



**STATE OF MISSOURI
COOPERATING TECHNICAL PARTNERS
MAPPING ACTIVITY STATEMENT**

Mapping Activity Statement No. 13 – Digital Flood Insurance Rate Map Production and Development of Updated Flood Data

In accordance with the Cooperating Technical Partners (CTP) Partnership Agreement dated June 17, 1999 between **Missouri State Emergency Management Agency** and the Federal Emergency Management Agency (FEMA), and contract between FEMA and the **National Service Provider**, Mapping Activity Statement (MAS) No. 13 is as follows.

Section 1: Objective and Scope

The objective of the Flood Map Project documented in this MAS is to develop a Digital Flood Insurance Rate Map (DFIRM) and Flood Insurance Study (FIS) report for the counties shown in Table 1-1. The DFIRM and FIS report will be produced in the FEMA countywide format.

Table 1-1. Summary of Mapping Effort

County	Total Stream Miles Zone A (existing approximate study; see note 1)	Total Stream Miles Zone AE (existing data; see note 2)		Total Stream Miles Zone AE (new detailed study)	Total Stream Miles Zone AE (digitized)	Total Stream Miles Zone AE (redelineated)
		With floodway	Without floodway			
Audrain	7.1	3.3	7.6	0.0	10.9	0.0
Boone	414.0	149.1	54.7	0.0	203.8	0.0
Franklin	385.0	275.0	36.6	16.5	292.5	19.1
Howard	382.7	47.8	26.7	0.0	74.5	0.0
Marion	169.3	6.9	22.2	7.2	29.1	0.0
McDonald	319.0	0.0	0.0	11.5	0.0	0.0
Montgomery	439.0	0.0	0.0	0.0	0.0	0.0
Pike	477.5	3.6	0.0	0.0	3.6	0.0
Ralls	291.1	2.6	0.0	0.0	2.6	0.0
Warren	174.6	34.4	44.4	0.0	78.8	0.0
Total	3059.3	522.7	192.2	35.2	695.8	19.1

Note 1: The actual miles of new approximate study is not known at this time. The Mapping Partner shall complete new approximate analysis according to the scope in task 8.

Note 2: Existing data from other sources may duplicate parts the effective detailed study areas.

Existing GIS data and study needs for the community have been researched, obtained, organized and uploaded to the Multi-hazard Information Platform (MIP) by the Regional Management Center (RMC). The RMC will provide a pre-scoping report for each county identified in Table 1-1.

The mapping partner will schedule a project notification meeting in the counties identified in Table 1-2. The purpose of the project notification meeting is to describe the project scope to interested community officials.

Table 1-2

County	Pre-award Project Community Coordination	Post-award Project Notification Meeting
Audrain		X
Boone	X	X
Franklin	X	X
Howard		X
Marion		X
McDonald		X
Montgomery		X
Pike		X
Ralls		X
Warren		X

The Mapping Partners involved in this project will develop new and/or updated flood hazard data, as summarized in table 1-3.

Table 1-3

Flooding Source	Reach Limits	Hydrologic Analyses	Hydraulic Analyses	Floodplain Mapping	Redelineation Using Effective Flood Profiles and Updated Topographic Data	Refinement or Creation of Zone A
All streams with drainage greater than 1 sq. mile; and All streams with drainage greater than 1 sq. mile and have effective approximate mapping.	County-wide					X
Union - Flat Creek North Tributary	Confluence with Flat Creek to upstream limit of detailed study				X	
Union – Flat Creek	Confluence with Bourbeuse River to x-section G				X	

Union – Fenton Creek	Confluence with Flat Creek upstream to St Hwy V				X	
Union – Possum Creek	Confluence with Flat Creek to the upstream limit of detailed study				X	
Washington – St. John’s Creek	Confluence with Missouri River to upstream limit of detailed study				X	
Washington – Southwest Branch Brush Creek	From the upstream limit of the URS study to x-section H				X	
Washington – Streams studied as part of the URS flood recovery study	Brush Creek, Southwest Branch Brush Creek, South Branch Brush Creek, Dubois Creek				X	
Marion Co – Minnow Branch	Future Veteran’s Rd to Munger Ln	X	X	X		
Marion Co – St. Clair Creek	St Hwy MM to N&W Railroad	X	X	X		
Marion Co – Bear Creek	US Hwy 36 to Bear Creek Reservoir	X	X	X		

The CTP shall notify FEMA and the **National Service Provider**, (NSP) of all meetings with community officials at least one week prior to the meeting. FEMA and/or the NSP may or may not attend the community meetings.

The following will complete this Flood Map Project:

- **Missouri State Emergency Management Agency;**
- USGS-Water Science Center, University of Missouri Center for Agricultural, Resource and Environmental Systems and the Geographic Resource Center, as contractors to SEMA;
- **National Service Provider.**

The tasks for this Flood Map Project, including required Quality Assurance (QA) reviews, and the Mapping Partners that will complete them are summarized in Table 1-4. All tasks that are to be

accomplished by **Missouri State Emergency Management Agency** are shown. The sections of this MAS that follow Table 1-4 describe the specific tasks, responsible Mapping Partner(s), FEMA standards that must be met, and resultant map components.

Flood insurance studies not represented on existing maps are designated as Legacy Projects (LP). They will be incorporated into the final DFIRM product and their various stages of completion are indicated in Table 1-4. Legacy Projects exist in Franklin and McDonald Counties.

New flood profiles and topographic data along the Missouri and Mississippi River have been prepared by the USACE as part of the Upper Mississippi River Flow Frequency Study. The **Missouri State Emergency Management Agency** will incorporate the data into the countywide mapping as part of Task 10B for areas that are currently unmapped or mapped by approximate methods.

The RMC has completed Preliminary Research Activities; researching effective information and researching available data for the Flood Map Project. A Pre-Scoping Report will be available for the counties identified in Table 1-1. The report will include: an inventory of the FEMA archives for effective FIRM panels, FIS reports, and other flood hazard data or existing study data; a summary of the information in the MNUSS database; a summary of the CAVs and CACs; a “scoping map”; an overview of the results of the research; identification of available base map information, topographic data, flood hazard data, legacy project details and other hydrologic and hydraulic information and data.

The RMC has identified potential obstacles in an effort to learn of any issues that could delay or prohibit the Flood Map Project. Some examples of potential obstacles to completing the project in a timely fashion include the following: lack of an available base map meeting FEMA minimum specifications (described in Appendix K of the *Guidelines and Specifications for Flood Hazard Mapping Partners*); hydrologic and/or hydraulic issues; reliance on other studies or data (e.g., topographic mapping) that will not be available within the project’s scheduling constraints; and other considerations (Federal/State/non-governmental organizations, programmatic, disaster-related, legal).

A new detailed study is available for the city of Anderson in McDonald Co. A technical review of the study data has been completed. The **Missouri State Emergency Management Agency** will obtain the study data and incorporate the data into the countywide mapping as part of Task 10.

A new detailed study is available for the cities of Union and Washington in Franklin County. A technical review of the study data has been completed. The **Missouri State Emergency Management Agency** will obtain the study data and incorporate the data into the countywide mapping as part of Task 10.

A new detailed study is available for the city of Hannibal in Marion County. A technical review of the study data has not been completed. The **Missouri State Emergency Management Agency** will obtain the study data, address technical comments, and incorporate the data into the countywide mapping as part of Task 10.

In additional to meeting the quality/deliverable standards presented in FEMA Guidelines and Specifications for Flood Hazard Mapping Partners and Data Capture Standards, the Mapping Partner shall be responsible for meeting the standards outlined in Chapter 7 of the Multi-Year Flood Hazard Identification Plan (MHIP). The standards presented in Chapter 7 of the MHIP are risk-based. Table 1-5 identified the Risk Class for each countywide Flood Map Project presented in this MAS.

Table 1-5 Risk Class Identification

County	Risk Class	Exceptions (1)
Audrain	C	
Boone	C	Risk Class B – The corporate limits of the City of Columbia and a 1 mile buffer.
Franklin	C	
Howard	C	
Marion	C	
McDonald	C	
Montgomery	C	
Pike	C	
Ralls	C	
Warren	C	

Note: (1) Areas of Risk Class B are limited to floodplains located within, and up to a distance of one-mile outside, the corporate boundary.

FEMA has developed tools to assist in the development of the flood hazard data studies and the Digital Flood Insurance Rate Maps (DFIRMs). FEMA will, through the NSP, provide all Mapping Partners access to and training in these tools. The use of these tools will assist in the Map Modernization effort and the efficiency of mapping partners.

If the Mapping Partner chooses not to use these production tools, then the Mapping Partner will be required to submit project data at major milestones in each Mapping Project in accordance with Data Capture Standards. Submitting data in these standards will aid in more efficient Quality Assurance reviews, data storage, archiving, and for future study updates.

The Data Capture Standards submittals will be required at the following study milestones:

- Project Scoping (as specified);
- Terrain Data Processing Completed;
- Field Survey Completed;
- Hydrology Completed (intermediate and final);
- Hydraulics Completed (intermediate and final);
- DFIRM Mapping (draft work map and final preliminary).

Although the scoping Task is not specifically included in this table, the Mapping Partner performing scoping activities will be required to submit scoping-related data in accordance with the data capture standards.

Quality Assurance review activities may be performed by the Mapping Partner or the NSP at the discretion of FEMA. Please note the NSP will also be performing periodic audits and overall study/project management to monitor study quality.

FEMA will be providing download/upload capability for Data Capture Standards submittals through the MIP. Data submittals uploaded via the MIP will include the same data required prior to the existence of the MIP. If the MIP is not available the FEMA Project Officer will provide an alternate point for submittal.

Task 1 – Pre-Scoping

Responsible Mapping Partner: Regional Management Center

Scope: Pre-Scoping or Mapping Needs Assessment forms the building block for the Scoping Phase. This task involves collecting data from a variety of sources including community surveys, legacy projects, other Federal and State Agencies, NFIP State Coordinators, Community Assistance Visits (CAVs) and FEMA archives. The RMC will evaluate the effective Flood Insurance Study (FIS) report and Flood Insurance Rate Map (FIRM) to see if they need to be updated. Lists of mapping needs will be obtained from the MNUSS database and community surveys.

Data collection will include obtaining the best available base map materials (e.g., corporate limits, roads, orthophotos) along with stream centerline files. The acquired data will be imported into the scoping tool and used during the Scoping Task. In the Scoping Tool, all streams should have unique names, the limits of the effective FEMA studies should be identified, Letter of Map Change (LOMC) areas should be identified, and community requests should be identified. This task also includes populating the streamlines with existing pipeline and scoped studies currently underway.

The Regional Management Center will provide a report that summarizes the data identified during pre-scoping. This report will be provided to the CTP/IDIQ for each county identified in Table 1.1. The report includes copies of all digital files obtained and lists of files that may be available at a later date; a summary of the community's needs; and Scoping Tool project files. The pre-scoping data is available on the MIP.

Standards: All work under Task 1 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: There are no deliverables associated with this task.

Task 2 – Scoping

Responsible Mapping Partner: **Missouri State Emergency Management Agency**

Scope: The scope of this Mapping Project has been determined through the pre-scoping completed by the RMC. Data obtained by the RMC is available on the MIP. The Responsible Mapping Partner shall contact the RMC for access to the MIP and associated tools.

The Responsible Mapping Partner shall contact the RMC for access to the MIP and associated tools.

Task 3 - Field Surveys and Reconnaissance

Responsible Mapping Partner: **Missouri State Emergency Management Agency**

Scope: To supplement any field reconnaissance conducted during the Project Scoping phase of this project, **Missouri State Emergency Management Agency** shall conduct a detailed field reconnaissance of the specific study area to determine conditions along the floodplain(s), types and numbers of hydraulic and/or flood-control structures, apparent maintenance or lack thereof of existing hydraulic structures, locations of cross sections to be surveyed, and other parameters needed for the hydrologic and hydraulic analyses.

In addition to the initial field reconnaissance, **Missouri State Emergency Management Agency** shall conduct field surveys, including obtaining channel and floodplain cross sections, identifying or establishing temporary bench marks, and obtaining the physical dimensions of hydraulic and flood-control structures. **Missouri State Emergency Management Agency** also shall coordinate with other Mapping Partners that are collecting topographic data under Task 4.

All surveys will use the NAVD 1988 vertical datum.

Standards: All work under Task 3 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Upon completion of floodplain mapping for the flood sources in Table 1.3, **Missouri State Emergency Management Agency** shall upload the digital data to the MIP or submit by using other digital media if the MIP is unavailable. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, **Missouri State Emergency Management Agency** shall make the following products available to FEMA by submitting it to the MIP or by digital media if the MIP is unavailable. This submittal will occur in accordance with the schedule outlined in the MIP. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.

- A report summarizing the findings of the field reconnaissance;
- Maps and drawings that provide the detailed survey results;
- Survey notebook containing cross sections and structural data; and
- FEMA Format Survey Database or Intermediate Data Delivery consistent with the FEMA Data Capture Standards.

Task 4 - Topographic Data Development

Responsible Mapping Partner: **Missouri State Emergency Management Agency**

Scope: To supplement the field surveys conducted under Task 3, **Missouri State Emergency Management Agency** shall obtain additional topographic data of the overbank areas of the flooding sources studied to delineate floodplain boundaries. **Missouri State Emergency Management Agency** also shall coordinate with other team members conducting field surveys under Task 3. The contour interval and/or accuracy for the topographic data shall be selected based on the current FEMA requirements as documented in *Guidelines and Specifications for Flood Hazard Mapping Partners*.

Specifically, **Missouri State Emergency Management Agency** shall generate topographic data for the flood sources listed in Table 1-3 using elevation data developed by the Univ. of Missouri – CARES. This elevation data is based on the USGS DEM and has been edged matched. Digital elevation data will also be provided by the Cities of Washington and Union.

This task includes obtaining and preparing existing elevation data from other sources for use in later tasks assigned in this Mapping Activity Statement. The Mapping Partner should obtain available documentation to make an assessment of the usability of the data. The Mapping Partner is not expected to provide certification of existing data obtained from other sources.

If a DEM from the USGS is used for the project, additional assessment by **Missouri State Emergency Management Agency** is not needed. The CARES elevation data will be considered to be equivalent to a DEM from the USGS.

All elevation data will use the NAVD 1988 vertical datum.

County Name	USGS DEM	Community Provided Elevation Data	Description of community provided elevation data
Audrain	TVC/10 m DEM		
Boone	TVC/10 m DEM	X	2 ft. contours for city of Columbia; countywide DEMs derived from orthos, resolution unknown at this time.
Franklin	TVC/10 m DEM	X	City of Washington – 2’ contour interval City of Union – 2’ contour interval
Howard	TVC/10 m DEM		
Marion	TVC/10 m DEM		
McDonald	TVC/10 m DEM		
Montgomery	TVC/10 m DEM		
Pike	TVC/10 m DEM		

Ralls	TVC/10 m DEM		
Warren	TVC/10 m DEM		

Standards: All work under Task 4 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverable: Upon completion of topographic data collection and processing for the flood sources in Table 1.3, **Missouri State Emergency Management Agency** shall upload the digital data to the MIP or submit by using other digital media if the MIP is unavailable, so that **National Service Provider** can access it for a review under Task 5. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, **Missouri State Emergency Management Agency** shall make the following products available to FEMA by submitting it to the MIP or by digital media if the MIP is unavailable. This submittal will occur in accordance with the schedule outlined in the MIP. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.

Topographic data developed as part of this mapping activity statement or obtained from a community source and used for Task 6, 8 & 10 will include:

- Checkpoint analyses to assess the accuracy of data, including Root Mean Square Error calculations to support vertical accuracy;
- Identification of remote-sensing data voids and methods used to supplement data voids; and
- National Geodetic Survey (NGS) data sheets for Network Control Points used to control remote- sensing and ground surveys;

Topographic data obtained from a community source and used for Task 10A will include:

- Accuracy documentation if available from the community providing the data;

All topographic data used for Task 10, 10A and 10B will include:

- Report summarizing methodology and results;
- Mass points and breaklines data if available from original source;
- Digital file with elevation data;
- Metadata compliant with Federal Geographic Data Committee standards; and
- FEMA Format Terrain Database or Intermediate Data Delivery consistent with the FEMA Data Capture Standards.

The **Missouri State Emergency Management Agency** shall provide a brief statement that **Missouri State Emergency Management Agency** will meet the quality / deliverable standards identified in Section 5.

Task 5 - Quality Assurance Review of Topographic Data

Responsible Mapping Partner: **National Service Provider**

Scope: The **National Service Provider** shall review the mapping data generated by **Missouri State Emergency Management Agency** under Task 4 to ensure that these data are consistent with FEMA standards and standard engineering practice and are sufficient to prepare the DFIRM.

If a DEM from the USGS is provided by **Missouri State Emergency Management Agency** under Task 4 the **National Service Provider** will acknowledge receipt of the deliverables. A DEM from the Univ. of Missouri-CARES will be equivalent to a DEM from the USGS. No additional Quality Assurance is needed.

Standards: All work under Task 5 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the **National Service Provider** shall make the following products available to FEMA by uploading the digital data to the MIP. This submittal will occur in accordance with the schedule in the MIP:

- Acknowledgement that the mapping data generated under Task 4 was reviewed;
- A Summary Report that describes the findings of the Quality Assurance review; and
- Recommendations to resolve any problems that are identified during the Quality Assurance review.

Task 6 – Hydrologic Analyses

Responsible Mapping Partner: **Missouri State Emergency Management Agency**

Scope: For streams listed in Table 1-3 of this MAS that will be studied by approximate methods, **Missouri State Emergency Management Agency** shall perform hydrologic analyses for approximately 5911 square miles of drainage area for the flooding source(s). The hydrologic methods used for this analysis will be the latest regression equations from the USGS. Peak flood discharges will be calculated for the 1% annual chance storm event.

For the streams identified in Table 1-3 that will be studied by detailed methods, hydrologic analyses will be completed for approximately 31.1 square miles of drainage area.

County Name	Square Miles of New Approximate Study	Square Miles of New Detailed Study
Audrain	696	0
Boone	690	0
Franklin	928	0
Howard	470	0
Marion	443	31.1
McDonald	539	0
Montgomery	541	0
Pike	684	0
Ralls	483	0
Warren	437	0

These flood discharges will be the basis for subsequent hydraulic analyses under Task 8. In addition, **Missouri State Emergency Management Agency** shall address all concerns or questions regarding Task 6 that are identified by the **National Service Provider** during the Quality Assurance review under Task 7.

If Geographic Information System (GIS)-based modeling is used, **Missouri State Emergency Management Agency** shall document the automated data processing and modeling algorithms and provide them to FEMA to ensure they are consistent with the standards outlined above. **Missouri State Emergency Management Agency** shall document digital datasets (such as elevation, basin, or land use data) and provide them to FEMA for approval before performing the hydrologic analyses to ensure the datasets meet minimum requirements. If non-commercial (i.e., custom-developed) software is used for the analysis, then **Missouri State Emergency Management Agency** shall provide full user documentation, technical algorithm documentation, and the software to FEMA for review before performing the hydrologic analyses.

The Mapping Partner will compare the calculated, or computed, discharge with discharge determined from reliable gage data, if any. This comparison will only be done at locations where the two discharge values are considered representative of the same flooding source. Results of this comparison will be used in making a professional judgment for determining the discharge to be used for the hydraulic analysis.

Standards: All work under Task 6 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Upon completion of hydrologic modeling for the flood sources in Table 1.3, **Missouri State Emergency Management Agency** shall upload the digital data to the MIP or submit by using other digital media if the MIP is unavailable. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, **Missouri State Emergency Management Agency** shall make the following products available to FEMA by submitting it to the MIP or by digital media if the MIP is unavailable. This submittal will occur in accordance with the schedule outlined in the MIP. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.

For stream studied by detail methods, **Missouri State Emergency Management Agency** shall provide the following deliverables:

- Digital copies of all hydrologic modeling (input and output) files for the 10-, 2-, 1-, and 0.2-percent-annual-chance storm events;
- Digital versions of the Summary of Discharges Table presenting discharge data for the flooding sources for which hydrologic analyses were performed;
- Digital versions of draft text for Section 3.1, Hydrologic Analyses, of the FIS report;
- Digital versions of all backup data used in the analysis, including work maps and basin delineation;
- For GIS-based modeling, deliverables shall include all input and output data, intermediate data processing products, and GIS data layers;
- FEMA Format Hydrology Database or Intermediate Data Delivery consistent with the FEMA Data Capture Standards; and
- Brief summary report documenting the study area, methodologies, assumptions, and any other pertinent information related to the engineering analysis performed

For stream studied by approximate methods, **Missouri State Emergency Management Agency** shall provide the following deliverables:

- Digital copies of all hydrologic modeling (input and output) files for the 1-percent-annual-chance storm event;
- Digital versions of all backup data used in the analysis, including work maps and basin delineation;
- For GIS-based modeling, deliverables shall include all input and output data, intermediate data processing products, and GIS data layers;

- FEMA Format Hydrology Database or Intermediate Data Delivery consistent with the FEMA Data Capture Standards; and
- Brief summary report documenting the study area, methodologies, assumptions, and any other pertinent information related to the engineering analysis performed.

The **Missouri State Emergency Management Agency** shall provide a brief statement that **Missouri State Emergency Management Agency** will meet the quality / deliverable standards identified in Section 5.

Task 7 - Quality Assurance Review of Hydrologic Analyses

Responsible Mapping Partner: **National Service Provider**

Scope: The **National Service Provider** shall review the technical, scientific, and other information submitted by **Missouri State Emergency Management Agency** under Task 6 to ensure that the data and modeling are consistent with FEMA standards and standard engineering practice and are sufficient to prepare the DFIRM. This work shall include, at a minimum, the activities listed below.

- Review the submittal for technical and regulatory adequacy, completeness of required information, and supporting data and documentation. The technical review is to focus on the following:
 - Use of acceptable models;
 - Use of appropriate methodology(ies);
 - Correctly applied methodology(ies)/model(s), including QA of input parameters;
 - Comparison with gage data and/or regression equations, if appropriate; and
 - Comparison with discharges for contiguous reaches or flooding sources.
- Maintain records of all contacts, reviews, recommendations, and actions and make them readily available to FEMA.
- Maintain an archive of all data submitted for hydrologic modeling review. (All supporting data must be retained for 3 years from the date funding recipient submits its final expenditure report to FEMA.)

Standards: All work under Task 7 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the **National Service Provider** shall make the following products available to FEMA by uploading the digital data to the MIP. This submittal will occur in accordance with the schedule in the MIP:

- A Summary Report that describes the findings of the Quality Assurance review; and
- Recommendations to resolve any problems that are identified during the Quality Assurance review.

Task 8 – Hydraulic Analyses

Responsible Mapping Partner: **Missouri State Emergency Management Agency**

Scope: For the streams identified in Table 1-3 of this MAS that will be studied by approximate methods, **Missouri State Emergency Management Agency** shall perform hydraulic analyses for all flooding sources within each county that have a drainage area greater than or equal to 1 mi². For all flood sources that have drainage areas less than 1 mi² and have effective approximate mapping, the **Missouri State Emergency Management Agency** shall also perform hydraulic analyses extending to the upstream limits of the effective study. The estimated length of approximate-studied streams is 5440-5940 miles for the flooding source(s). The modeling will include the 1% annual chance storm event based on peak discharges computed under Task 6. The hydraulic methods used for this analysis will include the normal depth method. The hydraulic analyses will be used to approximate flood elevations for the subject flooding sources.

For the streams identified in Table 1-3 that will be studied by detailed methods, **Missouri State Emergency Management Agency** will perform hydraulic analyses for approximately 7.2 miles of the flooding sources listed in the section 1 of this MAS. The modeling will include the 10%, 2%, 1% and 0.2% annual chance storm events based on peak discharges computed under Task 6. The hydraulic methods used for this analysis will include HEC-RAS computer program. The hydraulic analyses will be used to establish flood elevations and regulatory floodways for the subject flooding sources.

County Name	Length of Streams studied by Approximate Methods (Estimate stream miles)	Length of Streams studied by Detailed Methods
Audrain	750-800	0
Boone	450-500	0
Franklin	490-540	0
Howard	500-550	0
Marion	450-500	7.2
McDonald	650-700	0
Montgomery	550-600	0
Pike	700-750	0
Ralls	500-550	0
Warren	400-450	0

Missouri State Emergency Management Agency shall use the cross-section and field data collected under Task 3 to perform the hydraulic analyses. The hydraulic analyses shall be used to establish flood elevations and regulatory floodways for the subject flooding sources.

Missouri State Emergency Management Agency shall use the FEMA CHECK-2 or CHECK-RAS checking program to check the reasonableness of the hydraulic analyses for streams studied by detailed

methods. To facilitate the Quality Assurance review under Task 9, the **Missouri State Emergency Management Agency** shall provide explanations for unresolved messages from the CHECK-2 or CHECK-RAS program, as appropriate. In addition, **Missouri State Emergency Management Agency** shall address all concerns or questions regarding Task 8 that are identified by the **National Service Provider** during the Quality Assurance review under Task 9.

Missouri State Emergency Management Agency shall document automated data processing and modeling algorithms for GIS-based modeling and provide them to FEMA for review to ensure they are consistent with the standards outlined above. **Missouri State Emergency Management Agency** shall document the digital datasets and provide them to FEMA for approval before performing the hydraulic analyses to ensure that the datasets meet minimum requirements. If non-commercial (i.e., custom-developed) software is used for the analyses, then **Missouri State Emergency Management Agency** shall provide full user documentation, technical algorithm documentation, and software to FEMA for review before performing the hydraulic analyses.

Standards: All work under Task 8 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Upon completion of hydraulic modeling for the flood sources in Table 1.3, **Missouri State Emergency Management Agency** shall upload the digital data to the MIP or submit by using other digital media if the MIP is unavailable. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, **Missouri State Emergency Management Agency** shall make the following products available to FEMA by submitting it to the MIP or by digital media if the MIP is unavailable. This submittal will occur in accordance with the schedule outlined in the MIP. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.

For stream studied by detail methods, **Missouri State Emergency Management Agency** shall provide the following deliverables:

- Digital profiles of the 10-, 2-, 1- and 0.2-percent-annual-chance water-surface elevations representing existing conditions using the FEMA RASLOT program or similar software;
- Digital versions of the Floodway Data Table for each flooding source that is compatible with the DFIRM database;
- Digital work map showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, and with base map used from Task 12;
- Digital versions of all hydraulic modeling (input and output) files;
- Digital versions of a table showing ranges of Manning's "n" values;
- Explanations for unresolved messages from the CHECK-2 or CHECK-RAS program, as appropriate;
- Digital versions of all backup data used in the analyses;
- Digital versions of draft text for inclusion in the FIS report;
- For GIS-based modeling, deliverables include all input and output data, intermediate data processing products, GIS data layers, and final products in the format of the DFIRM database structure;

- FEMA Format Hydraulic Database or Intermediate Data Delivery consistent with the FEMA Data Capture Standards; and
- Brief summary report documenting the study area, methodologies, assumptions, and any other pertinent information related to the engineering analysis performed

For stream studied by approximate methods, **Missouri State Emergency Management Agency** shall provide the following deliverables:

- A digital work map showing the 1-percent-annual-chance floodplain boundary delineations with base map used from Task 12;
- Digital versions of all hydraulic modeling (input and output) files;
- Digital versions of a table showing ranges of Manning’s “n” values;
- Digital versions of all backup data used in the analyses;
- For GIS-based modeling, deliverables include all input and output data, intermediate data processing products, GIS data layers, and final products in the format of the DFIRM database structure;
- FEMA Format Hydraulic Database or Intermediate Data Delivery consistent with the FEMA Data Capture Standards;
- Digital versions of draft text for inclusion in the FIS report (only for counties that require a FIS report); and
- Brief summary report documenting the study area, methodologies, assumptions, and any other pertinent information related to the engineering analysis performed.

The **Missouri State Emergency Management Agency** shall provide a brief statement that **Missouri State Emergency Management Agency** will meet the quality / deliverable standards identified in Section 5.

Task 9 - Quality Assurance Review of Hydraulic Analyses

Responsible Mapping Partner: **National Service Provider**

Scope: The **National Service Provider** shall review the technical, scientific, and other information submitted by **Missouri State Emergency Management Agency** under Task 8 to ensure that the data and modeling are consistent with FEMA standards and standard engineering practice and are sufficient to prepare the DFIRM. This work shall include, at a minimum, the activities listed below.

- Review the submittal for technical and regulatory adequacy, completeness of required information, and supporting data and documentation. The technical review is to focus on the following:
 - Use of acceptable model(s);
 - Starting water-surface elevations;
 - Cross-section geometry;
 - Manning's "n" values and expansion/contraction coefficients;
 - Bridge and culvert modeling;
 - Flood discharges;
 - Regulatory floodway computation methods; and
 - Tie-ins to upstream and downstream non-revised Flood Profiles.
- Use the CHECK-2 or CHECK-RAS program as appropriate to flag potential problems and focus review efforts.
- Maintain records of all contacts, reviews, recommendations, and actions and make them readily available to FEMA.
- Maintain an archive of all data submitted for hydraulic modeling review. (All supporting data must be retained for 3 years from the date funding recipient submits its final expenditure report to FEMA.)

Standards: All work under Task 9 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the **National Service Provider** shall make the following products available to FEMA by uploading the digital data to the MIP. This submittal will occur in accordance with the schedule in the MIP:

- A Summary Report that describes the findings of the Quality Assurance review; and
- Recommendations to resolve any problems that are identified during the Quality Assurance review.

Task 10 - Floodplain Mapping (Detailed Riverine Analysis)

Responsible Mapping Partner: **Missouri State Emergency Management Agency**

Scope: **Missouri State Emergency Management Agency** shall delineate the 1- and 0.2-percent-annual-chance floodplain boundaries and the regulatory floodway boundaries (if required) for the flooding sources for which detailed analyses were performed. **Missouri State Emergency Management Agency** shall incorporate all new or revised modeling and shall use the topographic data acquired under Task 4 to delineate the floodplain and regulatory floodway boundaries on a digital work map. In addition, **Missouri State Emergency Management Agency** shall incorporate the results of all effective (at the time of funds award) Letters of Map Change (LOMCs) within the revised areas as appropriate. Only those LOMCs visible at the published map scale shall be included. Also, **Missouri State Emergency Management Agency** shall address all concerns or questions regarding Task 10 that are identified by the **National Service Provider** during the Quality Assurance review under Task 11.

A new detailed study is available for the city of Anderson in McDonald Co. A technical review of the study data has been completed. The **Missouri State Emergency Management Agency** will obtain the study data and incorporate the data into the countywide mapping as part of Task 10.

A new detailed study is available for the cities of Union and Washington in Franklin County. A technical review of the study data has been completed. The **Missouri State Emergency Management Agency** will obtain the study data and incorporate the data into the countywide mapping as part of Task 10.

A new detailed study is available for the city of Hannibal in Marion County. A technical review of the study data has not been completed. The **Missouri State Emergency Management Agency** will obtain the study data, address technical comments, and incorporate the data into the countywide mapping as part of Task 10.

All mapping will use the NAVD 1988 vertical datum.

DFIRM production completed under this task should be submitted for a Quality Assurance review concurrent with DFIRM production completed for Tasks 10A, 10B and 13. The base map identified in Task 12 will be submitted with the Task 10 deliverables.

Standards: All work under Task 10 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Upon completion of floodplain mapping for the flood sources in Table 1-3, **Missouri State Emergency Management Agency** shall upload the digital data to the MIP or submit by using other digital media if the MIP is unavailable. In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, **Missouri State Emergency Management Agency** shall make the following products available to FEMA by submitting it to the MIP or by digital media if the MIP is unavailable. This submittal will occur in accordance with the schedule outlined in the MIP. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.

- Digital work map showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs, flood insurance zone labels, and all applicable base map features;

- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- A Summary Report that describes and provides the results of all automated or manual Quality Control review steps taken during the preparation of the DFIRM;
- An explanation for the use of existing topography for the studied reaches, if appropriate; and
- Intermediate Format Mapping Database or Intermediate Data Delivery consistent with the FEMA Data Capture Standards.

The **Missouri State Emergency Management Agency** shall provide a brief statement that **Missouri State Emergency Management Agency** will meet the quality / deliverable standards identified in Section 5.

Task 10A - Floodplain Mapping (Redelineation of Detailed Floodplain Boundaries Using Updated Topographic Data)

Responsible Mapping Partner: **Missouri State Emergency Management Agency**

Scope: **Missouri State Emergency Management Agency** shall delineate the 1- and 0.2-percent-annual-chance floodplain boundaries and the regulatory floodway boundaries (if required) for the flooding sources identified in Table 1-3. **Missouri State Emergency Management Agency** shall use the topographic data acquired under Task 4 to delineate the floodplain and regulatory floodway boundaries as appropriate on a digital work map. In addition, **Missouri State Emergency Management Agency** shall incorporate the results of all effective (at the time of funds award) Letters of Map Change (LOMCs) within the revised areas as appropriate. Only those LOMCs visible at the published map scale shall be included. If the new topographic data do not reflect the same hydraulic characteristics as in the effective study, **Missouri State Emergency Management Agency** shall evaluate the topographic data to determine if changes are significant enough to invalidate the floodplain boundary and regulatory floodway boundary redelineations. If so, **Missouri State Emergency Management Agency** shall contact the FEMA Regional Project Officer identified in Section 11 of this MAS with a recommendation. In addition, **Missouri State Emergency Management Agency** shall address all concerns or questions regarding Task 10A that are identified by **National Service Provider** during the Quality Assurance review under Task 11.

All mapping completed for this task will use the NAVD 1988 vertical datum.

DFIRM production completed under this task should be submitted for a Quality Assurance review concurrent with DFIRM production completed for Tasks 10, 10B and 13. The base map identified in Task 12 will be submitted with the Task 10A deliverables.

Standards: All work under Task 10A shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Upon completion of floodplain mapping for the flood sources in Table 1-3, **Missouri State Emergency Management Agency** shall upload the digital data to the MIP or submit by using other digital media if the MIP is unavailable. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, **Missouri State Emergency Management Agency** shall make the following products available to FEMA by submitting it to the MIP or by digital media if the MIP is unavailable. This submittal will occur in accordance with the schedule outlined in the MIP. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.

- Digital work map showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs, flood insurance zone labels, and all applicable base map features;
- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- An explanation for the use of existing topography for the studied reaches, if appropriate; and
- FEMA Format Mapping Database or Intermediate Data Delivery consistent with the FEMA Data Capture Standards.

The **Missouri State Emergency Management Agency** shall provide a brief statement that **Missouri State Emergency Management Agency** will meet the quality / deliverable standards identified in Section 5.

Task 10B - Floodplain Mapping (Refinement or Creation of Zone A)

Responsible Mapping Partner: **Missouri State Emergency Management Agency**

Scope: **Missouri State Emergency Management Agency** shall delineate the 1-percent-annual-chance floodplain boundaries for the flooding sources identified in Table 1-3. **Missouri State Emergency Management Agency** shall use existing topographic data or the topographic data acquired under Task 4 to delineate the floodplain boundaries on a digital work map. In addition, **Missouri State Emergency Management Agency** shall incorporate the results of all effective (at the time of funds award) Letters of Map Change (LOMCs) within the revised areas as appropriate. In addition, **Missouri State Emergency Management Agency** shall address all concerns or questions regarding Task 10B that are identified by the **National Service Provider** during the Quality Assurance review under Task 11.

Missouri State Emergency Management Agency may expand on the approaches for analyzing Zone A areas outlined in *Guidelines and Specifications for Flood Hazard Mapping Partners* and in FEMA 265, *Managing Floodplain Development in Approximate Zone A Areas* (April 1995), and/or develop new approaches. Such approaches must be coordinated with the FEMA Regional Project Officer identified in Section 11 of this MAS before analysis and mapping begin.

New flood profiles and topographic data along the Missouri and Mississippi River have been prepared by the USACE as part of the Upper Mississippi River Flow Frequency Study. The **Missouri State Emergency Management Agency** will incorporate the data into the countywide mapping as part of this Task for areas that are currently unmapped or mapped by approximate methods.

The **Missouri State Emergency Management Agency** shall ensure that all flood sources are contained within the boundaries of the Floodway (if identified) and the Special Flood Hazard Area.

DFIRM production completed under this task should be submitted for a Quality Assurance review concurrent with DFIRM production completed for Tasks 10, 10A and 13. The base map identified in Task 12 will be submitted with the Task 10B deliverables.

Standards: All work under Task 10B shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Upon completion of floodplain mapping for the flood sources in Table 1.3, **Missouri State Emergency Management Agency** shall upload the digital data to the MIP or submit by using other digital media if the MIP is unavailable. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, **Missouri State Emergency Management Agency** shall make the following products available to FEMA by submitting it to the MIP or by digital media if the MIP is unavailable. This submittal will occur in accordance with the schedule outlined in the MIP. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.

- Digital work map showing the 1-percent-annual-chance floodplain boundary delineations, flood insurance zone labels, and all applicable base map features;
- Digital versions of input and output for any computer programs that were used;
- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*; and

- FEMA Format Mapping Database or Intermediate Data Delivery consistent with the FEMA Data Capture Standards.

The **Missouri State Emergency Management Agency** shall provide a brief statement that **Missouri State Emergency Management Agency** will meet the quality / deliverable standards identified in Section 5.

Task 11 - Quality Assurance Review of Floodplain Mapping (Revised Areas)

Responsible Mapping Partner: **National Service Provider**

Scope: The **National Service Provider** shall review the floodplain mapping submitted by **Missouri State Emergency Management Agency** under Activities 10, 10A, and 10B to ensure that the results of the analyses performed are accurately represented, the work maps are consistent with current FEMA standards. This work shall include, at a minimum, the activities listed below.

- Review the cross sections for proper location and orientation on the work map and agreement with the Floodway Data Table;
- Review the BFEs shown on the draft work map for proper location and agreement with the results of the hydraulic modeling;
- Review the regulatory floodway widths shown on the draft work map for agreement with the widths shown in the Floodway Data Table and the results of the hydraulic modeling;
- Review the floodplain boundaries shown on the work map or agreement with the flood elevations shown in the Floodway Data Table and the contour lines and other topographic information shown on the work maps maps;
- Review the floodplain widths at cross sections as shown on the work maps to ensure they match the Floodway Data Table;
- Review the floodplain boundaries as shown on the work maps to ensure they match the Flood Profiles;
- Review the flood insurance risk zones as shown on the work maps to ensure they are labeled properly;
- Review all effective LOMCs not superseded by the revised mapping to ensure they are included;
- Review the DFIRM mapping files to ensure they were prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*; and

Standards: All work under Task 11 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the **National Service Provider** shall make the following products available to FEMA by uploading the digital data to the MIP. This submittal will occur in accordance with the schedule in the MIP:

- A Summary Report that describes the findings of the QA review, noting any deficiencies in or agreeing with the mapping results;
- Recommendations to resolve any problems that are identified during the Quality Assurance review; and
- An annotated work map with all questions and/or concerns indicated, if necessary.

Task 12 - Base Map Acquisition

Responsible Mapping Partner: **Missouri State Emergency Management Agency**

Scope: **Missouri State Emergency Management Agency** shall provide the digital base map for the project. The required activities are as follows:

- Obtain digital files (raster or vector) of the base map.
- Secure necessary permissions from the map source to allow FEMA's use and distribution of hardcopy and digital map products using the digital base map, free of charge.
- Assess the digital data and determine the data meets the minimum standards and specifications that FEMA requires for DFIRM production.
- Populate the DFIRM database with the information required by FEMA.

Standards: All work under Task 12 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: For each mapping project **Missouri State Emergency Management Agency** shall upload the digital data to the MIP or submit by using other digital media if the MIP is unavailable. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, **Missouri State Emergency Management Agency** shall make the following products available to FEMA by submitting it to the MIP or by digital media if the MIP is unavailable. This submittal will occur in accordance with the schedule outlined in the MIP. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.

- Written statement that the digital data meet FEMA's minimum standards and specifications; and
- Documentation that FEMA can use the digital base map.

Task 13 – DFIRM Production (Non-Revised Areas)

Responsible Mapping Partner: **Missouri State Emergency Management Agency**

Scope: For all flooding sources except those segments for which updated flood data will be developed under Activities 1 through 11, **Missouri State Emergency Management Agency** shall convert the information shown on the effective FIRM and Flood Boundary Floodway Map (FBFM) panels for all incorporated and unincorporated areas of the counties identified in Table 1.1 to digital format in conformance with FEMA DFIRM specifications. **Missouri State Emergency Management Agency** shall use the base map acquired under Task 12 for the conversion. **Missouri State Emergency Management Agency** also shall incorporate the results of all effective LOMCs (at the time of funds award) for each affected community. Only those LOMCs visible at the published map scale shall be included.

For the unrevised flood sources the original work maps from the effective study should be obtained from the FEMA Technical Library. If the original work maps are not available, **Missouri State Emergency Management Agency** shall use the best quality paper FIRM and/or floodway maps for digitization.

All mapping completed for this task will use the NAVD 1988 vertical datum.

The **Missouri State Emergency Management Agency** will be required to fill in “gaps” in the Special Flood Hazard Areas (SFHA) studied by detailed methods. These gaps typically occur in an unmapped community, but may exist in other areas as well. To ensure there are no holes or gaps in the countywide maps the mapping partner shall use either unpublished information developed as part of an effective Flood Insurance Study, or sound engineering judgment based on the published data. The unpublished data will be obtained from the FEMA Technical Library by the **Missouri State Emergency Management Agency**.

The **Missouri State Emergency Management Agency** shall ensure that all flood sources are contained within the boundaries of the Floodway (if identified) and the Special Flood Hazard Area.

Also, **Missouri State Emergency Management Agency** shall address all comments and questions regarding Task 13 that are identified by the **National Service Provider** during the Quality Assurance review under Task 13A.

Missouri State Emergency Management Agency shall not digitize the flood theme for those segments of flooding sources for which updated flood data will be developed. Rather, **Missouri State Emergency Management Agency** shall leave these as “holes” in the digital flood theme that will be filled in as part of Task 14 using the digital flood data developed under Tasks 10, 10A, and 10B.

DFIRM production completed under this task should be submitted for a Quality Assurance review concurrent with DFIRM production completed for Tasks 10, 10A and 10B. The base map identified in Task 12 will be submitted with the Task 13 deliverables.

Standards: All work under Task 13 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Upon completion of each county, **Missouri State Emergency Management Agency** shall upload the digital data to the MIP or submit by using other digital media if the MIP is unavailable. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, **Missouri State Emergency Management Agency** shall make the following products available to FEMA by submitting it to the MIP or by digital media if

the MIP is unavailable. This submittal will occur in accordance with the schedule outlined in the MIP. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.

- Digital work maps showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs, flood insurance zone labels, and all applicable base map features;
- DFIRM mapping files in final format, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*; and
- Metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*.

The **Missouri State Emergency Management Agency** shall provide a brief statement that **Missouri State Emergency Management Agency** will meet the quality / deliverable standards identified in Section 5.

Task 13A – Quality Assurance Review of DFIRM Production (Non-Revised Areas)

Responsible Mapping Partner: **National Service Provider**

Scope: The **National Service Provider** shall review the DFIRM panels submitted by **Missouri State Emergency Management Agency** under Task 13 to ensure that the new DFIRM panels accurately represent the information shown on the effective FIRMs and FBFMs for the area mapped and are consistent with current FEMA standards. This work shall include, at a minimum, checking the following:

- Cross sections are properly located and oriented as shown on the FIRMs or FBFMs;
- BFEs are properly located and agree with the BFEs shown on the FIRMs;
- Regulatory floodway widths agree with the widths shown on the FIRMs or FBFMs;
- The 1 and 0.2-percent-annual-chance floodplain boundaries agree with the floodplain boundaries shown on the FIRM and the contour lines, other topographic information, and planimetric information shown on the DFIRM base map;
- Flood insurance risk zone designations are labeled properly;
- Review all effective LOMCs to ensure they are included;
- Road and floodplain relationships are maintained for all unrevised areas;
- DFIRM mapping files meet the GIS file and database format requirements specified in FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners* and conform to those requirements for content and attribution; and
- Metadata files describing the DFIRM data include the required information.

Standards: All work under Task 13A shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the **National Service Provider** shall make the following products available to FEMA by uploading the digital data to the MIP. This submittal will occur in accordance with the schedule in the MIP:

- A Summary Report that describes the findings of the QA review noting any deficiencies in or agreeing with the mapping results;
- Recommendations to resolve any problems that are identified during the Quality Assurance review; and
- An annotated copy of the work maps with all questions and/or concerns indicated, if necessary.

Task 14 – DFIRM Production (Merging Revised and Non-Revised Information)

Responsible Mapping Partner: Not Assigned

Scope: This task is not applicable to this Mapping Activity Statement.

Task 14A – DFIRM Production (Application of FEMA Graphics and Database Specifications)

Responsible Mapping Partner: **Missouri State Emergency Management Agency**

Scope: Upon completion of the floodplain mapping activities for the revised areas (Tasks 10, 10A, and/or 10B) and the DFIRM production for non-revised areas (Task 13), **Missouri State Emergency Management Agency** shall merge the digital floodplain data into a single, updated DFIRM. This work includes the tie-in of flood hazard information for areas that were not studied as part of the Flood Map Project documented in this MAS. **Missouri State Emergency Management Agency** also shall tie in the revised and non-revised Flood Profiles, floodplain boundaries, and regulatory floodway boundaries with contiguous communities that were not studied as part of the Flood Map Project documented in this MAS. **Missouri State Emergency Management Agency** shall apply the final FEMA DFIRM graphics and database specifications to the DFIRM files produced under Task 14. This work shall include adding all required annotation, line pattern, area shading, and map collar information (e.g., map borders, title blocks, legends, and notes to users). **Missouri State Emergency Management Agency** shall coordinate with FEMA and those Mapping Partners responsible for Activities 10, 10A, 10B, 13, and 14, as necessary, to resolve any problems that are identified during Task 14A.

This task includes the creation of the countywide Flood Insurance Study report. The FIS report may be based on new study data, existing FIS reports, or a combination of the two sources. The elevations shown in the FIS shall be referenced to NAVD 1988 vertical datum.

To facilitate later edits of the text placement the **Missouri State Emergency Management Agency** will submit annotation databases for all text created for the printed FIRM panels. The format of the annotation database should be coordinated with the Mapping Partner that will complete Tasks 15 & 16.

Standards: All work under Task 14A shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Upon completion of each county, **Missouri State Emergency Management Agency** shall upload the digital data to the MIP or submit by using other digital media if the MIP is unavailable. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, **Missouri State Emergency Management Agency** shall make the following products available to FEMA by submitting it to the MIP or by digital media if the MIP is unavailable. This submittal will occur in accordance with the schedule outlined in the MIP. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.

- Digital preliminary ready maps showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs, flood insurance zone labels, and all applicable base map features;
- DFIRM mapping files in final format, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- DFIRM database that meets final database specifications contained in Appendix L of the *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- The FIS report in the FEMA County-wide Format as documented in Appendix J of *Guidelines and Specifications for Flood Hazard Mapping Partners*; and

- An Adobe .pdf file for each FIRM panel that includes all layout text;
- One hardcopy color plot for each FIRM panel; and
- All Digital information used to compile and print panels which can include digital label and annotation files used to create labeling on panels (including all fonts and style files, if applicable) which can comprise cross sections, BFEs, flood insurance zone labels, and all applicable base map features.

Task 14B – Quality Assurance Review of DFIRM Product Meeting FEMA Graphics and Database Specifications

Responsible Mapping Partner: **National Service Provider**

Scope: Upon completion of the floodplain mapping activities (Tasks 10, 10A, and/or 10B) and DFIRM production activities (Activities 13, 14, and 14A), the **National Service Provider** shall review the DFIRM to ensure it meets current FEMA graphics specifications and is sufficient to prepare the DFIRM. In addition, the **National Service Provider** shall review the DFIRM spatial database to determine if it meets current FEMA database specifications. The **National Service Provider** shall coordinate with FEMA and other Mapping Partners, as necessary, to resolve any problems identified during this QA review. This work shall ensure that the requirements below are met.

- All required DFIRM features are accurately and legibly labeled and follow the examples shown in the FEMA DFIRM specifications. This includes all flood insurance risk zones, BFEs, cross sections, studied streams, mapped political entities, and all roads within and adjacent to the 1-percent-annual-chance floodplains;
- All DFIRM features are correctly symbolized with the appropriate symbol, line pattern, or area shading and follow the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- All map collar information is complete, correct, and follows the requirements specified in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- DFIRM mapping files are in one of the GIS file and database formats specified in FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners* and conform to those specifications for content and attribution;
- Perform a final QA review of the Preliminary DFIRM and FIS report, including all data tables, Flood Profiles, and other components of the FIS report. The QA review procedures shall be consistent with the *Guidelines and Specifications for Flood Hazard Mapping Partners*.
- Work with **Missouri State Emergency Management Agency** and FEMA as appropriate to resolve discrepancies identified during the final QA review.
- DFIRM database files are in one of the database formats specified in FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners* and conform to those specifications for content and attribution;
- Metadata files describing the DFIRM data include all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*; and
- The FIS report is prepared in the FEMA countywide format as documented in Appendix J of *Guidelines and Specifications for Flood Hazard Mapping Partners*.

Standards: All work under Task 14B shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the **National Service Provider** shall make the following products available to FEMA by uploading the digital data to the MIP. This submittal will occur in accordance with the schedule in the MIP:

- A Summary Report that describes the findings of the QA review noting any deficiencies in or agreeing with the mapping results and the results of all automated or manual QA steps taken during the Quality Assurance review;
- Recommendations to resolve any problems that are identified during the Quality Assurance review; and
- An annotated copy of the DFIRM with all questions and/or concerns indicated, if necessary.

Task 14C – Inclusion of Letter of Map Changes (LOMC)

Responsible Mapping Partner: Not Assigned

Scope: Not Applicable to this Mapping Activity Statement

Task 15 - Preliminary DFIRM and FIS Report Distribution

Responsible Mapping Partners: National Service Provider

Scope: Task 15 consists of the final preparation, review, and distribution of the Preliminary copies of the DFIRM and FIS report for community official and general public review and comment. The activities to be performed are summarized below.

Letters of Map Change. The NSP shall include all LOMCs that are approved after the funds were awarded to the Mapping Partner that prepared the DFIRM in Tasks 10, 10A & 13. Only those LOMCs visible at the published map scale shall be included.

Preliminary Transmittal Letter Preparation. The NSP or shall prepare letters to transmit the Preliminary copies of the DFIRM and FIS report and related enclosures to all affected communities, all other Project Team members, the State NFIP Coordinator, the FEMA Regional Office, and others as directed by FEMA.

Distribution of Preliminary DFIRM and FIS Report: The NSP shall distribute the Preliminary copies of the DFIRM and FIS report to all affected communities, all other Project Team members, the State NFIP Coordinator, the FEMA Regional Office, and others as directed by FEMA.

News Release Preparation: The NSP shall prepare news release notifications of BFE changes for all affected communities if appropriate and perform Quality Control reviews of the notifications for accuracy and compliance with FEMA format requirements. The NSP shall file the notifications for later submittal to FEMA for review.

Preliminary Summary of Map Actions (SOMA) Preparation: The NSP shall prepare Preliminary SOMAs for all affected communities if appropriate. The SOMAs shall list pertinent information regarding LOMCs that will be affected by the issuance of the DFIRM (i.e., superseded, incorporated, revalidated). The SOMA shall be organized by the new DFIRM panel numbers, not by community.

Standards: All work under Task 15 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the **National Service Provider** shall make the following products available to FEMA by uploading the digital data to the MIP. This submittal will occur in accordance with the schedule in the MIP:

- Preliminary transmittal letters shall be prepared. These letters and any additional letters requested by FEMA shall be prepared in accordance with the current version of the FEMA *Document Control Procedures Manual*;
- Preliminary copies of the DFIRM and FIS report, including all new or updated data tables and Flood Profiles, shall be prepared;
- Preliminary copies of the DFIRM and FIS report shall be mailed to the Chief Executive Officer (CEO) and floodplain administrator of each affected community, all other Project Team members, the State NFIP Coordinator, the FEMA Regional Office, and others as directed by FEMA;
- In addition to the hardcopy of the preliminary DFIRM and FIS report, an Adobe .pdf format of each shall be provided to the FEMA Project Officer.

- Preliminary SOMAs, prepared in accordance with FEMA requirements, shall be mailed with the Preliminary copies of the DFIRM and FIS report when appropriate;
- Revised DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*, shall be provided by uploading the digital data to the MIP if available or if not then on CD-ROM;
- Revised DFIRM database files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*, shall be provided by uploading the digital data to the MIP if available or if not then on CD-ROM;
- Revised metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*, shall be provided by uploading the digital data to the MIP if available or if not then on CD-ROM; and
- A Summary Report that describes and provides the results of all automated or manual Quality Control review steps taken during the preparation of the DFIRM shall be provided.

Task 16 - Post-Preliminary Processing

Responsible Mapping Partners: **National Service Provider**

Scope: Task 16 consists of finalizing the DFIRM and FIS report after the Preliminary copies of the DFIRM and FIS report have been issued to community officials and the public for review and comment. The activities to be performed are summarized below.

Initiation of Statutory 90-Day Appeal Period: When required, upon completion of a 30-day community comment period and/or final coordination meeting with the affected communities, the NSP shall arrange for and verify that the following activities are completed in accordance with the current version of the *FEMA Guidelines and Specifications for Flood Hazard Mapping Partners and Document Control Procedures Manual*:

- Proposed BFE determination letters are sent to the community CEOs and floodplain administrators;
- News release notifications of BFE changes are published in prominent newspapers with local circulation; and
- The appropriate notices (Proposed Rules) are published in the *Federal Register*.

Resolution of Appeals and Protests: The NSP shall support FEMA in reviewing and resolving appeals and protests received during the 90-day appeal period. The **Missouri State Emergency Management Agency** shall be available to address technical questions from the NSP. For each appeal and protest, the following activities shall be conducted as appropriate:

- Initial processing and acknowledgment of submittal;
- Technical review of submittal;
- Preparation of letter(s) requesting additional supporting data;
- Performance of revised analyses; and
- Preparation of a draft resolution letter and revised DFIRM and FIS report materials for FEMA review.

The NSP shall mail all associated correspondence upon authorization by FEMA.

Preparation of Special Correspondence: The NSP shall support FEMA in responding to comments not received within the 90-day appeal period (referred to as “special correspondence”), including drafting responses for FEMA review when appropriate and finalizing responses when requested by FEMA. The NSP also shall mail the final correspondence (and enclosures if appropriate) and distribute appropriate copies of the correspondence and enclosures upon receipt of authorization from FEMA.

Revision of DFIRM and FIS Report: If necessary, the NSP shall revise the DFIRM and FIS report at the direction of the FEMA Regional Project Officer and distribute Revised Preliminary copies of the DFIRM and FIS report to the CEO and floodplain administrator of each affected community, all other Project Team members, the State NFIP Coordinator, the FEMA Regional Office, and others as directed by FEMA.

Final SOMA Preparation: The NSP shall prepare Final SOMAs for the affected communities as appropriate.

Processing of Letter of Final Determination: The NSP shall work with FEMA to establish the effective date for the DFIRM and FIS report, and shall prepare a Letter of Final Determination (LFD) for each affected community for FEMA review in accordance with the *FEMA Document Control Procedures Manual*. The NSP also shall mail the final signed LFDs and enclosures (including the Final SOMA and the Final Rule for publication in the *Federal Register*, when appropriate) and distribute appropriate copies of the signed LFDs and enclosures upon receipt of authorization from FEMA.

Processing of Final DFIRM and FIS Report for Printing: The NSP shall prepare final reproduction materials for the DFIRM and FIS report and provide these materials to the FEMA Map Service Center for printing by the U.S. Government Printing Office. The NSP also shall prepare the appropriate paperwork to accompany the DFIRM and FIS report (including Print Processing Worksheet, Printing Requisition Forms, and Community Map Actions Form) and transmittal letters to the community CEOs.

Revalidation Letter Processing. The NSP, when appropriate, shall prepare and distribute revalidation letters to the community CEOs and floodplain administrators to notify the affected communities about LOMCs for which determinations will remain in effect after the DFIRM and FIS report become effective.

Archiving Data: The NSP shall ensure that technical and administrative support data are packaged in the FEMA-required TSDN format and stored properly in the library archives.

Standards: All work under Task 16 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the **National Service Provider** shall make the following products available to FEMA by uploading the digital data to the MIP. This submittal will occur in accordance with the schedule in the MIP:

- Documentation that the news release notifications were published in accordance with FEMA requirements;
- Documentation that the appropriate *Federal Register* notices (Proposed and Final Rules) were published in accordance with FEMA requirements;
- Draft and final Special Correspondence (and all associated enclosures, backup data, and other related information) for FEMA review and signature as appropriate;
- Draft and final Appeal and Protest acknowledgment, additional data, and resolution letters (and all associated enclosures, backup data, and other related information) for FEMA review and signature as appropriate;
- Draft and final LFDs (and all associated enclosures, backup data, and other related information) for FEMA review and signature;
- DFIRM negatives and final FIS report materials, including all updated data tables and Flood Profiles;
- Paperwork for the final DFIRM and FIS report materials;
- Transmittal letters for the printed DFIRM and FIS report;
- LOMC Revalidation Letters if appropriate; and

- Complete, organized archived technical and administrative support data.

Task 16A - Post-Preliminary DFIRM and FIS Report Finalization

Responsible Mapping Partners: Not Assigned

Scope: This task is not applicable to this Mapping Activity Statement

Task 17 – Outreach and Coordination

Responsible Entity: **Missouri State Emergency Management Agency**

Scope: The outreach activities for a Flood Map Project can best be understood as a process that begins during the Project Scoping phase and continues through the Map Production and Post-preliminary phases.

The overarching goal for conducting outreach is to create a climate of understanding and ownership of the mapping process at the State and local levels. Well-planned outreach activities can reduce political stress, confrontation in the media, and public controversy, which can arise from lack of information, misunderstanding, or misinformation. These outreach activities also can assist FEMA and other members of the Project Team in responding to congressional inquiries.

FEMA will conduct a Pre-Award Notification Meeting for the counties identified in Table 1.2 that are considered to be complex or politically sensitive. The meeting will allow FEMA to discover additional data or concerns not addressed in the pre-scoping report. A copy of the meeting minutes will be provided to **Missouri State Emergency Management Agency**.

Missouri State Emergency Management Agency will prepare a project description for each county identified in Table 1-1. FEMA will provide a template to the **Missouri State Emergency Management Agency**. The project description will be provided to each community that will receive a DFIRM as a result of this project.

Missouri State Emergency Management Agency will conduct a Project Notification Meeting in each county identified in Table 1-1. The meeting will afford local officials an opportunity to learn about the project and ask questions. The meeting should include project scope, schedules, post-preliminary processing, and the community's role in the process. A FEMA representative will attend each project notification meeting.

Following the release of the preliminary DFIRM and FIS for the counties identified in Table 1-1 FEMA will schedule a public meeting. The **Missouri State Emergency Management Agency** shall attend the meeting to address technical issues. The public meeting is expected to occur no later than 45 days after the issuance of the preliminary DFIRM and FIS.

FEMA will provide a database of the Chief Elected Official and Floodplain Manager (where applicable) for each community that will receive a DFIRM.

The **National Service Provider** has developed outreach materials that may be used by the **Missouri State Emergency Management Agency** during the post award notification meeting. The Regional Management Center should be contacted to obtain the materials.

Standards: All work conducted under this task shall conform to the standards specified for this task in Section 5, "Applicable Standards" of this MAS. In the event of any contradictions between the MAS and the standards, the standards shall control.

Deliverables: Upon completion of each county, **Missouri State Emergency Management Agency** shall upload the digital data to the MIP or submit by using other digital media if the MIP is unavailable. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, **Missouri State Emergency Management Agency** shall make the following products available to FEMA by submitting it to the MIP or by digital media if the MIP is unavailable. This submittal will occur in accordance with the schedule outlined in the MIP.

The **Missouri State Emergency Management Agency** shall provide the following to FEMA:

- Conduct a Project Notification meeting for community officials in each county that is identified in Table 1-1 within 60 days of funds award. The **Missouri State Emergency Management Agency** will arrange for a meeting location and time, and prepare invitation letters for all community officials within the county. The project description shall be included with the invitation letter. Copies of the notification letter, project description, meeting minutes and an attendance roster shall be provided to FEMA for the docket file, a copy provided to the State NFIP Coordinating Agency, and included with the TSDN.
- The **Missouri State Emergency Management Agency** is required to provide a representative at the final meeting.

SECTION 2—Technical and Administrative Support Data Submittals and Special Problem Reports

The Project Team members for this Flood Map Project that have responsibilities for activities included in this MAS shall comply with the data submittal requirements summarized below.

All supporting documentation for the activities in this MAS shall be submitted in the TSDN format in accordance with Appendix M of the FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners*, dated April 2003. Appendix M is available for viewing or download on the FEMA Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf. Table 2-1 indicates the sections of the TSDN that apply to each mapping Task.

Table 2-1. Mapping Task and Applicable TSDN Sections

TSDN Section	Mapping Task															
	1	2	3	4	5	6	7	8	9	10, 10 A, 10 B	11	12	13, 13 A	14, 14 A	15	16
General Documentation																
Special Problem Reports	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Telephone Conversation Reports	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Meeting Minutes/Reports	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
General Correspondence	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Engineering Analyses																
Hydrologic Analyses			X			X	X	X	X	X	X					
Hydraulic Analyses			X			X	X	X	X	X	X					

Key to Cross-Section Labeling			X			X	X	X	X	X	X					
Key to Transect Labeling			X			X	X	X	X	X	X					
Draft FIS Report						X	X	X	X							
Mapping Information	X	X		X	X					X	X	X	X	X	X	X
Miscellaneous Reference Information	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

If any issues arise that could affect the completion of a Task within the proposed scope or budget, the responsible Mapping Partner shall complete a Special Problem Report (SPR) as soon as possible after the issue is identified and submitted to FEMA. The SPR is to describe the issue and propose possible resolutions. (For additional information on SPRs, refer to Appendix M, Subsection M.2.1.1 of *Guidelines and Specifications for Flood Hazard Mapping Partners*.)

The NSP shall collect and maintain a set of products for all Activities and shall compile a comprehensive TSDN for the entire project.

Section 3—Period of Performance

The mapping activities assigned to **Missouri State Emergency Management Agency** in this MAS will be completed within the period of performance as specified in the Agreement Articles of the Cooperative Agreement. The Mapping Activities may be terminated at the option of FEMA or **Missouri State Emergency Management Agency** in accordance with the provisions of the June 17, 1999 CTP Partnership Agreement.

Section 4—Funding/Leverage

Funds will be provided to **Missouri State Emergency Management Agency** by FEMA through cooperative agreement for the completion for this Flood Map Project. The cooperative agreement budget identifies the amount to be provided by each party. **Missouri State Emergency Management Agency** shall provide any additional resources required to complete the assigned activities for this Flood Map Project.

Section 5—Standards

The standards relevant to this MAS are provided in Tables 5-1 and 5-2. Information on the correct volume, appendix, section, or subsection of the FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners* to be referenced for each mapping task is summarized in Table 5-2. These Guidelines

are available for viewing or download from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/fhm/dl_cgs.shtm.

Requirements applicable to this Mapping Activity Statement from Chapter 7 of the Multi-Year Flood Hazard Identification Plan, (MHIP) are summarized in Table 5-3. The MHIP is available for download at <http://hazards.fema.gov/resources/>.

In addition, Data Capture Standards referenced in the previous sections are to be applied to the project for the data formats to be submitted to FEMA.

Table 5-1. Applicable Standards for Project Activities

Applicable Standards	Activities															
	1	2	3	4	5	6	7	8	9	10, 10 A, 10B	11	12	13, 13A	14, 14A	15	16
<i>Guidelines and Specifications for Flood Hazard Mapping Partners</i> , April 2003	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
American Congress on Surveying and Mapping Procedures			X	X	X											
Global Positioning System (GPS) Surveys: National Geodetic Survey (NGS-510), “Guidelines for Establishing GPS-Derived Ellipsoid Heights,” November 1997			X	X	X											
Engineer Manual 1110-1-1000, <i>Photogrammetric Mapping</i> (USACE), July 1, 2002			X	X	X											
Engineer Manual 1110-2-1003, <i>Hydrographic Surveys</i> (USACE), January 1, 2002			X													
“Numerical Models Accepted by FEMA for NFIP Usage,” Updated April 2003						X	X	X	X							
<i>Content Standard for Digital Geospatial Metadata</i> (Federal Geographic Data Committee), 1998				X	X					X	X	X	X	X	X	X
<i>Document Control Procedures Manual</i> , December 2000															X	X

Table 5-2. Project Tasks and Applicable Portions of FEMA Guidelines and Specifications

Task Number	Task Description	Applicable Volume, Section/Subsection, and Appendix
1	Pre-Scoping	Volume 1, and Appendix I
2	Scoping	Volume 1, and Appendix I
3	Field Surveys and Reconnaissance	Volume 1, Section 1.4 (specifically Subsection 1.4.2.1) ----- Appendix A, Sections A.4, A.5, A.6, A.7, and A.8 ----- Appendix F, Section F.3 ----- Appendices B, C, M, and N
4	Topographic Data Development	Volume 1, Section 1.4 (specifically Subsection 1.4.2.1) ----- Appendix A, Sections A.2, A.3, A.7, and A.8 ----- Appendix M and N
5	Quality Assurance Review of Topographic Data	Volume 1, Section 1.4 (specifically Subsections 1.4.1 and 1.4.2.1) ----- Appendix A, Sections A.2, A.3, A.7 (specifically Subsection A.7.5), and A.8 (specifically Subsection A.8.6) ----- Appendix M
6	Hydrologic Analyses	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4) ----- Appendix A, Section A.4 ----- Appendix C, Sections C.1 and C.7 ----- Appendices E, F, G, H, M, and N ----- Appendix A, Section A.4 ----- Appendices B, D, M, and N

Table 5-2. Project Activities and Applicable Portions of FEMA Guidelines and Specifications (Cont'd)

Task Number	Task Description	Applicable Volume, Section/Subsection, and Appendix
7	Quality Assurance Review of Hydrologic Analyses	Volume 1, Section 1.4 (specifically Subsection 1.4.1) ----- Appendix A, Section A.4 ----- Appendix C, Section C.2 ----- Appendices E, F, G, H, and M ----- Appendix A, Section A.4 ----- Appendices B, D, and M
8	Hydraulic Analyses	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4) ----- Appendix A, Section A.4 (specifically Subsection A.4.7) ----- Appendix C, Sections C.3 and C.7 ----- Appendices B, E, F, G, H, M, and N
9	Quality Assurance Review of Hydraulic Analyses	Volume 1, Section 1.4 (specifically Subsection 1.4.1) ----- Appendix A, Section A.4 (specifically Subsection A.4.7) ----- Appendix C, Section C.5 ----- Appendices B, E, F, G, H, and M
10	Floodplain Mapping (Detailed Riverine or Coastal Analysis)	Volume 1, Section 1.4 (specifically Subsection 1.4.2.3) ----- Appendix C, Sections C. 4 and C.6 ----- Appendix D, Sections D.2 (specifically Subsection D.2.7) and D.3 (specifically Subsection D.3.7) ----- Appendices E, F, G, H, K, L, M, and N

Table 5-2. Project Activities and Applicable Portions of FEMA Guidelines and Specifications (Cont'd)

Task Number	Task Description	Applicable Volume, Section/Subsection, and Appendix
10A	Floodplain Mapping (Redelineation Using Effective Flood Profiles and Updated Topographic Data)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.3) ----- Appendix C, Section C.6 (specifically Subsection C.6.1.3) ----- Appendices K, L, M, and N
10B	Floodplain Mapping (Refinement or Creation of Zone A)	Volume 1, Section 1.4 (specifically Subsection 1.4.2.3) ----- Appendix C, Sections C.4 and C.6 ----- Appendices K, L, and M
11	Quality Assurance Review of Floodplain Mapping (Revised Areas)	Volume 1, Section 1.4 (specifically Subsections 1.4.1 and 1.4.2.3) ----- Appendix C, Sections C.4 and C.6 ----- Appendix D, Sections D.2 (specifically Subsection D.2.7) and D.3 (specifically Subsection D.3.7) ----- Appendices E, F, G, H, K, L, and M
12	Base Map Acquisition and Preparation	Volume 1, Section 1.3 (specifically Subsection 1.3.1.8) and 1.4 (specifically Subsections 1.4.3.1 and 1.4.3.2) ----- Appendix A, Section A.1 (specifically Subsection A.1.1)
13	DFIRM Production (Non-Revised Areas)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2, 1.4.2.3, and 1.4.3.2) ----- Appendices K, L, and M
13A	Quality Assurance Review of DFIRM Production (Non-Revised Areas)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2, 1.4.2.3, and 1.4.3.2) ----- Appendices K, L, and M

Table 5-2. Project Activities and Applicable Portions of FEMA Guidelines and Specifications (Cont'd)

Task Number	Task Description	Applicable Volume, Section/Subsection, and Appendix
14	DFIRM Production (Merging Revised and Non-Revised Areas)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.3 and 1.4.3.3) ----- Appendices K, L, and M
14A	DFIRM Production (Application of FEMA Graphics and Database Specifications)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.3, 1.4.3.3, 1.4.3.9, and 1.4.3.10) ----- Appendices K, L, and M
14B	Quality Assurance Review of DFIRM Product Meeting FEMA Graphics and Database Specifications	Volume 1, Section 1.4 (specifically Subsections 1.4.2.3, 1.4.3.3, 1.4.3.9, and 1.4.3.10) ----- Appendices K, L, M, and N
15	Preliminary DFIRM and FIS Report Distribution	Volume 1, Sections 1.4 (specifically Subsections 1.4.2 and 1.4.3) and 1.5 (specifically Subsection 1.5.1) ----- Appendices J, K, L, and M
16	Post-Preliminary Processing	Volume 1, Section 1.5 (specifically Subsection 1.5.2) ----- Appendices J, K, L, and M

Table 5-3. Project Activities and Applicable Portions of MHIP Chapter 7

Task Number	Task Description	
4	Topographic Data Development	Table 7-6 Suitability of Topographic Data Sources
6	Hydrologic Analyses	Table 7-3 Suitability of Various Hydrologic Analyses Methods Table 7-4 Suitability of Various Methods of Validation
8	Hydraulic Analyses	Table 7-5 Suitability of Manning’s N-value Methodology Table 7-7 Suitability of the Inclusion of Hydraulic Structures
10, 10A, 10B	Floodplain Mapping	Table 7-1 Risk Classes of Flood Insurance Rate Maps
13	DFIRM Production (Non-Revised Areas)	Section 7.4.3 Utilization of Effective Flood Insurance Study Information

Section 6—Schedule

The tasks documented in this Mapping Activity Statement shall be completed in accordance with the project schedule. The Multi-Hazard Information Platform (MIP) will be used to report progress for this Mapping Activity Statement. The initial schedule will be entered into MIP within three weeks of funds award. The data reported in the MIP will include estimated and actual completion dates, budget and amount spent, and the percent complete of each task identified in the Mapping Activity Statement. Each county identified in Table 1-1 will have separate schedule established.

The Preliminary DFIRM for all counties identified in Table 1-1 shall be issued no later than September 30, 2006. The Effective Date for all counties identified in Table 1-1 shall be no later than September 30, 2007. All Mapping Partners assigned tasks in this Mapping Activity Statement shall coordinate schedules to ensure all required tasks are completed with dates identified in this paragraph. A schedule that is coordinated with all Mapping Partners shall be required prior to funds award.

If changes to the schedule are required, the responsible Mapping Partner shall coordinate with FEMA and the other Mapping Partners in a timely manner.

Section 7—Certifications

If applicable, the following certifications apply to this MAS:

Task 3 (Field Surveys and Reconnaissance) and Task 4 (Topographic Data Development)

A Registered Professional Engineer or Licensed Land Surveyor shall certify topographic data, in accordance with 44 CFR 65.5(c). Certification of topographic data by the American Society for Photogrammetry and Remote Sensing is also acceptable.

Task 6 (Hydrologic Analyses), Task 8 (Hydraulic Analyses), Task 10 (Floodplain Mapping—Detailed Riverine Analysis), Task 10A (Floodplain Mapping {Redelineation Using Effective Flood Profiles and Updated Topographic Data}), and Task 10B (Floodplain Mapping {Refinement or Creation of Zone A})

- A Registered Professional Engineer shall certify hydrologic and hydraulic analyses and data in accordance with 44 CFR 65.6(f).
- A Registered Professional Engineer or Licensed Land Surveyor shall certify topographic information in accordance with 44 CFR 65.5(c).
- Any levee systems to be accredited will be certified in accordance with 44 CFR 65.10(e).

Task 10 (Floodplain Mapping— Detailed Riverine Analysis), Task 10A (Floodplain Mapping {Redelineation Using Effective Flood Profiles and Updated Topographic Data}), and Task 10B (Floodplain Mapping {Refinement or Creation of Zone A}), Task 11 (Quality Assurance Review of Floodplain Mapping {Revised Areas}), Task 13 (DFIRM Production {Non-Revised Areas}), Task 14 (DFIRM Production {Merging Revised and Non-Revised Information}), and Task 14A (DFIRM Production {Application of FEMA Graphics and Database Specifications})

The DFIRM metadata files shall include a description of the horizontal and vertical accuracy of the DFIRM base map and floodplain information.

Task 12 (Base Map Acquisition and Preparation)

- Written statement that the digital data meet FEMA's minimum standards and specifications.

- The responsible Mapping Partner shall provide documentation that the digital base map can be used by FEMA. Please note that uploading base map data to the MIP does not constitute agreement that the digital base map can be used by FEMA. Documentation that the digital base map can be used by FEMA will still be required.

Certifications must be made at the time the intermediate data is submitted. For example, if hydrologic data is submitted, certification will be required at the time it is submitted.

Section 8—Technical Assistance and Resources

Project Team members may obtain copies of FEMA-issued LOMCs, archived engineering backup data, and data collected as part of the FEMA Mapping Needs Assessment Process from the NSP

General technical and programmatic information, such as FEMA 265 and the Quick-2 computer program, can be downloaded from the FEMA Web site (<http://www.fema.gov/fhm/>). Specific technical and programmatic support may be provided through the NSP; such assistance should be requested through the FEMA Project Officer specified in Section 11 of this MAS.

Project Team members also may consult with the FEMA Regional Project Officer to request support in the areas of selection of data sources, digital data accuracy standards, assessment of vertical data accuracy, data collection methods or subcontractors, and GIS-based engineering and modeling training.

Section 9—Contractors

Missouri State Emergency Management Agency intends to use the services of the USGS-Water Science Center, the University of Missouri Center for Agricultural, Resource and Environmental Systems and the Geographic Resource Center as a contractor for this Flood Map Project. If federal funds are used **Missouri State Emergency Management Agency** shall ensure that the procurement for all contractors used for this Flood Map Project complies with the requirements of 44 CFR 13.36. Part 13 may be downloaded in PDF or text format from the U.S. Government Printing Office Web site at http://www.access.gpo.gov/nara/cfr/waisidx_02/44cfr13_02.html.

Section 10— Reporting

Missouri State Emergency Management Agency shall provide progress and financial reports to the FEMA Regional Project Officer and Contracting Officer in accordance with Cooperative Agreement Articles V & VI.

Progress reporting will utilize the MIP or other systems as identified by FEMA. Other progress reports are not anticipated. When the **Missouri State Emergency Management Agency** provides deliverables through the MIP, the **Missouri State Emergency Management Agency** shall ensure the MIP reflects the current status of the related task.

The Project Officer, as needed, may request additional information on status on an ad hoc basis.

Section 11—Points of Contact

The points of contact for this Flood Map Project are Robert Franke, the FEMA Regional Project Officer; George Riedel, the Project Manager for **Missouri State Emergency Management Agency**; or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. When

necessary, the assistance of the NSP should be requested through the FEMA Project Officer, Robert Franke.

Section 12—Project Coordination

Throughout the project, all members of the Project Team will coordinate, as necessary, to ensure the products meet the technical and format specifications required and contain accurate, up-to-date information. Coordination activities may include:

- Meetings, teleconferences, and videoconferences with FEMA and other Project Team members on an ad hoc basis;
- Telephone conversations with FEMA and other Project Team members on an ad hoc basis, as required;
- Updates to the MIP, MNUSS database, and other FEMA status information systems in accordance with requirements in Volumes 1 and 3 of *Guidelines and Specifications for Flood Hazard Mapping Partners*; and
- E-mail, facsimile transmissions, and letters, as required.
- Project Team members shall meet with the **Regional Management Center** and/or FEMA quarterly to review the progress of the project. **These meetings will be** held via a conference call at a mutually agreeable time to be determined. Typically the call will occur following the submittal of the quarterly progress report.

Each party has caused this MAS to be executed by its duly authorized representative.



Ronald M. Reynolds
Project Manager
Missouri State Emergency Management Agency

6-8-05

Date



for Robert G. Bissell, Director
Federal Insurance and Mitigation Division
Federal Emergency Management Agency, Region VII

6/13/05

Date