FLOOD INSURANCE STUDY

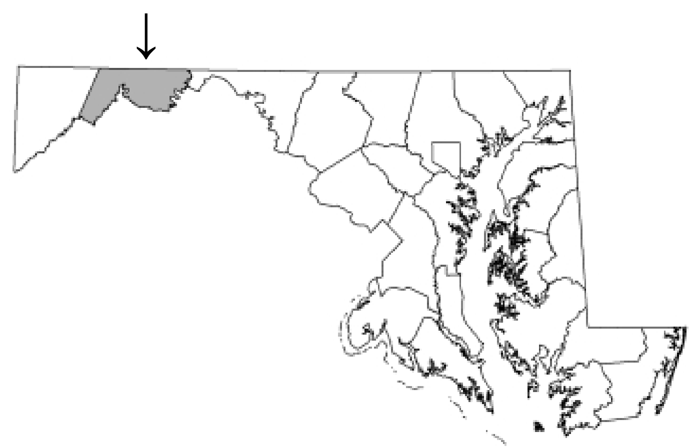
ALLEGANY COUNTY, MARYLAND

AND INCORPORATED AREAS

Volume 1 of 2

PRELIMINARY
April 14, 2011

Allegany County



Community Name	Community Number
ALLEGANY COUNTY (UNINCORPORATED AREAS)	240001
BARTON, TOWN OF	240002
CUMBERLAND, CITY OF	240003
FROSTBURG, CITY OF	240004
LONACONING, TOWN OF	240005
LUKE, TOWN OF	240114
MIDLAND, TOWN OF	240006
WESTERNPORT, CITY OF	240007

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER:

24001CV001A

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 process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and check the Community Map Repository to obtain the most current FIS report components.

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 and cross sections). In addition, Flood Insurance Rate Map panels for this community contain new flood zone designations. The flood hazard zones have been changed as follows:

Old Zone(s)	New Zone
A1 – A30	AE
B	X
C	X

Initial Countywide FIS Effective Date: TBD

TABLE OF CONTENTS- Volume 1

Page

TABLE OF CONTENTS-Volume 1- continued

Page

FIGURES

TABLES

EXHIBITS

TABLE OF CONTENTS- Volume 2

FLOOD INSURANCE STUDY
ALLEGANY COUNTY, MARYLAND AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This countywide Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of Allegany County, Maryland, including the Cities of Cumberland, Frostburg, and Westernport, the Towns of Barton, Lonaconing, Luke, and Midland, and the unincorporated areas of Allegany County (hereinafter referred to collectively as Allegany County.

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 above referenced communities 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.

1.2 Authority and Acknowledgements

The sources of authority for this Flood Insurance Study 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, Allegany County in a countywide format FIS. The information on the authority and acknowledgments for previous FIS issued for each jurisdiction in Allegany County is as follows:

Allegany County:	In the February 18, 1981 FIS, the hydrologic and hydraulic analysis were prepared by Toups and Loiederman, for FEMA, under Contract No. H-3928. That work was completed in December 1977. For the September 29, 1989, FIS, updated hydrologic and hydraulic analysis were completed for Wills Creek by the Maryland Department of Natural Resources (MDNR). This work was completed in August 1987 (Reference 1).

Barton, Town of:	In the March 1979 FIS, the hydrologic and hydraulic analysis were prepared by Toups and Loiederman, for FEMA, under Contract No. H-3928. The work was completed in October 1977 (Reference 2).
Cumberland, City of:	In the September 1, 1983 FIS, the hydrologic and hydraulic analysis were prepared by Dalton-Dalton-Little-Newport, for FEMA, under Contract No. H-3810. That work was completed in January 1977 (Reference 3).
Frostburg, City of:	In the June 1979 FIS, the hydrologic and hydraulic analysis were prepared by Toups and Loiederman, for FEMA, under Contract No. H-3928. That work was completed in December 1977 (Reference 4).
Lonaconing, Town of:	In the March 1979 FIS, the hydrologic and hydraulic analysis were prepared by Toups and Loiederman, for FEMA, under Contract No. H-3928. That work was completed in November 1977 (Reference 5).
Luke, Town of:	In the February 1980 FIS, the hydrologic and hydraulic analysis were prepared by Toups and Loiederman, for FEMA, under Contract No. H-3928. That work was completed in September 1977 (Reference 6).
Midland, Town of:	In the February 1979 FIS, the hydrologic and hydraulic analysis were prepared by Toups and Loiederman, for FEMA, under Contract No. H-3928. That work was completed in November 1977 (Reference 7).
Westernport, City of:	In the January 1983 FIS, the hydrologic and hydraulic analysis were prepared by Toups and Loiederman, for FEMA, under Contract No. H-3928. That work was completed in October 1977 (Reference 8).

For this Countywide FIS, updated hydraulic analyses were completed for all studied flooding sources excluding the Potomac River and the North Branch Potomac River. These analyses were completed by the U.S. Army Corps of Engineers (USACE) for the Maryland Department of the Environment (MDE) as part of FEMA's Map Modernization Program (MMP) under Contract No. ICA-08-CRL-01. The MMP study was completed in August 2010.

Flood elevation data for the detailed study portions of the Potomac River was taken from the effective FIS on the Allegany County side of the river along with the effective Morgan County, West Virginia, FIS (Reference 9). Flood elevation data for the detailed study portions of the North Branch Potomac River was taken from the effective FIS on the Allegany County side of the river along with the effective Mineral County, West Virginia, FIS (Reference 10), the City of Piedmont, West Virginia, FIS (Reference 11), and the City of Keyser, West Virginia FIS (Reference 12). For both flooding sources, available flood elevation data from both sides of the river was analyzed and the most recent data for a given area was used.

The base mapping for this revision was obtained from the United States Department of Agriculture, National Aerial Imagery Program (NAIP), dated 2009. The projection used in the preparation of this map was Lambert Conformal Conic State Plane Maryland Zone 1900. 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 this FIRM.

1.3 Coordination

The purpose of the initial Consultation Coordination Officer (CCO) meeting is to discuss the scope of the study. A final CCO meeting is held to review the results of the study.

Allegany County, September 29, 1989 FIS

An initial Consultation and Coordination Officer's (CCO) meeting, attended by representatives of FEMA, Allegany County, MDNR, and Toups and Loiederman (the study contractor), was held in December 1975, to discuss the purpose, scope, and methods of study. The U. S. Geological Survey (USGS) and the Soil Conservation Service (SCS) were contacted for information and maps.

The final CCO meeting, attended by representatives of the FEMA, the study contractor, MDNR, and Allegany County, was held on August 9, 1979, to present the results of the study (Reference 1).

Barton, Town of, March 1979 FIS

An initial Consultation and Coordination Officer's (CCO) meeting, attended by representatives of FEMA, the Town of Barton, MDNR, and Toups and Loiederman (the study contractor), was held in December 1975, to discuss the purpose, scope, and methods of study. The USGS, the SCS and USACE were contacted for information and maps.

The final CCO meeting, attended by representatives of FEMA, the study contractor, MDNR, and Allegany County, was held on November 21, 1978, to present the results of the study (Reference 2).

Cumberland, City of, September 1, 1983 FIS

An initial Consultation and Coordination Officer’s (COO) meeting, attended by representatives of FEMA, Dalton-Dalton-Little-Newport (the study contractor), and the City of Cumberland was held in February 1975 to discuss the scope of the study. An additional coordination meeting was held on September 29, 1975, to discuss the purpose and methods of the study. The USACE was contacted for information on the flood control works impacting the Potomac River and Wills Creek. The USGS was also contacted for data and information.

The final CCO meeting, attended by representatives of FEMA, the study contractor, the State of Maryland, Allegany County, and the City of Cumberland, the Maryland Department of Planning, and the SCS, was held on January 5, 1977, to present the results of the study (Reference 3).

Frostburg, City of, June 1979 FIS

An initial Consultation and Coordination Officer's (CCO) meeting, attended by representatives of FEMA, the City of Frostburg, MDNR, and Toups and Loiederman (the study contractor), was held in December 1975, to discuss the purpose, scope, and methods of study.

The final CCO meeting, attended by representatives of FEMA, the study contractor, MDNR, and the City of Frostburg, was held on August 9, 1978, to present the results of the study (Reference 4).

Lonaconing, Town of, March 1979 FIS

An initial Consultation and Coordination Officer's (CCO) meeting, attended by representatives of FEMA, the Town of Lonaconing, MDNR, and Toups and Loiederman (the study contractor), was held in December 1975, to discuss the purpose, scope, and methods of study. The USGS, the SCS and Maryland Water Resources Administration (MWRA) were contacted for information and maps.

The final CCO meeting, attended by representatives of FEMA, the study contractor, MDNR, and the Town of Lonaconing, was held on November 21, 1978, to present the results of the study (Reference 5).

Luke, Town of, February 1980 FIS

An initial Consultation and Coordination Officer's (CCO) meeting, attended by representatives of FEMA, the Town of Luke, MDNR, and Toups and Loiederman (the study contractor), was held in December 1975, to discuss the purpose, scope, and methods of study. The USGS, SCS, MWRA and USACE were contacted for information and maps.

The final CCO meeting, attended by representatives of FEMA, the study contractor, MDNR, and the Town of Luke, was held on August 9, 1979, to present the results of the study (Reference 6).

Midland, Town of, February 1979 FIS

An initial Consultation and Coordination Officer's (CCO) meeting, attended by representatives of FEMA, the Town of Midland, MDNR, and Toups and Loiederman (the study contractor), was held in December 1975, to discuss the purpose, scope, and methods of study. The USGS, the SCS, and MWRA were contacted for information and maps.

The final CCO meeting, attended by representatives of FEMA, the study contractor, MDNR, and the Town of Midland, was held on September 12, 1978, to present the results of the study (Reference 7).

Westernport, City of, January 1983 FIS

An initial Consultation and Coordination Officer's (CCO) meeting, attended by representatives of FEMA, the City of Westernport, MDNR, and Toups and Loiederman (the study contractor), was held in December 1975, to discuss the purpose, scope, and methods of study. The U. S. Geological Survey (USGS), the SCS, MWRA and USACE were contacted for information and maps.

The final CCO meeting, attended by representatives of FEMA, the study contractor, MDNR, and the City of Westernport, was held on July 10, 1978, to present the results of the study (Reference 8).

Countywide

For this Countywide revision, the initial CCO meeting for this study was held on September 12, 2008 at the MDE offices and attended by representatives of MDE, FEMA, and the USACE (study contractor for this study).

2.0 AREA STUDIED

2.1 Scope of Study

This FIS report covers the geographic area of Allegany County, Maryland, including all incorporated communities listed in Section 1.1.

The USACE was contracted to perform new detailed studies on the same streams studied using detailed methods in the previous FIS, except for the Potomac River (see Section 1.2). In the previous FIS, the streams studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction. All or portions of the flooding sources listed in Table 1, "Flooding Sources Studied by Detailed Methods", were studied by detailed methods. Limits of detailed study are indicated on the flood profiles (Exhibit 1) and the FIRMs (Exhibit 2).

Table 1: Flooding Sources Studied by Detailed Methods

Braddock Run	Neff Run
Butcher Run	North Branch
Dry Run	North Branch Potomac River
Evitts Creek	Potomac River
Flintstone Creek	Sand Spring Run
Georges Creek	Warrior Run
Hill Run	Willow Brook
Jackson Run	Wills Creek
Jennings Run	Winchester Road Creek
Koontz Run	

The USACE was contracted to perform new approximate studies on the same streams studied using approximate methods in the previous FIS. In the previous FIS, approximate analyses were used to study those areas having a low development potential or minimal flooding hazards. The scope and methods of study were agreed upon by FEMA and the communities. Table 2, "Flooding Sources Studied by Approximate Methods", lists the streams studied by approximate methods.

Table 2. Flooding Sources Studied by Approximate Methods

Bear Camp Branch	Murley Branch
Bear Camp Branch Tributary	Nichols Run
Cabin Run	Picnic Run
Collier Run	Pine Lick Hollow
Deep Run	Roby Hollow
Elk Lick Run	Rocky Gap Run
Elklick Run	Rocky Gap Run Tributary A
Fifteenmile Creek	Sawpit Run
Fifteenmile Creek Tributary B	Seven Springs Run
Flat Run	Seven Springs Run Tributary
Gerlock Hollow	Terrapin Run
Maple Run	Town Creek
Maple Run Tributary	White Sulphur Run
Mill Run	Woodland Creek
Mudlick Hollow	

Letter of Map Revision (LOMR) cases 95-03-035P and 06-03-B234P have been incorporated into this revised FIS. All other LOMRs have been superseded by the new studies, as described above.

2.2 Community Description

Allegany County is located in the western Maryland. It is bordered by Garrett County, Maryland to the west, Somerset, Bradford and Fulton Counties, Pennsylvania, to the north, Washington County, Maryland to the east, and Mineral, Hampshire, and Morgan Counties, West Virginia, to the south.

According to the U.S. Bureau of the Census, the population of Allegany County in 2000 was 74,930, and the estimated population for 2009 was 72,532 (Reference 13).

The county encompasses approximately 428 square miles in the Ridge and Valley Province and the Appalachian Plateau, where topography and climate vary. Elevations range from 3,000 feet at the western edge of the county to 420 feet at the eastern boundary (Reference 1)

Because of its position in the middle latitudes, where the general atmospheric flow is from west to east across the North American continent, Allegany County has a continental type of climate with well-defined seasons. The average annual temperature ranges from 51 degrees Fahrenheit at Frostburg to 54 degrees Fahrenheit at Westernport. The county receives an annual rainfall ranging from 35 to 41 inches, and snowfall from 30 to 50 inches. Thunderstorms in Allegany County occur on an average of about 35 days per year and are most frequent from May through August. Occasional tropical systems, occurring during the summer and fall seasons, can also produce moderate to heavy rainfall (Reference 1).

2.3 Principal Flood Problems

The major flooding sources in Allegany County include the Potomac River and the North Branch Potomac River, Georges Creek, Wills Creek, Evitts Creek, Town Creek, and Fifteenmile Creek. Low-lying areas along these streams are subject to periodic flooding when general storms of long duration strike these areas. Records show that historic floods on the Potomac River occurred in 1924, 1936, 1954, and 1955. The March 1924 flood was 20 feet above normal, and devastated parts of the City of Cumberland. The estimated historic peak of the 1924 flood was 82,000 cubic feet per second (cfs). In March 1936, melting and heavy rainfall throughout the state caused extensive flooding on the Potomac River. On October 14, 1954, Hurricane Hazel produced heavy rains on the area over a twelve-hour period, which resulted in severe flooding on the North Branch Potomac River. Records indicate that significant flood events occurred on Georges Creek in 1936, 1937, 1954 and 1964 (Reference 1).

In January 1996, snowmelt combined with heavy rainfall caused severe flooding in Allegany County. At the USGS gage on Wills Creek near Cumberland, a stream flow of 45,900 cfs was recorded. This is the highest ever recorded flow at the gage, which has been in operation since 1924. (Reference 14)

In September 1996, rainfall resulting from Hurricane Fran caused major flooding on Georges Creek. Damage was especially extensive in the Town of Westernport. At the USGS gage on Georges Creek near Franklin, a stream flow of 6,500 cfs was recorded. This was the highest flow recorded at the gage since the 1936 and 1937 events (Reference 15).

2.4 Flood Protection Measures

Since 1913, the flow in the North Branch Potomac River has been regulated by the Stony River Dam and Reservoir, supplemented in 1950 by the Savage River Dam and Reservoir. The USACE has constructed the Bloomington Reservoir on the North Branch Potomac River, approximately 2 miles upstream of the Town of Luke, Maryland. The storage at these reservoirs contribute to the reduction of flows on the North Branch Potomac River (Reference 1).

After the extensive damage to the City of Cumberland caused by the 1936 and 1942 floods, the USACE undertook a comprehensive flood protection system, including 1.6 miles of channel improvements along Wills Creek, 1.7 miles of channel improvements along the North Branch Potomac River, and levees/floodwalls. This flood protection system is designed to protect against discharges 28% greater than the March 1936 flood (Reference 16).

Following the 1996 floods on Georges Creek, a multi-agency flood mitigation project was completed, including bridge/roadway improvements, stream restoration, property acquisition, and sewer line relocation. The project reduces the flood risk associated with Georges Creek (Reference 17). Other flood protection measures include the Neff Run system, the Lonaconing Floodwall system, and the Westernport Floodwalls project.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the community (Table 1), standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded 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 the peak discharge-frequency relationships for floods of selected recurrence intervals for each stream studied in detail in the county.

MDE contracted Dr. Glenn Moglen of the Department of Civil and Environmental Engineering at the University of Maryland to perform hydrologic calculations. 10-, 2-, 1-, and 0.2-percent annual chance flows were calculated. Dr. Moglen’s peak flow calculations were used for all streams except Georges Creek.

The current regional regression equations being used by the Maryland State Highway Administration (MSHA) were developed by Jonathan Dillow, a hydrologist for the USGS. Dillow defined regression equations for five hydrologic fixed regions: Appalachian Plateaus and Allegheny Ridges, Blue Ridge and Great Valley, Piedmont, Western Coastal Plain and Eastern Coastal Plain (Reference 18).

Dr. Moglen developed a new set of regression equations, called the fixed region regression equations, for the State of Maryland. The fixed region method used in his study is based on the predefined regions of Dillow since these regions are based on physiographic regions. Allegany County is located within the Appalachian Plateaus region.

The fixed Appalachian Plateaus region equations are based on 23 stations in Maryland with drainage area (*DA*) ranging from 0.52 to 293.7 square miles and land slope (*LSLOPE*) ranging from 0.06632 to 0.22653 ft/ft. One station, 03076505, was an outlier and eliminated from the regression analysis. Basin relief, channel slope, and basin shape have relatively high correlations with drainage area (0.78, 0.77, and 0.62, respectively) and were not statistically significant in the regression equations. The standard error range from 20.7 percent (0.089 log units) for Q_2 to 48.0 percent (0.198 log units) for Q_{500}.

TABLE 3 –APPALACHIAN PLATEAUS EQUATIONS

Appalachian Plateaus Fixed Region Regression Equations	Standard Error (Percent)	Equivalent Years of Record
$Q_{1.25} = 70.25\ DA^{0.837}\ LSLOPE^{0.327}$	23.6	5.7
$Q_{1.50} = 87.42\ DA^{0.837}\ LSLOPE^{0.321}$	21.9	5.9
$Q_{1.75} = 96.37\ DA^{0.836}\ LSLOPE^{0.307}$	21.2	6.4
$Q_{2} = 101.41\ DA^{0.834}\ LSLOPE^{0.300}$	20.7	7.1
$Q_{5} = 179.13\ DA^{0.826}\ LSLOPE^{0.314}$	21.6	12
$Q_{10} = 255.75\ DA^{0.821}\ LSLOPE^{0.340}$	24.2	14
$Q_{25} = 404.22\ DA^{0.812}\ LSLOPE^{0.393}$	29.1	15
$Q_{50} = 559.80\ DA^{0.806}\ LSLOPE^{0.435}$	33.1	16
$Q_{100} = 766.28\ DA^{0.799}\ LSLOPE^{0.478}$	37.4	15
$Q_{200} = 1046.9\ DA^{0.793}\ LSLOPE^{0.525}$	41.8	15
$Q_{500} = 1565.0\ DA^{0.784}\ LSLOPE^{0.589}$	48.0	15

All calculations using the fixed region regression equations were performed with GISHydro2000. GISHydro is a computer program used to assemble and evaluate hydrologic models for watershed analysis. Originally developed in the mid-1980s, the program combines a database of terrain, land use, and soils data with specialized GIS tools for assembling data and extracting model parameters. The primary purpose of the GISHydro program is to assist engineers in performing watershed analyses in the State of Maryland. In the Fall of 1997, a new collaborative project between the Department of Civil and Environmental Engineering at the University of Maryland and the MSHA began to update and enhance GISHydro into GISHydro2000. See Reference 19 for additional supporting documentation related to Dr. Moglen's methodology and procedures.

It should also be emphasized that these regression equations, although not developed by the USGS, provide a better standard error performance than the current USGS regression equations for Maryland and also apply not just to rural but to both rural and urban watershed conditions. These equations were endorsed for use in Maryland by the Maryland Hydrology Panel as documented in their report which can be obtained from the MSHA or from the following URL:

http://www.gishydro.umd.edu/HydroPanel/panel_report_103106.pdf (University of Maryland 2006).

10-, 2-, 1-, and 0.2-percent annual chance flows for Georges Creek were brought forward from the previous FIS (References 1, 2, 3, 5, 7, 8).

Hydrologic data for the detailed study sections of the Potomac River and the North Branch Potomac River was taken from effective studies in adjacent communities (see Section 1.2).

Peak discharge-drainage area relationships for the streams studied by detailed methods are listed in Table 4, "Summary of Discharges".

TABLE 4 –SUMMARY OF DISCHARGES

		PEAK DISCHARGES (cubic feet per second)			
FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
BRADDOCK RUN					
At Confluence with Wills Creek	17.65	2,050	3,990	5,180	9,270
At Vocke Road	10.72	1,310	2,540	3,290	5,860
At Vale Summit Road	3.29	495	976	1,270	2,300

TABLE 4 –SUMMARY OF DISCHARGES (Continued)

		PEAK DISCHARGES (cubic feet per second)			
FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
BUTCHER RUN					
At Confluence with Georges Creek	2.25	370	736	966	1,770
DRY RUN					
At Downstream Limit of Study/ Drop Structure	2.32	334	667	865	1,530
EVITTS CREEK					
At Confluence with North Branch Potomac River	94.01	8,340	16,000	20,600	36,200
Approximately 2000 feet downstream of Old Mount Pleasant Road	75.76	6,990	13,400	17,300	30,600
At Bottle Run Road	54.39	5,420	10,500	13,600	24,300
FLINTSTONE CREEK					
At Confluence with Town Creek	31.08	3,370	6,550	8,500	15,200
Approximately 1700 feet upstream of Flintstone Creek Road	23.41	2,680	5,250	6,830	12,300
GEORGES CREEK					
At Confluence with North Branch Potomac River	74.5	4,260	7,180	8,730	13,100
At Confluence of Koontz Run	38.1	3,420	5,310	6,150	8,240
At Martin Run Road	1.0	320	483	554	728
HILL RUN					
At Confluence with Georges Creek	2.05	331	653	853	1550

TABLE 4 –SUMMARY OF DISCHARGES (Continued)

		PEAK DISCHARGES (cubic feet per second)			
FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
JACKSON RUN					
At Jackson Run Road	2.53	393	775	1,010	1,830
JENNINGS RUN					
At Confluence with Wills Creek	37.97	3,780	7,240	9,330	16,400
At Woodcock Hollow Road	19.28	2,080	3,980	5,120	8,980
At Mount Savage Road	5.11	685	1,330	1,720	3,050
KOONTZ RUN					
At Confluence with Georges Creek	3.77	571	1,130	1,480	2,700
NEFF RUN					
At Confluence with Georges Creek	5.59	783	1,540	2,010	3,630
NORTH BRANCH					
At Confluence with Jennings Run	12.29	1,520	2,970	3,870	6,940
NORTH BRANCH POTOMAC RIVER					
At Cumberland, MD Gaging Station	875	*	*	51,000	*
At Luke, MD Gaging Station	404	*	*	12,000	*
POTOMAC RIVER					
At USGS Gage Paw Paw, WV	*	*	*	160,000	*
SAND SPRING RUN					
At Confluence with Georges Creek	4.35	585	1,130	1,460	2,580
At U.S. Route 40	0.37	52	93	116	187

* Data not available

TABLE 4 –SUMMARY OF DISCHARGES (Continued)

		PEAK DISCHARGES (cubic feet per second)			
FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
WARRIOR RUN					
At Confluence with North Branch Potomac River	7.22	1,100	2,230	2,960	5,560
WILLOW BROOK					
At Interstate Route 68	0.41	68	128	164	281
WILLS CREEK					
At Confluence with North Branch Potomac River	252.71	18,100	33,900	43,200	74,000
At Confluence of Jennings Run	227.09	16,600	31,100	39,700	68,200
At Maryland/Pennsylvania Border	183.61	14,000	26,200	33,500	57,600
WINCHESTER ROAD CREEK					
At MRI Road	1.68	362	769	1,040	2,050

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding were carried out to provide estimates of the elevations of floods for the selected recurrence intervals. Users should be aware that flood elevations shown on the Flood Insurance Rate Map (FIRM) represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles 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 report in conjunction with the data shown on the FIRM.

A Digital Elevation Model (DEM), which is a 3-D model of the ground surface, was provided by Allegany County. Cross sections for the hydraulic analyses were obtained from this DEM. For detailed study streams, below-water portions of the cross sections were either obtained from the previous FEMA hydraulic models, which in most cases were originally obtained by field survey, or estimated from the thalweg on the profile sheet in the effective FIS. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

The previous FEMA hydraulic models contained surveyed structural geometry and measurements for bridges and culverts. In an effort to identify any bridges/culverts that had been modified or added since the previous studies had been conducted, MDE provided the USACE with a database of bridge/culvert measurements and photographs. This database was supplemented by additional field investigation conducted by the USACE. Information from the database/field investigation was compared to the data from the previous hydraulic models. If no difference existed, the surveyed elevations and measurements from the previous model were used. If a difference existed or the bridge/culvert was not included in the previous model, the measurement information from the database/field investigation was used, and structural elevations were based off the DEM. Additional channel, bridge/culvert, and other hydraulic model input data was obtained from effective Letters of Map Revision (LOMRs) when applicable. As-built plans for the Wills Creek flood control channel were provided by the USACE-Baltimore District (Reference 16).

Water-surface elevations for floods of the selected recurrence intervals were computed through use of the USACE's HEC-RAS (Version 4.0) step-backwater computer program (Reference 20).

Starting water-surface elevations were calculated using the slope-area method for most detailed study streams. Where the detailed study began at an existing structure with known backwater effects, the headwater elevation for each frequency flood was acquired from the effective FIS and used as the starting water surface elevation in the hydraulic analysis.

Channel and overbank roughness factors (Manning's "n" values) were chosen by engineering judgment and were based on field inspection, aerial photography, stream photographs, and values used in the previous models. Table 5, "Manning's 'n' Values", lists the range of values used for Manning's "n":

TABLE 5 –MANNING’S “n” VALUES

STREAM	CHANNEL “n”	OVERBANK “n”
Braddock Run	0.045	0.045 – 0.8
Butcher Run	0.045	0.06 – 0.1
Dry Run	0.05	0.06 – 0.1
Evitts Creek	0.045	0.05 – 0.1
Flintstone Creek	0.045	0.07 – 0.1
Georges Creek	0.03 – 0.1	0.02 – 0.12
Hill Run	0.045	0.05 – 0.1
Jackson Run	0.035 – 0.045	0.04 – 0.1
Jennings Run	0.035 – 0.45	0.08 – 0.1
Koontz Run	0.035 – 0.05	0.08 – 0.1
Neff Run	0.05 – 0.055	0.013 – 0.1
North Branch	0.035	0.05 – 0.08
North Branch Potomac River	*	*
Potomac River	*	*
Sand Spring Run	0.045	0.05 – 0.1
Warrior Run	0.03 – 0.045	0.06 – 0.07
Willow Brook	0.013 – 0.5	0.04 – 0.08
Wills Creek	0.013 – 0.035	0.08 – 0.12
Winchester Road Creek	0.055 – 0.06	0.08 – 0.1

* Data Not Available

Updated hydraulic analyses for all flooding sources included in this study were conducted using the methodology described above, with the exception of the Potomac River and North Branch Potomac River. For the detailed study sections of the Potomac River and North Branch Potomac River, hydraulic data was brought forward from effective studies in adjacent communities (see Section 1.2). For the approximate study section of the Potomac River and North Branch Potomac River, an automated analysis was conducted using the WISE computer program, in conjunction with HEC-RAS, to compute water surface elevations at each cross section. The WISE program produces the input data that is brought into HEC-RAS (Reference 21) .

The hydraulic analyses in this study are based on the effects of unobstructed flow. The efficiency of hydraulic structures can be seriously reduced by debris blockage, ice jams, and siltation. The flood elevations as shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

Qualifying bench marks within a given jurisdiction are cataloged by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (NSRS). First or Second Order Vertical bench marks that have a vertical stability classification of A, B, or C are shown and labeled on the FIRM with their 6 character NSRS Permanent Identifier.

Bench marks cataloged by the NGS and entered into the NSRS vary widely in vertical stability classification. NSRS vertical stability classifications are as follows:

Stability A: Monuments of the most reliable nature, expected to hold position/elevation well (e.g., mounted in bedrock)

Stability B: Monuments which generally hold their position/elevation well (e.g., concrete bridge abutments)

Stability C: Monuments which may be affected by surface ground movements (e.g., concrete mounted below frost line)

Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

In addition to NSRS bench marks, the FIRM may also show vertical control monument established by a local jurisdiction; these monuments will be shown on the FIRM with the appropriate designations. Local monuments will only be placed on the FIRM if the community has requested that they be included, and if the monuments meet the aforementioned NSRS inclusion criteria.

To obtain current elevation, description and/or location information for bench marks shown on the FIRM for this jurisdiction, please contact the Information Services Branch of the NGS at (301)-713-3242, or visit their Web site, www.ngs.noaa.gov. It is important to note that temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purposes of establishing local vertical control. Although these monuments are not shown on the digital FIRM, they may be found in the Technical Support Data Notebook associated with this FIS and FIRM. Interested individuals may contact FEMA to access this data.

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 used for newly created or revised FIS reports and FIRMs was NGVD 29. With the completion of NAVD 88, many FIS reports and FIRMs are now prepared using NAVD 88 as the referenced vertical datum.

The elevations shown in the FIS report and on the FIRM for Allegany County are referenced to NAVD 88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD 29 by applying a standard conversion factor to the NAVD 88 values. The conversion factor to NGVD 29 used in this study is +0.61.

The BFE's shown on the FIRM represent whole-foot rounded values. For example, a BFE of 102.4 feet will appear as 102 on the FIRM, and a BFE of 102.6 feet will appear on the FIRM as 103. Therefore, users that wish to convert the elevations in this FIS to NGVD 29 should apply the stated conversion factor to elevations shown on the Flood Profiles in this FIS Report, which are shown at a minimum to the nearest 0.1 foot.

NAVD 88 +0.61= NGVD 29

For additional information regarding conversion between NGVD 29 and NAVD 88, visit the NGS website at www.ngs.noaa.gov, or contact the NGS at the following address:

NGS Information Services
NOAA, N/NGS 12
National Geodetic Survey, SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282

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 and Floodway Data 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 (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community.

For all flooding sources included in this report, the 1 and 0.2 percent annual chance floodplain boundaries shown on the FIRM were delineated utilizing a Triangulated Irregular Network (TIN). The ground elevation TIN was created from Light Detection and Ranging (LIDAR) data provided by Washington County. The 1 and 0.2 percent annual chance flood elevations calculated at cross sections (as described in Section 3.2) were converted to a water surface TIN. The water surface TIN was then intersected with the ground elevation TIN. The 1 and 0.2 percent annual chance floodplain are boundaries depicted at locations where the two TIN surfaces intersect.

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 2). In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to the limitations of the map scale.

For the streams studied by approximate methods only the 1-percent-annual-chance floodplain boundary is shown.

4.2 Floodways

Encroachment of floodplains, such as structures and fill, reduces the flood carrying capacity, increases the 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 1.0 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.

The floodways presented in this study were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 6, "Floodway Data"). The computed floodways are shown on the FIRM (Exhibit 2). In cases where the floodway and the 1-percent annual chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body. Therefore, "Without Floodway" elevations presented in Table 6 for certain downstream cross sections of Braddock Run, Jennings Run, North Branch, and Wills Creek are lower than the regulatory flood elevations in that area, which must take into account the 1-percent annual chance flooding due to backwater from other sources.

Encroachment into areas subject to inundation by floodwaters having hazardous velocities aggravates the risk of flood damage, and heightens potential flood hazards by further increasing velocities. A listing of stream velocities at selected cross sections is provided in Table 6. In order to reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside the floodway.

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Braddock Run								
A	172[1]	66	701	7.5	668.2	664.1[2]	664.1	0.0
B	887[1]	55	363	14.0	668.2	667.1[2]	667.4	0.3
C	1,881[1]	110	593	8.6	681.3	681.3	682.0	0.7
D	3,045[1]	111	493	10.1	698.6	698.6	699.0	0.4
E	5,458[1]	65	405	12.0	727.2	727.2	727.8	0.6
F	6,457[1]	216	673	7.2	738.7	738.7	739.0	0.3
G	7,289[1]	91	424	11.5	751.0	751.0	751.5	0.5
H	8,256[1]	58	472	8.2	765.0	765.0	766.0	1.0
I	8,524[1]	47	272	14.2	769.0	769.0	769.0	0.0
J	9,054[1]	95	370	10.5	777.7	777.7	777.7	0.0
K	10,177[1]	145	464	8.0	794.1	794.1	794.4	0.3
L	11,721[1]	117	541	6.9	818.7	818.7	819.5	0.8
M	14,034[1]	42	377	9.3	861.9	861.9	862.6	0.7
N	15,177[1]	157	464	7.6	881.4	881.4	882.3	0.9
O	15,882[1]	137	408	8.6	897.7	897.7	898.1	0.4
P	17,209[1]	76	317	11.1	925.2	925.2	925.3	0.1
Q	19,092[1]	63	317	10.3	959.7	959.7	960.3	0.6
R	19,795[1]	41	236	13.7	976.6	976.6	976.7	0.1
S	20,851[1]	36	221	14.0	1001.9	1001.9	1001.9	0.0

[1]Stream distance in feet above confluence with Wills Creek

[2]Elevation computed without consideration of backwater effects

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

BRADDOCK RUN

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Braddock Run (Continued)								
T	21,829[1]	46	245	12.8	1026.7	1026.7	1026.7	0.0
U	22,816[1]	86	317	9.7	1050.0	1050.0	1050.0	0.0
V	23,514[1]	50	260	10.7	1064.9	1064.9	1065.0	0.1
W	24,341[1]	51	231	12.0	1084.7	1084.7	1084.7	0.0
X	24,921[1]	30	206	13.4	1098.9	1098.9	1098.9	0.0
Y	26,437[1]	72	271	10.2	1138.4	1138.4	1138.4	0.0
Z	27,837[1]	120	430	6.5	1180.7	1180.7	1181.4	0.7
AA	29,309[1]	38	199	13.0	1216.8	1216.8	1217.0	0.2
AB	30,862[1]	45	232	11.2	1260.4	1260.4	1260.8	0.4
AC	32,138[1]	71	223	10.8	1303.6	1303.6	1303.6	0.1
AD	33,142[1]	30	175	13.8	1340.5	1340.5	1341.1	0.6
AE	34,982[1]	62	220	9.3	1402.8	1402.8	1403.8	1.0
AF	36,675[1]	39	196	10.4	1452.1	1452.1	1452.1	0.0
AG	37,763[1]	57	316	4.7	1481.8	1481.8	1482.5	0.7
AH	39,037[1]	22	115	12.9	1515.2	1515.2	1515.4	0.2
AI	39,877[1]	33	125	11.1	1541.7	1541.7	1541.7	0.0
AJ	40,823[1]	29	113	11.2	1568.8	1568.8	1568.8	0.0
AK	41,600[1]	46	122	9.0	1592.1	1592.1	1592.1	0.0

[1]Stream distance in feet above confluence with Wills Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

BRADDOCK RUN

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Butcher Run								
A	59[1]	19	110	8.8	1270.4	1270.4	1270.4	0.0
B	779[1]	36	99	9.5	1312.8	1312.8	1312.8	0.0
C	1,369[1]	38	103	9.1	1343.5	1343.5	1343.5	0.0
Dry Run								
A	2,729[2]	105	538	2.3	660.0	660.0	661.0	1.0
B	5,810[2]	40	225	5.2	699.3	699.3	700.3	1.0
C	6,877[2]	66	207	4.9	709.9	709.9	710.6	0.7
D	7,836[2]	58	245	4.2	721.4	721.4	722.4	1.0
E	8,799[2]	67	230	3.9	734.8	734.8	735.6	0.8
F	9,520[2]	43	106	8.2	742.5	742.5	742.5	0.0
G	10,891[2]	40	127	6.0	755.4	755.4	756.0	0.6
H	11,443[2]	20	99	6.7	762.3	762.3	763.1	0.8
I	12,175[2]	19	59	11.1	770.7	770.7	770.7	0.0
J	12,838[2]	95	222	3.0	780.4	780.4	781.3	0.9
K	13,423[2]	15	72	9.1	787.1	787.1	788.0	0.9
L	13,841[2]	19	75	8.8	793.3	793.3	793.6	0.3
M	14,802[2]	23	113	6.7	807.2	807.2	808.0	0.8
N	15,474[2]	17	41	5.1	821.3	821.3	821.5	0.2

[1]Stream distance in feet above confluence with Georges Creek

[2]Stream Distance in feet above confluence with Wills Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

BUTCHER RUN - DRY RUN

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Dry Run (Continued)								
O	16,328[1]	16	32	6.4	835.1	835.1	835.3	0.2
P	17,813[1]	24	21	3.8	858.2	858.2	858.4	0.2
Q	18,631[1]	15	25	3.2	876.5	876.5	877.0	0.5
R	19,047[1]	15	18	4.6	883.6	883.6	884.2	0.6
S	19,588[1]	15	16	5.0	895.4	895.4	895.6	0.2
T	20,360[1]	15	22	3.7	917.9	917.9	918.3	0.4
Evitts Creek								
A	8,782[2]	405	4,363	4.6	617.6	617.6	618.5	0.9
B	15,661[2]	440	5,475	3.6	631.7	631.7	632.6	0.9
C	20,278[2]	335	2,704	7.3	638.1	638.1	638.8	0.7
D	25,108[2]	410	5,556	3.5	652.7	652.7	653.3	0.6
E	32,327[2]	210	1,880	9.4	667.8	667.8	667.9	0.1
F	38,480[2]	380	4,817	3.6	688.0	688.0	688.1	0.1
G	44,546[2]	365	2,376	6.8	703.0	703.0	703.9	0.9
H	50,869[2]	250	1,732	9.2	740.5	740.5	740.5	0.0
I	53,053[2]	680	4,083	3.5	748.8	748.8	749.8	1.0
J	59,006[2]	520	2,996	4.5	782.6	782.6	783.6	1.0

[1]Stream distance in feet above confluence with Wills Creek

[2]Stream Distance in feet above confluence with North Branch Potomac River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

DRY RUN - EVITTS CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Flintstone Creek								
A	1,293[1]	190	958	8.9	770.7	770.7	770.7	0.0
B	2,967[1]	610	1,646	5.0	778.4	778.4	779.3	1.0
C	4,230[1]	63	958	8.7	795.5	795.5	796.5	1.0
D	7,659[1]	170	1,987	4.1	816.5	816.5	817.4	0.9
E	8,386[1]	185	1,158	6.7	824.0	824.0	824.0	0.0
F	9,404[1]	255	1,940	4.0	827.9	827.9	828.7	0.8
G	10,923[1]	210	1,055	7.3	837.0	837.0	837.9	0.9
H	12,466[1]	262	1,045	7.5	848.2	848.2	848.8	0.6
I	14,137[1]	165	1,009	7.3	861.2	861.2	861.4	0.2
J	15,392[1]	230	979	7.2	873.2	873.2	873.2	0.0
K	16,868[1]	140	801	8.6	892.9	892.9	893.4	0.5
L	18,056[1]	85	660	10.5	909.8	909.8	910.4	0.6
M	18,642[1]	72	504	13.7	916.5	916.5	916.6	0.1
N	19,178[1]	128	1,161	6.0	930.6	930.6	931.2	0.6
O	20,876[1]	60	548	12.5	942.1	942.1	943.0	0.9

[1]Stream distance in feet above confluence with Town Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

FLINTSTONE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Georges Creek								
A	767[1]	209	820	10.7	917.8	917.8	918.0	0.2
B	2,856[1]	146	1,123	7.7	949.0	949.0	949.4	0.4
C	3,588[1]	90	622	13.8	954.3	954.3	954.4	0.1
D	4,400[1]	60	560	15.3	966.3	966.3	966.3	0.0
E	5,988[1]	80	616	13.9	990.3	990.3	990.3	0.0
F	7,265[1]	86	605	14.2	1006.6	1006.6	1006.9	0.3
G	8,091[1]	106	853	10.1	1017.8	1017.8	1017.9	0.1
H	9,215[1]	80	569	12.3	1032.9	1032.9	1033.6	0.7
I	10,211[1]	68	508	13.8	1047.0	1047.0	1047.3	0.3
J	11,565[1]	151	660	10.6	1065.6	1065.6	1065.7	0.1
K	12,948[1]	127	669	10.5	1084.9	1084.9	1085.0	0.1
L	13,948[1]	97	627	11.2	1096.4	1096.4	1096.6	0.2
M	14,940[1]	180	747	9.4	1112.6	1112.6	1112.6	0.0
N	16,227[1]	138	684	10.3	1129.6	1129.6	1129.6	0.0
O	17,614[1]	80	620	11.3	1145.0	1145.0	1145.8	0.8
P	18,523[1]	134	670	10.5	1157.3	1157.3	1157.3	0.0
Q	19,666[1]	78	528	13.3	1170.2	1170.2	1170.5	0.3
R	21,216[1]	69	543	12.8	1189.2	1189.2	1189.6	0.4

[1]Stream distance in feet above confluence with North Branch Potomac River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

GEORGES CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Georges Creek (Continued)								
S	21,927[1]	93	882	7.9	1200.3	1200.3	1200.3	0.0
T	22,986[1]	116	600	11.6	1214.8	1214.8	1214.8	0.0
U	24,083[1]	95	573	11.9	1230.0	1230.0	1230.2	0.2
V	25,445[1]	147	636	10.7	1249.0	1249.0	1249.1	0.1
W	26,539[1]	85	574	11.9	1259.3	1259.3	1259.4	0.1
X	31,144[1]	66	456	14.1	1317.3	1317.3	1317.5	0.2
Y	32,091[1]	100	678	9.5	1333.3	1333.3	1333.4	0.1
Z	32,730[1]	110	536	12.0	1341.5	1341.5	1341.6	0.1
AA	33,872[1]	68	507	12.7	1354.4	1354.4	1354.7	0.3
AB	35,966[1]	173	687	9.4	1384.6	1384.6	1384.6	0.0
AC	36,640[1]	62	487	13.2	1394.1	1394.1	1394.1	0.0
AD	38,207[1]	108	515	12.5	1414.9	1414.9	1414.9	0.0
AE	40,218[1]	165	509	12.6	1442.5	1442.5	1442.5	0.0
AF	44,101[1]	63	571	10.8	1487.2	1487.2	1487.9	0.7
AG	44,804[1]	64	422	14.6	1496.7	1496.7	1496.7	0.0
AH	50,198[1]	201	811	7.1	1569.4	1569.4	1569.8	0.4
AI	51,501[1]	85	578	9.9	1583.9	1583.9	1584.0	0.1

[1]Stream distance in feet above confluence with North Branch Potomac River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

GEORGES CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Georges Creek (Continued)								
AJ	52,507[1]	71	437	13.1	1593.2	1593.2	1593.2	0.0
AK	54,362[1]	95	585	9.8	1612.3	1612.3	1613.2	0.9
AL	56,247[1]	156	926	6.2	1631.9	1631.9	1632.3	0.4
AM	58,264[1]	132	582	9.8	1649.5	1649.5	1650.2	0.7
AN	59,359[1]	67	567	9.6	1662.8	1662.8	1663.7	0.9
AO	60,790[1]	151	597	9.1	1676.2	1676.2	1676.2	0.0
AP	63,245[1]	207	1,296	3.7	1701.2	1701.2	1701.5	0.3
AQ	63,990[1]	226	976	4.9	1703.4	1703.4	1703.7	0.3
AR	65,876[1]	45	466	8.9	1716.0	1716.0	1716.8	0.8
AS	66,977[1]	176	1,043	4.0	1719.2	1719.2	1719.7	0.5
AT	79,509[1]	216	993	3.3	1770.8	1770.8	1771.1	0.3
AU	80,252[1]	278	618	5.4	1775.3	1775.3	1775.6	0.3
AV	83,553[1]	157	882	3.8	1824.8	1824.8	1825.0	0.2
AW	84,579[1]	174	1,090	3.0	1835.2	1835.2	1835.5	0.3
AX	86,793[1]	59	197	2.8	1857.5	1857.5	1857.7	0.2
AY	88,148[1]	39	125	4.4	1863.5	1863.5	1863.8	0.5
AZ	88,838[1]	48	121	4.4	1869.1	1869.1	1869.6	0.5

[1]Stream distance in feet above confluence with North Branch Potomac River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

GEORGES CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Georges Creek (Continued)								
BA	89,512[1]	32	73	7.2	1873.8	1873.8	1873.8	0.0
BB	90,391[1]	25	92	5.7	1882.6	1882.6	1882.8	0.2
BC	91,161[1]	33	171	2.0	1888.7	1888.7	1889.5	0.8
BD	91,722[1]	34	91	3.8	1892.8	1892.8	1893.4	0.6
BE	92,922[1]	43	87	4.0	1911.2	1911.2	1911.4	0.2
Hill Run								
A	381[2]	33	90	9.5	1550.7	1550.7	1550.7	0.0
B	705[2]	26	84	10.2	1571.0	1571.0	1571.0	0.0
C	1,317[2]	29	84	10.1	1600.6	1600.6	1600.6	0.0
D	2,383[2]	34	92	9.3	1649.4	1649.4	1649.4	0.0
E	3,557[2]	31	10	9.3	1699.3	1699.3	1699.3	0.0

[1]Stream distance in feet above confluence with Potomac River

[2]Stream distance in feet above confluence with Georges Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

GEORGES CREEK - HILL RUN

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Jackson Run								
A	1,698[1]	29	204	11.0	1500.4	1500.4	1500.8	0.4
B	2,286[1]	21	162	8.8	1524.2	1524.2	1524.4	0.2
C	3,612[1]	38	138	10.4	1582.7	1582.7	1582.7	0.0
D	5,099[1]	18	77	11.8	1649.1	1649.1	1649.4	0.3
E	6,840[1]	34	98	9.3	1730.5	1730.5	1730.5	0.0
Jennings Run								
A	614[2]	105	1,110	8.3	715.8	712.4[3]	713.0	0.5
B	1,777[2]	180	824	11.2	724.5	724.5	724.6	0.1
C	2,215[2]	160	911	10.1	730.4	730.4	731.4	1.0
D	3,549[2]	180	848	10.6	750.5	750.5	750.5	0.0
E	4,598[2]	70	627	14.3	763.9	763.9	764.2	0.3
F	6,095[2]	110	778	11.2	786.6	786.6	786.7	0.1
G	6,789[2]	160	972	8.9	797.0	797.0	797.8	0.8
H	7,582[2]	125	817	10.4	808.6	808.6	808.7	0.1
I	17,930[2]	55	382	13.4	975.9	975.9	975.9	0.0
J	18,621[2]	191	489	10.5	986.8	986.8	986.8	0.0
K	19,207[2]	105	464	11.0	997.4	997.4	998.3	0.9

[1]Stream distance in feet above confluence with Georges Creek
[2]Stream distance in feet above confluence with Wills Creek
[3]Elevation computed without consideration of backwater effects

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

JACKSON RUN - JENNINGS RUN

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Jennings Run (Continued)								
L	20,226[2]	277	620	8.3	1019.1	1019.1	1019.1	0.0
M	21,112[2]	290	718	5.8	1035.7	1035.7	1035.7	0.0
N	22,107[2]	58	317	13.1	1052.3	1052.3	1052.3	0.0
O	22,705[2]	250	586	7.1	1066.6	1066.6	1066.6	0.0
P	23,987[2]	135	495	8.4	1093.3	1093.3	1094.2	0.9
Q	24,708[2]	40	263	14.5	1104.4	1104.4	1104.5	0.1
R	25,264[2]	60	299	12.8	1117.4	1117.4	1117.4	0.0
S	26,403[2]	86	559	8.4	1138.9	1138.9	1138.9	0.0
T	27,028[2]	63	309	12.4	1151.0	1151.0	1151.0	0.0
U	27,685[2]	235	721	5.3	1164.7	1164.7	1165.5	0.8
V	28,369[2]	95	352	10.5	1178.7	1178.7	1178.7	0.0
W	28,839[2]	70	322	11.5	1188.4	1188.4	1188.4	0.0
X	29,277[2]	51	308	12.0	1197.6	1197.6	1198.1	0.5
Y	29,751[2]	48	475	7.8	1209.4	1209.4	1209.4	0.0
Z	31,805[2]	39	187	12.3	1260.3	1260.3	1260.3	0.0
AA	32,684[2]	48	226	10.2	1284.5	1284.5	1284.6	0.1
AB	33,826[2]	44	185	11.5	1312.8	1312.8	1313.5	0.7
AC	35,069[2]	41	181	11.8	1350.7	1350.7	1351.0	0.3

[1]Stream distance in feet above confluence with Wills Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

JENNINGS RUN

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Jennings Run (Continued)								
AD	37,193[1]	48	164	10.5	1410.6	1410.6	1410.6	0.0
AE	37,658[1]	39	151	11.4	1425.6	1425.6	1425.6	0.0
AF	38,352[1]	95	319	5.4	1445.1	1445.1	1445.8	0.7
AG	39,827[1]	110	225	7.6	1465.5	1465.5	1465.5	0.0
Koontz Run								
A	607[2]	71	201	7.0	1524.1	1524.1	1524.2	0.1
B	1,603[2]	24	112	12.5	1564.8	1564.8	1564.8	0.0
C	1,950[2]	33	126	11.2	1577.1	1577.1	1577.1	0.0
D	2,449[2]	32	125	11.2	1598.5	1598.5	1598.5	0.0
E	3,004[2]	36	126	10.6	1622.7	1622.7	1622.8	0.1
F	4,049[2]	40	213	6.2	1663.5	1663.5	1664.2	0.7
G	5,167[2]	36	117	10.4	1712.2	1712.2	1712.2	0.0
H	6,311[2]	67	147	8.1	1776.1	1776.1	1776.1	0.0

[1]Stream distance in feet above confluence with Wills Creek

[2]Stream distance in feet above confluence with Georges Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

JENNINGS RUN - KOONTZ RUN

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Neff Run								
A	804[1]	45	183	10.7	1711.8	1711.8	1711.8	0.0
B	1,814[1]	29	166	11.8	1734.1	1734.1	1734.2	0.1
C	2,858[1]	23	123	12.4	1756.9	1756.9	1757.2	0.3
D	3,862[1]	33	132	10.9	1778.3	1778.3	1778.3	0.0
E	4,544[1]	57	177	8.1	1793.0	1793.0	1793.1	0.1
F	5,413[1]	65	186	7.8	1812.2	1812.2	1812.2	0.0
North Branch								
A	229[2]	103	8	7.6	974.4	973.2[3]	973.2	0.0
B	706[2]	44	297	11.5	984.6	984.6	984.6	0.0
C	1,396[2]	64	283	12.1	997.1	997.1	997.1	0.0
D	2,413[2]	30	234	14.6	1020.3	1020.3	1021.2	0.9
E	3,395[2]	88	396	8.4	1045.9	1045.9	1046.2	0.3
F	4,619[2]	31	221	15.0	1070.6	1070.6	1070.9	0.3

[1]Stream distance in feet above confluence with Georges Creek
[2]Stream distance in feet above confluence with Jennings Run
[3]Elevation computed without consideration of backwater effects

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

NEFF RUN - NORTH BRANCH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Sand Spring Run								
A	3,656[1]	34	112	10.3	1877.1	1877.1	1877.5	0.4
B	4,507[1]	22	99	11.6	1894.4	1894.4	1894.6	0.2
C	5,152[1]	35	115	10.0	1907.6	1907.6	1907.7	0.1
D	5,620[1]	31	109	10.5	1919.1	1919.1	1919.1	0.1
E	6,558[1]	22	112	9.2	1945.9	1945.9	1946.2	0.3
F	7,273[1]	21	88	11.7	1967.1	1967.1	1967.5	0.4
G	7,768[1]	40	117	8.8	1984.1	1984.1	1984.1	0.1
H	8,254[1]	34	203	5.1	1998.4	1998.4	1998.4	0.1
I	8,840[1]	17	71	8.1	2017.3	2017.3	2018.2	0.8
J	9,338[1]	22	57	8.9	2039.0	2039.0	2039.1	0.1
K	10,110[1]	32	66	7.7	2067.2	2067.2	2067.2	0.0
L	10,770[1]	38	72	7.0	2091.5	2091.5	2091.5	0.0
M	11,176[1]	14	27	4.3	2108.5	2108.5	2108.7	0.2
N	11,617[1]	51	31	3.7	2126.3	2126.3	2126.3	0.0
Warrior Run								
A	2,592[2]	280	634	4.4	656.4	656.4	657.3	0.9
B	4,525[2]	135	594	4.6	689.2	689.2	689.7	0.5

[1]Stream distance in feet above confluence with Georges Creek

[2]Stream distance in feet above confluence with North Branch Potomac River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

SAND SPRING RUN - WARRIOR RUN

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Warrior Run (continued)								
C	5,028[1]	125	816	3.4	700.0	700.0	700.8	0.8
D	5,592[1]	69	782	6.0	711.6	711.6	712.5	0.9
E	6,916[1]	45	237	11.7	730.4	730.4	730.9	0.5
F	7,777[1]	65	465	5.7	743.9	743.9	744.9	1.0
Willow Brook								
A	5,922[2]	20	90	2.6	694.4	694.4	695.4	1.0
B	6,624[2]	67	240	1.0	707.4	707.4	707.4	0.0
C	7,845[2]	73	249	0.7	734.4	734.4	734.4	0.0
D	8,206[2]	77	367	0.5	743.6	743.6	743.6	0.0
E	8,817[2]	57	270	0.1	754.4	754.4	754.4	0.0
F	10,025[2]	12	6	4.1	773.7	773.7	773.9	0.2
G	11,196[2]	22	60	0.4	799.7	799.7	799.9	0.2
H	12,672[2]	12	6	4.1	834.2	834.2	834.2	0.0
I	13,424[2]	33	16	1.6	855.5	855.5	855.5	0.0

[1]Stream distance in feet above confluence with North Branch Potomac River

[2]Stream Distance in feet above confluence with Evitts Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

WARRIOR RUN - WILLOW BROOK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Wills Creek								
A	644[1]	152	2,163	20.0	612.2	610.9[2]	610.9	0.0
B	1408[1]	97	1,778	24.3	615.3	615.3	615.3	0.0
C	2,107[1]	118	2,741	15.7	624.4	624.4	624.4	0.0
D	3,267[1]	155	3,355	12.9	626.7	626.7	626.7	0.0
E	5,006[1]	130	1,943	21.9	628.4	628.4	628.4	0.0
F	6,022[1]	135	1,993	21.4	632.6	632.6	632.6	0.0
G	7,624[1]	137	1,972	21.6	641.4	641.4	641.4	0.0
H	8,408[1]	178	3,337	12.8	652.2	652.2	652.2	0.0
I	10,961[1]	200	3,524	12.1	662.0	662.0	662.2	0.2
J	12,221[1]	370	5,052	8.4	666.5	666.5	666.8	0.3
K	14,702[1]	425	5,178	7.7	673.7	673.7	674.6	0.9
L	16,003[1]	948	8,809	4.5	677.1	677.1	677.9	0.8
M	17,476[1]	813	5,308	7.5	681.2	681.2	682.2	1.0
N	19,413[1]	965	7,076	5.6	691.7	691.7	691.9	0.2
O	21,530[1]	660	7,091	6.2	702.8	702.8	702.8	0.0
P	24,773[1]	687	10,760	3.2	717.5	717.5	717.7	0.2
Q	29,538[1]	875	14,039	2.4	722.2	722.2	722.7	0.5
R	33,774[1]	551	6,767	5.0	729.6	729.6	730.3	0.7
S	35,020[1]	1,130	9,850	3.4	732.4	732.4	732.8	0.4

[1]Stream distance in feet above confluence with North Branch Potomac River

[2]Elevation computed without consideration of backwater effects

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

WILLS CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Winchester Road Creek								
A	105[1]	110	550	4.9	746.3	746.3	747.0	0.7
B	593[1]	55	298	4.6	753.2	753.2	753.8	0.6
C	1,308[1]	48	251	5.4	767.8	767.8	768.0	0.2
D	2,276[1]	130	342	3.5	785.5	785.5	785.9	0.4
E	2,923[1]	55	288	4.2	800.3	800.3	800.3	0.0
F	3,620[1]	62	310	3.9	817.0	817.0	817.5	0.5
G	4,699[1]	90	655	1.8	841.0	841.0	841.9	0.9
H	7,585[1]	25	138	5.0	919.2	919.2	919.2	0.0
I	9,335[1]	26	72	7.6	976.3	976.3	976.5	0.2
J	10,695[1]	23	62	8.8	1022.7	1022.7	1023.2	0.5

[1]Stream distance in feet above confluence with Warrior Run

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD AND INCORPORATED AREAS

FLOODWAY DATA

WINCHESTER ROAD CREEK

A floodway has not been computed for the Potomac River or the North Branch Potomac River Along streams where floodways have not been computed, the community must ensure that the cumulative effect of development in the floodplains will not cause more than a 1.0-foot increase in the BFEs at any point within the community.

The area between the floodway and the 1-percent annual chance floodplain boundaries is termed the floodway fringe. The floodway fringe thus encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent annual chance flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1, "Floodway Schematic".

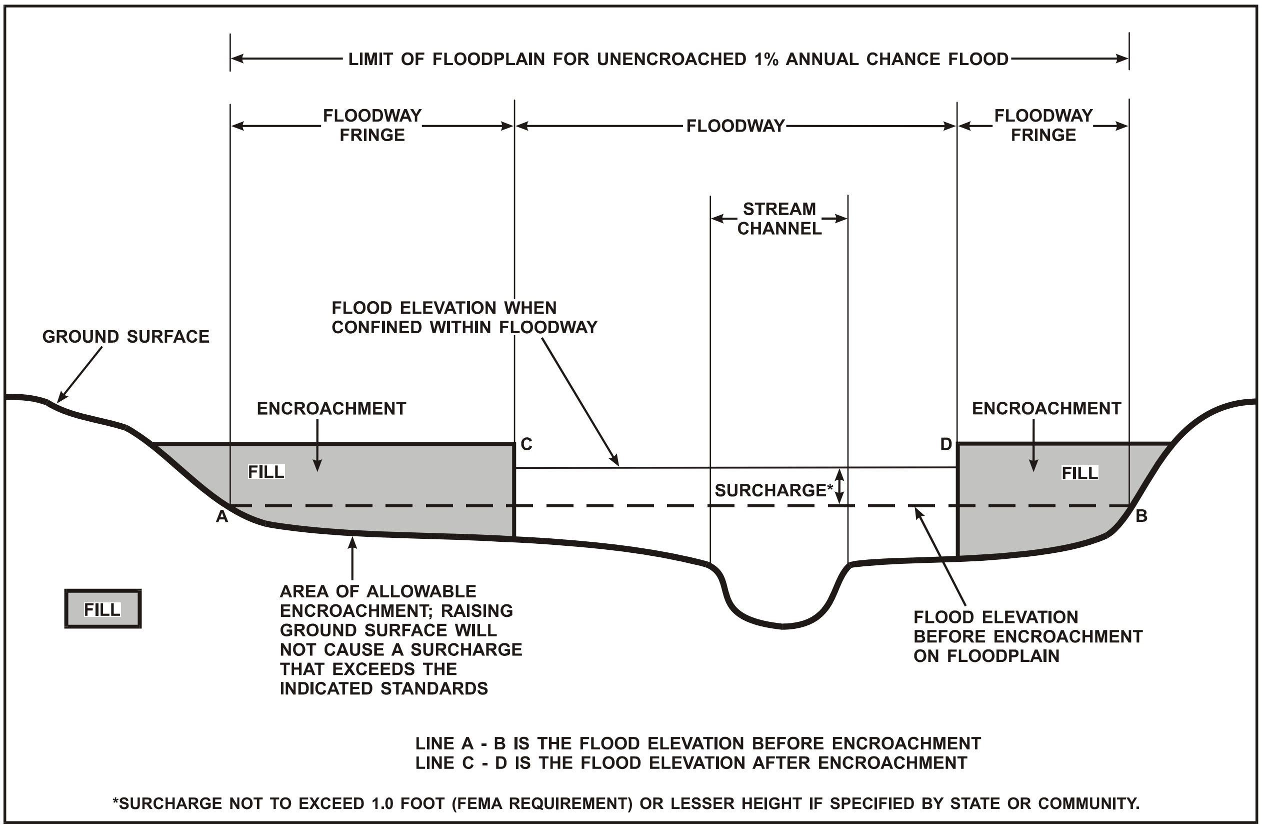


Figure 1 – Floodway Schematic

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 risk zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no Base Flood Elevations (BFEs) or base flood depths are shown within this zone.

Zone AE:

Zone AE is the flood insurance risk zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS by detailed methods. In most instances, 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. The current FIRM presents flooding information for the entire geographic area of Washington County.

For flood insurance applications, the map designates flood insurance risk 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 current FIRM presents flooding information for the entire geographic area of Allegany County. Previously, separate Flood Hazard Boundary Maps and/or FIRMs were prepared for each incorporated community with identified flood hazard areas and the unincorporated areas of the county. Historical map dates relating to pre-countywide maps prepared for each community are presented in Table 7, “Community Map History”.

COMMUNITY NAME	INITIAL NFIP MAP DATE	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	INITIAL FIRM DATE	FIRM REVISIONS DATE
Allegany County (Unincorporated Areas)	February 7, 1975	None	February 18, 1981	September 30, 1983 September 29, 1989
Barton, Town of	February 13, 1976	None	September 28, 1979	
Cumberland, City of	July 26, 1974	February 27, 1976	September 1, 1978	September 1, 1983
Frostburg, City of	September 20, 1974	January 30, 1976	December 18, 1979	
Lonaconing, Town of	September 20, 1974	January 30, 1976	September 28, 1979	
Luke, Town of	July 18, 1975	None	August 1, 1980	January 29, 1982 August 15, 1983
Midland, Town of	August 9, 1974	February 20, 1976	August 15, 1979	
Westernport, City of	February 1, 1974	February 20, 1976	July 16, 1979	January 14, 1983

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

This is a multi-volume FIS. Each volume may be revised separately, in which case it supersedes the previously printed volume. Users should refer to the Table of Contents in Volume 1 for the current date of each volume; volumes bearing these dates contain the most up-to-date flood hazard data.

Information pertaining to revised and unrevised flood hazards for each jurisdiction within Allegany County has been complied into this FIS. Therefore, this FIS supersedes all previously printed FIS reports, FIRMs, and FBFMs for all of the incorporated and unincorporated jurisdictions within Allegany County.

This study was completed in coordination with the effective or in-progress studies in the adjacent communities of Washington County, MD (and Incorporated Areas), Garrett County, MD (and Incorporated Areas), Morgan County, WV (and Incorporated Areas), Hampshire County, WV (and Incorporated Areas), Mineral County, WV (and Incorporated Areas), Franklin County, PA (all Jurisdictions), Bedford County, PA (all Jurisdictions) and Fulton County, PA (all Jurisdictions).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Flood Insurance and Mitigation Division, Federal Emergency Management Agency, One Independence Mall, 6th floor, 615 Chestnut Street, Philadelphia, PA 19106-4404.

9.0 BIBLIOGRAPHY AND REFERENCES

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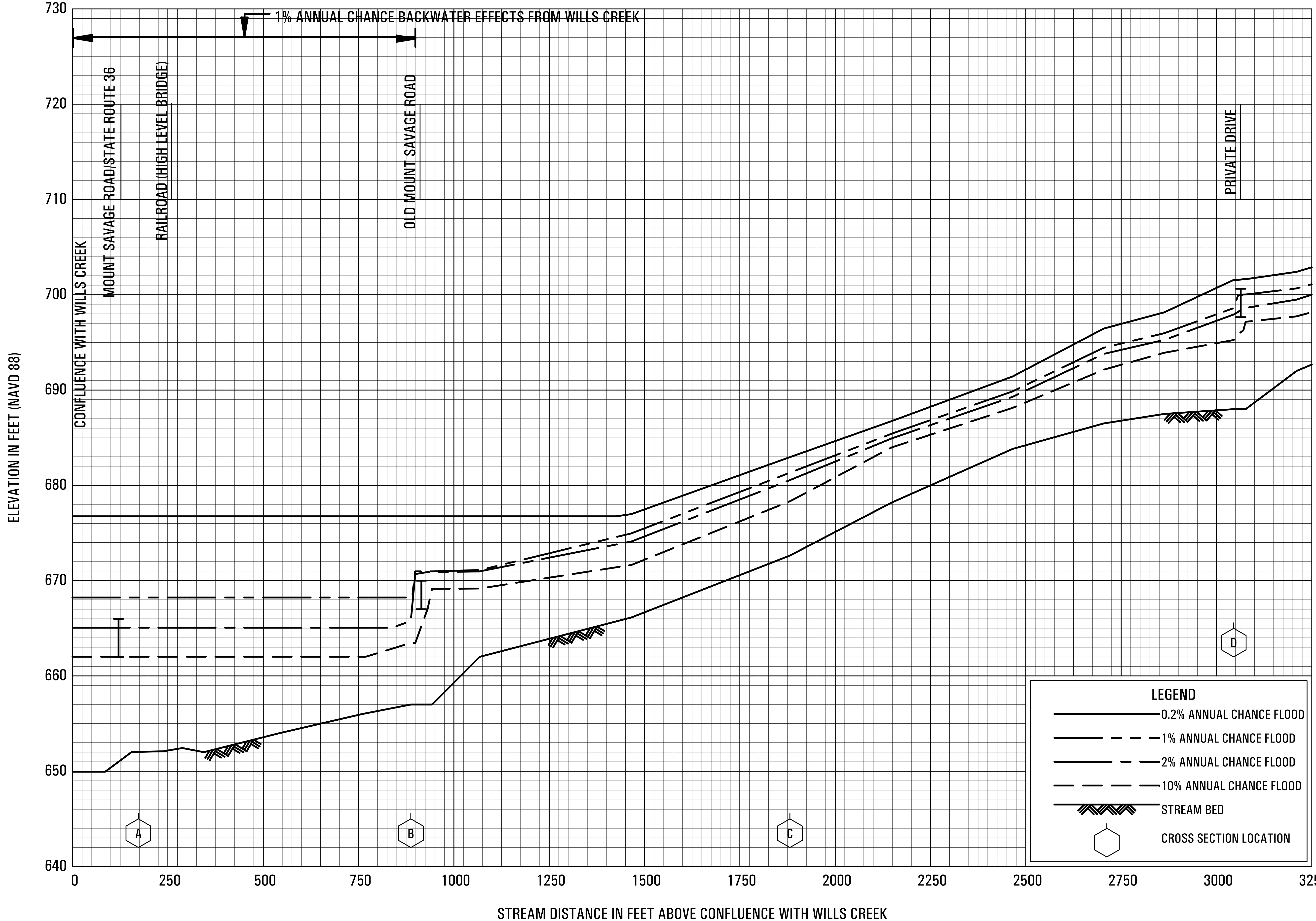

FLOOD PROFILES

BRADDOCK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS

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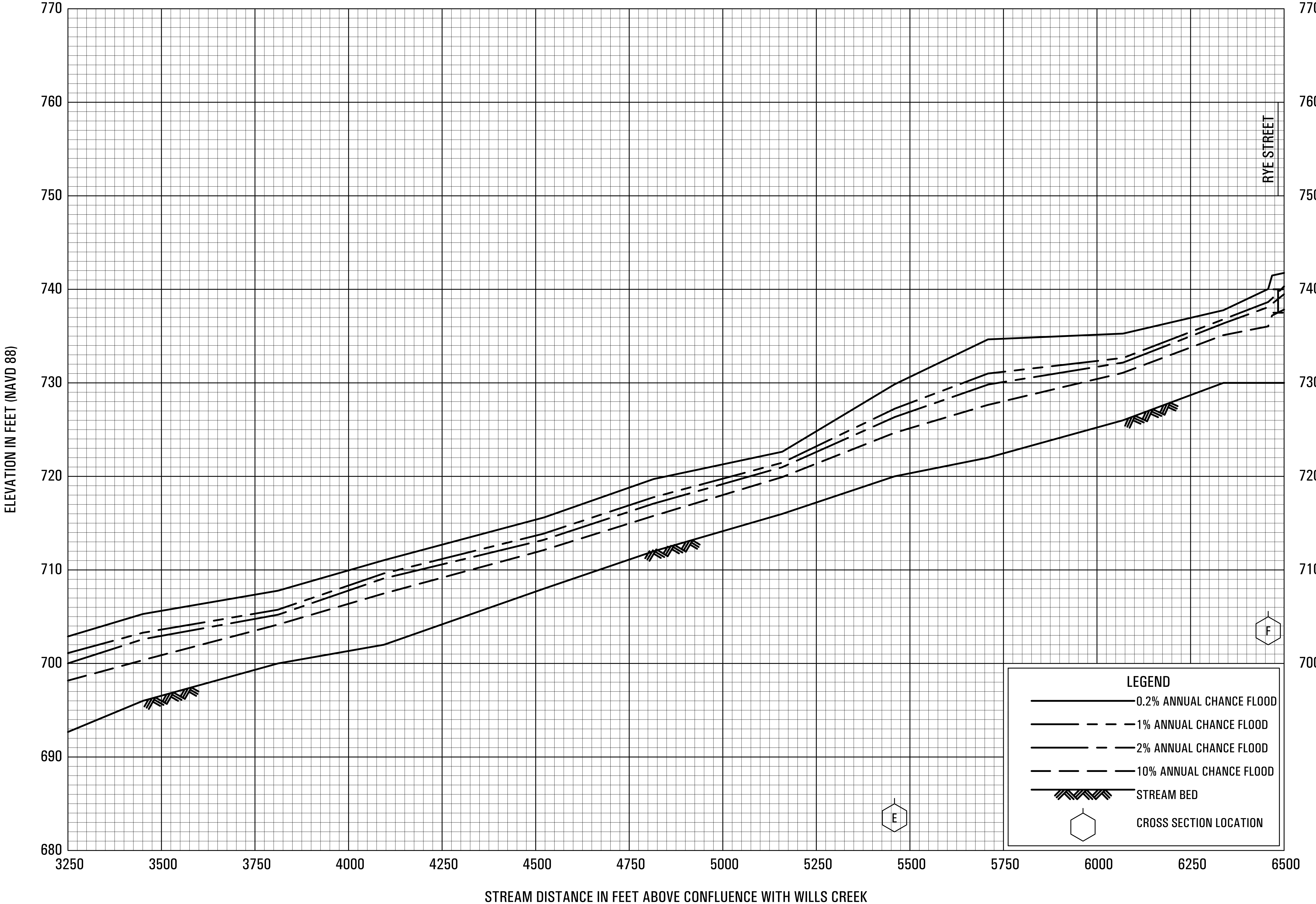

FLOOD PROFILES

BRADDOCK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS

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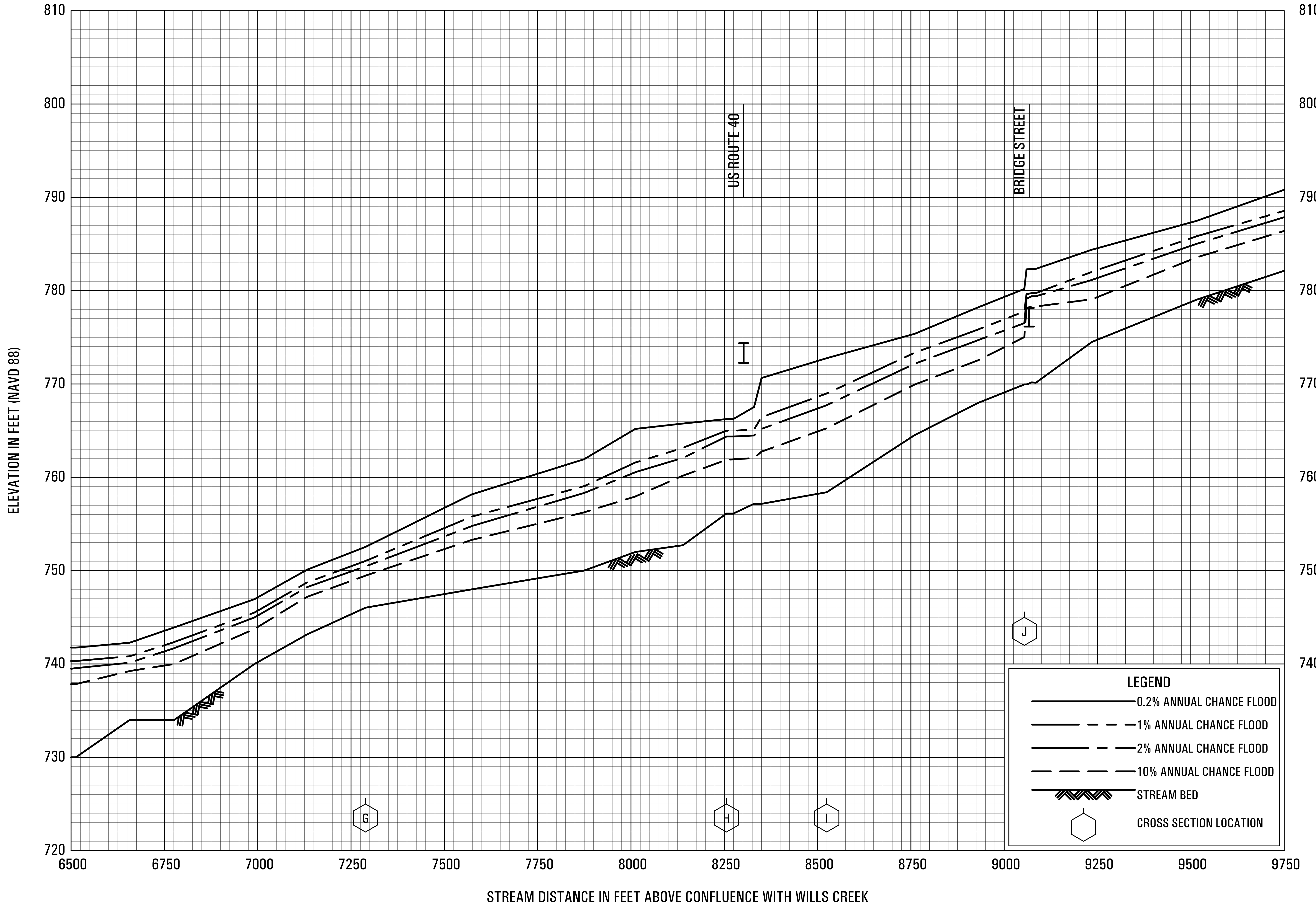


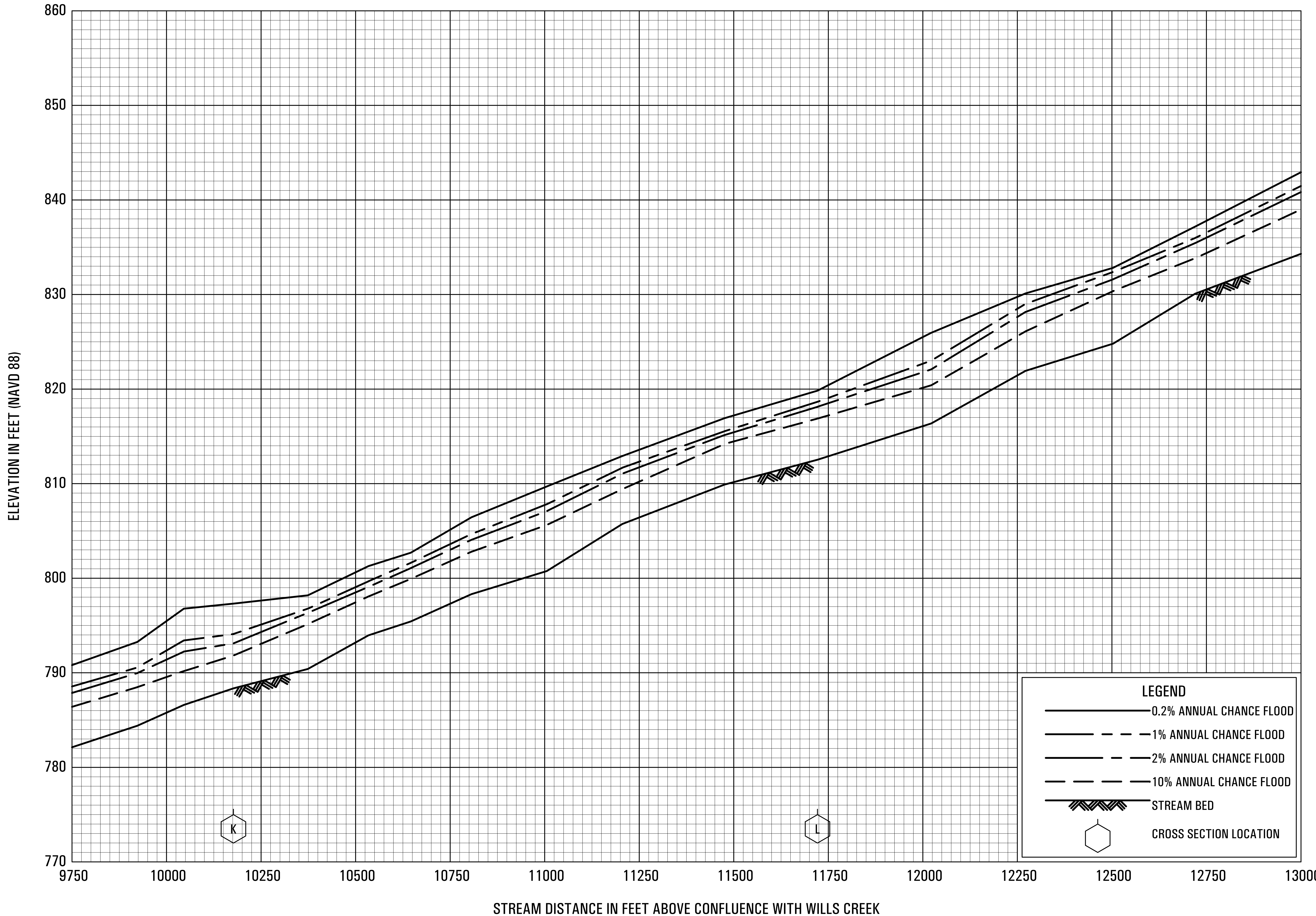
FLOOD PROFILES

BRADDOCK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



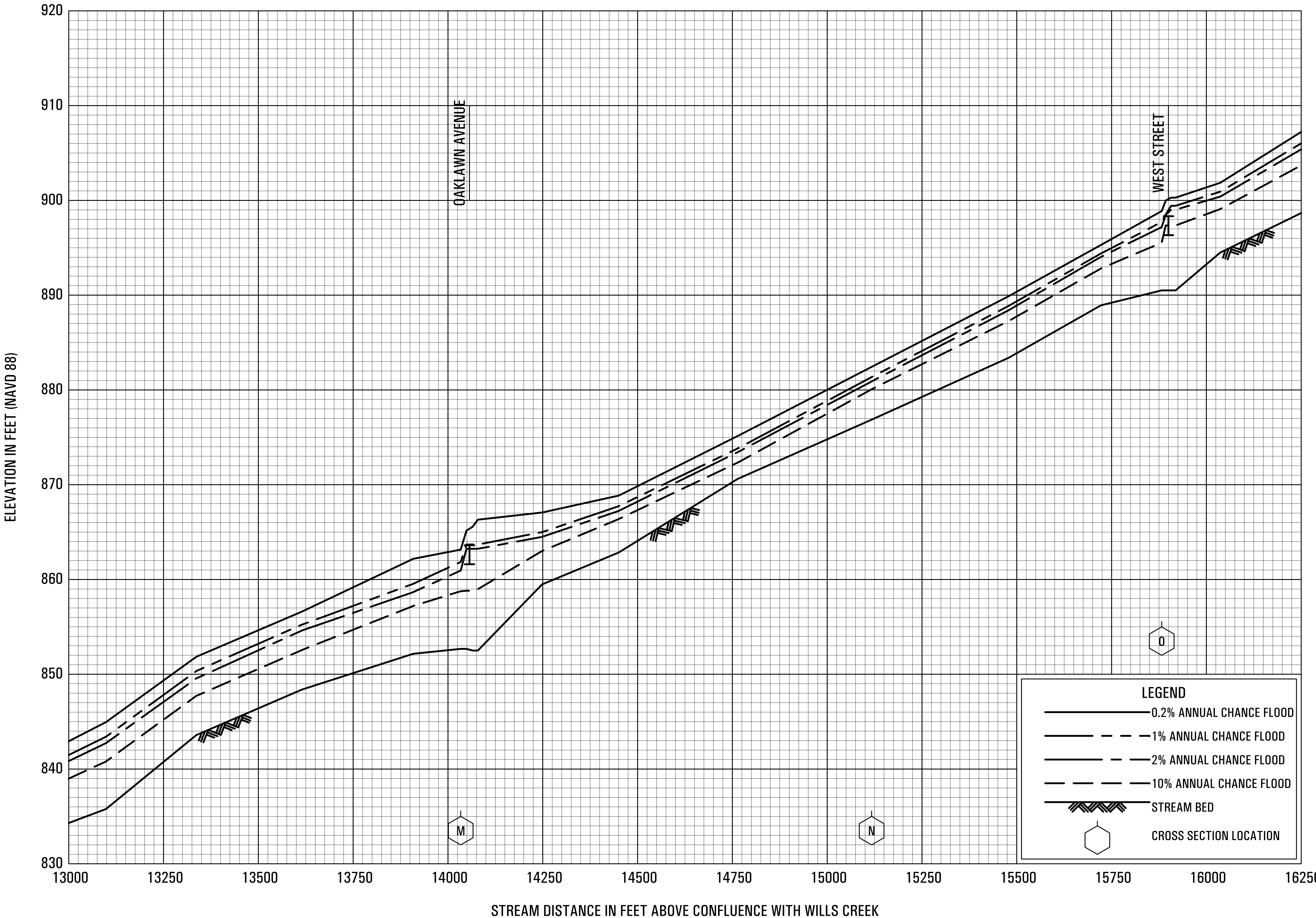
FLOOD PROFILES

BRADDOCK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



FLOOD PROFILES

BRADDOCK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS

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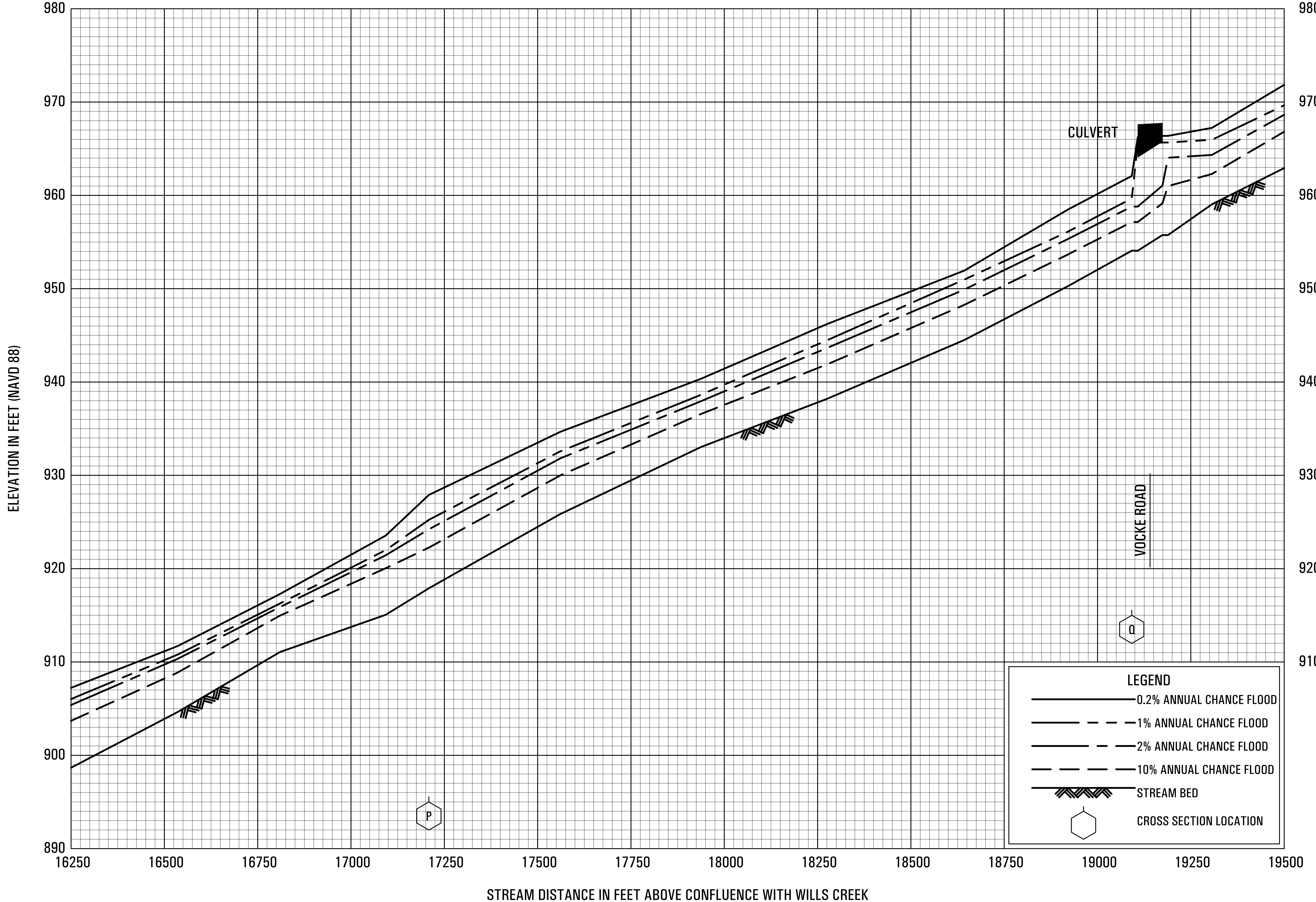

FLOOD PROFILES

BRADDOCK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS

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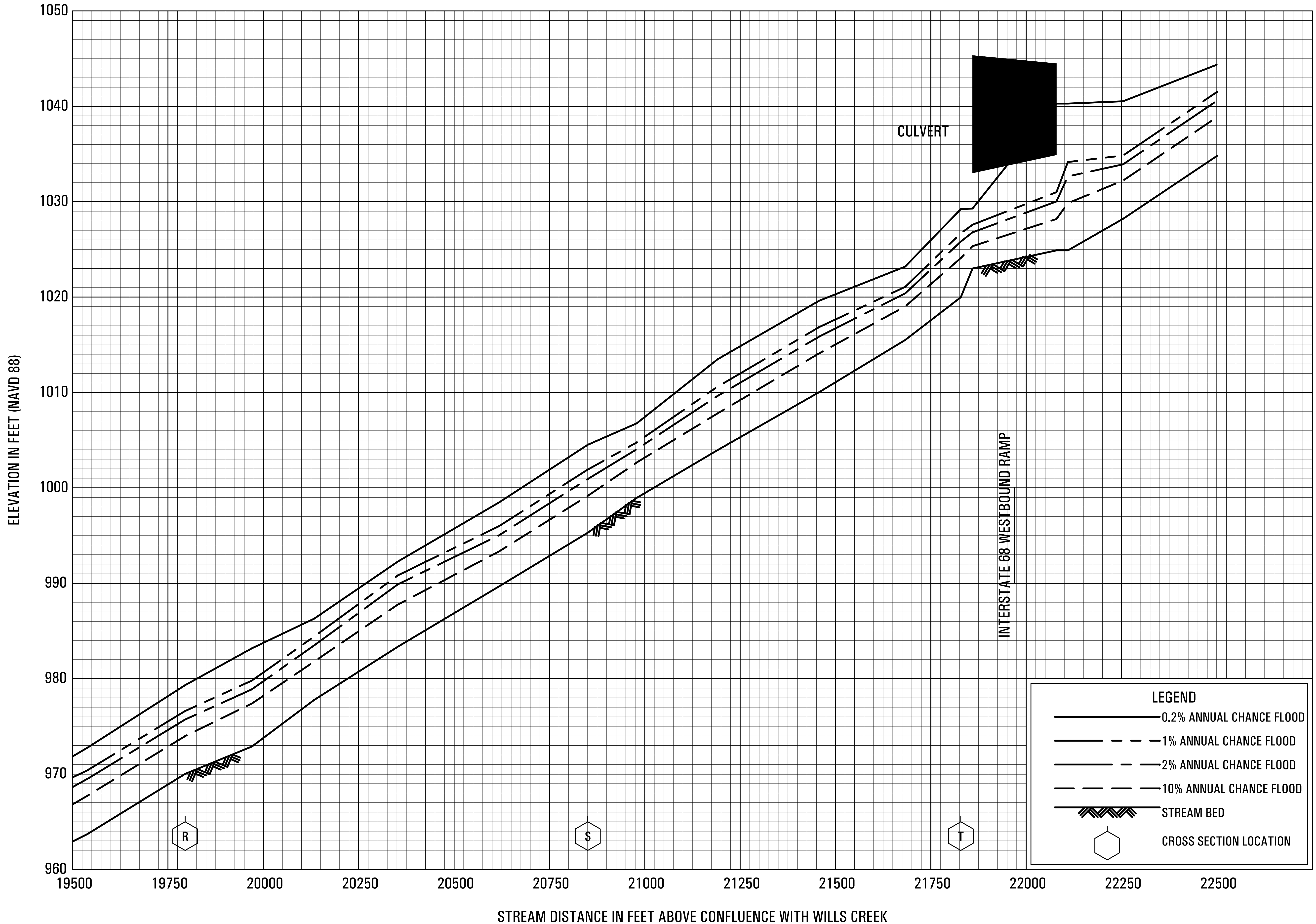

FLOOD PROFILES

BRADDOCK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS

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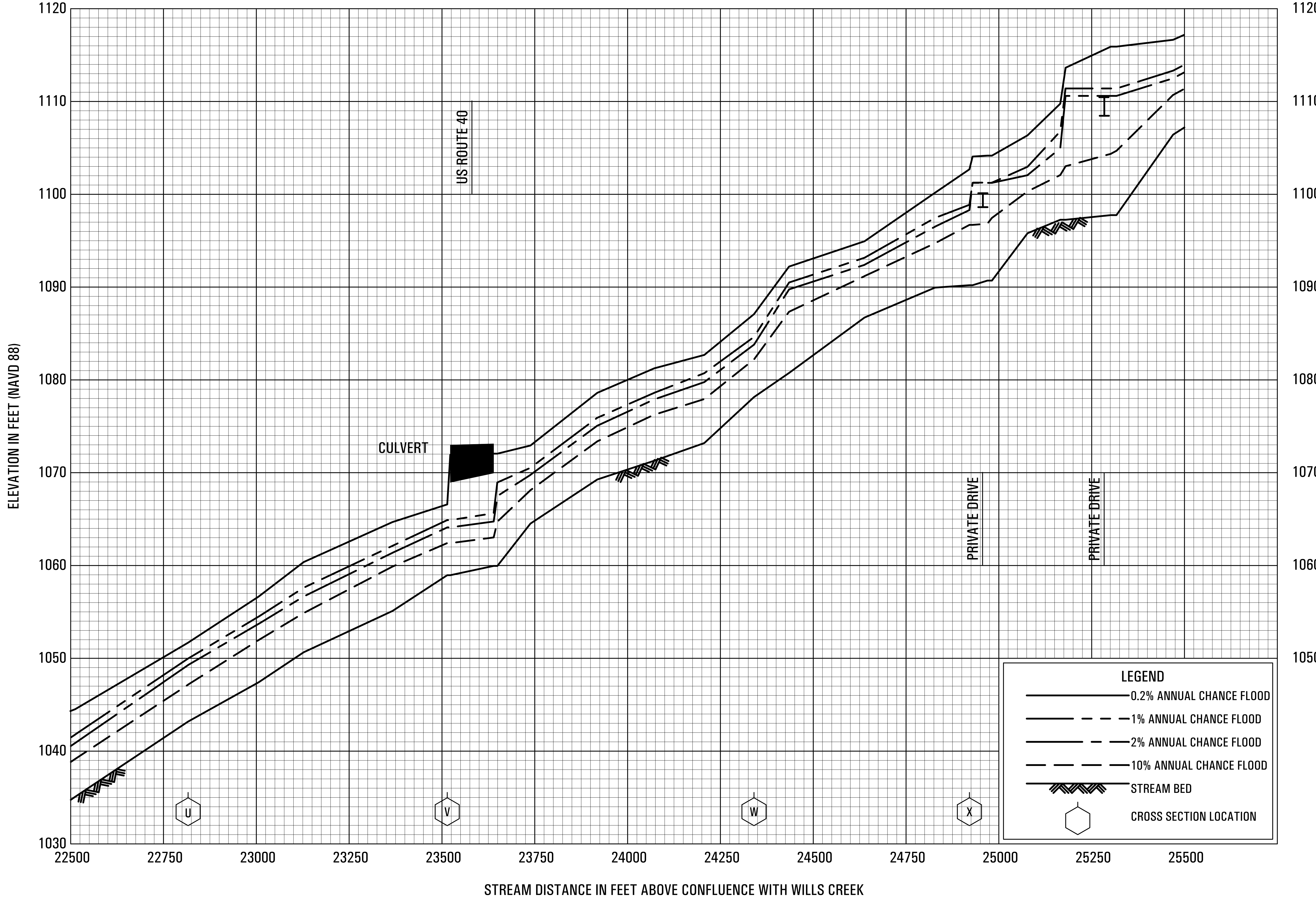


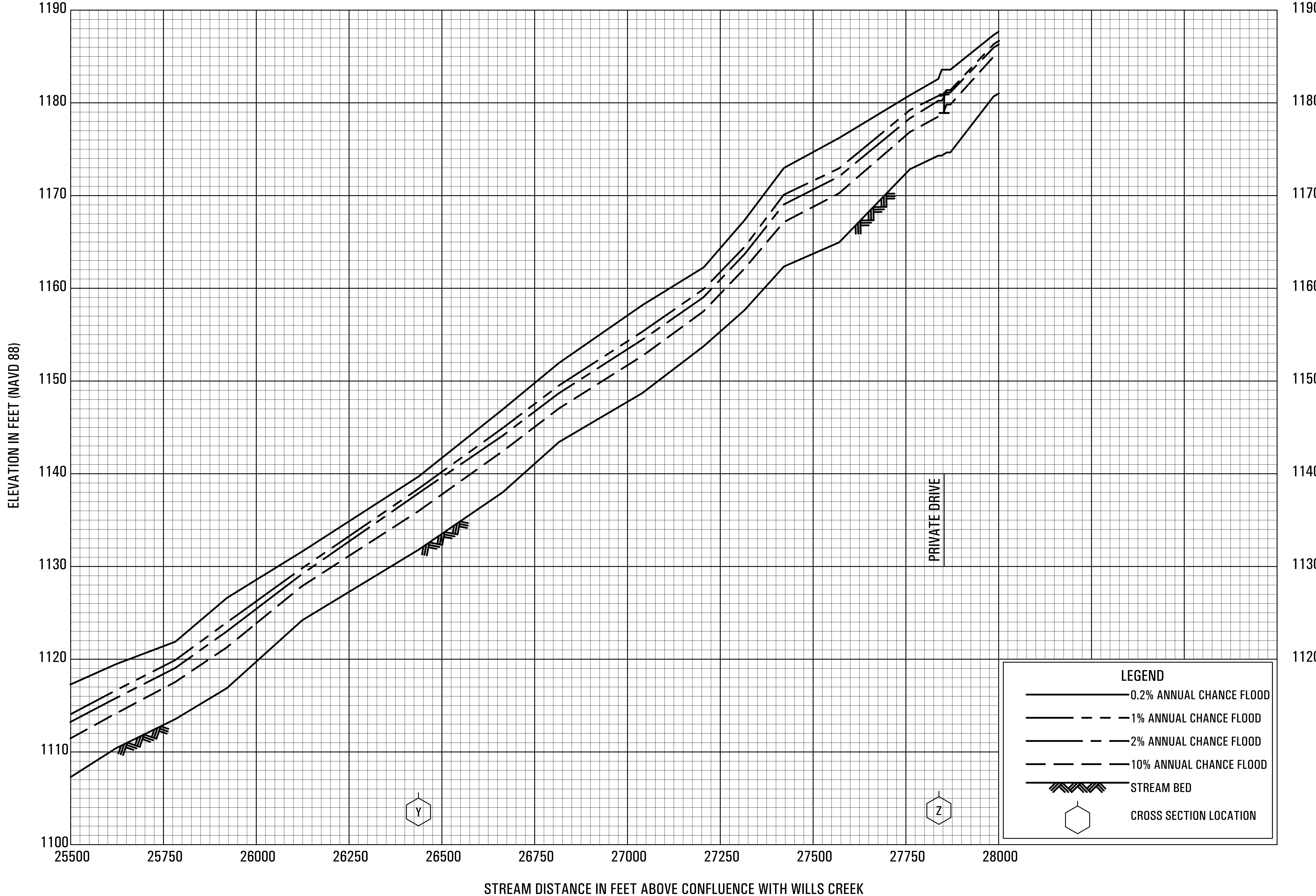
FLOOD PROFILES

BRADDOCK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



FLOOD PROFILES

BRADDOCK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS

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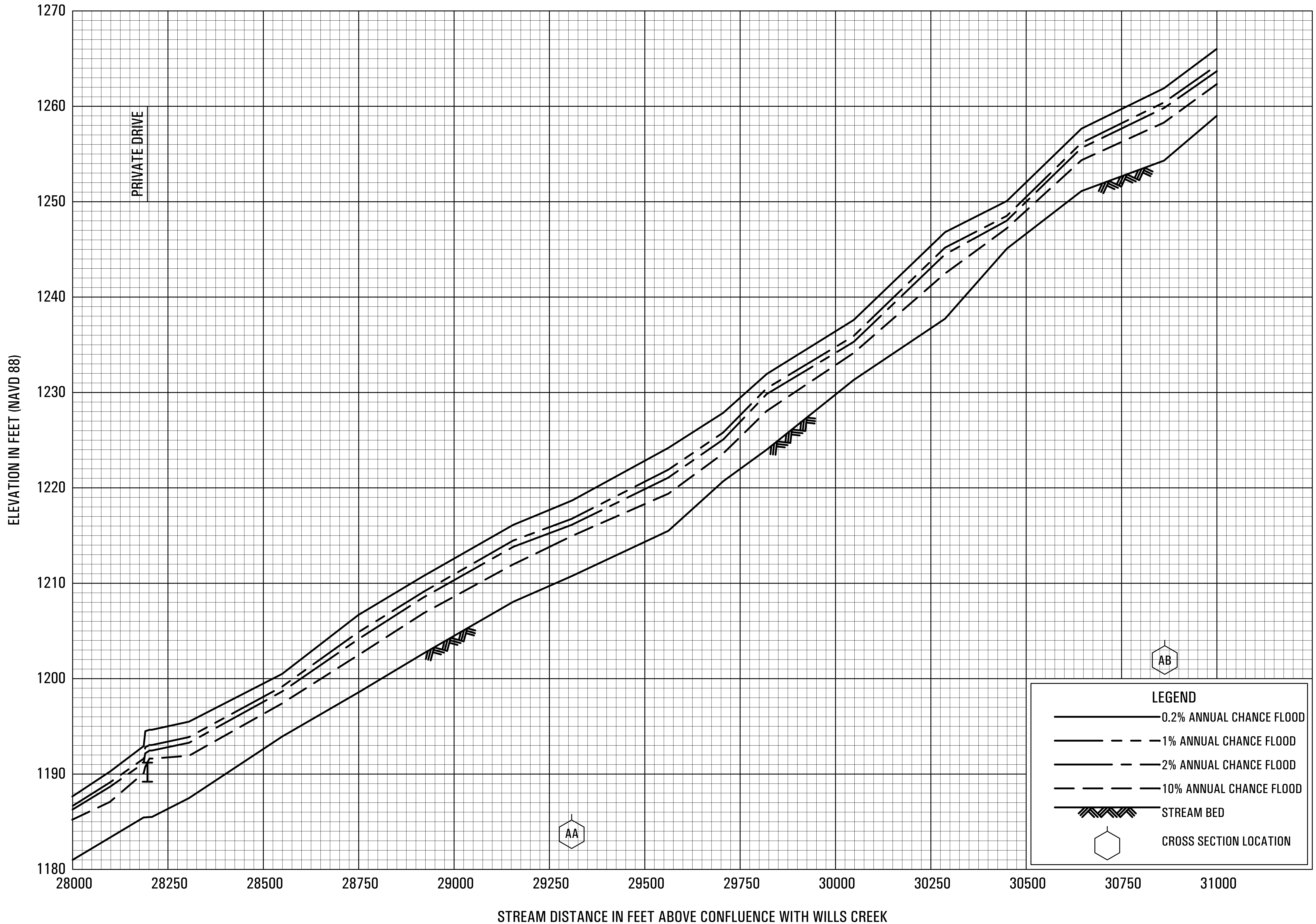

FLOOD PROFILES

BRADDOCK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS

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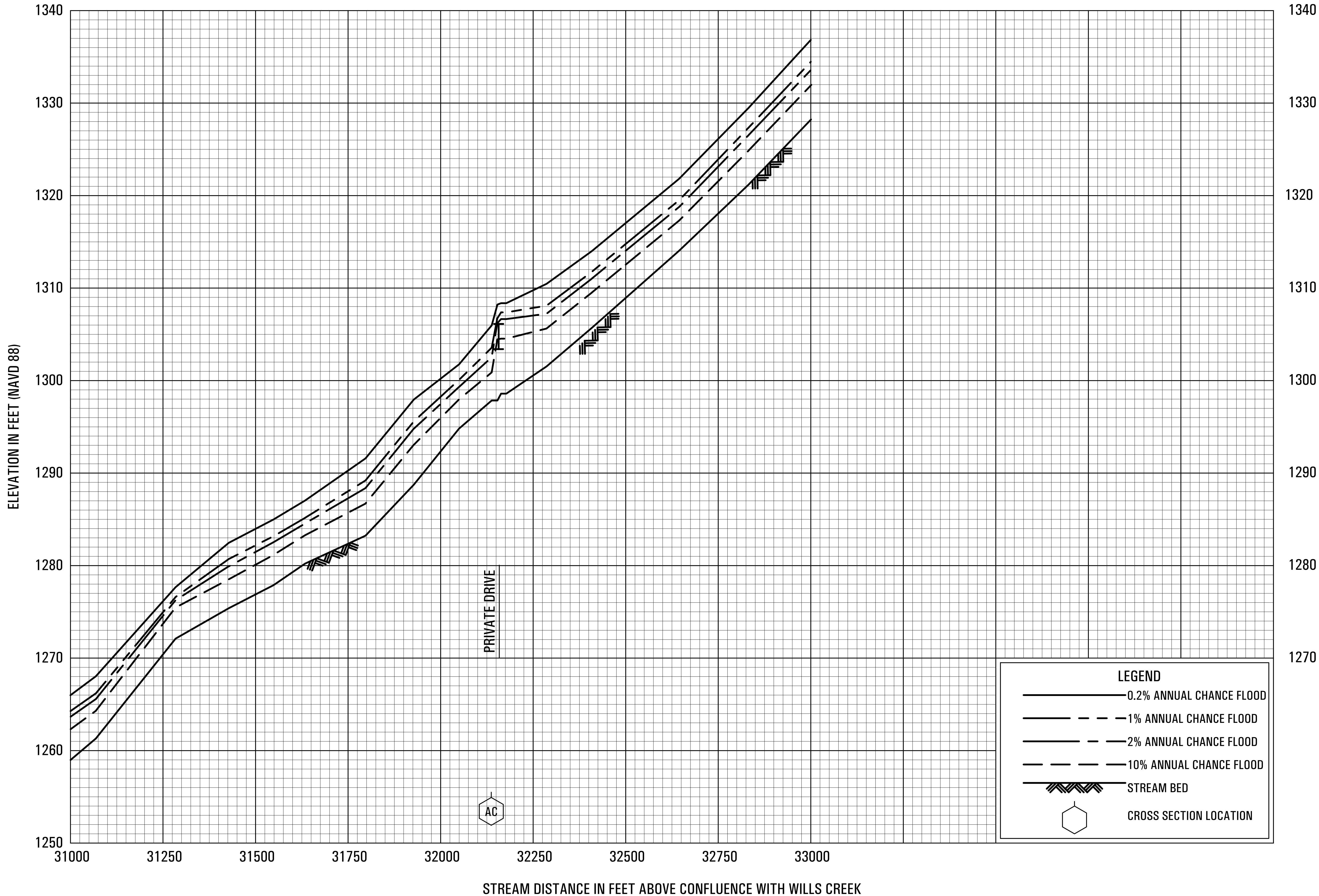


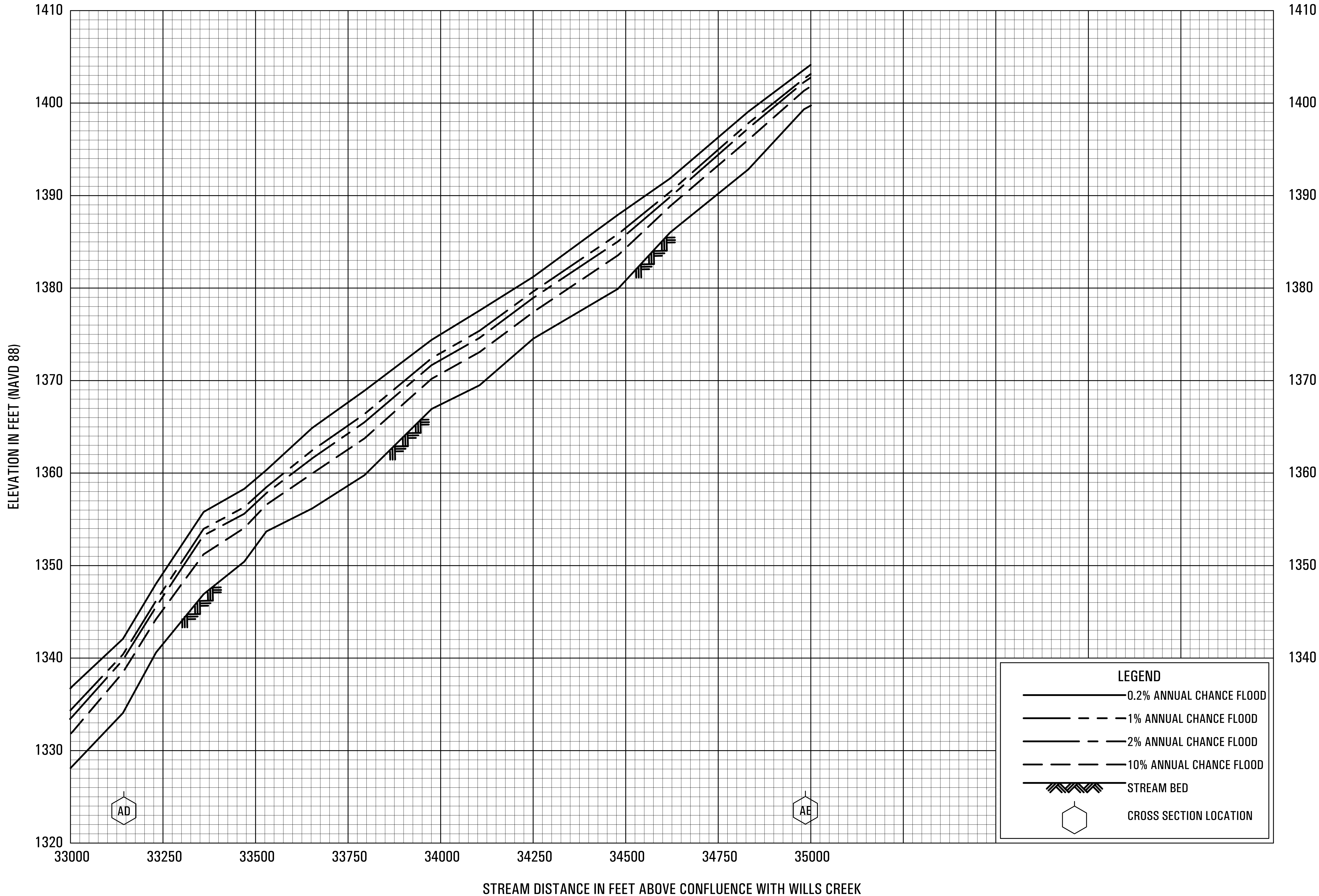
FLOOD PROFILES

BRADDOCK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



FLOOD PROFILES

BRADDOCK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS

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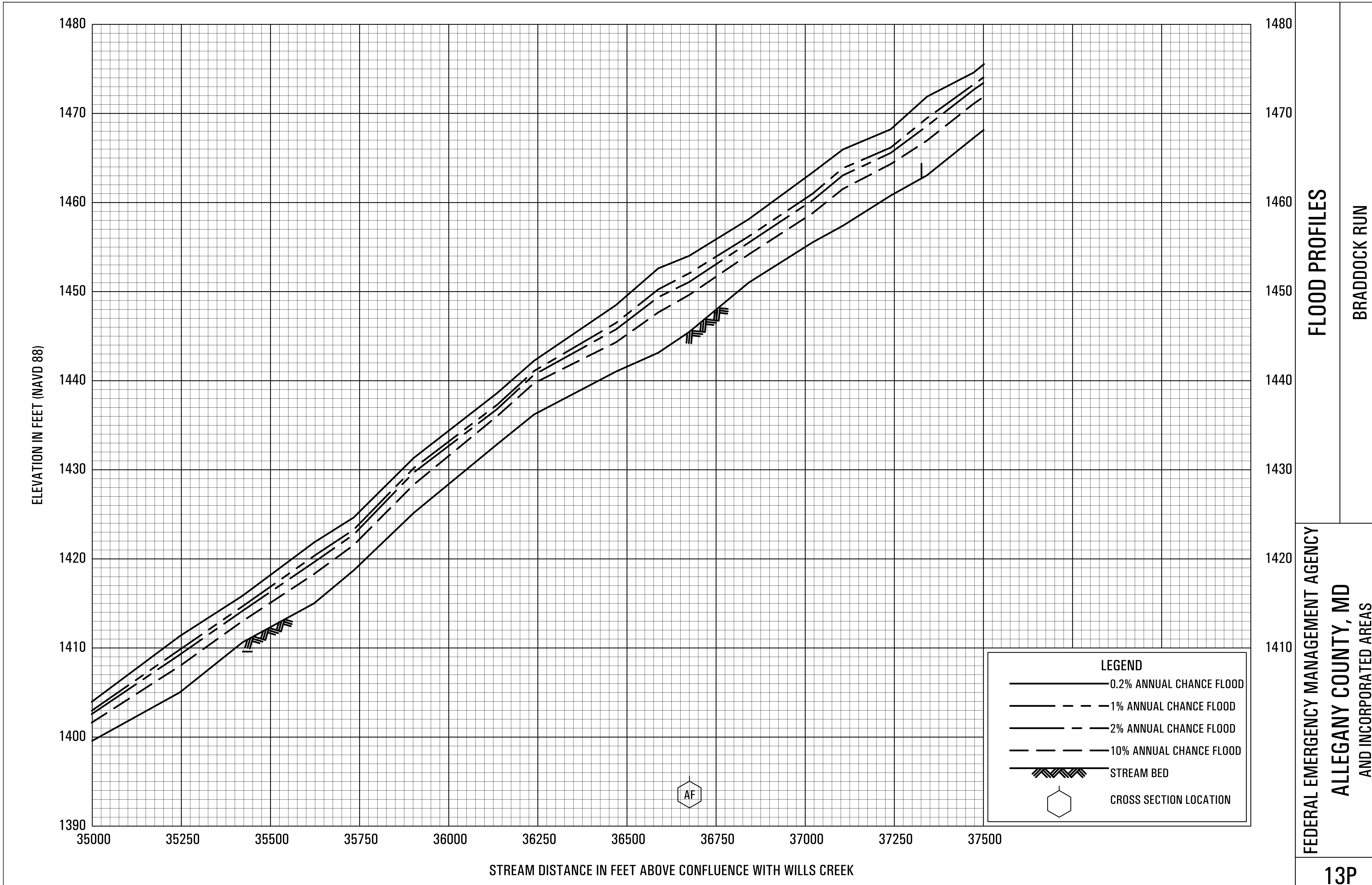

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FLOOD PROFILES
BRADDOCK RUN
FEDERAL EMERGENCY MANAGEMENT AGENCY
ALLEGANY COUNTY, MD
AND INCORPORATED AREAS
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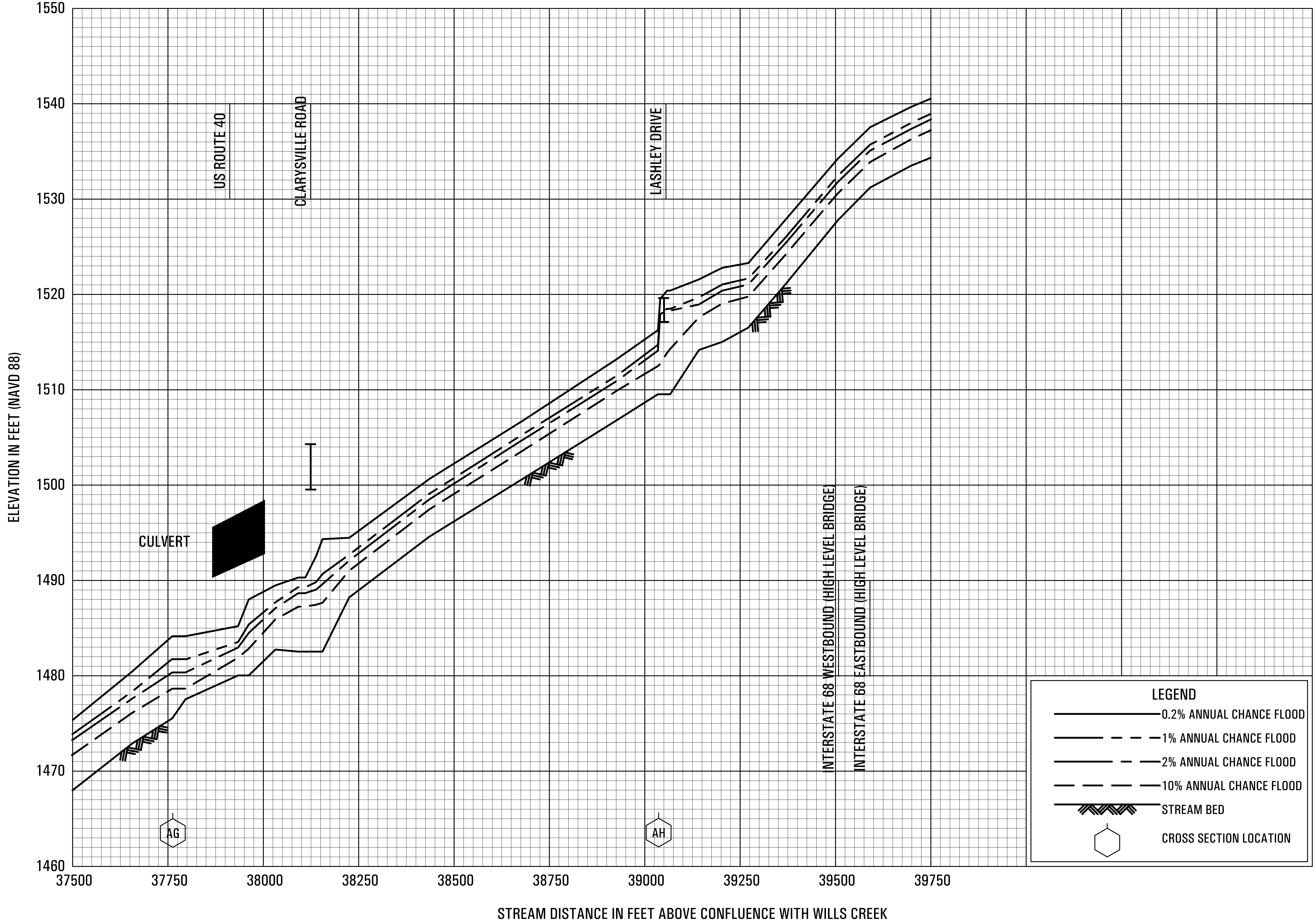

FLOOD PROFILES

BRADDOCK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS

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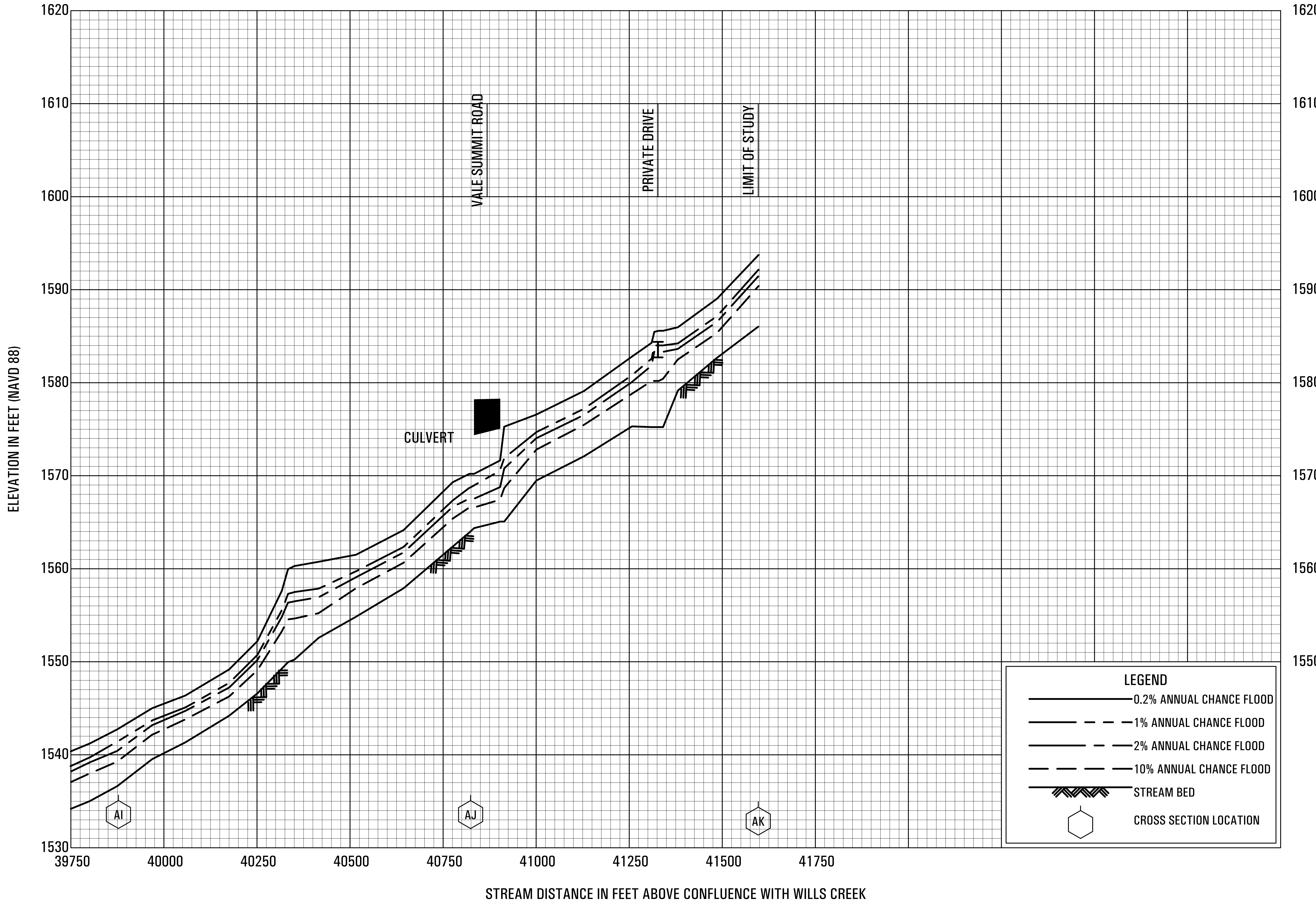


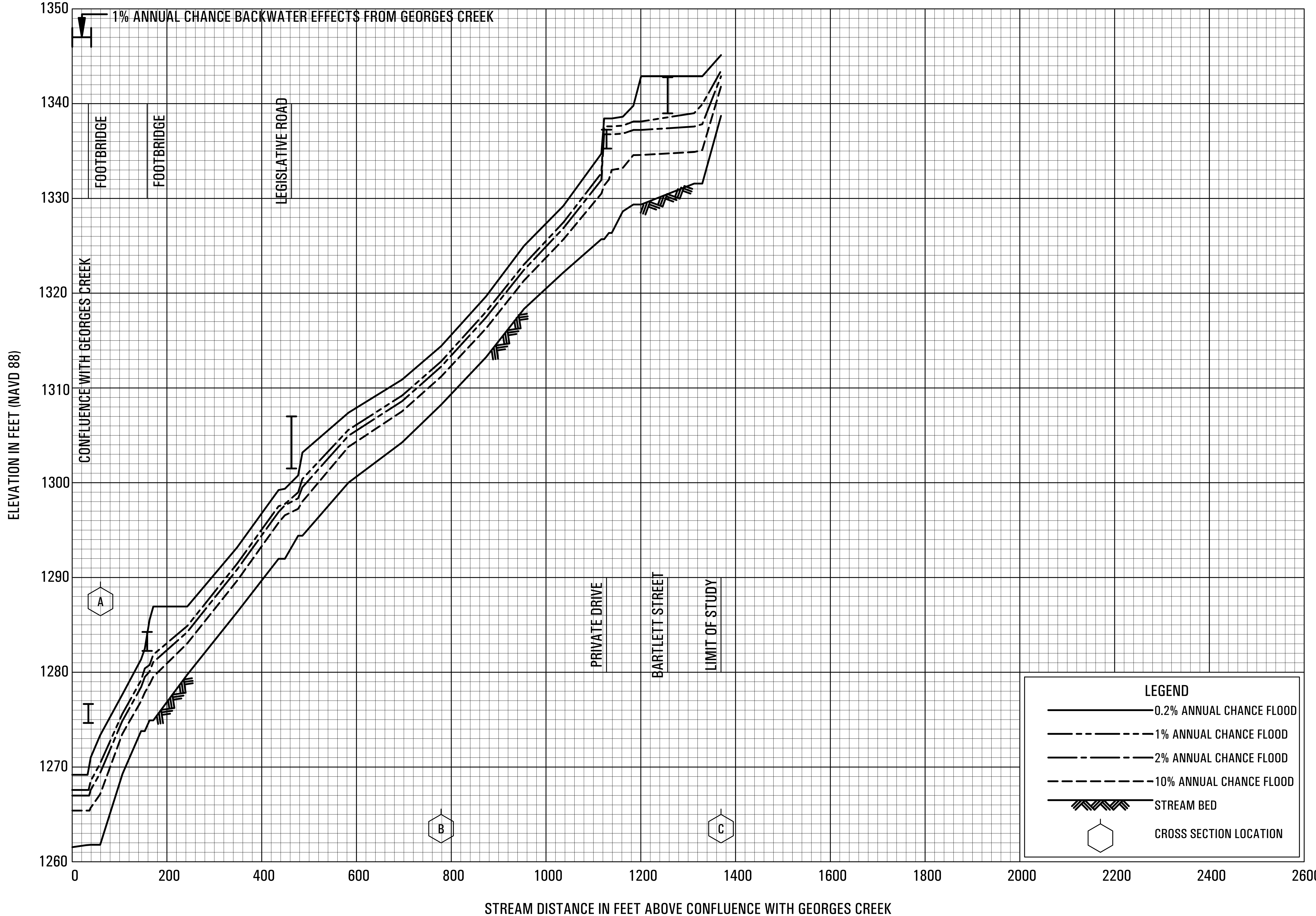
FLOOD PROFILES

BRADDOCK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



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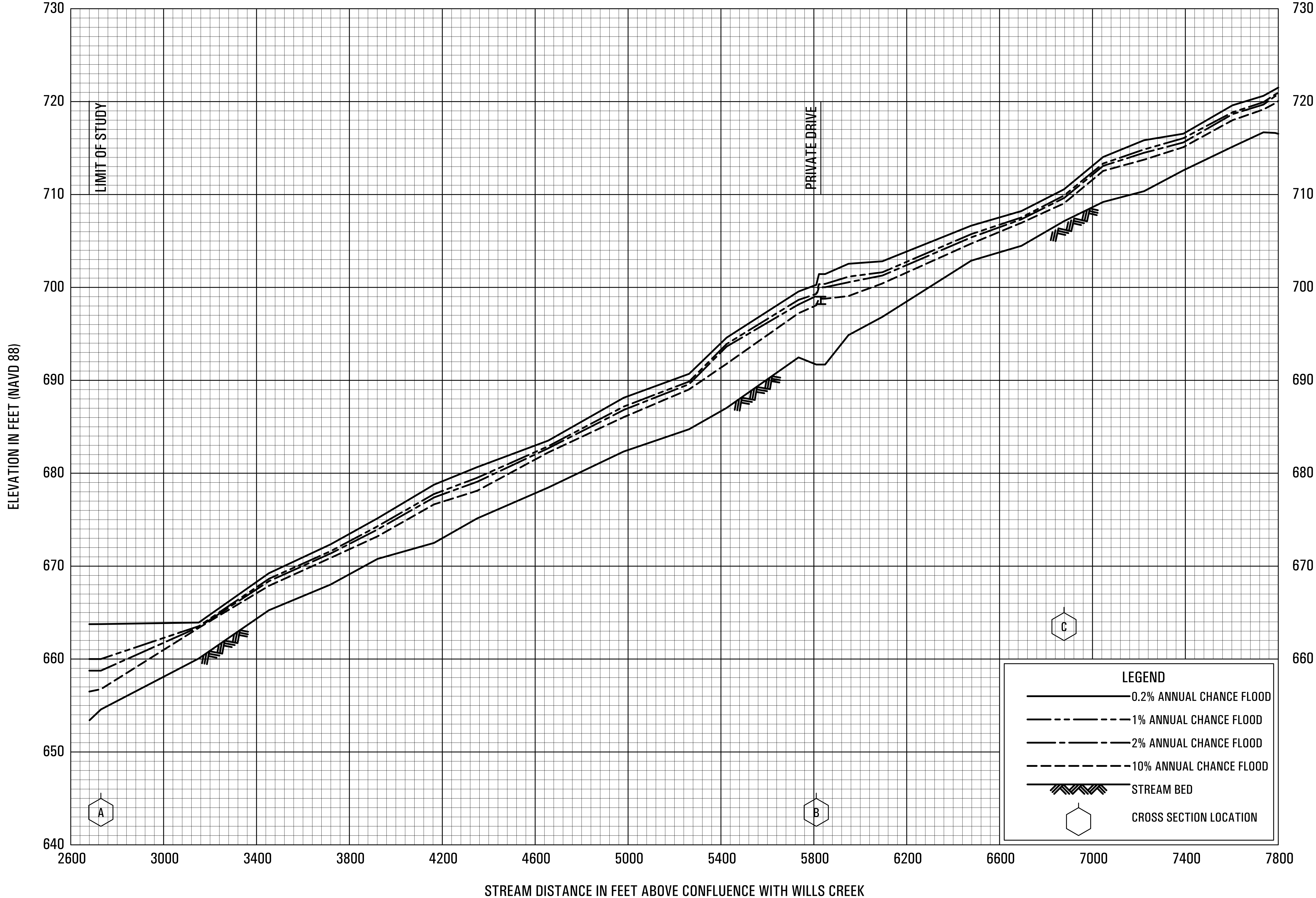
FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



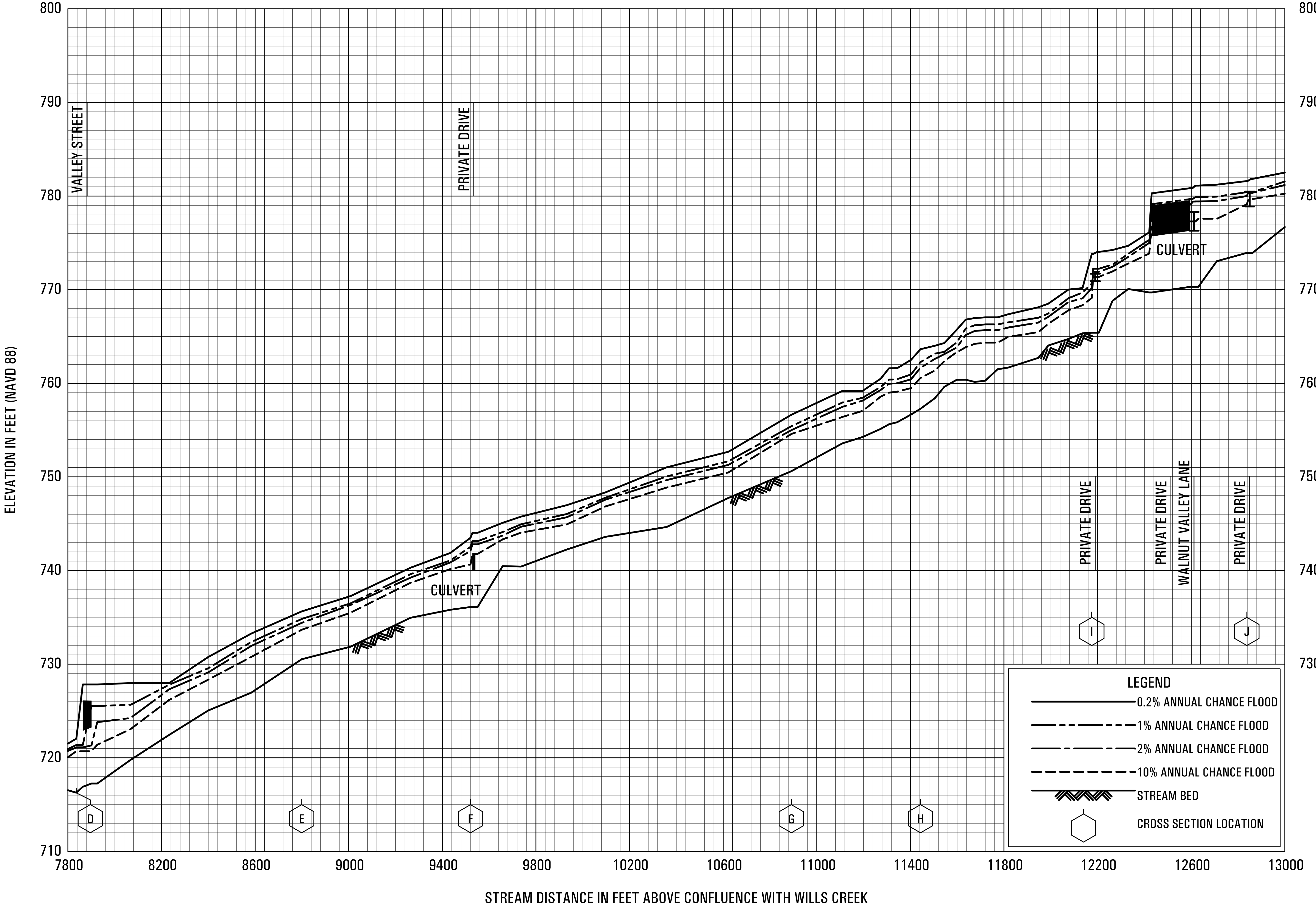
FLOOD PROFILES

DRY RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



FLOOD PROFILES

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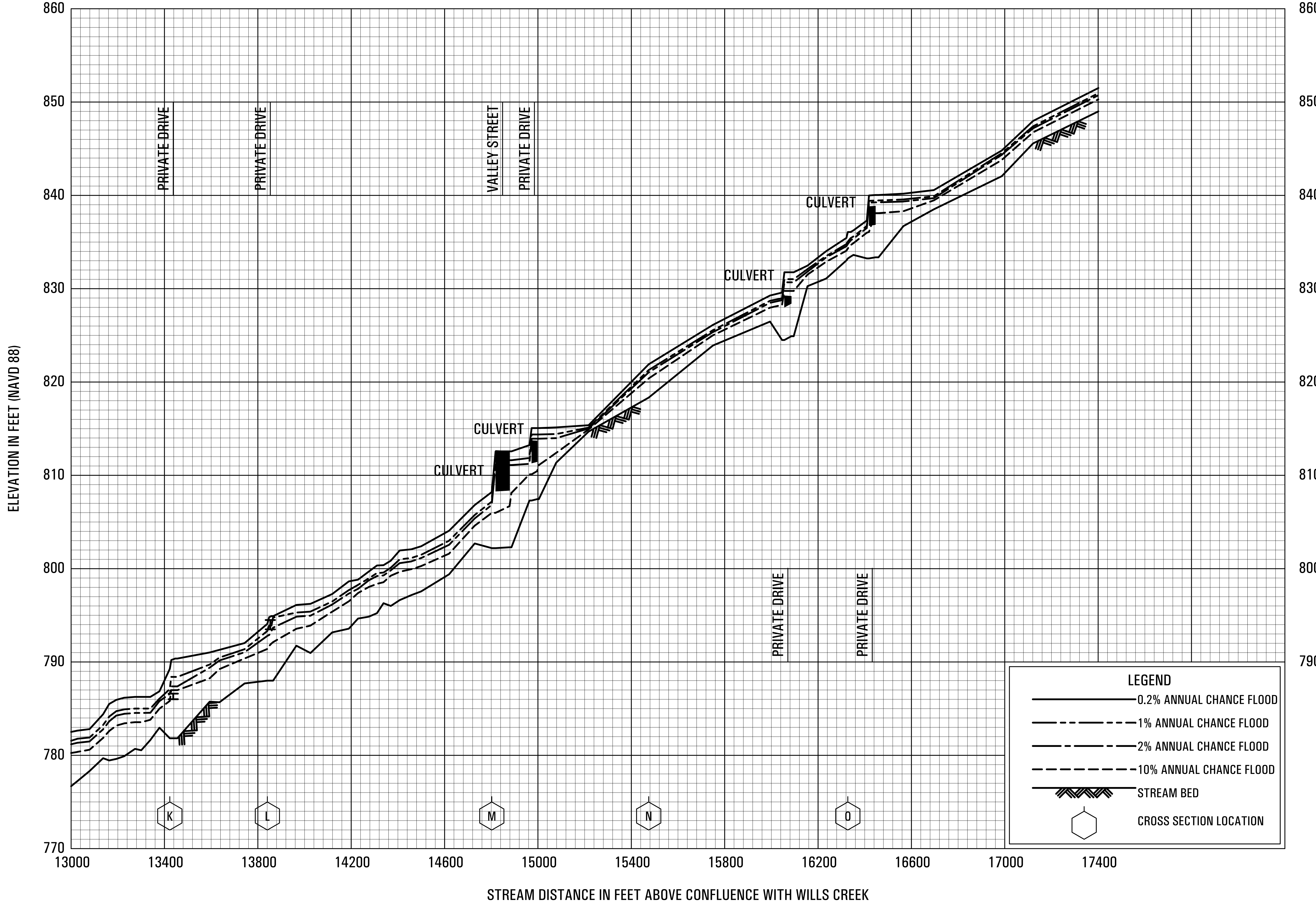
FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



FLOOD PROFILES

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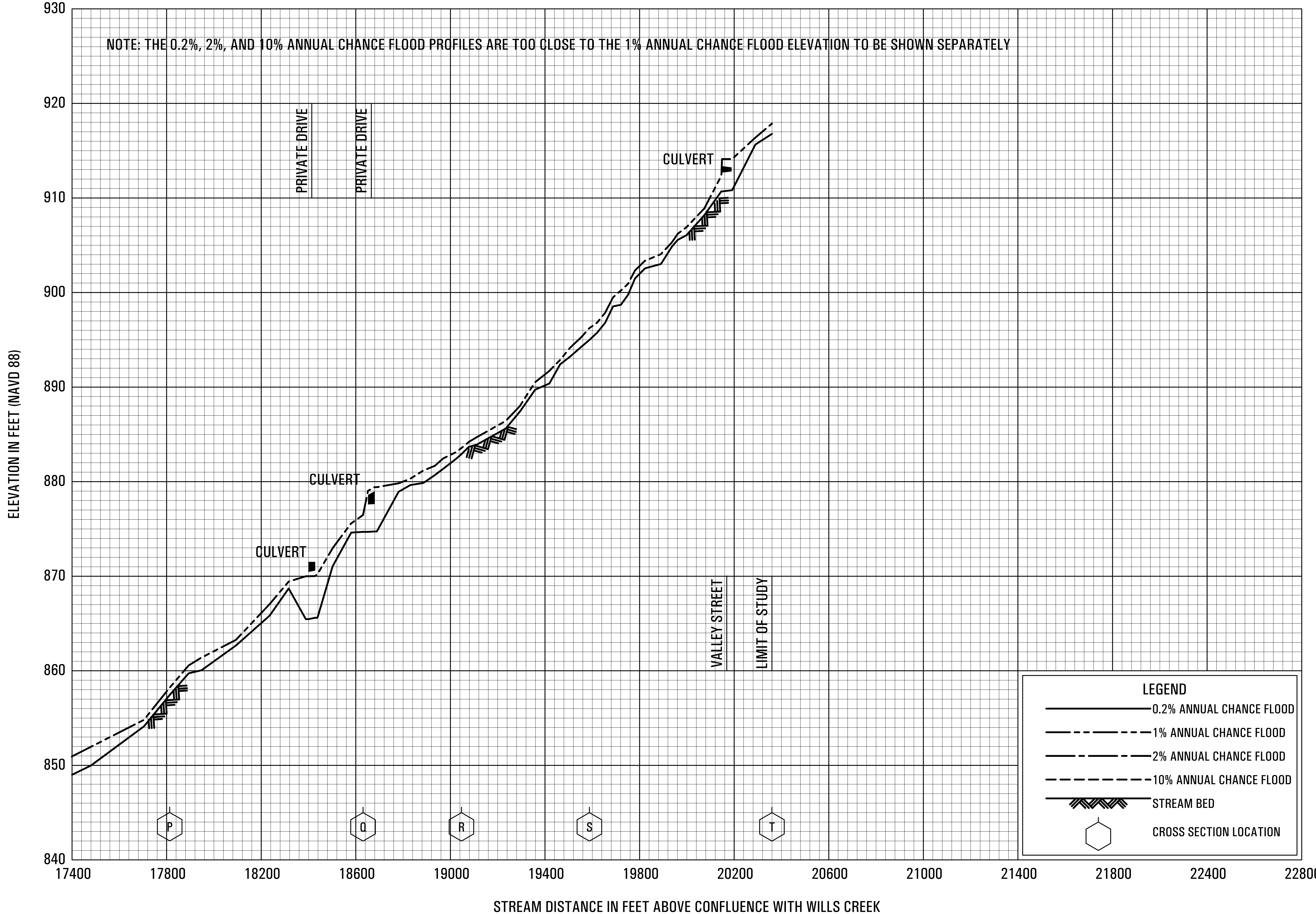
FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



FLOOD PROFILES

DRY RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS

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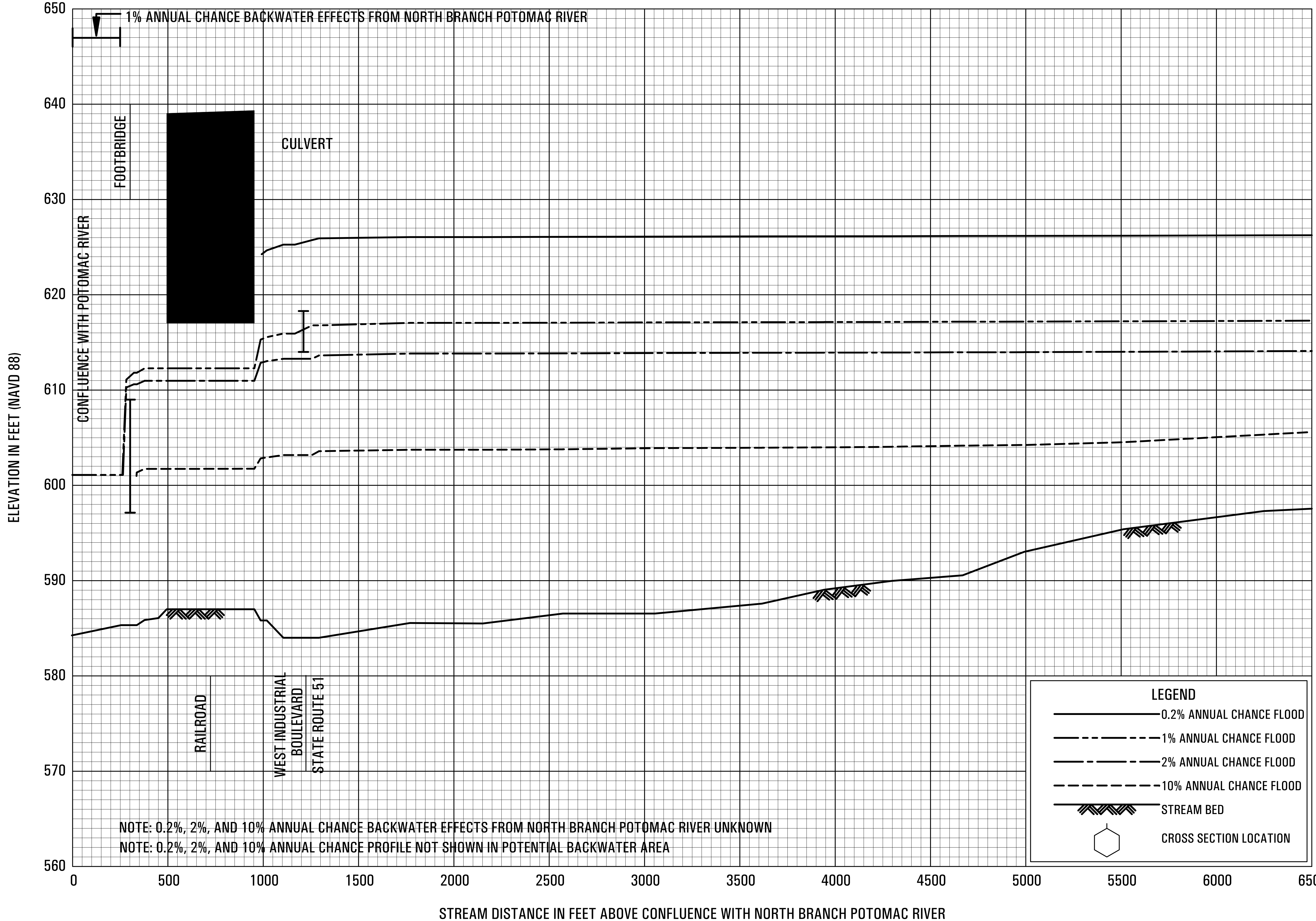

FLOOD PROFILES

EVITTS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS

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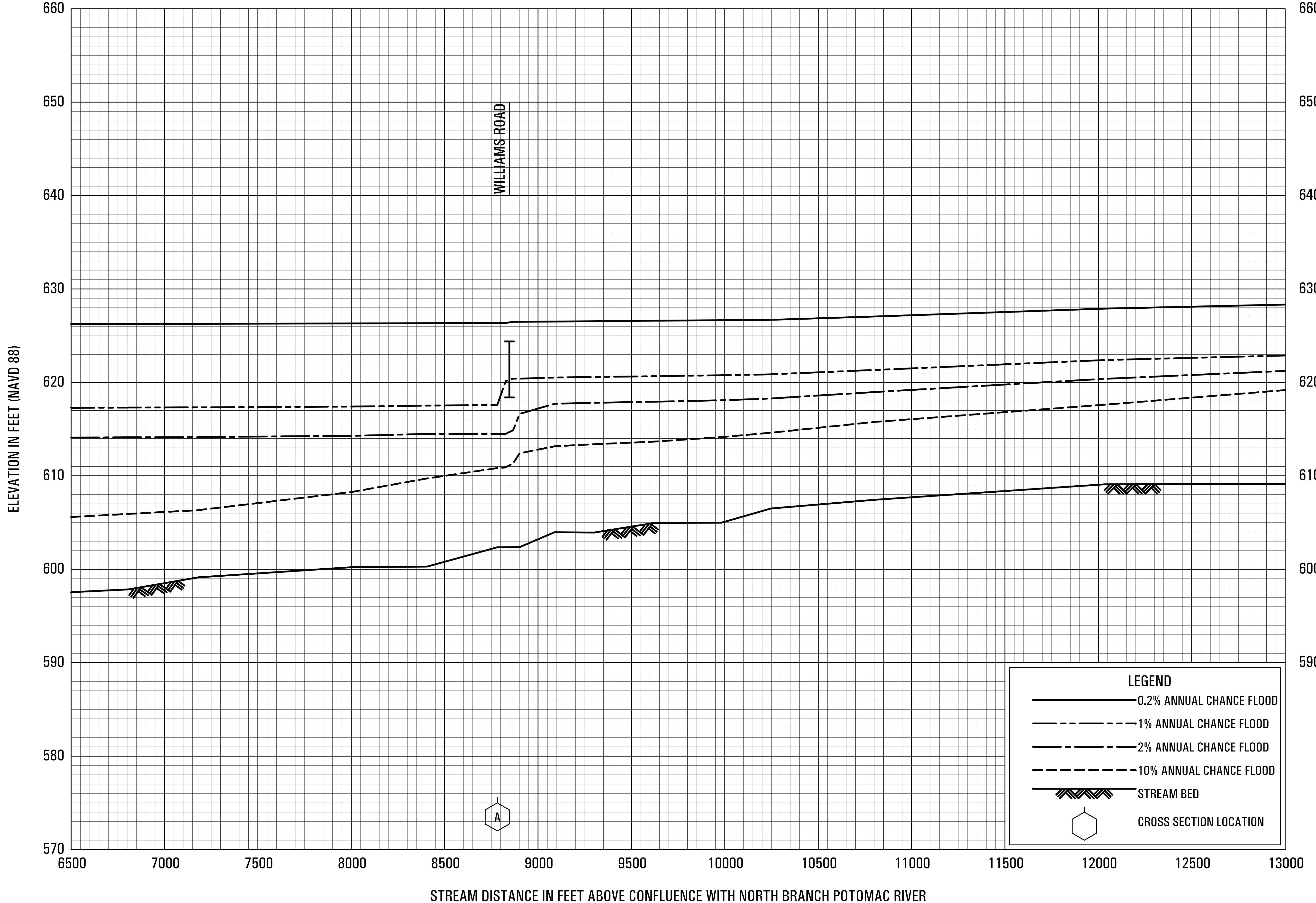


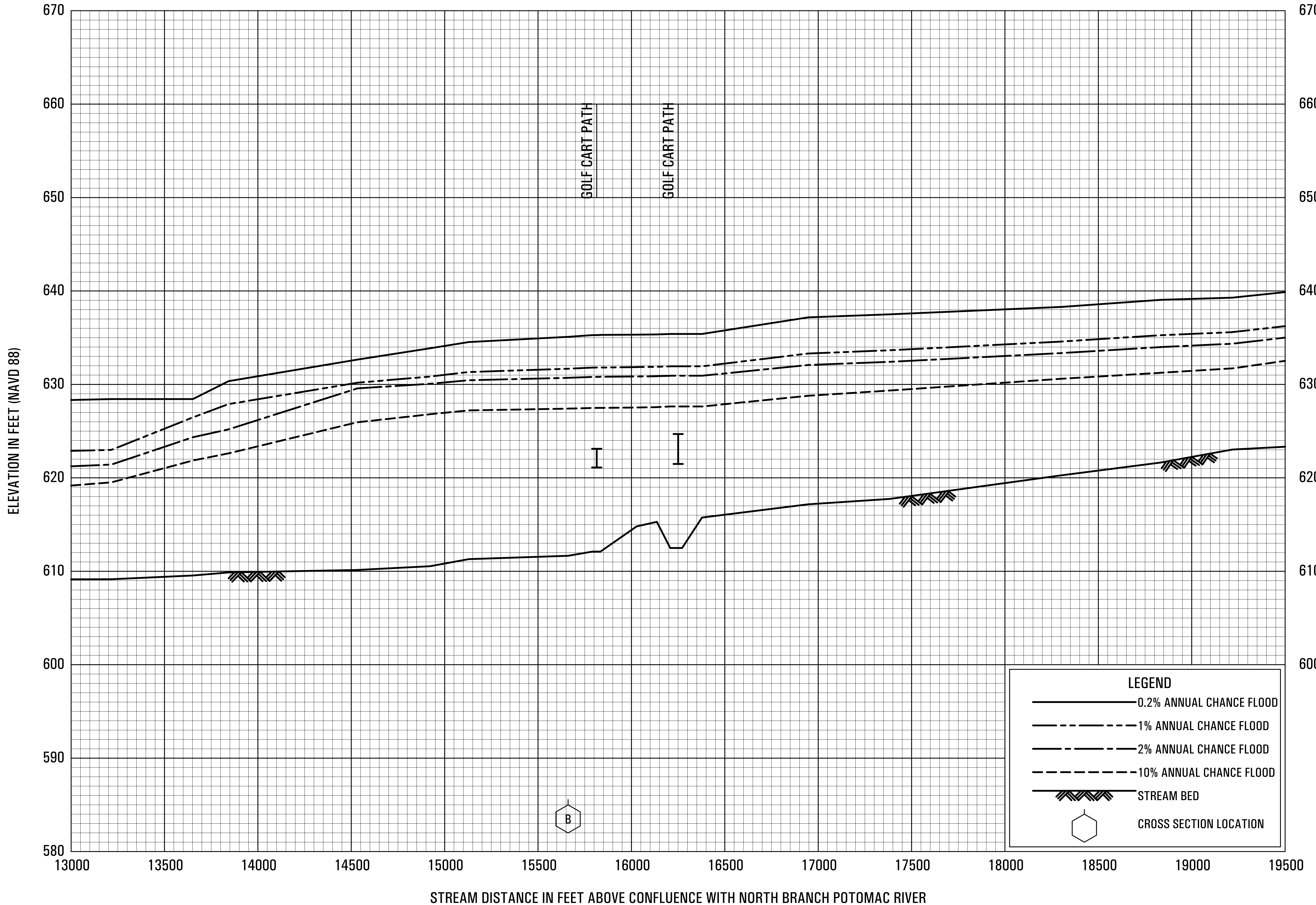
FLOOD PROFILES

EVITTS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



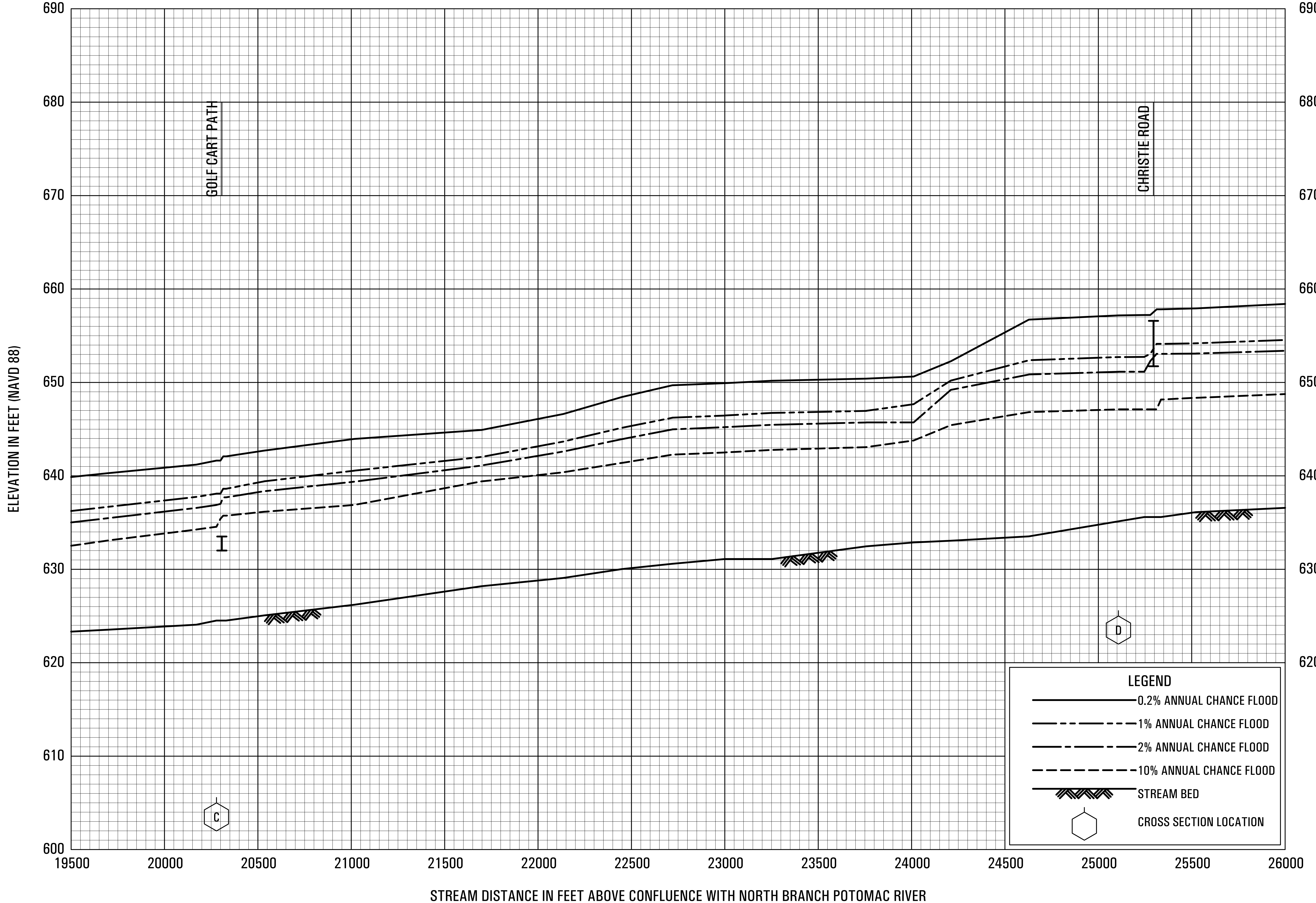
FLOOD PROFILES

EVITTS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



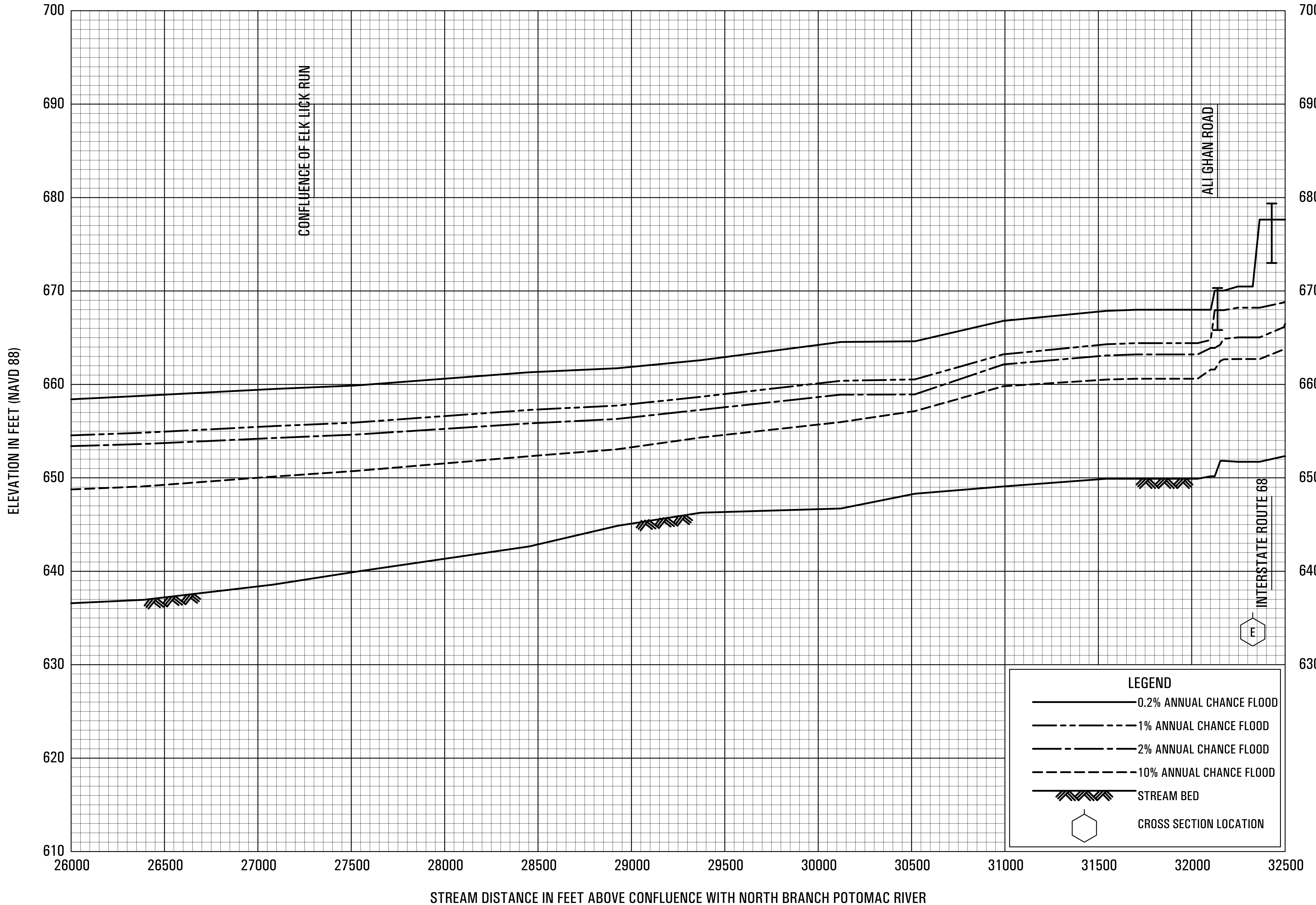
FLOOD PROFILES

EVITTS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



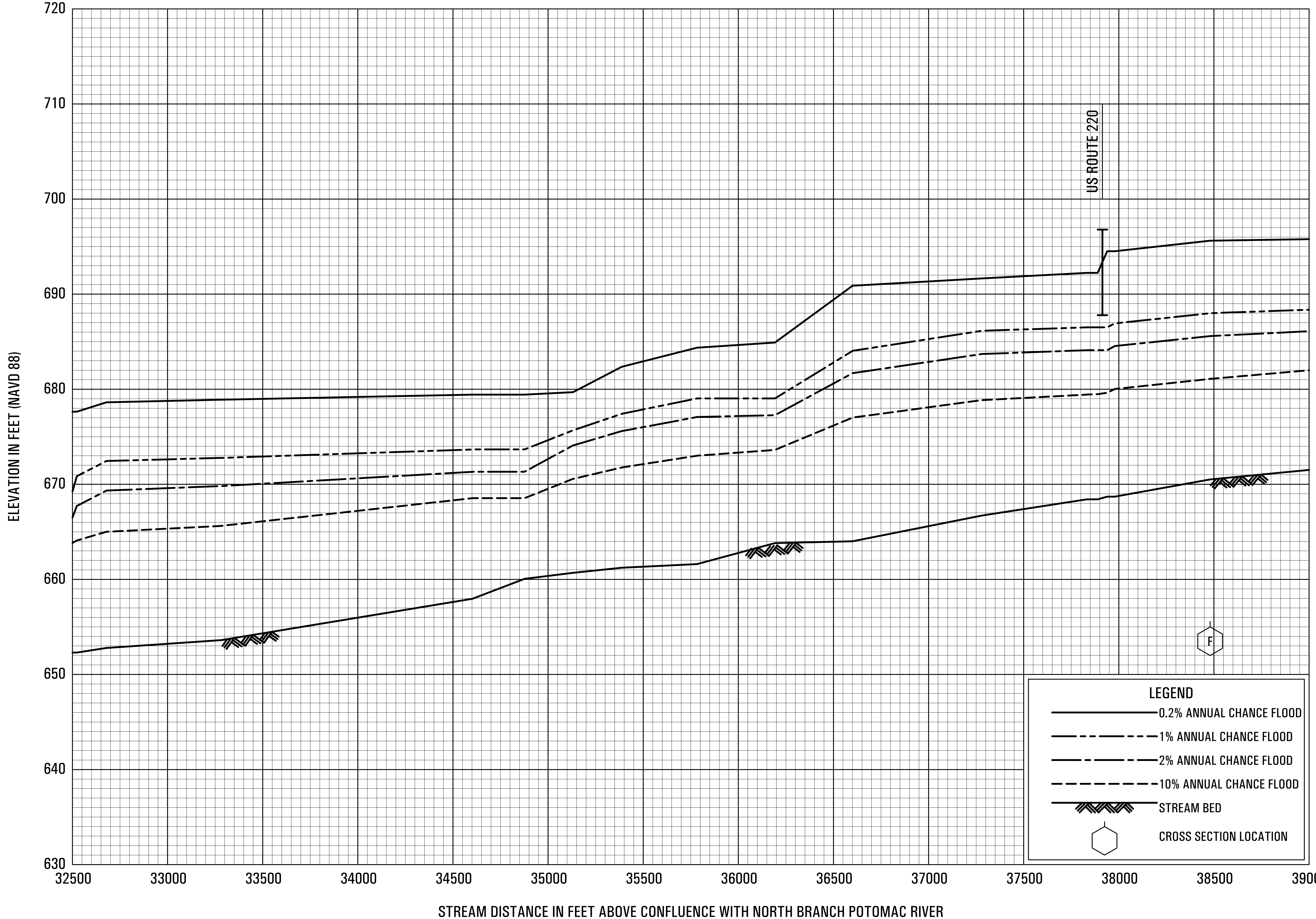
FLOOD PROFILES

EVITTS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



FLOOD PROFILES

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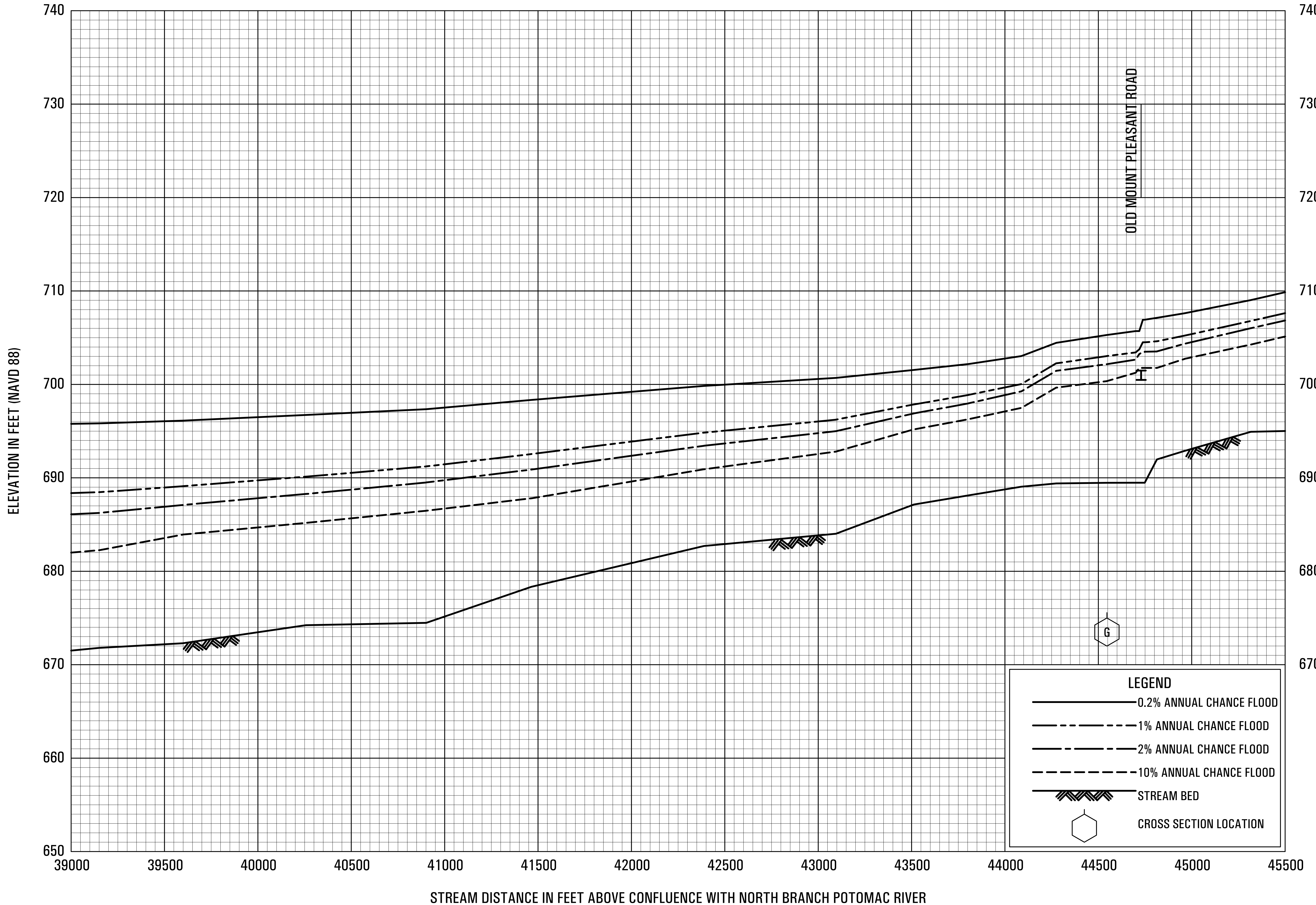
ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



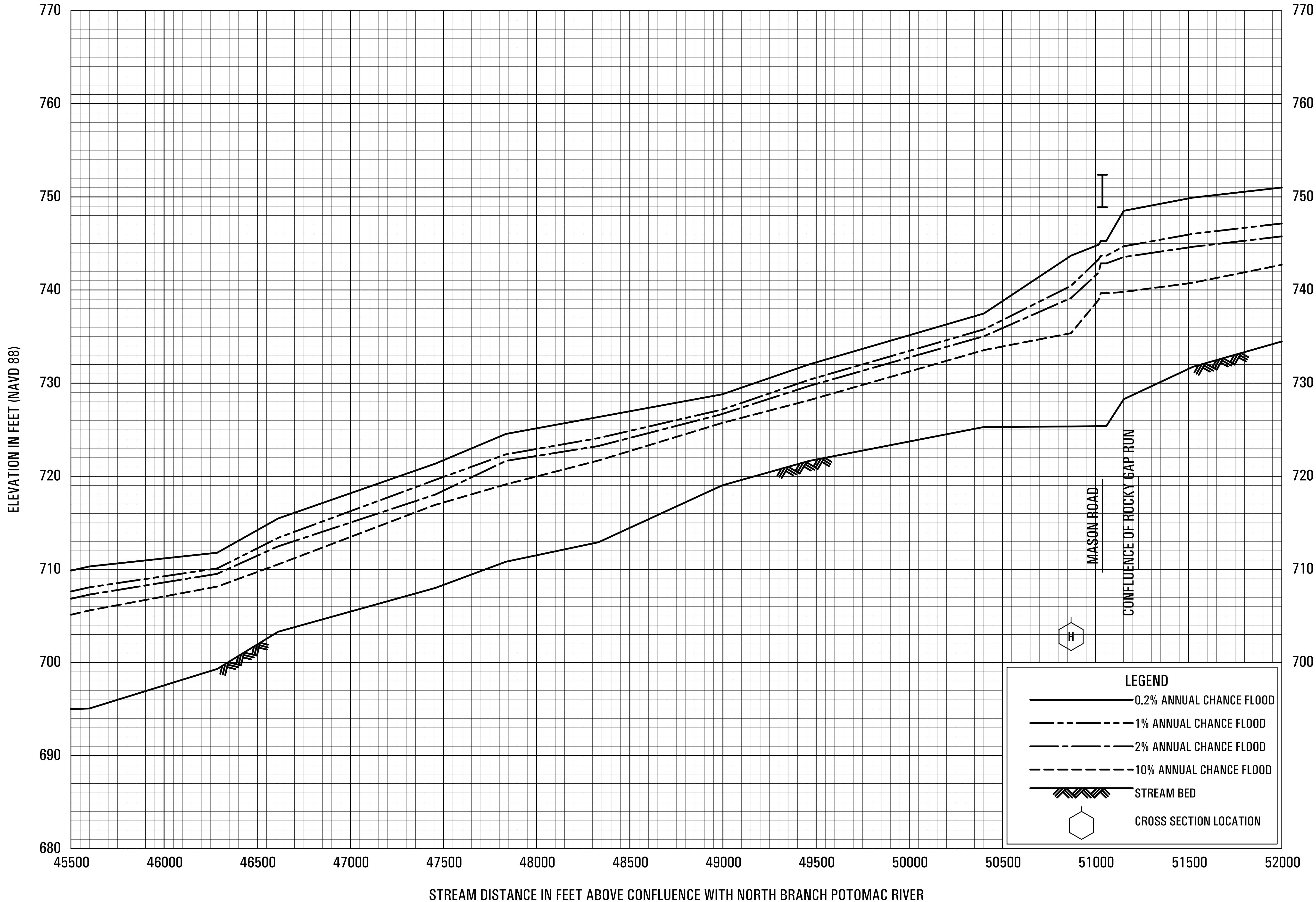
FLOOD PROFILES

EVITTS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



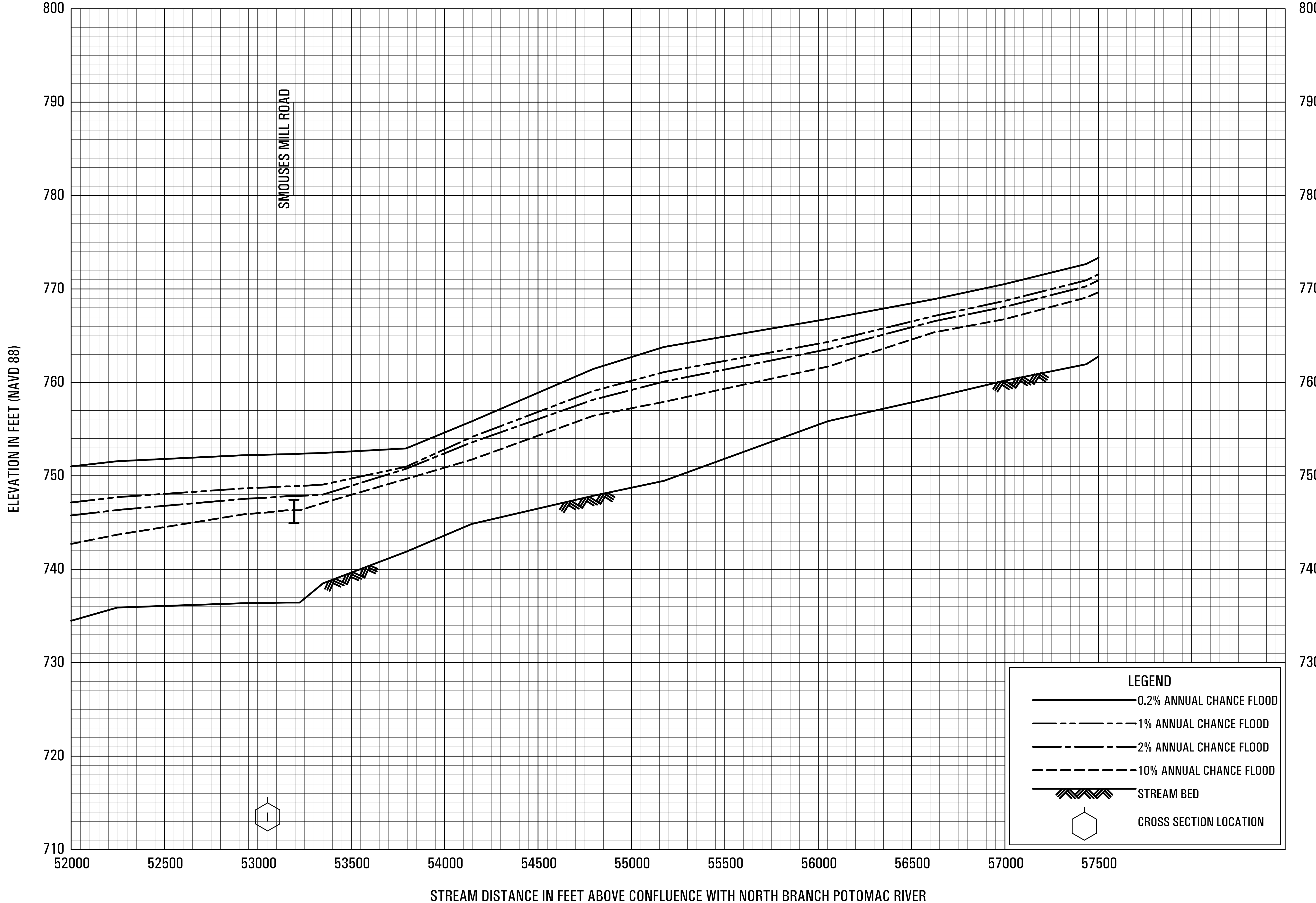
FLOOD PROFILES

EVITTS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



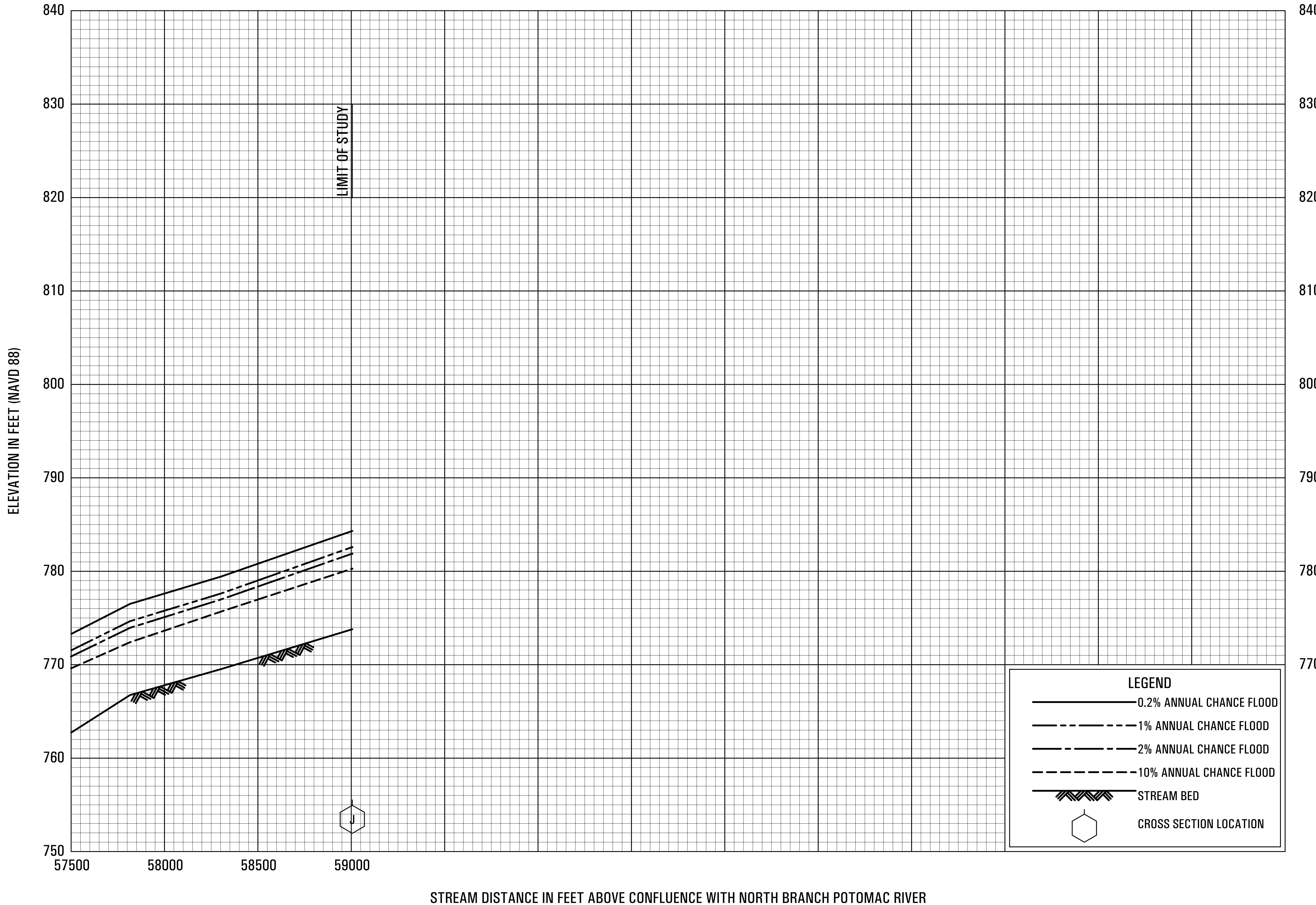
FLOOD PROFILES

EVITTS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



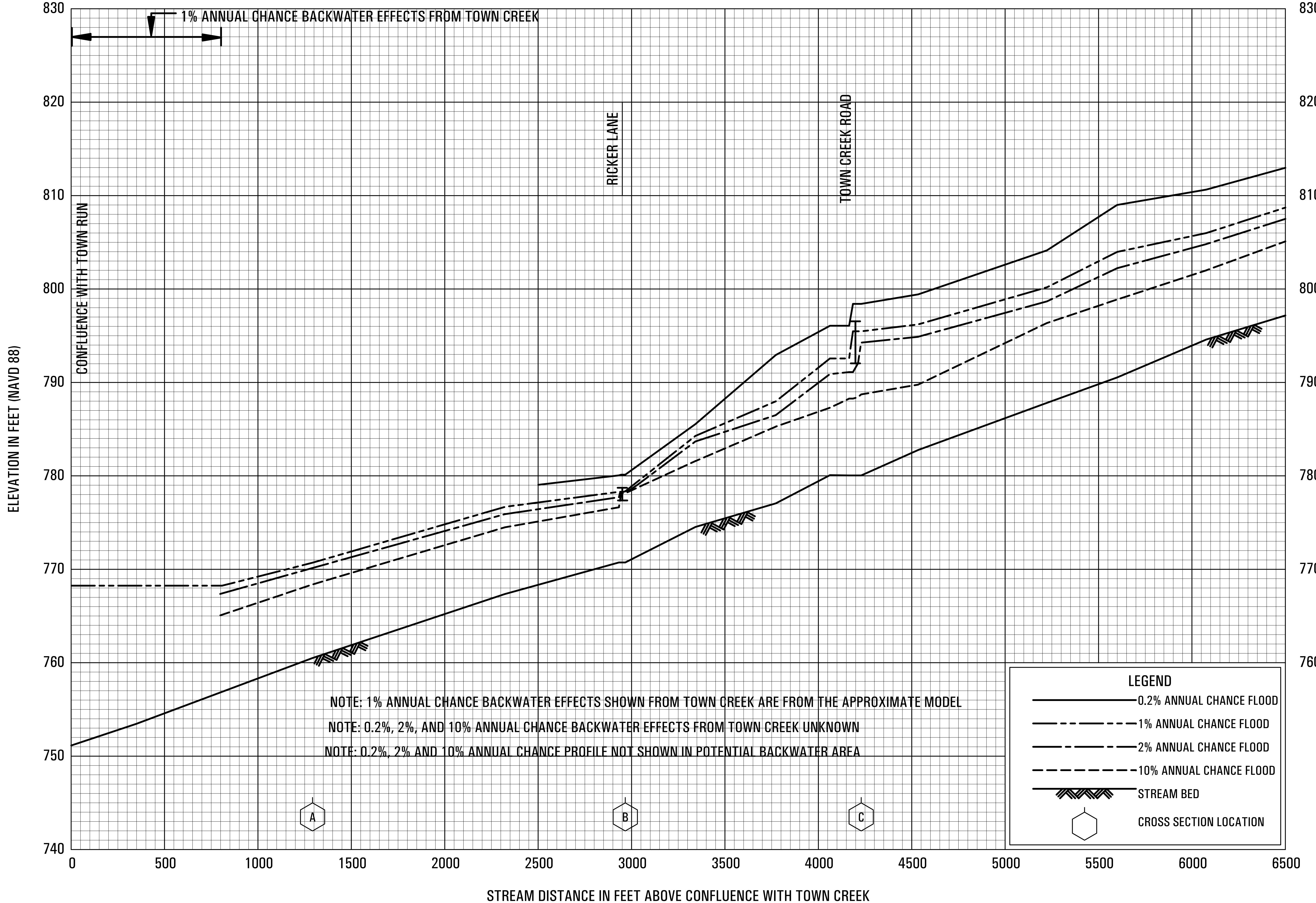
FLOOD PROFILES

EVITTS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



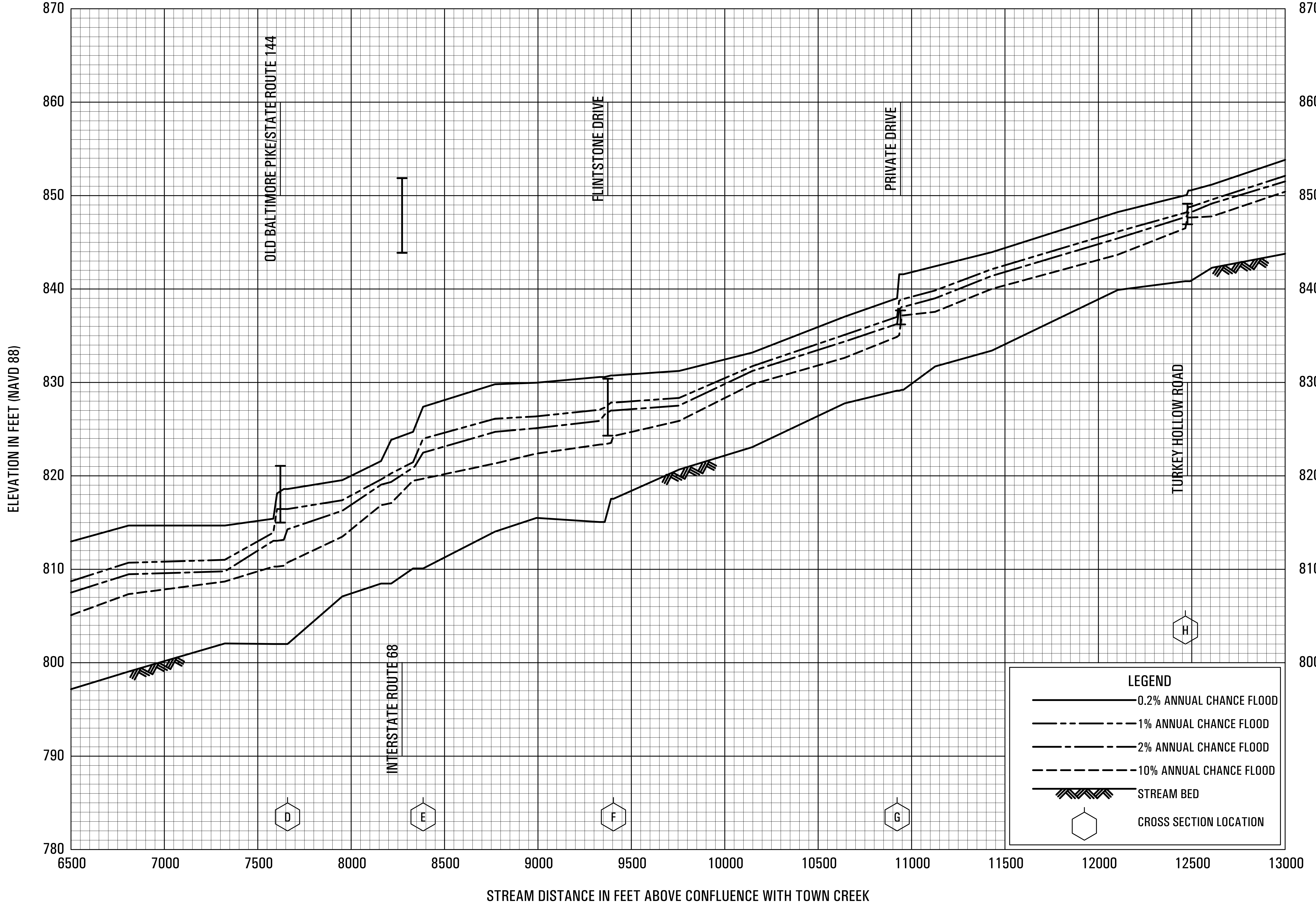
FLOOD PROFILES

FLINTSTONE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



FLOOD PROFILES

FLINTSTONE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS

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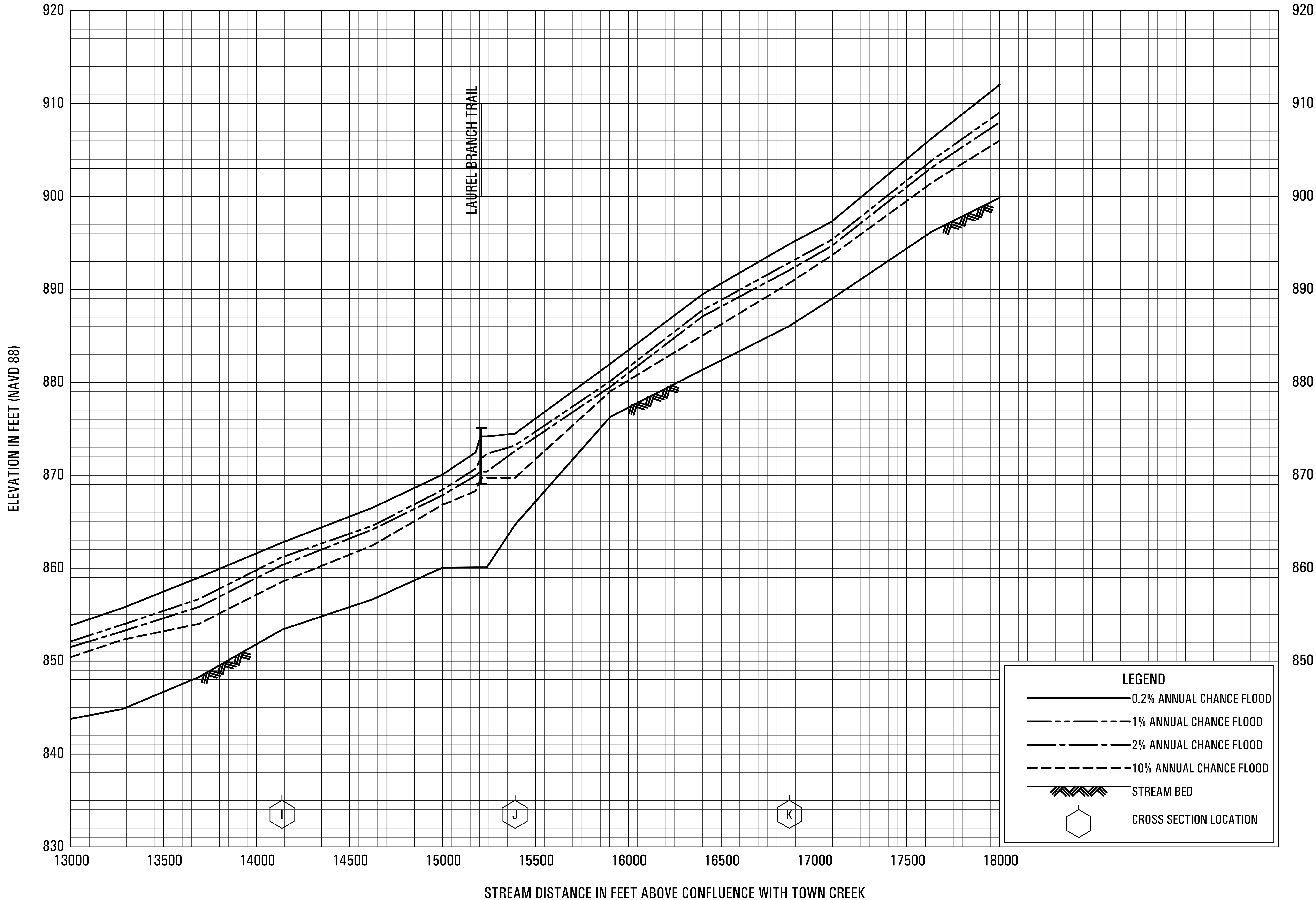


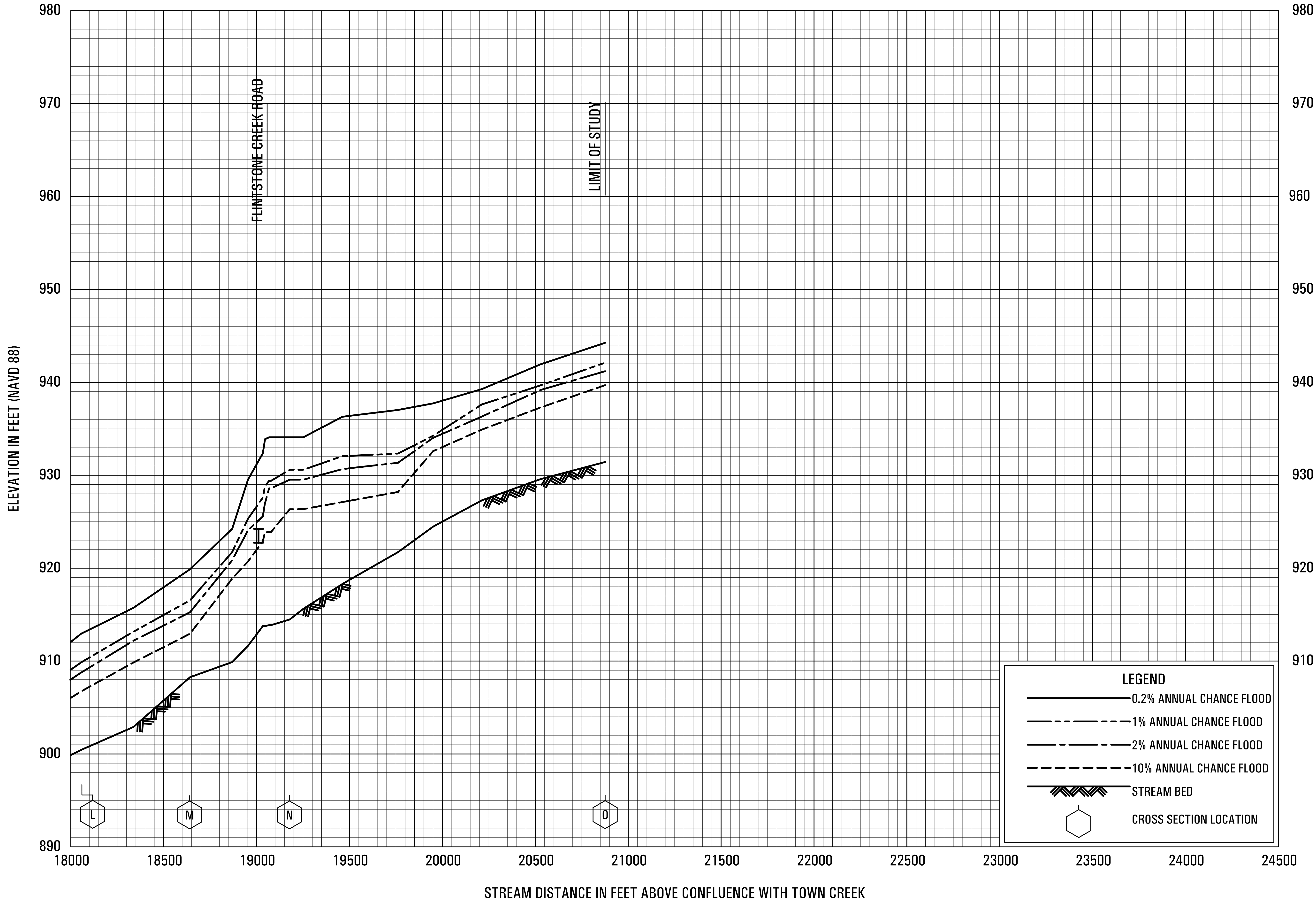
FLOOD PROFILES

FLINTSTONE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS



FLOOD PROFILES

FLINTSTONE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGANY COUNTY, MD

AND INCORPORATED AREAS