Washington County
Federal Emergency Management Agency
Cooperating Technical Community
Mapping Activities Statement

Task Agreement #2 - Floodplain Mapping

In accordance with the CTC Memorandum of Agreement dated September 12, 2000 between Washington County and the Federal Emergency Management Agency, Task Agreement #2 is as follows:

1. **Objective and Scope:** The objective of this agreement is to develop floodplain and floodway mapping in Washington County. Analyses will be done in accordance with the results of the Washington County Landlocked Basin Pilot Project. Mapping analyses will be completed in the following order: a) basins with known flooding problems, b) landlocked DNR basins in the Brown's Creek, Carnelian Marine, Valley Branch, Marine on St.Croix, and South Washington Watersheds; and finally all remaining unmapped landlocked basins in Washington County as funding allows. Based on analysis of over 400 DNR protected waters basins, we estimate that approximately 10-15 percent of those basins need to be mapped. Delineations may be provided with the standards developed by the Landlocked Basin Pilot Project and may be used by FEMA to revise the Flood Insurance Study dated November 17, 1981 Insurance Study (FIS) and Flood Insurance Rate Maps (FIRM) for Washington County.

   GIS-based mapping techniques will be applied to develop digital GIS data sets in support of the automation or semi-automation of floodplain mapping. All input data and intermediate data processing steps will be developed as required for generating model input parameters and data structures, as well as for processing and visualization of model output data and results. Data collection and processing will be stored in Digital FIRM database structures.

2. **Period of Performance:** This Task Agreement will begin on September 28, 2001 and end no later than September 29, 2003. This Task Agreement may be terminated at the option of FEMA or Washington County in accordance with the provisions of the September 12, 2000 CTC Memorandum of Agreement.

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

4. **Standards:** The following standards and documents are relevant to this Task Agreement:

- Methodology used as a result of the Washington County Landlocked Basin Study Project.
- Floodplain mapping must 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 website at http://www.fema.gov/mit/tsd/EN_reg.htm.
- Computer models used for hydrologic and/or hydraulic analyses must 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 floodplain and floodway boundaries must be of adequate scale and topographic definition to provide reasonable accuracy. Planimetric features must be compatible with the base map (with respect to horizontal accuracy) to be used by FEMA for Digital FIRM production. Topographic mapping taken from aerial photogrammetry or surveys must comply with the requirements of Appendix 4 of FEMA 37. The selection of the topographic mapping source to be used must be coordinated with the FEMA 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 must comply with the requirements of 44 CFR 65.10. Chapter 7 of FEMA 37 provides guidelines for evaluating levee systems.
- Flood elevations and floodplain and floodway boundaries must reasonably tie-in to non-revised information in accordance with 44 CFR 65.6(a)(6).
- The floodway must be established in accordance with 44 CFR 65.7, as well as any applicable state requirements.
- Digital mapping must 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 must be documented and submitted to ensure they are consistent with the standards outlined above. Digital data sets (such as elevation, basin, or land use data) must be documented and submitted to FEMA for approval prior to performing the analysis to ensure they meet minimum requirements. If non-commercial (ie, custom developed) software is used for the analysis, then full user documentation, technical algorithm documentation, and the software must be submitted to FEMA for review prior to performing the scope of work.
- Digital Elevation Models (DEMs) and field survey data must meet vertical accuracy requirements contained in Appendix 4 of FEMA 37.

5. **Deliverables:** Mapping analyses will be completed in the following order: a) basins with known flooding problems, b) landlocked DNR basins in the Brown's Creek, Carnelian Marine, Valley Branch, Marine on St.Croix, and South Washington Watersheds and finally all remaining unmapped landlocked basins in Washington County as funding allows. Washington County shall deliver all items outlined in Chapter 11 of FEMA 37 in the Technical Support Data Notebook (TSDN) format. These include, but are not limited to, digital floodplain and floodway boundaries;

water surface elevations; FIS report; and all backup data used in the analyses or mapping. For GIS-based mapping, Washington County must deliver all digital input and output data, intermediate data processing products, GIS data layers, and final deliverables in the format of the DFIRM database structure.

6. Schedule and Milestones:

Milestone 1: Tasks to be completed for the first milestone include:

- Final selection of flooding sources and limits to be studied.
- Mapping analyses will be completed in the following order: a) basins with known flooding problems, b) landlocked DNR basins in the Brown's Creek, Carnelian Marine, Valley Branch, Marine on St.Croix, and South Washington Watersheds and finally all remaining unmapped landlocked basins in Washington County as funding allows.
- Initial data research to compile information such as effective FIS modeling; historical flood data, gage records, and highwater marks; copies of historical Letters of Map Change (LOMCs); and "as built" construction plans. Guidance for such research is contained in Chapter 3 of FEMA 37.
- Selection of suitable topographic data for floodplain delineation, including comparison of planimetric features (such as roads) to the base map planned for use by FEMA for Digital FIRM production.
- Selection of analysis methodologies.

Deliverables for the first milestone include:

- Annotated copies of effective FIRMs depicting limits of proposed study.
- Documentation of the proposed source of topographic data, including: scale; contour interval; source/methodology; date of survey/data collection; vertical and horizontal datums; and comparison of planimetric features with the Digital FIRM base map planned for use by FEMA.
- 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 a copy of the source codes and custom-developed software applications for GIS-based mapping must also be submitted.

- **Milestone 2 (Final Deliverables):** Mapping analyses will be completed in the following order: a) basins with known flooding problems, b) landlocked DNR basins in the Brown's Creek, Carnelian Marine, Valley Branch, Marine on St.Croix, and South Washington Watersheds and finally all remaining unmapped landlocked basins in Washington County as funding allows. Tasks to be completed for the second milestone include completion of the floodplain mapping;

compilation of the FIS report; and completion of the TSDN. The final deliverable will be the completed TSDN and accompanying data. A QA/QC report documenting the results of the independent review of all computational and data processing procedures were independently reviewed must also be submitted. Final deliverables will be submitted to the FEMA Project Officer no later than January 1, 2002.

7. **Certification:** The following certifications apply to this Task Agreement (as appropriate):
   - Mapping analyses and data must be certified by a registered professional engineer or licensed land surveyor in accordance with 44 CFR 65.6(f).
   - Topographic information must be certified by a registered professional engineer or licensed land surveyor in accordance with 44 CFR 65.5(c).

8. **Technical Assistance and Resources:** Washington County may obtain copies of LOMCs, archived engineering backup data, and data collected as part of the Five-Year Mapping Needs Assessment from FEMA's Mapping Coordination Contractor (MCC) as part of the initial data research. Copies of FEMA's rule-based engineering software packages such as CHECK-2 to evaluate HEC-2 models and FISPLOT, an automated flood profile plotting software package, may also be obtained through the MCC. The MCC may be contacted at 1-877 FEMA MAP. General technical and programmatic information can be downloaded from FEMA's Flood Hazard Mapping website (www.fema.gov/mit/tsd/). Specific technical and programmatic support may be provided through FEMA's MCC; such assistance should be requested through the FEMA Project Officer specified in Section 12 of this agreement.

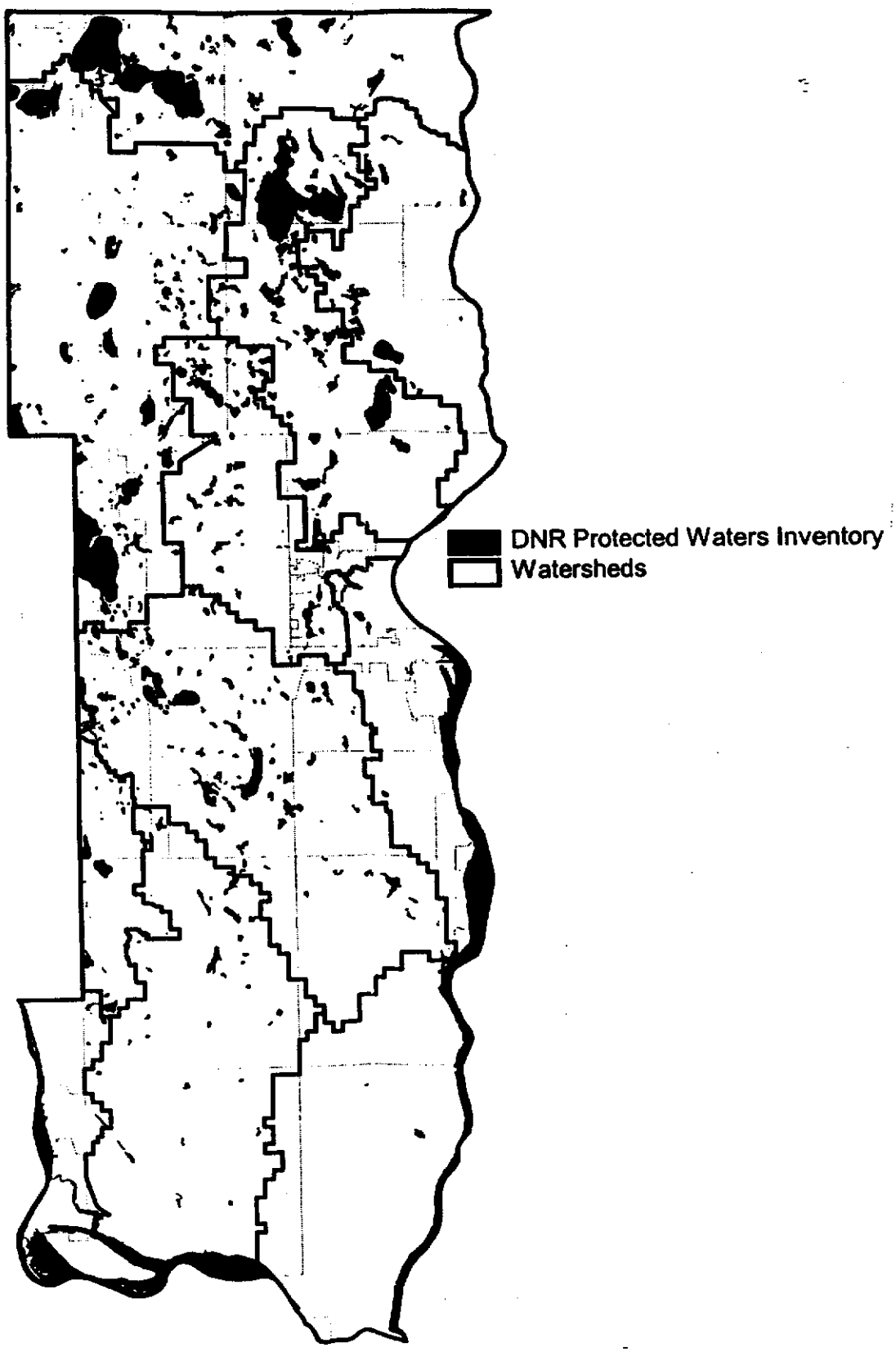
   Washington County may also consult with the FEMA Project Officer to request support in the areas of: recommended data sources, recommended digital data accuracy standards, assessing vertical data accuracy, data collection methods or sub-contractors, GIS-based engineering and modeling training.

   The Minnesota Department of Natural Resources will review all technical analysis and mapping data

9. **Subcontractors:** Procurement of subcontractors using Federal funds provided as part of this Task Agreement must comply with the requirements of 44 CFR 13.36.

10. **QA/QC Procedures:** The Quality Assurance procedures outlined in Chapter 10 of the *Guidelines and Specifications for Study Contractors* should be followed during the development floodplain mapping. Analyses and mapping should be independently reviewed for compliance with the standards defined in Section 4 of this agreement. This independent review will be conducted by a qualified contractor during Milestone 2.

    For GIS-based, automated modeling, QA/QC tasks should ensure automated calculations are reasonable and in compliance with standard flood modeling and



Approx 400 Basins

mapping approaches. Washington County must document internal QA/QC procedures to FEMA to ensure all calculations and data processing were reviewed.

11. **Reporting:** Reporting requirements will in accordance with the *Guidelines and Specifications for Study Contractors.*

12. **Points of Contact:** The FEMA Project Officer is Ken Hinterlong and the CTC's Project Manager is Ann Pung-Terwedo, or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities.

This party has caused this Task Agreement to be executed by its duly authorized representative.

Ann Pung-Terwedo
CTC Partner's authorized representative

Ann Pung-Terwedo
Date 8-29-01

Terry Reuss Fell

Sept. 13, 2001
date

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