



FEMA

KENTUCKY DIVISION OF WATER COOPERATING TECHNICAL PARTNERS MAPPING ACTIVITY STATEMENT

Mapping Activity Statement No. FY09.07

In accordance with the Cooperating Technical Partners (CTP) Partnership Agreement dated August 16, 1999 between the Kentucky Division of Water and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement (MAS) No. FY09.07 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 Boyd, Bracken, Bullitt, Campbell, Fayette, Franklin, Greenup, Hancock, Jefferson, Kenton, Lewis, Magoffin, Mason, Pendleton, and Pike Counties. This MAS also will address the expiration of Provisionally Accredited Levees (PALs) in Franklin, Hancock, Kenton, and Pike Counties. 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). These documents can be found on FEMA's website at http://www.fema.gov/plan/prevent/fhm/gs_main.shtml and http://www.fema.gov/plan/prevent/fhm/gs_memos.shtml.

The DFIRM and FIS report will be produced in the FEMA Countywide format in the North American Vertical Datum of 1988 (NAVD88) in all counties, with the exception of Kenton and Pike Counties. In these counties only the panels that have restudy efforts as a result of levees will be produced. The North American Datum of 1983 (NAD83), Kentucky Single Zone Projection, will be used for each countywide study. (Refer to PM 41 for exceptions.)

In addition, the Mapping Partners involved in this project will develop new and/or updated flood hazard data, as summarized in Table 1.1, Flooding Source(s) to be Studied. These are estimates and may be revised in the detailed Scoping Reports for each county. These Scoping Reports will provide additional detail on the sources listed in Tables 1.1. Appendix A indicates the effective SFHAs for each county.

Table 1.1 Flooding Source(s) to be Studied

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
Boyd County							
Big Sandy River	From the confluence with the Ohio River to the southeastern county boundary	14.3	14.3	14.3			
Ohio River	From the northeastern county boundary to the confluence with the Big Sandy River	7.6		7.6			
Various - Streams with greater than 1 mi ² drainage area	Various - up to 1 mi ² drainage area	86.9			86.9		
Various - Existing Zone AE streams	Various - those streams not being restudied as part of this MAS	59.6				59.6	
County Totals		168.4	14.3	21.9	86.9	59.6	0

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
Bracken County							
Licking River	From the northwestern county boundary to the southwestern county boundary	3.1	3.1	3.1	3.1		
Ohio River	From the northwestern county boundary to the northeastern county boundary	19.4		19.4			
North Fork Licking River	From the southwestern county boundary to the southeastern county boundary	30.2			30.2		
Various - Streams with greater than 1 mi ² drainage area	Various - up to 1 mi ² drainage area	111.5					111.5
Various - Existing Zone AE streams	Various - those streams not being restudied as part of this MAS	9.1				9.1	
County Totals		173.3	3.1	22.5	30.2	9.1	111.5

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
Bullitt County							
Salt River	From the confluence with the Ohio River to the eastern county boundary	37.6	37.6	37.6			
Various - Streams with greater than 1 mi ² drainage area	Various - up to 1 mi ² drainage area	186.0			30.1		155.9
Various - Existing Zone AE streams	Various - those streams not being restudied as part of this MAS	68.5				68.5	
County Totals		292.1	37.6	37.6	30.1	68.5	155.9

Flowing Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
Campbell County							
Licking River	From the confluence with the Ohio River to the southern county boundary	32.8	32.8	32.8			
Ohio River	From the northwestern county boundary along the north and eastern county boundaries to the southeastern county boundary	26.3		26.3			
Various - Streams with greater than 1 mi ² drainage area	Various - up to 1 mi ² drainage area	111.3			58.8		52.5
Various - Existing Zone AE streams	Various - those streams not being restudied as part of this MAS	25				25	
County Totals		195.4	32.8	59.1	58.8	25	52.5

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
Fayette County							
Cane Run Tributary 6	1.8 miles upstream from the confluence with Cane Run	1.8	1.8	1.8			
Cane Run Tributary 7	2.9 miles upstream from the confluence with the county boundary	2.9	2.9	2.9			
East Hickman Creek Trib 3	1.7 miles upstream from the confluence with East Hickman Creek	1.7	1.7	1.7			
East Hickman Creek Trib 9	1.6 miles upstream from the confluence with East Hickman Creek	1.6	1.6	1.6			
Kentucky River	From the southwestern county boundary to the southeastern county boundary	12.8	12.8	12.8			
North Elkhorn Creek	1.2 miles upstream from the confluence with North Elkhorn Creek Trib 2	2.5	2.5	2.5			

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
North Elkhorn Creek Trib 2	1 mile upstream from the confluence with North Elkhorn Creek	1.0	1.0	1.0			
North Elkhorn Creek Trib 3	1 mile upstream from the confluence with North Elkhorn Creek	1.0	1.0	1.0			
North Elkhorn Creek Trib 4	1.3 mile upstream from the confluence with North Elkhorn Creek	1.3	1.3	1.3			
North Elkhorn Creek Trib 5	2.5 miles upstream from the confluence with North Elkhorn Creek Trib 5.1	2.5	2.5	2.5			
North Elkhorn Creek 5.2	.4 miles upstream from the confluence with Walsh Court	1.0	1.0	1.0			
North Elkhorn Creek Trib 5.3	1 miles upstream from the confluence with North Elkhorn Creek Trib 5.2.1	1.0	1.0	1.0			
North Elkhorn Creek 5.4	.3 miles upstream from the confluence with North Elkhorn Creek Trib 5	0.3	0.3	0.3			

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
South Elkhorn Creek Trib 2	.3 miles upstream from the intersection with Bingham Dr.	0.3	0.3	0.3			
South Elkhorn Creek 3,2	.5 miles upstream from the confluence with South Elkhorn Creek Trib 3	0.5	0.5	0.5			
Various - Streams with greater than 1 mi ² drainage area	Various - up to 1 mi ² drainage area	151.9			151.9		
Various - Existing Zone AE streams	Various - those streams not being restudied as part of this MAS	117.1				117.1	
County Totals		301.2	32.2	32.2	151.9	117.1	0

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
Franklin County							
Kentucky River (includes levee)	From the southern county border to the northern county border	30.4	30.4	30.4			
Benson Creek	1.5 miles upstream from the confluence with South Benson Creek	1.5	1.5	1.5			
Slickway Branch	3.5 miles upstream of the confluence with I-64	3.5	3.5	3.5			
South Benson Creek	2.3 miles upstream from the confluence with Benson Creek	2.3	2.3	2.3			
Various - Streams with greater than 1 mi ² drainage area	Various - up to 1 mi ² drainage area	122.3			14.2		108.1
County Totals		160.0	37.7	37.7	14.2	0	108.1

Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
Flooding Source						
Greenup County						
Ohio River	32.4		32.4			
Various - Streams with greater than 1 mi ² drainage area	153.8			78.5		75.3
Various - Existing Zone AE streams	98.1				98.1	
County Totals	284.3	0	32.4	78.5	98.1	75.3
Hancock County						
Ohio River (includes levees)	29.4				29.4	
Various - Streams with greater than 1 mi ² drainage area	140.4					140.4

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
County Totals		169.8	0	0	0	29.4	140.4
Jefferson County							
Ohio River	From the northwestern county boundary to the northeastern county boundary	36.8		36.8			
Bearcamp Run	2.2 miles upstream from the confluence with Pond Creek	2.2	2.2	2.2			
Brush Run	1.5 miles upstream from the confluence with Floyds Fork	1.5	1.5	1.5			
Chenoweth Run I	4.9 miles upstream from the confluence with Floyds Fork	4.9	4.9	4.9			
Chenoweth Run II	3.9 miles upstream from the confluence with Floyds Fork	3.9	3.9	3.9			

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
Goose Creek Trib 1	1 mile upstream from the confluence with Goose Creek	1.0	1.0	1.0			
Little Goose Creek	2.4 miles upstream from a point approx. 2 miles upstream of the confluence with Goose Creek	2.4	2.4	2.4			
Little Goose Creek	1 mile upstream from a point approx 1.5 miles from the confluence with Little Goose Creek Trib 1	1.0	1.0	1.0			
Little Goose Creek Trib 1	8 miles upstream from the confluence with Little Goose Creek	0.8	0.8	0.8			
McNeely Lake	Extents of the lake, 1.6 miles upstream of the dam	1.6		1.6			
Middle Fork Beargrass Creek	2.3 miles upstream of a point approx. 2.5 miles from the confluence with Middle Fork Beargrass Creek Trib 2	2.3	2.3	2.3			

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
Middle Fork Beargrass Creek Trib 1	1.2 miles upstream from the confluence with Middle Fork Beargrass Creek	1.2	1.2	1.2			
Middle Fork Beargrass Creek Trib 2	3.2 miles upstream from the confluence with Middle Fork Beargrass Creek	3.2	3.2	3.2			
Middle Fork Beargrass Creek Trib 2.1	1 mile upstream from the confluence with Middle Fork Beargrass Creek Trib 2	1.0	1.0	1.0			
Muddy Fork	6.9 miles upstream from the confluence with Beargrass Creek	6.9	6.9	6.9			
Various - Streams with greater than 1 mi ² drainage area	Various - up to 1 mi ² drainage area	64			38.5		25.5
Various - Existing Leverage Studies from MSD	Various	33.3	33.3	33.3			

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
County Totals		168.0	65.6	104.0	38.5	0	25.5
Kenton County							
Licking River (includes levee)	From the northern county boundary to the southern county boundary	30.7	30.7	30.7			
County Totals		30.7	30.7	30.7	0	0	0
Lewis County							
Kinniconik Creek	3 miles upstream from a point 2 miles upstream from the confluence with the Ohio River	3.0	3.0	3.0			
Ohio River	From the northwestern county boundary to the northeastern county boundary	43.8		43.8			

Flooding Source	Reach Limits	Reach Length	Detailed Rivertine - Hydrology	Detailed Rivertine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
Various - Streams with greater than 1 mi ² drainage area	Various - up to 1 mi ² drainage area	295.4					295.4
Various - Existing Zone AE streams	Various - those streams not being restudied as part of this MAS	49.9				49.9	
County Totals		392.1	3.0	46.8	0	49.9	295.4
Magoffin County							
Licking River	From the northern county boundary to the southern county boundary	12.5	12.5	12.5			
Various - Streams with greater than 1 mi ² drainage area	Various - up to 1 mi ² drainage area	202.2			44.2		158.0

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
Various - Existing Zone AE streams	Various - those streams not being restudied as part of this MAS	10.0				10.0	
County Totals		224.7	12.5	12.5	44.2	10.0	158.0
Mason County							
Ohio River	From the northwestern county boundary to the northeastern county boundary	19.3		19.3			
North Fork of Licking River	From the western county boundary to the eastern county boundary	38.7			38.7		
Various - Streams with greater than 1 mi ² drainage area	Various - up to 1 mi ² drainage area	153			18.1		134.9

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
Various - Existing Zone AE streams	Various - those streams not being restudied as part of this MAS.	3.8				3.8	
County Totals		214.8	0	19.3	56.8	3.8	134.9
Pendleton County							
Licking River	From the northern county boundary to the southern county boundary	41.1	41.1	41.1			
Kincaid Lake	Extents of the lake	4.8		4.8			
Ohio River	From the northeastern county boundary to the southeastern county boundary	3.3		3.3			

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
Various - Streams with greater than 1 mi ² drainage area	Various - up to 1 mi ² drainage area	231.0					231.0
Various - Existing Zone AE streams	Various - those streams not being restudied as part of this MAS	2.5				2.5	
County Totals		232.7	41.1	49.2	0	2.5	231.0
Pike County							
Levisa Fork and tributaries (USACE leverage study)	Various	20.7	20.7	20.7			
Tug Fork	From the northeastern county boundary to the southeastern county boundary	46.0				46.0	
Various - Streams with greater than 1 mi ² drainage area	Various - up to 1 mi ² drainage area	93.9					93.9

Flooding Source	Reach Limits	Reach Length	Detailed Riverine - Hydrology	Detailed Riverine - Hydraulics	Limited Detail Study	Redelineation of SFHAs Using Effective Profiles and New Topography	Refine/ Establish Zone A
Various - Existing Zone AE streams	Various - those streams not being restudied as part of this MAS	36.9				36.9	
County Totals		197.5	20.7	20.7	0	82.9	93.9
Project Totals		3255.0	331.3	529.7	590.1	556.5	1582.4

This Flood Map Project will be completed by the following Mapping Partners:

- The Kentucky Division of Water (KDOW) (CTP);
- The KDOW study contractor (SC);
- The KDOW (QA/QC) contractor (QA/QC); and
- FEMA or FEMA's Study Contractor.

The Mapping Partner shall notify FEMA and all applicable parties 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 Mapping Partner shall maintain an archive of all data submitted. (All supporting data must be retained for three years from the date a funding recipient submits its final expenditure report to FEMA.)

The activities for this Flood Map Project, including any required Quality Control Requirements as outlined in 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.

Table 1.2 Flood Mapping Project Activities.

TASK ASSIGNMENTS

OR6 Check LED		X
QR5 Validate Final DFIRM Database and		X
QR4 Validate BFE Notice and CEO Letters		X
Post Preliminary Processing	X	
Distribute Preliminary Map Products	X	
QR3 10% Visual Check		X
QR2 Auto Validation of Preliminary Database		X
Perform Independent QA/QC of Preliminary Map Products	X	
Produce Preliminary Map Products	X	
Quality Review (QR)1 Auto Validation of Draft DFIRM Database		X
Develop DFIRM Database	X	
Perform Independent QA/QC of Perform Floodplain Mapping	X	
Perform Floodplain Mapping	X	
Perform Independent QA/QC of Hydraulic	X	
Perform Hydraulic Analyses	X	
Perform Independent QA/QC of Hydrologic	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	
Program Management	X	
Partner Type	CTP	Core TO
Partner Name	KDOW/SCQAQ	Core TO
County	All Counties	All Counties
State	KY	KY

The CTP assigned the floodplain mapping task will include the Provisionally Accredited Levee (PAL) classification if known. Levee classification will be documented in Table 1.3, Levee PAL Classification. If the PAL Classification for a levee changes during the course of the project FEMA will contact the Kentucky Division of Water to discuss the need to revise the statement of work. In addition, this MAS will also address expiring PALs in Franklin, Hancock, Kenton, and Pike Counties. Additional details regarding hydraulic analysis and floodplain mapping for the expiring PALs will be addressed in the applicable sections of this MAS.

Table 1.3 – Levee PAL Classification

Boyd	Ashland Local Protection Project (LPP)	B	Yes
Boyd	Catlettsburg LPP	B	Yes
Campbell	Dayton Local Flood Protection Project (LFPP)	B	Yes
Campbell	Newport LFPP	B	Yes
Franklin	Frankfort LFPP	B	Yes
Greenup	Russell LFPP	B	Yes
Jefferson	Louisville LFPP	B	Yes
Jefferson	Southwestern Jefferson LFPP	B	Yes
Mason	Maysville LPP	B	Yes
Franklin	South Frankfort LFPP	Expiring PAL	Yes
Hancock	Hawesville LFPP	Expiring PAL	Yes
Kenton	Covington LFPP	Expiring PAL	Yes
Pike	South Williamson SEC 202 LPP	Expiring PAL	Yes
Pike	Pikeville LPP	Expiring PAL	Yes
Pike	Appalachian Regional Hospital LPP	Expiring PAL	Yes

The Kentucky Division of Water is responsible for the implementation of an independent Quality Assurance/Quality Control (QA/QC) plan for all assigned activities. The Kentucky Division of Water will submit a Summary Report that describes and provides the results of all automated or manual QA/QC review steps. The report should include the process for all assigned activities.

Independent QC review activities may be performed by the CTPs or FEMA's contractor at the discretion of FEMA. If the CTP will be utilizing its staff and contractors to do the QC review, this should be identified during scoping. The CTP will need to submit its QC plan 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 independent QC, including re-submittal of deliverables as needed to pass technical review.

Metadata is required for all activities. All applicable Data Capture Standards (DCS) will be adhered to as part of this MAS. NOTE: The DCS are being updated. This MAS will be updated accordingly when guidance from FEMA Region IV is provided to the CTP once the DCS update is complete. Mapping Partners are required to comply with Appendix N (Data Capture Standards, or DCS) and Appendix M (TSDN) of Guidelines and Specifications for Flood Hazard Mapping Partners to completely document the work performed. On July 9, 2008, FEMA provisionally released a revised version of the DCS. FEMA recommends that the new DCS be implemented, in lieu of the current DCS (Appendix N), on any project where it is expected to save time and/or money. The ultimate goal of the new DCS is to consolidate the DCS deliverables and the TSDN to reduce the overlapping requirements for Mapping Partners. Because the newly released revised DCS is not yet complete and the necessary MIP changes have not yet been implemented, in order to ensure that FEMA retains complete documentation of studies, FEMA requires that all FEMA-contracted studies must comply with either the existing or the revised DCS and a complete TSDN be submitted as a final deliverable by the effective date of the project (in addition to uploads to the MIP). Mapping Partners are required to certify their TSDNs by signing the certification of project page to ensure that TSDNs submitted represent the final version of all required documentation or that all MIP uploads represent a complete set of required documentation. The submittal of the TSDN requirement will continue until the revised DCS is finalized.

DFIRM-related tasks require a passing QC Report from FEMA's National DFIRM database auto-validation tool for Quality Review (QR) #1, #2, and #5 as described in PM 42. Training materials for this step are available on the Mapping Information Platform (MIP) at MIP User Care Training Materials.

FEMA will provide download/upload capability for data submittals through the MIP located at <https://hazards.fema.gov>. As each activity is completed, the data must be submitted to the MIP.

The CTP assigned the activity will respond to any comments generated as a result of the mandatory quality control checks by FEMA or FEMA's Contractor as described in PM 42. The PM 42 QC validation process is nationally funded and required on each FIS. The PM 42 validation QC process includes the following activities:

- **Validate Content Submission.** Automatic metadata and visual validation of submitted data for Perform Field Survey, Develop Topographic Data, Develop Hydrologic Data, Develop Hydraulic Data, Perform Coastal Analysis, Acquire Base Map Data, Perform Floodplain Mapping, Develop DFIRM Database, Produce Preliminary Map Products and Final Map Products tasks.
- **QR #1.** Performed after the Develop DFIRM Database task.
- **QR #s 2 and 3.** Performed after the Produce Preliminary Map Products task.
- **QR #4.** Performed after the Create Base Flood Elevation (BFE) Notices step in the MIP workflow during Post Preliminary Processing.

- QR #5. Performed after the Produce Final Map Products task during Post Preliminary Processing.
- QR #6. Performed after the Prepare LFD Docket step in the MIP workflow during Post Preliminary Processing.
- QR #7. Performed after the Submit MSC Deliverable step in the MIP workflow during Post Preliminary Processing.

In cooperation with the FEMA Project Officer, a Project Management Team (PMT) will be established by the CTP consisting of representatives from the KDOW, the KDOW study contractor, the KDOW QA/QC contractor, FEMA's regional engineer, FEMA's Contractor, and other appropriate parties. The PMT will be responsible for coordinating the activities identified in this MAS. The FEMA Region will be provided with documentation identifying the established PMT.

The MIP shall be updated for status reporting of each of the data development activities within the Manage Data Development task, not less than every thirty days, when the activity is complete, and also include leverage data. At minimum, the "As of" date must be updated not less than every thirty days even if the reported percent complete and money spent have not changed from previous month. Similarly the Manage Preliminary Map Production and Manage Post Preliminary Processing tasks shall be updated monthly when the producer is performing work on a task in those modules. The "Manage" tasks will be open and accepting updates for up to 90 days after the completion of the last producer task in each module. The MIP shall also be populated with appropriate leverage information regarding who paid for the data provided and the amount of data used by the Flood Map Project.

Scoping

Responsible Mapping Partner: Kentucky Division of Water (KDOW) and/or its Contractor

Scope: The Project Scoping phase typically begins once some level of a community's mapping needs have been identified and FEMA and the community have decided to initiate a Flood Map Project to create or update the FIRM. The scoping process is divided into three main parts – Pre-Scoping Meeting Activities, the Scoping Meeting Activities, and the Post-Scoping Meeting Activities. The Scoping activities pertaining to this MAS were completed by the KDOW as part of MAS FY07.05. It is the KDOW's intention to utilize the Scoping activities in this MAS for additional meetings in order to address levee issues. It is also the KDOW's intention to continue the Coordinated Needs Management Strategy (CNMS). Future funding is anticipated to develop CNMS data for FY 2010 counties.

Pre-Scoping Meeting Activities

- Initiate the Pre-Scoping activities by identifying the PMT, determining the community contacts, and collecting pertinent information about the community. Conduct background research to collect current mapping needs and begin available geospatial data search. In accordance with the FEMA document titled "Guide for Validating Flood Hazard Data" dated April 9, 2007, the CTP and the CTP Contractor will prepare a Needs Assessment which identifies flooding sources that may not accurately represent current flood hazard risk.
- Obtain spatial data to be used during the meeting preparation effort.
- Acquire the current effective data for the community, such as the flood hazard data shown in effective FIS reports and on effective FIRMs and Flood Boundary and Floodway Maps (FBFMs), and pertinent flood structure data.
- If pre-scoping steps are performed by a separate Contractor, submit a report summarizing the data collection efforts and deliverables.

Preliminary Research Activities can be separated into three categories—researching selected needs, effective information and researching available data for the Flood Map Project. The selected needs data identified during the Mapping Needs Assessment process can be obtained through the FEMA Region and plotted on the scoping map for discussion during the scoping meeting. The following tasks shall be completed to research effective information: inventory the FEMA's archives and/or information management systems for effective FIRM panels, FBFM panels, FIS reports, and other flood hazard data or existing study data; summarize the information in the effective streams file and effective coastal study; summarize contiguous community agreement checks; review Community Assistance Visit (CAV) and Community Assistance Contact files; and develop a "scoping map" and an overview of the results of the research. Other data collected during preliminary research activities will include obtaining community information and the best readily available base map materials (political areas, transportation, hydrology, shorelines orthoimagery, and topography data). Stream centerlines should be populated with the limits of the effective FEMA studies and selected needs attributes.

Scoping Meeting

- Coordinate, setup, and hold the Scoping Meeting to inform the community of the upcoming flood study and of their responsibilities related to it; this includes identifying a time, place, and participants. The purpose of this meeting is to present the information gathered during the preliminary research activities to the local officials (State, county, and municipal) and coordinate on prioritization and identification of study areas. The CTP shall be responsible for compiling the necessary information for the meeting.
- Review list of selected needs and capture additional community needs and/or wants in order to determine the level of effort and the extent of any new/updated studies. Review the selected needs list, effective and other data research findings, and make selections of proposed methods for obtaining/producing flood data.
- Compile the information prepared for and recorded during the Scoping Meeting

During the Scoping Meeting, the PMT shall review the needs list. Any additions or changes to the selected needs list shall be discussed with all members.

The Kentucky Division of Water (KDOW) will be acting as the Consultation Coordination Officer (CCO) for this flood study as identified in 44 CFR Part 66. During the Scoping Meeting,

the CTP must inform the communities of their responsibilities as described under the above-referenced regulation. Following initial contact with the communities, the CTP will prepare and setup the Community Case File and Flood Elevation Determination Docket for the maintenance of all communication and coordination throughout the project as outlined in 44CFR Parts 66 and 67.

Post-Scoping Meeting Activities

- Select available and needed geospatial data to be used in the study and update FEMA's geospatial data tracking systems, National Digital Elevation Program (NDEP) and National Digital Orthophoto Program (NDOP) located at <http://hazards.fema.gov/metadata/NDEP> and <http://hazards.fema.gov/metadata/NDOP>.
- Evaluate selected needs and community requests and/or wants to determine the community's unmet needs and develop the final Scope of Project document for delivery to FEMA and the community.
- Update FEMA's needs management tracking and other geospatial tracking systems (Mapping Needs Update Support System (MNUSS), CNMS, NDEP, and NDOP).
- Supply a copy of the approved Scoping Report back to the communities in order to ensure they are aware of which needs were selected to be updated during the flood study.

Based on the discussion of flood data update and base map update requests, the CTP and the FEMA Project Officer will finalize the areas to be included in the final scope of project (based on recommendations provided by the PMT). Areas to be studied by detailed, limited detailed, redelineation, and approximate methods shall be identified. The following issues will be discussed and refined: Review and Refinement of Flood Hazard Identification Methodologies, Review of Proposed Paneling Scheme, Review and Refinement of Base and Topographic Map Source, and Finalization of Map Production and Database Options.

Identify all stream reaches where levees are shown as providing protection against the 1-percent-annual-chance flood. The CTP should work with the FEMA Regional Office to request the information specified in Title 44 Code of Federal Regulations (CFR) 65.10, mapping of areas protected by levee systems, from the community or other party seeking continued recognition of the levee and provide this information to the FEMA Regional Office and/or PMT.

Many of the activities at each phase can take place concurrently and are not contingent on the completion of previous tasks. The FEMA Project Officer, working in close coordination with the PMT, has the flexibility of tailoring the Scoping process to best fit the needs of the project. The CTP will evaluate the effective flood data, available base data and selected needs to determine the scope of project to be approved by FEMA.

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

Deliverables: The CTP shall make the following products available to FEMA by uploading the digital data to the MIP.

- Final Scope of Project documented in MAS will be delivered in accordance with the schedule outlined in Section 6 - Schedule to the Regional Project Officer for approval.
- QA/QC Plan for the review of the mapping project outlined in this MAS. This will include the checklists developed for that review in accordance with the schedule included in Section 6 - Schedule.
- Updated list of CEO or local FPA contacts or a report from CIS showing this information has been updated.
- Report documenting levee information transmitted to the FEMA Regional office and/or the PMT. In the event that there are not any levees within the study area, this fact can be documented in the Scoping Report.
- Report from MNUSS and/or other FEMA needs management system, showing needs identified during the scoping process that will not be addressed in the final scope of project are entered. Unmet needs should be documented in a geospatial format so they can be input to FEMA's needs management system. If there are not any unmet needs for the study area, this fact should be documented in the scoping report.
- Report showing that, if obtained from non-Federal sources, information on available terrain and ortho-imagery data has been entered into the NDEP and NDOP project tracking Web sites, respectively.
- Other deliverables including reports, correspondence, agenda, meeting summaries, tabular data, and geospatial files to be submitted throughout the scoping process as specified in FEMA's G&S, Appendix I and Appendix M.

Outreach

Responsible Mapping Partner: Kentucky Division of Water (KDOW) and/or its Contractor

(NOTE: The performance of outreach takes place throughout the life of the flood study project. Therefore, we recommend tracking the outreach budget, in the MIP Workflow, equally between Produce Preliminary Map Products and Post Preliminary Processing. An alternate tracking method is acceptable with approval from the FEMA Regional Office.)

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 PMT in responding to congressional inquiries.

The CTP will work with the Regional Office during the initiation of this activity to determine an Outreach Plan for implementation throughout the mapping project. The Regional Office will have access to many

outreach tools that have been developed for this process that can be utilized or customized. Volume 1 of the G&S provides specific outreach goals that can be considered.

All communication with local governments will be done in accordance with 44 CFR Part 66.

Deliverables:

- Upon determination of an Outreach and Coordination Approach, the CTP shall deliver the following to the FEMA Regional Project Officer in accordance with the schedule outlined in Section 6 - Schedule:
 - A report detailing outreach and coordination activities
 - Backup or supplemental information used in writing this report

Field Survey

Responsible Mapping Partner: Kentucky Division of Water and/or its Contractor

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

The CTP shall conduct field surveys, including obtaining channel and floodplain cross sections, identifying or establishing temporary or permanent bench marks, and obtaining the physical dimensions of hydraulic and flood-control structures. The CTP also shall coordinate with other Mapping Partners that are involved in the Topographic Data Development process regarding ongoing activities and deliverables.

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

Deliverables: The CTP shall make the following products available to FEMA by uploading the digital data to the MIP. A metadata file complying with the NFIP Metadata Profiles Specifications, must accompany the G&S compliant digital data. Additionally, the Technical Support Data Notebook (TSDN) format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

This submittal will occur in accordance with the schedule outlined in Section 6 - Schedule. 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 section and structure data;
- Documentation of the horizontal and vertical datum;
- Digital versions of draft text for inclusion in the FIS report;
- Digital survey data consistent with the DCS as described in the G&S, 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.

Topographic Data Development

Responsible Mapping Partner: Kentucky Division of Water and/or its Contractor

Scope: The CTP shall obtain additional topographic data of the overbank areas of the flooding sources and coastal floodplains studied. These data will be used for hydrologic analysis, hydraulic analysis, floodplain boundary delineation and/or testing of floodplain boundary standard compliance. The CTP shall gather information on what topographic data is available for the given community and what accuracy and currency it meets. The CTP shall use this topographic data that is better than that of the original study. In coordination with the partner who performed scoping, ensure that the FEMA Geospatial Data Coordination Policy and Implementation Guide is followed and the data obtained or to be produced are documented properly. The CTP shall coordinate with other federal, state and local partner agencies in order to obtain and utilize LIDAR data gathered as part of this MAS.

The CTP shall generate new topographic data for Bracken, Boyd, Fayette, Greenup, Hancock, Lewis, Magoffin, Mason, and Pendleton Counties. The CTP shall also generate new topographic data in Pike County along the Tug Fork and Levisa Fork corridors in order to update areas affected by levees on those streams. The CTP also shall coordinate with team members conducting field surveys. Accuracy for the topographic data shall be selected based on the current FEMA requirements as documented in the G&S. Normally this is 37cm RMSE except for extremely flat areas. No FEMA funds shall be expended on new topographic data unless prior approval is given by the Regional Project Officer after analyzing the need for updated topographic data at the end of the scoping period. Based on the scoping activities that were conducted as part of MAS FY07.05, there is considerable need for updated topographic information in the above mentioned counties. For this reason, the CTP plans to collect new topographic information and share it with other federal, state, and local partners and leverage topographic information collected in conjunction with those same partners in future years.

For this activity, the CTP also shall generate the data collected under this Topographic Data Development task and via field surveys to create a best available digital elevation model for the subject flooding sources. In addition, the CTP shall address all concerns or questions regarding the topographic data development and processing that are raised by the CTP during the independent QA/QC review. The CTP should confirm with the FEMA Project Officer the automated appropriate data model(s) (i.e. contours, Digital Elevation Models (DEMs), TIN, mass points and breaklines) for the intended use of the data.

The CTP shall use topographic data for the areas described in the Table 1.4 Summary of Topographic Data table. The source of the topographic data should be indicated as well. The CTP also shall coordinate with other team members conducting field surveys. Contour interval and/or accuracy for the topographic data shall be selected based on the current FEMA requirements as documented in the G&S.

For this activity, the CTP also shall develop topographic maps and/or DEMs for the subject flooding sources using the data collected under this Topographic Data Development process and via field surveys. In addition, the CTP shall address all concerns or questions regarding the topographic data development that are raised by the CTP during the independent QC review, or during the PM 42 defined Validation Process.

Table 1.4 Summary of Currently Available Topographic Data

County	Description	Source
Bracken, Boyd, Fayette, Greenup, Hancock, Lewis, Magoffin, Mason, and Pendleton	LIDAR – 1 m spacing; 2 ft. contour equivalent	Planned to be Procured as part of this activity
Pike – Tug and Levisa Fork corridors only	LIDAR – 1 m spacing; 2 ft. contour equivalent	Planned to be Procured as part of this activity
Bullitt, Campbell, Jefferson and Kenton	LIDAR – 1 m spacing; 2 ft. contour equivalent	Community supplied
Franklin	2 ft. contours in urban service areas; 5 ft. contours in remaining parts of county	Community supplied

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

Deliverables: In accordance with the G&S, the CTP shall make the following products available to FEMA by uploading the digital data to the MIP and submitting in Technical Support Data Notebook (TSDN) format so that the CTP can access it for an independent QA/QC review in accordance with the schedule outlined in Section 6 - Schedule. A metadata file complying with the NFIP Metadata Profiles Specifications, must accompany the uploaded G&S compliant digital data. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

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 contour data;
- Report summarizing methodology and results;
- Mass points and breaklines data;
- Gridded digital elevation model data
- TIN data
- Checkpoint analyses to assess the accuracy of data, including Root Mean Square Error calculations to support vertical accuracy;
- Identification of data voids and methods used to supplement data voids;

- National Geodetic Survey data sheets for Network Control Points used to control remote-sensing and ground surveys;
- Other supporting files consistent with the DCS in the G&S; 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.

Independent QA/QC Review of Topographic Data

Responsible Mapping Partner: Kentucky Division of Water and/or its QA/QC Contractor

Scope: The CTP shall perform an impartial review of the mapping data generated by the CTP Contractor under Topographic Data Development to ensure that these data are consistent with FEMA standards and standard engineering practice, and are sufficient to prepare the DFIRM. The CTP and contractor for the CTP, if applicable must ensure that independent QA/QC is performed and that organizational conflict of interest issues do not exist with respect to independent QA/QC processes. FEMA may audit or assist in these activities if deemed to be necessary by the Regional Project Officer.

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 independent QC, including re-submittal of deliverables as needed to pass technical review.

Standards: All Topographic Data Development work shall be reviewed in accordance with the standards specified in Section 5 - Standards.

Deliverables: In accordance with the G&S, the CTP shall make the following products available to FEMA by uploading the digital data to the MIP. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

This submittal will occur in accordance with the schedule outlined in Section 6 - Schedule.

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

Base Map Acquisition and Preparation

Responsible Mapping Partner: Kentucky Division of Water and/or its Contractor

Scope: Base Map Acquisition consists of obtaining the digital base map, which will be 2006 or 2008 FSA NAIP 1-meter resolution imagery or local imagery if that imagery proves to be of better quality and resolution than the 2006 or 2008 FSA imagery based on scoping, for the project and as necessary, preparing the base map for use. The CTP shall provide the digital base map. The required activities are as follows:

- Obtain digital files (raster or vector) of the base map. In coordination with the partner who performed scoping, ensure that the FEMA Geospatial Data Coordination Policy and Implementation Guide is followed.
- 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.
- Review and supplement the content of the acquired base map to comply with the requirements of the G&S.
- For the base map components that have a mandatory data structure, convert the base map data to the format required in the G&S.
- Certify that the digital data meets the minimum standards and specifications that FEMA requires for DFIRM production.

In addition, the CTP shall address all concerns or questions regarding the base map that are raised during the Independent QC review performed by the CTP, or during the FEMA or FEMA's Contractor Validate Content Submission Process. Optional Table 1.5 Summary of Base Map is useful if multiple counties are involved with this map update. The CTP shall summarize the base map that will be used for each county in optional Table 1.5 Summary of Base Map.

Table 1.5 Summary of Planned Base Map (if known): Update Scoping Report

County	Description	Source
Bracken, Boyd, Greenup, Hancock, Lewis, Magoffin, Mason, Pendleton	2006 or 2008 1-meter FSA NAIP imagery	USDA-FSA Aerial Photography Field Office
Bullitt, Campbell, Fayette, Franklin, Jefferson, Kenton and Pike	1-foot local imagery (dates vary)	Community supplied

Standards: All Base Map Acquisition work shall be performed in accordance with the standards specified in Section 5 - Standards. The DCS must be met for this deliverable to be acceptable.

Deliverables: In accordance with the G&S, the CTP shall make the following products available to FEMA by uploading the digital data to the MIP so that the CTP can access it for an independent QA/QC review in accordance with the schedule outlined in Section 6 - Schedule. A metadata file complying with the NFIP Metadata Profiles Specifications, must accompany the uploaded digital data. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

- Digital base map files that comply with the G&S requirements

- Written certification that the digital data meet the minimum standards and specifications;
- Digital versions of draft text for inclusion in the FIS report;
- Documentation that FEMA can use the digital base map; and
- Documentation of the Datum, if appropriate.

Independent QA/QC Review of Base Map

Responsible Mapping Partner: Kentucky Division of Water and/or its QA/QC Contractor

Scope: The CTP shall perform an impartial review of the base map acquired by the CTP to ensure it includes data consistent with FEMA standards and sufficient to include on the DFIRM. Any needed edits should be made to the product to comply with FEMA standards. The CTP and contractor for the CTP, if applicable must ensure that independent QA/QC is performed and that organizational conflict of interest issues do not exist with respect to independent QA/QC processes.

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 independent QC, including re-submittal of deliverables as needed to pass technical review.

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

Deliverables: In accordance with the G&S, the CTP shall make the following products available to FEMA by uploading the digital data to the MIP. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

This submittal will occur in accordance with the schedule outlined in Section 6 - Schedule.

- A Summary Report that describes the findings of the independent QA/QC review;
- Recommendations to resolve any problems that are identified during the independent QA/QC review; and
- If the data is changed during review, then updated deliverables from previous tasks will be submitted at this time.

Hydrologic Analyses

Responsible Mapping Partner: Kentucky Division of Water and/or its Contractor

Scope: For hydrologic analyses of new or revised studies, the CTP shall use discharge data developed by the Kentucky Office of the U.S. Geologic Survey (USGS) or other source as determined in scoping. The Kentucky Office of USGS has computed peak flood discharges for the 10-, 2-, 1-, and 0.2-percent annual chance storm events for streams throughout the state. In addition, the CTP has coordinated with the local USGS office to assess using the USGS TOPMODEL hydrologic model. If this model proves to be a viable option, the CTP will coordinate with the Regional Project Officer on its usability. These

approaches will apply mainly to approximate and limited detailed studies conducted as part of this MAS. For detailed studies, the CTP shall perform hydrologic analyses for drainage areas identified as having the need for detailed hydrologic data as determined by scoping activities. The CTP shall calculate peak flood discharges for the 10-, 2-, 1-, and 0.2-percent-annual-chance storm events using the USACE HEC-HMS computer program or conduct a gage analysis. It is anticipated that for the Regional studies conducted in the Licking and Salt River Basins, a gage analysis will be performed; these basins have a good stream gage network and will provide data based on actual flood discharge events in order to support hydraulic analysis. The flood discharge data collected in this task will be the basis for subsequent Hydraulic Analyses performed under this MAS. In addition, the CTP shall address all concerns or questions regarding the hydrologic analyses that are raised during the independent QA/QC review performed by the CTP during the QA/QC review.

If GIS-based modeling is used, the CTP shall document automated data processing and modeling algorithms, and provide the data to FEMA to ensure these are consistent with FEMA standards. Digital datasets (such as elevation, basin, or land use data) are to be documented and provided 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 the CTP shall provide full user documentation, technical algorithm documentation, and the software to FEMA for review before performing the hydrologic analyses.

For the flooding sources listed in this MAS where new or revised leverage study data derived from a federal agency or sealed by a licensed professional engineer will be incorporated, these studies will be assumed acceptable as received. No hydrologic analysis will be performed beyond that provided by the study source. Hydrology, hydraulics, and floodplains will be verified and tied-in at reach limits. Associated hydrologic modeling and documentation for leverage studies will be delivered if made available, but the CTP will not prepare this data and no adjustments are anticipated.

Table 1.6 Summary of Hydrologic Analysis is useful when multiple counties are involved in a project. The table to summarize the hydrology analysis that will be used for each county and is useful to define the scope. The CTP shall summarize the hydrologic analysis for each county in optional Table 1.6 Summary of Hydrologic Analysis. Also shown are approximate locations for the stream gages in the Licking and Salt River Basins, respectively.

Table 1.6 Summary of Hydrologic Analysis

County Name	Method	Square Miles of New Detailed Hydrology
Kenton, Campbell, Pendleton, Bracken, Lewis Magoffin – Licking River Basinwide study	Gage analysis	3705
Bullitt and Jefferson – Salt River Basinwide study	Gage analysis	2918
Boyd	HEC -HMS	14.3

Bracken	HEC -HMS	3.1
Bullitt	HEC -HMS	37.6
Campbell	HEC -HMS	32.8
Fayette	HEC -HMS	32.2
Franklin	HEC -HMS	37.7
Jefferson	HEC -HMS	65.6
Kenton	HEC -HMS	30.7
Lewis	HEC -HMS	3.0
Magoffin	HEC -HMS	12.5
Pendleton	HEC -HMS	41.1
Pike	HEC -HMS	20.7

Figure 1.1 USGS Gage Stations in the Licking River Basin

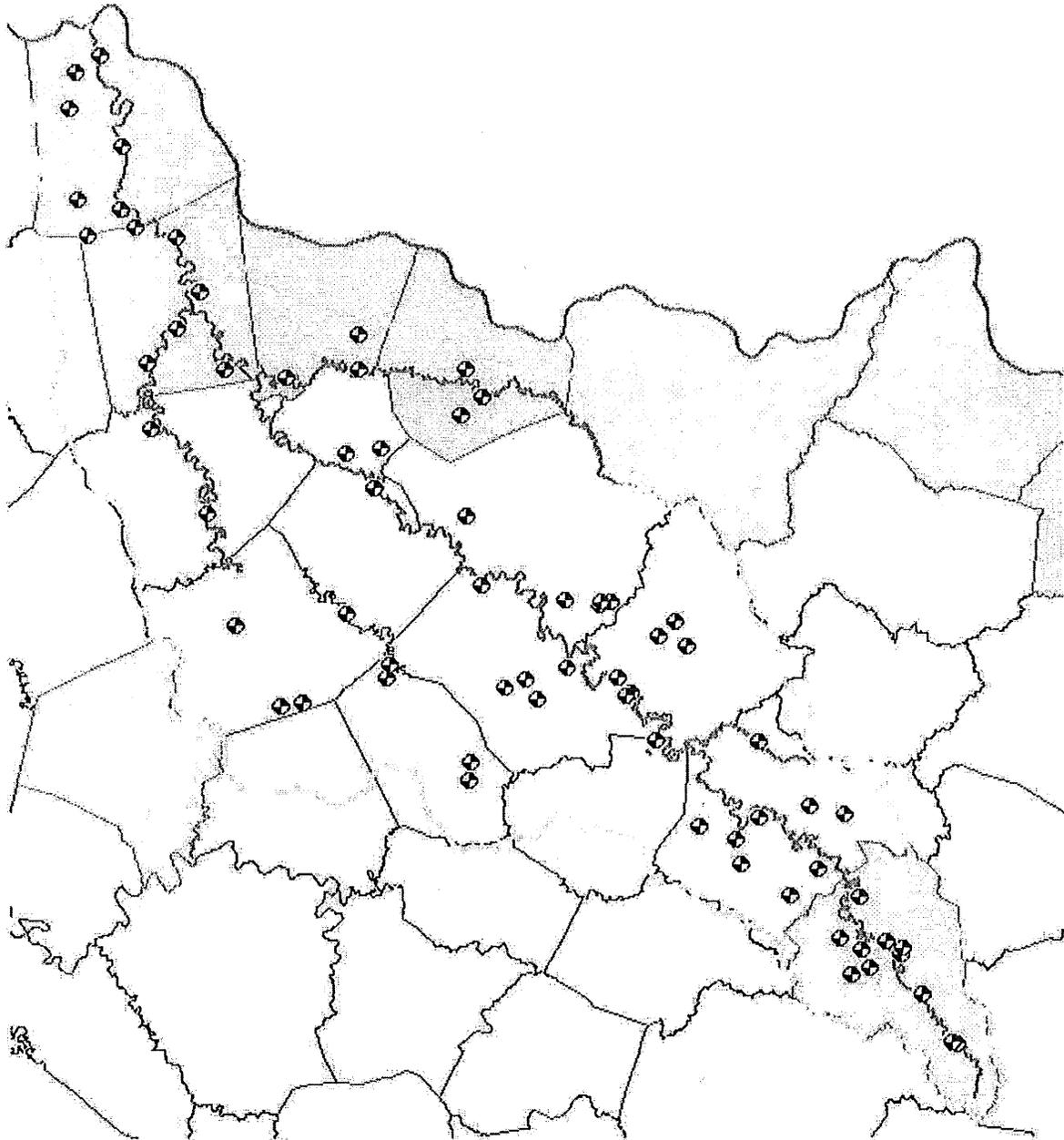
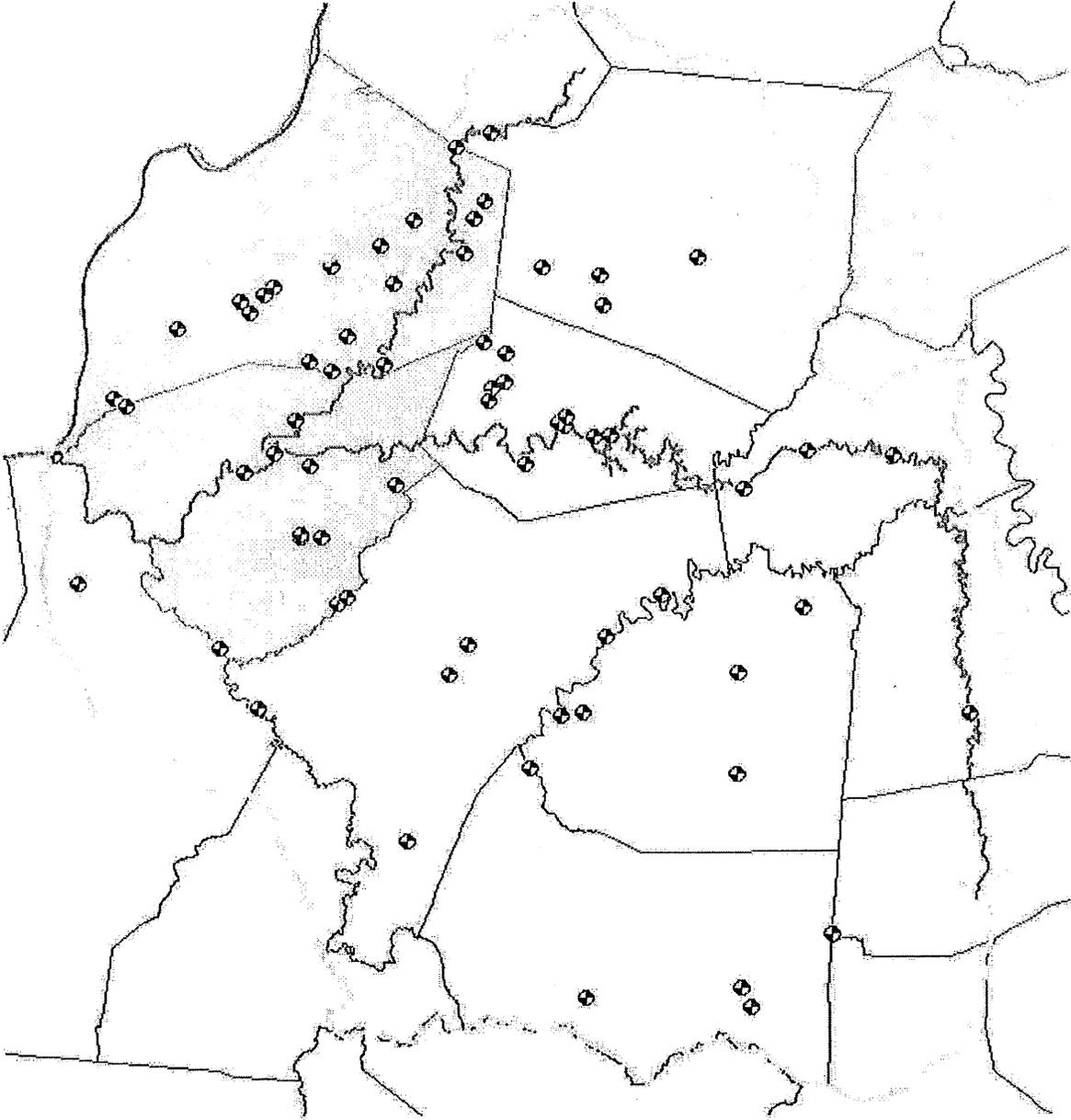


Figure 1.2 USGS Gage Stations in the Salt River Basin



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

Deliverables: In accordance with the G&S, the CTP shall make the following products available to FEMA by uploading the digital data to the MIP so that the CTP can access it for an independent QA/QC review in accordance with the schedule outlined in Section 6 - Schedule. A metadata file complying with the NFIP Metadata Profiles Specifications, must accompany the uploaded digital data. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

For approximate studies, some of the following deliverables may not be applicable. In these instances, a revised set of deliverables will be outlined in the detailed Scoping Reports for each county.

- Digital copies of all hydrologic modeling (input and output) files for the 10-, 2-, 1-, and 0.2-percent-annual-chance storm events;
- Digital Summary of Discharges Tables presenting discharge data for the flooding sources for which hydrologic analyses were performed;
- Digital Summary of Discharges Tables presenting discharge data for the flooding sources where limited detailed analysis was performed;
- Digital versions of draft text for inclusion in the FIS report;
- Digital versions of all backup data used in the analysis including work maps;
- Format Hydrology Database or Data Delivery consistent with the DCS—in the G&S; 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.
- For GIS-based modeling, deliverables shall include all input and output data, intermediate data processing products, and GIS data layers.
- 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.

Independent QA/QC Review of Hydrologic Analyses

Responsible Mapping Partner: Kentucky Division of Water and/or its QA/QC Contractor

Scope: The CTP shall perform an impartial review of the technical, scientific, and other information submitted by the CTP 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. The CTP and contractor for the CTP, if applicable must ensure that independent QA/QC is performed and that organizational conflict of interest issues do not exist with respect to independent QA/QC processes. 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.

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 independent QC, including re-submittal of deliverables as needed to pass technical review.

- 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; and
- If data changed during review, then updated deliverables for previous tasks will be submitted at this time.

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

Deliverables: In accordance with the G&S, the CTP shall make the following products available to FEMA by uploading the digital data to the MIP. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

This submittal will occur in accordance with the schedule outlined in Section 6 - Schedule.

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

Hydraulic Analyses

Responsible Mapping Partner: Kentucky Division of Water and/or its Contractor

Scope: The CTP shall perform hydraulic analyses for the flooding sources listed in this MAS. The procedure for performing the hydraulic analyses will depend upon the type of study being performed.

Scope for Detailed Riverine Analysis: The modeling will include the 10-, 2-, 1-, and 0.2-percent-annual-chance events based on peak discharges computed under Hydrologic Analyses. The hydraulic methods used for this analysis will include step backwater calculations performed using the latest approved version of the US Army Corps of Engineers Hydraulic Engineering Center River Analysis System (HEC-RAS) computer model.

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

The CTP shall use the FEMA CHECK-2 or CHECK-RAS checking program to verify the reasonableness of the hydraulic analyses. To facilitate the independent QA/QC review, the CTP shall provide explanations for unresolved messages from the CHECK-2 or CHECK-RAS program, as appropriate. In addition, the CTP shall address all concerns or questions regarding the hydraulic analyses that are raised by the CTP and/or FEMA during the independent QA/QC review.

The CTP 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 the CTP shall provide full user documentation, technical algorithm documentation, and software to FEMA for review before performing the hydraulic analyses.

Scope for Limited Detailed Studies (LDS): The modeling will include the 1-percent-annual-chance events based on peak discharges computed under Hydrologic Analyses; analyses for the 0.2 percent annual chance flood event will not be performed. The hydraulic methods used for this analysis will include step backwater calculations performed using the latest approved version of the US Army Corps of Engineers Hydraulic Engineering Center River Analysis System (HEC-RAS) computer model.

The LDS stream reaches are located in existing Zone A or proposed Zone A studies where the topography data meets the criteria for a detailed study. For LDS's the CTP shall utilize existing structure data from the Kentucky Transportation Cabinet's (KYTC) Bridge Scour database and other data sources to describe the hydraulic opening(s). The openings will be integrated into the topography model per best fit and field-checked by the CTP. The inverts of hydraulic structures will be used for guidance in developing channels in the topography. The 1% chance floodplain will be developed, mapped and published for the LDS reaches and subsequently mapped as a Zone AE with BFEs on the DFIRMs. The LDS data will be included in the Technical Support Data Notebook (TSDN) and may be issued to stakeholders via a Best Available Data letter.

The CTP shall use the cross-section and field data collected during Field Survey and the topographic data collected during the Topographic Data Collection, when appropriate, to perform the hydraulic analyses. The hydraulic analyses will be used to establish flood elevations and a 0.7-foot floodway encroachment for the subject flooding sources. The encroachment areas will not be mapped on the printed DFIRM panels; however, communities can use the results as an estimate of a maximized floodway. These floodway encroachment values will be reported as an addendum to the FIS text. It is the CTP's preference to not publish these values in the FIS text in order to avoid confusion with detailed studied streams.

Scope for New Approximate Studies: Hydraulic modeling for new approximate studies will be performed for the 1-percent chance annual event based on the peak discharges defined under Hydrologic Analysis. Discharge locations in the models will be assigned to the upstream limit of study reaches, at major stream junctions, and as needed based on the judgment of the CTP. The hydraulic analyses will be used to establish flood elevations to delineate the 1-percent annual chance floodplain on the DFIRMs as outlined in Floodplain Mapping.

A simplified HEC-RAS model will be developed to perform the hydraulic calculations. A single representative Manning's roughness value will be assigned to the channel, left overbank, and right overbank for the entire length of the studied stream reach. Manning's roughness values will be selected based on reviewing aerial photography, limited site reconnaissance, or engineering judgment. Geometry for model cross sections will be based on information collected in Topographic Data Development. Cross sections for approximate models will not be field surveyed. Bridge/culvert structures will not be included in approximate study models. Downstream boundary conditions for approximate models will be based on either known elevations, where available, or normal depth. Floodway encroachment analysis for approximate models will not be performed. Levees and other hydraulic obstructions will be included if the present in the topography.

FEMA's CHECK-RAS program is designed to verify the validity of an assortment of parameters found in the HEC-RAS hydraulic modeling program, specifically for detailed study models. As a result, FEMA's CHECK-RAS program will not be used to verify models developed for new approximate studies.

Scope for Existing Studies (Leverage): Existing studies from the US Army Corps of Engineers (USACE), the Natural Resources Conservation Service (NRCS), local partners, or USGS, have performed detailed analyses for certain flooding sources listed in this MAS that have previously been accepted by FEMA or performed using engineering methods accepted by FEMA. The CTP shall contact the FEMA Regional Office to coordinate incorporation of the study data into the production efforts. The CTP shall obtain these studies, review the data for applicability, and provide documentation pertaining to FEMA compliance. The CTP will incorporate the approved data into the production process. The CTP will perform QA/QC on leverage study information received from project partner(s) before incorporation into the production process. The CTP will incorporate the results of leverage studies, but the certification requirements for the studies will revert to the parent agency that produced the study and leverage information will not be reformatted to meet *Appendix N: Data Capture Standards*.

Scope for Levee System Evaluation: Any flooding sources associated with a levee that are mapped as providing protection on effective FIRMs, but will not meet certification requirements for the new FIRMs, will require revised hydraulic analysis. This revised analysis should be done in accordance with the G&S, PMs 34, 43, 52, 53 and others that may be appropriate.

To ensure the appropriate approach for analysis and floodplain mapping is conducted under this MAS, the CTP shall assess the levee systems, if present, in the counties identified in this MAS. The CTP shall use the information gathered during the scoping task on what levee data is available for the given community and the levee system's ability to provide protection from the 1-percent-annual-chance flood. The CTP shall use the criteria outlined in Section 65.10 of the NFIP regulations and the step-by-step procedures in Appendix H of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*, dated April 2003.

For this activity, the CTP shall conduct a detailed hydraulic analysis, either a new analysis or utilizing a leverage hydraulic model obtained from the USACE, of the stream that is affected by the levee with the levee encroachments in the hydraulic model. Subsequently, the CTP will conduct a secondary analysis without the levee encroachment in the hydraulic model. These revised analyses shall be done in accordance with Appendix H of the *Guidelines and Specifications for Flood Hazard Mapping Partners*.

In cases where the MAS includes multiple counties it is beneficial to summarize the hydraulic analysis that will be used for each county in Table 1.7 Summary of Hydraulic Analysis. The CTP shall summarize the hydrologic analysis for each county in optional Table 1.7 Summary of Hydraulic Analysis.

Table 1.7 Summary of Hydraulic Analysis

County Name	Method	Total Miles of New Detailed Hydraulics	Total Miles of Limited Detailed Hydraulics	Total Miles of Approximate Hydraulics
Boyd	HEC-RAS	21.9	86.9	0
Bracken	HEC-RAS	25.6	30.2	111.5
Bullitt	HEC-RAS	37.6	30.1	155.9
Campbell	HEC-RAS	59.1	58.8	52.5
Fayette	HEC-RAS	32.2	151.9	0
Franklin	HEC-RAS	37.7	14.2	108.1
Greenup	HEC-RAS	32.4	78.5	75.3
Hancock	HEC-RAS	0	0	140.4
Jefferson	HEC-RAS	104.0	38.5	25.5
Kenton	HEC-RAS	30.7	0	0
Lewis	HEC-RAS	46.8	0	295.4
Magoffin	HEC-RAS	12.5	44.2	158
Mason	HEC-RAS	19.3	56.8	134.9
Pendleton	HEC-RAS	49.2	0	231.0
Pike	HEC-RAS	20.7	0	93.9
Totals		529.7	590.1	1582.4

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

Deliverables: In accordance with the G&S, the CTP shall make the following products available to FEMA by uploading the digital data to the MIP so that the CTP can access it for an independent QA/QC review

in accordance with the schedule outlined in Section 6 - Schedule. A metadata file complying with the NFIP Metadata Profiles Specifications, must accompany the uploaded compliant digital data. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

For approximate studies, some of the following deliverables may not be applicable. In these instances, a revised set of deliverables will be outlined in this MAS.

- Digital profiles of the 10-, 2-, 1- and 0.2-percent-annual-chance water-surface elevations representing existing conditions using the FEMA RASPLOTT program or similar software;
- Digital Floodway Data Tables for each flooding source that is compatible with the DFIRM database;
- A Floodway Data Table appendix for each flooding source studied by limited detailed methods that is compatible with the DFIRM database;
- Digital hydraulic modeling (input and output) files;
- Digital tables with range 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;
- Format Hydraulic Database or Data Delivery consistent with the Data Capture Standards in the G&S; 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.
- 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;
- 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. Appropriate leverage information includes who paid for the data and the amount of data used by the Flood Map Project.

Independent QA/QC Review of Hydraulic Analyses

Responsible Mapping Partner: Kentucky Division of Water and/or its QA/QC Contractor

Scope: The CTP shall perform an impartial review of the technical, scientific, and other information submitted by the CTP 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. The CTP and contractor for the CTP, if applicable must ensure that independent QA/QC is performed and that organizational conflict of interest issues do not exist with respect to independent QA/QC processes. 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:

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 independent QC, including re-submittal of deliverables as needed to pass technical review.

- 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 hydraulic 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
- If data changed during review, then updated deliverables for previous tasks will be submitted at this time.

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

Deliverables: In accordance with the G&S, the CTP shall make the following products available to FEMA by uploading the digital data to the MIP. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

This submittal will occur in accordance with the schedule outlined in Section 6 - Schedule.

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

- If the data changed during the Hydrologic and/or Hydraulic Analyses QA/QC process, then the updated and verified deliverables from these activities will be resubmitted at this time.

Floodplain Mapping

Responsible Mapping Partner: Kentucky Division of Water and/or its Contractor

Scope for Detailed Riverine Analysis: The CTP shall delineate the 1- and 0.2-percent-annual-chance floodplain boundaries and the regulatory floodway boundaries (if required) and any other applicable elements for the flooding sources for which detailed hydrologic and hydraulic analyses were performed. The CTP shall incorporate all new or revised hydrologic and hydraulic modeling and shall use the topographic data acquired under Topographic Data Development to delineate the floodplain and regulatory floodway boundaries on a digital work map.

Scope for Limited Detailed Study: The CTP shall delineate the 1-percent annual chance floodplain boundaries and any other applicable elements for the flooding sources for which limited detailed hydrologic and hydraulic analyses were performed as a Zone AE. The CTP shall incorporate all new or revised hydrologic and hydraulic modeling and shall use the topographic data acquired under Topographic Data Development to delineate the floodplain boundaries on a digital work map. Floodway encroachment widths with a 0.7-foot increase will be identified as an appendix to the FIS report. One-percent annual chance BFEs will be shown on the DFIRM panels.

Scope of Redelineation of Detailed Floodplain Boundaries Using Updated Topographic Data: The CTP shall delineate the 1- and 0.2-percent-annual-chance floodplain boundaries and regulatory floodway boundaries for the flooding sources listed in this MAS. The CTP shall use the topographic data acquired under Topographic Data Development to delineate the floodplain and regulatory floodway boundaries, as appropriate, on a digital work map. If the new topographic data do not reflect the same hydraulic characteristics as in the effective study, the CTP shall evaluate the topographic data to determine if changes are significant enough to invalidate the floodplain boundary and regulatory floodway boundary redelineations. If so, the CTP shall contact the FEMA Regional Project Officer, identified in Section 12 – Points of Contact, with a recommendation.

Scope for Refinement or Creation of Zone A: The CTP shall delineate the 1-percent-annual-chance floodplain boundaries for the flooding sources listed in this MAS. The CTP shall use existing topographic data or the topographic data acquired under Topographic Data Development to delineate the floodplain boundaries on a digital work map. The CTP may expand on the approaches for analyzing Zone A areas outlined in G&S 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 identified in Section 12 – Points of Contact, before analysis and mapping begin.

Scope for Non-revised Areas: For all flooding sources except those segments for which updated flood data will be developed, the CTP shall convert the information shown on the effective FIRM and FBFM panels for all incorporated and unincorporated areas of the counties listed in this MAS to digital format in conformance with FEMA DFIRM specifications. The CTP shall use the acquired base map for the conversion. The CTP shall digitize the appropriate FIRM and FBFM panels as outlined in this MAS. The CTP shall not digitize the flood theme for those segments of flooding sources for which updated flood data will be developed. It is estimated that zero county-wide DFIRM panels will be produced by the CTP for non-revised areas.

Scope for Merging Revised and Non-Revised Information: Upon completion of the floodplain mapping activities for the revised and non-revised areas, the CTP 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. The CTP 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. The CTP shall coordinate with FEMA and any additional Mapping Partners responsible for other components of Floodplain Mapping, as necessary, to resolve any potential tie-in issues.

Scope for Mapping Areas Affected by Levees: Upon completion of the hydraulic analysis for areas affected by levees, the CTP shall delineate the 1-annual-chance floodplain boundaries and the regulatory floodway boundaries (if required) and any other applicable elements for the applicable flooding sources. This includes, but may not be limited to, inserting applicable PAL notes and additional flood zone designations. Based on the two hydraulic analyses conducted, the CTP shall delineate the areas affected without the levee encroachment in the hydraulic model as a shaded Zone X. This methodology will eliminate the need for future hydraulic analysis if the levee system becomes decertified.

The CTP shall incorporate the results of all effective Letters of Map Change (LOMCs) for all affected communities on the DFIRM. Also, the CTP shall address all concerns or questions regarding Floodplain Mapping that are raised by the CTP during the independent QA/QC review.

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 PM 38, dated October 17, 2007. The CTP will perform self-certification audits for the Floodplain Boundary Standards, as described in PM 38 and all subsequent revisions, for all flood hazard areas. The CTP may expand on the approaches for analyzing Zone A areas outlined in G&S 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.

The CTP assigned the floodplain mapping task will complete all activities pertaining to levees in accordance with the G&S, PMs 34, 43, 52, 53 and others that may be appropriate.

Deliverables: In accordance with the G&S, and upon completion of floodplain mapping for those flooding sources listed in this MAS, the CTP shall make the following products available to FEMA by uploading the digital data to the MIP so that the CTP can access it for the independent QA/QC review in accordance with the schedule outlined in Section 6 - Schedule. A metadata file complying with the NFIP Metadata Profiles Specifications, must accompany the compliant digital data. Additionally, the TSDN format described in the G&S 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 the Independent QA/QC review at the completion of this activity.

This submittal will occur in accordance with the schedule outlined in Section 6 - Schedule.

- 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;

- LDS deliverables include the 1-percent annual chance BFE for each stream and 0.7 percent floodway encroachment widths in an addendum to the FIS text;
- Digital versions of input and output for any computer programs that were used consistent with the DCS—in the G&S;
- 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 QA/QC review of Hydrologic, and Hydraulic Analyses and Floodplain Mapping consistent with the DCS—in the G&S;
- 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;
- If automated GIS-based models are applied, all input data, output data, intermediate data processing products, and GIS data layers shall be submitted consistent with the DCS—in the G&S;
- 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.

Independent QA/QC Review of Floodplain Mapping

Responsible Mapping Partner: Kentucky Division of Water and/or its QA/QC Contractor

Scope: The CTP shall perform an impartial review of the floodplain mapping submitted by the CTP under 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. The CTP and contractor for the CTP, if applicable must ensure that independent QA/QC is performed and that organizational conflict of interest issues do not exist with respect to independent QA/QC processes. 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.

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 independent QC, including re-submittal of deliverables as needed to pass technical review.

- Review the cross sections for proper location and orientation on the work map and agreement with the Floodway Data Table.
- 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 encroachment floodway widths in the HEC-RAS models for agreement with the widths shown in the Floodway Data Table appendices for limited detailed studies. For LDS studies, encroachment floodway widths will not be shown on the DFIRMs.
- 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 G&S.
- Review the metadata files to ensure the data includes all required information shown in the NFIP Metadata Profiles Specifications.

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

Deliverables: In accordance with the G&S, the CTP shall make the following products available to FEMA by uploading the digital data to MIP. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal. This submittal will occur in accordance with the schedule outlined in Section 6 - Schedule.

- A Summary Report that describes the findings of the QA/QC review, noting any deficiencies in or agreeing with the mapping results;
- Recommendations to resolve any problems that are identified during the independent QA/QC review;
- An annotated work map with all questions and/or concerns indicated, if necessary; and
- If data changed during review, then updated deliverables for previous tasks will be submitted at this time.

Develop Draft DFIRM Database

Responsible Mapping Partner: Kentucky Division of Water and/or its Contractor

Scope: The CTP shall prepare the database in accordance with G&S, for upload to the MIP. The CTP shall coordinate with appropriate Mapping Partners, as necessary, to resolve any problems that are identified during development of the DFIRM Database.

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

Deliverables: In accordance with G&S, the CTP 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 G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

- DFIRM database files prepared in accordance with the requirements in G&S and in the required format(s) and
- A metadata file complying with the FEMA NFIP Metadata Profile Specifications.

Produce Preliminary Map Products

Responsible Mapping Partner: Kentucky Division of Water and/or its Contractor

Scope: The CTP 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). The CTP will be preparing the database for this project in the Standard format. The database shall be produced in accordance with the G&S. The CTP shall coordinate with those Mapping Partners responsible for Floodplain Mapping and/or Redelineation, as necessary, to resolve any problems that are identified during development of the DFIRM Database and graphics.

Preliminary Summary of Map Actions (SOMA) Preparation: The CTP 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).

Standards: All DFIRM Database 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 G&S, the CTP shall make the following products available to FEMA by uploading the digital data to the MIP. A metadata file complying with the NFIP Metadata Profiles Specifications, must accompany the compliant digital data. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

This submittal will occur in accordance with the schedule outlined in Section 6 - Schedule.

- Preliminary DFIRM database or revised Preliminary DFIRM database prepared in accordance with the requirements in G&S;
- FIS Report and the Preliminary SOMA prepared using the SOMA Tool on the MIP.
- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale; 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 approved QA/QC Plan.

- Passing Quality Review report

Independent QA/QC Review of Produce Preliminary Map Products

Responsible Mapping Partner: Kentucky Division of Water and/or its QA/QC Contractor

Scope: Upon completion of the floodplain mapping and redelineation activities, the CTP shall perform an impartial review of the DFIRM spatial database to determine if it meets current FEMA database specifications. In addition, the CTP shall review the DFIRM to ensure it meets current FEMA graphic specifications. The CTP shall coordinate with other Mapping Partners, as necessary, to resolve any problems identified during this QA/QC review. The CTP and contractor for the CTP, if applicable must ensure that independent QA/QC is performed and that organizational conflict of interest issues do not exist with respect to independent QA/QC processes. FEMA may audit or assist in these activities if deemed to be necessary by the Regional Project Officer.

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 independent QC, including re-submittal of deliverables as needed to pass technical review.

This work shall ensure that the requirements below are met.

- All required DFIRM features are accurately and legibly labeled and following the examples shown in the FEMA DFIRM specifications. This includes all flood insurance risk zones, BFEs, gutters, cross sections, transects, studied streams and shorelines, 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 G&S.
- All map collar information is complete, correct, and follows the requirements specified in G&S.
- Preliminary DFIRM database is in a GIS file and database format as specified in FEMA's G&S, and conform to those specifications for content and attribution.
- DFIRM database files are in one of the database formats specified in FEMA's G&S, and conform to those specifications for content and attribution.

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

Deliverables: In accordance with the G&S, the CTP shall make the following products available to FEMA by uploading the digital data to the MIP. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

This submittal will occur in accordance with the schedule outlined in Section 6 – Schedule.

- A Summary Report that describes the findings of the QA/QC review noting any deficiencies in or agreeing with the mapping results and the results of all automated or manual QA/QC steps taken during the independent QA/QC review.

- Recommendations to resolve any problems that are identified during the independent QA/QC review; and
- An annotated copy of the DFIRM with all questions and/or concerns indicated, if necessary.
- If the data changed during the QA/QC process, then the updated deliverables from Floodplain Mapping and Redelineation will be resubmitted at this time.

Distribute Preliminary Map Products

Responsible Mapping Partners: Kentucky Division of Water and/or its Contractor

Scope: Preliminary Map Products consists of the final preparation, review, and distribution of the Preliminary copies of the DFIRM and FIS report and the Preliminary SOMA for community officials and the general public review and comment. FEMA may audit or assist in these activities if deemed to be necessary by the Regional Project Officer. The activities to be performed are summarized below.

Preliminary Transmittal Letter Preparation: The CTP shall prepare letters and 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. This letter may be prepared for FEMA only or for signature by FEMA and the CTP.

Distribution of Preliminary DFIRM and FIS Report: The CTP 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 CTP shall use the BFEs on the Web tool in accordance with PM 44 to create BFE notices for studies that result in new or modified BFEs. The CTP shall prepare the BFE determination letters as well as the news release notifications of BFE changes for all affected communities. The CTP shall perform QA/QC reviews of the notices for accuracy and compliance with FEMA format requirements. The CTP shall file the notifications for later submittal to FEMA for review.

Standards: All Preliminary Map Products work shall be performed in accordance with the standards specified in Section 5 - Standards. Mapping quality standards must be consistent with PM 38, dated October 17, 2007. Preliminary DFIRM Maps shall pass the QRs, as outlined in PM 42, before this activity is completed and the maps are issued Preliminary.

Deliverables: In accordance with the G&S, the CTP shall make the appropriate deliverables available to FEMA by uploading the digital data to the MIP. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

This submittal will occur in accordance with the schedule outlined in Section 6 - Schedule. Preliminary transmittal letters shall be prepared and transmitted. 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* and in conjunction with Guidance provided by the Region and/or its contractor.

- Preliminary copies of the DFIRM and FIS report, including all updated data tables and Flood Profiles 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.

- Preliminary SOMAs, prepared in accordance with FEMA requirements, shall be provided as appropriate.
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the final preparation of the preliminary DFIRM shall be provided as outlined in the approved QA/QC Plan.
- The CTP will submit a summary of outreach activities and any changes made in the outreach approach based on the actual implementation.

Post-Preliminary Processing

Responsible Mapping Partners: CTP and FEMA

Scope: Post-Preliminary Processing includes coordination with FEMA and the Community to schedule a Community Meeting(s) for review of the Preliminary DFIRM, if required. This activity 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. FEMA may audit or assist in these activities if deemed to be necessary by the Regional Project Officer. The activities to be performed are summarized below.

Community Coordination Meeting: If a community coordination meeting is required it is recommended that it be held within 60 days of the issuance of the Preliminary DFIRM and, the CTP shall arrange for and verify that the following activities are completed:

- Establish invitee list,
- Schedule meeting date and place,
- Complete and Distribute Meeting Notice/Letter,
- Record Meeting Minutes,
- Record follow ups with communities not in attendance, and
- Identify any/all communities with BFE changes for required appeal period.

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, FEMA and/or the CTP shall arrange for and verify that the following activities are completed in accordance with the current version of the FEMA G&S, appropriate PMs and Document Control Procedures Manual:

- Proposed BFE determination letters are sent to the community CEOs and floodplain administrators.
- Ensure that news release notifications of BFE changes are published in prominent newspapers with local circulation in accordance with 44 CFR.

- The CTP shall prepare the appropriate notices (Proposed Rules) that are to be published in the *Federal Register*. The CTP shall then deliver those notices to FEMA for publication.
- When the CTP holds public meetings to present and discuss the results of this Flood Map Project, FEMA may attend the meetings and assist where possible, if requested.

Resolution of Appeals and Protests: The CTP shall review and resolve appeals and protests received during the 90-day appeal period. 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 for signature with FEMA and revised DFIRM and FIS report materials for FEMA review.

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

Preparation of Special Correspondence: The CTP 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. The CTP 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, the CTP 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.

Final SOMA Preparation: The CTP shall prepare Final SOMAs for the affected communities with assistance from FEMA, as appropriate.

Processing of Letter of Final Determination: The CTP shall work with FEMA to establish the effective date for the DFIRM and FIS report, and shall prepare Letters of Final Determination (LFDs) for each affected community for FEMA review in coordination with the Region and its contractor, and in accordance with the FEMA *Document Control Procedures Manual*. FEMA or its designated contractor shall mail the final signed LFDs and enclosures and distribute appropriate copies of the signed LFDs. All work must pass the automated and visual “National QA/QC” reviews and review of LFD prior to the distribution of the LFD.

- The CTP shall prepare the appropriate notices (Final Rules) that are to be published in the *Federal Register*. The CTP shall then deliver those notices to FEMA for publication.

Processing of Final DFIRM and FIS Report for Printing: The CTP shall prepare final reproduction materials for the DFIRM and FIS report and provide these materials to MSC in accordance with PM 42 for printing by the United States Government Printing Office. The CTP shall also 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 CTP shall prepare and distribute letters for FEMA signature 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 CTP shall ensure that technical and administrative support data are packaged in the FEMA required format and stored properly in the library archives until transmitted to the FEMA Engineering Study Data Package Facility. In addition, the CTP will maintain copies of all data for a period of no less than three years.

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

Deliverables: In accordance with the G&S, the CTP shall make the following products available to FEMA by uploading the digital data to the MIP. A metadata file complying with the NFIP Metadata Profiles Specifications, must accompany the compliant digital data. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

This submittal will occur in accordance with the schedule outlined in Section 6 - Schedule.

- Documentation that the news releases 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 (if applicable) 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;
- 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 below.

All supporting documentation for the activities in this MAS/SOW shall be submitted in the TSDN format in accordance with the FEMA G&S. Table 2.1 Mapping Activities and Applicable TSDN Sections indicates the sections of the TSDN that apply to each mapping activity.

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 G&S.)

Table 2.1- Mapping Activities and Applicable TSDN Sections

TSDN Section	Mapping Activities													
	Scoping	Field Survey	Topo Data	QA/QC of Topo	Base Map	Hydrology	QA/QC of Hydrology	Hydraulic Analysis	QA/QC of Hydraulics	Flood-plain Mapping (and Re-delineation)	QA/QC of FP Mapping	DFIRM Database	Preliminary Map Products	Post-Preliminary
General Documentation														
Special Problem Reports	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
Meeting Minutes/ Reports	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
Engineering Analyses														
Hydrologic Analyses		X			X	X	X	X	X	X	X			
Hydraulic Analyses		X			X	X	X	X	X	X	X			

TSDN Section	Mapping Activities													
	Scoping	Field Survey	Topo Data	QA/QC of Topo	Base Map	Hydrology	QA/QC of Hydrology	Hydraulic Analysis	QA/QC of Hydraulics	Flood-plain Mapping (and Re-delineation)	QA/QC of FP Mapping	DFIRM Database	Preliminary Map Products	Post-Preliminary
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	X					
Mapping Information	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

SECTION 3—PERIOD OF PERFORMANCE

The mapping activities outlined in this MAS will be completed as specified in the Agreement Articles of the Cooperative Agreement. The Mapping Activities may be terminated at the option of FEMA or the Kentucky Division of Water in accordance with the provisions of the Partnership Agreement dated August 16, 1999. If these mapping activities are terminated, all products produced to date must be returned and updated into the MIP and the remaining funds from uncompleted activities, provided by FEMA for this MAS, will be returned to FEMA.

The period of performance for this MAS will be the date that notice to proceed is given to the Kentucky Division of Water through September 30, 2012.

SECTION 4—FUNDING/LEVERAGE

FEMA is providing funding, in the amount _____ to the Kentucky Division of Water for the completion of this Flood Map Project. The Kentucky Division of Water shall provide any additional resources required to complete the assigned activities for this Flood Map Project. During the scoping process, additional needs may be identified. Activities associated with any additional needs would be performed based on availability of additional funds. The leverage listed below includes in-kind services and blue book values for acquired information (i.e. base map data, hydrologic and hydraulic analyses, etc.). These values should also be reported in the MIP by the appropriate task owner. The current Blue Book is dated January 2009 and can be downloaded from FEMA's Information Resource Library at <http://www.fema.gov/library/viewRecord.do?id=2473>. More detailed leverage information will be determined during the detailed scoping process and reported back to FEMA upon completion of scoping activities.

Table 4.1 Contribution and Leverage

Project Task	FEMA Contribution	Partner Contribution	% Partner Leverage	Total Project Cost
Detailed Hydraulics – Ohio River (Campbell, Bracken, Pendleton, Mason, Lewis, Greenup, and Boyd Counties)				
TOTAL FUNDING AMOUNTS				

* Approximate partner contributions based on Scoping activities; this value will be updated upon completion of Scoping Reports for each county.

Leverage dollars or units shall be entered as applicable within the Manage Data Development task in the MIP workflow.

SECTION 5—STANDARDS

The standards relevant to this MAS are provided in Tables 5-1 Applicable Standards for Project Activities and 5-2 Project Activities and Applicable Portions of FEMA Guidelines and Specifications. Information on the correct volume and appendix of the G&S to be referenced for each mapping activity are summarized in Table 5-2 for convenience. However, all mapping partners working on a Flood Map Project are responsible for complying with all appropriate requirements in FEMA's G&S including the Final Draft Guidelines for Coastal Flood Hazard Analysis and Mapping for the Pacific Coast of the United States and Atlantic Ocean and Gulf of Mexico Coastal Guidelines Update Final Draft, collectively referred to as "Coastal Guidelines Updates"; and related PMs published by FEMA as of the date of this agreement.

These guidelines may be downloaded from the FEMA Flood Hazard Mapping website at http://www.fema.gov/plan/prevent/fhm/dl_cgs.shtm. The Geospatial Data Coordination Policy and the Geospatial Data Coordination Implementation Guide are located at <https://hazards.fema.gov> under "Tools & Links."

Table 5-1. Applicable Standards for Project Activities

Applicable Standards	Activities																
	Scoping	Field Survey	Topo Data	QA/QC Topo Data	Base Map	Coastal	QA/QC Coastal	Hydrology	QA/QC Hydrology	Hydraulic Analysis	QA/QC of Hydraulic Analysis	Floodplain Mapping (inc. Redefinition)	QA/QC Flood-plain Mapping	DFIRM Dbase	QA/QC DFIRM Database	Preliminary Map Products	Post-Preliminary Processing
<i>Guidelines and Specifications for Flood Hazard Mapping Partners and Procedure Memorandums</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FEMA's Geospatial Data Coordination Policy	X		X		X												
FEMA's Geospatial Data Coordination Implementation Guide	X		X		X												
Engineer Manual 1110-2-1003, <i>Hydrographic Surveys</i> (USACE), January 1, 2002	X	X															

		Activities																	
Applicable Standards		Scoping	Field Survey	Topo Data	QA/QC Topo Data	Base Map	Coastal	QA/QC Coastal	Hydrology	QA/QC Hydrology	Hydraulic Analysis	QA/QC of Hydraulic Analysis	Floodplain Mapping (inc. Redelineation)	QA/QC Flood-plain Mapping	DFIRM Dbase	QA/QC DFIRM Database	Preliminary Map Products	Post-Preliminary Processing	
"Numerical Models Accepted by FEMA for NFIP Usage," Updated April 2003		X					X	X	X	X	X								
NFIP Metadata Profile Specifications		X		X	X								X	X	X	X	X	X	X
Document Control Procedures Manual		X															X	X	X
44 Code of Federal Regulations, Parts 65, 66 and 67		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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

Activity Description	Applicable Volume, Section/Subsection, and Appendix
Scoping	Volume 1 Appendix I Scoping Report document 44 Code of Federal Regulations Part 66 and 67
Outreach	Volume 1 Appendix I
Field Survey	Volume 1 Appendices A, B, C, F, and M
Topographic Data Development and Independent QA/QC Review of Topographic Data	Volume 1, Appendices A and M
Base Map Acquisition and Preparation And Independent QA/QC Review of Base Map	Volume 1 Appendices A, K, L, and M
Hydrologic Analyses and Independent QA/QC Review of Hydrologic Analyses	Volume 1 Appendices A, C, E, F, G, H, and M
Hydraulic Analyses and Independent QA/QC Review of Hydraulic Analyses	Volume 1 Appendices A, B, C, E, F, G, H, and M

Activity Description	Applicable Volume, Section/Subsection, and Appendix
Coastal Hazard Analyses and Independent QA/QC of Coastal Hazard Analyses	Volume 1 Appendices A, B, C, D, H, and M Coastal Guidelines Updates*
Floodplain Mapping and Independent QA/QC Floodplain Mapping (including Redefinition/Digitization)	Volume 1 Appendices C, D, E, F, G, H, K, L, and M
Produce Preliminary Map Products and Independent QA/QC Review of Produce Preliminary Map Products	Volume 1 Appendices K, L, and M
Distribute Preliminary Map Products and Independent QA/QC Review of Distribute Preliminary Map Products	Volume 1 Appendices J, K, L, and M
Post-Preliminary Processing	Volume 1 Appendices J, K, L, and M

SECTION 6— SCHEDULE

The activities documented in this MAS shall be completed in accordance with Table 6.1 Mapping Activities Schedule. If changes to this schedule are required, the responsible Mapping Partner shall coordinate with FEMA and the other Mapping Partners in a timely manner. Please also identify to whom the products associated with each task are to be submitted to (i.e. the MIP, FEMA Regional Office, etc.). Final schedules and costs will be listed in the MIP supplemental forms.

Table 6.1 Mapping Activities Schedule

ACTIVITIES	RESPONSIBLE PARTNER(S)	START DATE	END DATE	COST
Scoping	CTP	N/A	N/A	
Field Surveys	CTP	8/30/2009	2/12/2010	
Topographic Data Development	CTP	7/3/2009	5/21/2010	
Independent QA/QC Review of Topographic Data	CTP	11/30/2009	5/21/2010	
Base Map Acquisition	CTP	7/3/2009	3/19/2010	
Independent QA/QC Review of Base Map	CTP	8/31/2009	3/19/2010	
Hydrologic Analyses	CTP	8/17/2009	6/18/2010	
Independent QA/QC Review of Hydrologic Analyses	CTP	10/5/2009	6/18/2010	
Hydraulic Analyses	CTP	10/5/2009	7/16/2010	
Independent QA/QC Review of Hydraulic Analyses	CTP	10/19/2009	7/16/2010	
Floodplain Mapping: Detailed Riverine	CTP	11/30/2009	8/13/2010	
Floodplain Mapping: Refinement or Creation of Zone A	CTP	11/30/2009	8/13/2010	
Floodplain Mapping: Merging Revised and Unrevised Areas	CTP	11/30/2009	8/13/2010	
Floodplain Mapping: Redelineation	CTP	11/30/2009	8/13/2010	
Independent QA/QC Review of Floodplain Mapping	CTP	1/11/2010	8/13/2010	
Develop Draft DFIRM Database	CTP	12/14/2009	9/10/2010	
Produce Preliminary Map Products (including Graphic Specifications)	CTP	1/18/2010	9/10/2010	
Independent QA/QC Review of Produce Preliminary	CTP	2/22/2010	9/10/2010	

ACTIVITIES	RESPONSIBLE PARTNER(S)	START DATE	END DATE	COST
Map Products				
Distribute Preliminary Map Products	CTP	5/7/2010	9/30/2010	
Post-Preliminary Processing	CTP and FEMA	10/4/2010	9/30/2011	
TOTAL COST				

The CTP and FEMA's contractor shall update the MIP workflow tasks with schedule and cost information within 30 days once funds are awarded.

SECTION 7—CERTIFICATIONS

Data Capture Standards

- **DCS Certification Form**
- All applicable Data Capture Standards (DCS) will be complied with as part of this MAS. The Mapping Partner will comply with the revised DCS standards as outlined in revised version of Appendix M, including the certification requirements. A PDF of the form with the signature, data, and seal affixed to the form must be submitted digitally. This form must be signed by a registered Professional Engineer (or Surveyor if appropriate) from the firm contracted to perform the work, or by the responsible official of a government agency. A digital version of this form is available at www.fema.gov.

Field Surveys and Topographic Data Development

A Registered Professional Engineer or Licensed Land Surveyor shall provide an accuracy statement for field surveys and/or topographic data used and shall certify these data meet the accuracy statement provided. Data accuracy should be stated used the Federal Geographic Data Committee National Standards for Spatial Data Accuracy, but the American Society for Photogrammetry and Remote Sensing accuracy reporting standards are acceptable.

Base Map Acquisition and Preparation

- A community official or responsible party shall provide written certification that the digital data meet FEMA 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 is still 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.

Hydrologic Analyses, Hydraulic Analyses, and Floodplain Mapping

- A Registered Professional Engineer shall certify hydrologic and hydraulic and coastal analyses and data in accordance with 44 CFR 65.6(f).
- Any levee systems to be accredited will be certified in accordance with 44 CFR 65.10.

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 Mapping Needs Assessment Process from FEMA and/or your Regional Project Officer.

General technical and programmatic information, such as FEMA 265 and the Quick-2 computer program, can be downloaded from the FEMA website at http://www.fema.gov/plan/prevent/flm/frm_soft.shtml. Specific technical and programmatic support may be provided through FEMA and/or its contractor; such assistance should be requested through the FEMA Project Officer specified in Section 12 – Points of Contact.

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.

Assistance with the MIP may be requested at miphelp@riskmapeds.com.

SECTION 9—CONTRACTORS (CTP)

The Kentucky Division of Water intends to use the services of a study contractor(s) and QA/QC contractor, both of which are currently under solicitation for this Flood Map Project. The Kentucky Division of Water will be conducting the majority of QA/QC activities. The Kentucky Division of Water 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 United States Government Printing Office website at http://www.access.gpo.gov/nara/cfr/waisidx_04/44cfr13_04.html.

SECTION 10—REPORTING

Financial Reporting: Because funding has been provided to the Kentucky Division of Water by FEMA, financial reporting requirements for the Kentucky Division of Water will be in accordance with Cooperative Agreement Articles. The Kentucky Division of Water shall also refer to 44 CFR 13.41.

The Kentucky Division of Water shall provide financial reports to the FEMA Regional Project Officer and Assistance Officer in accordance with the terms of the signed Cooperative Agreement for this MAS.

Status Reporting: Status reports will be submitted on a quarterly basis in accordance with the financial reporting submittals. The Kentucky Division of Water shall refer to 44 CFR 13.4 to obtain minimum requirements for status reporting. The Project Officer, as needed, may request additional information on status.

The Kentucky Division of Water may meet with FEMA and/or its contractor up to bi-weekly, or more frequently if needed, to review the progress of the project in addition to the quarterly financial and status submittals. These meetings will alternate between FEMA's Regional Office, the Kentucky Division of Water office, and conference calls, as necessary.

Earned Value Reporting: The MIP Workflow is designed to track the Earned Value of mapping projects. This information is automatically calculated by the MIP, using the Actual cost and schedule of work performed, or "actuals" and comparing them to the expected cost and schedule of work performed, or "baseline".

Once the FEMA Regional office has funded a project the NSP and/or FEMA, will complete the "Obligate Project Funds" screen in the MIP. This step establishes the baseline for the project in the MIP, using the cost and schedule information for each task as outlined in this document and agreed to at the completion of the scoping process.

The MIP study workflow allows the Kentucky Division of Water to report on the status of these projects at a task level. The cost and schedule information, updated by the Kentucky Division of Water for each

contracted task, is compared to the baseline established for those tasks. This information is rolled up to a project level and monitored by the FEMA Region to assess progress and Earned Value.

Earned Value reporting involves the reporting of cost, schedule and performance (physical percent complete) in the MIP by the Kentucky Division of Water.

Once the baseline has been established in the MIP, the Kentucky Division of Water shall input the performance and actual cost to date for each contracted task for each project. This must be completed at minimum every thirty days and at the completion of the task. The "As of" date must be updated not less than every thirty days even if the reported percent complete and money spent have not changed from previous month. When a task is completed, including all QA/QC activities in this MAS plus the Quality Control Reviews established in PM 42, the Kentucky Division of Water shall enter 100% complete, enter the actual completion cost, and the actual completion date within the Manage Data Development, Manage Preliminary Map Production, or Manage Post Preliminary Processing, as applicable.

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

Section 11—Project Coordination

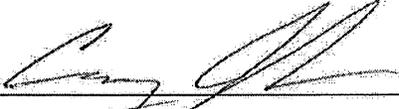
Throughout the project, all members of the Project Team will coordinate, as necessary, to ensure the products meet the technical and format specifications required and contain accurate, up-to-date information. Coordination activities shall include:

- Meetings, teleconferences, and video conferences with FEMA and other Project Team members as needed;
- Telephone conversations with FEMA and other Project Team members on a scheduled basis and an ad hoc basis, as required;
- Updates to the MIP and other FEMA status information systems in accordance with requirements in Volumes 1 and 3 of G&S; and
- E-mail, facsimile transmissions, and letters, as required.

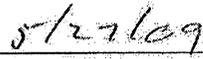
SECTION 12—POINTS OF CONTACT (CTP)

The points of contact for this Flood Map Project are Laura Algeo, P.E. the FEMA Regional Project Officer; Carey Johnson, the Project Manager for the Kentucky Division of Water; 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.

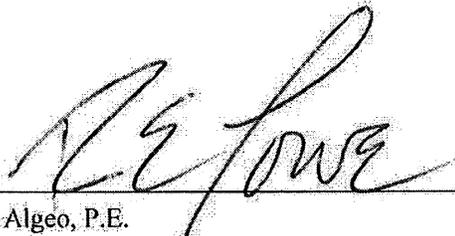
Each party has caused this MAS to be executed by its duly authorized representative.



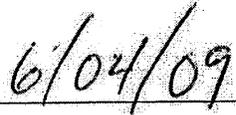
Carey Johnson
Project Manager
Kentucky Division of Water



Date



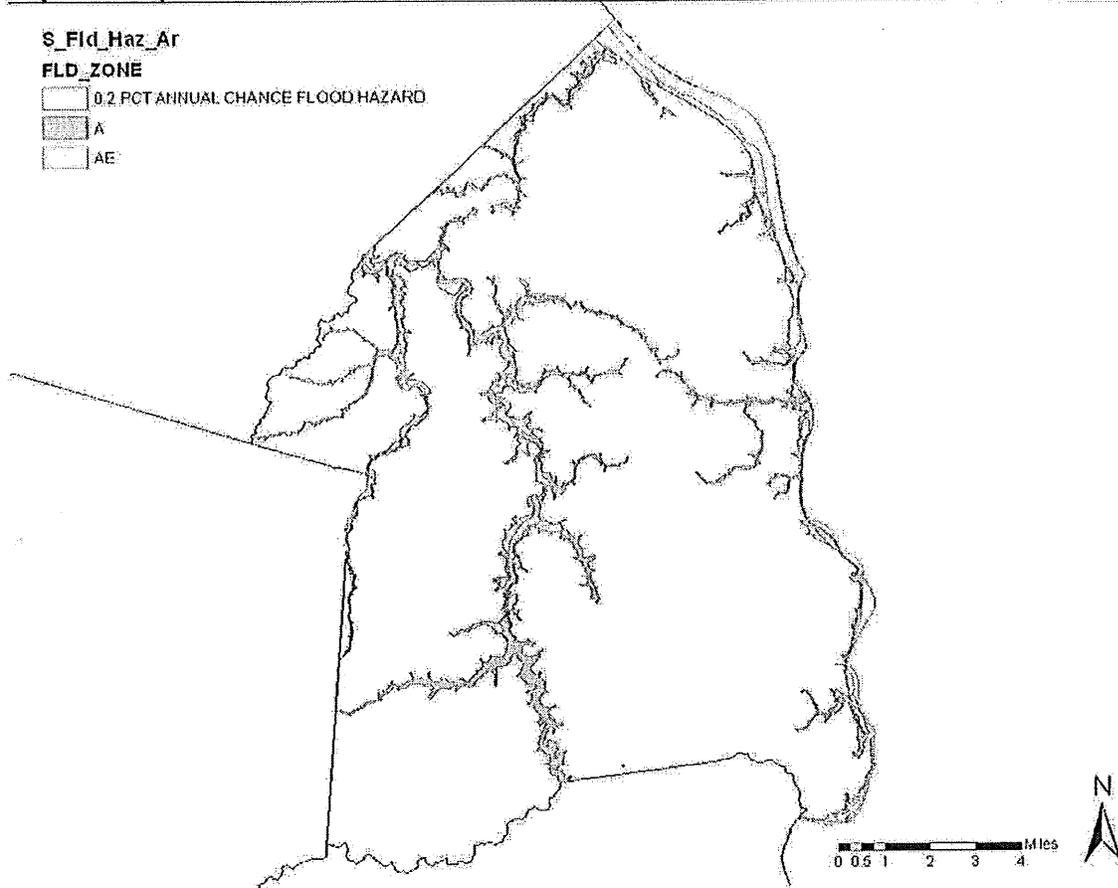
Laura Algeo, P.E.
Regional Project Officer
Federal Emergency Management Agency, Region IV



Date

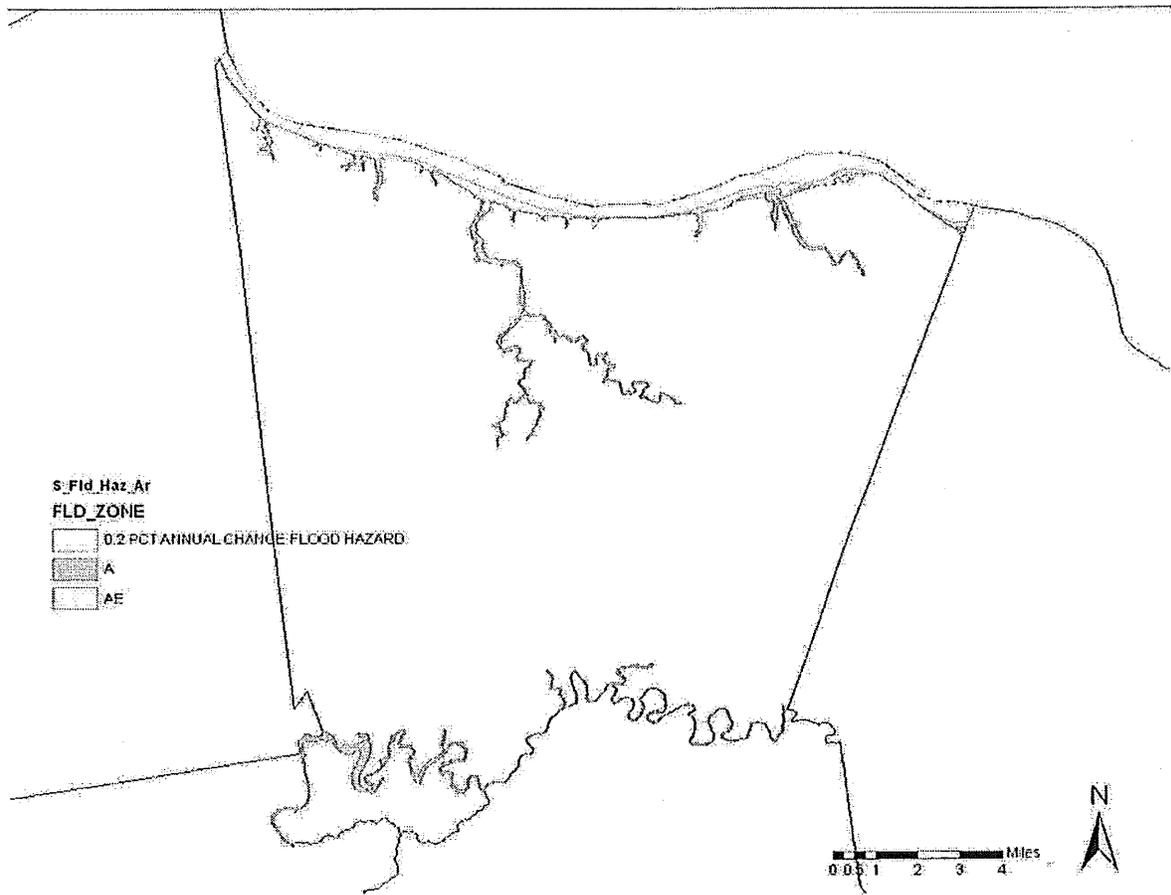
Appendix A: Overview of Effective SFHAs in FY 2009 Counties

Boyd County Effective SFHAs

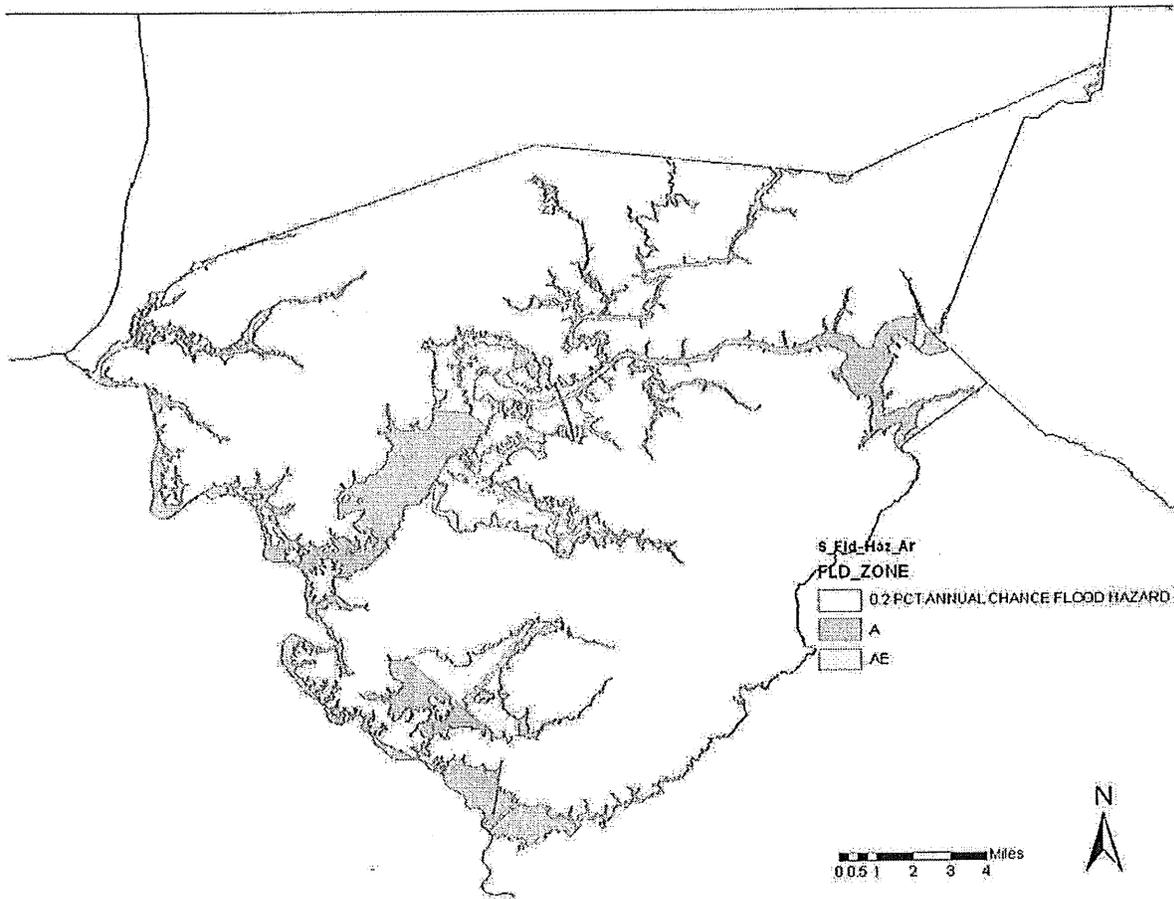


Bracken County Effective SFHAs

FY09 MAS/SOW Template Version 8.1
Mapping Activity Statement No. FY09.07
Kentucky Division of Water

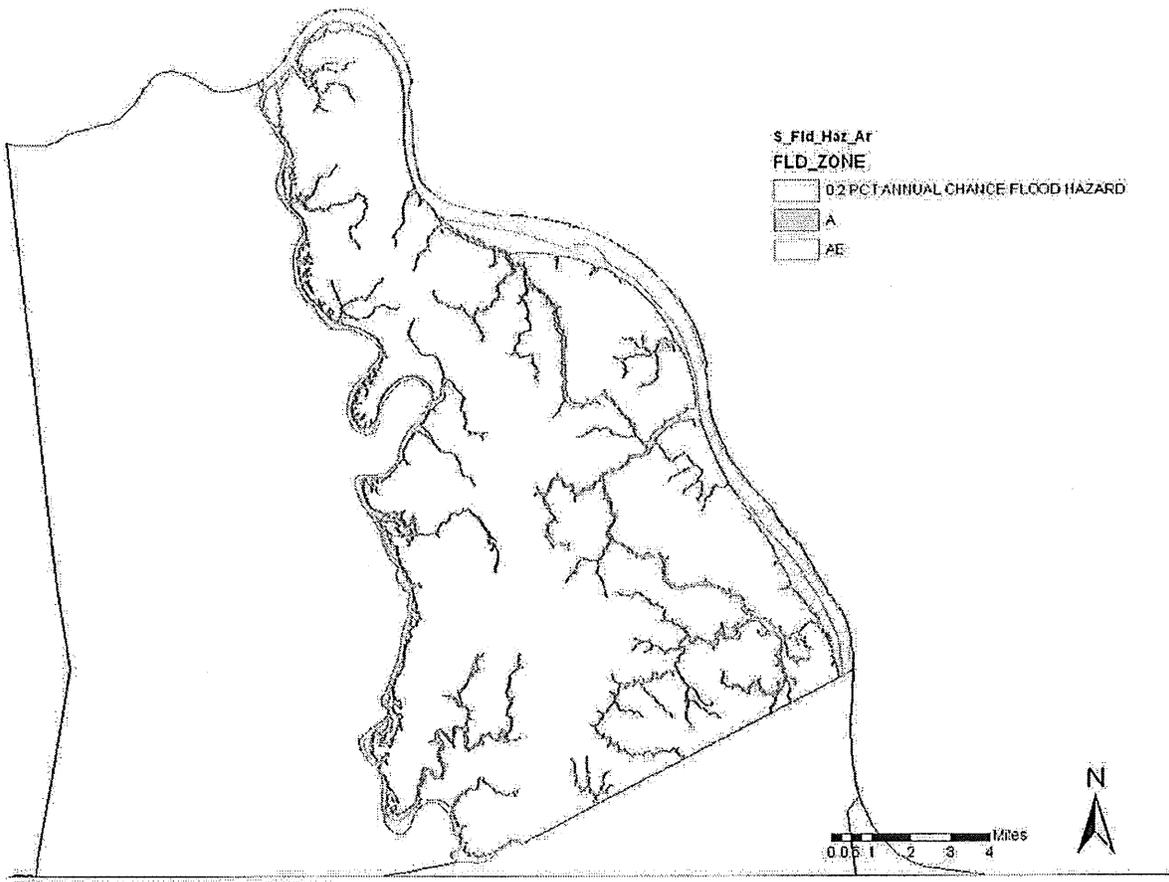


Bullitt County Effective SFHAs



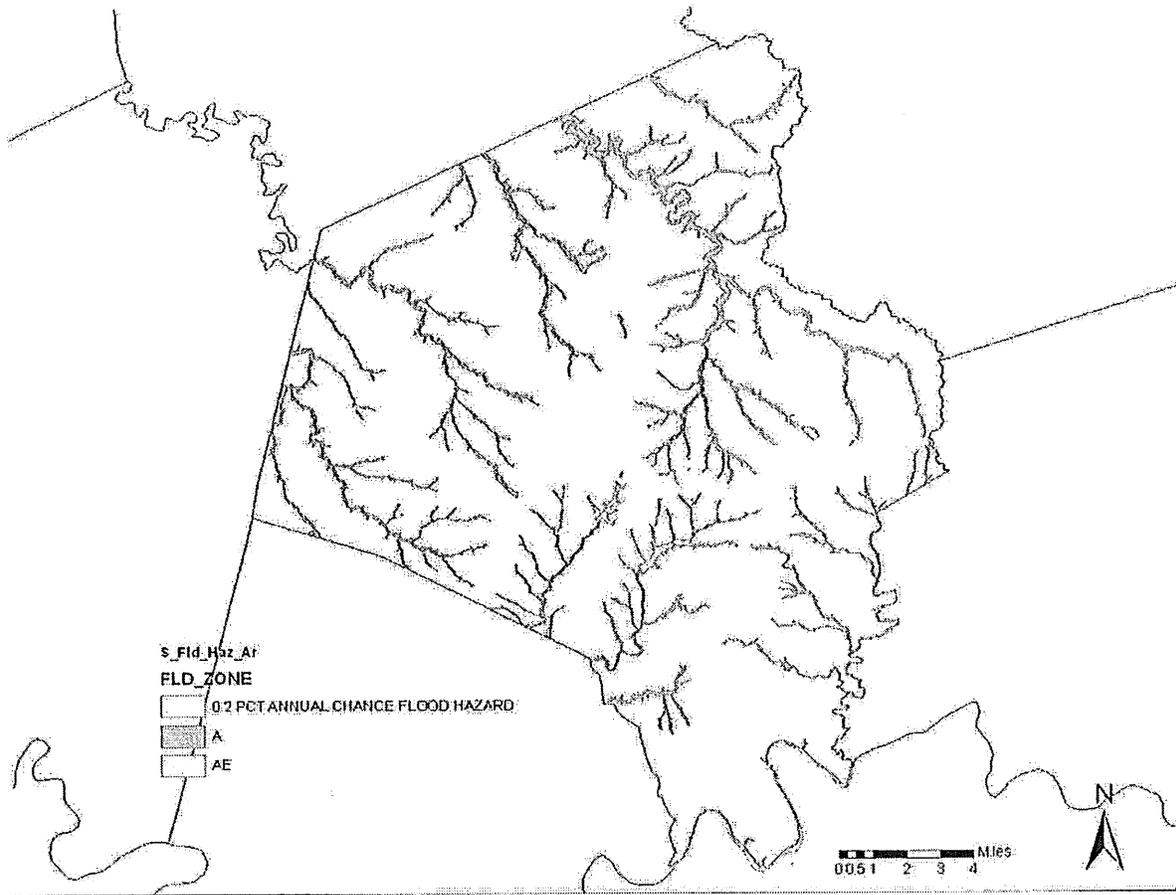
Campbell County Effective SFHAs

FY09 MAS/SOW Template Version 8.1
 Mapping Activity Statement No. FY09.07
 Kentucky Division of Water



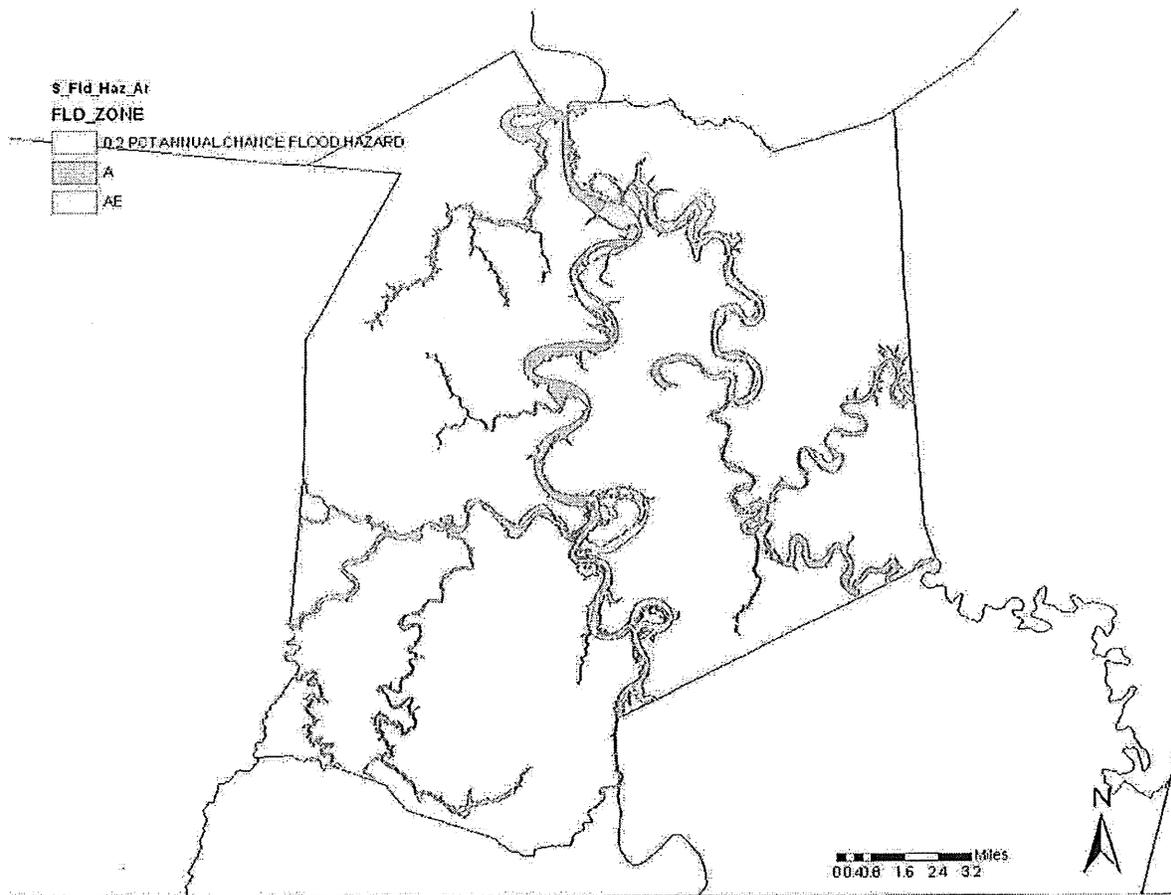
Fayette County Effective SFHAs

FY09 MAS/SOW Template Version 8.1
 Mapping Activity Statement No. FY09.07
 Kentucky Division of Water



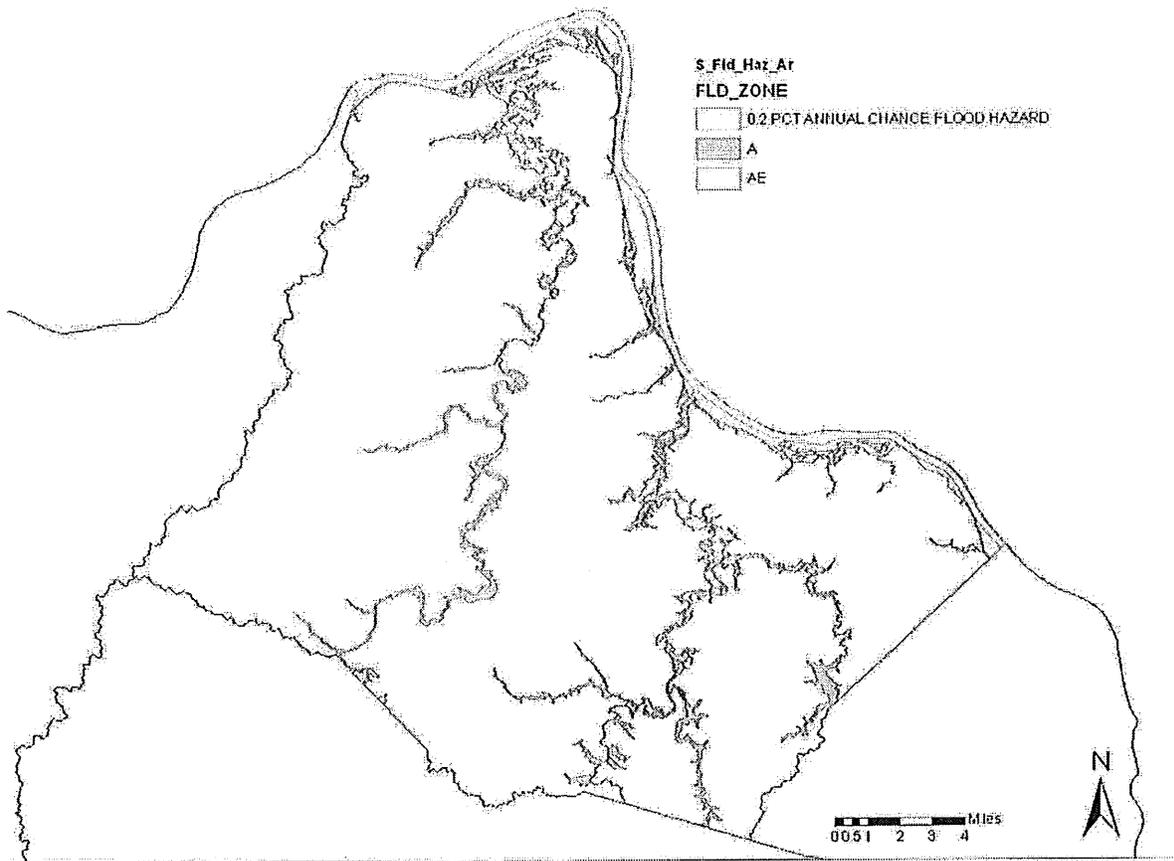
Franklin County Effective SFHAs

FY09 MAS/SOW Template Version 8.1
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 Kentucky Division of Water



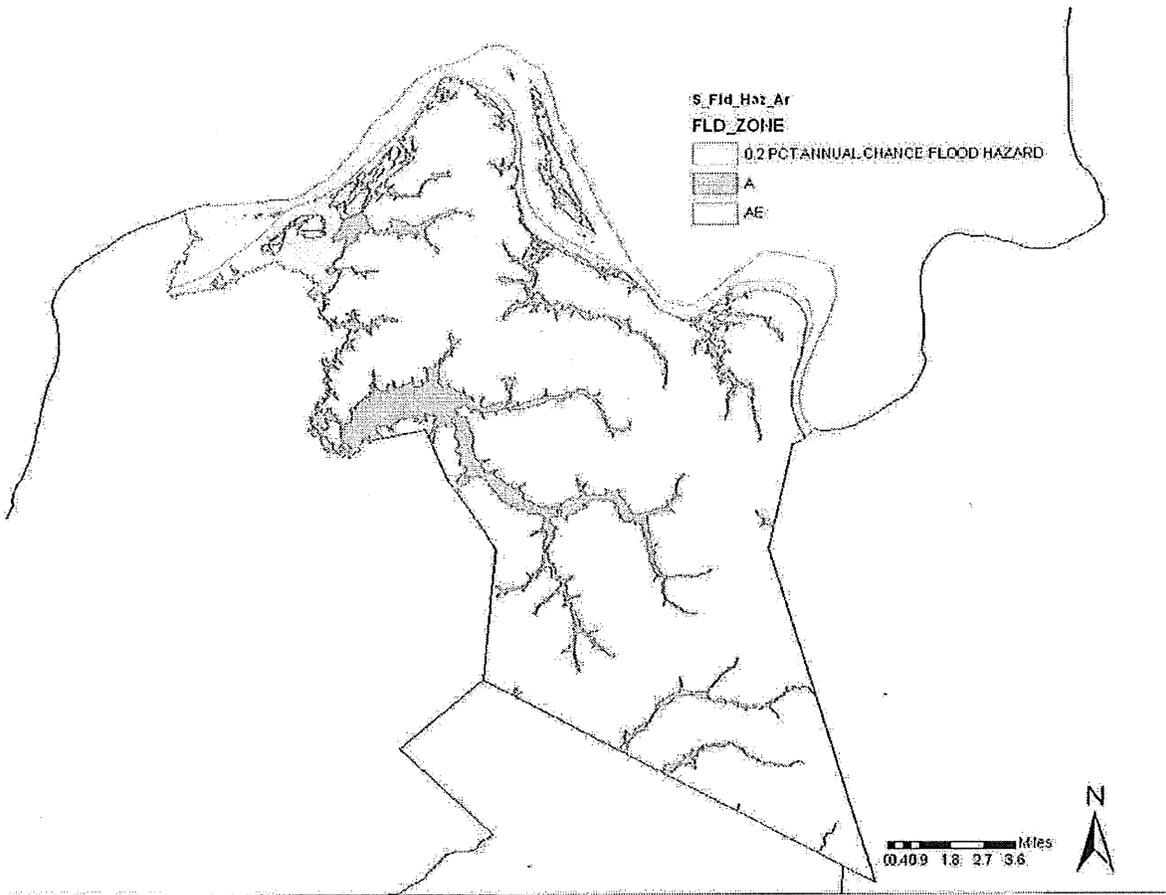
Greenup County Effective SFHAs

FY09 MAS/SOW Template Version 8.1
Mapping Activity Statement No. FY09.07
Kentucky Division of Water



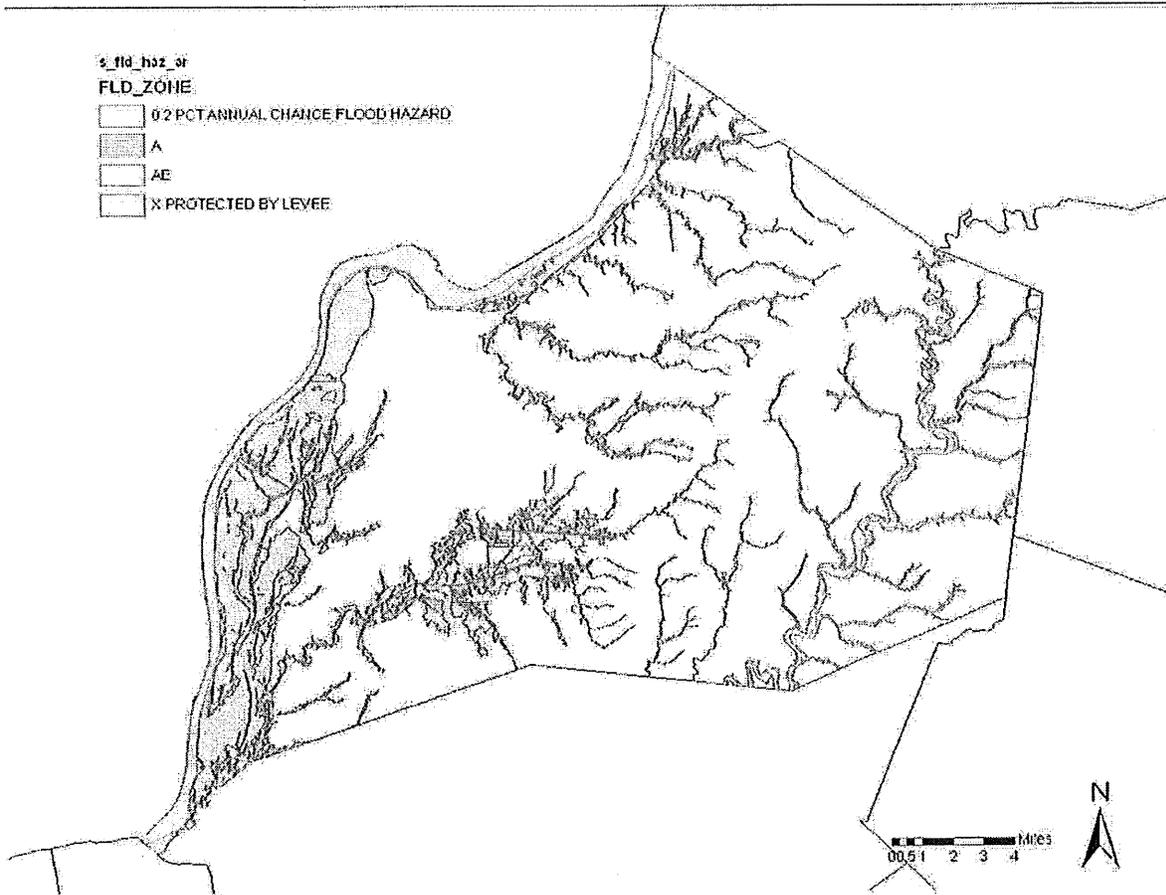
Hancock County Effective SFHAs

FY09 MAS/SOW Template Version 8.1
 Mapping Activity Statement No. FY09.07
 Kentucky Division of Water



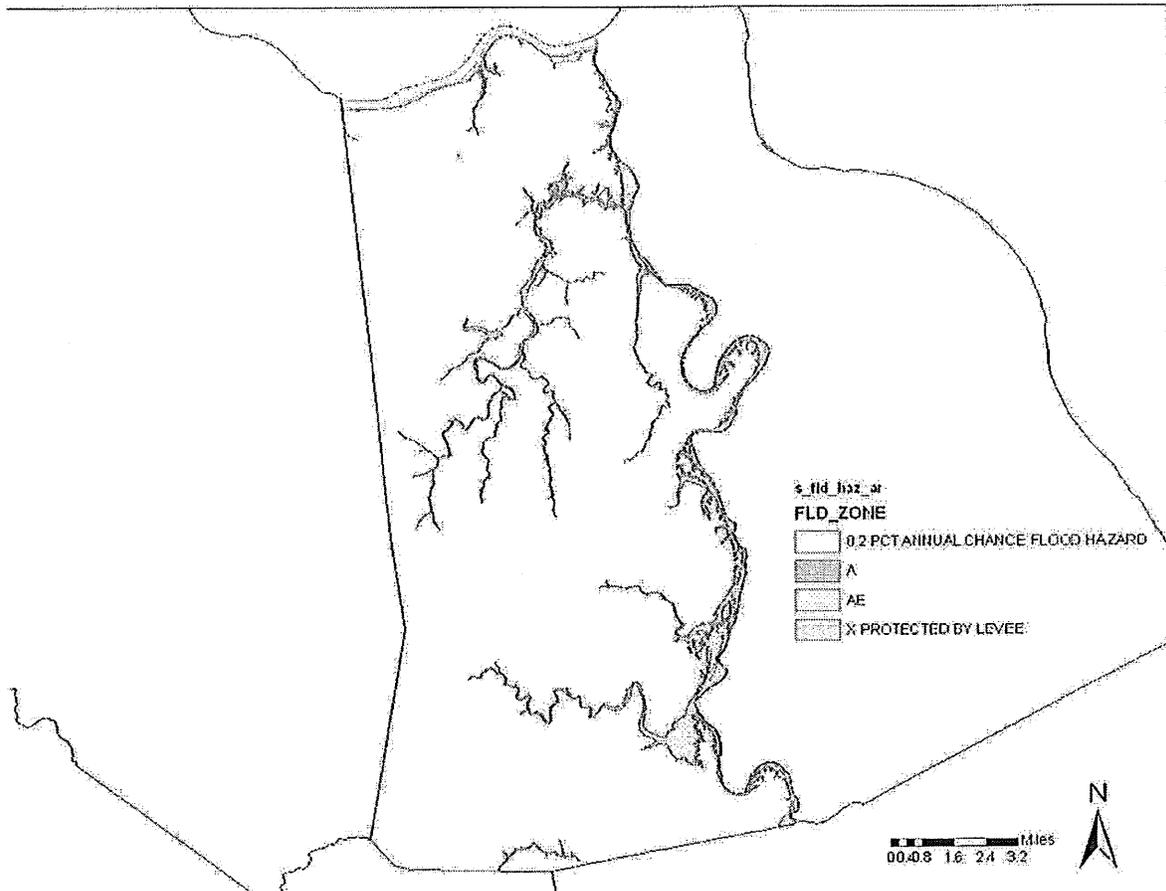
Jefferson County Effective SFHAs

FY09 MAS/SOW Template Version 8.1
 Mapping Activity Statement No. FY09.07
 Kentucky Division of Water

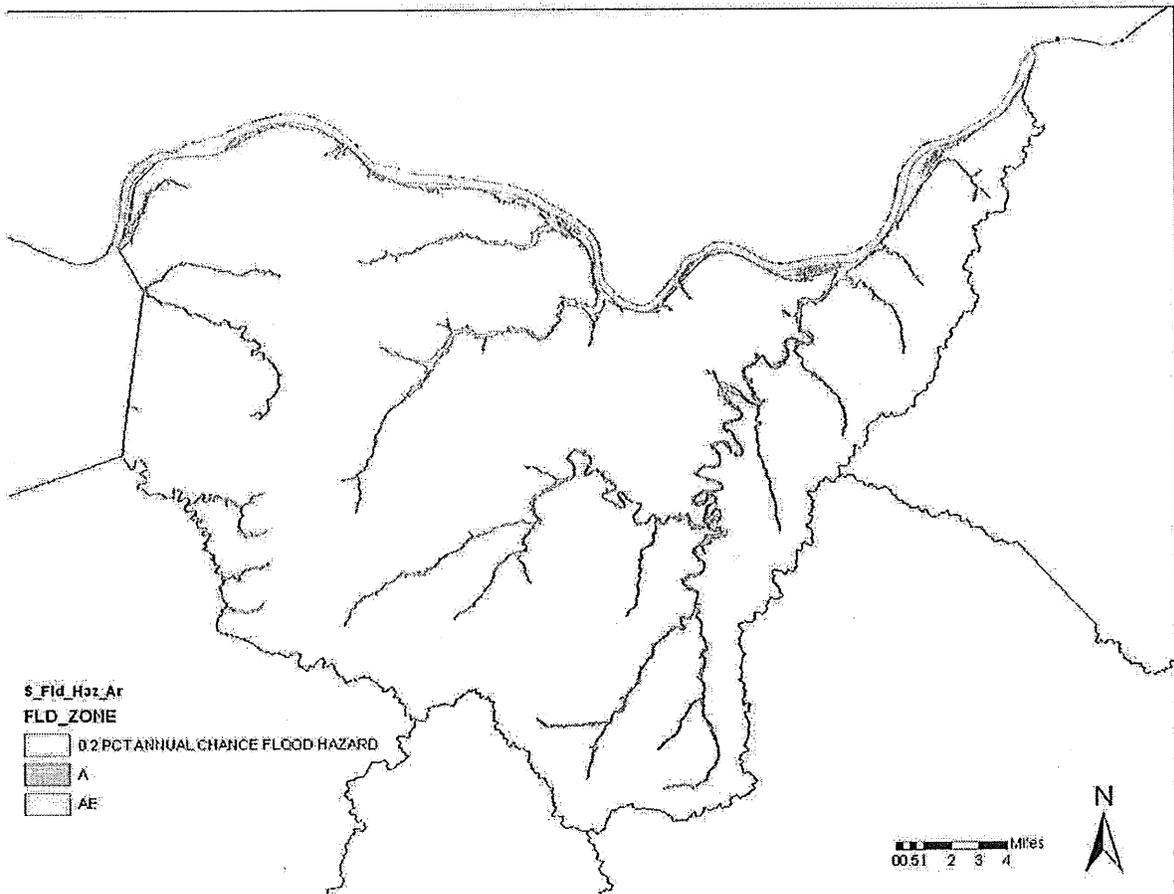


Kenton County Effective SFHAs

FY09 MAS/SOW Template Version 8.1
 Mapping Activity Statement No. FY09.07
 Kentucky Division of Water

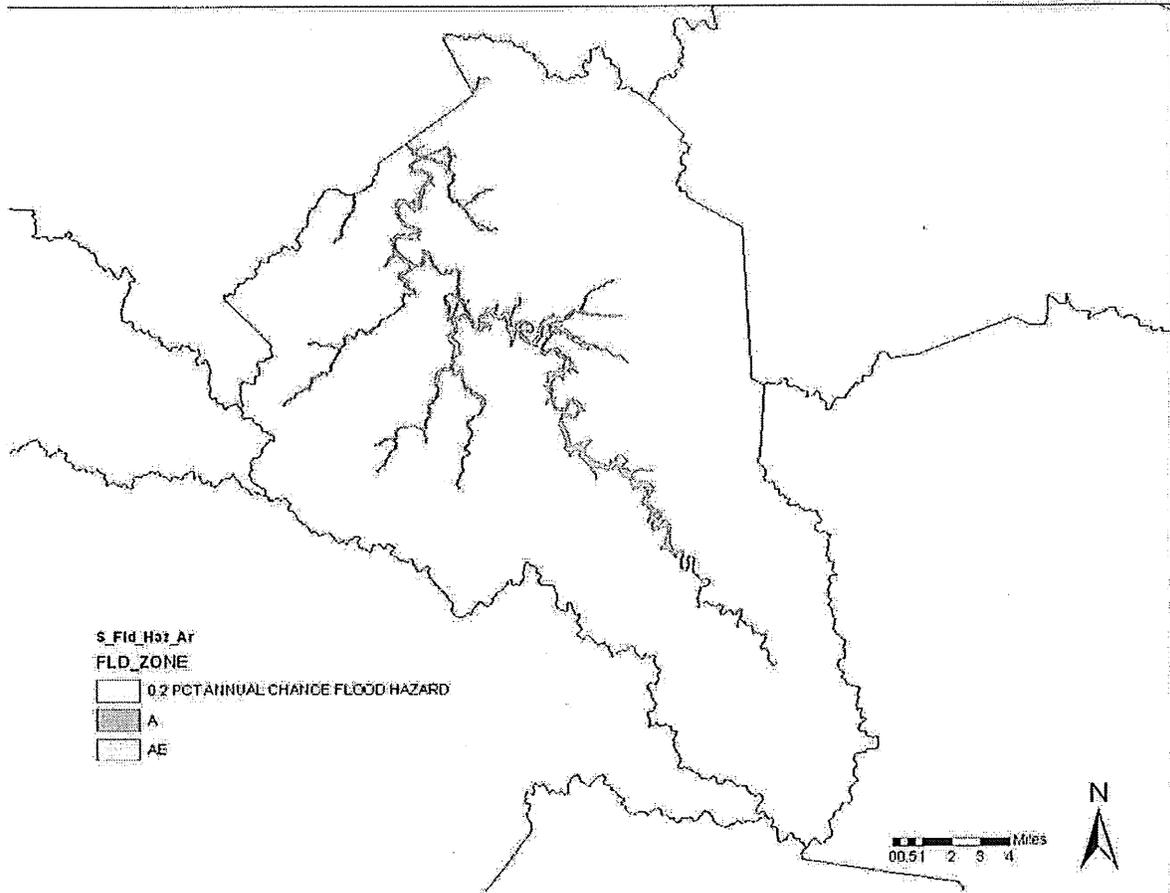


Lewis County Effective SFHAs

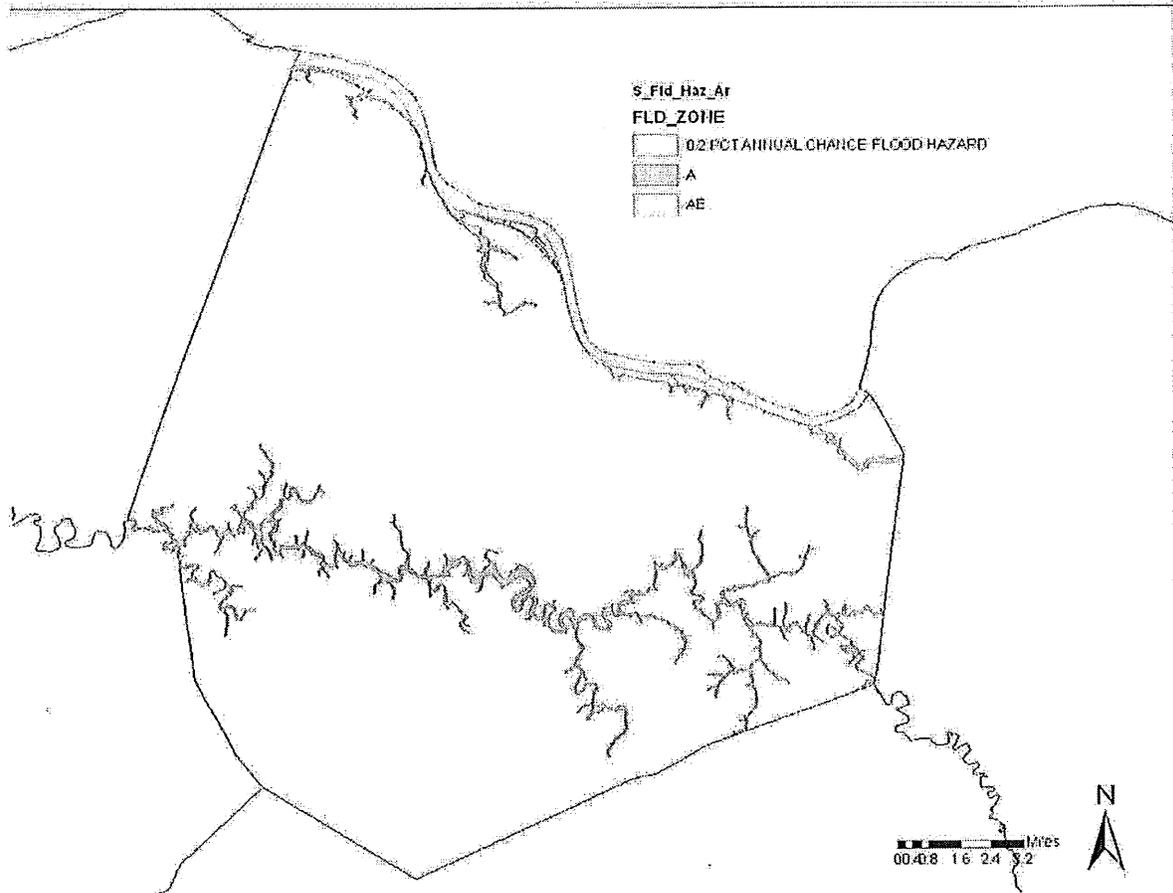


Magoffin County Effective SFHAs

FY09 MAS/SOW Template Version 8.1
 Mapping Activity Statement No. FY09.07
 Kentucky Division of Water

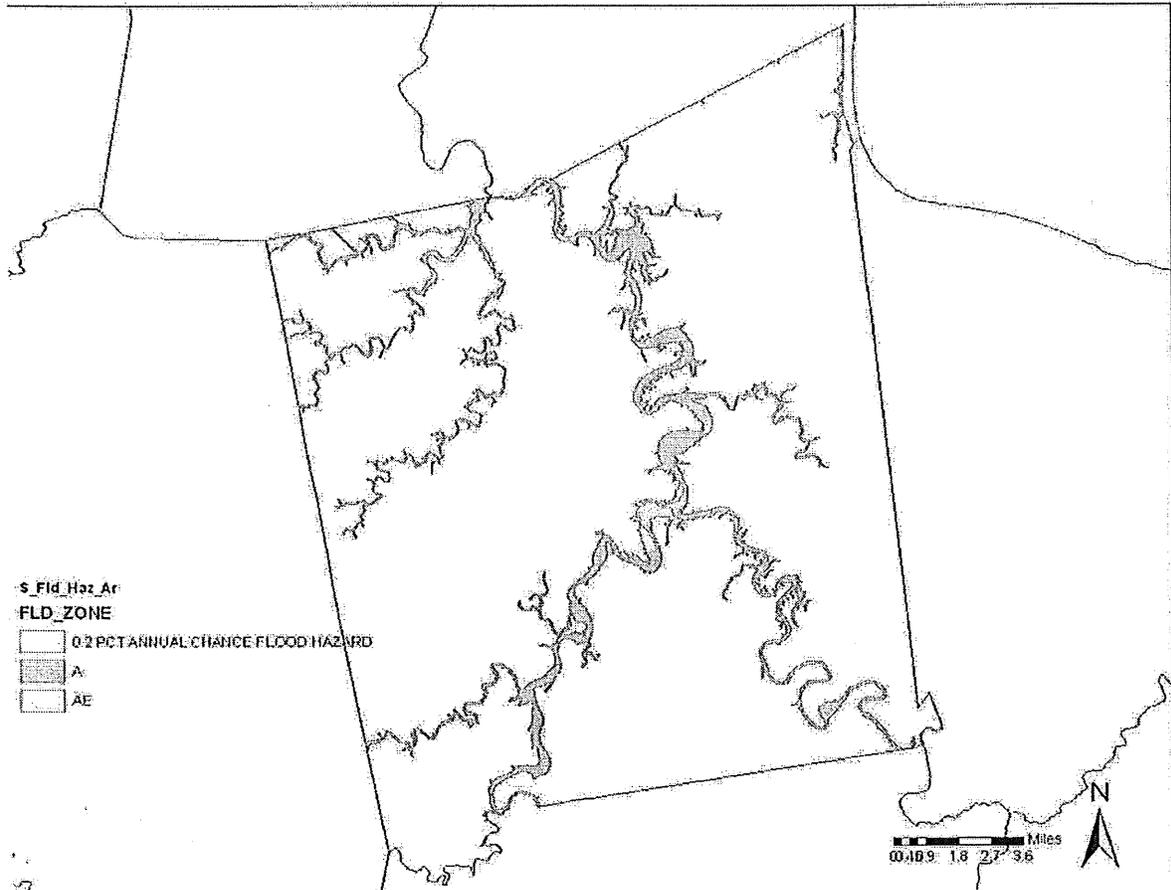


Mason County Effective SFHAs



Pendleton County Effective SFHAs

FY09 MAS/SOW Template Version 8.1
 Mapping Activity Statement No. FY09.07
 Kentucky Division of Water



Pike County Effective SFHAs

FY09 MAS/SOW Template Version 8.1
 Mapping Activity Statement No. FY09.07
 Kentucky Division of Water

