each data type.

Your electronic submission shall consist of forms SF-424, SF-424a, and SF-424b, plus the items described below. No additional documents or materials may be submitted. Failure to comply with the required application components listed below may result in the proposal being rejected. To view complete forms instructions, please visit the Grants.gov Forms Repository at http://www.grants.gov/agencies/aapproved_standard_forms.jsp#1

Items A through H as described below shall be combined together, in the order noted below, and submitted through Grants.gov in either MS Word or PDF format. **The application shall not exceed 25 single-spaced pages** (including figures, tables, references, appendices, etc.), and the **type size shall not be smaller than 11 point**. All pages of the application shall be numbered. All text, figures, and tables shall be sized to fit on 8½" by 11" paper. The SF forms, detailed budget, negotiated rate agreement, site location information, vitae, and letters of support do **not** count toward the 25-page limit. The application shall be in color as needed for review by peer review panel members. Do not submit copies of published papers with the application.

In the Grants.gov forms, floating your mouse over a field will provide instructions for completing that field. You can also click on the Check Package for Errors button to check the entire application for validation errors (incomplete fields, etc.)

The application submitted through grants.gov as the Project Narrative Attachment Form (in MS Word or PDF format) shall be **assembled in the following order**:

- A. Proposal Information Summary. This summary is mandatory in all proposals and shall follow the same format as shown in Attachment C.
- B. Table of contents.
- C. Proposed budget. The proposed budget shall be presented in two parts, a one-page summary (in the format in Attachment D) followed by a detailed budget. **Place the budget summary, followed by the detailed budget, after the Table of Contents**. Non-federal funds available to support the project may be reflected in the detailed budget or the SF 424 in block 18, as

appropriate. **The budget shall also include a breakdown per objective. If funding will be used to complete part of a larger project, a budget overview for the entire project should be provided to allow the project office to make an informed determination of a project's readiness.** A narrative budget justification should indicate if the project has been submitted for funding consideration elsewhere, what amount has been requested or secured from other sources, and whether the funds requested/secured are Federal or non Federal. If matching funds are proposed, include a detailed budget for matching funds as set forth below. The detailed budget must include the amount proposed for the proposed term of the project for each of the following items, in this order:

1. Salaries and wages. Identify individuals or categories of salaries and wages, estimated hours or percent of time, and the rate of compensation proposed for each person or category. Include an explanation of the amounts included for projected increases if the rate of pay shown is higher than the current rate of pay. Identify each person with a task in the project. For students (undergraduate and graduate), requests for support must clearly identify the role of the individual in the operation and maintenance or development and expansion of the network, and the hours assigned to these tasks.
2. Fringe benefits/labor overhead. Indicate the rates/amounts in conformance with normal accounting procedures. Explain what costs are covered in this category and the basis of the rate computations. Indicate whether rates are used for proposal purposes only or whether they are also fixed or provisional rates for billing purposes. **Include a copy of the Negotiated Rate Agreement or internal memo supporting the proposed rates.**
3. Equipment. Show the cost of all special-purpose equipment necessary for achieving the objectives of the project. "Special-purpose equipment" means scientific equipment having a useful life of more than 1 year and having a cost of \$5,000 or more per item. Each item should be itemized and include a full justification and a dealer or manufacturer quote, if available. General-purpose equipment must be purchased from the applicant's operating funds. Title to non-expendable personal property shall be vested solely with the Recipient. Under **no** circumstances shall property title be vested in a sub-tier recipient.
4. Supplies. Enter the cost for all tangible property. Include the cost of office, laboratory, computing, and field supplies separately. Provide detail on any specific item that represents a significant portion of the proposed amount. (Note: publications costs will not be considered.)
5. Services or consultants. Identify the tasks or problems for which such services would be used. List the contemplated sub-recipients by name (including consultants), the estimated amount of time required, and the quoted rate per day or hour. If known, state whether the consultant's rate is the same as she/he has received for similar services or under government contracts or assistance awards.
6. Travel. Travel is allowable for station installation and related work. State the purpose of the trip and itemize the estimated travel costs to show the number of trips required, the destinations, the number of people traveling, the per diem rates, the cost of transportation, and any miscellaneous expenses for each trip. Calculations of other special transportation costs (such as charges for use of applicant-owned vehicles or vehicle rental costs) should also be shown.
7. Other direct costs. Itemize the different types of costs not included elsewhere, such as shipping and equipment-use charges. Provide breakdowns showing how the cost was estimated (for example, equipment-use charges should show the type of equipment, estimated time of use, and the established rates).
8. Total direct costs. Total of items 1 through 7.
9. Indirect cost/general and administrative (G&A) cost. Show the proposed rate, cost base, and proposed amount for allowable indirect costs based on the cost principles applicable to the Applicant's organization. If the Applicant has separate rates for recovery of labor overhead and G&A costs, each charge should be shown. Explain the distinction between items included in the two cost pools. The Applicant should propose rates for evaluation purposes that they are also willing to establish as fixed or ceiling rates in any resulting award. **A copy of the negotiated**

indirect cost rate agreement with the Federal government shall be included with the paper original. If one is not established, a letter from a Certified Public Accountant must be included to support the cost.

D. Executive Summary providing project overview (1 page maximum)

E. Project Narrative (10 pages maximum):

The **project narrative** should closely follow the organization of the evaluation criteria (see Section 10, Evaluation of Applications) for the application to receive a consistent review against competing applications. The body of the project narrative description should be no more than 10, one-sided, 8.5x11 pages long (in 11-point font with 1" margins), and should give a clear presentation of the proposed work. In general, applications should indicate how the proposed work generates new data collections for lidar and orthoimagery, that the data will meet minimum specifications, employment and, social and economic benefits.

F. Site Location of the area of interest in Google KMZ, PDF, or JPEG formats.

G. Brief curriculum vitae or resume of primary project personnel (maximum of 1 page per person); and

H. Any other relevant supporting documents, such as letters of support and site photos.

Note: Applicants should not assume prior knowledge on the part of USGS as to the relative merits of the project described in the application. Inclusion of supplementary materials such as photographs, diagrams, etc. are strongly encouraged, and should be submitted along with the application as a single PDF file not to exceed 25 pages total. The panel review will be based solely on the information contained in the application.

9. Rejection of Proposals after Initial Review

If a proposal does not meet all requirements that are specified in the Announcement as determined by the Contracting Officer in consultation with the National Map Program Officer, the applicant will be promptly notified in writing of the rejection along with the reason for the rejection.

10. Evaluation of Applications

A. Evaluation Criteria.

Evaluation of proposals is through peer review by a panel of experts who read all the proposals prior to meeting and discuss each proposal according to the evaluation criteria. Reviewers will assign scores to applications ranging from 0 to 100 points based on the following four evaluation criteria and respective weights specified below.

(1) Importance and Applicability (32 points)

This criterion ascertains whether there is intrinsic value in the proposed work and relevance to USGS, Federal, regional, state or local activities. For *The National Map* Imagery and Elevation Maps competition, applications will be evaluated based on the following:

- The project location and areal extent. Applications will be assigned points based on the location relative to priority areas and amount of data collected.
 - For lidar proposals, the highest priority areas are the coastal watersheds of the United States (see Figure 1) to include the counties that they lie in. Areal extent is evaluated based on coverage within those priority areas and the number of square miles of revised, higher resolution elevation data available for entry into the National Elevation Dataset as a result of the project.

OR

- For orthoimagery proposals, data collection may be for any area of the United States including Alaska and Hawaii, with a priority for areas that have been identified by the USGS as one of the following (See Figure 2):
 - Priority Ecosystems
 - Integrated Landscape Monitoring
 - Priority Hazards Area
- Large area, leaf-off collections in order to gain economies of scale.
- Significant, new, higher resolution orthoimagery coverage and the number of square miles added to the USGS Orthoimagery Dataset as a result of this project.

More detailed graphics of the ARRA Lidar Project Areas of Interest for both lidar and orthoimagery can be found at: www.xxx.gov

- The potential of an application to meet the intent of the ARRA to readily maximize jobs created or maintained through implementation of projects that lead to the collection of high resolution lidar or orthoimagery data, and improve the short- and long-term economic condition of an area (e.g., improved flood plain maps, improved flood control, better elevation models, etc.) based on the significance of the anticipated outcomes of the project. This includes the extent to which the project(s) will provide tangible, specific results that are measurable with respect to the number, type and duration (in labor hours) of jobs created or maintained directly resulting from the project.
- The potential of the project to be relevant and meaningful. The potential of an application to meet the USGS mission to protect property and lives and provide lasting benefits of regional or national significance for coastal watershed areas. Reviewers will be looking for evidence that there is demonstrated support for the project in the form of a letter from partners, local entities, and/or state and local governments, and a letter of commitment from the appropriate resource agency personnel for a project in the designated priority areas (letters of support or significant financial or other in-kind investment).

(2) Technical Merit (28 points)

This criterion assesses whether the approach is technically sound and/or innovative, if the methods are appropriate, and whether there are clear project goals and objectives. For the National Map Imagery and Elevation Maps competition, applications will be evaluated based on the following:

- The extent to which the applicant has described a realistic data collection plan, that is likely to be fully achievable within 12-18 months.

For lidar proposals: how well proposals for lidar will provide products that adhere to the Base Lidar Specification (Attachment A). **This specification is also available online at: www.XXX.gov**

- o Proposals for lidar data must meet minimum USGS base lidar specifications for data collection and delivery to ensure data collected are suitable for processing and ingestion in the National Elevation Dataset at the 1/9 arc-second resolution. The point cloud data must be delivered in a consistent state and clearly defined format that will allow it to be used by a broad range of users.

OR

For orthoimagery proposals: how well the proposal for orthoimagery provides products that adhere to the Base Orthoimagery Specification (Attachment B). **This specification is also available online at: www.XXX.gov**

- o Proposals for orthoimagery data must meet minimum USGS base orthoimagery specifications for data collection and delivery to ensure data collected are suitable for ingestion into the USGS Orthoimagery Dataset as 1-ft, ground sample distance (gsd), leaf -off imagery.
- The overall technical approach of the project, including whether the proposal is technically sound, safe, and uses appropriate methods and personnel. This includes the likelihood that a project is able to achieve stated project goals and objectives, and whether there is an effective mechanism to evaluate project performance (e.g., sufficient, cost-effective monitoring appropriate to the scope and scale of the project), for which results will be available within and following the award period. Those projects that identify specific quantifiable targets, achievable during the award period, are likely to score higher.

Applicants are not expected to determine a data vendor before submitting an application. However, the applicant should describe their method of data acquisition and the process they will use to achieve it. This could be utilizing in-house resources for all or some of the tasks and/or contracting with a vendor for some of the tasks.

(3) Overall Qualifications of Applicants (12 points)

This criterion ascertains whether the applicant possesses the necessary education, experience, training, facilities, and administrative resources to accomplish the proposed objectives. For the USGS National Map Imagery and Elevation Maps Project competition, applications will be evaluated based on the following:

- The capacity/knowledge of the applicant and associated project personnel to conduct the scope and scale of the proposed work, as indicated by the qualifications and past experience of the project leaders and/or partners in designing, implementing and effectively managing and overseeing projects. This includes, when relevant to the proposal, any experience with evaluating and selecting qualified vendors capable of collecting, processing, and delivering quality geospatial data. Examples of projects similar in scope and nature that have been successfully completed by the applicant are encouraged.
- The facilities/equipment and/or administrative resources and capabilities available to the applicant, or that will be secured to support and successfully manage the data collection work and cooperative agreement responsibilities.

(4) Project Costs (28 points)

This criterion evaluates the budget to determine if it is realistic and commensurate with the project needs and time-frame. For the USGS National Map Imagery and Elevation Maps Project competition, applications will be evaluated on the following:

- Whether the proposed budget is cost-effective and realistic, based on the applicant's stated objectives, time frame, and amount of overall project budget already secured from other sources. Applications will be evaluated based on the amount of funds requested against proposed quality and amount of data collected.
- Whether the proposed budget is sufficiently detailed, with appropriate budget breakdown and justification of Federal and any non-Federal shares by cost category as listed in the budget summary and detailed budget. If funding will be used to complete part of a larger project, a budget overview for the entire project should be provided to allow the panel to make an informed determination of a project's readiness.
- Whether an applicant can leverage the Federal investment through additional contributions towards the project. Applicants are encouraged to provide contributions and work with partners to improve cost-effectiveness.

B. Funding Recommendations

The majority of funding recommendations follow the recommended rankings of the peer review panels. However, other factors which may be taken into consideration when making final award determinations include funding allocations for each program objective, program goals, geographic considerations, and the best interests of the National Geospatial Program (NGP) and the USGS. The NGP reserves the right to deviate from the order of ranking to accommodate program priorities, special conditions, and available funds. Funding recommendations that differ markedly from the panel's rank order will be supported by written rationale to Office of Acquisition and Grants (OAG). The Contracting Officer will make necessary final determinations.

11. Special Terms and Conditions

Award Recipients shall comply with grant award Special Terms and Conditions (see **Attachment E**) and Cost Principles, Audit, and Administrative Requirements (see **Attachment F**).

- (1) No pre-award costs are authorized.

- (2) No-cost extensions are discouraged. The timely conduct of funded projects is important to achieving program goals under ARRA. Applicants should consider time commitments prior to applying for a cooperative agreement. Requests for no-cost extensions will be considered on a case-by-case basis. The USGS reserves the right to limit the length of time and number of no-cost extensions. Please note that no-cost extensions are not intended to be used merely for the purpose of expending unobligated balances. Applicants should supply documentation supporting their request for an extension, as described in Attachment E, Section 4.
- (3) Supplemental Funds. Requests for any increase in funds beyond the amount awarded are also discouraged. The peer review panel recommends funding at a rate according to their judgment of the merit of a proposal and their expert knowledge of the expenses likely to be incurred in the conduct of the project. [Note: No ARRA funding is available after September 30, 2010.]

12. Notification

Following the peer panel review, the USGS will make funding decisions and will notify applicants of one of three possible decisions: the proposal has been recommended for funding in FY 2010; the proposal is being declined and will not be funded; or a portion of the proposal is declined for funding and the applicant will be notified and requested to submit an amended proposal and budget.

13. Paperwork Reduction Act Statement

The Paperwork Reduction Act requires us to tell you why we are collecting this information, how we will use it, and whether or not you have to respond. We will use the information that we collect to evaluate proposals submitted to acquire funding for imagery and elevation maps. Your response is required to receive funding. A Federal agency may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number. We estimate that it will take an average of 60 hours to complete the application. The average estimated annual burden associated with writing and submitting required quarterly and final reports is 14 hours. You may send comments concerning the burden estimates or any aspect of this information collection to the Information Collection Clearance Officer, U.S. Geological Survey, 2150 Centre Avenue, Fort Collins, CO 80525.

14. Payment to Foreign Recipients

The USGS requires that all financial assistance payments be made using the Department of Health and Human Services (DHHS) Payment Management System (PMS). Paper based claims for reimbursement are no longer acceptable. In order to receive payment, Recipients will be required to establish an account with PMS. With the award of each grant, a sub-account will be set up from which the Recipient can draw down funds. It should be noted that foreign recipients will only be permitted to draw down funds if a U.S. corresponding bank is linked to their account (i.e., the recipient must bank directly with a US bank or their foreign bank must have a corresponding US bank). It is the responsibility of the applicant to verify that, in the event they receive a grant, they can meet this condition of the award. It is strongly recommended that foreign applicants make any necessary banking arrangements prior to submitting their applications. Applicants who are recommended for funding who cannot meet this condition may not receive an award.

15. American Recovery and Reinvestment Notices

2 CFR §176.150 Notice of Required Use of American Iron, Steel, and Manufactured Goods—Section 1605 of the American Recovery and Reinvestment Act of 2009.

(a) Definitions. “Manufactured good,” “public building and public work,” and “steel,” as used in this notice, are defined in the 2 CFR 176.140.

(b) Requests for determinations of inapplicability. A prospective applicant requesting a determination regarding the inapplicability of section 1605 of the American Recovery and Reinvestment Act of 2009 (Pub. L. 111-5) (Recovery Act) should submit the request to the award official in time to allow a determination before submission of applications or proposals. The prospective applicant shall include the information and applicable supporting data required by paragraphs (c) and (d) of the award term and condition at 2 CFR 176.140 in the request. If an applicant has not requested a determination regarding the inapplicability of 1605 of the Recovery Act before submitting its application or proposal, or has not received a response to a previous request, the applicant shall include the information and supporting data in the application or proposal.

(c) *Evaluation of project proposals.*

If the Federal government determines that an exception based on unreasonable cost of domestic iron, steel, and/or manufactured goods applies, the Federal Government will evaluate a project requesting exception to the requirements of section 1605 of the Recovery Act by adding to the estimated total cost of the project 25 percent of the project cost, if foreign iron, steel, or manufactured goods are used in the project based on unreasonable cost of comparable manufactured domestic iron, steel, and/or manufactured goods.

(d) Alternate project proposals.

(1) When a project proposal includes foreign iron, steel, and/or manufactured goods not listed by the Federal Government at paragraph (b)(2) of the award term and condition at 2 CFR 176.140, the applicant also may submit an alternate proposal based on use of equivalent domestic iron, steel, and/or manufactured goods.

(2) If an alternate proposal is submitted, the applicant shall submit a separate cost comparison table prepared in accordance with paragraphs (c) and (d) of the award term and condition at 2 CFR 176.140 for the proposal that is based on the use of any foreign iron, steel, and/or manufactured goods for which the Federal Government has not yet determined an exception applies.

(3) If the Federal government determines that a particular exception requested in accordance with paragraph (b) of the award term and condition at 2 CFR 176.140 does not apply, the Federal Government will evaluate only those proposals based on use of the equivalent domestic iron, steel, and/or manufactured goods, and the applicant shall be required to furnish such domestic items.

2 CFR§176.170 Notice of Required Use of American Iron, Steel, and Manufactured Goods (covered under International Agreements)—Section 1605 of the American Recovery and Reinvestment Act of 2009.

(a) **Definitions.** “Designated country iron, steel, and/or manufactured goods,” “foreign iron, steel, and/or manufactured good,” “manufactured good,” “public building and public work,” and “steel,” as used in this provision, are defined in 2 CFR 176.160(a).

(b) **Requests for determinations of inapplicability.** A prospective applicant requesting a determination regarding the inapplicability of section 1605 of the American Recovery and Reinvestment Act of 2009 (Pub. L. 111-5)(Recovery Act) should submit the request to the award official in time to allow a determination before submission of applications or proposals. The prospective applicant shall include the information and applicable supporting data required by paragraphs (c) and (d) of the award term and condition at 2 CFR 176.160 in the request. If an applicant has not requested a determination regarding the inapplicability of 1605 of the Recovery Act before submitting its application or proposal, or has not received a response to a previous request, the applicant shall include the information and supporting data in the application or proposal.

(c) *Evaluation of project proposals.*

If the Federal government determines that an exception based on unreasonable cost of domestic iron, steel, and/or manufactured goods applies, the Federal Government will evaluate a project requesting exception to the requirements of section 1605 of the Recovery Act by adding to the estimated total cost of the project 25 percent of the project cost if foreign iron, steel, or manufactured goods are used based on unreasonable cost of comparable domestic iron, steel, or manufactured goods.

(d) Alternate project proposals.

(1) When a project proposal includes foreign iron, steel, and/or manufactured goods, other than designated country iron, steel, and/or manufactured goods, that are not listed by the Federal Government in this Buy American notice in the request for applications or proposals, the applicant may submit an alternate proposal based on use of equivalent domestic or designated country iron, steel, and/or manufactured goods.

(2) If an alternate proposal is submitted, the applicant shall submit a separate cost comparison table prepared in accordance with paragraphs (c) and (d) of the award term and condition at 2 CFR 176.160 for the proposal that is based on the use of any foreign iron, steel, and/or manufactured goods for which the Federal Government has not yet determined an exception applies.

(3) If the Federal government determines that a particular exception requested in accordance with paragraph (b) of the award term and condition at 2 CFR 176.160 does not apply, the Federal Government will evaluate only those proposals based on use of the equivalent domestic or designated country iron, steel, and/or manufactured goods, and the applicant shall be required to furnish such domestic or designated country items.

2 CFR§176.190 Award term- Wage Rate Requirements under Section 1606 of the Recovery Act

(a) Section 1606 of the Recovery Act requires that all laborers and mechanics employed by contractors and subcontractors on projects funded directly by or assisted in whole or in part by and through the Federal Government pursuant to the Recovery Act shall be paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by the Secretary of Labor in accordance with subchapter IV of chapter 31 of title 40, United States Code.

Pursuant to Reorganization Plan No. 14 and the Copeland Act, 40 U.S.C. 3145, the Department of Labor has issued regulations at 29 CFR Parts 1, 3, and 5 to implement the Davis-Bacon and related Acts. Regulations in 29 CFR 5.5 instruct agencies concerning application of the standard Davis-Bacon contract clauses set forth in that section. Federal agencies providing grants, cooperative agreements, and loans under the Recovery Act shall ensure that the standard Davis-Bacon contract clauses found in 29 CFR 5.5(a) are incorporated in any resultant covered contracts that are in excess of \$2,000 for construction, alteration or repair (including painting and decorating).

(b) For additional guidance on the wage rate requirements of section 1606, contact your awarding agency. Recipients of grants, cooperative agreements and loans should direct their initial inquiries concerning the application of Davis-Bacon requirements to a particular federally assisted project to the Federal agency funding the project. The Secretary of Labor retains final coverage authority under Reorganization Plan Number 14.

16. **SPECIAL NOTICE:** Full or partial funding for requirements to be completed by resultant financial assistance award(s) may utilize funds provided by the American Recovery and Reinvestment Act of 2009. Inclusion of unique provisions required implementing the Act, including those for significant reporting and transparency requirements by the successful recipient(s), will be required in any resultant financial assistance award.

Attachments

Base Lidar Specification
For projects funded under the
American Recovery and Reinvestment Act of 2009
U.S. Geological Survey Program Announcement
09HQPA0023

The following base specification for Lidar data collection and delivery was derived for interim use on American Reinvestment and Recovery Act (ARRA) Programs pending final development of a data standard.

The USGS has cooperated in the collection of numerous lidar datasets across the nation for a wide array of applications. These collections used a variety of specifications and required a diverse set of products, resulting in many incompatible datasets and making cross-project analysis extremely difficult. The need for a single base specification, defining minimum collection parameters and a consistent set of deliverables, is apparent.

Beginning in late 2009, an increase in the rate of lidar data collection due to ARRA funding for The National Map makes it imperative that a data specification be used to ensure consistency and improve data utility.

Adherence to this minimum specification ensures that Lidar data collected under this initiative are suitable for ingest into the NED (National Elevation Dataset) at the 1/9 arc-second resolution, and can be resampled for use in the 1/3 and 1 arc-second NED resolutions. It also ensures that point cloud source data are handled in a consistent manner by all data providers and delivered to the USGS in clearly defined formats. This allows straight-forward ingest into CLICK (Center for Lidar Information Coordination and Knowledge) and simplifies subsequent use of the source data by the broader scientific community.

The following specifications, guidelines, and requirements are minimum parameters.

It is expected that local conditions in any given project area, specialized applications for the data, or the preferences of cooperators, may mandate more stringent requirements. The USGS encourages the collection of more detailed, accurate, or value-added data. A list of common options beyond the base specification is provided in Section D.

I. COLLECTION

1. Multiple Discrete Return, capable of at least 3 returns per pulse
2. Intensity values for each return.
3. Nominal **Pulse** Spacing (NPS) no greater than 2 meters; assessment to be made against single swath, first return data.
4. Data Voids [areas => $(4*NPS)^2$, measured using 1st-returns only] within a single swath are not acceptable, except:
 - where caused by water bodies
 - where caused by areas of low near infra-red (NIR) reflectivity such as asphalt or composition roofing.
 - where caused by lidar shadowing AND filled-in by another swath.
5. The spatial distribution of points is expected to be uniform and free from clustering. In order to ensure uniform densities throughout the data set:
 - The contracted NPS value will be converted into Points per Square Meter (PPSM) using the formula: **PPSM = $(1/NPS^2)$**
 - A regular 1x1 meter grid will be laid over the data.
 - At least 90% of the cells in the grid shall contain the requisite number of PPSM.
 - Clustering will be tested against the 1st return data; acceptable data voids identified previously in this specification are excluded
6. Scan Angle (total FOV) not to exceed 40°.
7. Vertical Accuracy:

*Note: The term “accuracy” has commonly been used in the industry to refer to the tested $RMSE_z$ of the lidar data. Technically, this is improper usage: NSSDA Accuracy_z is defined as the 95% confidence level, equal to $(RMSE_z * 1.96)$ in a set of errors assumed to be normally distributed. In keeping with common usage to reduce confusion, this Specification’s use of the term “accuracy” is indicative of the $RMSE_z$ value and will be annotated as such. See the FEMA “Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix A”, Section A.3.2 for additional information.*

NSSDA $RMSE_z = 15cm$ (NSSDA Accuracy_z 95% = 30cm) or better; assessment procedures to comply with FEMA guidelines.

Note: This requirement may be relaxed to NSSDA $RMSE_z = 18.5cm$ (NSSDA Accuracy_z 95% = 37cm) in cases:

- *where there exists a demonstrable increase in cost to obtain 15cm $RMSE_z$ accuracy over 18.5cm $RMSE_z$ accuracy.*
 - *where the 18.5cm $RMSE_z$ specification is needed to conform to previously contracted phases of a single larger overall collection effort, i.e., multi-year statewide collections, etc.*
 - *where the USGS agrees that it is reasonable and in the best interest of all stakeholders to use the 18.5cm $RMSE_z$ specification.*
8. Relative accuracy of 5cm or better; assessment to be made swath-to-swath and within single swaths.

Note: This requirement will be relaxed to 6cm on collections using an 18.5cm vertical accuracy specification.

9. Flightline overlap 20% or greater, as required to ensure there are no data gaps between the usable portions of the swaths. Collections in high relief terrain are expected to require greater overlap. Any data with gaps between the **usable** portions of the swaths will be rejected.
10. Collection Area: Defined Project Area, buffered by a minimum of 200*NPS.

Note: For collections in coastal areas, this requirement may be relaxed on seaward boundaries to eliminate needless collection over water.

11. Collection Conditions:

- Atmospheric: Cloud and fog-free between the aircraft and ground
- Ground: Snow free, no unusual flooding or inundation
- Vegetation: **Leaf-off is preferred, however:** Recognizing that scientific research applications may require varying vegetative conditions, the USGS only requires that penetration to the ground must be adequate to produce an accurate and reliable bare-earth surface suitable for incorporation into the 1/9 (3-meter) NED.

II. DATA PROCESSING and HANDLING

1. All processing should be carried out with the understanding that all point products are required to be in **fully compliant LAS v1.2 format**. Data producers are encouraged to review the LAS specification in detail.

Note: LAS v1.3 (draft) is nearing approval by the American Society of Photogrammetry and Remote Sensing (ASPRS). LAS v1.3 includes a number of small but significant changes that are of great value to the USGS.

2. GPS times are to be recorded as POSIX times, at a precision sufficient to allow unique timestamps for each return. POSIX Time is defined to be the time, in seconds, measured since January 1, 1970 in Universal Coordinated Time (UTC)
3. The USGS preferred Spatial Reference System for CONUS is: UTM, NAD83, Meters; NAVD88, Meters. Both horizontal and vertical should reference the most recent geoid model approved by the NGS. Each discrete project is to be processed using the predominant UTM zone for the overall collection area. State Plane Coordinate Reference Systems that have been accepted by the European Petroleum Survey Group (EPSG) and are recognized by ESRI GIS software may be used by prior agreement with the USGS. Alternative projected coordinate systems for collections in Alaska, Hawaii, and other Outside Conterminous United States (OCONUS) areas must be approved by the USGS prior to collection.
4. All references to the Unit of Measure “Feet” or “Foot” must specify either “International” or “U.S. Survey”
5. Long swaths (those which result in an LAS file larger than 2GB) should be split into segments. Each segment will thenceforth be regarded as a unique swath.
6. Point Families (multiple return “children” of a single “parent” pulse) shall be maintained intact through all processing prior to tiling. Multiple returns from a given pulse shall be stored in sequential order.

7. Each swath will be assigned a unique File Source ID. The Point Source ID field shall be set equal to the File Source ID prior to any processing of the data. See the LAS Specification.
8. All collected swaths are to be provided. This includes calibration swaths and cross-ties. All collected points are to be delivered. No points are to be deleted from the swath LAS files. This in no way requires or implies that calibration swath data are to be included in product generation. Excepted from this are extraneous data (aircraft turns, transit between the Collection Area and airport, transit between fill-in areas, etc.) that should be permanently removed.
9. Within each LAS file, points from a given swath shall be stored together and in their collected order.
10. Outliers, blunders, noise points, geometrically unreliable points near the extreme edge of the swath, and other points deemed unusable are to be identified using the “Withheld” flag, as defined in the LAS specification.
 - This applies primarily to points which are identified during pre-processing or through automated post-processing routines.
 - “Noise points” identified during manual Classification and Quality Assurance/Quality Control (QA/QC) may be assigned the standard LAS classification value (class value = 7), regardless of whether the noise is “low” or “high” relative to the ground surface.
11. The Overlap Classification (class value = 12) shall not be used. ALL points not tagged as “Withheld” are to be classified.
12. If there is a requirement that overlap points be identified for processing, they are to be tagged using Bit:0 of the User Data byte, as defined in the LAS specification. (1=Overlap). If required, this tag is to be provided..

Note: LAS v1.3 (draft) defines a field for this tag. Upon adoption of LAS v1.3, this requirement shall change the overlap bit flag location to that specified by the format.

13. Positional Accuracy Validation: The absolute and relative accuracy of the data, both horizontal and vertical, relative to known control, shall be verified prior to classification and subsequent product development. A detailed report of this validation is required.
14. Classification Accuracy: It is expected that due diligence in the classification process will produce data that meet the following test:

Within any 1km x 1km area, no more than 2% of points will possess a demonstrably erroneous classification value. This includes points in Classes 0 and 1 that should correctly be included in a different Class required by the contract.

Note: This requirement may be relaxed to accommodate collections in areas where the USGS agrees classification to be difficult.

15. Tiles:

Note: This section assumes a projected coordinate reference system.

- A single non-overlapped tiling scheme will be established and agreed upon by the provider and the USGS prior to collection. This scheme will be used for **all** tiled products.
- Tile size must be an integer multiple of the cell size of raster deliverables.
- Tiled products shall conform to the tiling scheme, without added overlap.
- Tiled products shall edge-match seamlessly in both the horizontal and vertical.

III. PRODUCTS

The USGS shall have unrestricted rights to all received data and reports, which shall be placed in the public domain. This standard places no restrictions on the data provider's rights to resell data or derivative products as they see fit.

1. Metadata

- Collection Report detailing mission planning and flight logs
- Survey Report detailing the collection of control and reference points used for calibration and QA/QC).
- Processing Report detailing calibration, classification, and product generation procedures including methodology used for breakline collection and hydro-flattening [*see: Section V. DEM HYDRO-FLATTENING*]).
- QA/QC Reports detailing the analysis, accuracy assessment and validation of:
 - The point data (absolute, within swath, and between swath)
 - The bare-earth surface (absolute)
 - Other optional deliverables as appropriate
- Control and Calibration points: All control and reference points used to calibrate, control, process, and validate the lidar point data or any derivative products are to be provided.
- Geo-referenced, digital spatial representation of the precise extents of each delivered dataset. This should reflect the extents of the actual lidar source or derived product data, exclusive of Triangular Irregular Network (TIN) artifacts or raster NODATA areas. A union of tile boundaries or minimum bounding rectangle is not acceptable. Polygon shapefile is preferred.
- Product metadata (FGDC compliant, XML format metadata). One file for each:
 - Project
 - Lift
 - Swath
 - Tiled deliverable product group (classified point data, bare-earth DEMs, breaklines, etc.)

Note: Metadata files for individual tiles are not required

2. Raw Point Cloud

- Fully compliant LAS v1.2, Point Record Format 1 (or 3)
- Georeference information included in LAS header
- GPS times recorded as POSIX times, at a precision sufficient to allow unique timestamps for each return.
- Intensity values (rescaled to 8-bit)
- Full swaths, all collected points to be provided.
- 1 file per swath, 1 swath per file, file size not to exceed 2GB, as described in DATA HANDLING AND PROCESSING, Paragraph 5.

3. Classified Point Cloud

- Fully compliant LAS v1.2, Point Record Format 1 (or 3)
- Georeference information included in LAS header
- GPS times recorded as POSIX times, at a precision sufficient to allow unique timestamps for each return.
- Intensity values (rescaled to 8-bit)
- Tiled delivery, without overlap (tiling scheme TBD)
- Classification Scheme (minimum):

| Code | Description |
|------|---|
| 1 | Processed, but unclassified |
| 2 | Bare-earth ground |
| 7 | Noise (low or high, manually identified, if needed) |
| 9 | Water |
| 10 | Ignored Ground (Breakline Proximity) |

Note: Class 7, Noise, is listed as a convenience for the data provider, It is not required that all “noise” be assigned to Class 7.

Note: Class 10, Ignored Ground, is intended 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. The requirement to use this class is dependent on the breakline/DEM generation methodology employed by the data provider.

4. Bare Earth Surface (Raster DEM)

- Cell Size no greater than 3 meters or 10 feet, and no less than the design NPS.
- Product is in an industry-standard, GIS-compatible, 32-bit floating point raster format (ERDAS .IMG preferred)
- Georeference information shall be included in raster file
- Tiled product, without overlap
- DEMs tiles will show no edge artifacts or mismatch
- Discernable Water Bodies (ponds, lakes, wide streams and rivers, oceans) are to be flattened within the DEM.
- Void areas (i.e., areas outside the project boundary but within the tiling scheme) shall be coded using a unique “NODATA” value. This value shall be identified in the appropriate location within the file header.
- Vertical Accuracy (RMSE_z) of the bare earth surface is to be assessed using the methods described in the FEMA “Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix A”, Section A.8.5 paragraph 1, Section A.8.6.1, and Section A.8.6.2 (substituting the

contracted vertical accuracy requirements ($RMSE_z$) for those listed in the FEMA document). All QA/QC analysis materials and results are to be provided to the USGS.

- Depressions (sinks), natural or human-induced, are not to be filled (as in hydro-conditioning and hydro-enforcement).
- Water Bodies (ponds and lakes), wide streams and rivers (“double-line”), and oceans or other boundary waters are to be hydro-flattened within the DEM. Hydro-flattening shall be applied to all water impoundments, natural or man-made, that are larger than 50’ in diameter (approximately 2000 square feet), to all streams that are nominally wider than 50’, and to all boundary waters bordering the project area regardless of size. The methodology used for hydro-flattening is at the discretion of the data provider.

Note: This adjustment to the DEM surface is neither “hydro-conditioning” nor “hydro-enforcement”, as defined in Digital Elevation Model Technologies and Applications: The DEM Users Manual, 2nd Edition (Maune et al., 2007). Please refer to the section on DEM Hydro-Flattening for detailed discussion.

5. Breaklines

- All breaklines developed for use in hydro-flattening shall be delivered as an ESRI feature class (PolylineZ or PolygonZ format, as appropriate to the type of feature represented and the methodology used by the data provider). Shapefile is preferred.
- Each feature class or shapefile will include properly formatted and accurate georeference information in the standard location. Shapefiles must include the companion .prj file.
- Breakline elevations will use the same coordinate reference system (horizontal and vertical) and units as the lidar point delivery.
- Breakline delivery may be as a continuous layer or in tiles, at the discretion of the vendor. Tiled deliveries must edge-match seamlessly in both the horizontal and vertical.

IV. COMMON OPTIONS ABOVE BASE SPECIFICATIONS

1. Independent 3rd-Party QA/QC (encouraged)
2. Higher NPS
 - 1.4m, 1.0m, 0.7m, etc...
3. Increased Vertical Accuracy ($RMSE_z$)
 - 12cm, 9.25cm, etc...
4. Additional Environmental Constraints
 - Tidal coordination, flood stages, crop/plant growth cycles, etc.
 - Shorelines corrected for tidal variations within a collection
5. Top-of Canopy (First-Return) Raster Surface (tiled)

6. Intensity Images (8-bit gray scale, tiled)
7. Detailed Classification (additional classes):

| Code | Description |
|------|---|
| 3 | Low vegetation |
| 4 | Medium vegetation (use for single vegetation class) |
| 5 | High vegetation |
| 6 | Buildings, bridges, other man-made structures |
| 7 | Noise (low or high) |
| n | additional Class(es) as agreed upon in advance |

8. Breaklines (PolylineZ and PolygonZ) for single-line hydrographic features, including appropriate integration into delivered DEMs
9. Breaklines (PolylineZ and PolygonZ) for other features (TBD), including appropriate integration into delivered DEMs
10. Extracted Buildings (PolygonZ): Footprints with maximum elevation and/or height above ground as an attribute.
11. Other products as defined by requirements and agreed upon in advance of funding commitment.

V. DEM HYDRO-FLATTENING

The subject of modifications to lidar-based DEMs is somewhat new, and although there are authoritative references available, there remains significant variation in the understanding of the topic across the industry. The following material was developed to provide a definitive reference on the subject as it relates to the creation of DEMs intended to be integrated into the USGS NED. The information presented here is not meant to supplant other reference materials and it should not be considered authoritative beyond its intended scope.

The term “hydro-flattening” is also new, coined for this document and to convey our specific needs. It is not, at this time, a known or accepted term across the industry. It is our hope that its use and acceptance will in time expand beyond the USGS with the assistance of other industry leaders.

The Digital Elevation Model Technologies and Applications: The DEM Users Manual, 2nd Edition (Maune *et al.*, 2007) provides the following definitions related to the adjustment of DEM surfaces for hydrologic analyses:

1. **Hydrologically-Conditioned (Hydro-Conditioned)** - Processing of a DEM or TIN so that the flow of water is continuous across the entire terrain surface, including the removal of all spurious sinks or pits. The only sinks that are retained are the real ones on the landscape. Whereas “hydrologically-enforced” is relevant to drainage features that are generally mapped, “hydrologically-conditioned” is relevant to the entire land surface and is done so that water flow is continuous across the surface, whether that flow is in a stream channel or not. The purpose for continuous flow is so that relationships/links among basins/catchments can be known for large areas. This term is specifically used when describing EDNA (see Chapter 4), the dataset of NED derivatives made specifically for hydrologic modeling purposes.

2. **Hydrologically-Enforced (Hydro-Enforced)** – Processing of mapped water bodies so that lakes and reservoirs are level and so that streams flow downhill. For example, a DEM, TIN or topographic contour dataset with elevations removed from the tops of selected drainage structures (bridges and culverts) so as to depict the terrain under those structures. Hydro-enforcement enables hydrologic and hydraulic models to depict water flowing under these structures, rather than appearing in the computer model to be dammed by them because of road deck elevations higher than the water levels. Hydro-enforced TINs also utilize breaklines along shorelines and stream centerlines, for example, where these breaklines form the edges of TIN triangles along the alignment of drainage features. Shore breaklines for streams would be 3-D breaklines with elevations that decrease as the stream flows downstream; however, shore breaklines for lakes or reservoirs would have the same elevation for the entire shoreline if the water surface is known or assumed to be level throughout. See figures 1.21 through 1.24. See also the definition for “hydrologically-conditioned” which has a slightly different meaning.

While these are important and useful modifications, they both result in surfaces that differ significantly from a traditional DEM. A “hydro-conditioned” surface has had its sinks filled and may have had its water bodies flattened. This is necessary for correct flow modeling within and across large drainage basins. “Hydro-enforcement” extends this conditioning by requiring water bodies be leveled and streams flattened with the appropriate downhill gradient, and also by cutting through road crossings over streams (culvert locations) to allow a continuous flow path for water within the drainage. Both treatments result in a surface on which water behaves as it physically does in the real world, and both are invaluable for specific types of hydraulic and hydrologic (H&H) modeling activities. Neither of these treatments is typical of a traditional DEM surface.

A traditional DEM such as the NED, on the other hand, attempts to represent the ground surface more the way a bird, or person in an airplane, sees it. On this surface, natural depressions do exist, and road fills do create sinks. Bridges, it should be noted, are removed in most all types of DEMs because they are man-made structures that have been added to the landscape.

Note: DEMs developed solely for orthophoto production may include bridges, as their presence can prevent the “smearing” of structures and reduce the amount of post-production correction of the final orthophoto. These are “special use DEMs” and are not relevant to this discussion.

For years, raster Digital Elevation Models (DEMs), have been created from a Digital Surface Model (DSM) of masspoints and breaklines, which in turn were created through photogrammetric compilation from stereo imagery. Photogrammetric DSMs inherently contain breaklines defining the edges of water bodies, coastlines, single-line streams, and double-line streams and rivers, as well as numerous other surface features.

Lidar technology, however, does not inherently collect the breaklines necessary to produce traditional DEMs. Breaklines have to be developed separately through numerous techniques, and either used with the lidar points in the generation of the DEM, or applied as a correction to DEMs generated without breaklines.

In order to maintain the consistent character of the NED as a traditional DEM, the USGS requires that all DEMs delivered have their water bodies flattened. This does not imply that a complete network of topologically correct hydrologic breaklines be developed for every dataset; only those breaklines necessary to ensure the following conditions exist in the final DEM:

1. Ponds and Lakes:
 - 50' or greater nominal diameter, ~2000 ft² or greater surface area
 - Flat and level water bodies (single elevation for every bank vertex defining a given water body).
 - The entire water surface edge must be at or below the immediately surrounding terrain.
 - Long impoundments such as reservoirs, inlets, and fjords, whose water surface elevations drop when moving downstream, should be treated as rivers.
2. Wide Streams and Rivers:
 - 50' **nominal** width: This should not unnecessarily break a stream or river into multiple segments. At times it may squeeze slightly below 50' for short segments. Data providers should use their best professional judgement.
 - Flat and level bank-to-bank (perpendicular to the imaginary flow centerline); gradient to follow the immediately surrounding terrain.
 - The entire water surface edge must be at or below the immediately surrounding terrain.
 - Streams should break at road crossings (culvert locations). These road fills should not be removed from DEM).
 - Streams and rivers should not break at bridges (bridges should be removed from DEM).
3. Boundary Waters:
 - Water boundaries such as oceans, seas, gulfs, and bays.
 - Represented only as an edge within the project area.
 - Elevation along this edge should behave consistently throughout the project. May be a single elevation (i.e., ocean) or gradient (i.e., river).
 - It is not normally required by the USGS to vertically tie these elevations to adjacent or coincident water bodies that are outside the project and/or from previous mapping efforts. However, other participating partners may have different requirements!
 - Should be represented as a gradient or level surface out to the extent of the delivery area and/or effected tile(s).
 - The entire water surface edge must be at or below the immediately surrounding terrain.

Cooperating partners often specify collection and integration of single-line streams within their lidar projects. While the USGS does not require these breaklines be collected or integrated, it does require that if used and incorporated into the DEMs the following guidelines are met:

1. All vertices along single-line stream breaklines are at or below the immediately surrounding terrain.
2. Single-line stream breaklines are not to be used to introduce cuts into the DEM at road crossings (culverts), dams, or other such features. This is hydro-enforcement and as

discussed earlier, creates a non-traditional DEM that is not suitable for integration into the NED.

3. All breaklines used to modify the surface are to be delivered to the USGS with the DEMs.

The USGS does not require any particular process or methodology be used for breakline collection, extraction, or integration. However, the following general guidelines must be adhered to:

1. Bare-earth lidar points that are close to breaklines must be excluded from the DEM generation process. This is analogous to the removal of masspoints in a traditional photogrammetrically compiled DTM.
2. These points are to be retained in the delivered lidar point dataset and shall be reclassified as “Ignored Ground” (class value = 10) so that they may be subsequently identified.
3. The proximity threshold for reclassification as “Ignored Ground” is at the discretion of the data provider, but in general should not be less than the NPS.

REFERENCES:

Maune, D.F., 2001. Definitions, in *Digital Elevation Model Technologies and Applications: The DEM Users Manual, 2nd Edition* (D.F. Maune, editor), American Society for Photogrammetry and Remote Sensing, Bethesda, MD pp. 550-551

National Digital Elevation Program, 2004. Guidelines for Digital Elevation Data—Version 1, 93 p., [URL: http://www.ndep.gov/NDEP_Elevation_Guidelines_Ver1_10May2004.pdf](http://www.ndep.gov/NDEP_Elevation_Guidelines_Ver1_10May2004.pdf) (last date accessed: 15 July 2009)

Base Orthoimagery Specification
For projects funded under the
American Recovery and Reinvestment Act of 2009
U.S. Geological Survey Program Announcement
09HQPA0023

This set of specifications for 30-centimeter, high-resolution orthoimagery is based on a draft high-resolution imagery specification under development at the U.S. Geological Survey. It is being used for the collection of orthoimagery funded by the American Recovery and Reinvestment Act of 2009 programs to insure consistency and usability by a wide range of orthoimagery data users.

Many Federal, State, and local programs use high-resolution orthoimagery for various applications including critical infrastructure management, vector data updates, land use analysis, natural resource inventory, and extraction of data by means of photogrammetric measurements. The complex nature of large-area orthoimagery datasets, combined with the broad interest in orthoimagery which is of consistent quality and spatial accuracy, requires high-resolution orthoimagery to meet or exceed format and content outlined in this specification.

The following specifications, guidelines, and requirements are minimum parameters.

It is expected that local conditions in any given project area, specialized applications for the data, or the preferences of cooperators, may mandate more stringent requirements. The USGS encourages the collection of more detailed, accurate, or value-added data. A list of common options beyond the base specification is provided as Attachment B-4 for those areas and projects which require more stringent specifications.

I. General

- 1. Geographic Extent:** Each high-resolution *project* shall cover the assigned area with a minimum 300 (± 30) meter buffer on all sides. Extents shall be computed by projecting the geographic corners and side midpoints to the appropriate projection, then adding the buffer on each side of the resulting minimum bounding rectangle. The orthoimagery shall be divided into smaller areas or tiles. The tile extent and grid shall be approved per project area.
- 2. Non-image data:** Orthoimagery tiles shall not contain any non-image data. Non-image data includes photographic frame borders, fiducial marks, artifacts, and titling.
- 3. Datums and Coordinates:** All high-resolution orthoimagery shall be projected in the North American Datum of 1983 (NAD83), using the corresponding native Universal Transverse Mercator (UTM) zone representing the predominance of the project area (see Figure B- 1, UTM Zones) with coordinates in meters, adjustment to be specified on a project by project basis. The vertical datum for **the supporting elevation data used to create** high-resolution digital orthoimagery shall be North American Vertical Datum of 1988 (NAVD88). The project will be controlled using the latest available NGS control adjustment of the project area, unless another adjustment is specifically requested and described by the customer.

4. **Image Mosaicking:** Orthoimagery may be created using multiple digital images (“chips”) to produce the final product. Specular reflections and other artifacts should be minimized, especially in developed areas, by patching the area using chips from other imagery.

1. **Radiometry Balance.** When a mosaic of two or more chips is made, the brightness and color values of the other chips will be adjusted to match that of the principal chip. The seamlines between the overlapping chips will be chosen to minimize tonal variations. Localized adjustment of the brightness and color values will be done to reduce radiometric differences between join areas. Changes in color balance across the project, if they exist, shall be gradual. Abrupt tonal variations between tiles are not acceptable.
2. **Edge-Matching.** Excessive horizontal displacement along seamlines or at tile boundaries is not allowed. The maximum allowable mis-join between transportation features or other well defined linear features is ± 3 pixels.

II. **Sensor & Acquisition:** The following specifications are for the collection and provision of the required high-resolution natural-color aerial imagery. All USGS collections will be digital images. Other users of this specification may, at their discretion, request either film-based photographs or digital images. If film is selected, requirements in section IIA (below) should be observed.

A. **Film:** If imagery is captured on aerial film, Kodak 2444 Aerocolor III film or equivalent, or AGFA X100 film or equivalent shall be used. Data providers may choose a film that processes to either a negative or positive image.

B. Special Collection Conditions:

1. **Acceptable Window:** The acceptable window for the data collection shall be specific to the project areas based on geographic location and project requirements.
2. **Time of Day and Year:** Imagery shall be collected during minimal shadow conditions. Image collection shall occur when the sun angle is greater than 30-degrees. In urban areas containing many high-rise structures, the sun angle should be sufficiently high to minimize shadows.
3. **Collection Conditions:** Imagery shall be collected under conditions free from clouds and cloud shadows, smoke, haze, light streaks, snow, foliage, flooding, and excessive soil moisture. Leaf-off imagery is preferred but leaf-on projects will be considered on a project-by-project basis.
4. **Image Coverage:** The extent of image coverage over the project area shall be sufficient to ensure void areas do not exist in resulting 1500 meter x 1500 meter orthophoto tiles. Full image tiles that meet or exceed the 300 meter buffer specified in section I.A., above, are required. Partial tiles are not considered acceptable.
5. **Calibration:** Aerial Sensors/Camera(s) used to collect project imagery shall have current USGS certification, or in the case of digital sensors a current USGS digital aerial sensor type certification.

C. Camera Station Control:

1. **Airborne GPS:** Camera position (latitude, longitude, and elevation) shall be recorded at the instant of exposure with airborne GPS. Airborne GPS data shall be differentially corrected and organized as individual data sets grouped by corresponding film roll or flight line. Differentially corrected Airborne GPS positional data shall be stored on portable media, in a nonproprietary format acceptable to each organization. The horizontal root-mean-square error (RMSE) of the airborne GPS control data shall not exceed 20cm. The vertical RMSE of the Airborne GPS control shall not exceed 30cm.
 2. **Inertial Measurement unit (IMU) Exterior Orientation Data (Optional):** If IMU is included as a component of the camera station control; the contractor shall record the camera attitude at the instant of exposure. The IMU data shall be adjusted and organized as individual data sets grouped by corresponding film roll. The RMSE of the adjusted IMU data shall not exceed 30 cm.
- D. **Supplemental Ground Control:** Differentially corrected GPS ground control, or conventionally surveyed first-order ground control, used to supplement the Airborne GPS positional adjustment shall be stored on portable media, in a non-proprietary format mutually agreeable to the USGS and the cooperator. The data provider shall publish and submit a Supplemental Ground Control report that contains narrative, computations and field notes/photos for all points used in the supplemental ground control solution.
- E. **Photography Supplemental Report:** The report shall show the flight line numbers and exposure station or strip numbers. The USGS Aerial Photography Supplemental Report form shall be used for this purpose. An example of this form is included in Attachment B-2 of this document.
- F. **Titling:** If film is used, each exposure shall be clearly titled along the north edge (if flown north-south) or west edge (if flown east-west) of the photography. Each exposure shall be marked clearly with a numerical abbreviation of the month, day and year of exposure, the number of the roll, the number of the exposure on the roll, the photo scale expressed as a ratio, and the three letter designator, e.g. **BOS07** for rolls of film used on Boston MA project shall be numbered consecutively, beginning with number 1; and the exposures on each roll shall be numbered consecutively, beginning with the number 1. Coarse Airborne GPS position shall be included in the title as encoded in the camera data chamber. For cameras that do not have camera station positional encoders, the data provider shall manually add the coarse camera position on the opposite edge of the film from the roll exposure designator. An example of a diagram for the titling is included in Attachment B-3 of this document.
- G. **Resolution and Accuracy:** The natural color source imagery shall be of sufficient resolution to support production of digital orthorectified images to a ground pixel resolution of 30 centimeters and to the specifications contained in Section III, A through K, below.

III. Digital Orthophoto Production: Shall be produced consistent with the following requirements:

- A. **Aerotriangulation data:** Aerotriangulation (AT) data, if used in the orthorectification process, shall consist of a minimum of refined image coordinates and adjusted ground coordinates. If Aerotriangulation is performed, the data provider shall provide a comprehensive AT report.

B. Digital Orthorectified Image Datum: Digital Orthorectified images shall be referenced to North American Datum 1983, Universal Transverse Mercator (UTM) meters. If a subset adjustment of NAD83 is desired, it must be specified.

C. Digital Orthorectified Image Color: Images shall be natural color.

D. Spatial Resolution: The spatial resolution will be 30 centimeter ground sample distance (GSD). Orthoimagery produced under this specification shall not be resampled from the original image, original scan or original capture, with resolution greater or less than the following numbers:

| Ground Sample Distance (GSD) | Original Image Resolution | |
|------------------------------|---------------------------|----------------|
| | Maximum | Minimum |
| 30 centimeters | 15 centimeters | 32 centimeters |

E. Horizontal Accuracy: All orthoimagery shall have 95% (NSSDA Confidence Interval) of all well-defined points tested fall within the specified distance listed below of true ground:

| Ground Sample Distance (GSD) | Horizontal Accuracy |
|------------------------------|---------------------|
| 30 centimeters | 5.19 meters |

- Product Accuracy Information Reporting.** Product accuracy information shall be reported according to NSSDA guidelines which are available at: <http://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part3/index.html>
- . At a minimum, statements concerning source materials and production processes used must be provided at the project level sufficient to meet the requirement of section III.E of the guidelines.

F. Digital Orthorectified Image Format: Images shall be submitted in uncompressed, untiled, ArcGIS readable, GeoTIFF file format, Version 1.8.2, (<http://www.remotesensing.org/geotiff/spec/geotiffhome.html>) with no internal tiling or overviews. Data shall not be compressed during ANY PHASE of the production process. Presence of compression artifacts will be cause for rejection. GeoTIFF files shall include (as a minimum) the following GeoTIFF tags and keys:

- ModelTiepointTag
 - ModelPixelScaleTag
- OR**
- ModelTransformation Tag

AND

- GTModelTypeGeoKey

- GTRasterTypeGeoKey
- ProjectedCSTypeGeoKey

G. Digital Orthorectified Image Tile Size: Orthorectified GeoTIFF files shall represent “tiles” 1500 meters X 1500 meters cut at even 1500 meter grid lines with no tile overedge. Corner coordinates will be based on the UTM Grid and shall be evenly divisible by 1500 meters. Tiles shall be accompanied by an index sheet and shape file suitable for loading into ArcGIS. Index sheet shall include tile boundary and filename. The Index sheet collar shall include Latitude/Longitude reference coordinates.

H. Digital Orthorectified Image Characteristics: Relative join (misalignment) of transportation features between adjacent image chips/tiles shall not exceed 3 pixels. Orthophotos shall be tonally balanced to produce a uniform contrast and tone across the image tiles of the entire project. Changes in color balance across the project, if they exist, shall be gradual. Abrupt tonal variations between tiles are not acceptable. Building tilt shall be corrected to the extent that transportation features are not obscured. Ground features appearing in the orthophoto imagery, such as building roof tops, water towers, and radio towers, shall not be clipped at seamlines or between individual tiles. Image artifacts introduced during the scanning process and appearing in the final orthophotos are unacceptable, except for very minimal artifacts falling in noncritical coverage areas, e.g., a small piece of lint appearing in a timbered area.

I. Radiometric Resolution

1. Color Imagery. All color imagery shall be an 8-bit RGB image accordance with Section 6, RGB Full Color Images, of the TIFF Specification, Revision 6 (<http://www.remotesensing.org/geotiff/spec/geotiffhome.html>).
2. Color Infrared Imagery. All color infrared imagery shall be an 8-bit Near-IR, RG image in accordance with Section 6, RGB Full Color Images, of the TIFF Specification.
3. 4-Band Imagery. All imagery that contains both natural color and near-IR shall meet the same requirements as color imagery specified in the paragraph above and shall have the bands saved in the following order: Red, Green, Blue, and Infrared.
4. Imagery with greater than 8 bits per pixel is allowed providing that the following TIFF tags are included in the image header::
 - a. SampleFormat,
 - b. MinSampleValue,
 - c. MaxSampleValue.

J. File Naming Convention: The 1500 x 1500 ortho tile file name shall be derived from the southwest corner of each tile and shall be based on the U.S. National Grid. File names will include Grid Zone Designation (GZD), 100,000 meter block designator and X and Y grid coordinates truncated to 100 meters. Supplemental instructions for naming Digital Orthorectified Image tiles can be accessed at <http://www.fgdc.gov/usng>.

K. Elevation data: The elevation data created for use in the orthorectification process shall be submitted in a common or non-proprietary format.

IV. Metadata: Project and tile metadata describing the orthophoto production process shall be submitted as a product.

Federal Geographic Data Committee (FGDC) compliant metadata shall be provided in extensible markup language (.xml) format for each 1500-meter x 1500-meter orthorectified tile.

FGDC compliant metadata for orthoimage tiles shall be delivered on portable Media.

This site contains the files that define and support production of FGDC compliant metadata: Download the following files from <ftp://ftpext.usgs.gov/pub/cr/mo/rolla/release/xmlinput/>

A.XMLInput1_64.zip: Contains an application (XMLInput) for creating and editing .xml metadata files. It is not mandatory that this software be used; it is merely available if needed. When the zip file is unzipped, it also contains a template (**133UAtemplate.xml**) and a dtd (**csdgm2.dtd**) to help with FGDC compliance. The **XMLInput.jar** is the executable.

B.Help.pdf and XMLInput123.doc: User's guide for XML Input. Use this guide to install and use XMLInput.

C.metadata _overview.doc: Additional information

V. Use and Distribution Rights: All imagery and data produced under this agreement shall become the property of the United States Government. All data and documentation shall be free from restrictions regarding use and distribution. Data and documentation shall be freely distributable by government agencies.

VI. Products:

A.Source Imagery:

1. **Natural Color Film:** If film is used, the the original natural color film acquired for the project shall be provided. The standard USGS Film Can Label form is included in Attachment B-2.
2. **Calibration Reports:** Camera Calibration Report(s) for Aerial Camera(s), or in the case of digital sensors, a current Product Characterization Report of the instrument used shall be included as a product.
3. **Camera Station Control:**
 - i. **Airborne GPS:** Positional data and a statistical summary report shall be submitted on portable media, in a non-proprietary format mutually agreeable to the Government and the producer. In addition, the producer shall produce a statistical report summarizing the results of the airborne GPS adjustment.
IMU Data: If IMU exterior orientation data are part of the Contractors Technical Proposal, the sensor orientation data and a statistical summary report shall be submitted on portable media, in a nonproprietary format mutually agreeable to the

Government and the producer. The producer shall also produce a statistical report summarizing the overall accuracy of the adjusted IMU data.

4. **Supplemental Ground Control:** Differentially corrected GPS Ground Control used to supplement the Airborne GPS positional data shall be provided on portable media, in a non-proprietary format mutually agreeable to the Government and the Contractor.
5. **Flight Diagram:** A Flight Diagram that illustrates the project area outline, the location of the flight lines and, if relevant, the approximate location of image centers shall be included as a product. This diagram shall be provided in hardcopy and softcopy in shape file format suitable for loading into ArcGIS.
6. **Photography and Supplemental Report(s):** A Photography Supplemental Report of all the imagery flown shall be produced for the project. The report shall show the flight line numbers and exposure station or strip numbers. The provider shall use the USGS Aerial Photography Supplemental Report form. An example of this form is included in Attachment B-2 of this document.

B. Digital Orthophoto Production:

1. **Aerotriangulation data:** Aerotriangulation data, if used in the orthorectification process, consisting of a minimum of refined plate coordinates, adjusted ground coordinates, and statistical summary report shall be submitted to the Government in both hardcopy and softcopy format.
2. **Elevation data:** Elevation data created or modified for use in the orthorectification process shall be submitted in a non proprietary format on portable media.
3. **Delivery Medium and Format:** Digital Orthorectified Images, in GeoTIFF format, shall be submitted on portable media. Image tiles shall be accompanied by an index sheet and shape file suitable for loading into ArcGIS.
4. **Metadata:** Metadata shall be delivered as described in Section IV.

VII. Quality Assurance:

A Quality Assurance shall be performed to ensure that all processes and procedures used, and metadata produced by the data provider were adequate to meet all specifications cited.

1. Visual inspection of the data will be performed for the following
 - a Completeness of data to cover the specified geographic extent, with no omissions or corrupt data.
 - b Tonal balancing problems across the block.
 - c Ground Sample Distance to ensure that it meets the specified resolution.
 - d Mis-joins between linear features greater than 3 pixels
 - e Cloud cover, smoke/haze, corrupt data, and void areas.
 - f Extreme tonal or color variation across seamlines.

- g** Excessive horizontal displacement along seamlines in images (more than ± 3 pixels along transportation features, unless project specifications specifically state otherwise).
- h** Excessive tilt in bridges, buildings, and other raised features.
- i** Transportation features obstructed by buildings or shadows.
- j** Clipping of features (e.g. radio towers, water tanks, buildings) at tile boundaries.
- k** Building/structure warp that may indicate bad elevation data.
- l** Smearing.
- m** Evidence of oversaturation or undersaturation as a result of image processing or histogram manipulation.
- n** Evidence of image compression.

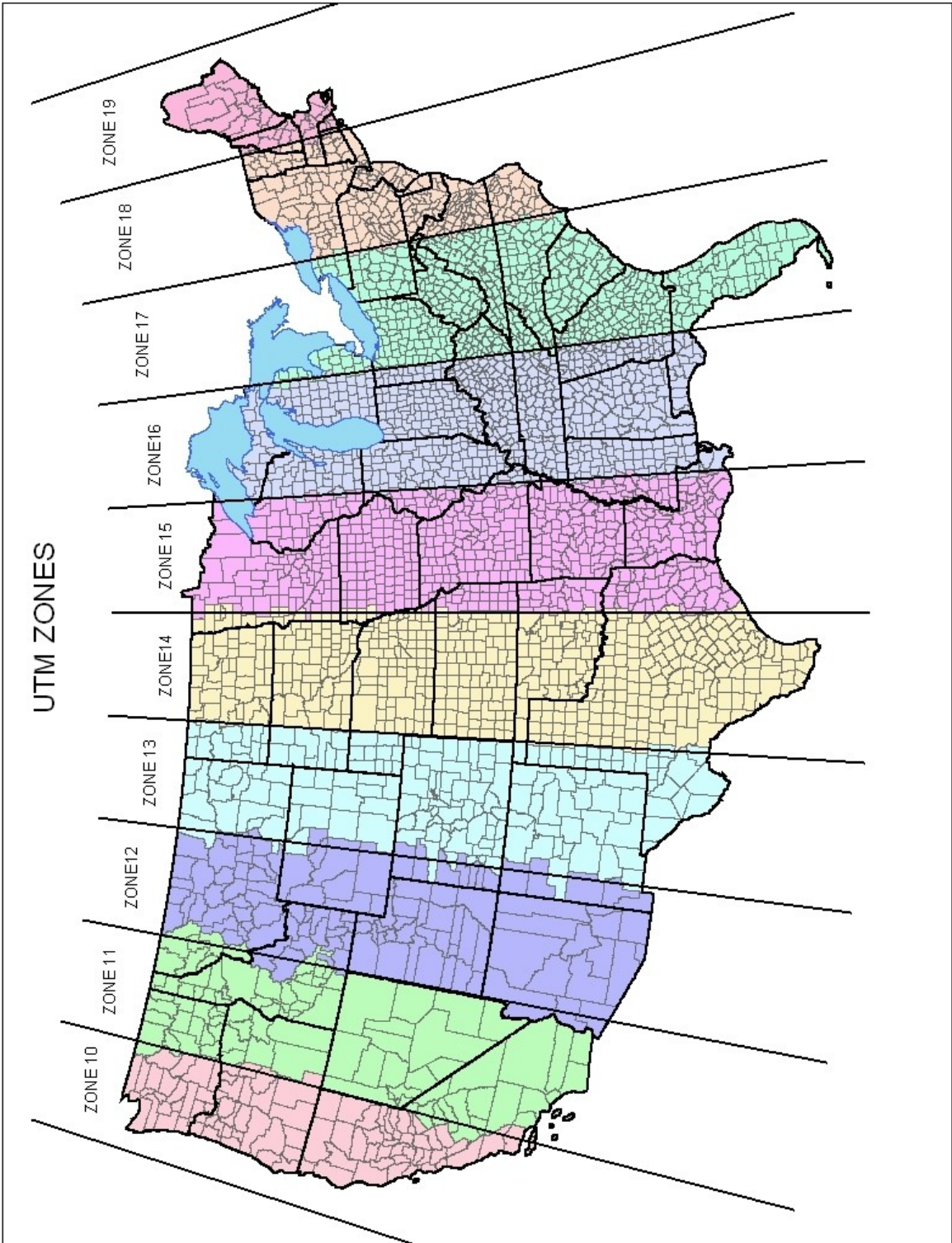
2. Horizontal Accuracy Testing

Testing is performed if suitable test-point control is furnished as part of the data product. Test-point control must be completely independent of control used during data production.

3. Verification of Metadata


Verify that accompanying metadata is complete as defined by FGDC metadata standards (<http://www.fgdc.gov/metadata>).

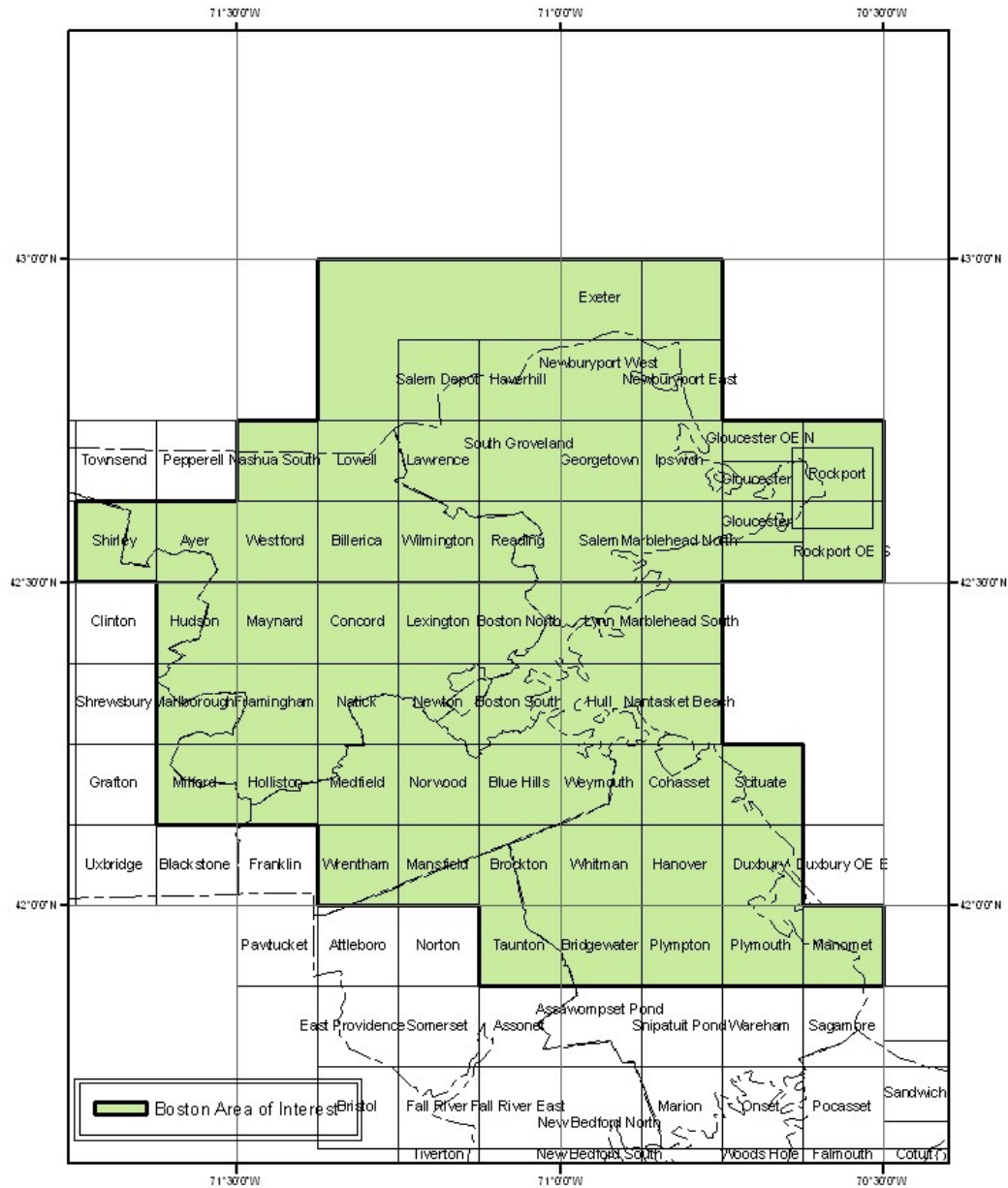
Figure B-1. **UTM Zones**



Example of Project Diagram

Boston MA, 133UA Ortho - Project Diagram

 ATTACHMENT 'A'
Boston, MA 133 UA
PROJECT DIAGRAM



Example of Supplemental Forms List

Boston MA, 133UA Ortho

Attached Supplementary Forms.PDF

USGS Film Can
USGS Aerial Photography Supplemental Report
USGS Aerial Camera Specifications

Example of Project Titling

Boston MA, 133UA Ortho

Sample Photograph Titling

(north or west edge)

| MO/DY/YR | 1:SCALE | ROLL-PHOTO# | CITY ABR. |
|-----------------------|---------|-------------|-----------|
| COARSE AGPS POSITION* | | | |

(9X9 FILM)

*For cameras that have camera station position encoders the coarse AGPS position can be along the edge where placed by the camera.

Common Options beyond Base Specifications

The following are considered to be options beyond the minimum requirements for one-foot orthoimagery for the ARRA funded projects:

- color-infrared
- panchromatic
- four-band
- increased footprint
- better horizontal accuracy
- increased resolution (ex. – 6-in)
- reduced resolution (requires resampling)
- better elevation resolution

FY2010 National Map Proposal Information Summary

Use the format below for the required Proposal Information Summary

Panel Designation (Check one): Orthoimagery _____ Elevation (lidar) _____
(Orthoimagery and Elevation may
NOT be combined on one proposal)

Name of the Cooperating Institution:

Project Title:

Principal Investigator(s): (Name)
(Institute/Organization Name)
(Street Address/P.O. Box)
(City, State, Zip Code)
(Telephone Number), (FAX Number), (E-mail Address)

Authorized Institutional Representative: (Name)
(Institute/Organization Name)
(Organizational Unit)
(Street Address/P.O. Box)
(City, State, Zip Code)
(Telephone Number), (FAX Number), (E-mail Address)

Areal extent of the collection: (State and Counties within Area of Interest)
(Number of square miles covered)
(Brief description of location)

Amount Requested: USGS Funds:
Matching Funds, if applicable:

Proposed Project Period _____ through _____
(The project start date must be between
_____, 2010 and _____, 2010 and be complete by
September 30, 2011)

**Number and types of jobs created
or retained, labor hours and
anticipated duration for each:**

Budget Summary *

Project Title:

Principal Investigator(s):

| Cost Category | Federal Funding Requested | Non-Federal/ Matching Funds Identified | TOTAL |
|---|---------------------------|--|-------|
| 1. Salaries and Wages | \$ | \$ | \$ |
| 2. Fringe Benefits/ Labor Overhead | \$ | \$ | \$ |
| 3. Equipment | \$ | \$ | \$ |
| 4. Supplies | \$ | \$ | \$ |
| 5. Services or Consultants | \$ | \$ | \$ |
| 6. Travel | \$ | \$ | \$ |
| 7. Other Direct Costs | \$ | \$ | \$ |
| 8. Total Direct Costs (sum of 1-7) | \$ | \$ | \$ |
| 9. Indirect cost/G&A | \$ | \$ | \$ |
| 10. Amount Proposed (8 + 9) | \$ | \$ | \$ |
| 11. Total Project Cost (Federal + non-Federal amounts) | | | \$ |

* Use this sheet for the Budget Summary that precedes the detailed budget.

Special Terms and Conditions

1. Method of Payment

The U.S. Geological Survey (USGS) is using the Department of Health and Human Services (DHHS) Payment Management System (PMS) to provide electronic invoicing and payment for assistance award recipients. The Recipient has established or will establish an account with PMS. With the award of each grant/cooperative agreement, a sub-account will be set up from which the Recipient can draw down funds. The sub-account number will be shown in block 4 of the face page of each award or modification.

Payments will be made available through the PMS. The PMS is administered by the DHHS, Division of Payment Management of the Financial Management Service, Program Support Center. The DHHS will forward instructions for obtaining payments to the recipients. Inquiries regarding payment should be directed to:

Division of Payment Management
Department of Health and Human Services
P.O. Box 6021
Rockville, MD 20852

The Division of Payment Management web address is www.dpm.psc.gov. Problems or questions with electronic drawdown procedures should be directed to Raynette Robinson at (301) 443-9180 or the help desk at (877) 614-5533 or email to PMSSupport@psc.gov.

Payments may be drawn in advance only as needed to meet immediate cash disbursement needs. All draw downs must be completed by September 15, 2011.

2. Definitions

A. Grant Agreement

A grant agreement is the legal instrument reflecting a relationship between the Federal Government and a State or local government or other recipient whenever:

- (1) the principal purpose of the relationship is the transfer of money, property, services, or anything of value to the State or local government or other recipient in order to accomplish a public purpose of support or stimulation authorized by Federal statute, rather than acquisition, by purchase, lease, or barter, of property or services for the direct benefit or use of the Federal Government; and
- (2) no substantial involvement is anticipated between the executive agency, acting for the Federal Government, and the State or local government or other recipient during performance of the contemplated activity.

B. Cooperative Agreement

A cooperative agreement is the legal instrument reflecting a relationship between the Federal Government and a State or local government or other recipient whenever:

- (1) the principal purpose of the relationship is the transfer of money, property, services, or anything of value to the State or local government or other recipient to accomplish a public purpose of support, or stimulation authorized by Federal statute, rather than acquisition, by purchase, lease, or barter, of property or services for the direct benefit or use of the Federal Government; and
- (2) substantial involvement is anticipated between the executive agency, acting for the Federal Government, and State or local government or other recipient during performance of the activity.

C. Grantee/Cooperator

Grantee or cooperator means the nonprofit corporation or other legal entity to which a grant or cooperative agreement is awarded and which is accountable to the Federal Government for the use of the funds provided. The grantee or cooperator is the entire legal entity even if only a particular component of the entity is designated in the award document. For example, a grant or cooperative agreement award document may name as the grantee one school or campus of a university. In this case, the granting agency usually intends, or actually requires, that the named component assume primary or sole responsibility for administering the grant-assisted project or program. Nevertheless, the naming of a component of a legal entity as the grantee or cooperator in a grant or cooperative agreement award document shall not be construed as relieving the whole legal entity from accountability to the Federal Government for the use of the funds provided.

The term “grantee” or “cooperator” does not include secondary recipients such as sub grantees, contractors, etc., who may receive funds from a grantee pursuant to a grant.

D. Recipient

Recipient means grantee or cooperator.

E. Principal Investigator

The Principal Investigator (PI) is the individual designated by the Recipient (and approved by the USGS) who is responsible for the technical direction of the research project. The Principal Investigator cannot be changed or become substantially less involved than was indicated in the Recipient's proposal, without the prior written approval of the Contracting Officer.

F. Grants Program Manager

- (1) The Grants Program Manager will work closely with the Principal Investigator to

ensure that all technical requirements are being met. The Grants Program Manager's responsibilities include, but are not limited to, providing technical advice on the accomplishment of the proposal's objectives; reviewing the technical content of reports and the other information delivered to the USGS; determining the adequacy of technical reports; and conducting site visits, in coordination with the Contracting Officer, as frequently as practicable.

- (2) The Grants Program Manager is Teresa Dean, U.S. Geological Survey, MS 511, 12201 Sunrise Valley Drive, Reston, VA 20192. The Program Manager does not have the authority to issue any technical direction which constitutes an assignment of additional work outside the scope of the award; in any manner cause a change in the total cost or the time required for performance of the award; or change any of the terms, conditions, or general provisions of the award.

G. USGS Geospatial Liaison

- (1) A USGS Geospatial Liaison will work closely with the Grants Program Manager and the Principal Investigator to ensure coordination for overall conformance with USGS program goals and objectives. The USGS Geospatial Liaison Network consists of USGS [Geospatial Liaisons](#) located in Partnership Offices across the nation. These liaisons and offices perform numerous partnership related functions in support of *The National Map*. They represent and coordinate NGP initiatives in state, local, and other federal agencies, cultivate and maintain long-term relationships, and develop partnerships and supporting agreements. The USGS Geospatial Liaison Network is the "local face" of the NGP. The Liaison's responsibilities include, but are not limited to, providing technical advice on the accomplishment of the proposal's objectives; reviewing the technical content of reports and other information delivered to the USGS; determining the adequacy of the technical reports; and conducting site visits, in coordination with the Grants Program Manager and the Contracting Officer, as frequently as practicable.
- (2) The USGS Geospatial Liaison does not have the authority to issue any technical direction which constitutes an assignment of additional work outside the scope of the award; in any manner causes a change in the total cost or the time required for performance of the award; or changes any of the terms, conditions, or general provisions of the award.

H. Contracting Officer (CO)

Contracting officers are individuals who have been delegated in writing by the USGS Office of Acquisition and Grants as the sole authority designated to obligate Federal funds and create terms and conditions of awards. They are the only individuals who have authority to negotiate, enter into, and administer awards resulting for this program. Contracting officers have responsibility to ensure the effective use of Federal funds.

Functions of the contracting officer include but are not limited to:

- (1) Issuing the grant program announcement in coordination with the grants program manager.

- (2) Receiving grant proposals and related documents in response to a grant program announcement. The contracting officer as receiving official shall mark all proposals with a control number and the date officially received. He shall notify each applicant of the receipt of its proposal.
- (3) Approving the grant program manager's Technical Evaluation Plan, which describes in detail the evaluation process for a competitive grant/cooperative agreement program. The contracting officer shall ensure the openness and fairness of the evaluation and selection process.
- (4) Serving in an advisory capacity at peer review panel meetings. He shall interpret grant management policies to panel members.
- (5) Notifying grant program applicants whether or not they were selected for funding or of any other disposition of their application.
- (6) Negotiating, as necessary, the final grant/cooperative agreement budget.
- (7) Issuing grant/cooperative agreement awards and revisions to awards.
- (8) Approving invoice payments.
- (9) Receiving all requests for changes to an award. The contracting officer shall serve as the mandatory control point for all official communications with the grantee which may result in changing the amount of the grant/cooperative agreement, the grant/cooperative agreement budget, or any other terms and conditions of the grant.
- (10) Receiving financial reports required by the terms and conditions of the award.
- (11) Closing out grant/cooperative agreement awards when all applicable award requirements have been complied with.

3. Reporting Requirements and Dissemination of Results

Data generated as a part of work funded under this program must be made readily available; there is no provision for PIs to have exclusive access to data for a proprietary period of time. The USGS reserves a royalty-free, nonexclusive and irrevocable license to reproduce, publish, or otherwise use, and to authorize others to use, the data for Government purposes.

Selected applications will be funded through a cooperative agreement with the USGS. USGS will be substantially involved with the PI(s) and other institution staff throughout the course of the project. It is expected that there will be frequent contact between the USGS Geospatial Liaison and the PI to discuss project progress and issues. Additional USGS staff will be involved in collaborative discussions regarding data specifications and validation, cost estimates, monitoring ARRA reporting, and data delivery schedules. USGS will perform quality control, data processing into national databases, data dissemination and archive of the final product. Teleconferences will be held on a monthly basis to discuss and review project status. Quarterly reports and a final report at the end of the project are required.

A. **Required reports/documents.** The Principal Investigator or Director, Sponsored Research Office is required to submit the following reports or documents:

| Report/Document | No. of Copies and Method of Transmittal | Submit To | When Due |
|---|--|---|---|
| (1) ARRA* Reporting | See Section 3.B(1) | See Section 3.B(1) | See Section 3.B(1) |
| (2) Final Technical Report | Send Adobe Acrobat PDF file as an email attachment; Maximum size: 10 MB | Grants Program Manager | Within 90 calendar days after the end of each 12-month budget period. See details of formatting in section B(2) below. |
| (3) SF 272 Federal Cash Transactions Report | Electronic submission | USGS via PMS Electronic 272 System [see Section 3.B(3)] | See Section 3.B(3) |
| (4) SF 269 Financial Status Report | See Section 3.B(4) | See Section 3.B(4) | See Section 3.B(4) |
| (5) Final SF 269 Financial Status Report | See Section 3.B(5) | See Section 3.B(5) | See Section 3.B(5) |
| (6) Quarterly Status Reports | Send Adobe Acrobat PDF file as an email attachment | Grants Program Manager | Within 7 days of the beginning of each quarter. |
| (7) Elevation Data and Documentation** | Forwarded with final collected and processed data. See Attachment A, Base Lidar Specification: Item C. Products | Grants Program Manager or designated POC per Grants Program Manager | Within 90 days of data collection and processing. |
| (8) Orthoimagery Data and Documentation** | Forwarded with final collected and processed data. See Attachment B, Base Orthoimagery Specification: Section VI. Products | Grants Program Manager or designated POC per Grants Program Manager | Within 90 days of data collection and processing |

* ARRA – American Recovery and Reinvestment Act

** The Not Applicable item will be struck out at time of award, i.e. elevation or orthoimagery.

B. **Report preparation instructions.** The Recipient shall prepare the reports/documents in accordance with the following instructions:

(1) *American Recovery and Reinvestment Act (ARRA) Recipient Reporting*

Recipients of Federal awards from funds authorized under Division A of the ARRA must comply with all requirements specified in Division A of the ARRA (Public Law 111-005), including reporting requirements outlined in Section 1512 of the Act. For purposes of reporting, recipients of ARRA funds from Department of the Interior must report on sub-recipient activities as specified below. Not later than ten (10) days after the end of each calendar quarter, starting with the quarter ending June 30, 2009 and reporting by July 10, 2009, the recipient must submit a report to the Department of the Interior that will posted to Recovery.gov, containing the following information:

- (a) The total amount of ARRA funds under this award;
- (b) The amount of ARRA funds received under this award that were obligated and expended to projects or activities;
- (c) The amount of unobligated award balances;
- (d) A detailed list of all projects or activities for which ARRA funds under this award were obligated and expended, including:
 - (1) The name of the project or activity;
 - (2) Description of the project or activity;
 - (3) An evaluation of the completion status of the project or activity;
 - (4) An estimate of the number of jobs created and the number of jobs retained by the project or activity; and
 - (5) For infrastructure investments made by State and local governments, the purpose, total cost, and rationale of the agency for funding the infrastructure investment with funds made available under this Act, and the name of the person to contact at the agency if there are concerns with the infrastructure investment.
- (e) Detailed information on any subcontracts or sub-grants awarded by the grant recipient to include the data elements required to comply with the Federal Funding Accountability and Transparency Act of 2006 (Public Law 109-282). For any sub-award equal to or larger than \$25,000, the following information:
 - The name of the entity receiving the sub-award;
 - The amount of the sub-award;
 - The transaction type;
 - The North American Industry Classification System code or Catalog of Federal Domestic Assistance (CFDA) number;
 - Program source;
 - An award title descriptive of the purpose of each funding action;
 - The location of the entity receiving the award;
 - The primary location of performance under the award, including the city, State, congressional district, and country; and
 - A unique identifier of the entity receiving the award and of the parent entity of the recipient, should the entity be owned by another entity.

(f) All sub-awards less than \$25,000 or to individuals may be reported in the aggregate, as prescribed by the Department of the Interior.

(g) Recipients must account for each ARRA award and sub-award separately. Recipients will draw down funds on an ARRA award by ARRA award basis. Pooling or commingling of ARRA award funds with other funds for drawdown or other purposes is not permitted.

(h) Recipients must account for each ARRA award by referencing the assigned CFDA number for each award.

The definition of terms and data elements, as well as any specific instructions for reporting, including required formats, will be provided in subsequent guidance issued by Department of the Interior.

(2) *Final Technical Report.* The final technical report shall document and summarize the results of the work. Such reports shall contain a comparison of actual accomplishments to the goals established for the period; reasons why established goals were not met, if applicable; and other pertinent information. The final report shall be submitted within 90 calendar days of the end of the project period.

(a) Submit the Final Technical Report electronically as an Adobe Acrobat PDF file e-mail attachment to: XXXX at e-mail, with a copy of the transmittal sent to Margaret Eastman at mrussell@usgs.gov.

(b) Final Technical reports shall consist of the following sections:

(i) Cover page with the following information:

Award Number

Title

Author and Affiliation with Address and zip code

Author's Telephone numbers, fax numbers and E-mail addresses

Term covered by the award (start and end dates)

Submittal Date of Final Technical Report

(ii) Abstract

(iii) Main body of the report shall be single-spaced in 8 ½" x 11" format.

The main body of the report shall be formatted double-sided, including figures and bibliography. Oversized pages should be used only if they are critical to convey data or conclusions. Electronic versions of oversized illustrations are also required to be sent with the electronic version of reports.

(3) *SF 272, Federal Cost Transactions Report* is required quarterly for each PMS sub-account. Quarterly reports are due 45 working days after the end of each fiscal quarter until Financial Status Report is submitted. Instructions for submitting the SF272 can be found at the following website:

http://www.dpm.psc.gov/grant_recipient/psc_272_reports/psc_272_reports.aspx?explorer.event=true

If after 45 days, the recipient has not submitted a report, the account will be placed in a manual review status. Funds may be withheld for accounts with delinquent reports.

(4) *SF 269, Financial Status Report (original)* is required annually and is due 90 calendar days after the end of the annual budget period. Reports will be submitted to the Contracting Officer at the address shown in Block 5 of the award form.

(5) *Final SF 269, Financial Status Report.*

(a) The recipient will liquidate all obligations incurred under the award and submit a final SF 269 Financial Status Report due no later than 90 calendar days after the grant completion date. The recipient will promptly return any unexpended federal cash advances or will complete a final draw from PMS to obtain any remaining amounts due. Once 120 days has passed since the grant completion date, the PMS subaccount for this award may be closed by USGS at any time.

(b) Subsequent revision to the final SF269, Financial Report, will be considered only as follows:

(1) When the revision results in a balance due to the Government, the recipient must submit a revised SF 269 and refund the excess payment whenever the overcharge is discovered, no matter how long the lapse of time since the original due date of the report.

(2) When the revision represents additional reimbursement costs claimed by the recipient, a revised SF 269 may be submitted to the Contracting Officer with an explanation. If approved, the USGS will either request and pay a final invoice or re-establish the PMS subaccount to permit the recipient to make a revised final draw. Any revised final report representing additional reimbursable amounts must be submitted no later than 1 year from the due date of the original report, i.e., 15 months following the agreement completion date. USGS will not accept any revised SF 269 report covering additional expenditures after that date and will return any late request for additional payment to the recipient.

(6) *Quarterly Status Reports:* This is a quarterly status report to the Grants Program Manager. Within 7 days of the beginning of each quarter, a report is to be submitted summarizing the previous quarter's progress. Unless there are significant issues to explain, this report should fit on no more than two pages and outline significant accomplishments. Content should include:

1. *Brief narrative of accomplishments*
2. *Status of contracts with dates (rfp, proposal reviews, award, etc.)*
3. *Percentage of data collection complete*
4. *Percentage of data processing complete*
5. *Work anticipated in following quarter*
6. *Deliveries*
7. *Issues/Difficulties*

(7) *Data and Documentation for Elevation.*** (Attachment A: Base Lidar Specification)

(a) No later than 90 days after the collection and processing of the data, the recipient shall submit to the Grants Program Manager or designated POC, the data and all

accompanying reports per the specification above as described in section C entitled “Products”, including the following:

- ** The Not Applicable item will be struck out at time of award, i.e. elevation or orthoimagery.
 - (1) Metadata
 - (2) Raw Point Cloud
 - (3) Classified Point Cloud
 - (4) Bare Earth Surface
 - (5) All reports pertaining to the collection and quality assurance of the data, e.g. final AOI flown,

*(8) Data and Documentation for Orthoimagery.** (Attachment B: Base Orthoimagery Specification)*

- (a) No later than 90 days after the collection and processing of the data, the recipient shall submit to the Grants Program Manager or designated POC, the data and all accompanying reports per the specification above as described in section titled: **VI. Products**, including the following:
 - (1) Metadata
 - (2) Source reports: calibration, supplemental control, camera specifications
 - (3) All collected imagery
 - (4) All reports pertaining to the collection and quality assurance of the data, e.g. final AOI flown,

- ** The Not Applicable item will be struck out at time of award, i.e. elevation or orthoimagery.

C. Adherence to reporting requirements. A Recipient's failure to submit the required Final Technical Report and final financial report, generally within 6 months of the end date of the award, will likely result in delay or non-issuance of new awards. Failure to submit a Progress Report for multi-year awards will likely result in delayed renewal of funds.

4. Adherence to Original Research Objective and Budget Estimate

- A. Any commitments or expenditures incurred by the Recipient in excess of the funds provided by this award shall be the responsibility of the Recipient. Expenditures incurred prior to the effective date of this award cannot be charged against award funds.
- B. The following requests for change **require advance written approval by the Contracting Officer shown on your award. Your request must be submitted to the Contracting Officer at least 45 calendar days prior to the requested effective date of the change:**
 - (1) Changes in the scope, objective, or key personnel referenced in the Recipient's proposal.
 - (2) Request for supplemental funds.
 - (3) Transfer of funds between direct cost categories when the cumulative amount of transfers during the project period exceeds 10 percent of the total award.

- (4) Foreign travel not approved at time of award.
- (5) Acquisition of nonexpendable personal property (equipment) not approved at time of award.
- (6) Creation of any direct cost line item not approved at time of award.
- (7) Any other significant change to the award.
- (8) No-cost Extensions to the Project Period. **No-cost extensions are discouraged**. The National Geospatial Program awards cooperative agreements for data collection that extends, supplements, or improves The National Map (TNM) elevation and imagery data holdings within the USGS. The timely conduct of funded projects is of great importance to the achievement of ARRA and TNM goals. Applicants should consider their time commitments at the time of application for a grant. Requests for no-cost extensions will be considered on a case-by-case basis. The USGS reserves the right to limit the length of time and number of no-cost extensions. Please note that no-cost extensions are not intended to be used merely for the purpose of expending unobligated balances. Applicants must supply documentation supporting their request for an extension.

The Recipient **shall include** in the request:

- the cause of the needed extension,
- a description of the remaining work to be completed,
- the proposed new end date, and
- the amount of funds remaining.

A request for an extension that is received by the Contracting Officer after the expiration date shall **not** be honored. Requests for no-cost extensions shall be submitted to the Contracting Officer **at least 45 days** before the grant end date.

- C. The Contracting Officer will notify the Recipient in writing within 30 calendar days after receipt of the request for revision or adjustment whether the request has been approved.

5. Nonexpendable Personal Property

The recipient shall comply with 2 CFR Part 215, Section 215.34. Title to nonexpendable personal property acquired wholly or in part with Federal funds shall be vested in the Recipient unless otherwise specified in the award document. The Recipient shall retain control and maintain a property inventory of such property as long as there is a need for such property to accomplish the purpose of the project, whether or not the project continues to be supported by Federal funds. When there is no longer a need for such property to accomplish the purpose of the project, the Recipient shall use the property in connection with other Federal awards the Recipient has received. Under no circumstances shall title to such property be vested in a sub-tier recipient. Disposal of nonexpendable personal property shall be in accordance with the applicable OMB circular.

The following equipment shall be vested: To be determined at award

6. Record Retention Period

Unless a longer period is requested by the award, a Recipient shall retain all records for 3 years after the end of the project period for which it uses USGS award funds.

7. Pre-agreement Costs

Pre-agreement costs are not authorized under this program. Costs must be obligated during the project period.

8. Site Visits

Site visits may be made by USGS representatives to review program accomplishments and management control systems and to provide technical assistance, as required.

9. Metric Conversion (43CFR Sec 12.915)

All progress and final reports, other reports, or publications produced under this award shall employ the metric system of measurements to the maximum extent practicable. Both metric and inch-pound unit (dual units) may be used if necessary during any transition period(s). However, the recipient may use non-metric measurements to the extent the recipient has supporting documentation that the use of metric measurements is impracticable or is likely to cause significant inefficiencies or loss of markets to the recipient, such as when foreign competitors are producing competing products in non-metric units.

10. Violation of Award Terms

If a Recipient materially fails to comply with the terms of the award, the Contracting Officer may suspend, terminate, or take such other remedies as may be legally available and appropriate in the circumstances.

11. Award Closeout

Awards will be closed out once all requirements have been met. Technical and financial reports must be submitted on time as specified in section 3, above. Failure to adhere to the reporting requirements may result in no future awards.

12. Partnership with Grantees/Cooperators

The USGS, through its federal grant/cooperative agreement awards, will collaborate with universities, federal state, local and tribal governments, and private organizations and businesses to provide relevant, timely, objective knowledge and information on natural resources, hazards, and the environment.

13. Buy American Act Notice (43 CFR Sec. 12.710(c))

Pursuant to Section 307(b) of the Department of the Interior (DOI) and Related Agencies Appropriations Act, FY 2000, Public Law 106-113, please be advised on the following:

“In the case of any equipment or product that may be authorized to be purchased with financial assistance provided using funds made available in this Act, it is the sense of the Congress that entities receiving the assistance should, in expending the assistance, purchase only American-made equipment and products.”

14. Buy American - Use of American Iron, Steel, and Manufactured Goods (ARRA Term)

Recipients may not use any funds obligated under this award for the construction, alteration, maintenance, or repair of a public building or public work unless all of the iron, steel, and manufactured goods used in the project are produced in the United States unless the Department of the Interior waives the application of this provision. (ARRA Sec. 1605)

15. Anti-Lobbying (43 CFR Part 18)

The Recipient shall not use any part of the appropriated funds from the Department of the Interior for any activity or the publication or distribution of literature that in any way tends to promote public support or opposition to any legislative proposal on which Congressional action is not complete.

16. Seat Belt Provision (43 CFR Sec. 12.2(e))

Recipients of grants/cooperative agreements and/or sub-awards are encouraged to adopt and enforce on-the-job seat belt use policies and programs for their employees when operating company-owned, rented, or personally owned vehicles. These measures include, but are not limited to, conducting education, awareness, and other appropriated programs for their employees about the importance of wearing seat belts and the consequences of not wearing them.

17. Whistleblower Protection (ARRA Term)

Each recipient or sub-recipient awarded funds made available under the ARRA shall promptly refer to the Department of the Interior, Office of Inspector General any credible evidence that a principal, employee, agent, contractor, sub-recipient, subcontractor, or other person has submitted a false claim under the False Claims Act or has committed a criminal or civil violation of laws pertaining to fraud, conflict of interest, bribery, gratuity, or similar misconduct involving those funds. (ARRA Sec. 1553) The Department of the Interior, Office of Inspector General can be reached at 1-800-424-5081 or via e-mail at <http://www.oig.Deparment.gov/fraud/hotline/>

18. No Endorsement Provision (43 CFR 12.2(d))

[Paragraph (B) applies to all awards. The remainder of this provision applies only when:

(1) the principal purpose of the agreement is a partnership where the recipient/partner contributes resources to promote agency programs or publicize agency activities, assists in fundraising, or provides assistance to the agency; and

(2) the agreement authorizes joint dissemination of information and promotion of activities being supported; and

(3) *the recipient is not a State government, a local government, or a Federally-recognized Indian tribal government.*]

(A) Recipient shall not publicize or otherwise circulate, promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts or other publications) which states or implies governmental, Departmental, bureau, or government employee endorsement of a product, service, or position which the recipient represents. No release of information relating to this award may state or imply that the Government approves of the recipient's work products, or considers the recipient's work product to be superior to other products or services.

(B) All information submitted for publication or other public releases of information regarding this project shall carry the following disclaimer:

The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government.

(C) Recipient must obtain prior Government approval for any public information releases concerning this award which refer to the Department of the Interior or any bureau or employee (by name or title). The specific text, layout photographs, etc. of the proposed release must be submitted with the request for approval.

(D) A recipient further agrees to include this provision in a sub-award to any sub-recipient, except for a sub-award to a State government, a local government, or to a Federally-recognized Indian tribal government.

19. Use of U.S. Flag Air Carriers

Any air transportation to, from, between or within a country other than the U.S. of persons or property, the expense of which will be paid in whole or in part by U.S. Government funding, must be performed by, or under a code-sharing arrangement with, a U.S. flag air carrier if service provided by such a carrier is "available" (49 U.S.C. 40118, commonly referred to as the Fly America Act). Tickets (or documentation for electronic tickets) must identify the U.S. flag air carrier's designator code and flight number. See the Federal Travel Regulation §301-10.131 - §301-10.143 for definitions, exceptions, and documentation requirements. (See also Comp. Gen. Decision B-240956, dated September 25, 1991.)

20. DUNS/CCR (ARRA Term)

Recipients must require that first tier sub-recipients begin planning activities, including obtaining a DUNS number (or updating the existing DUNS record), and registering with the Central Contractor Registration (CCR) no later than the first time ARRA data requirements are due.

21. Activities on Private and Other Non-Federal Lands

[Paragraph B applies to all awards. The remainder of this provision applies only when the award involves funds appropriated to the biological research activity of the USGS.]

A. Funds provided for the biological research activity in USGS annual appropriations may not be used to conduct surveys on private property, unless specifically authorized in writing by the property owner.

(i) Accordingly, the recipient shall not enter non-Federal real property for the purpose of collecting information regarding the property, unless the owner of the property has –

- consented in writing to the entry;
- been provided notice of that entry; and
- been notified that any raw data collected from the property must be made available at no costs, if requested by the land owner.

(ii) In this provision, the term “recipient” includes any person that is an officer, employee, or agent of the recipient, including a person acting pursuant to a contract or sub-agreement.

B. The recipient shall comply with applicable State, local, and Tribal government laws, including laws relating to private property rights.

The Recipient shall comply with applicable State, local, and Tribal government laws, including laws relating to private property rights.

22. National Environmental Policy Act (NEPA) Requirements

The USGS has determined that the work to be performed under this grant qualifies for a categorical exclusion under the National Environmental Policy Act (NEPA). However, if the project requires any field work, such as the installation of a ground control station, the work must avoid all sensitive natural resource and unique geographic features such as historic or cultural resources; properties listed, or eligible for listing, on the National Register of Historic Places; park, recreation or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; migratory birds; species listed, or proposed to be listed, on the List of Endangered or Threatened Species or have significant impacts on designated Critical Habitat for these species; and other ecologically significant or critical areas. If sensitive natural resource and unique geographic features cannot be avoided, the applicant shall notify the USGS Grants Program Manager before taking any action.

23. Access to Research Data

A. By regulation (43 CFR 12.936), recipients that are institutions of higher education, hospitals, or non-profit organizations are required to release research data first produced in a project supported with Federal funds that are cited publicly and officially by a Federal agency in support of an action that has the force and effect of law (e.g., regulations and administrative orders). “Research data” is defined as the recorded factual material commonly accepted in the

scientific community as necessary to validate research findings. It does not include preliminary analyses; drafts of scientific papers; plans for future research; peer reviews; communications with colleagues; physical objects (e.g., laboratory samples, audio or video tapes); trade secrets; commercial information; materials necessary to be held confidential by a researcher until publication in a peer-reviewed journal; information that is protected under the law (e.g., intellectual property); personnel and medical files and similar files, the disclosure of which would constitute an unwarranted invasion of personal privacy; or information that could be used to identify a particular person in a research study.

B. These requirements do not apply to commercial organizations or to research data produced by State or local governments. However, if a State or local governmental grantee contracts with an educational institution, hospital, or non-profit organization, and the contract results in covered research data, those data are subject to these disclosure requirements.

C. Requests for the release of research data subject to this policy are required to be made to USGS, which will handle them as FOIA requests under 43 CFR 2.25. If the data are publicly available, the requestor will be directed to the public source. Otherwise, the USGS Contracting Officer/Grants Officer, in consultation with the affected recipient and the PI, will handle the request. This policy also provides for assessment of a reasonable fee to cover recipient costs as well as (separately) the USGS costs of responding.

24. Trafficking in Persons (22 U.S.C. § 7104(g))

A. Provisions applicable to a recipient that is a private entity.

(i) You as the recipient, your employees, sub-recipients under this award, and sub-recipients' employees may not--

(a) Engage in severe forms of trafficking in persons during the period of time that the award is in effect;

(b) Procure a commercial sex act during the period of time that the award is in effect; or

(c) Use forced labor in the performance of the award or sub-awards under the award.

(ii) We as the Federal awarding agency may unilaterally terminate this award, without penalty, if you or a sub-recipient that is a private entity --

(a) Is determined to have violated a prohibition in paragraph a.1 of this award term; or

(b) Has an employee who is determined by the agency official authorized to terminate the award to have violated a prohibition in paragraph a.1 of this award term through conduct that is either—

1. Associated with performance under this award; or

2. Imputed to you or the sub-recipient using the standards and due process for imputing the conduct of an individual to an organization that are provided in 2 CFR part 180, "OMB Guidelines to Agencies on Government-wide Debarment and Suspension (Non-procurement)," as implemented by our agency at 43 CFR Part 42.

B. Provisions applicable to a recipient other than a private entity. We as the Federal awarding agency may unilaterally terminate this award, without penalty, if a sub-recipient that is a private entity --

(i) Is determined to have violated a prohibition in paragraph a.1 of this award term; or

(ii) Has an employee who is determined by the agency official authorized to terminate the award to have violated a prohibition in paragraph a.1 of this award term through conduct that is either—
(a) Associated with performance under this award; or
(b) Imputed to you or the sub-recipient using the standards and due process for imputing the conduct of an individual to an organization that are provided in 2 CFR part 180, “OMB Guidelines to Agencies on Government-wide Debarment and Suspension (Non-procurement),” as implemented by our agency at 43 CFR Part 42.

C. Provisions applicable to any recipient.

(i) You must inform us immediately of any information you receive from any source alleging a violation of a prohibition in paragraph a.1 of this award term.

(ii) Our right to terminate unilaterally that is described in paragraph a.2 or b of this section:
(a) Implements section 106(g) of the Trafficking Victims Protection Act of 2000 (TVPA), as amended (22 U.S.C. 7104(g)), and
(b) Is in addition to all other remedies for noncompliance that are available to us under this award.

(iii) You must include the requirements of paragraph a.1 of this award term in any sub-award you make to a private entity.

D. Definitions. For purposes of this award term:

(i) “Employee” means either:

(a) An individual employed by you or a sub-recipient who is engaged in the performance of the project or program under this award; or
(b) Another person engaged in the performance of the project or program under this award and not compensated by you including, but not limited to, a volunteer or individual whose services are contributed by a third party as an in-kind contribution toward cost sharing or matching requirements.

(ii) “Forced labor” means labor obtained by any of the following methods: the recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.

(iii) “Private entity”:

(a) Means any entity other than a State, local government, Indian tribe, or foreign public entity, as those terms are defined in 2 CFR 175.25.

(b) Includes:

1. A nonprofit organization, including any nonprofit institution of higher education, hospital, or tribal organization other than one included in the definition of Indian tribe at 2 CFR 175.25(b).
2. A for-profit organization.

(iv) Severe forms of trafficking in persons,” “commercial sex act,” and “coercion” have the meanings given at section 103 of the TVPA, as amended (22 U.S.C. 7102).

25. Research Integrity

A. USGS requires that all grant or cooperative agreement recipient organizations adhere to the Federal Policy on Research Misconduct, Office of Science and Technology Policy, December 6, 2001, 65 Federal Register (FR) 76260, http://www.ostp.gov/html/001207_3.html. The Federal Policy on Research Misconduct outlines requirements for addressing allegations of research misconduct, including the investigation, adjudication, and appeal of allegations of research misconduct and the implementation of appropriate administrative actions.

B. The recipient must promptly notify the USGS Project Office when research misconduct that warrants an investigation pursuant to the Federal Policy on Research Misconduct is alleged.

26. Fiscal Integrity

The recipient will notify the USGS Contracting Officer/Grants officer of any significant problems relating to the administrative or financial aspects of the award, such as misappropriation of Federal funds.

27. Program Income

A. The recipient will have no obligation to the Federal Government for program income earned from license fees and royalties for copyrighted material, in accordance with 43 CFR 12.924(h) (for A-110 recipients) or 43 CFR 12.65(e) (for A-102 recipients).

B. If a purpose of this award is to support a conference, symposium, or similar event, income related to that event will be deducted from total allowable costs to determine the net allowable costs before calculating the Government's share of reimbursable costs, as provided in 3 CFR 12.65(g)(1) (for A-102 recipients) or 43 CFR 12.924(b)(3) (for A-110 recipients).

C. If the recipient is an educational institution or nonprofit research organization, any other program income will be added to funds committed to the project by the Federal awarding agency and recipient and be used to further eligible project or program objectives, as described in 43 CFR 12.924(b)(1).

D. For all other types of recipients, any other program income will be deducted from total allowable costs to determine the net allowable costs before calculating the Government's share of reimbursable costs, as provided in 3 CFR 12.65(g)(1) (for A-102 recipients) or 43 CFR 12.924(b)(3) (for A-110 recipients).

28. Wage Rate Requirements (ARRA Term)

Subject to further clarification issued by the Office of Management and Budget and notwithstanding any other provision of law and in a manner consistent with other provisions of ARRA, all laborers and mechanics employed by contractors and subcontractors on projects funded directly by or assisted in whole or in part by and through the Federal Government pursuant to this award shall be paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by the Secretary of Labor in accordance with subchapter IV of chapter 31 of title 40, United States Code. With respect to the labor standards specified in this section, the Secretary of Labor shall have the authority and functions set forth in Reorganization Plan Numbered 14 of 1950 (64 Stat. 1267; 5 U.S.C. App.) and section 3145 of title 40, United States Code. (ARRA Sec. 1606)

29. Schedule of Expenditures of Federal Awards (ARRA Term)

Recipients agree to separately identify the expenditures for each grant award funded under ARRA on the Schedule of Expenditures of Federal Awards (SEFA) and the Data Collection Form (SF-SAC) required by Office of Management and Budget Circular A-133, "Audits of States, Local Governments, and Non-Profit Organizations." This identification on the SEFA and SF-SAC shall include the Federal award number, the Catalog of Federal Domestic Assistance (CFDA) number, and amount such that separate accountability and disclosure is provided for ARRA funds by Federal award number consistent with the recipient reports required by ARRA Section 1512(c).

30. Responsibilities for Informing Sub-recipients (ARRA Term)

Recipients agree to separately identify to each sub-recipient, and document at the time of sub-award and at the time of disbursement of funds, the Federal award number, CFDA number, and amount of ARRA funds.

31. 2 CFR §176.50 Award term--Reporting and Registration Requirements under Section 1512 of the American Recovery and Reinvestment Act, Public Law 111-5

(a) This award requires the recipient to complete projects or activities which are funded under the American Recovery and Reinvestment Act of 2009 ("Recovery Act") and to report on use of Recovery Act funds provided through this award. Information from these reports will be made available to the public.

(b) The reports are due no later than ten calendar days after each calendar quarter in which the recipient receives the assistance award funded in whole or in part by the Recovery Act.

(c) Recipients and their first-tier recipients must maintain current registrations in the Central Contractor Registration (www.ccr.gov) at all times during which they have active federal awards funded with Recovery Act funds. A Dun and Bradstreet Data Universal Numbering System (DUNS) Number (www.dnb.com) is one of the requirements for registration in the Central Contractor Registration.

(d) The recipient shall report the information described in section 1512(c) using the reporting instructions and data elements that will be provided online at www.FederalReporting.gov and ensure that any information that is pre-filled is corrected or updated as needed.

32. 2 CFR §176.140 Award term- Required Use of American Iron, Steel, and Manufactured Goods—Section 1605 of the American Recovery and Reinvestment Act of 2009

(a) **Definitions.** As used in this award term and condition—

"Manufactured good" means a good brought to the construction site for incorporation into the building or work that has been--

(1) Processed into a specific form and shape; or

(2) Combined with other raw material to create a material that has different properties than the properties of the individual raw materials.

“Public building” and "public work" means a public building of, and a public work of, a governmental entity (the United States; the District of Columbia; commonwealths, territories, and minor outlying islands of the United States; State and local governments; and multi-State, regional, or interstate entities which have governmental functions). These buildings and works may include, without limitation, bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, power lines, pumping stations, heavy generators, railways, airports, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, and canals, and the construction, alteration, maintenance, or repair of such buildings and works.

“Steel” means an alloy that includes at least 50 percent iron, between .02 and 2 percent carbon, and may include other elements.

(b) *Domestic preference.*

(1) This award term and condition implements Section 1605 of the American Recovery and Reinvestment Act of 2009 (Recovery Act)(Pub. L. 111-5), by requiring that all iron, steel, and manufactured goods used in the project are produced in the United States except as provided in paragraph (b)(3) and (b)(4) of this term and condition.

(2) This requirement does not apply to the material listed by the Federal Government as follows: none.

(3) The award official may add other iron, steel, and/or manufactured goods to the list in paragraph (b)(2) of this term and condition if the Federal government determines that—

(i) The cost of the domestic iron, steel, and/or manufactured goods would be unreasonable. The cost of domestic iron, steel, or manufactured goods used in the project is unreasonable when the cumulative cost of such material will increase the cost of the overall project by more than 25 percent;

(ii) The iron, steel, and/or manufactured good is not produced, or manufactured in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or

(iii) The application of the restriction of section 1605 of the Recovery Act would be inconsistent with the public interest.

(c) *Request for determination of inapplicability of Section 1605 of the Recovery Act.*

(1)(i) Any recipient request to use foreign iron, steel, and/or manufactured goods in accordance with paragraph (b)(3) of this term and condition shall include adequate information for Federal Government evaluation of the request, including—

(A) A description of the foreign and domestic iron, steel, and/or manufactured goods;

(B) Unit of measure;

(C) Quantity;

(D) Cost;

(E) Time of delivery or availability;

(F) Location of the project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign iron, steel, and/or manufactured goods cited in accordance with paragraph (b)(3) of this term and condition.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed cost comparison table in the format in paragraph (d) of this term and condition.

(iii) The cost of iron, steel, and/or manufactured goods material shall include all delivery costs to the construction site and any applicable duty.

(iv) Any recipient request for a determination submitted after Recovery Act funds have been obligated for a project for construction, alteration, maintenance, or repair shall explain why the recipient could not reasonably foresee the need for such determination and could not have requested the determination before the funds were obligated. If the recipient does not submit a satisfactory explanation, the award official need not make a determination.

(2) If the Federal government determines after funds have been obligated for a project for construction, alteration, maintenance, or repair that an exception to section 1605 of the Recovery Act applies, the award official will amend the award to allow use of the foreign iron, steel, and/or relevant manufactured goods. When the basis for the exception is non-availability or public interest, the amended award shall reflect adjustment of the award amount, redistribution of budgeted funds, and/or other actions taken to cover costs associated with acquiring or using the foreign iron, steel, and/or relevant manufactured goods. When the basis for the exception is the unreasonable cost of the domestic iron, steel, or manufactured goods, the award official shall adjust the award amount or redistribute budgeted funds by at least the differential established in 2 CFR 176.110(a).

(3) Unless the Federal Government determines that an exception to section 1605 of the Recovery Act applies, use of foreign iron, steel, and/or manufactured goods is noncompliant with section 1605 of the American Recovery and Reinvestment Act.

| | | | |
|--|-----------------|----------|-----------------|
| (d) Data. To permit evaluation of requests under paragraph (b) of this term and condition based on unreasonable cost, the Recipient shall include the following information and any applicable supporting data based on the survey of suppliers: FOREIGN AND DOMESTIC ITEMS COST COMPARISON | | | |
| Description | Unit of Measure | Quantity | Cost (Dollars)* |
| Item 1: | | | |
| Foreign steel, iron, or manufactured good | _____ | _____ | _____ |

33. 2 CFR §176.160 Award term- Required Use of American Iron, Steel, and Manufactured Goods (covered under International Agreements)—Section 1605 of the American Recovery and Reinvestment Act of 2009

(a) **Definitions.** As used in this award term and condition—

“Designated country” --

(1) A World Trade Organization Government Procurement Agreement country (Aruba, Austria, Belgium, Bulgaria, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea (Republic of), Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and United Kingdom);

(2) A Free Trade Agreement (FTA) country (Australia, Bahrain, Canada, Chile, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Israel, Mexico, Morocco, Nicaragua, Oman, Peru, or Singapore); or

(3) A United States-European Communities Exchange of Letters (May 15, 1995) country: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, and United Kingdom.

“Designated country iron, steel, and/or manufactured goods” --

(1) Is wholly the growth, product, or manufacture of a designated country; or

(2) In the case of a manufactured good that consist in whole or in part of materials from another country, has been substantially transformed in a designated country into a new and different manufactured good distinct from the materials from which it was transformed.

"Domestic iron, steel, and/or manufactured good" --

(1) Is wholly the growth, product, or manufacture of the United States; or

(2) In the case of a manufactured good that consists in whole or in part of materials from another country, has been substantially transformed in the United States into a new and different manufactured good distinct from the materials from which it was transformed. There is no requirement with regard to the origin of components or subcomponents in manufactured goods or products, as long as the manufacture of the goods occurs in the United States.

“Foreign iron, steel, and/or manufactured good” means iron, steel and/or manufactured good that is not domestic or designated country iron, steel, and/or manufactured good.

“Manufactured good” means a good brought to the construction site for incorporation into the building or work that has been--

(1) Processed into a specific form and shape; or

(2) Combined with other raw material to create a material that has different properties than the properties of the individual raw materials.

“Public building” and "public work" means a public building of, and a public work of, a governmental entity (the United States; the District of Columbia; commonwealths, territories, and minor outlying islands of the United States; State and local governments; and multi-State, regional, or interstate entities which have governmental functions). These buildings and works may include, without limitation, bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, power lines, pumping stations, heavy generators, railways, airports, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, and canals, and the construction, alteration, maintenance, or repair of such buildings and works.

“Steel” means an alloy that includes at least 50 percent iron, between .02 and 2 percent carbon, and may include other elements.

(b) *Iron, steel, and manufactured goods.*

(1) This award term and condition implements

(i) Section 1605(a) of the American Recovery and Reinvestment Act of 2009 (Pub. L. 111-5) (Recovery Act), by requiring that all iron, steel, and manufactured goods used in the project are produced in the United States; and

(ii) Section 1605(d), which requires application of the Buy American requirement in a manner consistent with U.S. obligations under international agreements. The restrictions of section 1605 of the Recovery Act do not apply to designated country iron, steel, and/or manufactured goods. The Buy American requirement in section 1605 shall not be applied where the iron, steel or manufactured goods used in the project are from a Party to an international agreement that obligates the recipient to treat the goods and services of that Party the same as domestic goods and services. This obligation shall only apply to projects with an estimated value of \$7,443,000 or more.

(2) The recipient shall use only domestic or designated country iron, steel, and manufactured goods in performing the work funded in whole or part with this award, except as provided in paragraphs (b)(3) and (b)(4) of this term and condition.

(3) The requirement in paragraph (b)(2) of this term and condition does not apply to the iron, steel, and manufactured goods listed by the Federal Government as follows: none.

(4) The award official may add other iron, steel, and manufactured goods to the list in paragraph (b)(3) of this award term and condition if the Federal government determines that—

(i) The cost of domestic iron, steel, and/or manufactured goods would be unreasonable. The cost of domestic iron, steel, and/or manufactured goods used in the project is unreasonable when the cumulative cost of such material will increase the overall cost of the project by more than 25 percent;

(ii) The iron, steel, and/or manufactured goods is not produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality; or

(iii) The application of the restriction of section 1605 of the Recovery Act would be inconsistent with the public interest.

(c) *Request for determination of inapplicability of section 1605 of the Recovery Act or the Buy American Act.*

(1)(i) Any recipient request to use foreign iron, steel, and/or manufactured goods in accordance with paragraph(b)(4) of this term and condition shall include adequate information for Federal Government evaluation of the request, including—

(A) A description of the foreign and domestic iron, steel, and/or manufactured goods;

(B) Unit of measure;

(C) Quantity;

(D) Cost;

(E) Time of delivery or availability;

(F) Location of the project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign iron, steel, and/or manufactured goods cited in accordance with paragraph (b)(4) of this term and condition.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed cost comparison table in the format in paragraph (d) of this term and condition.

(iii) The cost of iron, steel, or manufactured goods shall include all delivery costs to the construction site and any applicable duty.

(iv) Any recipient request for a determination submitted after Recovery Act funds have been obligated for a project for construction, alteration, maintenance, or repair shall explain why the recipient could not reasonably foresee the need for such determination and could not have requested the determination before the funds were obligated. If the recipient does not submit a satisfactory explanation, the award official need not make a determination.

(2) If the Federal government determines after funds have been obligated for a project for construction, alteration, maintenance, or repair that an exception to section 1605 of the Recovery Act applies, the award official will amend the award to allow use of the foreign iron, steel, and/or relevant manufactured goods. When the basis for the exception is nonavailability or public interest, the amended award shall reflect adjustment of the award amount, redistribution of budgeted funds, and/or other appropriate actions taken to cover costs associated with acquiring or using the foreign iron, steel, and/or relevant manufactured goods.. When the basis for the exception is the unreasonable cost of the domestic iron, steel, or manufactured goods, the award official shall adjust the award amount or redistribute budgeted funds, as appropriate, by at least the differential established in 2 CFR 176.110(a).

(3) Unless the Federal Government determines that an exception to the section 1605 of the Recovery Act applies, use of foreign iron, steel, and/or manufactured goods other than designated country iron, steel, and/or manufactured goods is noncompliant with the applicable Act.

| (d) Data. To permit evaluation of requests under paragraph (b) of this term and condition based on unreasonable cost, the applicant shall include the following information and any applicable supporting data based on the survey of suppliers: FOREIGN AND DOMESTIC ITEMS COST COMPARISON | | | |
|---|-----------------|----------|-----------------|
| Description | Unit of Measure | Quantity | Cost (Dollars)* |
| Item 1: | | | |
| Foreign steel, iron, or manufactured good | | | |
| Domestic steel, iron, or manufactured good | | | |
| Item 2: | | | |
| Foreign steel, iron, or manufactured good | | | |
| Domestic steel, iron, or manufactured good | | | |
| [List name, address, telephone number, email address, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.] | | | |
| [Include other applicable supporting information.] | | | |
| [* Include all delivery costs to the construction site.] | | | |

34. 2 CFR §176.190 Award term- Wage Rate Requirements under Section 1606 of the Recovery Act

(a) Section 1606 of the Recovery Act requires that all laborers and mechanics employed by contractors and subcontractors on projects funded directly by or assisted in whole or in part by and through the Federal Government pursuant to the Recovery Act shall be paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by

the Secretary of Labor in accordance with subchapter IV of chapter 31 of title 40, United States Code.

Pursuant to Reorganization Plan No. 14 and the Copeland Act, 40 U.S.C. 3145, the Department of Labor has issued regulations at 29 CFR Parts 1, 3, and 5 to implement the Davis-Bacon and related Acts. Regulations in 29 CFR 5.5 instruct agencies concerning application of the standard Davis-Bacon contract clauses set forth in that section. Federal agencies providing grants, cooperative agreements, and loans under the Recovery Act shall ensure that the standard Davis-Bacon contract clauses found in 29 CFR 5.5(a) are incorporated in any resultant covered contracts that are in excess of \$2,000 for construction, alteration or repair (including painting and decorating).

(b) For additional guidance on the wage rate requirements of section 1606, contact your awarding agency. Recipients of grants, cooperative agreements and loans should direct their initial inquiries concerning the application of Davis-Bacon requirements to a particular federally assisted project to the Federal agency funding the project. The Secretary of Labor retains final coverage authority under Reorganization Plan Number 14.

35. 2 CFR §176.210 Award term- Recovery Act Transactions listed in Schedule of Expenditures of Federal Awards and Recipient Responsibilities for Informing Sub-recipients

(a) To maximize the transparency and accountability of funds authorized under the American Recovery and Reinvestment Act of 2009 (Public Law 111-5)(Recovery Act) as required by Congress and in accordance with 2 CFR 215, subpart __. 21 “Uniform Administrative Requirements for Grants and Agreements” and OMB A-102 Common Rules provisions, recipients agree to maintain records that identify adequately the source and application of Recovery Act funds.

(b) For recipients covered by the Single Audit Act Amendments of 1996 and OMB Circular A-133, “Audits of States, Local Governments, and Non-Profit Organizations,” recipients agree to separately identify the expenditures for Federal awards under the Recovery Act on the Schedule of Expenditures of Federal Awards (SEFA) and the Data Collection Form (SF-SAC) required by OMB Circular A-133. This shall be accomplished by identifying expenditures for Federal awards made under Recovery Act separately on the SEFA, and as separate rows under Item 9 of Part III on the SF-SAC by CFDA number, and inclusion of the prefix “ARRA-” in identifying the name of the Federal program on the SEFA and as the first characters in Item 9d of Part III on the SF-SAC.

(c) Recipients agree to separately identify to each sub-recipient, and document at the time of sub-award and at the time of disbursement of funds, the Federal award number, CFDA number, and amount of Recovery Act funds. When a recipient awards Recovery Act funds for an existing program, the information furnished to sub-recipients shall distinguish the sub-awards of incremental Recovery Act funds from regular sub-awards under the existing program.

(d) Recipients agree to require their sub-recipients to include on their SEFA information to specifically identify Recovery Act funding similar to the requirements for the recipient SEFA described above. This information is needed to allow the recipient to properly monitor sub-recipient expenditure of ARRA funds as well as oversight by the Federal awarding agencies, Offices of Inspector General and the Government Accountability Office.

36. Other Standard Terms and Conditions

All other grant policy terms and conditions contained in applicable Department of the Interior Grant Policy Statements apply unless they conflict or are superseded by the following terms and conditions implementing the American Recovery and Reinvestment Act of 2009 (ARRA) requirements below. Recipients are responsible for contacting their grant managers for any needed clarifications. Sub-awards include sub-grants and sub-contracts issued from this award.

COST PRINCIPLES, AUDIT, AND ADMINISTRATIVE REQUIREMENTS

The Recipient shall be subject to the following OMB circulars and regulations, which are incorporated herein by reference. Copies of these Circulars can be obtained from the Internet at: <http://www.whitehouse.gov/omb/circulars/index.html>.

I. OMB Circulars and Regulations

A. Educational Institutions

- 2 CFR 220, Cost Principles for Educational Institutions (OMB Circular No. A-21)
- OMB Circular No. A-110, Uniform Administrative Requirements for Grants and Other Agreements with Institutions of Higher Education, hospitals, and Other Non-profit Organizations, as implemented in 2 CFR 215 and 43 CFR Part 12, Subpart F.
- OMB Circular No. A-133, Audits of States, Local Governments and Non-Profit Organizations, as implemented in 43 CFR Part 12, Subpart A: Administrative and Audit Requirements and Cost Principles for Assistance Programs

B. State and Local Governments

- 2 CFR 225, Cost Principles for State, Local, and Indian Tribal Governments (OMB Circular A-87)
- OMB Circular A-102, Grants and Cooperative Agreements with State and Local Governments; as implemented in 43 CFR Part 12, Subpart C
- OMB Circular No. A-133, Audits of States, Local Governments and Non-Profit Organizations, as implemented in 43 CFR Part 12, Subpart A: Administrative and Audit Requirements and Cost Principles for Assistance Programs

II. ADDITIONAL REGULATIONS

This award is subject to the following additional Government-wide regulations:

- (1) 2 CFR 180, Government Debarment and Suspension (Non-procurement)
- (2) 2 CFR 1400, Department of the Interior Non-procurement Debarment and Suspension

This award is subject to the following additional regulations of the U.S. Department of the Interior:

- (3) 43 CFR Part 12, Subpart E: Buy American Requirements for Assistance Programs
- (4) 43 CFR Part 17, Subpart A: Nondiscrimination on the Basis of Race, Color, or National Origin
- (5) 43 CFR Part 17, Subpart B: Nondiscrimination on the Basis of Handicap
- (6) 43 CFR Part 17, Subpart C: Nondiscrimination on the Basis of Age
- (7) 43 CFR Part 17, Subpart E: Enforcement of Nondiscrimination on the Basis of Handicap in Programs or Activities Conducted by the Department of the Interior
- (8) 43 CFR Part 18, New Restrictions on Lobbying

- (9) 43 CFR Part 41, Nondiscrimination on the basis of sex in education programs or activities receiving Federal financial assistance [*Applies only if this award provides assistance to an education program or student(s).*]
- (10) 43 CFR Part 43, Government-wide Requirements for Drug Free Workplace