

# FLOOD INSURANCE STUDY

## FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 1



## HENDERSON COUNTY, KENTUCKY AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
*CORYDON, CITY OF	210400
HENDERSON, CITY OF	210109
HENDERSON COUNTY UNINCORPORATED AREAS	210286
ROBARDS, CITY OF	210447
*No Special Flood Hazard Areas Identified	



# FEMA

**REVISED:**

11/17/2015

**PRELIMINARY**

FLOOD INSURANCE STUDY NUMBER  
21101CV000B

Version Number 2.3.3.0

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**Exhibits**

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Adams Street Tributary	01 P
Audubon Park Creek	02 P
Canoe Creek	03-05 P
East Fork Canoe Creek	06-08 P
Elam Ditch	09-10 P
Elam Ditch Tributary 1	11 P
Elam Ditch Tributary 2	12 P
Elam Ditch Tributary 3	13 P
Highway 60 Tributary	14 P
Kimsey Lane Left Tributary	15 P
Kimsey Lane Right Tributary	16 P
Middle Canoe Creek	17 P
North Fork Canoe Creek	18-19 P
North Fork Canoe Creek Tributary	20-21 P
Ohio River	22-27 P
Sellers Ditch/ Upper Canoe Creek	28-29 P
Sugar Creek	30 P
Tiger Ditch	31-32 P
Tiger Ditch Tributary 1	33 P
Wilson Creek	34-36 P

**Published Separately**

Flood Insurance Rate Map (FIRM)

# FLOOD INSURANCE STUDY REPORT HENDERSON COUNTY, KENTUCKY

## SECTION 1.0 – INTRODUCTION

### 1.1 The National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a voluntary Federal program that enables property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.

For decades, the national response to flood disasters was generally limited to constructing flood-control works such as dams, levees, sea-walls, and the like, and providing disaster relief to flood victims. This approach did not reduce losses nor did it discourage unwise development. In some instances, it may have actually encouraged additional development. To compound the problem, the public generally could not buy flood coverage from insurance companies, and building techniques to reduce flood damage were often overlooked.

In the face of mounting flood losses and escalating costs of disaster relief to the general taxpayers, the U.S. Congress created the NFIP. The intent was to reduce future flood damage through community floodplain management ordinances, and provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for the protection.

The U.S. Congress established the NFIP on August 1, 1968, with the passage of the National Flood Insurance Act of 1968. The NFIP was broadened and modified with the passage of the Flood Disaster Protection Act of 1973 and other legislative measures. It was further modified by the National Flood Insurance Reform Act of 1994 and the Flood Insurance Reform Act of 2004. The NFIP is administered by the Federal Emergency Management Agency (FEMA), which is a component of the Department of Homeland Security (DHS).

Participation in the NFIP is based on an agreement between local communities and the Federal Government. If a community adopts and enforces floodplain management regulations to reduce future flood risks to new construction and substantially improved structures in Special Flood Hazard Areas (SFHAs), the Federal Government will make flood insurance available within the community as a financial protection against flood losses. The community's floodplain management regulations must meet or exceed criteria established in accordance with Title 44 Code of Federal Regulations (CFR) Part 60.3, *Criteria for land Management and Use*.

SFHAs are delineated on the community's Flood Insurance Rate Maps (FIRMs). Under the NFIP, buildings that were built before the flood hazard was identified on the community's FIRMs are generally referred to as "Pre-FIRM" buildings. When the NFIP was created, the U.S. Congress recognized that insurance for Pre-FIRM buildings would be prohibitively expensive if the premiums were not subsidized by the Federal Government. Congress also recognized that most of these floodprone buildings were built by individuals who did not have sufficient knowledge of the flood hazard to make informed decisions. The NFIP requires that full actuarial rates reflecting the complete flood risk be charged on all buildings constructed or substantially improved on or after

the effective date of the initial FIRM for the community or after December 31, 1974, whichever is later. These buildings are generally referred to as “Post-FIRM” buildings.

**1.2 Purpose of this Flood Insurance Study Report**

This Flood Insurance Study (FIS) report revises and updates information on the existence and severity of flood hazards for the study area. The studies described in this report developed flood hazard data that will be used to establish actuarial flood insurance rates and to assist communities in efforts to implement sound floodplain management.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive than the minimum Federal requirements. Contact your State NFIP Coordinator to ensure that any higher State standards are included in the community’s regulations.

**1.3 Jurisdictions Included in the Flood Insurance Study Project**

This FIS Report covers the entire geographic area of Henderson County, Kentucky.

The jurisdictions that are included in this project area, along with the Community Identification Number (CID) for each community and the 8-digit Hydrologic Unit Codes (HUC-8) sub-basins affecting each, are shown in Table 1. The Flood Insurance Rate Map (FIRM) panel numbers that affect each community are listed. If the flood hazard data for the community is not included in this FIS Report, the location of that data is identified.

The location of flood hazard data for participating communities in multiple jurisdictions is also indicated in the table.

Jurisdictions that have no identified SFHAs as of the effective date of this study are indicated in the table. Changed conditions in these communities (such as urbanization or annexation) or the availability of new scientific or technical data about flood hazards could make it necessary to determine SFHAs in these jurisdictions in the future.

**Table 1: Listing of NFIP Jurisdictions**

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Corydon, City of <sup>1</sup>	210400	05140202	21101C0330E	
Henderson, City of	210109	05140202	21101C0089E, 21101C0093E, 21101C0095E, 21101C0209E, 21101C0216E, 21101C0217E, 21101C0226E, 21101C0227F, 21101C0228F, 21101C0229F, 21101C0231F, 21101C0232E, 21101C0233F, 21101C0236F, 21101C0237F, 21101C0241E	

**Table 1: Listing of NFIP Jurisdictions**

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Henderson County (Unincorporated Areas)	210286	05110005, 05140201, 05140202	21101C0020E, 21101C0040E, 21101C0045E, 21101C0065E, 21101C0070E, 21101C0080E, 21101C0089E, 21101C0090E, 21101C0093E, 21101C0095E, 21101C0105E, 21101C0110E, 21101C0115E, 21101C0120E, 21101C0140E, 21101C0145E, 21101C0160E, 21101C0180E, 21101C0185E, 21101C0190E, 21101C0195E, 21101C0205E, 21101C0209E, 21101C0210E, 21101C0215E, 21101C0216E, 21101C0217E, 21101C0218E, 21101C0219E, 21101C0227F, 21101C0228F, 21101C0229F, 21101C0231F, 21101C0232E, 21101C0233F, 21101C0234E, 21101C0236F, 21101C0237F, 21101C0238E, 21101C0239E, 21101C0241E, 21101C0242E, 21101C0243E, 21101C0244E, 21101C0255E, 21101C0260E, 21101C0265E, 21101C0270E, 21101C0280E, 21101C0285E, 21101C0290E, 21101C0295E, 21101C0310E, 21101C0320E, 21101C0330E, 21101C0335E, 21101C0340E, 21101C0345E, 21101C0352E, 21101C0355E, 21101C0356E, 21101C0357E, 21101C0360E, 21101C0365E, 21101C0370E, 21101C0380E, 21101C0385E, 21101C0390E, 21101C0395E, 21101C0405E, 21101C0410E	
Robards, City of	210447	05110005, 05140202	21101C0360E, 21101C0370E	

<sup>1</sup> No Special Flood Hazard Areas Identified

## 1.4 Considerations for using this Flood Insurance Study Report

The NFIP encourages State and local governments to implement sound floodplain management programs. To assist in this endeavor, each FIS Report provides floodplain data, which may include a combination of the following: 10-, 4-, 2-, 1-, and 0.2-percent annual chance flood elevations (the 1% annual chance flood elevation is also referred to as the Base Flood Elevation (BFE)); delineations of the 1% annual chance and 0.2% annual chance floodplains; and 1% annual chance floodway. This information is presented on the FIRM and/or in many components of the FIS Report, including Flood Profiles, Floodway Data tables, Summary of Non-Coastal Stillwater Elevations tables, and Coastal Transect Parameters tables (not all components may be provided for a specific FIS).

This section presents important considerations for using the information contained in this FIS Report and the FIRM, including changes in format and content. Figures 1, 2, and 3 present information that applies to using the FIRM with the FIS Report.

- Part or all of this FIS Report may be revised and republished at any time. In addition, part of this FIS Report may be revised by a Letter of Map Revision (LOMR), which does not involve republication or redistribution of the FIS Report. Refer to Section 6.5 of this FIS Report for information about the process to revise the FIS Report and/or FIRM.

It is, therefore, the responsibility of the user to consult with community officials by contacting the community repository to obtain the most current FIS Report components. Communities participating in the NFIP have established repositories of flood hazard data for floodplain management and flood insurance purposes. Community map repository addresses are provided in Table 31, “Map Repositories,” within this FIS Report.

- New FIS Reports are frequently developed for multiple communities, such as entire counties. A countywide FIS Report incorporates previous FIS Reports for individual communities and the unincorporated area of the county (if not jurisdictional) into a single document and supersedes those documents for the purposes of the NFIP.

The initial Countywide FIS Report for Henderson County became effective on August 5, 2010. Refer to Table 28 for information about subsequent revisions to the FIRMs.

- Selected FIRM panels for the community may contain information (such as floodways and cross sections) that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels. In addition, former flood hazard zone designations have been changed as follows:

<u>Old Zone</u>	<u>New Zone</u>
A1 through A30	AE
B	X (shaded)
C	X (unshaded)

- FEMA does not impose floodplain management requirements or special insurance ratings based on Limit of Moderate Wave Action (LiMWA) delineations at this time. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. If the LiMWA is shown on the FIRM, it is being provided by FEMA as information only. For communities that do adopt Zone VE building standards in the area defined by the

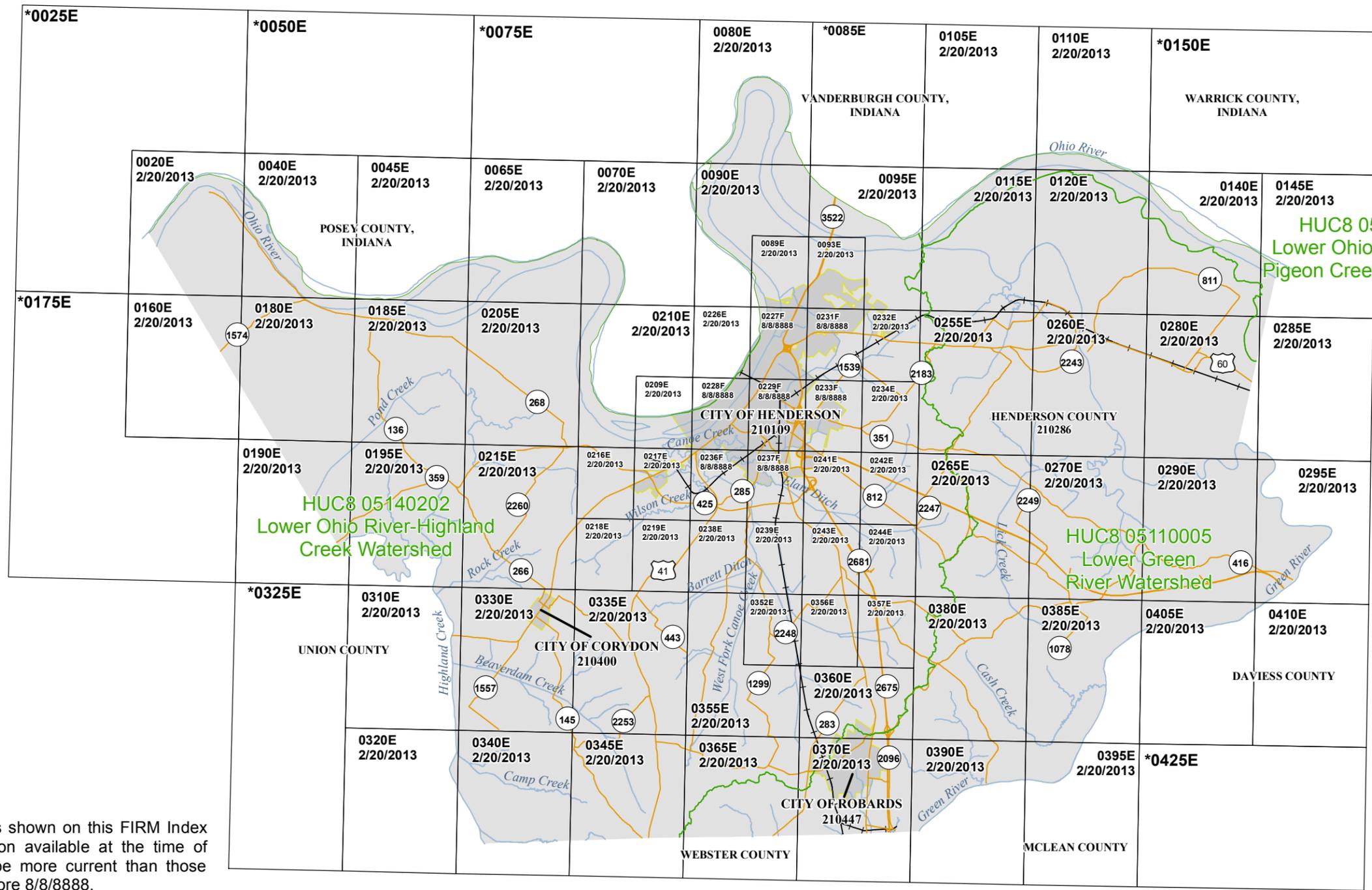
LiMWA, additional Community Rating System (CRS) credits are available. Refer to Section 2.5.4 for additional information about the LiMWA.

The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Visit the FEMA Web site at <http://www.fema.gov> or contact your appropriate FEMA Regional Office for more information about this program.

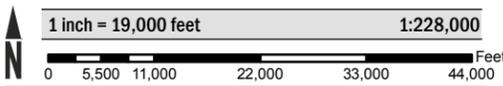
- Previous FIS Reports and FIRMs may have included levees that were accredited as providing protection from the 1% annual chance flood based on the information available and the mapping standards of the NFIP at that time. For FEMA to continue to accredit the identified levees with providing protection from the base flood, the levees must meet the criteria of the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10), titled “Mapping of Areas Protected by Levee Systems.”

Since the status of levees is subject to change at any time, the user should contact the appropriate agency for the latest information regarding levees presented in Table 9 of this FIS Report. For levees owned or operated by the U.S. Army Corps of Engineers (USACE), information may be obtained from the USACE national levee database. For all other levees, the user is encouraged to contact the appropriate local community.

- FEMA has developed a *Guide to Flood Maps* (FEMA 258) and online tutorials to assist users in accessing the information contained on the FIRM. These include how to read panels and step-by-step instructions to obtain specific information. To obtain this guide and other assistance in using the FIRM, visit the FEMA Web site at <http://www.fema.gov>.



**ATTENTION:** The corporate limits shown on this FIRM Index are based on the best information available at the time of publication. As such, they may be more current than those shown on FIRM panels issued before 8/8/8888.

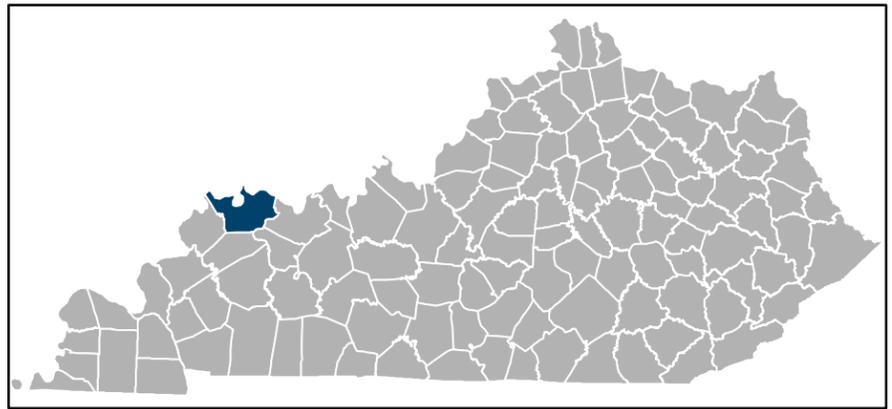
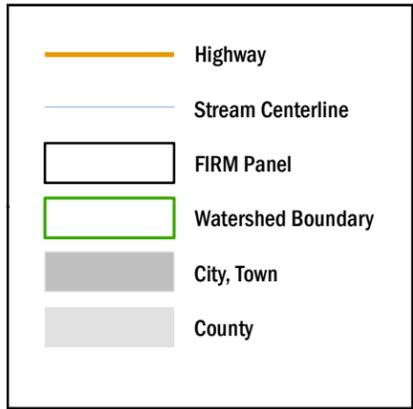


Map Projection:  
State Plane Lambert Conformal Conic,  
Kentucky Zone 1600; North American Datum 1983

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

[HTTP://MSC.FEMA.GOV](http://MSC.FEMA.GOV)

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION



**NATIONAL FLOOD INSURANCE PROGRAM**  
FLOOD INSURANCE RATE MAP INDEX

HENDERSON COUNTY, KENTUCKY and Incorporated Areas

PANELS PRINTED:  
0020, 0040, 0045, 0065, 0070, 0080, 0089, 0090, 0093, 0095, 0105, 0110, 0115, 0120, 0140, 0145, 0160, 0180, 0185, 0190, 0195, 0205, 0209, 0210, 0215, 0216, 0217, 0218, 0219, 0226, 0227, 0228, 0229, 0231, 0232, 0233, 0234, 0236, 0237, 0238, 0239, 0241, 0242, 0243, 0244, 0255, 0260, 0265, 0270, 0280, 0285, 0290, 0295, 0310, 0320, 0330, 0335, 0340, 0345, 0352, 0355, 0356, 0357, 0360, 0365, 0370, 0380, 0385, 0390, 0395, 0405, 0410



FEMA

MAP NUMBER  
21101CIND0B

MAP REVISED  
PRELIMINARY

\*PANEL NOT PRINTED - AREA OUTSIDE COUNTY BOUNDARY

**Figure 2: FIRM Notes to Users**

## **NOTES TO USERS**

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates, refer to Table 28 in this FIS Report.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

PRELIMINARY FIS REPORT: FEMA maintains information about map features, such as street locations and names, in or near designated flood hazard areas. Requests to revise information in or near designated flood hazard areas may be provided to FEMA during the community review period, at the final Consultation Coordination Officer's meeting, or during the statutory 90-day appeal period. Approved requests for changes will be shown on the final printed FIRM.

The map is for use in administering the NFIP. It may not identify all areas subject to flooding, particularly from local drainage sources of small size. Consult the community map repository to find updated or additional flood hazard information.

BASE FLOOD ELEVATIONS: For more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables within this FIS Report. Use the flood elevation data within the FIS Report in conjunction with the FIRM for construction and/or floodplain management.

Coastal Base Flood Elevations are not applicable to this FIS project.

FLOODWAY INFORMATION: Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the FIS Report for this jurisdiction.

FLOOD CONTROL STRUCTURE INFORMATION: Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4.3 "Non-Levee Flood Protection Measures" of this FIS Report for information on flood control structures for this jurisdiction.

**PROJECTION INFORMATION:** The projection used in the preparation of the map was Kentucky State Plane Single Zone. The horizontal datum was North American Datum of 1983 (NAD83). Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

**ELEVATION DATUM:** Flood elevations on the FIRM are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

*NGS Information Services  
NOAA, N/NGS12  
National Geodetic Survey  
SSMC-3, #9202  
1315 East-West Highway  
Silver Spring, Maryland 20910-3282  
(301) 713-3242*

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community listed in Table 31 of this FIS Report.

**BASE MAP INFORMATION:** Base map information shown on the FIRM was provided by the U.S. Geological Survey, National Geodetic Survey, National Atlas, Kentucky Transportation Cabinet (KYTC), Kentucky GeoNet, U.S. Army Corps of Engineers, Federal Emergency Management Agency, and the National Agriculture Imagery Program (NAIP). Ortho imagery was provided by NAIP in 2014, has a 1 meter ground resolution. For information about base maps, refer to Section 6.2 “Base Map” in this FIS Report.

The map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map.

Corporate limits shown on the map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after the map was published, map users should contact appropriate community officials to verify current corporate limit locations.

## **NOTES FOR FIRM INDEX**

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Henderson County, Kentucky, corresponding revisions to the FIRM Index will be incorporated within the FIS Report to reflect the effective dates of those panels. Please refer to Table 28 of this FIS Report to determine the most recent FIRM revision date for each community. The most recent FIRM panel effective date will correspond to the most recent index date.

## **SPECIAL NOTES FOR SPECIFIC FIRM PANELS**

This Notes to Users section was created specifically for Henderson County, Kentucky, effective 8/8/8888.

COASTAL BARRIER RESOURCES SYSTEM (CBRS): This section is not applicable to this FIS project.

LIMIT OF MODERATE WAVE ACTION: This section is not applicable to this FIS project.

ACCREDITED LEVEE: This section is not applicable to this FIS project.

PROVISIONALLY ACCREDITED LEVEE: This section is not applicable to this FIS project.

FLOOD RISK REPORT: A Flood Risk Report (FRR) may be available for many of the flooding sources and communities referenced in this FIS Report. The FRR is provided to increase public awareness of flood risk by helping communities identify the areas within their jurisdictions that have the greatest risks. Although non-regulatory, the information provided within the FRR can assist communities in assessing and evaluating mitigation opportunities to reduce these risks. It can also be used by communities developing or updating flood risk mitigation plans. These plans allow communities to identify and evaluate opportunities to reduce potential loss of life and property. However, the FRR is not intended to be the final authoritative source of all flood risk data for a project area; rather, it should be used with other data sources to paint a comprehensive picture of flood risk.

**Figure 3: Map Legend for FIRM**

**SPECIAL FLOOD HAZARD AREAS:** *The 1% annual chance flood, also known as the base flood or 100-year flood, has a 1% chance of happening or being exceeded each year. Special Flood Hazard Areas are subject to flooding by the 1% annual chance flood. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. See note for specific types. If the floodway is too narrow to be shown, a note is shown.*



Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (Zones A, AE, AH, AO, AR, A99, V and VE)

- Zone A The flood insurance rate zone that corresponds to the 1% annual chance floodplains. No base (1% annual chance) flood elevations (BFEs) or depths are shown within this zone.
- Zone AE The flood insurance rate zone that corresponds to the 1% annual chance floodplains. Base flood elevations derived from the hydraulic analyses are shown within this zone.
- Zone AH The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the hydraulic analyses are shown at selected intervals within this zone.
- Zone AO The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the hydraulic analyses are shown within this zone.
- Zone AR The flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- Zone A99 The flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or flood depths are shown within this zone.
- Zone V The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.
- Zone VE Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown within this zone as static whole-foot elevations that apply throughout the zone.



Regulatory Floodway determined in Zone AE.

**OTHER AREAS OF FLOOD HAZARD**



Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.



Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined based on future-conditions hydrology. No base flood elevations or flood depths are shown within this zone.



Area with Reduced Flood Risk due to Levee: Areas where an accredited levee, dike, or other flood control structure has reduced the flood risk from the 1% annual chance flood. See Notes to Users for important information.

**OTHER AREAS**

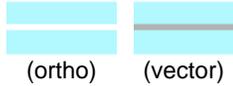


Zone D (Areas of Undetermined Flood Hazard): The flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible



Unshaded Zone X: Areas determined to be outside the 0.2% annual chance flood hazard

**FLOOD HAZARD AND OTHER BOUNDARY LINES**



Flood Zone Boundary (white line on ortho-photography-based mapping; gray line on vector-based mapping)



Limit of Study

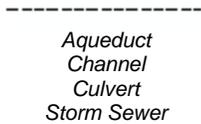


Jurisdiction Boundary

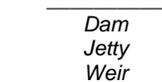


Limit of Moderate Wave Action (LiMWA): Indicates the inland limit of the area affected by waves greater than 1.5 feet

**GENERAL STRUCTURES**



Channel, Culvert, Aqueduct, or Storm Sewer



Dam, Jetty, Weir



Levee, Dike, or Floodwall



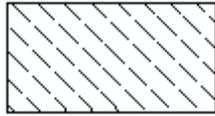
Bridge

**COASTAL BARRIER RESOURCES SYSTEM (CBRS) AND OTHERWISE PROTECTED AREAS (OPA):** *CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas. See Notes to Users for important information.*



**CBRS AREA**  
09/30/2009

Coastal Barrier Resources System Area: Labels are shown to clarify where this area shares a boundary with an incorporated area or overlaps with the floodway.



**OTHERWISE PROTECTED AREA**  
09/30/2009

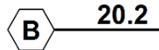
Otherwise Protected Area

**REFERENCE MARKERS**

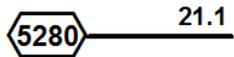


River mile Markers

**CROSS SECTION & TRANSECT INFORMATION**



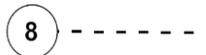
Lettered Cross Section with Regulatory Water Surface Elevation (BFE)



Numbered Cross Section with Regulatory Water Surface Elevation (BFE)



Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)



Coastal Transect



Profile Baseline: Indicates the modeled flow path of a stream and is shown on FIRM panels for all valid studies with profiles or otherwise established base flood elevation.



Coastal Transect Baseline: Used in the coastal flood hazard model to represent the 0.0-foot elevation contour and the starting point for the transect and the measuring point for the coastal mapping.



Base Flood Elevation Line

**ZONE AE**  
(EL 16)

Static Base Flood Elevation value (shown under zone label)

**ZONE AO**  
(DEPTH 2)

Zone designation with Depth

**ZONE AO**  
(DEPTH 2)  
(VEL 15 FPS)

Zone designation with Depth and Velocity

## BASE MAP FEATURES

Missouri Creek

River, Stream or Other Hydrographic Feature



Interstate Highway



U.S. Highway



State Highway



County Highway

MAPLE LANE

Street, Road, Avenue Name, or Private Drive if shown on Flood Profile



Railroad



Horizontal Reference Grid Line



Horizontal Reference Grid Ticks



Secondary Grid Crosshairs

Land Grant

Name of Land Grant

7

Section Number

R. 43 W. T. 22 N.

Range, Township Number

**4276<sup>000m</sup>E**

Horizontal Reference Grid Coordinates (UTM)

**365000 FT**

Horizontal Reference Grid Coordinates (State Plane)

**80° 16' 52.5"**

Corner Coordinates (Latitude, Longitude)

## **SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS**

### **2.1 Floodplain Boundaries**

To provide a national standard without regional discrimination, the 1% annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2% annual chance (500-year) flood is employed to indicate additional areas of flood hazard in the community.

Each flooding source included in the project scope has been studied and mapped using professional engineering and mapping methodologies that were agreed upon by FEMA and Henderson County as appropriate to the risk level. Flood risk is evaluated based on factors such as known flood hazards and projected impact on the built environment. Engineering analyses were performed for each studied flooding source to calculate its 1% annual chance flood elevations; elevations corresponding to other floods (e.g. 10-, 4-, 2-, 0.2-percent annual chance, etc.) may have also been computed for certain flooding sources. Engineering models and methods are described in detail in Section 5.0 of this FIS Report. The modeled elevations at cross sections were used to delineate the floodplain boundaries on the FIRM; between cross sections, the boundaries were interpolated using elevation data from various sources. More information on specific mapping methods is provided in Section 6.0 of this FIS Report.

Depending on the accuracy of available topographic data (Table 23), study methodologies employed (Section 5.0), and flood risk, certain flooding sources may be mapped to show both the 1% and 0.2% annual chance floodplain boundaries, regulatory water surface elevations (BFEs), and/or a regulatory floodway. Similarly, other flooding sources may be mapped to show only the 1% annual chance floodplain boundary on the FIRM, without published water surface elevations. In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% annual chance floodplain boundary is shown on the FIRM. Figure 3, “Map Legend for FIRM”, describes the flood zones that are used on the FIRMs to account for the varying levels of flood risk that exist along flooding sources within the project area. Table 2 and Table 3 indicate the flood zone designations for each flooding source and each community within Henderson County, KY, respectively.

Table 2, “Flooding Sources Included in this FIS Report,” lists each flooding source, including its study limits, affected communities, mapped zone on the FIRM, and the completion date of its engineering analysis from which the flood elevations on the FIRM and in the FIS Report were derived. Descriptions and dates for the latest hydrologic and hydraulic analyses of the flooding sources are shown in Table 13. Floodplain boundaries for these flooding sources are shown on the FIRM (published separately) using the symbology described in Figure 3. On the map, the 1% annual chance floodplain corresponds to the SFHAs. The 0.2% annual chance floodplain shows areas that, although out of the regulatory floodplain, are still subject to flood hazards.

Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data. The procedures to remove these areas from the SFHA are described in Section 6.5 of this FIS Report.

### **2.2 Floodways**

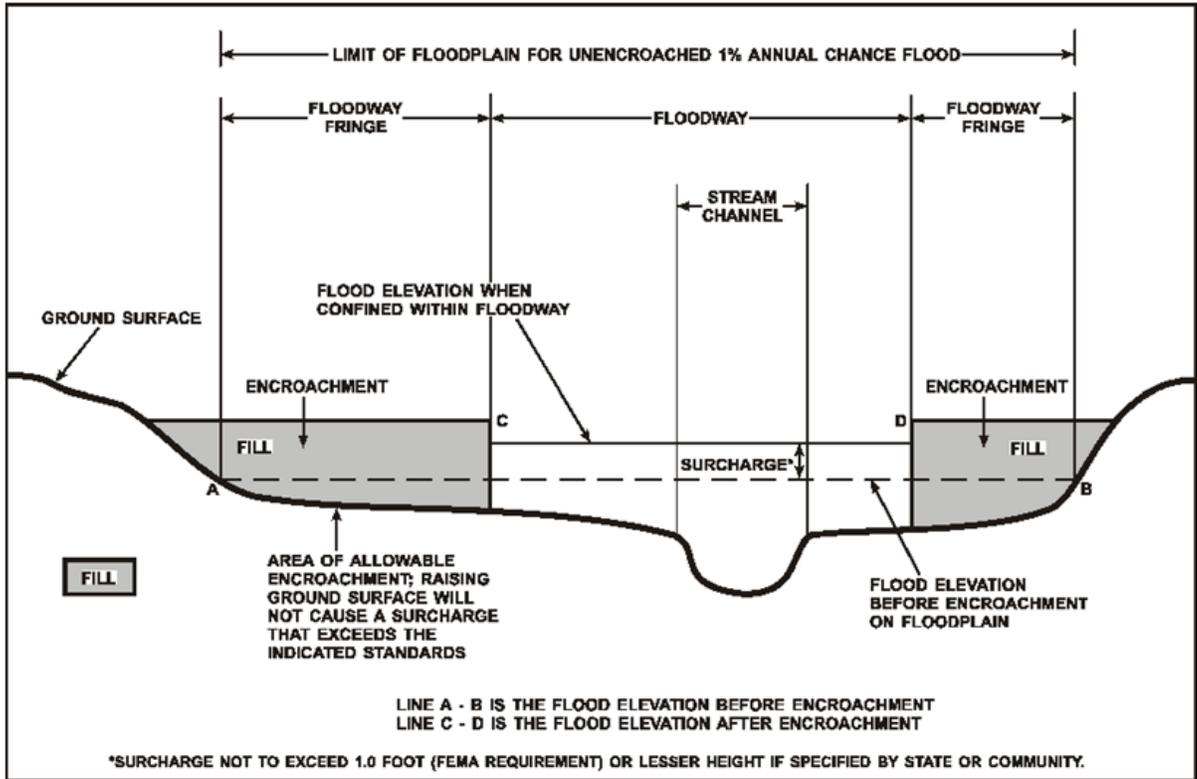
Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the

encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard.

For purposes of the NFIP, a floodway is used as a tool to assist local communities in balancing floodplain development against increasing flood hazard. With this approach, the area of the 1% annual chance floodplain on a river is divided into a floodway and a floodway fringe based on hydraulic modeling. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment in order to carry the 1% annual chance flood. The floodway fringe is the area between the floodway and the 1% annual chance floodplain boundaries where encroachment is permitted. The floodway must be wide enough so that the floodway fringe could be completely obstructed without increasing the water-surface elevation of the 1% annual chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 4.

To participate in the NFIP, Federal regulations require communities to limit increases caused by encroachment to 1.0 foot, provided that hazardous velocities are not produced. Regulations for Kentucky require communities in Henderson County to limit increases caused by encroachment to 1.0 foot and several communities have adopted additional restrictions. The floodways in this project are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway projects.

Figure 4: Floodway Schematic



Floodway widths presented in this FIS Report and on the FIRM were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. For certain stream segments, floodways were adjusted so that the amount of floodwaters conveyed on each side of the floodplain would be reduced equally. The results of the floodway computations have been tabulated for selected cross sections and are shown in Table 24, "Floodway Data."

**Table 2: Flooding Sources Included in this FIS Report**

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi <sup>2</sup> ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Adams Street Tributary	City of Henderson	Confluence with North Fork Canoe Creek	Approximately 3,870 feet upstream of the confluence with North Fork Canoe Creek	05140202	0.7		Y	AE	October 1984
Audubon Park Creek Tributary	City of Henderson, Henderson County	Confluence with Ohio River	Approximately 960 feet upstream of intersection with Watson Ln	05140202	1.9		Y	AE	October 1984
Barrett Ditch	Henderson County	Confluence with West Fork Canoe Creek	Approximately 1,450 feet upstream of intersection with KY-443	05140202	4.1		N	A	June 2010
Beaverdam Creek	Henderson County	Confluence with Highland Creek	Approximately 1.06 miles upstream of intersection with Dixon #1 Rd	05140202	8		N	A	June 2010
Beaverdam Creek Tributary 10	Henderson County	Confluence with Beaverdam Creek	Approximately 4,760 feet upstream of intersection with Sulphur Springs Rd	05140202	1.9		N	A	June 2010
Beaverdam Creek Tributary 12	Henderson County	Confluence with Beaverdam Creek	Approximately 1,620 feet upstream of intersection with Hughes-Sights Rd	05140202	2.2		N	A	June 2010
Beaverdam Creek Tributary 12.1	Henderson County	Confluence with Beaverdam Creek Tributary 12	Approximately 1,000 feet upstream of intersection with Hughes-Sights Rd	05140202	1.4		N	A	June 2010
Beaverdam Creek Tributary 17	Henderson County	Confluence with Beaverdam Creek	Approximately 1.4 miles upstream of the confluence with Beaverdam Creek	05140202	1.4		N	A	June 2010

**Table 2: Flooding Sources Included in this FIS Report**

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi <sup>2</sup> ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Beaverdam Creek Tributary 19	Henderson County	Confluence with Beaverdam Creek	Approximately 2,620 feet upstream of the confluence with Beaverdam Creek	05140202	0.5		N	A	June 2010
Beaverdam Creek Tributary 2	Henderson County	Confluence with Beaverdam Creek	Approximately 1.2 miles upstream of the confluence with Beaverdam Creek	05140202	1.2		N	A	June 2010
Beaverdam Creek Tributary 9	Henderson County	Confluence with Beaverdam Creek	Approximately 1.8 miles upstream of the confluence with Beaverdam Creek	05140202	1.8		N	A	June 2010
Camp Creek	Henderson County	Confluence with Highland Creek	Approximately 5,190 feet upstream of intersection with B.F. Overfield Rd	05140202	5.2		N	A	June 2010
Canoe Creek	Henderson County	Approximately 3,020 feet downstream of the confluence of Barrett Ditch	Approximately 4,640 feet upstream of intersection with Ed Otey Rd	05140202	6.6		N	A	June 2010
Canoe Creek	Henderson County	Confluence with Ohio River	Confluence of Middle Canoe Creek	05140202	13.4		Y	AE	February 4, 2014
Canoe Creek Tributary 1	City of Henderson, Henderson County	Confluence with Canoe Creek	Approximately 2,895 feet upstream of intersection with KY-136	05140202	1.8		N	A	June 2010
Canoe Creek Tributary 11	Henderson County	Confluence with Canoe Creek	Approximately 3,235 feet upstream of intersection with KY-283	05140202	2.8		N	A	June 2010

**Table 2: Flooding Sources Included in this FIS Report**

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi <sup>2</sup> ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Canoe Creek Tributary 14	Henderson County	Confluence with Canoe Creek	Approximately 0.7 miles upstream of the confluence with Canoe Creek	05140202	0.7		N	A	June 2010
Cash Creek	Henderson County	Confluence with Green River	Approximately 3.4 miles upstream of intersection with Griffin and Griffin Rd	05110005	8.3		N	A	June 2010
Cash Creek Tributary 1	Henderson County	Confluence with Cash Creek	Approximately 600 feet upstream of intersection with Freeman-Pearcy Rd	05110005	2		N	A	June 2010
East Fork Canoe Creek	Henderson County	Confluence with Upper Canoe Creek	Approximately 3,105 feet upstream of intersection with KY-136	05140202	7		Y	AE	October 1984
East Fork Canoe Creek Tributary 3	Henderson County	Confluence with East Fork Canoe Creek	Approximately 0.9 miles upstream of the confluence with East Fork Canoe Creek	05140202	0.9		N	A	June 2010
East Fork Canoe Creek Tributary 9	Henderson County	Confluence with East Fork Canoe Creek	Approximately 540 feet upstream of intersection with North Pleasant Valley Rd	05140202	2.4		N	A	June 2010
Elam Ditch	Henderson County	Approximately 40 feet downstream of intersection with KY-612	Approximately 1.1 miles upstream of intersection with KY-612	05140202	1.1		N	A	June 2010

**Table 2: Flooding Sources Included in this FIS Report**

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi <sup>2</sup> ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Elam Ditch	Henderson County	Confluence with Canoe Creek	Approximately 40 feet downstream of intersection with KY-612	05140202	4.9		Y	AE	June 2010
Elam Ditch Tributary 1	Henderson County	Confluence with Elam Ditch	Approximately 1.3 miles upstream of the confluence of Elam Ditch Tributary 1.1	05140202	2.3		Y	AE	June 2010
Elam Ditch Tributary 1.1	Henderson County	Confluence with Elam Ditch Tributary 1	Approximately 0.9 miles upstream of the confluence with Elam Ditch Tributary 1	05140202	0.9		N	A	June 2010
Elam Ditch Tributary 2	Henderson County	Approximately 40 feet downstream of intersection with KY-612	Approximately 3,370 feet upstream of intersection with KY-351	05140202	2.6		N	A	June 2010
Elam Ditch Tributary 2	Henderson County	Confluence with Elam Ditch	Approximately 40 feet downstream of intersection with KY-612	05140202	0.8		Y	AE	June 2010
Elam Ditch Tributary 2.1	Henderson County	Confluence with Elam Ditch Tributary 2	Approximately 2,445 feet upstream of intersection with Audubon Parkway	05140202	1.4		N	A	June 2010
Elam Ditch Tributary 2.2	Henderson County	Confluence with Elam Ditch Tributary 2	Approximately 0.3 miles upstream of the confluence with Elam Ditch Tributary 2	05140202	0.3		N	A	June 2010

**Table 2: Flooding Sources Included in this FIS Report**

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi <sup>2</sup> ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Elam Ditch Tributary 3	Henderson County	Approximately 45 feet downstream of intersection with Toy Anthoston Rd	Approximately 0.9 miles upstream of intersection with Toy Anthoston Rd	05140202	1		N	A	June 2010
Elam Ditch Tributary 3	Henderson County	Confluence with Elam Ditch	Approximately 45 feet downstream of intersection with Toy Anthoston Rd	05140202	0.6		Y	AE	June 2010
Elam Ditch Tributary 4	Henderson County	Confluence with Elam Ditch	Approximately 2,060 feet upstream of intersection with US-41	05140202	1.1		N	A	June 2010
Elam Ditch Tributary 8	Henderson County	Confluence with Elam Ditch	Approximately 2,530 feet upstream of intersection with Cheatham Toy Rd	05140202	1.2		N	A	June 2010
Grane Creek	City of Robards, Henderson County	County Boundary	Approximately 1,055 feet upstream of intersection with Robards-Rockhouse Rd	05110005	2.4		N	A	June 2010
Grane Creek Tributary 1	Henderson County	County Boundary	Approximately 2,000 feet upstream of intersection with Railroad	05110005	0.7		N	A	June 2010
Grane Creek Tributary 5	City of Robards, Henderson County	Confluence with Grane Creek	Approximately 170 feet upstream of intersection with Busby Hollow Rd	05110005	0.8		N	A	June 2010
Grane Creek Tributary 6	City of Robards, Henderson County	Confluence with Grane Creek	Approximately 3,295 feet upstream of intersection with US-41 South	05110005	0.8		N	A	June 2010

**Table 2: Flooding Sources Included in this FIS Report**

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi <sup>2</sup> ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Groves Creek	Henderson County	County Boundary	Approximately 1,375 feet upstream of intersection with W.N Royster Rd	05110005	1		N	A	June 2010
Highland Creek	Henderson County	Western County Boundary	Southern County Boundary	05140202	16.2		N	A	June 2010
Highland Creek Tributary 2	Henderson County	Confluence with Highland Creek	Approximately 1.4 miles upstream of intersection with KY-359	05140202	3.5		N	A	June 2010
Highland Creek Tributary 3	Henderson County	Confluence with Highland Creek	Approximately 4,850 feet upstream of the confluence of Highland Creek Tributary 3.2	05140202	2.9		N	A	June 2010
Highland Creek Tributary 3.2	Henderson County	Confluence with Highland Creek Tributary 3	Approximately 4,310 feet upstream of intersection with Cooper-Cooper Rd	05140202	1.1		N	A	June 2010
Highway 60 Tributary	City of Henderson, Henderson County	Confluence with North Fork Canoe Creek	Approximately 595 feet upstream of intersection with Gaslight Dr	05140202	1.6		Y	AE	October 1984
Kimsey Lane Left Tributary	City of Henderson, Henderson County	Approximately 0.3 miles upstream of the confluence with North Fork Canoe Creek	Approximately 3,935 feet upstream of intersection with KY-1539	05140202	1.5		N	A	June 2010
Kimsey Lane Left Tributary	City of Henderson, Henderson County	Confluence with North Fork Canoe Creek	Approximately 0.3 miles upstream of the confluence with North Fork Canoe Creek	05140202	0.3		Y	AE	June 2010

**Table 2: Flooding Sources Included in this FIS Report**

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi <sup>2</sup> ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Kimsey Lane Right Tributary	City of Henderson	Confluence with North Fork Canoe Creek	Approximately 0.2 miles upstream of the confluence with North Fork Canoe Creek	05140202	0.2		Y	AE	October 1984
Lick Creek	Henderson County	Confluence with Green River	Approximately 1.25 miles upstream of intersection with KY-416	05110005	13		N	A	June 2010
Lick Creek Tributary 11	Henderson County	Confluence with Lick Creek	Approximately 700 feet upstream of intersection with Stone McClellan Rd	05110005	1.6		N	A	June 2010
Lick Creek Tributary 16	Henderson County	Confluence with Lick Creek	Approximately 2,640 feet upstream of intersection with South Negley Rd	05110005	0.5		N	A	June 2010
Lick Creek Tributary 19	Henderson County	Confluence with Lick Creek	Approximately 0.8 miles upstream of the confluence with Lick Creek	05110005	0.8		N	A	June 2010
Lick Creek Tributary 2	Henderson County	Confluence with Lick Creek	Approximately 3,250 feet upstream of intersection with KY-416	05110005	3.9		N	A	June 2010
Lick Creek Tributary 2.1	Henderson County	Confluence with Lick Creek Tributary 2	Approximately 1,200 feet upstream of intersection with Mason Landing Rd	05110005	1.2		N	A	June 2010

**Table 2: Flooding Sources Included in this FIS Report**

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi <sup>2</sup> ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Lick Creek Tributary 2.2	Henderson County	Confluence with Lick Creek Tributary 2	Approximately 1.26 miles upstream of the confluence of Lick Creek Tributary 2.2.1	05110005	1.4		N	A	June 2010
Lick Creek Tributary 2.2.1	Henderson County	Confluence with Lick Creek Tributary 2.2	Approximately 1,015 feet upstream of intersection with Alves Ferry Rd	05110005	1.8		N	A	June 2010
Lick Creek Tributary 22	Henderson County	Confluence with Lick Creek	Approximately 860 feet upstream of intersection with Jones Bros. Rd	05110005	0.4		N	A	June 2010
Lick Creek Tributary 4	Henderson County	Confluence with Lick Creek	Approximately 95 feet upstream of intersection with KY-351	05110005	1.5		N	A	June 2010
Lick Creek Tributary 6	Henderson County	Confluence with Lick Creek	Approximately 0.9 miles upstream of the confluence with Lick Creek	05110005	0.9		N	A	June 2010
Lick Creek Tributary 8	Henderson County	Confluence with Lick Creek	Approximately 1 mile upstream of intersection with Hatchett Mill Rd	05110005	2.5		N	A	June 2010
Lick Creek Tributary 8.1	Henderson County	Confluence with Lick Creek Tributary 8	Approximately 4,440 feet upstream of intersection with Connaway Rd	05110005	1.6		N	A	June 2010
Middle Canoe Creek	City of Henderson, Henderson County	Confluence with Upper Canoe Creek	Confluence of Canoe Creek	05140202	1.2		Y	AE	June 2010

**Table 2: Flooding Sources Included in this FIS Report**

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi <sup>2</sup> ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
North Fork Beaverdam Creek	Henderson County	Confluence with Beaverdam Creek	Approximately 2,705 feet upstream of intersection with Rock Springs-Dixie Rd	05140202	1.6		N	A	June 2010
North Fork Canoe Creek	Henderson County	Approximately 140 feet downstream stream of the confluence of North Fork Canoe Creek Tributary 6	Approximately 0.5 miles upstream of the confluence of North Fork Canoe Creek Tributary 9	05140202	2.1		N	A	June 2010
North Fork Canoe Creek	City of Henderson, Henderson County	Confluence with Canoe Creek	Approximately 140 feet downstream stream of the confluence of North Fork Canoe Creek Tributary 6	05140202	4.1		Y	AE	February 4, 2014
North Fork Canoe Creek Tributary	City of Henderson	Confluence with North Fork Canoe Creek	Approximately 775 feet upstream of intersection with Clark St	05140202	0.4		Y	AE	October 1984
North Fork Canoe Creek Tributary 6	City of Henderson, Henderson County	Confluence with North Fork Canoe Creek	Approximately 4,080 feet upstream of intersection with US-60 East	05140202	2.4		N	A	June 2010
North Fork Canoe Creek Tributary 8	Henderson County	Confluence with North Fork Canoe Creek	Approximately 1.6 miles upstream of the confluence with North Fork Canoe Creek	05140202	1.6		N	A	June 2010

**Table 2: Flooding Sources Included in this FIS Report**

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi <sup>2</sup> ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
North Fork Canoe Creek Tributary 9	Henderson County	Confluence with North Fork Canoe Creek	Approximately 1 mile upstream of intersection with US-60 East	05140202	1.6		N	A	June 2010
Ohio River	City of Henderson, Henderson County	Western County Boundary	Eastern County Boundary	05140202	61		Y	AE	October 2007
Old Knoblick Road Creek	Henderson County	County Boundary	Approximately 0.6 miles upstream of the County Boundary	05110005	0.6		N	A	June 2010
Opossum Creek	Henderson County	Confluence with Camp Creek	Approximately 3,575 feet upstream of intersection with Lod Powell Rd	05140202	1.5		N	A	June 2010
Pond Creek	Henderson County	County Boundary	Approximately 4,920 feet upstream of intersection with Jarboe Ln	05140202	15.2		N	A	June 2010
Pond Creek Tributary 3	Henderson County	Confluence with Pond Creek	Approximately 2,180 feet upstream of intersection with Martin and Martin Rd	05140202	1.5		N	A	June 2010
Pond Creek Tributary 6	Henderson County	Confluence with Pond Creek	Approximately 70 feet upstream of intersection with KY-268	05140202	2.6		N	A	June 2010
Race Creek	Henderson County	Confluence with Green River	Approximately 2.24 miles upstream of intersection with KY-1078	05110005	5.9		N	A	June 2010

**Table 2: Flooding Sources Included in this FIS Report**

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi <sup>2</sup> ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Race Creek Tributary 1	Henderson County	Confluence with Race Creek	Approximately 330 feet upstream of intersection with Railroad	05110005	1.6		N	A	June 2010
Race Creek Tributary 2	Henderson County	Confluence with Race Creek	Approximately 2,380 feet upstream of intersection with KY-1078	05110005	2		N	A	June 2010
Rock Creek	Henderson County	Confluence with Highland Creek	Approximately 2,380 feet upstream of intersection with KY-1078	05140202	3.9		N	A	June 2010
Rock Creek Tributary 6	Henderson County	Confluence with Rock Creek	Approximately 1.4 miles upstream of the confluence with Rock Creek	05140202	1.4		N	A	June 2010
Royster Road Creek	Henderson County	County Boundary	Approximately 2,040 feet upstream of intersection with Thomason Rd	05110005	1.8		N	A	June 2010
Sellers Ditch/Upper Canoe Creek	Henderson County	Confluence with Canoe Creek	Approximately 3,800 feet upstream of the confluence of East Fork Canoe Creek	05140202	3		Y	AE	June 2010
Sputzman Creek	Henderson County	Confluence with Green River	Approximately 2,560 feet upstream of intersection with Roberts Rd	05110005	4.5		N	A	June 2010
Sputzman Creek Tributary 1	Henderson County	Confluence with Sputzman Creek	Approximately 3,175 feet upstream of intersection with Moss and Moss Rd	05110005	2.4		N	A	June 2010

**Table 2: Flooding Sources Included in this FIS Report**

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi <sup>2</sup> ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Sputzman Creek Tributary 2	Henderson County	Confluence with Sputzman Creek	Approximately 0.6 miles upstream of the confluence with Sputzman Creek	05110005	0.6		N	A	June 2010
Sputzman Creek Tributary 7	Henderson County	Confluence with Sputzman Creek	Approximately 485 feet upstream of intersection with Roberts Rd	05110005	0.9		N	A	June 2010
Sugar Creek	City of Henderson	Confluence with Ohio River	Approximately 3,220 feet upstream of intersection with Marywood Dr	05140202	1.4		Y	AE	October 1984
Tiger Ditch	City of Henderson, Henderson County	Confluence with North Fork Canoe Creek	Approximately 1,640 feet upstream of intersection with Stadium Dr	05140202	1.6		Y	AE	June 2010
Tiger Ditch Tributary 1	Henderson County	Confluence with Tiger Ditch	Approximately 0.3 miles upstream of the confluence with Tiger Ditch	05140202	0.3		Y	AE	June 2010
West Fork Canoe Creek	Henderson County	Confluence with Canoe Creek	Approximately 4,595 feet upstream of intersection with KY-416	05140202	7.1		N	A	June 2010
West Fork Canoe Creek Tributary 15	Henderson County	Confluence with West Fork Canoe Creek	Approximately 1.05 miles upstream of intersection with KY-1217	05140202	1.7		N	A	June 2010
West Fork Canoe Creek Tributary 15.1	Henderson County	Confluence with West Fork Canoe Creek Tributary 15	Approximately 1,280 feet upstream of intersection with Eblen-Hancock Rd	05140202	1.6		N	A	June 2010

**Table 2: Flooding Sources Included in this FIS Report**

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi <sup>2</sup> ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
West Fork Canoe Creek Tributary 19	Henderson County	Confluence with West Fork Canoe Creek	Approximately 0.96 miles upstream of intersection with Smith Denton Rd	05140202	2.3		N	A	June 2010
West Fork Canoe Creek Tributary 2	Henderson County	Confluence with West Fork Canoe Creek	Approximately 1.47 miles upstream of intersection with KY-1217	05140202	2.3		N	A	June 2010
Whitelick Creek	Henderson County	Confluence with Highland Creek	Approximately 4.8 miles upstream of the confluence with Highland Creek	05140202	4.8		N	A	June 2010
Wilson Creek	Henderson County	Approximately 1,925 feet upstream of intersection with Wilson Station Rd	Approximately 1,25 feet upstream of the confluence of Wilson Creek Tributary 11	05140202	1.93		N	A	June 2010
Wilson Creek	Henderson County	Confluence with Canoe Creek	Approximately 1,925 feet upstream of intersection with Wilson Station Rd	05140202	4.97		Y	AE	October 1988
Wilson Creek Tributary 11	Henderson County	Confluence with Wilson Creek	Approximately 2,015 feet upstream of intersection with Corydon-D. Fellows Rd	05140202	0.7		N	A	June 2010

All floodways that were developed for this FIS project are shown on the FIRM using the symbology described in Figure 3. In cases where the floodway and 1% annual chance floodplain boundaries are either close together or collinear, only the floodway boundary has been shown on the FIRM. For information about the delineation of floodways on the FIRM, refer to Section 6.3.

## **2.3 Base Flood Elevations**

The hydraulic characteristics of flooding sources were analyzed to provide estimates of the elevations of floods of the selected recurrence intervals. The Base Flood Elevation (BFE) is the elevation of the 1% annual chance flood. These BFEs are most commonly rounded to the whole foot, as shown on the FIRM, but in certain circumstances or locations they may be rounded to 0.1 foot. Cross section lines shown on the FIRM may also be labeled with the BFE rounded to 0.1 foot. Whole-foot BFEs derived from engineering analyses that apply to coastal areas, areas of ponding, or other static areas with little elevation change may also be shown at selected intervals on the FIRM.

Cross sections with BFEs shown on the FIRM correspond to the cross sections shown in the Floodway Data table and Flood Profiles in this FIS Report. BFEs are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM.

## **2.4 Non-Encroachment Zones**

Some States and communities use non-encroachment zones to manage floodplain development. While not a FEMA designated floodway, the non-encroachment zone represents that area around the stream that should be reserved to convey the 1% annual chance flood event. This section is not applicable to this Flood Risk Project.

Regulations for Kentucky require communities in Henderson County to limit increases caused by encroachment to 1 foot and several communities have adopted additional restrictions for non-encroachment areas.

Non-encroachment determinations may be delineated where it is not possible to delineate floodways because specific channel profiles with bridge and culvert geometry were not developed. Any non-encroachment determinations for this FIS project have been tabulated for selected cross sections and are shown in Table 25, “Flood Hazard and Non-Encroachment Data for Selected Streams.”

## **2.5 Coastal Flood Hazard Areas**

This section is not applicable to this FIS project.

### **2.5.1 Water Elevations and the Effects of Waves**

This section is not applicable to this FIS project.

**Figure 5: Wave Runup Transect Schematic**  
**[Not Applicable to this FIS Project]**

### 2.5.2 Floodplain Boundaries and BFEs for Coastal Areas

This section is not applicable to this FIS project.

### 2.5.3 Coastal High Hazard Areas

This section is not applicable to this FIS project.

### Figure 6: Coastal Transect Schematic

[Not Applicable to this FIS Project]

### 2.5.4 Limit of Moderate Wave Action

This section is not applicable to this FIS project.

## SECTION 3.0 – INSURANCE APPLICATIONS

### 3.1 National Flood Insurance Program Insurance Zones

For flood insurance applications, the FIRM designates flood insurance rate zones as described in Figure 3, “Map Legend for FIRM.” Flood insurance zone designations are assigned to flooding sources based on the results of the hydraulic or coastal analyses. Insurance agents use the zones shown on the FIRM and depths and base flood elevations in this FIS Report in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

The 1% annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (e.g. Zones A, AE, V, VE, etc.), and the 0.2% annual chance floodplain boundary corresponds to the boundary of areas of additional flood hazards.

Table 3 lists the flood insurance zones in the unincorporated and incorporated areas of Henderson County.

**Table 3: Flood Zone Designations by Community**

Community	Flood Zone(s)
Corydon, City of	X
Henderson, City of	A, AE, X
Henderson County (Unincorporated Areas)	A, AE, X
Robards, City of	A, AE, X

### 3.2 Coastal Barrier Resources System

The Coastal Barrier Resources Act (CBRA) of 1982 was established by Congress to create areas along the Atlantic and Gulf coasts and the Great Lakes, where restrictions for Federal financial assistance including flood insurance are prohibited. In 1990, Congress passed the Coastal Barrier Improvement Act (CBIA), which increased the extent of areas established by the CBRA and added “Otherwise Protected Areas” (OPA) to the system. These areas are collectively referred to as the John H Chafee Coastal Barrier Resources System (CBRS). The CBRS boundaries that have

been identified in the project area are in Table 4, “Coastal Barrier Resources System Information.”

**Table 4: Coastal Barrier Resources System Information**

[Not Applicable to this FIS Project]

**SECTION 4.0 – AREA STUDIED**

**4.1 Basin Description**

Table 5 contains a description of the characteristics of the HUC-8 sub-basins within which each community falls. The table includes the main flooding sources within each basin, a brief description of the basin, and its drainage area.

**Table 5: Basin Characteristics**

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description of Affected Area	Drainage Area (square miles)
Lower Green River	05110005	Green River	Eastern portion of Henderson County	923
Lower Ohio River- Little Pigeon Creek	05140201	Ohio River	Northeast boundary of Henderson County	405
Lower Ohio River- Highland Creek	05140202	Ohio River	Largest watershed within Henderson County, encompassing most of the center and west side of the county	483

**4.2 Principal Flood Problems**

Table 6 contains a description of the principal flood problems that have been noted for Henderson County by flooding source.

**Table 6: Principal Flood Problems**

Flooding Source	Description of Flood Problems
Ohio River	A number of streets and highway bridges spanning various streams in the City of Henderson tend to obstruct flow through the channels. (FEMA 2013)
Canoe Creek	Significant flooding is caused by frontal system and convective storms. (FEMA 2013)

Table 7 contains information about historic flood elevations in the communities within Henderson County.

### Table 7: Historic Flooding Elevations

[Not Applicable to this FIS Project]

#### 4.3 Non-Levee Flood Protection Measures

Table 8 contains information about non-levee flood protection measures within Henderson County such as dams, jetties, and or dikes. Levees are addressed in Section 4.4 of this FIS Report.

**Table 8: Non-Levee Flood Protection Measures**

Flooding Source	Structure Name	Type of Measure	Location	Description of Measure
North Fork Canoe Creek and Canoe Creek	N/A	Ditch Widening and Clearing	Along North Fork from cross section 14567.2 downstream to Canoe Creek cross section 43423.9	Several studies were completed to determine favorable alternatives to reduce peak water surface elevations along these two reaches, which has had prevalent flooding issues. Between 2009 and 2012, ditch widening and clearing along these reaches was completed, resulting in revised base flood elevations. (FEMA 2013)

#### 4.4 Levees

This section is not applicable to this FIS project.

**Table 9: Levees**  
**[Not Applicable to this FIS Project]**

## SECTION 5.0 – ENGINEERING METHODS

For the flooding sources in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded at least once on the average during any 10-, 25-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 25-, 50-, 100-, and 500-year floods, have a 10-, 4-, 2-, 1-, and 0.2% annual chance, respectively, of being equaled or exceeded during any year.

Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedance) during the term of a 30-year mortgage is approximately 26 percent (about 3 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

The engineering analyses described here incorporate the results of previously issued Letters of Map Change (LOMCs) listed in Table 27, “Incorporated Letters of Map Change”, which include Letters of Map Revision (LOMRs). For more information about LOMRs, refer to Section 6.5, “FIRM Revisions.”

### 5.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for floods of the selected recurrence intervals for each flooding source studied. Hydrologic analyses are typically performed at the watershed level. Depending on factors such as watershed size and shape, land use and urbanization, and natural or man-made storage, various models or methodologies may be applied. A summary of the hydrologic methods applied to develop the discharges used in the hydraulic analyses for each stream is provided in Table 13. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

A summary of the discharges is provided in Table 10. Frequency Discharge-Drainage Area Curves used to develop the hydrologic models may also be shown in Figure 7 for selected flooding sources. A summary of stillwater elevations developed for non-coastal flooding sources is provided in Table 11. Stream gage information is provided in Table 12.

**Table 10: Summary of Discharges**

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Adams Street Tributary	At confluence with North Fork Canoe Creek	0.30	350	*	550	610	*
Adams Street Tributary	At approximate 0.6 miles above confluence with North Fork Canoe Creek	0.18	220	*	370	400	*
Audubon Park Creek	At confluence with Ohio River	1.02	550	*	770	820	*
Canoe Creek	Just downstream from confluence with Elam Ditch	N/A	1,025	*	2,190	2,800	*
Canoe Creek	Just upstream of Old Madisonville Rd	N/A	2,690	*	4,810	5,790	*
Canoe Creek	Just upstream of Rocks Rd	N/A	2,320	*	3,970	4,780	*
Canoe Creek	Just downstream of confluence with Sellers Ditch	104.60	9,390	*	13,510	15,500	*
East Fork Canoe Creek	At confluence with Upper Canoe Creek	15.36	3,544	*	5,337	5,337	*
East Fork Canoe Creek	At railroad	13.75	3,288	*	4,959	5,711	*
East Fork Canoe Creek	Approximately 7400 feet upstream of confluence with Upper Canoe Creek	12.96	3,159	*	4,768	5,492	*

**Table 10: Summary of Discharges**

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
East Fork Canoe Creek	Approximately 1200 feet downstream of Anthoston Frog Island Rd	10.43	2,727	*	4,129	4,760	*
East Fork Canoe Creek	Just downstream of Agnew Rd	8.44	2,363	*	3,588	4,140	*
East Fork Canoe Creek	Approximately 2400 feet upstream of Agnew Rd	7.21	2,124	*	3,232	3,732	*
East Fork Canoe Creek	Approximately 1000 feet downstream of Pennyrile Parkway	2.15	936	*	1,449	1,681	*
East Fork Canoe Creek	Approximately 400 feet downstream of Cox Rd	1.7	799	*	1,240	1,440	*
Elam Ditch	Just above KY-425	22.14	1,090	*	1,723	2,028	*
Elam Ditch	Just above Pennyrile Parkway	19.96	1,680	*	2,780	3,180	*
Elam Ditch	Approximately 5500 feet above Pennyrile Parkway	8.29	1,410	*	2,137	2,500	*
Elam Ditch	Approximately 1700 feet above Toy Anthoston Rd	5.17	1,820	*	2,760	3,220	*
Elam Ditch Tributary 1	Approximately 5500 feet above confluence with Elam Ditch	1.97	1,090	*	1,650	1,910	*
Elam Ditch Tributary 2	Just below Airline Rd	6.94	1,940	*	2,960	3,450	*
Elam Ditch Tributary 3	Just below Toy Anthoston Rd	1.88	930	*	1,410	1,630	*

**Table 10: Summary of Discharges**

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Highway 60 Tributary	Just above U.S. Highway 60	0.17	240	*	360	400	*
Kimsey Lane Left Tributary	1500 feet upstream from confluence with North Fork Canoe Creek	2.2	550	*	870	1,025	*
Kimsey Lane Right Tributary	At confluence with North Fork Canoe Creek	0.5	530	*	900	990	*
Middle Canoe Creek	Just downstream from confluence with Elam Ditch	N/A	450	*	1,060	1,350	*
North Fork Canoe Creek	Just below confluence with Tiger Ditch	19.75	2,820	*	4,290	4,970	*
North Fork Canoe Creek	Approximately 1300 feet downstream from 5th St	15.58	2,210	*	3,180	3,770	*
North Fork Canoe Creek	At US-41	13.27	2,020	*	2,930	3,470	*
North Fork Canoe Creek	At Kimsey Ln	12.96	2,100	*	2,970	3,600	*
North Fork Canoe Creek	Approximately 3400 feet below Zion Larue Rd	9.97	2,000	*	3,245	3,880	*
North Fork Canoe Creek Tributary	At confluence with North Fork Canoe Creek	0.99	260	*	380	410	*
Ohio River	At river mile 826	107,750	679,000	*	772,000	775,000	*
Ohio River	At river mile 814.5	107,600	712,000	*	856,000	923,000	*
Ohio River	At river mile 807.0	107,500	712,000	*	856,000	923,000	*
Ohio River	At river mile 801.3	107,400	708,000	*	853,000	920,000	*

**Table 10: Summary of Discharges**

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Ohio River	At river mile 784.5	106,920	708,000	*	853,000	920,000	*
Ohio River	At river mile 777.3	97,500	646,000	*	805,000	870,000	*
Sellers Ditch	Just upstream of Old Madisonville Rd	N/A	7,480	*	11,250	12,700	*
Sugar Creek	At Atkinson Park Culvert	0.81	740	*	1,330	1,470	*
Sugar Creek	Just above U.S. Highway 41	0.46	420	*	800	890	*
Tiger Ditch	Just downstream of Pennyriile Pkwy	2.33	857	*	1,268	1,400	*
Tiger Ditch	Just upstream of South Gardenmile	1.94	810	*	1,146	1,285	*
Tiger Ditch	Just downstream of confluence with Tiger Ditch Tributary 1	0.86	650	*	990	1,160	*
Tiger Ditch	Just downstream of Zion Rd	0.36	350	*	530	620	*
Tiger Ditch Tributary 1	Just downstream of Adams Ln	0.35	240	*	380	440	*
Upper Canoe Creek	Just downstream of Hwy 425	56.44	7,650	*	12,370	14,980	*
Upper Canoe Creek	Just upstream of Hwy 425	55.61	8,270	*	14,385	17,200	*
Wilson Creek	At confluence with Canoe Creek	11.72	2,951	*	4,461	5,140	*
Wilson Creek	Just upstream of Illinois Central Railroad	11.48	2,910	*	4,400	5,071	*

**Table 10: Summary of Discharges**

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Wilson Creek	Approximately 1200 feet downstream of State Route 425	9.86	2,625	*	3,978	4,587	*
Wilson Creek	Approximately 7200 feet upstream of State Route 425	7.75	2,230	*	3,391	3,914	*
Wilson Creek	Approximately 5000 feet downstream of Wilson Station Rd	6.82	2,046	*	3,115	3,598	*

\*Not calculated for this FIS project

**Figure 7: Frequency Discharge-Drainage Area Curves**

[Not Applicable to this FIS Project]

**Table 11: Summary of Non-Coastal Stillwater Elevations**

[Not Applicable to this FIS Project]

**Table 12: Stream Gage Information used to Determine Discharges**

**[Not Applicable to this FIS Project]**

## **5.2 Hydraulic Analyses**

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Base flood elevations on the FIRM represent the elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations. These whole-foot elevations may not exactly reflect the elevations derived from the hydraulic analyses. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM. The hydraulic analyses for this FIS were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

For streams for which hydraulic analyses were based on cross sections, locations of selected cross sections are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 6.3), selected cross sections are also listed on Table 24, "Floodway Data."

A summary of the methods used in hydraulic analyses performed for this project is provided in Table 13. Roughness coefficients are provided in Table 14. Roughness coefficients are values representing the frictional resistance water experiences when passing overland or through a channel. They are used in the calculations to determine water surface elevations. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Adams Street Tributary	Confluence with North Fork Canoe Creek	Approximately 3,870 feet upstream of the confluence with North Fork Canoe Creek	HEC-1	HEC-2	October 1984	AE	None
Audubon Park Creek Tributary	Confluence with Ohio River	Approximately 960 feet upstream of intersection with Watson Ln	HEC-1	HEC-2	October 1984	AE	Hydraulic analysis of Audubon Park Creek showed that the base flood would produce hazardous velocities under natural conditions in the rather narrow and steep flood plain. Floodway computations are not feasible under such circumstances; thus, the entire 1-percent-annual-chance floodplain as delineated on the 1986 effective maps for the City of Henderson was selected as the floodway (Reference FEMA 1986). Audubon Park Creek floodway computations will therefore not appear in Table 24.
Barrett Ditch	Confluence with West Fork Canoe Creek	Approximately 1,450 feet upstream of intersection with KY-443	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Beaverdam Creek	Confluence with Highland Creek	Approximately 1.06 miles upstream of intersection with Dixon #1 Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Beaverdam Creek Tributary 10	Confluence with Beaverdam Creek	Approximately 4,760 feet upstream of intersection with Sulphur Springs Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Beaverdam Creek Tributary 12	Confluence with Beaverdam Creek	Approximately 1,620 feet upstream of intersection with Hughes-Sights Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Beaverdam Creek Tributary 12.1	Confluence with Beaverdam Creek Tributary 12	Approximately 1,000 feet upstream of intersection with Hughes-Sights Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Beaverdam Creek Tributary 17	Confluence with Beaverdam Creek	Approximately 1.4 miles upstream of the confluence with Beaverdam Creek	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Beaverdam Creek Tributary 19	Confluence with Beaverdam Creek	Approximately 2,620 feet upstream of the confluence with Beaverdam Creek	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Beaverdam Creek Tributary 2	Confluence with Beaverdam Creek	Approximately 1.2 miles upstream of the confluence with Beaverdam Creek	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Beaverdam Creek Tributary 9	Confluence with Beaverdam Creek	Approximately 1.8 miles upstream of the confluence with Beaverdam Creek	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Camp Creek	Confluence with Highland Creek	Approximately 5,190 feet upstream of intersection with B.F. Overfield Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Canoe Creek	Approximately 3,020 feet downstream of the confluence of Barrett Ditch	Approximately 4,640 feet upstream of intersection with Ed Otey Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Canoe Creek	Confluence with Ohio River	Confluence of Middle Canoe Creek	HEC-HMS	HEC-RAS v. 4.0	February 4, 2014	AE	None
Canoe Creek Tributary 1	Confluence with Canoe Creek	Approximately 2,895 feet upstream of intersection with KY-136	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Canoe Creek Tributary 11	Confluence with Canoe Creek	Approximately 3,235 feet upstream of intersection with KY-283	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Canoe Creek Tributary 14	Confluence with Canoe Creek	Approximately 0.7 miles upstream of the confluence with Canoe Creek	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Cash Creek	Confluence with Green River	Approximately 3.4 miles upstream of intersection with Griffin and Griffin Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Cash Creek Tributary 1	Confluence with Cash Creek	Approximately 600 feet upstream of intersection with Freeman-Pearcy Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
East Fork Canoe Creek	Confluence with Upper Canoe Creek	Approximately 3,105 feet upstream of intersection with KY-136	Other	HEC-2	October 1984	AE	None
East Fork Canoe Creek Tributary 3	Confluence with East Fork Canoe Creek	Approximately 0.9 miles upstream of the confluence with East Fork Canoe Creek	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
East Fork Canoe Creek Tributary 9	Confluence with East Fork Canoe Creek	Approximately 540 feet upstream of intersection with North Pleasant Valley Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Elam Ditch	Approximately 40 feet downstream of intersection with KY-612	Approximately 1.1 miles upstream of intersection with KY-612	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Elam Ditch	Confluence with Canoe Creek	Approximately 40 feet downstream of intersection with KY-612	HEC-HMS	HEC-RAS v. 4.0	June 2010	AE	None

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Elam Ditch Tributary 1	Confluence with Elam Ditch	Approximately 1.3 miles upstream of the confluence of Elam Ditch Tributary 1.1	HEC-HMS	HEC-RAS v. 4.0	June 2010	AE	None
Elam Ditch Tributary 1.1	Confluence with Elam Ditch Tributary 1	Approximately 0.9 miles upstream of the confluence with Elam Ditch Tributary 1	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Elam Ditch Tributary 2	Approximately 40 feet downstream of intersection with KY-612	Approximately 3,370 feet upstream of intersection with KY-351	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Elam Ditch Tributary 2	Confluence with Elam Ditch	Approximately 40 feet downstream of intersection with KY-612	HEC-HMS	HEC-RAS v. 4.0	June 2010	AE	None
Elam Ditch Tributary 2.1	Confluence with Elam Ditch Tributary 2	Approximately 2,445 feet upstream of intersection with Audubon Parkway	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Elam Ditch Tributary 2.2	Confluence with Elam Ditch Tributary 2	Approximately 0.3 miles upstream of the confluence with Elam Ditch Tributary 2	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Elam Ditch Tributary 3	Approximately 45 feet downstream of intersection with Toy Anthoston Rd	Approximately 0.9 miles upstream of intersection with Toy Anthoston Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Elam Ditch Tributary 3	Confluence with Elam Ditch	Approximately 45 feet downstream of intersection with Toy Anthoston Rd	HEC-HMS	HEC-RAS v. 4.0	June 2010	AE	None
Elam Ditch Tributary 4	Confluence with Elam Ditch	Approximately 2,060 feet upstream of intersection with US-41	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Elam Ditch Tributary 8	Confluence with Elam Ditch	Approximately 2,530 feet upstream of intersection with Cheatham Toy Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Grane Creek	County Boundary	Approximately 1,055 feet upstream of intersection with Robards-Rockhouse Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Grane Creek Tributary 1	County Boundary	Approximately 2,000 feet upstream of intersection with Railroad	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Grane Creek Tributary 5	Confluence with Grane Creek	Approximately 170 feet upstream of intersection with Busby Hollow Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Grane Creek Tributary 6	Confluence with Grane Creek	Approximately 3,295 feet upstream of intersection with US-41 South	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Groves Creek	County Boundary	Approximately 1,375 feet upstream of intersection with W.N Royster Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Highland Creek	Western County Boundary	Southern County Boundary	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Highland Creek Tributary 2	Confluence with Highland Creek	Approximately 1.4 miles upstream of intersection with KY-359	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Highland Creek Tributary 3	Confluence with Highland Creek	Approximately 4,850 feet upstream of the confluence of Highland Creek Tributary 3.2	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Highland Creek Tributary 3.2	Confluence with Highland Creek Tributary 3	Approximately 4,310 feet upstream of intersection with Cooper-Cooper Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Highway 60 Tributary	Confluence with North Fork Canoe Creek	Approximately 595 feet upstream of intersection with Gaslight Dr	HEC-1	HEC-2	October 1984	AE	None
Kimsey Lane Left Tributary	Approximately 0.3 miles upstream of the confluence with North Fork Canoe Creek	Approximately 3,935 feet upstream of intersection with KY-1539	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Kimsey Lane Left Tributary	Confluence with North Fork Canoe Creek	Approximately 0.3 miles upstream of the confluence with North Fork Canoe Creek	HEC-HMS	HEC-RAS v. 4.0	June 2010	AE	None
Kimsey Lane Right Tributary	Confluence with North Fork Canoe Creek	Approximately 0.2 miles upstream of the confluence with North Fork Canoe Creek	HEC-1	HEC-2	October 1984	AE	None
Lick Creek	Confluence with Green River	Approximately 1.25 miles upstream of intersection with KY-416	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Lick Creek Tributary 11	Confluence with Lick Creek	Approximately 700 feet upstream of intersection with Stone McClellan Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Lick Creek Tributary 16	Confluence with Lick Creek	Approximately 2,640 feet upstream of intersection with South Negley Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Lick Creek Tributary 19	Confluence with Lick Creek	Approximately 0.8 miles upstream of the confluence with Lick Creek	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Lick Creek Tributary 2	Confluence with Lick Creek	Approximately 3,250 feet upstream of intersection with KY-416	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Lick Creek Tributary 2.1	Confluence with Lick Creek Tributary 2	Approximately 1,200 feet upstream of intersection with Mason Landing Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Lick Creek Tributary 2.2	Confluence with Lick Creek Tributary 2	Approximately 1.26 miles upstream of the confluence of Lick Creek Tributary 2.2.1	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Lick Creek Tributary 2.2.1	Confluence with Lick Creek Tributary 2.2	Approximately 1,015 feet upstream of intersection with Alves Ferry Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Lick Creek Tributary 22	Confluence with Lick Creek	Approximately 860 feet upstream of intersection with Jones Bros. Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Lick Creek Tributary 4	Confluence with Lick Creek	Approximately 95 feet upstream of intersection with KY-351	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Lick Creek Tributary 6	Confluence with Lick Creek	Approximately 0.9 miles upstream of the confluence with Lick Creek	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Lick Creek Tributary 8	Confluence with Lick Creek	Approximately 1 mile upstream of intersection with Hatchett Mill Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Lick Creek Tributary 8.1	Confluence with Lick Creek Tributary 8	Approximately 4,440 feet upstream of intersection with Connaway Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Middle Canoe Creek	Confluence with Upper Canoe Creek	Confluence of Canoe Creek	HEC-HMS	HEC-RAS v. 4.0	June 2010	AE	None
North Fork Beaverdam Creek	Confluence with Beaverdam Creek	Approximately 2,705 feet upstream of intersection with Rock Springs-Dixie Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
North Fork Canoe Creek	Approximately 140 feet downstream stream of the confluence of North Fork Canoe Creek Tributary 6	Approximately 0.5 miles upstream of the confluence of North Fork Canoe Creek Tributary 9	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
North Fork Canoe Creek	Confluence with Canoe Creek	Approximately 140 feet downstream stream of the confluence of North Fork Canoe Creek Tributary 6	HEC-HMS	HEC-RAS v. 4.0	February 4, 2014	AE	None
North Fork Canoe Creek Tributary	Confluence with North Fork Canoe Creek	Approximately 775 feet upstream of intersection with Clark St	HEC-1	HEC-2	October 1984	AE	North Fork Canoe Creek Tributary upstream of cross section C was delineated as a Zone A based on the elevation of the last detailed cross section

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
North Fork Canoe Creek Tributary 6	Confluence with North Fork Canoe Creek	Approximately 4,080 feet upstream of intersection with US-60 East	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
North Fork Canoe Creek Tributary 8	Confluence with North Fork Canoe Creek	Approximately 1.6 miles upstream of the confluence with North Fork Canoe Creek	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
North Fork Canoe Creek Tributary 9	Confluence with North Fork Canoe Creek	Approximately 1 mile upstream of intersection with US-60 East	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Ohio River	Western County Boundary	Eastern County Boundary	Other	HEC-RAS and HEC-2	September 5, 2008	AE	None
Old Knoblick Road Creek	County Boundary	Approximately 0.6 miles upstream of the County Boundary	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Opossum Creek	Confluence with Camp Creek	Approximately 3,575 feet upstream of intersection with Lod Powell Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Pond Creek	County Boundary	Approximately 4,920 feet upstream of intersection with Jarboe Ln	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Pond Creek Tributary 3	Confluence with Pond Creek	Approximately 2,180 feet upstream of intersection with Martin and Martin Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Pond Creek Tributary 6	Confluence with Pond Creek	Approximately 70 feet upstream of intersection with KY-268	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Race Creek	Confluence with Green River	Approximately 2.24 miles upstream of intersection with KY-1078	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Race Creek Tributary 1	Confluence with Race Creek	Approximately 330 feet upstream of intersection with Railroad	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Race Creek Tributary 2	Confluence with Race Creek	Approximately 2,380 feet upstream of intersection with KY-1078	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Rock Creek	Confluence with Highland Creek	Approximately 2,380 feet upstream of intersection with KY-1078	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Rock Creek Tributary 6	Confluence with Rock Creek	Approximately 1.4 miles upstream of the confluence with Rock Creek	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Royster Road Creek	County Boundary	Approximately 2,040 feet upstream of intersection with Thomason Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Sellers Ditch/Upper Canoe Creek	Confluence with Canoe Creek	Approximately 3,800 feet upstream of the confluence of East Fork Canoe Creek	HEC-HMS	HEC-RAS v. 4.0	June 2010	AE	None
Sputzman Creek	Confluence with Green River	Approximately 2,560 feet upstream of intersection with Roberts Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Sputzman Creek Tributary 1	Confluence with Sputzman Creek	Approximately 3,175 feet upstream of intersection with Moss and Moss Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Sputzman Creek Tributary 2	Confluence with Sputzman Creek	Approximately 0.6 miles upstream of the confluence with Sputzman Creek	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Sputzman Creek Tributary 7	Confluence with Sputzman Creek	Approximately 485 feet upstream of intersection with Roberts Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Sugar Creek	Confluence with Ohio River	Approximately 3,220 feet upstream of intersection with Marywood Dr	HEC-1	HEC-2	October 1984	AE	None
Tiger Ditch	Confluence with North Fork Canoe Creek	Approximately 1,640 feet upstream of intersection with Stadium Dr	HEC-HMS	HEC-RAS v. 4.0	June 2010	AE	None

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Tiger Ditch Tributary 1	Confluence with Tiger Ditch	Approximately 0.3 miles upstream of the confluence with Tiger Ditch	HEC-HMS	HEC-RAS v. 4.0	June 2010	AE	None
West Fork Canoe Creek	Confluence with Canoe Creek	Approximately 4,595 feet upstream of intersection with KY-416	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
West Fork Canoe Creek Tributary 15	Confluence with West Fork Canoe Creek	Approximately 1.05 miles upstream of intersection with KY-1217	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
West Fork Canoe Creek Tributary 15.1	Confluence with West Fork Canoe Creek Tributary 15	Approximately 1,280 feet upstream of intersection with Eblen-Hancock Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
West Fork Canoe Creek Tributary 19	Confluence with West Fork Canoe Creek	Approximately 0.96 miles upstream of intersection with Smith Denton Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
West Fork Canoe Creek Tributary 2	Confluence with West Fork Canoe Creek	Approximately 1.47 miles upstream of intersection with KY-1217	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Whitelick Creek	Confluence with Highland Creek	Approximately 4.8 miles upstream of the confluence with Highland Creek	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None

**Table 13: Summary of Hydrologic and Hydraulic Analyses**

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Wilson Creek	Approximately 1,925 feet upstream of intersection with Wilson Station Rd	Approximately 1,25 feet upstream of the confluence of Wilson Creek Tributary 11	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None
Wilson Creek	Confluence with Canoe Creek	Approximately 1,925 feet upstream of intersection with Wilson Station Rd	Other	HEC-2	October 1988	AE	None
Wilson Creek Tributary 11	Confluence with Wilson Creek	Approximately 2,015 feet upstream of intersection with Corydon-D. Fellows Rd	Regression Equation	HEC-RAS v. 4.0	June 2010	A	None

**Table 14: Roughness Coefficients**

Flooding Source	Channel “n”	Overbank “n”
Canoe Creek	0.042-0.049	0.08-0.12
Elam Ditch	0.042-0.049	0.09-0.11
Elam Ditch Tributary 1	0.048-0.050	0.09-0.10
Elam Ditch Tributary 2	0.050	0.09
Elam Ditch Tributary 3	0.055	0.09
Kimsey Lane Left Tributary	0.049	0.10
Middle Canoe Creek	0.040-0.048	0.09-0.11
North Fork Canoe Creek	0.042-0.048	0.08-0.11
Sellers Ditch	0.070	0.09-0.10
Tiger Ditch	0.048-0.049	0.08-0.12
Tiger Ditch Tributary 1	0.045	0.08-0.11

**5.3 Coastal Analyses**

This section is not applicable to this FIS project.

**Table 15: Summary of Coastal Analyses**

[Not Applicable to this FIS Project]

**5.3.1 Total Stillwater Elevations**

This section is not applicable to this FIS project.

**Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas**

[Not Applicable to this FIS Project]

**Table 16: Tide Gage Analysis Specifics**

[Not Applicable to this FIS Project]

**5.3.2 Waves**

This section is not applicable to this FIS project.

**5.3.3 Coastal Erosion**

This section is not applicable to this FIS project.

#### 5.3.4 Wave Hazard Analyses

This section is not applicable to this FIS project

**Table 17: Coastal Transect Parameters**

[Not Applicable to this FIS Project]

**Figure 9: Transect Location Map**

[Not Applicable to this FIS Project]

#### 5.4 Alluvial Fan Analyses

This section is not applicable to this FIS project.

**Table 18: Summary of Alluvial Fan Analyses**

[Not Applicable to this FIS Project]

**Table 19: Results of Alluvial Fan Analyses**

[Not Applicable to this FIS Project]

### SECTION 6.0 – MAPPING METHODS

#### 6.1 Vertical and Horizontal Control

All FIS Reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS Reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the completion of the North American Vertical Datum of 1988 (NAVD88), many FIS Reports and FIRMs are now prepared using NAVD88 as the referenced vertical datum.

Flood elevations shown in this FIS Report and on the FIRMs are referenced to NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between NGVD29 and NAVD88 or other datum conversion, visit the National Geodetic Survey website at [www.ngs.noaa.gov](http://www.ngs.noaa.gov), or contact the National Geodetic Survey at the following address:

NGS Information Services  
NOAA, N/NGS12  
National Geodetic Survey  
SSMC-3, #9202  
1315 East-West Highway  
Silver Spring, Maryland 20910-3282  
(301) 713-3242

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not

shown on the FIRM, they may be found in the archived project documentation associated with the FIS Report and the FIRMs for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks in the area, please contact information services Branch of the NGS at (301) 713-3242, or visit their website at [www.ngs.noaa.gov](http://www.ngs.noaa.gov).

The datum conversion calculated for the previous Henderson County FIS for the entire county was -0.35 feet.

**Table 20: Countywide Vertical Datum Conversion**  
**[Not Applicable to this FIS Project]**

**Table 21: Stream-by-Stream Vertical Datum Conversion**  
**[Not Applicable to this FIS Project]**

**6.2 Base Map**

The FIRMs and FIS Report for this project have been produced in a digital format. The flood hazard information was converted to a Geographic Information System (GIS) format that meets FEMA’s FIRM database specifications and geographic information standards. This information is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community. The FIRM Database includes most of the tabular information contained in the FIS Report in such a way that the data can be associated with pertinent spatial features. For example, the information contained in the Floodway Data table and Flood Profiles can be linked to the cross sections that are shown on the FIRMs. Additional information about the FIRM Database and its contents can be found in FEMA’s *Guidelines and Standards for Flood Risk Analysis and Mapping*, <http://www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping>.

Base map information shown on the FIRM was derived from the sources described in Table 22.

**Table 22: Base Map Sources**

Data Type	Data Provider	Data Date	Data Scale	Data Description
Digital Orthophoto	USDA-FSA Aerial Photography Field Office	2014	2 feet	Color orthoimagery was provided for the county
Political boundaries	Kentucky Geographic Network	1/30/2013	N/A	Municipal and county boundaries
Transportation Features	Kentucky Geographic Network	2/18/2015	N/A	Roads and railroads

**Table 22: Base Map Sources**

Data Type	Data Provider	Data Date	Data Scale	Data Description
Surface Water Features	FEMA	2/23/2015	N/A	National Flood Hazard Layer for Henderson County (no changes from effective data.)

**6.3 Floodplain and Floodway Delineation**

The FIRM shows tints, screens, and symbols to indicate floodplains and floodways as well as the locations of selected cross sections used in the hydraulic analyses and floodway computations.

For riverine flooding sources, the mapped floodplain boundaries shown on the FIRM have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using the topographic elevation data described in Table 23.

In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% annual chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

The floodway widths presented in this FIS Report and on the FIRM were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. Table 2 indicates the flooding sources for which floodways have been determined. The results of the floodway computations for those flooding sources have been tabulated for selected cross sections and are shown in Table 24, “Floodway Data.”

**Table 23: Summary of Topographic Elevation Data used in Mapping**

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Scale	Contour Interval	Citation
Corydon, City of	All in City of Corydon	Analytical stereo plotters	1"=100'	2 ft.	GRW 2003
Henderson, City of	Canoe Creek, Lower Canoe Creek, Elam Ditch, Middle Canoe Creek, North Fork Canoe Creek, Sellers Ditch, Tiger Ditch	LiDAR	1 meter GSD	2 ft.	KYGeonet

**Table 23: Summary of Topographic Elevation Data used in Mapping**

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Scale	Contour Interval	Citation
Henderson County (Unincorporated Areas)	All others in Henderson County	Analytical stereo plotters	1"=100'	2 ft.	GRW 2003
Robards, City of	All in City of Robards	Analytical stereo plotters	1"=100'	2 ft.	GRW 2003

BFEs shown at cross sections on the FIRM represent the 1% annual chance water surface elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>Adams Street Tributary</b>								
A	1,690	39	127	3.2	387.4	387.4	388.3	0.9
B	2,376	23	90	4.5	390.8	390.8	391.3	0.5
C	3,062	25	112	3.6	395.0	395.0	395.9	0.9
D	3,854	26	123	3.3	399.1	399.1	400.0	0.9

<sup>1</sup>Feet above confluence with North Fork Canoe Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**ADAMS STREET TRIBUTARY**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>Audubon Park Creek Tributary</b>								
A	6,442	*	*	*	392.9	392.9	*	*
B	7,366	*	*	*	400.8	400.8	*	*
C	8,960	*	*	*	414.0	414.0	*	*
D	9,926	*	*	*	421.8	421.8	*	*

<sup>1</sup>Feet Above confluence with Ohio River

\*Floodway computations are not feasible for Audubon Park Creek Tributary.

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**AUDUBON PARK CREEK TRIBUTARY**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>Canoe Creek</b>								
A	2,903	180	2,783	5.6	375.5	360.3 <sup>2</sup>	360.3	0.0
B	5,340	180	2,923	5.3	375.5	361.9 <sup>2</sup>	362.1	0.2
C	7,405	159	2,255	6.9	375.5	363.3 <sup>2</sup>	363.6	0.2
D	10,388	152	2,475	6.3	375.5	366.3 <sup>2</sup>	366.5	0.2
E	13,121	239	3,452	4.5	375.5	368.7 <sup>2</sup>	368.8	0.1
F	16,561	242	3,163	4.9	375.5	370.5 <sup>2</sup>	371.0	0.5
G	18,979	200	2,896	5.4	375.5	372.4 <sup>2</sup>	373.4	1.0
H	21,968	203	2,868	5.4	375.5	374.5 <sup>2</sup>	375.3	0.8
I	23,282	470	6,064	2.6	376.1	376.1	376.9	0.9
J	24,591	314	4,145	1.2	376.4	376.4	377.2	0.9
K	27,382	363	4,470	1.1	376.6	376.6	377.4	0.9
L	32,362	300	3,898	1.2	376.8	376.8	377.7	0.9
M	38,022	483	4,673	1.0	377.1	377.1	378.1	1.0
N	45,793	380	4,452	1.3	377.5	377.5	378.5	1.0
O	49,104	627	5,867	1.0	378.1	378.1	379.0	0.9
P	51,434	548	5,278	1.1	378.4	378.4	379.3	1.0
Q	54,651	305	3,675	1.5	378.8	378.8	379.8	0.9
R	58,824	365	3,622	1.5	379.8	379.8	380.7	0.9
S	59,995	350	3,913	1.5	380.2	380.2	381.0	0.9
T	62,970	495	5,145	1.1	380.5	380.5	381.4	0.9
U	64,315	300	3,281	0.9	381.4	381.4	382.2	0.8
V	69,228	340	2,863	1.0	381.7	381.7	382.6	0.9
W	70,671	285	2,327	1.2	381.9	381.9	382.8	0.9

<sup>1</sup>Feet Above confluence with Ohio River

<sup>2</sup>Elevation computed without consideration of backwater effects from Ohio River

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**CANOE CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>East Fork Canoe Creek</b>								
A	3,310	584	2,385	2.3	384.5	380.4 <sup>2</sup>	381.3	0.9
B	4,425	470	3,037	1.8	384.5	381.0 <sup>2</sup>	381.8	0.8
C	5,330	272	2,716	2.1	384.7	382.6 <sup>3</sup>	383.4	0.8
D	6,353	418	4,108	1.4	384.7	382.8 <sup>3</sup>	383.7	0.9
E	7,750	765	6,165	0.9	384.7	382.9 <sup>3</sup>	383.9	1.0
F	8,010	780	6,113	0.9	384.7	383.0 <sup>3</sup>	384.0	1.0
G	9,500	924	7,298	0.8	384.7	383.1 <sup>3</sup>	384.1	1.0
H	12,230	888	5,307	1.0	384.7	384.2 <sup>3</sup>	385.1	0.9
I	13,705	917	4,778	1.1	384.7	384.6 <sup>3</sup>	385.6	1.0
J	15,425	930	5,693	1.0	385.1	385.1	386.1	1.0
K	17,105	1,001	3,934	1.2	385.4	385.4	386.4	1.0
L	18,515	1,143	3,861	1.2	385.9	385.9	386.9	1.0
M	22,150	900	3,314	1.4	390.6	390.6	391.4	0.8
N	23,650	1,066	4,189	1.0	391.1	391.1	392.1	1.0
O	26,003	505	1,404	2.7	392.6	392.6	393.3	0.7
P	26,990	551	1,996	1.0	394.0	394.0	394.9	0.9
Q	27,814	706	3,169	0.7	395.2	395.2	396.2	1.0
R	28,805	626	2,630	0.8	395.4	395.4	396.4	1.0
S	30,800	315	959	1.8	397.9	397.9	398.7	0.8
T	32,178	100	1,301	1.3	407.0	407.0	407.5	0.5
U	34,278	140	1,341	1.1	407.3	407.3	408.2	0.9

<sup>1</sup>Feet above confluence with Upper Canoe Creek

<sup>2</sup>Elevation computed without consideration of overflow effect from Upper Canoe Creek

<sup>3</sup>Elevation computed without consideration of backwater effects from Upper Canoe Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**EAST FORK CANOE CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>Elam Ditch</b>								
A	1,439	55	408	5.0	382.2	380.2 <sup>2</sup>	380.2	0.0
B	2,492	79	491	4.1	382.2	381.9 <sup>2</sup>	381.9	0.0
C	4,171	316	1,421	2.3	382.6	382.6	382.7	0.1
D	6,813	1,050	6,916	0.9	382.8	382.8	383.5	0.7
E	9,804	650	4,176	1.5	382.9	382.9	383.7	0.8
F	11,852	1,451 <sup>3</sup>	3,487	1.3	383.8	383.8	384.6	0.8
G	17,554	2,507 <sup>3</sup>	10,929	0.9	383.8	383.8	384.8	1.0
H	19,927	1,219	1,738	6.4	384.3	384.3	385.3	1.0
I	22,411	153	595	8.4	387.7	387.7	388.7	1.0
J	25,611	560	3,222	1.8	393.1	393.1	393.8	0.7

<sup>1</sup>Feet above confluence with Canoe Creek

<sup>2</sup>Elevation computed without consideration of backwater effects from Canoe Creek

<sup>3</sup>Combined floodway width of Elam Ditch and Elam Ditch Tributary 1

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**ELAM DITCH**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>Elam Ditch Tributary 1</b>								
A	9,597	435	817	1.0	384.2	383.4 <sup>2</sup>	384.4	1.0
B	11,063	228	443	1.8	388.1	388.1	389.1	1.0
C	12,181	31	111	7.3	394.6	394.6	395.0	0.4

<sup>1</sup>Feet above confluence with Elam Ditch

<sup>2</sup>Elevation computed without consideration of overflow effect from Elam Ditch

**TABLE 24**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**ELAM DITCH TRIBUTARY 1**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Elam Ditch Tributary 2								
A	1,830	1,026	4,621	0.8	383.8	380.0 <sup>2</sup>	380.9	0.9
B	4,283	991	3,261	1.1	383.8	380.7 <sup>2</sup>	381.7	1.0

<sup>1</sup>Feet above confluence with Elam Ditch

<sup>2</sup>Elevation computed without consideration of backwater effects from Elam Ditch

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**ELAM DITCH TRIBUTARY 2**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Elam Ditch Tributary 3								
A	2,186	506	1,395	1.2	386.8	386.3 <sup>2</sup>	387.2	1.0
B	3,034	496	1,064	1.5	387.4	387.4	388.3	0.9

<sup>1</sup>Feet above confluence with Elam Ditch

<sup>2</sup>Elevation computed without consideration of overflow effect from Elam Ditch

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**ELAM DITCH TRIBUTARY 3**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>Highway 60 Tributary</b>								
A	7,128	19	68	5.8	414.4	414.4	414.6	0.2
B	8,026	19	73	5.4	419.9	419.9	420.3	0.4

<sup>1</sup>Feet above confluence with North Fork Canoe Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**HIGHWAY 60 TRIBUTARY**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>Kimsey Lane Left Tributary</b>								
A	961	255	851	1.2	387.8	386.2 <sup>2</sup>	386.8	0.6
B	1,581	272	890	1.2	387.8	386.3 <sup>2</sup>	387.3	1.0

<sup>1</sup>Feet above confluence with North Fork Canoe Creek

<sup>2</sup>Elevation computed without consideration of backwater effects from North Fork Canoe Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**KIMSEY LANE LEFT TRIBUTARY**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Kimsey Lane Right Tributary A	829	178	685	1.4	387.8	386.7 <sup>2</sup>	387.7	1.0

<sup>1</sup>Feet above confluence with North Fork Canoe Creek

<sup>2</sup>Elevation computed without consideration of backwater effects from North Fork Canoe Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**KIMSEY LANE RIGHT TRIBUTARY**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>Middle Canoe Creek</b>								
A	770	437	3,699	0.5	382.1	382.1	382.9	0.8
B	1,900	350	3,741	0.4	382.1	382.1	382.9	0.8
C	3,538	250	2,616	0.5	382.1	382.1	383.0	0.9
D	5,512	420	3,518	0.4	382.1	382.1	383.0	0.9

<sup>1</sup>Feet above confluence with Upper Canoe Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**MIDDLE CANOE CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>North Fork Canoe Creek</b>								
A	1,455	170	1,182	4.2	381.4	376.9 <sup>2</sup>	377.3	0.4
B	2,538	178	1,292	3.9	381.4	378.8 <sup>2</sup>	379.2	0.5
C	3,856	833	2,230	2.2	381.4	380.1 <sup>2</sup>	380.6	0.4
D	5,739	661	3,406	1.1	381.4	380.9 <sup>2</sup>	381.5	0.5
E	6,707	689	3,360	1.1	381.4	381.1 <sup>2</sup>	381.7	0.6
F	7,564	405	2,210	1.7	381.4	381.4	382.0	0.6
G	8,580	348	2,305	1.6	381.9	381.9	382.5	0.6
H	9,719	128	1,113	3.4	382.3	382.3	382.9	0.6
I	10,362	158	1,290	2.9	382.7	382.7	383.2	0.5
J	11,032	170	1,167	3.2	383.2	383.2	383.7	0.6
K	11,497	145	937	4.0	383.7	383.7	384.3	0.6
L	12,028	112	908	4.2	385.2	385.2	385.7	0.5
M	13,273	446	2,289	1.5	386.4	386.4	387.0	0.5
N	14,567	746	5,514	0.6	386.6	386.6	387.3	0.7
O	15,534	1,051	3,542	1.0	386.8	386.8	387.4	0.6
P	16,904	1,039	4,894	0.7	387.8	387.8	388.3	0.5
Q	18,470	954	4,899	0.8	387.9	387.9	388.4	0.6
R	21,592	1,071	4,110	0.9	389.0	389.0	389.8	0.8

<sup>1</sup>Feet above confluence with Canoe Creek

<sup>2</sup>Elevation computed without consideration of backwater effects from Canoe Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**NORTH FORK CANOE CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>North Fork Canoe Creek Tributary</b>								
A	480	19	61	6.7	385.1	378.3 <sup>2</sup>	378.7	0.4
B	1,167	235	1,211	0.3	388.2	388.2	388.6	0.4
C	2,112	455	1,807	0.2	388.3	388.3	388.6	0.3

<sup>1</sup>Feet above confluence with North Fork Canoe Creek

<sup>2</sup>Elevation computed without consideration of backwater effects from North Fork Canoe Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**NORTH FORK CANOE CREEK TRIBUTARY**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET) <sup>2</sup>	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>Ohio River</b>								
I	830	5,877/34,558 <sup>3</sup>	155,316	5.0	371.1	371.1	372.1	1.0
J	824	21,480/14,016	466,039	2.0	372.5	372.5	373.5	1.0
K	822	17,283/12,738	350,444	2.6	372.6	372.6	373.6	1.0
L	820	16,442/15,041	374,734	2.5	373.1	373.1	374.0	0.9
M	815	18,450/18,377	311,015	3.0	373.9	373.9	374.9	1.0
N	810	16,820/2,105	332,988	2.8	374.7	374.7	375.7	1.0
O	809	18,615/2,496	366,453	2.5	375.0	375.0	376.0	1.0
P	808	19,310/3,907	389,663	2.4	375.3	375.3	376.3	1.0
Q	807	18,095/3,489	387,474	2.4	375.5	375.5	376.5	1.0
R	805	16,180/2,502	339,259	2.7	375.8	375.8	376.8	1.0
S	803	13,240/2,022	298,297	3.1	376.1	376.1	377.1	1.0
T	801	12,430/3,643	293,322	3.1	376.6	376.6	377.5	0.9
U	799	6,866/15,168 <sup>3</sup>	203,776	2.7	377.2	377.2	378.1	0.9
V	793	3,860/32,869 <sup>3</sup>	141,713	3.9	377.7	377.7	378.7	1.0
W	786	11,710/7,363	250,417	3.7	379.0	379.0	380.0	1.0
X	785	12,300/3,833	238,487	3.9	379.3	379.3	380.3	1.0
Y	783	13,470/7,385	291,471	3.0	380.1	380.1	381.1	1.0
Z	780	9,736/9,736	195,616	4.5	380.8	380.8	381.7	0.9
AA	777	10,041/10,041	244,394	3.6	381.9	381.9	383.0	1.1
A	773	7,690/6,826	211,871	4.1	383.1	383.1	384.1	1.0
B	772	9,651/7,558	224,028	3.9	383.4	383.4	384.4	1.0

<sup>1</sup>Miles below Pittsburgh, PA

<sup>2</sup>Width/Width within county boundary

<sup>3</sup>Width within county boundary represents plotted width of floodway and differs from the actual width as per model. This is due to the meandering of the stream and the plotting position of the upstream or downstream floodway encroachments.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>Sellers Ditch/Upper Canoe Creek</b>								
A	1,319	190	3,182	3.8	377.6	377.6	378.3	0.7
B	2,341	207	3,839	3.3	380.0	380.0	380.0	0.0
C	4,432	563	5,948	2.1	381.3	381.3	381.5	0.2
D	6,031	720	5,477	2.3	381.7	381.7	382.1	0.4
E	6,888	310	4,655	3.2	382.0	382.0	382.6	0.6
F	7,858	700	5,906	2.6	382.2	382.2	383.1	0.9
G	9,324	500	5,584	2.7	382.8	382.8	383.6	0.8
H	10,035	360	4,467	3.4	383.7	383.7	384.4	0.7
I	11,748	1,500	13,336	1.1	384.3	384.3	385.1	0.8
J	15,747	4,100	28,669	0.6	384.6	384.6	385.5	0.9

<sup>1</sup>Feet above confluence with Canoe Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**SELLERS DITCH/UPPER CANOE CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>Sugar Creek</b>								
A	2,244	81	490	2.7	376.4	372.9 <sup>2</sup>	373.9	1.0
B	8,358	16	47	9.5	408.1	408.1	408.6	0.5

<sup>1</sup>Feet above confluence with Ohio River

<sup>2</sup>Elevation computed without consideration of backwater effects from Ohio River

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**SUGAR CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Tiger Ditch Tributary 1								
A	520	34	134	3.3	385.5	385.5	385.5	0.0
B	1,581	33	92	4.8	390.4	390.4	390.4	0.0

<sup>1</sup>Feet above confluence with Tiger Ditch

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**TIGER DITCH TRIBUTARY 1**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>Tiger Ditch</b>								
A	1,059	68	400	3.5	381.4	379.4 <sup>2</sup>	379.7	0.3
B	2,457	113	628	2.2	381.4	379.9 <sup>2</sup>	380.8	0.9
C	3,944	578	2,038	0.6	382.3	382.3	383.2	0.9
D	4,665	308	1,085	1.1	382.4	382.4	383.3	0.9
E	6,202	182	487	2.4	383.7	383.7	384.6	0.9
F	6,862	42	179	3.9	385.2	385.2	386.0	0.8
G	7,428	145	424	1.6	386.5	386.5	387.4	0.9
H	7,891	53	207	3.3	387.0	387.0	388.0	1.0
I	8,661	42	158	3.9	390.2	390.2	391.0	0.8

<sup>1</sup>Feet above confluence with North Fork Canoe Creek

<sup>2</sup>Elevation computed without consideration of backwater effects from Canoe Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**TIGER DITCH**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
<b>Wilson Creek</b>								
A	80	113	1,221	4.2	375.5	364.2 <sup>2</sup>	365.2	1.0
B	3,855	110	1,379	3.7	375.5	371.2 <sup>2</sup>	371.8	0.6
C	4,100	126	1,410	3.6	375.5	371.3 <sup>2</sup>	372.0	0.7
D	6,200	126	1,722	2.9	375.5	372.7 <sup>2</sup>	373.6	0.9
E	7,840	260	2,573	2.0	375.5	373.5 <sup>2</sup>	374.5	1.0
F	11,250	168	1,534	3.0	377.0	377.0	377.8	0.8
G	14,080	235	2,328	2.0	379.6	379.6	380.5	0.9
H	15,980	250	1,789	2.2	380.4	380.4	381.4	1.0
I	17,720	507	4,468	0.9	381.1	381.1	382.1	1.0
J	19,240	945	5,964	0.7	381.3	381.3	382.2	0.9
K	20,820	1,307	9,110	0.4	382.6	382.6	383.6	1.0
L	22,420	1,346	5,365	0.7	382.7	382.7	383.7	1.0
M	23,370	818	3,915	0.8	382.9	382.9	383.9	1.0
N	24,080	584	2,919	1.1	383.0	383.0	384.0	1.0
O	24,500	376	1,394	2.3	383.4	383.4	384.4	1.0
P	26,260	349	1,829	1.6	384.5	384.5	385.5	1.0

<sup>1</sup>Feet above confluence with Canoe Creek

<sup>2</sup>Elevation computed without consideration of backwater effects from Ohio River

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**WILSON CREEK**

## **Table 25: Flood Hazard and Non-Encroachment Data for Selected Streams**

[Not Applicable to this FIS Project]

### **6.4 Coastal Flood Hazard Mapping**

This section is not applicable to this FIS project.

## **Table 26: Summary of Coastal Transect Mapping Considerations**

[Not Applicable to this FIS Project]

### **6.5 FIRM Revisions**

This FIS Report and the FIRM are based on the most up-to-date information available to FEMA at the time of its publication; however, flood hazard conditions change over time. Communities or private parties may request flood map revisions at any time. Certain types of requests require submission of supporting data. FEMA may also initiate a revision. Revisions to FIS projects may take several forms, including Letters of Map Amendment (LOMAs), Letters of Map Revision Based on Fill (LOMR-Fs), Letters of Map Revision (LOMRs) (referred to collectively as Letters of Map Change (LOMCs)), Physical Map Revisions (PMRs), and FEMA-contracted restudies. These types of revisions are further described below. Some of these types of revisions do not result in the republishing of the FIS Report. To assure that any user is aware of all revisions, it is advisable to contact the community repository of flood-hazard data (shown in Table 31, “Map Repositories”).

#### **6.5.1 Letters of Map Amendment**

A LOMA is an official revision by letter to an effective NFIP map. A LOMA results from an administrative process that involves the review of scientific or technical data submitted by the owner or lessee of property who believes the property has incorrectly been included in a designated SFHA. A LOMA amends the currently effective FEMA map and establishes that a specific property is not located in a SFHA. A LOMA cannot be issued for properties located on the PFD (primary frontal dune).

To obtain an application for a LOMA, visit <http://www.fema.gov> and download the form “MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill”. Visit the “Flood Map-Related Fees” section to determine the cost, if any, of applying for a LOMA.

FEMA offers a tutorial on how to apply for a LOMA. The LOMA Tutorial Series can be accessed at [http://www.fema.gov/media/fhm/lomrf/ot\\_loma.html](http://www.fema.gov/media/fhm/lomrf/ot_loma.html).

For more information about how to apply for a LOMA, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627).

#### **6.5.2 Letters of Map Revision Based on Fill**

A LOMR-F is an official revision by letter to an effective NFIP map. A LOMR-F states FEMA’s determination concerning whether a structure or parcel has been elevated on fill above the base flood elevation and is, therefore, excluded from the SFHA.

Information about obtaining an application for a LOMR-F can be obtained in the same manner as that for a LOMA, by visiting <http://www.fema.gov> for the “MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill” or by calling the FEMA Map Information eXchange, toll free, at 1-877-FEMA MAP (1-877-336-2627). Fees for applying for a LOMR-F, if any, are listed in the “Flood Map-Related Fees” section.

A tutorial for LOMR-F is available at [http://www.fema.gov/media/fhm/lomrf/ot\\_lomrf.html](http://www.fema.gov/media/fhm/lomrf/ot_lomrf.html).

### 6.5.3 Letters of Map Revision

A LOMR is an official revision to the currently effective FEMA map. It is used to change flood zones, floodplain and floodway delineations, flood elevations and planimetric features. All requests for LOMRs should be made to FEMA through the chief executive officer of the community, since it is the community that must adopt any changes and revisions to the map. If the request for a LOMR is not submitted through the chief executive officer of the community, evidence must be submitted that the community has been notified of the request.

To obtain an application for a LOMR, visit <http://www.fema.gov> and download the form “MT-2 Application Forms and Instructions for Conditional Letters of Map Revision and Letters of Map Revision”. Visit the “Flood Map-Related Fees” section to determine the cost of applying for a LOMR. For more information about how to apply for a LOMR, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627) to speak to a Map Specialist.

Previously issued mappable LOMCs (including LOMRs) that have been incorporated into the Henderson County FIRM are listed in Table 27.

**Table 27: Incorporated Letters of Map Change**

Case Number	Effective Date	Flooding Source	FIRM Panel(s)
LOMR 14-09-0109P	N/A	Canoe Creek, Elam Ditch, North Fork, and Tiger Ditch	21101C0227F, 21101C0228F, 21101C0229F, 21101C0231F, 21101C0233F, 21101C0236F, 21101C0237F

### 6.5.4 Physical Map Revisions

PMRs are an official republication of a community’s NFIP map to effect changes to base flood elevations, floodplain boundary delineations, regulatory floodways and planimetric features. These changes typically occur as a result of structural works or improvements, annexations resulting in additional flood hazard areas or correction to base flood elevations or SFHAs.

The community’s chief executive officer must submit scientific and technical data to FEMA to support the request for a PMR. The data will be analyzed and the map will be revised if warranted. The community is provided with copies of the revised information and is afforded a review period. When the base flood elevations are changed, a 90-day appeal period is provided. A 6-month adoption period for formal approval of the revised map(s) is also provided.

For more information about the PMR process, please visit <http://www.fema.gov> and visit the “Flood Map Revision Processes” section.

### **6.5.5 Contracted Restudies**

The NFIP provides for a periodic review and restudy of flood hazards within a given community. FEMA accomplishes this through a national watershed-based mapping needs assessment strategy, known as the Coordinated Needs Management Strategy (CNMS). The CNMS is used by FEMA to assign priorities and allocate funding for new flood hazard analyses used to update the FIS Report and FIRM. The goal of CNMS is to define the validity of the engineering study data within a mapped inventory. The CNMS is used to track the assessment process, document engineering gaps and their resolution, and aid in prioritization for using flood risk as a key factor for areas identified for flood map updates. Visit [www.fema.gov](http://www.fema.gov) to learn more about the CNMS or contact the FEMA Regional Office listed in Section 8 of this FIS Report.

### **6.5.6 Community Map History**

The current FIRM presents flooding information for the entire geographic area of Henderson County. Previously, separate FIRMs, Flood Hazard Boundary Maps (FHBM) and/or Flood Boundary and Floodway Maps (FBFM) may have been prepared for the incorporated communities and the unincorporated areas in the county that had identified SFHAs. Current and historical data relating to the maps prepared for the project area are presented in Table 28, “Community Map History.” A description of each of the column headings and the source of the date is also listed below.

- *Community Name* includes communities falling within the geographic area shown on the FIRM, including those that fall on the boundary line, nonparticipating communities, and communities with maps that have been rescinded. Communities with No Special Flood Hazards are indicated by a footnote. If all maps (FHBM, FBFM, and FIRM) were rescinded for a community, it is not listed in this table unless SFHAs have been identified in this community.
- *Initial Identification Date (First NFIP Map Published)* is the date of the first NFIP map that identified flood hazards in the community. If the FHBM has been converted to a FIRM, the initial FHBM date is shown. If the community has never been mapped, the upcoming effective date or “pending” (for Preliminary FIS Reports) is shown. If the community is listed in Table 28 but not identified on the map, the community is treated as if it were unmapped.
- *Initial FHBM Effective Date* is the effective date of the first Flood Hazard Boundary Map (FHBM). This date may be the same date as the Initial NFIP Map Date.
- *FHBM Revision Date(s)* is the date(s) that the FHBM was revised, if applicable.
- *Initial FIRM Effective Date* is the date of the first effective FIRM for the community. This is the first effective date that is shown on the FIRM panel.
- *FIRM Revision Date(s)* is the date(s) the FIRM was revised, if applicable. This is the revised date that is shown on the FIRM panel, if applicable. As countywide studies are completed or revised, each community listed should have its FIRM dates updated accordingly to reflect the date of the countywide study. Once the FIRMs exist in

countywide format, as Physical Map Revisions (PMR) of FIRM panels within the county are completed, the FIRM Revision Dates in the table for each community affected by the PMR are updated with the date of the PMR, even if the PMR did not revise all the panels within that community.

The initial effective date for the Henderson County FIRMs in countywide format was 02/20/2013.

**Table 28: Community Map History**

Community Name	Initial Identification Date (First NFIP Map Published)	Initial FHBM Effective Date	FHBM Revision Date(s)	Initial FIRM Effective Date	FIRM Revision Date(s)
Corydon, City of	None	None	None	None	None
Henderson, City of	February 15, 1974	February 15, 1974	July 9, 1976	June 15, 1978	June 17, 1986 November 21, 1980
Henderson County (Unincorporated Areas)	June 24, 1977	June 24, 1977	None	February 6, 1991	None
Robards, City of	February 20, 2013	February 20, 2013	None	February 20, 2013	None

## SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION

### 7.1 Contracted Studies

Table 29 provides a summary of the contracted studies, by flooding source, that are included in this FIS Report.

**Table 29: Summary of Contracted Studies Included in this FIS Report**

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
Canoe Creek, North Fork Canoe Creek	8/8/8888	Powers Engineering	EMA-2013-CA-5355	February 4, 2014	City of Henderson, Henderson County Unincorporated Areas

**Table 29: Summary of Contracted Studies Included in this FIS Report**

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
Canoe Creek, Kimsey Lane Left Tributary, North Fork Canoe Creek, Sellers Ditch, & all approximate studies	2/20/2013	AMEC Earth & Environmental	EMA-2006-CA-5616	January 2008	City of Henderson, Henderson County Unincorporated Areas, and City of Robards
Ohio River	2/20/2013	USACE, Louisville District & IDNR	EMA-2006-CA-5616	January 2008	City of Henderson, Henderson County Unincorporated Areas
East Fork Canoe Creek, Wilson Creek	2/6/1991	Booker Associates, Inc.	EMW-87-C-2456	October 1988	Henderson County Unincorporated Areas
Adams Street Tributary, Audubon Park Creek, Highway 60 Tributary, Kimsey Lane Right Tributary, North Fork Canoe Creek Tributary, Sugar Creek	6/17/1986	USACE, Louisville District	EMW-E-1153	October 1984	City of Henderson

## 7.2 Community Meetings

The dates of the community meetings held for this FIS project and any previous FIS projects are shown in Table 30. These meetings may have previously been referred to by a variety of names (Community Coordination Officer (CCO), Scoping, Discovery, etc.), but all meetings represent opportunities for FEMA, community officials, study contractors, and other invited guests to discuss the planning for and results of the project.

**Table 30: Community Meetings**

Community	FIS Report Dated	Date of Meeting	Meeting Type	Attended By
¹Corydon, City of	February 20, 2013	May 22, 2006	Initial CCO	Henderson County, AMEC Earth & Environmental Inc., the National Service Provider (NSP) – Michael Baker Corporation and FEMA and the Kentucky Division of Water (KDOW)
		October 10, 2008	Final PDCC	Henderson County, AMEC Earth & Environmental Inc., the National Service Provider (NSP) – Michael Baker Corporation and FEMA and the Kentucky Division of Water (KDOW)
Henderson, City of	June 17, 1986	May 1983	Initial CCO	U.S. Army Corps of Engineers, Louisville District, FEMA, City of Henderson
		June 26, 1985	Final CCO	U.S. Army Corps of Engineers, Louisville District, FEMA, City of Henderson
	February 20, 2013	May 22, 2006	Initial CCO	Henderson County, AMEC Earth & Environmental Inc., the National Service Provider (NSP) – Michael Baker Corporation and FEMA and the Kentucky Division of Water (KDOW)
		October 10, 2008	Final PDCC	Henderson County, AMEC Earth & Environmental Inc., the National Service Provider (NSP) – Michael Baker Corporation and FEMA and the Kentucky Division of Water (KDOW)
Henderson County (Unincorporated Areas)	February 6, 1991	October 30, 1986	Initial CCO	Henderson County, FEMA, and Booker Associates, Inc.
		March 22, 1990	Final CCO	Henderson County, FEMA, and Booker Associates, Inc.
	February 20, 2013	May 22, 2006	Initial CCO	Henderson County, AMEC Earth & Environmental Inc., the National Service Provider (NSP) – Michael Baker Corporation and FEMA and the Kentucky Division of Water (KDOW)

**Table 30: Community Meetings**

Community	FIS Report Dated	Date of Meeting	Meeting Type	Attended By
	February 20, 2013	October 10, 2008	Final PDCC	Henderson County, AMEC Earth & Environmental Inc., the National Service Provider (NSP) – Michael Baker Corporation and FEMA and the Kentucky Division of Water (KDOW)
Robards, City of	February 20, 2013	May 22, 2006	Initial CCO	Henderson County, AMEC Earth & Environmental Inc., the National Service Provider (NSP) – Michael Baker Corporation and FEMA and the Kentucky Division of Water (KDOW)
		October 10, 2008	Final PDCC	Henderson County, AMEC Earth & Environmental Inc., the National Service Provider (NSP) – Michael Baker Corporation and FEMA and the Kentucky Division of Water (KDOW)

<sup>1</sup> No Special Flood Hazard Areas Identified

## SECTION 8.0 – ADDITIONAL INFORMATION

Information concerning the pertinent data used in the preparation of this FIS Report can be obtained by submitting an order with any required payment to the FEMA Engineering Library. For more information on this process, see <http://www.fema.gov>.

Table 31 is a list of the locations where FIRMs for Henderson County can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

**Table 31: Map Repositories**

Community	Address	City	State	Zip Code
Corydon, City of	Corydon City Hall 130 Main Street	Corydon	KY	42406
Henderson, City of	Henderson City Hall 222 First Street	Henderson	KY	42419
Henderson County (Unincorporated Areas)	Henderson County Courthouse 20 North Main Street	Henderson	KY	42420
Robards, City of	Robards City Hall 8253 Highway 416 W	Robards	KY	42452

The National Flood Hazard Layer (NFHL) dataset is a compilation of effective FIRM databases and LOMCs. Together they create a GIS data layer for a State or Territory. The NFHL is updated as studies become effective and extracts are made available to the public monthly. NFHL data can be viewed or ordered from the website shown in Table 32.

Table 32 contains useful contact information regarding the FIS Report, the FIRM, and other relevant flood hazard and GIS data. In addition, information about the state NFIP Coordinator and GIS Coordinator is shown in this table. At the request of FEMA, each Governor has designated an agency of State or territorial government to coordinate that State's or territory's NFIP activities. These agencies often assist communities in developing and adopting necessary floodplain management measures. State GIS Coordinators are knowledgeable about the availability and location of state and local GIS data in their state.

**Table 32: Additional Information**

FEMA and the NFIP	
FEMA and FEMA Engineering Library website	<a href="http://www.fema.gov">http://www.fema.gov</a>
NFIP website	<a href="http://www.fema.gov/national-flood-insurance-program">http://www.fema.gov/national-flood-insurance-program</a>
NFHL Dataset	<a href="http://msc.fema.gov">http://msc.fema.gov</a>

**Table 32: Additional Information**

FEMA Region IV	Federal Regional Office, 3003 Chamblee Tucker Rd, Atlanta, GA 30341 (770) 220-5200
Other Federal Agencies	
USGS website	<a href="http://www.usgs.gov">http://www.usgs.gov</a>
Hydraulic Engineering Center website	<a href="http://www.hec.usace.army.mil">http://www.hec.usace.army.mil</a>
State Agencies and Organizations	
State NFIP Coordinator	Abigail Rains Kentucky Division of Water 200 Fair Oaks Lane Frankfort, KY 40601 (502) 564-3410 Abigail.Rains@ky.gov
State GIS Coordinator	Tom Rossman Acting Division Director 101 Cold Harbor Drive Frankfort, KY 40601 (502) 564-6412 Tom.Rossman@ky.gov
Statewide Regulatory Coordinator	Carey Johnson Coordinating Technical Program Manager Kentucky Division of Water 200 Fair Oaks Lane Frankfort, KY 40601 (502) 564-3410 Carey.Johnson@ky.gov

**SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES**

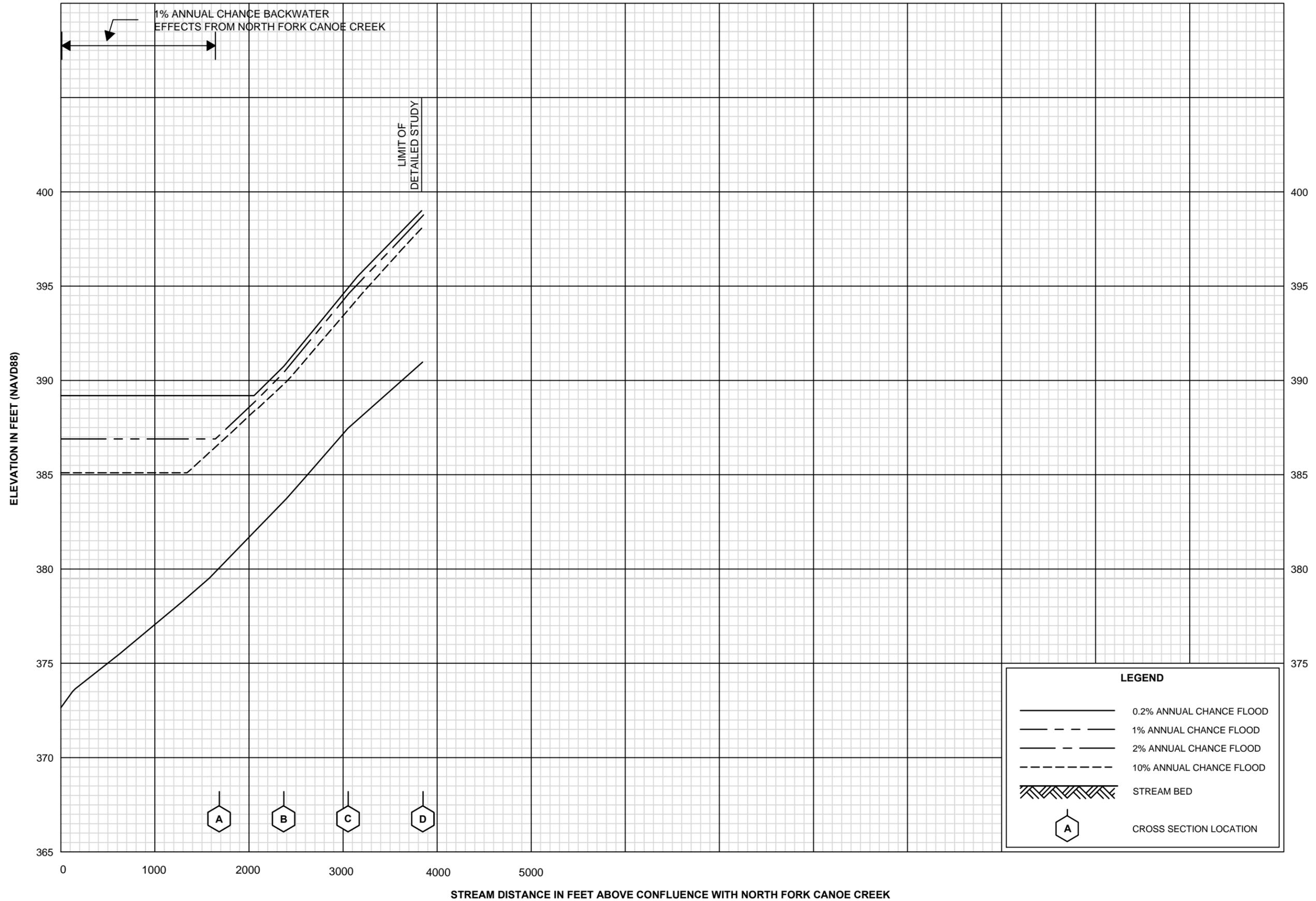
Table 33 includes sources used in the preparation of and cited in this FIS Report as well as additional studies that have been conducted in the study area.

**Table 33: Bibliography and References**

Citation in this FIS	Publisher/ Issuer	Publication Title, "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
Army Corp 1962	Army Corps of Engineers	<i>Statistical Methods in Hydrology</i>	Leo R. Beard	Sacramento , CA	Jan-62	
CED 2007	Cabinet for Economic Development	<i>Kentucky Quick Facts</i>			16-Mar-07	<a href="http://www.thinkkentucky.com">http://www.thinkkentucky.com</a>
FEMA 1986	Federal Emergency Management Agency	<i>Flood Insurance Study, City of Henderson, Henderson County Kentucky</i>		Washington, D. C.	17-Jun-86	
FEMA 1991	Federal Emergency Management Agency	<i>Flood Insurance Study, Henderson County Unincorporated Areas, Kentucky</i>		Washington, D. C.	6-Feb-91	
FEMA 2013	Federal Emergency Management Agency	<i>Flood Insurance Study, Henderson County, Kentucky and Incorporated Areas</i>		Washington, D. C.	February 20, 2013	
GRW 2003	GRW Aerial Surveys, Inc.	<i>Topographic Information, 1"=100' scale &amp; 2 foot contour interval</i>			Dec-03	
IDNR 2007	Indiana Department of Natural Resources	<i>HEC-RAS Models and Flood Elevations for the Ohio River</i>			Oct-07	
KYGeonet	Kentucky Geography Network	<i>LiDAR Topographic Information, 2 foot contour interval</i>			2013	<a href="http://kygissserver.ky.gov/geoportal/catalog/main/home.page">http://kygissserver.ky.gov/geoportal/catalog/main/home.page</a>

**Table 33: Bibliography and References**

Citation in this FIS	Publisher/ Issuer	Publication Title, "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
USACE 1983	U.S. Army Corps of Engineers, Louisville District, Ohio River Diversion	<i>Canoe Creek, Henderson, Kentucky - Detailed Project Report</i>		Louisville, Kentucky	Jan-83	
USACE 2007	United States Army Corps of Engineers	<i>HEC-2 Model and GIS Data for the Ohio River</i>			Oct-07	
USGS 1976	U.S. Geological Survey, Water Resources Investigations 72-76	<i>Techniques for Estimating Magnitude and Frequency of Floods in Kentucky</i>			Nov-76	
USGS 2003	U.S. Geological Survey	<i>Estimating the Magnitude of peak Flows for Streams in Kentucky for Selected Recurrence Intervals (WRIR 03-4180)</i>	Glenn A. Hodgkins, Gary R. Martin		2003	<a href="http://pubs.usgs.gov/wri/wri034180/">http://pubs.usgs.gov/wri/wri034180/</a>

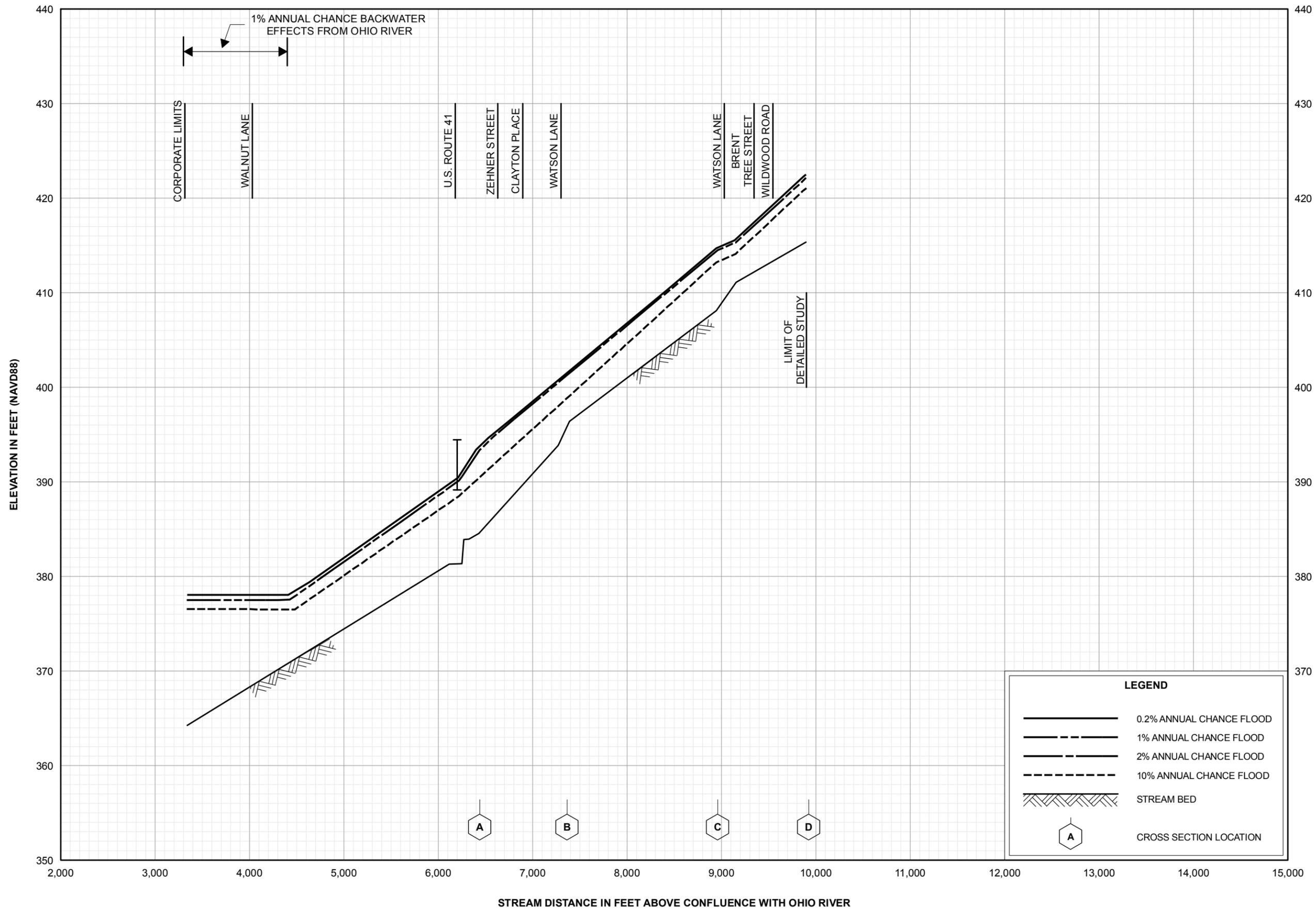


**FLOOD PROFILES**

**ADAMS STREET TRIBUTARY**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

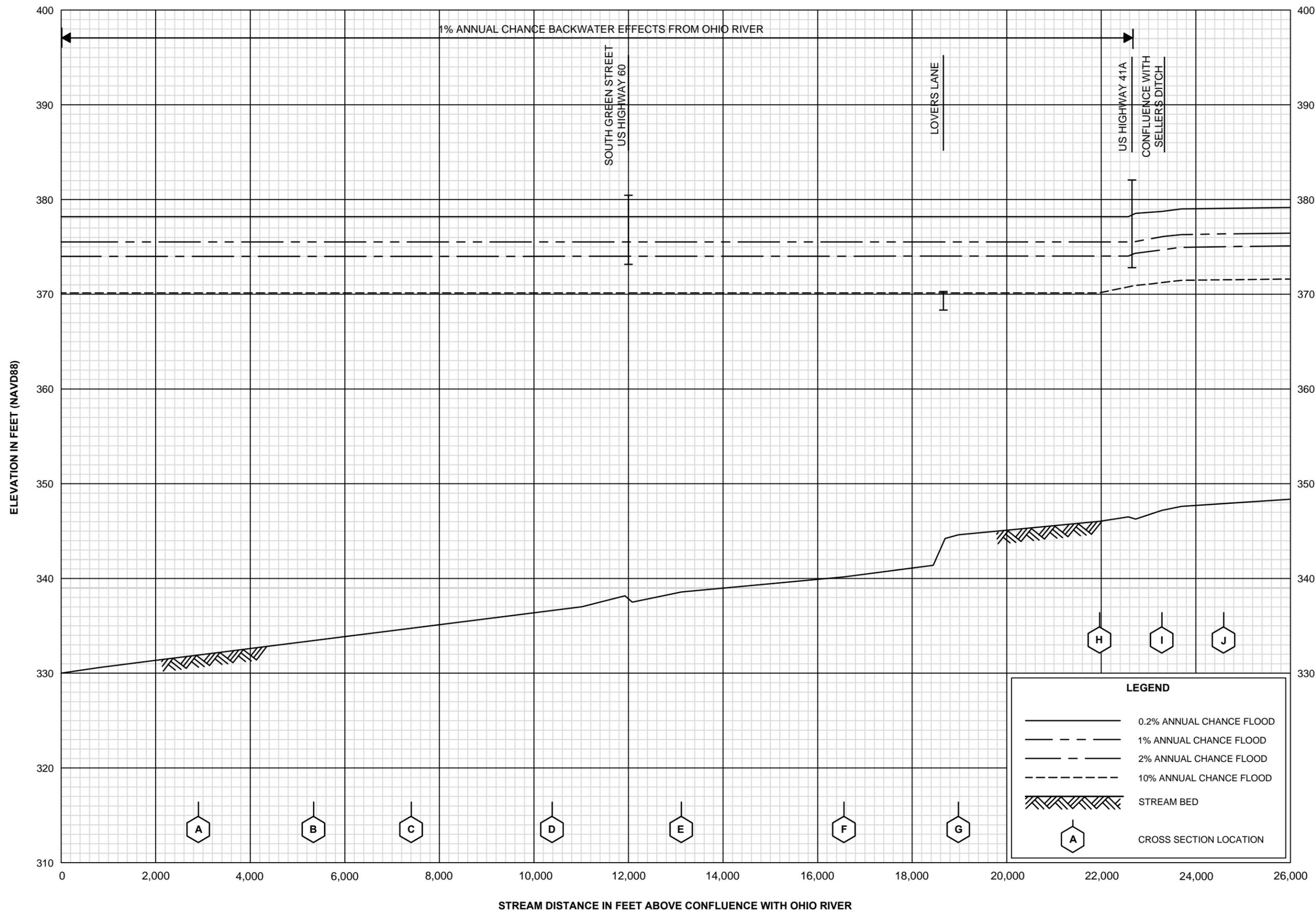


**FLOOD PROFILES**

**AUDUBON PARK CREEK TRIBUTARY**

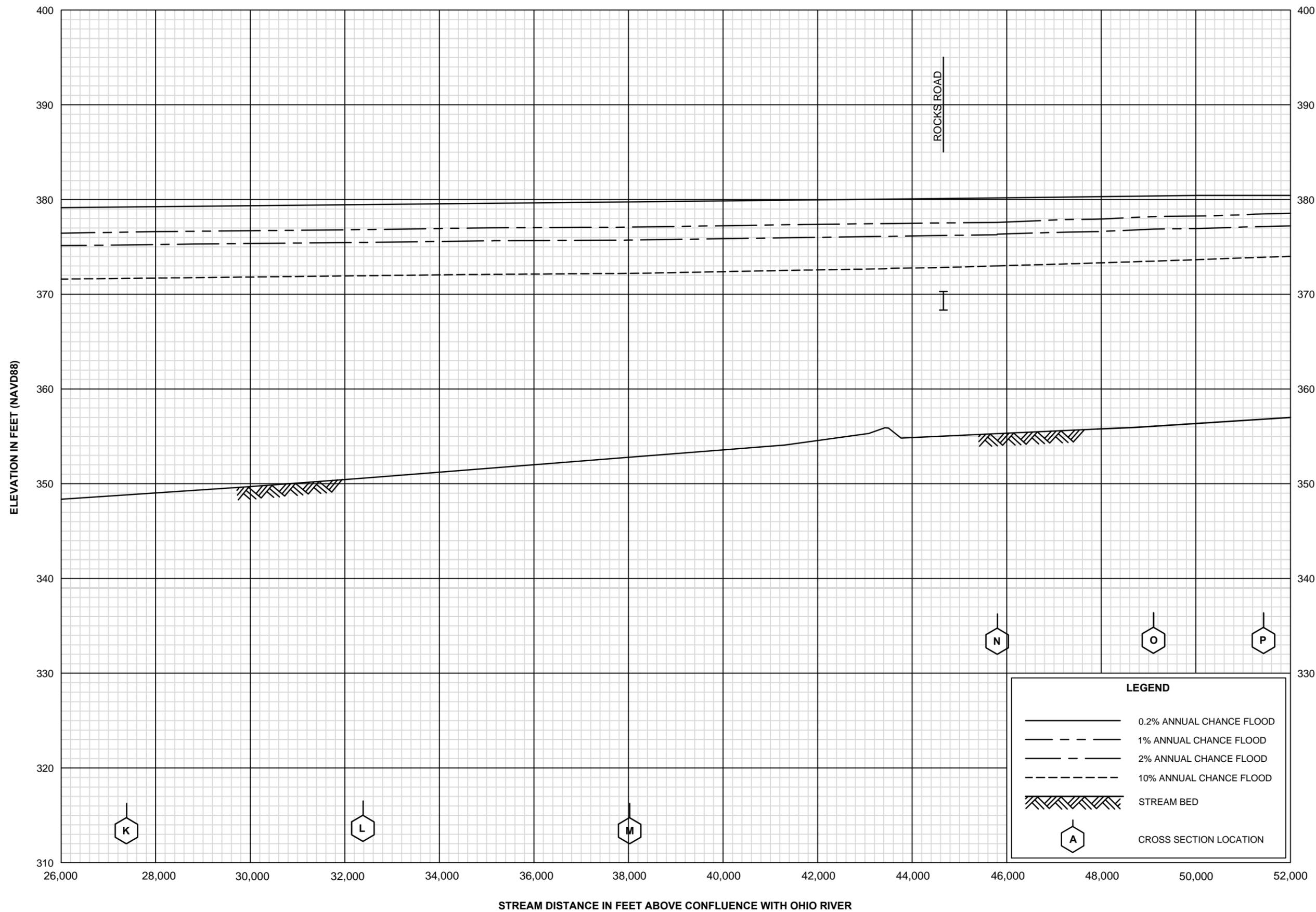
FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**



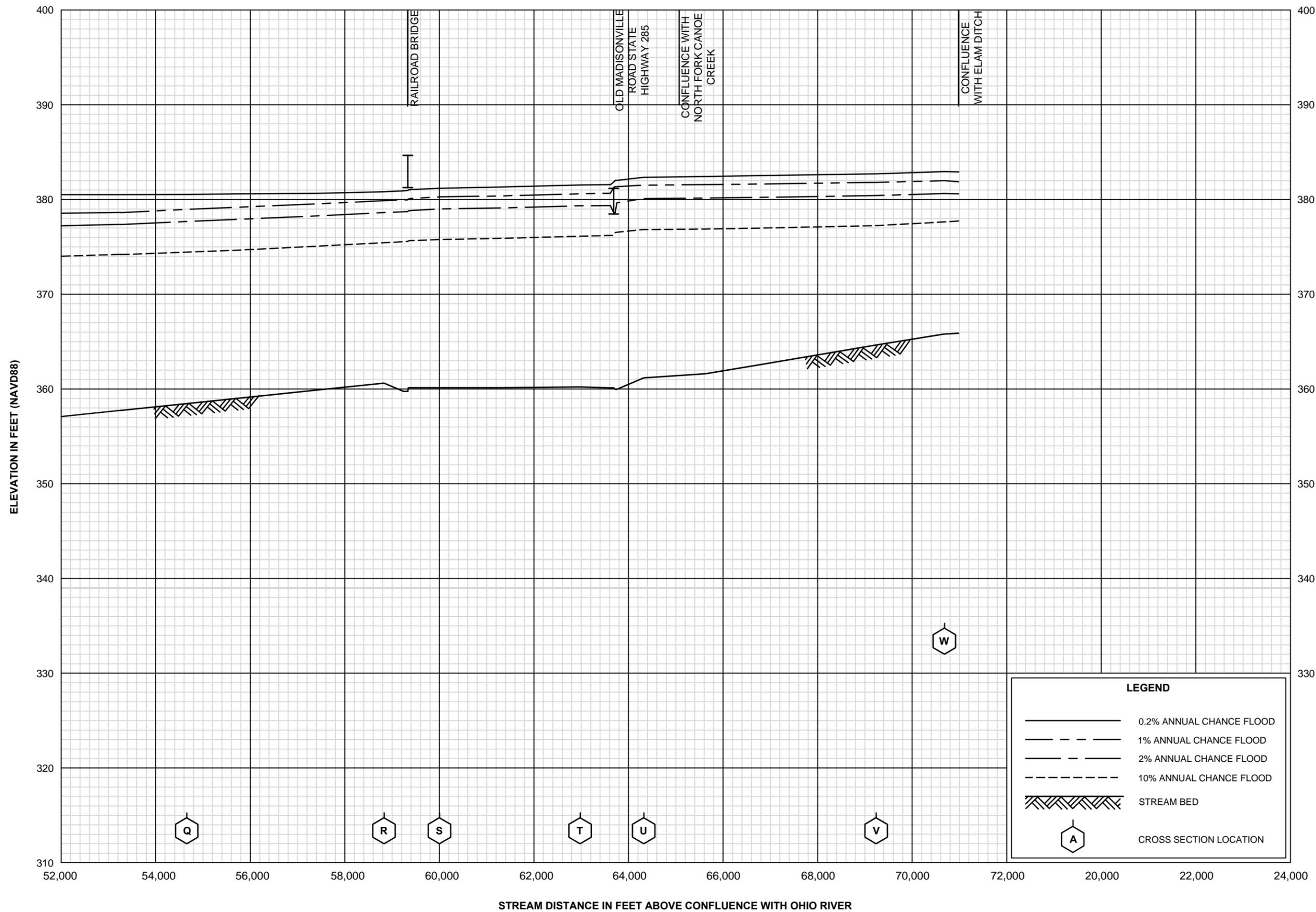
**FLOOD PROFILES**  
**CANOE CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
AND INCORPORATED AREAS



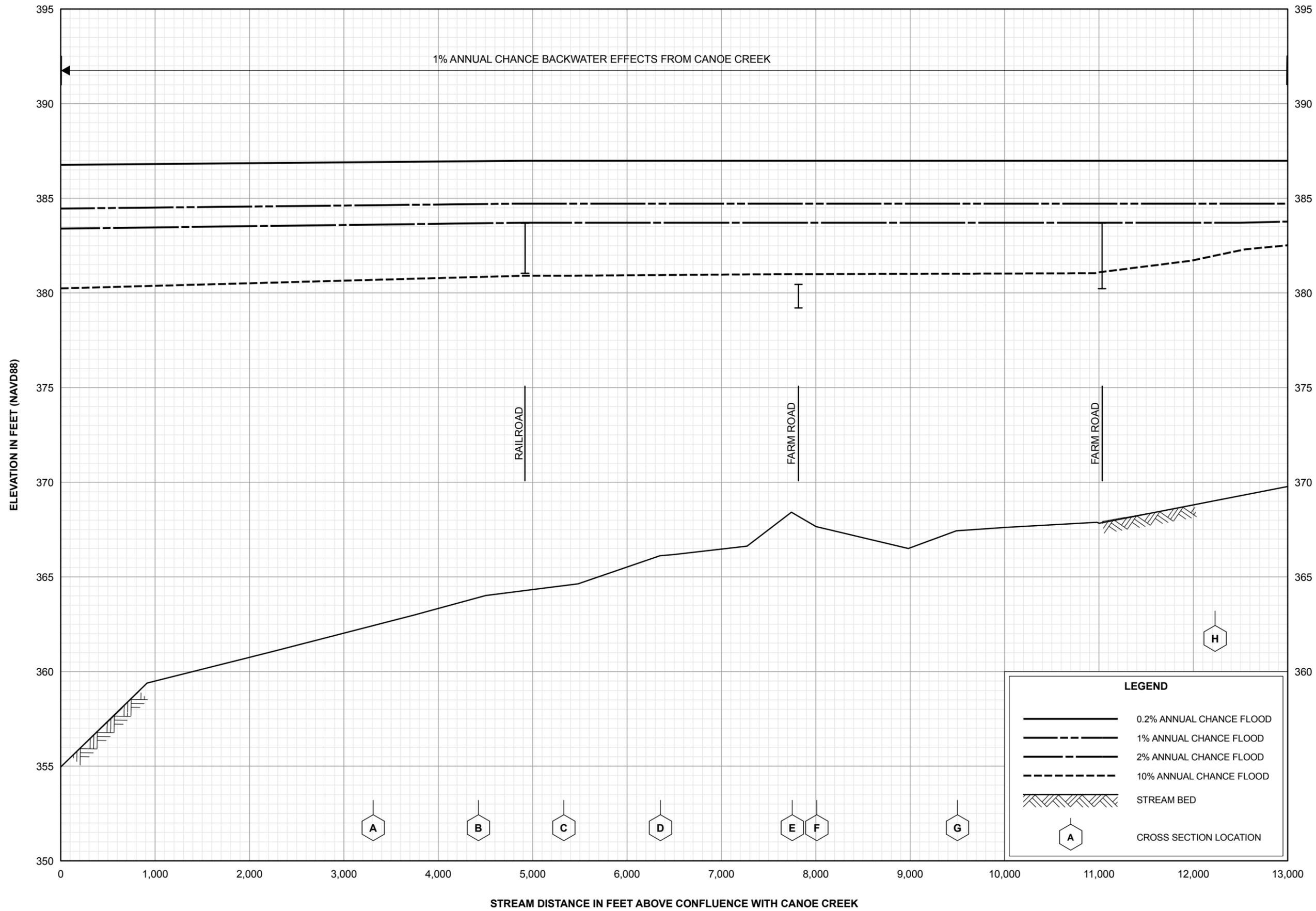
**FLOOD PROFILES**  
**CANOE CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
AND INCORPORATED AREAS



**FLOOD PROFILES**  
**CANOE CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
AND INCORPORATED AREAS

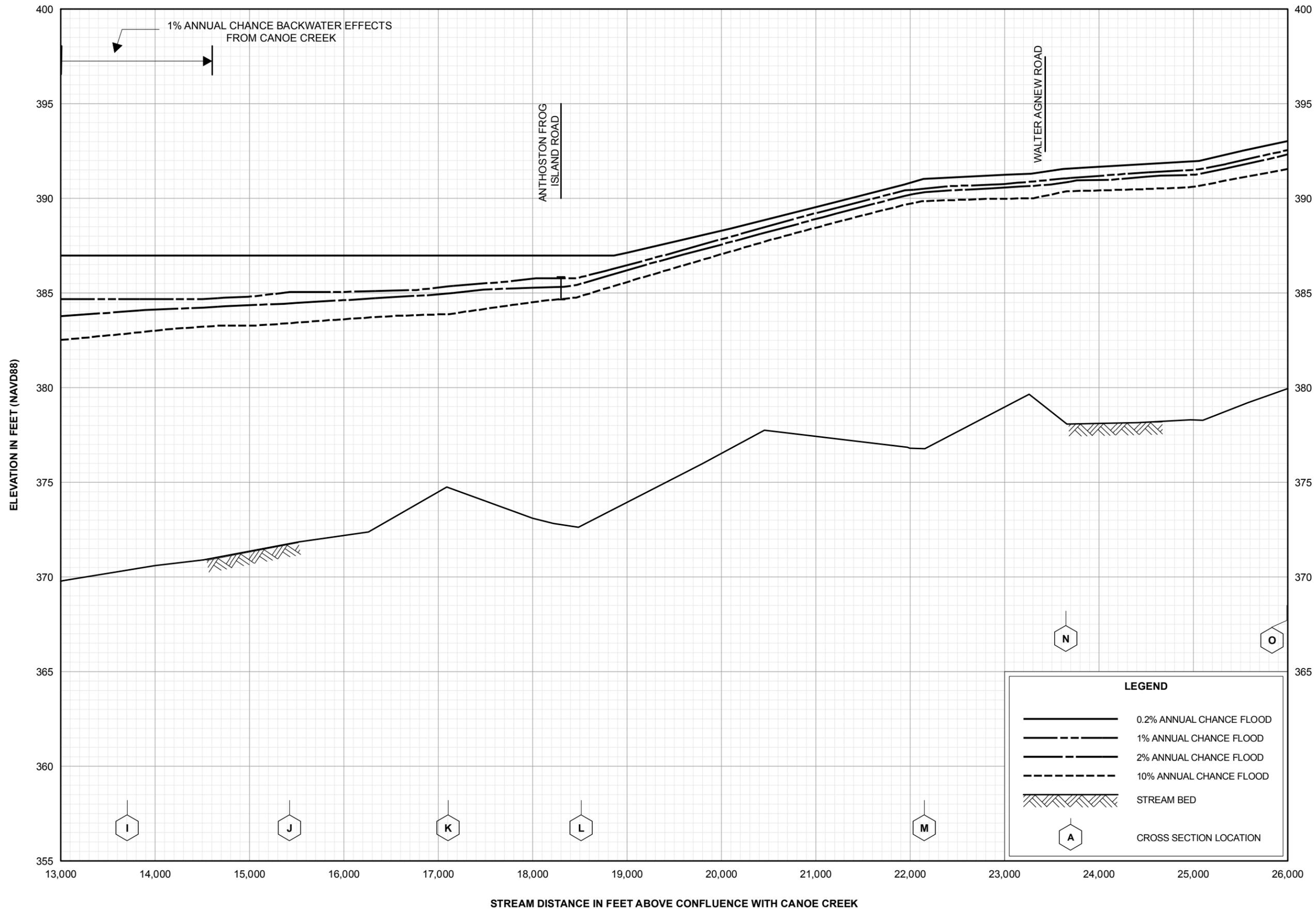


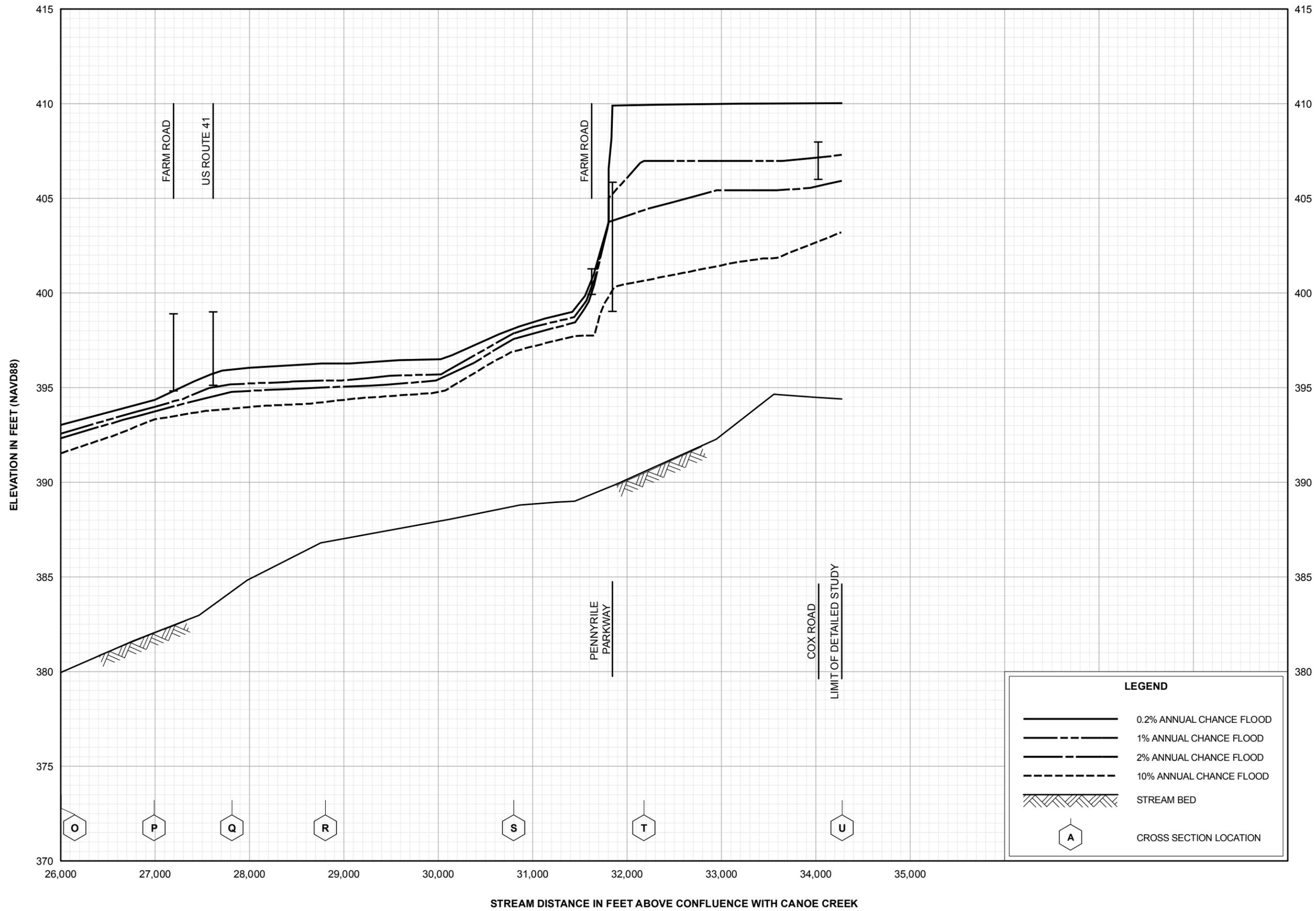
**FLOOD PROFILES**  
**EAST FORK CANOE CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
AND INCORPORATED AREAS

**LEGEND**

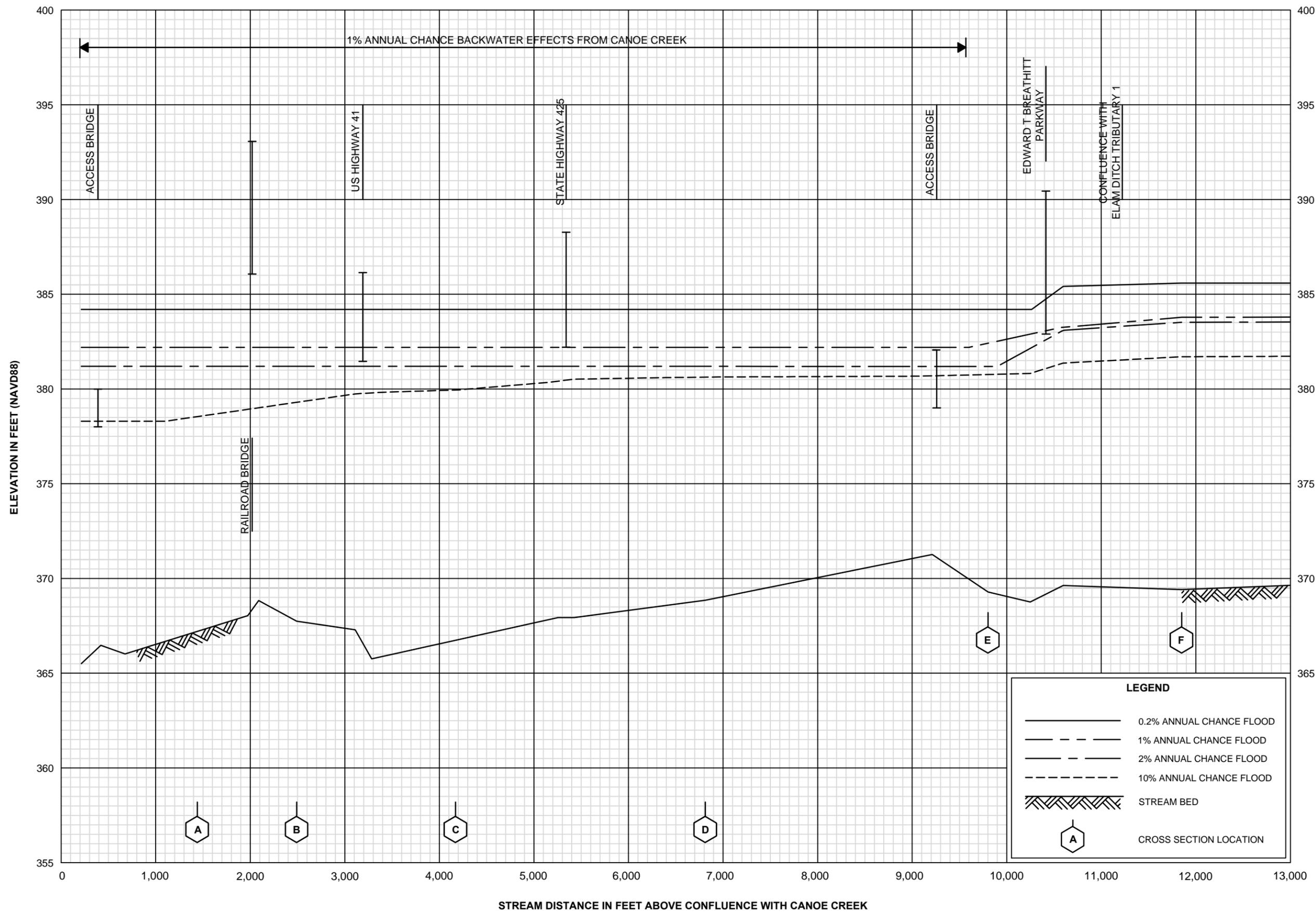
	0.2% ANNUAL CHANCE FLOOD
	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION





**FLOOD PROFILES**  
**EAST FORK CANOE CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
AND INCORPORATED AREAS

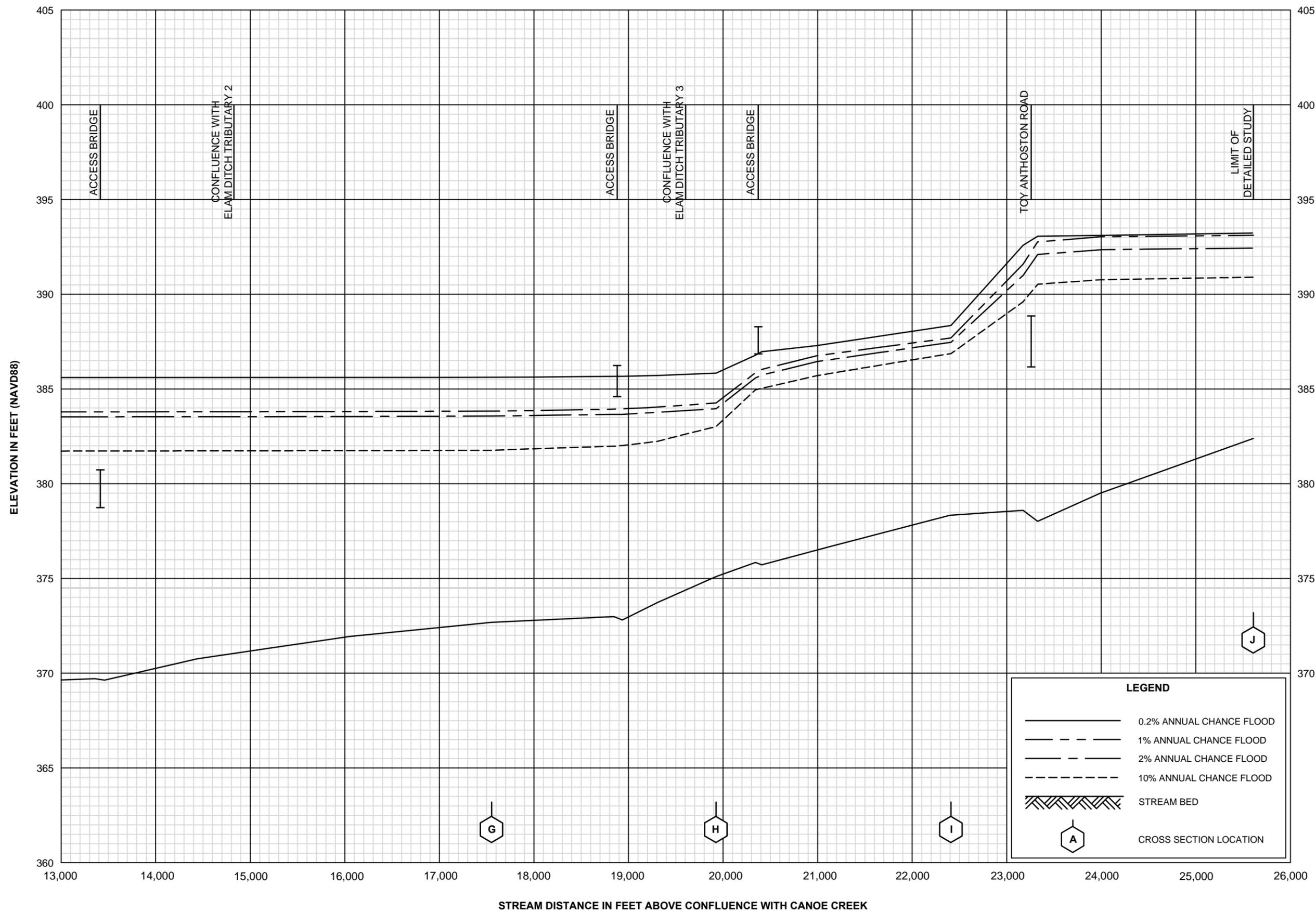


**FLOOD PROFILES**

**ELAM DITCH**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

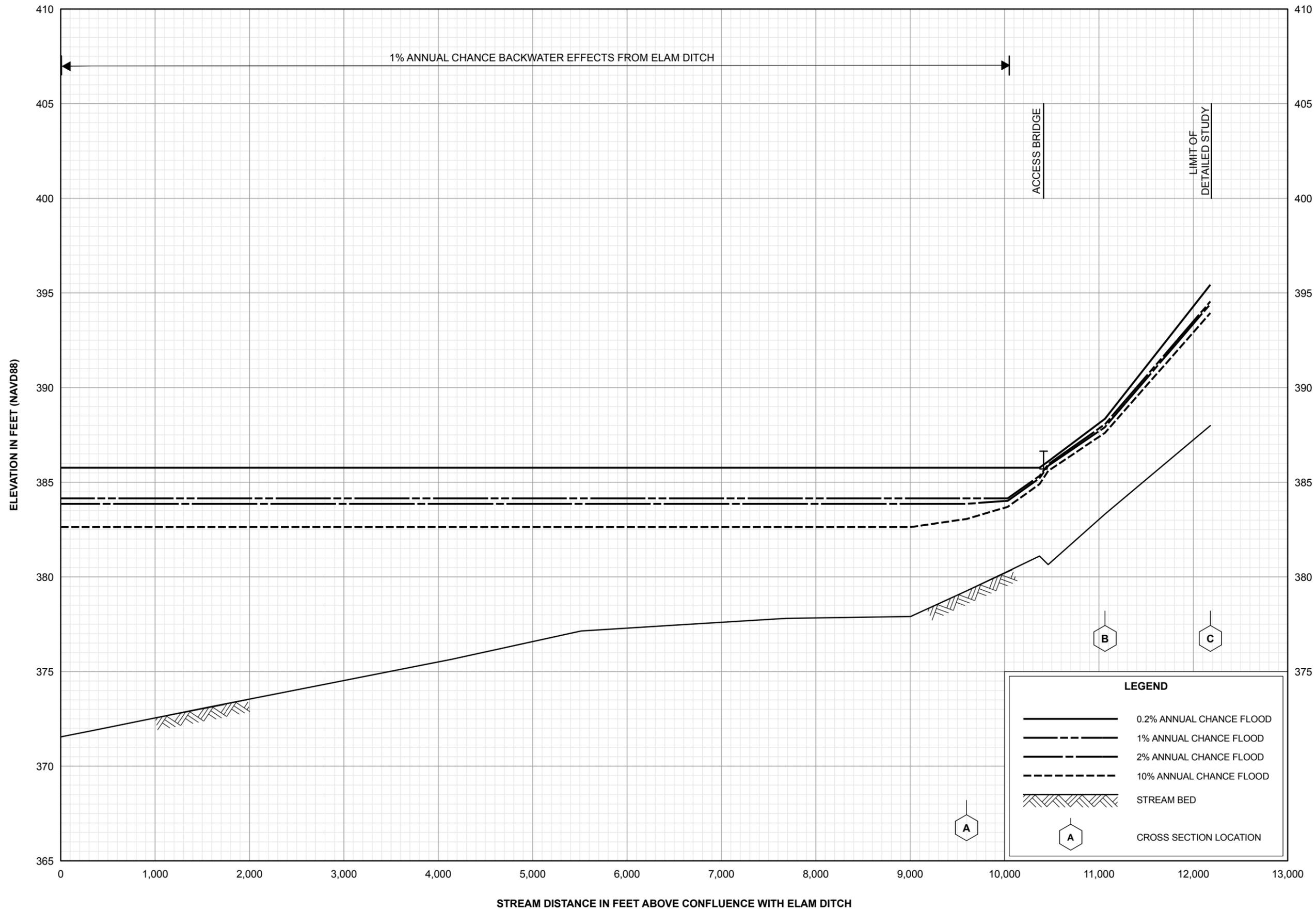


**FLOOD PROFILES**

**ELAM DITCH**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

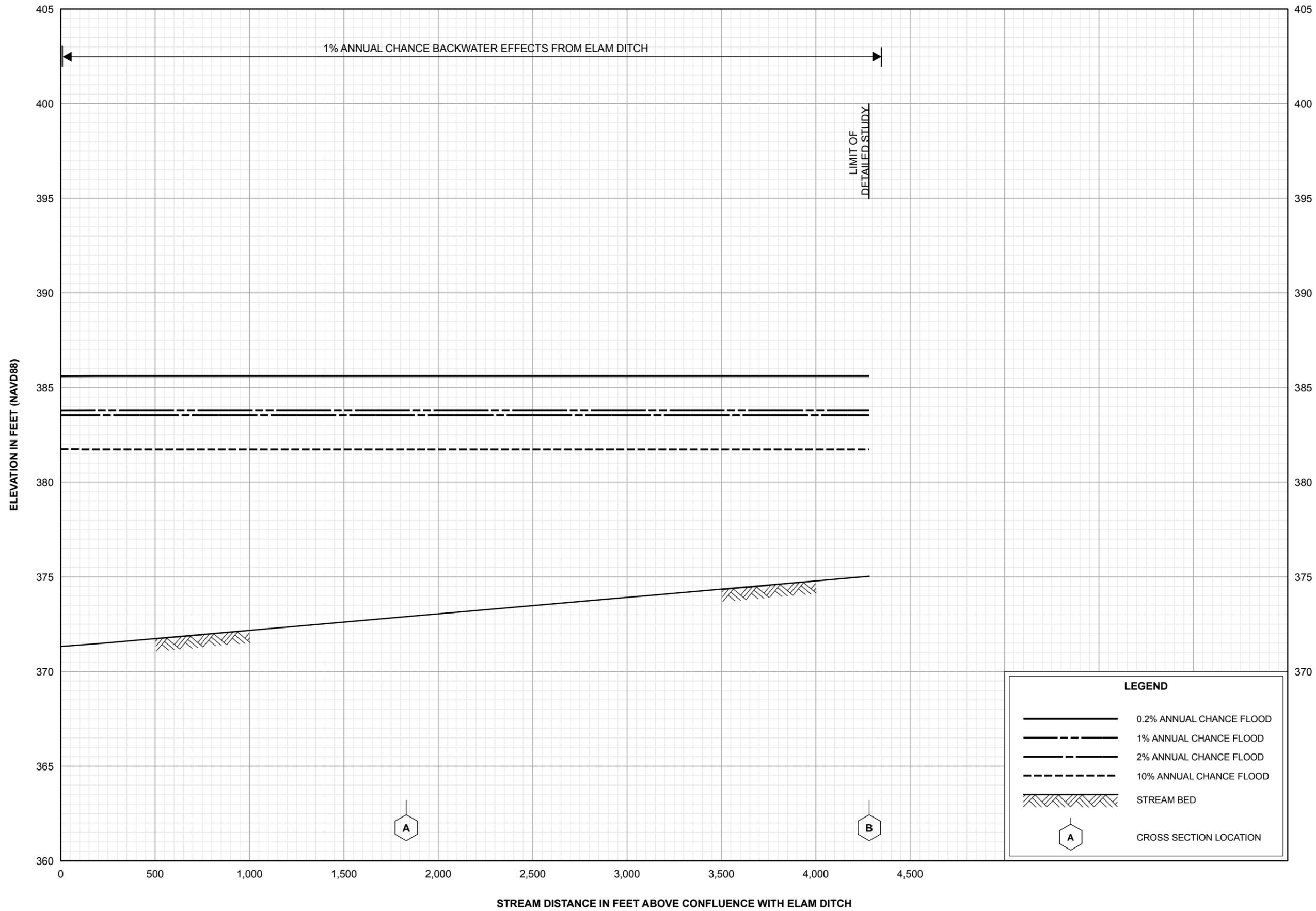


**FLOOD PROFILES**

**ELAM DITCH TRIBUTARY 1**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

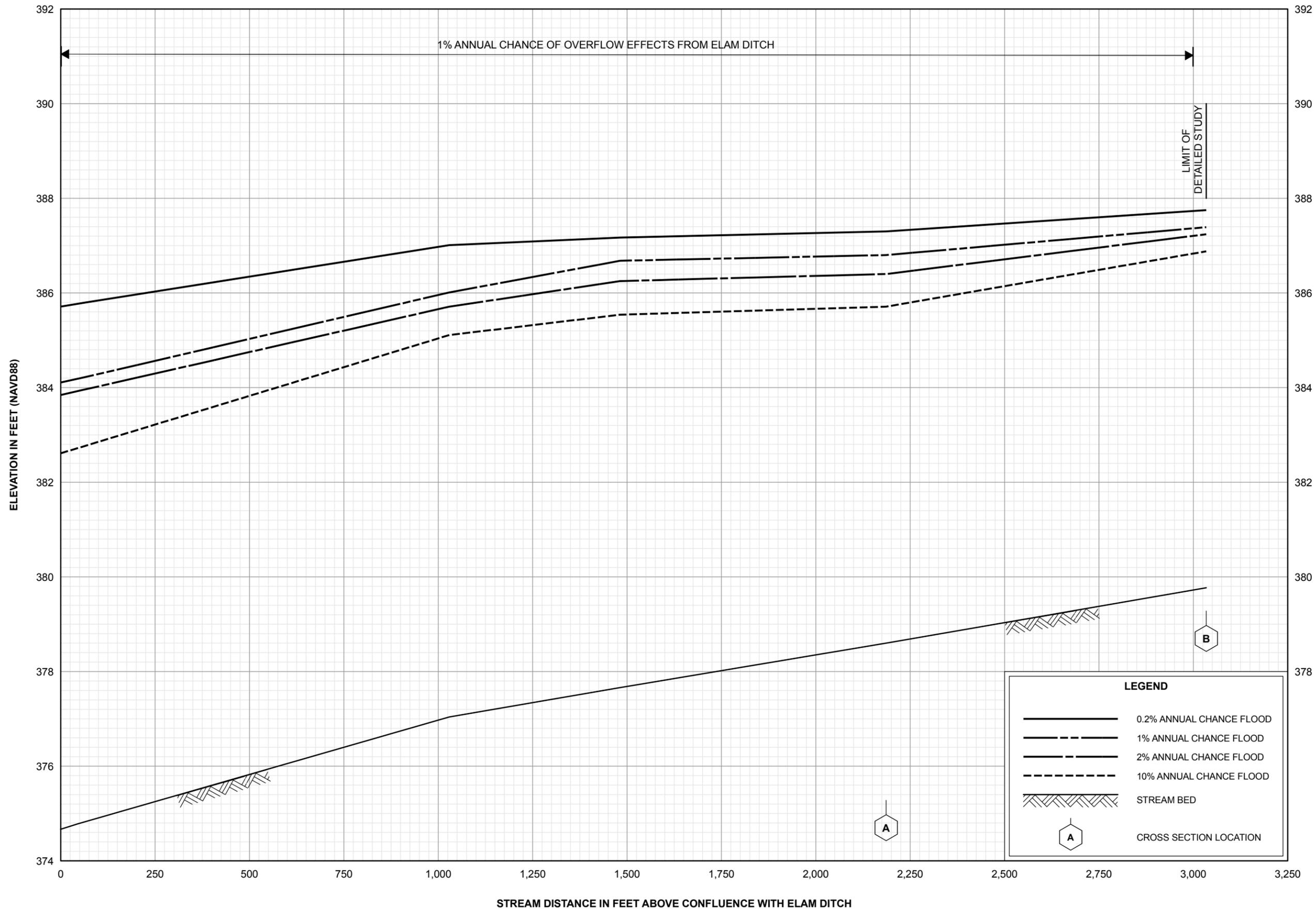


**FLOOD PROFILES**  
**ELAM DITCH TRIBUTARY 2**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
AND INCORPORATED AREAS

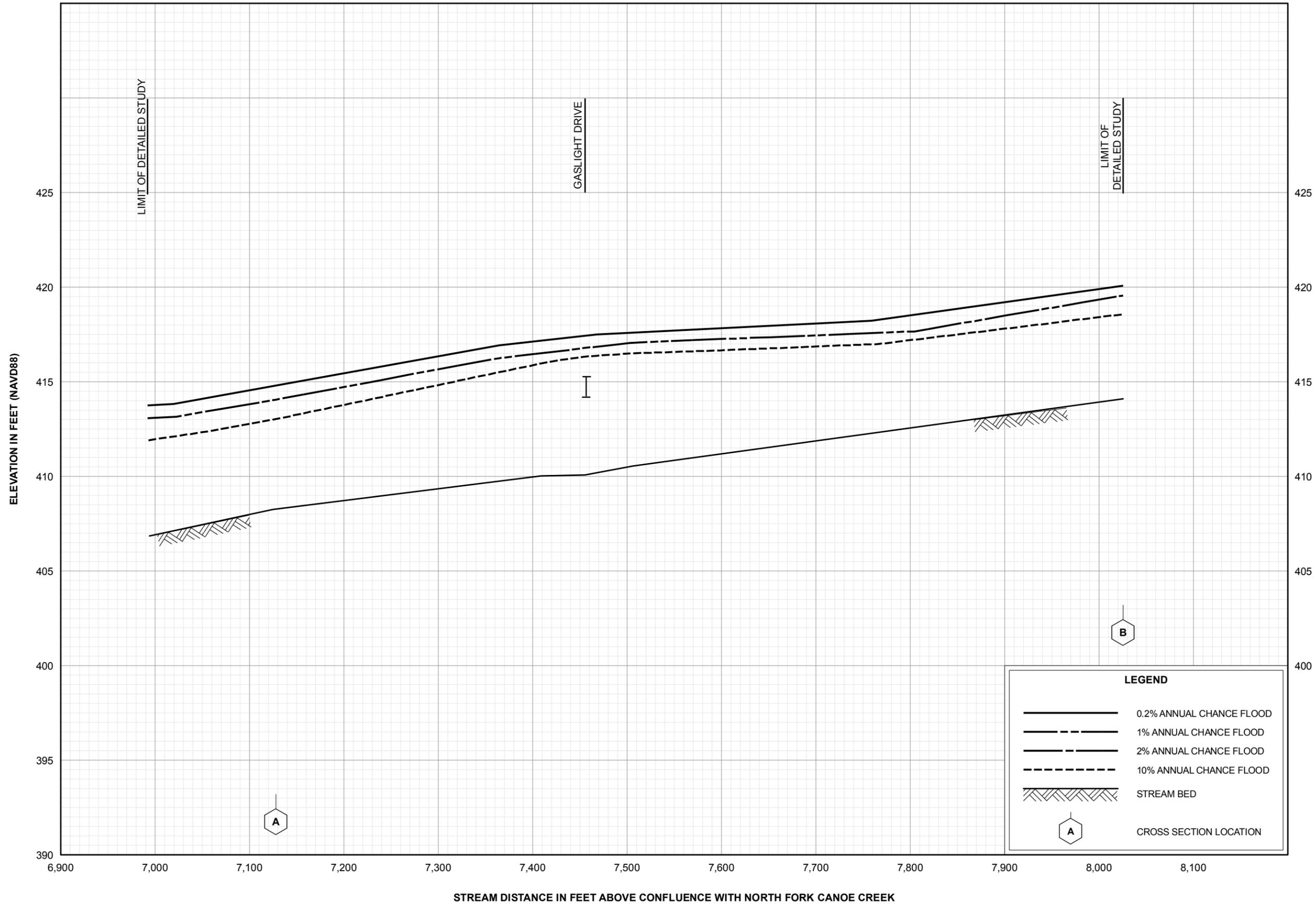
**LEGEND**

	0.2% ANNUAL CHANCE FLOOD
	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION



**FLOOD PROFILES**  
**ELAM DITCH TRIBUTARY 3**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
AND INCORPORATED AREAS

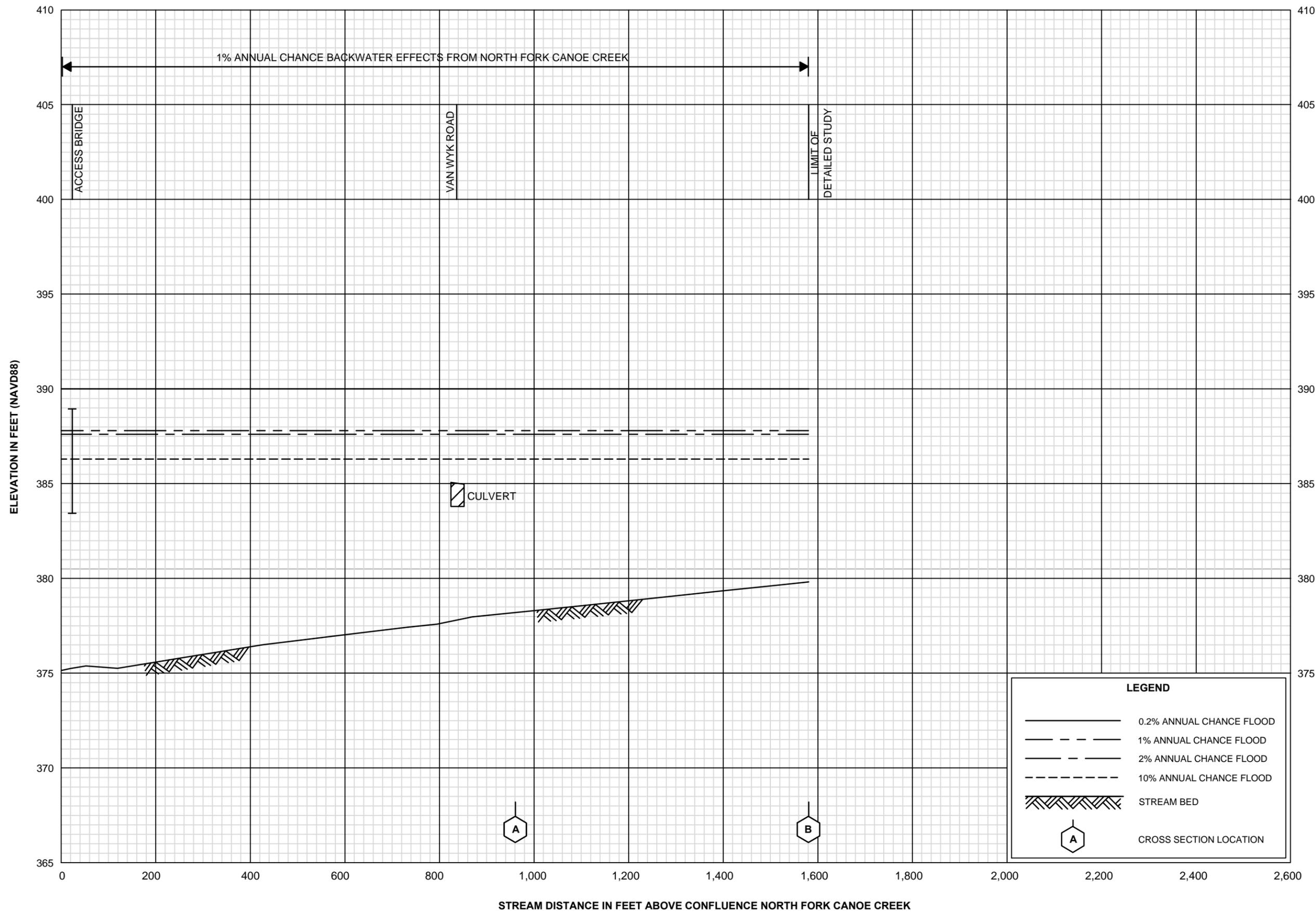


**FLOOD PROFILES**

**HIGHWAY 60 TRIBUTARY**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

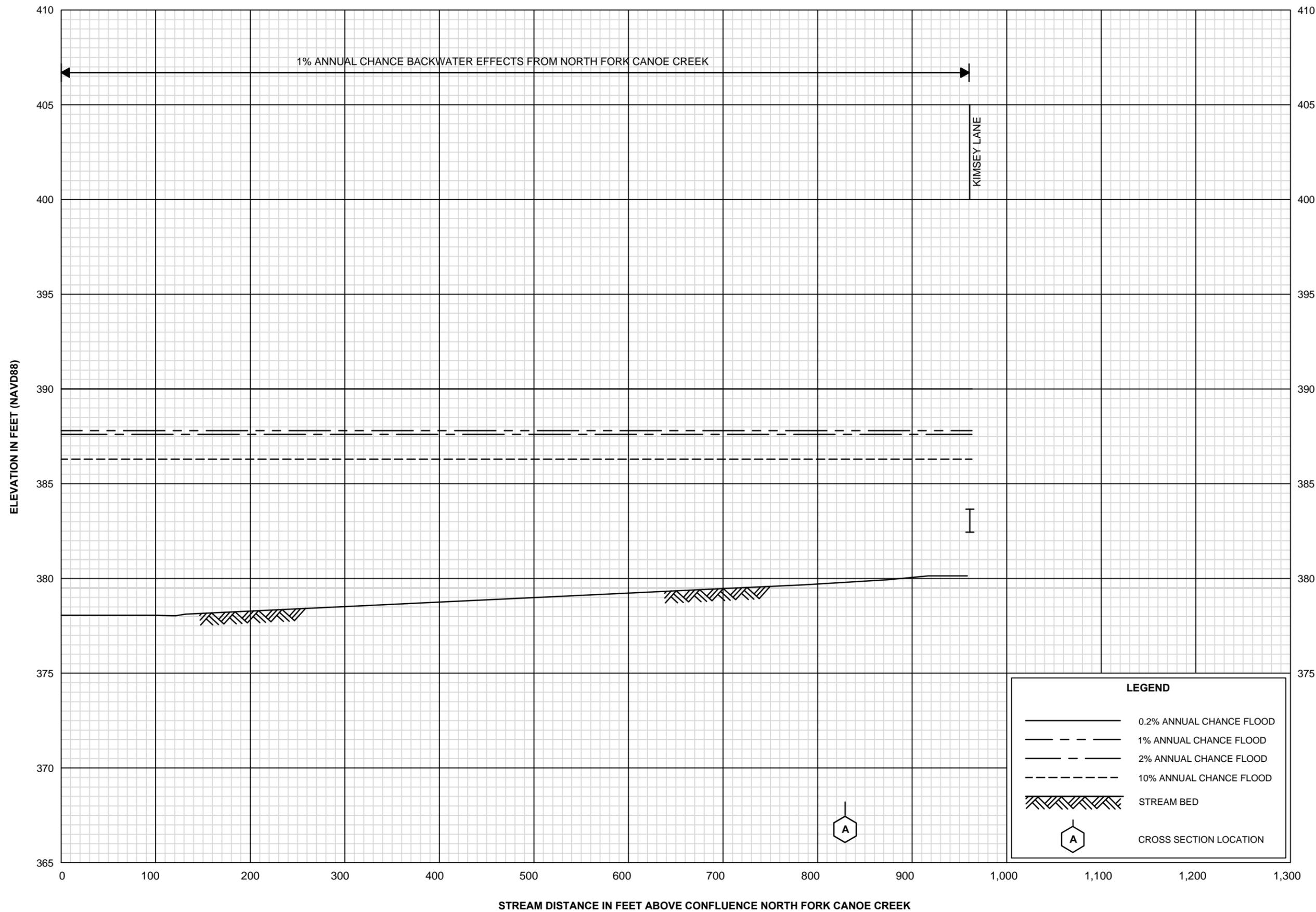


**FLOOD PROFILES**

**KIMSEY LANE LEFT TRIBUTARY**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

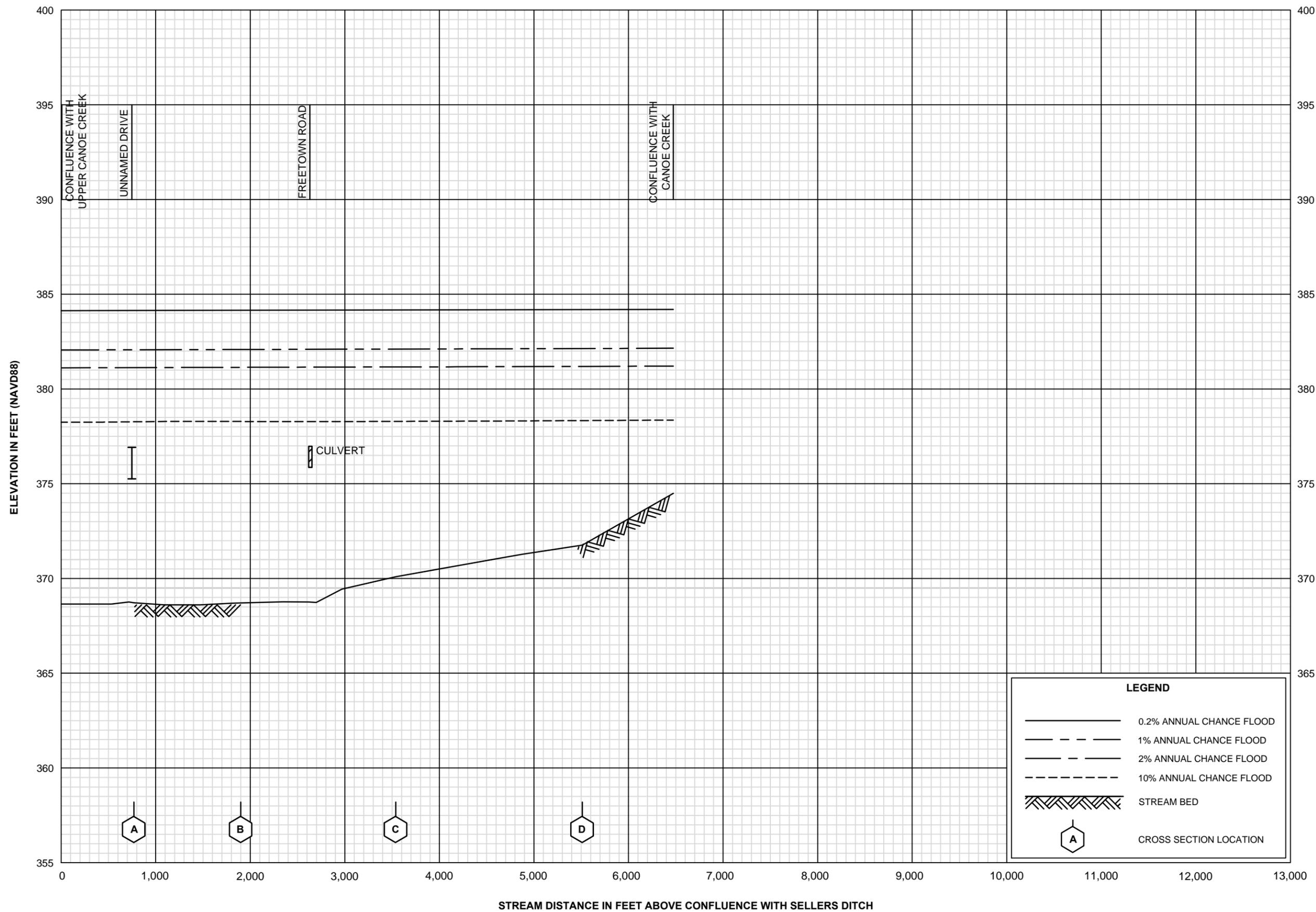


**FLOOD PROFILES**

**KIMSEY LANE RIGHT TRIBUTARY**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

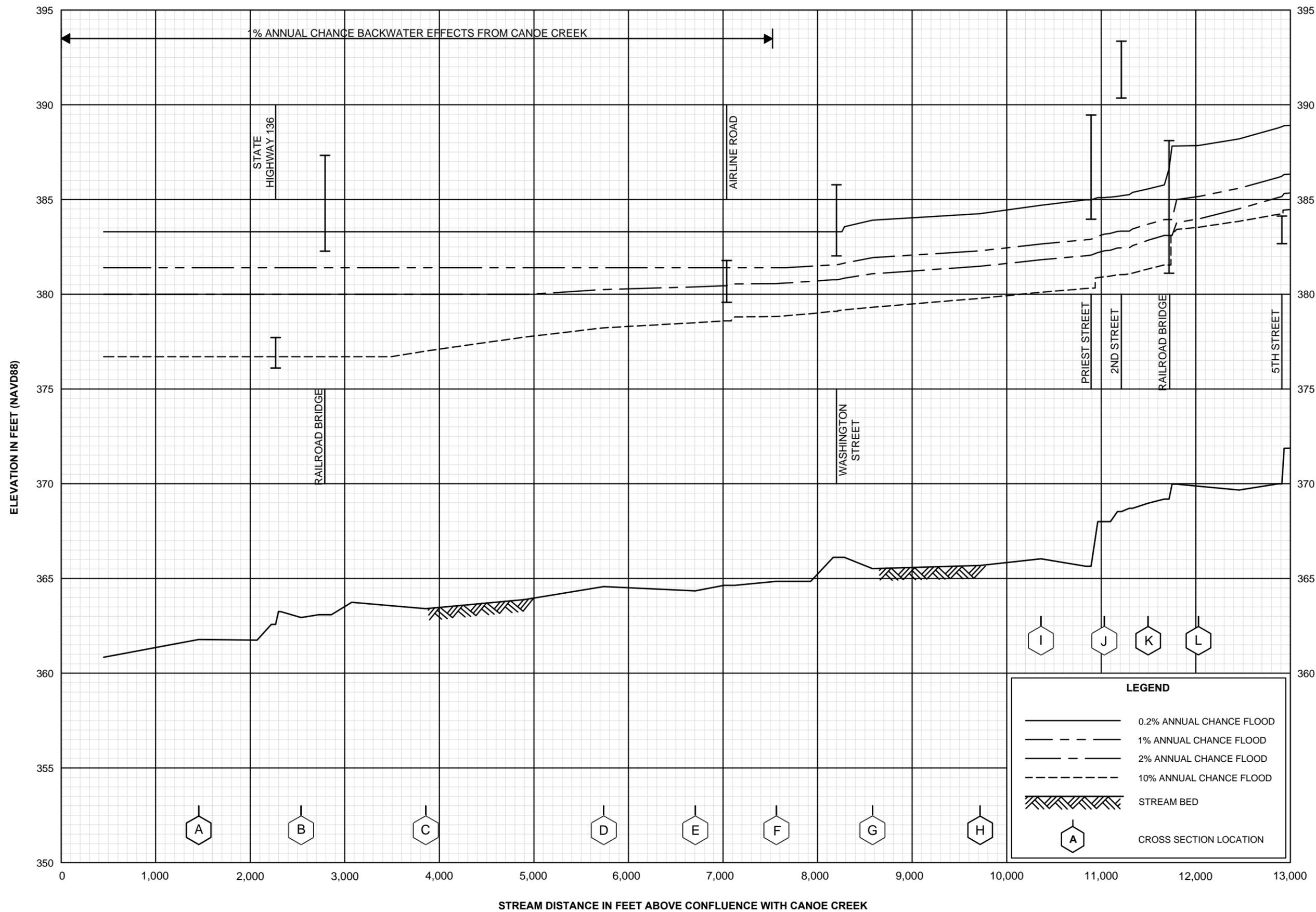


**FLOOD PROFILES**

**MIDDLE CANOE CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

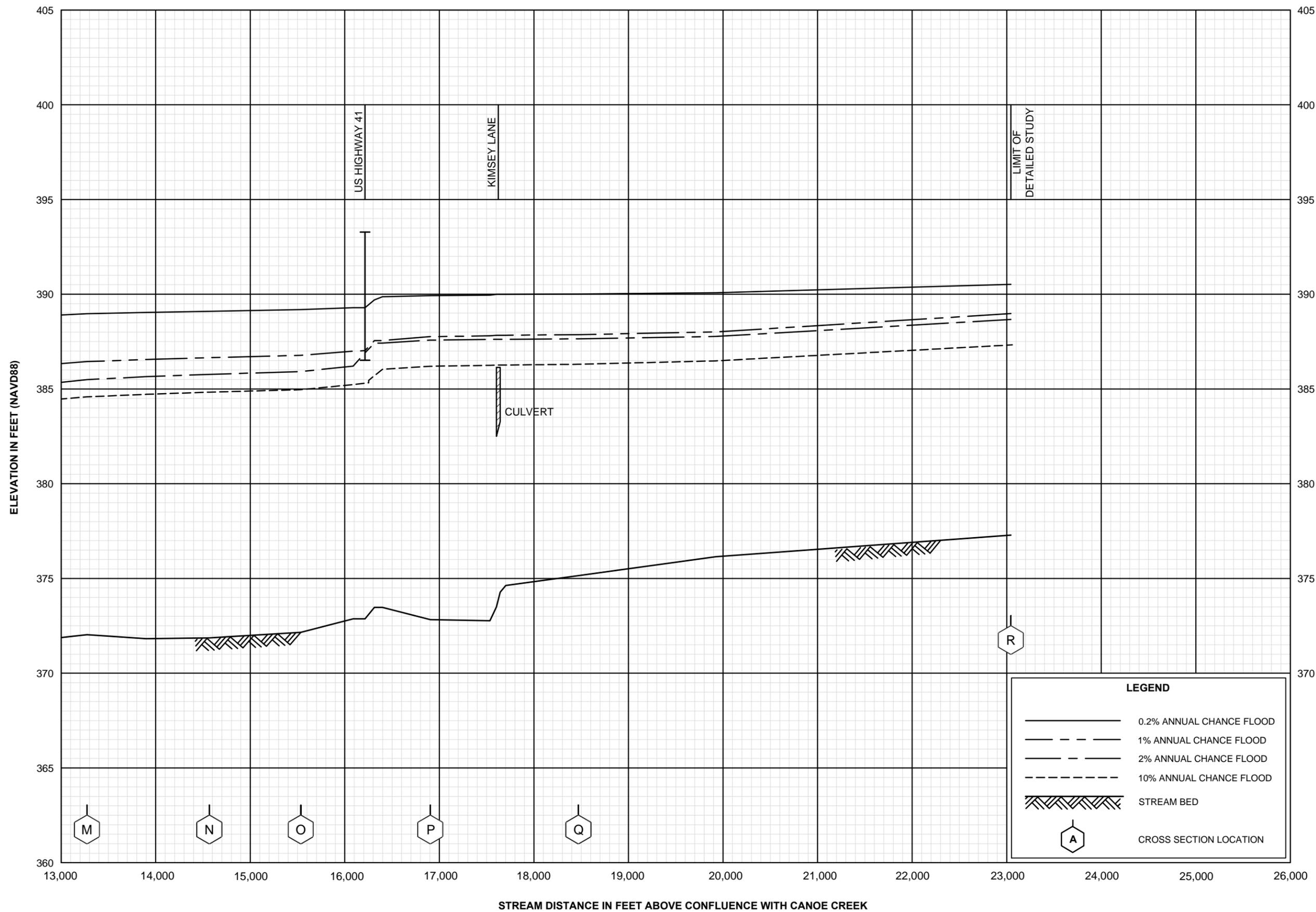


**FLOOD PROFILES**

**NORTH FORK CANOE CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

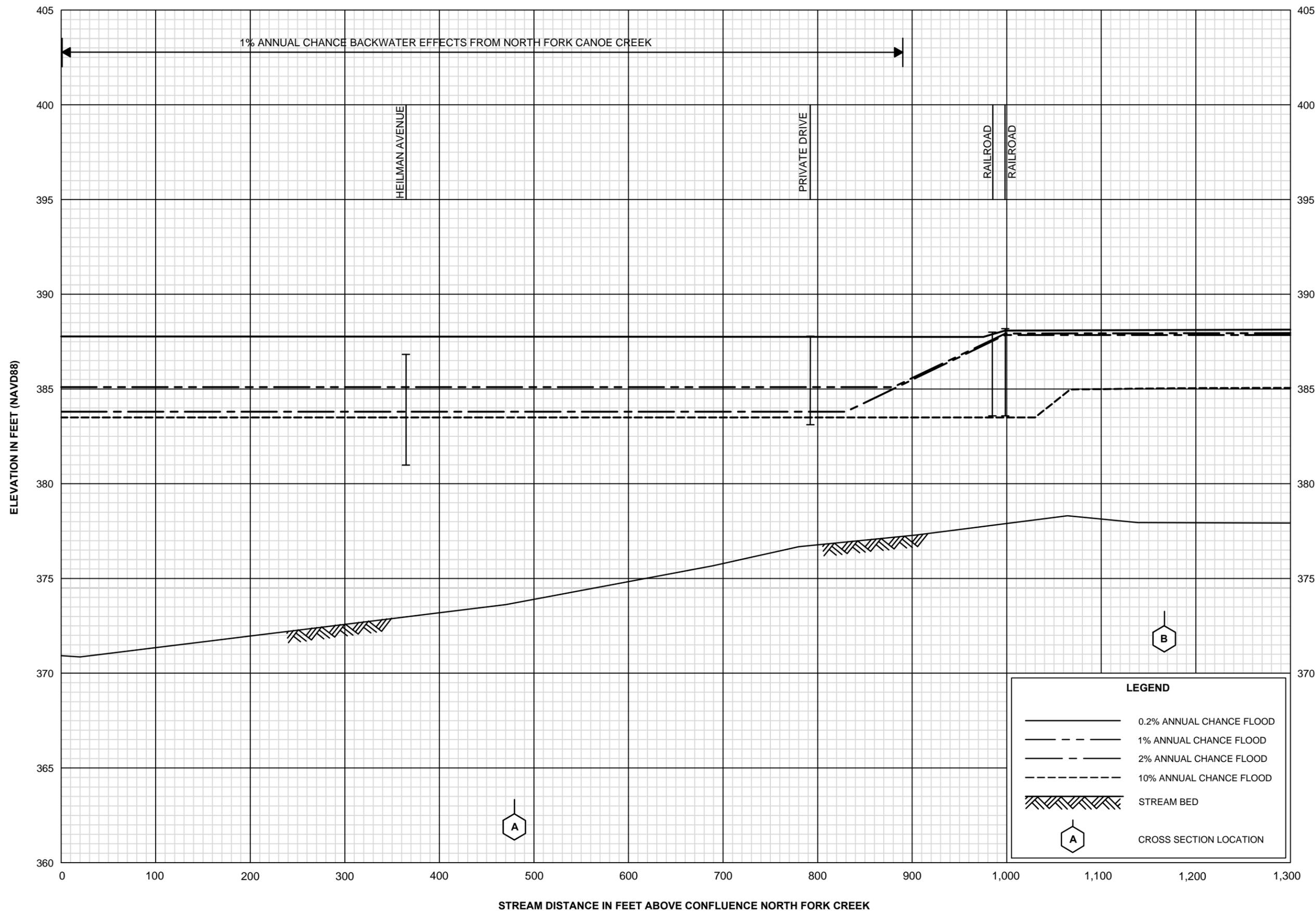


**FLOOD PROFILES**

**NORTH FORK CANOE CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

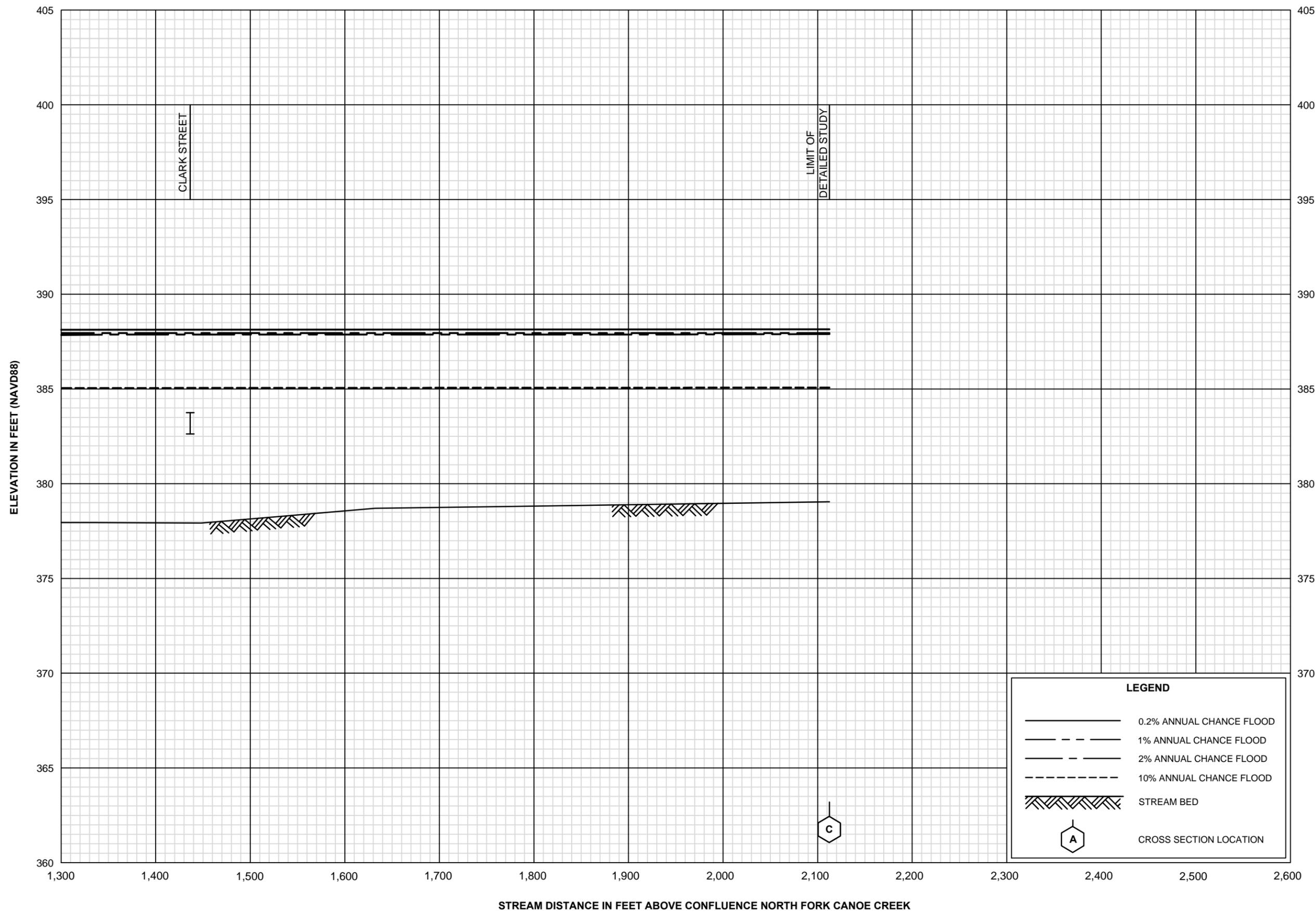


**FLOOD PROFILES**

**NORTH FORK CANOE CREEK TRIBUTARY**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

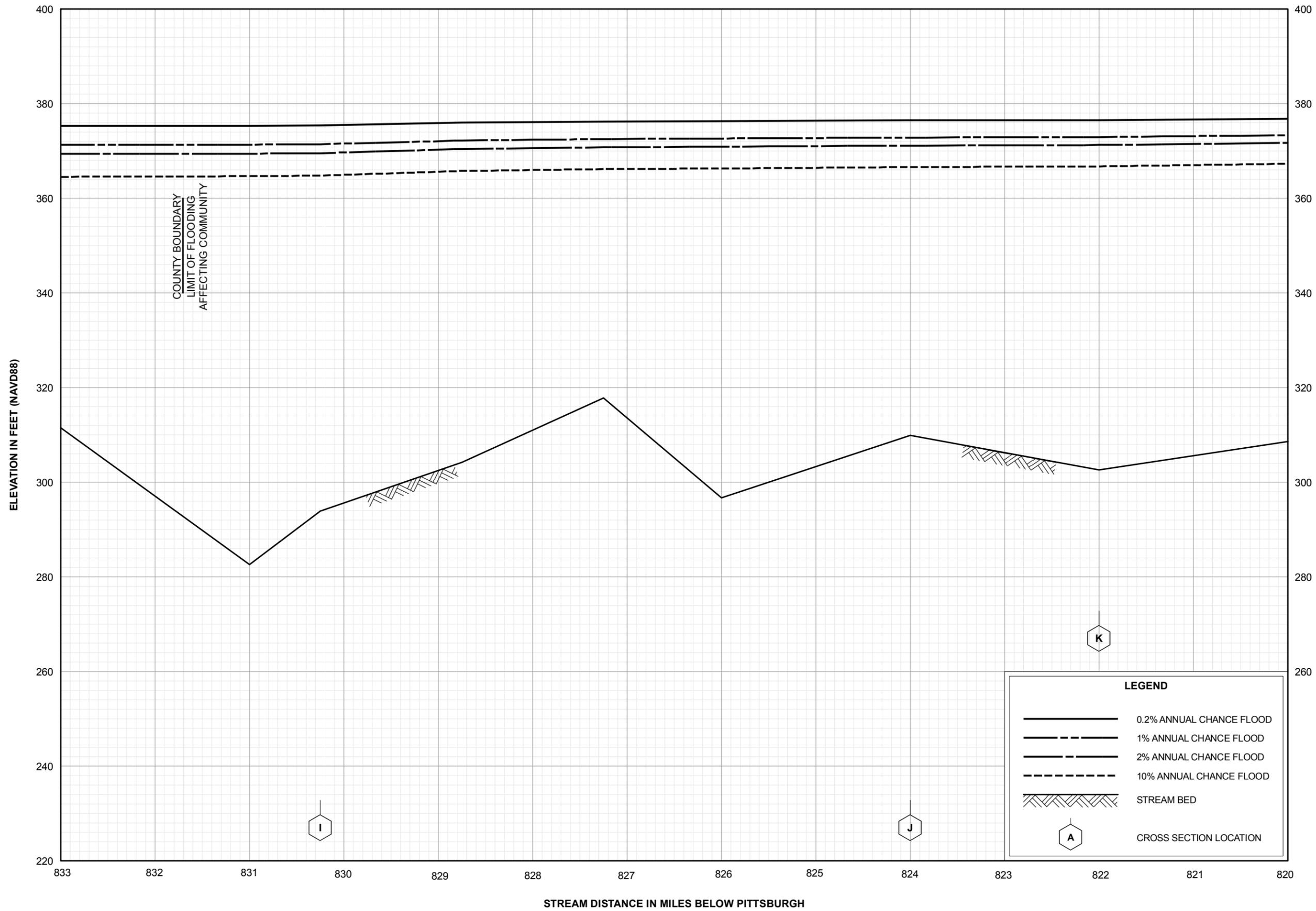


**FLOOD PROFILES**

**NORTH FORK CANOE CREEK TRIBUTARY**

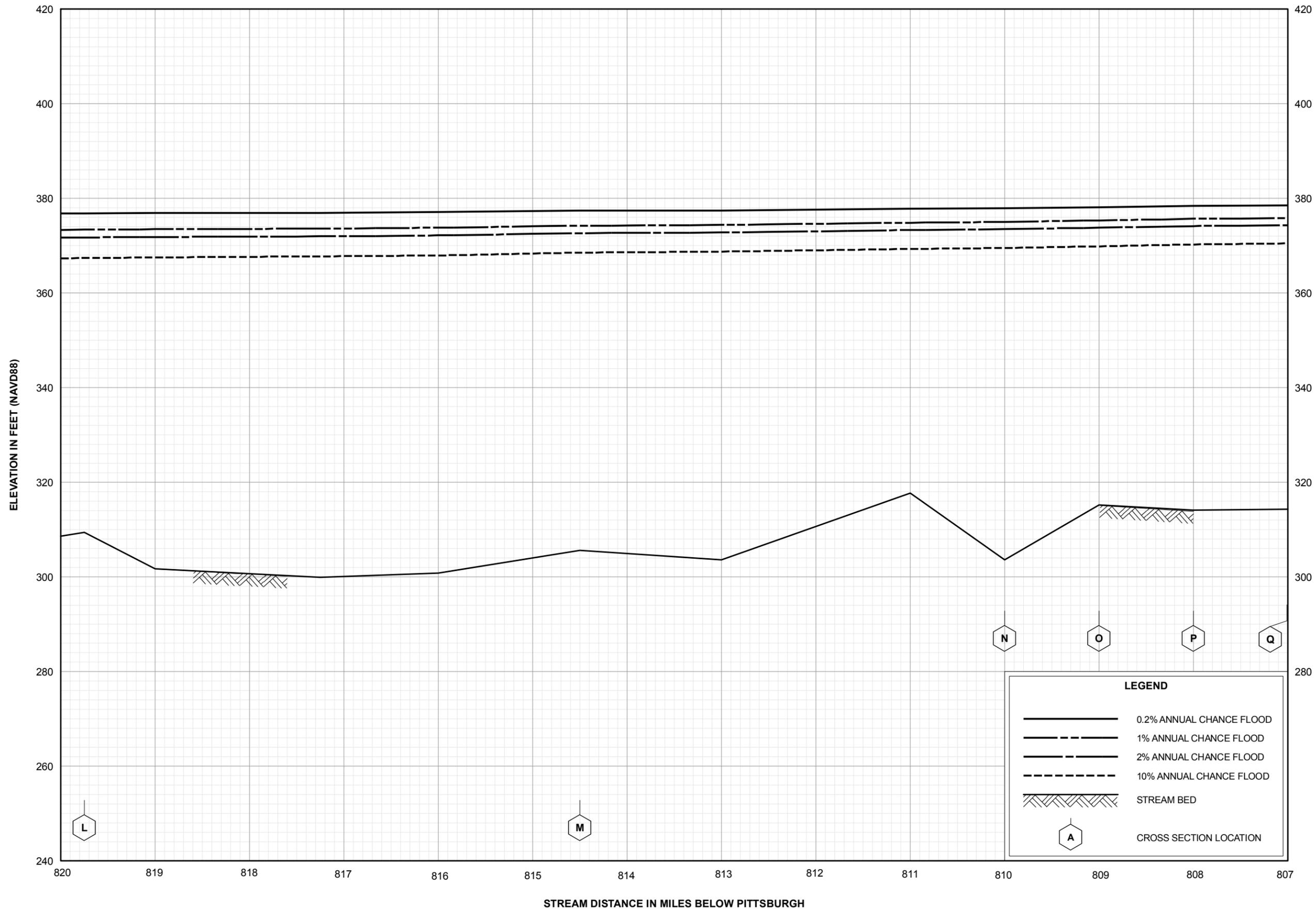
FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**



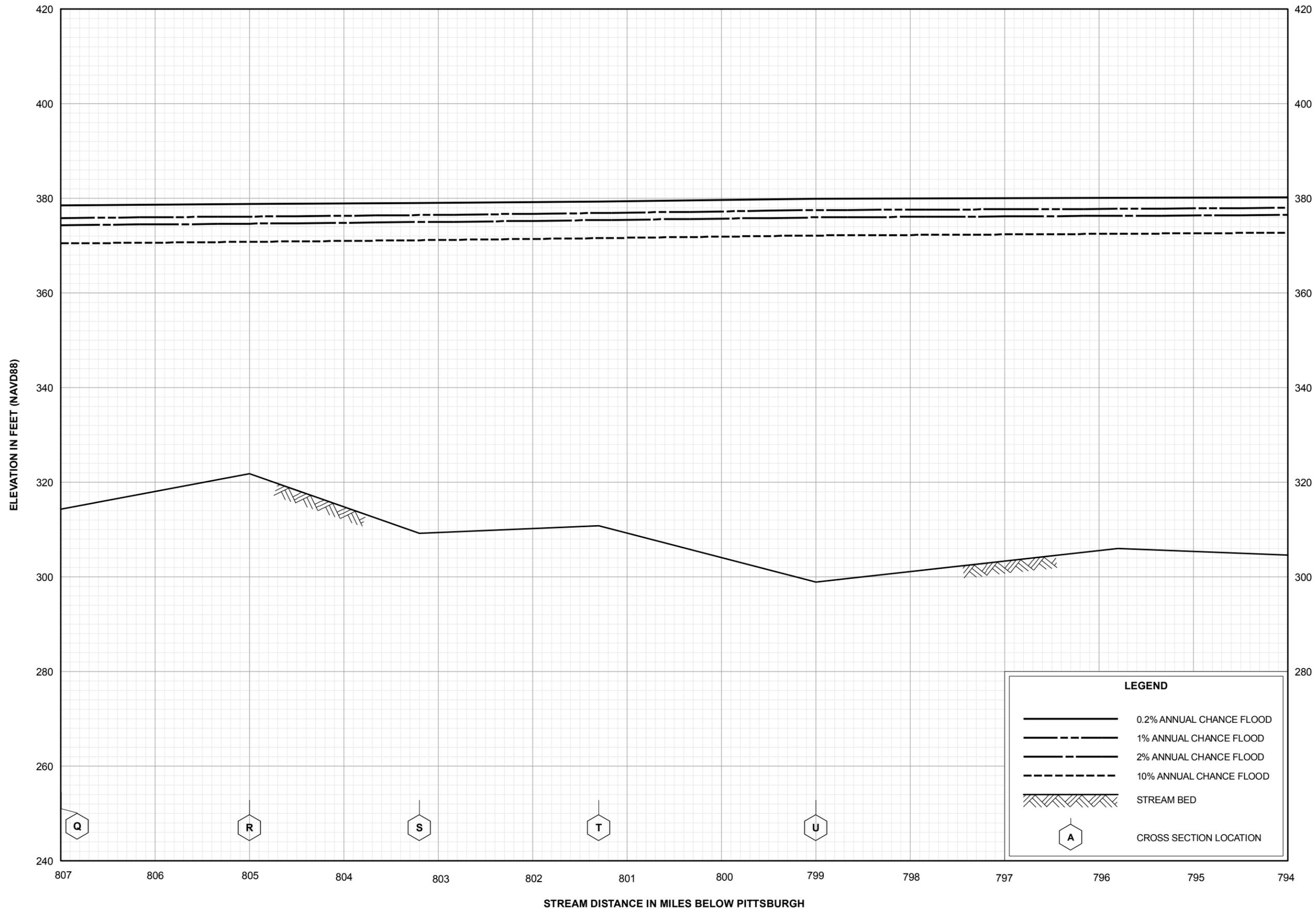
**FLOOD PROFILES**  
**OHIO RIVER**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
AND INCORPORATED AREAS



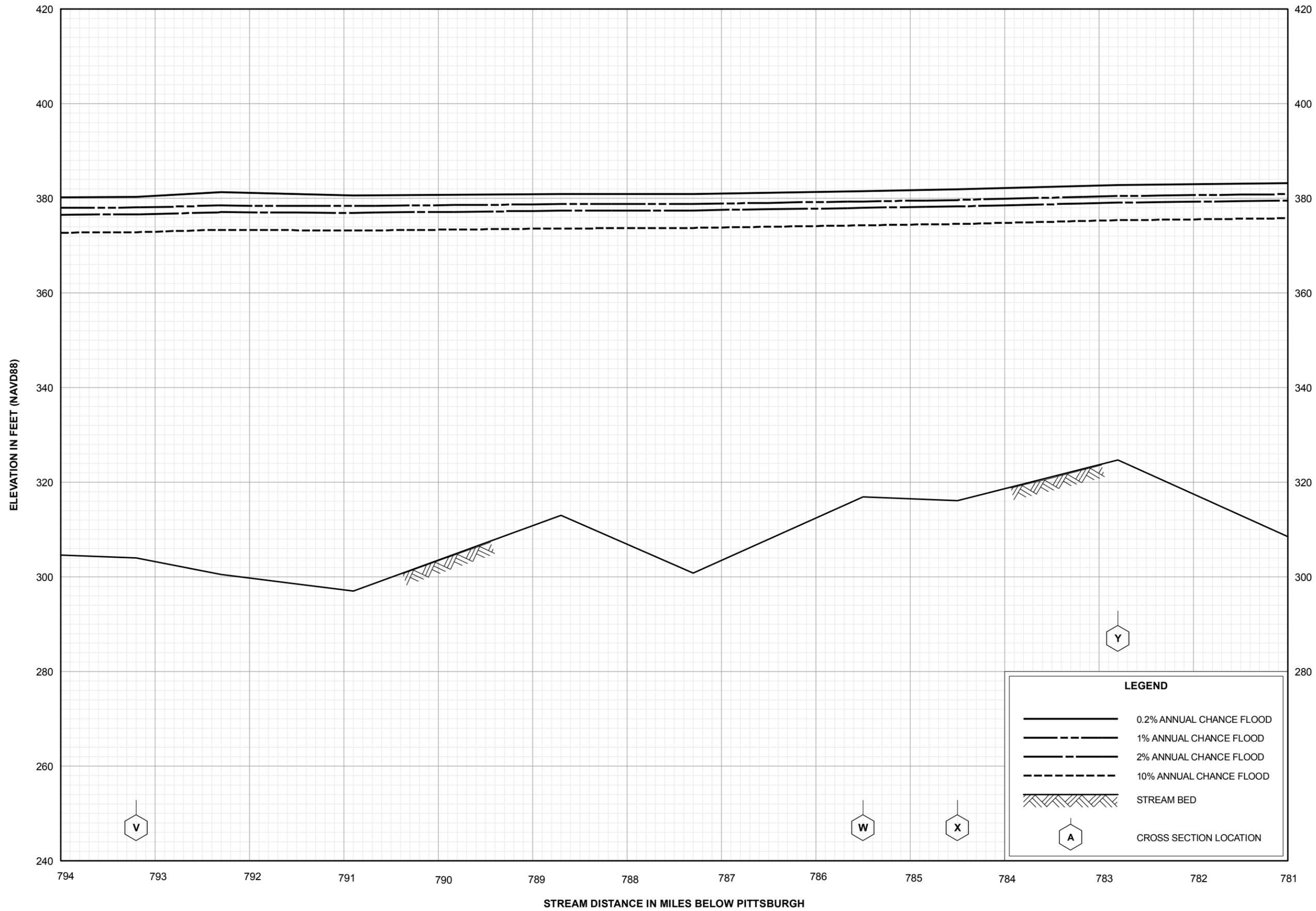
**FLOOD PROFILES**  
**OHIO RIVER**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
AND INCORPORATED AREAS



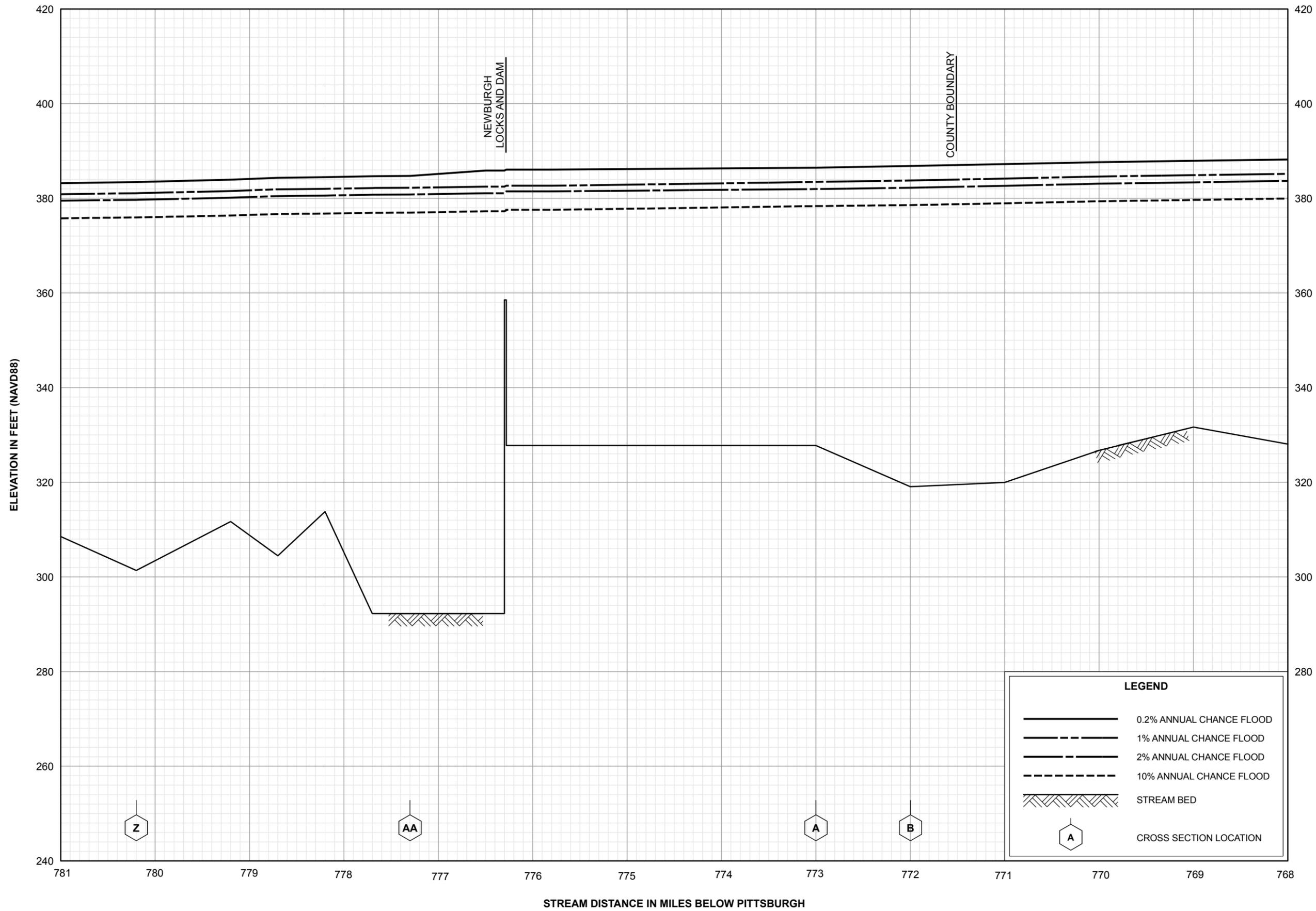
**FLOOD PROFILES**  
**OHIO RIVER**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
AND INCORPORATED AREAS



**FLOOD PROFILES**  
**OHIO RIVER**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
AND INCORPORATED AREAS



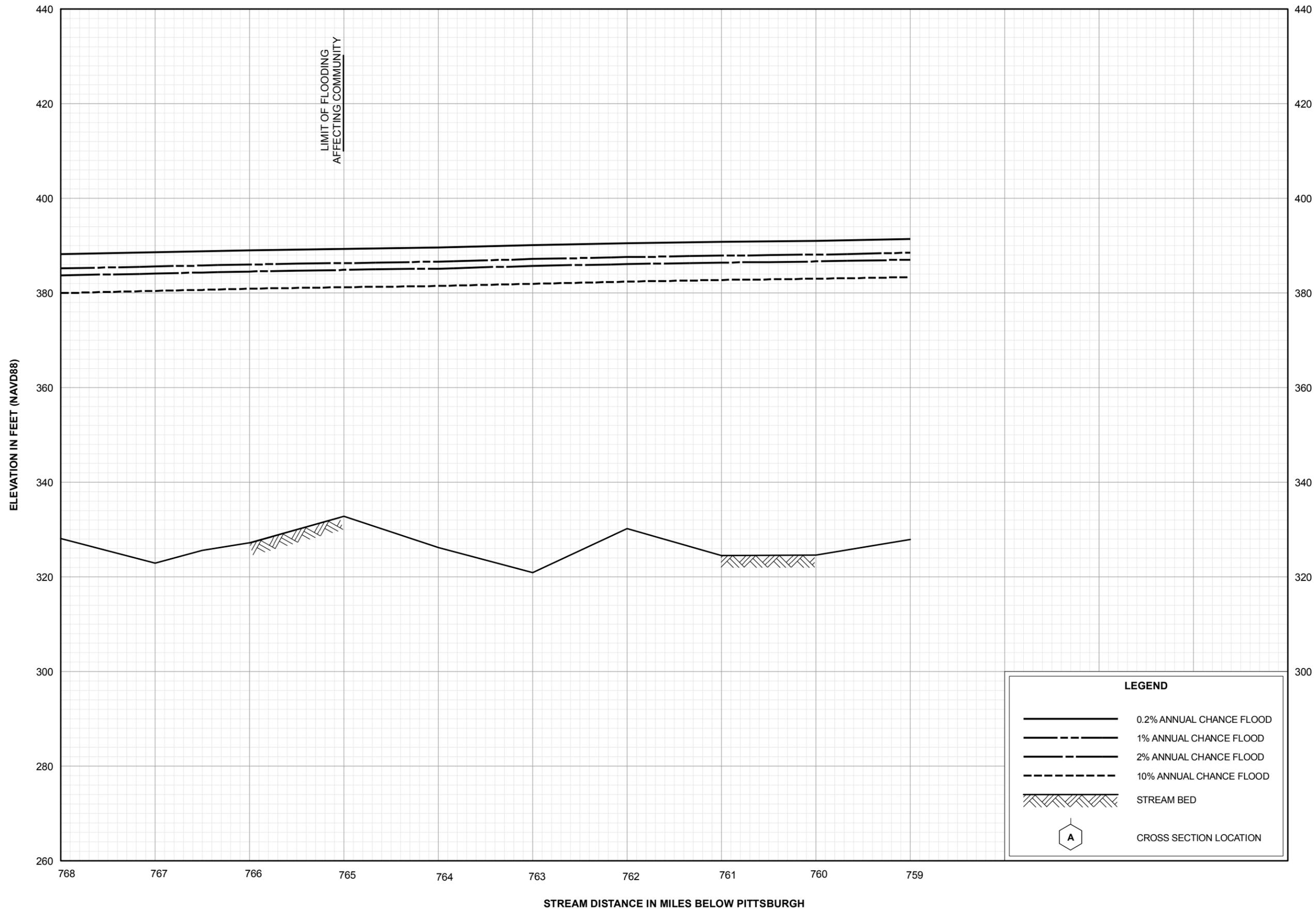
**FLOOD PROFILES**

**OHIO RIVER**

FEDERAL EMERGENCY MANAGEMENT AGENCY

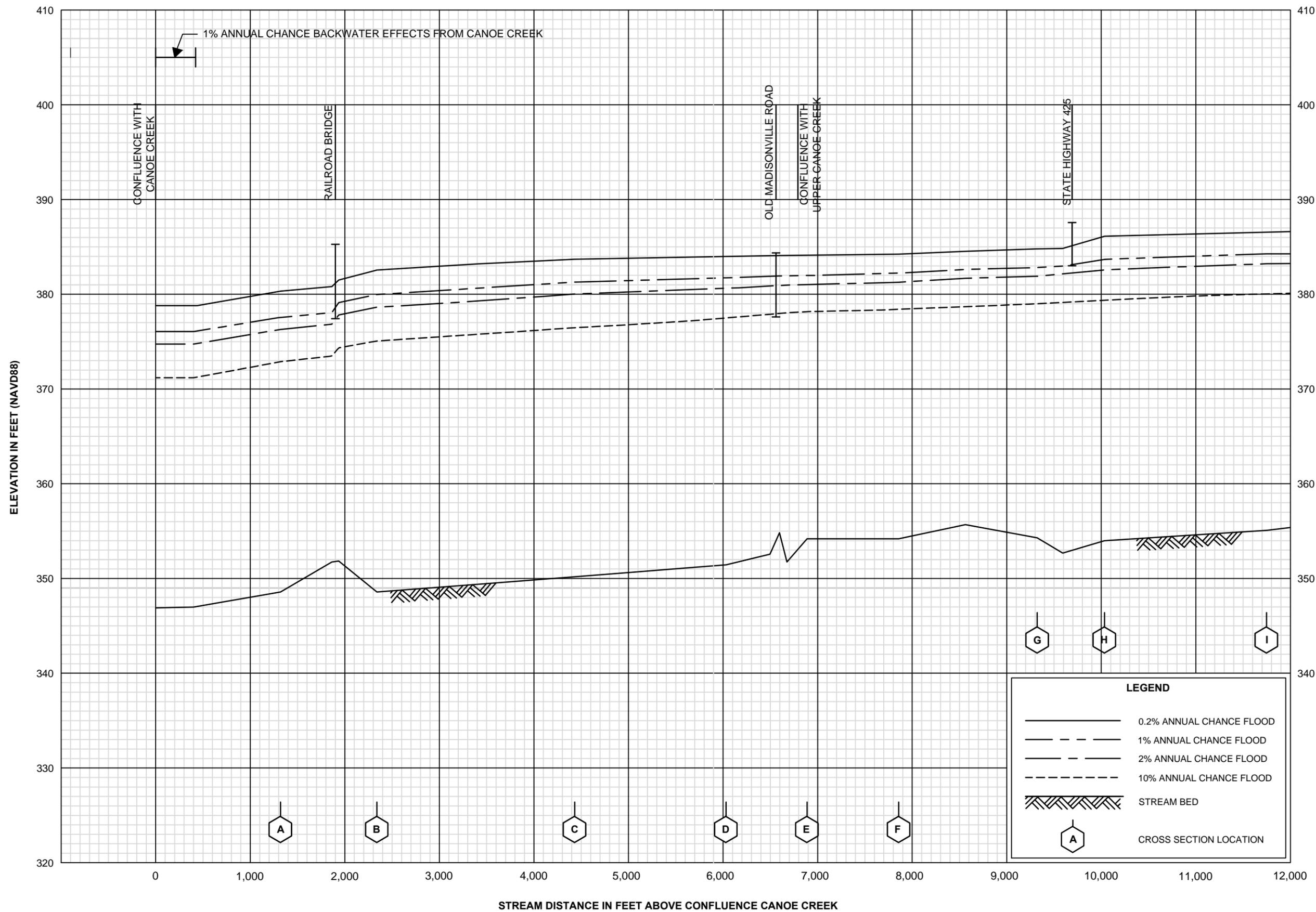
**HENDERSON COUNTY, KY**

**AND INCORPORATED AREAS**



**FLOOD PROFILES**  
**OHIO RIVER**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY**  
AND INCORPORATED AREAS

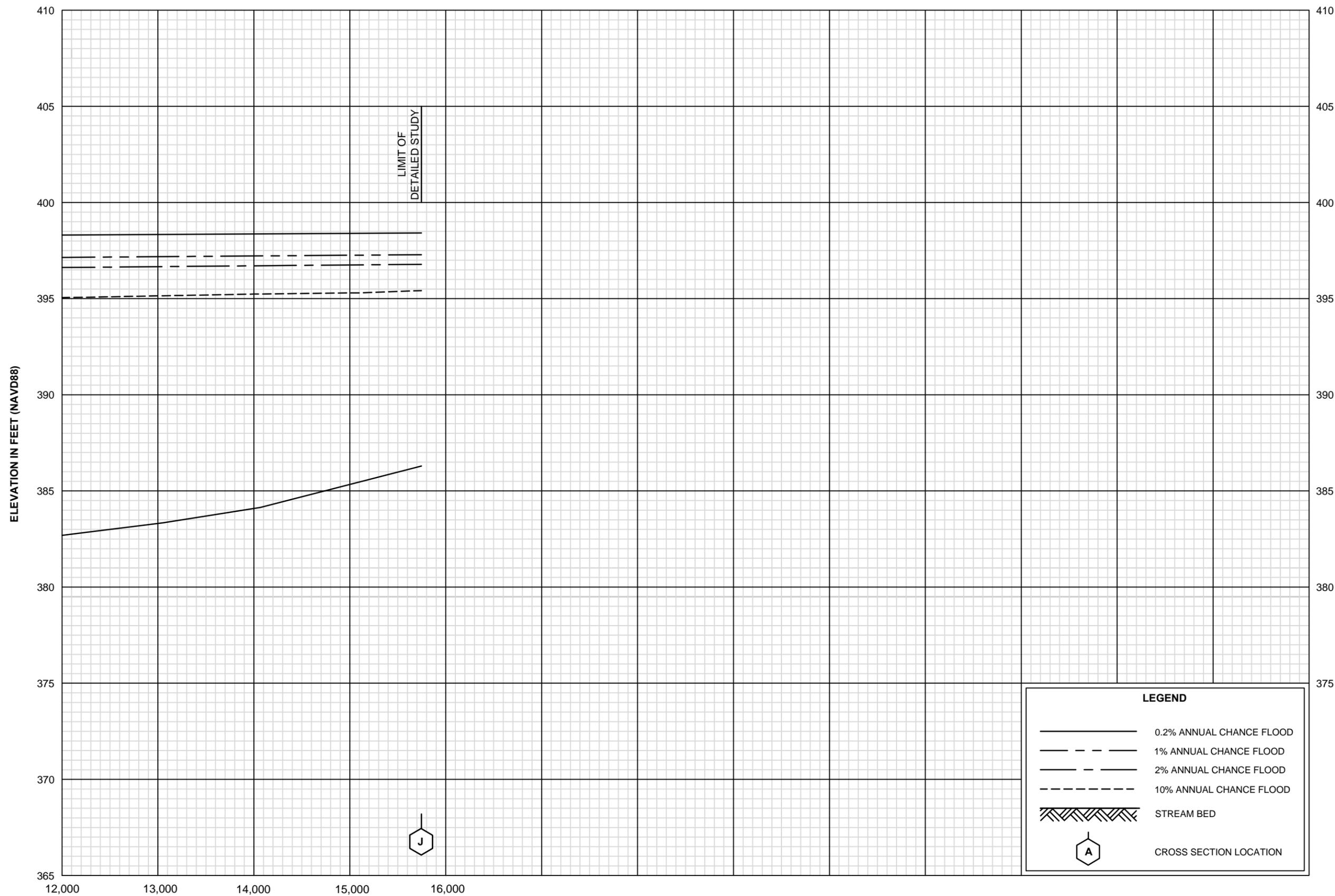


**FLOOD PROFILES**

**SELLERS DITCH/UPPER CANOE CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

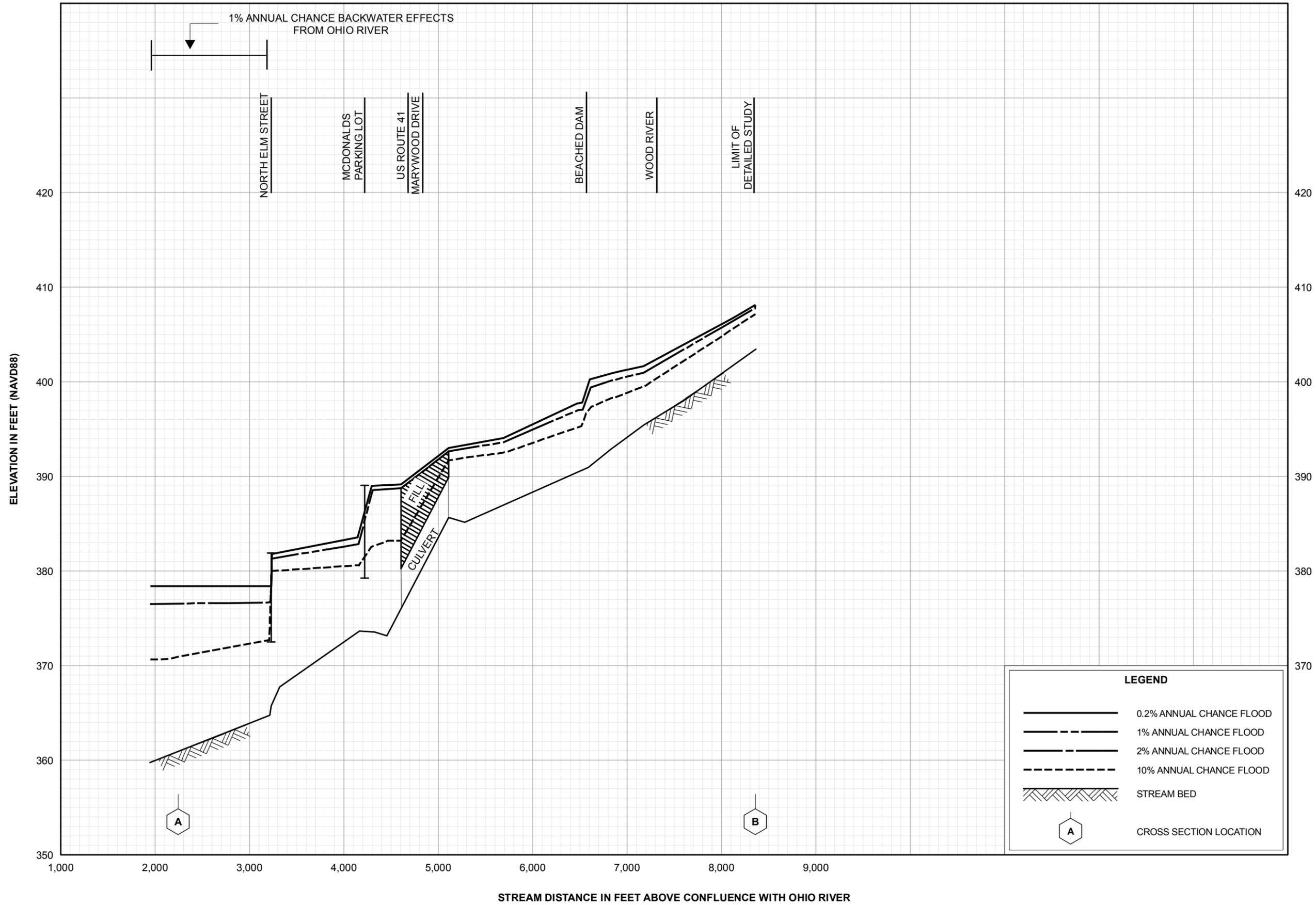


**FLOOD PROFILES**

**SELLERS DITCH/UPPER CANOE CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**



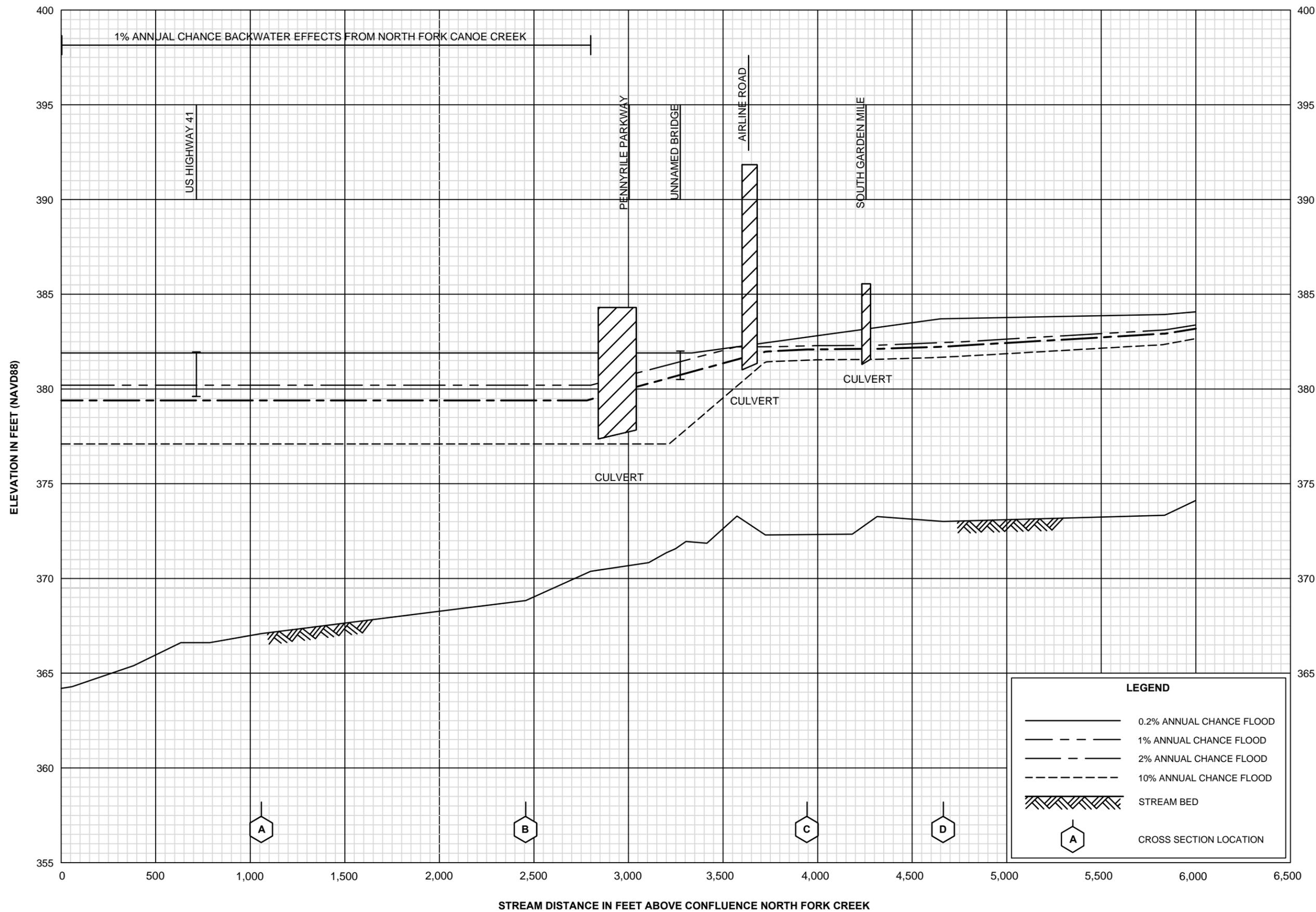
**FLOOD PROFILES**

**SUGAR CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY**

**AND INCORPORATED AREAS**

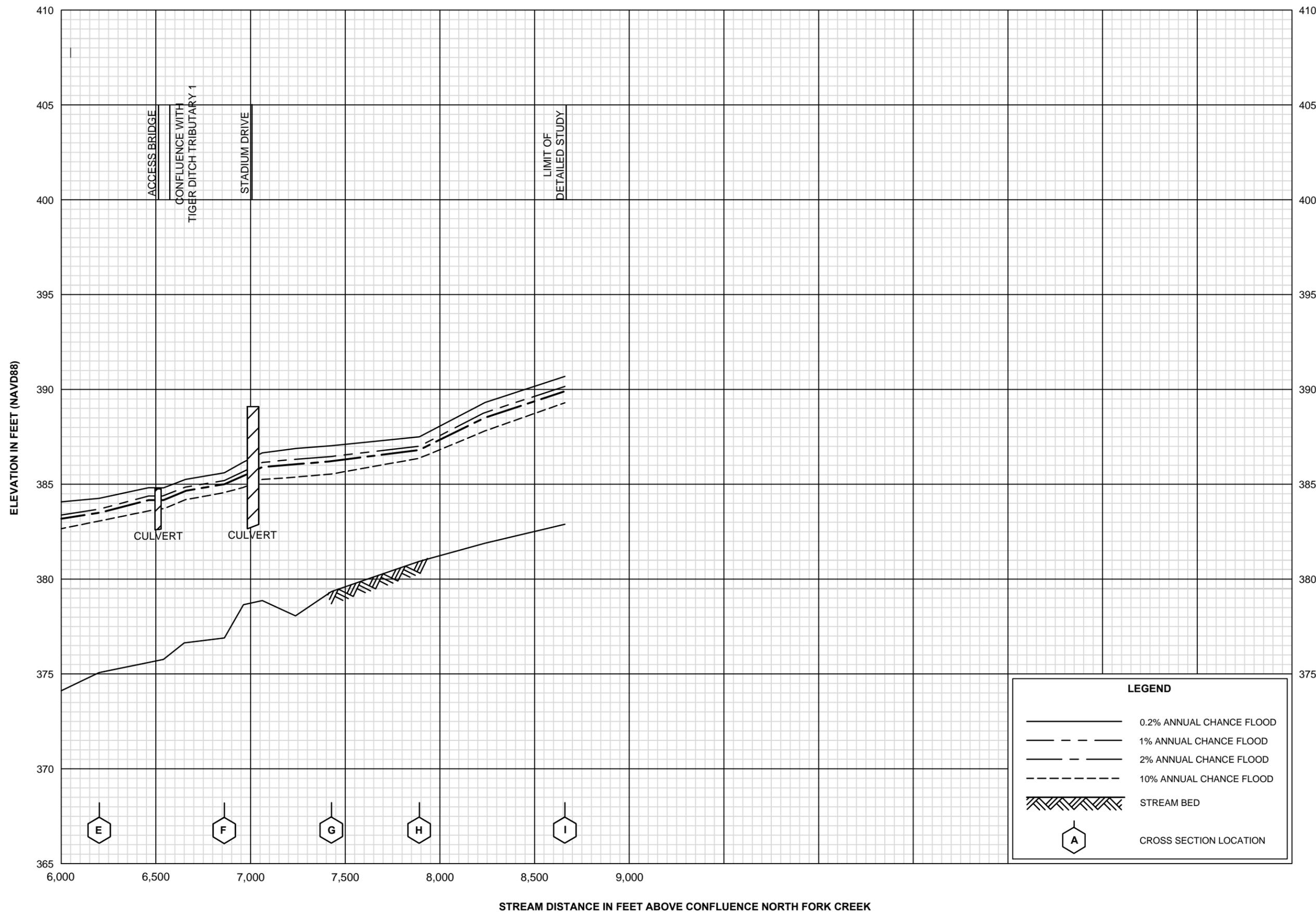


**FLOOD PROFILES**

**TIGER DITCH**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

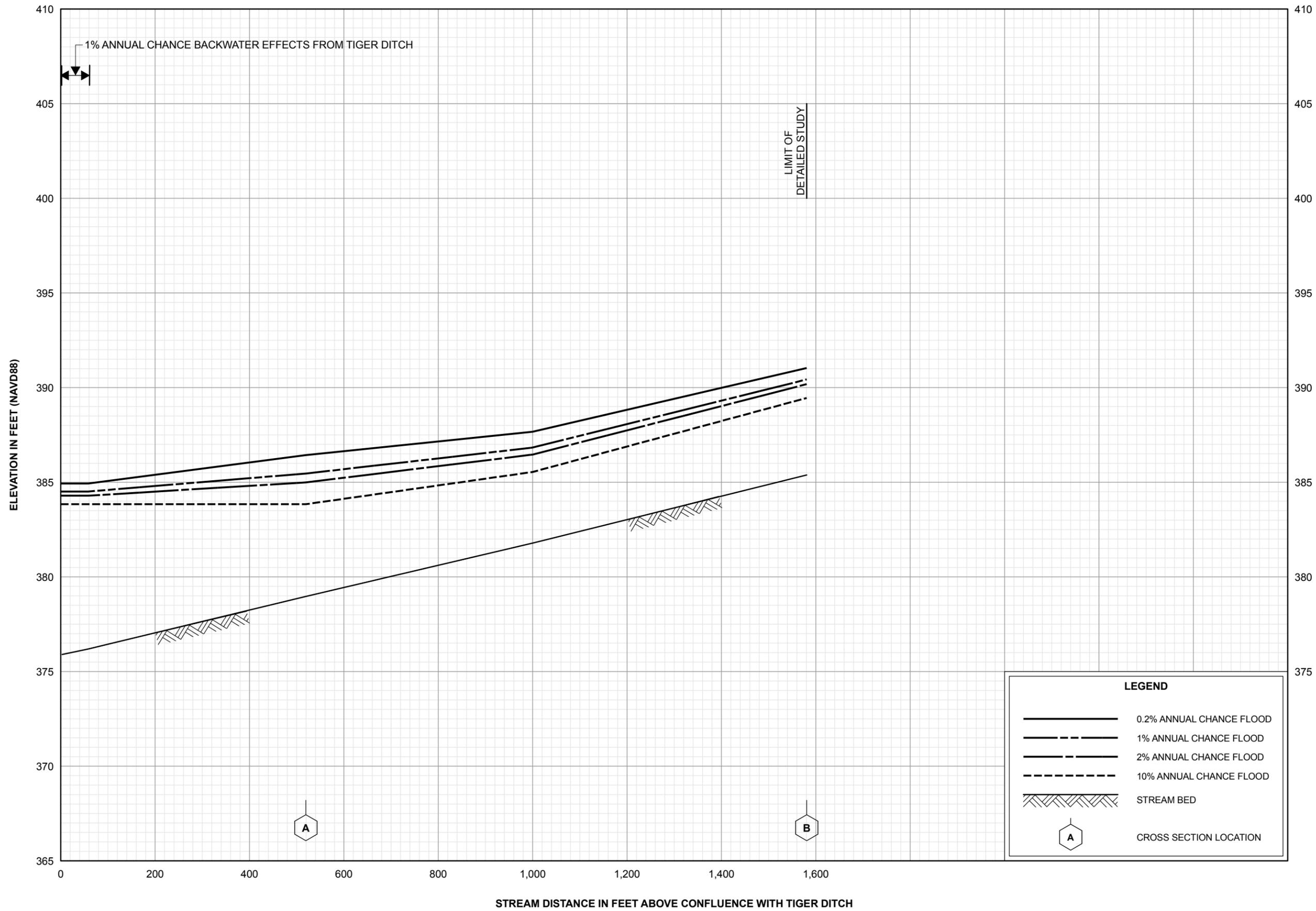


**FLOOD PROFILES**

**TIGER DITCH**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

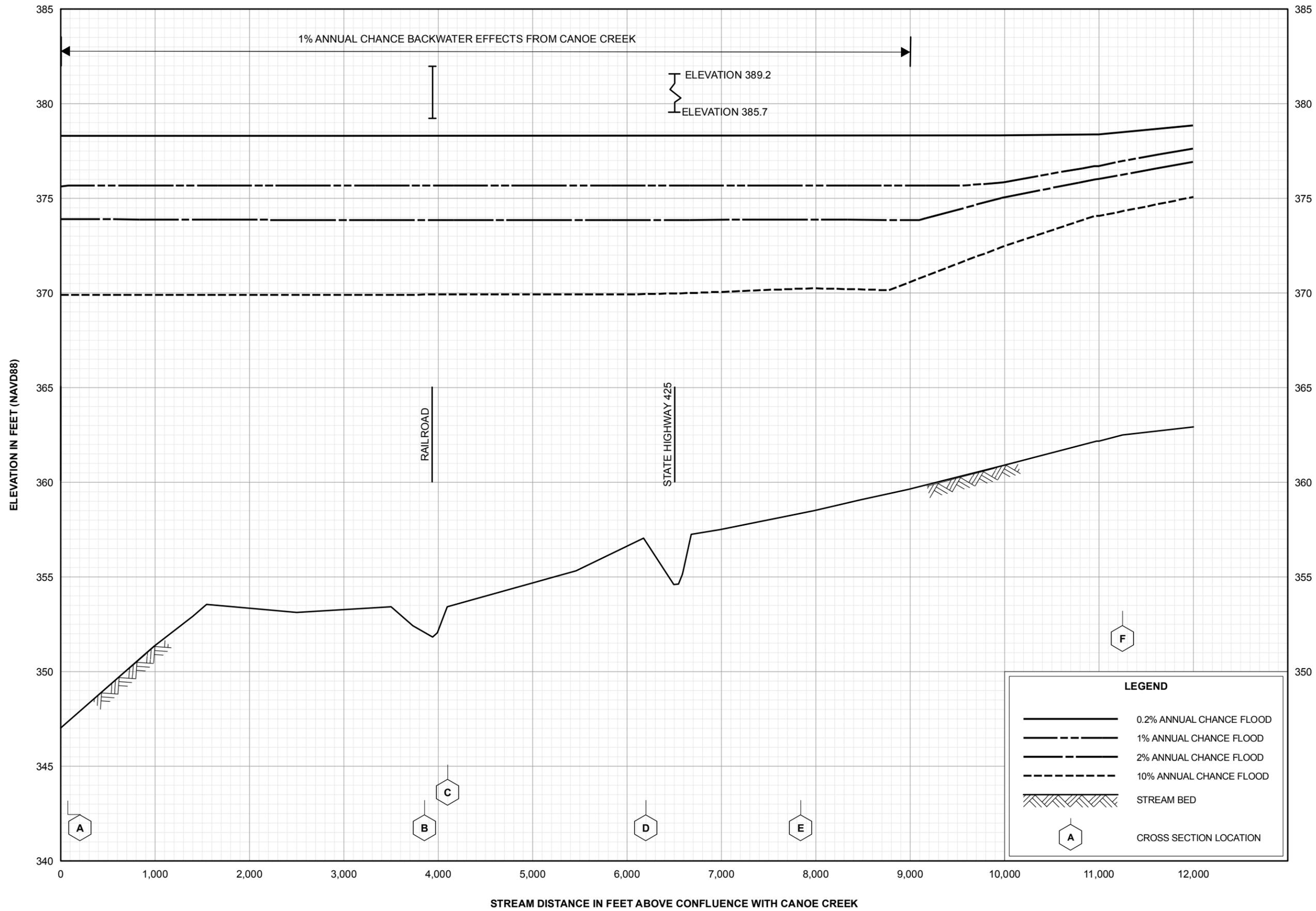


**FLOOD PROFILES**

**TIGER DITCH TRIBUTARY 1**

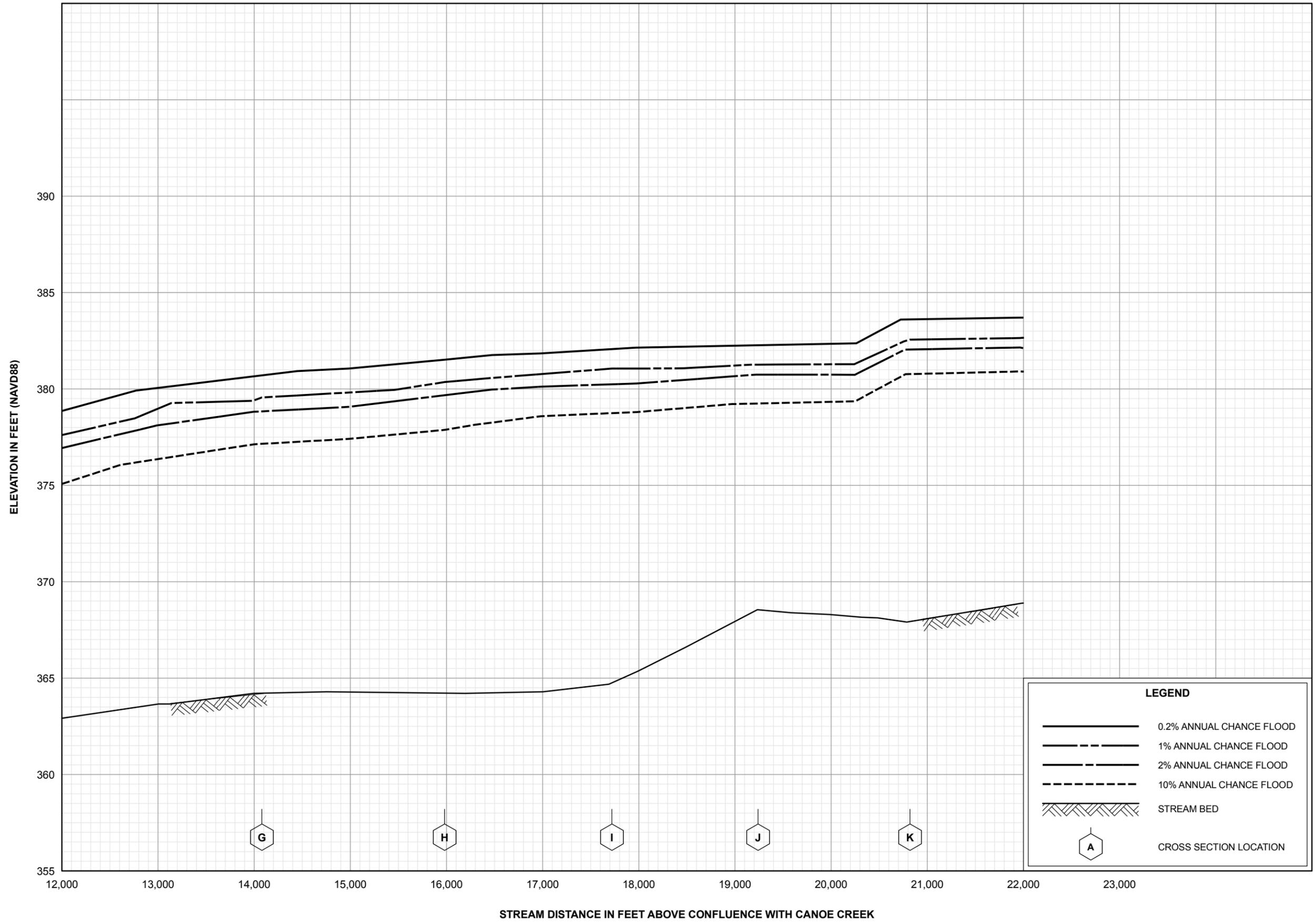
FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**



**FLOOD PROFILES  
WILSON CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**

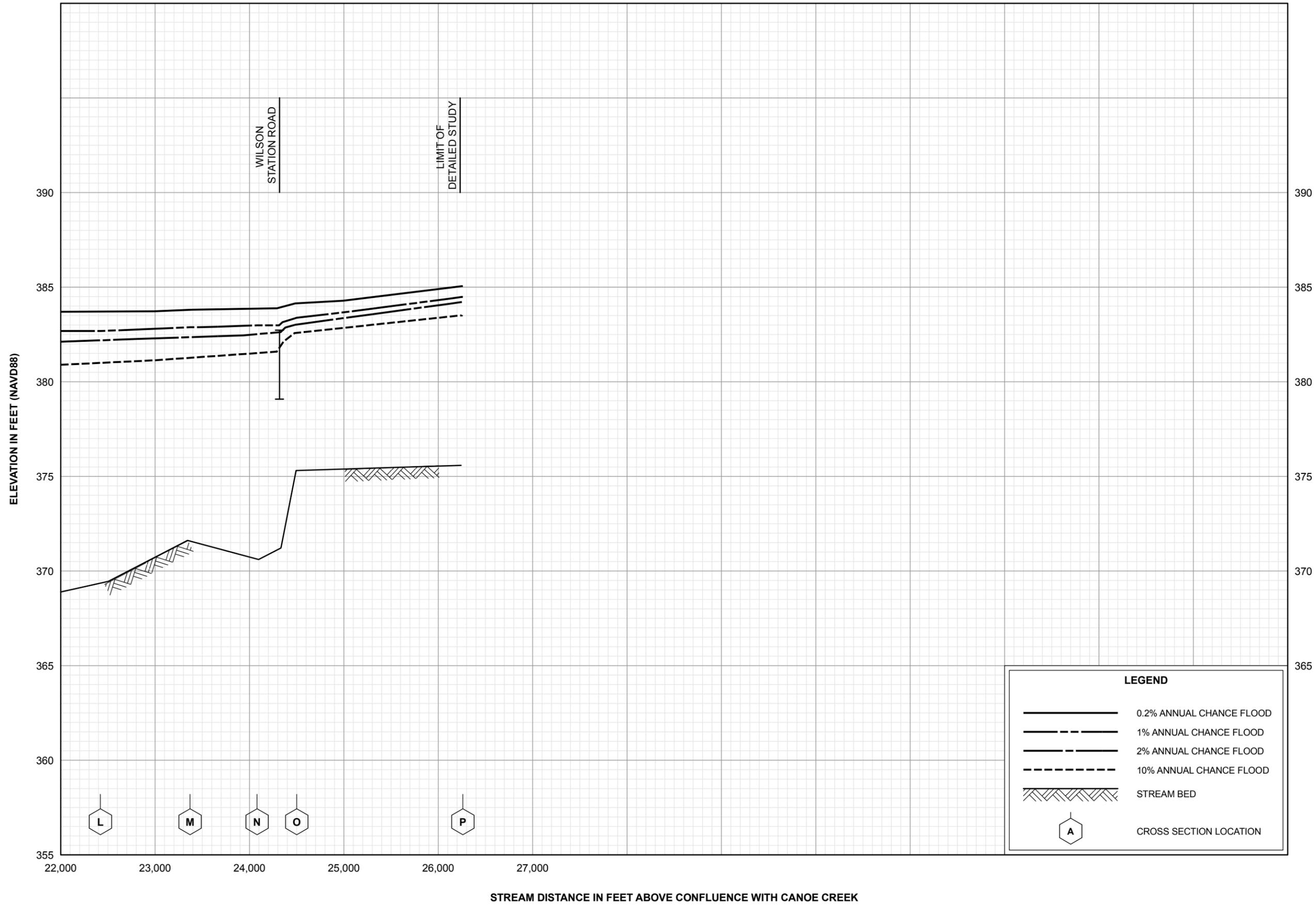


**FLOOD PROFILES**

**WILSON CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**



**FLOOD PROFILES  
WILSON CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**HENDERSON COUNTY, KY  
AND INCORPORATED AREAS**