The Wisconsin Dept. of Natural Resources
Cooperating Technical Partner
Mapping Activity Statement

Agreement WNDR 2001-01 - Hydrologic and Hydraulic Analyses and Redelineation of Floodplain Boundaries Using Updated Topographic Data

In accordance with the Cooperating Technical Partner (CTP) Memorandum of Agreement dated September 1, 2001, between The Wisconsin Dept. of Natural Resources and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement WDNR 2001-01 is as follows:

1. **Objective and Scope:** The objective of this Mapping Activity is to develop detailed floodplain and floodway mapping in Brown County and all incorporated Cities and Villages contained within Brown County. floodplain mapping will be completed for 46 stream segments completed for Hydrologic and Hydraulic analyses which have been completed which consist of approximately 50 linear miles of flooding. The flooding sources are included in an attached list.

   GIS-based hydrologic and hydraulic mapping techniques will be applied to develop GIS data sets in support of the automation or semi-automation of floodplain mapping.

2. **Period of Performance**:
   This Mapping Activity will begin on October 1, 2001 and will be completed no later than September 30, 2002. This Mapping Activity may be terminated at the option of FEMA or The Wisconsin Dept. of Natural Resources in accordance with the provisions of the September 14, 2001, CTP Memorandum of Agreement.
   The period of performance will be in accordance with Agreement Article II.

3. **Funding/Cost-Sharing:**

4. **Standards:** The following standards and documents are relevant to this Mapping Activity:
   - Wisconsin Administrative Code, NR116.07, 'Standards for hydrologic and hydraulic studies'.
   - Detailed hydrologic and hydraulic analyses and floodplain mapping will follow the standards set forth in FEMA 37, *Guidelines and Specifications for Study Contractors* (January 1995), and Title 44 of the Code of Federal Regulations (CFR), Part 65. FEMA 37 is available at FEMA's Web site at http://www.fema.gov/mit/tsd/EN_reg.htm. Title 44 of the CFR is available at FEMA's Web site at www.access.gpo.gov/cgi-bin/cfrassemble.cgi?title=199944.
   - Computer models used for hydrologic and/or hydraulic analyses will meet the requirements of 44 CFR 65.6(a)(6) and be on FEMA's *Numerical Models Accepted by FEMA for NFIP Usage* (http://www.fema.gov/mit/tsd/EN_modl.htm).
   - Topographic mapping used to delineate floodplains and floodways will be of adequate scale and topographic definition to provide reasonable accuracy. Planimetric features will

be compatible with the base map (with respect to horizontal accuracy) selected by FEMA for Digital FIRM production. Topographic mapping taken from aerial photogrammetry or surveys will comply with the requirements of Appendix 4 of FEMA 37. The selection of the topographic mapping source to be used will be coordinated with the FEMA Regional Project Officer prior to analysis and mapping.

- Any levee or dike systems to be shown on the community's FIRM as providing protection from the 1% annual chance flood will comply with the requirements of 44 CFR 65.10. Chapter 7 of FEMA 37 provides guidelines for evaluating levee and dike systems.
- Flood elevations and floodplain and floodway boundaries will reasonably tie in to non-revised information in accordance with 44 CFR 65.6(a)(2).
- The floodway will be established in accordance with 44 CFR 65.7, as well as any applicable state and/or community requirements.
- Digital mapping will comply with the requirements of Chapter 9 and Appendix 7 of FEMA 37.
- Automated data processing and modeling algorithms for GIS-based modeling and mapping will be documented and provided to FEMA to ensure that they are consistent with the standards outlined above. Digital data sets (such as elevation, basin, or land use data) will be documented and provided to FEMA for approval prior to performing the analysis to ensure that they meet minimum requirements. If non-commercial (i.e., custom developed) software is used for the analysis, then full user documentation, technical algorithm documentation, and the software will be provided to FEMA for review prior to performing the scope of work.
- Digital Elevation Models (DEMs) and field survey data will meet vertical accuracy requirements contained in Appendix 4 of FEMA 37.

5. **Products:** The Wisconsin Dept. of Natural Resources will make available items outlined in Chapter 11 of FEMA 37 in the Technical Support Data Notebook (TSDN) format. These include:
   - Digital 1% and 0.2% annual chance floodplain and floodway boundaries;
   - Digital profiles of the 1%, and 0.2% annual chance water-surface elevations, representing existing conditions;
   - Flood Insurance Study (FIS) report;
   - Floodway data tables;
   - Digital copies of all hydrologic and hydraulic modeling (input and output files); and
   - All back-up data used in the analyses or mapping.
   - Digitized topographic work maps depicting the revised 1% and 0.2% annual chance floodplain boundaries, floodway limits, cross sections, BFEs, and Flood Insurance Zone Rate labels.
   - Form 5 of *Revisions to National Flood Insurance Program Maps, Application/Certification Forms and Instructions* (MT-2).

   For GIS-based modeling and mapping, The Wisconsin Dept. of Natural Resources will deliver all digital input and output data, intermediate data processing products, GIS data layers, and final products in the format of the Digital Flood Insurance Rate Map (DFIRM) database structure.

6. Schedule and Milestones:

Milestone 1 (Scoping Phase): Products for the first milestone to be provided to the FEMA Project Officer include:

- Annotated copies of effective FIRMs depicting limits of proposed study.
- Documentation of the proposed source of topographic data, scale, contour interval, source/methodology, date of survey/data collection, vertical and horizontal datums, and comparison of planimetric features with the DFIRM base map selected by FEMA for DFIRM production.
- A written summary of the initial data research, proposed analysis methodologies, and a work plan.
- Documentation of digital data sets to be used (such as elevation, basin, and land use data). Full user documentation, technical description of methodologies and algorithms, and a copy of the source codes and custom-developed software applications for GIS-based modeling will also be provided.

Milestone 2 (Final Products): Final products to be provided to the FEMA Project Officer include:

- The completed TSDN and accompanying data containing the information outlined in Section 5 of this Mapping Activity Statement.
- A QA/QC report documenting the results of the independent review of all computational and data processing procedures.
- Digital topographic work maps depicting 1% and 0.2% annual chance floodplain boundaries, floodway limits, BFEs, and Flood Insurance Rate Zone labels, presented on an Aerial Photo base of Brown County.
- Completed Form 5 of *Revisions to National Flood Insurance Program Maps, Application/Certification Forms and Instructions* (MT-2).
- Final products will be made available to FEMA in accordance with the Period of Performance defined in Section 2 of this Mapping Activity Statement.

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7. Certification:

The following certifications apply to this Mapping Activity (as appropriate):

- Hydrologic and/or hydraulic analyses and data will be certified by a registered Professional Engineer or Licensed Land Surveyor in accordance with 44 CFR 65.6(f).
- Topographic information will be certified by a registered Professional Engineer or Licensed Land Surveyor in accordance with 44 CFR 65.5(c).
- Any levee systems to be accredited as discussed in Section 4 of this Mapping Activity Statement will be certified in accordance with 44 CFR 65.10(e).

8. Technical Assistance and Resources:

The Wisconsin Dept. of Natural Resources may obtain copies of FEMA-issued Letters of Map Change (LOMCs), archived engineering back-up data, and data collected as part of the Mapping Needs Assessment Process from FEMA's Mapping Coordination Contractor (MCC). Specific technical and programmatic support may

be provided through FEMA's MCC; such assistance should be requested through the FEMA MCC Project Officer specified in Section 12 of this Mapping Activity Statement. FEMA will provide all digitized current FIS information to WDNR to provide the basis for a 'match' to existing data.

The Wisconsin Dept. of Natural Resources may also consult with the FEMA 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 sub-contractors, and GIS-based engineering and modeling training.

9. **Contractors:** Procurement of subcontractors using Federal funds provided as part of this Mapping Activity will comply with the requirements of 44 CFR 13.36.

10. **Quality Assurance/Quality Control (QA/QC) Procedures:** FEMA, through the Mapping Coordination Contract will undertake internal QC reviews to ensure that the products described under Section 5 of this Mapping Activity Statement conform with the standards outlined under Section 4 of this Mapping Activity Statement.

    For GIS-based, automated mapping, QA/QC activities should ensure automated calculations are reasonable and in compliance with standard flood mapping approaches. The Wisconsin Dept. of Natural Resources will document internal QA/QC procedures to ensure all calculations and data processing were reviewed.

    Reporting: Reporting requirements will be in accordance with Agreement Articles V & VI.

11. **Points of Contact:** The FEMA Regional Project Officer is Ken Hinterlong or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. If it is necessary, the assistance of FEMA's MCC should be requested through the FEMA MCC Project Officer.

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

Robert Watson, Watershed Management,
Wisconsin Department of Natural Resources

9/13/01
Date

Terry Reuss Fell, Chief
Hazard Identification and Risk Assessment Branch
FEMA, Region V

09-21-01
Date

Bill Blanton, MCC Project Officer,
Federal Emergency Management Agency*

Date

* MCC PO approval is required only for Mapping Activity Statements in which the MCC is programmed to participate.