

# REQUEST FOR PROPOSAL

SOLICITATION NUMBER: AG-8447-S-12-0002

DIGITAL AERIAL IMAGERY  
for the Tonto National Forest, Arizona

Solicitation Issue Date: March 28, 2012

Proposal Due Date: April 27, 2012



U.S. DEPARTMENT OF AGRICULTURE  
FARM SERVICE AGENCY  
AERIAL PHOTOGRAPHY FIELD OFFICE

## NOTICE TO OFFEROR

Any proposal submitted for this RFP must be identified with the following information labeled on the outside of the mailing package:

**SOL.NO: AG-8447-S-12-0002**  
**DUE DATE: April 27, 2012, 4:30 PM**  
**RECEIVING OFFICE: CONTRACTING**

Mail To: AERIAL PHOTOGRAPHY FIELD OFFICE  
CONTRACTING OFFICER  
2222 WEST 2300 SOUTH  
SALT LAKE CITY UTAH 84119

## NOTICE TO PROSPECTIVE OFFERORS :

OFFERORS ARE CAUTIONED TO NOTE THE FOLLOWING SPECIAL CONTRACT REQUIREMENTS:

Proposal Preparation Instructions, See Section L. Any proposal submitted in response to this solicitation must be presented in two parts, a pricing proposal and a technical proposal.

The Base Item in Section B-2 includes 4-band, 8-bit per band Color Corrected, Georeferenced Uncompressed Image Files. Option Items for 4-band, 16-bit per band, Radiometrically Uncorrected, Georeferenced, Uncompressed Image files; Stereo Block Files; Orthorectification Services are included in Section B-3 through B-5.

This RFP is subject to the Availability of Funds Clause (FAR 52.232-18). See Section B-1.6.

The complete text of any or all clauses referenced herein may be obtained by submitting a request, identifying this solicitation number, to the Contracting Officer, USDA, FSA, Aerial Photography Field Office, 2222 West 2300 South, Salt Lake City, Utah 84119. Complete copies of the FAR in loose-leaf or CFR form may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington D.C. 20402.

<b>SOLICITATION, OFFER AND AWARD</b>		1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700)		RATING	PAGE OF PAGES
2. CONTRACT NUMBER	3. SOLICITATION NUMBER	4. TYPE OF SOLICITATION <input type="checkbox"/> SEALED BID (IFB) <input type="checkbox"/> NEGOTIATED (RFP)	5. DATE ISSUED	6. REQUISITION/PURCHASE NUMBER	
7. ISSUED BY		CODE	8. ADDRESS OFFER TO (If other than Item 7)		

**NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".**

**SOLICITATION**

9. Sealed offers in original and \_\_\_\_\_ copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if handcarried, in the depository located in \_\_\_\_\_ until \_\_\_\_\_ local time \_\_\_\_\_ (Hour) \_\_\_\_\_ (Date)

CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-1. All offers are subject to all terms and conditions contained in this solicitation.

10. FOR INFORMATION CALL:	A. NAME	B. TELEPHONE (NO COLLECT CALLS)		C. E-MAIL ADDRESS
		AREA CODE	NUMBER	EXT.

**11. TABLE OF CONTENTS**

(X)	SEC.	DESCRIPTION	PAGE(S)	(X)	SEC.	DESCRIPTION	PAGE(S)
PART I - THE SCHEDULE				PART II - CONTRACT CLAUSES			
	A	SOLICITATION/CONTRACT FORM			I	CONTRACT CLAUSES	
	B	SUPPLIES OR SERVICES AND PRICES/COSTS		PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACH.			
	C	DESCRIPTION/SPECS./WORK STATEMENT			J	LIST OF ATTACHMENTS	
	D	PACKAGING AND MARKING		PART IV - REPRESENTATIONS AND INSTRUCTIONS			
	E	INSPECTION AND ACCEPTANCE			K	REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS	
	F	DELIVERIES OR PERFORMANCE			L	INSTRS., CONDS., AND NOTICES TO OFFERORS	
	G	CONTRACT ADMINISTRATION DATA			M	EVALUATION FACTORS FOR AWARD	
	H	SPECIAL CONTRACT REQUIREMENTS					

**OFFER (Must be fully completed by offeror)**

NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within \_\_\_\_\_ calendar days (60 calendar days unless a different period is inserted by the offeror) from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.

13. DISCOUNT FOR PROMPT PAYMENT <i>(See Section I, Clause No. 52.232-8)</i>	<input type="checkbox"/> 10 CALENDAR DAYS (%)	<input type="checkbox"/> 20 CALENDAR DAYS (%)	<input type="checkbox"/> 30 CALENDAR DAYS (%)	<input type="checkbox"/> CALENDAR DAYS (%)
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14. ACKNOWLEDGMENT OF AMENDMENTS <i>(The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated):</i>	AMENDMENT NO.	DATE	AMENDMENT NO.	DATE

15A. NAME AND ADDRESS OF OFFEROR	CODE	FACILITY	16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER <i>(Type or print)</i>
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15B. TELEPHONE NUMBER	AREA CODE	NUMBER	EXT.	17. SIGNATURE	18. OFFER DATE
<input type="checkbox"/> 15C. CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE.					

**AWARD (To be completed by Government)**

19. ACCEPTED AS TO ITEMS NUMBERED	20. AMOUNT	21. ACCOUNTING AND APPROPRIATION
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22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION: <input type="checkbox"/> 10 U.S.C. 2304(c) ) <input type="checkbox"/> 41 U.S.C. 253(c) ( )	23. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified)
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24. ADMINISTERED BY (If other than Item 7)	25. PAYMENT WILL BE MADE BY
--	-----------------------------

26. NAME OF CONTRACTING OFFICER (Type or print)	27. UNITED STATES OF AMERICA  <i>(Signature of Contracting Officer)</i>	28. AWARD DATE
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IMPORTANT - Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.

## PART I - THE SCHEDULE

### SECTION B - SUPPLIES OR SERVICES AND PRICES/COSTS

#### B-1 DIGITAL AERIAL PHOTOGRAPHY SERVICES

Furnish direct digital aerial imagery and all related services and supplies in accordance with the requirements, specifications, terms, conditions, clauses, and provisions specified herein.

##### 1.1 Intended Use of Imagery

The imagery shall be used by the United States Forest Service to collect and evaluate natural resource data by means of photo interpretation, image processing and geographic information systems (GIS) technologies. Resource management use includes lands, minerals, recreation, travel management, vegetation, and wildlife. The digital imagery will be used for visual display and for stereo-viewing.

##### 1.2 Importance of Image Quality

Any imagery submitted to the Government that does not meet the minimum quality requirement may impact the Government's ability to properly use the imagery for its intended purpose and may be subject to a price reduction based on the diminished usability of the product.

##### 1.3 Project Flight Planning Requirement

Contractor is required to provide the necessary flight line plans, which shall include flight altitude determinations, for the acquisition of precise vertical aerial imagery in accordance with the technical requirements in Section C-5.2, Flight Planning.

##### 1.4 Direct Digital Sensor Acquisition

The direct digital imagery acquisition requirements will be for the collection of visible (Red, Green, Blue) and color near infrared (IR) imagery captured simultaneously. The digital sensor system shall be a tested, stable, geometrically calibrated system with appropriate documentation.

- (a) Digital sensor acquisitions require the Contractor to comply with the technical requirements and specifications of this contract, and Attachment A: USDA Digital Camera Specification which defines the essential elements in securing high quality direct digital imagery.

##### 1.5 Non-Discrimination Statement

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where

applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of Discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW., Washington, DC 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

1.6 Availability of Funds (FAR 52.232-18, APR 1984)

Funds are not presently available for this contract. The Government's obligation under this contract is contingent upon the availability of appropriated funds from which payment for contract purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the Contracting Officer for this contract and until the Contractor receives notice of such availability, to be confirmed in writing by the Contracting Officer.

**B-2 PROJECT ITEM 1: TONTO NATIONAL FOREST, AZ**

Provide aerial imagery services and related materials for the acquisition and production of high resolution, 4-band, direct digital stereo imagery.

<b>PROJECT ITEM 1: TONTO NATIONAL FOREST, ARIZONA, INCLUDING 8-BIT COLOR CORRECTED STEREO IMAGERY</b>					
<b>PROJECT ITEM</b>	<b>GSD</b>	<b>QTY</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>TOTAL AMOUNT</b>
1	30cm	4,632	Square Miles	\$	\$

2.1 Project Code: 613120; Agency Designator: USDA-F; Project Identifier: USDA-FS-1-12

2.2 Project Item Requirements:

- (a) Spatial Resolution: All imagery shall be acquired at 30cm ground sample distance (GSD) or better.
- (b) Radiometric Resolution: All imagery shall be collected at a minimum of 12-bits per band.
- (c) Acquisition Period: May 15, 2012 through September 30, 2012.
- (d) Minimum Sun Angle: 45 degrees.
- (e) Overlaps: Endlap: Optimum 62%; Minimum 57%; Recommended Maximum 67%  
Sidelap: Optimum 30%; Minimum 20%; Recommended Maximum 45%

Recommended maximum overlaps do not apply to scanning sensors.

- (f) Coverage: Imagery shall be collected to cover the project boundary plus one full stereo neat model beyond the boundary.

2.3 Contract Deliverables

**THE CONTRACTOR SHALL SUBMIT ONE (1) COMPLETE COPY OF ALL DELIVERABLES.** The following deliverables shall be submitted by the Contractor and prepared in accordance with specifications and work statement (Section C), packaging and marking (Section D), inspection and acceptance (Section E), and delivery schedule (Section F):

- (a) Project flight plan (for review prior to acquisition of imagery)
- (b) Pre-production image samples (See Section C-6.1)
- (c) 4-band, 8-bit per band, color corrected, georeferenced, uncompressed digital image files in tile format (See Section C-6.1), including the following files\*:

<b>Frame-Based Sensor</b>	<b>Scanning (Pushbroom) Sensor – Files for Each Flight Line</b>
<b>.tif</b> uncompressed, georeferenced image	<b>.ads</b> header with pointers to .tif segments
<b>.aux</b> auxiliary statistic/projection file	<b>.hist</b> xml file containing histogram
<b>.rrd</b> reduced resolution dataset pyramid file	<b>.min</b> minification header
<b>.sup</b> support/orientation file	<b>.odf</b> orientation data file
Metadata and other text files	<b>.odf.adj</b> adjusted orientation after AT
	<b>.sup</b> support/orientation file
	<b>.tif</b> image segment
	Metadata and other text files

(d) ABGPS/IMU Data Files in raw, projected, and ecef format (See Section C-6.5)\*

(e) Photo-Center File (See Section C-7.4)\*

(f) Project Geodatabase (See Section C-7.5)\*

Including feature classes for:

Photo Center Point

Flight Line

Image Footprint Polygon

(g) Pilot logs

(h) Progress reports

\* delivered on internal SATA hard drive

**B-3 OPTION ITEM 2: DELIVERY OF 4-BAND, 16-BIT PER BAND, RADIOMETRICALLY UNCORRECTED, GEOREFERENCED, UNCOMPRESSED IMAGE FILES**

<b>OPTION ITEM 2: 4-BAND, 16-BIT PER BAND, RADIOMETRICALLY UNCORRECTED, GEOREFERENCE, UNCOMPRESSED IMAGE FILES</b>					
<b>PROJECT ITEM</b>	<b>GSD</b>	<b>QTY</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>TOTAL AMOUNT</b>
1	30cm	4,630	Square Miles	\$	\$

- 2.1 Project Code: 613120; Agency Designator: USDA-F; Project Identifier: USDA-FS-1-12
- 2.2 Project Item Requirements: Same requirements as B-2.
- 2.3 Contract Deliverables

**THE CONTRACTOR SHALL SUBMIT ONE (1) COMPLETE COPY OF ALL DELIVERABLES.** The following deliverables shall be submitted by the Contractor and prepared in accordance with specifications and work statement (Section C), packaging and marking (Section D), inspection and acceptance (Section E), and delivery schedule (Section F):

- (a) Pre-production image sample (See Section C-6.2)
- (b) 4-band, 16-bit per band, radiometrically uncorrected, georeferenced, uncompressed digital image files in tile format (See Section C-6.2), including the following files\*:

<b>Frame-Based Sensor</b>	<b>Scanning (Pushbroom) Sensor – Files for Each Flight Line</b>
<b>.tif</b> uncompressed, georeferenced image	<b>.ads</b> header with pointers to .tif segments
<b>.aux</b> auxiliary statistic/projection file	<b>.hist</b> xml file containing histogram
<b>.rrd</b> reduced resolution dataset pyramid file	<b>.min</b> minification header
<b>.sup</b> support/orientation file	<b>.odf</b> orientation data file
Metadata and other text files	<b>.odf.adj</b> adjusted orientation after AT
	<b>.sup</b> support/orientation file
	<b>.tif</b> image segment
	Metadata and other text files

- (c) Image Footprint Polygon Feature Class included in Project Geodatabase (See Section C-7.5)\*

\* delivered on internal SATA hard drive

**B-4 OPTION ITEM 3: STEREO BLOCK FILES (*Without Orthorectification Services*).**

The Government will consider price proposals on an optional award for stereo block files if Option Item 4 for orthorectification services (Section B-5) is **not** awarded. The Contracting Officer may exercise this option upon contract award or by notice to the Contractor within 60 days of the contract award.

Option items will **not** be awarded without the corresponding base and/or option item. Therefore, pricing below should reflect only the incremental or additional price for performing the option item in conjunction with the base/option Items in Sections B-2 and B-3. Option Item 3b may be awarded only if Option Item 2 is awarded.

<b>OPTION ITEM 3: STEREO BLOCK FILES</b>					
<b>OPTION ITEM</b>	<b>IMAGE FILES</b>	<b>QTY</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>TOTAL AMOUNT</b>
3a	8 bit (in B-2)	6	Ranger Districts	\$	\$
3b	16 bit (in B-3 if awarded)	6	Ranger Districts	\$	\$

4.1 Project Item Requirements: Generation of stereo block files to open and view image files in Sections B-2 and B-3 (if awarded) in stereo (See Section C-6.7).

(a) Image File Reference Structure: Each stereo block file should reference images from only one Ranger District as defined in Section J, Exhibit 1(b). Separate sets of stereo block files shall be included for the 8-bit and 16-bit image files (if awarded).

4.2 Contract Deliverables

**THE CONTRACTOR SHALL SUBMIT ONE (1) COMPLETE COPY OF ALL DELIVERABLES.** The following deliverables shall be submitted by the Contractor and prepared in accordance with specifications and work statement (Section C), packaging and marking (Section D), inspection and acceptance (Section E), and delivery schedule (Section F):

- (a) One stereo block file for each Ranger District referencing 8 bit geoTIFFs (See Section C-6.7)\*
- (b) One stereo block file for each Ranger District referencing 16 bit geoTIFFs (if Option Item 2 in B-3 is awarded) (See Section C-6.7)\*
- (c) Metadata (See Section C-6.7)\*

\* delivered on internal SATA hard drive(s)

**B-5 OPTION ITEM 4: DOQQQ ORTHORECTIFICATION SERVICES**

The Government will consider price proposals on an optional award for 4-band, 8-bits per band, digital orthorectified quarter-quarter quadrangles (DOQQQs). The Contracting Officer may exercise this option upon contract award or by notice to the Contractor within 60 days of the contact award.

Option items will **not** be awarded without the corresponding base item. Therefore, pricing below should reflect only the incremental or additional price for performing the option item in conjunction with the base Item(s) in Section B-2.

<b>OPTION ITEM 4: DOQQQ ORTHORECTIFIED IMAGERY (INCLUDES COMPRESSED PROJECT MOSAIC (CPM))</b>					
<b>OPTION ITEM</b>	<b>GSD</b>	<b>QTY</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>TOTAL AMOUNT</b>
5	30cm	1,325	DOQQQ*	\$	\$

\*Insert average price per DOQQQ, as some will be partial

**5.1 Project Item Requirements:**

- (a) Spatial Resolution: All imagery shall have a 30cm ground sample distance (GSD) or better.
- (b) Horizontal Accuracy Requirements: All well-defined points tested on Orthorectified tiles shall fall within 6.0 meters of true ground at a 95% confidence level (see FGDC-STD-007.3-1998, page 3-10).

**5.2 Contract deliverables**

**THE CONTRACTOR SHALL SUBMIT ONE (1) COMPLETE COPY OF ALL DELIVERABLES.** The following deliverables shall be submitted by the Contractor and prepared in accordance with specifications and work statement (Section C), packaging and marking (Section D), inspection and acceptance (Section E), and delivery schedule (Section F):

- (a) Pre-production samples
- (b) 4-band, 8-bit per band, Digital Orthorectified Quarter-Quarter Quadrangle (DOQQQ) Tiles in uncompressed GeoTIFF format\* (see Section C-6.3), including supporting files:
  - (1) Raster Support Files
    - a. Auxliary statistic/projection file (.aux)
    - b. Reduced Resolution Dataset pyramid file (.rrd)

- (2) Metadata and other text files
- (c) Project Geodatabase feature classes for Seamlines and Orthorectified Image Index (See Section C-7.5)
- (d) One stereo block file for each Ranger District, referencing 8-bit geoTIFFs in Section B-2 – six (6) total; and one stereo block file for each Ranger District, referencing 16-bit geoTIFFs in Section B-3 (if Option Item 2 is awarded) (see Section C-6.7)
- (e) Two 3-band, 8-bit Compressed Project Mosaics (CPM) in MrSID format\*: one in Natural Color, and one in Near Infrared (see Section C-6.4)
- (c) RMSE Accuracy and Quality Control Reports \*

\* delivered on internal SATA hard drive

## B-7 GOVERNMENT-FURNISHED PROPERTY

Pursuant to the Government-Furnished Property (GFP) clause (see Section I, Contract Clauses) the Government shall furnish the item(s) of property listed below as GFP to the Contractor.

### 7.1 Coverage Shapefile

The Contractor will be furnished upon award one (1) ESRI compatible shapefile containing the required contract coverage for each Project Item awarded. Due to the unique footprint of digital sensors the Contractor is responsible for the complete stereo coverage acquisition within the shapefile area.

### 7.2 Metadata Template

The Contractor will be furnished upon award data text files (.txt), as applicable, containing Federal Geographic Data Committee (FGDC) compliant metadata templates to be used for: (1) the georeferenced uncompressed digital image files in Sections C-6.1 and C-6.2, (2) the DOQQ files required in Section C-6.3, (3) the CPM files required in C-6.4, (4) the Stereo Block Files in Section C-6.7, (5) the Photo Center File in Section C-7.4, and (6) the Project Geodatabase in Section C-7.5. Metadata Templates for orthorectified image files and CPM will be provided only if the corresponding option item is exercised. Government furnished templates will not be provided for other required metadata.

### 7.3 Ranger District Boundary Files

If either the optional award item for Stereo Block files (Section B-4) or Orthorectified imagery is awarded (Section B-5), the contractor will be furnished upon award one set of Ranger District boundary shapefiles for creation of stereo block files in Section C-6.7.

### 7.4 DOQQ/DOQQQ Shapefile (*Applicable only if Ortho Option is Exercised*)

The Contractor will be furnished upon award one (1) ESRI compatible shapefile containing the required DOQQ/DOQQs for each project item awarded.

### 7.5 Project Geodatabase Template

The Contractor will be furnished upon award one (1) ESRI compatible geodatabase template for use in producing the Project Geodatabase Template in Section C-7.5.

### 7.6 File Directory Template

The Contractor will be furnished upon award a folder structure template for the delivery drives.

## PART I - THE SCHEDULE

### SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

#### C-1 SCOPE OF CONTRACT

The general scope of the contract is to procure precise vertical aerial imagery for natural resource inventory and analysis and stereo model review. The Contractor is responsible for furnishing direct digital imagery and related services and supplies in accordance with requirements, specifications, terms and conditions specified herein.

##### 1.1 Technical Requirements and Specifications

The technical requirements and specifications of this contract are described in this section and Attachments A, B, and C which define the essential elements in securing high quality digital imagery. Any deviation from the specifications stated herein may cause increased time and effort in using the imagery as intended.

##### 1.2 Delivery and Performance

The delivery and performance requirements of this contract are described in Section F, Deliveries or Performance. All contract materials shall be shipped within the time limits and to the place of delivery specified herein. Performance of the contract shall be authorized and monitored by the Contracting Officer and/or the Contracting Officer's Representative.

##### 1.3 Quality Control

Quality control shall be exercised by the Contractor continuously throughout the performance of the contract as described in Section C-8, Quality Control.

##### 1.4 Location of Work

The project name, location, and quantities of areas to be acquired under this contract will be described in Section B, Supplies or Services & Price/Cost, and shown on the project maps in Section J, Exhibit 1, Project Maps. The Contractor's place of performance where work will be performed on this contract shall be indicated in ORCA Certification. (See Section K-1, Representations, Certifications, and Other Statements of Offers)

##### 1.5 Project Management and Flight Planning

The Contractor is required to provide the necessary project management, coordination, and supervision to conduct project planning, flight line planning and acquisition, image processing, product delivery, and related technical and progress reports as required in the contract (see Section C-7, Project Management).

## 1.6 Labor and Materials

The Contractor shall furnish all materials, equipment, transportation, superintendence, and labor as required herein. The Contractor shall execute and finish the imagery acquisition, imagery production and related services for the project specified and shall deliver to the USDA all materials called for in Section F-1, Materials to be Delivered.

## C-2 APPLICABLE DOCUMENTS

### 2.1 Attachments

The following documents attached to this solicitation document are considered requirements and specifications under the resulting contract(s), as applicable to the Contractor's technical proposal:

- (a) Aerial Photography Field Office (APFO) USDA Specification for Digital Camera Based Acquisition, dated February 1, 2012 (Attachment A)
- (b) Aerial Photography Field Office (APFO) USDA Digital Imagery Quality Specification, dated February 1, 2012 (Attachment B)
- (c) USDA Digital File Format Specification, dated February 1, 2012, Updated for Resource March 21, 2012 (Attachment C)

### 2.2 References

The following documents referenced in this solicitation document are considered requirements and specifications under the resulting contract(s), as applicable to the Contractor's technical proposal:

- (a) Federal Geographic Data Committee (FGDC) Specification, FGDC-STD-001-1998 ("Content Standard for Digital Geospatial Metadata")
- (b) Federal Geographic Data Committee (FGDC) Specifications, FGDC-STD-007.3-1998 ("Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy")
- (c) Code of Federal Regulation (CFR) Title 14 ("Federal Aviation Regulations")
- (d) GeoTIFF Revision 1.0 Specification, dated December 28, 2000 (Version 1.8.2)
- (e) TIFF Specification Revision 6 dated June 3, 1992 (Adobe Systems Inc.)

## C-3 GENERAL REQUIREMENTS

The Contractor shall furnish all materials, equipment, transportation, superintendence, and labor required to plan, acquire, manage, and process digital imagery for the project items as specified in Section B, Supplies or Services and Price/Cost.

## C-4 EQUIPMENT REQUIREMENTS

### 4.1 Platform/Camera Requirements

- (a) Platform/Camera Approval: Any equipment (platform and cameras) proposed to be used by the Contractor must be approved for use by the Contracting Officer (see Attachment A, paragraph 4.0, Digital Camera Approval Requirements, for instructions and process for platform/camera approval). If the platform and camera proposed for use are not owned by the Contractor, a written statement of availability from the owner of the equipment shall be provided to the Contracting Officer.
- (b) System Malfunction: The Contracting Officer shall have the right to require the removal of a camera from use when deficiencies in imagery attributable to the camera are found to exist (see Attachment A, paragraph 3.7, System Malfunctions). Any platform/camera removed from use by the Contracting Officer shall not be returned to use on any APFO contract until the cause of the malfunction is corrected to the satisfaction of the Contracting Officer. That determination will be based on acceptable samples, field reports, manufacturer reports, and/or calibration reports.

### 4.2 Aircraft Requirements

- (a) FAA Certification. All aircraft used in the performance of this contract shall be maintained and operated in accordance with all regulations required by the U.S. Department of Transportation, Federal Aviation Administration (FAA). Aircraft operated in the acquisition of aerial imagery under this contract shall be FAA certified to a service ceiling with operating load (crew, sensor system, oxygen, and other required equipment) of not less than the highest altitude required.
- (b) Positive Control Airspace. The project item areas may contain areas of controlled or restricted airspace. It is the responsibility of the Contractor to obtain all approvals necessary to assure that required clearances are achieved. When the flight plan and location of any project area coverage fall within positive-control airspace, the aircraft must contain the appropriate equipment to operate in such positive-control areas within the purview of the Federal Aviation Regulations. In addition, 18 USC Section 795 requires permission of the commanding officer to photograph or map some military and naval installations. If any delay to the acquisition or production schedule is caused due to 18 USC Section 795 or similar statutes, the Contractor is required to notify the Contracting Officer in writing within 72 hours and shall include detail information regarding the issue, point of contact at the installation, and estimated delay. (See Section H-1, Permits and Clearances.)
- (c) Aircraft Configuration. The design of the aircraft shall be such that when the sensor system is mounted with all its parts within the outer structure, an unobstructed field of view is obtained. The field of view shall be shielded from the exhaust gases, oil, effluence, and air turbulence. The sensor system port glass shall be free of scratches

and of such quality that it will not degrade the resolution or the accuracy of the sensor system.

- (d) Airborne Global Positioning System. The aircraft shall have an Airborne Global Positioning System (ABGPS), Inertial Measurement Unit (IMU) system capable of generating accurate control points used in the creation of the photo-center data file (see Section C-7.4, Photo-Center Data File).

## C-5 IMAGERY ACQUISITION REQUIREMENTS

### 5.1 Photographic Conditions

Imagery shall be acquired when skies are clear, free from smoke, clouds, cloud shadows, excessive haze, and well-defined images can be resolved. The ground shall be free from snow below timberline, standing water (other than natural or man-made ponds and lakes), flood waters from streams which have overflowed their banks, and wet ground which obscures vegetation or other features. If any conditions besides clouds and cloud shadows noted above are present at time of acquisition, communication between the contractor's flight operations leader and the Contracting Officer or Representative should be in writing to determine possible acceptance of acquisition due to potential USFS mission time constraints.

### 5.2 Flight Planning

The Contractor shall create a flight plan to be submitted to the Contracting Officer for Government review prior to commencing acquisition of the project area. The flight plan shall provide flight line planning necessary to acquire precision, high quality, stereo imagery, which shall include at a minimum, exposure stations, flight altitude determinations and overlap stereoscopic coverage. The boundaries and exact coverage of this project item is determined by the official coverage shapefile and requirements stated in Section B-2.2, Project Requirements. See Section B-7.1, Coverage Shapefile.

### 5.3 Flight Requirements

The Contractor shall obtain precise vertical digital imagery in accordance with the following technical requirements:

- (a) Acquisition Periods. The Contractor shall acquire imagery only during that portion of the day when the sun angle exceeds the requirement stated in Section B, Minimum Sun Angle. The Contractor shall limit operations to the dates specified in Section B, Supplies or Services & Price/Cost, or as otherwise provided in writing by the Contracting Officer as stated under Section F-4, Performance of the Work.
- (b) Tilt. It is desired that exposures be made when the optical axis of the digital sensor is in a vertical position. The Contractor shall not acquire imagery when the tilt (departure from the vertical) of any exposure exceeding four degrees (4°) or relative

tilt between any two successive exposures exceeding six degrees (6°). Tilt shall not average more than 2 degrees (2°) in any 16 km (10 mile) section of a flight line and shall not average more than 1 degree (1°) for the entire project.

## C-6 DIGITAL IMAGERY PROCESSING

### 6.1 4-band, 8-Bit per Band Color Corrected, Georeferenced, Uncompressed Digital Image Files

The Contractor shall produce 4-band, 8-bit per band, georeferenced, stereo-coverage, color corrected digital image files at the resolution in accordance with Section B. The image shall be submitted in the native camera footprint. Non-frame based sensors shall submit imagery in a tile format comparable to frame-based sensors with file sizes no larger than 1.3 gigabytes. The file shall cover the entire area of the native camera footprint and shall be projected in the 1983 North American Datum (NAD83), using the native Universal Transverse Mercator (UTM) zone in meters. If any digital image files are rejected by the contractor's quality control process and/or reflights are acquired, only one acceptable image file shall be submitted.

- (a) Image Quality: Contractor shall make necessary radiometric adjustments, including stretching, dodging, color correction, etc., to the acquired imagery in order to match ground conditions at the time of exposure and to ensure the best possible color balance of the images across the project area for both natural color and color infrared. The RGB and CIR should be balanced in all frames to remove hot spots or ground condition differences from multiple acquisition dates without compromising the validity of the data. A pixel value of "0,0,0,0" should be used only for non-data values. All imagery shall meet the quality requirements specified in Attachment B, USDA Digital Imagery Quality Specifications.
- (b) File Format. The 4-band imagery shall be 8-bit per band in accordance with the Adobe TIFF and GeoTIFF Specifications and shall have the following band order: Red, Green, Blue, and Infrared. GeoTIFF files shall be saved such that the first pixel (0,0) is the northwest corner of the image. The image shall be saved so that the most northwest corner of the image is saved to the file as the top left pixel (i.e. north faces up on a computer screen), and viewable in ArcMap in the same north orientation. The Contractor shall provide an AUX (ESRI and ERDAS compatible Auxiliary statistic/projection file) and a RRD (ESRI and ERDAS compatible Reduced Resolution Dataset pyramid file) for each image file. Each image file shall have an associated Pyramid Layer file created at a 3X3 kernel, Binomial Interpolation. Each image file shall have statistics calculated with the Skip Factor in the X and Y as 1, and Bin Type as Direct. The auxiliary file shall contain the proper projection information for the tile and shall match the information in the GeoTIFF header. The files shall use the same naming convention as the image tiles but with an ".rrd" and ".aux" extension respectively. The Contractor shall also provide a support file containing photogrammetric metadata associated with each image file, with the image path hardcoded to E: \. Files shall use the naming convention specified in Section J, Exhibit 2, File Naming Convention.

Flight lines and exposures should be numbered according to Section J, Exhibit 8, Flight Line and Exposure Numbering.

- (c) Pre-Production Sample: The Contractor shall submit a sample of radiometrically corrected images prior to production for Government review. If the project area has a diversified landscape, the contractor shall provide enough samples to properly reflect the overall project landscapes. The sample(s) shall be provided as a georeferenced TIFF(s) meeting all image requirements, including TIFF and GeoTIFF tags specified in Attachment C, and submitted on a standard CD or DVD (labeling requirements in Section E are not required). The Government will evaluate and provide an approval or disapproval letter with comments no later than three (3) business days, with a goal of 24 hours. Additional project item area samples may be submitted for review if approved by the Contracting Officer Representative (COR).
- (d) Georeferenced Accuracy. The principal point shall have an accuracy not exceeding a 6 meter offset from true ground.
- (e) Metadata. The Contractor shall create Federal Geographic Data Committee (FGDC) compliant, per FGDC-STD-001-1998 specification, metadata file for each digital image file. Metadata must parse cleanly through the USGS metadata parser “mp” version 2.8.10 (or later version) without any errors.
- (f) Media Requirements. All georeferenced imagery shall be delivered on internal computer hard drives as defined in Section D-1.3, Internal Hard Drives. **Maximum disk space that can be used cannot exceed ninety percent (90%) of the individual hard drive capacity.** The files shall be stored in a single subdirectory under the root directory called “georeferenced.” Minification pyramid files (from scanning sensors) should be delivered in a separate subdirectory called “minification” under the root directory.

6.2 16-Bit Radiometrically Uncorrected, Georeferenced, Uncompressed Digital Image Files  
*(Applicable only if Option Item 2 is Exercised)*

Contractor shall provide georeferenced, stereo-coverage, radiometrically uncorrected digital image files at the resolution in accordance with Section B. Requirements for this product shall be the same as those listed in Section C-6.1 with the exception of the following elements:

- (a) Image Quality. The Contractor shall not make any radiometric enhancements, such as stretching, dodging, or other Look Up Table (LUT) adjustments, to the acquired imagery. The imagery shall not contain any borders, artifacts, or other non-image items.
- (b) File Format. The 4-band imagery shall be 16-bit per band in accordance with the Adobe TIFF and GeoTIFF Specifications and shall have the following band order: Red, Green, Blue, and Infrared. GeoTIFF files shall be saved such that the first pixel

(0,0) is the northwest corner of the image. The image shall be saved so that the most northwest corner of the image is saved to the file as the top left pixel (i.e. north faces up on a computer screen), and viewable in ArcMap in the same north orientation. The Contractor shall provide an AUX (ESRI and ERDAS compatible Auxiliary statistic/projection file) and a RRD (ESRI and ERDAS compatible Reduced Resolution Dataset pyramid file) for each image file. Each image file shall have an associated Pyramid Layer file created at a 3X3 kernel, Binomial Interpolation. Each image file shall have statistics calculated with the Skip Factor in the X and Y as 1, and Bin Type as Direct. The auxiliary file shall contain the proper projection information for the tile and shall match the information in the GeoTIFF header. The files shall use the same naming convention as the image tiles but with an “.rrd” and “.aux” extension respectively. The Contractor shall also provide a support file containing photogrammetric metadata associated with each image file, with the image path hardcoded to E: Files shall use the naming convention specified in Section J, Exhibit 2, File Naming Convention.

- (c) Pre-production Sample: The Contractor shall submit a single 16 bit per band image prior to production for Government review. The sample shall be a TIFF meeting the requirements of the contract, including TIFF and GeoTIFF tags as specified in Attachment C, and submitted on a standard CD or DVD (labeling requirements in Section E are not required). The Government will evaluate and provide an approval or disapproval letter with comments no later than three (3) business days, with a goal of 24 hours. Additional project item area samples may be submitted for review if approved by the Contracting Officer or Representative (COR).

### 6.3 Digital Orthorectified Quarter-Quarter Quadrangle (DOQQQ) Tiles (*Applicable only if Orthorectification Option Item 4 is Exercised*)

The Contractor shall provide ortho-rectification services to produce 4-band, 8-bits per band, mosaicked digital orthorectified quarter-quarter quadrangles (DOQQQs) for the project area defined in Section B-5.1, Coverage Shapefiles. The DOQQQ shall cover the entire image area of one quarter of a USGS standard quarter quadrant, with a 300 pixel buffer on all four sides. The DOQQQs shall be projected in NAD83 native UTM Zone in meters.

- (a) Image Quality: All DOQQQs shall meet the image quality requirements specified in Attachment B, USDA Digital Image Quality Specifications. The Contractor shall radiometrically balance the files used to create the DOQQQs to eliminate any checker board pattern appearance. Significant radiometric differences among image frames inhibits interpretation of ground features. The DOQQQs shall not contain any borders, artifacts, or other non-image items.
- (b) Seamlines: Image seams should be blended to a smooth seam. Visible seamlines within or between tiles which exhibit a noticeable edge or displacement effect are not acceptable. Sharp contrast should not be visible at seams, as it affects image interpretation. Placement of seamlines in tree and shrub vegetation should be minimized. Seamlines should be centered on linear features such as roads, rivers, streams, and trails when available. When linear features are not available, seamlines shall be placed at landcover type transition areas such as between a meadow and forested area or based on terrain breaks derived from topographic data such as ridgelines and valley bottoms.

- (c) Coverage: When a DOQQQ partially covers the forest boundary, the Contractor may elect to submit a partial DOQQQ so that it completely covers the forest boundary. Any partial DOQQQ shall include a 300 pixel buffer on the outside of the forest boundary.
- (d) Pre-Production Sample: The Contractor shall submit a 4 DOQQQ's sample set that make up the same DOQQ images prior to production for Government review. If the project area has a diversified landscape, the contractor shall provide enough samples to properly reflect the overall project landscapes. The samples shall be a TIFF and meet all image requirements, including TIFF and GeoTIFF tags as specified in Attachment C, submitted on a standard CD or DVD (labeling requirements in Section E are not required). The Government will evaluate and provide an approval or disapproval letter with comments no later than three (3) business days, with a goal of 24 hours. Additional project item area samples may be submitted for review if approved by the Contracting Officer or Representative (COR).
- (e) Spatial Resolution: Specified in Section B-5
- (f) Horizontal Accuracy: Specified in Section B-5
- (g) File Format. The DOQQQ tiles shall be a 4-band, 8-bit per band georeferenced tagged image file format (GeoTIFF) created in accordance with Attachment C, paragraph 4.0, USDA File Format Specification. Files shall use the same file naming specified in Section J, Exhibit 2, File Naming Convention and Exhibit 5, Quarter-Quarter Quad Numbering Logic.
- (h) Raster Support File: The Contractor shall provide an AUX (ESRI and ERDAS compatible Auxiliary statistic/projection file) and a RRD (ESRI and ERDAS compatible Reduced Resolution Dataset pyramid file) for each image file. Each image file shall have an associated Pyramid Layer file created at a 2X2 kernel, Binomial Interpolation. Each image file shall have statistics calculated with the Skip Factor in the X and Y as 1, and Bin Type as Direct. The auxiliary file shall contain the proper projection information for the tile and shall match the information in the GeoTIFF header. The files shall use the same naming convention as the image tiles but with an ".rrd" and ".aux" extension respectively.
- (i) Image Source: The Contractor may use imagery from multiple exposures, i.e., using the "sweet spot" from a preceding or succeeding image, when creating the tile images. Using "chips" (imagery pieces from other frames) to correct defects is also permitted. All exposures shall be from the same type of sensor and must be from the same acquisition season. When multiple exposures are used in creating a tile, the acquisition date with the largest area shall be used when reporting dates in a single date field, such as metadata or attribute data. An average or mean date shall not be used.
- (j) Metadata: The Contractor shall create Federal Geographic Data Committee (FGDC) compliant, per FGDC-STD-001-1998 specification, metadata file for each digital image file. Metadata must include a separate lineage section for each georeferenced, uncompressed digital image file used in the creation of the DOQQQ. The lineage

title will contain the actual file name of the image tile used. Metadata must parse cleanly through the USGS metadata parser “mp” version 2.8.10 (or later version) without any errors. The metadata file shall use the same naming convention as the DOQQQ but shall use a “.met” extension.

- (k) Media Requirements: All files shall be delivered on internal computer hard drives as defined in Section D-1.3, Internal Hard Drives. **Maximum disk space that can be used cannot exceed ninety percent (90%) of the individual hard drive capacity**. The files shall be stored in a single subdirectory under the root directory called “ortho”.

#### 6.4 Compressed Project Mosaic (CPM) (Applicable only if Option Item 4 is Exercised)

The Contractor shall produce a two (2) compressed project mosaic (CPM) files, a natural color and a near color infrared, for project items using the imagery associated with the tiles created in Section C-6.3, Digital Orthorectified Quarter-Quarter Quadrangle Tiles. The CPMs shall be projected in NAD83, UTM Zone 12 in meters.

- (a) Image Quality. The Contractor shall tone balance the composite DOQQQs to give the CPM a consistent and uniform image quality. The resulting CPM should maintain as much of the original color and appearance of the color corrected tiles as practical.
- (b) Horizontal Accuracy. The accuracy requirements from Section B-2, Horizontal Accuracy Requirements, shall be preserved when creating the CPM using the imagery associated with the quarter quadrangle tiles.
- (c) File Format. The CPMs shall be compressed and saved in LizardTech's MrSID<sup>®</sup> Generation Three (MG3) format. The image header shall contain correct ESRI<sup>®</sup> compatible projection information for the mosaic. When encoding the CPM, the following settings shall be applied: compression block size of 64; both the transparency and background values set to an RGB value of 0,0,0 (black); and use the “maximum zoom level” applicable to the input image, for example: checking the “Use Maximum Zoom Levels for Image” button in the encoding options menu. All standard MrSID<sup>®</sup> MG3 files generated by the LizardTech software (i.e., .sid, .sdw, and .txt) shall be included.
  - (1) Compression Ratio: Compression ratio shall be 15:1. All CPM compression shall be at the same ratio and settings ("region of interest" compressed at a different ratio will not be accepted).
  - (2) MrSID Log File: The Contractor shall provide the “text” file created when generating the CPM. The file shall use the same naming convention as the CCM but with a “.txt” extension.
- (d) Metadata. The Contractor shall create a Federal Geographic Data Committee (FGDC) compliant, per the FGDC-STD-001-1998 specification, metadata file using the Government provided template for each CPM generated. The metadata must

parse cleanly through the USGS metadata parser “mp” version 2.8.10 (or later version) without any errors. The metadata file shall use the same naming convention as the CPM but shall use a “.met” extension.

- (e) Auxiliary File. The Contractor shall provide an “.aux”(statistic/projection files) that is compatible with all ESRI® ArcGIS 9.3 and 10 versions for CPM. The auxiliary file shall contain the proper projection information for the mosaic and shall match the information in the CPM header. The file shall use the same naming convention as the CPM but with an “.aux” extension.
- (f) Media Requirements. All CPMs and associated support files shall be delivered on internal computer hard drives as defined in Section D-1.3, Internal Hard Drives. The Contractor shall not mix imagery from different project items on the same hard drive. The files shall be stored in a single subdirectory under the root directory called “mosaics.”

## 6.5 ABGPS/IMU Data Files

The Contractor shall post-process Airborne Global Positioning System (ABGPS) and Inertial Measurement Unit (IMU) data. The Contractor shall submit the raw and processed data. See Section F-1.7, ABGPS/IMU Data Files. The processed data shall be compatible with ERDAS Imagine, Leica Photogrammetry Suite (LPS), ERDAS Stereo Analyst for ArcGIS, BAE Socet Set, and ERDAS Stereo Analyst for IMAGINE.

The Contractor shall deliver the data in two coordinates systems: projected (using the same coordinates reference system as the GeoTIFF images) and earth-centered earth-fixed (.ecf) format.

- (a) File Format: The ABGPS/IMU Data shall be an ASCII text file. The ASCII text file shall be comma delimited in the following order of ABGPS/IMU post processed data:

Image File Name    X        Y        Z        Kappa Phi    Omega

- (b) Media: ABGPS/IMU data files shall be delivered on internal computer hard drives as defined in Section D-1.3, Internal SATA Hard Drives. The files shall be stored in a separate subdirectories, “raw” and “processed,” under the root directory called “gps”.
- (c) Metadata: The Contractor shall create a metadata file for each ABGPS/IMU file that includes the date of creation and a brief description of the data.

## 6.6 Supplemental GPS Ground Data

The Contractor shall provide any GPS ground data used to supplement the ABGPS positional data adjustments. For example, base stations or CORS. The data shall use the same datum and projection required for the GeoTIFF image files.

- (a) File Format: Supplemental data shall be delivered in a non-proprietary format mutually agreeable to the Government and Contractor. Contractor may use any consistent and logical naming convention.
- (b) Media: All supplemental ground control files shall be delivered on internal computer hard drives as defined in Section D-1.3, Internal Hard Drives. The files shall be stored in a single subdirectory under the root directory called “gps\_base”.
- (c) Metadata: The Contractor shall create a metadata file for each supplemental ground data file that was used to supplement positional data.

6.7 Stereo Block Files (*Applicable only if either Option Item 3, Stereo Block Files, or Option Item 4, DOQQ Orthorectification Services, is Exercised*)

The Contractor shall provide stereo block files so that digital image files created in Section C-6.1, 4-Band, 8-Bit per Band, Color Corrected, Georeferenced, Uncompressed Digital Image Files, and Section C-6.2, 16-Bit Radiometrically Uncorrected, Georeferenced, Uncompressed Digital Image Files (if awarded), can be brought in and viewed in stereo-pairs with very minimal adjustment to the x or y parallax. Data fields in the stereo block file shall be populated with sensor specific data. Each block file should include the average flying height for the area covered by that block file, rather than for the entire project area. In the case of reflights or the completion flight line(s) during an additional acquisition season, the stereo block file must be updated to include new and/or reflight imagery for the affected flight lines.

- (a) Image Reference Structure: One stereo block file shall be produced for each Ranger District, as defined in Section J, Exhibit 1(b) and for each image file bit depth (if Option 3b is exercised). Each block file shall contain reference to images for only one Ranger District and one bit depth. Example: one stereo block file references the 8-bit image files for the Mesa Ranger District and a second stereo block file references the 16-bit image files (if awarded) for the Mesa Ranger District.
- (b) File Format. The stereo block files shall be Leica Photogrammetry Suite (LPS) compatible and shall be readable in Stereo Analyst extensions for ERDAS IMAGINE 2011 and ESRI ArcGIS 9.3 and 10, as well as LPS. The Government prefers the use of .blk over .prj files. See Section J, Exhibit 2 for naming convention.
- (c) Media. Stereo block files shall be delivered on internal computer hard drives as defined in Section D-1.3, Internal SATA Hard Drives. The stereo block files, georeferenced digital image files, and all associated files shall be stored in a single subdirectory called “georeferenced” under the root directory. **Image and data paths for the Stereo Block Files (.blk or .prj) and support files (.sup) should be hardcoded to “e:\”.**
- (d) Metadata. The Contractor shall create FGDC compliant, per the FGDC-STD-001-1998 specification, metadata file for each block file. Metadata must parse cleanly through

the USGS metadata parser “mp” version 2.8.10 (or later version) without any errors. A Metadata template will be provided.

## 6.8 Regional Settings

All digital files, including imagery and metadata, shall be created using standard ANSI English-US setting. For example, periods (ACII 46) shall be used to separate the whole number from the fractional portion when recording decimal numbers and data representing a long date shall be recorded as “Thursday, August 18, 2012 5:09:38 PM.”

## C-7 PROJECT MANAGEMENT

The Contractor shall establish and maintain a project management system with a designated project manager for this effort. Project management consists of those activities required to plan, manage, administer, and control efforts to accomplish the objective of the contract. The project manager identified in the proposal will serve as the primary point of contact for the Contractor’s activity with the Government. The project manager’s contact information shall be identified, in writing, to the Contracting Officer within 21 calendar days of contract award.

### 7.1 Progress Reports

A Progress Report is required for each day progress is made in acquiring project imagery. Each progress report shall be sent by email transmission not later than the day following performance and only for days when performance was accomplished.

In the event that day is a holiday or non-business day, the report shall be sent on the next business day. Separate reports are required from each photographic crew assigned to a project item. Such "next day" reporting shall start when the Contractor receives the Notice to Proceed, and continue until the area is completed or the photographic season and any extensions end. If reflights are determined necessary or ordered by the Contracting Officer, progress reports covering such performance are required.

An e-mail address will be provided at contract award. See Section J, Exhibit 4, Progress Report, for syntax and example.

### 7.2 Flight Logs

The Contractor shall maintain daily flight logs for all acquisition missions. As a minimum, flight logs should record date of flight, tail number, camera serial number and for each flight line information should include: line number, start and stop time, direction, altitude, speed, and number of exposures.

### 7.3 Subcontract Management

If the Contractor uses subcontractors in the performance of the contract, a plan and procedure will be established to manage its subcontractors. Contractor should give prior notification of any subcontracts in accordance with Section G-5, Subcontracts. The Contractor is encouraged to maximize its use of partnerships and subcontractors to accomplish the requirements of this contract. However, the Contractor is solely responsible for the performance and cost control of its partnerships and subcontractors.

7.4 Photo-Center File

The Contractor shall prepare a digital photo-center data file for the aerial imagery delivered under this contract. The photo-center location, latitude and longitude coordinates, shall be corrected to reflect the physical ground location and shall be accurate within 6 meters of true location. The coordinates shall be expressed in Decimal Degrees and formatted to the same datum and projection required for the GeoTIFF image files. The photo-center file must be updated with any resubmissions or corrections to imagery files.

- (a) File Format. The photo-center file(s) shall be provided in ASCII comma delimited text format. A comma delineated header file shall precede the data in each file as shown in the example. Files shall use the naming convention specified in Exhibit 1, File Naming Convention. The file(s) shall include the following attributes:

DESCRIPTION	MAX NUMBER OF CHARACTERS IN FIELD	HEADER NAME
Project Identification Code	6	ProjID
Flight Line Number*	4	FltLn
Exposure Number*	4	ExpNum
Date of Exposure (YYYYMMDD)	8	ExpDate
Time of Exposure – Local 24 Hour Clock (HHMMSS)	6	ExpTime
Sensor Serial Number **	15	Sensor
Corrected Latitude (DD.DDDDDD)	9	Lat
Corrected Longitude (-DDD.DDDDDD (Negative))	11	Lon
Flight Altitude in meters at camera (MMMMM.MM; MSL)	8	FltAlt
Number of GPS Satellites Acquired	2	GPSNum
Position Dilution of Precision (PDOP)	3	PDOP
IMU omega value (Radians)	10	Omega
IMU phi value (Radians)	10	Phi
IMU kappa value (Radians)	10	Kappa

\* Same image number used for image file naming convention.

\*\* If a digital camera has more than one sensor head please use the camera serial number.

Example:

ProjID,FltLn,ExpNum,ExpDate,ExpTime, Sensor,Lat,Lon,FltAlt,GPSNum,PDOP,Omega,Phi,Kappa  
613120,25,1,20110827,130755, 12345678,57.71936,-135.41498,7048.63,5,1.5,,0001358,,01073000,-.873265

- (b) Media. Photo-center file(s) shall be delivered on external computer hard drives as defined in Section D-1.3, External Hard Drives. The files shall be stored in a single subdirectory called “pcf” under the root directory.
- (c) Metadata. The Contractor shall create FGDC compliant, per the FGDC-STD-001-1998 specification, metadata file for each photo-center file. Metadata must parse cleanly through the USGS metadata parser “mp” version 2.8.10 (or later version) without any errors. A metadata template will be provided.

**7.5 Project Geodatabase**

The Contractor shall provide an ESRI® compatible (with ArcGIS 9.3 and 10) file geodatabase projected in the same coordinate system as specified in Section C-6.1 (also Sections C-6.2 and C-6.3 if applicable). The geodatabase shall contain a flight plan feature data set that contains a polygon feature class for each georeferenced exposure footprint, a line feature class for each flight line, and a point feature class for each photo center location delivered under this contract. If ortho option items are awarded, the project geodatabase shall also contain a polygon feature class for an Orthorectified image index and a line feature class for the seamlines. The photo-center location, latitude and longitude coordinates, shall be corrected to reflect the physical ground location and shall be accurate within 6 meters (19.7 feet) of true ground. The coordinates shall be expressed in Decimal Degrees and formatted to the same datum and projection required for the GeoTIFF image files. The project geodatabase must be resubmitted with corrections reflecting any image corrections, reflights, or completion of additional flights after original submission. The filename for the Geodatabase and all feature data sets shall use the naming convention specified in Exhibit 2, File Naming Convention. A template will be provided by the Government.

- (a) Photo Center Point Feature Class. The flight plan feature data set shall include the following attributes for the photo center point feature class:

ATTRIBUTE DESCRIPTION	COLUMN NAME	DATA TYPE	EXAMPLE
Project Identification Code	PROJID	Char(6)	613120
Flight Line number	FLTLN	Char(4) <sup>±</sup>	0025
Exposure number	EXPNUM	Char(4) <sup>±</sup>	0001
Date of exposure (YYYY-MM-DD)	IDATE	Char(10)	2012-08-27
Image file name	NAME	Char(50)	613120_0025_0001_20120827.tif
Point Acquisition date/time*	DATE	Char(16)	08/27/2012 13:52
Color Type**	BCON	Char(3)	M4B
Camera type***	CAM_TYPE	Char(20)	Digital

Camera manufacturer	CAM_MAN	Char(50)	Zeiss
Camera model	CAM_MOD	Char(25)	DMC
Sensor serial number	SENSNUM	Char(100)	30029
Corrected center point latitude (DD.DDDDDD)	LAT	Double(19)‡	57.71936
Corrected center point longitude (-DDD.DDDDDD)	LON	Double(19)‡	-135.41498
Flight altitude in meters at camera (MMMMM.MM; MSL)	FLTALT	Double(19)‡	7048.63
Number of GPS satellites acquired	GPSNUM	Short Integer	5
Position Dilution of Precision (PDOP)	PDOP	Double(19)‡	1.5
IMU omega value (Radians)	OMEGA	Double(19)‡	.0001358
IMU phi value (Radians)	PHI	Double(19)‡	.01073000
IMU kappa value (Radians)	KAPPA	Double(19)‡	-.873265

± Padded with leading zeros

‡ Double data type shall be length of 19 (18 precision, 11 scale)

\* Local 24-hour clock. The start/end time will be for the collection of the individual polygon (will be the same for frame-based systems)

\*\* Possible values are: NC (natural color), CIR (color infrared), and M4B (4-band)

\*\*\* Possible values are: Digital or Film

(b) Flight Line Feature Class. The flight plan feature data set shall include the following attributes for the flight line feature class:

ATTRIBUTE DESCRIPTION	COLUMN NAME	DATA TYPE	EXAMPLE
Project Identification Code	PROJID	Char(6)	613120
Flight Line number	FLTLN	Char(4)±	0025
Date of exposure (YYYY-MM-DD)	IDATE	Char(10)	2012-08-27
Flight Line start date/time*	SDATE	Char(16)	08/27/2012 13:52
Flight Line end date/time*	EDATE	Char(16)	08/27/2012 13:53
Color Type**	BCON	Char(3)	M4B
Camera type***	CAM_TYPE	Char(20)	Digital
Camera manufacturer	CAM_MAN	Char(50)	Intergraph
Camera model	CAM_MOD	Char(25)	DMC
Sensor serial number	SENSNUM	Char(100)	30029
Flight Line Direction	DIR	Char(20)	North
Flight altitude in meters at camera (MMMMM.MM; MSL)	FLTALT	Double(19)‡	7048.63

- ± Padded with leading zeros
- ‡ Double data type shall be length of 19 (18 precision, 11 scale)
- \* Local 24-hour clock. The start/end time will be for the collection of the individual polygon (will be the same for frame-based systems)
- \*\* Possible values are: NC (natural color), CIR (color infrared), and M4B (4-band)
- \*\*\* Possible values are: Digital or Film

(c) Image Footprint Polygon Feature Class. The flight plan feature data set shall include the following attributes for the image footprint polygon feature class:

ATTRIBUTE DESCRIPTION	COLUMN NAME	DATA TYPE	EXAMPLE
Project Identification Code	PROJID	Char(6)	613120
Flight Line number	FLTLN	Char(4) <sup>±</sup>	0025
Exposure number	EXPNUM	Char(4) <sup>±</sup>	0001
Date of exposure (YYYY-MM-DD)	IDATE	Char(10)	2012-08-27
Image file name	NAME	Char(50)	613120_0025_0001_20120827.tif
Polygon start date/time*	SDATE	Char(16)	08/27/2012 13:52
Polygon end date/time*	EDATE	Char(16)	08/27/2012 13:53
Color Type**	BCON	Char(3)	M4B
Camera type***	CAM_TYPE	Char(20)	Digital
Camera manufacturer	CAM_MAN	Char(50)	Intergraph
Camera model	CAM_MOD	Char(25)	DMC
Sensor serial number	SENSNUM	Char(100)	30029
Corrected center point latitude (DD.DDDDDD)	LAT	Double(19) <sup>‡</sup>	57.71936
Corrected center point longitude (-DDD.DDDDDD)	LON	Double(19) <sup>‡</sup>	-135.41498
Flight altitude in meters at camera (MMMMM.MM; MSL)	FLTALT	Double(19) <sup>‡</sup>	7048.63
Number of GPS satellites acquired	GPSNUM	Short Integer	5
Position Dilution of Precision (PDOP)	PDOP	Double(19) <sup>‡</sup>	1.5
IMU omega value (Radians)	OMEGA	Double(19) <sup>‡</sup>	.0001358
IMU phi value (Radians)	PHI	Double(19) <sup>‡</sup>	.01073000
IMU kappa value (Radians)	KAPPA	Double(19) <sup>‡</sup>	-.873265

- ± Padded with leading zeros
- ‡ Double data type shall be length of 19 (18 precision, 11 scale)
- \* Local 24-hour clock. The start/end time will be for the collection of the individual polygon (will be the same for frame-based systems)

- \*\* Possible values are: NC (natural color), CIR (color infrared), and M4B (4-band)  
\*\*\* Possible values are: Digital or Film

(e) Seamline Feature Class. The feature class shall include the following attributes:

ATTRIBUTE DESCRIPTION	COLUMN NAME	DATA TYPE	EXAMPLE
Project Identification Code	PROJID	Char(6)	613120
Area Name	AREA_NM	Char(100)	Tonto National Forest
Method of Creation***	METHD	Char(10)	Manual
Software Used to Generate Seamlines	SOFT	Char(50)	Socet_Set

\*\*\* Possible values are: Manual or Automatic

(f) Orthorectified Image Index Feature Class. The feature class shall include the following attributes:

ATTRIBUTE DESCRIPTION	COLUMN NAME	DATA TYPE	EXAMPLE
Project Identification Code	PROJID	Char(6)	613120
Area Name	AREA_NM	Char(100)	Tonto National Forest
Majority Date of Imagery (YYYY-MM-DD)	IDATE	Char(10)	2012-08-27
Image File Name	NAME	Char(50)	m_3311162_ne_1_12_30_20120721.tif
Pixel Resolution in centimeters	RES	Double(5)	30
Color Type**	BCON	Char(3)	M4B
Image Type	IMG_TYPE	Char(20)	DOQQQ

\*\* Possible values are: NC (natural color), CIR (color infrared), and M4B (4-band)

- (f) Media. The Project Geodatabase shall be delivered on internal computer hard drives as defined in Section D-1.3, Internal SATA Hard Drives. The files shall be stored in a single subdirectory called “index” under the root directory.
- (g) Metadata. The Contractor shall create FGDC compliant, per the FGDC-STD-001-1998 specification, metadata file for each Project Geodatabase. Metadata must parse cleanly through the USGS metadata parser “mp” version 2.8.10 (or later version) without any errors. A metadata template will be provided.

## C-8 QUALITY CONTROL

Quality control shall be exercised by the Contractor continuously throughout the performance of the contract. Procedures shall be established to assure that all contract materials are delivered in

accordance with the delivery schedule and at the required level of accuracy and quality. The Contractor shall inspect and constantly monitor the image quality and coverage, and shall undertake immediate reflights of any imagery where the quality fails to meet minimum requirements of the contract specifications. Any marginal photography/imagery submitted for inspection which does not meet minimum requirements may be rejected. The marginal photography may be accepted, at the Government's convenience, but shall be subject to a price reduction based on the diminished usability of the product. The nature and urgency of this project may require the Government to make equitable financial adjustments for materials deemed rejectable or where product use is adversely impacted. USDA inspection and acceptance procedures are described in Section E, Inspection and Acceptance.

8.1 RMSE Accuracy and Quality Control Report (*Only Applicable if Option 4 is Exercised*)

The Contractor shall provide RMSE accuracy reports and quality control reports generated during the AT and/or orthorectification processes for all image files in accordance with Section F-1.4, RMSE Accuracy and Quality Control Report.

- (a) File Format. The reports shall be delivered in a non-proprietary format mutually agreeable to the Government and Contractor. Contractor may use any consistent and logical naming convention.
- (b) Media. Accuracy Reports shall be delivered on external computer hard drives as defined in Section D-1.3, Internal Hard Drives. The files shall be stored in a single subdirectory under the root directory called "rmse".

## PART I - THE SCHEDULE

### SECTION D - PACKAGING AND MARKING

#### D-1 PREPARATION OF MATERIALS FOR SHIPMENT

All digital imagery and text files shall be labeled and shipped in packaging designed for their protection.

##### 1.1 Compact Disks

All compact disks (CDs) shall be delivered on archival media, 700 Megabytes (80-minute) per disk CD-R, hybrid ISO 9660 Mode 1 format using level 2 interchange with Rockridge and Joliet extensions. The format of the CD will allow long file names up to 64 characters in length, and will be readable by both Windows and UNIX systems where the file names will appear the same on both systems. The Contractor must insure that each and every copy session has been properly closed. No multi-session enabled CDs shall be acceptable. The CD media shall have a label attached identifying the digital contents of the CD in accordance with Section J, Exhibit 3, Figures 1, CD/DVD Label, (thermal printed CDs are acceptable). In addition to the packaging requirements in Section D-2, all CD media shall be packaged in standard single CD jewel cases (5-5/8" x 4-15/16" x 3/8") with a clear front cover. The CD label should be readable without opening the case or removing the CD from the case. "Slim" or other non-standard sized jewel cases will not be accepted.

##### 1.2 Digital Versatile Disk

All digital versatile disks (DVDs) shall be delivered on archival media, single-sided, 4.7 Gigabyte (120-minutes) DVD-R discs. DVD-R(A), DVD-RW, DVD+R, or DVD+RW formats are not acceptable. DVDs shall meet all other requirements, except of the media type, required for CDs (see paragraph above).

##### 1.3 Internal SATA Hard Drives

All hard disk drives (HDDs) used to deliver imagery shall be internal Serial Advanced Technology Attachment (SATA) 3½ inch, 3.0 Gbit/s transfer-rate hard drives, with a minimum rotation speed of 7,200 rpm, not more than 2 Terabyte capacity. **Maximum disk space that can be used cannot exceed seventy-five percent (75%) of the individual hard drive capacity for georeferenced digital image files, and ninety percent (90%) for orthorectified digital image files, unless otherwise specified in Section C.** The SATA drives shall be formatted using Microsoft's NTFS file system. Each drive will be enclosed in a static bag and shall have one label attached directly to the outer surface of the static bag and on placed directly on the internal hard drive identifying the project contained on the drive in accordance with Section J, Exhibit 3, Figure 2, Hard

Drive Labeling Requirements. The drives shall become property of the Government and will not be returned to the Contractor.

#### D-2 PACKAGING FOR SHIPMENT

All material shall be packed for shipment in such a manner that will insure acceptance by common carrier and safe delivery at destination. Containers and closures shall comply with the Interstate Commerce Commission regulations, Uniform Freight Classification rules, or regulations of other carriers as applicable to the mode of transportation. Damaged materials will be replaced by the Contractor at no cost to the Government.

A packing slip shall accompany each shipment and shall itemize all material included in the shipment.

#### D-3 SHIPPING RECEIPTS

Receipts from common carriers for shipment of materials shall be retained by the Contractor and be made available to the Contracting Officer upon request.

#### D-4 SHIPPING CONTAINER MARKINGS

All shipping containers shall be clearly marked with delivery address. See Section F-2, Place of Delivery – FOB Destination, within Consignee’s Premises.

## PART I -THE SCHEDULE

### SECTION E - INSPECTION AND ACCEPTANCE

#### E-1 INSPECTION AND ACCEPTANCE (FEB 1988)(AGAR 452.246-70)

The Contracting Officer or the Contracting Officer's duly authorized representative will inspect and accept the supplies and/or services to be provided under this contract.

Inspection and acceptance will be performed at:

Aerial Photography Field Office  
2222 West 2300 South  
Salt Lake City, Utah 84119-2020

#### E-2 INSPECTION PROCEDURE

All materials specified in Section F-1, Materials to be Delivered, will be inspected to determine conformance to all contract requirements and specifications. Inspection of the image files will be performed utilizing a comprehensive method of quality assurance inspection procedures including a random sampling technique to test for compliance to the horizontal accuracy requirement in the imagery delivered. (Refer to FAR 52.246-2, Inspection of Supplies-Fixed Price and FAR 52.246-4, Inspection of Services-Fixed Price)

If inspection of materials reveals deficiencies that may cause increased time and effort in using the digital imagery and aerial photography as intended, the Government may require the Contractor to perform the services again in conformity with contract requirements, at no increase in contract amount. When the defects in services cannot be corrected by re-performance, the Government may:

- (a) Require the Contractor to take necessary action to ensure that future performance conforms to contract requirements and
- (b) Reduce the contract price to reflect the reduced value of services performed.

The warranty clause in Section I-3, Warranty of Supplies of a Non-Complex Nature, applies to latent defects that cannot reasonably be discovered during a thorough inspection process and is intended for “processing” correction of those defects.

#### E-3 INSPECTION SCHEDULE

The Government will make every effort to inspect all material specified within 60 calendar days after they are received at the point designated. **Therefore, without the complete delivery of all materials the Government cannot efficiently begin inspection, thus delaying the inspection**

**schedule.** Should the inspection procedure be delayed longer than 60 days, the Contractor will be notified of the reason(s) for delay and given the estimated completion date. Contract materials will be inspected in the order of their receipt, unless otherwise prioritized by the Government. Inspection of project items where the photographic season is open will be given priority over projects for which the season has closed.

The Contractor will be notified in writing whether the materials are satisfactory and what areas, if any, shall be reacquired and what materials, if any, shall be remade because of nonconformity with contract requirements.

#### E-4 PARTIAL COVERAGE

If the Contractor obtains only partial coverage for any project item during the season, all partial imagery and contract deliverables shall be processed and delivered according to the requirements specified for completed imagery. Interim products may be required to satisfy partial delivery. The requirement for processing partial coverage may be waived only by the Contracting Officer.

#### E-5 ACCEPTANCE

##### 5.1 Final Acceptance

Final acceptance will be made by the Contracting Officer after inspection by the Government of all required materials delivered at the specified destination. The acceptance date shall be the date of the letter, by the Government to the Contractor, stating all materials are acceptable and an invoice may be submitted.

##### 5.2 Partial Acceptance of a Completed Project

The Government may make a partial acceptance on a completed project area due to the rejection of deficient or non-compliant material(s). A partial acceptance will result in a contract price reduction based on the final determination of contract material compliance to contract requirements and specifications. The Government will issue an acceptance letter to the Contractor, stating the materials that have been accepted and the materials that have been rejected, at which time an invoice may be submitted.

##### 5.3 Partial Acceptance of a Project with a Contract Season Extension

Partial acceptance on any uncompleted project will be made only after the acquisition season has ended and all materials required for the project area have been delivered, inspected, and accepted by the Government. The acceptance date shall be the date of the letter by the Government to the Contractor identifying the amount of partial acceptance and at which time an invoice may be submitted.

E-6 CLAUSES INCORPORATED BY REFERENCE (FEB 1998) (FAR 52.252-2)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this address: [www.arnet.gov/far](http://www.arnet.gov/far).

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES:

- 52.246-02 Inspection of Supplies - Fixed Price (AUG 1996)
- 52.246-04 Inspection of Services - Fixed Price (AUG 1996)
- 52.246-16 Responsibility for Supplies (APR 1984)

PART I - THE SCHEDULE

SECTION F - DELIVERIES OR PERFORMANCE

F-1 MATERIALS TO BE DELIVERED

The materials shall be delivered as required and consist of the following items. Corrected or resubmitted materials must be delivered on media separate from original materials being submitted and include a separate packing slip. The Contractor shall maintain a copy of the digital data until APFO acknowledges receipt.

1.1 PROJECT FLIGHT PLAN

Item	Requirement
Format	ESRI compatible shapefile
Media	Paper Copy, Email, or CD/DVD
Naming Convention	None
Quantity	One (1)
Date of First Submittal	Prior to Commencing Acquisition
Submittal Frequency	Once
Government Approval Required	Yes
Required Metadata	No

1.2 8-BIT, COLOR CORRECTED, GEOREFERENCED, DIGITAL IMAGE FILES

Item	Requirement
Format	GeoTIFF
Media	Hard Drive (see Section D-1.3)
Naming Convention	See Section J, Exhibit 2 (i.e. "613120_0025_0001_20120827_8b.tif")
Quantity	One (1) set of images per set of hard drives. Only one project item on each set of drives.
Date of First Submittal	No later than ninety (90) calendar days after acquisition period.
Submittal Frequency	Once (pre-production sample submission required prior to production)
Government Approval Required	Yes (see Section E)
Required Metadata	Yes (separate file for each image file)

1.3 16-BIT GEOREFERENCED, UNCOMPRESSED DIGITAL IMAGE FILES  
*(Applicable only if Option Item 2 is Exercised)*

Item	Requirement
Format	GeoTIFF
Media	Hard Drive (see Section D-1.3)
Naming Convention	See Section J, Exhibit 2 (i.e. “613120_0025_0001_20120827_16b.tif”)
Quantity	One (1) set of images per set of hard drives. Only one project item on each set of drives.
Date of First Submittal	No later than ninety (90) calendar days after acquisition period.
Submittal Frequency	Once (pre-production sample submission required prior to production)
Government Approval Required	Yes (see Section E)
Required Metadata	Yes (separate file for each image file)

1.4 DIGITAL ORTHORECTIFIED QUARTER-QUARTER QUADRANGLES (DOQQQ)  
*(Applicable Only if Orthorectification Option Item 4 is Exercised)*

Item	Requirement
Format	GeoTIFF (Option Item 4)
Media	Hard Drive (see Section D-1.3)
Naming Convention	See Section J, Exhibit 2 and Exhibit 5 (i.e. “m_3311162_ne_1_15_25_20120721.tif”)
Quantity	One (1) set of ortho-rectified image files per set of hard drives. Only one project item on each set of drives.
Date of First Submittal	No later than one hundred twenty (120) calendar days after acquisition period.
Submittal Frequency	Once (pre-production sample submission required prior to production)
Government Approval Required	Yes (see Section E)
Required Metadata	Yes (separate file for each orthorectified image file)

1.5 COMPRESSED PROJECT MOSAICS (*Applicable Only if Orthorectification Option Item 4 is Exercised*)

Item	Requirement
Format	MrSID (see Attachment C, Paragraph 5.0)
Media	Hard Drive (see Section D-1.3)
Naming Convention	See Section J, Exhibit 2 (i.e. “613120_1-12_1_c.sid”)
Quantity	Two (2) Compressed Project Mosaics: One (1) Natural Color CPM One (1) Color Infrared CPM
Date of First Submittal	Delivered with DOQQs. No later than one hundred twenty (120) calendar days after acquisition period.
Submittal Frequency	Once
Government Approval Required	Yes (see Section E)
Required Metadata	Yes (separate file for each orthorectified image file)

1.6 RMSE ACCURACY AND QUALITY CONTROL REPORTS (*Applicable Only if Orthorectification Option Item 4 is Exercised*)

Item	Requirement
Format	ASCII preferred
Media	Hard Drive (see Section D-1.3)
Naming Convention	None
Quantity	One (1)
Date of First Submittal	Delivered with DOQQ Files
Submittal Frequency	Once
Government Approval Required	No
Required Metadata	None

1.7 PROGRESS REPORTS

Item	Requirement
Format	See Section J, Exhibit 4
Media	Electronic mail
Quantity	One per day per crew
Date of First Submittal	Daily (as required in accordance with Section C- 7.1)
Submittal Frequency	Daily (only required for days that aerial acquisition was accomplished)
Government Approval Required	No
Required Metadata	None

1.8 ABGPS/IMU DATA FILES

Item	Requirement
Format	ASCII comma delimited text file
Media	Hard Drive (see Section D-1.3)
Naming Convention	None
Quantity	One of each file format per set of imagery: One (1) raw One (1) projected One (1) ECEF file format
Date of First Submittal	Delivered with Georeferenced, Uncompressed Digital Image Files (see Section F-1.2)
Submittal Frequency	As necessary
Government Approval Required	No
Required Metadata	Yes

1.9 PHOTO-CENTER FILE

Item	Requirement
Format	ASCII comma delimited text file
Media	Hard Drive (see Section D-1.3)
Naming Convention	See Section J, Exhibit 2
Quantity	One (1)
Date of First Submittal	Delivered with Georeferenced, Stereo, Uncompressed Digital Image Files
Submittal Frequency	As necessary
Government Approval Required	No
Required Metadata	Yes

1.10 PROJECT GEODATABASE

Item	Requirement
Format	ESRI File Geodatabase
Media	Hard Drive (see Section D-1.3)
Naming Convention	See Section J, Exhibit 2
Quantity	One (1)
Date of First Submittal	Delivered with Georeferenced, Stereo, Uncompressed Digital Image Files
Submittal Frequency	Update with ortho-related Feature Classes, and as necessary
Government Approval Required	No
Required Metadata	Yes

1.11 **STEREO-BLOCK FILE(S)** (*Applicable Only if either Option Item 3, Stereo Block Files or Option Item 4, DOQQQ Orthorectification Services is Exercised*)

Item	Requirement
Format	Leica LPS Compatible File
Media	Hard Drive (see Section D-1.3)
Naming Convention	See Section J, Exhibit 2 (i.e. 613050_16b_01.blk)
Quantity	One (1) file per Ranger District per image file type in C-6.1 and C-6.2
Date of First Submittal	Delivered with Georeferenced, Stereo, Uncompressed Digital Image Files
Submittal Frequency	Once
Government Approval Required	No
Required Metadata	Yes (separate file for each block file)

1.12 **PILOT LOGS**

Item	Requirement
Format	Paper copies
Media	Paper
Quantity	One per mission
Date of First Submittal	Delivered with Georeferenced, Uncompressed Digital Image Files (see Section F-1.2)
Submittal Frequency	Once
Government Approval Required	No
Required Metadata	None

F-2 **PLACE OF DELIVERY - FOB DESTINATION, WITHIN CONSIGNEE'S PREMISES**

The materials to be furnished hereunder shall be delivered, all transportation charges paid by the Contractor, and in accordance with FAR Clause 52.247-35, F.o.b. Destination, Within Consignee's Premises, to:

USDA Aerial Photography Field Office  
Attn: Contracting – Resource COR  
2222 West 2300 South  
Salt Lake City, Utah 84119-2020

Offers submitted on a basis other than F.o.b. Destination within consignee's premises will be deemed unacceptable or rejected as non-responsive.

**F-3 SCHEDULE FOR DELIVERY OF MATERIALS**

All delivery materials required in this contract shall be shipped within the time period specified below. Failure to ship within this period will be considered as failure by the Contractor to prosecute the work as to ensure completion and will render the contract subject to default. Date of shipment will be shown by postmark or carrier receipt.

**3.1 Original Materials - Delivery Schedule**

All contract materials, including options, required for a project item shall be shipped no later than the period specified below from the end of the acquisition period, or any season extension thereof. Early delivery of materials is encouraged to facilitate timely inspection and avoid delays due to peak seasonal inspection workload.

<b>DELIVERY SCHEDULE</b>			
<b>Item or Option Number</b>	<b>Project Name</b>	<b>Calendar Days from End of Acquisition</b>	<b>Maximum Required Shipment Date without Season Extension</b>
Project Item 1	Tonto National Forest, AZ, 8-bit, Color Corrected, Rectified, Georeferenced, Uncompressed Digital Image Files	90	December 29, 2012
Option Item 2	16-bit, Radiometrically Unorrected, Rectified, Georeferenced, Uncompressed Digital Image Files	90	December 29, 2012
Option Item 3	Stereo Block Files (if Option Item 3 or 4 is awarded)	90	December 29, 2012
Option Item 4	DOQQQ Orthorectification Services	120	January 28, 2013
Option Item 5	Compress Project Mosaics	120	January 28, 2013

**3.2 Remake Materials - Delivery Schedule**

Remake materials shall be shipped as soon as possible after correction is made, but no later than 30 days after receipt in the Contractor's facility of the materials or data required to make the corrections. Only materials as specifically requested by the Contracting Officer

or Contracting Officer's Representative to be remade shall be submitted for inspection. Signed delivery receipts will be required to verify date of receipt of such data or materials by the Contractor.

#### F-4 PERFORMANCE OF THE WORK

The Contracting Officer will authorize and direct the acquisition period to begin or end anytime within thirty (30) days before or after the approximate acquisition dates specified in Section B, depending upon the weather, ground, foliage, and sun angle conditions required for the project item. No imagery shall be undertaken before the Notice to Proceed is issued or after the final date of the acquisition period (or its extension) has occurred. Weather and ground conditions for all project locations will be monitored daily to determine Contractor compliance to performance requirements.

##### 4.1 Notice To Proceed

The Notice to Proceed will be given by telephone or email, and confirmed in writing by regular mail. Failure of the Contractor to proceed with flights on a project item within ten (10) calendar days after a "Notice to Proceed" is given, may be considered as evidence of failure to perform the work so as to ensure its timely completion. As evidence of performance, Progress Reports shall be submitted.

##### 4.2 Acquisition Period Extension

The Government reserves the right to extend the acquisition period of this contract beyond the approximate period indicated in Section B. A lower minimum sun angle requirement may be necessary to allow the season extension.

The Government may extend the season of this contract, at no increase in price, by written notice to the Contractor at any time prior to the end of the acquisition period. (Refer to FAR 52.217-08, Option to Extend Services)

##### 4.3 Option to Extend the Term of the Contract (MAR 2000) (FAR 52.217-9)

**IT IS THE EXPRESSED INTENT OF THE GOVERNMENT TO HAVE ALL IMAGERY REQUIRED UNDER THIS CONTRACT COMPLETED WITHIN THE ACQUISITION PERIOD SPECIFIED IN SECTION B.**

The Government may extend the term of this contract, at no increase in price, by written notice to the Contractor within six (6) months after the acquisition period has ended. The Contracting Officer may extend this option twice. (Refer to FAR 52.217-09 "Option to Extend the Term of the Contract".)

F-5 CLAUSES INCORPORATED BY REFERENCE (FEB 1998) (FAR 52.252-2)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this address: [www.arnet.gov/far](http://www.arnet.gov/far).

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES:

- 52.211-11 Liquidated Damages-Supplies, Services, or Research and Development (SEP 2000)
- 52.242-15 Stop Work Order (AUG 1989)
- 52.242-17 Government Delay of Work (APR 1984)

PART I - THE SCHEDULE

SECTION G - CONTRACT ADMINISTRATION DATA

G-1 CONTRACTING OFFICE

The Aerial Photography Field Office (APFO) of the United States Department of Agriculture (USDA), Farm Service Agency (FSA), is responsible for the solicitation, award, and administration of this contract.

Communications shall be directed to:

Contracting Officer, USDA - FSA  
Aerial Photography Field Office  
2222 West 2300 South  
Salt Lake City, Utah 84119-2020

Telephone (801) 844-2910  
Facsimile (801) 956-3641

Written correspondence shall reference the contract number and/or solicitation number plus the project item number.

G-2 CONTRACTING OFFICER'S REPRESENTATIVE

Each awarded contract item may have a Contracting Officer's Representative (COR) or a Contracting Officer's Technical Representative (COTR). Such designations will be made either at the time of award or by appointment letter.

G-3 CONTRACT INTERPRETATION

Technical assistance regarding interpretation of the specifications and/or terms of the contract will be provided by the Contracting Officer or the COR. Only the Contracting Officer has authority to award, modify, and terminate contracts. The Contractor is encouraged to visit the USDA-APFO facilities and discuss the contract and inspection procedures.

3.1 Discrepancies

Any discrepancy in the schedule or official flight data shall be immediately called to the attention of the Contracting Officer for decision. A discrepancy shall not be adjusted without approval of the Contracting Officer, except at the Contractor's own risk and expense.

#### G-4 PROGRESS REPORTS

Progress Reports are required for this contract. If completion instructions contained in the reports (see Section J, Exhibit 4) are not adequate, contact the Contracting Officer for clarification. It is essential that all items of information requested on the report be provided. Progress Reports shall be prepared and submitted for performance periods during the acquisition period as stated in Sections C-7.1 and F-1.5, Progress Reports. Failure to comply with the requirement may result in \$25,000 or 5 percent of the contract amount, whichever is less, being withheld from payment. (Refer to FAR 52.242-2, Production Progress Reports)

#### G-5 SUBCONTRACTS

Before entering into a subcontract covering any part of the work called for, the Contractor shall inform the Contracting Officer and submit information required by the Contracting Officer to determine acceptability and approval of the anticipated subcontractor's equipment to be used.

#### G-6 CHARGES TO CONTRACTOR

The USDA may, at its option, correct deficiencies found to exist in connection with materials submitted by the Contractor and deduct from the Contractor's vouchers the cost thereof to the Government. When the deficiencies to be corrected are such that the cost exceeds \$500.00 at current prices, such corrections will be made only with the prior approval of the Contractor, except in the event of termination for default.

#### G-7 INVOICES

One original invoice shall be submitted to the Contracting Officer designated in this contract. To constitute a proper invoice, the invoice must include the following information and/or attached documentation:

- (a) Name and address of the Contractor
- (b) Invoice date and invoice number
- (c) Contract number, or other authorization for supplies delivered or services performed
- (d) Description, quantity, unit of measure, unit price, and extended price of supplies delivered or services performed
- (e) Shipping and payment terms
- (f) Name (where practicable), title, phone number, and complete mailing address of responsible official to whom payment is to be sent
- (g) Any other information or documentation required by the contract
- (h) While not required, contractors are strongly encouraged to assign an identification number to each invoice.

Notice of an apparent error, defect, or impropriety in an invoice will be given to the Contractor within 7 days of receipt of an invoice and suitable documented.

## G-8 PERFORMANCE-BASED PAYMENTS

The Contractor shall adhere to the following performance-based payment description and schedule. Reference Section I-2 Performance-Based Payments (FAR 52.232-32).

### 8.1 Performance-Based Payments

- (a) Proper invoices (see Section G-7) shall be submitted by a Project Item area and line item basis and include information and certification required in FAR Clause 52.232-32, Performance-Based Payments.
- (b) Upon the delivery of materials for a line item, the Contractor may submit an invoice for a maximum of sixty percent (60%) of the total quantity delivered for that line item multiplied by the awarded unit price. Only one performance-based payment will be made per line item within a month. Additional performance-based payment for any corrections or resubmittals will not be accepted.
- (c) No other performance-based payments shall be issued without the Contracting Officer's approval.

### 8.2 Performance Criterion

- (a) In addition to required information and certification, the request for a performance-based payment must include certification of the quantity of products delivered for the line item as listed in Section B. If the Contractor did not complete acquisition within the acquisition period specified in Section B-2.2(c), or any approved extensions, a performance-based payment may be requested based on the percentage of the item delivered and must include certification of the approximate square miles or other unit acquired.
- (b) The Contracting Officer may approve a request for a performance-based payment upon determination that:
  - 1. The basis for which the payment is being requested has been fulfilled by a brief review of progress reports submitted and materials delivered.

### 8.3 Final Acceptance

Upon final acceptance by the Government of a Project Line Item, a proper invoice may be submitted to the Contracting officer.

### G-9 PARTIAL PAYMENTS

For a partially completed project item or partially completed area within a project item, listed as a line item in Section B, Supplies or Services and Prices/Costs, acceptance and payment will be made on a quantity basis at the rate of ninety (90) percent of the amount due. Any payment thus made is a partial payment of the contract. Upon acceptance of the complete project item awarded, the remaining payment, to total the full payment due for the project item awarded, will be made. Partial payments shall be approved by the Contracting Officer under the conditions stated in FAR 52.232-1, Payments.

### G-10 PAYMENT DUE DATE

The required payment date will be thirty (30) calendar days after the date of actual receipt of a proper invoice by the office designated to receive the invoice, or the date all contract deliverables are accepted, whichever is later. The date of the check issued in payment or the date of the payment by electronic funds transfer shall be considered to be the date payment is made.

### G-11 INTEREST ON OVERDUE PAYMENTS

The Prompt Payment Act, Public Law 100-496 (96 Stat. 85, 31 USC 1801) is applicable to payments under this contract and requires the payment to Contractors of interest on overdue payments and improperly taken discounts.

Determinations of interest due will be made in accordance with the provisions of the Prompt Payment Act and Office of Management and Budget Circular A-125.

## PART I - THE SCHEDULE

### SECTION H - SPECIAL CONTRACT REQUIREMENTS

#### H-1 PERMITS AND RESPONSIBILITIES

The Contractor shall, without additional expense to the Government, be responsible for obtaining any necessary licenses and permits, and for complying with any Federal, State, and municipal laws, codes, and regulations applicable to the performance of the work. The Contractor shall also be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.

#### H-2 AIRSPACE PERMITS AND CLEARANCES

It shall be the responsibility of the Contractor to determine and secure all necessary permits and clearances for controlled or restricted airspace areas.

The Contractor shall contact the Federal Aviation Administration (FAA) watch supervisor in charge of the Air Traffic Control (ATC) facility to gain approval to operate within controlled airspace. It is suggested that pre-flight coordination be completed at least one week in advance. The FAA suggests that on the day of the flight, the photo mission pilot will contact the ATC facility and:

- (a) Confirm previous arrangements, and
- (b) State that "this is a photo survey mission" via air/ground communications, and subsequently inform the controller when the flight line is commenced.

Military Operation Areas (MOA) will be identified in advance, and if necessary a contact for airspace clearance established. The Contractor is responsible for obtaining flight approvals and security clearances if required by the U.S. Department of Defense. Photographic and digital materials of classified areas shall be stored, handled, and shipped in accordance with existing security regulations. In the event of difficulty, the Contracting Officer shall be contacted for guidance and/or assistance.

#### H-3 AIRCRAFT REGULATIONS AND CERTIFICATIONS

All aircraft used in the performance of the work under this contract shall be maintained and operated in accordance with all regulations required by the U.S. Department of Transportation, Federal Aviation Administration (FAA). Aircraft operated in the acquisition of aerial photography or digital imagery under this contract shall be FAA certified to the highest flying altitude required to obtain proposed imagery.

#### H-4 OWNERSHIP OF CONTRACT MATERIALS

The Government shall receive copyright and ownership to all data delivered under this contract, including but not limited to photographic materials, imagery, databases, and paper products, upon formal acceptance. The Contractor agrees to transfer copyright to the Government upon payment of the delivery invoice (see G-8, Performance-Based Payments) or final acceptance, whichever occurs first. The Contractor may maintain copyright and ownership of all original or derived works which are not required submittals under this contract. The Contractor is encouraged to create, market, and sell derived works not related to or in direct competition with the data delivered under this contract. For example, if this contract requires 30cm georeferenced, uncorrected imagery be delivered to the Government, the Contractor may create 50cm imagery from the original product, prior to its submittal to the Government, and resell it to other Government agencies or the general public. However, the Government also maintains the rights to derive additional products from the data delivered under this contract. No public distribution of the original or derived works shall be made prior to acceptance by the Government unless specified in the contract or authorized by the Contracting Officer.

#### H-5 NOTICE TO THE GOVERNMENT OF DELAY

The Contractor shall immediately, upon becoming aware of any difficulties in meeting performance requirements during the photographic season or when difficulties are encountered which may delay deliveries under the contract, notify the Contracting Officer in writing thereof. Such notification shall identify difficulties, the reasons therefore, and the estimated period of anticipated delay.

FAILURE OF THE CONTRACTOR TO GIVE SUCH NOTICE MAY PRECLUDE LATER CONSIDERATION OF ANY CLAIM FOR NON-PERFORMANCE DUE TO WEATHER CONDITIONS OR ANY REQUEST FOR AN EXTENSION OF CONTRACT TIME.

#### H-6 WAGE DETERMINATION

The Wage Determination applicable to any contract resulting from this solicitation is determined by the location of the Contractor's establishment. Wage Determination number 1995-0222, Revision 31, dated June 13, 2011, will be applicable for Contractors located nationwide. See Section J, Exhibit 5, Wage Determination.

#### H-7 INDUSTRY SMALL BUSINESS STANDARD

The small business industry size standard for the type of services covered by this procurement, under NAICS code 541922, is the average annual receipts of the concern and its affiliates for the preceding three (3) years not in excess of \$7 million.

PART II - CONTRACT CLAUSES

SECTION I - CONTRACT CLAUSES

I-1 STATEMENT OF EQUIVALENT RATES FOR FEDERAL HIRES (MAY 1989) (FAR 52.222-42)

In compliance with the Service Contract Act of 1965, as amended, and the regulations of the Secretary of Labor (29 CFR part 4), this clause identifies the classes of service employees expected to be employed under the contract and states the wages and fringe benefits payable to each if they were employed by the contracting agency subject to the provisions of 5 U.S.C. 5341 or 5332.

THIS STATEMENT IS FOR INFORMATION ONLY.  
IT IS NOT A WAGE DETERMINATION.

<u>Employee Class</u>	<u>Monetary Wage - Fringe Benefits</u>
Aircraft Pilot	\$25.27
First Officer	\$23.01
Aerial Photographer	\$12.63

I-2 PERFORMANCE-BASED PAYMENTS (AUG 2010) (FAR 52.232-32)

- (a) Amount of payments and limitation on payments. Subject to such other limitations and conditions as are specified in this contract and this clause, the amount of payments and limitations on payments shall be specified in the contract's description of the basis for payment.
- (b) Contractor request for performance-based payments. The Contractor may submit requests for payment of performance-based payments not more frequently than monthly, in a form and manner acceptable to the Contracting Officer. Unless otherwise authorized by the Contracting Officer, all performance-based payments in any period for which payment is being requested shall be included in a single request, appropriately itemized and totaled. The Contractor's request shall contain the information and certification detailed in paragraph (1) and (m) of this clause.
- (c) Approval and payment of requests.
  - (1) The Contractor shall not be entitled to payment of a request for performance-based payment prior to successful accomplishment of the event or performance criterion for which payment is requested has been successfully accomplished in accordance with the terms of the contract. The Contracting Officer may, at any time, require the Contractor to substantiate the successful performance of any event or performance criterion which has been or is represented as being payable.
  - (2) A payment under this performance-based payment clause is a contract financing payment under the Prompt Payment clause of this contract and not subject to the interest penalty provision of the Prompt Payment Act. The designated payment office will pay approved

requests on the 30th day after receipt of the request for performance-based payment. However, the designated payment office is not required to provide payment if the contracting Officer requires substantiation as provided in paragraph (c)(1) of this clause, or inquires into the status of an event or performance criterion or into any of the conditions listed in paragraph (e) of this clause, or into the Contractor certification. The payment period will not begin until the Contracting Officer approves the request.

- (3) The approval by the Contracting Officer of a request for performance-based payment does not constitute an acceptance by the Government and does not excuse the Contractor from performance of obligations under this contract.

(d) Liquidation of performance-based payment.

- (1) Performance-based finance amounts paid prior to payment for delivery of an item shall be liquidated by deducting a percentage or a designated dollar amount from the delivery payment. If the performance-based finance payments are on a delivery item basis, the liquidation amount for each such line item shall be the percent of that delivery item price that was previously paid under performance-based finance payments are on a whole contract basis, liquidation shall be by either predesignated dollar amount. If the performance-based finance payments are on a whole contract basis, liquidation shall be by either predesignated liquidation amounts or a liquidation percentage.

- (2) If at any time the amount of payments under this contract exceeds any limitation in this contract, the Contractor shall repay to the Government the excess. Unless otherwise determined by the Contracting Officer, such excess shall be credited as a reduction on the unliquidated performance-based payment balance(s), after adjustment of invoice payments and balances for any retroactive price adjustments.

(e) Reduction or suspension of performance-based payments. The Contracting Officer may reduce or suspend performance-based payments, liquidate performance-based payments by deduction from any payment under the contract, or take a combination of these actions after finding upon substantial evidence any of the following conditions:

- (1) The Contractor failed to comply with any material requirement of this contract (which includes paragraphs (h) and (i) of this clause).

- (2) Performance of this contract is endangered by the Contractor's:

- (i) Failure to make progress; or
- (ii) Unsatisfactory financial condition.

- (3) The Contractor is delinquent in payment of any subcontractor or supplier under this contract in the ordinary course of business.

(f) Title.

- (1) Title to the property described in this paragraph (f) shall vest in the Government. Vestiture

shall be immediately upon the date of the first performance-based payment under this contract, for property acquired or produced before that date. Otherwise, vestiture shall occur when the property is or should have been allocable or properly chargeable to this contract.

(2) "Property," as used in this clause, includes all of the following described items acquired or produced by the Contractor that are or should be allocable or properly chargeable to this contract under sound and generally accepted accounting principles and practices:

- (i) Parts, materials, inventories, and work in process;
- (ii) Special tooling and special test equipment to which the Government is to acquire title;
- (iii) Nondurable (i.e., noncapital) tools, jigs, dies, fixtures, molds, patterns, taps, gauges, test equipment and other similar manufacturing aids, title to which would not be obtained as special tooling under paragraph (f)(2)(ii) of this clause: and
- (iv) Drawings and technical data, to the extent the Contractor or subcontractors are required to deliver them to the Government by other clauses of this contract.

(3) Although title to property is in the Government under this clause, other applicable clauses of this contract (e.g., the termination clauses) shall determine the handling and disposition of the property.

(4) The Contractor may sell any scrap resulting from production under this contract, without requesting the Contracting Officer's approval, provided that any significant reduction in the value of the property to which the Government has title under this clause is reported in writing to the Contracting Officer.

(5) In order to acquire for its own use or dispose of property to which title is vested in the Government under this clause, the Contractor must obtain the Contracting Officer's advance approval of the action and the terms. If approved the basis for payment (the events or performance criteria) to which the property is related shall be deemed to be not in compliance with the terms of the contract and not payable (if the property is part of or needed for performance), and the Contractor shall refund the related performance-based payments in accordance with paragraph (d) of this clause.

(6) When the Contractor completes all of the obligations under this contract, including liquidation of all performance-based payments, title shall vest in the Contractor for all property (or the proceeds thereof) not -

- (i) Delivered to, and accepted by, the Government under this contract; or
- (ii) Incorporated in supplies delivered to, and accepted by, the Government under this contract and to which title is vested in the Government under this clause.

(7) The terms of this contract concerning liability for Government-furnished property shall not apply to property to which the Government acquired title solely under this clause.

(g) Risk of Loss. Before delivery of and acceptance by the Government, the Contractor shall bear the risk of loss for property, the title to which vests in the Government under this clause, except to the extent the Government expressly assumes the risk. If any property is lost, stolen, damaged, or destroyed, the basis of payment (the events or performance criteria) to which the

- property is related shall be deemed to be not in compliance with the terms of the contract and not payable (if the property is part of or needed for performance), and the Contractor shall refund the related performance-based payments in accordance with paragraph (d) of this clause.
- (h) Records and controls. The Contractor shall maintain records and controls adequate for administration of this clause. The Contractor shall have no entitlement to performance-based payments during any time the Contractor's records or controls are determined by the Contracting Officer to be inadequate for administration of this clause.
- (i) Reports and Government access. The Contractor shall promptly furnish reports, certificates, financial statements, and other pertinent information requested by the Contracting Officer for the administration of this clause and to determine that an event or other criterion prompting a financing payment has been successfully accomplished. The Contractor shall give the Government reasonable opportunity to examine and verify the Contractor's records and to examine and verify the Contractor's performance of this contract for administration of this clause.
- (j) Special terms regarding default. If this contract is terminated under the Default clause,
- (1) The Contractor shall, on demand, repay to the Government the amount of unliquidated performance-based payments, and
  - (2) Title shall vest in the Contractor, on full liquidation of all performance-based payments, for all property for which the Government elects not to require delivery under the Default clause of this contract. The Government shall be liable for no payment except as provided by the Default clause.
- (k) Reservation of rights.
- (1) No payment or vesting of title under this clause shall -
    - (i) Excuse the Contractor from performance of obligations under this contract; or
    - (ii) Constitute a waiver of any of the rights or remedies of the parties under the contract.
  - (2) The Government's rights and remedies under this clause -
    - (i) Shall not be exclusive, but rather shall be in addition to any other rights and remedies proved by law or this contract; and
    - (ii) Shall not be affected by delayed, partial, or omitted exercise of any right, remedy, power, or privilege, nor shall such exercise under this clause or the exercise of any right, power, or privilege of the Government.
- (l) Content of Contractor's request for performance-based payment. The Contractor's request for performance-based payment shall contain the following:
- (1) The name and address of the Contractor;
  - (2) The date of the request for performance-based payment;

- (3) The contract number and/or other identifier of the contract or order under which the request is made;
  - (4) Such information and documentation as is required by the contract's description of the basis for payment; and
  - (5) A certification by a Contractor official authorized to bind the Contractor, as specified in paragraph (m) of this clause.
- (m) Content of Contractor's Certification. As required in paragraph (1)(5) of this clause, the Contractor shall make the following certification in each request for performance-based payment:

I certify to the best of my knowledge and belief that -

- (1) This request for performance-based payment is true and correct; this request (and attachments) has been prepared from the books and records of the Contractor, in accordance with the contract and the instructions of the Contracting Officer;
- (2) (Except as reported in writing on \_\_\_\_\_, all payments to subcontractors and suppliers under this contract have been paid, or will be paid, currently, when due in the ordinary course of business;
- (3) There are no encumbrances (except as reported in writing on \_\_\_\_\_ against the property acquired or produced for, and allocated or properly chargeable to, the contract which would affect or impair the Government's title;
- (4) There has been no materially adverse change in the financial condition of the Contractor since the submission by the Contractor to the Government of the most recent written information dated \_\_\_\_\_; and
- (5) After the making of this requested performance-based payment, the amount of all payments for each deliverable item for which performance-based payments have been requested will not exceed any limitation in the contract, and the amount of all payments under the contract will not exceed any limitation in the contract.

I-3 WARRANTY OF SUPPLIES OF A NONCOMPLEX NATURE. (JUN 2003)  
(FAR 52.246-17)

As prescribed in 46.710(a)(1), insert a clause substantially as follows:

(a) Definitions. As used in this clause-

"Acceptance" means the act of an authorized representative of the Government by which the Government assumes for itself, or as an agent of another, ownership of existing supplies, or approves specific services as partial or complete performance of the contract.

"Supplies" means the end items furnished by the Contractor and related services required under this contract. The word does not include "data."

(b) Contractor's obligations.

(1) Notwithstanding inspection and acceptance by the Government of supplies furnished under this contract, or any condition of this contract concerning the conclusiveness thereof, the Contractor warrants that for a period of one year from the date of final acceptance of all materials:

- (i) All supplies furnished under this contract will be free from defects in material or workmanship and will conform with all requirements of this contract; and
- (ii) The preservation, packaging, packing, and marking, and the preparation for, and method of, shipment of such supplies will conform with the requirements of this contract.

(2) When return, correction, or replacement is required, transportation charges and responsibility for the supplies while in transit shall be borne by the Contractor. However, the Contractor's liability for the transportation charges shall not exceed an amount equal to the cost of transportation by the usual commercial method of shipment between the place of delivery specified in this contract and the Contractor's plant, and return.

(3) Any supplies or parts thereof, corrected or furnished in replacement under this clause, shall also be subject to the terms of this clause to the same extent as supplies initially delivered. The warranty, with respect to supplies or parts thereof, shall be equal in duration to that in paragraph (b)(1) of this clause and shall run from the date of delivery of the corrected or replaced supplies.

(4) All implied warranties of merchantability and "fitness for a particular purpose" are excluded from any obligation contained in this contract.

(c) Remedies available to the Government.

(1) The Contracting Officer shall give written notice to the Contractor of any breach of warranties in paragraph (b)(1) of this clause within 30 days after discovery of the defect.

(2) Within a reasonable time after the notice, the Contracting Officer may either-

- (i) Require, by written notice, the prompt correction or replacement of any supplies or parts thereof (including preservation, packaging, packing, and marking) that do not conform with the requirements of this contract within the meaning of paragraph (b)(1) of this clause; or
- (ii) Retain such supplies and reduce the contract price by an amount equitable under the circumstances.

(3) (i) If the contract provides for inspection of supplies by sampling procedures, conformance of supplies or components subject to warranty action shall be determined by the applicable sampling procedures in the contract. The Contracting Officer-

- (A) May, for sampling purposes, group any supplies delivered under this contract;
- (B) Shall require the size of the sample to be that required by sampling procedures specified in the contract for the quantity of supplies on which warranty action is proposed;
- (C) May project warranty sampling results over supplies in the same shipment or other supplies contained in other shipments even though all of such supplies are not present at the point of reinspection; provided, that the supplies remaining are reasonably representative of the quantity on which warranty action is proposed; and
- (D) Need not use the same lot size as on original inspection or reconstitute the original inspection lots.

(ii) Within a reasonable time after notice of any breach of the warranties specified in paragraph (b)(1) of this clause, the Contracting Officer may exercise one or more of the following options:

- (A) Require an equitable adjustment in the contract price for any group of supplies.
- (B) Screen the supplies grouped for warranty action under this clause at the Contractor's expense and return all nonconforming supplies to the Contractor for correction or replacement.
- (C) Require the Contractor to screen the supplies at locations designated by the Government within the contiguous United States and to correct or replace all nonconforming supplies.
- (D) Return the supplies grouped for warranty action under this clause to the Contractor (irrespective of the f.o.b. point or the point of acceptance) for screening and correction or replacement.

(4) (i) The Contracting Officer may, by contract or otherwise, correct or replace the nonconforming supplies with similar supplies from another source and charge to the Contractor the cost occasioned to the Government thereby if the Contractor-

- (A) Fails to make redelivery of the corrected or replaced supplies within the time established for their return; or
- (B) Fails either to accept return of the nonconforming supplies or fails to make progress after their return to correct or replace them so as to endanger performance of the delivery schedule, and in either of these circumstances does not cure such failure within a period of 10 days (or such longer period as the Contracting Officer may authorize in writing) after receipt of notice from the Contracting Officer specifying such failure.

(ii) Instead of correction or replacement by the Government, the Contracting Officer may require an equitable adjustment of the contract price. In addition, if the Contractor fails to furnish timely disposition instructions, the Contracting Officer may dispose of the nonconforming supplies for the Contractor's account in a reasonable manner. The Government is entitled to reimbursement from the Contractor, or from the proceeds of such disposal, for the reasonable expenses of the care and disposition of the nonconforming supplies, as well as for excess costs incurred or to be incurred.

(5) The rights and remedies of the Government provided in this clause are in addition to and do not limit any rights afforded to the Government by any other clause of this contract.

(End of clause)

I-4 CLAUSES INCORPORATED BY REFERENCE (FEB 1998) (FAR 52.252-2)

This contract incorporates the following clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this address: [www.arnet.gov/far](http://www.arnet.gov/far).

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES:

- 52.202-01 Definitions (JAN 2012)
- 52.203-03 Gratuities (APR 1984)
- 52.203-05 Covenant Against Contingent Fees (APR 1984)
- 52.203-06 Restrictions on Subcontractor Sales to the Government (SEP 2006)
- 52.203-07 Anti-Kickback Procedures (OCT 2010)
- 52.203-08 Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity (JAN 1997)
- 52.203-10 Price or Fee Adjustment for Illegal or Improper Activity (JAN 1997)
- 52.203-12 Limitation on Payments to Influence Certain Federal Transactions (OCT 2010)
- 52.204-04 Printing/Copying Double-Sided on Recycled Paper (MAY 2011)
- 52.204-07 Central Contractor Registration (APR 2008)
- 52.204-08 Annual Representations and Certifications (JAN 2011)
- 52.209-06 Protecting the Government's Interest When Subcontracting With Contractors Debarred, Suspended, or Proposed for Debarment (DEC 2010)
- 52.211-05 Material Requirements (AUG 2000)
- 52.215-02 Audit and Records - Negotiation (OCT 2010)
- 52.215-08 Order of Precedence - Uniform Contract Format (OCT 1997)

- 
- 52.215-11 Price Reduction for Defective Cost or Pricing Data - Modifications (OCT 2010)
  - 52.215-13 Subcontractor Cost or Pricing Data - Modifications (OCT 2010)
  - 52.215-14 Integrity of Unit Prices (OCT 2010)
  - 52.217-08 Option to Extend Services (NOV 1999)
  - 52.217-09 Option to Extend the Term of the Contract (MAR 2000)
  - 52.219-04 Notice of Price Evaluation Preference for HUBZone Small Business Concerns (JAN 2011)
  - 52.219-08 Utilization of Small Business Concerns (JAN 2011)
  - 52.219-09 Small Business Subcontracting Plan (JAN 2011)
  - 52.219-16 Liquidated Damages – Subcontracting Plan (JAN 1999)
  - 52.222-03 Convict Labor (JUN 2003)
  - 52.222-04 Contract Work Hours and Safety Standards Act - Overtime Compensation (JUL 2005)
  - 52.222-19 Child Labor – Cooperation with Authorities and Remedies (JUN 2010)
  - 52.222-21 Prohibition of Segregated Facilities (FEB 1999)
  - 52.222-26 Equal Opportunity (MAR 2007)
  - 52.222-35 Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (SEP 2010)
  - 52.222-36 Affirmative Action for Workers with Disabilities (OCT 2010)
  - 52.222-37 Employment Reports on Special Disabled Veterans and Veterans of the Vietnam Era, and Other Eligible Veterans (SEP 2010)
  - 52.222-41 Service Contract Act of 1965, as Amended (NOV 2007)
  - 52.222-44 Fair Labor Standards Act and Service Contract Act - Price Adjustment (SEP 2009)
  - 52.222-50 Combating Trafficking in Persons (FEB 2009)
  - 52.223-06 Drug-Free Workplace (MAY 2001)
  - 52.223-14 Toxic Chemical Release Reporting (AUG 2003)
  - 52.225-03 Buy American Act - North American Free Trade Agreement - Israeli Trade Act (JUN 2009)

- 52.225-13 Restrictions on Certain Foreign Purchases (JUN 2008)
- 52.227-01 Authorization and Consent (DEC 2007)
- 52.227-02 Notice and Assistance regarding Patent & Copyright Infringement (DEC 2007)
- 52.227-03 Patent Indemnity (APR 1984)
- 52.227-14 Rights in Data - General - Alternate I (DEC 2007)
- 52.229-03 Federal, State, and Local Taxes (APR 2003)
- 52.232-01 Payments (APR 1984)
- 52.232-08 Discounts for Prompt Payment (FEB 2002)
- 52.232-09 Limitation on Withholding of Payments (APR 1984)
- 52.232-11 Extras (APR 1984)
- 52.232-17 Interest (OCT 2010)
- 52.232-18 Availability of Funds (APR 1984)
- 52.232-19 Availability of Funds for the Next Fiscal Year (APR 1984)
- 52.232-23 Assignment of Claims (JAN 1986)
- 52.232-25 Prompt Payment (OCT 2008)
- 52.232-33 Payment by Electronic Funds Transfer – Central Contractor Registration (OCT 2003)
- 52.233-01 Disputes (JUL 2002)
- 52.233-03 Protest After Award (AUG 1996)
- 52.242-02 Production Progress Reports (APR 1991)
- 52.242-13 Bankruptcy (JUL 1995)
- 52.243-01 Changes - Fixed Price - Alternate II (APR 1987)
- 52.244-06 Subcontracts for Commercial Items (DEC 2010)
- 52.245-01 Government Property (AUG 2010)
- 52.245-09 Use and Charges (AUG 2010)

- 52.246-25      Limitation of Liability - Services (FEB 1997)
- 52.248-01      Value Engineering (OCT 2010)
- 52.249-04      Termination for Convenience of the Government (Services) (Short Form) (APR 1984)
- 52.249-08      Default (Fixed-Price Supply and Service) (APR 1984)
- 52.253-01      Computer Generated Forms (JAN 1991)

PART III - LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS

SECTION J - LIST OF ATTACHMENTS

<u>Exhibit</u>	<u>Description</u> .....	<u>Page</u>
Exhibit 1	Project Maps (3 pages) .....	60-62
Exhibit 2	File Naming Convention (2 pages) .....	63-64
Exhibit 3	Labeling Requirements (2 pages) .....	65-66
Exhibit 4	Progress Report (2 pages) .....	67-68
Exhibit 5	Quarter Quarter Quad Numbering Logic (1 page).....	69
Exhibit 6	Wage Determination (4 Pages) .....	70-73
Exhibit 7	Glossary and Definitions (2 pages).....	74-75
Exhibit 8	Flight Line Naming (3 pages).....	76-78
Attachment A:	Aerial Photography Field Office (APFO) Specification for Digital Camera Based Acquisition, dated February 1, 2012 (4 pages)	
Attachment B:	Aerial Photography Field Office (APFO) USDA Digital Imagery Quality Specification, dated February 1, 2012 (4 pages)	
Attachment C:	USDA Digital File Format Specification, April 16, 2010 (10 pages)	

**EXHIBIT 1**  
**Figure 1(a)**  
**PROJECT MAP**

U.S. DEPARTMENT OF AGRICULTURE  
AERIAL IMAGERY  
SOLICITATION NO: AG-8447-S-12-0002  
ITEM 1: Tonto National Forest,  
ARIZONA  
GROUND SAMPLE DIST: 30cm (11.8 inches)  
IMAGERY: 4 Band Direct Digital  
PROJECT IDENTIFICATION CODE: 613120

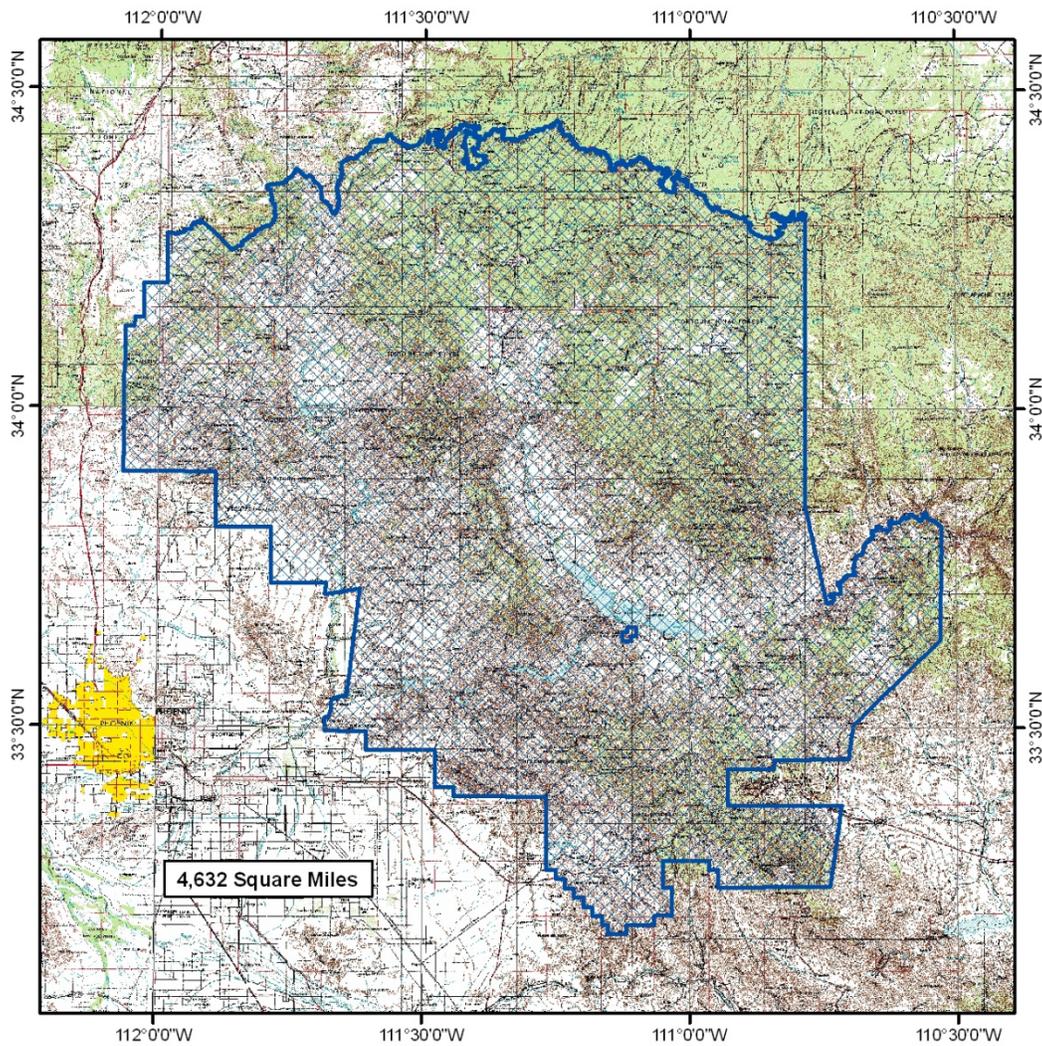
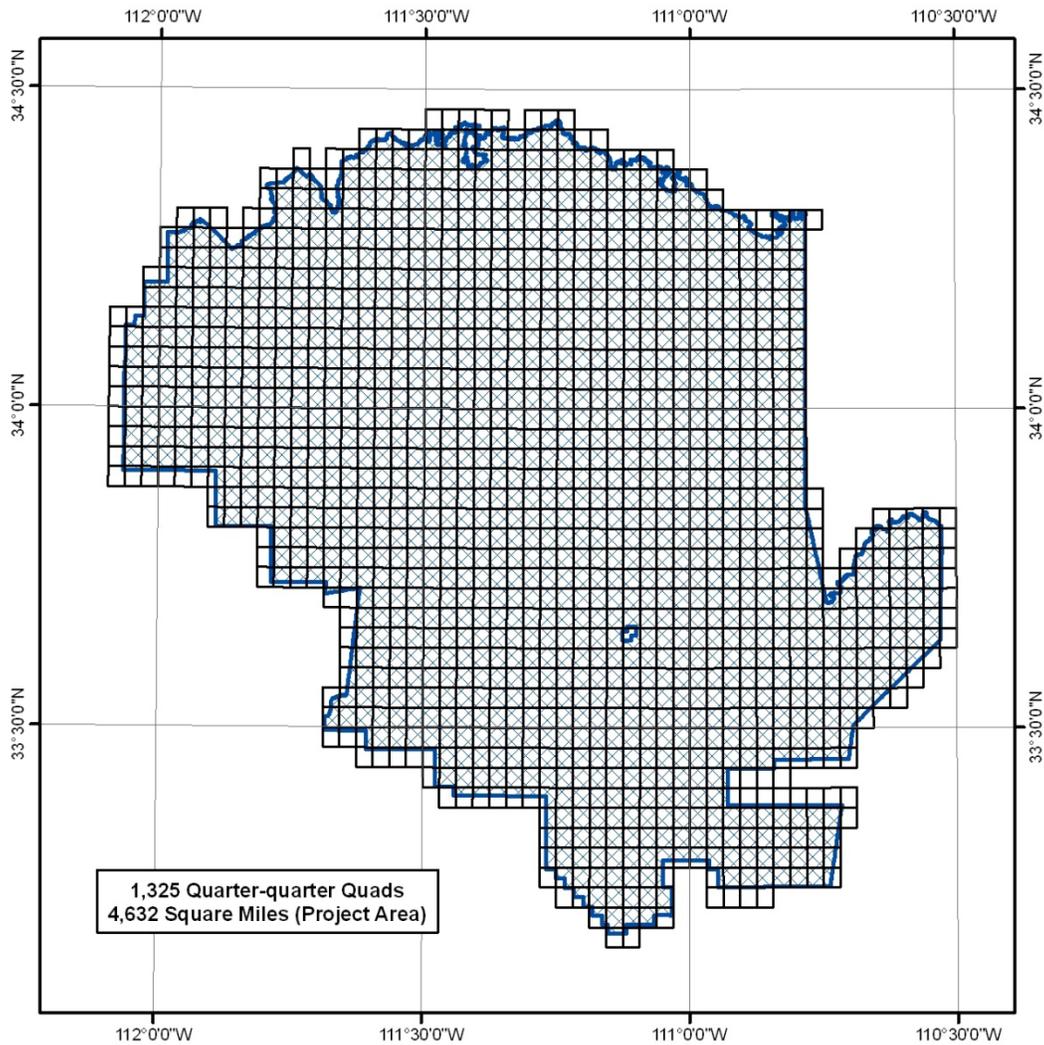


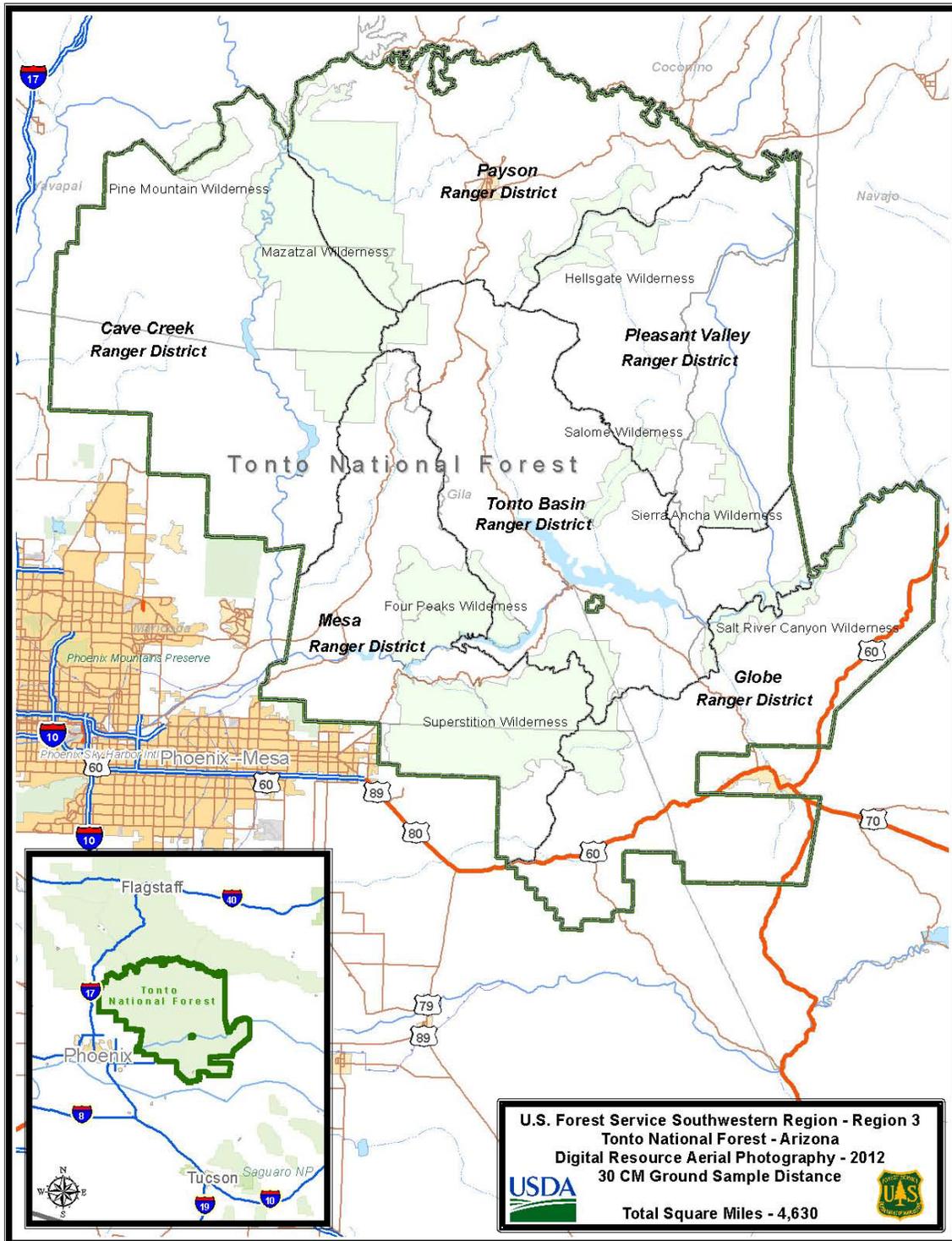
EXHIBIT 1  
**Figure 1(b)**  
PROJECT MAP

U.S. DEPARTMENT OF AGRICULTURE  
AERIAL IMAGERY  
SOLICITATION NO: AG-8447-S-12-0002  
ITEM 1: Tonto National Forest,  
ARIZONA  
GROUND SAMPLE DIST: 30cm (11.8 inches)  
IMAGERY: 4 Band Direct Digital  
PROJECT IDENTIFICATION CODE: 613120



**EXHIBIT 1**  
**Figure 1(c)**  
**PROJECT MAP**

**TONTO NATIONAL FOREST, ARIZONA**  
**RANGER DISTRICT BOUNDARIES**



**EXHIBIT 2**  
**FILE NAMING CONVENTION**

**Georeferenced, Digital Image Files:**

File Name: <project code>\_<flight line >\_<exposure>\_<yyyymmdd>\_<bit>.tif

- <project code> - project code for each project item specified in Section B
- <flight line> - flight line number (4 characters padded with leading zeros)
- <exposure> - consecutively numbered value (4 characters padded with leading zeros)
- <yyyymmdd> - image exposure date
- <bit> - image bit depth (16b or 8b)

Example: 613120\_0025\_0001\_20120827\_8b.tif

**Quadrangle, Quarter Quadrangle and Quarter-Quarter Quadrangle Image Tiles:**  
*(Applicable Only if Orthorectification Option is Exercised):*

QQQ File Name: m\_<lat><lon><quad>\_<loc>\_<n>\_<xx>\_<r>\_<yyyymmdd>.tif

QQ File Name: m\_<lat><lon><quad>\_<loc>\_<xx>\_<r>\_<yyyymmdd>.tif

Q File Name: m\_<lat><lon><quad>\_<xx>\_<r>\_<yyyymmdd>

- m = multispectral
- <lat> - latitude, identified by 2 digit numerical value of a 1° block
- <lon> - longitude, identified by 3 digit numerical value of a 1° block (including the leading “0” if needed)
- <quad> - quadrangle number, identified by grid number
- <loc> - quadrangle location, identified by grid letters (nw, ne, sw, se)
- <n> - quarter quadrangle location, identified by number (1, 2, 3, 4)
- <xx> – two digit UTM zone
- <r> - resolution in centimeters
- <yyyymmdd> - date of acquisition (majority date)

QQQ Example: m\_3311162\_ne\_1\_12\_30\_20120721.tif

QQ Example: m\_3311162\_ne\_12\_30\_20120721.tif

Q Example: m\_3311162\_12\_30\_20120721.img

**Photo-center File:**

File Name: <project code>\_pcf\_<projid>.txt

- <project code> - project code for each project item specified in Section B
- <projid> - project identifier (from B-2)
- <item> - project item number

Example: 613120\_pcf\_1-12\_1.txt

**Project Geodatabase:**

File Name: Project\_Geodatabase\_<project code>\_<projid>.gdb

<project code> - project code for each project item specified in Section B  
<projid> - project identifier (from B-2)

Example: Project\_Geodatabase\_613120\_1dash12.gdb

**Flight Plan Feature Dataset:**

File Name: <area name>\_<project code>\_<projid>\_<item>

<area name> - name of forest or grassland  
<project code> - project code for each project item specified in Section B  
<projid> - project identifier (from B-2)  
<item> - project item number

Example: tonto\_613120\_1dash12\_1

**Image Footprint Feature Class:**

File Name: <footprint type>\_<project code>\_<spatial resolution>\_<spectral resolution>\_<radiometric resolution>\_<projid>\_<item>

<footprint type> - sensor footprint based upon level of processing. Must be uncorrected, georeferenced, or ortho  
<project code> - project code for each project item specified in Section B  
<spatial resolution> - ground sample distance in units as dictated by the contract  
<spectral resolution> - number of bands  
<radiometric resolution> - bit depth (either 8 or 16)  
<projid> - project identifier (from B-2)  
<item> - project item number

Example: georeferenced\_613120\_30\_4\_8\_1dash12\_1

**Flight Line Feature Class:**

File Name: flight\_line\_<project code>\_<projid>\_<item>

<project code> - project code for each project item specified in Section B  
<projid> - project identifier (from B-2)  
<item> - project item number

Example: flight\_line\_613120\_1dash12\_1

**Photo Center Feature Class:**

File Name: photo\_center\_<project code>\_<projid>\_<item>

<project code> - project code for each project item specified in Section B  
<projid> - project identifier (from B-2)  
<item> - project item number

Example: photo\_center\_613120\_1dash12\_1

**Orthorectified Image Index Feature Class:**

File Name: ortho\_index\_<project code>\_<spatial resolution>\_<spectral resolution>\_<projid>\_<item>

<project code> - project code for each project item specified in Section B  
<spatial resolution> - ground sample distance in units as dictated by the contract  
<spectral resolution> - number of bands  
<projid> - project identifier (from B-2)  
<item> - project item number

Example: ortho\_index\_613120\_30\_4\_1dash12\_1

**Seamline Feature Class:**

File Name: seamlines\_<project code>\_<projid>\_<item>

<project code> - project code for each project item specified in Section B  
<projid> - project identifier (from B-2)  
<item> - project item number

Example: seamlines\_613120\_1dash12\_1

**Stereo Block File: (Applicable Only if Stereo Block File or Orthorectification Option is Exercised)**

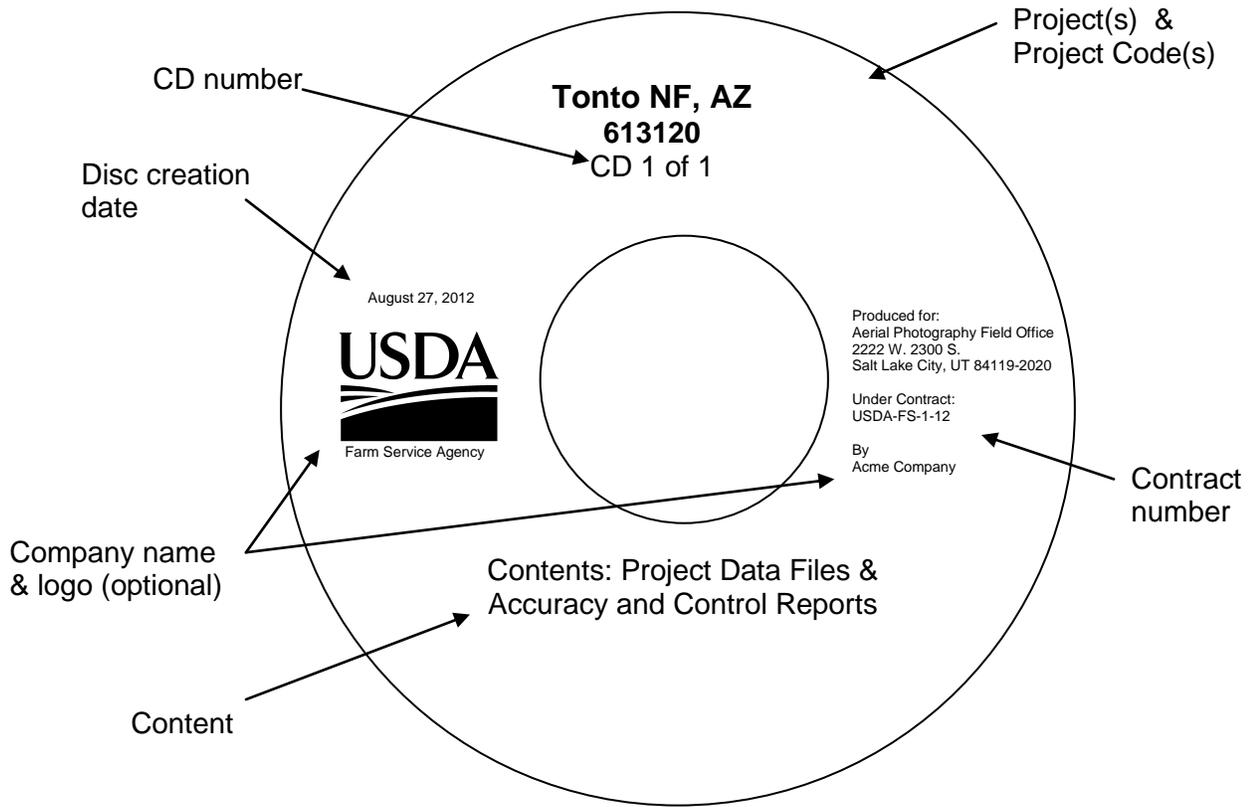
File Name: <project code>\_<bit>\_<block no>.blk

<project code> - project code for each project item specified in Section B  
<bit> - image bit depth (16b or 8b)  
<block no> - consecutively numbered value for each image bit depth  
(2 characters padded with leading zero)

Example: 613120\_16b\_01.blk through 613120\_16b\_05.blk  
613120\_8b\_01.blk through 613120\_8b\_05.blk

**EXHIBIT 3**  
**Figure 1**

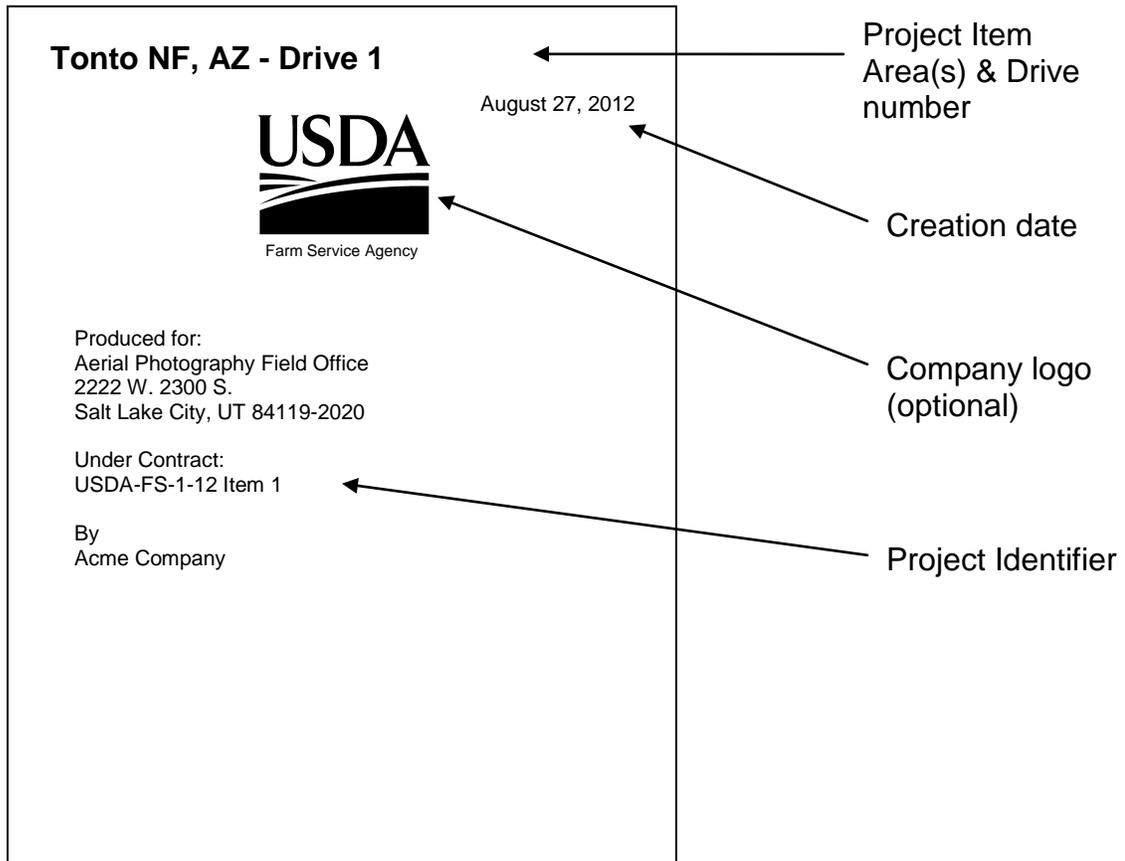
CD/DVD Labeling Requirements



ELEMENT	EXAMPLE
CD Number	CD 1 of 1
Company name & logo	Acme Company
Content	Project Data Files & Accuracy and Control Reports
Project Identifier	USDA-FS-1-12-1
Creation date	August 27, 2012
Project	Tonto NF, AZ
Project Code	613120

**EXHIBIT 3**  
**Figure 2**

Hard Drive Labeling Requirements



ELEMENT	EXAMPLE
Company name & logo	Acme Company
Project Identifier	USDA-FS-1-12-1
Creation date	August 27, 2012
Project item area & drive number	Tonto NF, AZ-Hard Drive 1

Approximate label dimensions: 3-1/2" (width) x 4-1/2" (height)

EXHIBIT 4

PROGRESS REPORT CONVENTION

Syntax:

HEADER ITEMS: field-name “:”[field-body][CRLF]

BODY ITEMS: body item [CRLF]

Header Items:

All four header items are required to be submitted in each and every submittal.

<u>DESCRIPTION</u>	<u>KEYWORD</u>	<u>FORMAT</u>
Contractor Name	CONTRACTOR	Alphanumeric
Contract Award Number	CONTRACT	Numeric (N-YY)
Award Item	ITEM	Numeric (N)
Date Flown	DATE	Date (YYYYMMDD)

Body Items:

All data elements are required for each line of data submitted. Data elements are to be separated by 5 ASCII decimal 32 (white space). Acquisition and rejected exposure stations can be submitted as separate reports or as a combined report.

<u>DESCRIPTION</u>	<u>KEYWORD</u>	<u>FORMAT</u>
Latitude	N/A	DD.DDDDD
Longitude	N/A	-DDD.DDDDD
Status	N/A	Char(1)*

\* Status Field:

A - Indicates the Exposure Station has been collected

R – Indicates the contractor has rejected a previously acquired Exposure Station

When an exposure station is rejected the exposure station will appear in a later report marked with an “R”. Each report submitted should include only one status indicator for a particular exposure station.

EXHIBIT 4 (CON'T)

PROGRESS REPORT CONVENTION

**Sample:**

CONTRACTOR: Acme Photography  
CONTRACT: 1-11  
ITEM: 1  
DATE: 20110827

64.00002,-144.18751,A  
64.04166,-144.18750,A  
64.08332,-144.18752,A  
64.12501,-144.18751,A

Notes:

- 1) Text is case insensitive.
- 2) Header fields are not required to occur in any particular order.
- 3) Body items must occur after the headers.
- 4) Each header item must be on a single line (no “folding”)
- 5) Keywords may not contain spaces and must be followed immediately by a colon.
- 6) The header items and body items may be separated by a NULL line (a blank line with a carriage-return/line-feed (CRLF)(ASCII 13 and 10).
- 7) Body items can only contain one data item per line and must be terminated by a carriage-return/line-feed.
- 8) Contract award number must be sent without prefix (i.e., USDA-FS-4-11 should be sent as 4-11).
- 9) Date must be transmitted as YYYYMMDD.
- 10) No e-mail attachments.

EXHIBIT 5

QUARTER-QUARTER QUAD NUMBERING LOGIC

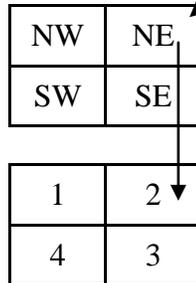
112° 00' 00"  
 34° 00' 00" •

01	02	03	04	05	06	07	08
09	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64

00' 00"

• 33°

111° 00' 00"



The ID for this QQQ would be:  
 3311162\_ne\_2

Each Block (ie: A3) is a full Quad within the 1 degree grid; it is further subdivided into 4 quarter-quads, i.e. 3311162\_ne

Then the quarter quad is further subdivided into quarter-quarter quads:

Sample: 3311162\_ne\_2      Where:

Latitude: Identified by 2 digit numerical value of a 1 degree block.

Longitude: Identified by 3 digit numerical value of a 1 degree block, including a leading "0" as needed.

Quadrangle Number: Identified by grid number (01, 02, 03, ... 63, 64).

Quarter Quadrangle Location: Identified by grid letters (nw, ne, sw, se)

Quarter-Quarter Quadrangle Location: Identified by grid numbers (1, 2, 3, 4)

EXHIBIT 6

WD 95-0222 (Rev.-32) was first posted on www.wdol.gov on 06/17/2011  
Aerial Photographers/Seeding/Spraying

\*\*\*\*\*  
\*\*\*

REGISTER OF WAGE DETERMINATIONS UNDER THE SERVICE CONTRACT ACT By direction of the Secretary of Labor	U.S. DEPARTMENT OF LABOR EMPLOYMENT STANDARDS ADMINISTRATION WAGE AND HOUR DIVISION WASHINGTON, D.C. 20210
Diane C. Koplewski    Division of Wage Director                    Determinations	Wage Determination No: 1995-0222 Revision No: 32 Date Of Revision: 06/13/2011

-----  
Nationwide: Applicable in the continental U.S. Alaska, Puerto Rico, Hawaii and  
Virgin Islands.  
-----

---  
\*\*Fringe Benefits Required Follow the Occupational Listing\*\*

Employed on U.S. Government contracts for aerial photographer, aerial seeding,  
aerial spraying, transportation of personnel and cargo, fire reconnaissance,  
administrative flying, fire detection, air taxi mail service, and other flying  
services.

OCCUPATION CODE - TITLE RATE	FOOTNOTE
31010 - Airplane Pilot 25.27 (not set) - First Officer (Co-Pilot) 23.01 (not set) - Aerial Photographer 12.63	

EXCEPT SCHEDULED AIRLINE TRANSPORTATION AND LARGE MULTI-ENGINE AIRCRAFT SUCH AS  
THE B-727, DC-8, AND THE DC-9.

-----  
ALL OCCUPATIONS LISTED ABOVE RECEIVE THE FOLLOWING BENEFITS:

HEALTH & WELFARE: \$3.59 per hour or \$143.60 per week or \$622.27 per month

VACATION: 2 weeks paid vacation after 1 year of service with a contractor or  
successor; 3 weeks after 5 years, and 4 weeks after 15 years. Length of service  
includes the whole span of continuous service with the present contractor or  
successor, wherever employed, and with the predecessor contractors in the  
performance of similar work at the same Federal facility. (Reg. 29 CFR 4.173)

HOLIDAYS: A minimum of ten paid holidays per year, New Year's Day, Martin  
Luther  
King Jr's Birthday, Washington's Birthday, Memorial Day, Independence Day,  
Labor  
Day, Columbus Day, Veterans' Day, Thanksgiving Day, and Christmas Day. (A  
contractor may substitute for any of the named holidays another day off with  
pay  
in accordance with a plan communicated to the employees involved.) (See 29 CFR

EXHIBIT 6 (Con't)

4174)

VACATION (Hawaii): 2 weeks paid vacation after 1 year of service with a contractor or successor; 3 weeks after 10 years, and 4 weeks after 15 years. Length of service includes the whole span of continuous service with the present contractor or successor, wherever employed, and with the predecessor contractors in the performance of similar work at the same Federal facility. (Reg. 29 CFR 4.173)

HEALTH & WELFARE (Hawaii): \$1.47 per hour, or \$58.80 per week, or \$254.80 per month hour for all employees on whose behalf the contractor provides health care

benefits pursuant to the Hawaii prepaid Health Care Act. For those employees who

are not receiving health care benefits mandated by the Hawaii prepaid Health Care Act, the new health and welfare benefit rate will be \$3.59 per hour.

HAZARDOUS PAY DIFFERENTIAL: An 8 percent differential is applicable to employees employed in a position that represents a high degree of hazard when working with or in close proximity to ordnance, explosives, and incendiary materials. This includes work such as screening, blending, dying, mixing, and pressing of sensitive ordnance, explosives, and pyrotechnic compositions such as lead azide, black powder and photoflash powder. All dry-house activities involving propellants or explosives. Demilitarization, modification, renovation, demolition, and maintenance operations on sensitive ordnance, explosives and incendiary materials. All operations involving regrading and cleaning of artillery ranges.

A 4 percent differential is applicable to employees employed in a position that represents a low degree of hazard when working with, or in close proximity to ordnance, (or employees possibly adjacent to) explosives and incendiary materials which involves potential injury such as laceration of hands, face, or arms of the employee engaged in the operation, irritation of the skin, minor burns and the like; minimal damage to immediate or adjacent work area or equipment being used. All operations involving, unloading, storage, and hauling of ordnance, explosive, and incendiary ordnance material other than small arms ammunition. These differentials are only applicable to work that has been specifically designated by the agency for ordnance, explosives, and incendiary material differential pay.

\*\* UNIFORM ALLOWANCE \*\*

If employees are required to wear uniforms in the performance of this contract (either by the terms of the Government contract, by the employer, by the state or local law, etc.), the cost of furnishing such uniforms and maintaining (by laundering or dry cleaning) such uniforms is an expense that may not be borne by an employee where such cost reduces the hourly rate below that required by the wage determination. The Department of Labor will accept payment in accordance with the following standards as compliance:

The contractor or subcontractor is required to furnish all employees with an adequate number of uniforms without cost or to reimburse employees for the

## EXHIBIT 6 (Con't)

actual cost of the uniforms. In addition, where uniform cleaning and maintenance is made the responsibility of the employee, all contractors and subcontractors subject to this wage determination shall (in the absence of a bona fide collective bargaining agreement providing for a different amount, or the furnishing of contrary affirmative proof as to the actual cost), reimburse all employees for such cleaning and maintenance at a rate of \$3.35 per week (or \$.67 cents per day). However, in those instances where the uniforms furnished are made of "wash and wear" materials, may be routinely washed and dried with other personal garments, and do not require any special treatment such as dry cleaning, daily washing, or commercial laundering in order to meet the cleanliness or appearance standards set by the terms of the Government contract, by the contractor, by law, or by the nature of the work, there is no requirement that employees be reimbursed for uniform maintenance costs.

The duties of employees under job titles listed are those described in the "Service Contract Act Directory of Occupations", Fifth Edition, April 2006, unless otherwise indicated. Copies of the Directory are available on the Internet. A links to the Directory may be found on the WHD home page at <http://www.dol.gov/esa/whd/> or through the Wage Determinations On-Line (WDOL) Web site at <http://wdol.gov/>.

REQUEST FOR AUTHORIZATION OF ADDITIONAL CLASSIFICATION AND WAGE RATE {Standard Form 1444 (SF 1444)}

### Conformance Process:

The contracting officer shall require that any class of service employee which is not listed herein and which is to be employed under the contract (i.e., the work to be performed is not performed by any classification listed in the wage determination), be classified by the contractor so as to provide a reasonable relationship (i.e., appropriate level of skill comparison) between such unlisted classifications and the classifications listed in the wage determination. Such conformed classes of employees shall be paid the monetary wages and furnished the fringe benefits as are determined. Such conforming process shall be initiated by the contractor prior to the performance of contract work by such unlisted class(es) of employees. The conformed classification, wage rate, and/or fringe benefits shall be retroactive to the commencement date of the contract. {See Section 4.6 (C)(vi)} When multiple wage determinations are included in a contract, a separate SF 1444 should be prepared for each wage determination to which a class(es) is to be conformed.

The process for preparing a conformance request is as follows:

- 1) When preparing the bid, the contractor identifies the need for a conformed occupation(s) and computes a proposed rate(s).
- 2) After contract award, the contractor prepares a written report listing in order proposed classification title(s), a Federal grade equivalency (FGE) for each proposed classification(s), job description(s), and rationale for proposed wage rate(s), including information regarding the agreement or disagreement of the authorized representative of the employees involved, or where there is no authorized representative, the employees themselves. This report should be submitted to the contracting officer no later than 30 days after such unlisted class(es) of employees performs any contract work.

### EXHIBIT 6 (Con't)

3) The contracting officer reviews the proposed action and promptly submits a report of the action, together with the agency's recommendations and pertinent information including the position of the contractor and the employees, to the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, for review. (See section 4.6(b)(2) of Regulations 29 CFR Part 4).

4) Within 30 days of receipt, the Wage and Hour Division approves, modifies, or disapproves the action via transmittal to the agency contracting officer, or notifies the contracting officer that additional time will be required to process the request.

5) The contracting officer transmits the Wage and Hour decision to the contractor.

6) The contractor informs the affected employees.

Information required by the Regulations must be submitted on SF 1444 or bond paper.

When preparing a conformance request, the "Service Contract Act Directory of Occupations" (the Directory) should be used to compare job definitions to insure

that duties requested are not performed by a classification already listed in the wage determination. Remember, it is not the job title, but the required tasks that determine whether a class is included in an established wage determination. Conformances may not be used to artificially split, combine, or subdivide classifications listed in the wage determination.

**\*\* OCCUPATIONS NOT INCLUDED IN THE SCA DIRECTORY OF OCCUPATIONS \*\***

**Aerial Photographer**

The aerial photographer must be skilled in reading flight maps, capable of assisting the pilot to adhere to flight lines, be able to level and operate a cartographic camera and its auxiliary equipment mounted in the aircraft so that the photographs that are taken will have the required forward lap and side lap for use in photogrammetric mapping equipment, and possess a working knowledge of aerial films and camera filters to insure proper exposure of the films.

**First Officer (Co-Pilot)**

Is second in command of commercial airplane and its crew while transporting passengers, mail, or other cargo on scheduled or nonscheduled flights. Assists or relieves an airline captain in operating the controls of an airplane; monitoring flight and engine instruments; and maintaining air-to-ground communications.

## EXHIBIT 7

### GLOSSARY AND DEFINITIONS

Acquisition Period: The calendar period in which the project item area imagery is required to be acquired.

Camera System: The combination of lens, cone, magazine(s), and camera filter(s) which have been calibrated as an integral unit.

Contract Award Item: A separately awarded contract that may contain one or more project item areas awarded to a single contractor. Contract award items are indicated by the numeric solicitation number followed by sequential award item numbers (i.e., 1-06-1, 1-06-2, 1-06-3, etc).

Contracting Officer's Technical Representative (COTR): A person who has the responsibility of providing technical information such as site ground and weather conditions on a contract.

Contracting Officer's Representative (COR): A person who is responsible for specific technical and administrative duties related to a contract.

Direct Digital Imagery: Vertical, high resolution imagery directly captured using a digital sensor. Either airborne or space-borne systems.

Exposure Stations: Pre-determined locations where photo centers of individual frames are to be exposed.

Georeferenced: Registering data with correct real world coordinates. Defining location using map coordinates and assignment of a known reference system, which allows data to be viewed, queried, and analyzed with other geographic data.

Ground Sample Distance: The ground sample distance is the distance on the ground represented by each pixel in the x and y components.

Original Imagery/Photography: All aerial imagery/photography, as secured by the Contractor, prior to its inspection by the USDA, including any reflights made at the discretion of the Contractor.

Project Item Area: An area or areas described in the Schedule for which an award shall be made to one offeror.

Reflight Photography: Photography reflown to replace original imagery/photography rejected by USDA.

Remake Materials: Any contract materials ordered remade by USDA.

Stereomodel: The area covered by the conjugate images of three successive overlapping exposures.

Uncorrected: No radiometric corrections or enhancements.

## EXHIBIT 7 (Cont'd)

### FILE EXTENSIONS

.ads: ADS header (text) file, with pointers to .tif segments (for scanning sensors).

.aux: Stands for “auxiliary file.” A file that accompanies the raster in the same location and stores any auxiliary information that cannot be stored in the raster file itself, including statistical information for the raster data set. It can also store the color map, histogram or table, coordinate system, transformation, and projection information.

.blk: Stands for “block file.” A term used to describe and characterize all of the information associated with a photogrammetric mapping project, such as projection, spheroid, and datum; imagery; camera or sensor model information; GCPs; and geometric relationship between imagery and the ground. A block file is a binary file.

.gdb: Stands for “geodatabase.” A geodatabase is a collection of geographic datasets of various types used in ArcGIS and managed in either a file folder or a relational database.

.hist: Stands for “histogram.” XML file containing histogram of imagery.

.ige: Large Raster Spill File. One of two ERDAS IMAGINE files created when an image requiring more than 4GB of disk space is created. It contains the actual image data in a separate non-HFA file format (normally with the extension .ige).

.img: Stands for “image file.” An ERDAS IMAGINE file used to store raster data, including file information, ground control points, sensor information, layer information, attribute data, statistics, map information, projection information, pyramid layers, data file values, compression, and block size. This file uses Hierarchical File Format (HFA).

.odf: File that contains absolute orientation data for every image.

.odf.adj: File that contains adjusted (more accurate) absolute orientation data than what is contained in the .odf data.

.prj: Stands for “project file.” A SOCET SET file containing the information required to restore the current state of a work. All necessary files, settings, and preferences are stored in the project file.

.rrd: Stands for “reduced resolution dataset.” A file containing pyramids created for a raster dataset.

.sup: Stands for “support file.” Generally a SOCET SET file containing photogrammetric metadata associated with an image in a project file.

.tif: Stands for “tagged image file.” High-quality graphics format often used for storing images with many colors, such as digital photos; short for “TIFF;” includes support for layers and multiple pages.

## EXHIBIT 8

### FLIGHT LINE AND EXPOSURE NUMBERING

**Flight Line:** The Contractor shall logically number the flight lines in a consistent manner:

**North-South oriented flights:** Begin with flight line number 0001, for the western most flight line, and numbering each flight line consecutively moving east through the project (Contractor may choose other techniques for numbering flight lines based on specific project layouts).

**East-West oriented flights:** Begin with the most northern most flight line.

**Flight line numbers:** shall start at 0001 and not have any breaks in the consecutive numbering.

**Imagery that is duplicated within a flight line due to flight breaks or datum breaks, or is being resubmitted to the Government due to reflights:**

**Flight breaks and reflights:** shall use the original flight line number but shall be padded with a preceding number in the first digit position (consecutively numbered for each flight line). For example:

- (1) If flight line 0014 required a break due to clouds in the original flight, or a datum break, the new flight with overlapping exposures and continuing exposures, would be numbered 1014.
- (2) If flight line 0015 has a reflight, the first reflight would be numbered 1015. Subsequent breaks and reflights in the same flight line would be numbered in sequence (i.e., 2015, 3015, etc.) and would be limited to the nine available numbers as the leading digit.
- (3) Multiple flight breaks and reflights in a single flight line may share the same leading digit if they do not overlap.

EXHIBIT 8 (Continued)

FLIGHT LINE AND EXPOSURE NUMBERING

**Exposure Number:** The contractor shall consecutively number exposures starting at 0001 at the northern end of each North-South flight line (at the western end for East-West flights) and continue in sequence through the last exposure. The exposure number shall restart at 0001 for each flight line.

Imagery that has flight breaks or is being resubmitted to the Government due to reflights: shall keep the originally planned exposure number. For example:

- (1) If exposure 0006 was the last exposure before a break on flight line 0014, the overlapping exposure would be numbered the same 0006 preceded by a “padded” flight line number, for a combined number of 1014-0006
- (2) If exposure 0050 on flight line 0015 has a reflight, the reflight exposures (minimum 3 exps.) would be numbered with identical exposure numbers, preceded by the “padded” flight line number, for a combined number of 1015-0050.

See below for examples of numbering methods for this project.

EXHIBIT 8 (Continued)

FLIGHT LINE AND EXPOSURE NUMBERING

FLIGHT BREAK:

Line No.  
0014  
Exp. No.

0001

0002

0003

Line No.  
0004 1014  
Exp. No.

0005 0005  
- flight break -  
0006 0006

0007

0008

0009

REFLIGHT:

Line No.  
0015  
Exp. No.

0045

0046

0047 Reflight  
Line No.  
0048 1015  
Exp. No.

0049 0049

0050 0050

0051 X 0051

0052 X 0052

0053 X 0053

PART IV - REPRESENTATIONS AND INSTRUCTIONS

SECTION K

REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF OFFERORS

K-1 ANNUAL REPRESENTATIONS AND CERTIFICATIONS (JAN 2011) (FAR 52.204-8)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is **541922**.

(2) The small business size standard is **\$7 million**.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b)(1) If the clause at 52.204-7, Central Contractor Registration, is included in this solicitation, paragraph (c) of this provision applies.

(2) If the clause at 52.204-7 is not included in this solicitation, and the offeror is currently registered in CCR, and has completed the ORCA electronically, the offeror may choose to use paragraph (c) of this provision instead of completing the corresponding individual representations and certifications in the solicitation. The offeror shall indicate which option applies by checking one of the following boxes:

(i) Paragraph (c) applies.

(ii) Paragraph (c) does not apply and the offeror has completed the individual representations and certifications in the solicitation.

(c) The offeror has completed the annual representations and certifications electronically via the Online Representations and Certifications Application (ORCA) website at <http://orca.bpn.gov>. After reviewing the ORCA database information, the offeror verifies by submission of the offer that the representations and certifications currently posted electronically have been entered or updated within the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201); except for the changes identified below [*offeror to insert changes, identifying change by clause number, title, date*]. These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer.

FAR Clause #	Title	Date	Change
_____	_____	_____	_____

Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on ORCA.

(End of provision)

**K-2 INCOMPLETE CONTRACTS AS OF DATE OF PROPOSAL**

Indicate below incomplete contracts that would utilize the same resources, including equipment and personnel, that are being proposed for utilization on this contract.

<i>Indicate by Square Miles</i>	Remaining Work - Summer	Remaining Work - Winter
U.S. Government Contracts		
All Other Contracts		

**K-3 AIRCRAFT TO BE USED IN COMPLETION OF ITEM(S) IN THIS CONTRACT**

Make/Model	Registration #	Operating Ceiling	Offeror Owned (check appropriate block)
			<input type="checkbox"/> Yes <input type="checkbox"/> No *
			<input type="checkbox"/> Yes <input type="checkbox"/> No *
			<input type="checkbox"/> Yes <input type="checkbox"/> No *

\* If the aircraft is/are not offeror owned, a written statement of availability from the owner of the aircraft must be enclosed. See Section C-2, Description/Specifications/Work Statement.

**K-4 CAMERA(S) TO BE USED IN COMPLETION OF ITEM(S) IN THIS CONTRACT**

Current calibration report(s) must be enclosed or on file at the Aerial Photography Field Office.

Calibration Report Number	Camera Make/Model	Serial Number	Offeror Owned (check appropriate block)
			<input type="checkbox"/> Yes <input type="checkbox"/> No *
			<input type="checkbox"/> Yes <input type="checkbox"/> No *
			<input type="checkbox"/> Yes <input type="checkbox"/> No *

\* If the camera(s) is/are not offeror owned, a written statement of availability from the owner(s) of the camera(s) must be enclosed. See Section C-4, Equipment Requirements.

**K-5 PLACE OF PERFORMANCE (OCT 1997) (FAR 52.215-6)**

(a) The offeror or respondent, in the performance of any contract resulting from this solicitation,  intends,  does not intend [check applicable block] to use one or more plants or facilities located at a different address from the address of the offeror or respondent as indicated in this proposal or response to request for information.

(b) If the offeror or respondent checks “intends” in paragraph (a) of this provision, it shall insert in the following spaces the required information:

PLACE OF PERFORMANCE  
(STREET ADDRESS, CITY,  
STATE, COUNTY, ZIP CODE)

NAME AND ADDRESS OF OWNER  
AND OPERATOR OF THE PLANT OR  
FACILITY IF OTHER THAN OFFEROR  
OR RESPONDENT

_____	_____
_____	_____

**K-6 ADDRESS TO WHICH PAYMENT SHOULD BE MAILED**

In the space provided below, the Contractor is requested to indicate the address to which payment should be mailed, or indicate "same" if it is the same as the address shown on the solicitation form (page 1).

\_\_\_\_\_

\_\_\_\_\_

**K-7 PAST PERFORMANCE REFERENCES**

If no previous contracts have been held by the offeror with the Aerial Photography Field Office, list two (2) references with whom the offeror has held similar contracts. If possible, one reference should be within the Federal Government. List company or agency name, address, name of person to contact, and telephone number:

(1) _____	(2) _____
_____	_____
_____	_____

**K-8 KEY PERSONNEL INTENDED FOR PERFORMANCE ON THIS CONTRACT**

List all key professional and technical personnel intended to perform on this contract. List may include project manager, pilot(s), photographer(s), and key back-up or support personnel.

Name	Title	Education	Years of Experience

**K-9 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)  
 (FAR 52.252-1)**

This contract incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this address: [www.arnet.gov/far](http://www.arnet.gov/far).

**FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) PROVISIONS:**

- 52.203-11 Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions (SEP 2007)
- 52.204-05 Women-Owned Business (Other Than Small Business) (MAY 1999)

## PART IV - REPRESENTATIONS AND INSTRUCTIONS

### SECTION L - INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS

#### L-1 TYPE OF CONTRACT (APR 1984)(FAR 52.216-01)

The Government contemplates award of a Firm-Fixed-Price contract resulting from this solicitation.

#### L-2 INSTRUCTIONS FOR PREPARATION OF TECHNICAL AND PRICING PROPOSALS

The following instructions establish the acceptable minimum requirements for the format and content of proposals. Offerors are advised to furnish all information in the sequence and format specified below. Failure to furnish all information requested may adversely affect the evaluation of the proposal. Proposals will be evaluated in accordance with the evaluation factors set forth in Section M of this solicitation.

##### 2.1 General Instructions

Proposal must be prepared in two parts: Part I: Pricing Proposal, and Part II: Technical Proposal. Each of the parts shall be separate and complete in itself so that evaluation of one may be accomplished independently from evaluation of the other. The technical proposal must not contain any reference to cost or price.

Proposal should be precise, factual and responsive and must include, but is not limited to, the information listed below. Proposal content shall be organized in two separate parts and be submitted in the order indicated as follows:

##### 2.2 PART I - Pricing Proposal

Pricing information and related data shall be submitted as Part I of the offeror's proposal. Each proposal must contain a signed and dated Standard Form 33 (page 1 of the solicitation) with items 12 through 18 completed. Section B should be submitted in its entirety with the quantities offered, the unit price(s), and the total price(s) for the item(s) indicated in the appropriate locations.

##### 2.3 PART II - Technical Proposal

Response to the following technical statements will form the basis of a proposal's technical merit. Offerors are cautioned to address all requested information as complete and accurate as possible. Data contained in Section K of the solicitation document shall be referenced in support of statements. **If a non-frame based sensor is being proposed, the submission of samples are required as indicated in (c) below.**

(a) Past Performance History

- (1) Past performance will be evaluated based on relevant performance history contained in USDA contract records of projects awarded by the FSA Aerial Photography Field Office. Offeror's past performance will be evaluated according to the following criteria and may include other relevant factors:
  - (i) Contract performance record;
  - (ii) Project completion record;
  - (iii) Delivery schedule compliance record.
- (2) If no previous contracts have been held by the offeror with the Aerial Photography Field Office, list two (2) references with whom the offeror has held similar contracts. List past performance references in the space provided in Section K of the solicitation document.
- (3) If an offeror does not have, or have available, a past performance history, the offeror's proposal will not be evaluated favorably or unfavorably on past performance.

(b) Project Management Capability. Statement of project management capability that would assure timely completion and shipment of all work by or before the required delivery schedule. Statement should include detailed description of planned approach, procedures, management techniques, capacities, and specialized equipment and processes to be used in performance of the work. The following should be discussed in detail:

- (1) Subcontract Management. If subcontracts will be utilized in performance of this contract, include a subcontractor management plan: a list of proposed subcontractors, what work they will perform, how their performance will be managed and monitored, and contingency plan in the event of faulty performance.
- (2) Site Basing. Scheduling and site basing of aerial photo crew and aircraft based on knowledge of the weather patterns during the acquisition period and restricted/controlled airspace in vicinity of the project item.
- (3) Aircraft and Sensor Availability. List all aircraft and digital sensors intended to be used in completion of this contract in the appropriate locations in Section K of the solicitation document. If availability of equipment is contingent on other contractual commitments running concurrently with the work contemplated by this solicitation, indicate such in proposal statement. Unless otherwise stated, all aircraft and digital sensors listed will have exclusive availability for performance of the work as defined in this contract.
- (4) Personnel Qualifications. List all professional and technical personnel intended to perform on this contract in the appropriate location in Section K of this solicitation document. Recommended list includes: Project Manager, Aircraft Pilot(s), Aerial Photographer(s), and key back-up or support personnel. Brief resumes may be provided on separate papers for the personnel listed, stating name, title, education, past experience, and years of experience

- (c) Technical Approach. Statement of technical approach that would assure products and/or services meet all contract specifications and requirements. Statement should include detailed description of the digital image processing techniques, capacities, and specialized equipment and processes to be used in performance of the work. A visual representation of the proposed flight plan depicting flight line placement over the project area should be included in the body of the proposal. I.e. a screen print, similar in format to the project maps included in this solicitation. **If a non-frame based digital sensor system is being proposed, the proposal must include a detailed description of the process used in creating files in a tile format similar to that which is produced by a frame based sensor and include sample image tiles. must also be submitted can be.** The following should be discussed in detail:
- (1) Image Processing. Summary of the proposed post-processing workflow such as (i) pan-sharpening (if applicable); (ii) radiometric processing (including histogram stretching, LUT creation methodology, dodging techniques, and atmospheric condition adjustments; (iii) geometric processing; and (iv) initial acquisition inspection.
  - (2) Aero-Triangulation (AT). Describe the proposed AT process (such as traditional block solution or direct geopositioning) and the use of any automatic pass and tie points. Describe the process for collecting ground control (if applicable). Describe the proposed workflow for processing the ABGPS and IMU data.
  - (3) Stereo Block. Explain the production and verification processes to ensure the stereo block file can be utilized via software specified in Section C.
  - (4) Orthorectification. Explain the orthorectification workflow and include at a minimum: (i) step by step process, (ii) software that will be used; (iii) how results will be verified; (iv) indicate the elevation model that would be used; (v) explain the seamline generation process to create the mosaics, including (a) whether automated or manual seamline generation is being proposed and (b) if the contractor prescribes a proprietary in-house developed method, describe the basic method and anticipated results; and (vi) past experience with similar products from a similar geographical area (i.e. mountains and forest).
- (d) Quality Control System. Detailed statement on Contractor quality control system that will insure all contract materials submitted for inspection are in compliance with contract specifications. (See Section C, Description/Specifications/Work Statement, and C-1.3, Quality Control, for quality control requirements.
- (d) Incomplete Contracts. List all incomplete contracts which require performance during the approximate photographic period indicated in Section B that would utilize the same resources, including equipment and personnel listed herein. List shall include project name, client, and remaining linear miles. Total remaining square miles shall be summarized in the appropriate location in Section K, Representations, Certifications, and Other Statements of Offerors, of the solicitation document.

## 2.4 Solicitation Document and Supporting Data

The offeror's proposal must include the following required information and supporting data specified in the solicitation document:

### **Section K:**

- (a) Annual Representations and Certifications (CCR and ORCA),
- (b) Incomplete Contracts as of Date of Proposal,
- (c) Aircraft to be Used in Completion of the Contract,
- (d) Cameras or Digital Sensors to be Used in Completion of the Contract,
- (e) Past Performance References (if required),
- (f) Key Personnel to Perform on the Contract.

### **Section L:**

- (a) Camera Calibration Report(s),
- (b) Current Financial Statement,
- (c) Digital Sensor Sample Imagery

The solicitation document may be submitted in its entirety, complete with Sections C through M, or at a minimum with Sections A, B, K, and L.

## L-3 DIGITAL SENSOR APPROVAL REQUIREMENTS

Each offeror proposing to use a digital camera/sensor, shall have on file with the Aerial Photography Field Office, or shall submit with the offer, (1) a report of calibration, (2) sample digital imagery, **(2a) if the digital sensor proposed is not frame based, sample image tiles and contact prints must be submitted**, (3) digital sensor documentation from the camera/sensor proposed for use. Please refer to Attachment A for digital camera/sensor approval requirements.

For each digital sensor proposed to be used, please indicate which statement is correct:

- Digital Sensor Approval Requirements on file at APFO.
- Digital Sensor Approval Requirements submitted with offer.
- Not required.

## L-4 CURRENT FINANCIAL STATEMENT

Offerors may be required to provide a "current" financial statement. For purposes of this solicitation, a current financial statement would be the most recent annual report, updated, if necessary, so that information reflects the company's financial status within six (6) months.

All data shall be certified by an authorized company officer as to its accuracy and veracity or validated by an independent certified public account. If necessary, the Contracting Officer may request additional financial information.

Financial information received will be treated as confidential and will not be used for purposes other than evaluation of financial responsibility. Failure to provide this information may delay or prohibit the Contracting Officer from making an affirmative decision on the offerors responsibility. Please indicate which statement is correct:

Current financial statement on file at APFO.

Current financial statement submitted with offer.

#### L-5 CONTRACT DIFFICULTIES AND CONTINGENCIES

Offerors are cautioned to examine the solicitation, visit the work location if necessary, and evaluate the facilities needed and difficulties attending the execution of the proposed contract. Considerations include local conditions, uncertainty of weather, availability of landing fields, restricted air space, and all other contingencies.

#### L-6 SERVICE OF PROTEST (SEP 2006) (FAR 52.233-2)

Protests, as defined in Section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO) shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from; Director, Acquisition Management, USDA/FSA/MSD/AG Code 0567, P.O. Box 2415, Washington, D.C. 20013-2415.

The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

#### L-7 INQUIRIES (FEB 1988) (AGAR 452.204-70)

Inquiries and all correspondence concerning this solicitation should be submitted in writing to the Contracting Officer. Offerors should contact only the contracting officer issuing the solicitation about any aspect of this requirement prior to contract award.

#### L-8 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998) (FAR 52.252-1)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this address: [www.arnet.gov/far](http://www.arnet.gov/far).

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) PROVISIONS:

52.207-1 Notice of Standard Competition.(MAY 2006)

52.215-01 Instructions to Offerors - Competitive Acquisition (JAN 2004)

## PART IV - REPRESENTATIONS AND INSTRUCTIONS

### SECTION M - EVALUATION FACTORS FOR AWARD

#### M-1 PROPOSAL EVALUATION

Proposal evaluation is an assessment of the proposal and the offeror's ability to perform the prospective contract successfully. The Government shall establish an evaluation team that includes appropriate contracting, technical, and other expertise to ensure a comprehensive evaluation of proposals.

##### 1.1 Technical Evaluation Team

The Technical Evaluation Team will evaluate, and rank according to technical merit, all proposals in accordance with the evaluation factors established in this solicitation. The team will not have access to the pricing proposal during the technical evaluation process. The offeror's proposal shall be in the format prescribed in Section L and shall contain a response to each of the areas identified.

##### 1.2 Competitive Range

The Contracting Officer shall establish the competitive range based on ratings of each proposal against all evaluation criteria including price. The competitive range shall be comprised of all of the most highly rated proposals. The competitive range can be limited for purposes of efficiency (see FAR 52.215-1(f)(4)). If negotiations are conducted in the source selection process they shall occur after establishment of the competitive range.

##### 1.3 Source Selection Decision

The Contracting Officer shall select for purposes of contract award the overall superior proposal which offers the "best value" to the Government, price and other factors considered. The decision shall be based on a comparative assessment of proposals against all source selection criteria in the solicitation.

##### 1.4 Evaluation of Options (JULY 1990)(FAR 52.217-5)

Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interests, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirement. Evaluation of options will not obligate the Government to exercise the option(s).

## M-2 EVALUATION FACTORS

Proposals shall be evaluated according to the following criteria including all supporting information furnished by the offeror with the proposal. The evaluation criteria are listed in descending order of importance with relative point values indicated. See Section L for instructions for preparation of technical and pricing proposals.

### 2.1 Technical Evaluation

<u>Evaluation Criteria</u>	<u>Relative Point Value</u>
(a) Past Performance History	25
(b) Project Management Capability	25
(c) Technical Approach	20
(d) Quality Control System	20
(e) Incomplete Contracts	<u>10</u>
	100

### 2.2 Price Evaluation

While technical excellence is considered more significant than price, the proposed price between technically superior proposals shall be an important factor in selection of a proposal for award. The Government reserves the right to make an award to other than the lowest priced offeror, or other than the highest technically rated offeror, when the perceived benefits and tradeoffs provide the Government the greatest value.

Based on comparative evaluations of the pricing proposals for the basic and optional award item requirements the Government will consider for award that offer that represents the greatest value and is determined to be in the best interest and the most advantageous to the Government.

Offerors are cautioned to insert the unit price and the total price for the Project Item(s) in the appropriate locations in Section B. In case of discrepancy between a unit price (price per square mile) and an extended price (total price), the unit price will be presumed to be correct, subject, however, to correction to the same extent and in the same manner as any other mistake.

### 2.3 Other Factors

The Contracting Officer will consider, in addition to the evaluation criteria, the prospective Contractor's responsibility record in terms of financial resources, business integrity and ethics, and other standards, as defined in the Federal Acquisition Regulation, Part 9.

### M-3 CONTRACT AWARD

The Government intends to evaluate proposals and award a contract or contracts resulting from this solicitation after conducting discussions with offerors whose proposals have been determined to be within the competitive range.

#### 3.1 Contract Award

The contract will be awarded to that responsive and responsible offeror whose proposal represents the greatest value and is determined to be in the best interest and the most advantageous to the Government, price and other factors considered.

#### 3.2 Possibility of Award Without Discussion

Notice is given to all offerors that there is a possibility that award may be made without discussion or further negotiation. Proposals should be submitted initially on the most favorable terms, from a price and technical standpoint, which the offeror can submit to the Government.

#### 3.3 Required or Requested Information

Award will be made only in conjunction with proposals from responsible prospective Contractors. Failure to provide the information, material, and/or documentation either required in Sections K and L may result in the proposal being rejected. Information requested by the Contracting Officer shall be submitted within eight (8) calendar days of the request, failure to do so may result in the proposal being rejected.

# **AERIAL PHOTOGRAPHY FIELD OFFICE (APFO) SPECIFICATION FOR DIGITAL CAMERA BASED ACQUISITION**

(Dated February 1, 2012 – Modified for USFS Resource Imagery March 26, 2012)

## **1.0 INTRODUCTION AND BACKGROUND**

The U.S. Federal Government has not established an independent government evaluation and calibration policy for digital cameras since sensor technology is still rather new. Until a policy is developed and implemented, the U.S. Department of Agriculture (USDA), Farm Service Agency (FSA) has proceeded to validate the quality and capabilities of current digital cameras by obtaining relevant information from camera manufacturers, data providers, and other government agencies and organizations. The following specifications and requirements have been developed to ensure that any digital camera proposed for use on USDA contracts meets minimum requirements to provide the highest quality digital imagery products.

## **2.0 DIGITAL CAMERA SPECIFICATIONS AND REQUIREMENTS**

This document covers camera specifications and requirements for any direct-digital imagery acquisition under contract to APFO. Cameras for acquiring precise vertical digital imagery are required to be tested and calibrated. Cameras proposed for use must be of comparable, or better, precision and quality as traditional film-based stereoscopic mapping cameras. Imagery captured with digital cameras must also be compatible with analytical mensuration procedures used in photogrammetric surveys and in preparing accurate orthophotography. Documentation and sample imagery will be reviewed and verified by the Government before approval is granted. Only approved digital cameras shall be used on contracts administered by APFO.

## **3.0 GENERAL REQUIREMENTS**

Digital cameras must be tested and calibrated with manufacturer certification documentation. The camera must be geometrically stable and suitable for use in precise, high-accuracy photogrammetric orthoimagery applications. All delivered imagery shall be acquired and processed in such a way as to eliminate or minimize pixel or band offset or misalignment between bands. The camera shall provide the following:

### **3.1 Spatial Resolution**

The camera shall provide the spatial resolution and field of view necessary to meet the ground sample distance (GSD) requirement as specified in the contract.

### **3.2 Image Fusion**

Pan sharpening will be permitted to achieve the necessary spatial resolution requirements. The multi-spectral bands may be used at a ratio no greater than 1:5 (multi-spectral to panchromatic) to achieve the required spatial resolution.

### 3.3 Radiometric Resolution and Accuracy

The camera's sensor shall capture and record a minimum of 12-bits of image information per color channel. If more than one lens and more than one shutter are used in the camera, the difference in radiometric values between two panchromatic or two multi-spectral sensors shall be less than  $\pm 5\%$ . For example, a 12-bit image shall not have more than  $\pm 205$  difference in gray values.

### 3.4 Spectral Resolution

The camera shall capture, as a minimum, natural color (approximately 440 – 850 nm) and near infrared color (approximately 780 – 850 nm) channel data simultaneously or near simultaneously using a single camera (near simultaneously is defined as less than 500 milliseconds). Additional multi-spectral bands may be collected with a secondary or auxiliary camera and/or system.

### 3.5 Camera Operation

The digital camera and its mount shall be checked for proper installation prior to each mission. An automatic exposure control device is permitted, but a manual override capability is required for some types of terrain to achieve proper coverage and exposure. The camera mount shall be regularly serviced and maintained and shall be insulated against aircraft vibration.

### 3.6 Camera Maintenance

The contractor shall perform all maintenance in accordance with the manufacturers recommended and established procedures. The contractor shall maintain a complete history of all maintenance done to the camera system and have it available for Government inspection. The contractor shall provide certification that the system has been maintained, preventive maintenance and calibration performed, to the manufacturers requirements.

### 3.7 System Malfunctions

The contracting officer shall be notified of all camera malfunctions within 72 hours with a written report of the malfunction. A malfunction is defined as a failure in any element or process of the camera that causes an interruption of the normal operations of the camera system (camera system is defined as the camera and any key components, such as camera mount, airborne global positioning system, and on-board data storage). All malfunctions or failures of global positioning systems or inertial measurement unit systems shall also be reported directly to the contracting officer.

#### 4.0 DIGITAL CAMERA APPROVAL REQUIREMENTS

All digital cameras must be approved by the Contracting Officer before acquiring imagery under any APFO contract. When requesting approval, the Contractor shall submit, or have on file with APFO, a report of calibration (see Paragraph 4.1), sample digital imagery (see Paragraph 4.2), and camera documentation (see Paragraph 4.3).

##### 4.1 Calibration Reports

Calibration reports for each digital camera proposed for use shall be submitted to the contracting officer with the contractor's proposal and prior to project imagery acquisition if the digital camera is removed and remounted. The contractor shall follow manufacturer's specifications for appropriate calibration and recalibration. The calibration reports shall address the geometric performance of the camera, and at a minimum, include:

- (a) Date of report
- (b) The name of the person or company performing the calibration
- (c) The methodology and procedures used for calibration
- (d) Final calibration parameters, such as calibrated focal length, lens distortion values, radiometric calibration parameters, and principal point location.

NOTE: The government recognizes that individual calibration reports, procedures, and parameters may be unique to a certain manufacturer since equipment and systems vary from manufacturer to manufacturer.

##### 4.2 Sample Imagery Requirements

The Contractor shall acquire and submit with their proposal, sample images from the digital camera proposed for use. The sample imagery shall provide the following minimum characteristics:

- (a) Display the same GSD resolution required in the solicitation.
- (b) Represent the type of terrain (agriculture, cropland, forest, etc.) that is similar to the proposed project area.
- (c) Re-sampled and submitted as an 8-bits per band image (unless the solicitation requires only 16-bit per band image delivery, in which case the sample imagery shall be submitted as a 16-bits per band image).
- (c) If ortho-rectification is required under the proposed solicitation, the sample image shall be ortho-rectified with the projection specified in the solicitation (for example, North American Datum 1983 (NAD83) and UTM Zone 12).
- (d) Sample shall be produced and submitted in the footprint and file format specified in the solicitation (for example, DOQQ formatted, GeoTIFF image).
- (e) The sample imagery shall fit on one standard CD or DVD. Delivered media will become part of the official Government contract file and will not be returned.

#### 4.3 Camera Documentation Requirements

The Contractor shall provide with their proposal detailed documentation of the digital camera proposed for use. Documentation may include brochures, technical specifications, marketing material, manufacturer's user manuals, or other descriptive literature. The documentation shall contain at a minimum the following information:

- (a) General overview information
- (b) Product configuration description
- (c) Camera component description
- (d) Technical specifications
- (e) Computer management and storage systems
- (f) Image acquisition and processing workflow

.

## **AERIAL PHOTOGRAPHY FIELD OFFICE (APFO) USDA DIGITAL IMAGERY QUALITY SPECIFICATION**

(Dated February 1, 2012 – Modified for USFS Resource Imagery March 26, 2012)

### 1.0 SCOPE

This document establishes the image quality criteria to be used in the production of digital imagery products for all contracts issued by the United States Department of Agriculture's (USDA) Aerial Photography Field Office.

### 2.0 APPLICABLE DOCUMENTS

In the event of conflict between the contents of this specification and the documents referenced herein, the contents of this specification shall take precedence.

- 2.1 National Agriculture Imagery Program (NAIP) Suggested Best Practices – Final Report, dated Feb 1, 2007 (ITT Space Systems Division)

### 3.0 GENERAL REQUIREMENTS

USDA uses imagery for various programs including, but not limited to forest management, agriculture land use analysis, natural resource inventory, and extraction of data by means of photogrammetric interpretation. The complex nature and need for consistent imagery requires adherence to exact format and content of this specification.

- 3.1 Image blemishes, scratches and artifacts. Imagery shall be free of blemishes, scratches, and artifacts that obscure ground feature detail. The following table defines the maximum acceptable limits for blemishes, scratches, and artifacts. Clusters of blemishes, scratches, and artifacts that do not individually meet these criteria may be considered unacceptable.

<b>ACCEPTABLE, IMAGE BLEMISHES, SCRATCHED, AND ARTIFACTS</b>	
1 pixel wide	100 pixels in length
2 pixels wide	60 pixels in length
3 pixels wide	20 pixels in length
4 – 12 pixels wide	12 pixels in length

- 3.2 Band-to-Band Registration Accuracy. Misregistration between any color bands shall not exceed 1 pixel.

- 3.3 Original Image Resolution. The original image, original scan, or original capture used to create the imagery shall not be resampled from the original image resolution greater or less than the following numbers in order to meet the Ground Sample Distance (GSD) specified in the contract:

GROUND SAMPLE DISTANCE (GSD)	ORIGINAL IMAGE RESOLUTION	
	MAXIMUM (meters)	MINIMUM (meters)
0.3-meter	0.15	0.32
0.5-meter	0.25	0.53
1-meter	0.50	1.05

#### 4.0 UNCORRECTED IMAGERY

Uncorrected imagery is defined as imagery that has been minimally processed before exporting to a non-camera specific file format, such as a TIFF. Uncorrected imagery is the closest “match” to a traditional film negative that the direct-digital camera can provide without having the end-user employ special and/or non-standard software.

- 4.1 Non-image data. Imagery shall only use a pixel digital number (DN) of zero (0) for non-data values.
- 4.2 Image Quality. The Contractor shall not make any radiometric enhancements, such as gamma correction, histogram stretching, dodging, or other Look Up Table (LUT) adjustments, to the acquired imagery. The imagery shall not contain any borders, artifacts, or other non-image items.

#### 5.0 COLOR CORRECTED IMAGERY

Imagery required to be color-corrected shall be adjusted so that the image matches the ground at the time of exposure. Adjustments shall include, but not limited to, any dodging, gamma correction, histogram stretching, brightness adjustments, and/or color balancing. The files shall not contain any borders, artifacts, or other non-image items.

- 5.1 Non-image data. Imagery shall only use a pixel digital number (DN) of zero (0) for non-data values.
- 5.2 Natural Color Image Quality.
- (a) Clipping. Imagery shall have a tonal range that prevents the clipping of highlight or shadow detail from the image. When calculated against the luminosity histogram, the cumulative pixel count between the first and last five histogram bin

values (5 and 250 respectively for 8-bit depth) shall not be less than 98.0%, with a preferred value greater than 99%.

- (b) **Contrast.** When calculated against the luminosity histogram, the difference between the histogram digital number (DN) value that contains 99.0% of the cumulative pixel count and the DN value that contains 1.0% shall be greater than  $\pm 59\%$  of the bit depth,  $\pm 4\%$  (aim point of 150,  $\pm 10$  for 8-bit depth). If the cumulative pixel count percentage falls between two histogram bin values, the closest value shall be used. For example, if an 8-bit image has a luminosity DN value 222 contains 99% of the cumulative pixel count and DN value 44 contains 1% count, therefore the difference is 178.

BIT DEPTH	DN DIFFERENCE		
	TARGET	MINIMUM	MAXIUMUM
8-bit	150	140	160
16-bit	38,550	35,930	41,170

- (c) **Brightness.** Imagery shall have a mean pixel count within  $\pm 7.5\%$  of the middle DN value allowed for the bit depth. For example, an 8-bit depth image must have the histogram mean value between 108 and 147.

BIT DEPTH	MEAN DN	
	MINIMUM	MAXIUMUM
8-bit	108	147
16-bit	27,853	37,683

- (d) **Color Balance.** Imagery should have a neutral tonal range without the dominance of any individual color. The difference between the minimum and maximum DN value in a RGB triplet of any nearly neutral objects within the image shall be less than 5.

5.2 **Color infrared Imagery.** All color infrared imagery shall have proper contrast to allow highlight and shadow detail.

5.3 **Multispectral Imagery.** Multispectral Imagery shall be radiometrically processed such that the natural color bands (RGB) meet the quality requirements in paragraph 5.1.

## 6.0 ORTHORECTIFIED IMAGERY

All orthorectified imagery shall be color-corrected in accordance with paragraph 5.0.

6.1 **Geographic Extent.** Imagery shall cover the entire image area, including the required minimum buffer on all four 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.

- 6.2 Specular reflections. Specular reflections in the imagery should be minimized, especially in agriculture areas, by patching the area using “chips” from different imagery but shall be from the same type of camera and must be from the same acquisition season. Any chips used in the imagery shall not have more than  $\pm 3$  pixels offset or the specified horizontal accuracy, whichever is the lesser distance, between the chip and principal image. Any chips used shall be radiometrically balanced in accordance with paragraph 6.3(a).
- 6.3 Image Mosaicking. Imagery may be created using multiple image segments from the same acquisition collection to produce the final product.
- (a) Radiometric Balance. When a mosaic is made from two or more image segments, the brightness and color values between the image segments will be adjusted to match that of neighboring image segments. The join lines between the overlapping image segments 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.
- 6.4 Spatial. All orthoimagery shall meet the horizontal accuracy requirement of the specified project.

## 7.0 DEFINITIONS

Chip – Each separate piece of a mosaicked image that contributes to the final image.

Clipping – The presence of pixels exhibiting the minimum or maximum digital number in an image’s dynamic range.

Digital Number – The value (0-255 for an 8-bit image) that depicts the pixel radiance for that color band.

Dodging – Manipulating the intensity of part of a photograph by selectively shading or masking.

Resample – Interpolation of pixel values based upon neighboring pixel values.

Uncorrected Imagery – Imagery that has been minimally processed, including no radiometric enhancements, such as stretching, dodging, or other Look Up Table (LUT) adjustments, to the acquired imagery.

## ATTACHMENT C

### USDA DIGITAL FILE FORMAT SPECIFICATION

Dated April 16, 2010 - Modified for USFS Resource Imagery March 26, 2012

#### 1.0 SCOPE

This document establishes the file format criteria to be used in the production of digital imagery for all contracts issued by the Aerial Photography Field Office.

#### 2.0 APPLICABLE DOCUMENTS

In the event of conflict between the contents of this specification and the documents referenced herein, the contents of this specification shall take precedence.

- 2.1 TIFF Specification Revision, 6 dated June 3, 1992 (Adobe Systems Inc.). The Tagged Image File Format (TIFF) is a copyrighted standard of Adobe Systems, Inc.
- 2.2 GeoTIFF Revision 1.0 Specification, dated December 28, 2000 (Version 1.8.2). The GeoTIFF Format Specification is a public domain extension of TIFF that provides a robust and flexible method of storing georeferencing information in a TIFF file.
- 2.3 JPEG 2000 Image Coding System, ISO/IEC 15444-1:2004 (JPEG Committee)

#### 3.0 TIFF REQUIREMENTS

Imagery shall be readable by older applications that assume TIFF 5.0 or an earlier version of the specification. Files that use designated “Extended TIFF 6.0 file” features, as defined in Section 2 of the TIFF Specification, shall not be used. This includes, but not limited to, any of the major new extensions such as “tiled images.” Features designated as “not recommended for general data interchange” are considered extensions to the baseline TIFF 6.0 specification and shall not be used. List 1, Tag Listings, List 2 and “tiffinfo” Output shows an example of a TIFF tag listing.

- 3.1 All public tags shall conform to the TIFF Specification and shall not be modified outside of the parameters given in the specification. Use of tag numbers not specified in the TIFF Specification for either Grayscale or RGB full color images, depending on color band of the imagery, is not permitted. As a minimum, the TIFF tags listed in Table 1, Required TIFF Tags, shall be included when creating imagery under this specification.
- 3.2 Tags numbered 32,768 or higher, sometimes called private tags, are reserved and shall not be used unless listed in Table 2, Approved Private Tags. Enumeration constants numbered 32,768 or higher are reserved and shall not be used.
- 3.3 Tags numbered in the “reusable” 65,000-65,535 range shall not be used.

- 3.4 Imagery files shall be created using the little-endian byte order as specified in the TIFF Specification. Bytes 0-1 of the Image File Header must be “II” (4949.H).
- 3.5 Imagery files shall only have a single Image File Directory (IFD).
- 3.6 Tiled TIFF files are not allowed.

Table 1, Required TIFF Tags

TAG NAME	DESCRIPTION
ImageDescription tag (270.d, 10e.h)	The ImageDescription tag shall contain the project item name. For example, under this contract the tag will read: “USDA-FSA-APFO-U.S. Forest Service Resource Program”
DocumentName tag (269.d, 10d.h)	Unless otherwise specified in the contract, the DocumentName tag shall have the following form: <Quad Name> <Quadrant> <Quad id> where: <Quad Name> is the name of the quadrangle taken from the provided list of quarter quadrangles for a county. <Quadrant> Is the quadrant identifier for a quadrangle. <Quad id> is the “Usgsqdno” field taken from the provided list of quarter quadrangles for a county

Table 2, Approved Private Tags

TAG NAME	ID
ModelPixelScaleTag	33550 (SoftDesk)
ModelTransformationTag	34264 (JPL Carto Group)
INGR Packet Data Tag	33918 (Intergraph)
INCR Flag Registers	33919 (Intergraph)
IrasB Transformation Matrix	33920 (Intergraph)
UnUsed	33921 (Intergraph)
ModelTiepointTag	33922 (Intergraph)
GeoKeyDirectoryTag	34735 (SPOT)
GeoDoubleParamsTag	34736 (SPOT)
GeoAsciiParamsTag	34737 (SPOT)

#### 4.0 GeoTIFF REQUIREMENTS

Georeferenced tagged image format (GeoTIFF) imagery shall meet all requirements listed in paragraph 3.0, TIFF Requirements, and be produced in accordance with this specification, the GeoTIFF 1.0 Specification, and the baseline TIFF 6.0 Specification (stated in order of precedent). List 3, ListGeo Output shows an example of a GeoTIFF tag listing.

- 4.1 A GeoTIFF file is a TIFF 6.0 file, and inherits the file structure as described in the corresponding portion of the TIFF Specification. All GeoTIFF specific information is encoded in several additional reserved TIFF tags, and contains no private Image File Directories (IFD's), binary structures, or other private information invisible to standard TIFF readers.
- 4.2 The GeoTIFF 1.0 standard uses a MetaTag (GeoKey) approach to encode dozens of data elements into just six TIFF 6.0 tags. GeoKeys are structurally similar to TIFF 6.0 tags, but at one lower level of abstraction. As a minimum, the four tags listed in Table 3, Required GeoTIFF MetaTags, shall be included when creating imagery under this specification.
- 4.3 As a minimum, the TIFF tags listed in Table 1, Required TIFF Tags, and Table 2, Required GeoTIFF Specific Tags, shall be included when creating imagery under this specification.

Table 3, Required GeoTIFF Specific Tags

TAG NAME	DESCRIPTION
ModelPixelScaleTag (33550.d, 830e.h)	The X and Y values must be populated and be equal to the ground distance of one pixel.
ModelTiepointTag (33922.d, 8482.h)	This tag specifies the (X,Y) ground coordinates of the (0,0) image pixel, by convention in the upper left corner of the image. GeoTIFF 1.0 allows considerable flexibility in how an image is tied to the ground, but image data should be tied to the (0,0) pixel. The Z coordinate value should be set to 0. See section 2.6.1 of the GeoTIFF 1.0 standard.
GeoAsciiParamsTag (34737.d, 87b1.h) (required)	This tag is used to store all the ASCII-valued GeoKeys. See section 2.4 of the GeoTIFF 1.0 standard.
GeoKeyDirectoryTag (34735.d, 87af.h) (required)	This tag references all non-ASCII GeoKeys. All projection and datum information is stored in GeoKeys. See section 2.10.2.2 of this standard and section 2.4 of the GeoTIFF 1.0 standard.

Table 3, Required GeoTIFF MetaTags

TAG NAME	DESCRIPTION
GTModelTypeGeoKey (1024.d, 400.h) (required)	The required value is 1 (ModelTypeProjected).
GTRasterTypeGeoKey (1025.d, 401.h) (required)	<ul style="list-style-type: none"> <li>a. The required value is 1 (RasterPixelIsArea) which is the default value.</li> <li>b. The "PixelIsArea" raster grid space uses coordinates I and J, with (0,0) denoting the upper-left corner of the image, and increasing I to the right, increasing J down. The first pixel-value fills the square grid cell with the bounds top-left = (0,0), bottom-right = (1,1) and so on; by extension this one-by-one grid cell is also referred to as a pixel. An N by M pixel image covers an area with the mathematically defined bounds (0,0),(N,M).</li> <li>c. This raster space designates the upper-left corner of an image. The coordinate pair values for this location shall be "a whole number of pixels." Each value "must be integer multiple of the resolution" of the imagery. For a 1-meter resolution image this pair can be odd or even whole numbers, for a 2-meter resolution image this pair needs to even whole numbers.</li> <li>d. The desired result is to have "Exact Pixel Registration," meaning that pixels from multiple images line up exactly. This should not be confused with overlaps or gaps, but the cells have to fall on an even multiple of the cell width and height from one another, and adjacent images cannot have cells starting halfway, or partially into the cells of the original image</li> </ul>
ProjectedCSTypeGeoKey (3072.d, c00.h) (required)	This key contains a coded value for the projection, datum, and possibly plane coordinate zone. Legal values for this key are listed in section 6.3.3.1 of the GeoTIFF 1.0 standard.
PCSCitationGeoKey (3073.d, c01.h) (required)	<p>This is a free text field for describing the projection and datum. These fields shall describe the datum and projection using &lt;datum&gt;/&lt;projection&gt; format.</p> <p>For example: NAD83 / UTM zone 15N</p>

<p>GTCitationGeoKey (1026.d, 402.h) (required)</p>	<p>This is a free text field for providing a description of the imagery. The GeoKey contents shall be in the following form.</p> <p>a. &lt;project&gt; &lt;year&gt; &lt;n&gt;_&lt;lat&gt;&lt;lon&gt;&lt;quad&gt;_&lt;loc&gt;_&lt;xx&gt;_&lt;rr&gt;_&lt;yyyymmdd&gt;</p> <p>Where:</p> <p><u>project</u> – Project code  <u>year</u> - Program year (i.e., 2010).  <u>m</u> – Spectrap type (n=natural color, c=color infrared, or m=multispectral)  <u>lat</u> – Latitude, identified by 2 digit numerical value of a 1° block (including the leading “0” if needed).  <u>lon</u> – Longitude, identified by 3 digit numerical value of a 1° block (including the leading “0” if needed).  <u>quad</u> – Quadrangle location, identified by a 2 digit numerical value to identify the position in a one degree block.  <u>loc</u> – Quarter quadrangle location, identified by grid letters (nw,ne,sw,se).  <u>xx</u> – Two digit UTM zone.  <u>r</u> – Image resolution in centimeters  <u>yyyymmdd</u> – date of acquisition.</p> <p>b. Example:  6131202012m_3309403_nw_12_30_20120827</p>
<p>ProjLinearUnitsGeoKey (3076.d, c04.h) (required)</p>	<p>This key contains a coded value for the linear units used by the projection. Legal values for this key are listed in section 6.3.3.1 of the GeoTIFF 1.0 standard. Imagery shall use the code value of 9001 (“Linear_Meter”).</p>

## 5.0 LizardTech's MrSID<sup>®</sup> REQUIREMENTS

MrSID imagery shall be compressed and saved in Generation Three (MG3) format. When encoding the image, the following settings shall be applied:

- compression block size of 64
- both the transparency and background values set to an RGB value of 0,0,0 (black)
- use the “maximum zoom level” applicable to the input image, for example: - checking the “Use Maximum Zoom Levels for Image” button in the encoding options menu.

- (a) Compression Ratio. Compression ratio shall be 15:1 if no ratio is specified differently for the specified project. All CCM compression shall be at the same ratio and settings ("region of interest" compressed at a different ratio will not be accepted). All

compression shall be at the same ratio and settings ("region of interest" compressed at a different ratio will not be accepted).

- (b) Header Information. The image header shall contain correct Esri® compatible projection information for the mosaic.
- (c) Required Files. All standard MrSID® MG3 files generated by the LizardTech software (i.e., .sid, .sdw, and .txt) shall be included.
- (d) Configuration File. The Contractor shall provide the text file created when generating the CCM. The file shall use the same naming convention as the CCM but with a “.txt” extension.
- (e) Auxiliary File. The Contractor shall provide an “.aux” file containing Esri® projection information for each CCM. The auxiliary file shall contain the proper projection information for the mosaic and shall match the information in the CCM header. The file shall use the same naming convention as the CCM but with an “.aux” extension.

## 6.0 JPEG2000 REQUIREMENTS

JPEG2000 imagery shall be compressed and saved in the JPEG 2000 format with an unsigned, 8-bit depth. A target compression ratio shall be 1:15 if no ratio is specified in the individual contract. When encoding the image, the following settings shall be applied:

- Tiling: None
- Code blocks: 64
- Precincts: 256 x 256
- Strip height: 12
- Progression order: rpcl
- Quality layers: 8
- Packet length markers: Yes
- Filter: 9-7
- Tile length markers: No
- Transparency: Yes
- Background: Transparent, Black, White (stated in order of preference)

All compression shall be at the same ratio and settings ("region of interest" compressed at a different ratio will not be accepted).

## 7.0 DEFINITIONS

Band – A range of wavelengths of electromagnetic radiation. Also, image data gathered at this wavelength range.

Field – Refers only to the entire field, including the value, of the geokey (as defined in the TIFF Specification).

Image File Directory – Contains information about the image. There must be at least 1 IFD in a TIFF file and each IFD must have at least one entry.

Metadata – Description of the content, quality, condition, and other characteristics of the data.

Private tags – TIFF tags numbered 32,768 or higher. Private tags are not defined in the TIFF Specification.

Public tags – TIFF tags that are defined by the TIFF Specification.

Tag – Refers only to the identifying number portion of the geokey (as defined in the TIFF Specification).

List 1, Tag Listings

The following table summarizes the TIFF 6.0, GeoTIFF 1.0, and GeoKey requirements. The values in the table are consistent with the TIFF 6.0 and GeoTIFF 1.0 standards, but there are less options than are allowed by TIFF. Additional guidelines and requirements for the values of tags and keys are detailed in the body of this standard. Additional public tags and keys may be used at the data producer's option, providing they do not conflict with the required tags.

**TIFF tags required by baseline TIFF:**

<u>TagName</u>	<u>Decimal</u>	<u>Hex</u>	<u>Type</u>	<u>Value</u>
ImageWidth	256	100	SHORT or LONG	
ImageLength	257	101	SHORT or LONG	
BitsPerSample	258	102	SHORT	8,8,8,8
Compression	259	103	SHORT	1
PhotometricInterpretation	262	106	SHORT	2
Orientation	274	112	SHORT	1
StripOffsets	273	111	SHORT or LONG	
SamplesPerPixel	277	115	SHORT or LONG	3 or 4
RowsPerStrip	278	116	SHORT or LONG	1
StripByteCounts	279	117	SHORT or LONG	
ExtraSamples*	338	152	SHORT	0

\* Tag required only if SamplesPerPixel is greater than 3.

**TIFF tags defined by GeoTIFF:**

<u>TagName</u>	<u>Decimal</u>	<u>Hex</u>	<u>Type</u>	<u>Value</u>
ModelPixelScaleTag	33550	830E	DOUBLE	
ModelTiepointTag	33922	8482	DOUBLE	
GeoAsciiParamsTag	34737	87B1	ASCII	
GeoKeyDirectoryTag	34735	87AF	SHORT	

**GeoKeys defined by GeoTIFF and used by APFO:**

<u>TagName</u>	<u>Decimal</u>	<u>Hex</u>	<u>Type</u>	<u>Value</u>
GTModelTypeGeoKey	1024	400	6.3.1.1 code	1
GTRasterTypeGeoKey	1025	401	6.3.1.2 code	1
GTCitationGeoKey		1026	402	ASCII
ProjectedCSTypeGeoKey	3072	C00	6.3.3.1 code	
PCSCitationGeoKey	3073	C01	ASCII	
ProjLinearUnitsGeoKey	3076	C04	SHORT	

### List 2, “tiffinfo” Output

This listing is an output of the libtiff utility program “tiffinfo”.

```
TIFF Directory at offset 0x2370bc4
Image Width: 3247 Image Length: 3815
Resolution: 200, 200 (unitless)
Bits/Sample: 8
Compression Scheme: none
Photometric Interpretation: RGB color
Document Name: “Garvin NE 3309401:
Image Description: “USDA-FSA-APFO-U.S. Forest Service Resource Program”
Samples/Pixel: 3
Rows/Strip: 1
Planar Configuration: single image plane
```

### List 3, ListGeo Output

The following is an example of a GeoTIFF tag and GeoKey listing from a NAIP image. This listing is the output of the libgeotiff utility program “listgeo”. The projection information below the line “End\_Of\_Geotiff” is implied by the standard projection and is not stored explicitly in the data file. The descriptions are retrieved from libgeotiff lookup tables in the listgeo application.

```
Geotiff_Information:
Version: 1
Key_Revision: 1.0
Tagged_Information:
  ModelTiepointTag (2,3):
    0      0      0
    337962  3763838  0
  ModelPixelScaleTag (1,3):
    2      2      1
  End_Of_Tags.
Keyed_Information:
  GTModelTypeGeoKey (Short,1): ModelTypeProjected
  GTRasterTypeGeoKey (Short,1): RasterPixelIsArea
  GTCitationGeoKey (Ascii,45): "6131202012m_3311162_nw_12_2_20120714"
  ProjectedCSTypeGeoKey (Short,1): PCS_NAD83_UTM_zone_12N
  PCSCitationGeoKey (Ascii,21): "NAD83 / UTM zone 12N"
  ProjLinearUnitsGeoKey (Short,1): Linear_Meter
  End_Of_Keys.
End_Of_Geotiff.
```

PCS = 26915 (name unknown)

Projection = 16015 ()  
Projection Method: CT\_TransverseMercator  
ProjNatOriginLatGeoKey: 0.000000 ( 0d 0' 0.00"N)  
ProjNatOriginLongGeoKey: -93.000000 ( 93d 0' 0.00"W)  
ProjScaleAtNatOriginGeoKey: 0.999600  
ProjFalseEastingGeoKey: 500000.000000  
ProjFalseNorthingGeoKey: 0.000000  
GCS: 4269/NAD83  
Datum: 6269/North American Datum 1983  
Ellipsoid: 7019/GRS 1980 (6378137.00,6356752.31)  
Prime Meridian: 8901/Greenwich (0.000000/ 0d 0' 0.00"E)  
Projection Linear Units: 9001/metre (1.000000m)

Corner Coordinates:

Upper Left ( 337962.000,3763838.000) ( 94d45'16.56"W, 34d 0' 9.55"N)  
Lower Left ( 337962.000,3756208.000) ( 94d45'11.47"W, 33d56' 1.94"N)  
Upper Right ( 344456.000,3763838.000) ( 94d41' 3.51"W, 34d 0'13.09"N)  
Lower Right ( 344456.000,3756208.000) ( 94d40'58.63"W, 33d56' 5.47"N)  
Center ( 341209.000,3760023.000) ( 94d43' 7.54"W, 33d58' 7.53"N)