FLOOD INSURANCE STUDY

JACKSON COUNTY, WISCONSIN
AND INCORPORATED AREAS

Community Name	Community Number
ALMA CENTER, VILLAGE OF	550185
BLACK RIVER FALLS, CITY OF	550186
HIXTON, VILLAGE OF	550187
HO-CHUNK NATION OF WISCONSIN	550630
JACKSON COUNTY (UNINCORPORATED AREAS)	550583
MELROSE, VILLAGE OF	550188
MERRILLAN, VILLAGE OF	550189
TAYLOR, VILLAGE OF	550190

PRELIMINARY
11/15/2016

Federal Emergency Management Agency
FLOOD INSURANCE STUDY NUMBER
55053CV000B

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision (LOMR) process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult community officials and check the Community Map Repository to obtain the most current FIS report components.

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

Old Zone(s)	New Zone
Al through A30	AE
B	X
C	X

Initial Countywide Effective Date: September 28, 2012

Revised Effective Date: To Be Determined

TABLE OF CONTENTS

1.0 INTRODUCTION……....1

1.1 Purpose of Study…...……...……..……..… .1

1.2 Authority and Acknowledgment……...……..…….…..2

1.3 Coordination……...…….....3

2.0 AREA STUDIED…….....4

2.1 Scope of Study……....4

2.2 Community Description…….……6

2.3 Principal Flood Problems…….....7

2.4 Flood Protection Measures…….....11

3.0 ENGINEERING METHODS……..…13

3.1 Hydrologic Analyses……...13

3.2 Hydraulic Analyses……...….15

3.3 Vertical Datum…….....17

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS…….… 19

4.1 Floodplain Boundaries…….....19

4.2 Floodways…….…..20

5.0 INSURANCE APPLICATIONS ……...31

6.0 FLOOD INSURANCE RATE MAP…….… 32

7.0 OTHER STUDIES…….….... ..34

8.0 LOCATION OF DATA……...….34

9.0 BIBLIOGRAPHY AND REFERENCES …….….34

10.0 ADDITIONAL INFORMATION….....38

10.1 FIRM Notes to Users…….…. 38

TABLE OF CONTENTS *(Continued)*

FIGURES

Figure 1 – "Great Flood of 1911" - Flooding at Black River Falls ……..…7
Figure 2 – Flooding at Grove area of Black River Falls – June 20, 1993…….....8
Figure 3 – Aerial photograph, flooding at Black River Falls – September 23, 2010……....10
Figure 4– Floodway Schematic…….....31
Figure 5 – FIRM Notes to Users……..38
Figure 6 – Map Legend for FIRM……....41

TABLES

Table 1 – Initial and Final CCO Meetings……..….4
Table 2 – Streams and Lakes Studied by Detailed Methods…….….…5
Table 3 – Streams and Lakes Mapped by Approximate Methods……..….5
Table 4 – Summary of Major Floods on the Black River [Galesville Gage No. 05382000]…….10
Table 5 – Summary of Discharges……..15
Table 6 – Manning's "n" Values for Detailed Study Streams ……..….17
Table 7 – Vertical Datum Conversion……....18
Table 8 – Floodway Data.……...…...22
Table 9 – Community Map History……...33

EXHIBITS

Exhibit 1 - Flood Profiles

Black River	Panels 01P-18P
Douglas Creek	Panel 19P
East Fork Black River	Panels 20P-25P
North Fork Buffalo River	Panels 26P-27P
Trempealeau River	Panels 28P-34P

Exhibit 2 - Flood Insurance Rate Map Index
Flood Insurance Rate Map

FLOOD INSURANCE STUDY JACKSON COUNTY, WISCONSIN AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) investigates the existence and severity of flood hazards in the geographic area of Jackson County, Wisconsin, including the City of Black River Falls, the Villages of Alma Center, Hixton, Melrose, Merrillan and Taylor, the Ho-Chunk Nation of Wisconsin, and the unincorporated areas of Jackson County (referred to collectively herein as Jackson County). Note that the Villages of Alma Center, Merrillan and Taylor, and the Ho-Chunk Nation of Wisconsin did not have previous FIS text until the countywide FIS in 2012. Also, the Ho-Chunk Nation of Wisconsin is located in both Jackson and Juneau Counties but only those portions of the Ho-Chunk Nation of Wisconsin located within Jackson County are included in this FIS.

This FIS aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This FIS has developed flood risk data for various areas of the county that will be used to establish actuarial flood insurance rates. This information will also be used by the communities of Jackson County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and will also be used by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the NFIP are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some States or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence, and the State (or other jurisdictional agency) will be able to explain them.

The Digital Flood Insurance Rate Map (DFIRM) and FIS report for this countywide study have been produced in digital format. Flood hazard information was converted to meet the Federal Emergency Management Agency (FEMA) DFIRM database specifications and Geographic Information System (GIS) format requirements. The flood hazard information was created and is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community.

1.2 Authority and Acknowledgments

The sources of authority for this FIS report are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This FIS was prepared to include the unincorporated areas of, and incorporated communities within, Jackson County in a countywide format. Information on the authority and acknowledgements for each jurisdiction included in this countywide FIS, as compiled from their previously printed FIS reports, is shown below:

Black River Falls, City of	The hydrologic and hydraulic analyses for this study were performed by Carl C. Crane, Inc. for the Federal Insurance Administration, under Contract H-4785. This study was completed in March 1979 (Reference 1).
Jackson County (Unincorporated Areas):	The hydrologic and hydraulic analyses for the East Fork Black River were performed by Globetrotters Engineering Corporation under Contract No. EMW-90-C-3096. The Federal Emergency Management Agency (FEMA) reviewed and accepted these data in January 1994 (Reference 2). The hydrologic and hydraulic analyses for the rest of the studies were performed by Carl C. Crane, Inc., for the Federal Insurance Administration, under Contract No. H-4785. These studies were completed in March 1979 (Reference 1).
Hixton, Village of:	The hydrologic and hydraulic analyses for this study were obtained from work done in preparation for the Flood Insurance Study for the Unincorporated Areas of Jackson County (Reference 3).
Melrose, Village of:	The hydrologic and hydraulic analyses for this study were performed by Carl C. Crane, Inc., for the Federal Insurance Administration, under Contract H-4785. This study was completed in March 1979 (Reference 4).

The authority and acknowledgments for the Villages of Alma Center, Merrillan and Taylor, and the Ho-Chunk Nation of Wisconsin are not included because there were no p reviously printed FIS reports for these communities.

Initial Countywide Analyses

For the countywide FIS all approximate areas were re-delineated by the WDNR to better fit the available contours shown on the U.S. Geological Survey (USGS) 7.5- minute Quadrangle Maps. This study was performed by the Wisconsin Department of Natural Resources (WDNR), for FEMA, under Mapping Activity Statement Contract No. WI-09-01. This work was completed in June 2011.

Base map information shown on the FIRM was derived from aerial photography dated 2010 and produced to meet 1:400 scale horizontal National Map Accuracy Standards. The projection used in the preparation of this map is Universal Transverse Mercator (UTM) Zone 15 North, and the horizontal datum used is North American Datum 1983 (NAD 83). Differences in datum, spheroid, projection or UTM zones used in the production of FIRMS for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of information shown on the FIRM.

This Physical Map Revision

This countywide FIS incorporates a 316-Physical Map Revision (PMR) that revises the levee in Black River Falls from the status of "Provisionally Accredited Levee" to "Accredited".

The coordinate system used for the production of the FIRM is UTM Zone 15, NAD 83, Geodetic Reference System of 1980 (GRS 80) spheroid. Differences in the datum and spheroid used in the production of FIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of information shown on the FIRM.

1.3 Coordination

An initial Consultation Coordination Officer (CCO) meeting is held typically with representatives of FEMA, the community and the study contractor to explain the nature and purpose of a FIS and to identify the streams to be studied or restudied. A final CCO meeting is typically held with representatives from FEMA, the community, and the study contractor to review the results of the study.

The dates of the initial and final CCO meetings held for previous FIS reports for Jackson County and its communities are listed in the following table:

Table 1 - Initial and Final CCO Meetings

Community	FIS Date	Initial Meeting	Final Meeting
Black River Falls, City of:	August 4, 1980	April 19, 1978	January 10, 1980
Jackson County (Unincorporated Areas):	January 19, 1994	April 19, 1978	January 10, 1980
Hixton, Village of:	January 2, 1987	April 19, 1978	February 12, 1986
Melrose, Village of:	September 16, 1980	April 20, 1978	April 16, 1980

The Villages of Alma Center, Merrillan, Taylor and the Ho-Chunk Nation of Wisconsin are not shown in the above tabulation because no FIS report was ever published for those communities.

For the 2012 countywide FIS, the WDNR performed a cursory review of the previous effective FIS modeling and mapping. This information was provided at the initial countywide scoping meeting November 22, 2010. The meeting was attended by the WDNR, Jackson County, City of Black River Falls and Village of Melrose representatives. The results of the study were reviewed at the final CCO meeting held on August 11, 2011, and attended by representatives of WDNR, Jackson County, City of Black River Falls, Village of Merrillan, and the Ho-Chunk Nation of Wisconsin. All problems raised at that meeting have been addressed in this study.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS report covers the geographic area of Jackson County, Wisconsin, including the incorporated communities listed in Section 1.1.

The following flooding sources were previously studied by detailed methods and their floodplains redelineated for this countywide FIS:

Table 2 – Streams and Lakes Studied by Detailed Methods

Stream	Reach
Black River	From the southwestern county boundary to the northern county boundary, with the exception of approximately four miles of state forests north of the City of Black River Falls
Douglas Creek	From confluence with Black River to the northern corporate limit of the Village of Melrose
East Fork Black River	From Pray Road to end of river
North Fork Buffalo River	From the western county boundary to 0.18 miles upstream of Moe Road
Trempealeau River	From the western county boundary to State Highway 95

The limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

Approximate techniques were used to map those areas having low development potential or minimal flood hazards. Named approximate streams and lakes are shown in Table 3.

Table 3 – Streams and Lakes Mapped by Approximate Methods

Beaver Creek	Levis Creek	Robinson Creek
Black River	Mill Creek	Schermerhorn Creek
Curran Coulee	Morrison Creek	Skutley Creek
Dickey Creek	North Branch Trempealeau River	South Branch Trempealeau River
Douglas Creek	North Fork Beaver Creek	South Fork Halls Creek
East Fork Black River	Perry Creek	Stoney Creek
East Fork Halls Creek	Pigeon Creek	Tank Creek
French Creek	Pine Creek	Trout Run
Halls Creek	Roaring Creek	Winter Creek

For the 2012 countywide FIS, the FIS report and FIRM were converted to countywide format, and the flooding information for the entire county, including both incorporated and unincorporated areas, is shown. Also, the vertical datum was converted from the National Geodetic Vertical Datum of 1929 (NGVD) to the North American Vertical Datum of 1988 (NAVD). The projection used in the preparation of this map is UTM Zone 15 North, and the horizontal datum used is NAD 83, GRS80 Spheroid.

2.2 Community Description

Jackson County is located in the west-central portion of Wisconsin. Jackson County, established in 1953, is bordered by Eau Claire and Clark Counties on the north, Wood and Juneau Counties on the east, Monroe and La Crosse Counties on the south, and Trempealeau County on the west. It has an area of 1,000 square miles (987 sq. mi. land and 13 sq. mi. water). According to the U.S. Census Bureau, in 2010 the population for Jackson County was 20,449 (Reference 5). Major lakes within Jackson County include the southern half of Lake Arbutus, Douglas Pond and the Potter Flowage. Major rivers include Douglas Creek and the Black, East Fork Black, North Fork Buffalo and Trempealeau Rivers.

The City of Black River Falls is the county seat and largest municipality in Jackson County. The city was incorporated in 1883 and is located in the central portion of Jackson County. The total land area contained within the city limits is approximately 3.25 square miles and according to the U.S. Census Bureau, in 2010 the population for the City of Black River Falls was 3,622 (Reference 5).

Two major highways serve Jackson County: Interstate 94 runs from Trempealeau County in the northwest to Monroe County in the southeast and U.S. Highway 12 from Clark County to the north to Monroe County in the southeast. Additional highways serving the county include State Highways 10, 27, 54 and 95.

The climate in west central Wisconsin is characterized by wide variations in temperatures. Average summer and winter temperatures range from 73 degrees Fahrenheit (°F) to 7°F, respectively. Annual average precipitation of the region is 30.0 inches, with an average recorded snowfall of 48 inches. Precipitation is normally higher in the spring and summer months (Reference 6 & 7).

Jackson County is split into two distinctive geological formations. The eastern part of the county is a broad, sandy alluvial plain, characterized by wet, marshy areas. The western part is hilly, uneven land, characteristic of the sandstone formation. The areas north of the City of Black River Falls are noted for its Pre-Cambrian crystalline formations of granite and gneiss, which occur along the bed of the Black River. Overlying the crystalline rocks over all other parts of the county is the Upper Cambrian (Potsdam) sandstone. A large amount of alluvial filling occupies the Black River valley south of Black River Falls, and similar surface deposits occur in all other valleys of the county (Reference 7).

The Black River flows southwesterly through the county. The total drainage area at the southwest county limit is approximately 2,000 square miles. Both the North Fork Buffalo River and the Trempealeau River originate in the

county and flow westerly to the western county limit. The approximate drainage area for these rivers at the western county limit is 20 square miles and 165 s quare miles, respectively (Reference 2). Douglas Creek flows southerly through the city. The total drainage area is approximately 24 square miles upstream of the corporate limits (Reference 4).

2.3 Principal Flood Problems

Jackson County is susceptible to flooding from both summer/fall rainstorms as well as spring snowmelt. During spring snowmelt, ice could jam at bridge constrictions and create much higher river stages than would normally be expected during a flood.

Countywide –

October 6, 1911

In early October, heavy rains filled the upstream tributaries to the Black River, and near dawn on October 6th, two dams above Black River Falls gave way. The river rose 20 feet over its already high level and rushed through the city all day. By nightfall, 85% of the business district had been washed downstream; 80 buildings and 42 acres of land, including entire hillside neighborhoods, were swept away. Only 14 structures remained in the downtown and damages were estimated at $2,000,000 (Reference 40).

Figure 1: “Great Flood of 1911” - Flooding at Black River Falls

June 7 – August 25, 1993

Months of rain hit the Midwest. Debris build up along the spillway at the Hatfield Dam led to damage and flooding while down river in Black River Falls over 100 homes were flooded due to a levee failure. Fifteen roads were also closed in the area (Reference 39).

Figure 2: Flooding at Grove area of Black River Falls – June 20, 1993 (Reference 39)

August 7-8, 2009

Slow moving thunderstorms produced very heavy rainfall and flash flooding across portions of northern Jackson County late in the evening on August 7th through the early morning hours on August 8th. Cooperative observers reported rainfall amounts of 6.50 inches at Hixton and 6.55 inches at Black River Falls. Law enforcement officials reported several washed out and flooded roadways in the northern half of Jackson County and vehicles submerged in the city of Black River Falls. Total cost of damage county-wide was $100,000 (Reference 9).

August 13, 2010

Various roads were closed across parts of Jackson county and sustained damage from flooding. The flooding also caused damage to some parks and utility systems. A line of severe thunderstorms moved out of Minnesota and into western and central Wisconsin during the morning hours of August 13th. Strong winds created tree and minor structural damage, while widespread heavy rain of 3 to 4 inches caused some flash flooding, road closures, and rises along rivers, streams and creeks. Significant damage occurred to roads, homes and businesses in west central Wisconsin due to the flooding with an estimated $2.78 million in damage to public sector infrastructure. More thunderstorms developed south of the initial storms across southwest Wisconsin, which brought heavy rains and caused flooding problems into the afternoon hours. The total cost of

damage county-wide was nearly $300,000 (Reference 9).

September 23, 2010

A stationary front set up across central Wisconsin on the evening of September 22nd. As an unusually moist air mass flowed over this boundary, heavy rain developed and fell repeatedly across the area during the evening and overnight hours. Soils were abnormally wet for this time of year; therefore, the extreme rainfall amounts that fell caused significant widespread flooding and flash flooding.

Locally heavy rains pushed the Black River at Black River Falls out of its banks from September 23rd to the 27th. The river exceeded the flood stage by over fourteen feet, cresting at 61.46 feet. This crest established a new flood of record. The dam at Black River Falls was being reconstructed during this event and was not in place during the peak.

Numerous roads were closed throughout the county due to heavy rains and flooding along rivers, streams, and creeks. Most bridges on township roads were over-topped with water. At one time, 56 roads were closed throughout the county. State Highway 95 was closed in several locations. A washout occurred near the intersection of State Highway 54 and County Road K. Other specific road closures included Old Highway 95 and County Roads S, X, and VV. Lowland flooding occurred across much of the county, while many roads, trails, and campgrounds in the Black River State Forest were closed. A mudslide occurred along County Road P near Petes Road. The West Arbutus Campground was evacuated as culverts were failing. Pigeon Creek was flooded and the Pigeon Falls Dam incurred some damage. Parks around Merrillan were all flooded, and the baseball field in Hixton was completely underwater. A person was rescued from a stranded vehicle on County Road VV, while assistance was given to a family evacuating in Irving Township.

In Melrose, 8 structures and 4 homes were damaged due to flooding from the Black River. Flooding from the Black River caused 80 homes in the city of Black River Falls to be evacuated. Throughout the county, 13 homes incurred major damage and 29 homes had minor damage. Although rain fell from the evening of the 22nd through much of the day on the 23rd, the majority of the rain had fallen as of 10 a.m. CST on the 23rd. At that point 5.30 inches had been measured in Merrillan Road. The total cost of damage county-wide was $2.6 million to property alone and another $500,000 in crop damage.

Buffalo, Trempealeau, Jackson, Taylor, Clark, and Juneau counties were included in federal disaster declarations (FEMA-1933-DR) (Reference 9).

Figure 3: Aerial photograph, flooding at Black River Falls – September 23, 2010

Black River –

The past history of flooding on the Black River within the Jackson County limits indicates that most major floods have occurred in the early spring and are usually the result of spring rains and/or snowmelt. There are two gages located on the Black River: one at Neillsville approximately 24 miles upstream of the county limit, and one at Galesville approximately 11 miles downstream of the county limit (Reference 12). Due to the effect of Lake Arbutus, which is located on the northern border of the county, the measured peak discharges at Neillsville do not always match the observed peaks within the county. The Galesville gage reveals major floods in the years 1938, 1952, and 1967. The magnitudes and frequencies for these floods are listed in Table 4 below (Reference 2).

Table 4 – Summary of Major Floods on the Black River (Galesville Gage No. 05382000) (References 1 & 39)

Date	Peak Discharge cubic feet per second (CFS)	Percent Annual Chance
September 11, 1938	58,000	2.4
April 3, 1952	51,000	4.3
April 1, 1967	65,500	1.3
June 21, 1993	64,000	1.5

Douglas Creek –

Douglas Creek is a small basin and, therefore, quite responsive to locally heavy rains. Floods can occur on this creek during any of the warmer months of the year. There are no gage records available for Douglas Creek (Reference 4).

North Fork Buffalo River and Trempealeau River –

The drainage basins for the North Fork Buffalo River and the Trempealeau River are considerably smaller and, therefore, more responsive to locally heavy rains. Floods can occur on these rivers during any of the warmer months of the year. There are no gage records available for these rivers within reasonable proximity to the study areas (References 2 & 3).

2.4 Flood Protection Measures

There are two dams on the Black River in Jackson County: the Hatfield Dam at Lake Arbutus and the dam located in Black River Falls. The dam at Hatfield has the limited ability to attenuate major peaks on the Black River; however, its primary purpose is for hydroelectric power generation and recreation. The present operating plan at the dam is to maintain the normal lake stage during periods of high flows by adjusting the amount and number of tainter gates opened. The structure has the capacity of passing approximately 42,200 cfs at normal lake stage with all gates open. For floods of larger magnitudes, the lake stage will increase, producing additional storage behind the structure and thus attenuating the peak discharges. The flooding effects of snowmelt and spring rains are reduced to some extent through the practice of reducing the lake stage throughout the winter months (Reference 2).

The dam at Black River Falls was designed primarily for hydroelectric power generation and recreation. It does not have any significant advantages for flood control (Reference 1).

Levees

A levee system is located along the Black River. This Black River Falls Flood Protection System consists of 5,000 lineal feet of concrete flood wall and earthen embankment along Town Creek and the Black River. Please refer to the corresponding Flood Insurance Rate Map panels for the protection status of this levee system. The levee complies with the minimum requirements of the National Flood Insurance Program (NFIP) regulations cited in the Code of Federal Regulations (CFR), Title 44, Section 65.10 (44 CFR 65.10), including meeting the minimum freeboard requirements.

For purposes of the NFIP, FEMA only recognizes levee systems that meet, and continue to meet, minimum design, operation, and maintenance standards that are consistent with comprehensive floodplain management criteria. The Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10) describes the information needed for FEMA to determine if a levee system provides protection from the 1% annual chance flood. This information must be supplied to FEMA by the community or other party

when a flood risk study or restudy is conducted, when FIRMs are revised, or upon FEMA request. FEMA reviews the information for the purpose of establishing the appropriate FIRM flood zone.

Levee systems that are determined to provide protection from the 1% annual chance flood are accredited by FEMA. FEMA can also grant provisional accreditation to a levee system that was previously accredited on an effective FIRM and for which FEMA is awaiting data and/or documentation to demonstrate compliance with Section 65.10. These levee systems are referred to as Provisionally Accredited Levees, or PALs. Provisional accreditation provides communities and levee owners with a specified timeframe to obtain the necessary data to confirm the levee's certification status. Accredited levee systems and PALs are shown on the FIRM. If the required information for a PAL is not submitted within the required timeframe, or if information indicates that a levee system no longer meets Section 65.10, FEMA will de-accredit the levee system and issue an effective FIRM showing the levee-impacted area as a SFHA.

FEMA coordinates its programs with the United States Army Corp of Engineers (USACE), who may inspect, maintain, and repair levee systems. The USACE has authority under Public Law 84-99 to supplement local efforts to repair flood control projects that are damaged by floods. Like FEMA, the USACE provides a program to allow public sponsors or operators to address levee system maintenance deficiencies. Failure to do so within the required timeframe results in the levee system being placed in an inactive status in the USACE Rehabilitation and Inspection Program. Levee systems in an inactive status are ineligible for rehabilitation assistance under Public Law 84-99.

Please note that the information presented is subject to change at any time. For that reason, the latest information regarding any USACE structure presented should be obtained by contacting USACE and accessing the USACE national levee database. For levees owned and/or operated by someone other than the USACE, contact the local community.

There are no known flood protection measures for either the Trempealeau River or the North Fork Buffalo River within the limits of this study (Reference 2).

There are no known flood protection measures for Douglas Creek with the exception of the dam located in Melrose. This dam, although it does not have the storage capacity to attenuate the discharge peaks to any appreciable degree, does provide minimal flood protection upstream (Reference 4).

Flood protection measures do not exist for the Trempealeau study area (Reference 3).

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods 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 is expected to be equaled or exceeded once on the average during any 10-, 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-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent 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 1-percent-annual-chance flood in any 50-year period is approximately 40 percent (4 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.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the community (Reference 1).

The following hydrologic analyses have not changed from the previous countywide FIS.

A HEC-1 hydrologic computer model was developed for the Black River basin upstream of the City of Black River Falls (Reference 8). The model included routings through the dams at Hatfield and Black River Falls. The outflow peak discharges of the Black River Falls dam and at the southwest county line was compared with values determined from gage records at Galesville, Wisconsin. A log-Pearson Type III distribution was performed on these records (gage no. 53820, operating since 1932), assuming a skew of -0.13. These comparisons were made using a discharge-area ratio with a 0.4 exponent. The discharges at the downstream gage are lower due to the effects of the dam. The infiltration loss rates used in the HEC-1 model were adjusted to provide an adequate comparison with the gage (Reference 1).

For the detailed study of Douglas Creek and the North Fork Buffalo River the hydrologic analysis was investigated, utilizing the methodology outlined in the Soil Conservation Service (SCS) National Engineering Handbook

(Reference 11). Using this procedure, the time of concentration and time of peak are computed for the basin and a unit hydrograph is developed. The expected 6-hour rainfall for the desired frequency event was obtained from Technical Paper No. 40 and distributed into 30- minute amounts as described in the SCS criteria for design storms (Reference 6). A6-hour duration storm was chosen since it was determined to be the "effective duration" for areas having an average annual precipitation of approximately 30 inches.

Rainfall excess was computed from accumulated rainfall, using an SCS runoff equation which equates runoff as a function of soil type, antecedent moisture condition, and land use. Utilizing this precipitation data and the derived unit hydrograph, an outflow hydrograph is computed for the basin.

The utilization of the States Multiple Regression Equations with drainage area, main channel slope, percent lakes and marsh, areal factor, and mean snowfall as the independent variables was also investigated (Reference 12). The derivation of these equations is described in detail in Estimating Magnitude and Frequency of Floods in Wisconsin by Duane H. Conger (Reference 12).

The results of these studies of peak discharges were also compared with data obtained from similar gaged basins. These discharges reflect the present land use within the basin. Increased development without regard to changes in the runoff characteristics of the basin could substantially increase these flows.

The hydrologic data for the Trempealeau River were taken from the Trempealeau River Floodplain Information Report (Reference 13). These data were then checked using the same procedure as the one used for the Douglas Creek and the North Fork Buffalo River. Adjustments were made using the discharge-area ratio with a 0.6 exponent where applicable.

New hydrologic analyses performed by Globetrotters Engineering Corporation on the East Fork Black River were incorporated into the 1994 Flood Insurance Study for Jackson County. Discharges were determined using regression equations (Reference 25). These discharges were compared and verified with data available from the floodplain repository (Reference 26) and found to be consistent.

Peak discharges for the 10-, 50-, 100-, and 500-year floods of the flooding source studied in detail in the community are shown in Table 5.

Table 5 – Summary of Discharges

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
BLACK RIVER					
Upstream of western county boundary	2,020	40,500	60,000	67,500	89,500
Upstream of Black River Falls Dam	1,590	34,300	55,800	61,900	81,000
DOUGLAS CREEK					
At corporate limit near Lovell Street	24.2	1,400	2,750	3,400	5,000
EAST FORK BLACK RIVER					
Just upstream of Pray Road	232	6,170	8,860	10,070	13,290
Just upstream of Knutes Road	196	5,730	8,330	9,510	12,550
At eastern county boundary	163	4,980	7,250	8,290	10,940
NORTH FORK BUFFALO RIVER					
At county boundary	20.5	1,200	2,100	2,700	4,000
TREMPEALEAU RIVER					
Upstream of western county boundary	165	4,600	7,700	9,400	14,200
Just upstream of Interstate 94	71	2,800	4,685	5,720	8,640

3.2 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 (References 1, 2, 3 and 4). Users should be aware that flood elevations shown on the FIRM [Flood Insurance Rate Map (FIRM)] represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. 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 in conjunction with the data shown on the FIRM.

The following hydraulic analyses have not changed from the previous countywide FIS.

Cross sections and bridge elevation data and structural geometry for the Black River, Douglas Creek, East Fork Black River, North Fork Buffalo River and Trempealeau River, as well as for the backwater analyses of the Black River and Trempealeau River, were obtained by field surveys by the Study Contractor. The channel soundings were also obtained by field measurement (Reference 2).

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the FIRM (Exhibit 2) (References 1, 2, 3 and 4).

Starting water-surface elevations for the Black River at the county line were obtained by using the slope-area method. Starting water-surface elevations for the Black River above the Black River Falls Dam were computed using stage-discharge rating tables. Starting water-surface elevations for each flood frequency studied for Douglas Creek and the North Fork Buffalo River were computed using the computer program Hydraulics of Bridge Waterways (Reference 14). The starting water elevations for the Trempealeau River were taken from the Trempealeau River Floodplain Report and adjusted to the study limits (Reference 13).

Water-surface elevations of floods of the selected recurrence intervals were computed through use of the U.S. Army Corps of Engineers (COE) HEC-2 step- backwater computer program (References 15 and 27).

The elevation for Lake Arbutus was determined from rating curves developed at Hatfield Dam. Elevations for the portion of the Black River studied by approximate methods were determined by extrapolating from the known elevations at the downstream and upstream limits of detailed study. Other approximate flood areas were taken from the U.S. Geological Survey Flood Prone Area Maps (Reference 16).

Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals (Exhibit 1). In cases where the 50-and 100-year flood elevations are close together, due to limitations of the profile scale, only the 100-year profile has been drawn (Reference 3).

Channel roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and were based on field observations of the streams and flood plain areas. T he Manning's "n" values for all detailed study streams are listed in Table 6 below:

Table 6 – Manning's "n" Values for Detailed Study Streams

Stream	Channel "n"	Overbank "n"
Black River (above Black River Falls Dam)	0.03-0.04	0.08-0.11
Black River (below Black River Falls Dam)	0.03-0.04	0.08-0.12
Douglas Creek	0.03-0.07	0.08-0.11
East Fork Black River	0.03-0.04	0.10-0.12
North Fork Buffalo River	0.045	0.09-0.12
Trempealeau River	0.04-0.045	0.075-0.095

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the Flood Profiles (Exhibit 1) are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

3.3 Vertical Datum

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 in use for newly created or revised FIS reports and FIRMs was NGVD29. With the finalization of the NAVD88, many FIS reports and FIRMs are now being prepared using NAVD88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on t he FIRM are referenced to NAVD88. Structure and ground elevations in the community must, therefore, be referenced to NAVD88. It is important to note that adjacent communities may be referenced to NGVD29. This may result in differences in Base Flood Elevations (BFEs) across the corporate limits between the communities. Some of the data used in this study were taken from the prior effective FIS reports and adjusted to NAVD88. The average conversion factor that was used to convert the data in this FIS report to NAVD88 was calculated using the National Geodetic Survey's (NGS) VERTCON online utility (Reference 29). The data points used to determine the conversion are listed in Table 7.

Vertical Datum Conversion: NGVD + 0.0 = NAVD

Table 7 - Vertical Datum Conversion

Quad Name	Corner	Latitude	Longitude	Conversion from NGVD to NAVD (feet)
Price	NW	44.625	91.125	0.05
Fairchild	NW	44.625	91.000	0.04
Wildcat Mountain	NW	44.625	90.875	0.02
Hixton	NW	44.500	91.125	0.03
Alma Center	NW	44.500	91.000	0.04
Merrillan	NW	44.500	90.875	0.00
Taylor	NW	44.375	91.125	-0.01
Stenulson Coulee	NW	44.375	91.000	-0.01
Black River Falls	NW	44.375	90.875	0.01
Hatfield SW	NW	44.375	90.750	-0.02
Hatfield SE	NW	44.375	90.625	-0.02
Spaulding	NW	44.375	90.500	-0.02
City Point	NW	44.375	90.750	-0.02
North Bend NE	NW	44.250	91.125	0.00
Melrose	NW	44.250	91.000	0.00
Shamrock	NW	44.250	90.875	-0.03
Millston	NW	44.250	90.750	0.01
Warrens West	NW	44.250	90.625	0.02
Warrens East	NW	44.250	90.500	0.00
Mather	NW	44.250	90.375	-0.03
Shennington	NW	44.125	90.375	-0.01
Wyeville	NW	44.125	90.500	0.01
North Bend	NW	44.125	91.125	-0.03
			Average	**0.0**

For additional information regarding conversion between NGVD and NAVD, visit the NGS website at www.ngs.noaa.gov, or contact the NGS at the following address:

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

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 Technical Support Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS report provides 1-percent-annual-chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent-annual-chance flood elevations; delineations of the 1- and 0.2-percent-annual-chance floodplains; and a 1-percent-annual-chance floodway. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS report as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

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

Detailed studies were delineated on 5-, 10- and 20- foot interval contours shown on the USGS 7.5-minute quadrangle maps (References 30-37). In the Town of Brockway, Jackson County, in an area called Tilden Mound adjacent to the Black River, the boundaries were interpolated using

topographic maps at a scale of 1:500, with a contour interval of 1 foot (Reference 41).

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 1). On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual- chance floodplain boundaries are close together, only the 1-percent-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.

For areas mapped by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM (Exhibit 2). Floodplain boundaries have been delineated using USGS 7.5-minute quadrangle maps with 5-, 10- and 20- foot intervals (References 30-38).

4.2 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 this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies. However, the WDNR has established a policy that requires a 0.0 foot surcharge except for the waterways which were redelineated, where the surcharge from the effective study remains valid (Reference 17).

The floodways presented in this FIS report and on the FIRM were computed at representative cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations have been tabulated for selected cross sections (Table 8). In cases where the floodway and 1-percent-annual- chance floodplain boundaries are either close together or collinear, only the floodway boundary has been shown.

In the redelineation efforts, the floodways were not recalculated. As a result, there were areas where the previous floodway did not fit within the boundaries of the redelineated 1-percent-annual chance floodplain. In these areas, the floodway was reduced to coincide with the 1-percent-annual chance floodplain. Water surface elevations, with and without a floodway, the mean velocity in the floodway, and the location and area at each surveyed cross section as determined by the hydraulic methods can be seen in Table 8. The width of the floodway depicted by the FIRM panels and the amount of reduction to fit the floodway inside the 1-percent annual chance floodplain, if necessary, is also listed.

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BLACK RIVER									
A	36.70	4,745 / 3,650[2]	45,997	1.5	0	695.2	695.2	695.2	0.0
B	37.29	5,466 / 3,456[2]	63,757	1.1	0	696.1	696.1	696.1	0.0
C	38.02	4,767	54,758	1.2	0	696.9	696.9	696.9	0.0
D	38.56	5,667	73,017	0.9	0	697.4	697.4	697.4	0.0
E	39.57	5,278	66,110	1.0	0	697.9	697.9	697.9	0.0
F	40.48	6,590	40,007	1.7	0	699.5	699.5	699.5	0.0
G	42.02	4,941	42,801	1.6	0	701.5	701.5	701.5	0.0
H	42.71	4,864 / 4,066[2]	36,915	1.8	0	704.2	704.2	704.2	0.0
I	43.66	4,062	26,970	2.5	0	708.0	708.0	708.0	0.0
J	44.59	4,827	50,689	1.3	0	710.5	710.5	710.5	0.0
K	45.57	6,015	43,871	1.5	0	712.3	712.3	712.3	0.0
L	46.56	5,141	41,877	1.6	0	714.5	714.5	714.5	0.0
M	47.52	1,937	16,555	4.1	0	716.8	716.8	716.8	0.0
N	48.07	642	10,746	6.3	0	720.7	720.7	720.7	0.0
O	48.51	2,218	26,636	2.5	0	722.9	722.9	722.9	0.0
P	49.07	4,048	62,078	1.1	0	723.8	723.8	723.8	0.0
Q	49.55	6,395 / 4,625[2]	80,904	0.8	0	724.0	724.0	724.0	0.0
R	50.64	5,466 / 1,232[2]	55,237	1.2	0	724.5	724.5	724.5	0.0
S	51.25	4,882 / 1,555[2]	52,249	1.3	0	724.9	724.9	724.9	0.0
T	51.92	3,868 / 122[2]	35,709	1.9	0	726.0	726.0	726.0	0.0

[1]MILES ABOVE MOUTH
[2]TOTAL WIDTH / WIDTH WITHIN JACKSON COUNTY

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

BLACK RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BLACK RIVER (CONTINUED)									
U	52.65	5,032 / 296[2]	43,872	1.5	0	727.9	727.9	727.9	0.0
V	53.37	6,457 / 1,654[2]	79,384	0.9	0	728.3	728.3	728.3	0.0
W	53.84	5,352 / 1,539[2]	65,180	1.0	0	728.5	728.5	728.5	0.0
X	54.70	5,195 / 4,906[2]	39,326	1.7	0	729.3	729.3	729.3	0.0
Y	55.51	2,367 / 1,888[2]	19,254	3.5	0	730.8	730.8	730.8	0.0
Z	56.36	1,635	18,467	3.7	732	733.9	733.9	733.9	0.0
AA	57.38	5,550	62,228	1.1	333	735.8	735.8	735.8	0.0
AB	58.32	5,070	60,316	1.1	657	736.3	736.3	736.3	0.0
AC	59.26	3,018	27,229	2.5	0	737.4	737.4	737.4	0.0
AD	60.04	2,404	16,224	4.2	0	739.7	739.7	739.7	0.0
AE	60.83	1,033	12,988	5.2	0	742.3	742.3	742.3	0.0
AF	61.37	4,200	50,685	1.3	0	743.3	743.3	743.3	0.0
AG	62.29	5,579	48,966	1.4	0	743.8	743.8	743.8	0.0
AH	63.09	4,967	55,424	1.1	0	744.4	744.4	744.4	0.0
AI	64.16	4,098	28,565	2.2	0	745.4	745.4	745.4	0.0
AJ	65.58	5,118	71,835	0.9	0	746.3	746.3	746.3	0.0
AK	66.60	3,997	57,600	1.1	0	746.7	746.7	746.7	0.0
AL	67.23	2,333	23,864	2.6	0	746.9	746.9	746.9	0.0
AM	67.60	1,992	18,891	3.3	0	747.6	747.6	747.6	0.0

[1]MILES ABOVE MOUTH
[2]TOTAL WIDTH / WIDTH WITHIN JACKSON COUNTY

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

BLACK RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BLACK RIVER (CONTINUED)									
AN	68.21	4,000	41,850	1.5	0	749.1	749.1	749.1	0.0
AO	68.76	4,178	60,448	2.0	0	749.8	749.8	749.8	0.0
AP	69.34	1,151	14,232	4.3	0	750.9	750.9	750.9	0.0
AQ	69.98	1,048	8,993	6.8	0	752.7	752.7	752.7	0.0
AR	70.65	742	11,814	5.2	0	755.3	755.3	755.3	0.0
AS	70.99	964	10,034	6.1	262	755.9	755.9	755.9	0.0
AT	71.31	311	6,383	9.6	0	756.6	756.6	756.6	0.0
AU	71.58	487	11,977	5.1	92	758.5	758.5	758.5	0.0
AV	71.89	542	11,272	5.5	0	759.4	759.4	759.4	0.0
AW	72.17	498	11,438	5.4	0	760.2	760.2	760.2	0.0
AX	72.33	563	10,968	5.6	0	760.5	760.5	760.5	0.0
AY	72.67	501	9,624	6.4	0	769.9	769.9	769.9	0.0
AZ	72.93	373	10,682	5.8	52	770.5	770.5	770.5	0.0
BA	73.28	311	7,687	8.1	0	770.7	770.7	770.7	0.0
BB	73.42	506	10,411	6.0	0	771.4	771.4	771.4	0.0
BC	73.77	402	9,304	6.7	0	771.9	771.9	771.9	0.0
BD	74.12	458	7,390	8.4	0	772.4	772.4	772.4	0.0
BE	74.71	649	9,226	6.7	0	774.4	774.4	774.4	0.0
BF	75.02	509	10,398	6.0	0	775.2	775.2	775.2	0.0

[1]MILES ABOVE MOUTH

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

BLACK RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BLACK RIVER (CONTINUED)									
BG	75.33	401	8,550	7.2	0	775.6	775.6	775.6	0.0
BH	75.70	544	7,462	8.3	0	778.0	778.0	778.0	0.0
BI	76.44	314	7,636	8.1	0	780.7	780.7	780.7	0.0
BJ	82.18	518	6,903	8.3	0	795.0	795.0	795.0	0.0
BK	82.57	308	4,209	13.6	0	799.0	799.0	799.0	0.0
BL	82.91	324	4,564	12.5	0	804.7	804.7	804.7	0.0
BM	83.07	250	3,883	14.7	0	807.6	807.6	807.6	0.0
BN	83.37	505	7,463	7.7	0	814.5	814.5	814.5	0.0
BO	83.60	207	2,979	19.3	0	818.5	818.5	818.5	0.0
BP	83.75	362	6,538	8.8	0	827.4	827.4	827.4	0.0
BQ	84.15	317	5,996	9.5	0	828.7	828.7	828.7	0.0
BR	84.45	379	7,036	8.1	0	830.7	830.7	830.7	0.0
BS	84.73	865	11,967	4.8	0	832.4	832.4	832.4	0.0
BT	85.16	477	10,053	5.7	0	833.6	833.6	833.6	0.0
BU	85.24	639	7,132	8.0	0	833.9	833.9	833.9	0.0
BV	85.44	170	3,320	17.2	0	837.6	837.6	837.6	0.0
BW	85.59	525	6,739	8.5	0	847.7	847.7	847.7	0.0
BX	85.73	815	13,643	4.2	0	854.7	854.7	854.7	0.0

[1]MILES ABOVE MOUTH

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

BLACK RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
DOUGLAS CREEK								
A	5,023	209	789	4.3	724.1	724.1	724.1	0.0
B	6,037	246	1,293	2.6	727.2	727.2	727.2	0.0
C	7,641	266	1,348	2.5	729.1	729.1	729.1	0.0
D	8,556	158	1,092	3.1	730.9	730.9	730.9	0.0
E	8,927	98	1,166	2.9	731.1	731.1	731.1	0.0
F	9,131	131	3,839	0.9	762.2	762.2	762.2	0.0
G	10,909	745	3,822	0.9	762.3	762.3	762.3	0.0
H	12,001	728	3,366	1.0	762.5	762.5	762.5	0.0
I	12,661	711	3,202	1.1	762.7	762.7	762.7	0.0

[1] FEET ABOVE MOUTH

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

DOUGLAS CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
EAST FORK BLACK RIVER								
A	52,333	120	1,150	8.8	928.6	928.6	928.6	0.0
B	59,400	674	2,795	3.6	933.7	933.7	933.7	0.0
C	66,043	786	2,992	3.4	939.8	939.8	939.8	0.0
D	71,696	1,373	8,309	1.2	944.1	944.1	944.1	0.0
E	75,686	710	4,708	2.1	945.7	945.7	945.7	0.0
F	78,215	1,020	6,278	1.6	947.0	947.0	947.0	0.0
G	81,178	1,371	7,961	1.3	947.5	947.5	947.5	0.0
H	85,636	679	3,348	3.0	947.8	947.8	947.8	0.0
I	88,389	1,301	7,833	1.3	949.5	949.5	949.5	0.0
J	90,663	581	2,736	3.7	950.5	950.4	950.4	0.0
K	93,799	1,462	7,416	1.4	951.5	951.5	951.5	0.0
L	98,632	1,468	7,856	1.3	952.2	952.2	952.2	0.0
M	101,808	1,317	6,633	1.4	952.8	952.7	952.7	0.0
N	105,302	1,713	7,905	1.2	955.5	955.5	955.5	0.0
O	108,602	2,128	8,587	1.1	956.3	956.3	956.3	0.0
P	111,732	1,509	6,062	1.6	957.0	957.0	957.0	0.0
Q	115,148	2,267	5,293	1.8	958.2	958.2	958.2	0.0
R	120,157	1,336	8,052	1.2	960.0	959.9	959.9	0.0
S	123,451	1,389	6,162	1.3	960.8	960.8	960.8	0.0

[1] FEET ABOVE COUNTY BOUNDARY

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

EAST FORK BLACK RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
NORTH FORK BUFFALO RIVER									
A	147,622	616	1,944	1.4	0	990.0	990.0	990.0	0.0
B	150,522	486	1,661	1.6	116	995.9	995.9	995.9	0.0
C	153,268	360	697	3.9	0	1,009.0	1,009.0	1,009.0	0.0
D	157,409	323	1,241	2.2	0	1,017.5	1,017.5	1,017.5	0.0
E	160,334	456	1,211	2.2	0	1,025.7	1,025.7	1,025.7	0.0
F	163,672	319	1,246	2.2	26	1,033.0	1,033.0	1,033.0	0.0
G	167,176	232	517	5.2	0	1,044.3	1,044.3	1,044.3	0.0
H	167,783	351	1,612	1.7	0	1,045.1	1,045.1	1,045.1	0.0
I	170,391	356	1,380	2.0	0	1,051.0	1,051.0	1,051.0	0.0

[1]FEET ABOVE STATE HIGHWAY 93

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK BUFFALO RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
TREMPEALEAU RIVER									
A	365,866	1,431	5,291	1.8	0	865.4	865.4	865.4	0.0
B	368,832	905	3,906	2.4	0	867.3	867.3	867.3	0.0
C	371,142	1,809	7,748	1.2	0	869.2	869.2	869.2	0.0
D	376,788	1,956	7,161	1.3	0	872.8	872.8	872.8	0.0
E	379,196	1,842	7,789	1.2	0	874.1	874.1	874.1	0.0
F	381,637	1,692	6,695	1.4	0	875.6	875.6	875.6	0.0
G	386,250	2,832	9,637	1.0	28	879.5	879.5	879.5	0.0
H	388,993	1,690	5,452	1.7	0	882.7	882.7	882.7	0.0
I	393,101	1,899	10,041	0.7	0	884.5	884.5	884.5	0.0
J	396,828	1,300	4,956	1.5	0	886.4	886.4	886.4	0.0
K	399,259	172	1,458	5.0	0	890.3	890.3	890.3	0.0
L	400,899	1,079	5,778	1.3	0	891.3	891.3	891.3	0.0
M	403,065	908	4,454	1.5	0	892.4	892.4	892.4	0.0
N	409,984	1,005	4,048	1.7	0	897.1	897.1	897.1	0.0
O	412,376	1,283	4,082	1.6	0	899.5	899.5	899.5	0.0
P	413,708	115	1,374	4.9	0	902.3	902.3	902.3	0.0
Q	416,201	1,191	6,093	1.1	0	904.2	904.2	904.2	0.0
R	418,019	949	3,623	1.9	0	905.0	905.0	905.0	0.0
S	419,899	748	3,061	2.2	0	907.2	907.2	907.2	0.0
T	424,397	1,554	4,371	1.3	84	911.2	911.2	911.2	0.0

[1]FEET ABOVE MOUTH

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

TREMPEALEAU RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
TREMPEALEAU RIVER (CONTINUED)									
U	427,907	650	1,683	3.4	0	914.4	914.4	914.4	0.0
V	430,666	583	2,463	2.3	0	916.6	916.6	916.6	0.0
W	433,626	86	714	8.0	0	921.1	921.1	921.1	0.0
X	433,977	360	1,926	3.0	0	924.9	924.9	924.9	0.0
Y	436,719	140	1,583	3.6	0	925.2	925.2	925.2	0.0
Z	438,744	1,136	3,703	1.2	648	926.5	926.5	926.5	0.0
AA	441,536	62	403	6.8	0	932.2	932.2	932.2	0.0
AB	444,095	674	1,793	1.5	159	935.1	935.1	935.1	0.0
AC	446,982	711	1,486	1.8	0	940.2	940.2	940.2	0.0
AD	447,300	66	399	6.9	0	940.6	940.6	940.6	0.0

[1]FEET ABOVE MOUTH

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

TREMPEALEAU RIVER

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation (WSEL) of the 1-percent-annual-chance flood more than 1 f oot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 4.

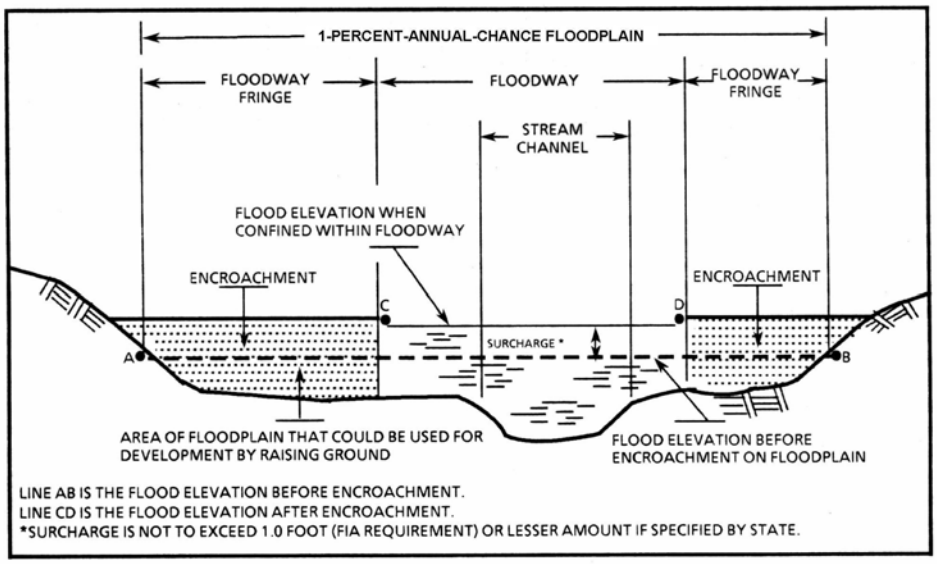


Figure 4 - Floodway Schematic

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS report by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base (1-percent-annual-chance) flood elevations (BFEs) or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS report by detailed methods. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or base flood depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The countywide FIRM presents flooding information for the entire geographic area of Jackson County. Previously, FIRMs were prepared for each incorporated community and the unincorporated areas of the County identified as flood-prone. This countywide FIRM also includes flood-hazard information that was presented separately on Flood Boundary and Floodway Maps, where applicable. Historical data relating to the maps prepared for each community are presented in Table 9.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE	FIRM EFFECTIVE DATE	FIRM REVISION DATE
Alma Center, Village of[1]	N/A	N/A	N/A	
Black River Falls, City of	December 17, 1973	May 21, 1976	February 4, 1981	
Hixton, Village of	May 17, 1974	March 19, 1976	January 2, 1987	
Ho-Chunk Nation of Wisconsin[1]	N/A	N/A	N/A	
Jackson County (Unincorporated Areas)	February 4, 1981	N/A	February 4, 1981	January 19, 1994
Melrose, Village of	December 17, 1973	April 9, 1976	March 16, 1981	
Merrillan, Village of	May 31, 1974	May 28, 1976	September 1, 1986	
Taylor, Village of	December 7, 1973	April 9, 1976	June 1, 1987	

[1] This community does not have map history prior to the first countywide mapping.

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

Flood Insurance Studies (FISs) have been prepared for Eau Claire County and Incorporated Areas (Reference 18); Clark County and Incorporated Areas (Reference 19); Wood County and Incorporated Areas (Reference 20); Trempealeau County and Incorporated Areas, (Reference 21); Monroe County and Incorporated Areas (Reference 22); Juneau County and Incorporated Areas (Reference 23) and La Crosse and Incorporated Areas (Reference 24).

This FIS report either supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting FEMA, Federal Insurance and Mitigation Division, 536 South Clark Street, Sixth Floor, Chicago, Illinois 60605.

9.0 BIBLIOGRAPHY AND REFERENCES

1. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, City of Black River Falls, Jackson County, Wisconsin, Flood Insurance Study Report, August 1980.

2. Federal Emergency Management Agency, Flood Insurance Study, Jackson County and Unincorporated Areas, Wisconsin, Flood Insurance Study Report, January 1994.

3. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Village of Hixton, Jackson County, Wisconsin, Flood Insurance Study Report, August 1987.

4. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Village of Melrose, Jackson County, Wisconsin, Flood Insurance Study Report, September 1980.

5. U.S. Census Bureau, American FactFinder, Jackson County, Wisconsin, 2010. Retrieved January 2012, from http://factfinder2.census.gov.

6. U.S. Department of Commerce, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, January 1963.

7. Wisconsin Legislative Reference Bureau, Geography and Climate, State of Wisconsin Blue Book 2007-2008, from http://www.legis.wisconsin.gov/lrb/bb/07bb/statistics.htm. Retrieved February 2011.

8. U.S. Army Corps of Engineers, Hydrologic Engineering Center, Computer Program 723-X6-L2010 HEC-l Flood Hydrograph Package, Davis, California, January 1973.

9. National Climatic Data Center (NCDC), Storm Events Database, http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms. Retrieved February 2011.

10. U.S. Water Resources Council, Bulletin No. 17, Guidelines for Determining Flood Flow Frequencies, March 1976.

11. U.S. Department of Agriculture, Soil Conservation Service, National Engineering Handbook, Section 4, Hydro1ogy, August 1972.

12. U.S. Geological Survey, Open-File Report, Estimating Magnitude and Frequency of Floods in Wisconsin, Conger, Duane H., 1971.

13. U.S. Army Corps of Engineers, St. Paul District, Floodplain Information Report: Trempealeau River, Trempealeau County, Wisconsin, August 1976.

14. Wisconsin Department of Natural Resources, Bureau of Water Regulation and Zoning, Hydraulic Review of Natural or Constricted Waterways (Bridge or Culvert).

15. U.S. Army Corps of Engineers, Hydrologic Engineering Center, Computer Program 723-X6-L202A, HEC-2 Water-Surface Profiles, Davis, California, November 1976 (with updates).

16. U.S. Geological Survey, Map of Flood Prone Areas, Hatfield, 1973; City Point, 1973; Spaulding, 1973; North Bend, 1970; Blair, 1970; Melrose, 1970; Fairchild, 1970; and Osseo, Wisconsin, 1970.

17. Wisconsin Department of Natural Resources, Wisconsin's Floodplain Management Program, Chapter NR116, Register No. 362, 1986.

18. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Eau Claire County and Incorporated Areas, Wisconsin, Flood Insurance Study Report, February 2009.

19. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Clark County and Incorporated Areas, Wisconsin, Flood Insurance Study Report, July 2010.

20. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Wood County and Incorporated Areas, Wisconsin, Flood Insurance Study Report, February 2010.

21. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Trempealeau County and Incorporated Areas, Wisconsin, Flood Insurance Study Report, April 2011.

22. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Monroe County and Incorporated Areas, Wisconsin, Flood Insurance Study Report, January 2010.

23. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Juneau County and Incorporated Areas, Wisconsin, Flood Insurance Study Report.

24. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, La Crosse County and Incorporated Areas, Wisconsin, Flood Insurance Study Report.

25. U.S. Geological Survey, Water Resources Investigations Report 80-1214, Techniques for Estimating Magnitude and Frequency of Floods for Wisconsin Streams, D. H. Conger, 1981.

26. Wisconsin Department of Natural Resources, Floodplain Repository Data for Jackson County, Wisconsin.

27. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water-Surface Profiles, Computer Program 723, Davis, California, Version 4.6, February 1991.

28. U.S. Geological Survey, 7.5 Minute Topographic Maps, Scale 1:24,000, Contour Interval 5 feet, Spaulding, City Point, 1970; Contour Interval 10 feet, Hatfield, Hatfield NE, City Point NW, Hatfield SW, Hatfield SE, 1970; Fairchild, Wildcat Mound, 1979; Shamrock, Millston, 1983; Alma Center, Merrillan, Black River Falls, 1984; Contour Interval 20 feet, North Bend, North Bend NE, Negg, 1969; Melrose, 1983; Pigeon Falls, Hixton, Blair, Taylor, and Stenulson Coulee, 1984.

29. National Geodetic Survey, VERTCON-North American Vertical Datum Conversion Utility. Retrieved September 26, 2008, from http://www.ngs.noaa.gov.

30. U.S. Geological Survey, 7.5 Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 5 feet: City Point and Spaulding; 1985.

31. U.S. Geological Survey, 7.5 Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 10 feet: Shamrock and Millston, 1983.

32. U.S. Geological Survey, 7.5 Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 10 feet: Black River Falls, Alma Center and Merrillan; 1984.

33. U.S. Department of the Interior, 7.5 Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 10 feet: City Point NW, Hatfield, Hatfield NE, Hatfield SE and Hatfield SW; 1985.

34. U.S. Department of the Interior, 7.5 Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 20 feet: North Bend and North Bend NE; 1969.

35. U.S. Department of the Interior, 7.5 Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 20 feet: Stevenstown and Hegg; 1974.

36. U.S. Department of the Interior, 7.5 Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 20 feet: Four Corners and Melrose; 1983.

37. U.S. Department of the Interior, 7.5 Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 20 feet: Stenulson Coulee, Taylor, Blair, Hixton, Price, Osseo and Pigeon Falls; 1984.

38. U.S. Department of the Interior, 7.5 Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 10 feet: Wildcat Mountain and Fairchild; 1979.

39. Wisconsin Department of Natural Resources - Bureau of Water Regulation & Zoning, The Floods of 1993: The Wisconsin Experience, December 1993.

40. Olson, Ann Marie, Black Friday: The Flood of October 6, 1911 in Black River Falls, Wisconsin, Block Print, 1987.

41. Carlson Surveying, Topographic Mapping of Tilden Mound Sec. 11, T21N, R4W, Scale 1:500, Contour Interval 1 foot, Baraboo, Wisconsin 1989.

10.0 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.

10.1 FIRM Notes to Users

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- percent-annual-chance flood elevation is also referred to as the Base Flood Elevation (BFE)); delineations of the 1-percent-annual-chance and 0.2-percent-annual-chance floodplains; and 1-percent-annual-chance floodway. This information is presented on the FIRM and/or in many components of the FIS report, including Flood Profiles and Floodway Data tables.

Figure 5 presents important considerations for using the information contained in this FIS report and the FIRM and is provided in response to changes in format and content. Figure 6 presents the map legend for the FIRM.

Figure 5: 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 Flood 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 Flood 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 9 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.

Figure 5: FIRM Notes to Users

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 Non-Coastal 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.

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 2.4 "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 Universal Transverse Mercator (UTM) Zone 15. The horizontal datum was NAD83, GRS1980 spheroid. 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 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 9 of this FIS Report.

Figure 5: FIRM Notes to Users

BASE MAP INFORMATION: Base map information shown on the FIRM was provided by the Jackson County. The aerial photography was acquired in the spring of 2010 to create 1:200 scale digital orthophotos with 1-foot ground resolution. For information about base maps, refer to Section 1.2 "Authority and Acknowledgments" in this FIS Report.

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 Jackson County, Wisconsin and Incorporated Areas, 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 9 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 Jackson County, Wisconsin and Incorporated Areas, effective TBD**.**

ACCREDITED LEVEE: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit www.fema.gov/national-flood-insurance-program.

Each FIRM panel contains an abbreviated legend for the features shown on the maps. However, the FIRM panel does not contain enough space to show the legend for all map features. Figure 6 shows the full legend of all map features. Note that not all of these features may appear on the FIRM panels in Jackson County.

Figure 6: 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.

Figure 6: Map Legend for FIRM

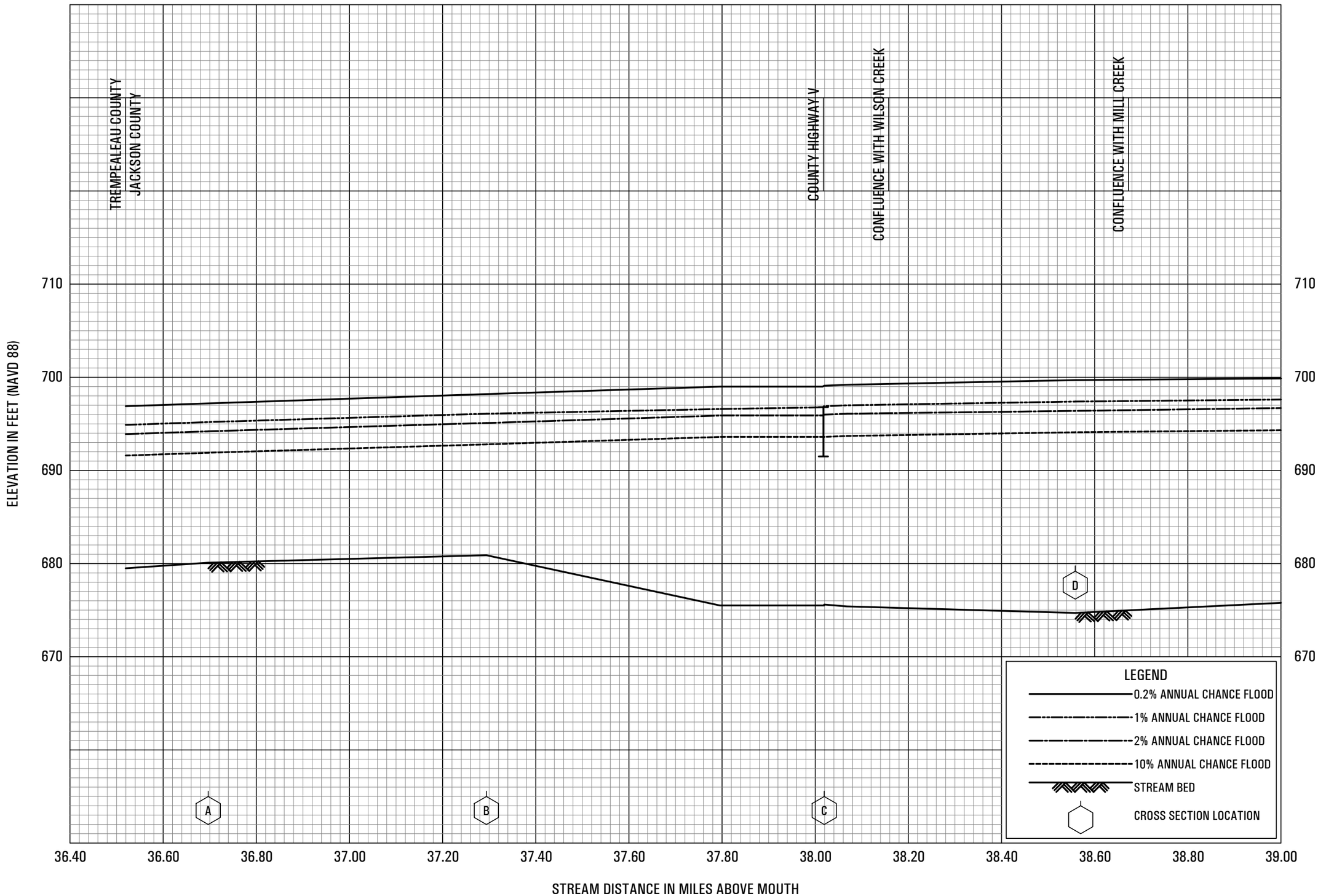
OTHER AREAS OF FLOOD HAZARD	
	Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.
	Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate 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.
	Area with Flood Risk due to Levee: Areas where a non-accredited levee, dike, or other flood control structure is shown as providing protection to less than the 1% annual chance flood.
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.
NO SCREEN	Unshaded Zone X: Areas of minimal flood hazard.
FLOOD HAZARD AND OTHER BOUNDARY LINES	
(ortho) (vector)	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	
Aqueduct *Channel* *Culvert* *Storm Sewer*	Channel, Culvert, Aqueduct, or Storm Sewer
Dam *Jetty* *Weir*	Dam, Jetty, Weir

Figure 6: Map Legend for FIRM

	Levee, Dike, or Floodwall
Bridge	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	
22.0	River mile Markers
CROSS SECTION & TRANSECT INFORMATION	
B 20.2	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
5280 21.1	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
17.5	Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)
8	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.
513	Base Flood Elevation Line
ZONE AE (EL 16)	Static Base Flood Elevation value (shown under zone label)

Figure 6: Map Legend for FIRM

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
234	Interstate Highway
234	U.S. Highway
234	State Highway
234	County Highway
MAPLE LANE	Street, Road, Avenue Name, or Private Drive if shown on Flood Profile
RAILROAD	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
$^{42}76^{000m}$E	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
80° 16’ 52.5”	Corner Coordinates (Latitude, Longitude)



FLOOD PROFILES

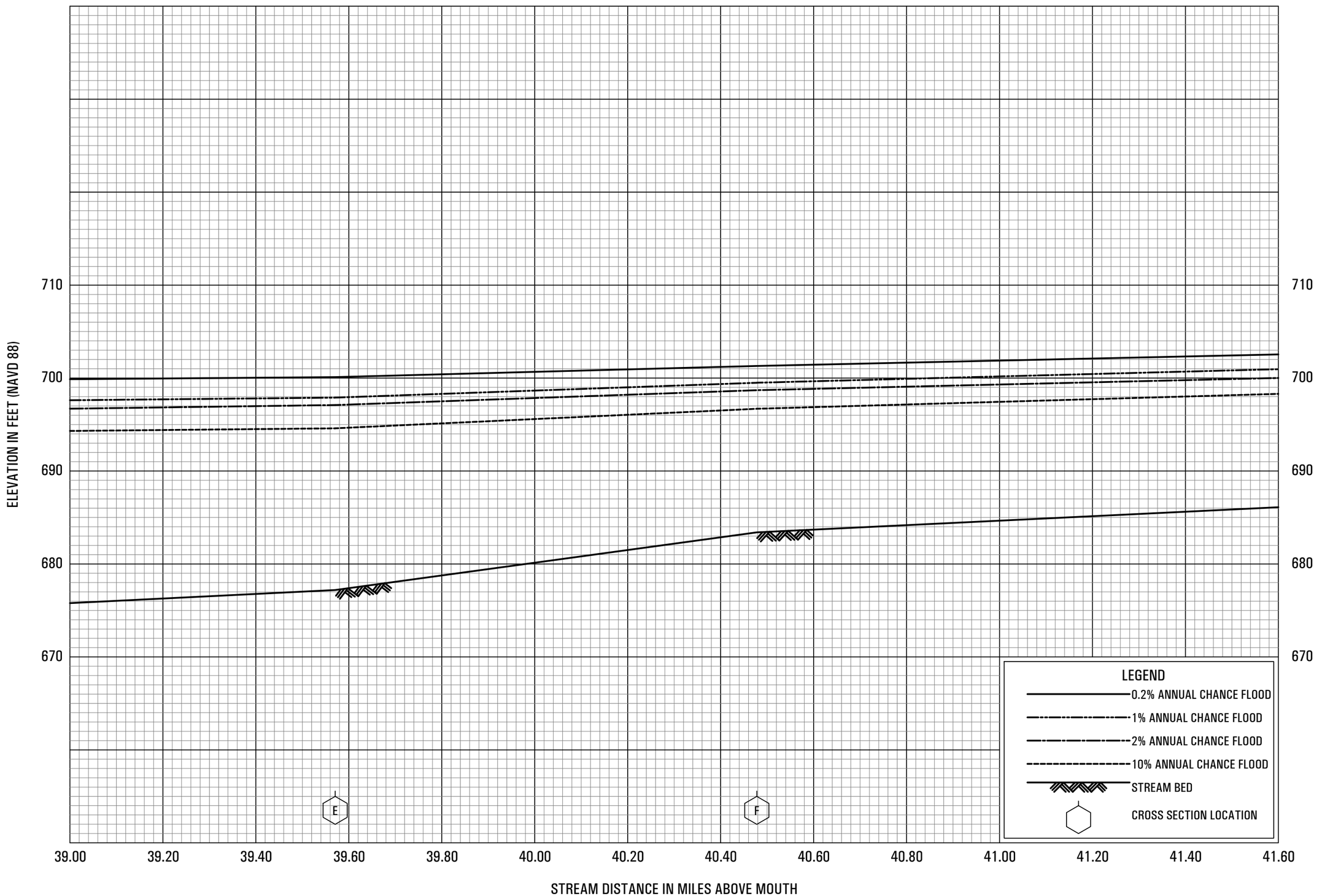
BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS

01P



FLOOD PROFILES

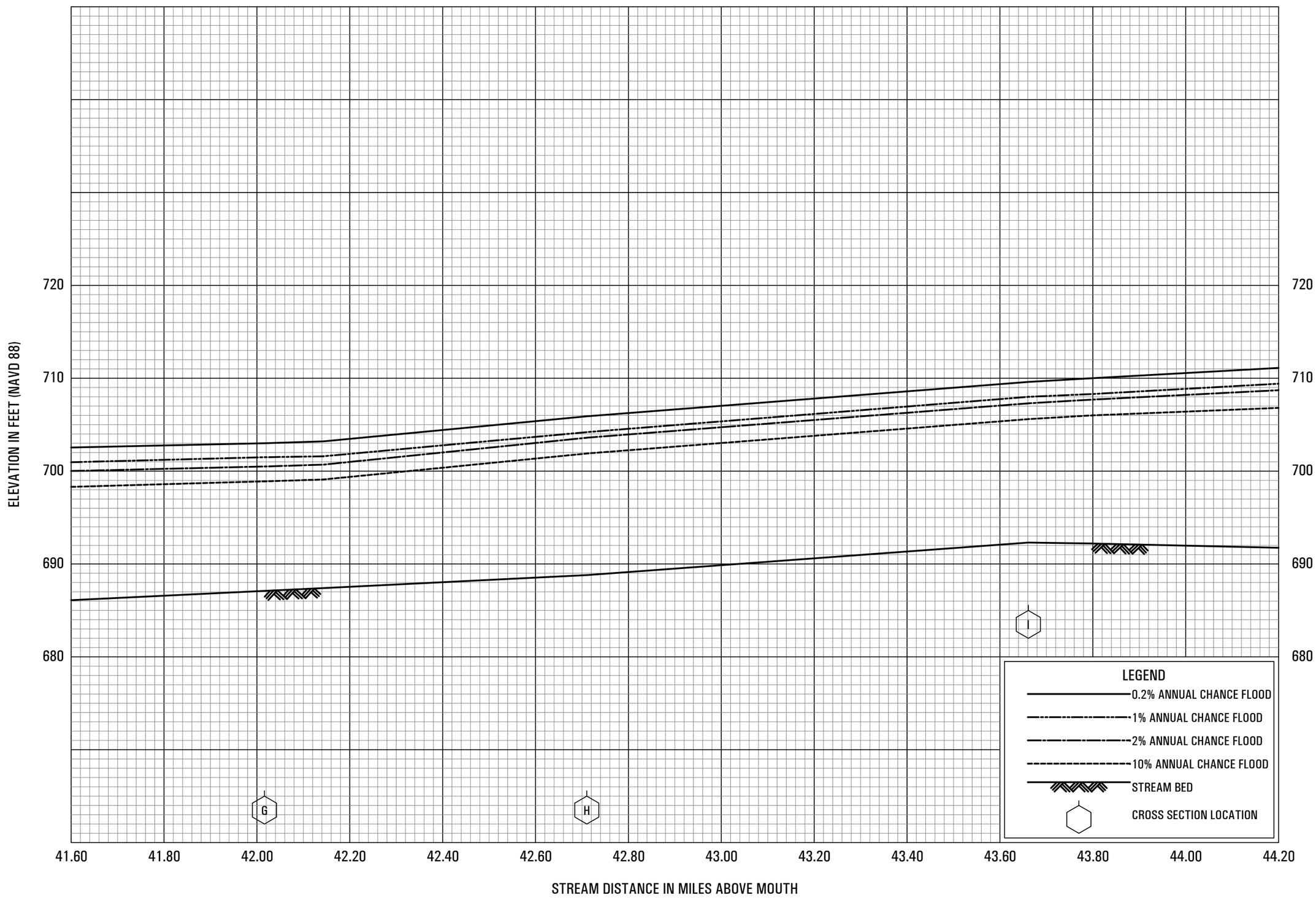
BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS

02P



FLOOD PROFILES

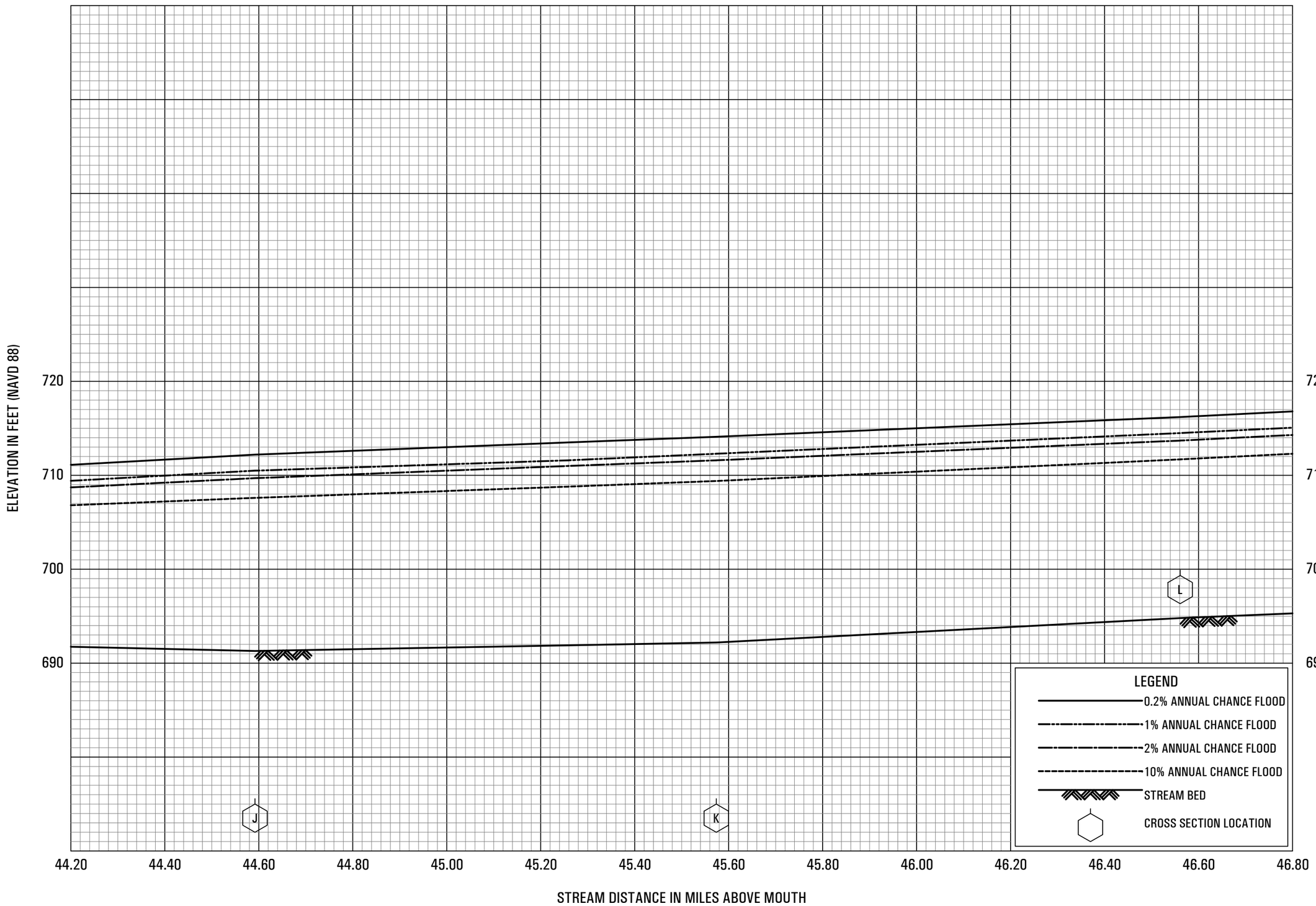
BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS

03P



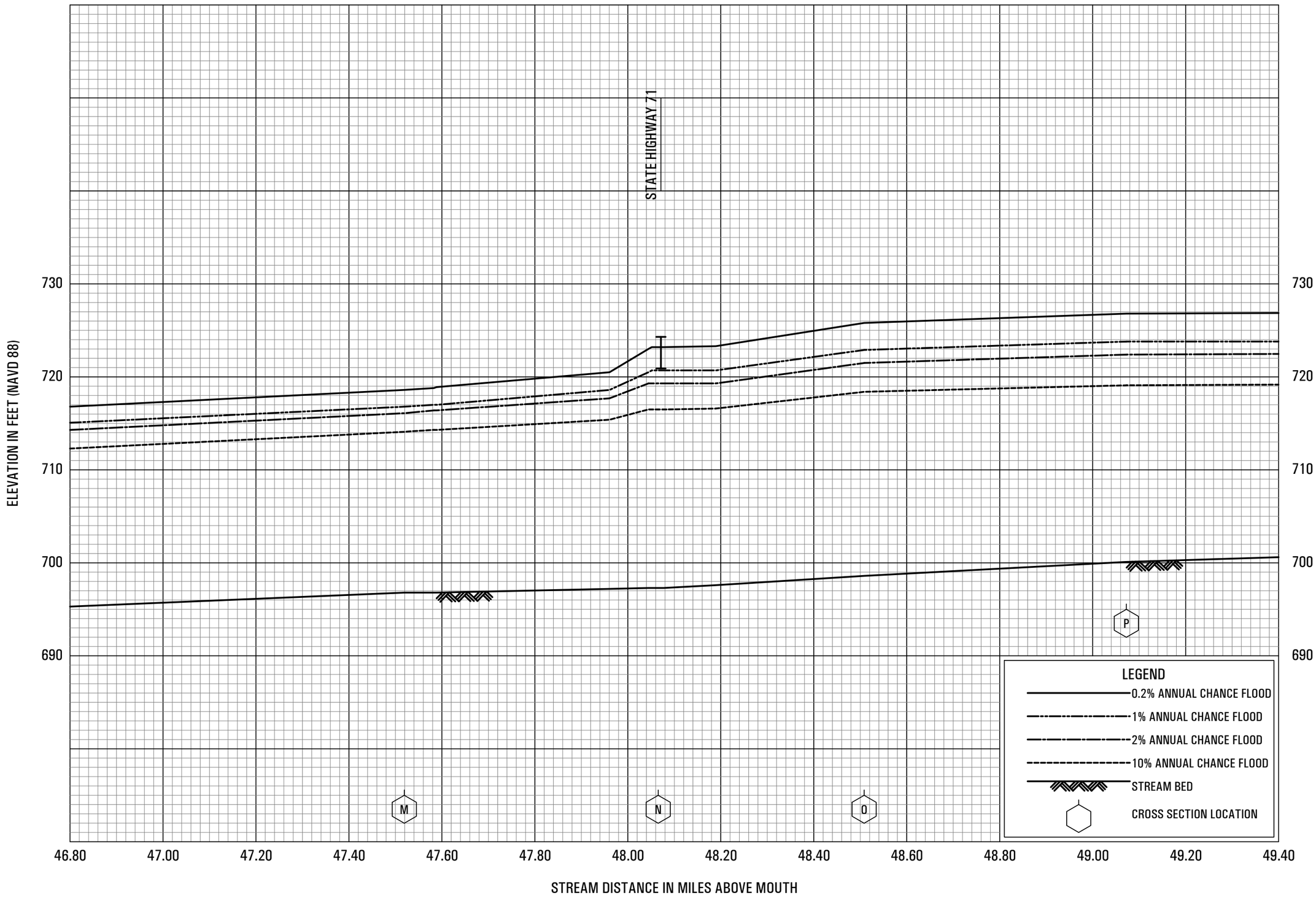
FLOOD PROFILES

BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



FLOOD PROFILES

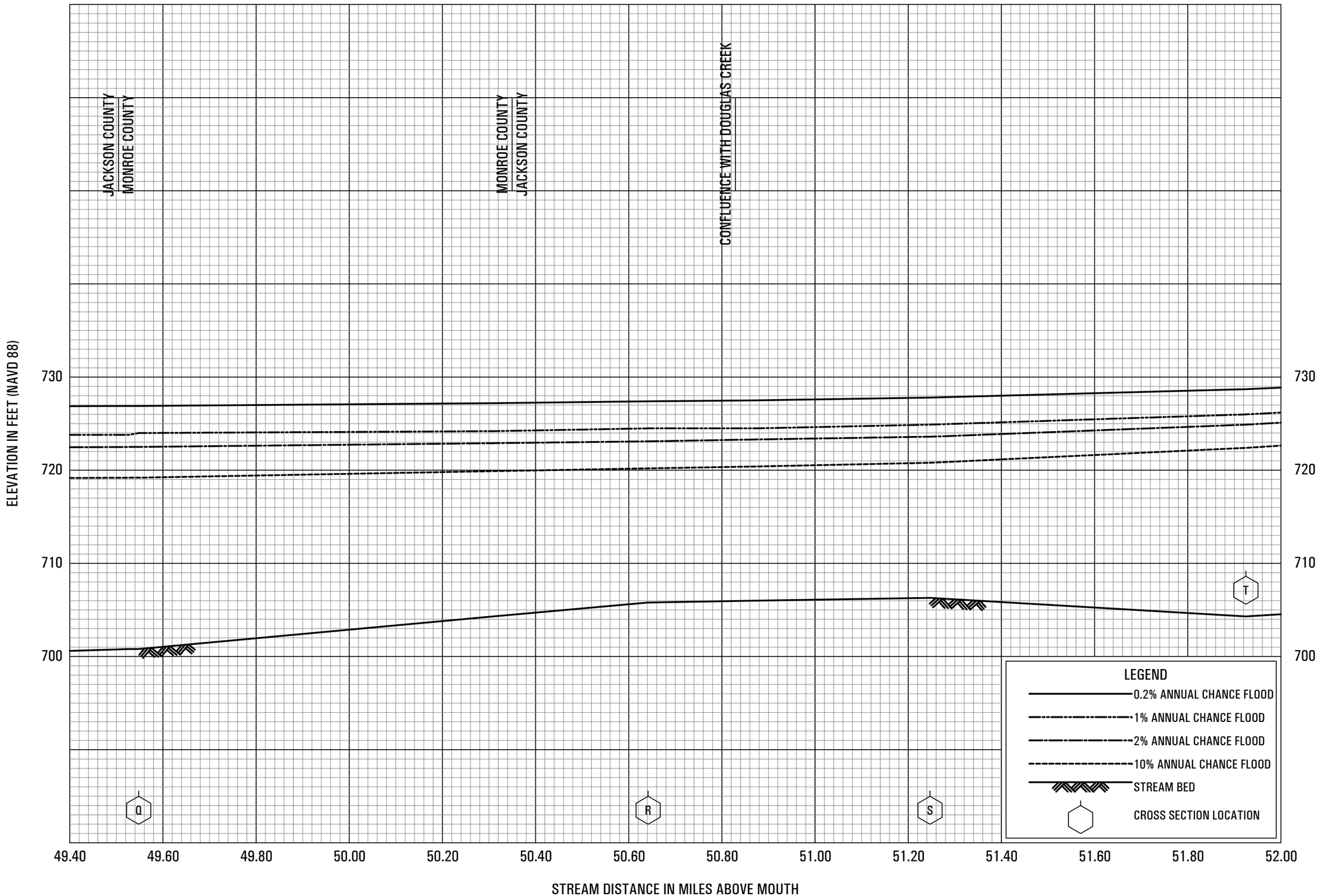
BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS

05P



FLOOD PROFILES

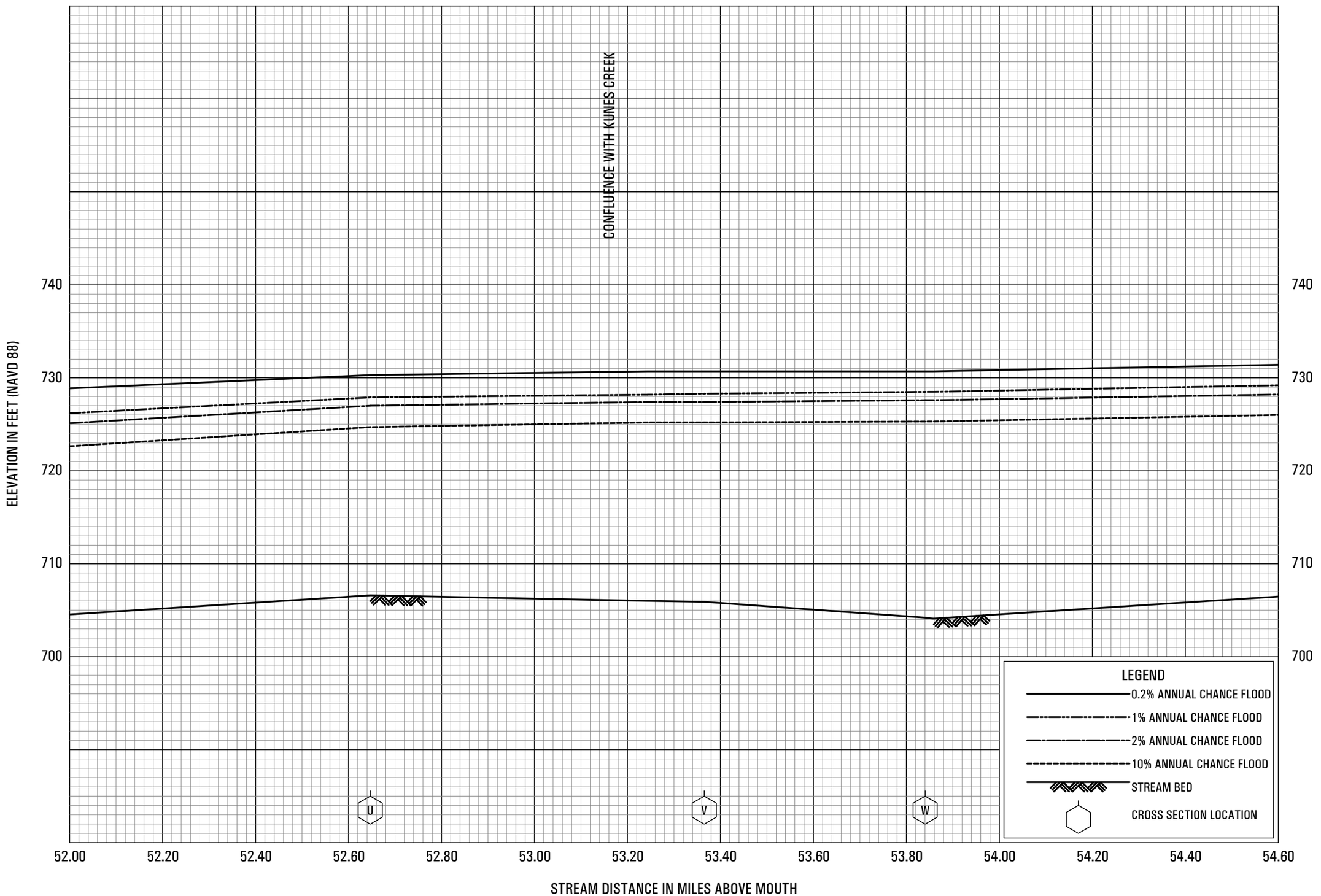
BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS

06P



FLOOD PROFILES

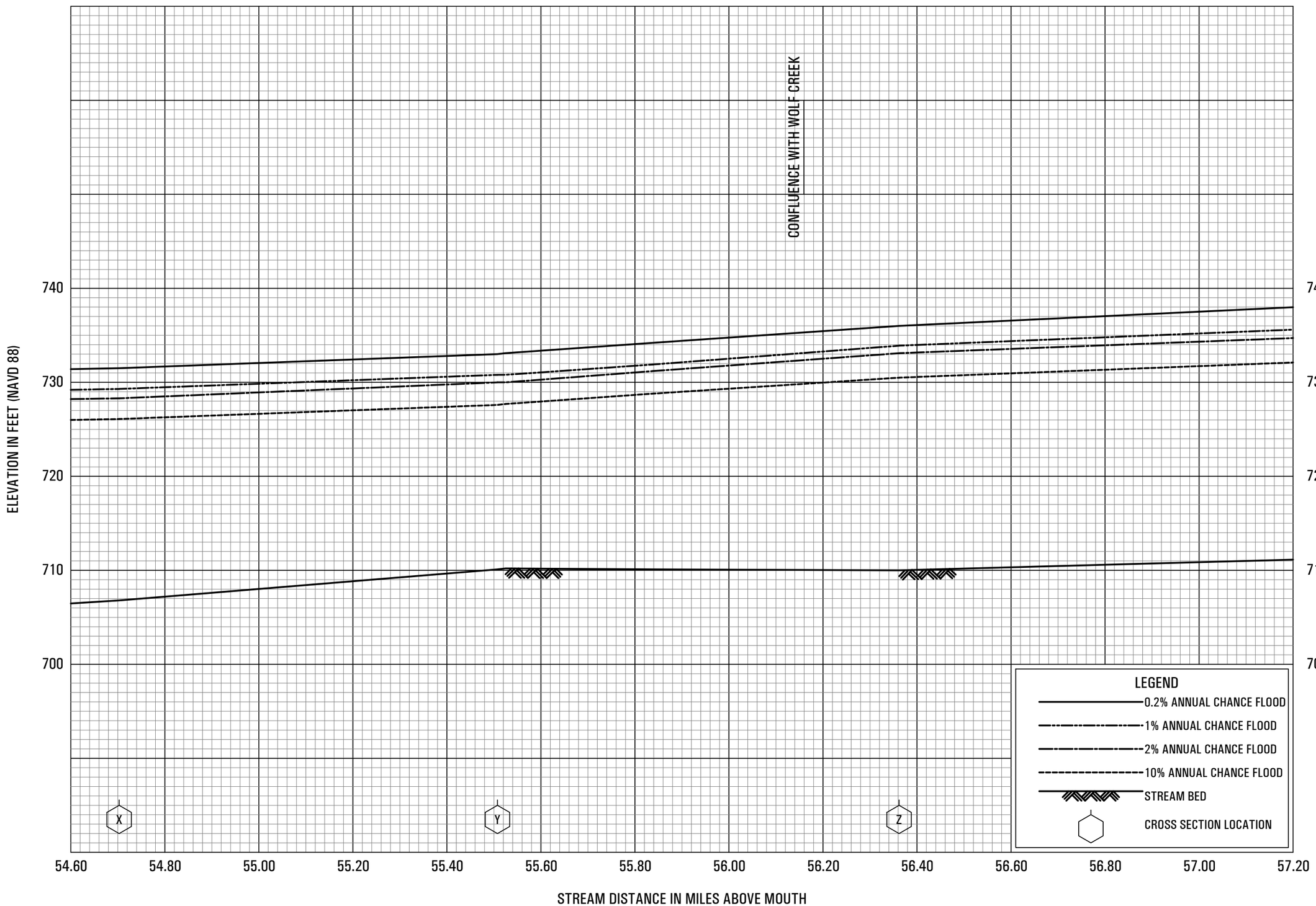
BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS

07P



FLOOD PROFILES

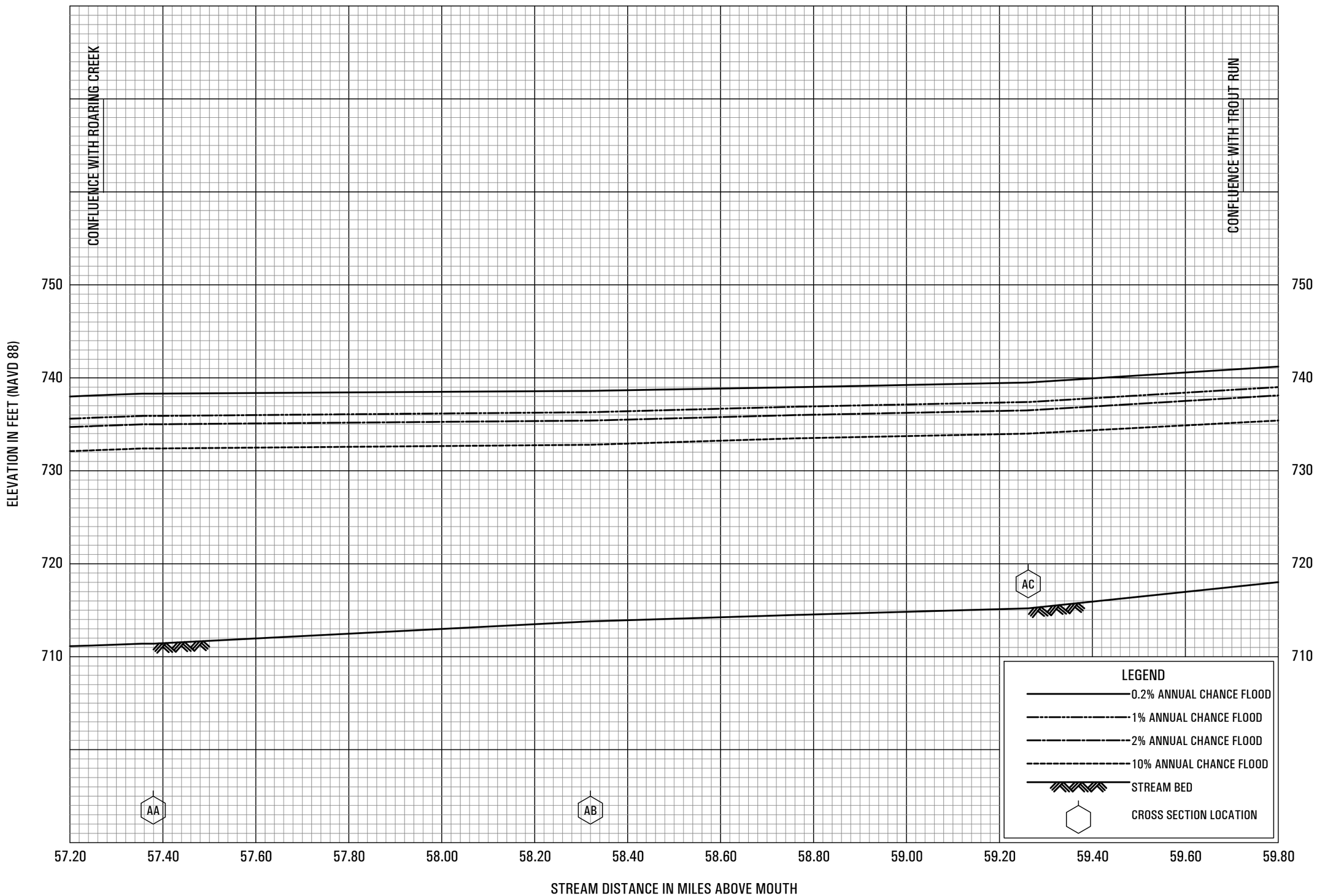
BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS

08P



FLOOD PROFILES

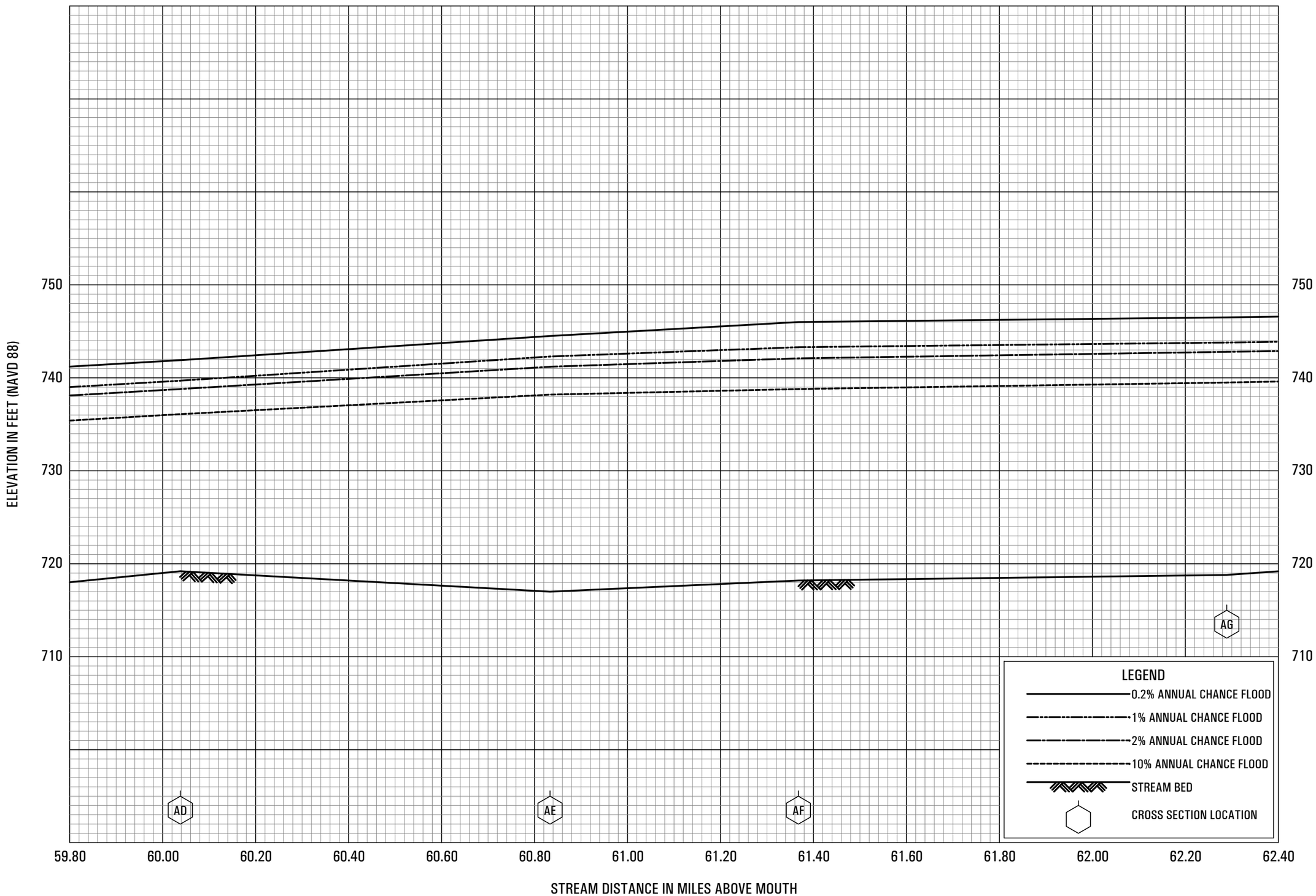
BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS

09P



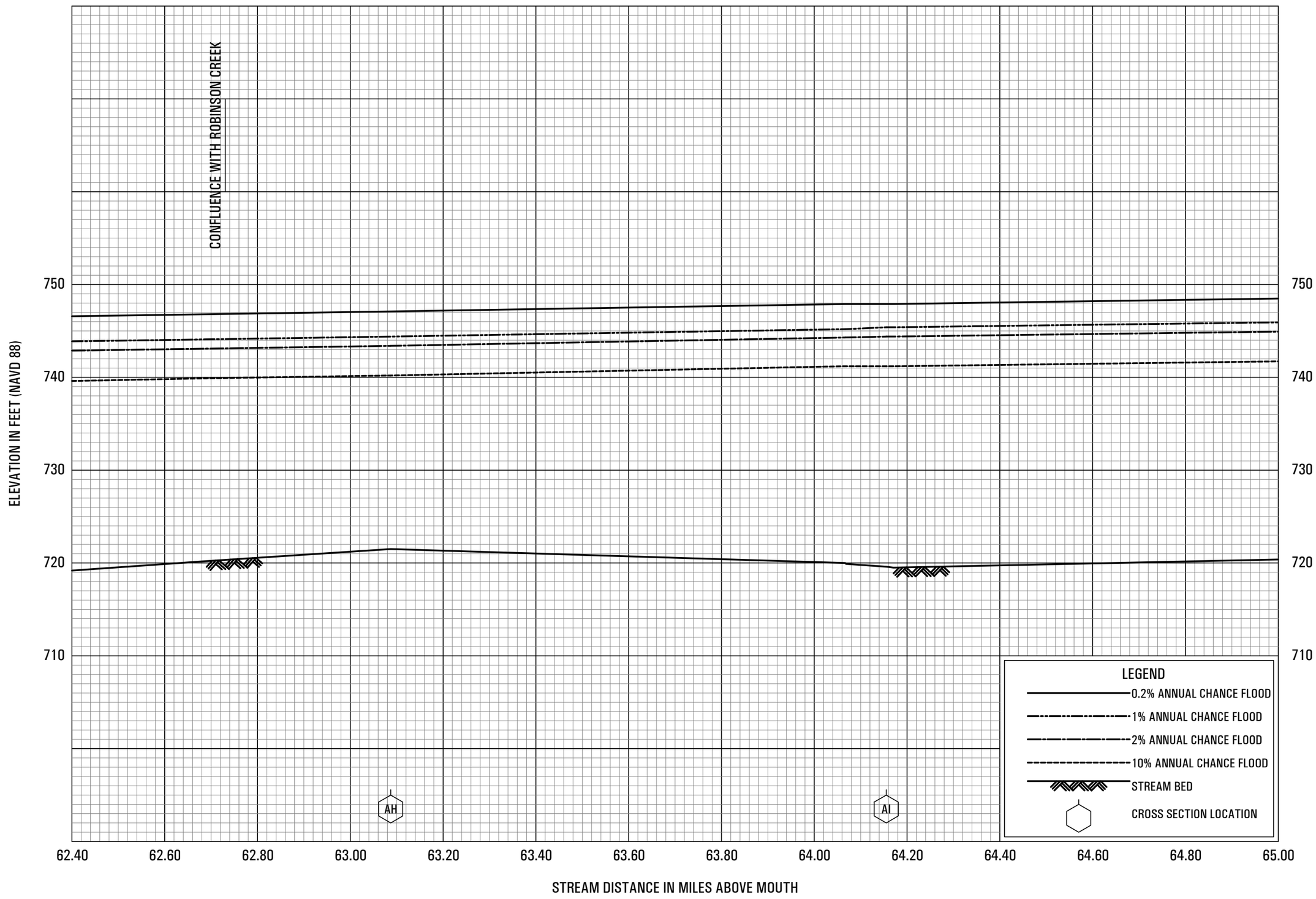
FLOOD PROFILES

BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



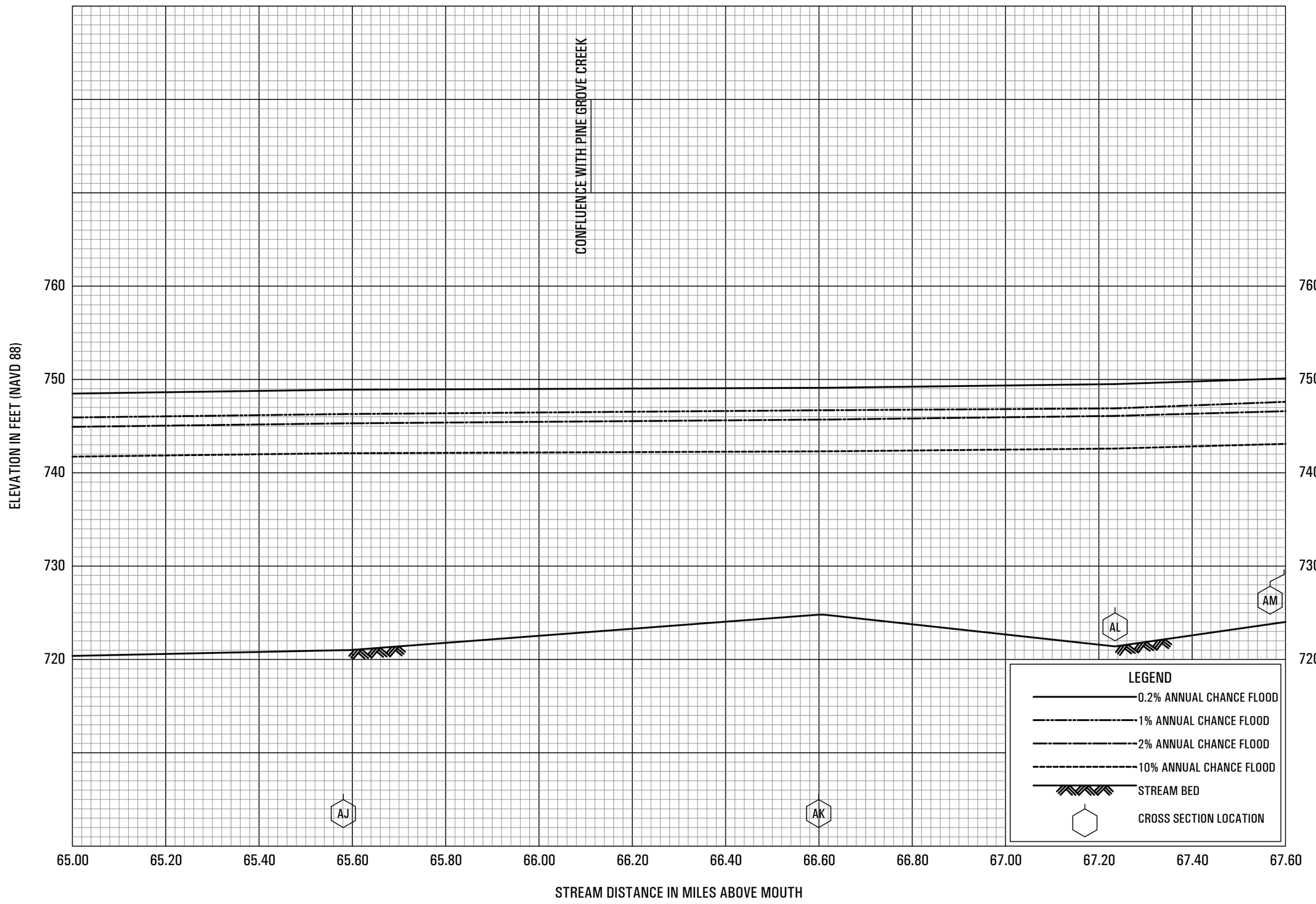
FLOOD PROFILES

BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



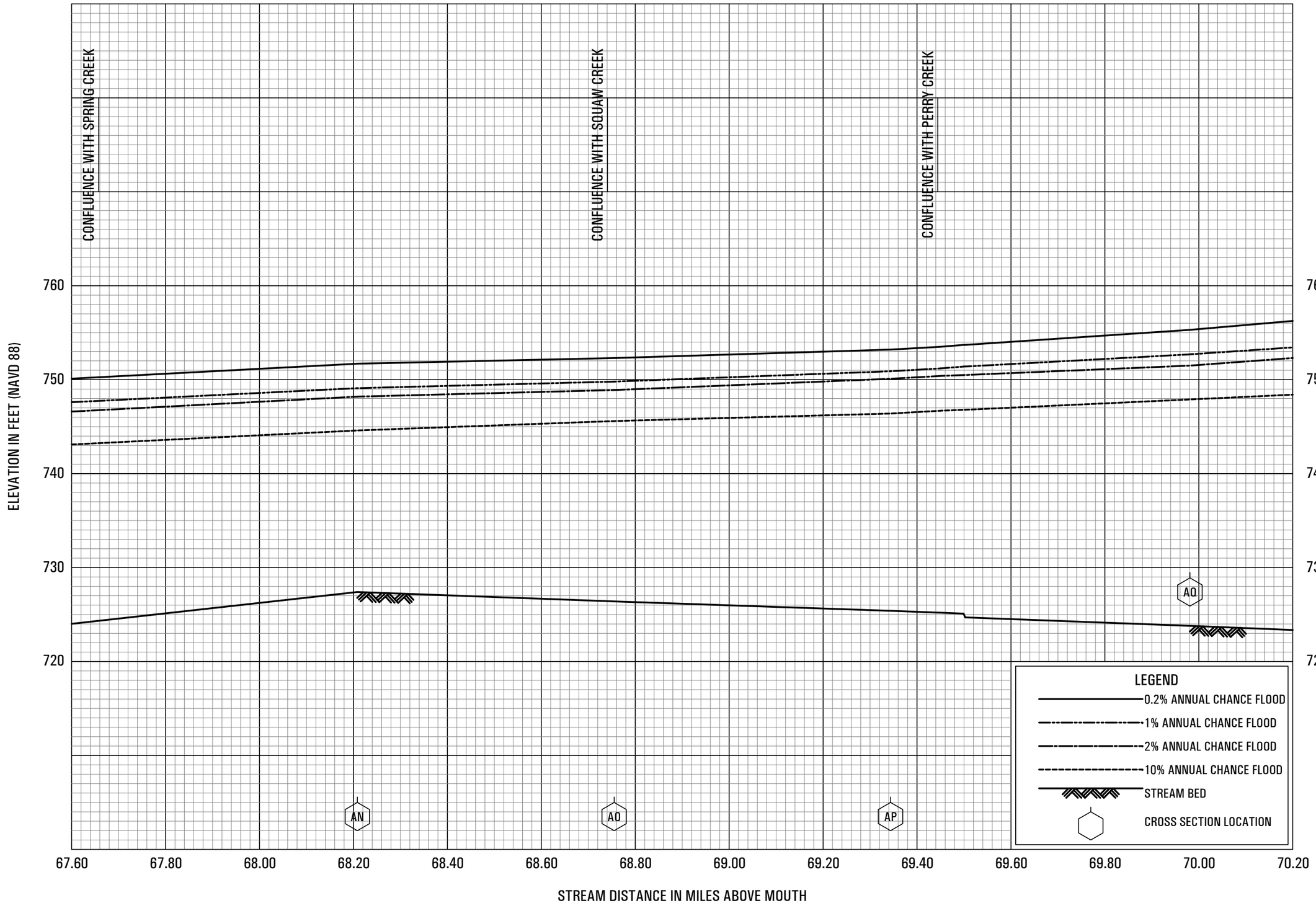
FLOOD PROFILES

BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



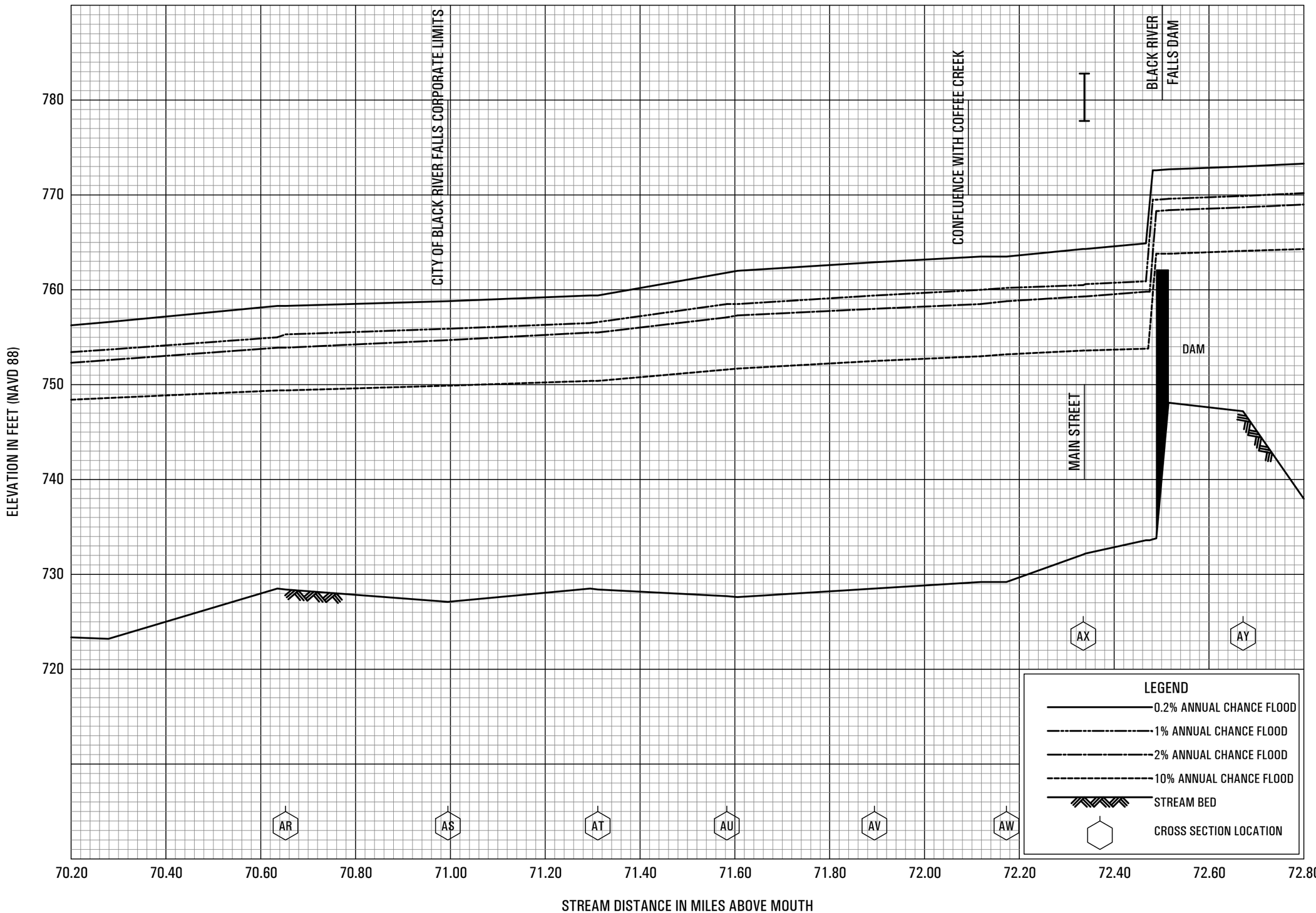
FLOOD PROFILES

BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



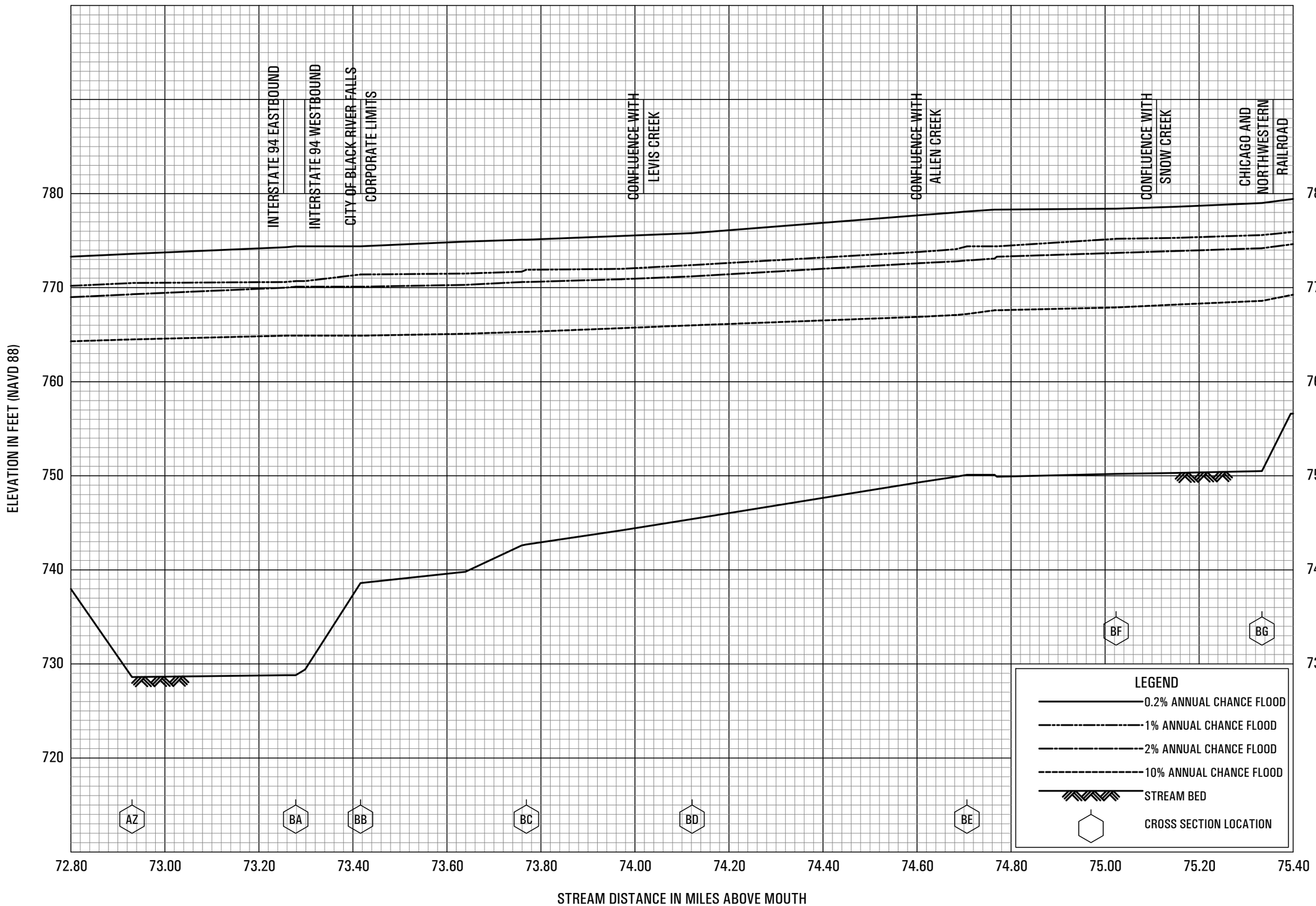
FLOOD PROFILES

BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



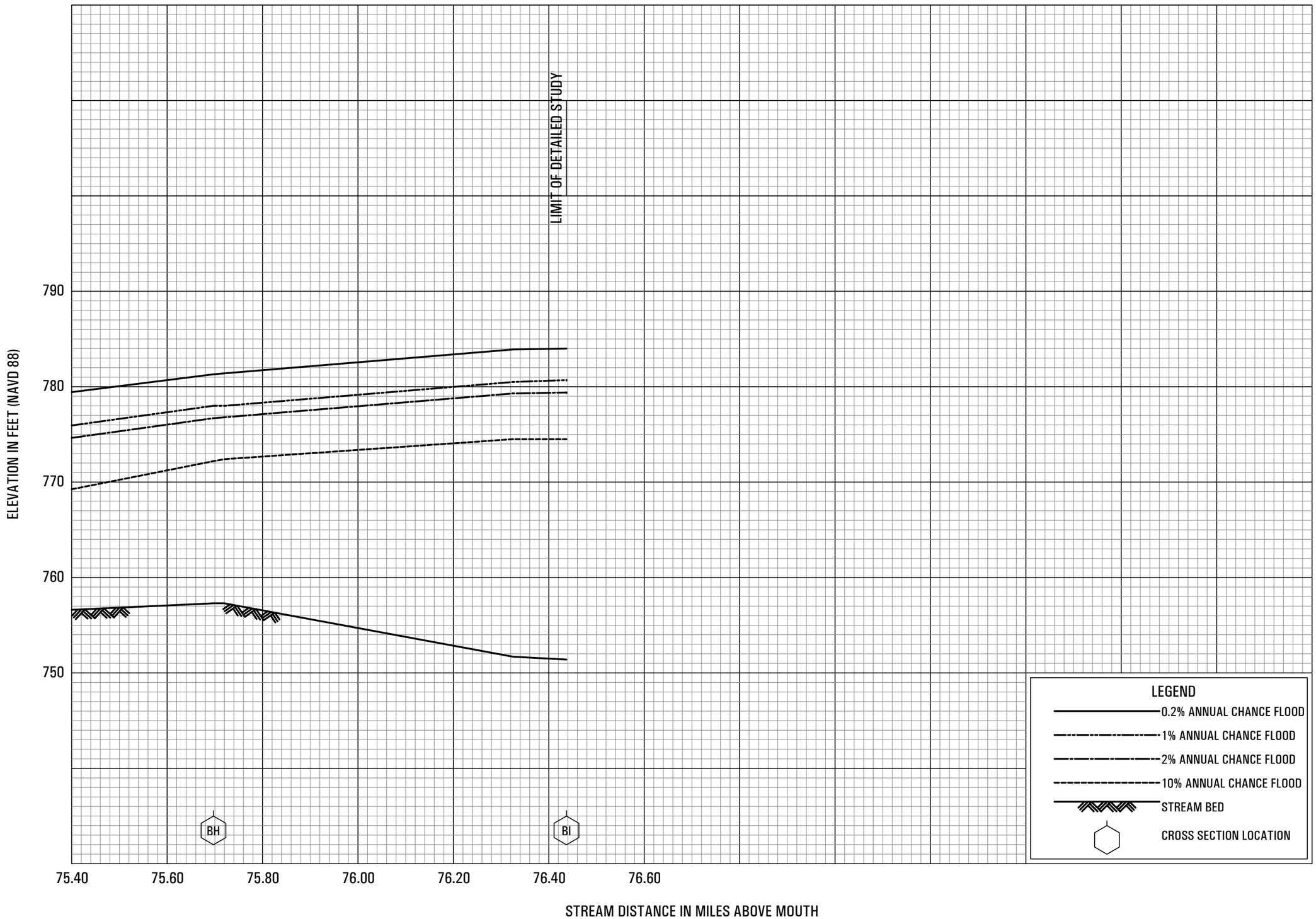
FLOOD PROFILES

BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



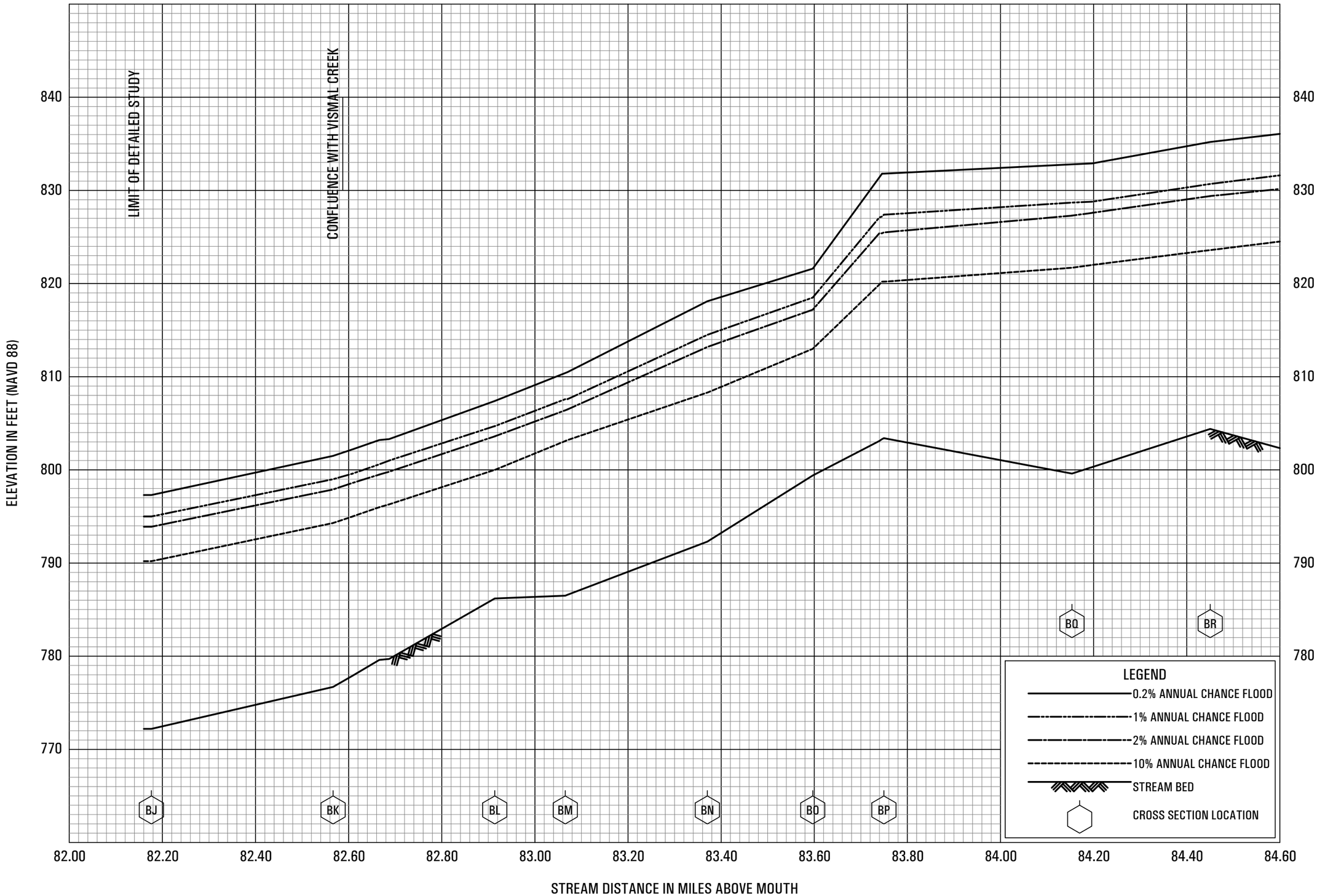
FLOOD PROFILES

BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



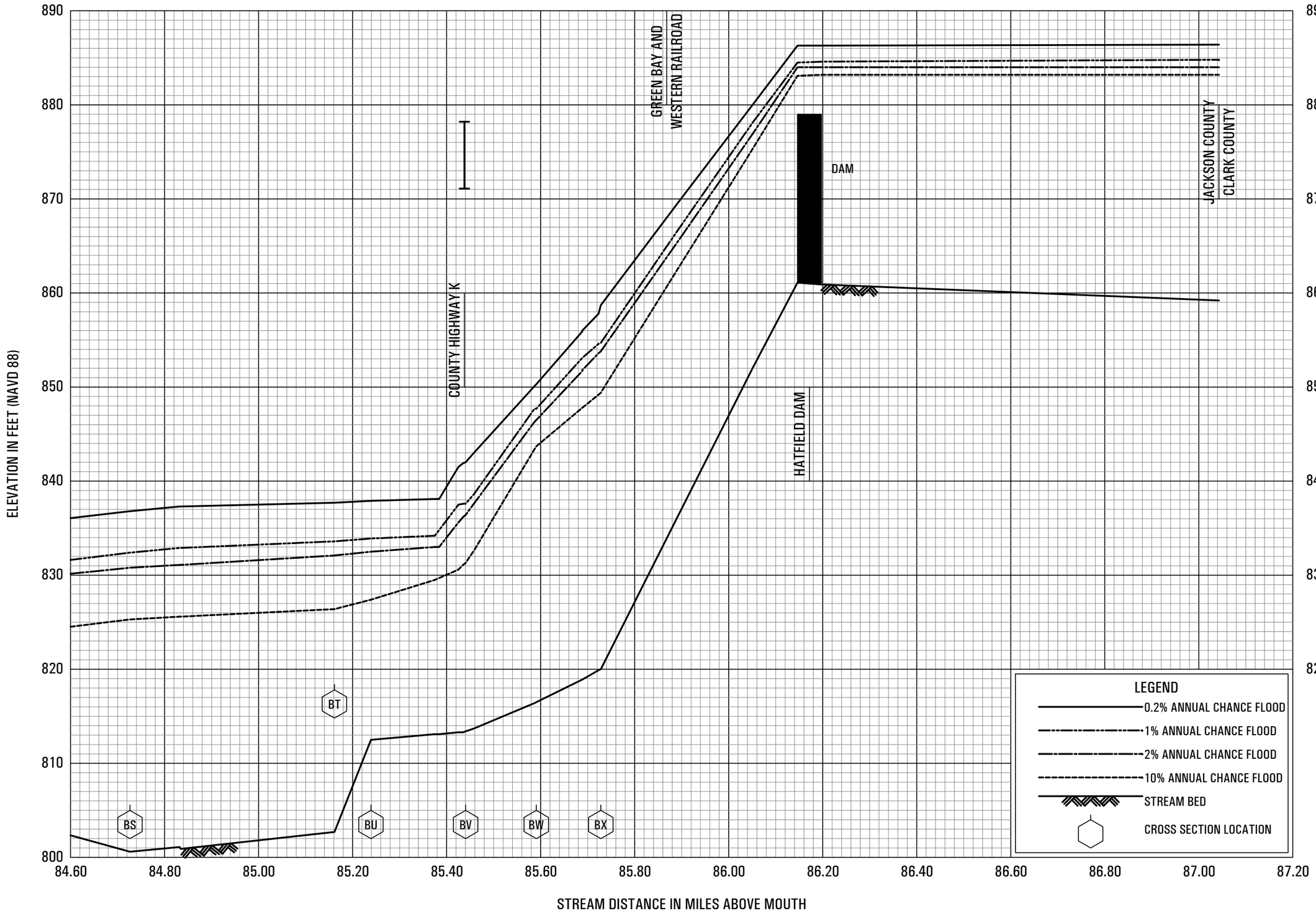
FLOOD PROFILES

BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



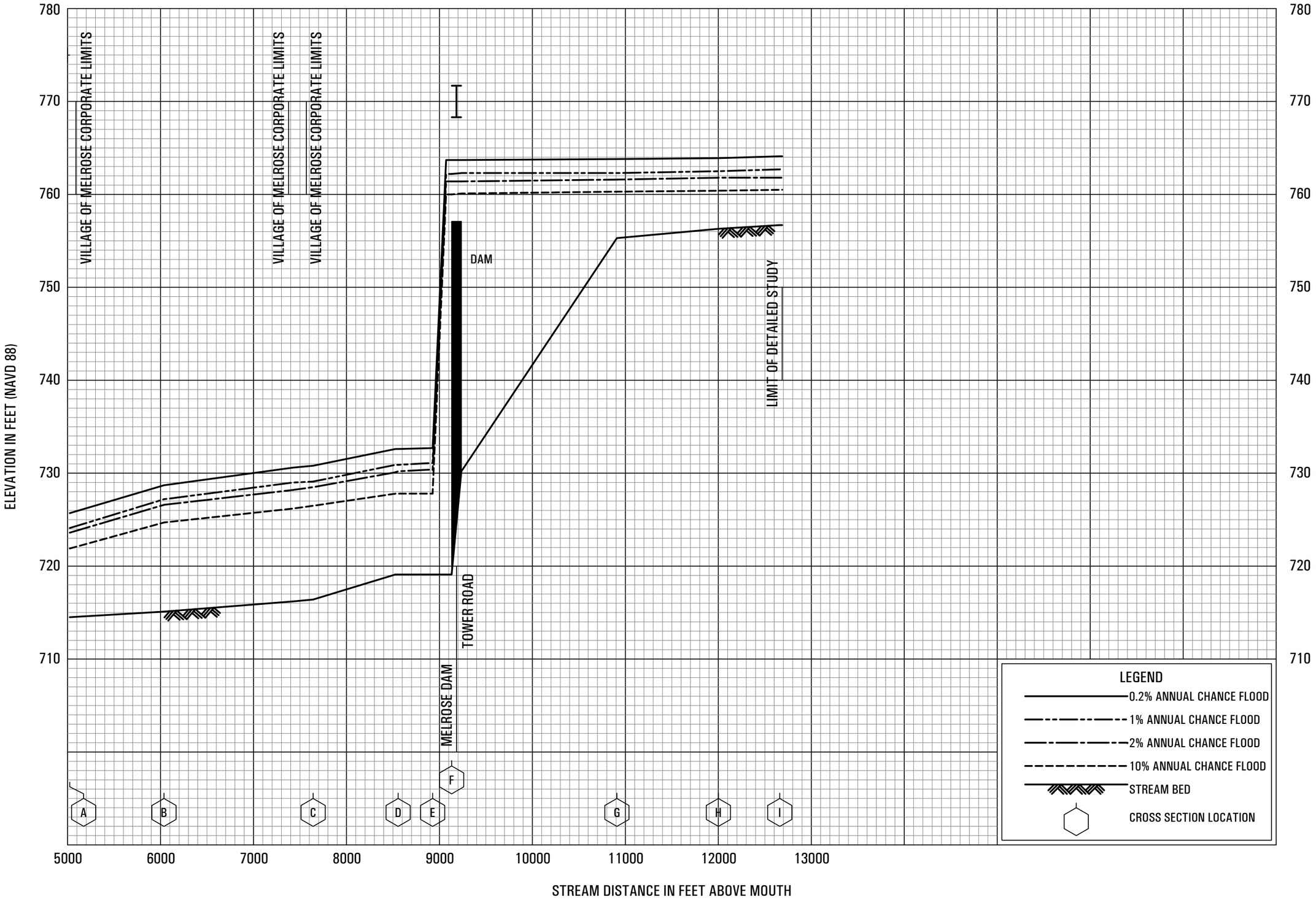
FLOOD PROFILES

BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



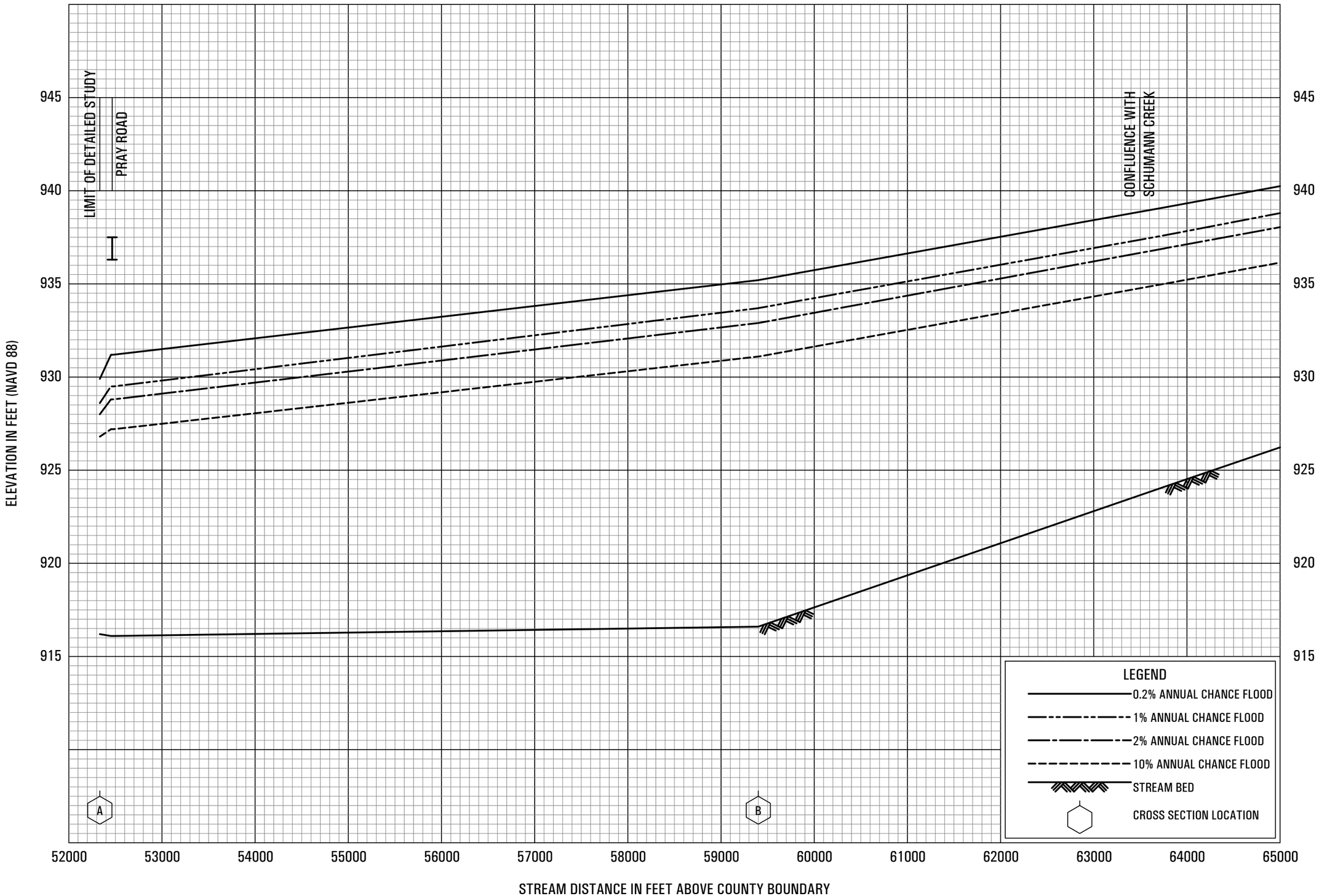
FLOOD PROFILES

DOUGLAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



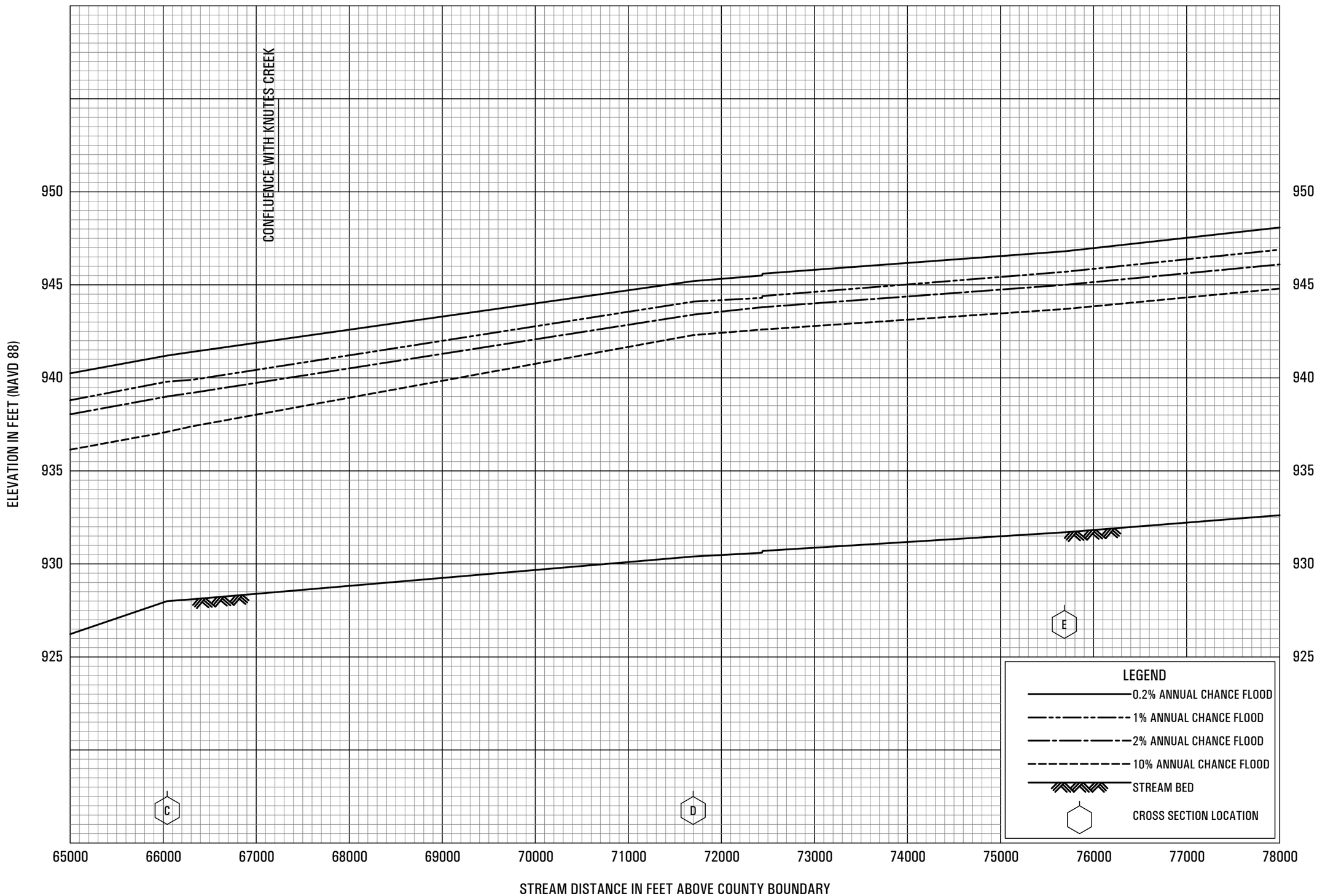
FLOOD PROFILES

EAST FORK BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



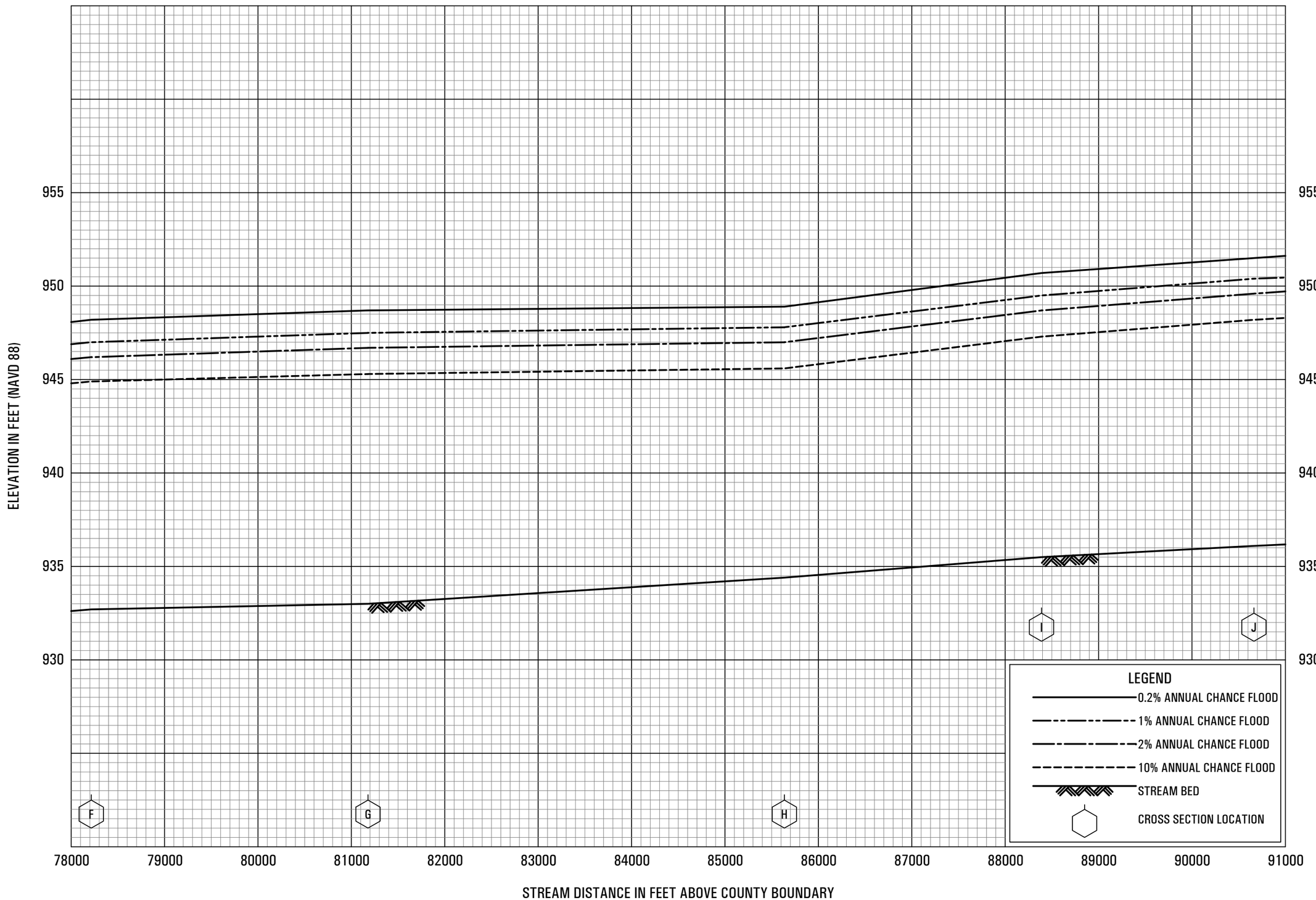
FLOOD PROFILES

EAST FORK BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



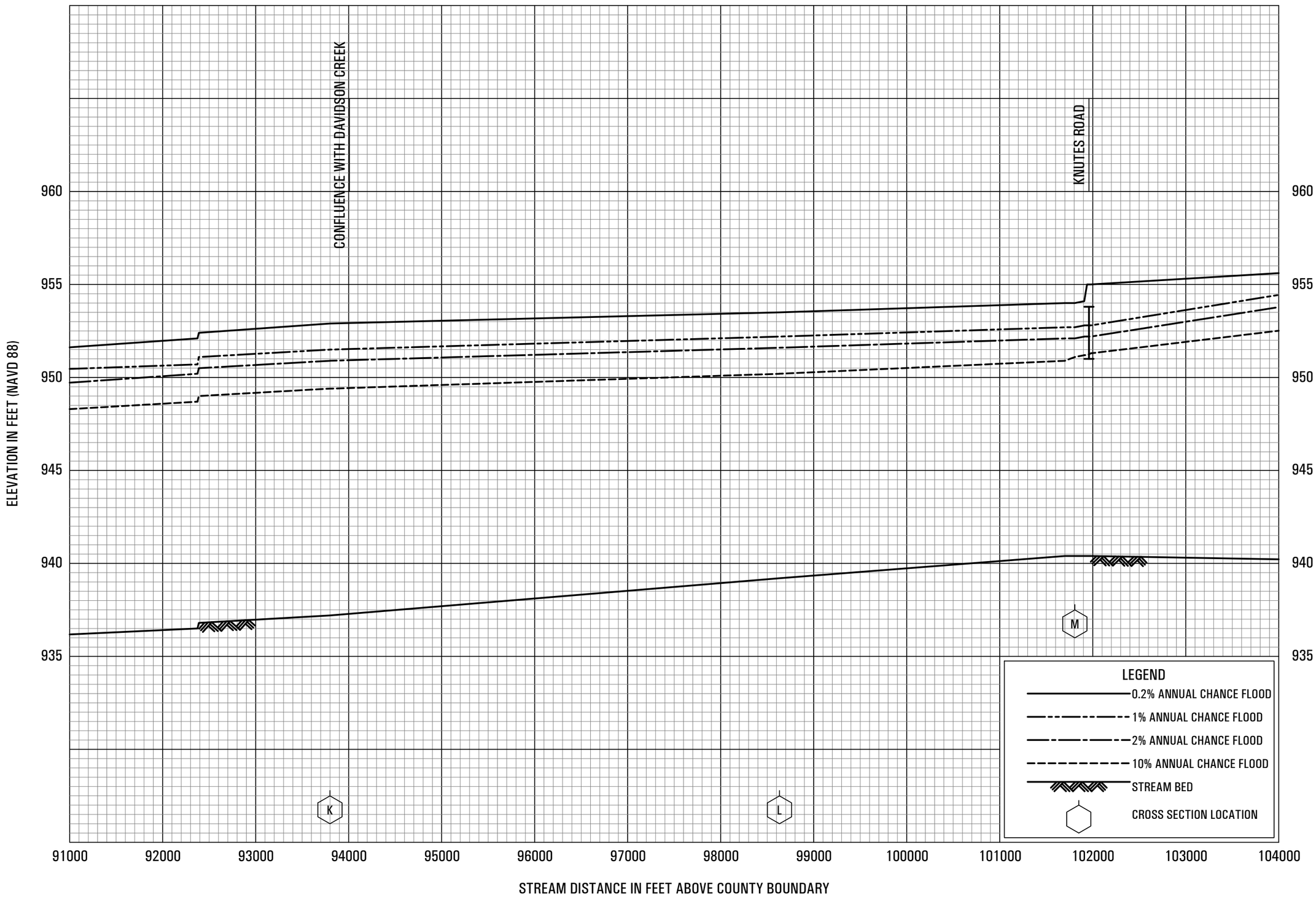
FLOOD PROFILES

EAST FORK BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



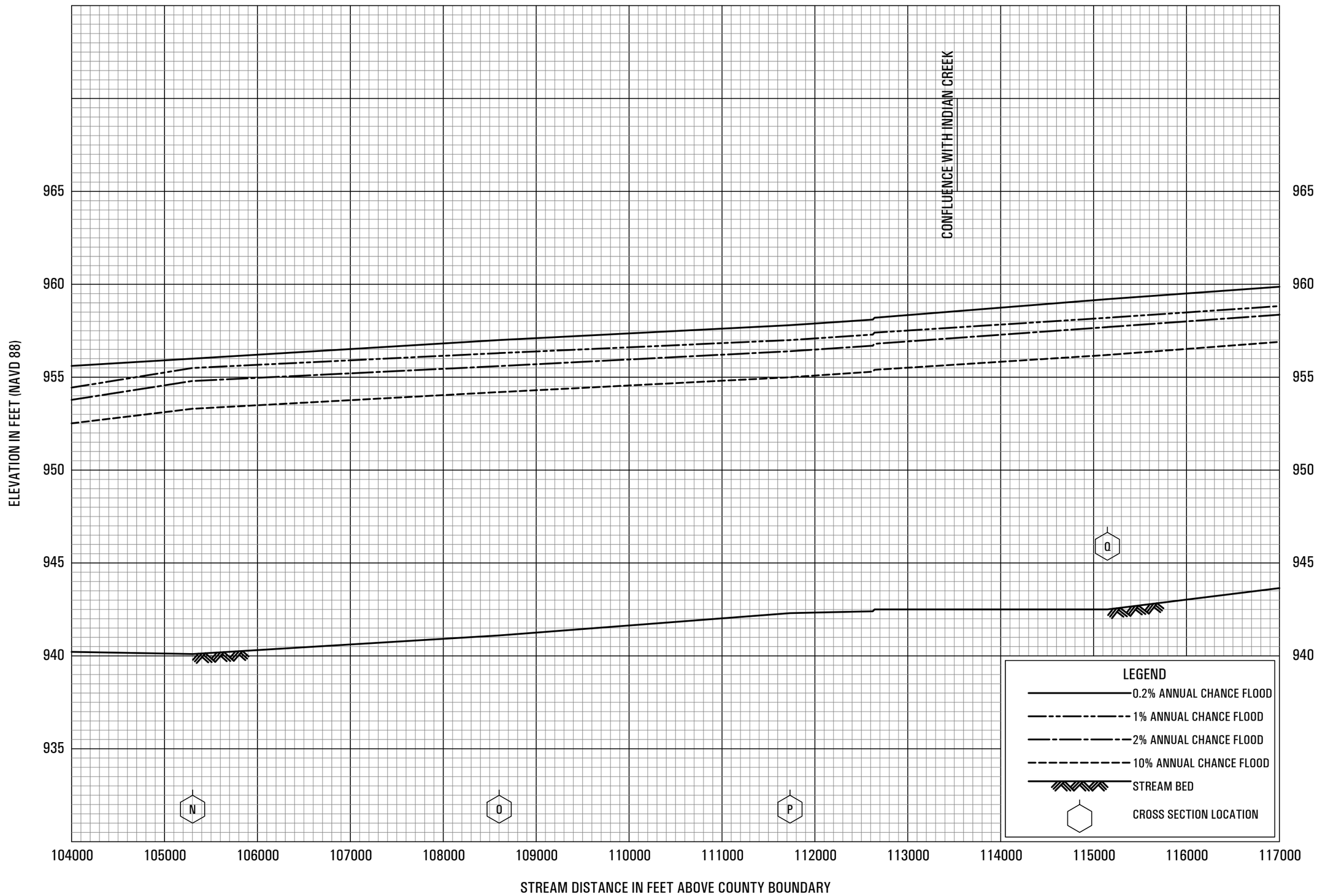
FLOOD PROFILES

EAST FORK BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



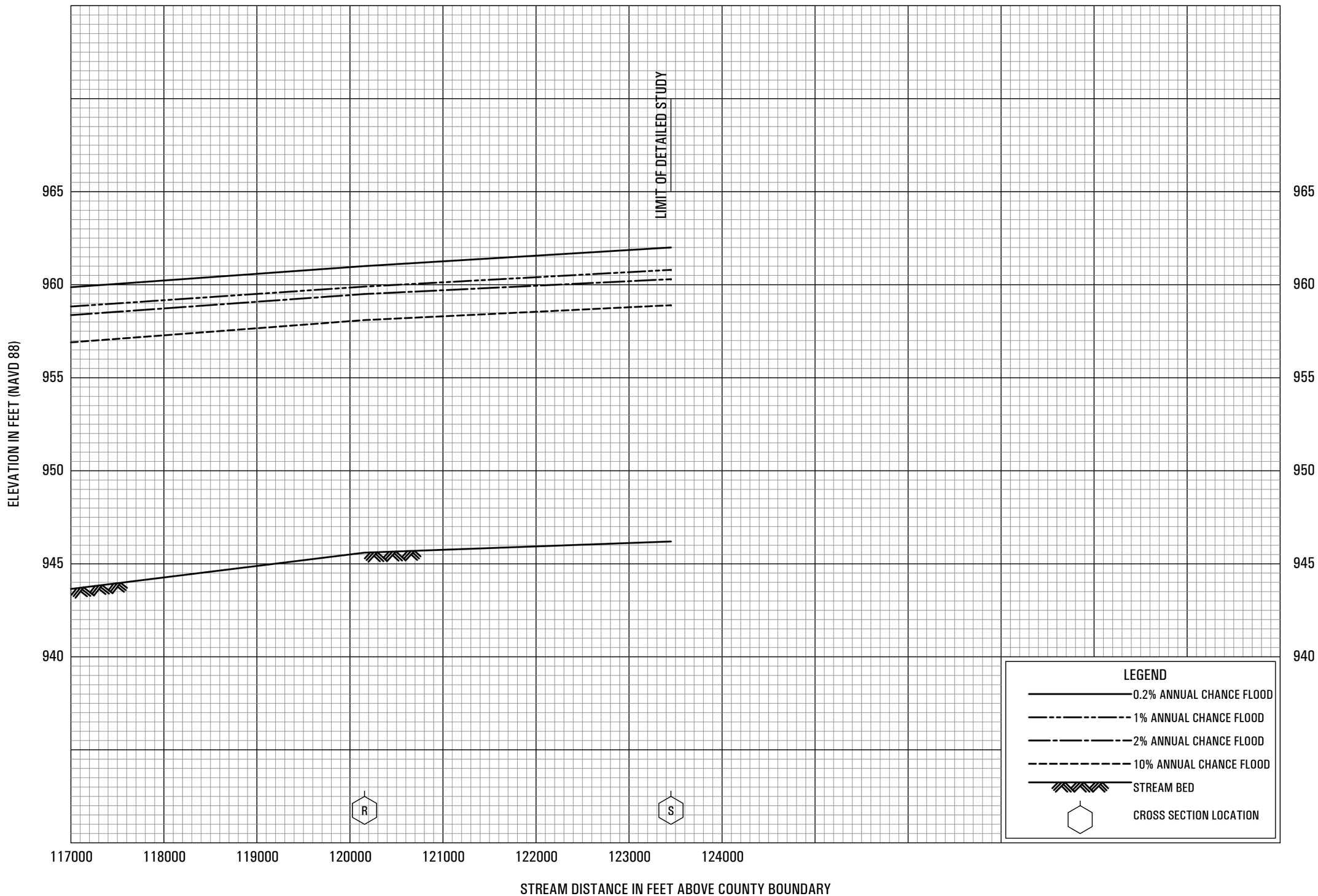
FLOOD PROFILES

EAST FORK BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



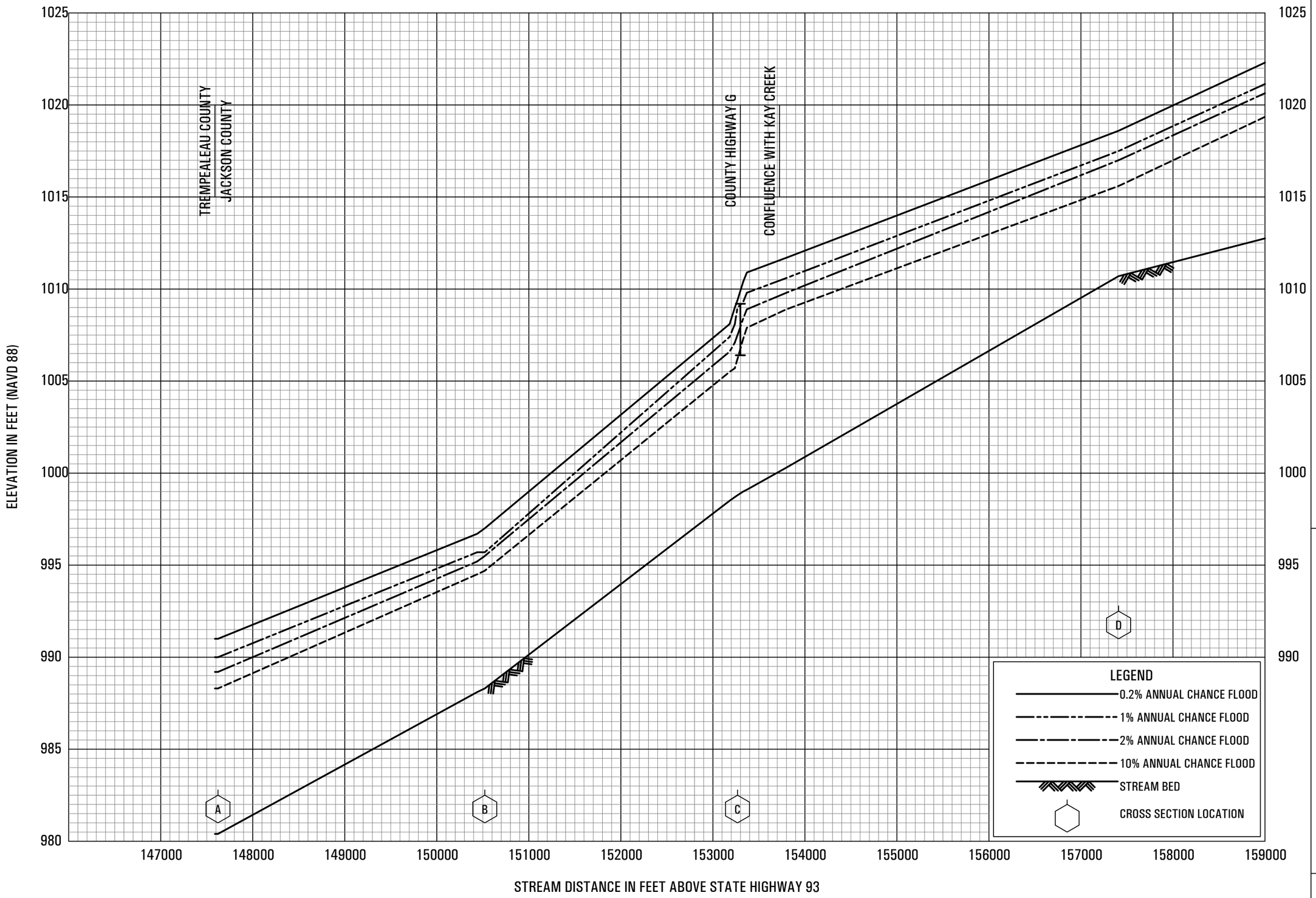
FLOOD PROFILES

EAST FORK BLACK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



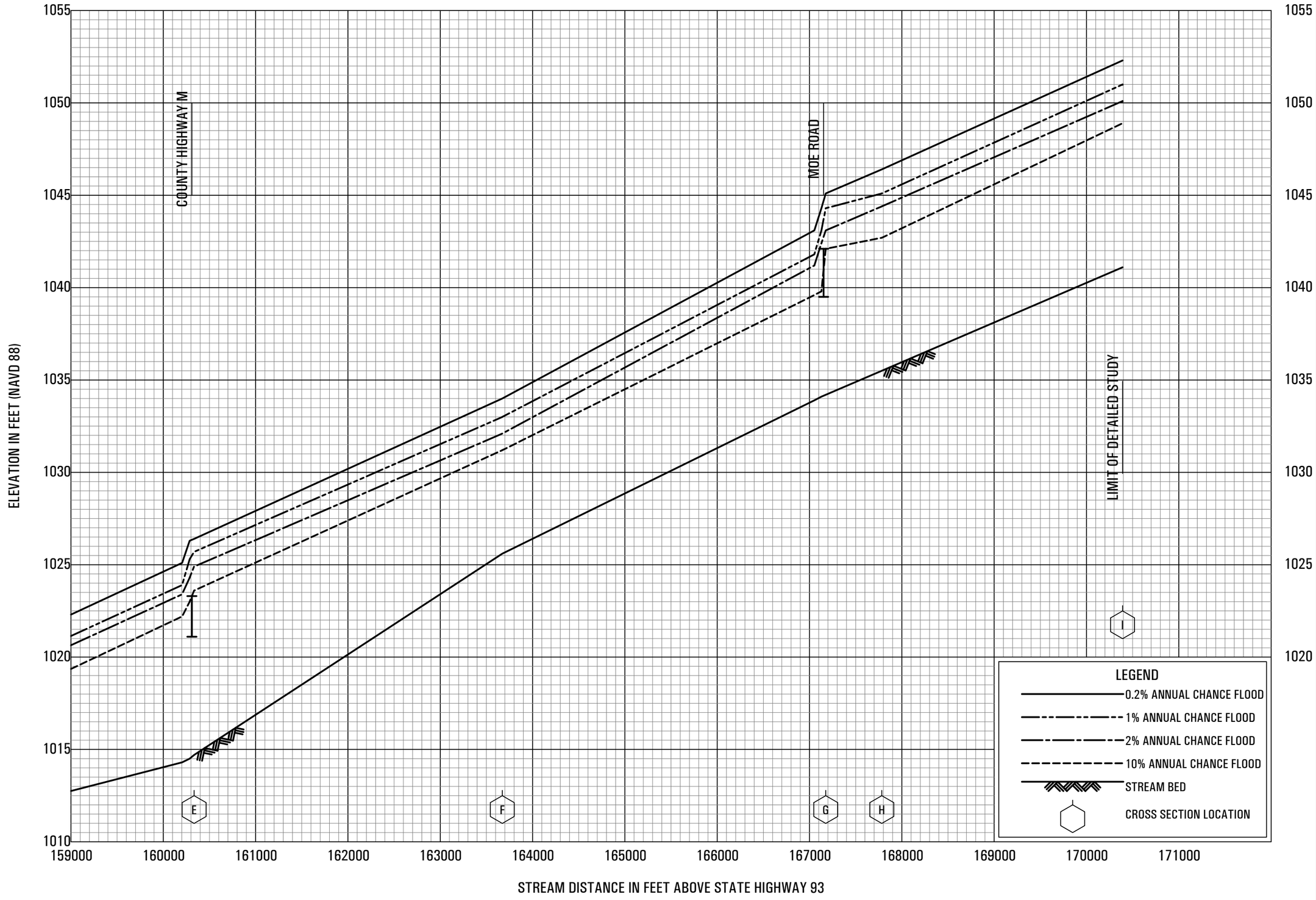
FLOOD PROFILES

NORTH FORK BUFFALO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



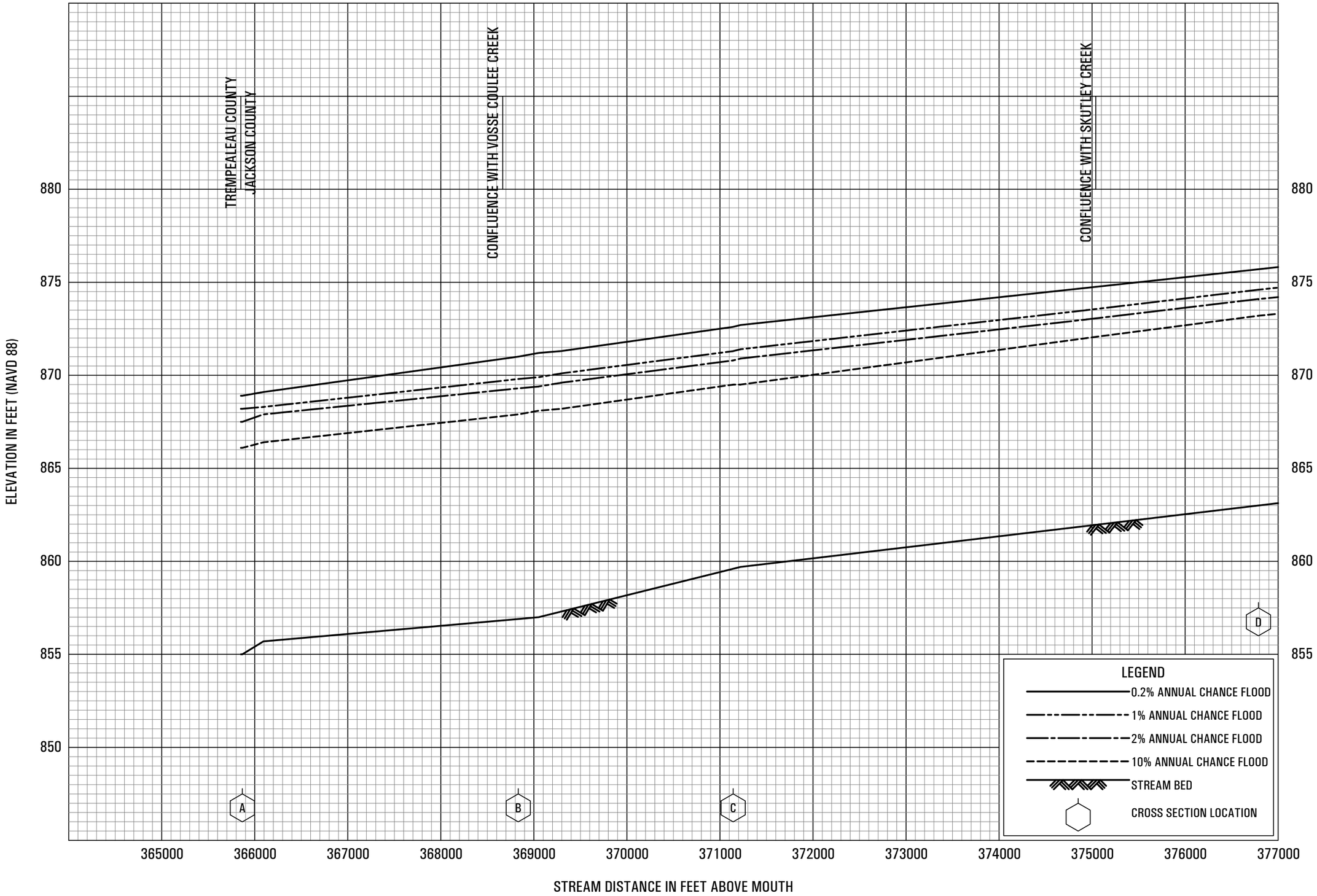
FLOOD PROFILES

NORTH FORK BUFFALO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



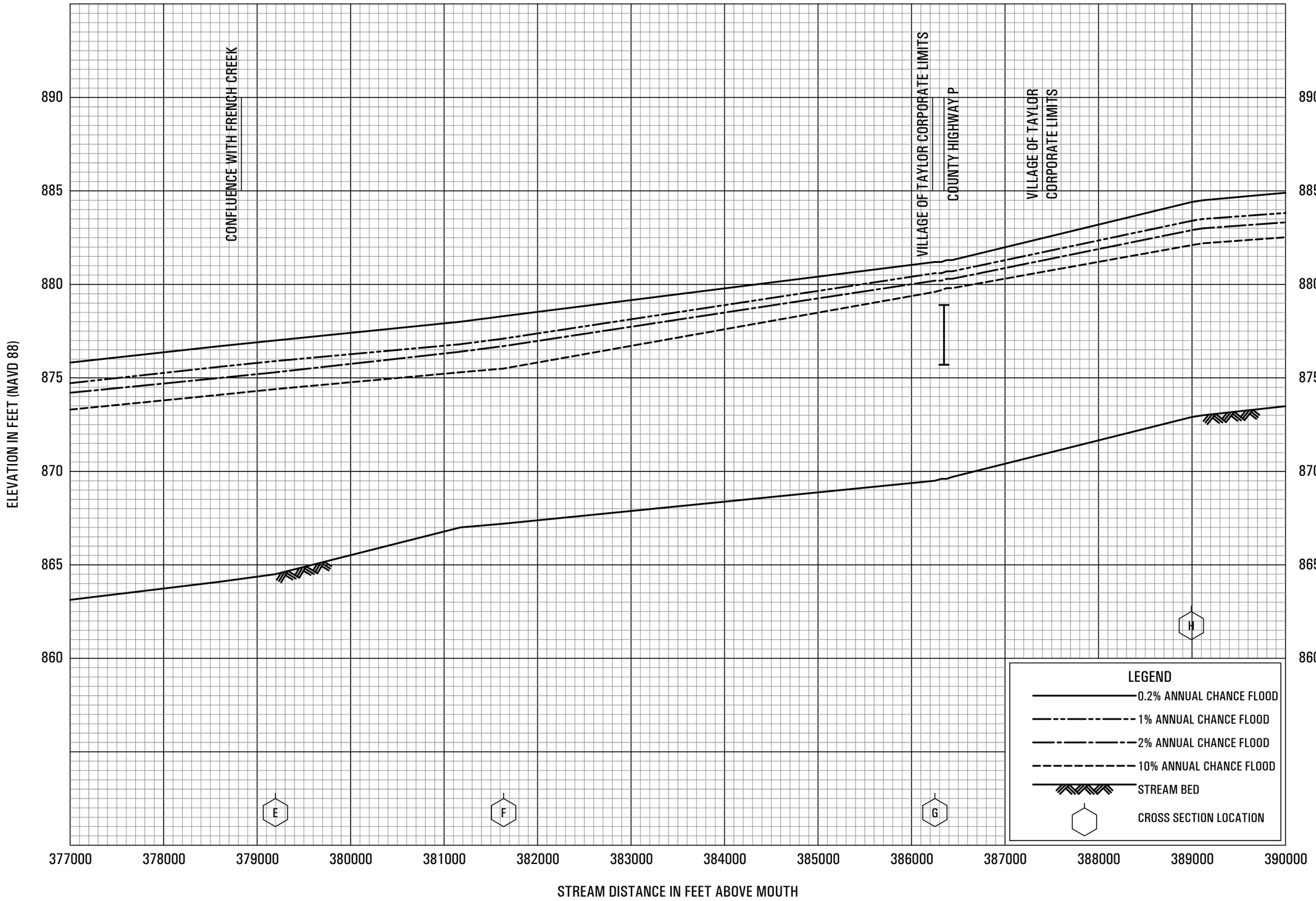
FLOOD PROFILES

TREMPEALEAU RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



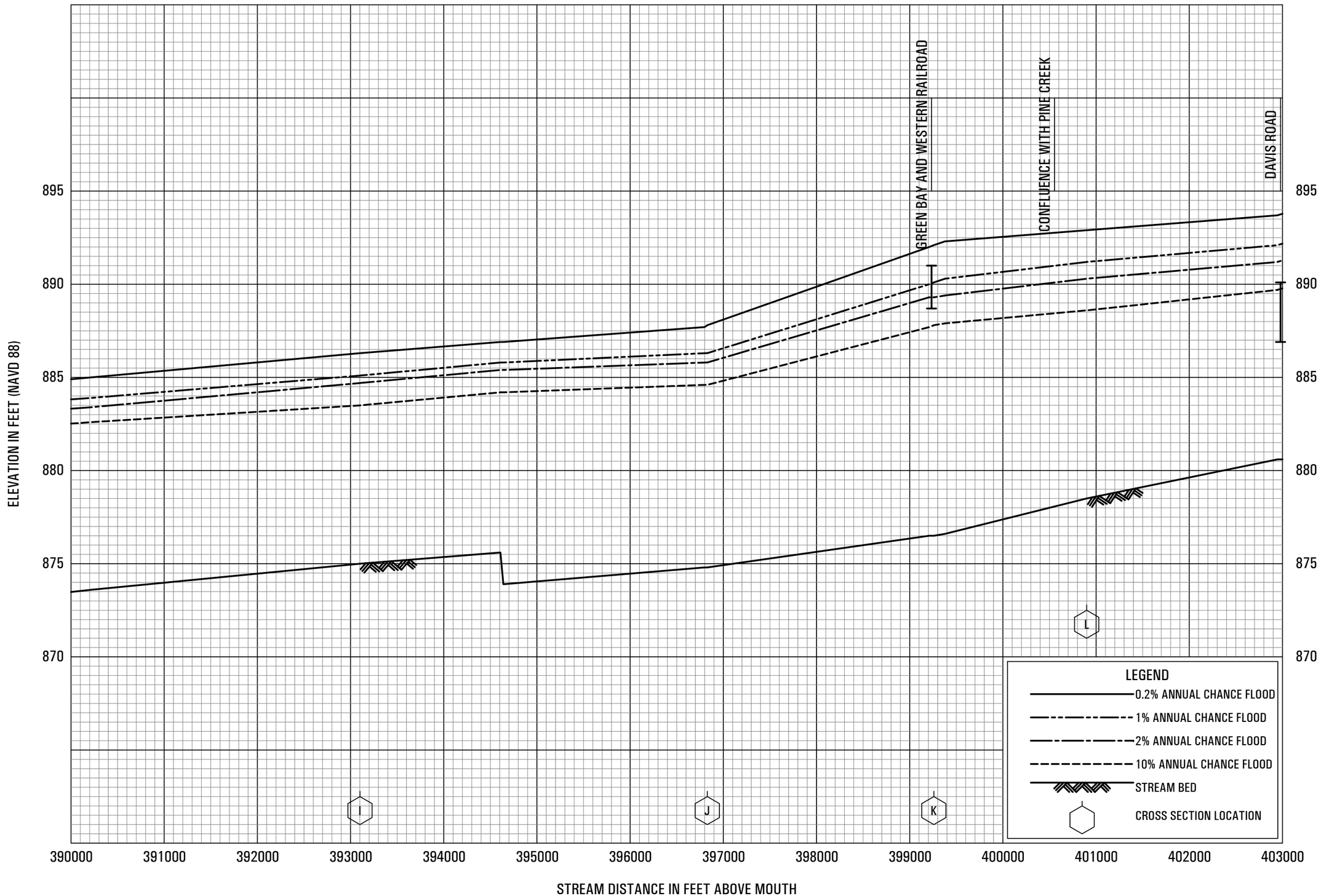
FLOOD PROFILES

TREMPEALEAU RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



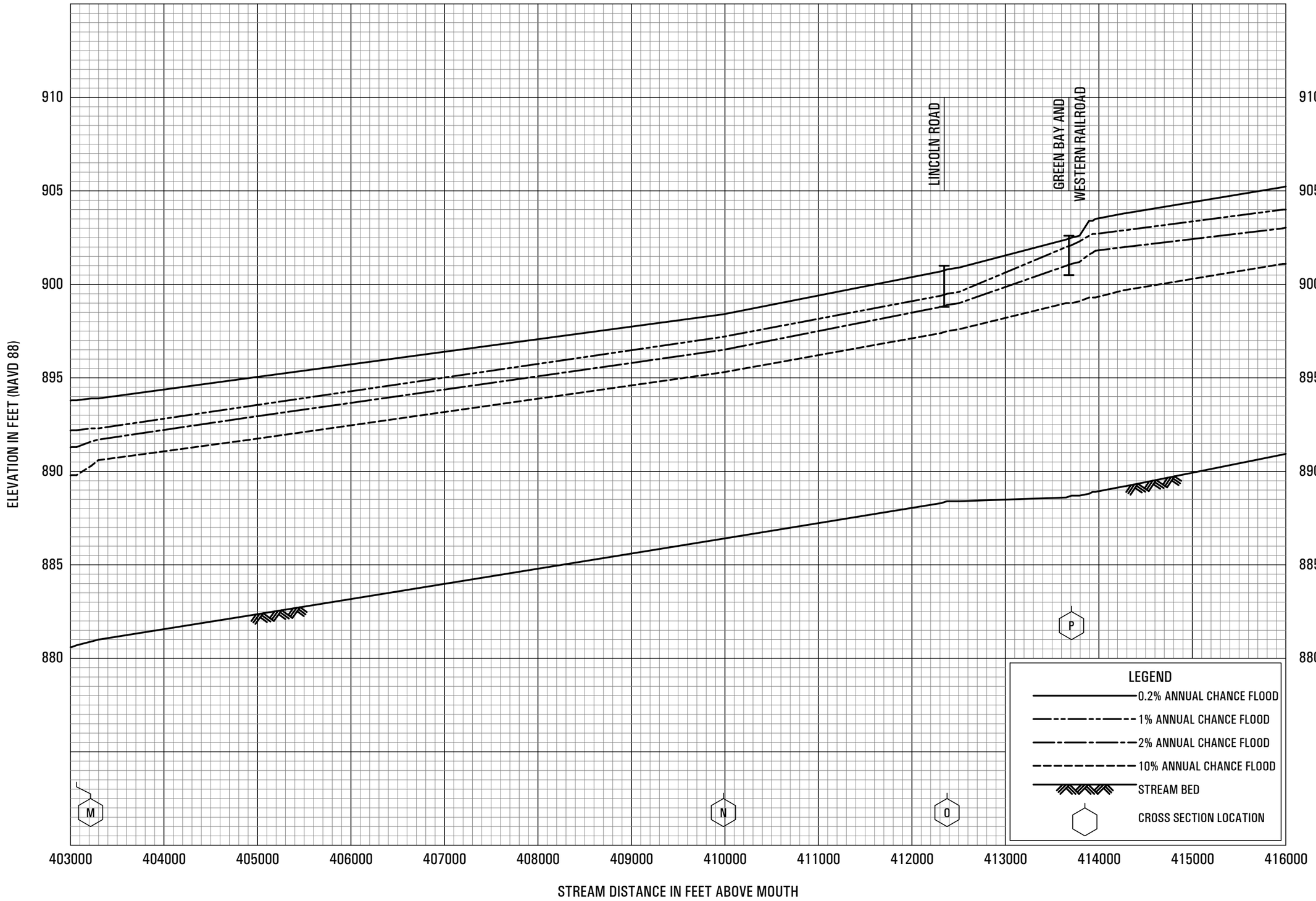
FLOOD PROFILES

TREMPEALEAU RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



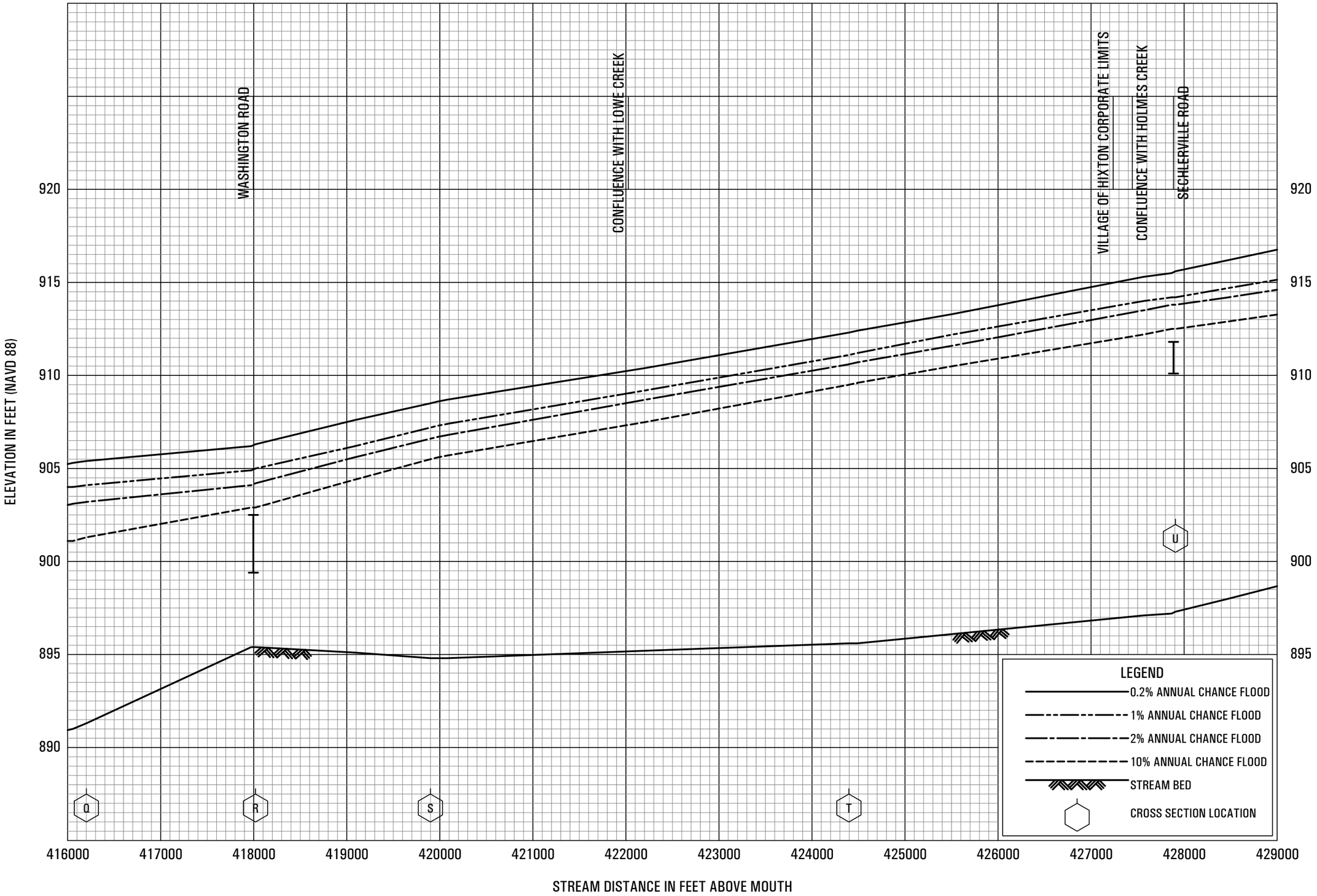
FLOOD PROFILES

TREMPEALEAU RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



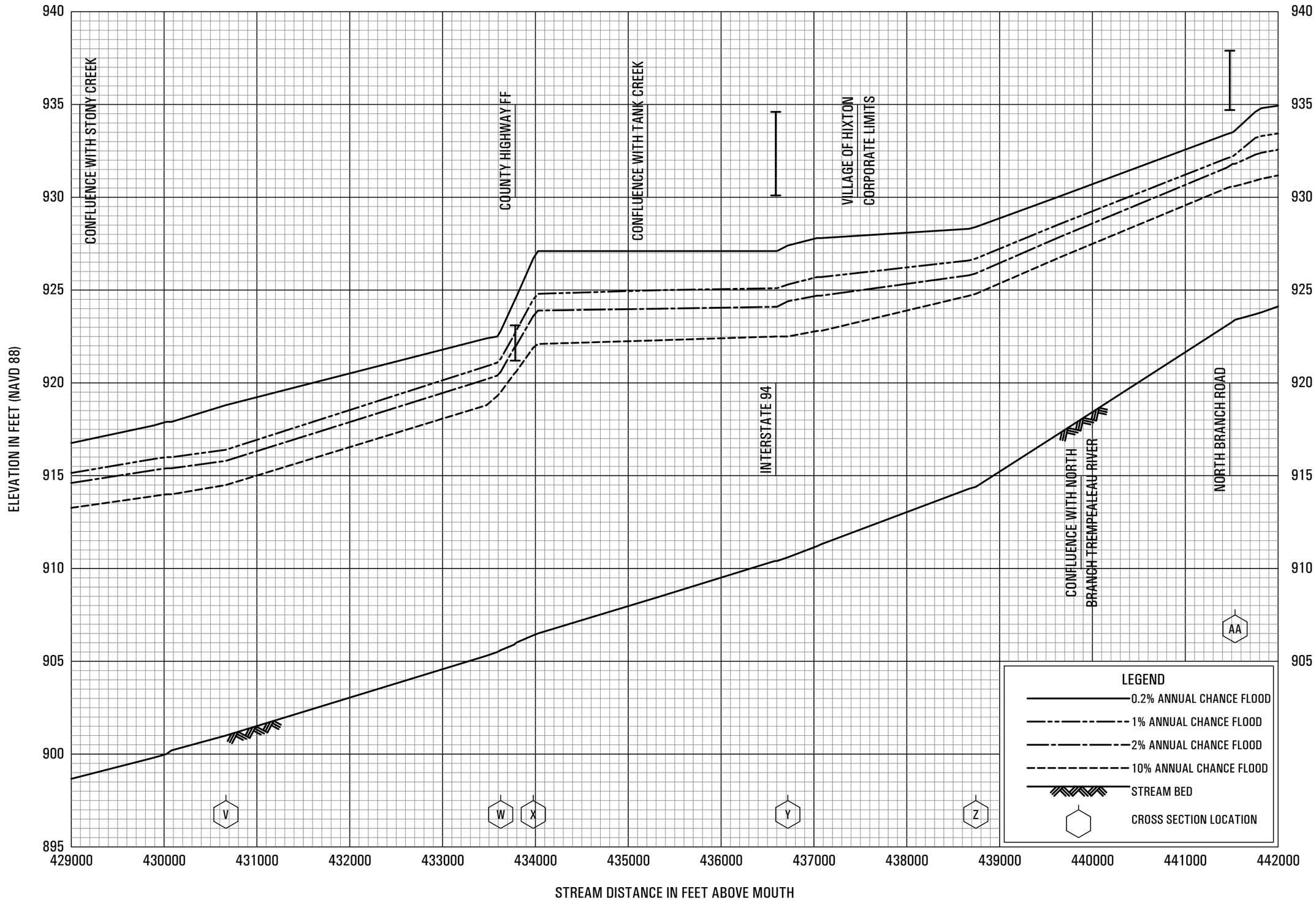
FLOOD PROFILES

TREMPEALEAU RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



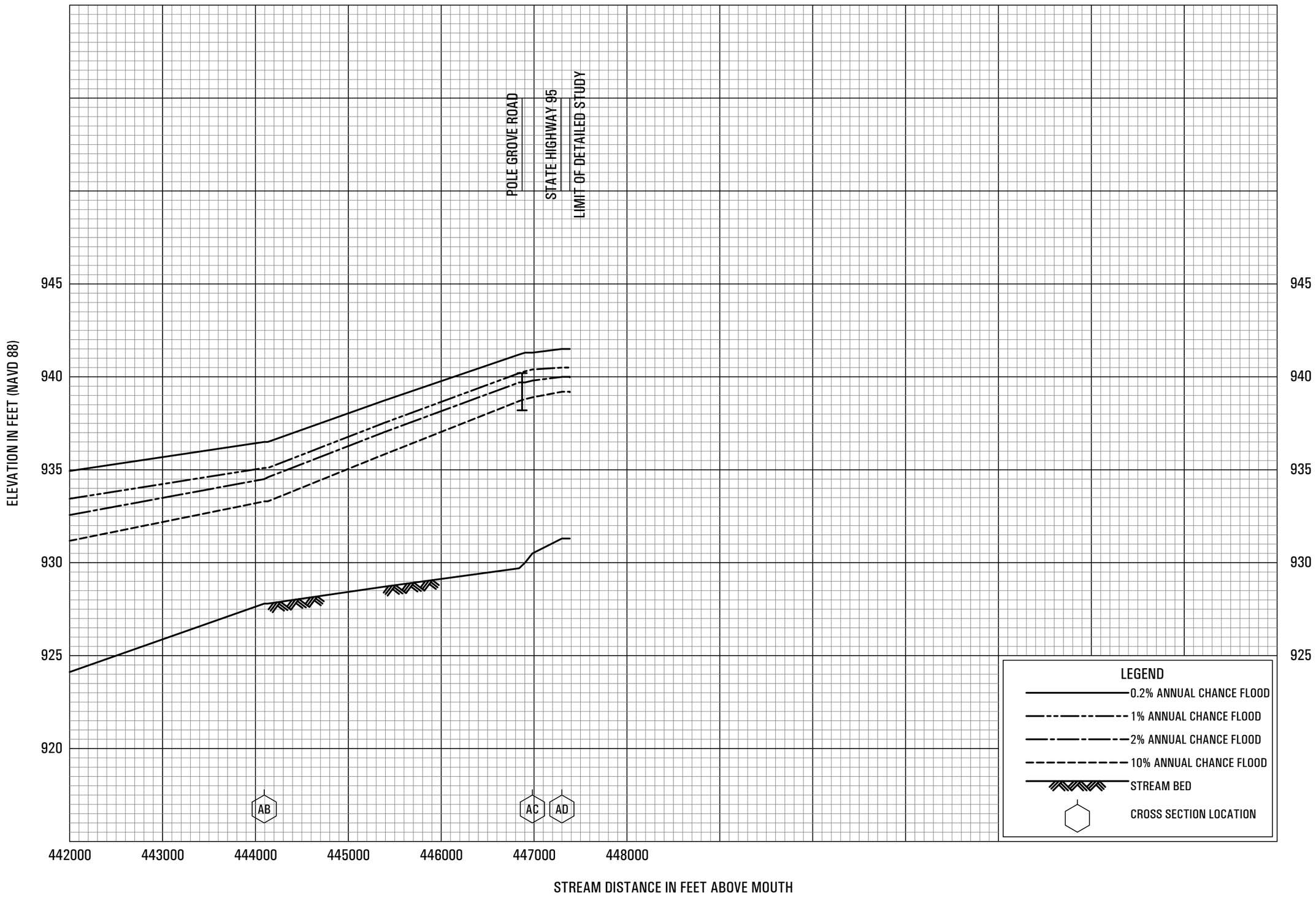
FLOOD PROFILES

TREMPEALEAU RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS



FLOOD PROFILES

TREMPEALEAU RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, WI

AND INCORPORATED AREAS