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**City of Harrisburg, Pennsylvania  
Cooperating Technical Partner  
Mapping Activity Statement**

**Agreement CTP 2001-01 - Hydrologic Analyses**

In accordance with the Cooperating Technical Partner (CTP) Memorandum of Agreement dated, September 19, 2001 between the City of Harrisburg and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement CTP2001-01 is as follows:

- 1. Objective and Scope:** The objective of this Mapping Activity is to develop detailed hydrologic analyses for approximately 20 square miles of Paxton Creek within the City of Harrisburg and Susquehanna and Lower Paxton Townships. HEC-HMS or Geo-HMS will be utilized to calculate the existing flows for the 5-, 10-, 25-, 50-, 100- and 500-year events. Land use, hydrologic soil group, and topographic data will be obtained from existing GIS databases in digital format, or digitized, as necessary. Digitizing is anticipated to input land use and hydrologic soil group data and additional efforts are anticipated to merge the existing two-foot digital topographic database within the City of Harrisburg with the twenty-foot contour intervals available for the remaining portion of the watershed.

**Period of Performance:** The period of performance will be in accordance with Agreement Article II.

- 2. Funding/Cost-Sharing:** FEMA will provide \$30,000 for this effort and the City of Harrisburg will provide in-kind services for contract monitoring and existing data estimated at \$0.
- 3. Standards:** The following standards and documents are relevant to this Mapping Activity:
  - Detailed hydrologic analyses 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](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](http://www.access.gpo.gov/cgi-bin/cfrassemble.cgi?title=199944).
  - Computer models used for hydrologic 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](http://www.fema.gov/mit/tsd/EN_modl.htm)).
  - 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.
  - Digital Elevation Models (DEMs) and field survey data will meet vertical accuracy requirements contained in Appendix 4 of FEMA 37.
- 4. Products:** The City of Harrisburg will make available items outlined in Chapter 11 of FEMA 37 in the Technical Support Data Notebook (TSDN) format. These include:
  - Digital copies of all hydrologic modeling (input and output files); and
  - All back-up data used in the analyses or mapping.

August 27, 2001

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## 5. Schedule and Milestones:

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

- 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 (Hydrology Phase):** Products for the second milestone to be provided to the FEMA Project Officer include draft hydrologic analyses in accordance with the TSDN format.

**Milestone 3 (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.

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):

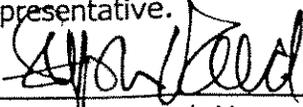
- Hydrologic and/or hydraulic analyses and data will be certified by a registered Professional Engineer or Licensed Land Surveyor in accordance with 44 CFR 65.6(f).
- Topographic information will be certified by a registered Professional Engineer or Licensed Land Surveyor in accordance with 44 CFR 65.5(c).
- If fill is to be considered in the mapping to raise land areas to or 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: The City of Harrisburg 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). The MCC may be contacted at 1-877 FEMA MAP (1-877-336-2627). General technical and programmatic information, such as FEMA 265, the

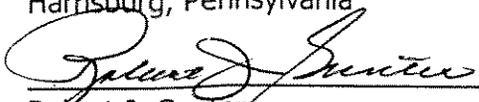
Quick-2 computer program, and the MT-2 forms, can be downloaded from FEMA's Flood Hazard Mapping Web site ([www.fema.gov/mit/tsd/](http://www.fema.gov/mit/tsd/)). Specific technical and programmatic support may be provided through FEMA's MCC; such assistance should be requested through the FEMA MCC Project Officer specified in Section 12 of this Mapping Activity Statement.

- 8. Contractors:** The City of Harrisburg will use Skelly & Loy to complete this work. Skelly & Loy are currently under contract to the City to complete a watershed study for the subject study area. 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 City of Harrisburg 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. Additionally, an independent review for compliance with these standards will be undertaken by Dewberry & Davis.
- 10. Reporting:** Reporting requirements will be in accordance with Agreement Articles V & VI.
- 11. Points of Contact:** The FEMA Regional Project Officer is Erik Rourke, and the CTP Project Manager is Daniel Leppo 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 representative.

  
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Stephen R. Reed, Mayor  
Harrisburg, Pennsylvania

9-13-01  
Date

  
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Robert J. Gunter,  
Division Director  
Federal Emergency Management Agency

9/19/01  
Date