NORTH DAKOTA STATE WATER COMMISSION
COOPERATING TECHNICAL PARTNERS
MAPPING ACTIVITY STATEMENT
GRAND FORKS COUNTY, NORTH DAKOTA

This template is for use for all NDSWC MASs prepared for 2005 funding allocations. It is prepared in such a format as to reduce time and effort in preparation. This MAS is an agreement between the NDSWC and FEMA only; the NDSWC will delegate contractors and consultants tasks in a separate document. Only highlighted portions of the text are to be altered. Red text must be updated for each MAS prepared. For initial review purposes, any questionable or new language is italicized. Once this template is approved by all parties, the italics will be removed. This paragraph should be deleted before this final document is delivered to FEMA /NSP.

Mapping Activity Statement No. 2 – Digital Flood Insurance Rate Map Production and Development of Updated Flood Data

In accordance with the Cooperating Technical Partners (CTP) Partnership Agreement dated October 18, 2004 between the North Dakota State Water Commission (NDSWC) and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement (MAS) No. 2 is as follows.

Section 1: Objective and Scope

The objective of the Flood Map Project documented in this MAS is to develop a Digital Flood Insurance Rate Map (DFIRM) and Flood Insurance Study (FIS) report for Grand Forks County and Incorporated Areas including around the City of Grand Forks. The DFIRM and FIS report will be produced in the FEMA Countywide Format.

If the Flood Map Project includes only DFIRM conversion, then Table 1-1 does not apply.

Table 1-1. Summary of Flood Hazard Data to be Created or Updated

Priority	Flooding Source	Reach Limits	Hydrologic Analyses	Hydraulic Analyses	Floodplain Mapping	Redelineation Using Effective Flood Profiles and Updated Topographic Data	Refinement or Creation of Zone A
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2	Red River	26 river miles			x	x	x
3							
4							

Within 30 days of this agreement, FEMA's National Service Provider (NSP) shall input the scope of work into the FEMA Scoping Tool. This includes information concerning community ordinance data, local GIS data availability, and the flood reach data for existing and proposed conditions. The FEMA Scoping Tool documentation can be found at http://www.hazards.gov/resources/scoping.htm.

The CTP 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:

- NDSWC;
- FEMA, and
- Michael Baker, Jr., Inc., 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 1-2. All activities that are to be accomplished by NDSWC or contractors to NDSWC, including contractors that may be selected after the project startup, are included in the "CTP" column. All activities that are to be accomplished by FEMA or FEMA's NSP are included in the FEMA/NSP column. The sections of this MAS that follow Table 1-2 describe the specific activities, responsible Mapping Partner(s), FEMA standards that must be met, and resultant map components.

Compliance with Floodplain Boundary Data Quality Standards: The data quality standards documented in Section 7 of the Multi-Year Flood Hazard Identification Plan (MHIP) for Fiscal Year 2004-2008 (Version 1, November 2004) should be used as the basis for producing DFIRMs. It has been determined that DFIRMs that do not meet the quality standards stated above may not be considered toward meeting the Map Mod metrics. The MIP utilities available at the time of study submittals should be run to verify compliance with these data quality standards. Compliance with these standards will help FEMA achieve a Map Modernization goal of providing a reliable, web-based national flood layer in digital GIS format.

The floodplain boundary data quality standards outlined in Table 7-1 of the MHIP should be followed in addition to existing standards specified for floodplain mapping in the Guidelines, including Volume I, Section 1.4 and Appendices C, D, E, F, G, H, K, L, M, and N. Table 7-1 shall be applied to all approximate, existing detailed and new detailed studies for riverine and coastal flooding sources.

Table 1-2. Summary of Project Activities and Assignments

Activities	CTP	FEMA /NSP
Activity 1: Pre-Scoping	X	X
Activity 2: Scoping	X	X
Activity 3: Field Surveys and Reconnaissance	X	
Activity 4: Topographic Data Development	X	
Activity 5: Independent QA/QC Review of Topographic Data		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)	X	
Activity 11: Independent QA/QC Review of Floodplain Mapping (Revised Areas)		X
Activity 12: Base Map Acquisition	X	
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)	X	
Activity 14B: Independent QA/QC Review of DFIRM Product Meeting FEMA Graphics and Database Specifications		X
Activity 15: Preliminary DFIRM and FIS Report Distribution	X	X
Activity 16: Post-Preliminary Processing	X	X
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 use of these tools will assist in the Map Modernization effort and the efficiency of mapping partners.

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

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

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

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

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 monitor study quality.

FEMA will be providing download/upload capability for data capture submittals through the MIP. Data submittals uploaded via the MIP will include the same data required prior to the existence of the MIP.

Activity 1 – Pre-Scoping

Responsible Mapping Partner: NDSWC and FEMA/NSP

Scope: Pre-Scoping or Mapping Needs Assessment forms the building block for the Scoping Phase. This task involves collecting data from a variety of sources including community surveys, other Federal and State Agencies, NFIP State Coordinators, Community Assistance Visits (CAVs) and FEMA archives. *FEMA/NSP* will collect and compile are such data and evaluate the effective FIS report and FIRM maps to see if they need to be updated. *FEMA/NSP* will compile lists of mapping needs from the MNUSS database, community surveys, *the Scoping Tool*, and CAVs if available.

Data collection will include obtaining the best available base map materials (e.g., corporate limits, roads, orthophotos) along with stream centerline files. The acquired data will be imported into the scoping tool and used during the Scoping Task. In the Scoping Tool, all streams should have unique names, the limits

of the effective FEMA studies should be identified, LOMC areas should be identified, and community requests should be identified. This task also includes populating the streamlines with existing pipeline and scoped studies currently underway.

The NDSWC will lead the effort to contact and coordinate with the communities and FEMA/NSP will be responsible for efforts related to existing data collection and the Scoping Tool.

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

Deliverables: FEMA/NSP shall make the following products available to FEMA *and the NDSWC*:

- Copies of all digital files obtained and lists of files that may be available at a later date;
- A Pre-Scoping Report including all data compiled from the described research;
- Summary of the Community's needs; and
- Scoping Tool project files.

Information on the Scoping Tool can be downloaded from http://www.hazards.gov/resources/scoping.htm.

Activity 2 – Scoping

Task 2-1 Project Management Team Participation

Responsible Mapping Partner: NDSWC and FEMA/NSP

Scope: In cooperation with the FEMA Region, a Project Management Team will be established consisting of the NDSWC, FEMA's Regional Engineer, Grand Forks County and other appropriate officials. The Project Management Team will be responsible for coordinating the activities of this project and completing all tasks identified in this Statement of Work.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables:

- NDSWC will provide a document listing the project management team along with their full contact information.
- FEMA/NSP will update the Scoping Tool files to include the project management team and contact information.

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

Task 2-2 Initial Community Contact

Responsible Mapping Partner: NDSWC

Scope: Coordinate with the FEMA Regional Project Officer to contact *the county and communities (listed in Section 1)* and notify them that FEMA and the NDSWC have selected them for a map update, and they will be working with the communities to develop the project scope. Topics to be reviewed with the communities include:

- Purpose of the Flood Map Project (i.e., the update needs that have prompted the map update);
- The community's perception of its mapping needs;
- Target schedule for completing the project;
- Possibility of the community participating as a CTP (if it isn't already); and
- The community's engineering, planning, and Geographic Information System (GIS) capabilities.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: A digital document reporting the results of the contact.

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

Task 2-3 Management Plan

Responsible Partner: NDSWC

Scope: The coordination protocol and general management objectives of the entire project will be addressed in *the North Dakota Multi-Hazard Flood Map Modernization State Business Case Plan 2004-2008, which will be updated regularly.* This plan identifies the *general* Project, Project Team, the lines and protocols of communication between the communities and the Team members, protocols for internal flow of information among the members of the Team, the project objectives, general milestones of the Flood Map Project, QA/QC review requirements, record keeping, and project completion goals. The NDSWC will communicate this information to Project Team members on an ongoing basis, and will provide additional documentation as needed.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverable: ND's Business Case Plan is available upon request.

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

Task 2-4 Initial Project Team *Coordination*

Responsible Partner: NDSWC

Scope: Following the completion of the Project Management Plan, *coordination will take place with* the Project Management Team members and the appropriate representatives of *the county and communities listed in Section 1.* The communities will be asked to provide input for its assessment of the flood mapping needs, available data for base maps, any existing studies or ongoing projects that may have an influence on flood mapping, the community's potential as a CTP, and the involvement of other regional or state agencies that may have an input for the map development process.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverable: A digital document summarizing coordination activities.

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

Task 2-5 Project Team Formation

Responsible Partner: NDSWC and FEMA/NSP

Scope: The composition of the Project Team will be based on the needs of the project. The selected Project Team members will consist of the Project Management Team plus other mapping partners and NFIP stakeholders whose collective capabilities will provide all the necessary resources to successfully complete the Flood Map Project.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: *The NDSWC will provide a document* listing the project team along with their full contact information. *FEMA/NSP will update* the Scoping Tool files to include the project team and contact information.

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

Task 2 –6 Preliminary Research Activities

Responsible Partner: FEMA/NSP

Scope: Preliminary Research Activities can be separated into two categories—researching effective information and researching available data for the Flood Map Project. The following tasks shall be completed to research effective information: conduct a thorough Mapping Needs Assessment (unless one has already been conducted); inventory the FEMA archives for effective FIRM panels, FIRM panels, FIS reports, and other flood hazard data or existing study data, including data for adjacent counties including those located within states that border North Dakota; summarize the information in the MNUSS database; summarize contiguous community agreement checks; review CAV and CAC files; and develop a "scoping map" and an overview of the results of the research.

The following tasks shall be completed to research available data for Flood Map Project: identify available base map information; identify available topographic data; identify available flood hazard data; and identify other available hydrologic and hydraulic information and data.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS. An Available Data Inventory template is provided in Appendix I, Subsection I.1.6 of the *Guidelines and Specifications for Flood Hazard Mapping Partners.*

Deliverables: An Available Data Inventory digital document.

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

Task 2-7 Potential Obstacles

Responsible Partner: NDSWC

Scope: The Project Management Team shall identify potential obstacles in an effort to learn of any issues that could delay or prohibit the Flood Map Project. Some examples of potential obstacles to completing the project in a timely fashion include the following: inability to address mapping needs adequately with available funding; difficulty coordinating community funding with FEMA funding; lack of an available base map meeting FEMA minimum specifications (described in Appendix K of the *Guidelines and Specifications for Flood Hazard Mapping Partners*); hydrologic and/or hydraulic issues; community concerns; reliance on other studies or data (e.g., topographic mapping) that will not be available within the project's scheduling constraints; needs not having as high a priority as originally identified; and other considerations (Federal/State/non-governmental organizations, programmatic, disaster-related, legal).

The Project Management Team shall explore potential issues on an ongoing basis. If potential obstacles are identified that could halt or significantly hinder the completion of the project, the Project Management Team shall evaluate all possible alternatives and develop an appropriate course of action as soon as practicable. *When identified, the issue will be communicated to the Project Team by NDSWC, who will also initiate discussion toward resolution of the issue.*

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS. A Potential Obstacle to Project Completion Checklist template is provided in Appendix I, Subsection I.1.7 of the *Guidelines and Specifications for Flood Hazard Mapping Partners.*

Deliverables: *Emails and phone calls to Project Team on an ongoing basis as needed on relevant issues.*

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

Task 2-8 Project Scope

Responsible Partner: NDSWC

Scope: Based on the collected information, NDSWC will develop a Project Scope of the identified mapping needs of *the county and communities (listed in Section 1).* Input received from the FEMA Regional Project Officer and other involved community agencies will be used in the development of the Project Scope. The following items will be addressed in the Project Scope: review available information; determine if and how effective FIS data can be used in new project; identify other data

needed to complete the Project and its source; and the DFIRM format. *This scope will be coordinated with members of the Project Team and the communities and county involved with the project.*

The Project Scope will establish priority levels for flooding sources to be analyzed and mapped, and estimate schedules and associated costs for completion of the components of flood mapping.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: NDSWC will provide a Project Scope document in digital form and FEMA/NSP will update the Scoping Tool files to include the draft scope.

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

Task 2-9 Distribution of Background Information

Responsible Partner: NDSWC

Scope: In preparation for the Scoping Meeting (Task 12), a detailed meeting agenda and scoping presentation will be prepared in accordance with the template provided in Appendix I, Subsection I.2.4 of the *Guidelines and Specifications for Flood Hazard Mapping Partners*. The NDSWC will distribute the Scoping Meeting agenda and present the project scope to all meeting attendees at the Scoping Meeting.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Copies of the Scoping Meeting Agenda will be distributed to the Project Team before the Scoping Meeting.

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

Task 2-10 Scoping Meeting Activities

Responsible Partner: NDSWC and FEMA/NSP

Scope: The NDSWC will coordinate, set up, and conduct the Scoping Meeting. This includes identifying a time, location, and all participants. The purpose of this meeting is to present the draft Scope of Project to the local officials (state, county and municipal) and coordinate the prioritization of proposed study areas. FEMA/NSP shall be responsible for compiling the necessary information for the meeting as contained on the Scoping Meeting Item Checklist. These items may include: FIS and FIRM for affected communities; USGS quads for the study area(s); best available community base map(s); effective FIRM summary; Available Data Inventory; Scoping Map; aerial photos/topographic mapping if available; existing drainage studies or other Hydrology & Hydraulics (H&H) data; Community master plan(s)/Drainage Master Plan(s); Zoning Maps; Street Maps; As-built plans; and Floodplain Ordinance(s).

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: A completed Scoping Meeting Package with all necessary forms will be *compiled cooperatively and distributed* to the NDSWC, the FEMA Regional Project Officer, and the NSP one week after the Scoping Meeting.

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

Task 2-11 Mapping Needs List Prioritization and Finalization

Responsible Partner: NDSWC

Scope: The Project Management Team shall review the mapping needs list, review the research findings, and make selections of proposed methods for obtaining/producing flood data. Any additions or changes to the needs list shall be discussed with all members. All needs shall be prioritized. In general, highest priority shall be given to the following areas: areas of dense existing or anticipated development, including areas where new road crossings have been constructed over stream(s); areas affected by flood-control structures and/or channelization; areas where natural physical changes in the floodplain have been significant (due to subsidence or extreme erosion, for example); areas that were studied by approximate methods and unmapped areas, especially those subject to development pressure; areas where the community has experienced flooding outside mapped floodplains, with severe damage to buildings and/or infrastructure; areas where mapped flood hazards do not match those shown on contiguous FIRMs (unless those FIRMs are not considered to be accurate); and areas where flood data (BFEs, floodplains, and regulatory floodways) are likely to be changed the most by a restudy.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: The NDSWC will prepare the final mapping needs list along with priorities.

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

Task 2-12 Refinement of Project Scope

Responsible Partner: NDSWC

Scope: Based on the discussion of mapping needs, NDSWC and FEMA Project Officer will finalize the areas to be included in the project (based on recommendations provided by the Project Team). Areas to be studied by detailed and approximate methods shall be identified. The following issues will be discussed and refined:

Review and Refinement of Flood Hazard Identification Methodologies:

The Project Team shall discuss the extent of riverine or coastal modeling required for the project. The research completed during the pre-Scoping Meeting phase shall be reviewed to determine the extent and applicability of previous modeling. Issues to be discussed include the following: models to be used from FEMA's approved models list; requirements for tie-ins to adjacent NFIP maps; areas where complex models might be required; and coordination on Coastal Issues.

Review of Proposed Paneling Scheme:

The scoping map shall be used to review the proposed paneling and scale scheme.

Review and Refinement of Base and Topographic Map Sources:
FEMA's base map specifications will be discussed. The discussion shall include the following topics: Base map source (i.e., locally developed data or DOQs meeting FEMA's minimum specifications) to be used for the project; Topographic and planimetric data sources; Coordination of countywide issues, if necessary; horizontal and vertical datums; and acquisition of the base map, if digital files are not available.

Finalization of Map Production and Database Options:

The proposed DFIRM format and optional features and data for the enhanced DFIRM Database (e.g., GIS data for watershed boundaries, stream reach hydrologic network structure, land use data, soil data, digital elevation certificates, photographs of structures) from the draft Scope of Project shall be reviewed, refined, and finalized.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: A digital Project Scope document *(FEMA/NSP will update the Scoping Tool files accordingly).*

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

Task 2-13 Community Partnership Agreements

Responsible Partner: NDSWC

Scope: *The county and communities (as listed in Section 1)* will be contacted and given the opportunity to sign a Memorandum of Agreement (MOA). MOAs will be obtained from as many affected communities as possible, within the Period of Performance of this Task Order. MOAs document the good faith efforts to collaboratively assess the community's needs, develop an appropriate Project Scope, and develop and adopt the resulting maps.

If these agreements cannot be signed at the Scoping meeting (for example, if they require city council approval), they are to be processed as soon as possible after the Scoping Meeting. MOA templates are provided in Appendix I, Subsections I.2.7 and I.2.8.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Signed Community Partner MOAs.

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

Task 2-14 Scoping Meeting Documentation

Responsible Partner: NDSWC

Scope: NDSWC shall prepare and distribute the meeting minutes, which shall include a list of all the participants and their respective assignments for the project, as well as the overall schedule for the project as discussed at the Scoping Meeting. The overall project schedule shall establish the basis for each Project Team member's assignment(s). Project Team members shall review their task assignments and provide feedback or comments. All changes to the proposed scope, schedule, and task assignments shall be coordinated with NDSWC and the other team members.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Scoping Meeting documents including attendees sign-in list, scoping meeting minutes, and the project schedule summarizing prioritized needs within the community. Priorities are established so that areas of greatest need can be addressed with the available funding. Backup or supplemental information used in writing this report should also be included.

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

Task 2-15 Statement of Work or Mapping Activity Statement Revision

Responsible Partner: NDSWC

Scope: NDSWC shall work closely with *their consultant* to develop or revise the Mapping Activity Statement (MAS) based on task assignments made during the Scoping Meeting and any subsequent changes. FEMA Regional Project Officer, FEMA Regional Contracting Officer, and FEMA HQ Program Manager shall review and approve the SOW or MAS before it is distributed to the Project Team members. The MAS shall follow the template provided in Appendix I, Subsection I.3.1 of the *Guidelines and Specifications for Flood Hazard Mapping Partners*.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: The deliverable shall be the revised Mapping Activity Statement or Statement of Work.

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

Task 2-16 Time and Cost Estimate Preparation

Responsible Partner: NDSWC

Scope: NDSWC shall be responsible for preparing time and cost estimates for all assigned tasks as well as coordinating and compiling time and cost estimates from other mapping partners. Based on the SOW or MAS, each mapping partner participating in the flood map project shall develop a time and cost estimate for assigned tasks. As part of these estimates, Project Team members also shall establish a schedule for their portion of the work within the schedule from the Scoping Meeting.

The time and cost estimates shall be prepared in accordance with the template for preparing time and cost estimates is provided in Appendix I, Subsection I.3.2 of the *Guidelines and Specifications for Flood Hazard Mapping Partners.*

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: *Documentation of time and cost estimate for the project.* Any backup or supplemental information will also be included upon request.

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

Task 2-17 Updates to Mapping Needs Update Support System (MNUSS) Database or its successor

Responsible Partner: NDSWC

Scope: Once the SOW or MAS is finalized, NDSWC shall update the MNUSS database to indicate that the needs included in the SOW or MAS are being addressed in an ongoing Flood Map Project. They shall also update the MNUSS database to add any new needs or revise existing needs identified during the scoping activities that will not be addressed by the current project. Additionally, they shall flag the needs that could not be verified during the research and community coordination activities as "not verified."

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Email from the MNUSS administrator stating that the MNUSS update was successful.

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

Task 2-18 Outreach, Coordination & Consultation

Responsible Partner: NDSWC

Scope: 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. *NDSWC has developed an outreach plan (located in the State Business Plan)* to accomplish the following: 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.

NDSWC shall also assist FEMA's Consultation Coordination Officer (CCO) in consultation and coordination efforts to address outreach activities to educate stakeholders about this Flood Map Project.

NDSWC shall also assist FEMA in the coordination and outreach with local officials by helping them contact the local officials and the State NFIP Coordinator and inform them that their community has been selected for a possible study. They shall also work with FEMA and local officials to inform the community and request information through meetings and other consultation activities.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: *The State's Business Case Plan is available upon request.*

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

Activity 3 - Field Surveys and Reconnaissance

Responsible Mapping Partner: NDSWC

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

In addition to the initial field reconnaissance, NDSWC shall conduct field surveys *as needed*, including obtaining channel and floodplain cross sections, identifying or establishing Temporary Bench Marks, and obtaining the physical dimensions of hydraulic and flood-control structures. NDSWC also shall coordinate with other Mapping Partners that are collecting topographic data under Activity 4.

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 Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the NDSWC shall make the following products available to FEMA:

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

Data Capture Standards can be downloaded from http://www.fema.gov/pdf/fhm/frm_gsana.pdf.

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

Activity 4 - Topographic Data Development

Responsible Mapping Partner: NDSWC

Scope: To supplement the field surveys conducted under Activity 3, the NDSWC shall obtain additional topographic data of the overbank areas of the flooding sources studied to delineate floodplain boundaries. Specifically, the *NDSWC shall collect the best available existing topographic data for flooding sources as listed in Table 1-1.* NDSWC also shall coordinate with other team members conducting field surveys under Activity 3. The contour interval and/or accuracy for the topographic data shall be compared to the

current FEMA requirements as documented in *Guidelines and Specifications for Flood Hazard Mapping Partners*.

If automated H&H is used, NDSWC also shall develop topographic maps and/or Digital Elevation Models for the subject flooding sources using the data collected under Activities 3 and 4. In addition, NDSWC shall address all concerns or questions regarding Activity 4 that are identified by FEMA/NSP during the independent QA/QC review under Activity 5.

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

Deliverable: Upon completion of topographic data collection and processing for *the flooding sources listed in Table 1-1*, NDSWC shall submit these data to FEMA/NSP for an independent QA/QC review under Activity 5. NDSWC shall submit the data 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*, NDSWC shall make the following products available to FEMA:

- Hardcopy topographic maps;
- Documentation of methodology and results;
- Mass points and breaklines data on CD-ROM;
- Digital work maps with contours;
- Checkpoint analyses to assess the accuracy of data, including Root Mean Square Error calculations to support vertical accuracy;
- Identification of remote-sensing data voids and methods used to supplement data voids;
- National Geodetic Survey (NGS) data sheets for Network Control Points used to control remote- sensing and ground surveys; and
- Metadata compliant with Federal Geographic Data Committee standards; and
- NSP Format Terrain Database or Intermediate Data Delivery consistent with the NSP Data Capture Standards.

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

Activity 5 - Independent QA/QC Review of Topographic Data

Responsible Mapping Partner: FEMA/NSP

Scope: FEMA/NSP shall review the mapping data generated by NDSWC under Activity 4 to ensure that these data are consistent with FEMA standards and standard engineering practice and are sufficient to prepare the DFIRM.

This review will be performed in a timely manner so as to eliminate impact to the project schedule.

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

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

- 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 6 – Hydrologic Analyses

Responsible Mapping Partner: NDSWC

Scope: The NDSWC shall perform hydrologic analyses as necessary for the detailed flooding source(s) identified in Table 1-1. The NDSWC shall calculate peak flood discharges for the 10-, 2-, 1-, and 0.2-percent-annual-chance storm events. These flood discharges will be the basis for subsequent hydraulic analyses under Activity 8. In addition, the NDSWC shall address all concerns or questions regarding Activity 6 that are identified by FEMA/NSP during the independent QA/QC review under Activity 7.

NDSWC shall perform approximate hydrologic analyses as necessary for the approximate flooding sources identified in Table 1-1, if applicable. The NDSWC shall calculate peak flood discharges for the 1-percent-annual-chance storm events.

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

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 the hydrologic modeling the flooding sources as listed in Table 1-1, NDSWC shall submit the results to FEMA/NSP for an independent QA/QC review under Activity 7. NDSWC 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 Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, NDSWC 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 copies of approximate hydrology results;*
- 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.

For GIS-based modeling, deliverables shall include all input and output data, intermediate data processing products, and GIS data layers.

- NSP Format Hydrology Database or Intermediate Data Delivery consistent with the NSP Data Capture Standards.

Appendix N may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsana.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 NDSWC 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.)

This review will be performed in a timely manner so as to eliminate impact to the project schedule.

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 Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, FEMA/NSP shall make the following products available to FEMA *and the NDSWC*:

- 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: NDSWC

Scope: NDSWC shall perform hydraulic analyses as necessary for the detailed flooding sources identified in Table 1-1. The modeling will include the 10-, 2-, 1-, and 0.2-percent-annual-chance events based on peak discharges computed under Activity 6.

Hydraulic analyses for approximate floodplains as listed in Table 1-1, if applicable, will be performed using automated routines or other methods as approved by the NDSWC. The analyses will be performed for the 1-percent-annual-chance events.

NDSWC 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.

NDSWC shall use the FEMA CHECK-2 or CHECK-RAS checking program to check the reasonableness of the hydraulic analyses. To facilitate the independent QA/QC review under Activity 9, the NDSWC shall provide explanations for unresolved messages from the CHECK-2 or CHECK-RAS program, as appropriate. In addition, NDSWC shall address all concerns or questions regarding Activity 8 that are identified by FEMA/NSP during the independent QA/QC review under Activity 9.

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

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 the flooding sources listed above (See Activity 8: Scope), NDSWC shall submit the results to FEMA/NSP for an independent QA/QC review under Activity 9. NDSWC 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 Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, NDSWC 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 RASPLOT program or similar software, if applicable;
- Digital results of the approximate hydraulic analyses, if applicable;

- 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-2 or 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.

For GIS-based modeling, deliverables include all input and output data, intermediate data processing products, GIS data layers, and final products in the format of the DFIRM database structure.

- NSP Format Hydraulic Database or Intermediate Data Delivery consistent with the NSP Data Capture Standards.

Appendix N may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsana.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 NDSWC 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.)

This review will be performed in a timely manner so as to eliminate impact to the project schedule.

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 Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, NSP/FEMA shall make the following products available to FEMA and the NDSWC:

- 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: NDSWC

Scope: NDSWC 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 as shown in Table 1-1. NDSWC 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, NDSWC shall incorporate the results of all effective Letters of Map Change (LOMCs) within the revised areas as appropriate. Also, NDSWC shall address all concerns or questions regarding Activity 10 that are identified by FEMA/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 the flooding sources as listed in Table 1-1, NDSWC shall submit the mapping to FEMA/NSP for an independent QA/QC review under Activity 11. NDSWC 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*, NDSWC 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*;

- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale;
- Documentation 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;
- An explanation for the use of existing topography for the studied reaches, if appropriate; and
- Intermediate Format Mapping Database or Intermediate Data Delivery consistent with the NSP Data Capture Standards.

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

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

Responsible Mapping Partner: NDSWC

Scope: NDSWC shall delineate the 1- and 0.2-percent-annual-chance floodplain boundaries and the regulatory floodway boundaries (if required) for all effective flooding sources. NDSWC 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, NDSWC shall evaluate the topographic data to determine if changes are significant enough to invalidate the floodplain boundary and regulatory floodway boundary redelineations. If so, NDSWC shall contact the FEMA Regional Project Officer identified in Section 11 of this MAS with a recommendation. In addition, NDSWC shall address all concerns or questions regarding Activity 10A that are identified by 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 *the flooding sources listed in Table 1-1*, NDSWC shall submit the mapping to FEMA/NSP for an independent QA/QC review under Activity 11. NDSWC 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*, NDSWC 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*;

- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale;
- Documentation 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.

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

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

Responsible Mapping Partner: NDSWC

Scope: NDSWC shall delineate the 1-percent-annual-chance floodplain boundaries for the flooding sources identified in Table 1-1. NDSWC shall use existing topographic data or the topographic data acquired under Activity 4 to delineate the floodplain boundaries on a digital work map. In addition, NDSWC shall address all concerns or questions regarding Activity 10B that are identified by FEMA/NSP during the independent QA/QC review under Activity 11.

NDSWC shall redelineate all approximate Zone A floodplain boundaries contained in the effective FIRM using the best available topographic data and/or aerial photography. Redelineation of Zone A's shall be in conformance with FEMA guidelines or other approaches as approved by the NDSWC.

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

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

Deliverables: Upon completion of floodplain mapping for the flooding sources as listed in Table 1-1, NDSWC shall submit the mapping to FEMA/NSP for an independent QA/QC review under Activity 11. NDSWC 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*, NDSWC shall make the following products available to FEMA:

- Digital work maps showing the new 1-percent-annual-chance floodplain boundary delineations and redelineations, flood insurance risk zone labels, and all applicable base map features;
- Written summary of the analysis methodologies;

- Any backup or supplemental information, including supporting calculations and assumptions for any computed 1-percent-annual-chance water-surface elevations used in the mapping required for the independent QA/QC review under Activity 11;
- Hardcopy and digital versions of input and output for any computer programs that were used;
- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale; and
- Documentation that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM;
- NSP Format Mapping Database or Intermediate Data Delivery consistent with the NSP Data Capture Standards.

If automated GIS-based models are applied, all input data, output data, intermediate data processing products, and GIS data layers shall be submitted.

Appendix N may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsana.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 NDSWC under Activities 10, 10A, and 10B to ensure that the results of the analyses performed are accurately represented, the work maps are consistent with current FEMA standards, 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*; and
- Review the metadata files to ensure they include all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*.

This review will be performed in a timely manner so as to eliminate impact to the project schedule.

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 Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners,* FEMA/NSP shall make the following products available to FEMA and the NDSWC:

- 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 12 - Base Map Acquisition

Responsible Mapping Partner: NDSWC

Scope: NDSWC shall provide the digital base map for the project. The required activities are as follows:

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

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

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

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

- Documentation that FEMA can use the digital base map.

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: NDSWC

Scope: For all flooding sources except those segments for which updated flood data will be developed under Activities 1 through 11, NDSWC shall convert the information shown on the effective FIRM and Flood Boundary Floodway Map (FBFM) panels for all incorporated and unincorporated areas of Grand Forks County to digital format in conformance with FEMA DFIRM specifications. *The redelineation will include adjustment of approximate zones utilizing best available aerial photography and/or topographic mapping as referenced in the North Dakota State Business Case Plan.* NDSWC shall use the base map acquired under Activity 12 for the conversion. NDSWC shall digitize 55 FIRM panels and 2 FBFM panels. NDSWC also shall incorporate the results of LOMCs issued by FEMA since the date of the current effective FIRM for each affected community.

Also, NDSWC shall address all comments and questions regarding Activity 13 that are identified by FEMA/NSP during the independent QA/QC review under Activity 13A.

NDSWC shall not digitize the flood theme for those segments of flooding sources for which updated flood data will be developed. Rather, NDSWC 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 DFIRM panels as noted above, NDSWC shall submit the panels to FEMA/NSP for an independent QA/QC review under Activity 11. In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, NDSWC 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*;
- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale; and
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM, 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: FEMA/NSP shall review the DFIRM panels submitted by NDSWC 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;
- Flood insurance risk zone designations are labeled properly;
- Road and floodplain relationships are maintained for all unrevised areas;
- DFIRM mapping files meet the GIS file and database format requirements specified in FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners* and conform to those requirements for content and attribution; and
- Metadata files describing the DFIRM data include the required information.

This review will be performed in a timely manner so as to eliminate impact to the project schedule.

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 Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, FEMA/NSP shall make the following products available to FEMA and the NDSWC:

- 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: NDSWC

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), NDSWC shall merge the digital floodplain data into a single, updated DFIRM. This work includes the tie-in of flood hazard information for areas that were not studied as part of the Flood Map Project documented in this MAS. NDSWC also shall tie in the revised and non-revised Flood Profiles, floodplain boundaries, and regulatory floodway boundaries with contiguous communities that were not studied as part of the Flood Map Project documented in this MAS. NDSWC 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 Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, NDSWC 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*;
- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale; and
- Dcoumentation 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 14A – DFIRM Production (Application of FEMA Graphics and Database Specifications)

Responsible Mapping Partner: NDSWC

Scope: NDSWC shall apply the final FEMA DFIRM graphics and database specifications to the DFIRM files produced under Activity 14. This work shall include adding all required annotation, line pattern, area shading, and map collar information (e.g., map borders, title blocks, legends, notes to users). NDSWC shall coordinate with FEMA and those Mapping Partners responsible for Activities 10, 10A, 10B, 13, and 14, as necessary, to resolve any problems that are identified during Activity 14A.

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

Deliverables: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, NDSWC 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*;
- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale; and
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM; and
- NSP Format DFIRM Database or Intermediate Data Delivery consistent with the NSP Data Capture Standards.

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

Activity 14B – Independent QA/QC Review of DFIRM Product Meeting FEMA Graphics and Database Specifications

Responsible Mapping Partner: FEMA/NSP

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

- All required DFIRM features are accurately and legibly labeled and follow the examples shown in the FEMA DFIRM specifications. This includes all flood insurance risk zones, BFEs, cross sections, studied streams, mapped political entities, and all roads within and adjacent to the 1-percent-annual-chance floodplains;
- All DFIRM features are correctly symbolized with the appropriate symbol, line pattern, or area shading and follow the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- All map collar information is complete, correct, and follows the requirements specified in *Guidelines and Specifications for Flood Hazard Mapping Partners*;

- DFIRM mapping files are in one of the GIS file and database formats specified in FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners* and conform to those specifications for content and attribution;
- DFIRM database files are in one of the database formats specified in FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners* and conform to those specifications for content and attribution;
- Metadata files describing the DFIRM data include all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*; and
- The FIS report is prepared in the FEMA Countywide Format as documented in Appendix J of *Guidelines and Specifications for Flood Hazard Mapping Partners.*

This review will be performed in a timely manner so as to eliminate impact to the project schedule.

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

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

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

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

Activity 15 - Preliminary DFIRM and FIS Report Distribution

Responsible Mapping Partners: NDSWC and FEMA/NSP

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

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

Preliminary FIS Report Preparation: The NDSWC shall prepare the FIS report in the FEMA Countywide Format following the FEMA requirements specified in Appendix J of *Guidelines and Specifications for Flood Hazard Mapping Partners.*

Final QA/QC Review of Preliminary DFIRM and FIS Report: The NSP shall perform a final QA/QC review of the Preliminary DFIRM and FIS report, including all data tables, Flood Profiles, and other

components of the FIS report. The QA/QC review procedures shall be consistent with the *Guidelines and Specifications for Flood Hazard Mapping Partners.*

Discrepancy Resolution: The NDSWC shall work with FEMA/NSP as appropriate to resolve discrepancies identified during the final QA/QC review.

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

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

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

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

Deliverables: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners* and the requirements documented in Section 1 and Appendix A of the FEMA *Document Control Procedures Manual,* the NDSWC shall make the products listed below available to FEMA.

- Preliminary transmittal letters shall be prepared. These letters and any additional letters requested by FEMA shall be prepared in accordance with the current version of the FEMA *Document Control Procedures Manual;*
- Preliminary copies of the DFIRM and FIS report, including all new or updated data tables and Flood Profiles, shall be prepared;
- Preliminary copies of the DFIRM and FIS report shall be mailed to the Chief Executive Officer (CEO) and floodplain administrator of each affected community, all other Project Team members, the State NFIP Coordinator, the FEMA Regional Office, and others as directed by FEMA;
- Preliminary SOMAs, prepared in accordance with FEMA requirements, shall be mailed with the Preliminary copies of the DFIRM and FIS report when appropriate;
- Revised DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*, shall be provided on CD-ROM;
- Revised DFIRM database files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*, shall be provided on CD-ROM;
- Revised metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*, shall be provided on CD-ROM; and
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM shall be provided.

Activity 16 - Post-Preliminary Processing

Responsible Mapping Partners: NDSWC and FEMA/NSP

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

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

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

Resolution of Appeals and Protests: The NDSWC shall support FEMA in reviewing and resolving appeals and protests received during the 90-day appeal period. For each appeal and protest, the following activities shall be conducted as appropriate:

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

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

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

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

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

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

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

Revalidation Letter Processing. The *FEMA/NSP shall prepare* revalidation letters to the community CEOs and floodplain administrators to notify the affected communities about LOMCs for which determinations will remain in effect after the DFIRM and FIS report become effective. *FEMA/NSP shall deliver these revalidation letters to NDSWC for distribution to community CEOs and floodplain* administrators.

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

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

Deliverables: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners* and the requirements documented in Section 1 and Appendix A of the FEMA *Document Control Procedures Manual*, the NSP and NDSWC shall make the following products available to FEMA:

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

- Transmittal letters for the printed DFIRM and FIS report;
- LOMC Revalidation Letters if appropriate; and
- Complete, organized archived technical and administrative support data.

Activity 17—Outreach

Task 17 – Outreach and Coordination

Responsible Entity: NDSWC

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 responsible Mapping Partner 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; and
- 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 MAS. In the event of any contradictions between the MAS and the standards, the standards shall control.

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

- Documentation detailing the outreach and coordination activities; and
- 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	Mapping Activities															
	1	2	3	4	5	6, 6A	7, 7A	8	9	10, 10A, 10B	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 on June 1, 2005, and will be completed no later than November 30, 2006. The mapping activities may be terminated at the option of FEMA or NDSWC in accordance with the provisions of the Partnership Agreement dated October 18, 2004.

Section 4—Funding/Cost-Sharing

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

Table 5-1. Applicable Standards for Project Activities

Applicable Standards	Activities															
	1	2	3	4	5	6, 6A	7, 7A	8	9	10, 10A, 10B	11	12	13, 13A	14, 14A	15	16
Guidelines and Specifications for Flood Hazard Mapping Partners, April 2003	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
American Congress on Surveying and Mapping Procedures	X	X	X	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, *Photogrammetric Mapping* (USACE), July 1, 2002	X	X	X	X	X											
Engineer Manual 1110-2-1003, *Hydrographic Surveys* (USACE), January 1, 2002	X	X	X													
"Numerical Models Accepted by FEMA for NFIP Usage," Updated April 2003	X	X				X	X	X	X							
Content Standard for Digital Geospatial Metadata (Federal Geographic Data Committee), 1998	X	X		X	X					X	X	X	X	X	X	X
Document Control Procedures Manual, 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
1	Pre-Scoping	Volume 1, and Appendix I
2	Scoping	Volume 1, and Appendix I
3	Field Surveys and Reconnaissance	Volume 1, Section 1.4 (specifically Subsection 1.4.2.1) Appendix A, Sections A.4, A.5, A.6, A.7, and A.8 Appendix F, Section F.3 Appendices B, C, M, and N
4	Topographic Data Development	Volume 1, Section 1.4 (specifically Subsection 1.4.2.1) Appendix A, Sections A.2 , A.3, A.7, and A.8 Appendix M and N
5	Independent QA/QC Review of Topographic Data	Volume 1, Section 1.4 (specifically Subsections 1.4.1 and 1.4.2.1) Appendix A, Sections A.2, A.3, A.7 (specifically Subsection A.7.5), and A.8 (specifically Subsection A.8.6) Appendix M
6	Hydrologic Analyses	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4) Appendix A, Section A.4 Appendix C, Sections C.1 and C.7 Appendices E, F, G, H, M, and N
6A	Coastal Hazard Analyses	Volume 1, Section 1.4 (specifically Subsection 1.4.2.2) Appendix A, Section A.4 Appendices B, D, M, and N

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

Activity Number	Activity Description	Applicable Volume, Section/Subsection, and Appendix
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
7A	Independent QA/QC Review of Coastal Hazard Analyses	Volume 1, Section 1.4 (specifically Subsection 1.4.1) Appendix A, Section A.4 Appendices B, D, and M
8	Hydraulic Analyses	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4) Appendix A, Section A.4 (specifically Subsection A.4.7) Appendix C, Sections C.3 and C.7 Appendices B, E, F, G, H, M, and N
9	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, M, and N

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
10A	Floodplain Mapping (Redelineation Using Effective Flood Profiles and Updated Topographic Data)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.3) Appendix C, Section C.6 (specifically Subsection C.6.1.3) Appendices K, L, M, and N
10B	Floodplain Mapping (Refinement or Creation of Zone A)	Volume 1, Section 1.4 (specifically Subsection 1.4.2.3) Appendix C, Sections C.4 and C.6 Appendices K, L, and M
11	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
12	Base Map Acquisition and Preparation	Volume 1, Section 1.3 (specifically Subsection 1.3.1.8) and 1.4 (specifically Subsections 1.4.3.1 and 1.4.3.2) Appendix A, Section A.1 (specifically Subsection A.1.1)
13	DFIRM Production (Non-Revised Areas)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2, 1.4.2.3, and 1.4.3.2) Appendices K, L, and M
13A	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

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

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 – Grand Forks County

ACTIVITIES	RESPONSIBLE PARTNER(S)	DATE DUE
Activity 1 – Pre-Scoping	NDSWC, FEMA/NSP	4/30/05
Activity 2 – Scoping	NDSWC, FEMA/NSP	5/30/05
Activity 3 – Field Surveys and Reconnaissance	NDSWC	n/a
Activity 4 – Topographic Data Development	NDSWC	n/a
Activity 5 – Independent QA/QC Review of Topographic Data	FEMA/NSP	n/a
Activity 6 – Hydrologic Analyses	NDSWC	11/1/05
Activity 7 – Independent QA/QC Review of Hydrologic Analyses	FEMA/NSP	11/15/05
Activity 8 – Hydraulic Analyses	NDSWC	12/15/05
Activity 9 – Independent QA/QC Review of Hydraulic Analyses	FEMA/NSP	1/1/06
Activity 10 – Floodplain Mapping (Detailed Riverine or Coastal Analysis)	NDSWC	n/a
Activity 10A – Floodplain Mapping (Redelineation Using Effective Flood Profiles and Updated Topographic Data)	NDSWC	2/1/06
Activity 10B – Floodplain Mapping (Refinement or Creation of Zone A)	NDSWC	2/1/06
Activity 11 – Independent QA/QC Review of Floodplain Mapping (Revised Areas)	FEMA/NSP	2/15/06
Activity 12 – Base Map Acquisition	NDSWC	11/1/05
Activity 13 – DFIRM Production (Non-Revised Areas)	NDSWC	3/1/06
Activity 13A – Independent QA/QC Review of DFIRM Production (Non-Revised Areas)	FEMA/NSP	4/1/06
Activity 14 – DFIRM Production (Merging Revised and Non-Revised Information)	NDSWC	5/1/06
Activity 14A – DFIRM Production (Application of DFIRM Graphics and Database Specifications)	NDSWC	7/15/06
Activity 14B – Independent QA/QC Review of DFIRM Product Meeting FEMA Graphics and Database Specifications	FEMA/NSP	8/15/06
Activity 15 – Preliminary DFIRM and FIS Report Distribution	NDSWC, FEMA/NSP	9/15/06
Activity 16 – Post-Preliminary Processing	NDSWC, FEMA/NSP	6/30/07
Activity 17 – Outreach	NDSWC	~~n/a~~ on-going J. Lin

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

ACTIVITIES	RESPONSIBLE PARTNER(S)	DATE DUE
Activity 1 – Pre-Scoping	NDSWC, FEMA/NSP	
Activity 2 – Scoping	NDSWC, FEMA/NSP	
Activity 3 – Field Surveys and Reconnaissance	NDSWC	
Activity 4 – Topographic Data Development	NDSWC	
Activity 5 – Independent QA/QC Review of Topographic Data	FEMA/NSP	
Activity 6 – Hydrologic Analyses	NDSWC	
Activity 7 – Independent QA/QC Review of Hydrologic Analyses	FEMA/NSP	
Activity 8 – Hydraulic Analyses	NDSWC	
Activity 9 – Independent QA/QC Review of Hydraulic Analyses	FEMA/NSP	
Activity 10 – Floodplain Mapping (Detailed Riverine or Coastal Analysis)	NDSWC	
Activity 10A – Floodplain Mapping (Redelineation Using Effective Flood Profiles and Updated Topographic Data)	NDSWC	
Activity 10B – Floodplain Mapping (Refinement or Creation of Zone A)	NDSWC	
Activity 11 – Independent QA/QC Review of Floodplain Mapping (Revised Areas)	FEMA/NSP	
Activity 12 – Base Map Acquisition	NDSWC	
Activity 13 – DFIRM Production (Non-Revised Areas)	NDSWC	
Activity 13A – Independent QA/QC Review of DFIRM Production (Non-Revised Areas)	FEMA/NSP	
Activity 14 – DFIRM Production (Merging Revised and Non-Revised Information)	NDSWC	

ACTIVITIES	RESPONSIBLE PARTNER(S)	DATE DUE
Activity 14A – DFIRM Production (Application of DFIRM Graphics and Database Specifications)	NDSWC	
Activity 14B – Independent QA/QC Review of DFIRM Product Meeting FEMA Graphics and Database Specifications	FEMA/NSP	
Activity 15 – Preliminary DFIRM and FIS Report Distribution	NDSWC, FEMA/NSP	
Activity 16 – Post-Preliminary Processing	NDSWC, FEMA/NSP	
Activity 17 - Outreach	NDSWC	

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 or Coastal Analysis), Activity 10A (Floodplain Mapping {Redelineation Using Effective Flood Profiles and Updated Topographic Data}), and Activity 10B (Floodplain Mapping {Refinement or Creation of Zone A})

- A Registered Professional Engineer shall certify hydrologic and hydraulic analyses and data in accordance with 44 CFR 65.6(f);
- A Registered Professional Engineer or Licensed Land Surveyor shall certify topographic information in accordance with 44 CFR 65.5(c); and
- 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}), and Activity 10B (Floodplain Mapping {Refinement or Creation of Zone A}), Activity 11 (Independent QA/QC Review of Floodplain Mapping {Revised Areas}), Activity 13 (DFIRM Production {Non-Revised Areas}), Activity 14 (DFIRM Production {Merging Revised and Non-Revised Information}), and Activity 14A (DFIRM Production {Application of FEMA Graphics and Database Specifications})

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

Activity 12 (Base Map Acquisition and Preparation)

- A community official or responsible party shall provide written certification that the digital data meet FEMA minimum standards and specifications.
- The responsible Mapping Partner shall provide documentation that the digital base map can be used by FEMA. Please note that uploading base map data to the MIP does not constitute agreement that the digital base map can be used by FEMA. Documentation that the digital base map can be used by FEMA will still be required.

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

Section 8—Technical Assistance and Resources

Project Team members may obtain copies of FEMA-issued LOMCs, archived engineering backup data, and data collected as part of the FEMA Mapping Needs Assessment Process from the NSP, who may be contacted by telephone at 720-514-1110 or by facsimile at 720-514-1120.

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

NDSWC intends to use the services of *Ulteig Engineers(Bismarck, ND)* as a contractor for the Flood Map Project documented in this MAS. NDSWC 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—Financial Reporting

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

NDSWC will meet with the NSP and/or FEMA *as needed* to review the progress of the project. These meetings will alternate between FEMA's Regional Office and the NDSWC office.

NDSWC will provide to the NSP regular updates for each of the mapping activity statements. This may, at FEMA's discretion be a spreadsheet template to be completed or the Monitoring Information on Contracted Studies (MICS) system may be used. It may include dollars spent, hours spent, and percent complete of each major Flood Map Project activity (e.g., field survey, terrain, hydrology) on a county basis. Specific reporting requirements will be finalized as a part of the scoping meeting.

Section 11—Points of Contact

The points of contact for this Flood Map Project are John Liou, the FEMA Regional Project Officer; Shandi Teltschik, the North Dakota Map Mod Coordinator for the NDSWC; 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, John Liou.

In addition, the NSP is required to coordinate project issues with the responsible Mapping Partner that 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 may include:

- Meetings, teleconferences, and videoconferences with FEMA and other Project Team members *as needed*;
- Telephone conversations with FEMA and other Project Team members *as needed*;
- Updates to the MICS, MNUSS database, and other FEMA status information systems in accordance with requirements in Volumes 1 and 3 of *Guidelines and Specifications for Flood Hazard Mapping Partners*; and
- E-mail, facsimile transmissions, and letters, as required.

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

Dale L. Frink, P.E.
State Engineer
North Dakota State Water Commission

3 June 2005
Date

Shandi Teltschik
North Dakota Map Mod Coordinator
Project Manager
North Dakota State Water Commission

Date

John Liou
Regional Project Officer
Federal Emergency Management Agency, Region VIII

6/8/5
Date

for Kevin Long
Project Officer
Federal Emergency Management Agency, Headquarters

6/8/05
Date

Dave Jula
Michael Baker Jr., Inc.
National Service Provider

Date