

Carter & Burgess

PROFESSIONAL SERVICES AGREEMENT

PROJECT NAME: Master Storm Water Drainage Plan

PROJECT NUMBER: 100643

CLIENT: City of Jonesboro

ADDRESS: City Hall
P.O. Box 1845
Jonesboro, Arkansas 72403-1845

hereby requests and authorizes Carter & Burgess, Inc. ("C&B") to perform the following Services:

SCOPE: Carter & Burgess, Inc. (C&B) will provide surveying and engineering services required to complete the Mapping Activity Statement as part of the Cooperating Technical Partnership (CTP) with FEMA. The Scope of Services and specifications for this project are more specifically described in Attachment A. The Scope includes portions of the CTP Agreement signed between FEMA and the City of Jonesboro in September of 2004. Attachment A begins with page 7 of the Agreement (EMT-2004-CA-0123). The schedule has been revised and is included in Attachment B.

COMPENSATION to be on a basis of:

Work will be completed for this Scope of Services for a Lump Sum amount of \$395,737. Detailed information is contained in Attachment C.

EXTENT OF AGREEMENT:

This Professional Services Agreement, the Provisions, and Attachments A, B, and C, represents the entire and integrated Agreement between the Client and C&B and supersede all other Agreements written or oral. This Agreement may be amended only by written instrument signed by both Client and C&B.

Accepted for **CITY OF JONESBORO**

Accepted for **CARTER & BURGESS, INC.**

By: _____

By: _____

Name: Honorable Doug Forman

Name: James E. Arbuckle

Title: Mayor

Title: Vice President

Date: _____

Date: 7/19/05

PROVISIONS

1. AUTHORIZATION TO PROCEED

Signing this Agreement shall be construed as authorization by CLIENT for C&B to proceed with the Services, unless otherwise provided for in this Agreement.

2. LABOR COSTS

In the event C&B's compensation is calculated by reference to C&B's Labor Costs, Labor Costs shall be the amount calculated by the number of hours actually worked by each of C&B's employees on CLIENT's Project, multiplied by an amount charged for each such employee's work, which is calculated by dividing each such employee's annualized, non-overtime compensation (whether salary or paid to such employee at an hourly rate, as the case may be) divided by 2,080 hours per year.

3. DIRECT EXPENSES

C&B's Direct Expenses shall be those costs incurred on or directly for the CLIENT's Project, including but not limited to necessary transportation costs including mileage at C&B's current rate when its automobiles are used, meals and lodging, laboratory tests and analyses, computer services, word processing services, telephone, printing and binding charges. Reimbursement for these EXPENSES is included in the overall Lump Sum amount.

4. OUTSIDE SERVICES

When technical or professional services are furnished by an outside source, when approved by CLIENT, an additional amount shall be added to the cost of these services for C&B's administrative costs, as provided on the reverse side of this agreement.

5. COST ESTIMATES

Any cost estimates provided by C&B will be on a basis of experience and judgment. Since C&B has no control over market conditions or bidding procedures, C&B does not warrant that bids or ultimate construction costs will not vary from these cost estimates.

6. PROFESSIONAL STANDARDS

C&B shall be responsible, to the level of competency presently maintained by other practicing professionals in the same type of work in CLIENT's community, for the professional and technical soundness, accuracy, and adequacy of all design, drawings, specifications, and other work and materials furnished under this Agreement. C&B makes no warranty, expressed or implied.

7. ADDITIONAL SERVICES

Services in addition to those specified in the Scope of Services will be provided by C&B if authorized in writing or otherwise confirmed by CLIENT. Additional services will be paid for by CLIENT as indicated in any Letter of Proposal, Task Authorization, or such other document as deemed appropriate by CLIENT and C&B. In the absence of an express agreement about compensation, C&B shall be entitled to an equitable adjustment to its compensation for performing such additional services.

8. SALES TAX

Applicable sales tax is not included in the above-proposed fee. Sales tax at an applicable rate will be indicated on invoice statements.

9. LIMITATION OF LIABILITY

C&B's liability to the CLIENT for any cause or combination of causes is in the aggregate, limited to an amount no greater than the fee earned under this Agreement.

10. DISPUTE RESOLUTION

All disputes arising out of this Agreement shall be mediated by the parties within a reasonable time after the first request for mediation, prior to either party filing a suit in a court of law, provided, however, that neither party

shall be obligated to mediate prior to requesting injunctive relief.

11. PAYMENT TO C&B / INTEREST ON PAST-DUE AMOUNTS

Monthly invoices will be issued by C&B for all Services performed under the terms of this agreement. Invoices are due and payable on receipt. CLIENT agrees to pay interest at the rate of 1½% per month on all past-due amounts, unless not permitted by law. Any interest charged or collected in excess of the highest legal rate will be applied to the principal amount owing to C&B, and if such interest exceeds the principal balance of CLIENT's indebtedness to C&B, will be returned to CLIENT. It is the intent of C&B and CLIENT to abide by all applicable laws regulating the maximum amount of interest that may be charged. To the greatest extent allowed by applicable law, CLIENT and C&B agree that in the event CLIENT and C&B enter into any compromise or settlement calling for the payment of past due principal and accrued and unpaid interest on any past-due invoice, C&B may charge and CLIENT agrees to pay interest on such combined past due principal and accrued and unpaid interest amount (the "New Principal Balance") at the rate of 1½% per month or at the highest rate allowed by law, subject, as provided herein, to C&B's agreement to credit excess interest or return same to CLIENT after the New Principal Balance is paid.

12. TERMINATION FOR NON-PAYMENT OF FEES

C&B may terminate this contract by giving written notice if any C&B invoice remains unpaid for more than 60 days. C&B's right to terminate this contract shall not be waived by C&B's continued performance during any period of investigation by C&B to determine the reasons for CLIENT'S nonpayment.

13. TERMINATION

Either CLIENT or C&B may terminate this Agreement by giving 30 days' written notice to the other party. In such event CLIENT shall forthwith pay C&B in full for all work previously authorized and performed prior to effective date of termination. If no notice of termination is given, relationships and obligations created by this Agreement shall be terminated upon completion of all applicable requirements of this Agreement.

14. LEGAL EXPENSES

In the event legal action is brought by C&B to enforce any of the obligations hereunder or arising out of any dispute concerning the terms and conditions hereby created, CLIENT shall pay C&B reasonable amounts for fees, costs and expenses as may be set by the court.

15. ASSIGNMENT TO RELATED ENTITY

Notwithstanding anything in this Agreement to the contrary, in the event C&B is not qualified and licensed in the relevant jurisdiction to provide any services required hereunder, C&B may, without the consent of any other party, assign all or any part of its obligation to provide such services to an entity related to C&B which is qualified and licensed to provide such services in the jurisdiction involved and which is contractually bound to C&B to provide such services.

16. SEVERABILITY

In case any one or more of the provisions contained in this Agreement shall be held illegal, the enforceability of the remaining provisions contained herein shall not be impaired thereby

17. STANDARDS, FORMATS, AND MASTERS

The fees and scope in this agreement are based on C&B using in-house standards with regard to AutoCAD or MicroStation drawing setup, third party software usage, layer naming protocol, line types, line colors, and directory structures.

Attachment A
Scope of Services

Attachment A

City of Jonesboro, Arkansas COOPERATING TECHNICAL PARTNERS MAPPING ACTIVITY STATEMENT

Mapping Activity Statement No. 1 – Digital Flood Insurance Rate Map Production and Development of Updated Flood Data

In accordance with the Cooperating Technical Partners (CTP) Partnership Agreement dated August 5, 2004 between the City of Jonesboro, Arkansas in Craighead County and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement (MAS) No. 1 is as follows.

Section 1—Objective and Scope

The objective of the Flood Map Project documented in this MAS is to develop information for the City of Jonesboro, Arkansas to be incorporated into a Digital Flood Insurance Rate Map (DFIRM) and Flood Insurance Study (FIS) report for Craighead County, Arkansas. The DFIRM and FIS report will be produced in the FEMA Countywide Format.

To accomplish this objective, the Mapping Partners involved in this project will develop new and/or updated flood hazard data, as summarized in the table below.

Flooding Source	Reach Limits	Hydrologic Analyses	Hydraulic Analyses	Floodplain Mapping	Redefinition Using Effective Flood Profiles and Updated Topographic Data	Refinement or Creation of Zone A
Christian Creek	Confluence w/ Lost Creek to Cherrywood Dr.	X	X	X		
Christian Creek Lateral	Christian Creek at County Rd. to Clubhouse St.	X	X	X		
Lost Creek	Confluence w/ Big Creek Ditch to County-City boundary	X	X	X		
Big Creek Ditch	West City boundary to North City-County boundary	X	X	X		AE and A to become only AE
Moore's Ditch	Lateral No. 3 to Road 332	X	X	X		
Lateral No. 3 of Moore's Ditch	Little Bay Ditch to Jonesboro Airport	X	X	X		
Moore's Ditch Lateral	Moore's Ditch to Jonesboro Airport	X	X	X		
Roger's Bayou / Davis Branch	Area inside Jonesboro corporate limits	X	X	X		Refining A to AE with detailed methods

Unnamed Airport Tributary	Hwy 332 to St. Louis SW RR	X	X	X		Refining A to AE with detailed methods
*Turtle Creek	Confluence w/ Whiteman's Creek at Willow Rd. to US Hwy 49		* Floodway and Profiles	* Floodway mapping		
*Turtle Creek Lateral	Confluence w/ Turtle Creek at RR to Aggie Rd.		* Floodway and Profiles	* Floodway mapping		
* Lateral No. 5 (to Turtle Creek)	Confluence w/ Turtle Creek at Vans Ave. to Belt St.		* Floodway and Profiles	* Floodway mapping		
* Whiteman's Creek	Highway 143 at FIS lettered XS A to Wilkin Dr.		* Floodway and Profiles	* Floodway mapping		
*Higginbottom Creek	Viney Slough and Hwy 143 to U/S of Parkview St.		* Floodway and Profiles	* Floodway mapping		
* Unnamed Tributaries to Viney Slough	Viney Slough Ditch to Business Rd. 1		* Floodway and Profiles	* Floodway mapping		
Spoil Bank	Along corporate limits of City of Jonesboro in area where new topographic data available				X	
Viney Slough Ditch	Along corporate limits of City of Jonesboro in area where new topographic data available				X	
Little Bay Ditch	Along corporate limits of City of Jonesboro in area where new topographic data available				X	
Butler's Ditch	Along corporate limits of City of Jonesboro in area where new topographic data available				X	
Maple Slough Ditch	Along corporate limits of City of Jonesboro in area where new topographic data available				X	

Within 30 days of this agreement, the CTP, in coordination with the National Service Provider (NSP), shall provide the final scope of work to be put into the FEMA Scoping tool as part of the Craighead County Scoping project. This also includes information concerning community ordinance data, local GIS data availability and the flood reach data for existing and proposed conditions.

The CTP/IDIQ shall notify FEMA and the NSP by e-mail of all meetings with community officials at least one week prior to the meeting. FEMA and/or the NSP may or may not attend the community meetings.

The following will complete this Flood Map Project:

- The City of Jonesboro, Arkansas;
- Carter and Burgess, Inc. (CTP Contractor); and
- Michael Baker, Jr. (FEMA NSP).

The activities for this Flood Map Project, including required Quality Assurance/Quality Control (QA/QC) reviews, and the Mapping Partners that will complete them are summarized in Table 1-1. All activities that are to be accomplished by the City of Jonesboro, Arkansas, or contractors to the City of Jonesboro, including contractors that may be selected after the project startup, are included in the “CTP” column. The sections of this MAS that follow Table 1-1 describe the specific activities, responsible Mapping Partner(s), FEMA standards that must be met, and resultant map components.

Table 1-1. Summary of Project Activities and Assignments

Activities	CTP	FEMA (SC)	FEMA (NSP)
Activity 3 – Field Surveys and Reconnaissance	X		
Activity 6 –Hydrologic Analyses	X		
Activity 7–Independent QA/QC Review of Hydrologic Analyses			X
Activity 8 – Hydraulic Analyses	X		
Activity 9 – Independent QA/QC Review of Hydraulic Analyses			X
Activity 10 – Floodplain Mapping (Detailed Riverine or Coastal Analysis)	X		
Activity 10A – Floodplain Mapping (Redelineation Using Effective Flood Profiles and Updated Topographic Data)	X		
Activity 10B – Floodplain Mapping (Refinement or Creation of Zone A)			
Activity 11 – Independent QA/QC Review of Floodplain Mapping (Revised Areas)			X
Activity 12 – Base Map Acquisition			
Activity 13 – DFIRM Production (Non-Revised Areas)	X		
Activity 13A – Independent QA/QC Review of DFIRM Production (Non-Revised Areas)			X
Activity 14 – DFIRM Production (Merging Revised and Non-Revised Information)	X		
Activity 14A – DFIRM Production (Application of FEMA Graphics and Database Specifications)			
Activity 14B – Independent QA/QC Review of DFIRM Product Meeting FEMA Graphics and Database Specifications			X
Activity 15 – Preliminary DFIRM and FIS Report Distribution			
Activity 16 – Post-Preliminary Processing			
Activity 17 – Outreach	X		

FEMA has developed tools to assist in the development of the flood hazard data studies and the Digital Flood Insurance Rate Maps (DFIRMs). FEMA will, through the NSP, provide all CTPs access to and training in these tools. The tools available at this time include WISE software and the DFIRM production tools.

If the CTP chooses not to use these production tools, then the CTP will be required to submit intermediate project data at major milestones in each Mapping Project in accordance with Appendix N: Data Capture Standards. Submitting data in these standards will aid in more efficient quality control reviews, data storage, archiving, and for future study updates. The Data Capture Standards and Guidelines submittals will be required at the following study milestones:

- Field Survey Completed
- Hydrology Completed (draft and final)
- Hydraulics Completed (draft and final)
- DFIRM Mapping (draft and preliminary)

QA/QC review activities may be performed by CTPs or the NSP at the discretion of FEMA. Please note the NSP will also be performing periodic audits and overall study/project management to ensure study quality.

FEMA will be providing download/upload capability for submittals through the Management Information Portal (MIP). Data submittals uploaded via the MIP, will include the same data required prior to the existence of the MIP.

Activity 3 - Field Surveys and Reconnaissance

Responsible Mapping Partner: City of Jonesboro’s (CTP’s) contractor, Carter & Burgess, Inc. and subcontractors to Carter & Burgess, Inc.

Scope: Carter & Burgess, Inc. or subcontractors to Carter & Burgess, Inc. shall conduct a detailed field reconnaissance of the specific study area to determine conditions along the floodplain(s), types and numbers of hydraulic and/or flood-control structures, apparent maintenance or lack thereof of existing hydraulic structures, locations of cross sections to be surveyed, and other parameters needed for the hydrologic and hydraulic analyses.

In addition the field reconnaissance, Carter & Burgess, Inc. or subcontractors to Carter & Burgess, Inc. shall conduct field surveys, including obtaining channel and floodplain cross sections, identifying or establishing Temporary Bench Marks, and obtaining the physical dimensions of hydraulic and flood-control structures.

Carter & Burgess, Inc. or subcontractors to Carter & Burgess, Inc. will conduct field surveys on the following creeks listed in the table below for this MAS:

Table 1-2: Field Survey Streams

Flooding Source	Reach Length (mi.)	Number of Structures	Number of Sections
Christian Creek	3.98	16	21
Christian Creek Lateral	1.14	6	6
Lost Creek	7.01	15	37
Big Creek Ditch	2.84	5	15
Moore’s Ditch	1.70	2	9
Lateral No. 3 (of Moore’s Ditch)	3.79	10	20
Moore’s Ditch Lateral	1.70	4	9
Unnamed Airport Tributary	1.14	4	6
Roger’s Bayou / Davis Branch	2.08	7	11

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

Deliverables: In accordance with the Technical Support Data Notebook (TSDN) format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, CTP or its' contractor(s) shall make the following products available to FEMA :

- A report summarizing the findings of the field reconnaissance;
- Maps and drawings that provide the detailed survey results; and
- Survey notebook containing cross sections and structural data;
- ASCII format point file of survey data as well as shapefile of the survey point data.
- NSP Format Survey Database or Intermediate Data Delivery consistent with the NSP Data Capture Standards and Guidelines.

Draft Data Capture Standards can be downloaded from http://www.fema.gov/fhm/gs_main.shtm. As of the date of this MAS, the effective Intermediate Data Specifications are dated April 2004.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

Activity 6 – Hydrologic Analyses

Responsible Mapping Partner: City of Jonesboro's (CTP's) contractor, Carter & Burgess, Inc.

Scope: Carter & Burgess, Inc. shall perform hydrologic analyses for approximately 42 square miles of drainage area for the flooding source(s) identified at the beginning of this MAS. CTP or its' contractor(s) shall calculate peak flood discharges for the 10-, 2-, 1-, and 0.2-percent-annual-chance storm events using HEC-1 computer program. These flood discharges will be the basis for subsequent hydraulic analyses under Activity 8. In addition, CTP or its' contractor(s) shall address all concerns or questions regarding Activity 6 that are raised by the FEMA NSP during the independent QA/QC review under Activity 7.

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

Deliverables: Upon completion of hydrologic modeling for Christian Creek, Christian Creek Lateral, Lost Creek, Big Creek Ditch, Moore's Ditch, Lateral No. 3 (of Moore's Ditch), Moore's Ditch Lateral, Unnamed Airport Tributary, Carter & Burgess, Inc. shall submit the results to FEMA NSP for an independent QA/QC review under Activity 7. Carter & Burgess, Inc. shall submit the results of the hydrologic analyses for the remaining flooding sources for a final QA/QC review at the completion of this activity. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, CTP or its' contractor(s) shall make the following products available to FEMA:

- Digital copies of all hydrologic modeling (input and output) files for the 10-, 2-, 1-, and 0.2-percent-annual-chance storm events;
- Digital and hardcopy versions of the Summary of Discharges Table presenting discharge data for the flooding sources for which hydrologic analyses were performed;
- Digital and hardcopy versions of draft text for Section 3.1, Hydrologic Analyses, of the FIS report; and
- Digital and hardcopy versions of all backup data used in the analysis, including work maps.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

Activity 7 - Independent QA/QC Review of Hydrologic Analyses

Responsible Mapping Partner: FEMA NSP

Scope: FEMA NSP shall review the technical, scientific, and other information submitted by the CTP (City of Jonesboro) under Activity 6 to ensure that the data and modeling are consistent with FEMA standards and standard engineering practice and are sufficient to prepare the DFIRM. This work shall include, at a minimum, the activities listed below.

- Review the submittal for technical and regulatory adequacy, completeness of required information, and supporting data and documentation. The technical review is to focus on the following:
 - Use of acceptable models;
 - Use of appropriate methodology(ies);
 - Correctly applied methodology(ies)/model(s), including 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 them readily available to FEMA.
- Maintain an archive of all data submitted for hydrologic modeling review. (All supporting data must be retained for 3 years from the date funding recipient submits its final expenditure report to FEMA.)

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

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, FEMA NSP shall make the following products available to FEMA:

- 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.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf

Activity 8 – Hydraulic Analyses

Responsible Mapping Partner: City of Jonesboro's (CTP's) contractor, Carter & Burgess, Inc.

Scope: Carter & Burgess, Inc. shall perform hydraulic analyses for approximately 23.3 miles of the flooding sources identified at the beginning of this MAS. The modeling will include the 10-, 2-, 1-, and 0.2-percent-annual-chance events based on peak discharges computed under Activity 6. The hydraulic analysis methods used for this analysis will include HEC-GeoRAS and HEC-RAS.

Carter & Burgess, Inc. shall use the cross-section and field data collected under Activity 3 to perform the hydraulic analyses. The hydraulic analyses shall be used to establish flood elevations and regulatory floodways for the subject flooding sources.

Carter & Burgess, Inc. shall use the FEMA CHECK-RAS checking program to check the reasonableness of the hydraulic analyses. To facilitate the independent QA/QC review under Activity 9, the Carter & Burgess, Inc. shall provide explanations for unresolved messages from the CHECK-RAS program, as appropriate. In addition, Carter & Burgess, Inc. shall address all concerns or questions regarding Activity 8 that are raised by the FEMA NSP during the independent QA/QC review under Activity 9.

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

Deliverables: Upon completion of hydraulic modeling for Christian Creek, Christian Creek Lateral, Lost Creek, Big Creek Ditch, Moore's Ditch, Lateral No. 3 (of Moore's Ditch), Moore's Ditch Lateral, Unnamed Airport Tributary; Carter & Burgess, Inc. shall submit the results to FEMA NSP for an independent QA/QC review under Activity 9. Carter & Burgess, Inc. shall submit the results of the hydraulic analyses for the remaining flooding sources for a final QA/QC review at the completion of this activity. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, Carter & Burgess, Inc. shall make the following products available to FEMA:

- 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 and hardcopy versions of the Floodway Data Table for each flooding source that is compatible with the DFIRM database;
- Digital and hardcopy versions of all hydraulic modeling (input and output) files;
- Digital and hardcopy versions of a table showing ranges of Manning's "n" values;
- Explanations for unresolved messages from the CHECK-RAS program, as appropriate;
- Digital and hardcopy versions of all backup data used in the analyses; and
- Digital and hardcopy versions of draft text for inclusion in the FIS report.

Draft Data Capture Standards can be downloaded from http://www.fema.gov/fhm/gs_main.shtm.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/firm_gsam.pdf

Activity 9 - Independent QA/QC Review of Hydraulic Analyses

Responsible Mapping Partner: FEMA NSP

Scope: FEMA NSP shall review the technical, scientific, and other information submitted by CTP (City of Jonesboro) under Activity 8 to ensure that the data and modeling are consistent with FEMA standards and standard engineering practice and are sufficient to prepare the DFIRM. This work shall include, at a minimum, the activities listed below.

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

- Maintain an archive of all data submitted for hydraulic modeling review. (All supporting data must be retained for 3 years from the date funding recipient submits its final expenditure report to FEMA.)

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

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, FEMA NSP shall make the following products available to FEMA:

- 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.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

Activity 10 - Floodplain Mapping (Detailed Riverine Analysis)

Responsible Mapping Partner: City of Jonesboro's (CTP's) contractor, Carter & Burgess, Inc.

Scope: Carter & Burgess, Inc. shall delineate the 1- and 0.2-percent-annual-chance floodplain boundaries and the regulatory floodway boundaries (if required) for the flooding sources for which detailed analyses were performed. Carter & Burgess, Inc. shall incorporate all new or revised modeling and shall use the topographic data acquired under Activity 4 to delineate the floodplain and regulatory floodway boundaries on a digital work map. In addition, Carter & Burgess, Inc. shall incorporate the results of all effective Letters of Map Change (LOMCs) within the revised areas as appropriate. Also, Carter & Burgess, Inc. shall address all concerns or questions regarding Activity 10 that are raised by the NSP during the independent QA/QC review under Activity 11.

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

Deliverables: Upon completion of floodplain mapping for Christian Creek, Christian Creek Lateral, Lost Creek, Big Creek Ditch, Moore's Ditch, Lateral No. 3 (of Moore's Ditch), Moore's Ditch Lateral, Unnamed Airport Tributary; Carter & Burgess, Inc. shall submit the mapping to NSP for an independent QA/QC review under Activity 11. Carter & Burgess, Inc. shall submit the mapping for the remaining flooding sources for a final QA/QC review at the completion of this activity. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, Carter & Burgess, Inc. shall make the following products available to FEMA:

- Digital work maps showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs;
- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- 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; and
- Any backup or supplemental information used in the mapping required for the independent QA/QC review outlined under Activity 11;

Intermediate Format Mapping Database or Intermediate Data Delivery consistent with the NSP Data Capture Standards and Guidelines.

Data Capture Standards and Guidelines can be downloaded from www.website.com.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

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

Responsible Mapping Partner: City of Jonesboro's (CTP's) contractor, Carter & Burgess, Inc.

Scope: Carter & Burgess, Inc. shall delineate the 1- and 0.2-percent-annual-chance floodplain boundaries and the regulatory floodway boundaries (if required) for the flooding sources identified at the beginning of this MAS. Carter & Burgess, Inc. shall use the topographic data acquired under Activity 4 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, Carter & Burgess, Inc. shall evaluate the topographic data to determine if changes are significant enough to invalidate the floodplain boundary and regulatory floodway boundary redelineations. If so, Carter & Burgess, Inc. shall contact the FEMA Regional Project Officer identified in Section 13 of this MAS with a recommendation. In addition, Carter & Burgess, Inc. shall address all concerns or questions regarding Activity 10A that are raised by the FEMA NSP during the independent QA/QC review under Activity 11.

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

Deliverables: Upon completion of floodplain mapping for Spoil Bank, Little Bay Ditch, Viney Slough Ditch, Maple Slough Ditch, and Butler's Ditch; Carter & Burgess, Inc. shall submit the mapping to the FEMA NSP for an independent QA/QC review under Activity 11. Carter & Burgess, Inc. shall submit the mapping for the remaining flooding sources for a final QA/QC review at the completion of this activity. In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, Carter & Burgess, Inc. shall make the following products available to FEMA:

- Digital work maps showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs, flood insurance risk zone labels, and all applicable base map features;
- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM;
- Any backup or supplemental information used in the mapping required for the independent QA/QC review outlined under Activity 11; and
- An explanation for the use of existing topography for the studied reaches, if appropriate;
- NSP Format Mapping Database or Intermediate Data Delivery consistent with the NSP Data Capture Standards and Guidelines.

Data Capture Standards and Guidelines can be downloaded from www.website.com.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

Activity 11 - Independent QA/QC Review of Floodplain Mapping (Revised Areas)

Responsible Mapping Partner: FEMA NSP

Scope: FEMA NSP shall review the floodplain mapping submitted by Carter & Burgess, Inc. under Activity 10 to ensure that the results of the analyses performed are accurately represented, the work maps are consistent with current FEMA standards, and the work maps are sufficient to prepare the DFIRM. This work shall include, at a minimum, the activities listed below.

- Review the cross sections for proper location and orientation on the work map and agreement with the Floodway Data Table.
- Review the BFEs shown on the work maps for proper location and agreement with the results of the hydraulic modeling.
- Review the regulatory floodway widths shown on the work maps for agreement with the widths shown in the Floodway Data Table and the results of the hydraulic modeling.
- Review the floodplain boundaries shown on the work maps or agreement with the flood elevations shown in the Floodway Data Table and the contour lines and other topographic information shown on the work maps.
- Review the floodplain widths at cross sections as shown on the work maps to ensure they match the Floodway Data Table.
- Review the floodplain boundaries as shown on the work maps to ensure they match the Flood Profiles.
- Review the flood insurance risk zones as shown on the work maps to ensure they are labeled properly.
- Review the DFIRM mapping files to ensure they were prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*.
- Review the metadata files to ensure they include all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*.

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

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, NSP shall make the following products available to FEMA:

- 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; and
- An annotated work map with all questions and/or concerns indicated, if necessary.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

Activity 13 – DFIRM Production (Non-Revised Areas)

Responsible Mapping Partner: City of Jonesboro's (CTP's) contractor, Carter & Burgess, Inc.

Scope: For all flooding sources except those segments for which updated flood data will be developed under Activities 1 through 11, Carter & Burgess, Inc. shall convert the information shown on the effective FIRM and Flood Boundary Floodway Map (FBFM) panels for all of the incorporated areas of the City of Jonesboro, Arkansas to digital format in

conformance with FEMA DFIRM specifications. Carter & Burgess, Inc. also shall incorporate the results of LOMCs issued by FEMA since the date of the current effective FIRM for each affected community.

Also, Carter & Burgess, Inc. shall address all comments and questions regarding Activity 13 that are raised by the FEMA NSP during the independent QA/QC review under Activity 13A.

Carter & Burgess, Inc. shall not digitize the flood theme for those segments of flooding sources for which updated flood data will be developed. Rather, Carter & Burgess, Inc. shall leave these as "holes" in the digital flood theme that will be filled in as part of Activity 14 using the digital flood data developed under Activities 10, 10A, and 10B.

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

Deliverables: Upon completion of the digital flood data for the non-revised areas, Carter & Burgess, Inc. shall submit the work maps to the FEMA NSP for an independent QA/QC review under Activity 13A. In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, Carter & Burgess, Inc. shall make the following products available to FEMA:

- Digital work maps showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs;
- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- 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, including a check that the road and floodplain relationship is maintained for all non-revised areas.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

Activity 13A – Independent QA/QC Review of DFIRM Production (Non-Revised Areas)

Responsible Mapping Partner: FEMA NSP

Scope: The FEMA NSP shall review the DFIRM panels submitted by Carter & Burgess, Inc. under Activity 13 to ensure that the new DFIRM panels accurately represent the information shown on the effective FIRMs and FBFMs for the area mapped and are consistent with current FEMA standards. This work shall include, at a minimum, checking the following:

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

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

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the FEMA NSP shall make the following products available to FEMA:

- 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; and
- An annotated copy of the DFIRM with all questions and/or concerns indicated, if necessary.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

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

Responsible Mapping Partner: City of Jonesboro’s (CTP’s) contractor, Carter & Burgess, Inc.

Scope: Upon completion of the floodplain mapping activities for the revised areas (Activities 10, 10A, and/or 10B) and the DFIRM production for non-revised areas (Activity 13), Carter & Burgess, Inc. 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. Carter & Burgess, Inc. also shall tie in the revised and non-revised Flood Profiles, floodplain boundaries, and regulatory floodway boundaries with contiguous areas in the City of Jonesboro and adjacent unincorporated areas to the corporate limits of the City of Jonesboro that were not studied as part of the Flood Map Project documented in this MAS. Carter & Burgess, Inc. shall coordinate with FEMA and those Mapping Partners responsible for Activities 10, 10A, 10B, and 13, as necessary, to resolve any potential tie-in issues.

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

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, Carter & Burgess, Inc. shall make the following products available to FEMA:

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

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

Activity 17—Outreach

Responsible Entity: CTP (City of Jonesboro)

Scope: The outreach activities for a Flood Map Project can best be understood as a process that begins during the Project Scoping phase and continues through the Map Production and Post-preliminary phases. A regulatory overview of required activities is followed by a description of tools that can be used in working with stakeholders to keep them informed and to solicit their input.

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

By proactively reaching out to all key stakeholders as early in the Flood Map Project as possible, the maps can be used to their full potential. The likelihood of appeals may also be reduced or eliminated. Specific Contractor activities shall include, but are not limited to -

- Establishing two-way communication to address the needs of, inform and obtain feedback from, the stakeholders;
- Ensuring compliance with due process requirements;
- Interacting with technical representatives to ensure production of accurate and up-to-date maps;
- Enhancing ownership by communities;
- Tracking, monitoring, and evaluating outreach activities and adjusting efforts according to ongoing feedback and evolving project needs.

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

Deliverables: Upon Completion of Outreach and Coordination the Contractor shall deliver the following to the FEMA Regional Project Officer in accordance with the delivery dates specified in task orders:

- A report detailing outreach and coordination activities
- Backup or supplemental information used in writing this report

SECTION 2—TECHNICAL AND ADMINISTRATIVE SUPPORT DATA SUBMITTALS AND SPECIAL PROBLEM REPORTS

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

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

Table 2-1. Mapping Activities and Applicable TSDN Sections

TSDN Section	1. Mapping Activities															
	1	2	3	4	5	6, 6 A	7, 7 A	8	9	10, 10 A, 10 B	11	12	13, 13A	14, 14A	15	16
General Documentation																
Special Problem Reports	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Telephone Conversation Reports	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Meeting Minutes/Reports	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
General Correspondence	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Engineering Analyses																
Hydrologic Analyses			X			X	X	X	X	X	X					
Hydraulic Analyses			X			X	X	X	X	X	X					
Key to Cross-Section Labeling			X			X	X	X	X	X	X					
Key to Transect Labeling			X			X	X	X	X	X	X					
Draft FIS Report						X	X	X	X							
Mapping Information	X	X		X	X					X	X	X	X	X	X	X
Miscellaneous Reference Information	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

If any issues arise that could affect the completion of 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 Appendix M, Subsection M.2.1.1 of *Guidelines and Specifications for Flood Hazard Mapping Partners*.)

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

Section 3—Period of Performance

The mapping activities documented in this MAS will begin no earlier than September 1, 2004, and will be completed no later than September 30, 2006. The mapping activities may be terminated at the option of FEMA or the City of Jonesboro, Arkansas, in accordance with the provisions of the Partnership Agreement dated August 5, 2004.

Section 4—Funding/Cost-Sharing

FEMA is providing funding, in the amount of \$200,000 to the City of Jonesboro, Arkansas, for the completion of the Flood Map Project documented in this MAS. The City of Jonesboro, Arkansas, shall provide any additional resources required to complete the assigned activities for this Flood Map Project.

Section 5—Standards

The standards relevant to this MAS are provided in Tables 5-1 and 5-2. Information on the correct volume, appendix, section, or subsection of the FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners* to be referenced for each mapping activity are summarized in Table 5-2. These Guidelines are available for viewing or download from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/fhm/dl_cgs.shtm.



In addition, intermediate data submission standards referenced in the previous sections are to be applied to the project for the data formats to be submitted to FEMA.

Table 5-1. Applicable Standards for Project Activities

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

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

Activity Number	Activity Description	Applicable Volume, Section/Subsection, and Appendix
3	Field Surveys and Reconnaissance	Volume 1, Section 1.4 (specifically Subsection 1.4.2.1) ----- Appendix A, Sections A.4, A.5, A.6, A.7, and A.8 ----- Appendix F, Section F.3 ----- Appendices B, C, and M
6	Hydrologic Analyses	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4) ----- Appendix A, Section A.4 ----- Appendix C, Sections C.1 and C.7 ----- Appendices E, F, G, H, and M
7	Independent QA/QC Review of Hydrologic Analyses	Volume 1, Section 1.4 (specifically Subsection 1.4.1) ----- Appendix A, Section A.4 ----- Appendix C, Section C.2 ----- Appendices E, F, G, H, and M
8	Hydraulic Analyses	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4) ----- Appendix A, Section A.4 (specifically Subsection A.4.7) ----- Appendix C, Sections C.3 and C.7 ----- Appendices B, E, F, G, H, and M

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

Activity Number	Activity Description	Applicable Volume, Section/Subsection, and Appendix
9	Independent QA/QC Review of Hydraulic Analyses	Volume 1, Section 1.4 (specifically Subsection 1.4.1) Appendix A, Section A.4 (specifically Subsection A.4.7) Appendix C, Section C.5 Appendices B, E, F, G, H, and M
10	Floodplain Mapping (Detailed Riverine or Coastal Analysis)	Volume 1, Section 1.4 (specifically Subsection 1.4.2.3) Appendix C, Sections C. 4 and C.6 Appendix D, Sections D.2 (specifically Subsection D.2.7) and D.3 (specifically Subsection D.3.7) Appendices E, F, G, H, K, L, and M
10A	Floodplain Mapping (Redelineation Using Effective Flood Profiles and Updated Topographic Data)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.3) Appendix C, Section C.6 (specifically Subsection C.6.1.3) Appendices K, L, and M
11	Independent QA/QC Review of Floodplain Mapping (Revised Areas)	Volume 1, Section 1.4 (specifically Subsections 1.4.1 and 1.4.2.3) Appendix C, Sections C.4 and C.6 Appendix D, Sections D.2 (specifically Subsection D.2.7) and D.3 (specifically Subsection D.3.7) Appendices E, F, G, H, K, L, and M

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

Activity Number	Activity Description	Applicable Volume, Section/Subsection, and Appendix
13	DFIRM Production (Non-Revised Areas)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2, 1.4.2.3, and 1.4.3.2) ----- Appendices K, L, and M
13A	Independent QA/QC Review of DFIRM Production (Non-Revised Areas)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2, 1.4.2.3, and 1.4.3.2) ----- Appendices K, L, and M
14	DFIRM Production (Merging Revised and Non-Revised Areas)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.3 and 1.4.3.3) ----- Appendices K, L, and M

Section 6—Schedule

The activities documented in this MAS shall be completed in accordance with the project schedule shown in Table 6-1. If changes to this schedule are required, the responsible Mapping Partner shall coordinate with FEMA and the other Mapping Partners in a timely manner.

Table 6-1. Project Schedule

Project schedule has been revised from original CTP Agreement and is presented in Attachment C

Section 7—Certifications

The following certifications apply to this MAS:

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

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

Activity 6 (Hydrologic Analyses), Activity 8 (Hydraulic Analyses), Activity 10 (Floodplain Mapping— Detailed Riverine Analysis)

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

Activity 10 (Floodplain Mapping— Detailed Riverine or Coastal Analysis), Activity 10A (Floodplain Mapping {Redelineation Using Effective Flood Profiles and Updated Topographic Data}), Activity 11 (Independent QA/QC Review of Floodplain Mapping {Revised Areas}), Activity 13 (DFIRM Production {Non-Revised Areas}), and Activity 14 (DFIRM Production {Merging Revised and Non-Revised Information})

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

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

Section 8—Technical Assistance and Resources

Project Team members may obtain copies of FEMA-issued LOMCs, archived engineering backup data, and data collected as part of the FEMA Mapping Needs Assessment Process from the NSP, who may be contacted by telephone at 703-960-8800 or by facsimile at 703-329-3023.

General technical and programmatic information, such as FEMA 265 and the Quick-2 computer program, can be downloaded from the FEMA Web site (<http://www.fema.gov/fhm/>). Specific technical and programmatic support may be provided through the NSP; such assistance should be requested through the FEMA Project Officer specified in Section 11 of this MAS. Project Team members also may consult with the FEMA Regional Project Officer to request support in the areas of selection of data sources, digital data accuracy standards, assessment of vertical data accuracy, data collection methods or subcontractors, and GIS-based engineering and modeling training.

Section 9—Contractors

City of Jonesboro, Arkansas, intends to use the services of Carter & Burgess, Inc. as a contractor for the Flood Map Project documented in this MAS. City of Jonesboro, Arkansas, shall ensure that the procurement for all contractors used for this Flood Map Project complies with the requirements of 44 CFR 13.36

Part 13 may be downloaded in PDF or text format from the U.S. Government Printing Office Web site at http://www.access.gpo.gov/nara/cfr/waisidx_02/44cfr13_02.html.

Section 10—Reporting

Because funding has been provided to City of Jonesboro, Arkansas, by FEMA for the Flood Map Project documented in this MAS, financial reporting requirements for City of Jonesboro, Arkansas, will be in accordance with Cooperative Agreement Articles V and VI.

City of Jonesboro, Arkansas will meet with the NSP and/or FEMA quarterly to review the progress of the project. These meetings will alternate between FEMA's Regional Office and the City of Jonesboro's office.

City of Jonesboro, Arkansas, or its contractor(s) will provide monthly reports to FEMA and the NSP by the 2nd business day of the month for this MAS. A monthly template will be used to document the study progress along with updating the Monitoring Information on Contracted Studies (MICS) system.

Section 11—Points of Contact

The points of contact for this Flood Map Project are Gary Zimmerer, the FEMA Regional Project Officer; and Claude Martin, the Project Manager for the City of Jonesboro, Arkansas; or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. When necessary, the assistance of the NSP should be requested through the FEMA Project Officer, Gary Zimmerer. The NSP point of contact for this project is Michael Anderson, PE, CFM of Michael Baker Corporation.

In addition, the NSP is required to coordinate project issues with the party that actually created the MAS deliverable or portions of the MAS deliverable product and will document all such coordination activities with the CTP and FEMA.

Section 12—Project Coordination

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

- Meetings, teleconferences, and videoconferences with FEMA and other Project Team members quarterly;
- Telephone conversations with FEMA and other Project Team members on a scheduled monthly basis and an ad hoc basis, as required;

- Updates to the MICS, Mapping Needs Update Support System database, and other FEMA status information systems in accordance with requirements in Volumes 1 and 3 of *Guidelines and Specifications for Flood Hazard Mapping Partners*; and
- E-mail, facsimile transmissions, and letters, as required.

Attachment B
Schedule

Attachment B

**Table 6-1. Project Schedule
Revision to EMT-2004-CA-0123 MAS #1 Schedule**

ACTIVITIES	RESPONSIBLE PARTNER(S)	START DATE (MM/DD/YY)	DUE DATE (MM/DD/YY)
Activity 3 – Field Surveys and Reconnaissance	CTP Contractor	08/08/05	10/21/05
Activity 6 –Hydrologic Analyses	CTP Contractor	08/08/05	11/1/05
Activity 7–Independent QA/QC Review of Hydrologic Analyses	FEMA NSP		
Activity 8 – Hydraulic Analyses	CTP Contractor	10/17/05	12/23/05
Activity 9 – Independent QA/QC Review of Hydraulic Analyses	FEMA NSP		
Activity 10 – Floodplain Mapping (Detailed Riverine Analysis)	CTP Contractor	11/28/05	01/27/06
Activity 10A – Floodplain Mapping (Redelineation Using Effective Flood Profiles and Updated Topographic Data)	CTP Contractor	08/08/05	01/27/06
Activity 11 – Independent QA/QC Review of Floodplain Mapping (Revised Areas)	FEMA NSP		
Activity 13 – DFIRM Production (Non-Revised Areas)	CTP Contractor	08/08/05	01/27/06
Activity 13A – Independent QA/QC Review of DFIRM Production (Non-Revised Areas)	FEMA NSP		
Activity 14 – DFIRM Production (Merging Revised and Non-Revised Information)	CTP Contractor	11/28/05	01/27/06
Activity 17 - Outreach	City of Jonesboro	08/08/05	09/30/06

Attachment C
Cost Proposal

Attachment C
Manhours and Cost Proposal
Mapping Activity Statement #1

PROJECT BUDGET CTP# MASH1 \$395,737		Jonesboro Master Drainage Plan - Fee Proposal: CTP# MASH1 City of Jonesboro, Arkansas - Craighead County C&B Project No. - 100643 (All Units)																		
Project Task Description	Task CTP	Project Director Hours	Project Manager Hours	DPM/Senior Engineer Hours	Design Engineer Hours	Senior Technician Hours	Design Technician Hours	Secretary Hours	Senior Land Surveyor Hours	Surveying Technician Hours	Survey Crew Hours	Overhead/ Direct Cost	Raw Total Hours C&B	Total Hours C&B	Raw C&B Per Task Cost	C&B Per Task Cost	C&B Average Hourly Rate	Total Task Cost	Group Task Cost	
Series 100: Develop Watershed Information																				
Project Kick-off Meeting		8.0	8.0	8.0								\$200	24	24	\$3,240	\$3,240	\$135	\$3,240		
Research & Review all Pertinent Storm Water Documents			8.35	10.02									18	18	\$2,079	\$2,079	\$113	\$2,079		
Quarterly Status Meetings, CTP Grant Administration		24.0	64.0	64.0									152	152	\$18,320	\$18,320	\$121	\$18,320	\$23,639	
Series 200: Develop Hydraulic Models																				
Field Survey (EMA Incorporated Cross Sections)	3		134.00	20.00			337.00		337.00		674.00		828	828	\$153,105	\$153,105	\$185	\$153,105		
Determine Drainage Areas	6		5.00	12.50	25.00								43	43	\$3,863	\$3,863	\$91	\$3,863		
Determine Watershed Parameters	6		5.00	12.50	25.00								43	43	\$3,863	\$3,863	\$91	\$3,863		
Develop and Run Hydrologic Models	6		20.00	25.00	100.00								145	145	\$13,075	\$13,075	\$90	\$13,075		
Link-In Cross Sections and Model Bridges	8		102.00	51.00	238.00	25.00							416	416	\$39,280	\$39,280	\$94	\$39,280		
Determine Creek Hydraulic Parameters	8		68.00	51.00	68.00								187	187	\$19,465	\$19,465	\$104	\$19,465		
Prepare Floodway and Profiles for Elbow Study Stream	8	4	20.00	40.00	220.00	20.00	200.00						504	504	\$37,000	\$37,000	\$73	\$37,000		
Hydrologic Mapping (Detailed)	10	8	102.00	51.00	203.00	51.00	337.00						752	752	\$57,905	\$57,905	\$77	\$57,905		
Hydrologic Mapping (Riveline/Roadway Zone A1)	10A		34.00	34.00	68.00	17.00	136.00						289	289	\$21,845	\$21,845	\$76	\$21,845		
Hydrologic Mapping (General/Residential Zone A1)	10B		4.00			4.00	7.00						15	15	\$1,185	\$1,185	\$79	\$1,185		
Maps Revised and Unrevised, DRRM database format	14	2	8.00	4.00	23.00	15.00	75.00						127	127	\$8,700	\$8,700	\$69	\$8,700	\$39,285	
Series 300: Prepare Final Report																				
Preparation of Draft Report		2	6.40	24.00	12.00	6.00						\$750	50	42	\$5,484	\$5,484	\$110	\$5,484		
Preparation of Final Report		2	6.40	12.00	6.00							\$1,200	26	22	\$3,924	\$3,924	\$151	\$3,924		
City Council Meetings & Preparation		4	8.00	8.00	8.00							\$325	28	23	\$3,405	\$3,405	\$122	\$3,405	\$12,813	
TOTAL HOURS		53	603	427	996	138	1,092	0	337	0	674		3,646	\$3,605	\$395,737	\$395,737	\$109.77		\$395,737	
		\$7,960	\$81,425	\$40,567	\$79,680	\$8,970	\$60,060	\$0	\$26,960	\$0	\$87,620	\$2,275						GRAND TOTAL CTP	\$395,737	