



Lycoming County
Federal Emergency Management Agency
Cooperating Technical Community
Mapping Activity Statement

Agreement CTC00-1- Hydrologic and Hydraulic Analyses and Floodplain Mapping

In accordance with the Cooperating Technical Community (CTC) Memorandum of Agreement dated October 25, 1999 between the Lycoming County and the Federal Emergency Management Agency (FEMA), Agreement CTC00-1 is as follows:

- 1. Objective and Scope:** The objective of this Mapping Activity is to develop detailed hydrologic and hydraulic analyses and floodplain and floodway mapping in Lycoming County. Hydrologic analyses will be completed for approximately 200 square miles of drainage area and hydraulic analysis and floodplain mapping for approximately 14 linear miles of flooding as shown on the attached map which includes the following flooding sources: Loyalsock and Muncy Creeks. Loyalsock Creek will be studied from the end of the ongoing study in Gamble Township through the Village of Barbours, just north of Days Roundtop (approximately 4 miles.) Muncy Creek will be studied from the upstream edge of backwater flooding on the West Branch Susquehanna River through the Village of Picture Rocks (approximately 10 miles.) The hydraulic model will be created using Hec-Ras 2.2 or higher and will include the 10-, 50-, 100- and 500-year profiles as well as a floodway determination. Existing contour data, supplemented by field surveyed bridge sections and wet sections will be utilized. The hydrology developed for Loyalsock Creek by the U.S.G.S. under contract to FEMA will be used for this project. A gage analysis and regression equation comparison will be done to verify the hydrology on Muncy Creek.
- 2. Period of Performance:**
The period of performance will be in accordance with Agreement Article II.

Funding/Cost-Sharing: FEMA will provide \$35,000 towards this effort and Lycoming County, together with Project Impact Partners, will provide in-kind services estimated at approximately \$10,000. County scope and involvement includes hiring a study contractor, providing digital geographic base data, providing digital 5-foot contour interval topography, reviewing Study Contractor work maps with local officials, assisting with data gathering field work (GPS elevations) and digitizing completed work maps for FEMA.

Flood Hazard Mapping Scope-of-Work:

County H& H Study Contractor	\$25,000
County EDPS and GIS Work	\$10,000
County & Project Impact Partners In-Kind	<u>\$10,000</u>
Total	\$45,000

- 3. Standards:** The following standards and documents are relevant to this Mapping Activity:

- 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.
 - 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 floodplain and floodway boundaries 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) to be used 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 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 systems.
 - Flood elevations and floodplain and floodway boundaries will reasonably tie in to non-revised information in accordance with 44 CFR 65.6(a)(6).
 - The floodway will be established in accordance with 44 CFR 65.7, as well as any applicable state requirements.
 - Digital mapping will comply with the requirements of Chapter 9 and Appendix 7 of FEMA 37.
 - Digital Elevation Models (DEMs) and field survey data will meet vertical accuracy requirements contained in Appendix 4 of FEMA 37.
4. **Products:** Lycoming County will make available the 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 10%, 2%, 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.

5. Schedule and Milestones:

Milestone 1 (Scoping Phase): Upon completion, products for the first milestone will be provided to the FEMA Project Officer. These 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.
- Copies of topographic maps depicting proposed cross section locations.

Milestone 2 (Hydrology Phase): Upon completion, products for the second milestone will be provided to the FEMA Project Officer. This includes draft hydrologic analyses in accordance with the TSDN format.

Milestone 3 (Hydraulics Phase): Upon completion, products for the third milestone will be provided to the FEMA Project Officer. These include the hydraulic models and sample floodplain mapping in accordance with TSDN format.

Milestone 4 (Final Products): Upon completion, final products will be provided to the FEMA Project Officer. These 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

Final products will be made available in accordance with the Period of Performance described in Section 2 of this Mapping Activity Statement.

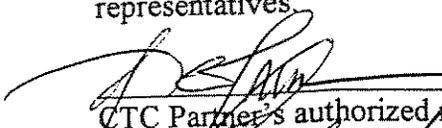
- 6. Certification:** The following certifications apply to this Mapping Activity (as appropriate):
 - Hydrologic and/or hydraulic analyses and data will be certified by a registered professional engineer or licensed land surveyor in accordance with 44 CFR 65.6(f).
 - Topographic information will be certified by a registered professional engineer or licensed land surveyor in accordance with 44 CFR 65.5(c).
 - If fill is to be considered in the mapping to raise land areas above the 1% annual chance flood elevation, certification of the fill will be provided in accordance with 44 CFR 65.5(a)(6) by the community's NFIP permit official, a registered professional engineer, or a licensed land surveyor.
 - 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).
- 7. Technical Assistance and Resources:** Lycoming County may obtain copies of LOMCs, archived engineering back-up data, and data collected as part of the Five-Year Mapping Needs Assessment from FEMA's Mapping Coordination Contractor (MCC)/Technical Evaluation Contractor (TEC) 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/TEC. The MCC/TEC may be contacted at 1-877-FEMA-MAP (336-2627). General technical and programmatic information can be downloaded from FEMA's Flood Hazard Mapping web site (www.fema.gov/mit/tsd). Specific technical and programmatic support may be provided through FEMA's MCC/TEC; such assistance should

be requested through the FEMA Project Officer specified in Section 12 of this Mapping Activity Statement.

Lycoming 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.

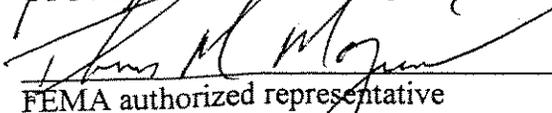
8. **Subcontractors:** Procurement of subcontractors using Federal funds provided as part of this Mapping Activity will comply with the requirements of 44 CFR 13.36.
9. **Quality Assurance/Quality Control (QA/QC) Procedures:** The QA/QC procedures outlined in Chapter 10 of the *Guidelines and Specifications for Study Contractors* should be followed during the development of the hydrologic and hydraulic analyses and floodplain mapping. Analyses and mapping should be independently reviewed for compliance with the standards defined in Section 4 of this Mapping Activity Statement. Dewberry & Davis will conduct this independent review.
10. **Reporting:** Reporting requirements will be in accordance with Agreement Articles V & VI.
11. **Points of Contact:** The FEMA Project Officer is Erik Rourke and the Lycoming County Project Manager is William Harris, or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities.

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



CTC Partner's authorized representative

3 Aug 2000
date



FEMA authorized representative

8/11/2000
date

State representative*

date

* In States where statutory and/or regulatory requirements require the State's review and/or approval of new flood hazard data, the State will be a signatory to a community's Mapping Activity Statement.