



# FEMA

## State Emergency Management Agency COOPERATING TECHNICAL PARTNERS MAPPING ACTIVITY STATEMENT

### Mapping Activity Statement No. 17 (supplement)

In accordance with the Cooperating Technical Partners (CTP) Partnership Agreement dated June 17, 1999 between the State Emergency Management Agency (SEMA) and the Federal Emergency Management Agency (FEMA), this supplement to Mapping Activity Statement (MAS) No. 17 is as follows:

### SECTION 1—OBJECTIVE AND SCOPE

The objective of the supplement is to revise the scope for streams within Jackson County/Kansas City. The revised scope will incorporate detailed engineering analyses provided by the city of Kansas City, Water Services Department. Previously these streams were not scoped for revised engineering analysis. The tasks described in this supplement will be incorporated in MIP cases 07-07-0009S and 07-07-0023S.

All processes and deliverables shall be completed in accordance to the Federal Emergency Management Agency's (FEMA's) *Guidelines and Specifications for Flood Hazard Mapping Partners (G&S)* and effective Procedure Memoranda (PMs). The Mapping Partners involved in this project will develop new and/or updated flood hazard data, as summarized in Table 1.1, Flooding Sources to be Studied.

**Table 1.1 - Flooding Source(s) to be Studied**

Flooding Source	Reach Limits	Reach Length	Detailed Riverine	
			Hydrology	Hydraulics
Blue River	Beginning at Confluence with Missouri River extending to 63rd Street	13.1	X	X
Blue River	Beginning at 63rd Street extending to County Boundary	19.7	X	X
Blue River Trib 17	From Confluence with Blue River to just downstream of I 70	0.9	X	X
Blue River Trib 14	From Confluence with Blue River to .5 miles upstream of Blue Parkway Dr	2.4	X	X
Blue River Trib 13	From Confluence with Blue River to .5 miles upstream of Lakeside Dr	1.2	X	X
Blue River Trib 12	From Confluence with Blue River to .7 miles upstream of confluence	0.8	X	X

Flooding Source	Reach Limits	Reach Length	Detailed Riverine	
			Hydrology	Hydraulics
Blue River Trib 11	From Confluence with Blue River to .2 miles upstream of I 435	1.5	X	X
Blue River Trib 10	From Confluence with Blue River to .1 upstream of US Highway 71	1.5	X	X
Blue River Trib 9	From Confluence with Blue River to just downstream of East 85th Street	2.3	X	X
Blue River Trib 7	From Confluence with Blue River to just upstream of East 111th Street	1.5	X	X
Blue River Trib 6	From Confluence with Blue River to 1 mile upstream of East 119th Street	1.5	X	X
Blue River Trib 5	From Confluence with Blue River .3 miles upstream of Warnall Rd	1.3	X	X
Blue River Trib 4	From Confluence with Blue River to .8 miles upstream of 129th St	1.3	X	X
Blue River Trib 4.1	From Confluence with Blue River to .1 miles upstream of East Blue Ridge Blvd	0.7	X	X
Blue River Trib 2	From Confluence with Blue River to .3 miles upstream of State Line Rd	1.6	X	X
Blue River Trib 1	From Confluence with Blue River to .6 miles upstream of Highway 150	2	X	X
Brush Creek	From confluence with Blue River to County Line	5.4	X	X
Brush Creek Trib 8	From confluence with Brush Creek to just downstream of 39th Street	1.4	X	X
Town Fork Creek	From confluence with Brush Creek to just downstream of E 63rd Street	2.4	X	X
Dyke Branch	From Confluence with Indian Creek to the County Boundary	2.1	X	X

Flooding Source	Reach Limits	Reach Length	Detailed Riverine	
			Hydrology	Hydraulics
Indian Creek	From Confluence with Blue River to the County Boundary	3.5	X	X
Round Grove	From Confluence with Blue River to 1.3 miles upstream of Raytown Rd	3.5	X	X
Round Grove Trib 2	From Confluence with Round Grove to .5 miles upstream of Conf.	0.5	X	X
Round Grove Trib 3	From Confluence with Round Grove to just downstream of I 70	1.8	X	X
Round Grove Trib 1	From Confluence with Round Grove to just upstream of Sterling Ave	2	X	X
Hickman Mills Creek	From Confluence with Blue River to .4 miles upstream of I 470	3.7	X	X
Hickman Mills Creek Trib 1	From confluence with Hickman Mills Creek to just upstream of I 435	1.6	X	X
Hickman Mills Creek Trib 2	From Confluence with Hickman Mills Creek to just upstream of I 470	0.5	X	X
Little Blue River (KC)	From just downstream of Lee Summit Road to just upstream of Highway 71	18	X	X
Little Blue River Trib 1	From Confluence with Little Blue River upstream 1.1 miles	1.1	X	X
Lumpkins Fork	From confluence with Little Blue River to County Line	5.2	X	X
Lumpkins Fork Trib 2	From confluence with Lumpkins Fork to 0.7 miles upstream of Peterson Road	1.8	X	X
Little Blue River Trib 4	From Confluence with Little Blue River to .3 miles upstream of Raytown Rd	0.9	X	X

Flooding Source	Reach Limits	Reach Length	Detailed Riverine	
			Hydrology	Hydraulics
Little Blue River Trib 5	From Confluence with Little Blue River to .4 miles upstream of Raytown Rd	1.6	X	X
Little Blue River Trib 7	From Confluence with Little Blue River to East 99th St	2	X	X
Wildcat Creek	From Confluence with Little Blue River to 1.6 miles upstream of Woodson Rd	2.6	X	X
Wildcat Creek Trib 1	From Confluence with Wildcat Creek to .15 miles upstream of Woodson Rd.	1.8	X	X
White Oak Creek	From Confluence with Little Blue to upstream of Raytown Road	1.7	X	X
White Oak Creek Trib 1	From Confluence with White Oak Creek to upstream of Elm Drive	1.8	X	X
Little Blue River Trib 16	From Confluence with Little Blue River to .3 miles upstream of Noland Rd	1.8	X	X
Little Blue River Trib 17	From Confluence with Little Blue River to just upstream of Noland Rd	2.6	X	X
Little Cedar Creek	From Confluence with Little Blue River 3.4 miles upstream of 79th St	4.2	X	X
Little Cedar Creek Trib 2	From Confluence with Little Cedar Creek to .7 miles upstream	0.7	X	X
	<b>Total Stream Miles</b>	<b>129.5</b>		

This Flood Map Project will be completed by the following Mapping Partner(s):

- State Emergency Management Agency;
- AMEC Earth and Environmental (as a contractor to SEMA).

SEMA shall notify FEMA and/or its contractor by e-mail of all meetings with community officials at least two weeks prior to the meeting (with as much notice as possible). FEMA and/or its contractor may or may not attend the community meetings.

The activities for this Flood Map Project, including any required Quality Control (QC) reviews as outlined in Procedure Memorandum (PM) 42, and the Mapping Partners that will complete them are summarized in Table 1.2, Flood Mapping Project Activities. The sections of this MAS that follow the table below describe the specific mapping activities, responsible Mapping Partner(s), FEMA standards that must be met, and resultant map deliverables.

SEMA is responsible for the implementation of a Quality Assurance plan for all assigned activities. SEMA will submit a Summary Report that describes and provides the results of all automated or manual QA review steps. The report should include the process for all assigned activities.

If the CTP will be utilizing its contractor to do the QC review, this should be identified during scoping. The CTP will need to submit its QC plan with checklist to the Regional Project Officer for approval. Please note FEMA will also be performing periodic audits and overall study/project management to ensure study quality. The CTP will be responsible for addressing any and all comments resulting from the review.

Independent QC Review of Hydrologic and Hydraulic Analyses, Floodplain Mapping, DFIRM database and Preliminary Map panels is required for the streams identified in Table 1.1. The city of Kansas City will fund the required reviews. SEMA's contractor, AMEC Earth and Environmental, will contract with Greenhorn and O'Mara to obtain the independent reviews.

The Regional Office has reviewed map panels for accredited levees on the Flood Insurance Rate Map. In coordination with the USACE, the Region has determined the PAL classification for each levee accredited on the FIRM. The classification is summarized in Table 1.3. SEMA will include the appropriate note for the associated PM 43 classification.

In those cases where the effective map does not include a shaded Zone X area on the landward side of the levee, SEMA will delineate the shaded Zone X area based on the elevation of the 1% of annual occurrence flood and existing topographic data.

Only accredited levees, or levees with a provisional accreditation, are to be depicted on the FIRM. Other levees, including non-accredited levee shown on the effective FIRM, are not to be included.

If the PAL Classification for a levee changes during the course of the project, FEMA will contact SEMA to discuss the need to revise the statement of work.

**Table 1.3 – Levee PAL Classification**

Stream	Levee Name	Provisionally Accredited Levee Classification	Additional Mapping Required
Blue River	GSA Bannister Complex	B	No*

\*Note: This levee was accredited by LOMR case 99-07-551P.

If the BFE for the location is modified then contact with GSA will be necessary to verify the freeboard using the revised BFE. If GSA is unable to provide the necessary information 120 days before the estimated preliminary date then a PAL agreement will be offered, and the appropriate note placed on the FIRM.

If the BFE for the location will not be modified, then no additional action will be required.

**Table 1.2 Flood Mapping Project Activities**

**Task Assignments**

Post-Preliminary Processing	X
Perform Independent QA/QC of Preliminary Map Product	X
Produce Preliminary Map Products	X
Develop DEIRM Database	X
Perform Independent QA/QC of Floodplain Mapping	X
Perform Floodplain Mapping	X
Perform Independent QA/QC of Hydraulic Analyses	X
Perform Hydraulic Analyses	X
Perform Independent QA/QC of Hydrologic Analyses	X
Perform Hydrologic Analyses	X
Acquire Base Map	X
Perform Independent QA/QC of Topographic Data	X
Develop Topographic Data	X
Perform Field Survey	X
Scoping	X
Partner Type	CTP
Partner Name	SBMA

## Perform Field Survey

Responsible Mapping Partner: State Emergency Management Agency

Scope: To supplement any field reconnaissance conducted during the Project Scoping phase of this project, SEMA 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.

SEMA 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. SEMA also shall coordinate with other Mapping Partners that are involved in the Topographic Data Development process.

SEMA shall address all concerns or questions regarding the field survey that are raised during the NSP's Validate Content Submission Process.

Standards: All Field Survey work shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: In accordance with the *Guidelines and Specifications for Flood Hazard Mapping Partners*, SEMA shall make the following products available to FEMA by uploading the digital data to the MIP. Additionally, the Technical Support Data Notebook format described in the *Guidelines and Specifications for Flood Hazard Mapping Partners* must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

- 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;
- Documentation of the Datum, (Refer to Procedure Memorandum 41);
- Digital version of draft text for inclusion in the FIS report;
- A metadata file complying with the FEMA NFIP Metadata Profile Specifications;
- Survey Database or Data Delivery consistent with the *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- A DCS QA Report, and
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM as outlined in the approved QA/QC Plan.

MIP workflow steps: Perform Field Survey.

### Perform Hydrologic Analyses

Responsible Mapping Partner: State Emergency Management Agency

Scope: SEMA shall perform hydrologic analyses for the flooding source(s) listed in Table 1.1. For streams studied by detailed methods, the SEMA shall calculate peak flood discharges for the 10-, 2-, 1-, and 0.2-percent-annual-chance storm events using the method indicated in the table below. These flood discharges will be the basis for subsequent Hydraulic Analyses performed under this MAS. In addition, SEMA shall address all concerns or questions regarding the hydrologic analyses that are raised during the Independent QC review performed by SEMA, or during the NSP's Validate Content Submission Process.

#### Summary of Hydrologic Analysis

Stream Name	Method	Square Miles of New Detailed Hydrology
Blue River	Gage Frequency Analysis	32.8
Little Blue River	Gage Frequency Analysis	18.0
All other streams in Table 1.1	HEC-HMS/SWMM*	78.7

\*Several of the leverage studies will be reviewed and if models are validated and meet FEMA G&S SWMM hydrology will be used. If the leverage models are not validated, new HEC-HMS models will be created.

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 Hydrologic Analyses work shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: In accordance with the *Guidelines and Specifications for Flood Hazard Mapping Partners*, SEMA shall make the following products available to FEMA by uploading the digital data to the MIP so that SEMA can access it for an Independent QC review. Additionally, the Technical Support Data Notebook format described in the *Guidelines and Specifications for Flood Hazard Mapping Partners* must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

For stream studied by detail methods, SEMA 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 draft text for Hydrologic Analyses Section of the FIS report; and
- Digital versions of all backup data used in the analysis including work maps.

For all streams, SEMA shall provide the following deliverables:

- Brief summary report documenting the study area, methodologies, assumptions, and any other pertinent information related to the engineering analysis performed.
- A metadata file complying with the FEMA NFIP Metadata Profile Specifications;
- Hydrology Database or Data Delivery consistent with the Data Capture Standards;
- A DCS QA Report;
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM as outlined in the approved QA/QC Plan; and
- For GIS-based modeling, deliverables shall include all input and output data, intermediate data processing products, and GIS data layers.

MIP workflow step equivalent: Perform Hydrologic Analyses.

### **Perform Independent QC Review of Hydrologic Analyses**

Responsible Mapping Partner: State Emergency Management Agency

Scope: SEMA shall review the technical, scientific, and other information submitted by SEMA specific to the hydrologic analyses to ensure that the data and modeling are consistent with FEMA standards and standard engineering practice, and are sufficient to prepare the DFIRM. If SEMA utilizes a contractor to perform the Independent QC, the contractor must be a different contractor than who performed the original analyses. FEMA may audit or assist in these activities if deemed to be necessary by the Regional Project Officer. 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 QC 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 the data readily available to FEMA;
- Maintain an archive of all data submitted for hydrologic modeling review. (All supporting data must be retained for three years from the date a funding recipient submits its final expenditure report to FEMA, and once the study is effective all associated data should be submitted to the FEMA library); and

Standards: All Independent QC work shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: : In accordance with the *Guidelines and Specifications for Flood Hazard Mapping Partners*, SEMA shall make the following products available to FEMA by uploading the digital data to the MIP, through the Load Studies Data Artifacts portlet under the Data Upload tab under Tools & Links. Additionally, the Technical Support Data Notebook format described in the *Guidelines and Specifications for Flood Hazard Mapping Partners* must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

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

MIP workflow step equivalent: Perform Independent QC for Hydrologic Analyses.

### Perform Hydraulic Analyses

Responsible Mapping Partner: State Emergency Management Agency

Scope: For the streams identified in Table 1.1 that will be studied by detailed methods, SEMA will perform hydraulic analyses for approximately 129.5 miles. The modeling will include the 10%, 2%, 1% and 0.2% annual chance storm events based on peak discharges computed in the Perform Hydrologic Analyses Task. 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.

SEMA shall use the cross-section and field data collected during Perform Field Survey and the topographic data collected during the Develop Topographic Data to perform the hydraulic analyses. The hydraulic analyses will be used to establish flood elevations and regulatory floodways for the subject flooding sources.

SEMA shall use the FEMA CHECK-2 or CHECK-RAS checking program to verify the reasonableness of the hydraulic analyses. To facilitate the Independent QC review, SEMA shall provide explanations for unresolved messages from the CHECK-2 or CHECK-RAS program, as appropriate. In addition, SEMA shall address all concerns or questions regarding the hydraulic analyses that are raised by SEMA during the Independent QC review, or during the NSP's Validate Content Submission Process.

SEMA shall document automated data processing and modeling algorithms for GIS-based modeling and provide the data to FEMA for review to ensure these are consistent with the standards outlined above. Digital datasets are to be documented and provided to FEMA for approval before performing the hydraulic analyses to ensure the datasets meet minimum requirements. If non-commercial (i.e., custom-developed) software is used for the analyses, then SEMA shall provide full user documentation, technical algorithm documentation, and software to FEMA for review before performing the hydraulic analyses.

#### Summary of Hydraulic Analysis

Stream Name	Method	Total Miles of New Detailed or Approximate Hydraulics
All streams identified in Table 1.1	HEC-RAS	129.5

Standards: All Hydraulic Analyses work shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: In accordance with the *Guidelines and Specifications for Flood Hazard Mapping Partners*, SEMA shall make the following products available to FEMA by uploading the digital data to the MIP so that SEMA can access it for an Independent QC review. Additionally, the Technical Support Data

Notebook format described in the *Guidelines and Specifications for Flood Hazard Mapping Partners* must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

For streams studied by detailed methods, SEMA 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 the Acquire Base Map Task;
- Explanations for unresolved messages from the CHECK-2 or CHECK-RAS program, as appropriate; and
- Digital versions of draft text for inclusion in the FIS report.

For all flood sources SEMA shall provide the following deliverables:

- 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;
- A metadata file complying with the FEMA NFIP Metadata Profile Specifications;
- Hydraulic Database or Data Delivery consistent with the Data Capture Standards of the *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- A DCS QA Report;
- A Summary Report that describes and provides the results of all automated or manual QA review steps taken during the preparation of the DFIRM as outlined in the approved QA Plan; and
- 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.

MIP workflow step equivalent: Perform Hydraulic Analyses.

### **Perform Independent QC Review of Hydraulic Analyses**

Responsible Mapping Partner: State Emergency Management Agency

Scope: SEMA shall review the technical, scientific, and other information submitted by SEMA under Hydraulic Analysis to ensure that the data and modeling are consistent with FEMA standards and standard engineering practice, and are sufficient to revise the FIRM. If SEMA utilizes a contractor to perform the QC, the contractor must be a different contractor than who performed the original analyses. FEMA may audit or assist in these activities if deemed to be necessary by the Regional Project Officer. 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-in 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 the data readily available to FEMA.
- Maintain an archive of all data submitted for hydrologic modeling review. (All supporting data must be retained for three years from the date a funding recipient submits its final expenditure report to FEMA, and once the study is effective all associated data should be submitted to the FEMA library); and
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**Standards:** All Independent QC work shall be performed in accordance with the standards specified in Section 5 - Standards.

**Deliverables:** In accordance with the *Guidelines and Specifications for Flood Hazard Mapping Partners*, SEMA shall make the following products available to FEMA by uploading the digital data to the MIP, through the Load Studies Data Artifacts portlet under the Data Upload tab under Tools & Links. Additionally, the Technical Support Data Notebook format described in Appendix M of the *Guidelines and Specifications for Flood Hazard Mapping Partners* must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

- A Summary Report that describes the findings of the Independent QC review;
- Recommendations to resolve any problems that are identified during the Independent QC review;

**MIP workflow step equivalent:** Perform Independent QC for Hydraulic Analyses.

### **Perform Floodplain Mapping**

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

**Scope for Detailed Riverine:** SEMA 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 hydrologic and hydraulic analyses were performed. SEMA shall incorporate all new or revised hydrologic and hydraulic modeling and shall use the topographic data acquired under Develop Topographic Data to delineate the floodplain and regulatory floodway boundaries on a digital work map.

**Scope for Merging Revised and Non-Revised Information:** Upon completion of the floodplain mapping activities for the revised and non-revised areas, SEMA shall merge the digital floodplain data into a single, updated DFIRM. This work is to include tie-in of flood hazard information for areas that were not studied as part of the Flood Map Project documented in this MAS. SEMA 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. SEMA shall coordinate with FEMA and any additional Mapping Partners responsible for other components of Perform Floodplain Mapping, as necessary, to resolve any potential tie-in issues.

**DFIRM Panel Summary**

Number of DFIRM panels	
Panels affected by the streams in Table 1.1	58

SEMA shall incorporate the results of all effective Letters of Map Change (LOMCs) within the revised areas as appropriate. Only those LOMCs visible at the published map scale shall be included.

SEMA shall address all concerns or questions regarding Floodplain Mapping that are raised by SEMA during the Independent QC review, or during the NSP's Validate Content Submission Process.

SEMA shall compare the effective FIRMs to the in-progress mapping to determine if any studies originally contained within a single jurisdiction will be plotted outside that jurisdiction's political boundaries when mapped in countywide format (this would include incorporating LOMRs). SEMA shall alert the Regional Office and the NSP using comments in the MIP about any instances where there is a BFE that needs to be published in the Federal Register and receive an appeal period. The communities that will have BFE changes, or will see the BFE for the first time, shall be listed in the Comments box on the Review screen in the Perform Floodplain Mapping task

**Standards:** All Floodplain Mapping work shall be performed in accordance with the standards specified in Section 5 - Standards. Mapping quality standards must be consistent with Procedure Memorandum No. 38, dated October 17, 2007. SEMA will perform self-certification audits for the Floodplain Boundary Standards, as described in PM 38 and all subsequent revisions, for all flood hazard areas. SEMA 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 and approved by the FEMA Regional Project Officer before analysis and mapping begin.

**Deliverables:** In accordance with the *Guidelines and Specifications for Flood Hazard Mapping Partners*, and upon completion of floodplain mapping for the counties identified in Table 1.1, SEMA shall make the following products available to FEMA by uploading the digital data to the MIP so that SEMA can access it for the Independent QC review. Additionally, the Technical Support Data Notebook format described in the *Guidelines and Specifications for Flood Hazard Mapping Partners* must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal. The mapping for the remaining flooding sources including any non-revised digital panels and all merged revised and non-revised floodplain mapping data is to be submitted for a final QC review at the completion of this activity.

- Digital work map showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs, flood insurance risk zone designation labels, and all applicable base map features;
- Draft DFIRM database prepared in accordance with the requirements in G&S;
- 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 QA/QC review steps taken during the preparation of the DFIRM as outlined in the approved QA/QC Plan;

- Any backup or supplemental information including supporting calculations and assumptions used in the mapping required for the Independent QC review of Hydrologic and /or Hydraulic Analyses and Floodplain Mapping;
- An explanation for the use of existing topography for the studied reaches, if appropriate.
- Written summary of the analysis methodologies;
- Digital versions of draft FIS report, Floodway Data Tables and updated profiles including all profiles and tables converted appropriate datum, as well as any other necessary items for the finalization of the preliminary FIS;
- Digital versions of input and output for any computer programs that were used;
- A metadata file complying with the FEMA NFIP Metadata Profile Specifications; and
- If automated GIS-based models are applied, all input data, output data, intermediate data processing products, and GIS data layers shall be submitted.

MIP workflow step equivalent: Perform Floodplain Mapping.

### **Perform Independent QC Review of Floodplain Mapping**

Responsible Mapping Partner: State Emergency Management Agency

Scope: SEMA shall review the floodplain mapping submitted by SEMA under Perform Floodplain Mapping to ensure that the results of the analyses performed are accurately represented; the redelineation of existing data on new, updated topography is appropriate; and to ensure that the new DFIRM panels accurately represent the information shown on the effective FIRMs and FBFMs for the unrevised areas that are mapped. If SEMA utilizes a contractor to perform the QA, the contractor must be a different contractor than who performed the original floodplain mapping. FEMA may audit or assist in these activities if deemed to be necessary by the Regional Project Officer. 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 work map for proper location and agreement with the results of the hydraulic modeling.
- Review the regulatory floodway widths for agreement with the widths shown in the Floodway Data Table and the results of the hydraulic modeling.
- Review the floodplain boundaries for agreement with the flood elevations shown in the Floodway Data Table, the contour lines, and other topographic information shown on the work maps.
- Review the floodplain widths at cross sections as shown on the work maps to ensure the data matches the Floodway Data Table.
- Review the floodplain boundaries as shown on the work maps to ensure the data matches the Flood Profiles.
- For non-revised floodplain areas, the 1- and 0.2-percent-annual-chance floodplain boundaries agree with the floodplain boundaries shown on the FIRM, the contour lines, other topographic information, and planimetric information shown on the DFIRM base.
- Road and floodplain relationships are maintained for all unrevised areas.
- Review the flood insurance risk zones as shown on the work maps to ensure the data are labeled properly.

- Review the DFIRM mapping files to ensure the data were prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*.
- Review the metadata file to ensure the data includes all required information shown in the FEMA NFIP Metadata Profiles.

**Standards:** All Independent QC work shall be performed in accordance with the standards specified in Section 5 - Standards.

**Deliverables:** In accordance with the *Guidelines and Specifications for Flood Hazard Mapping Partners*, SEMA shall make the following products available to FEMA by uploading the digital data to MIP, through the Load Studies Data Artifacts portlet under the Data Upload tab under Tools & Links. Additionally, the Technical Support Data Notebook format described in the *Guidelines and Specifications for Flood Hazard Mapping Partners* must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

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

**MIP workflow step equivalent:** Perform Independent QC for Floodplain Mapping.

### Develop DFIRM Database

Responsible Mapping Partner: State Emergency Management Agency

Scope: SEMA shall prepare the database, produced during Perform Floodplain Mapping in accordance with the *Guides and Specifications for Flood Hazard Mapping Partners*, for upload to the MIP. SEMA shall coordinate with those Mapping Partners responsible for Floodplain Mapping, as necessary, to resolve any problems that are identified during development of the DFIRM Database. The primary purpose of this activity is to ensure that a quality DFIRM database is prepared earlier in the flood study process and well in advance of the Preliminary DFIRM Map Production and Distribution.

Standards: All DFIRM Database work shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: In accordance with the *Guidelines and Specifications for Flood Hazard Mapping Partners*, SEMA shall make the following products available to FEMA by uploading the digital data to the MIP. Additionally, the Technical Support Data Notebook format described in Appendix M of the *Guidelines and Specifications for Flood Hazard Mapping Partners* must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

- DFIRM database files prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners* and in the format(s) required for the NSP's Validate Content Submission Process; and
- A metadata file complying with the FEMA NFIP Metadata Profile Specifications.

MIP workflow step equivalent: Develop DFIRM Database.

## Produce Preliminary Map Products

Responsible Mapping Partner: State Emergency Management Agency

Scope: SEMA shall apply the final FEMA DFIRM graphic and database specifications to the DFIRM files produced under Floodplain Mapping. This work shall include adding all required annotation, line pattern, area shading, and map collar information (e.g., map borders, title blocks, legends, notes to user). SEMA will be preparing the database for this project in the Standard format. The database shall be produced in accordance with the *Guides and Specifications for Flood Hazard Mapping Partners*. SEMA shall coordinate with those Mapping Partners responsible for the Perform Floodplain Mapping and Develop DFIRM Database tasks to resolve any problems that are identified during development of the Preliminary Map Products.

This task includes the creation of the countywide Flood Insurance Study (FIS) report. The FIS report will include the new study data and portions of the existing community based FIS reports as appropriate. The floodway data tables and profile sheets will be combined as needed to create a continuous table and profile for the subject streams. The elevations shown in the FIS shall be referenced to NAVD 1988 vertical datum.

Only accredited levees, or levees with a provisional accreditation, are to be depicted on the Flood Insurance Rate map. Other levees, including non-accredited levee shown on the effective FIRM, are not to be included.

The SEMA shall prepare Preliminary SOMAs for all affected communities, if appropriate. The SOMA shall list pertinent information regarding LOMCs that will be affected by the issuance of the DFIRM (i.e., superseded, incorporated, revalidated).

SEMA shall address all concerns or questions regarding the Preliminary Map Products that are raised by SEMA during the Independent QC review, or during the NSP's Validate Content Submission Process.

Standards: All DFIRM Database, DFIRM Map, and FIS Report work shall be performed in accordance with the standards specified in Section 5 - Standards. All work must pass the automated and visual "National QA/QC" reviews prior to the distribution of the preliminary copies of the DFIRM and FIS report and the Preliminary SOMA.

Deliverables: In accordance with the *Guidelines and Specifications for Flood Hazard Mapping Partners*, SEMA shall make the following products available to FEMA by uploading the digital data to the MIP. Additionally, the Technical Support Data Notebook format described in the *Guidelines and Specifications for Flood Hazard Mapping Partners* must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

- DFIRM mapping and database files prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners* and in the format(s) required for the NSP QC Process;
- 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;
- The Flood Insurance Study Report is prepared in the FEMA Countywide Format as documented in the *Guidelines and Specifications for Flood Hazard Mapping Partners*;

- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale;
- Draft Preliminary SOMA prepared using the SOMA Tool on the MIP;
- A metadata file complying with the FEMA NFIP Metadata Profile Specifications;
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM as outlined in approved QA/QC Plan; and
- Passing Quality Review report.

### **Independent QC Review of Preliminary Map Products**

Responsible Mapping Partner: State Emergency Management Agency

Scope: Upon completion of the Produce Preliminary Map Products activity, SEMA shall review the DFIRM spatial database to determine if it meets current FEMA database specifications. In addition, SEMA shall review the DFIRM panels to ensure they meet current FEMA graphic specifications. SEMA shall coordinate with other Mapping Partners, as necessary, to resolve any problems identified during this QC review. In addition, SEMA shall perform a review of the FIS report including all data tables, Flood Profiles, and other components of the FIS report. If SEMA utilizes a contractor to perform the Independent QC, the contractor must be a different contractor than who performed the original analyses. FEMA may audit or assist in these activities if deemed to be necessary by the Regional Project Officer. 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, pertinent notes, 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 a GIS file and database format as specified in FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*, and conform to those specifications for content and attribution.
- 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.
- The FIS report is prepared in the FEMA Countywide Format as documented in the *Guidelines and Specifications for Flood Hazard Mapping Partners*.
- Metadata files describing the DFIRM data include all required information shown in the FEMA NFIP Metadata Profile Specifications.

Standards: All DFIRM Database Development work shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: : In accordance with the *Guidelines and Specifications for Flood Hazard Mapping Partners*, SEMA shall make the following products available to FEMA by uploading the digital data to

the MIP, through the Load Studies Data Artifacts portlet under the Data Upload tab under Tools & Links. Additionally, the Technical Support Data Notebook format described in the *Guidelines and Specifications for Flood Hazard Mapping Partners* must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

- 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 Independent QC review;
- Recommendations to resolve any problems that are identified during the Independent QC review;
- An annotated copy of the DFIRM with all questions and/or concerns indicated, if necessary.

MIP workflow step equivalent: Perform Independent QA/QC of Preliminary Map Products.

### **Post-Preliminary Processing**

Responsible Mapping Partners: State Emergency Management Agency

Scope: This activity consists of finalizing the DFIRM, SOMA, 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 and are subject to the mandatory quality control checks by the National Service Provider (NSP), also as described 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, SEMA 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*:

- The SEMA shall prepare and distribute Proposed BFE determination letters to the CEOs and floodplain administrators of affected communities.
- The SEMA shall prepare legal notice of BFE changes and verify the notices are published in newspapers with local circulation in accordance with 44 CFR.
- The SEMA shall use the BFEs-on-theWeb tool to create BFE notices in accordance with Procedure Memorandum No. 44 – Protocol for Publishing Base Flood Elevation (BFE) Notices on the Web.
- The SEMA shall prepare the appropriate notices (Proposed Rules) that are to be published in the *Federal Register*. The SEMA shall then deliver those notices to FEMA for publication.

*Resolution of Protests:* SEMA shall review and resolve protests received during the comment or 90-day appeal periods. The activity will include all protests to correct street, stream and other names, corporate boundaries, and floodplain boundary changes due to topographic data. For each protest, the following activities shall be conducted as appropriate:

- Initial processing and acknowledgment of submittal;
- Technical review of submittal to determine validity of protest;
- Preparation of letter(s) requesting additional supporting data; and
- Preparation of a draft resolution letter for co-signature with FEMA and SEMA and revised DFIRM and FIS report materials for FEMA review.

SEMA shall mail all associated correspondence upon authorization by FEMA.

*Resolution of Appeals:* SEMA shall review and resolve appeals received during the 90-day appeal period. For each appeal, the following activities shall be conducted as appropriate:

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

SEMA shall mail all associated correspondence upon authorization by FEMA.

*Preparation of Special Correspondence:* SEMA 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 for co-signature. SEMA 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 FIRM and FIS Report:* If necessary, SEMA shall work together with FEMA to revise the DFIRM and FIS report and shall 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.

Standards: All Post Preliminary DFIRM work shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: In accordance with the *Guidelines and Specifications for Flood Hazard Mapping Partners*, SEMA shall make the following products available to FEMA by uploading the digital data to the MIP. Additionally, the Technical Support Data Notebook format described in the *Guidelines and Specifications for Flood Hazard Mapping Partners* must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

Hard copy documents to be supplied through the FEDD file (sent to FEMA library):

- Documentation that the legal notice(s) 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;
- Proof Copy Distribution Letter;

- LOMC Revalidation Letters, if appropriate;
- Completed, organized, and archived technical and administrative support data; and
- Completed, organized, and archived case files and flood elevation docket.

## **SECTION 2—TECHNICAL AND ADMINISTRATIVE SUPPORT DATA SUBMITTAL**

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 in this section.

All supporting documentation for the activities in this MAS shall be submitted in the TSDN format in accordance with the FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners*.

If any issues arise that could affect the completion of an activity 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 the *Guidelines and Specifications for Flood Hazard Mapping Partners*.)

## **SECTION 3—FUNDING/LEVERAGE**

Funds will be provided by the city of Kansas City, Water Services Department, to complete the tasks for the streams identified in Table 1.1. Federal funds are not available to complete the additional tasks associated with this supplement.

Activities associated with any additional needs would be performed based on availability of additional funds from the city of Kansas City. These values should also be reported in the MIP by the appropriate task owner. The current Blue Book is dated November 2006 and can be downloaded from FEMA's Information Resource Library at <http://www.fema.gov/library/index.jsp>

Funding for Project/Partner Name	FEMA Contribution	Partner Contribution	% Leverage	Total Project Cost
Field Survey	█	██████	███	██████
Hydrologic Analysis	█	██████	███	██████
Independent QC Review of Hydrologic Analysis	█	██████	███	██████
Hydraulic Analysis	█	██████	███	██████
Independent QC Review of Hydraulic Analysis	█	██████	███	██████
Floodplain Mapping	█	██████	███	██████
Independent QC Review of Floodplain Mapping	█	██████	███	██████
DFIRM Database	█	██████	███	██████
Produce Preliminary Map Products	█	██████	███	██████
Independent QC Review of Preliminary Map Products	█	██████	███	██████
Post-Preliminary Processing	█	██████	███	██████
<b>TOTAL FUNDING AMOUNTS</b>	█	██████	███	██████

**SECTION 4--SCHEDULE**

The tasks documented in this MAS shall be completed in accordance with the project schedule. The SEMA will use the MIP to report progress, entering Cost to Date, Percent Complete to Date, and "As of" date in the "Update Information" section of the Task Information screen for each task. Within three weeks of funds award, the SEMA will provide FEMA with the initial schedule for each county for entry into the MIP. 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 MAS.

Additional tasks will be added to MIP case 07-07-0023S for the activities associated with this MAS.

The SEMA will update the MIP at least monthly, and when a task is completed.

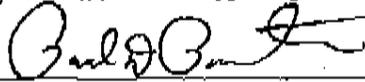
**SECTION 5—CONTRACTORS**

SEMA intends to use the services of AMEC Earth and Environmental as a contractor for this Flood Map Project. SEMA shall ensure that the procurement for all contractors used for this Flood Map Project complies with the requirements of 44 CFR 13.36.

**SECTION 6—POINTS OF CONTACT**

The points of contact for this Flood Map Project are Bob Franke, the FEMA Regional Project Officer; Dale Schmutzler, the Project Manager for SEMA; or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. When necessary, any additional FEMA assistance should be requested through the FEMA Regional Project Officer.

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



\_\_\_\_\_  
Paul D. Parmenter, Director  
Missouri State Emergency Management Agency

3/18/11

\_\_\_\_\_  
Date



\_\_\_\_\_  
Robert G Bissell  
Director, Mitigation Division  
Federal Emergency Management Agency, Region VII

4/4/11

\_\_\_\_\_  
Date