



**Delta Charter Township, in Eaton County, Michigan;
the Eaton County Drain Commissioner; and the
Michigan Department of Environmental Quality
Cooperating Technical Partners
Mapping Activity Statement**



Statement 2004-01 –Digital Flood Insurance Rate Map (DFIRM) Production and Development of Updated Flood Data

In accordance with the Cooperating Technical Partners (CTP) Memorandum of Agreement dated August 7, 2003, between Delta Charter Township, in Eaton County, Michigan (DCT); the Eaton County Drain Commissioner (ECDC); the Michigan Department of Environmental Quality (MDEQ) and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement 2004-01 is as follows:

- 1. Statement Objective and Scope:** The objective of this Mapping Activity for Delta Township is to develop a new Digital Flood Insurance Rate Map (DFIRM) and Flood Insurance Study (FIS) report for Delta Township, Eaton County, Michigan. The FIS and DFIRM will be produced in a community-based DFIRM format. Additionally, this project will include developing new and/or updated flood hazard data, as summarized in the following table:

Flooding Source	Reach Limits Upstream / Downstream	Reach Length (miles)	Detailed Riverine		Redelineation of SFHAs Using Effective Profiles
			Hydrology	Hydraulics	
Carrier Creek Drain (formerly Moon & Hamilton Drain)	I 96-I 69 Crossing / confluence with the Grand River	Approx. 7.0	X	X	
South Branch Carrier Creek Drain (formerly Proposed Branch 2)	Millett Highway / Carrier Creek Drain	Approx. 1.8	X	X	
Miller Creek	Upstream of St. Joe Highway / Confluence with Grand River	Approx. 3.2	X	X	
Grand River	Jolly Road (south corporate limit) / Waverly Road (east corporate limit)	Approx. 2.5			X
Grand River	Waverly Road (east corporate limit) / Royston Road (west corporate limit)	Approx. 7.5			X

This project will be completed by the Mapping Partners, which include the ECDC and their engineering consultant, Spicer Group, Inc., the MDEQ; and FEMA and their contractor. The activities, and who will complete them, are summarized in the table below.

The following sections describe the specific mapping activities associated with this mapping project. Each activity description identifies the responsible Mapping Partners, the Standards that must be met, and resultant map component.

Activity	CTP	FEMA	SC
Activity 1 – Field Surveys and Reconnaissance	ECDC		
Activity 2 – Topographic Data Development	ECDC		
Activity 3 – Independent QA/QC of Topographic Data		X	
Activity 4 – Hydrology	ECDC		
Activity 5 – Independent QA/QC of Hydrology	MDEQ		
Activity 6 – Hydraulics	ECDC		
Activity 7 – Independent QA/QC of Hydraulics	MDEQ		
Activity 8 – Floodplain Mapping (Detailed Riverine Analysis)	ECDC		

Activity 8A – Floodplain Mapping (Redelineation using effective profiles)	ECDC		
Activity 9 – Independent QA/QC of Floodplain Mapping		X	
Activity 10 – Base Map Acquisition and Preparation	ECDC		
Activity 12A – Apply DFIRM Graphic Specifications	ECDC		
Activity 12B – Independent QA/QC of DFIRM Graphics		X	
Activity 13 – Issue Preliminary FIS and FIRM		X	
Activity 14 – Post-Preliminary Processing		X	

Activity 1 - Field Surveys and Reconnaissance

Responsible Mapping Partner: ECDC and their engineering consultant will complete the field surveys and reconnaissance.

Scope: To supplement any field reconnaissance conducted during the scoping phase of this Flood Map Project, ECDC shall compile previous field reconnaissance information of the identified study reaches where detailed hydrology and hydraulics will be conducted.. ECDC will conduct a detailed field reconnaissance of the Carrier Creek Drain floodplain downstream of I-496 and for Miller Creek to determine conditions along the floodplain(s), types and numbers of hydraulic and/or flood-control structures, apparent maintenance status of existing hydraulic structures, locations of cross sections to be surveyed, and other parameters needed for the hydrologic and hydraulic analyses. In addition to the initial field reconnaissance, this activity includes conducting field surveys, including obtaining channel and floodplain cross sections, identifying or establishing temporary bench marks (ERMs), and obtaining the physical dimensions of hydraulic and flood-control structures. ECDC is responsible for coordinating with other team members collecting topographic data under Activity 2.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the Technical Support Data Notebook (TSDN) format described in Section 2, ECDC 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.

Activity 2 - Topographic Data Development

Responsible Entity: ECDC's photogrammetry consultant will provide digital elevation data consistent with FEMA guidelines and specifications for use in development of DFIRM products.

Scope: To supplement the field surveys conducted under Activity 1, additional topographic data of the over bank areas of the flooding sources collected in the year 2000 and 2002 will be utilized to delineate floodplain boundaries. Specifically, existing digital topographic data collected and processed in 2000, which supports 1-foot contour intervals, will be used for Carrier Creek Drain and South Branch Carrier Creek Drain upstream (south) of I-496. Flight data collected in 2002, which supports 2 foot contour intervals, will be processed for the over bank areas of the flooding sources for the remaining study reaches identified in Activity 1. ECDC is responsible for coordinating with other team members conducting field surveys under Activity 1.

Contour interval and/or accuracy for the topographic data will be selected based on the existing FEMA guidelines and specifications.

This Activity also consists of developing topographic maps and/or Digital Elevation Models (DEMs) for the subject flooding sources using the data collected in Activity 1 along with the previously obtained topographic data collected in 2000. Unless directed to do otherwise by FEMA, all new topographic data must be developed and submitted in digital format. Upon completion of topographic data processing for

the subject flooding sources, ECDC will submit this data to FEMA for an Independent Quality Assurance/Quality Control (QA/QC) review under Activity 3. ECDC will be responsible for addressing all concerns or questions regarding this Activity raised during the QA/QC review outlined in Activity 3.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, ECDC shall make the following products available to FEMA.

Hardcopy topographic maps;

Completed Form No. 5 of *Revisions to National Flood Insurance Program Maps, Application/Certification Forms and Instructions* (MT-2). Complete set of MT-2 forms are available from FEMA web site at http://www.fema.gov/mit/tsd/DL_MT-2.htm;

Report summarizing methodology and results;

Mass points and breaklines data on CD-ROM;

Digital workmap with contours;

Checkpoint analyses to assess the accuracy of data including Root Mean Square Error (RMSE) calculations to support vertical accuracy;

Identification of remote-sensing data voids and methods used to supplement data voids;

National Geodetic Survey (NGS) data sheets for Network Control Points (NCPs) used to control remote sensing and ground surveys;

Metadata compliant with Federal Geographic Data Committee standards.

Activity 3 - Independent QA/QC of Topographic Data

Responsible Entity: FEMA and their contractor will independently review the topographic data development produced by ECDC in Activity 2.

Scope: FEMA and their contractor shall review the mapping data generated by ECDC under Activity 2 of this Mapping Activity Statement to ensure that these data are consistent with FEMA standards as well as standard engineering practice and are sufficient to prepare or revise the FIRM.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, ECDC shall make the following products available to FEMA.

A Summary Report that describes the findings of the independent QA/QC review.

Recommendations to resolve any problems that arise as a result of the independent QA/QC review.

Activity 4 - Hydrology

Responsible Entity: ECDC and their engineering consultant shall be responsible for completing the hydrologic modeling.

Scope: Hydrologic analyses will be completed for approximately 11.5 square miles (Carrier Creek) and 6.0 square miles (Miller Creek) of drainage area for the flooding source(s) listed in Section 1 of this Mapping Activity Statement. The hydrologic method used for this analysis will be the US Army Corps of

Engineer's HEC-HMS model. Previously completed MDEQ SCS-92 Spreadsheet Models and XP-SWMM-32 Version 6.12 models will be used for verification of the HEC-HMS model and as a resource for hydrologic parameters for Carrier Creek. These models were used in previous analyses of the Carrier Creek watershed and were reviewed by the MDEQ. Peak flood discharges will be calculated for the 10%, 2%, 1% and 0.2% annual chance storm events for both Carrier Creek and Miller Creek. These flood discharges will be the basis for subsequent hydraulic analyses of the subject flooding source(s). In addition, ECDC will be responsible for addressing all concerns or questions regarding this Activity raised during the QA/QC review outlined in Activity 5.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: Upon completion of hydrologic modeling for Miller Creek and the Carrier Creek Drain and the South Branch Carrier Creek Drain, ECDC will submit the results to the MDEQ for an independent QA/QC review as described in Activity 5.

In accordance with the TSDN format described in Section 2, ECDC shall make the following products available to FEMA.

- Digital copies of all hydrologic modeling (input and output) files for 10%, 2%, 1% and 0.2% annual chance storm events.
- "Summary of Discharges" table(s) presenting discharge data for each flooding source.
- Draft text for Section 3.1, Hydrologic Analyses, of FIS report.
- Appropriate SC application/certification form for hydrology.
- All backup data used in the analysis, including work maps.

Activity 5 - Independent QA/QC Review of Hydrologic Analyses

Responsible Entity: The MDEQ will be responsible for the independent QA/QC review of the hydrologic analysis.

Scope: The MDEQ shall review the technical, scientific, and other information submitted by ECDC under Activity 4 of this Mapping Activity Statement to ensure that the data and modeling are consistent with FEMA standards and standard engineering practices and are sufficient to revise the FIRM. This work will include, at a minimum, the following activities:

- Review submittal for technical and regulatory adequacy, completeness of required information, application/certification forms, and supporting data and documentation. The technical review will focus on:
 - Use of acceptable models;
 - Use of appropriate methodology(ies);
 - Correctly applied methodology(ies)/model(s), including QC of input parameters;
- 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 should be retained for 3 years from the date funding recipient submits its final expenditure report to FEMA.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, the MDEQ 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 arise as a result of the QA/QC review.

Activity 6 – Hydraulic Analyses

Responsible Entity: ECDC and their engineering consultant will be responsible for completing the hydraulic analyses.

Scope: ECDC will perform hydraulic analyses for approximately 12.0 miles of the flooding sources listed in the Section 1 of this Mapping Activity Statement. The modeling will include the 10%, 2%, 1% and 0.2% annual chance storm events based on peak discharges computed under Activity 4. The hydraulic methods used for this analysis will include the most recent version of the U.S. Army Corps of Engineer's HEC-RAS Hydraulic Model for Steady-State modeling of water surface profiles. The U.S. Army Corps of Engineer's HEC-HMS model and/or the HEC-RAS model will be used to perform unsteady-state reach routing through in-line and off-line detention areas for Carrier Creek to determine peak discharges at the outlets of these detention control facilities. These computed peak flows will be used in the Carrier Creek steady state model. Previously completed XP-SWMM-32 Version 6.12 models for the Carrier Creek will be used for verification of the HEC-HMS model and as a resource for hydraulic parameters. ECDC will use cross-section and field data collected under Activity 1 to perform the hydraulic analyses. The hydraulic analyses will be used to establish flood elevations and regulatory floodways for the subject flooding sources. ECDC shall use CHECK-RAS to check the reasonableness of hydraulic analyses. To facilitate the independent QA/QC review under Activity 7, ECDC shall provide an explanation for each unresolved message from the CHECK-RAS program, as appropriate. In addition, ECDC will address all concerns or questions regarding this Activity raised during the independent QA/QC review under Activity 7.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: Upon completion of hydraulic modeling for the identified study reaches, ECDC will submit the results to the MDEQ for an independent QA/QC review as described in Activity 7.

In accordance with the TSDN format described in Section 2, ECDC shall make the following products available to FEMA:

- Digital profiles of the 10%, 2%, 1% and 0.2% annual chance water-surface elevations representing existing conditions using FEMA's RASLOT program or similar software;
- Floodway Data Table(s) for each subject flooding source. The Floodway Data Table(s) must be compatible with the DFIRM database;
- Digital copies of all hydraulic modeling (input and output) files;
- Table with range of Manning's "n" values
- An explanation for each unresolved message from the CHECK-RAS program, as appropriate;
- All backup data used in the analyses;
- Draft text for inclusion in Section 3.2, Hydraulic Analyses, of FIS report; and

Activity 7 - Independent QA/QC Review of Hydraulic Analyses

Responsible Entity: The MDEQ will be responsible for the independent QA/QC review of the hydraulic analyses.

Scope: The MDEQ shall review the technical, scientific, and other information submitted by ECDC under Activity 6 of this Mapping Activity Statement to ensure that the data and modeling are consistent with FEMA standards and standard engineering practices and are sufficient to revise the FIRM. This independent QA/QC review of the hydraulic analyses will include, at a minimum, the following activities:

- Review submittal for technical and regulatory adequacy, completeness of required information, application/certification forms, and supporting data and documentation. The technical review will focus on:
 - Use of acceptable models;

- Starting water-surface elevations;
 - Cross section geometry;
 - Manning's "n" values and expansion/contraction coefficients;
 - Bridge and culvert modeling;
 - Discharges;
 - Regulatory floodway computation methods; and
 - Tie-in to upstream and downstream non-revised profiles.
- Use CHECK-RAS programs 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 conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, the MDEQ 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 arise as a result of the independent QA/QC review.

Activity 8 – Floodplain Mapping (Detailed Riverine)

Responsible Entity: ECDC and their consultant will be responsible for the detailed riverine floodplain mapping.

Scope: ECDC shall delineate digital floodplain and regulatory floodway boundaries for the flooding sources listed in Section 1 of this Mapping Activity Statement. The mapping will incorporate all revised hydraulic modeling and newly acquired topographic information. ECDC will delineate the floodplain boundaries for the 1% and 0.2% recurrence intervals and the regulatory floodway on a digital work map based on topographic data developed under Activity 2 of this Mapping Activity Statement, which will be the basis of the revised FIRM. ECDC will incorporate the results of all effective Letters of Map Change as appropriate. In addition, ECDC will address all concerns or questions regarding this Activity raised during the independent QA/QC review outlined in Activity 9.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: Upon completion of floodplain mapping for the identified study reaches, ECDC will submit the results to FEMA for an independent QA/QC review under Activity 9.

In accordance with the TSDN format described in Section 2, ECDC shall make the following products available to FEMA:

Digital work maps with the 1% and 0.2% annual chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, Base Flood Elevations (BFEs), zone designation labels, and all applicable base map features;

Delta Township was flown in 2000 for the Carrier Creek Drain and the South Branch Carrier Creek Drain. Data was processed at that time for the area upstream of I-496 and 1 foot contour elevations were generated. Available data for the remainder of the township collected in 2002, which support 2 foot contour intervals, will be processed as part of Activity 2.

- DFIRM mapping files, in one of the GIS file and database formats specified in FEMA's DFIRM Specifications;
- Metadata files describing the DFIRM data, including the required information shown in the examples shown in FEMA's DFIRM Specifications;
- Complete set of plots of the DFIRM panels showing all detailed flood hazard information at a suitable scale;
- A QA/QC report that includes a description and the results of all automated or manual QA/QC 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 in Activity 9.

Activity 9 - Independent QA/QC Review of Floodplain Mapping

Responsible Entity: FEMA is responsible for the Independent QA/QC floodplain mapping review.

Scope: FEMA shall review the floodplain work maps submitted by ECDC under Activity 8 of this Mapping Activity Statement to ensure that the results of the hydraulic analyses are accurately represented on the work maps. This work will include, at a minimum, the following activities:

- Review the cross sections for proper location and orientation on the work map and agreement with the Floodway Data Table.
- Review the BFEs shown on the work map for proper location and agreement with the results of the hydraulic modeling.
- Review the regulatory floodway widths for agreement with the widths shown in the Floodway Data Table and the results of the hydraulic modeling.
- Review the floodplain boundaries for agreement with the flood elevations shown in the Floodway Data Table and the contour lines and other topographic information shown on the work maps.
- Floodplain widths at cross section must match floodway data table. Floodplain boundaries as shown on work maps match profiles.
- Ensure zone designations are indicated properly.
- Ensure DFIRM mapping files are in one of the GIS file and database formats specified in FEMA's DFIRM Specifications and conform to those specifications for content and attribution.
- Ensure metadata files describing the DFIRM data include the required information and follow the examples shown in FEMA's DFIRM Specifications.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, FEMA shall make the following products available:

A Summary Report that describes the findings of the independent QA/QC review noting any deficiencies and providing recommendations to resolve them or agreeing with the mapping results; and

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

Activity 10 - Base Map Acquisition and Preparation

Responsible Entity: ECDC is responsible for base map acquisition and preparation.

Scope: This is a required activity when Activity 8 is performed. This activity consists of obtaining the digital base map data layers, in state plane-south coordinates, from Delta Charter Township and the State of Michigan which includes: parcel names and identification numbers, road centerlines and road names, stream names, and community boundaries for the project. ECDC shall:

- Obtain digital files (raster or vector) of the base map;
- Secure necessary permissions from the map source to allow FEMA's use and distribution of hardcopy and digital map products using the digital base map, free of charge;
- Certify that the digital data meet the minimum standards and specifications that FEMA requires for DFIRM production; and
- Populate the DFIRM database for base map features and applicable data.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, ECDC shall make the following products available to FEMA.

Written certification that the digital data meet the minimum FEMA standards and specifications; and

Documentation that FEMA can use the digital base map and republish it as part of the DFIRM product.

Activity 12A – Application of DFIRM Graphic Specifications

Responsible Entity: ECDC and their consultant are responsible for the DFIRM Graphic Specification application.

Scope: Upon completion of merging of effective and revised floodplain mapping into a single, updated DFIRM for the identified flooding sources (Activity 12). ECDC shall apply the final FEMA DFIRM graphic specifications to the DFIRM mapping files. This work will include adding all required annotation, line patterns, area shading, and map collar information (e.g., map borders, title blocks, legends, and notes to user).

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, ECDC shall make the following products available to FEMA.

- DFIRM mapping files in one of the GIS file and database formats specified in FEMA's DFIRM Specifications, provided on CD-ROM;
- DFIRM database files in one of the database formats specified in FEMA's DFIRM Specifications, provided on CD-ROM;
- Metadata files describing the DFIRM data including the required information based on the examples shown in FEMA's DFIRM Specifications;
- Complete set of plots of the DFIRM panels showing all the details at the scale(s) agreed upon in the "Scope of Project;" and
- An internal QA/QC report that includes a description and the results of all automated or manual quality assurance steps taken during the preparation of the DFIRM.

Activity 12B - Independent QA/QC Review of DFIRM Graphics

Responsible Entity: FEMA is responsible for the QA/QC DFIRM graphics review.

Scope: FEMA shall review the DFIRM panels submitted by ECDC under Activity 12A of this Mapping Activity Statement to ensure that the DFIRM panels conform to FEMA's DFIRM graphic standards. This work will include, at a minimum, the following:

- All required DFIRM features are accurately and legibly labeled and follow the examples shown in FEMA's DFIRM Specifications. This includes all flood hazard zones, BFEs, cross sections, coastal transects, studied streams, mapped political entities, and all roads within and adjacent to the 1% annual chance flood hazard areas.
- All DFIRM features are correctly symbolized with the appropriate symbol, line pattern, or area shading and follow the examples shown in FEMA's DFIRM Specifications.
- All map collar information is complete, correct, and follows the examples shown in FEMA's DFIRM Specifications.
- DFIRM mapping files are in one of the GIS file and database formats specified in FEMA's DFIRM Specifications and conform to those specifications for content and attribution.
- DFIRM database files are in one of the database formats specified in FEMA's DFIRM Specifications and conform to those specifications for content and attribution.
- Metadata files describing the DFIRM data include the required information and follow the examples shown in FEMA's DFIRM Specifications.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, FEMA shall make the following products available.

A Summary Report that describes the findings of the independent QA/QC review, noting any deficiencies and providing recommendations to resolve them or agreeing with the mapping results; and

Annotated DFIRM panels with all questions and/or concerns indicated, if necessary.

Activity 13 – Preparation and Issuance of Preliminary FIS and DFIRM

Responsible Entity: FEMA will be responsible for preparation and issuance of the preliminary FIS and DFIRM.

Scope: This Activity consists of the final preparation, review, and distribution of the Preliminary copies of the FIRM and FIS report for community and public review and comment. The activities to be performed are summarized below.

FIS Report Preparation: Unless instructed otherwise by FEMA, ECDC will prepare the revised FIS report in the format of the existing FIS report, revising the report only to reflect current conditions and include updated data tables and flood profiles. At a minimum, the FIS report will include the following: text; cover; vicinity map; data tables; photographs (if available); flood profiles; floodway schematic; and, when necessary, transect schematic and transect location map.

Quality Assurance/Quality Control: Final QA/QC review of the FIS report, including all data tables, profiles, and other components of the FIS, as appropriate, and the news release will be conducted. The QA/QC procedures will be consistent with FEMA standards outlined below for this activity.

Discrepancy Resolution: FEMA will be responsible for working with ECDC and MDEQ who are responsible for performing many of the activities of this project to resolve discrepancies identified during QA/QC.

Distribution of Preliminary DFIRM and FIS Report: FEMA will distribute the preliminary copies of the FIS report and DFIRM to the affected communities, State agencies, and others as identified by FEMA.

- **News Release and Federal Register Notice Preparation:** FEMA will prepare the news release notifications of BFE changes. The news release will summarize newly proposed BFEs, modifications to existing BFEs, and any changes to the community's floodplain management ordinances to be NFIP compliant. Upon completion of a 30-day community comment period and/or final meeting with the community, and upon initiation of the 90-day appeal period, the FEMA will arrange for and verify that the news release is published in the prominent newspaper(s) with local circulation within each affected community identified by the community and FEMA. FEMA also will arrange for and verify that a similar notice is published in the *Federal Register*.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, FEMA shall make the following products available:

The necessary number of sets of printed preliminary DFIRMs and FIS reports, including all updated data tables and flood profiles for mailing to the CEO of each community, the State NFIP Coordinator, the FEMA Regional Office, and others as directed by FEMA;

Preliminary transmittal letter(s);

- DFIRM mapping files in one of the database formats specified in FEMA's DFIRM Specifications;
- DFIRM database files in one of the database formats specified in FEMA's DFIRM Specifications;
- Metadata files describing the DFIRM data, including the required information as presented in the examples shown in FEMA's DFIRM Specifications;
- A QA/QC report that includes a description and the results of all automated or manual QA/QC steps taken during the preparation of the preliminary copies of the DFIRM and FIS report;
- Documentation showing that the news release(s) was published correctly in accordance with FEMA requirements and that a similar notice was published correctly in the *Federal Register* in accordance with FEMA requirements

Activity 14 - Post-Preliminary Processing

Responsible Entity: FEMA

Scope: This Activity consists of finalizing the DFIRM and FIS report after the preliminary FIS and DFIRM have been issued for public review and comment. The activities to be performed include:

- **Participating in Public Meetings:** When FEMA holds public meetings to present and discuss the results of this Flood Map Project, ECDC and MDEQ and the necessary project contractors will attend the meetings and assist FEMA in the presentation as required.
- **Resolving Appeals and Protests:** Appeals and protests received during the 90-day appeal period will be reviewed and resolved prior to finalizing the FIRMs and FIS report. ECDC will provide support to FEMA in resolving appeals and protests. Activities may include, but not limited to, attending community meetings and assisting FEMA in addressing any issues that may arise in resolving appeals and protests from affected communities. For a typical appeal and protest, the following activities will be conducted: Initial processing of the appeal/protest, performing a technical review of the appeal/protest, preparing letters to request additional data, performing revised analyses, and preparing a proposed resolution for FEMA's review. FEMA will mail all associated correspondence.

Special Correspondence: Comments received within the 90-day appeal period (referred to as "special correspondence") will be reviewed, and responses will be drafted, authorized and mailed by FEMA.

Revise DFIRMs and FIS Report: If necessary, FEMA will work with those parties responsible for preparing the DFIRM under Activities 8, 8A, 8B, 11, and 12 to prepare revised preliminary copies of the DFIRMs and FIS report, including all data tables and flood profiles. FEMA will mail all revised preliminary copies of DFIRMs and associated correspondence.

Letter of Final Determination: FEMA and their contractor will establish an effective date for the DFIRM and FIS report, prepare a Letter of Final Determination (LFD) for FEMA review and signature, prepare a final notice for publication in the *Federal Register*, mail the LFD with appropriate enclosures, and coordinate publication of the final notice in the *Federal Register*.

GPO Processing: FEMA and their contractor will prepare final copies of the DFIRM and FIS report, and provide them to FEMA. This will include preparing camera-ready film negatives of the DFIRM and paper copies of the FIS report, including flood profiles; preparing appropriate paperwork to be included with DFIRM and FIS report materials, including the transmittal letter to the community CEO, the print processing worksheet, the Printing Requisition Form, and the Community Map Action Form; and delivering the final materials and paperwork to FEMA in the format prescribed by FEMA.

Archiving Data: FEMA and their contractor will package the backup data and correspondence for this Flood Map Project and transmit it to the Engineering Study Data Package Facility.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, ECDC shall make the following products available to FEMA as required:

- Draft LFD and associated backup data and information for FEMA review;
- Draft Special Correspondence and backup data and information for FEMA review;
- Appeal and Protest resolution letters, and all backup data and information for FEMA review;
- The **necessary number of sets** of DFIRM negatives and paper FIS reports, including all updated data tables and flood profiles for distribution as stated in Activity 13;
- Paperwork required for printing of DFIRM panels and FIS report;
- Complete DFIRM spatial database; and
- Completed and organized Engineering Study Data Packages.

2. Technical and Administrative Support Data Submittal: The Project Team members for this project that have responsibilities for activities included in this Mapping Activity Statement shall comply with the following data submittal requirements:

- All supporting documentation for the activities in this Mapping Activity Statement shall be submitted in accordance with Appendix M, Section M.2.1 of the *Guidelines and Specifications for Flood Hazard Mapping Partners*, prepared by FEMA, dated February 2002. The following table indicates the sections of the TSDN that apply to each activity.

TSDN—Applicable Sections

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

- If any issues arise that could affect the completion of an activity within the proposed scope or budget, the party responsible for that activity must complete a Special Problem Report (SPR) as soon as possible after the issue is identified and submitted to FEMA. The SPR should describe the issue and propose possible resolutions.

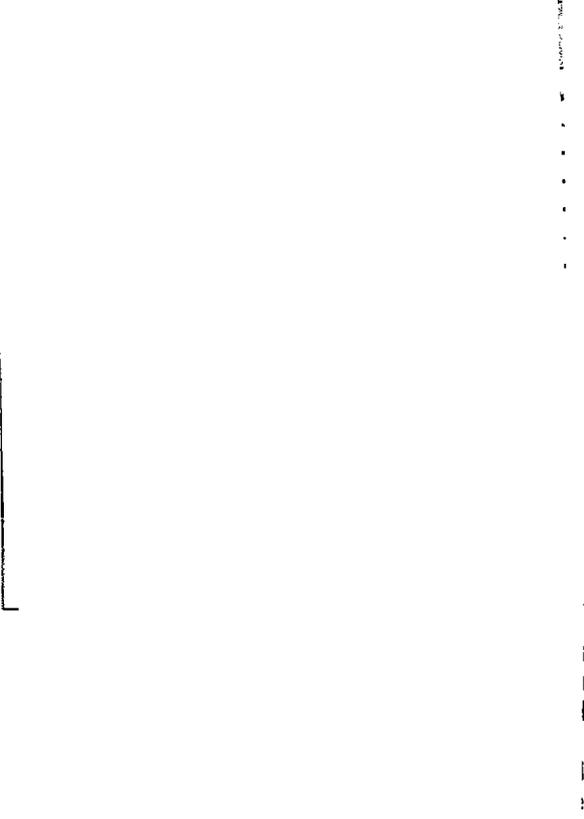
Additionally, ECDC will be responsible for collecting and maintaining a set of products for all Activities and shall compile a comprehensive TSDN for the entire project.

3. Period of Performance:

The mapping activities outlined in this MAS will begin on September 1, 2004 and will be completed no later than August 31, 2005 (See Schedule below for detailed deadlines by activity). The Mapping Activities may be terminated at the option of FEMA, MDEQ, Delta Charter Township (DCT) or the ECDC in accordance with the provisions of the August 7, 2003 CTP Partnership Agreement.

The period of performance will be in accordance with Cooperative Agreement Article II.

4. Funding/Cost-Sharing:



5. Standards: Table 5-1 indicates the standards and documentation relevant to this Mapping Activity Statement. Table 5-2 shows the applicable sections of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners* for each activity.

bi) Applicable Standards per Activity

Applicable Standards	Activities												
	1	2	3	4	5	6	7	8	9	10	11	12	
Guidelines and Specifications for Flood Hazard Mapping Partners, February 2002	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
American Congress on Surveying and Mapping (ACSM) procedures	✓	✓											
Global Positioning System (GPS) Surveys: National Geodetic Survey (NGS-58), "Guidelines for Establishing GPS-Derived Ellipsoid Heights," November 1997	✓	✓											
EM 1000-1-1000, "Photogrammetric Mapping," March 31, 1993	✓	✓											
EM 1110-2-1003, "Hydrographic Surveys," October 31, 1994	✓	✓											
Numerical Models Accepted by FEMA for NFIP Usage, January 11, 2002									✓				
Content Standards for Digital Geospatial Metadata (Federal Geographic Data Committee, 1998)		✓								✓		✓	✓
Document Control Procedures Manual dated October 1993.													✓

Table 5-2 Mapping Activities and Applicable Sections of Guidelines and Specifications for Flood Hazard Mapping Partners

Activity Number	Task Description	Applicable Volume, Section/Subsection, and Appendix of Guidelines and Specifications
1	Field Surveys and Reconnaissance	Volume 1, Sections 1.2, 1.3, 1.4 (specifically Subsection 1.4.2.1) Appendix A, Sections A.5, A.6, A.7, and A.8 Appendices B, C, and M
2	Topographic Data Development	Volume 1, Section 1.4 (specifically Subsection 1.4.2.1) Appendix A, Sections A.2 and A.3 Appendix M
3	Independent QA/QC of Topographic Data	Volume 1, Section 1.4 (specifically Subsections 1.4.1 and 1.4.2.1) Appendix A, Sections A.2, A.3, A.7 (specifically Subsection A.7.5), and A.8 (specifically Subsection A.8.6) Appendix M
4	Hydrology	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4) Appendix C, Sections C.1 and C.7 Appendices E, F, G, H, and M
5	Independent QA/QC Review of Hydrology	Volume 1, Section 1.4 (specifically Subsection 1.4.1) Appendix C, Section C.2 Appendices E, F, G, H, and M
6	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
7	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

Table 5-2 Mapping Activities and Applicable Sections of Guidelines and Specifications for Flood Hazard Mapping Partners (Cont.)

Task Number	Task Description	Applicable Volume, Section/Subsection, and Appendix of Guidelines and Specifications
8	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 Appendices K, L, and M
8A	Floodplain Mapping (Redelineation Using Effective Profiles and Updated Topographic Data)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.3) Appendices K, L, and M
9	Independent QA/QC Review of Floodplain Mapping	Volume 1, Section 1.4 (specifically Subsections 1.4.1 and 1.4.2.3) Appendix C, Sections C.4 and C.6 Appendices D, K, L, and M
10	Base Map Acquisition and Preparation	Volume 1, Sections 1.3 (specifically Subsection 1.3.1.8) and 1.4 (specifically Subsection 1.4.3) Appendices A and B
12A	Application of DFIRM Graphic Specifications	Volume 1, Section 1.4 (specifically Subsection 1.4.3) Appendices K and L
12B	Independent QA/QC Review of DFIRM Graphics	Volume 1, Section 1.4 (specifically Subsection 1.4.3) Appendices K, L, and M
13	Preparation and Issuance of Preliminary FIS and DFIRM	Volume 1, Sections 1.4 (specifically Subsections 1.4.2 and 1.4.3) and 1.5 (specifically Subsection 1.5.1) Appendices J, K, L, and M
14	Post-Preliminary Processing	Volume 1, Section 1.5 Appendices J, K, L, and M

6. Schedule and Milestones:

The following dates are based on a start date of September 1, 2004.

ACTIVITY	RESPONSIBLE ENTITY	DUE DATE
Activity 1 – Field Surveys and Reconnaissance	ECDC	September 2004
Activity 2 – Topographic Data Development	ECDC	October 2004
Activity 3 – Independent QA/QC of Topographic Data	FEMA	December 2004
Activity 4 –Hydrology	ECDC	November 2004
Activity 5–Independent QA/QC of Hydrology	MDEQ	December 2004
Activity 6 – Hydraulics	ECDC	January 2005
Activity 7 – Independent QA/QC of Hydraulics	MDEQ	March 2005
Activity 8 – Floodplain Mapping (Detailed Riverine)	ECDC	April 2005
Activity 8A – Floodplain Mapping (Redelineation Using Effective Profiles)	ECDC	April 2005
Activity 9 – Independent QA/QC of Floodplain Mapping	FEMA	May 2005
Activity 10 – Base Map Acquisition and Preparation	ECDC	April 2005
Activity 12A – Apply DFIRM Graphic Specifications	ECDC	June 2005
Activity 12B – Independent QA/QC of DFIRM Graphics	FEMA	July 2005
Activity 13 – Issue Preliminary FIS and FIRM	FEMA	
Activity 14 – Post-Preliminary Processing	FEMA	

7. Certification: The following certifications apply to this Mapping Activity Statement (as appropriate):

Activity 1 (Field Surveys and Reconnaissance) and Activity 2 (Topographic Data Development)

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

Activity 10 (Base Map Acquisition and Preparation)

- Community official or responsible party will provide written certification that the digital data meet FEMA's minimum standards and specifications.
- Responsible Mapping Partner will provide documentation that the digital base map can be used by FEMA.

Activity 8 (Floodplain Mapping)

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

Activity 4 (Hydrology), Activity 6 (Hydraulics), and Activity 8 (Floodplain Mapping)

- Hydrologic and/or hydraulic analyses and data will be certified by a Registered Professional Engineer or Licensed Land Surveyor in accordance with 44 CFR 65.6(f).
- Topographic Information will be certified by a Registered Professional Engineer or Licensed Land Surveyor 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).

8. Technical Assistance and Resources: ECDC's engineering consultant may obtain copies of FEMA-issued LOMCs), archived engineering backup data, and data collected as part of the Mapping Needs Assessment Process from FEMA'S contractor. The FEMA contractor may be contacted at 1-877 FEMA MAP (1-877-336-2627). General technical and programmatic information, such as FEMA 265, the Quick-2 computer program, and the MT-2 forms, can be downloaded from FEMA's Flood Hazard Mapping website (<http://www.fema.gov/fhm/>). Specific technical and programmatic support may be provided through FEMA's contractor; such assistance should be requested through the FEMA Project Officer specified in Section 11 of this Mapping Activity Statement.

9. Contractors: The ECDC's contractor is Spicer Group, Inc. The Project Manager will be Shawn Middleton, P.E., or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. Mr. Middleton can be reached at 989-928-8027 (cell) or 989-224-2355 (phone), by mail at 1400 Zeeb Drive, St. Johns, Michigan 48879 or by email at shawnm@spicergroup.com. The ECDC will ensure that procurement of subcontractors as part of this Mapping Activity Statement complies with the requirements of 44 CFR 13.36.

10. Financial Reporting: Financial reporting requirements will be in accordance with Cooperative Agreement Articles V & VI.

11. Points of Contact: The FEMA Regional Project Officer is Ken Hinterlong and the CTP Project Manager is David V. Wilcox or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. When necessary, the assistance of FEMA's contractor should be requested through the FEMA Project Officer, Ken Hinterlong.

Each party has caused this Mapping Activity Statement to be executed by its duly authorized representative

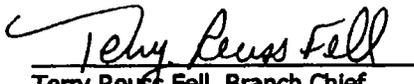


Braden L. Harrington
Eaton County Drain Commissioner

8-25-04
Date

Richard C. Sorrell, P.E. Chief, Hydrologic Studies Unit
Geological and Land Management Division, MDEQ

Date



Terry Reuss Fell, Branch Chief,
Hazard Identification and Risk Assessment Branch
Federal Emergency Management Agency Region V

7-20-04
Date