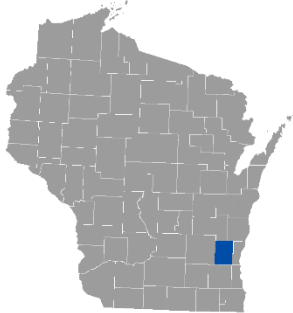


FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 4 OF 5



WASHINGTON COUNTY, WISCONSIN AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
GERMANTOWN, VILLAGE OF	550472
HARTFORD, CITY OF	550473
JACKSON, VILLAGE OF	550530
KEWASKUM, VILLAGE OF	550474
MILWAUKEE, CITY OF*	550278
NEWBURG, VILLAGE OF	550056
RICHFIELD, VILLAGE OF	550518
SLINGER, VILLAGE OF	550587
WASHINGTON COUNTY, UNINCORPORATED AREAS	550471
WEST BEND, CITY OF	550475

*No Special Flood Hazard Areas Identified



FEMA

EFFECTIVE: TBD

REVISED PRELIMINARY 03/15/2021

FLOOD INSURANCE STUDY NUMBER
55131CV004C

Version Number 2.5.3.0

TABLE OF CONTENTS

Volume 1

	<u>Page</u>
SECTION 1.0 – INTRODUCTION	1
1.1 The National Flood Insurance Program	1
1.2 Purpose of this Flood Insurance Study Report	2
1.3 Jurisdictions Included in the Flood Insurance Study Project	2
1.4 Considerations for using this Flood Insurance Study Report	5
 SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS	 14
2.1 Floodplain Boundaries	14
2.2 Floodways	33
2.3 Base Flood Elevations	34
2.4 Non-Encroachment Zones	34
2.5 Coastal Flood Hazard Areas	34
2.5.1 Water Elevations and the Effects of Waves	34
2.5.2 Floodplain Boundaries and BFEs for Coastal Areas	34
2.5.3 Coastal High Hazard Areas	35
2.5.4 Limit of Moderate Wave Action	35
 SECTION 3.0 – INSURANCE APPLICATIONS	 35
3.1 National Flood Insurance Program Insurance Zones	35
 SECTION 4.0 – AREA STUDIED	 36
4.1 Basin Description	36
4.2 Principal Flood Problems	36
4.3 Non-Levee Flood Protection Measures	37
4.4 Levees	38
 SECTION 5.0 – ENGINEERING METHODS	 39
5.1 Hydrologic Analyses	39
5.2 Hydraulic Analyses	66
5.3 Coastal Analyses	84
5.3.1 Total Stillwater Elevations	84
5.3.2 Waves	84
5.3.3 Coastal Erosion	84
5.3.4 Wave Hazard Analyses	84
5.4 Alluvial Fan Analyses	84

TABLE OF CONTENTS (*continued*)

Volume 1 (*continued*)

Figures

	<u>Page</u>
Figure 1: FIRM Panel Index	6
Figure 2: FIRM Notes to Users	7
Figure 3: Map Legend for FIRM	10
Figure 4: Floodway Schematic	33
Figure 5: Wave Runup Transect Schematic	34
Figure 6: Coastal Transect Schematic	35
Figure 7: Frequency Discharge-Drainage Area Curves	65
Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas	84
Figure 9: Transect Location Map	84

Tables

Table 1: Listing of NFIP Jurisdictions	3
Table 2: Flooding Sources Included in this FIS Report	15
Table 3: Flood Zone Designations by Community	35
Table 4: Basin Characteristics	36
Table 5: Principal Flood Problems	37
Table 6: Historic Flooding Elevations	37
Table 7: Non-Levee Flood Protection Measures	38
Table 8: Levees	38
Table 9: Summary of Discharges	40
Table 10: Summary of Non-Coastal Stillwater Elevations	65
Table 11: Stream Gage Information used to Determine Discharges	66
Table 12: Summary of Hydrologic and Hydraulic Analyses	67
Table 13: Roughness Coefficients	81
Table 14: Summary of Coastal Analyses	84
Table 15: Tide Gage Analysis Specifics	84
Table 16: Coastal Transect Parameters	84
Table 17: Summary of Alluvial Fan Analyses	85
Table 18: Results of Alluvial Fan Analyses	85

TABLE OF CONTENTS *(continued)*

Volume 2

SECTION 6.0 – MAPPING METHODS	86
6.1 Vertical and Horizontal Control	86
6.2 Base Map	87
6.3 Floodplain and Floodway Delineation	88
6.4 Coastal Flood Hazard Mapping	167
6.5 FIRM Revisions	167
6.5.1 Letters of Map Amendment	167
6.5.2 Letters of Map Revision Based on Fill	167
6.5.3 Letters of Map Revision	168
6.5.4 Physical Map Revisions	168
6.5.5 Contracted Restudies	169
6.5.6 Community Map History	169
SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION	171
7.1 Contracted Studies	171
7.2 Community Meetings	183
SECTION 8.0 – ADDITIONAL INFORMATION	185
SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES	186

Tables

	<u>Page</u>
Table 19: Countywide Vertical Datum Conversion	86
Table 20: Stream-by-Stream Vertical Datum Conversion	86
Table 21: Base Map Sources	87
Table 22: Summary of Topographic Elevation Data used in Mapping	89
Table 23: Floodway Data	93
Table 24: Flood Hazard and Non-Encroachment Data for Selected Streams	167
Table 25: Summary of Coastal Transect Mapping Considerations	167
Table 26: Incorporated Letters of Map Change	168
Table 27: Community Map History	170
Table 28: Summary of Contracted Studies Included in this FIS Report	171
Table 29: Community Meetings	184
Table 30: Map Repositories	185
Table 31: Additional Information	186
Table 32: Bibliography and References	187

TABLE OF CONTENTS *(continued)*

Volume 3

Exhibits

Flood Profiles	<u>Panel</u>
Amy Bell Creek	01 P
Ashippun River	02-09 P
Ashippun River – Overland Flowpath	10 P
Ashippun River Tributary 2	11-13 P
Ashippun River Tributary 2.1	14 P
Ashippun River Tributary 2.2	15 P
Ashippun River Tributary 3	16 P
Ashippun River Tributary 4	17 P
Ashippun River Tributary 5	18 P
Bark River	19-23 P
Bark River Tributary 1	24 P
Bark River Tributary 1.1	25 P
Bolton Brook	26-28 P
Bonniwell Creek	29-30 P
Butler Creek Tributary 1	31 P
Butler Creek Tributary 2	32 P
Cedar Creek	33-49 P
Cedarburg Creek	50-52 P
Coney River	53-59 P
Coney River – Overland Flowpath	60 P
Deer Creek	61-63 P
East Branch Rock River	64 P
Edgewood Creek	65 P
Edgewood Creek Overflow Channel	66 P
Evergreen Bypass	67 P
Evergreen Creek	68-72 P
Flynn Creek	73-75 P
Frieden's Creek	76-79 P
Hasmer Creek	80-81 P
Hubertus Ditch No. 1	82 P
Jackson Creek	83-85 P
Kettleview Creek	86-88 P
Kewaskum Creek	89-93 P

TABLE OF CONTENTS *(continued)*

Volume 4

Exhibits *(continued)*

Flood Profiles		<u>Panel</u>
Kewaskum Creek Overflow Channel	94	P
Knights Creek	95-97	P
Kohlsville River	98-99	P
Kohlsville River – Park Route	100	P
Kressen Branch	101-103	P
Lehner Outlet	104-106	P
Little Cedar Creek	107-113	P
Little Cedar Creek Bypass	114	P
Little Oconomowoc River	115-118	P
Marsh Creek	119	P
Mason Creek	120-121	P
Mason Creek Tributary 1	122	P
Menomonee River	123-125	P
Milwaukee River	126-138	P
Myra Creek	139-140	P
Nature's Friends Tributary	141	P
North Branch Cedar Creek	142-145	P
North Branch Menomonee River	146-150	P
North Branch Milwaukee River	151-152	P
North Creek	153-155	P
North Crossway Channel	156-157	P
Oconomowoc Bypass	158-159	P
Oconomowoc River	160-164	P
Polk Springs Creek	165-166	P
Putter Creek	167	P
Quass Creek	168-172	P
Rubicon River	173-177	P
Rubicon River Overland Flowpath	178	P
Rubicon River Tributary 1	179	P
Rubicon River Tributary 2	180	P
Scenic Brook	181	P

Volume 5

Exhibits *(continued)*

Flood Profiles		<u>Panel</u>
Silver Creek	182-187	P
Silverbrook Creek	188	P
Springside Creek	189-190	P
Stony Creek	191-193	P
Tributary No. 1	194-195	P

TABLE OF CONTENTS *(continued)*

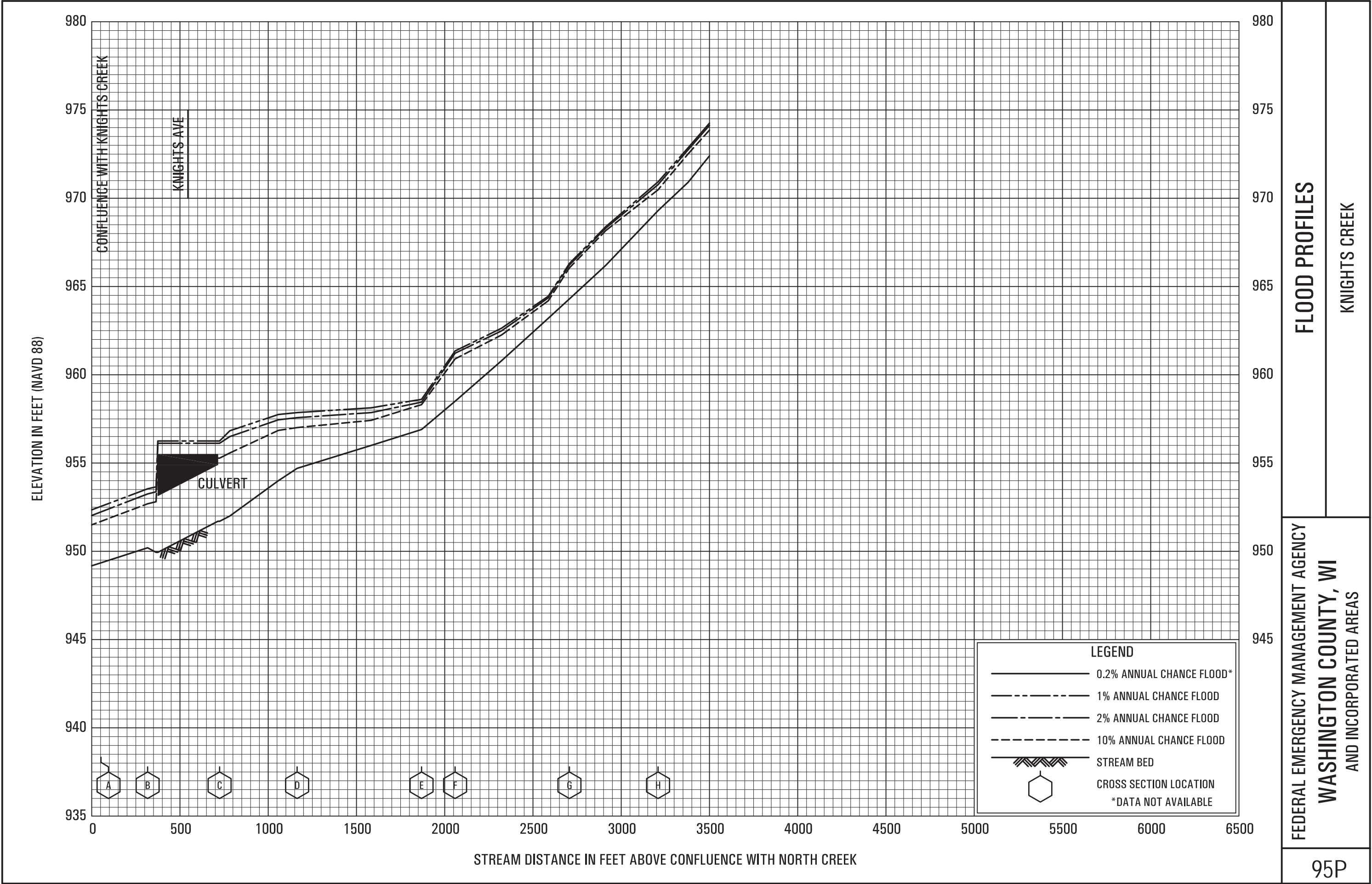
Volume 5 *(continued)*

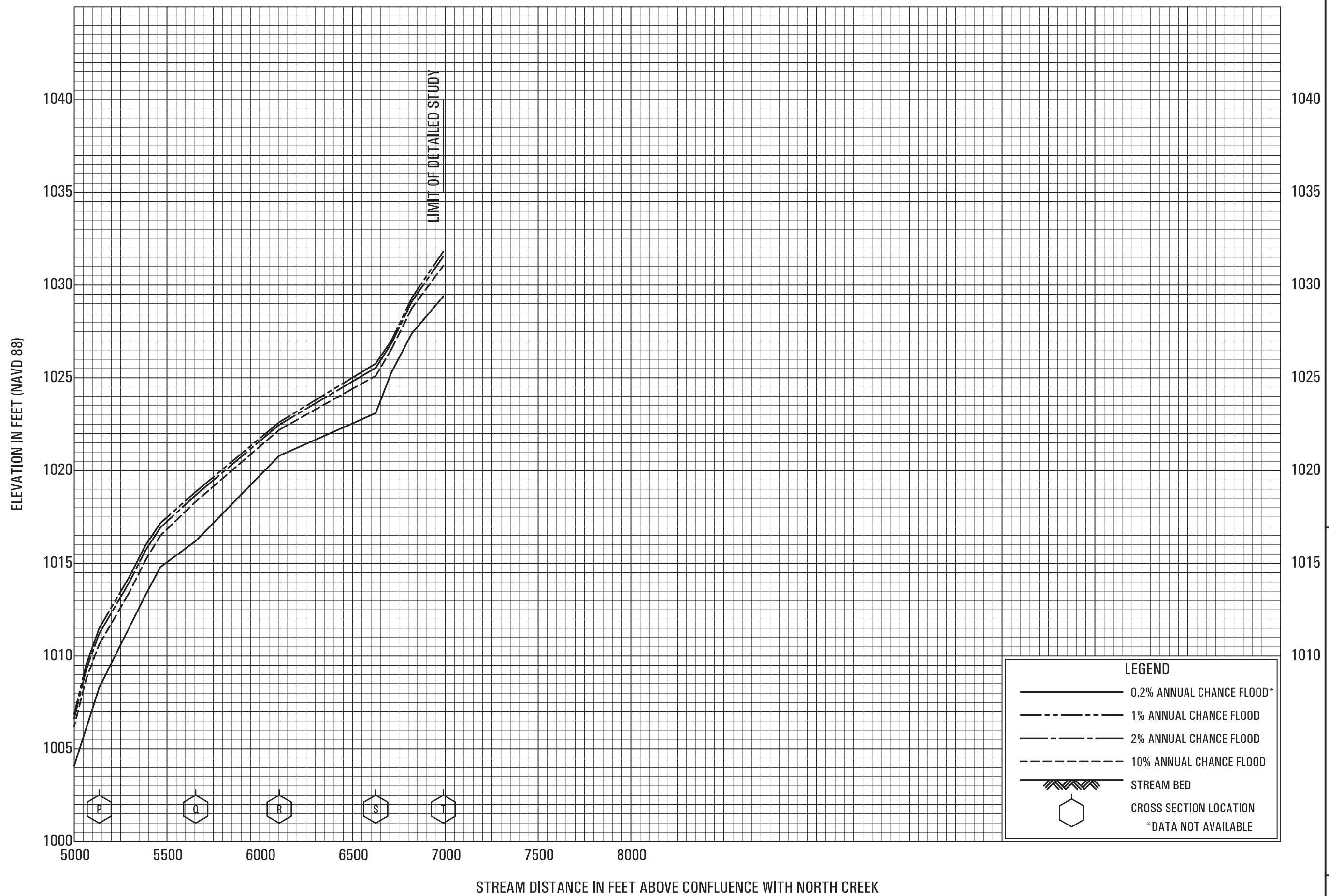
Exhibits *(continued)*

Flood Profiles		<u>Panel</u>
Tributary No. 1A	196	P
Tributary No. 1B	197	P
Tributary No. 2	198	P
Tributary No. 3	199	P
Tributary No. 5	200	P
Unnamed Tributary to Ashippun River	201	P
Unnamed Tributary to Frieden's Creek	202	P
Unnamed Tributary to Kewaskum Creek	203	P
Unnamed Tributary to		
North Crossway Channel	204-205	P
UT-1 to Big Cedar Lake	206-208	P
UT-1 to Cedar Creek	209	P
UT-1 to Coney River	210	P
UT-1 to Coney River Overflow	211	P
UT-1 to Coney River Overflow West	212	P
UT-1 to Evergreen Creek	213	P
UT-1 to Hasmer Creek	214	P
UT-1 to Kressen Branch	215-216	P
UT-1 to Little Cedar Creek	217	P
UT-1 to Little Cedar Lake	218	P
UT-1 to Oconomowoc River	219-220	P
UT-1 to Polk Springs Creek	221	P
UT-1 to Rubicon River	222-224	P
UT-1.1 to Rubicon River	225	P
UT-1.1.1 to Rubicon River	226	P
UT-1.2 to Rubicon River	227	P
UT-1.2.1 to Rubicon River	228	P
UT-2 to Cedar Creek	229-230	P
UT-2 to Coney River	231	P
UT-2 to Little Cedar Creek	232	P
UT-2 to Oconomowoc River	233-234	P
UT-2 to Rubicon River	235-237	P
UT-2.1 to Rubicon River	238	P
UT-3 to Rubicon River	239-241	P
UT-3.1 to Rubicon River	242	P
UT-4 to Rubicon River	243	P
UT-5 to Rubicon River	244	P
Washington Creek	245	P
West Branch Menomonee River	246-249	P
West Branch Milwaukee River	250	P
Willow Creek	251-253	P
Wingate Creek	254-255	P

Published Separately

Flood Insurance Rate Map (FIRM)





STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH NORTH CREEK

LEGEND

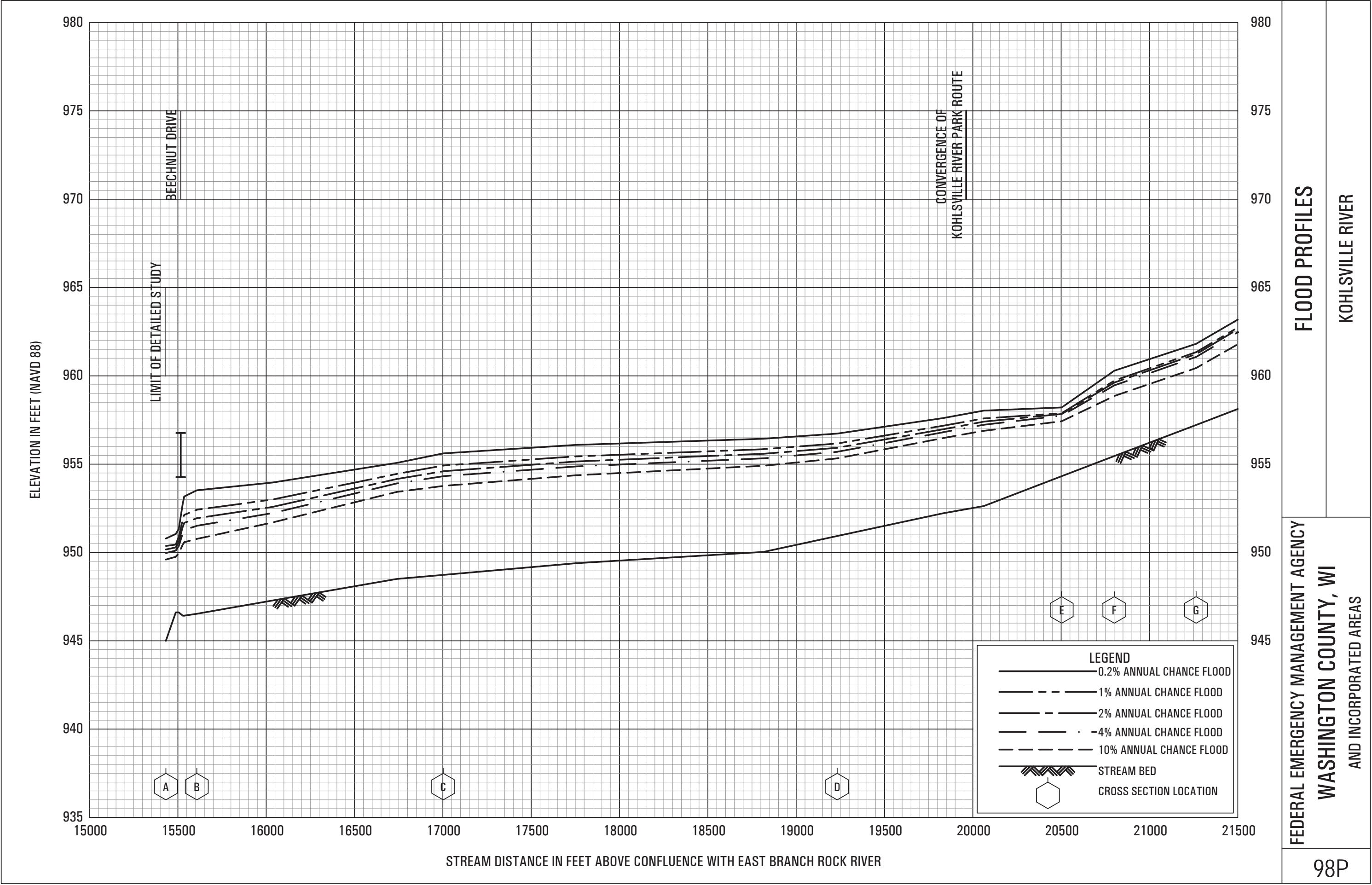
FEDERAL EMERGENCY MANAGEMENT AGENCY

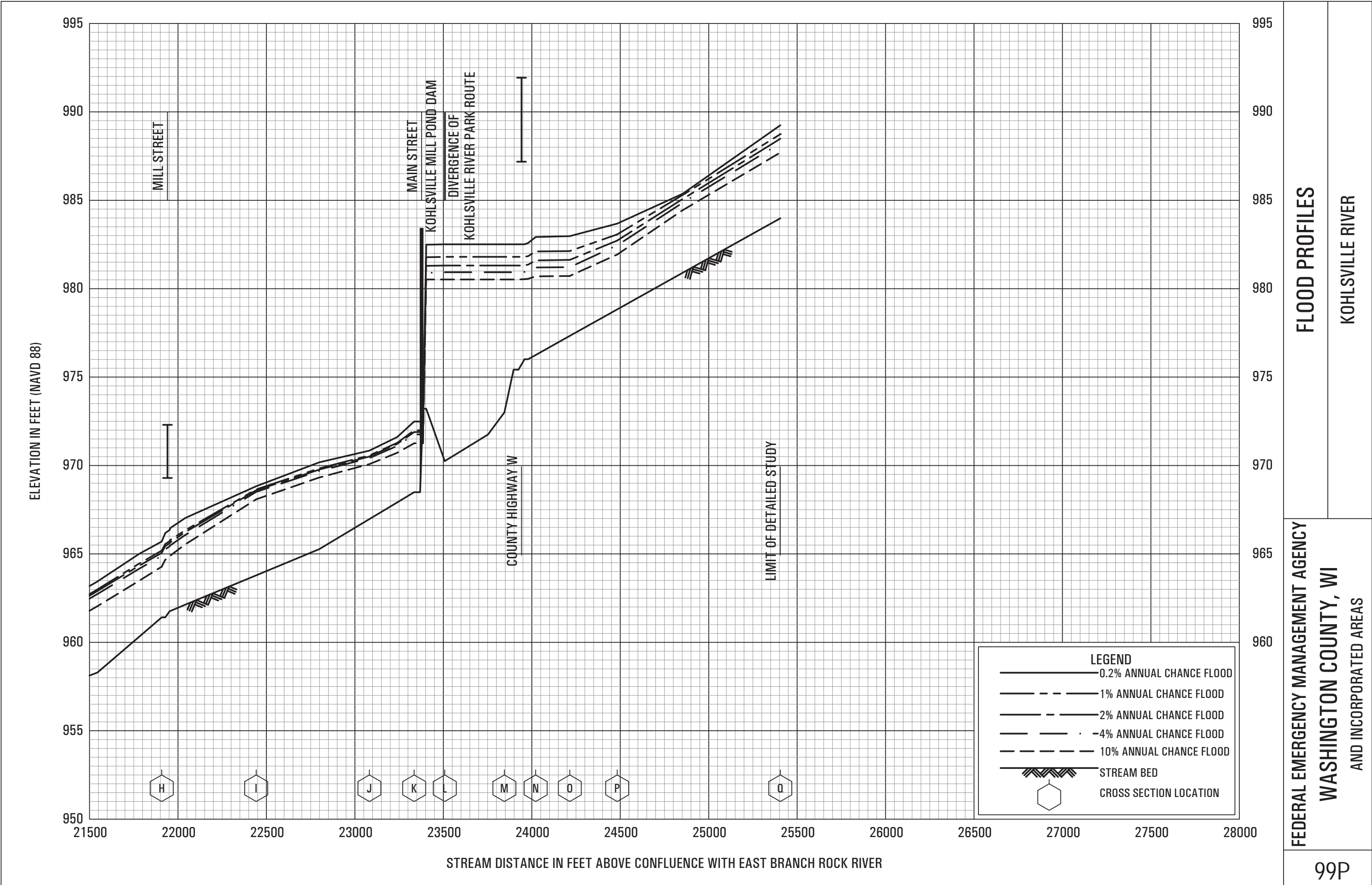
**WASHINGTON COUNTY, WI
AND INCORPORATED AREAS**

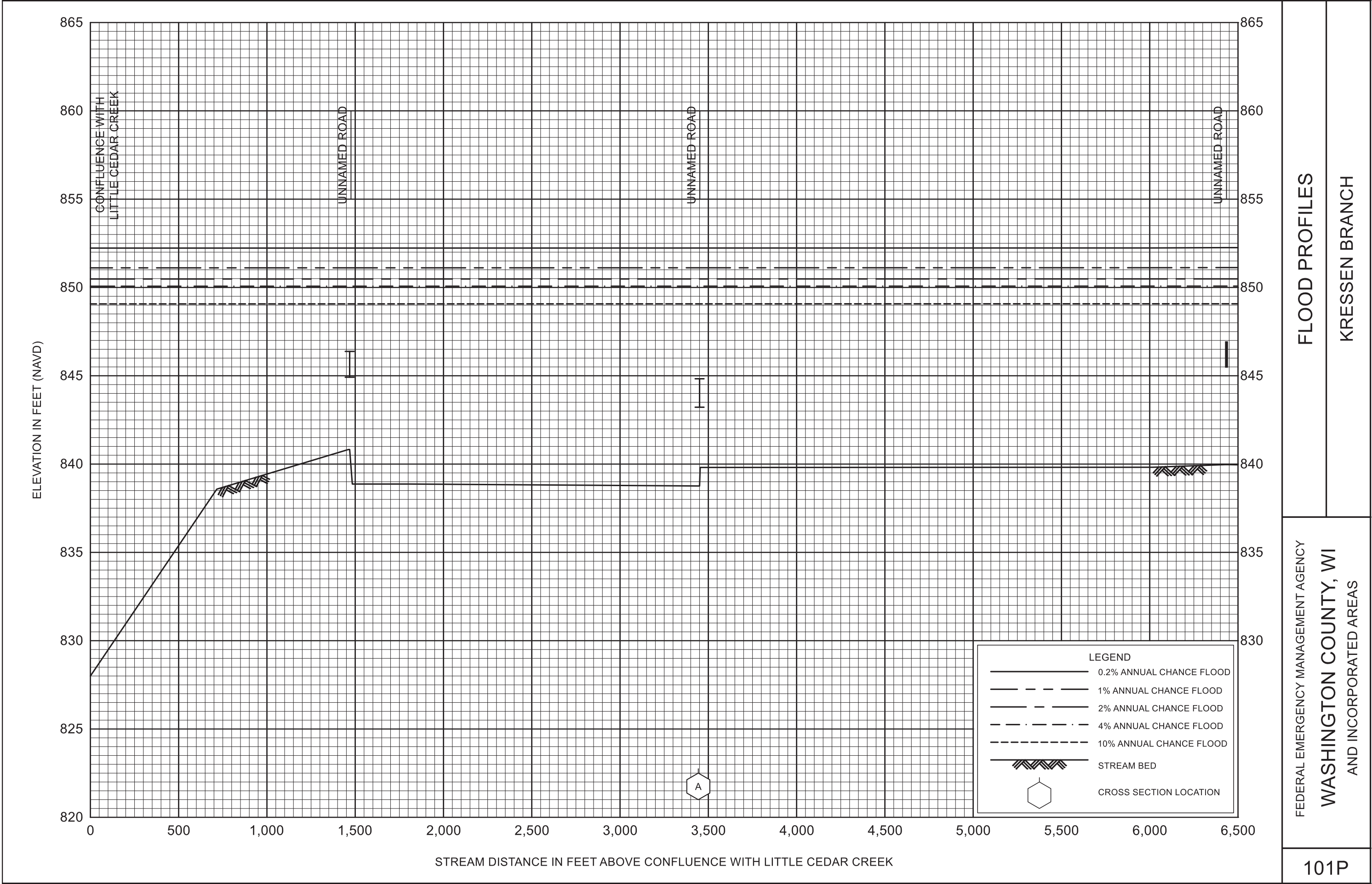
KNIGHTS CREEK

FLOOD PROFILES

97P





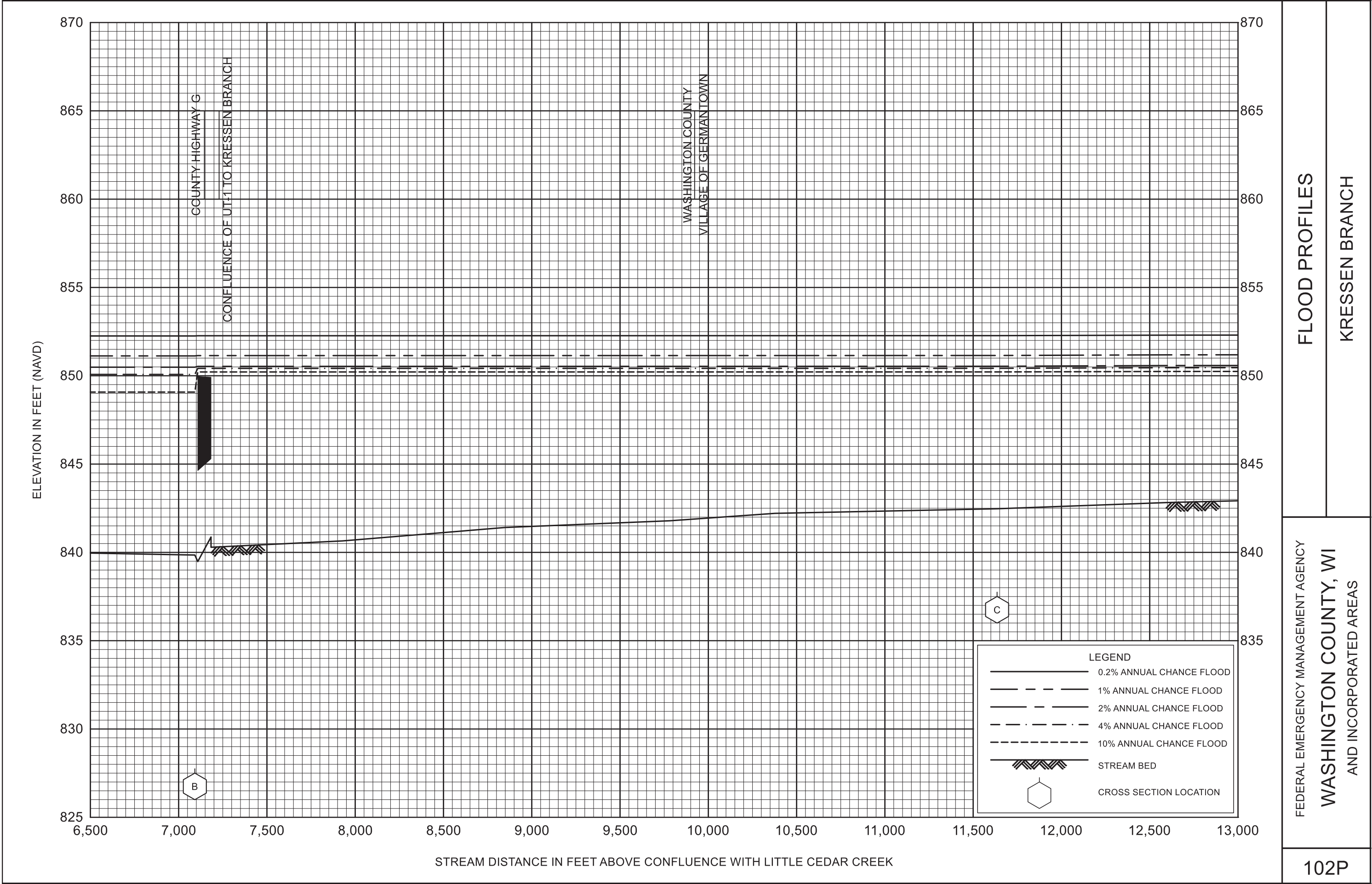


FLOOD PROFILES

KRESSEN BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, WI
AND INCORPORATED AREAS

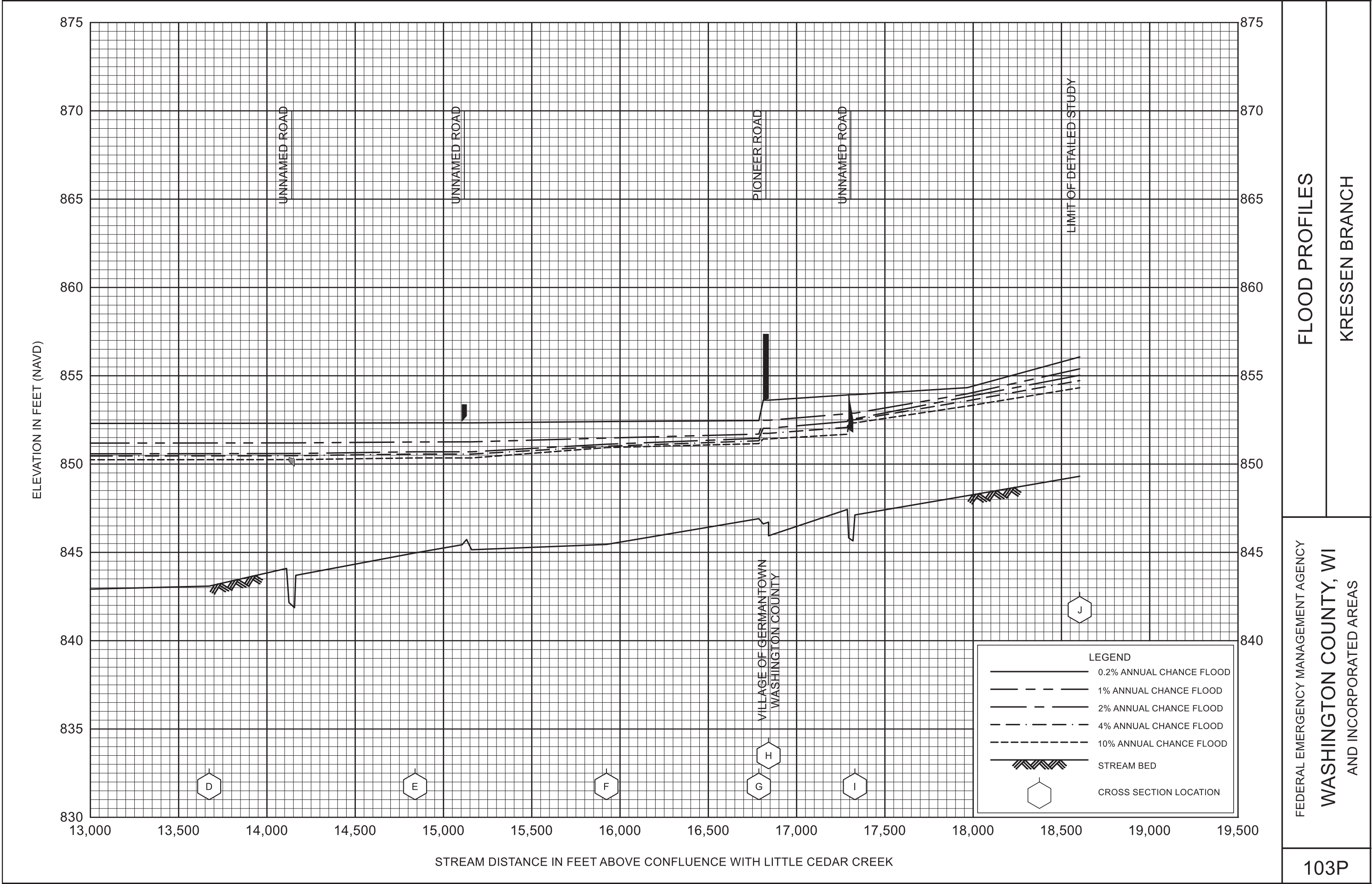


FLOOD PROFILES

KRESSEN BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, WI
AND INCORPORATED AREAS

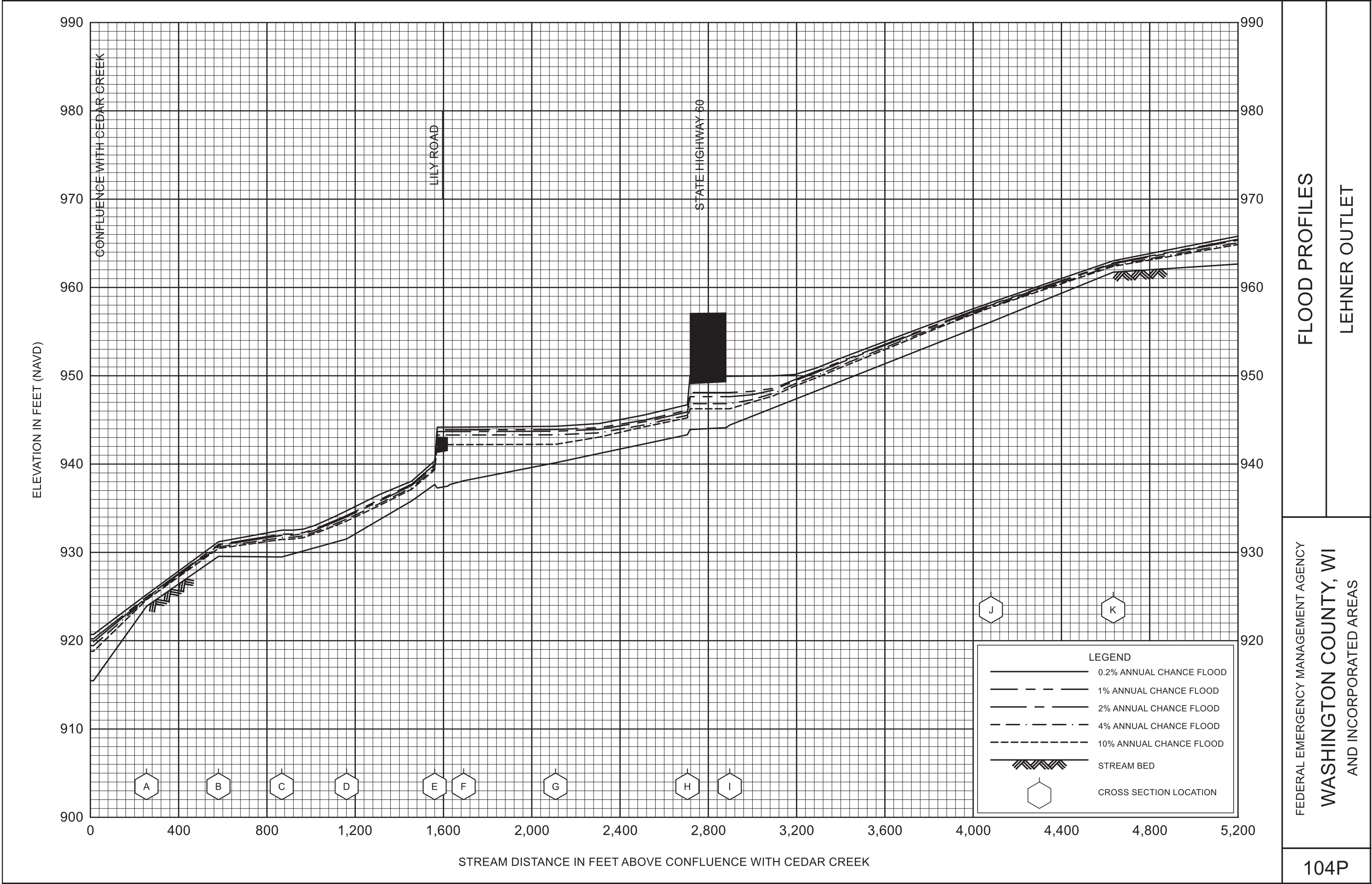


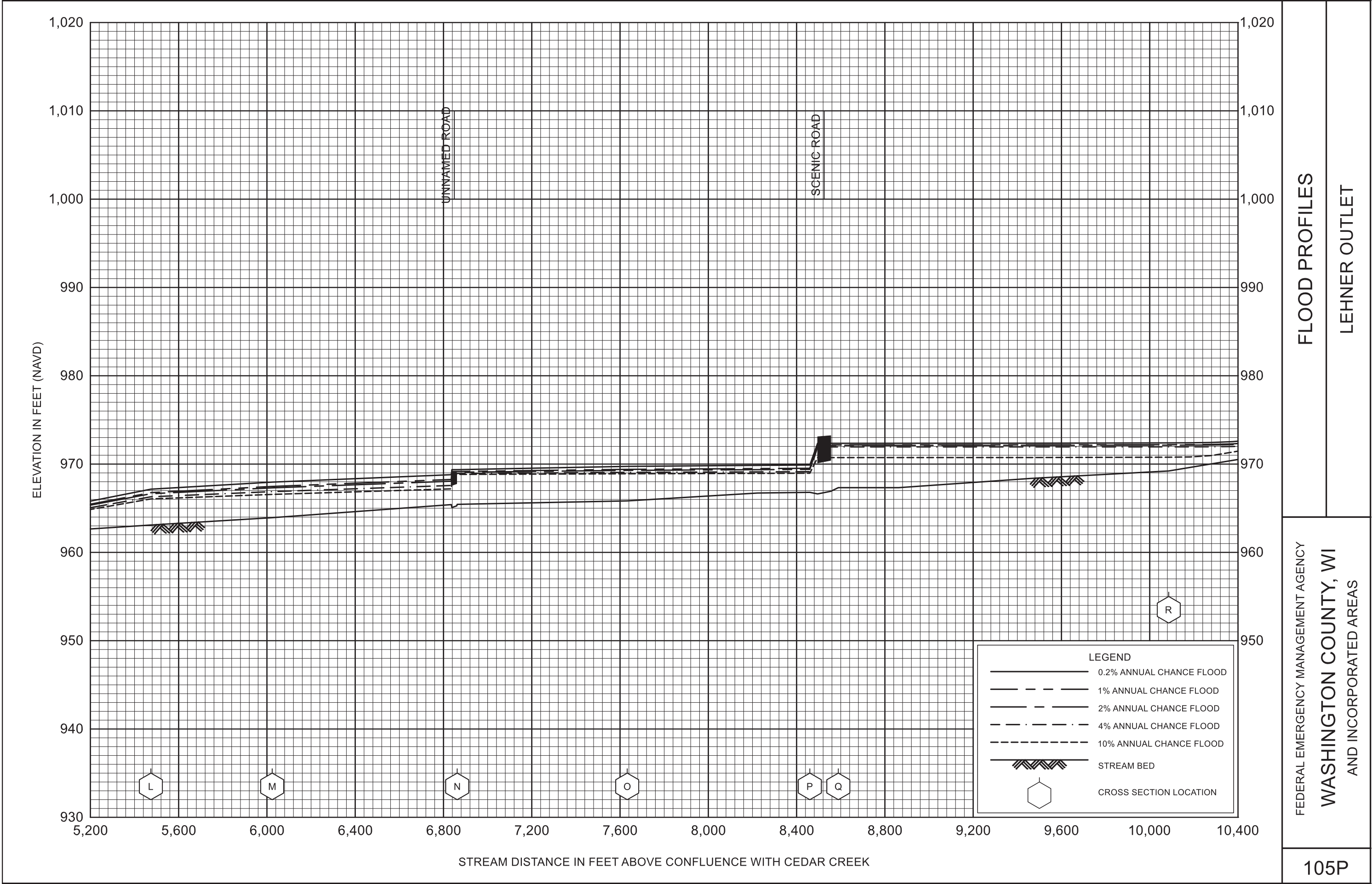
FLOOD PROFILES

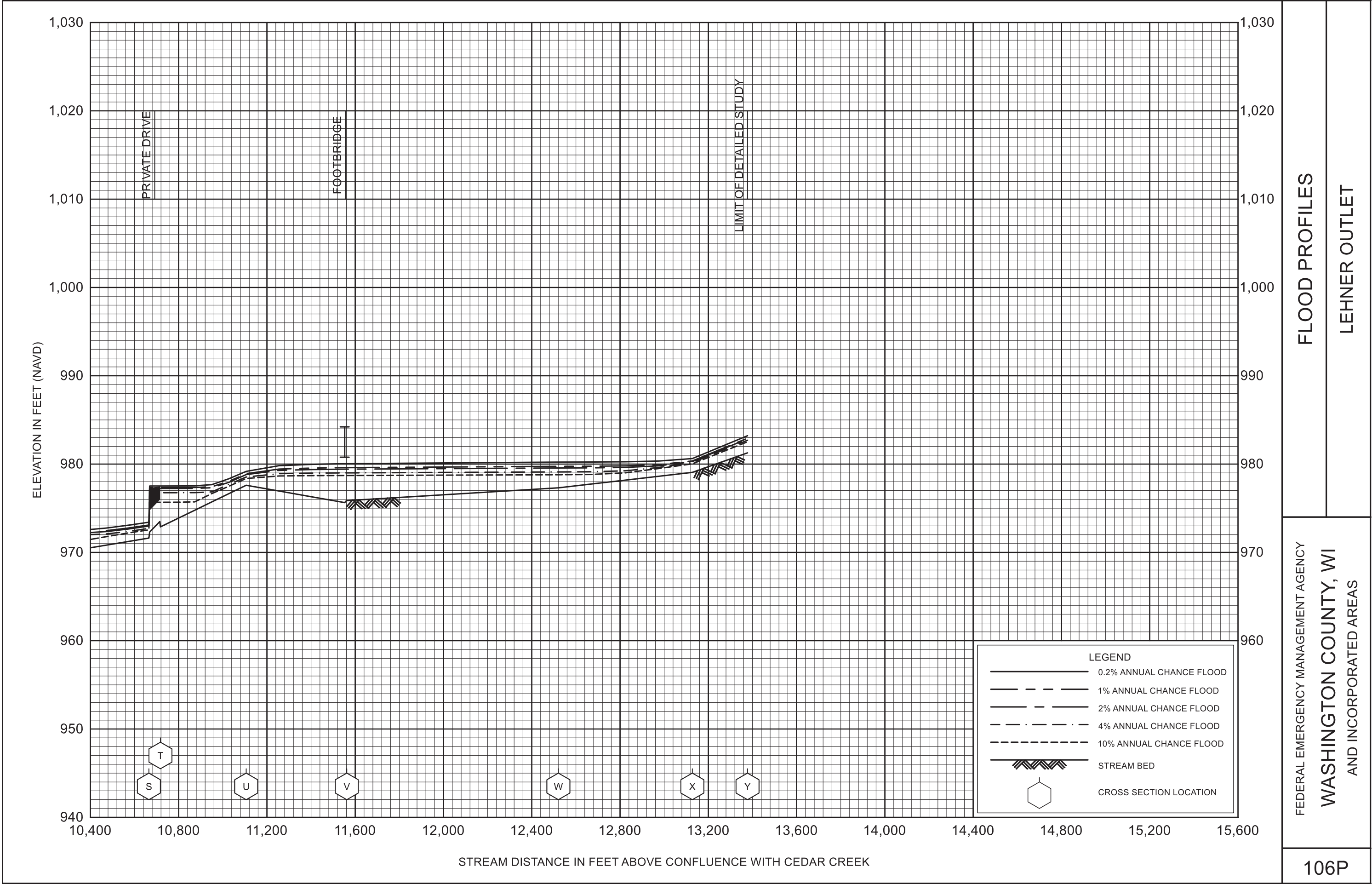
KRESSEN BRANCH

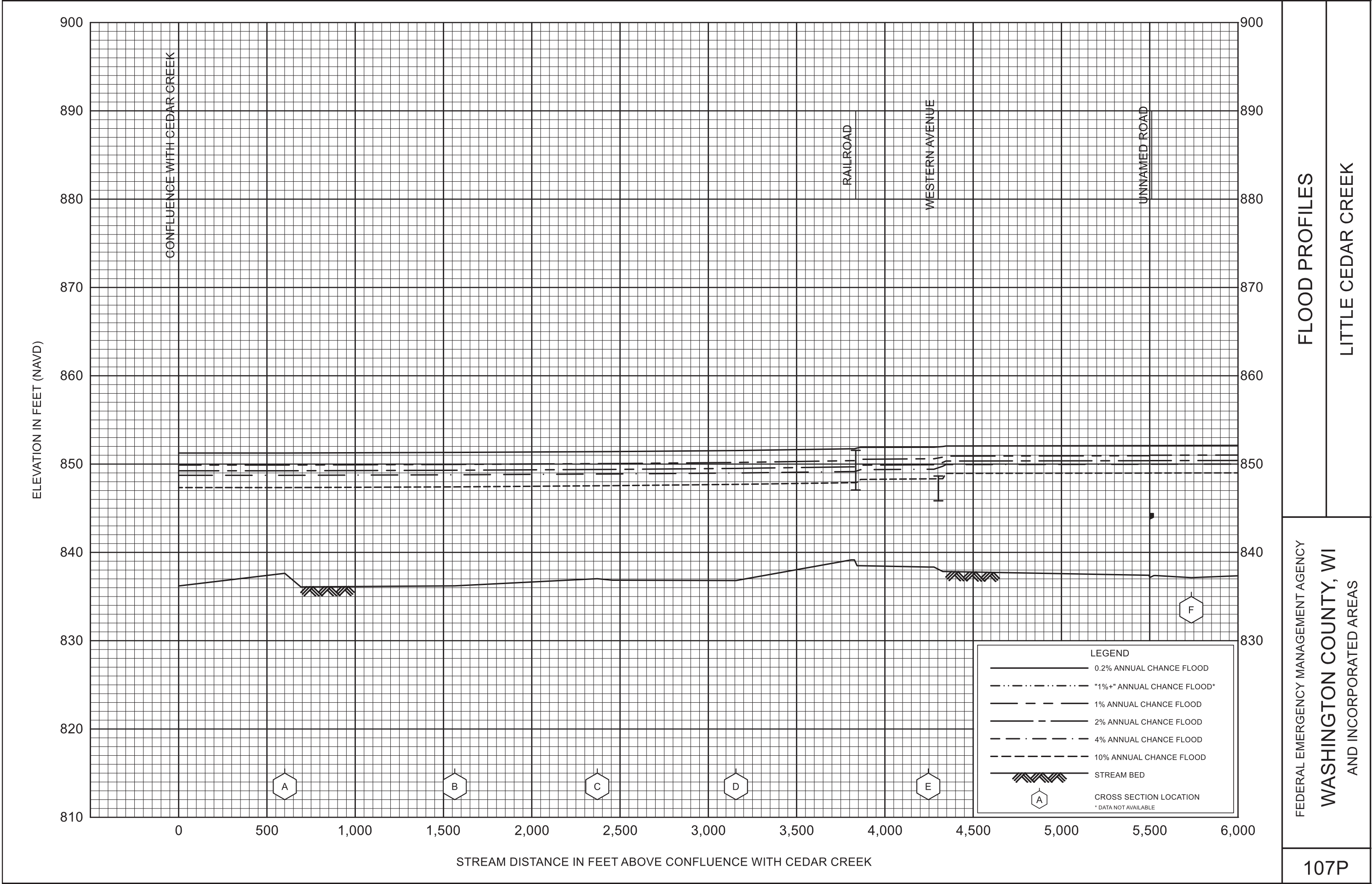
FEDERAL EMERGENCY MANAGEMENT AGENCY

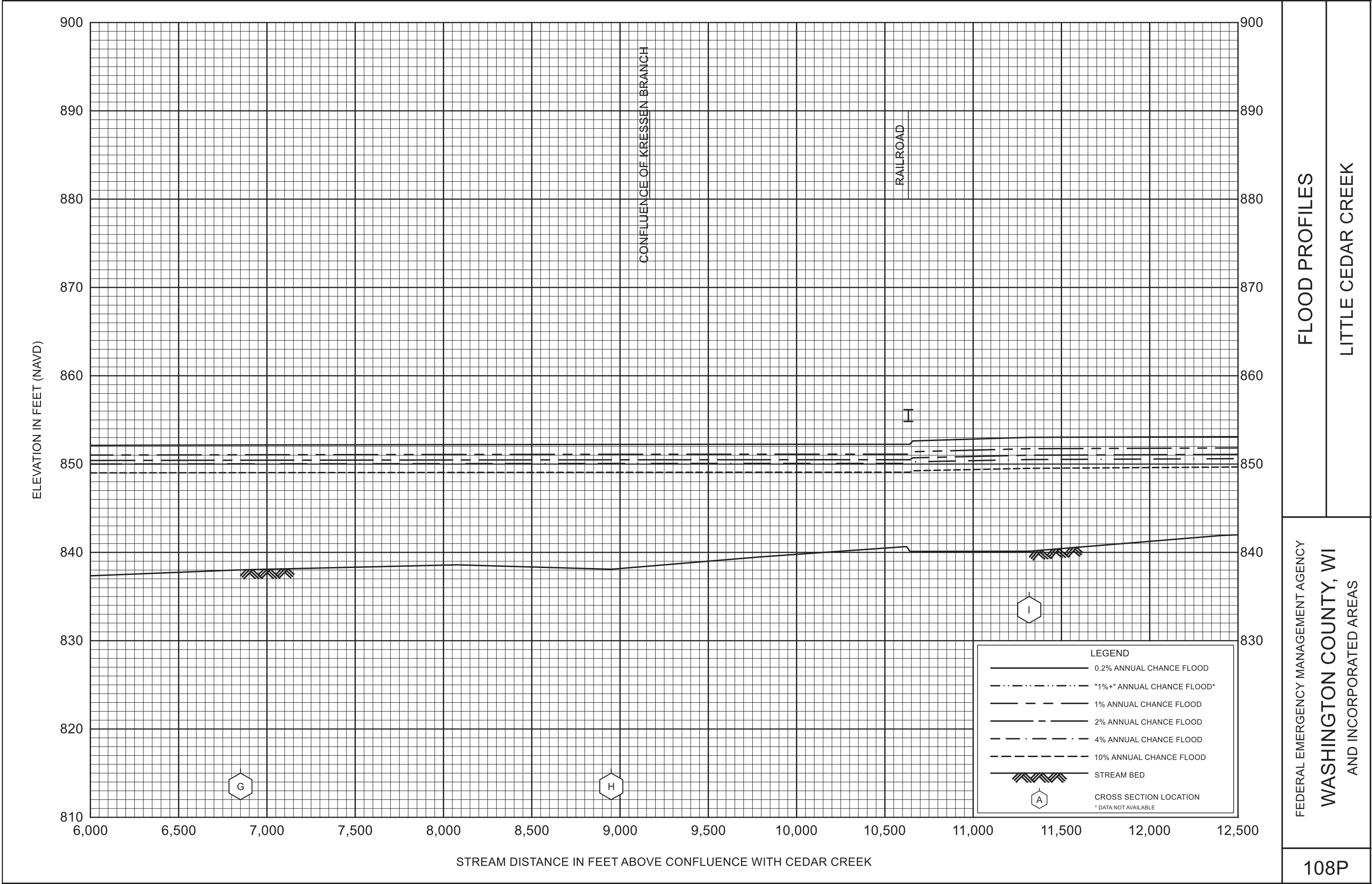
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS

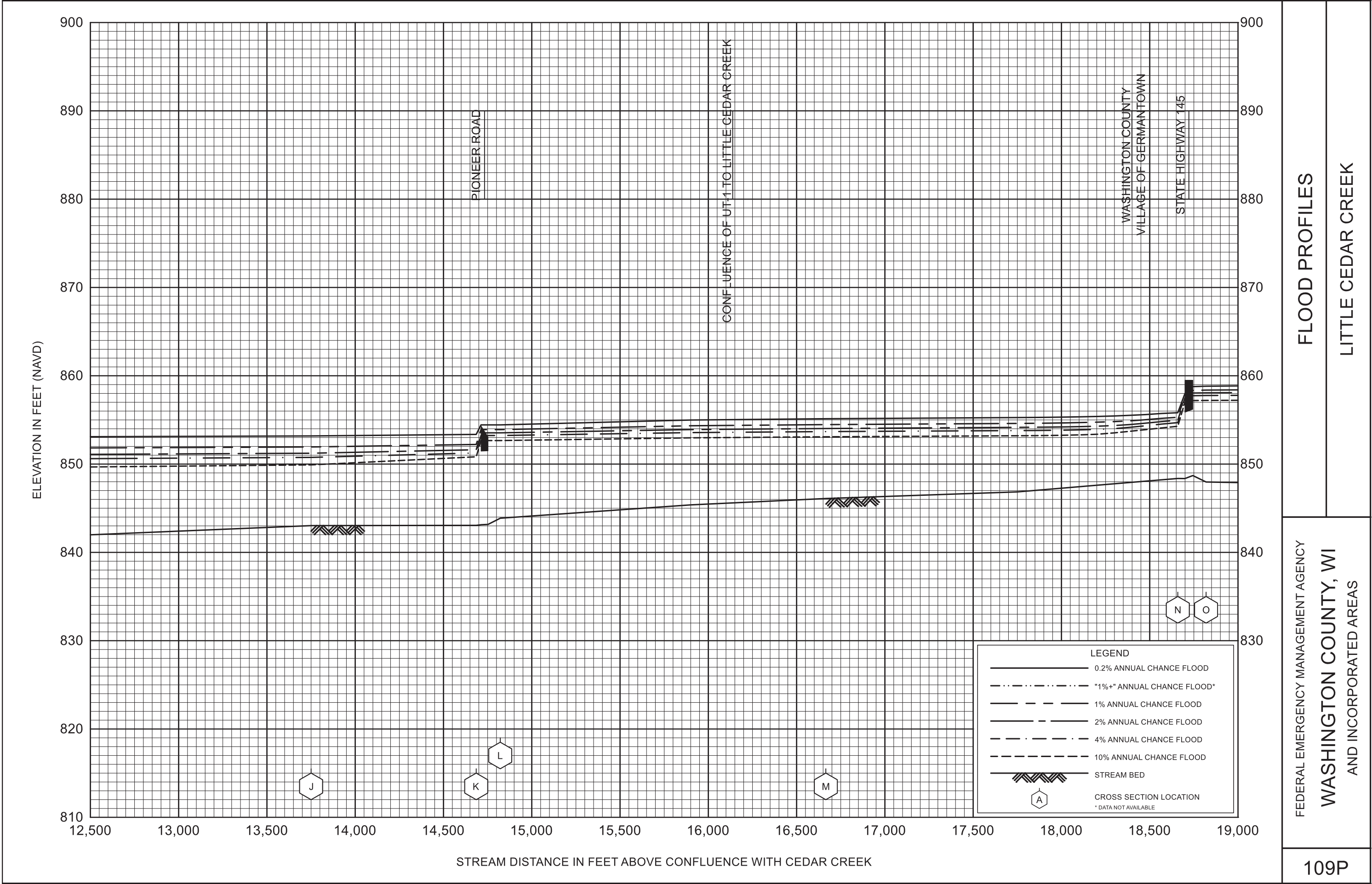


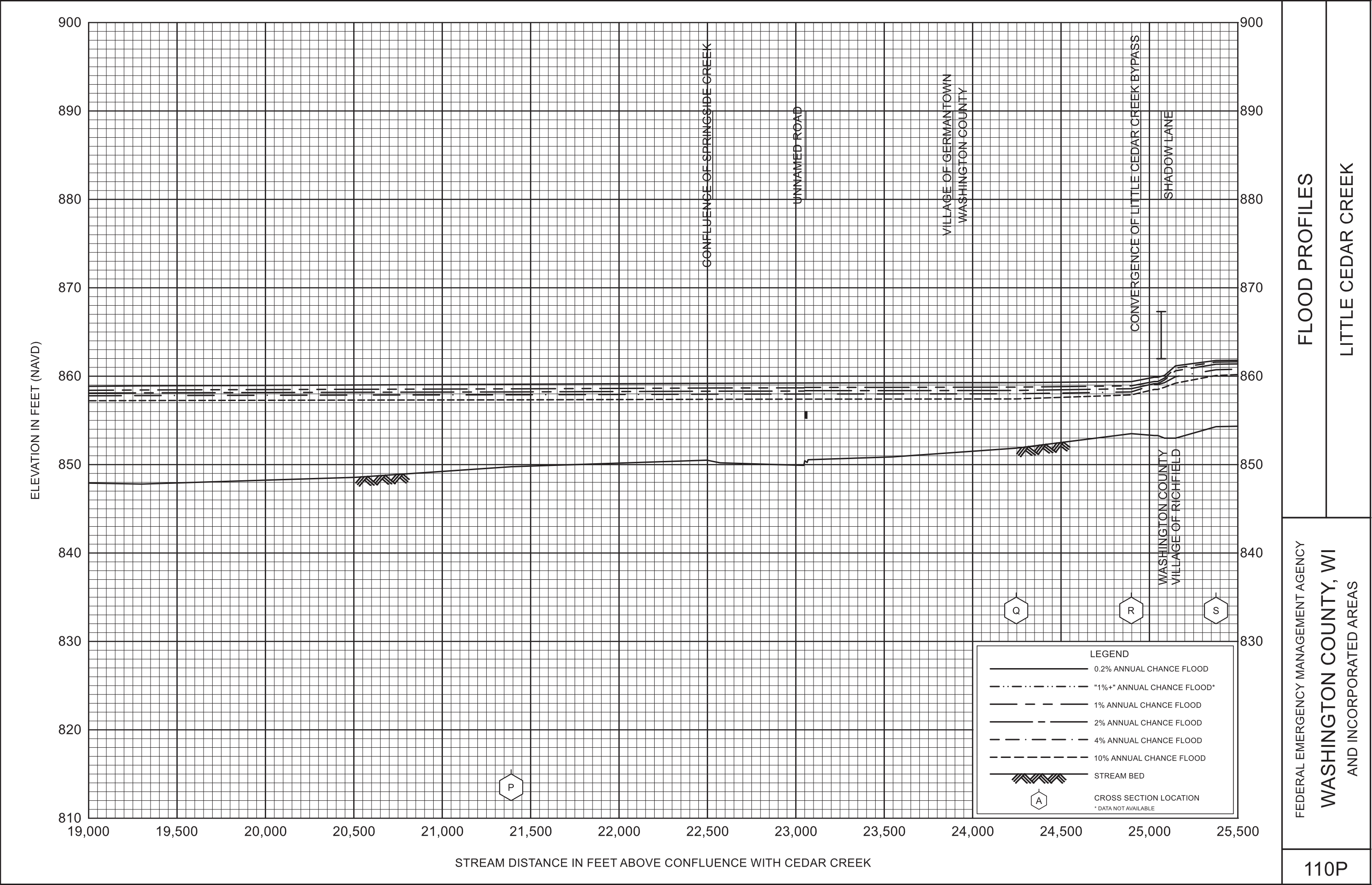


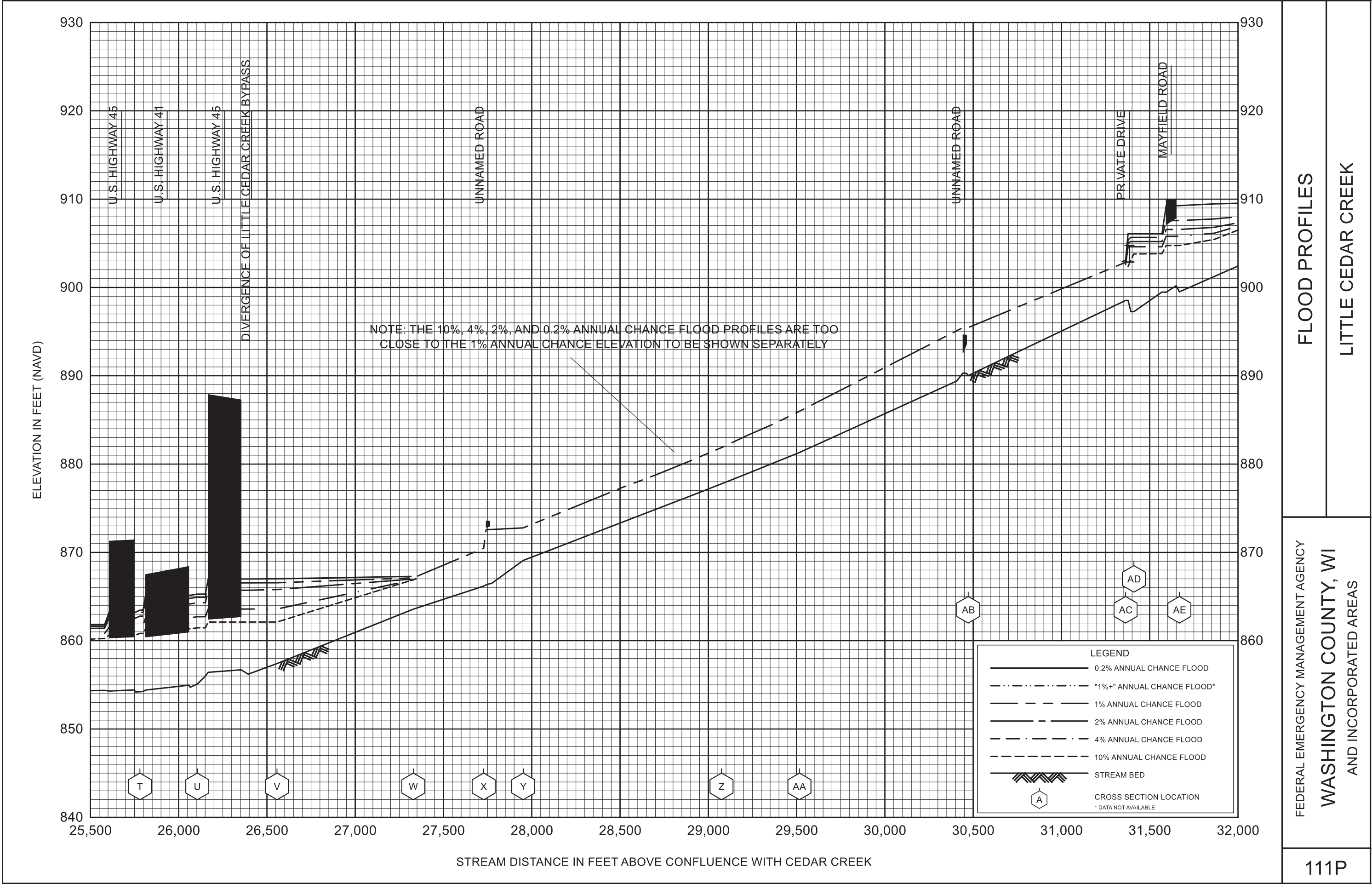












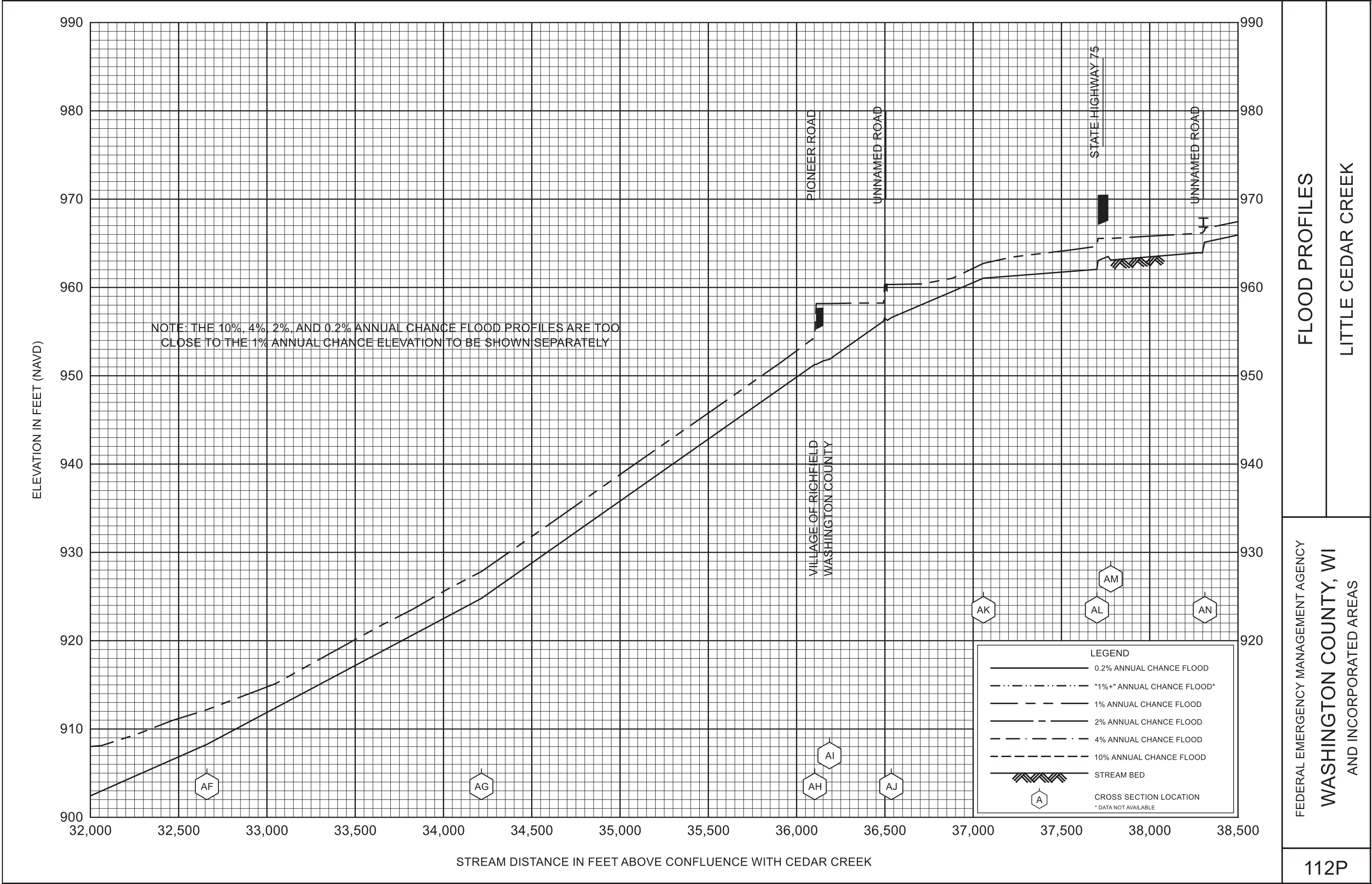
FLOOD PROFILES

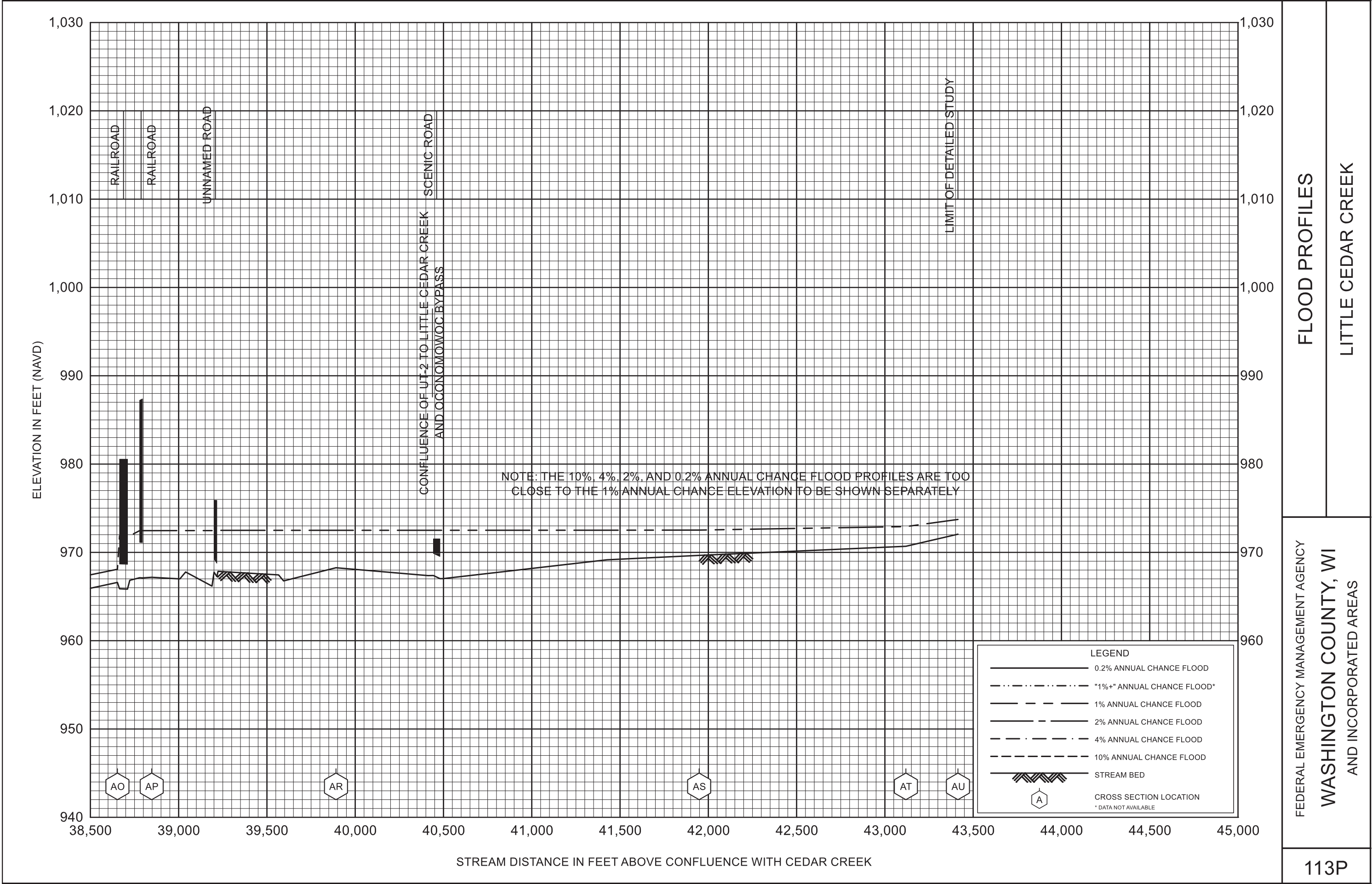
LITTLE CEDAR CREEK

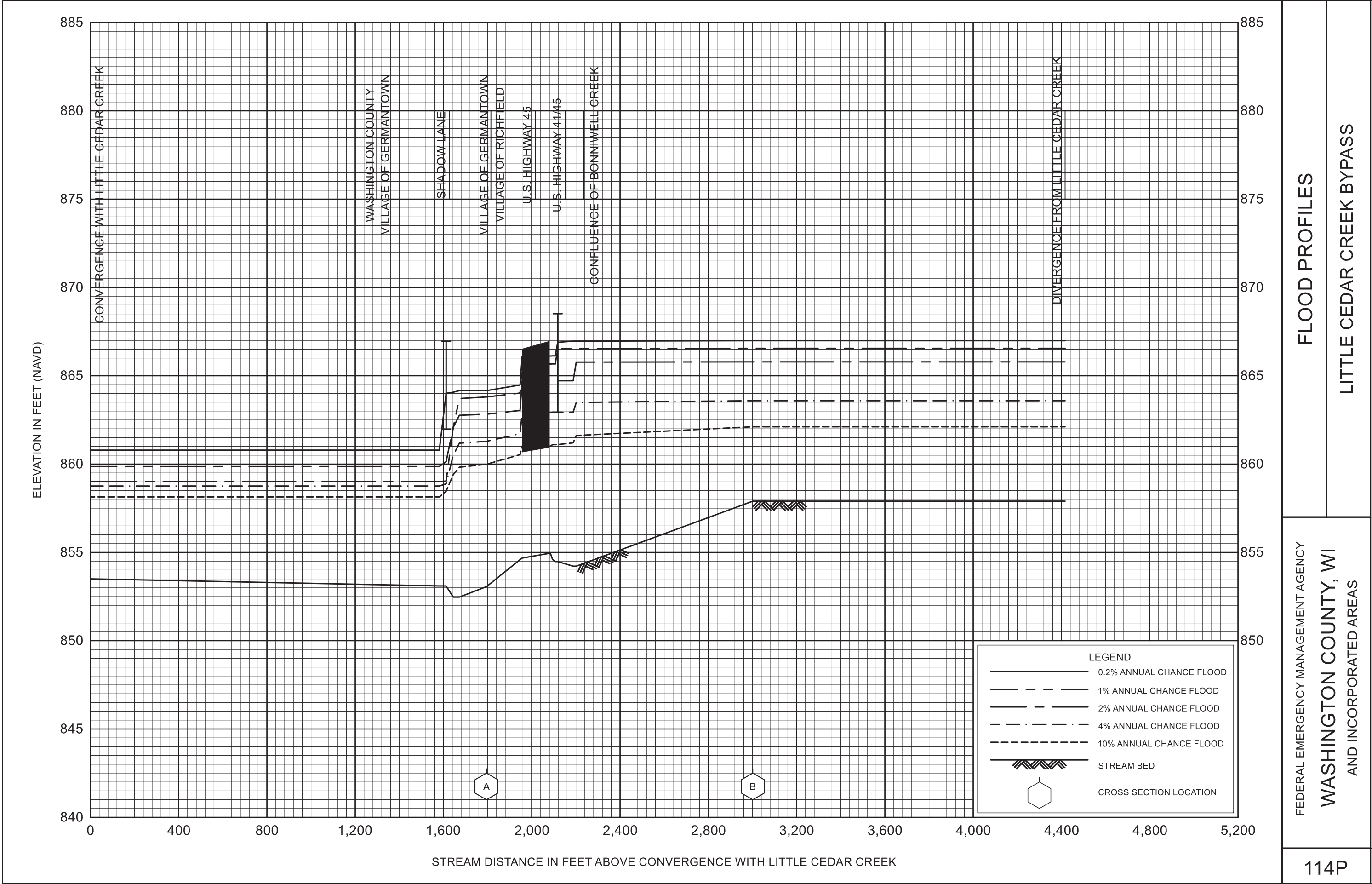
FEDERAL EMERGENCY MANAGEMENT AGENCY

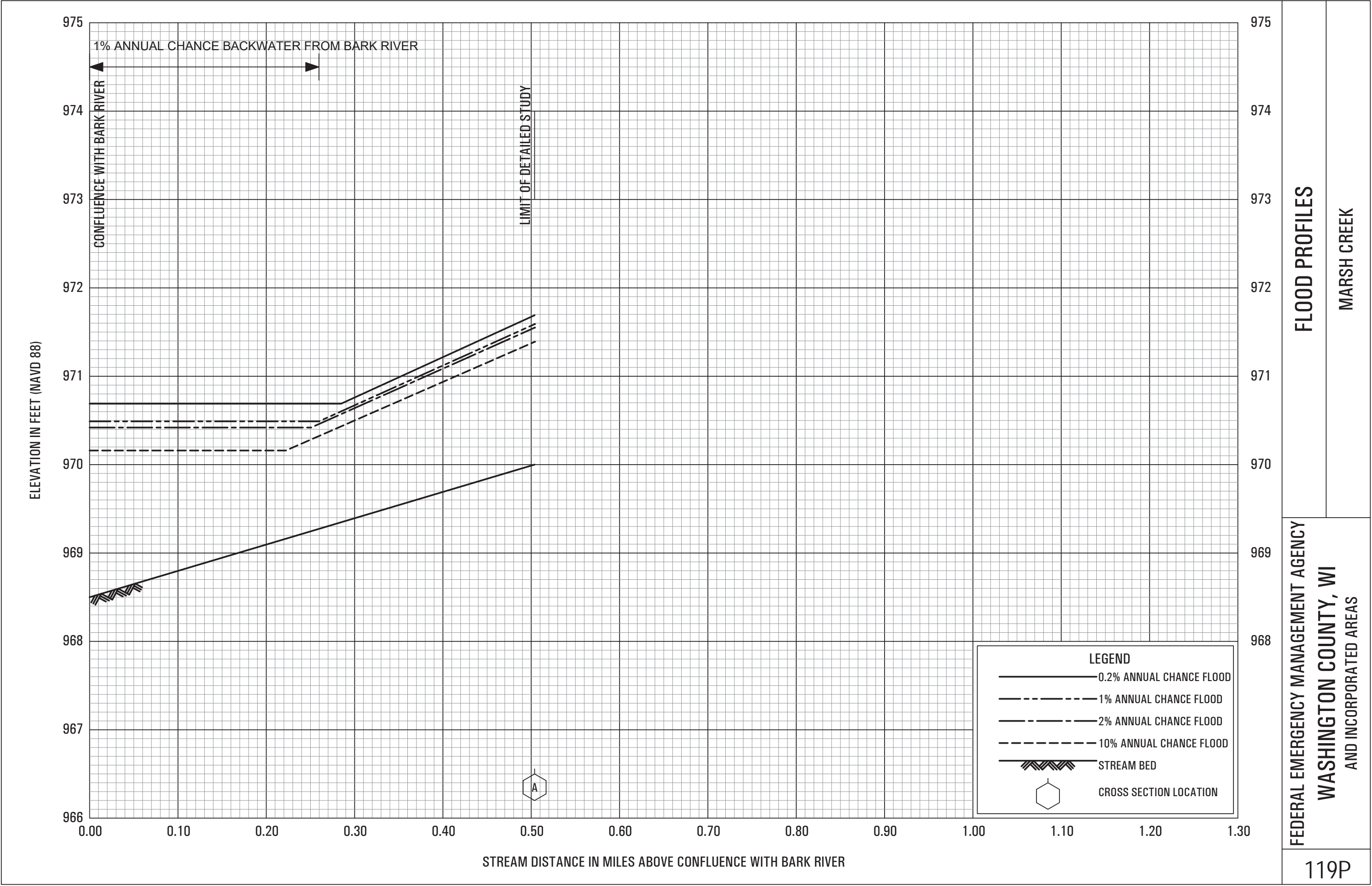
WASHINGTON COUNTY, WI

AND INCORPORATED AREAS





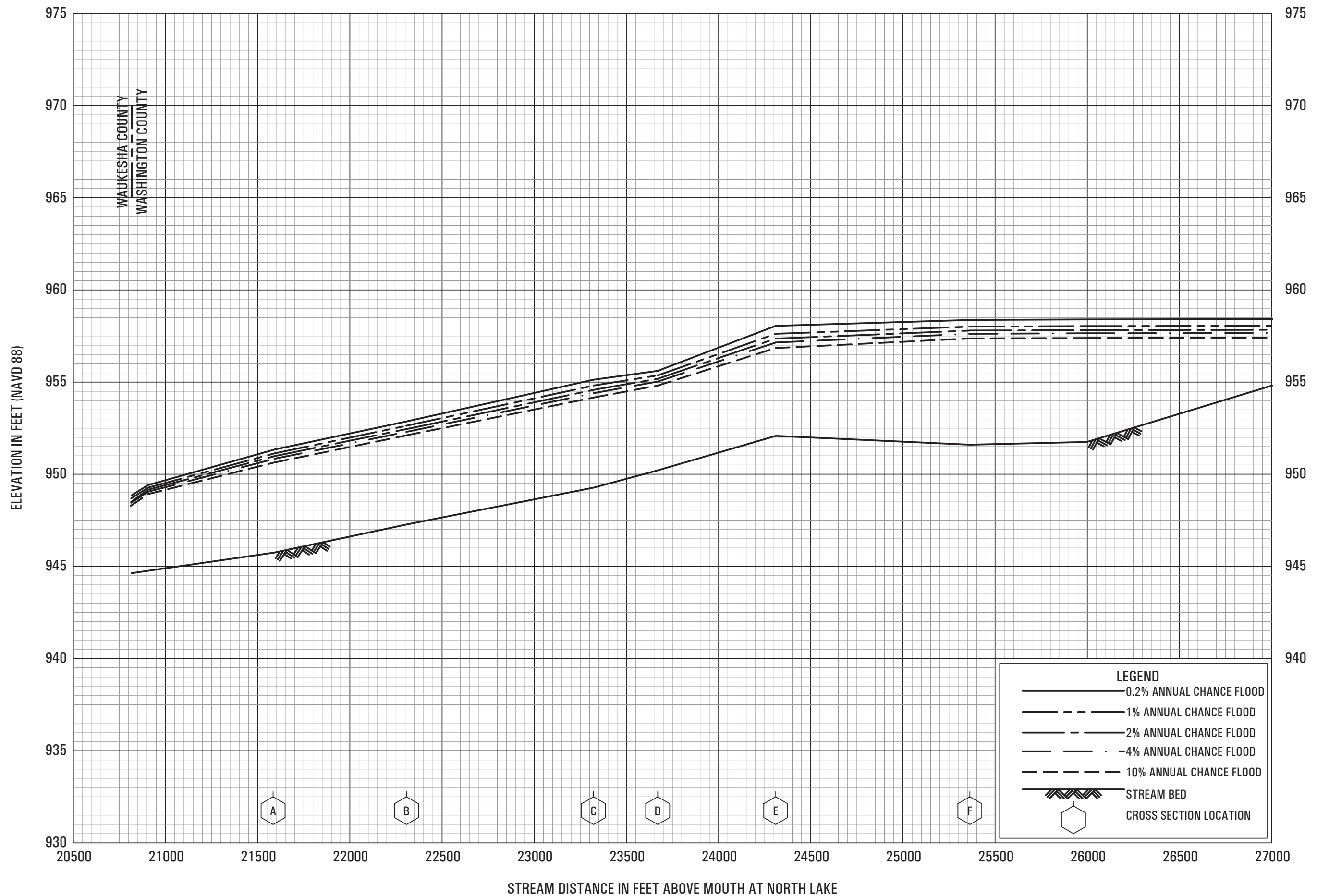




FLOOD PROFILES

MARSH CREEK

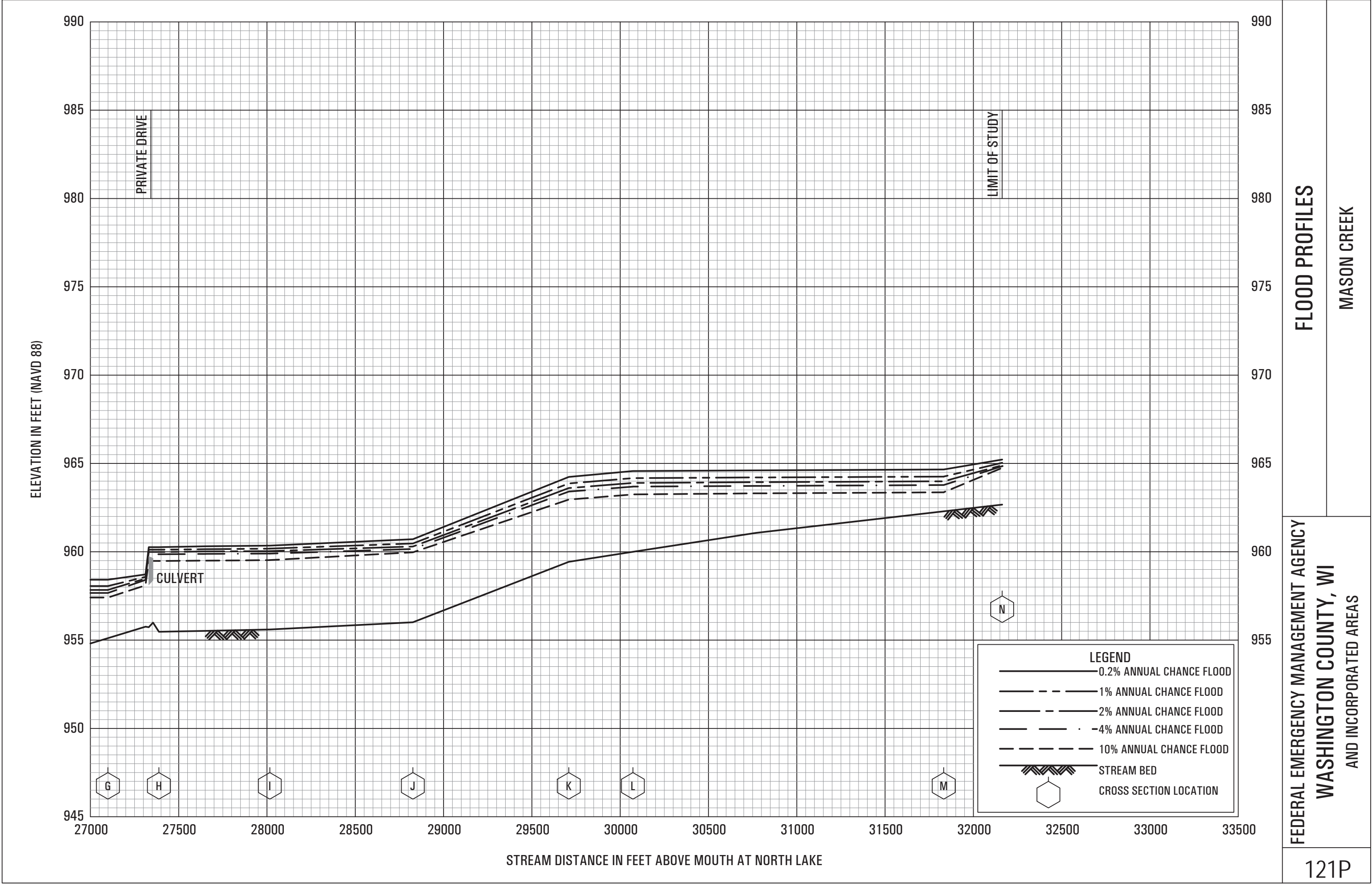
FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS



**FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS**

FLOOD PROFILES

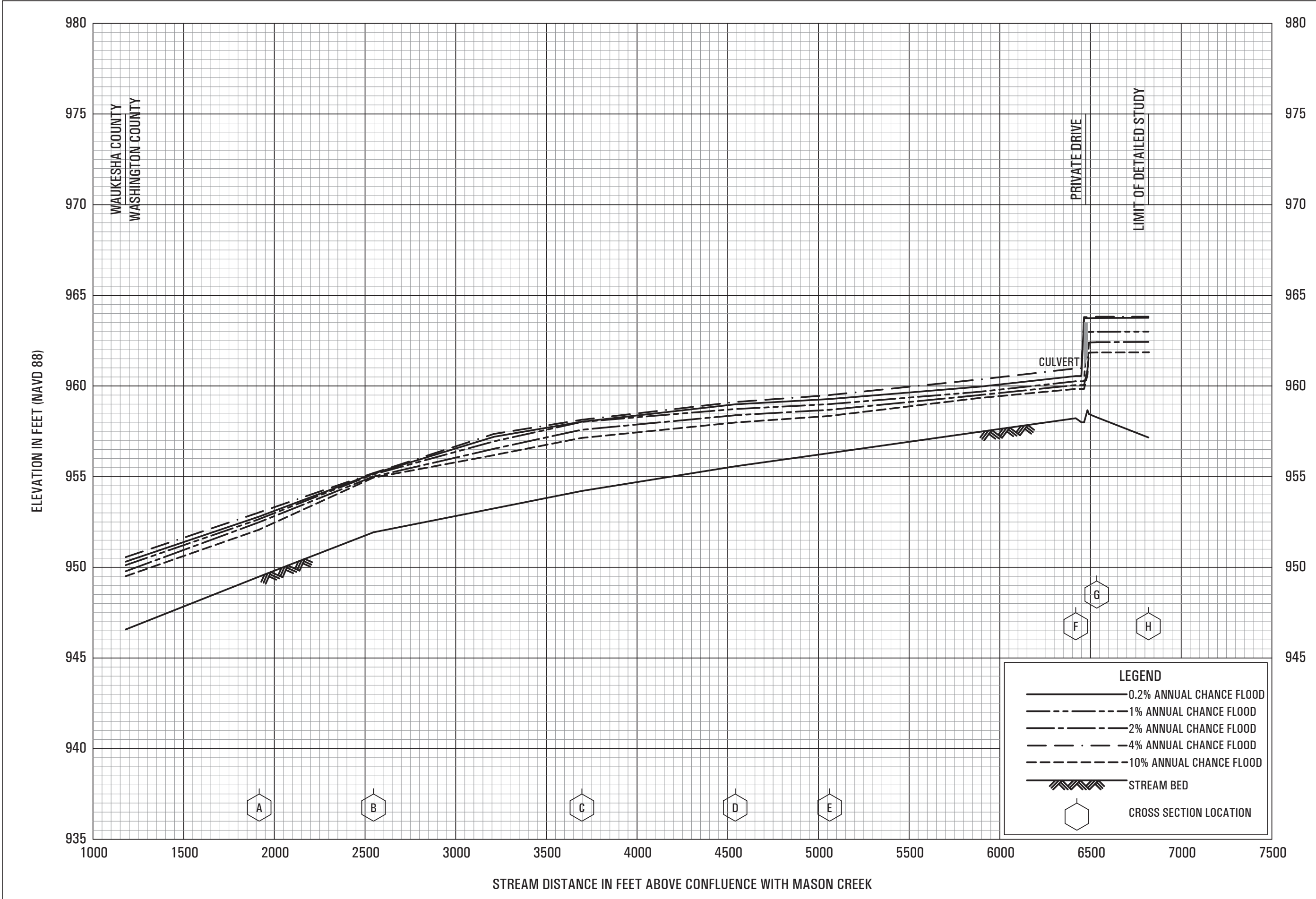
MASON CREEK

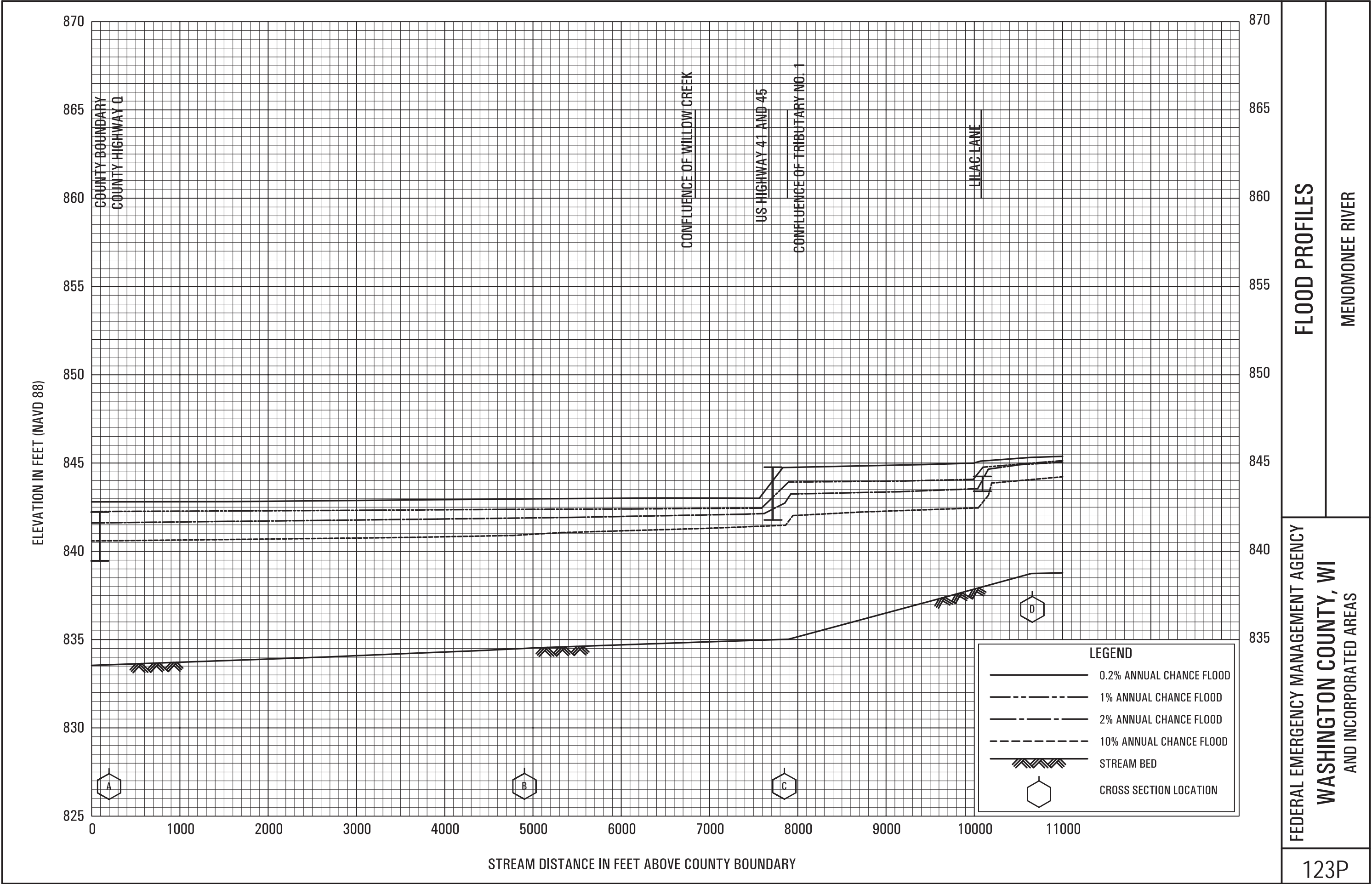


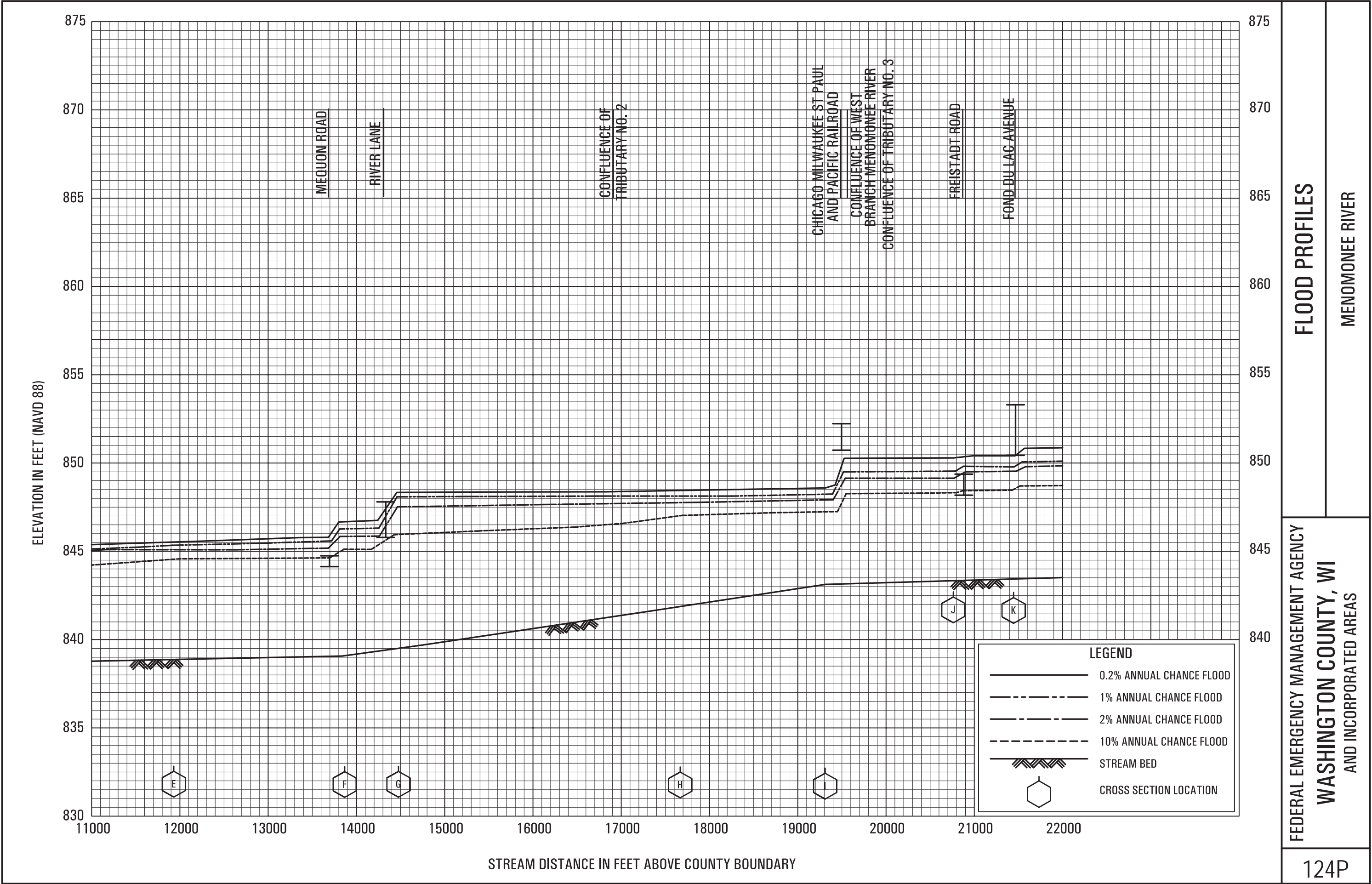
FLOOD PROFILES

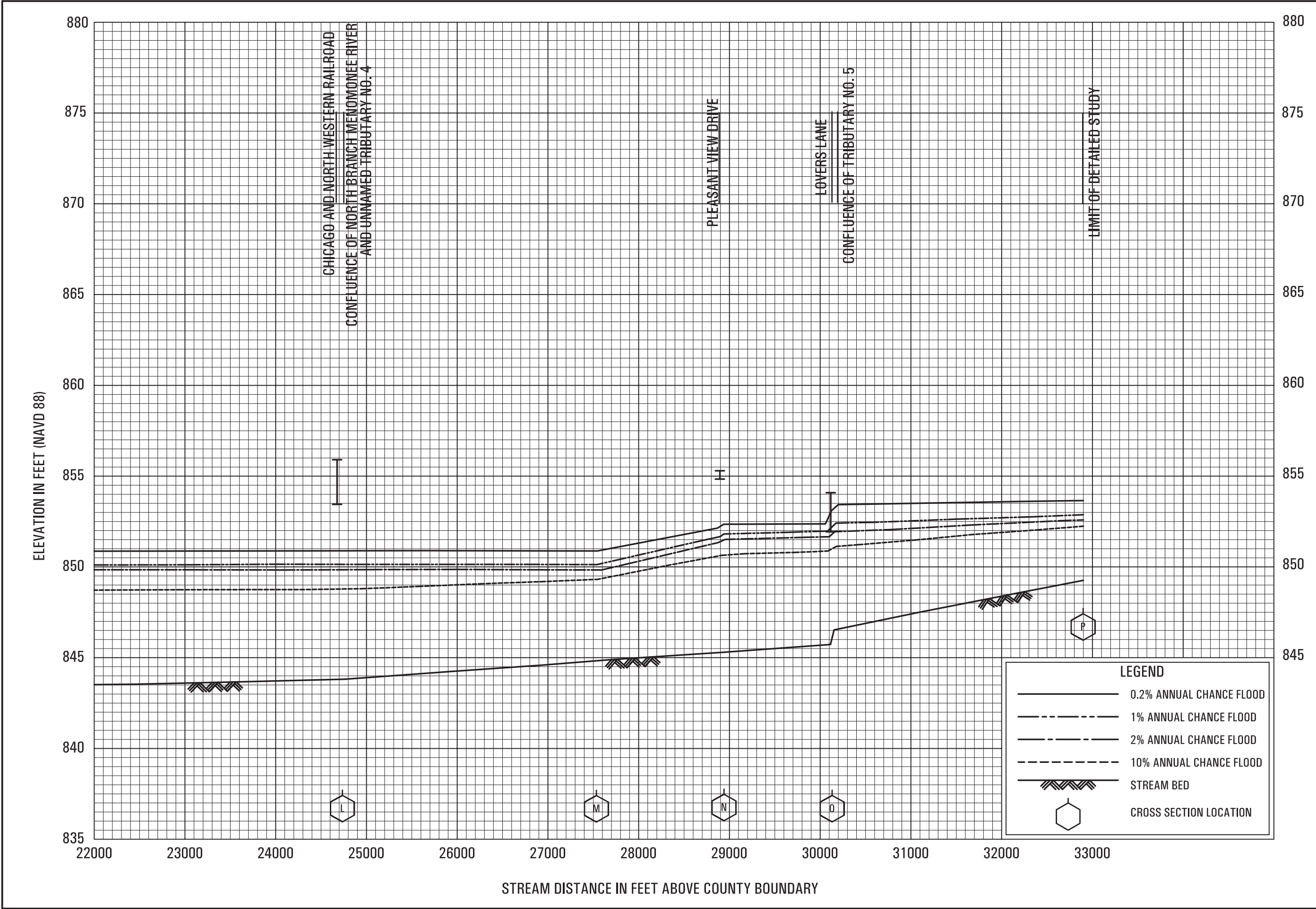
MASON CREEK

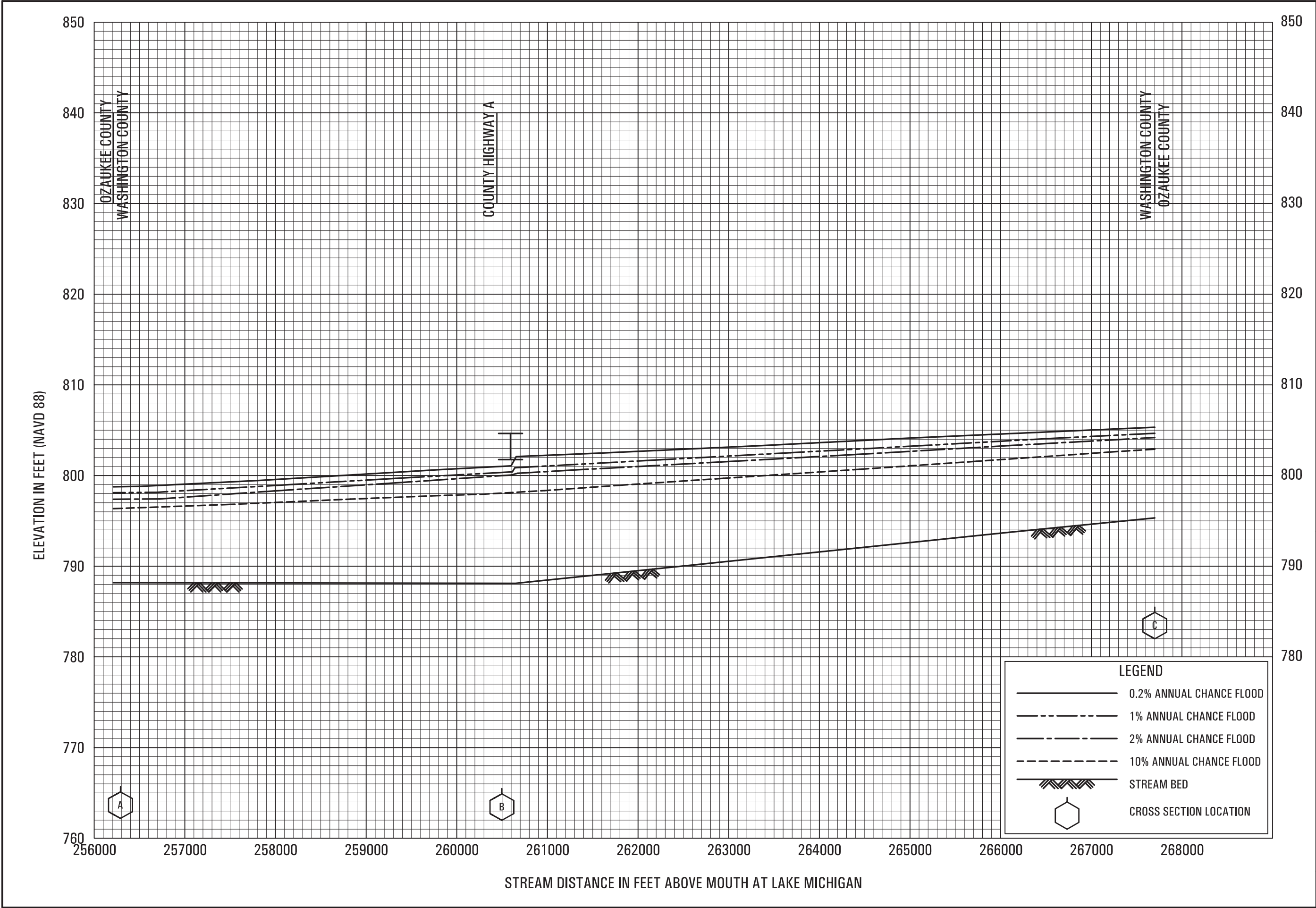
FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS

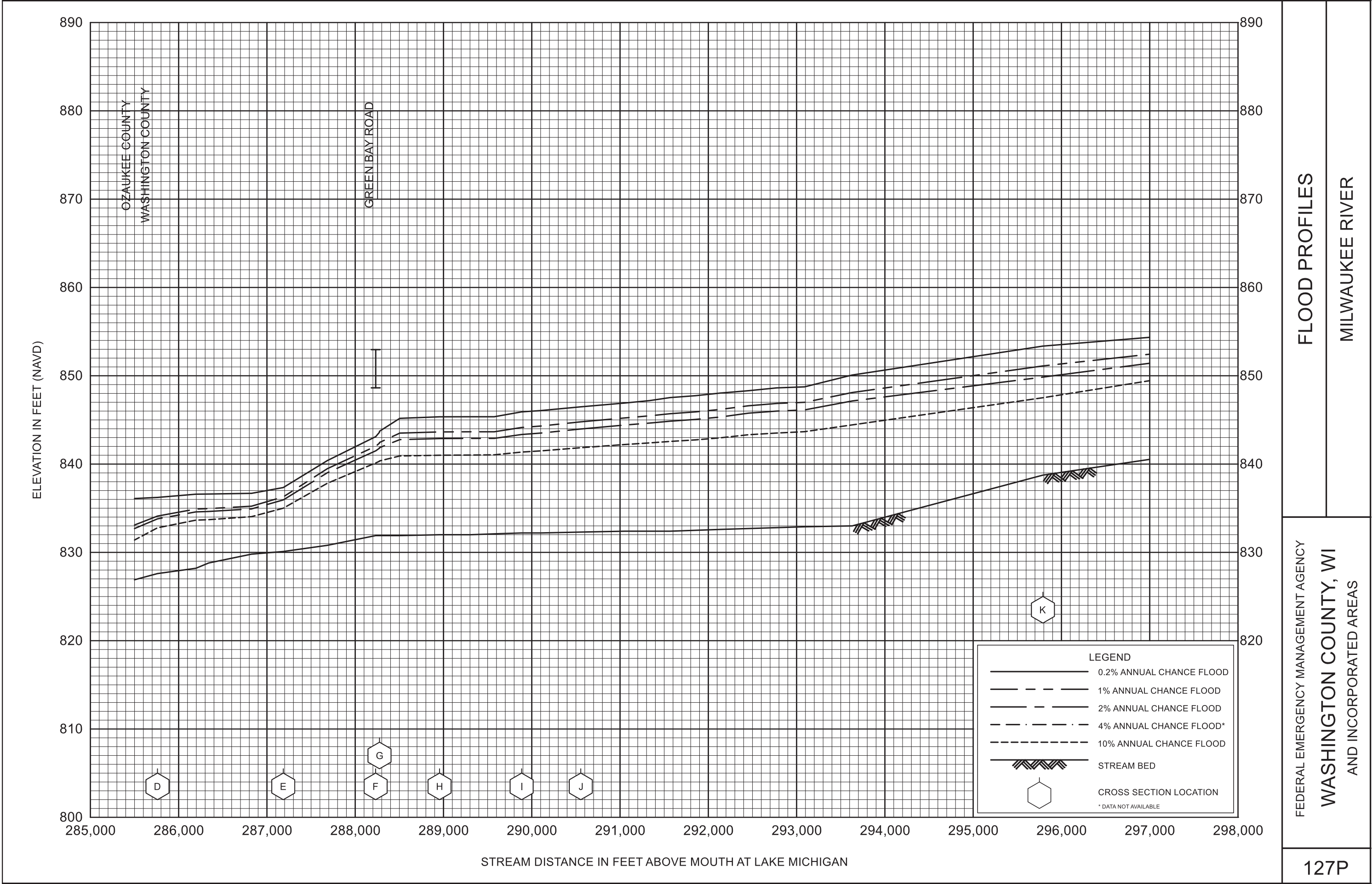


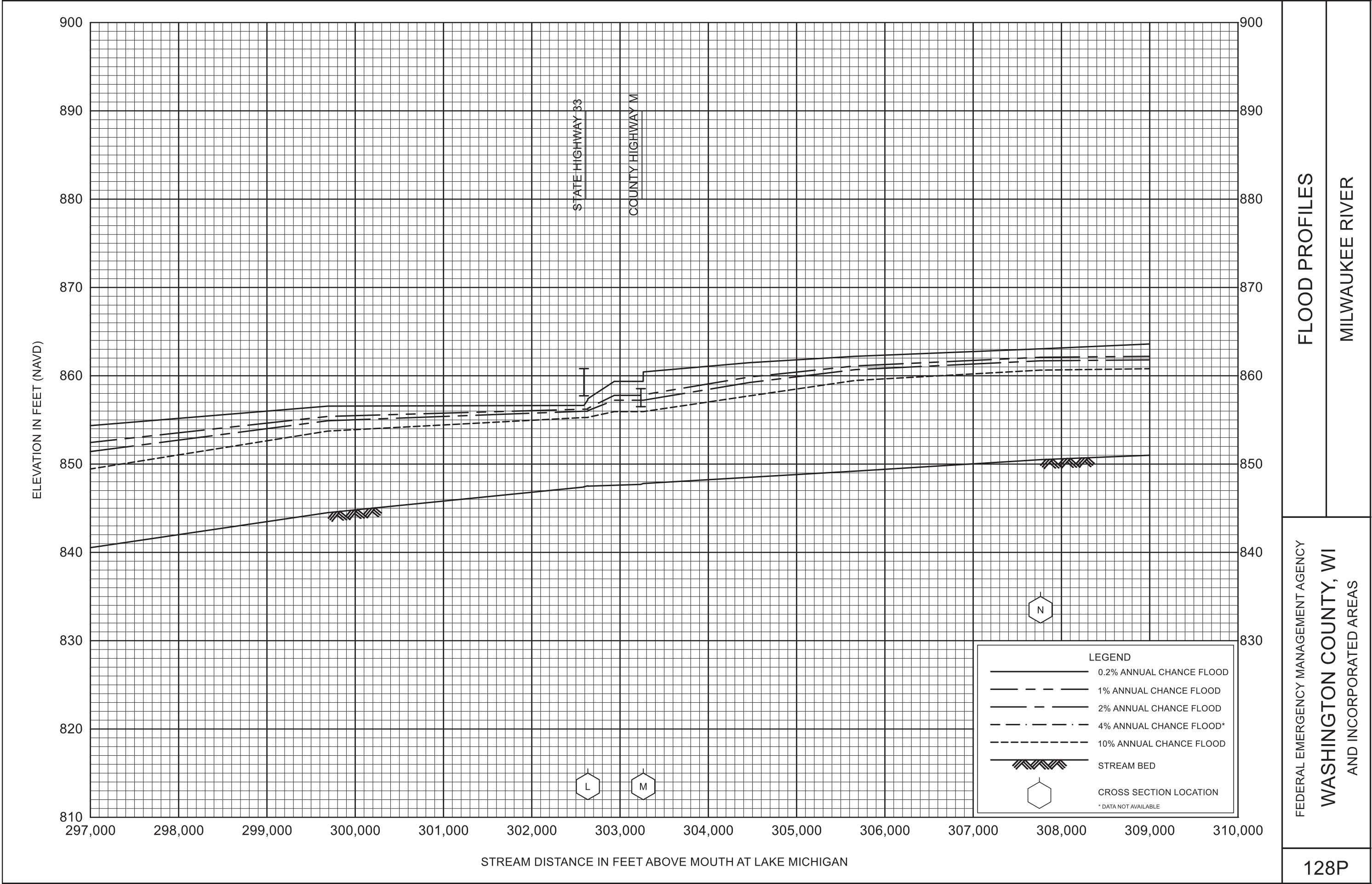










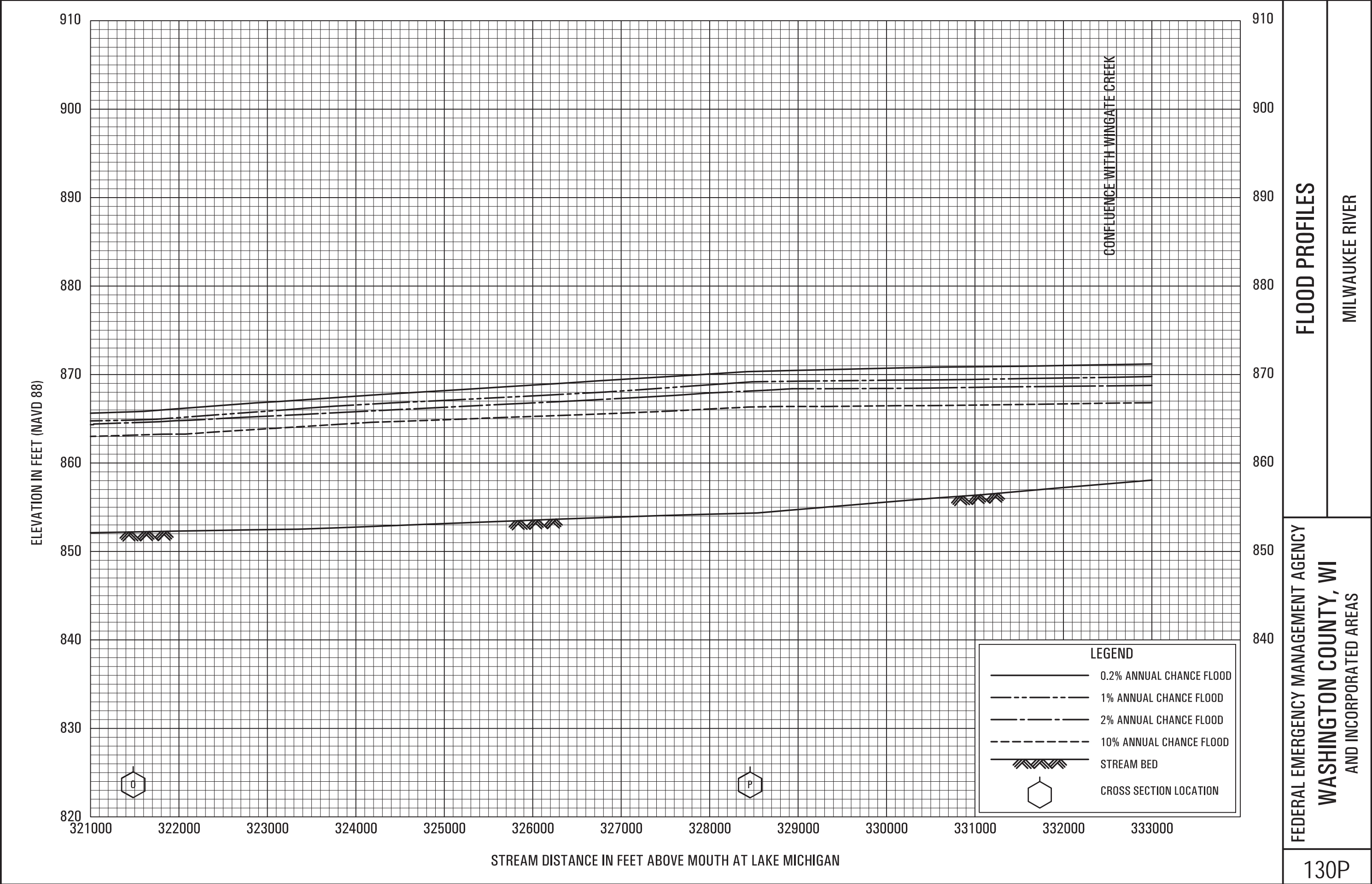


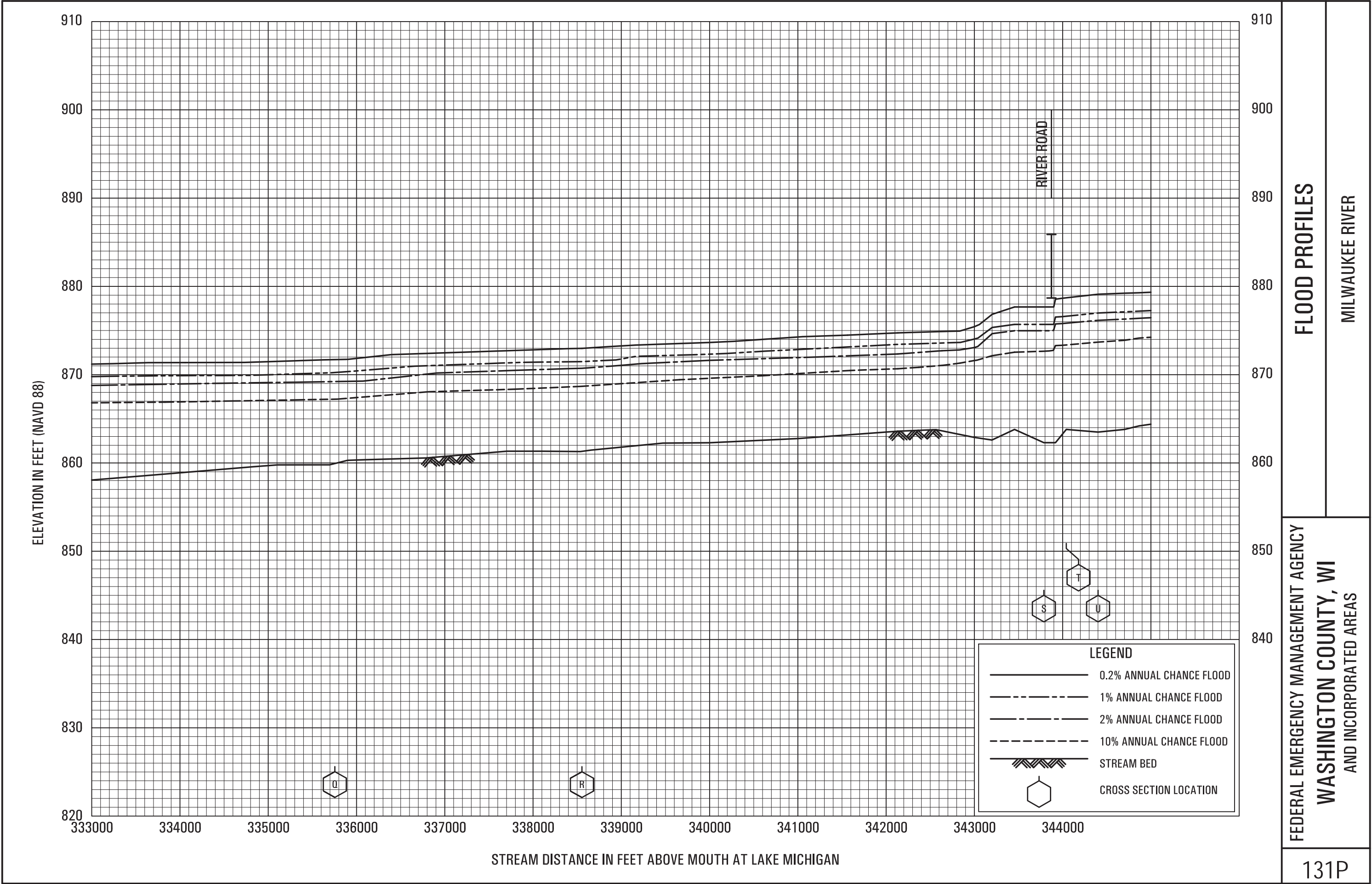
FLOOD PROFILES

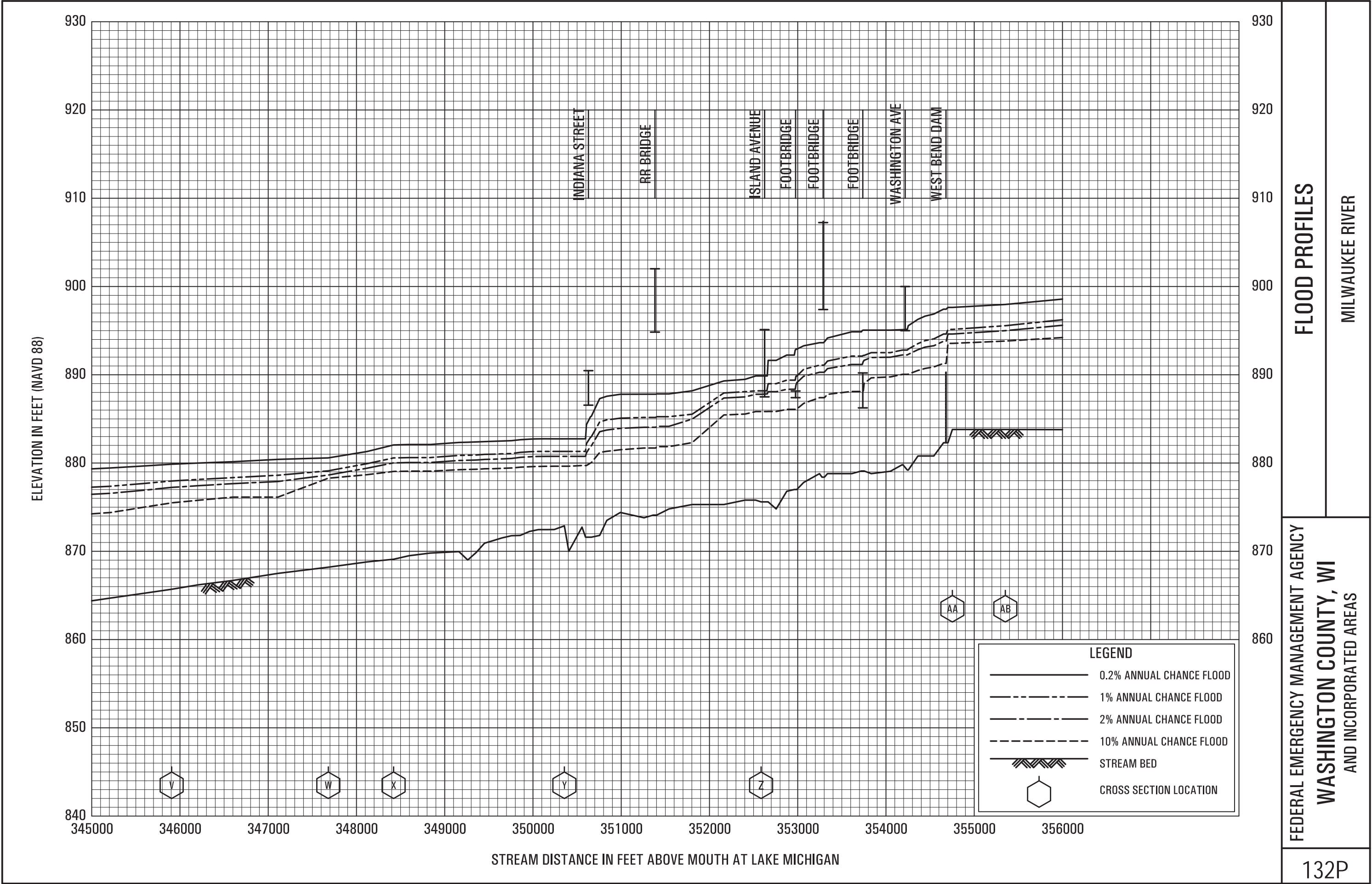
MILWAUKEE RIVER

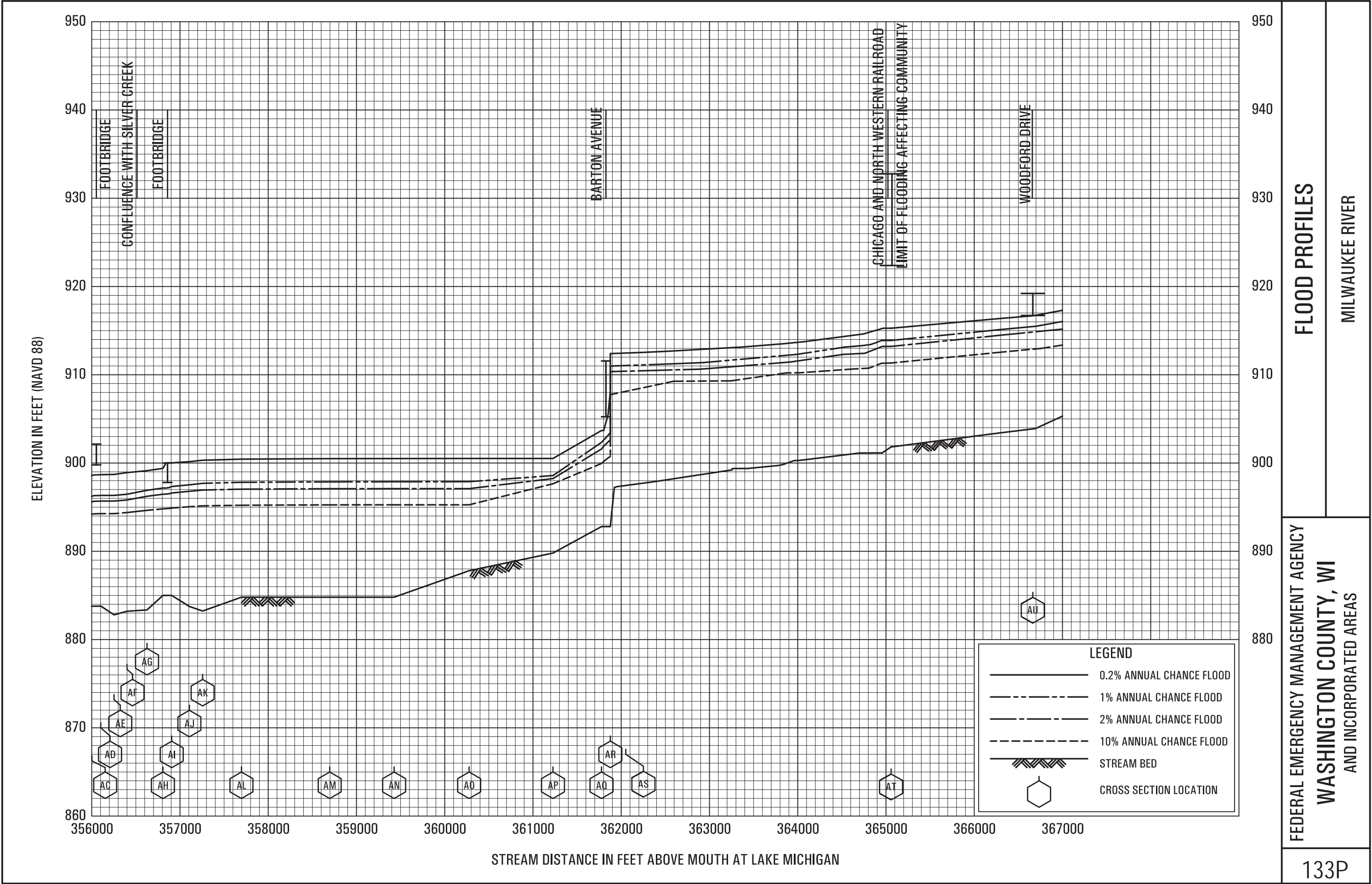
FEDERAL EMERGENCY MANAGEMENT AGENCY

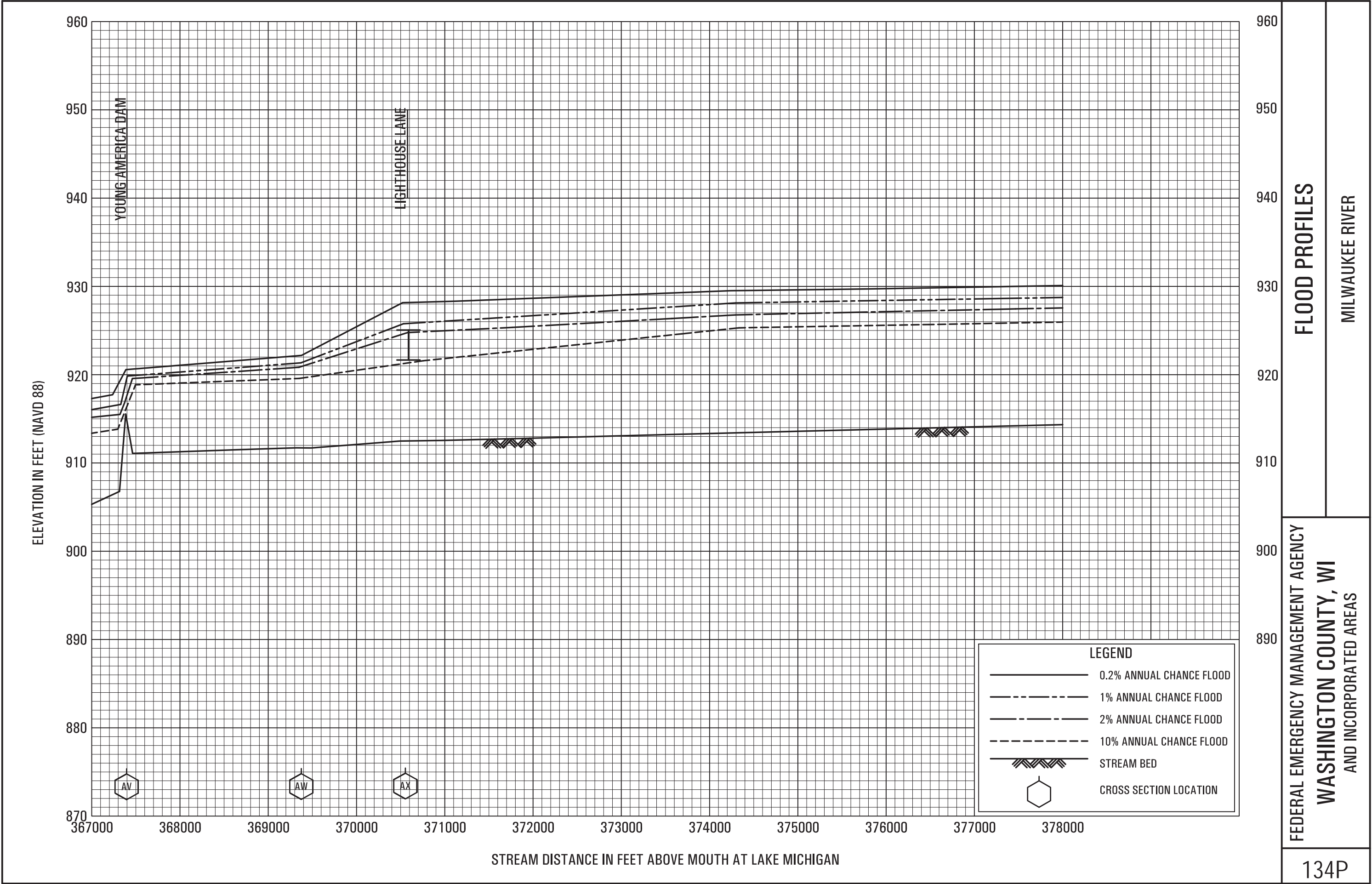
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS







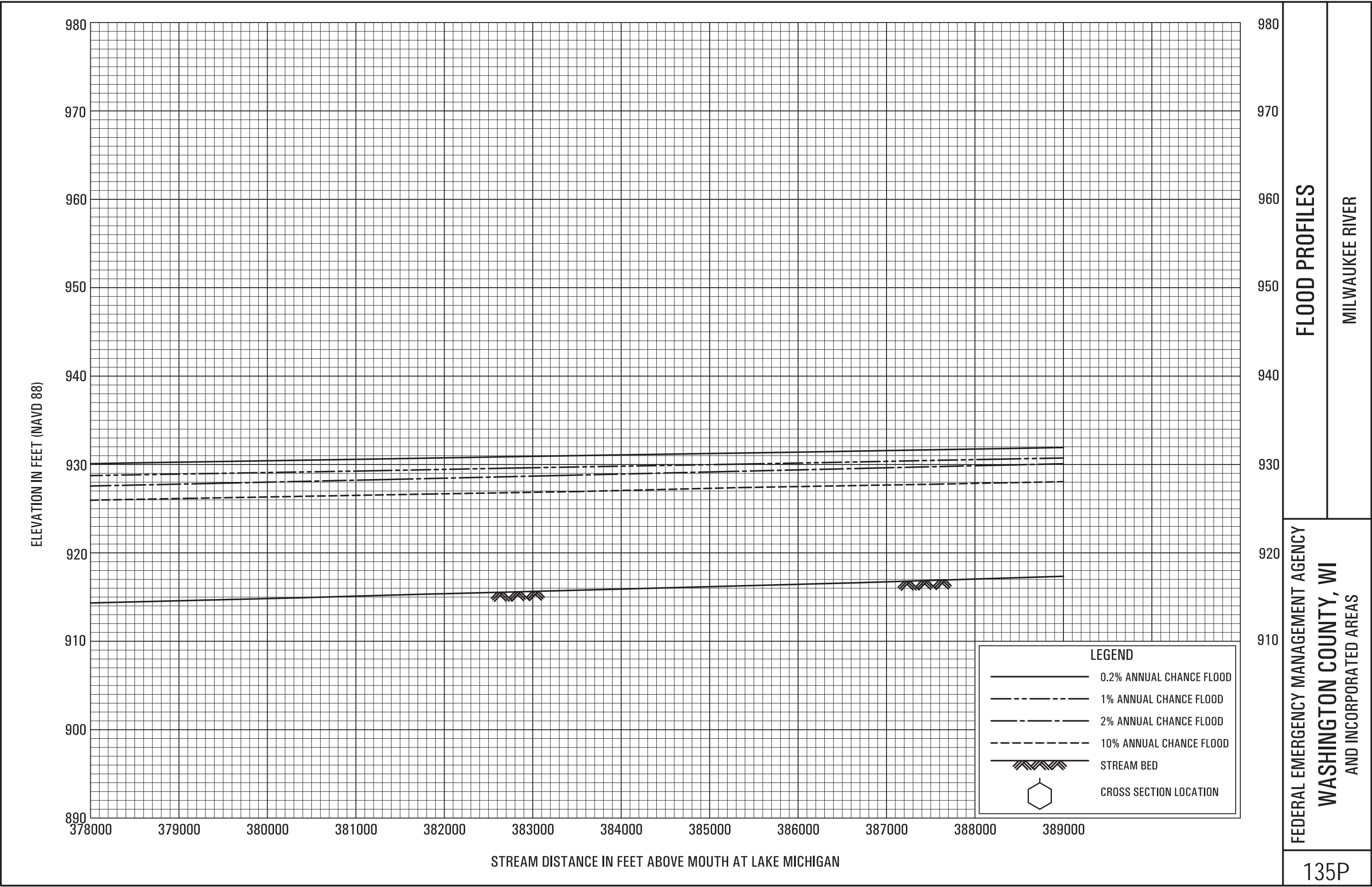


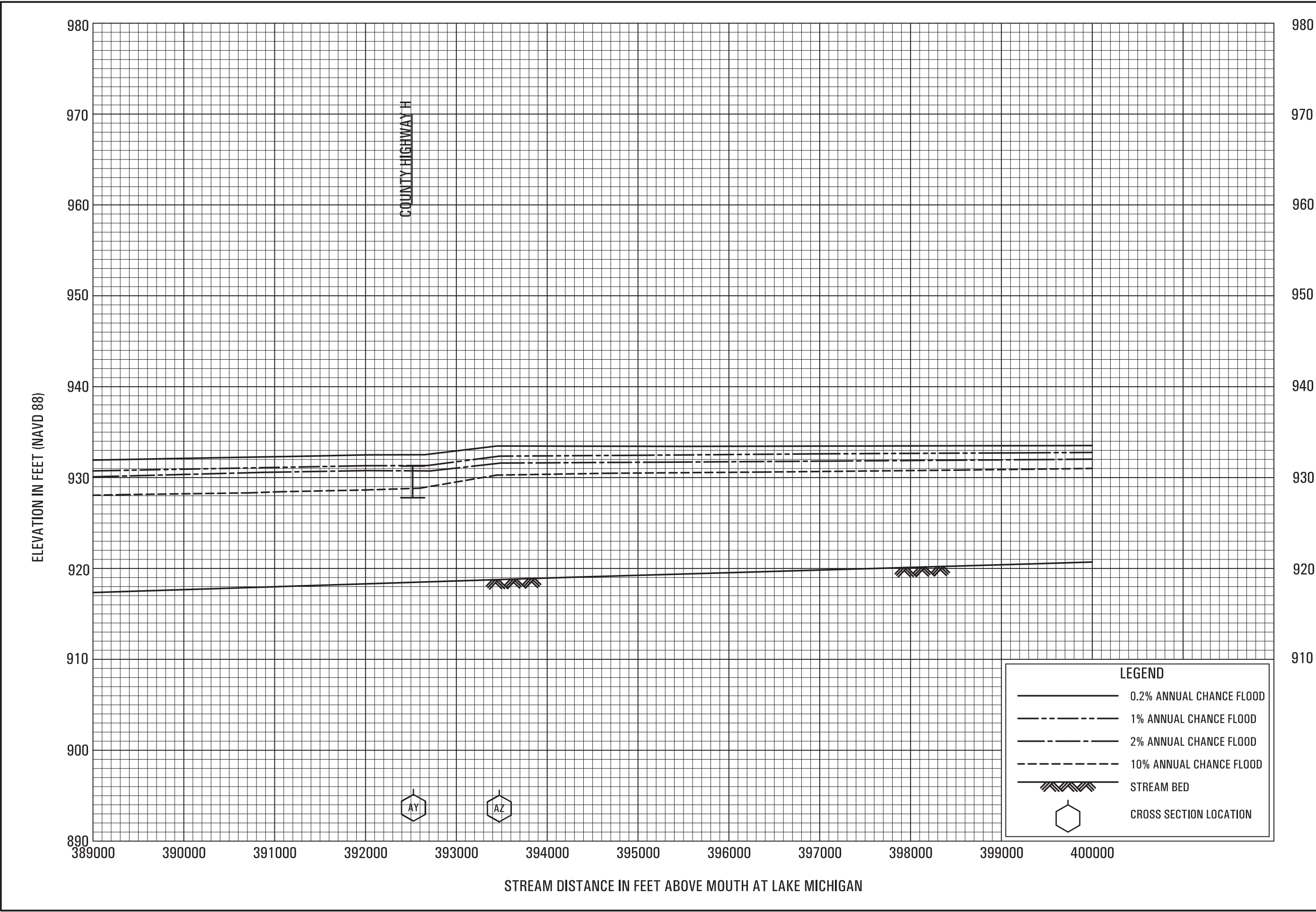


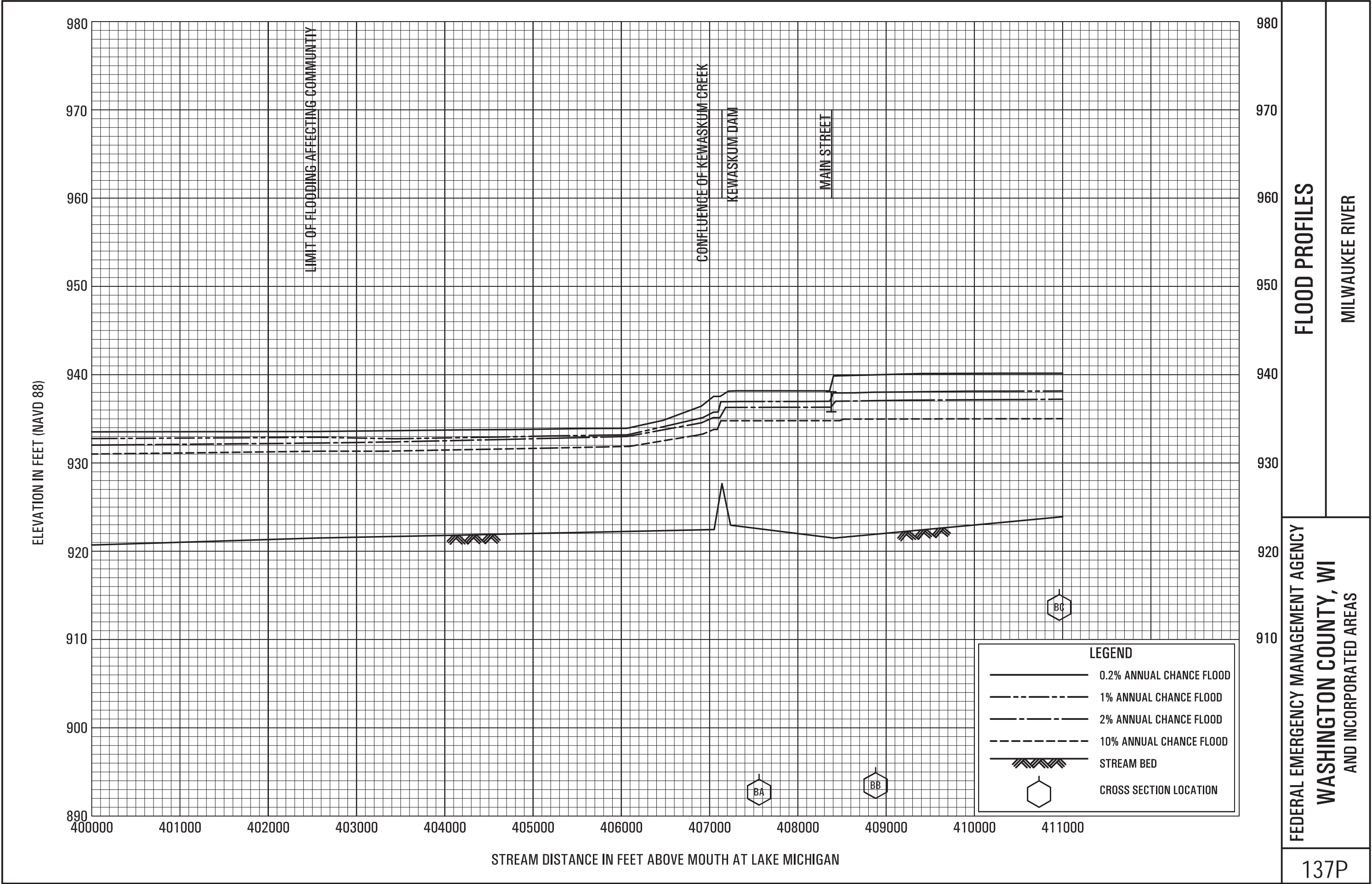
FLOOD PROFILES

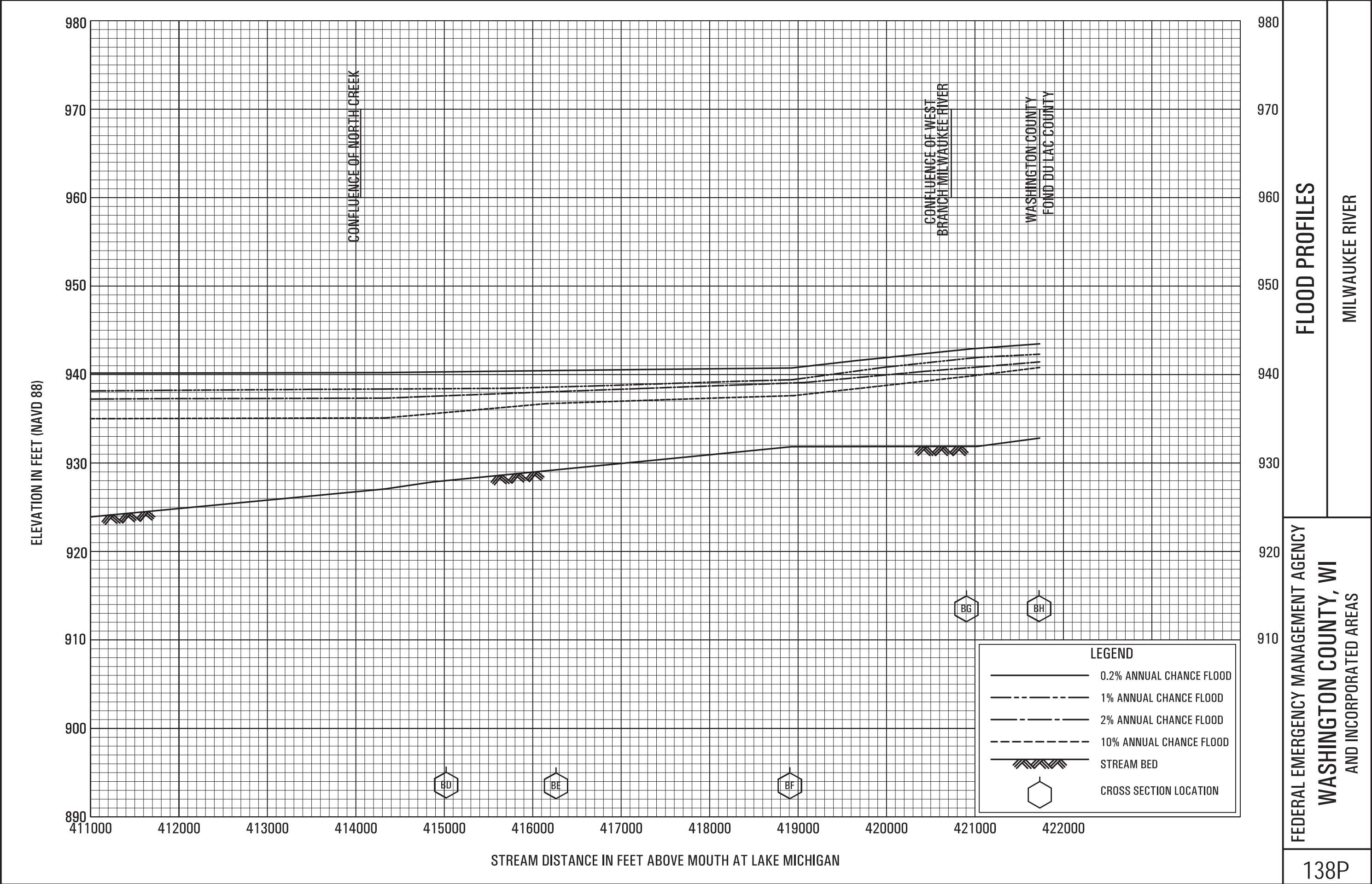
MILWAUKEE RIVER

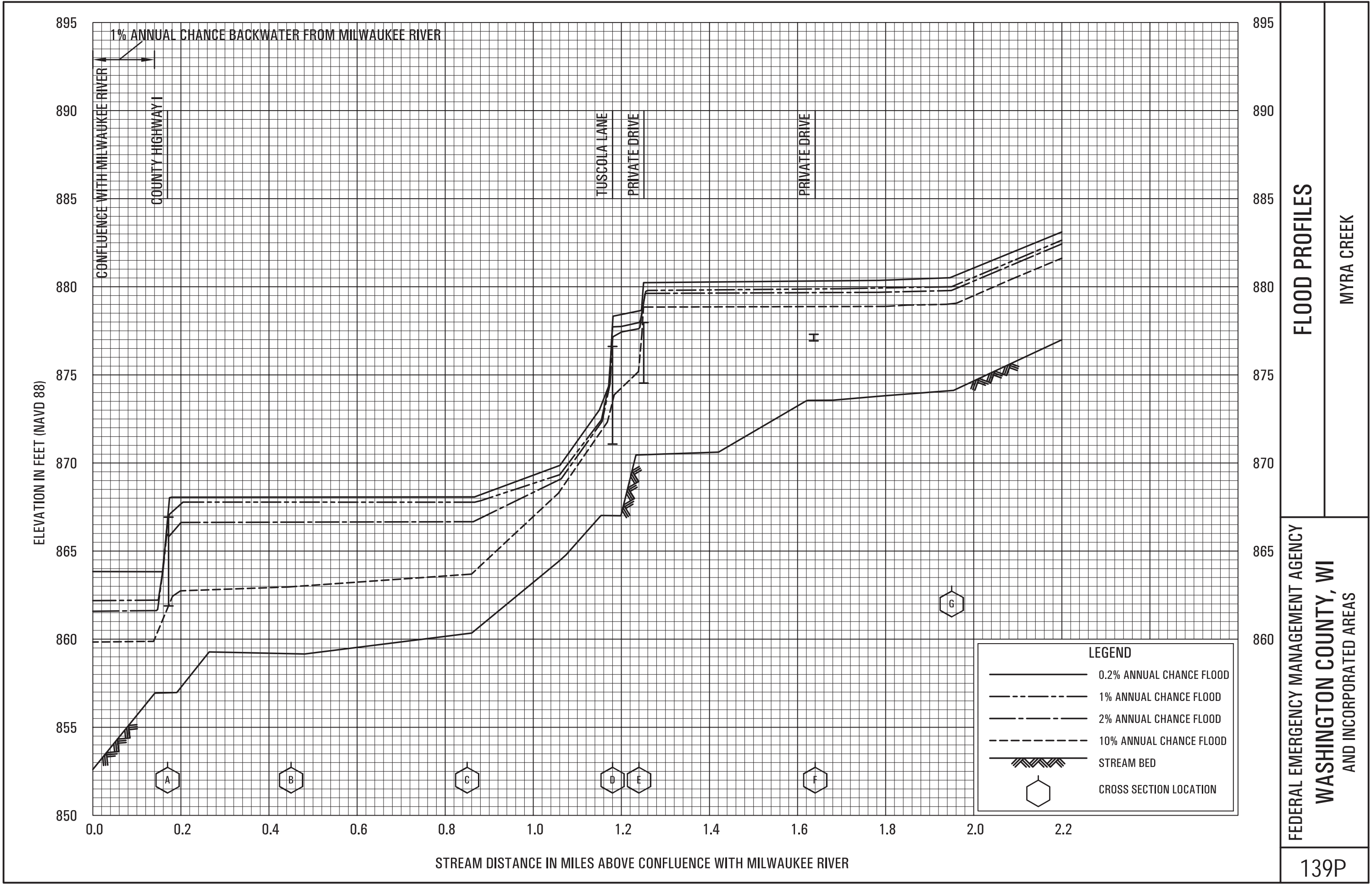
FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS

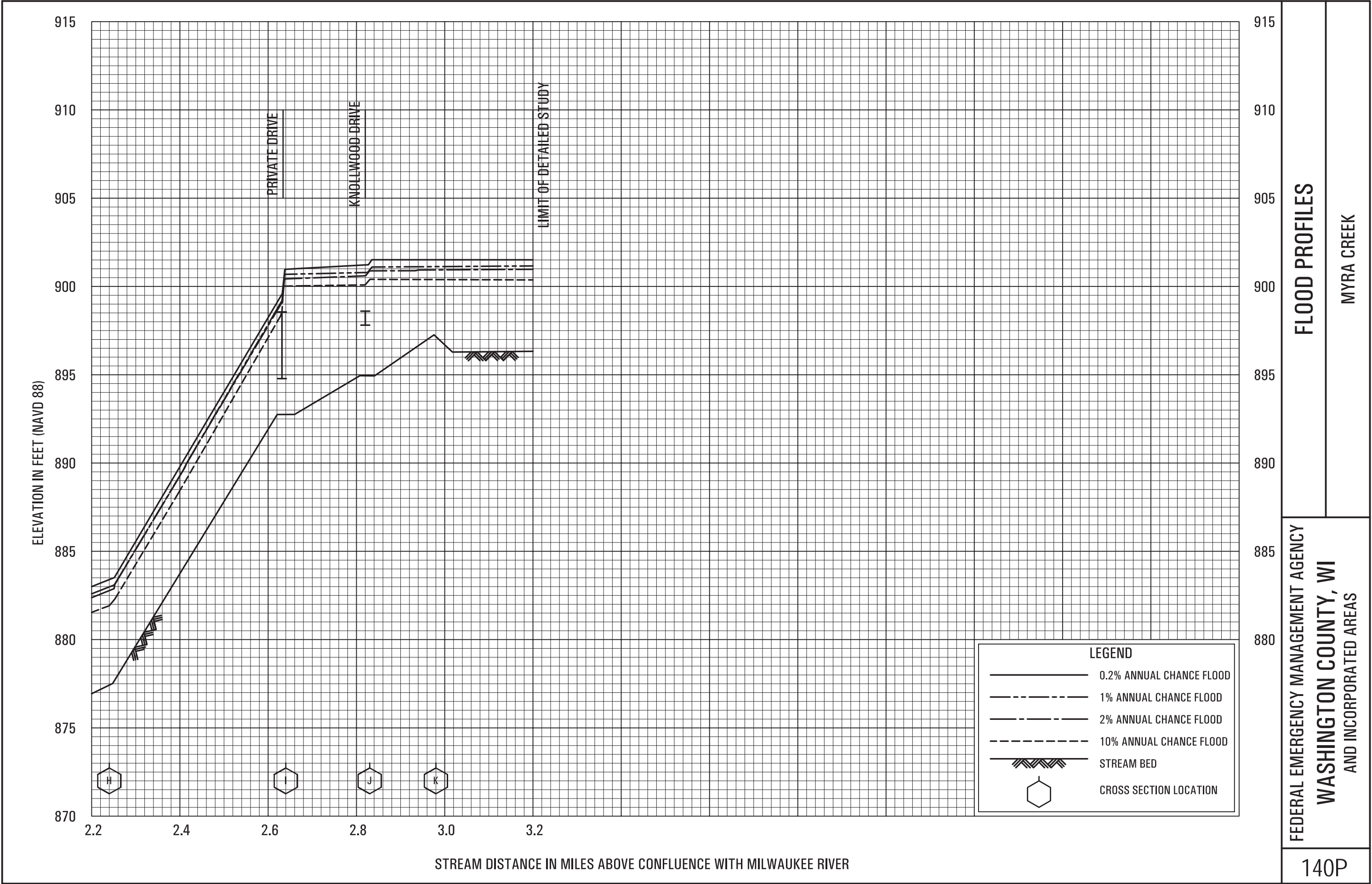


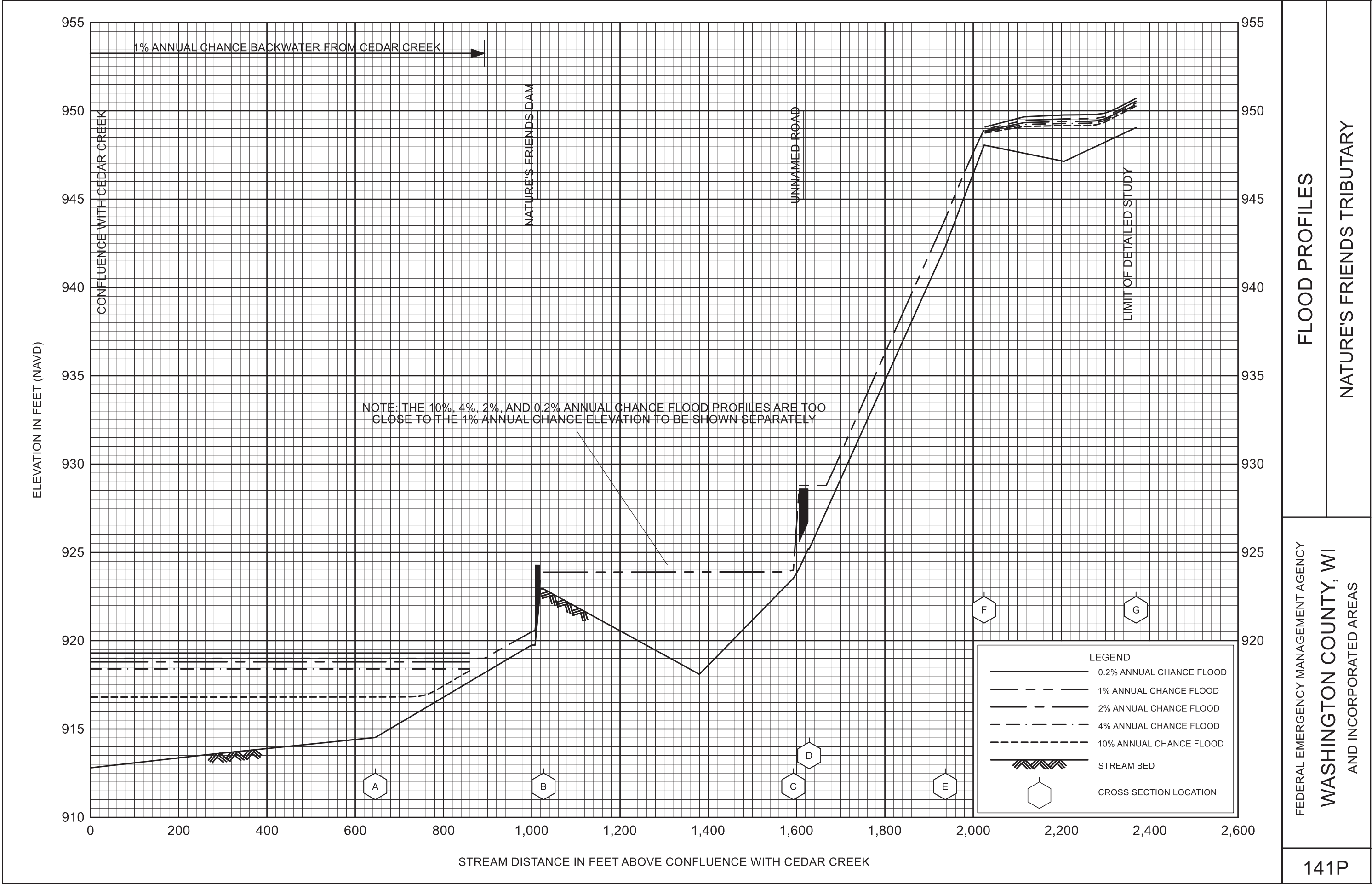


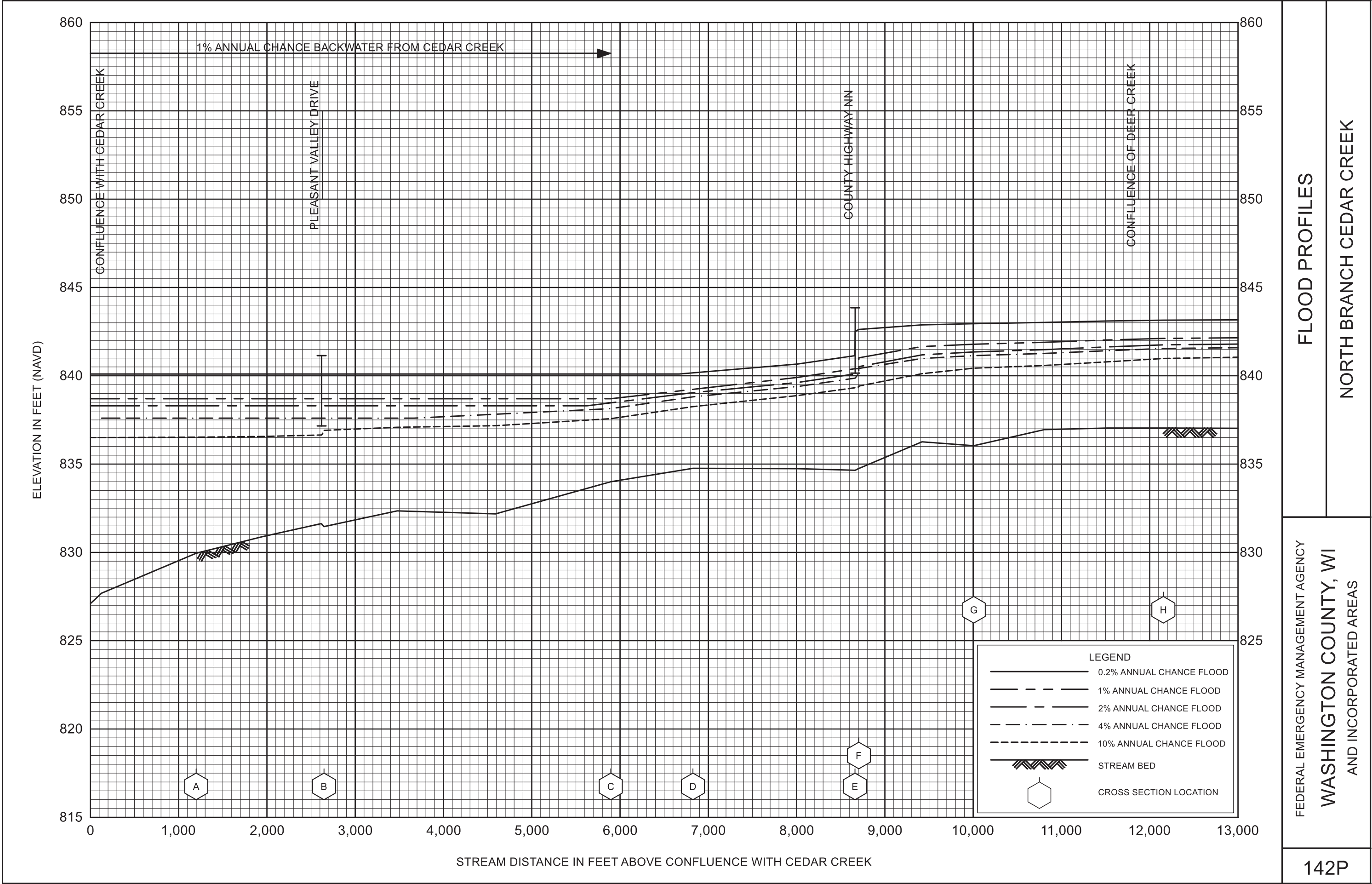










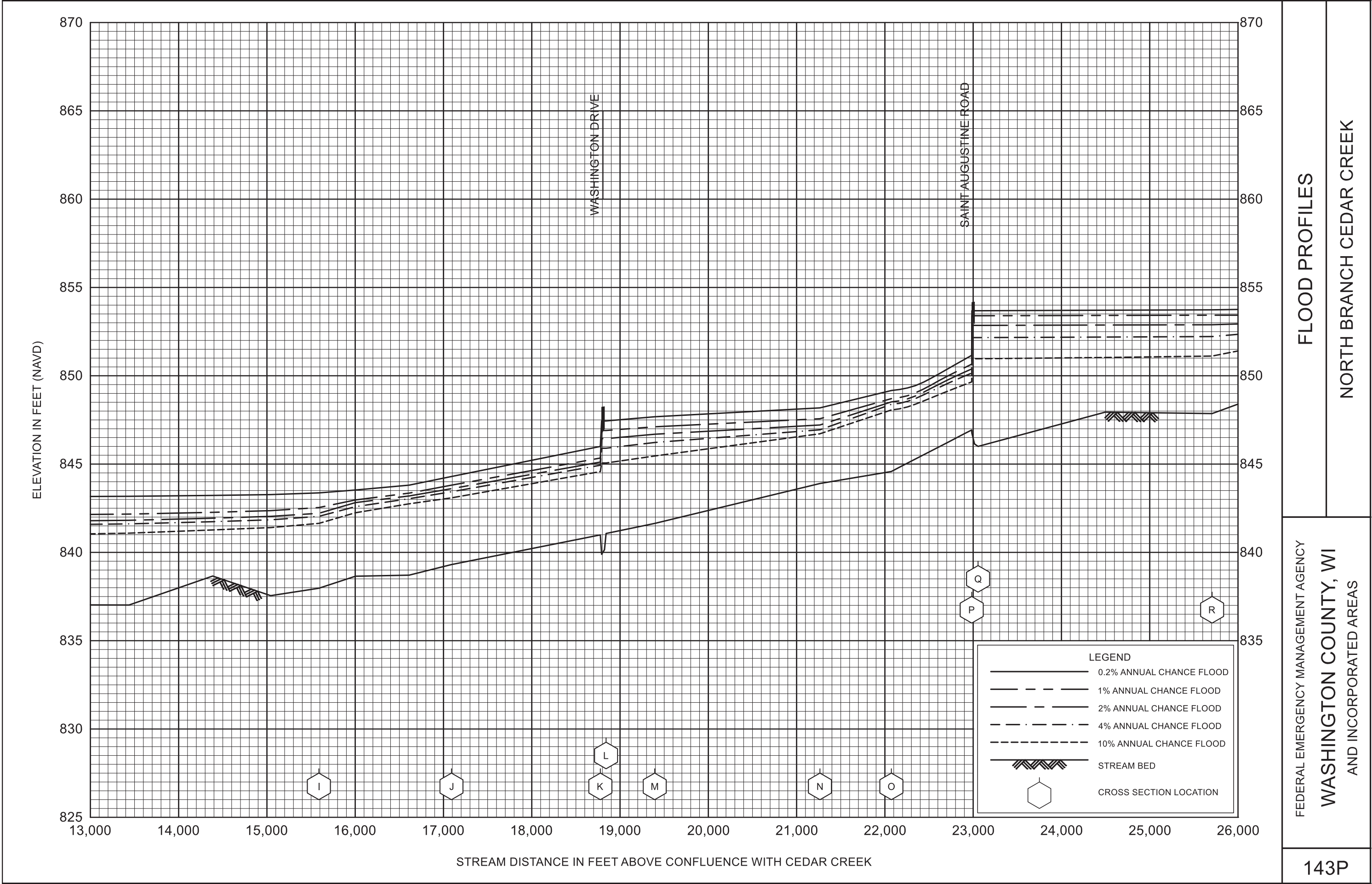


FLOOD PROFILES

NORTH BRANCH CEDAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, WI
AND INCORPORATED AREAS

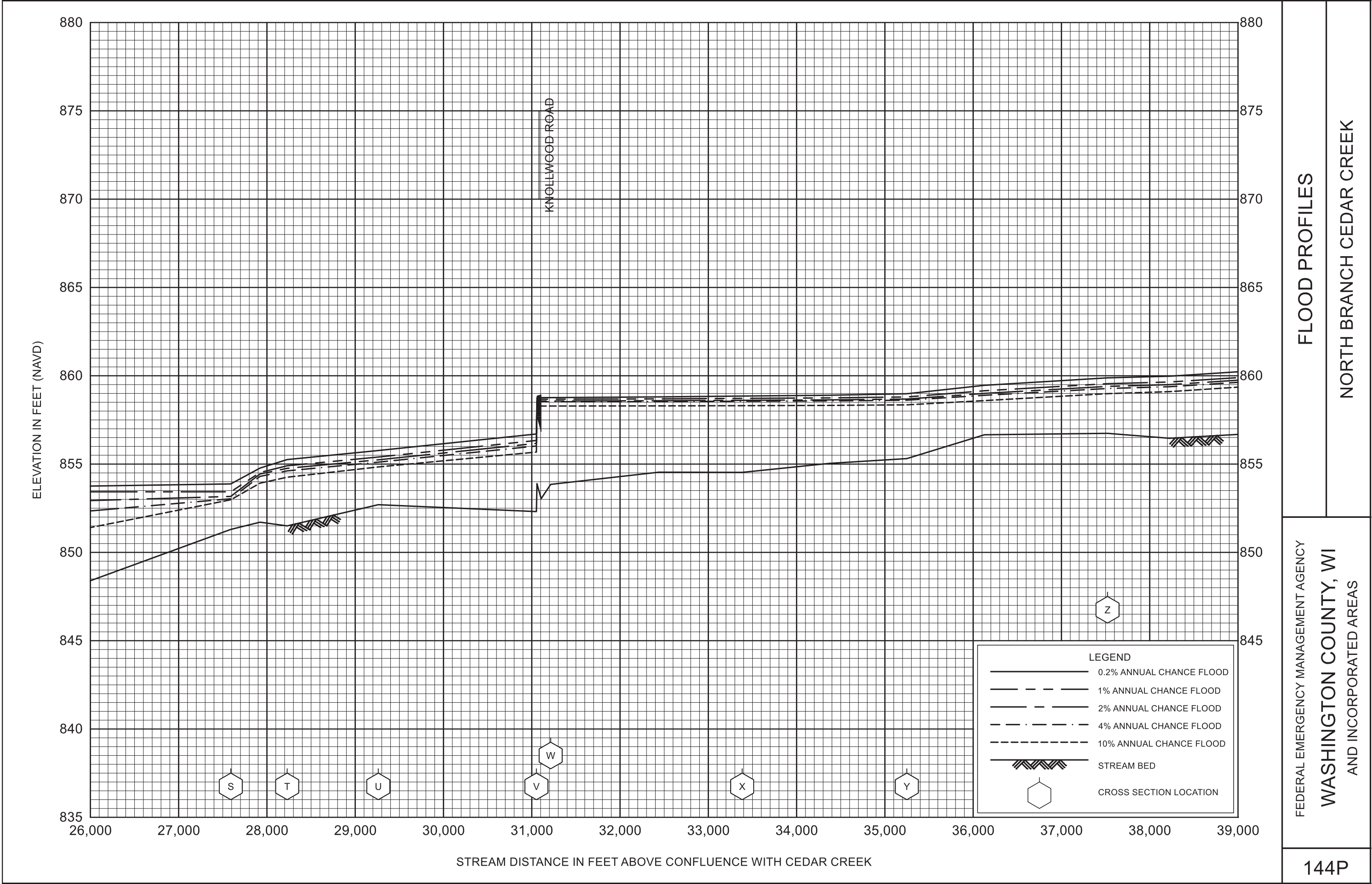


FLOOD PROFILES

NORTH BRANCH CEDAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, WI
AND INCORPORATED AREAS

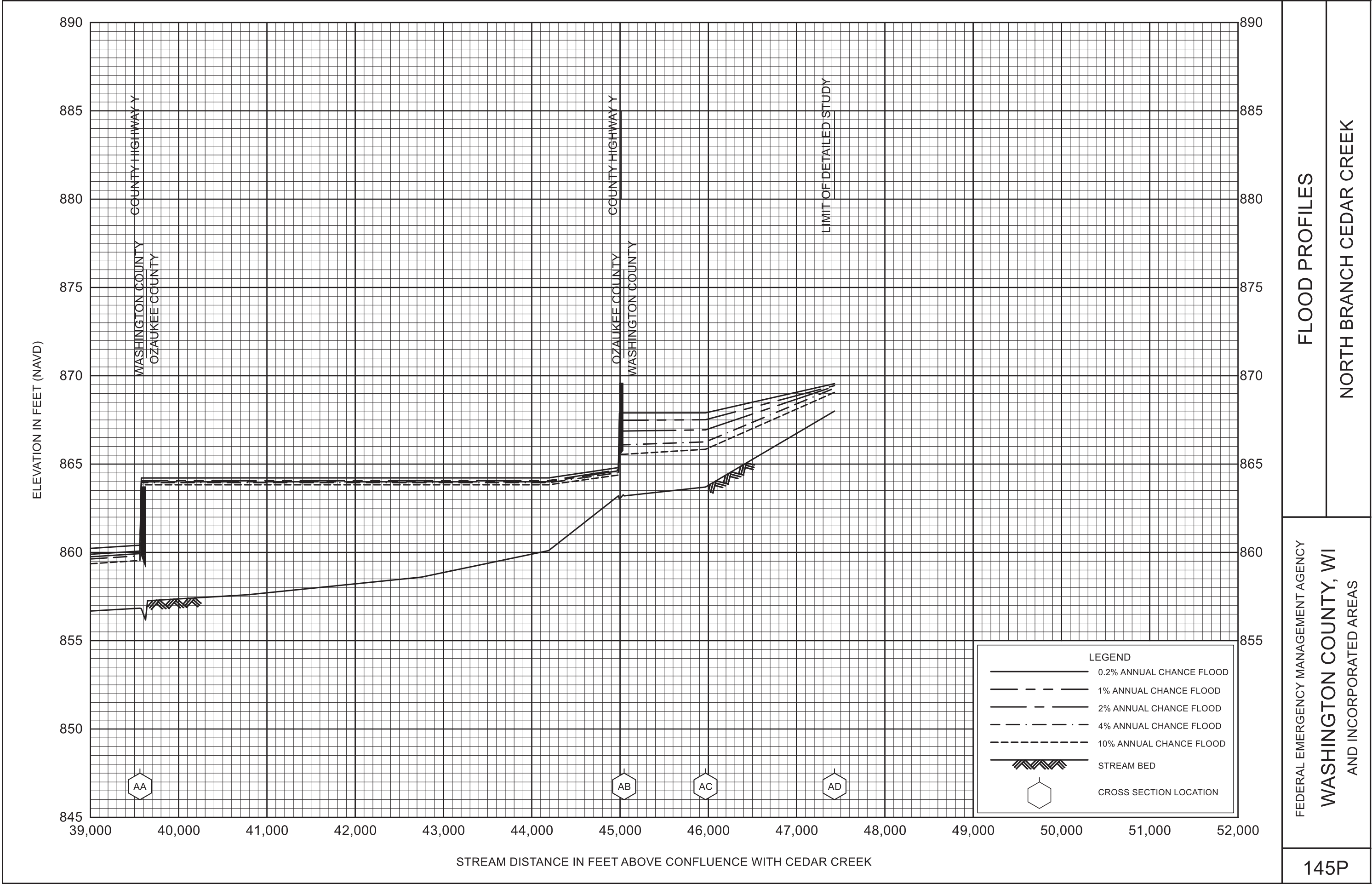


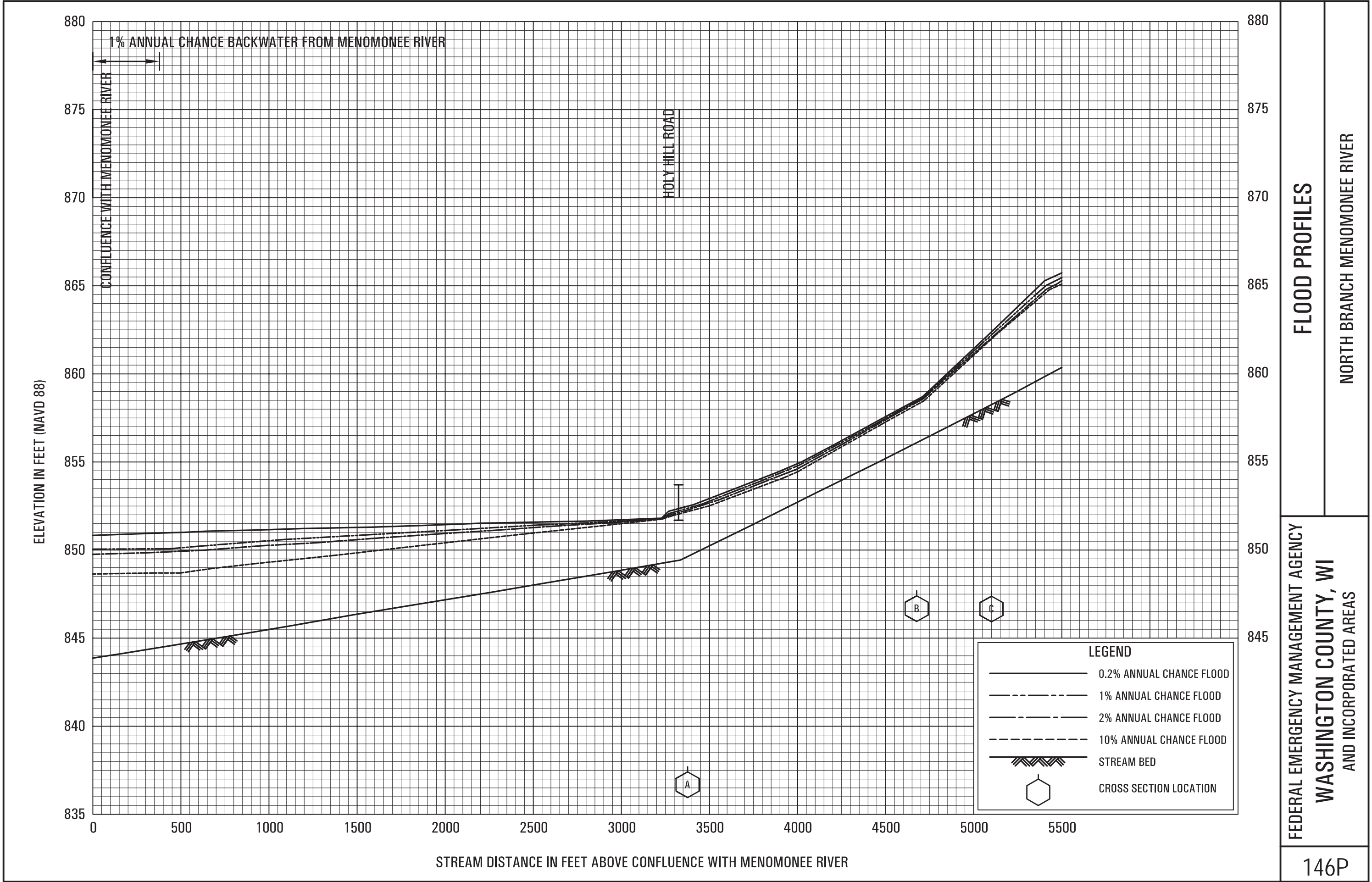
FLOOD PROFILES

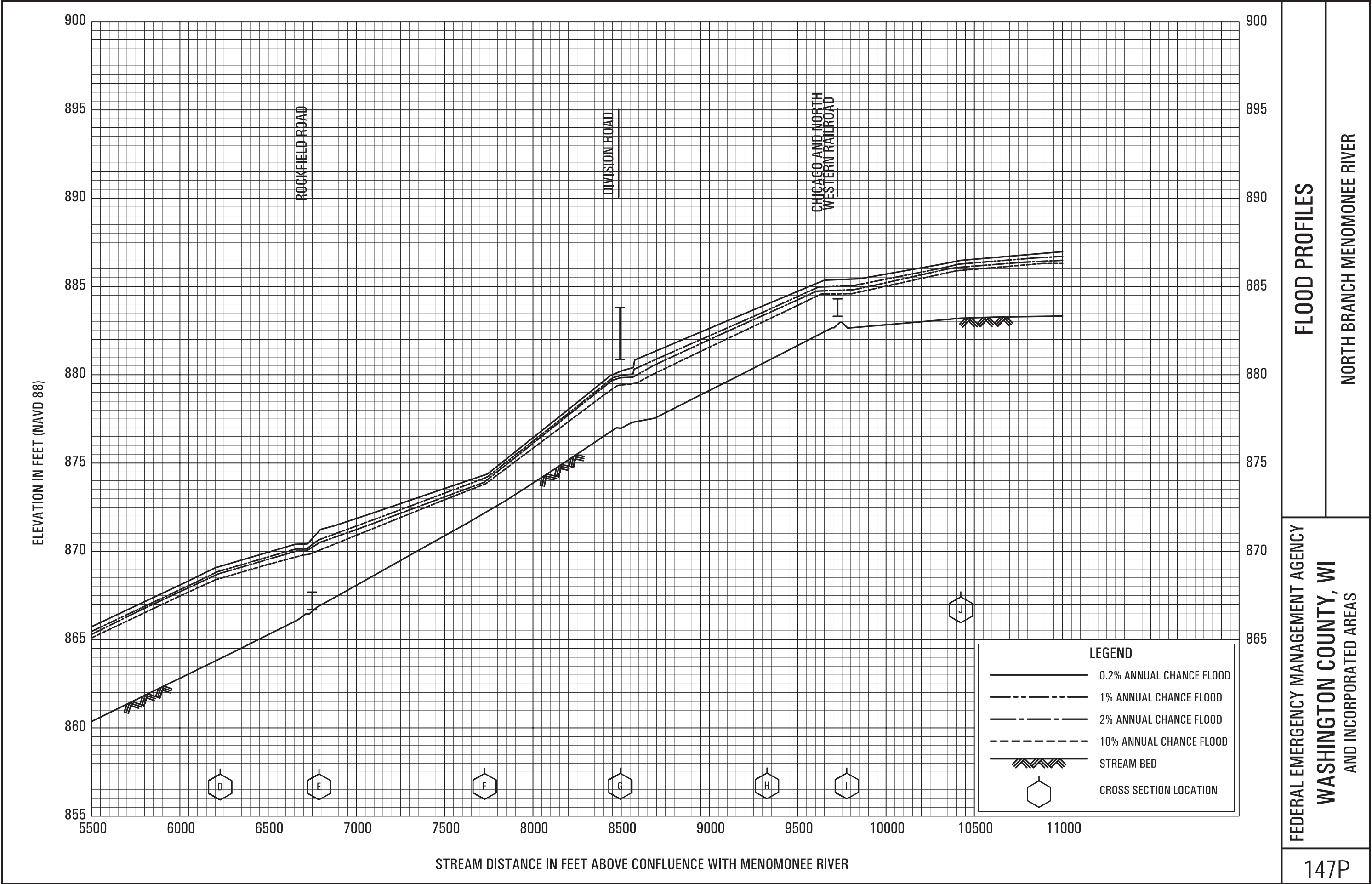
NORTH BRANCH CEDAR CREEK

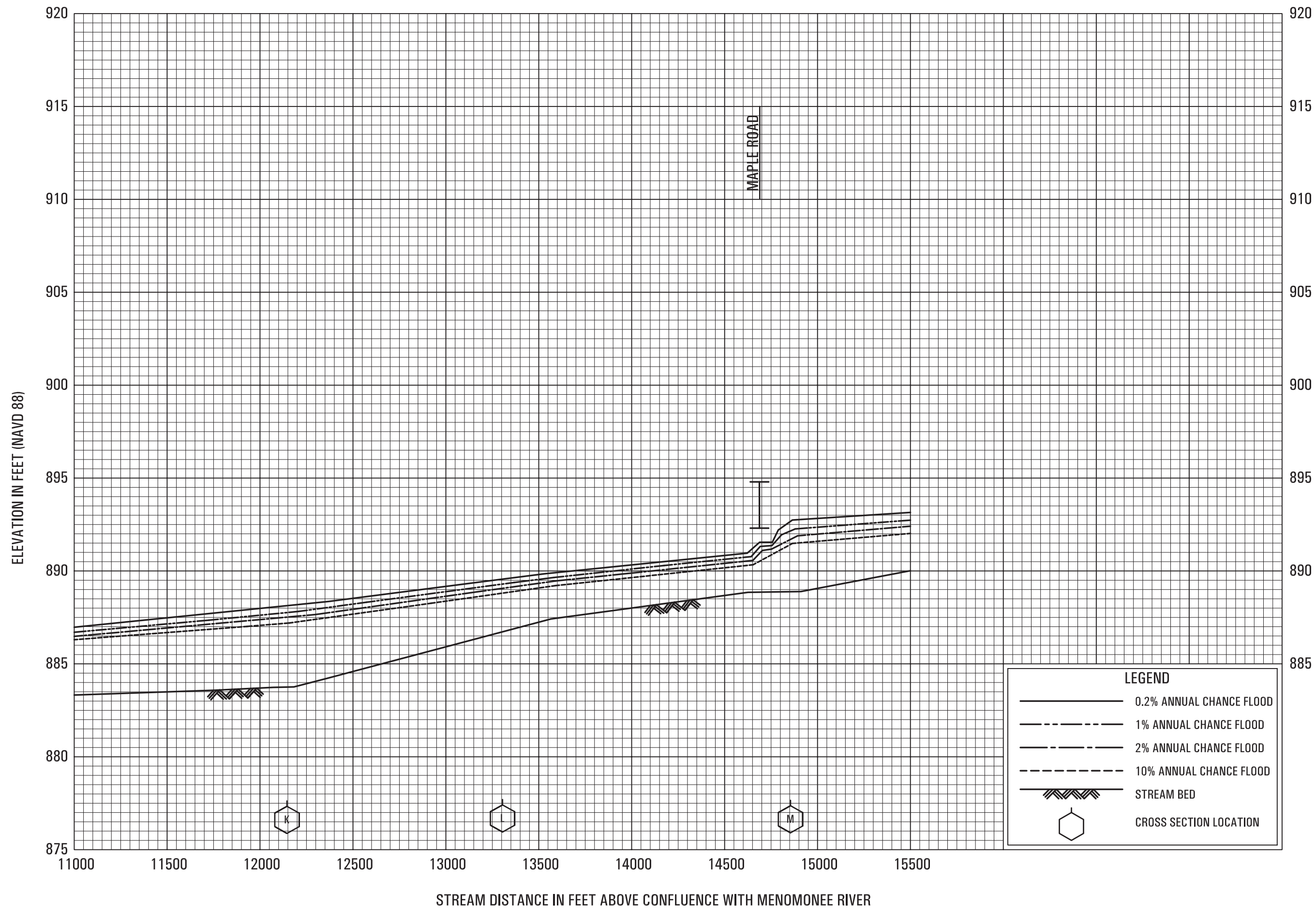
FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, WI
AND INCORPORATED AREAS







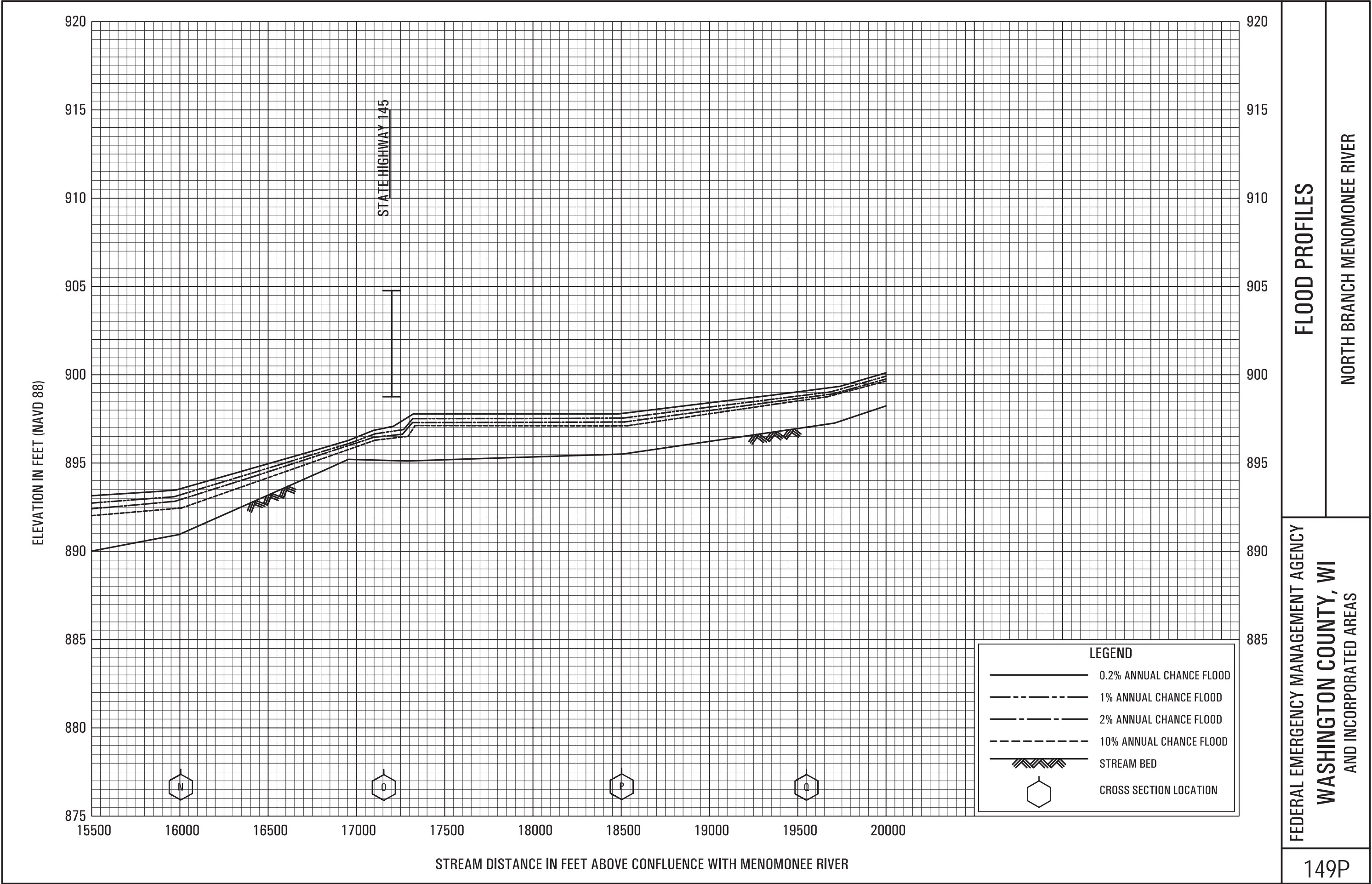


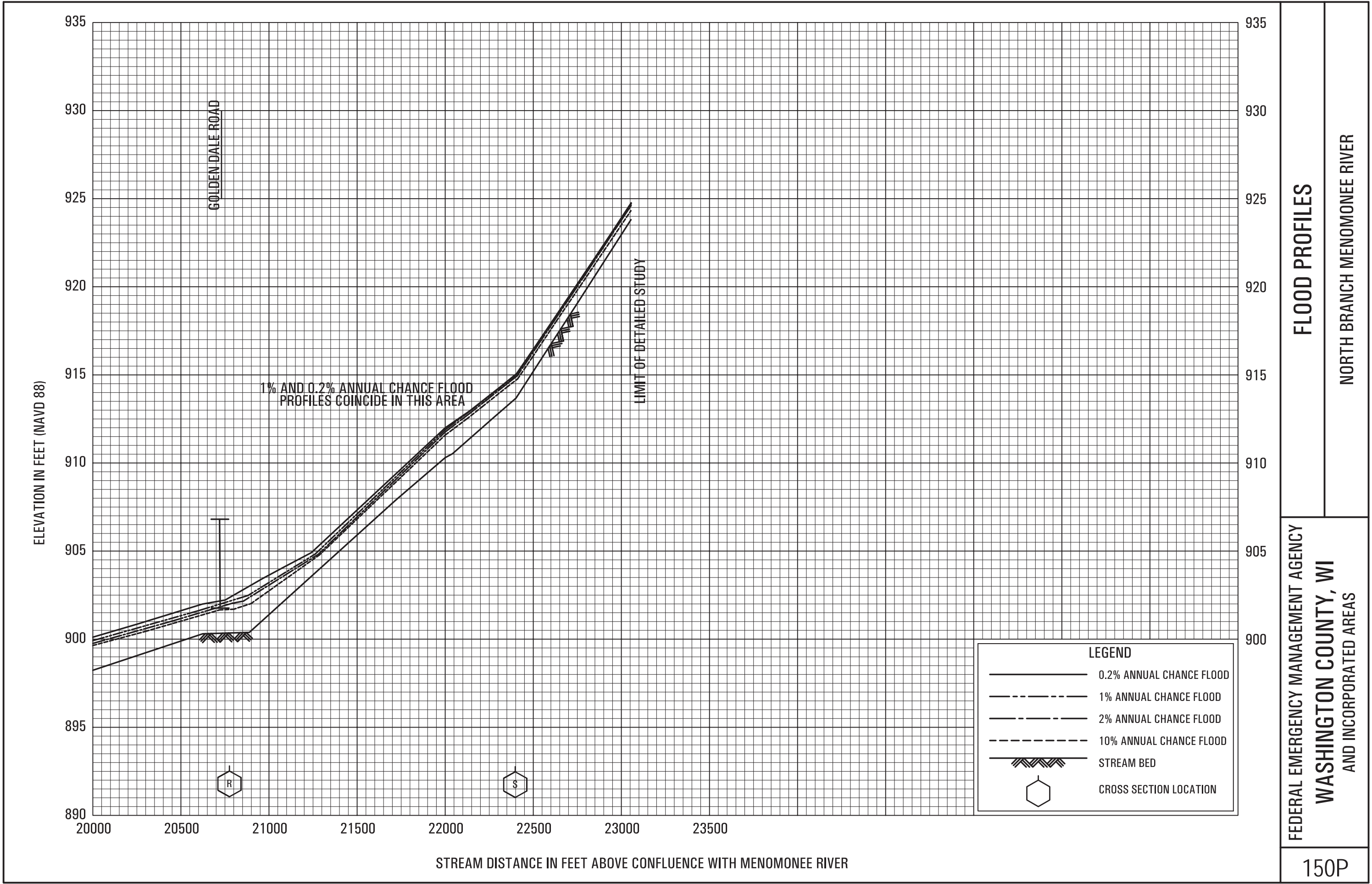
FLOOD PROFILES

NORTH BRANCH MENOMONEE RIVER

**FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS**

148P





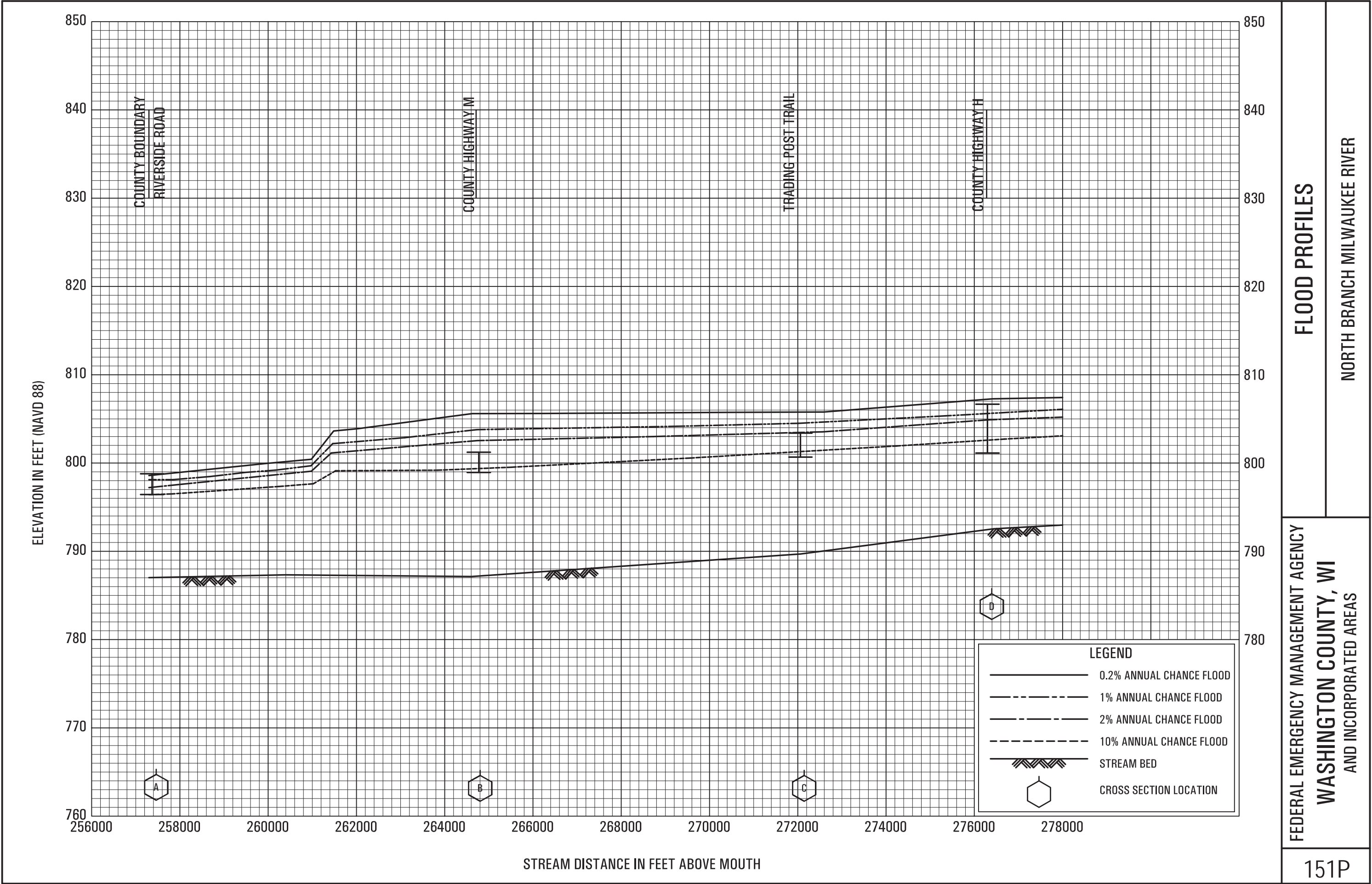
FLOOD PROFILES

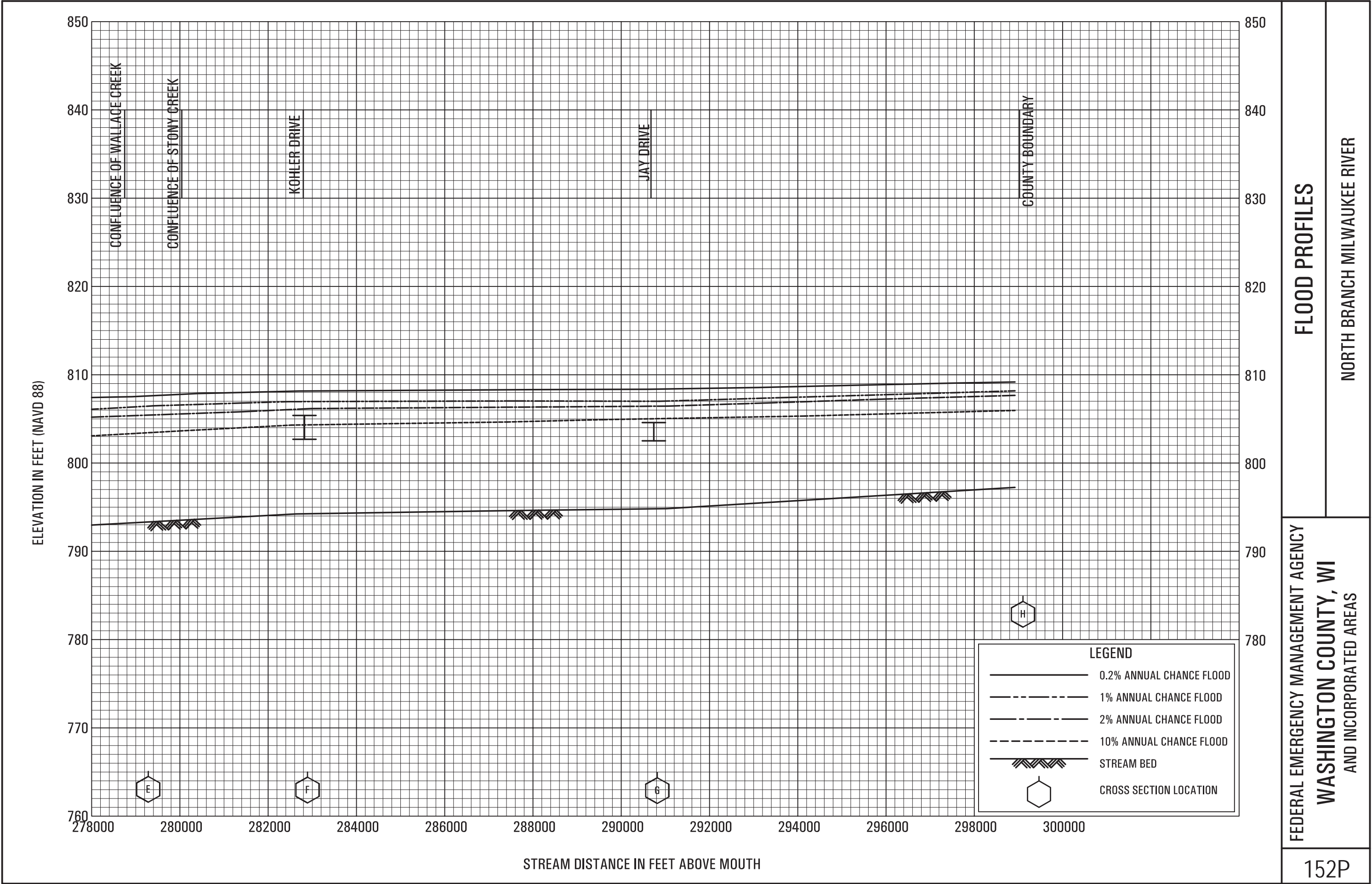
NORTH BRANCH MENOMONEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, WI

AND INCORPORATED AREAS

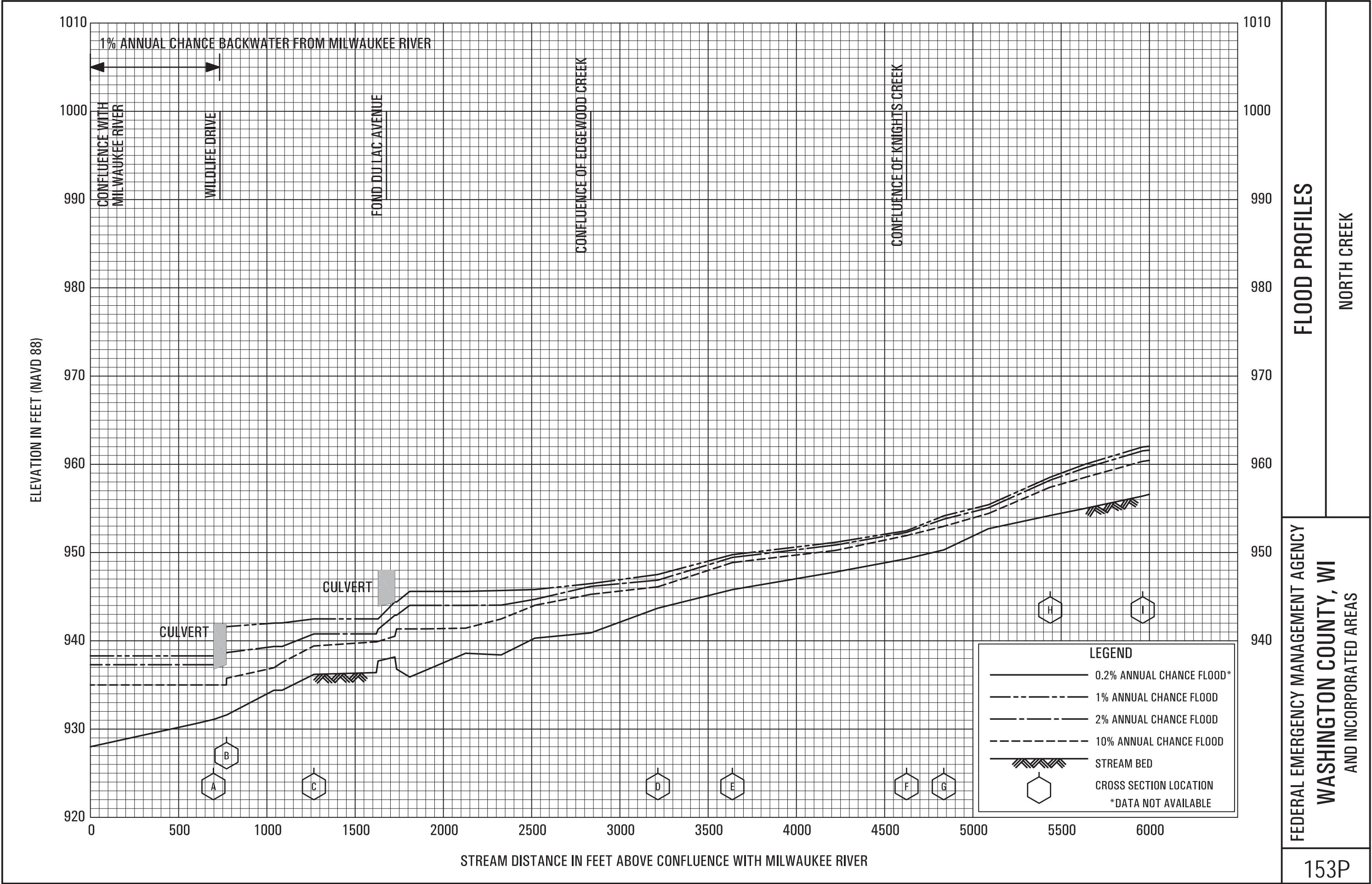


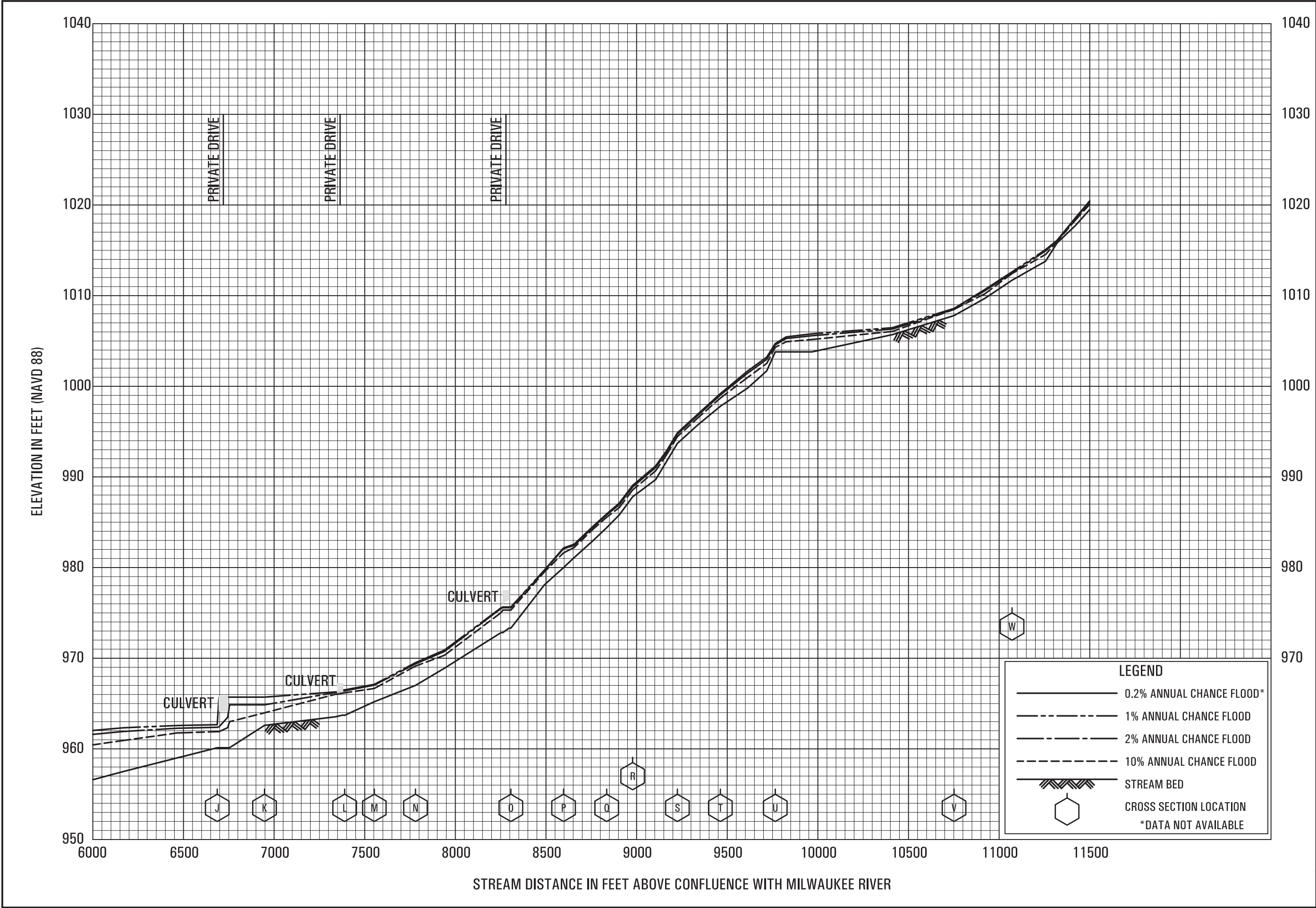


FLOOD PROFILES

NORTH BRANCH MILWAUKEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS

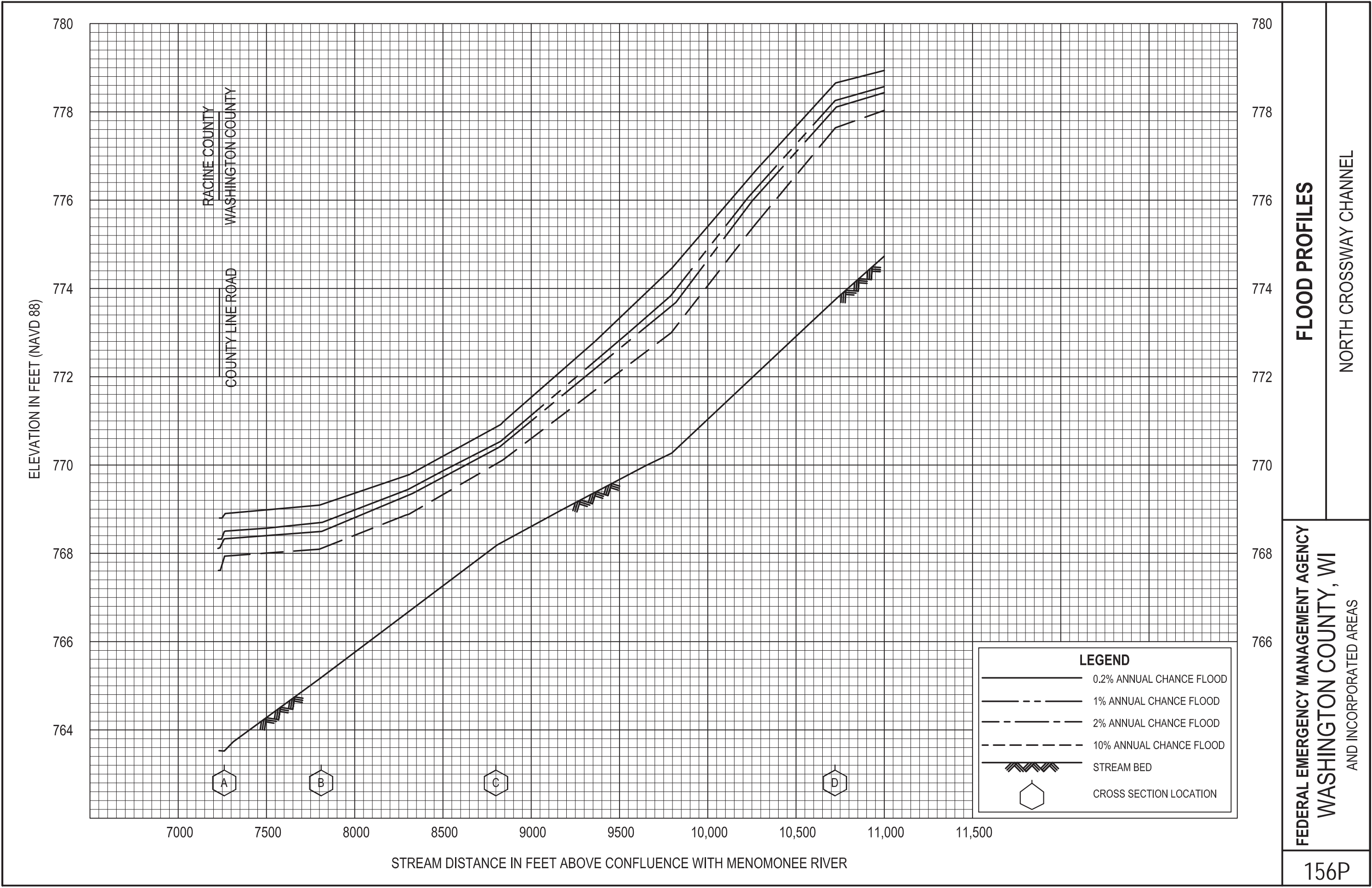


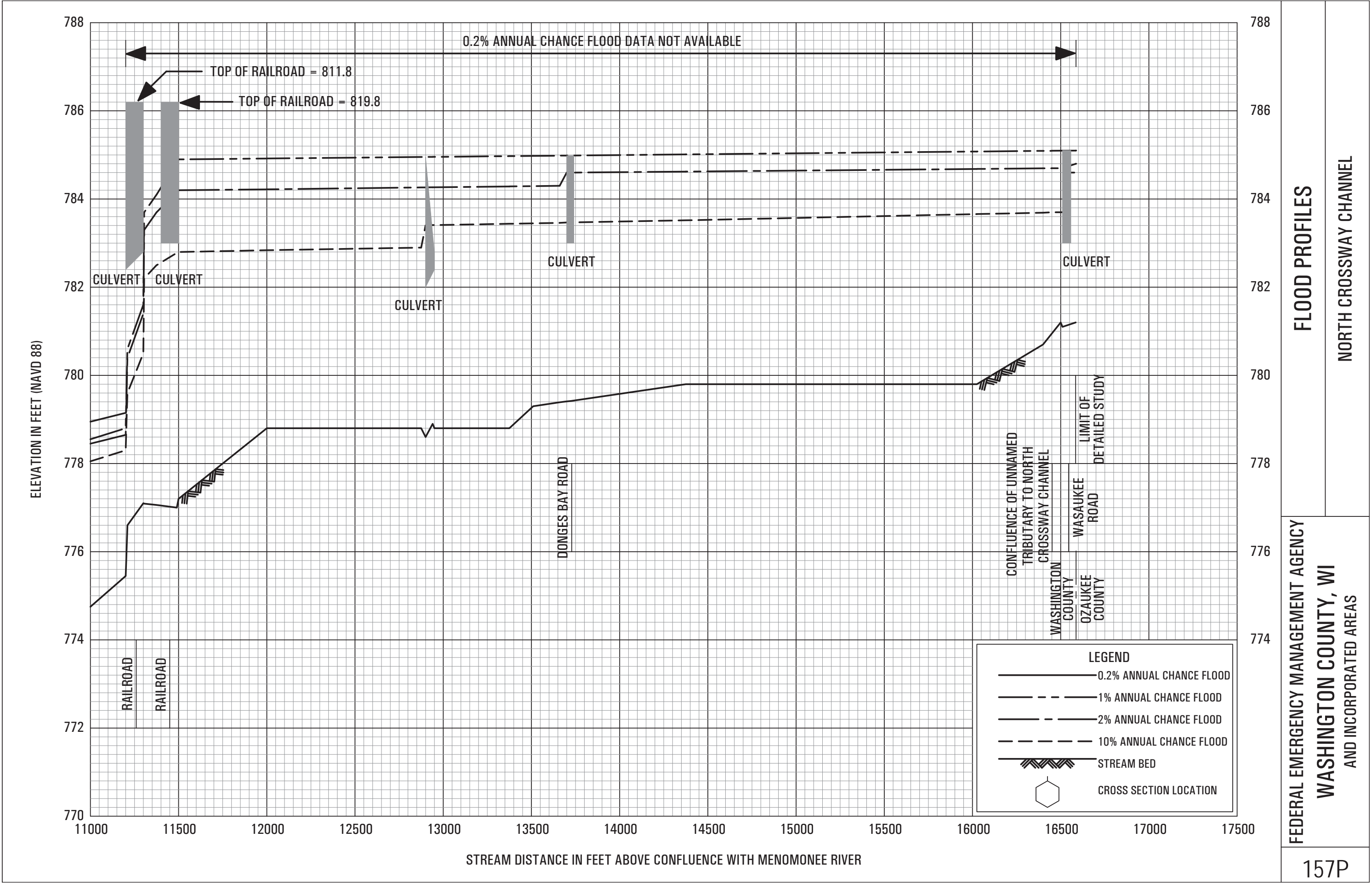


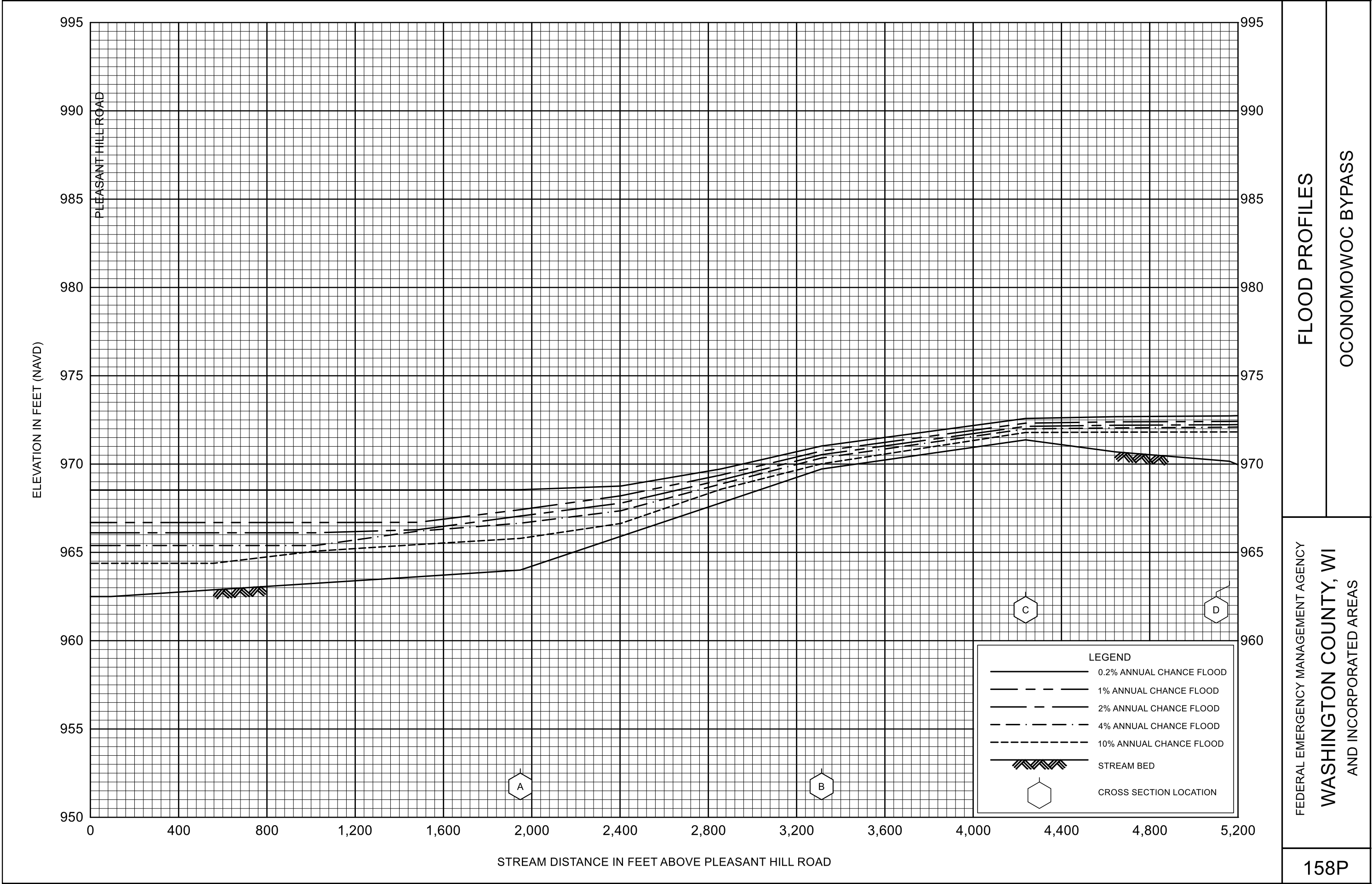
FLOOD PROFILES

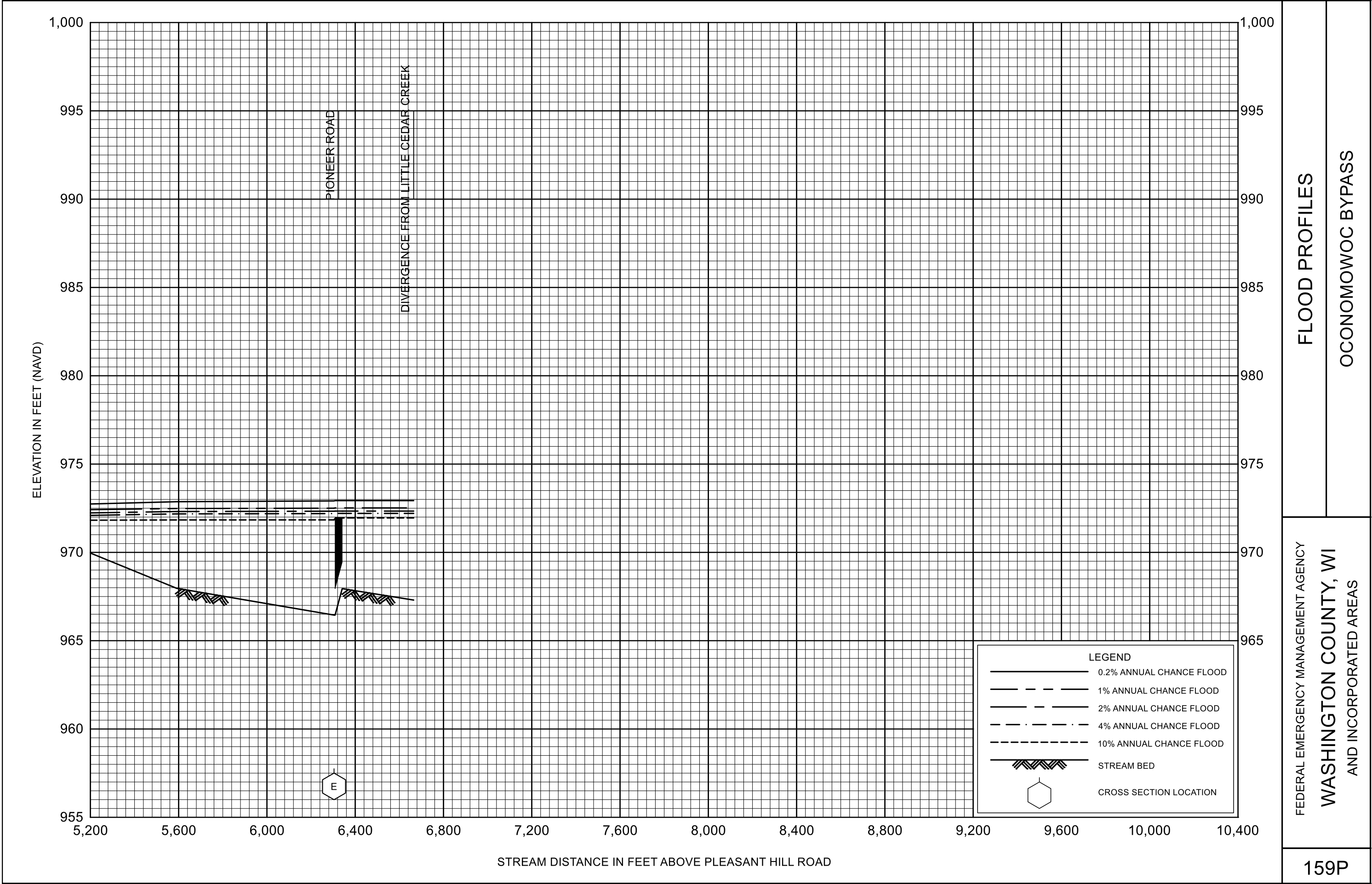
NORTH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS



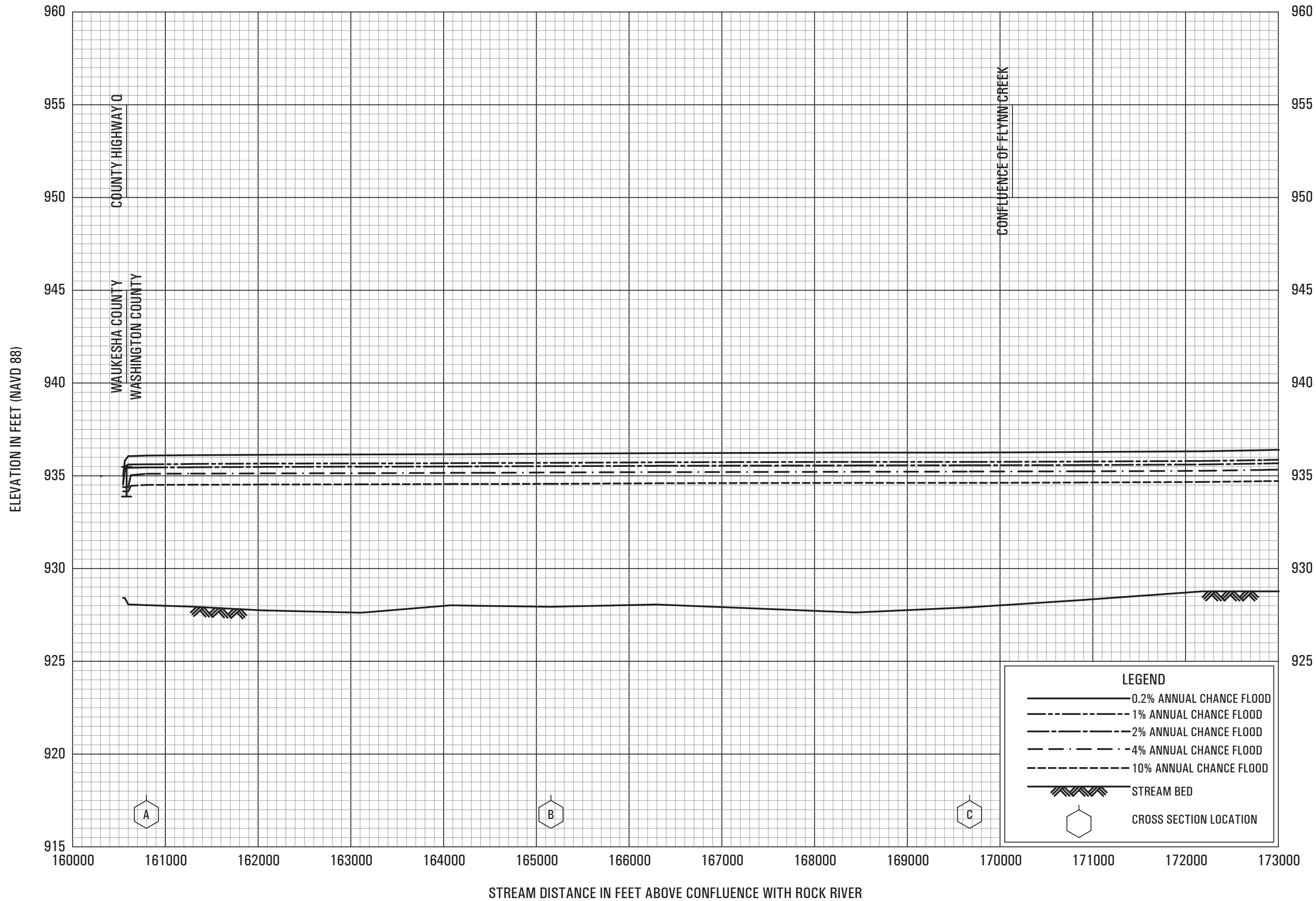






FLOOD PROFILES
OCONOMOWOC BYPASS

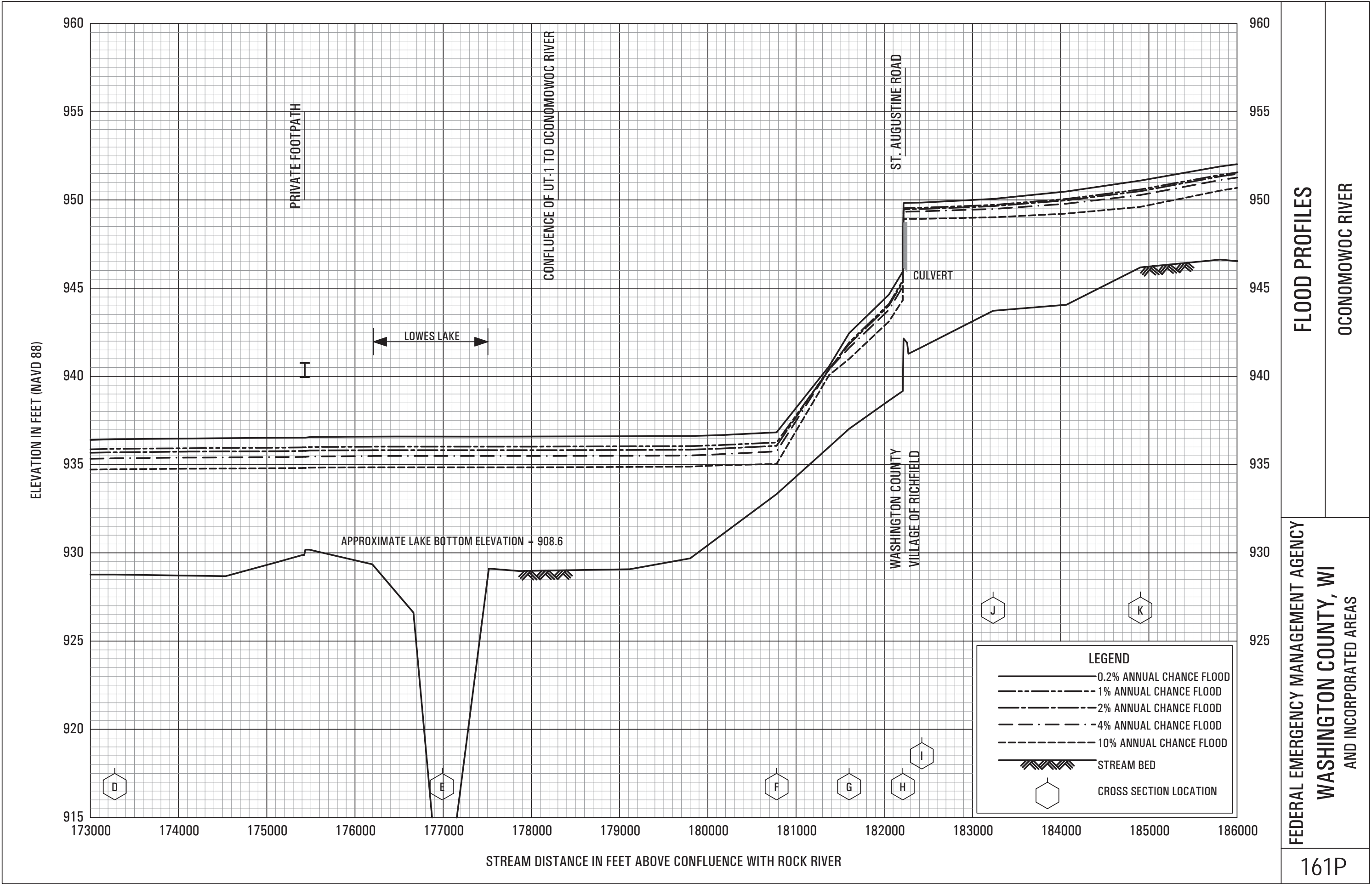
FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS



FLOOD PROFILES

OCONOMOWOC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS



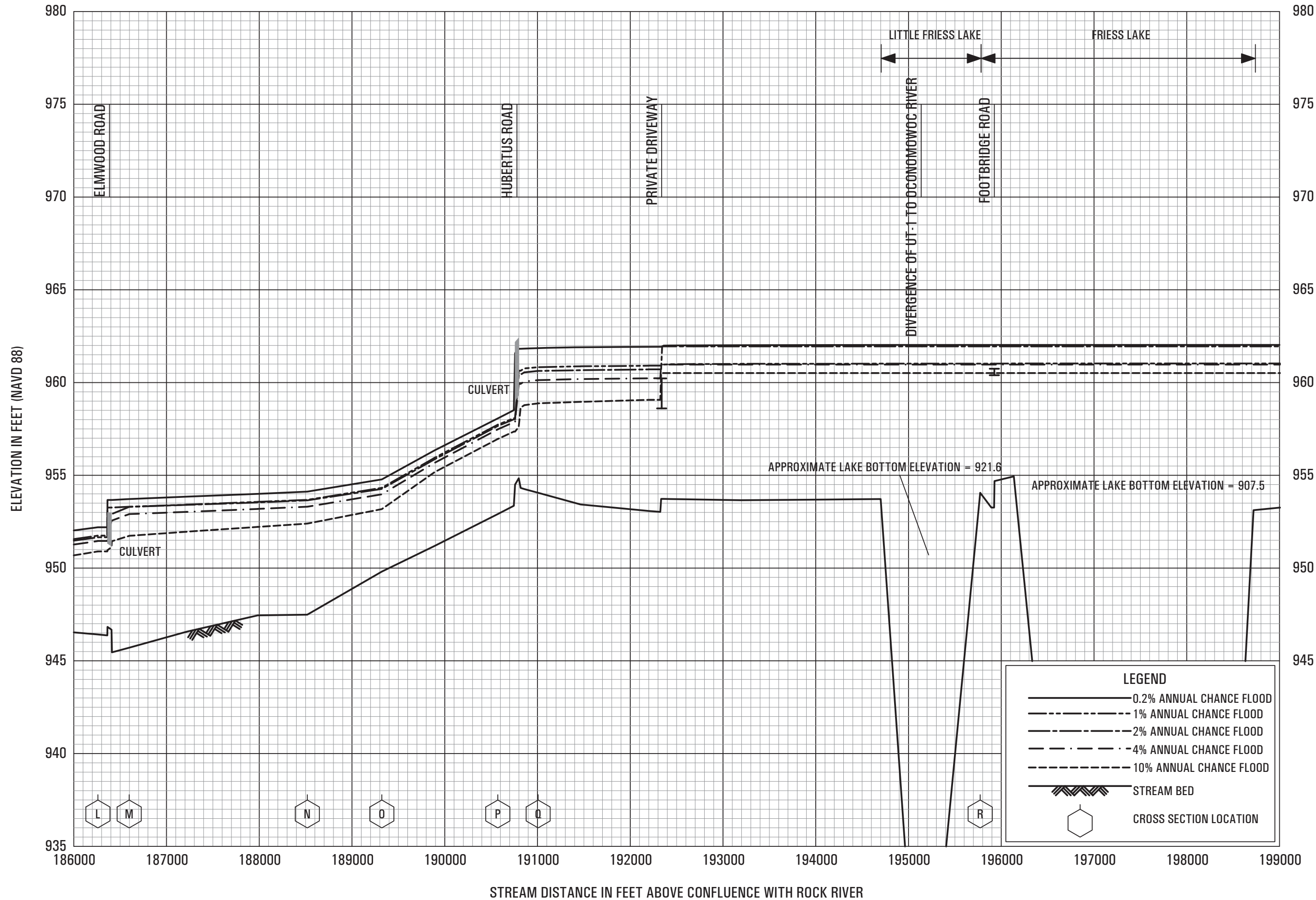
FLOOD PROFILES

OCONOMOWOC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, WI

AND INCORPORATED AREAS

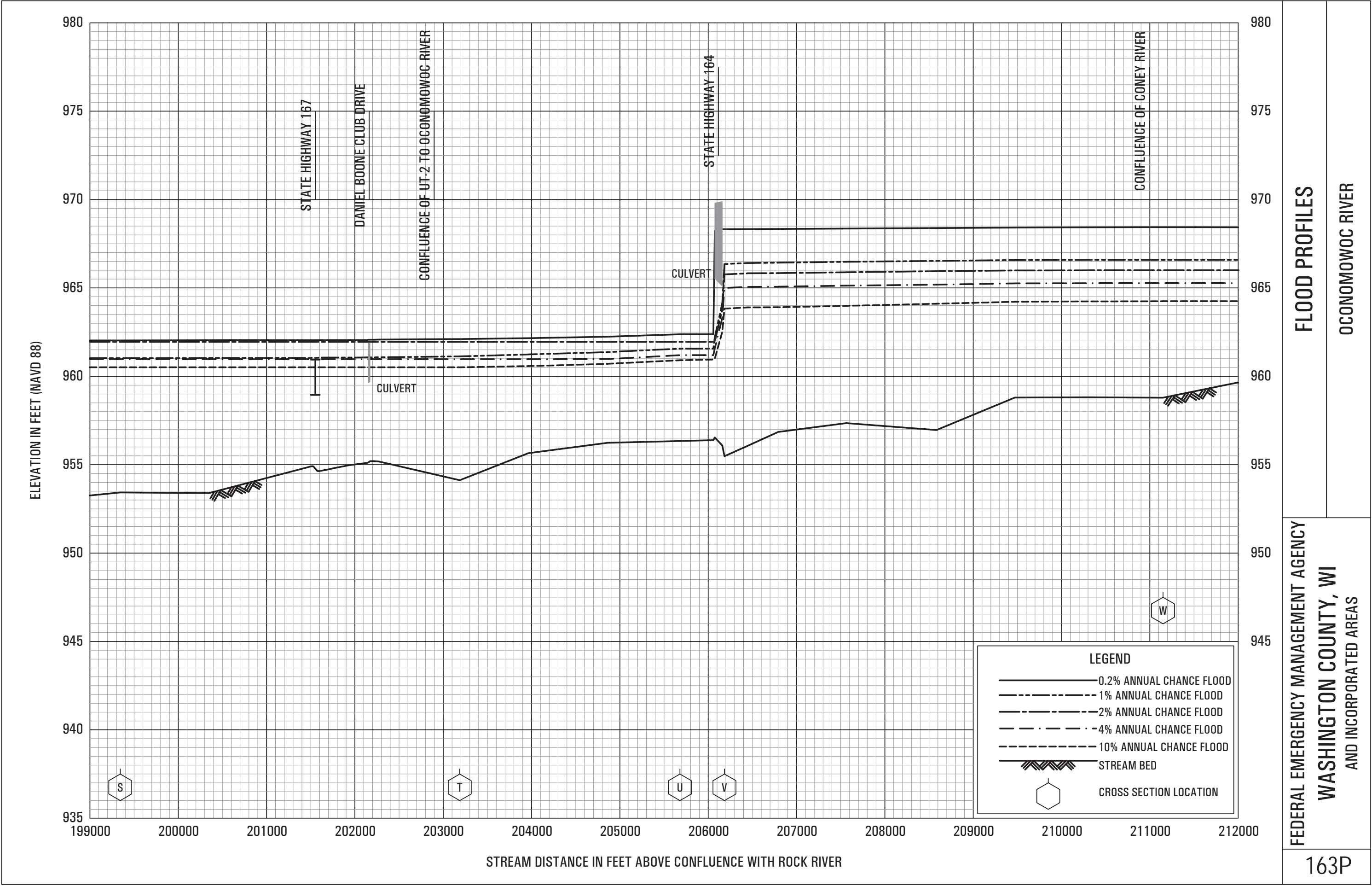


FLOOD PROFILES

OCONOMOWOC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

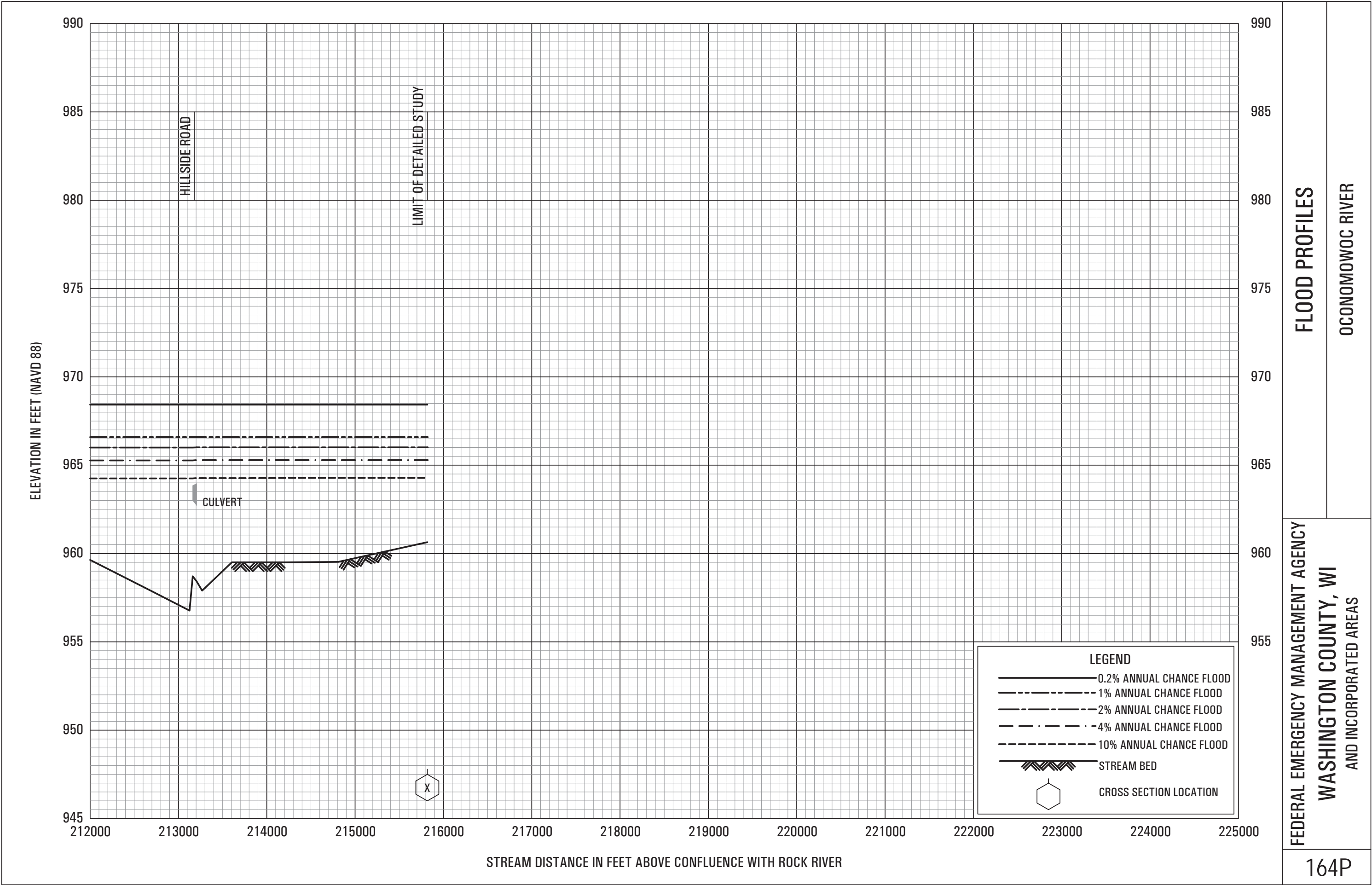
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS



FLOOD PROFILES

OCONOMOWOC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS



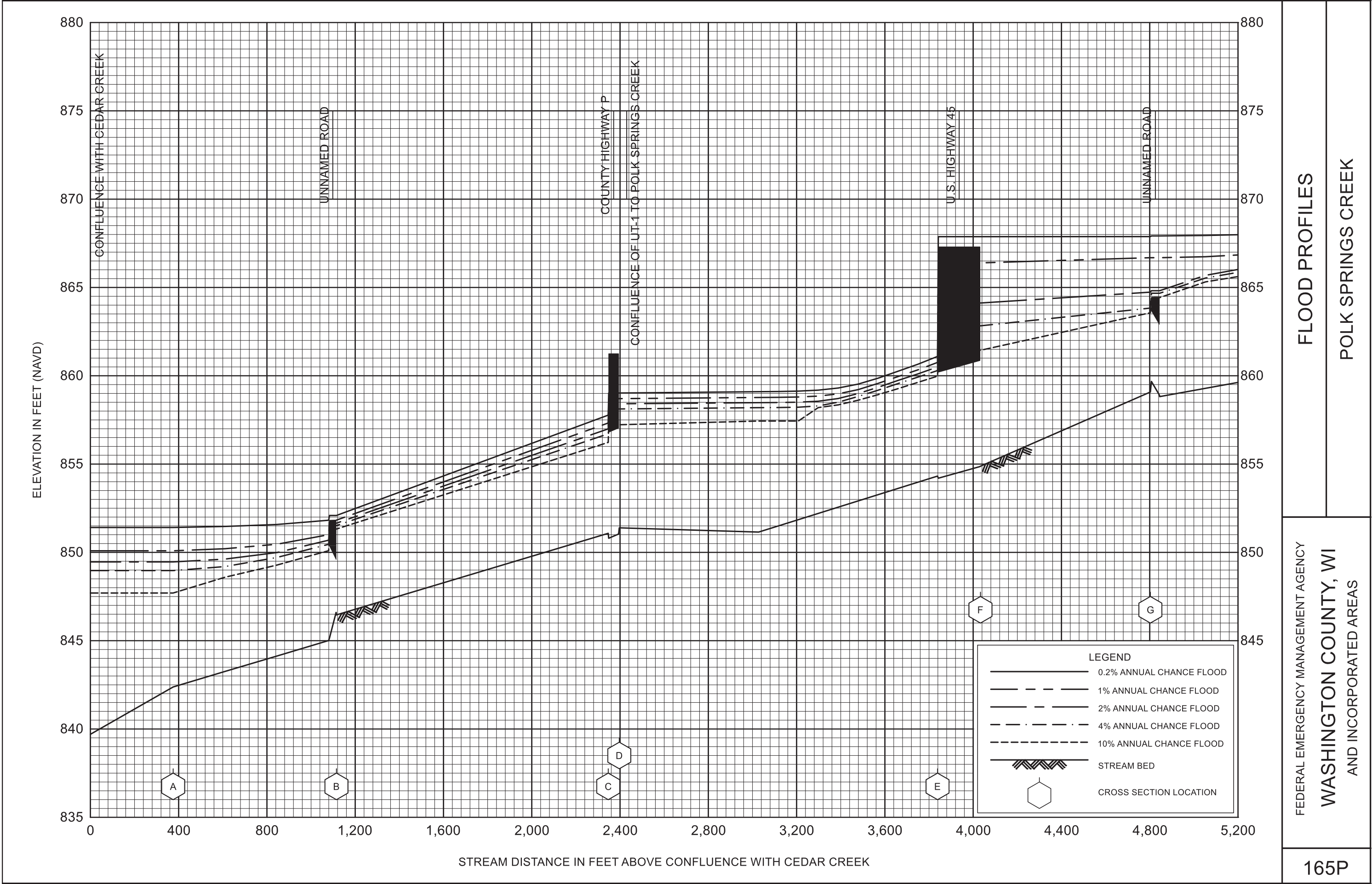
FLOOD PROFILES

OCONOMOWOC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

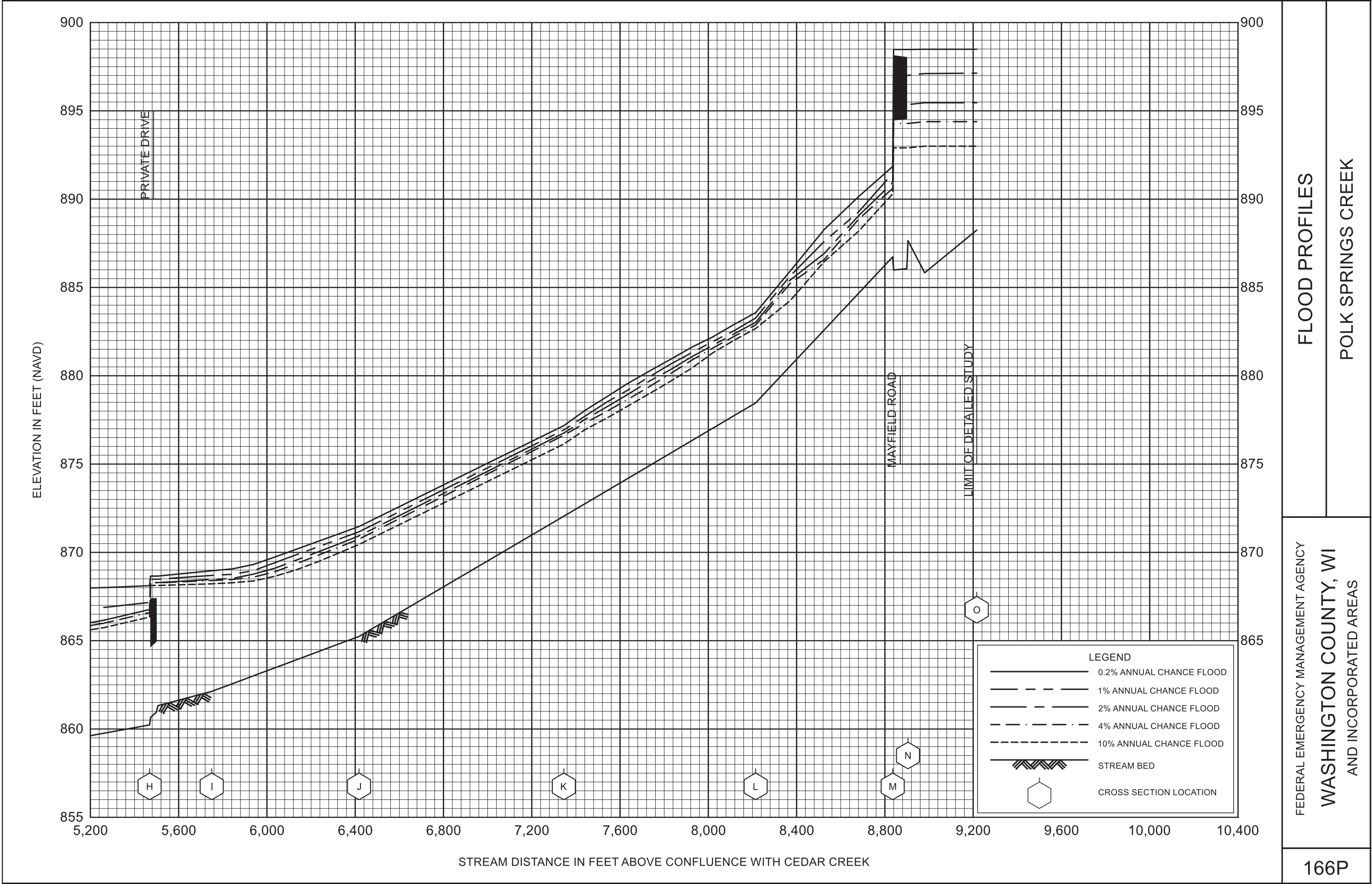
WASHINGTON COUNTY, WI

AND INCORPORATED AREAS



FLOOD PROFILES
POLK SPRINGS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS



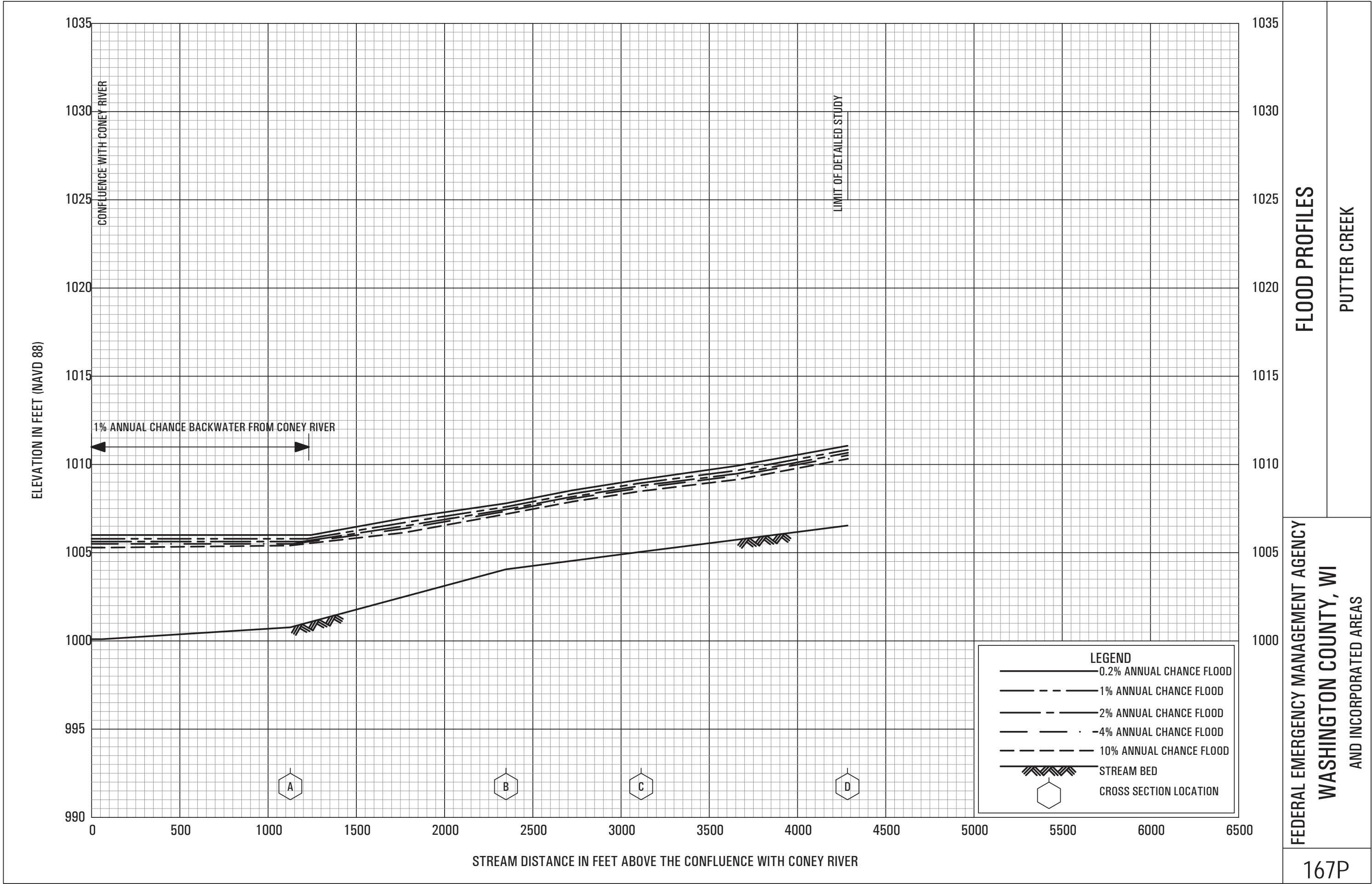
FLOOD PROFILES

POLK SPRINGS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, WI

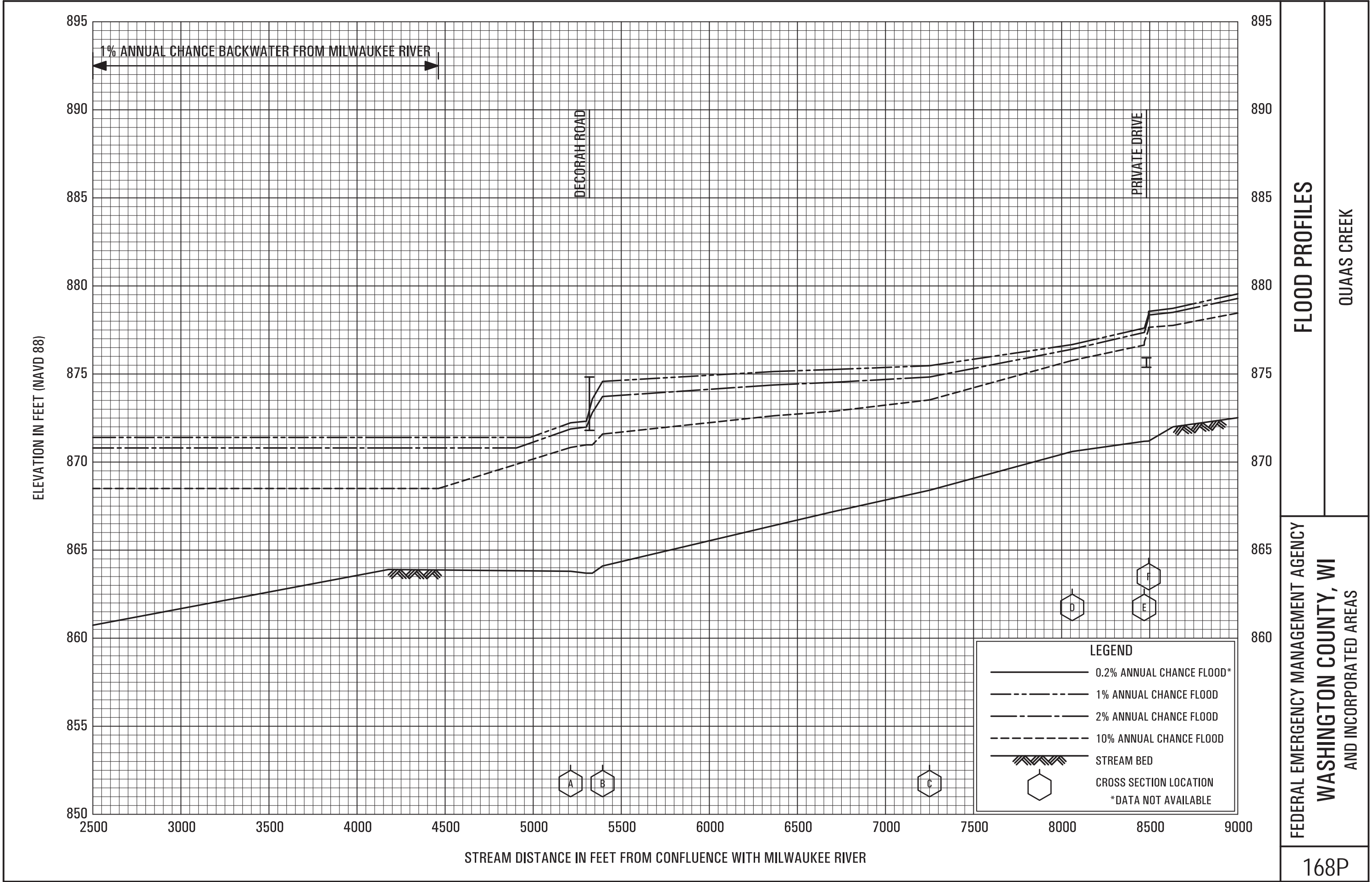
AND INCORPORATED AREAS

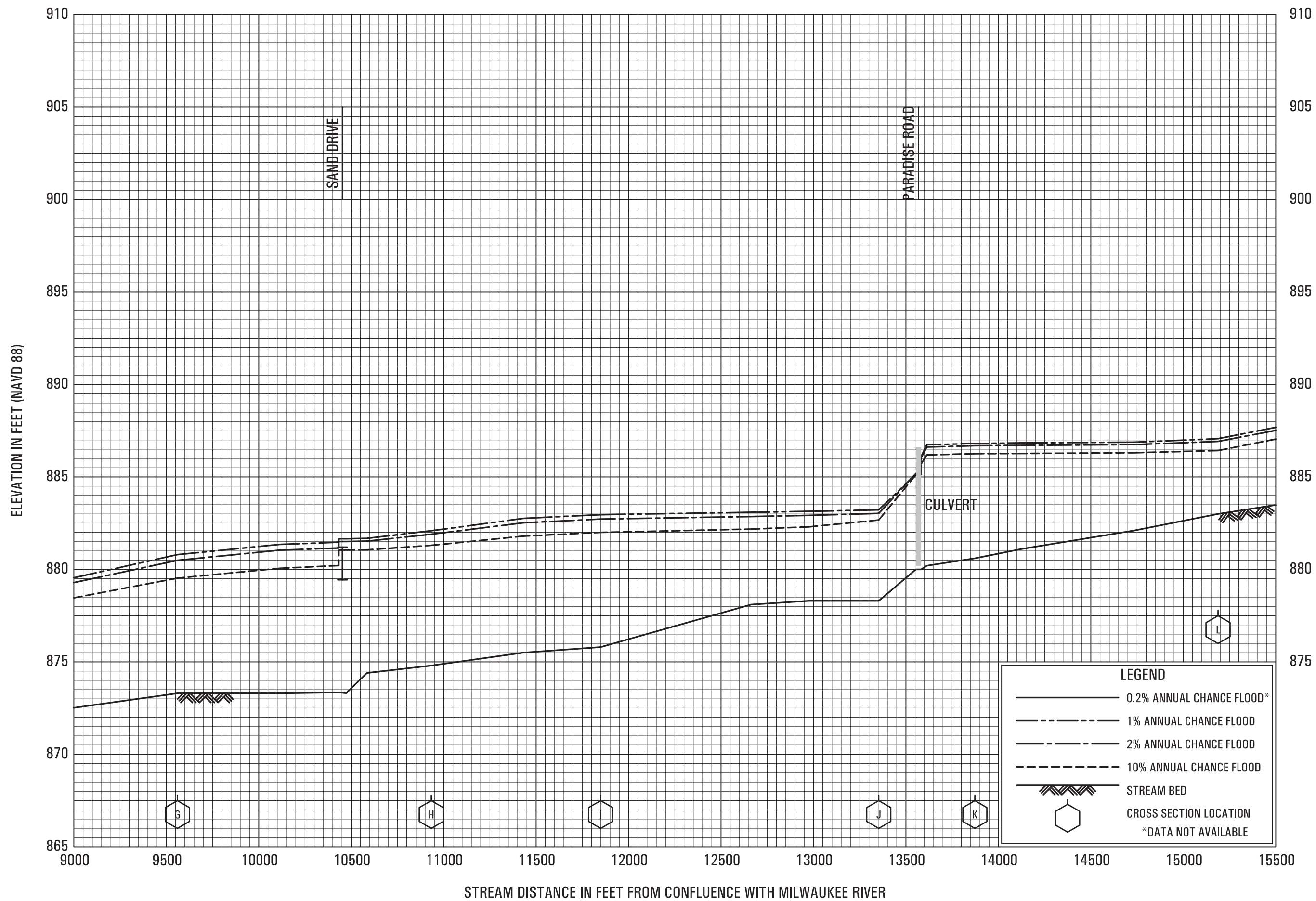


FLOOD PROFILES

PUTTER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS

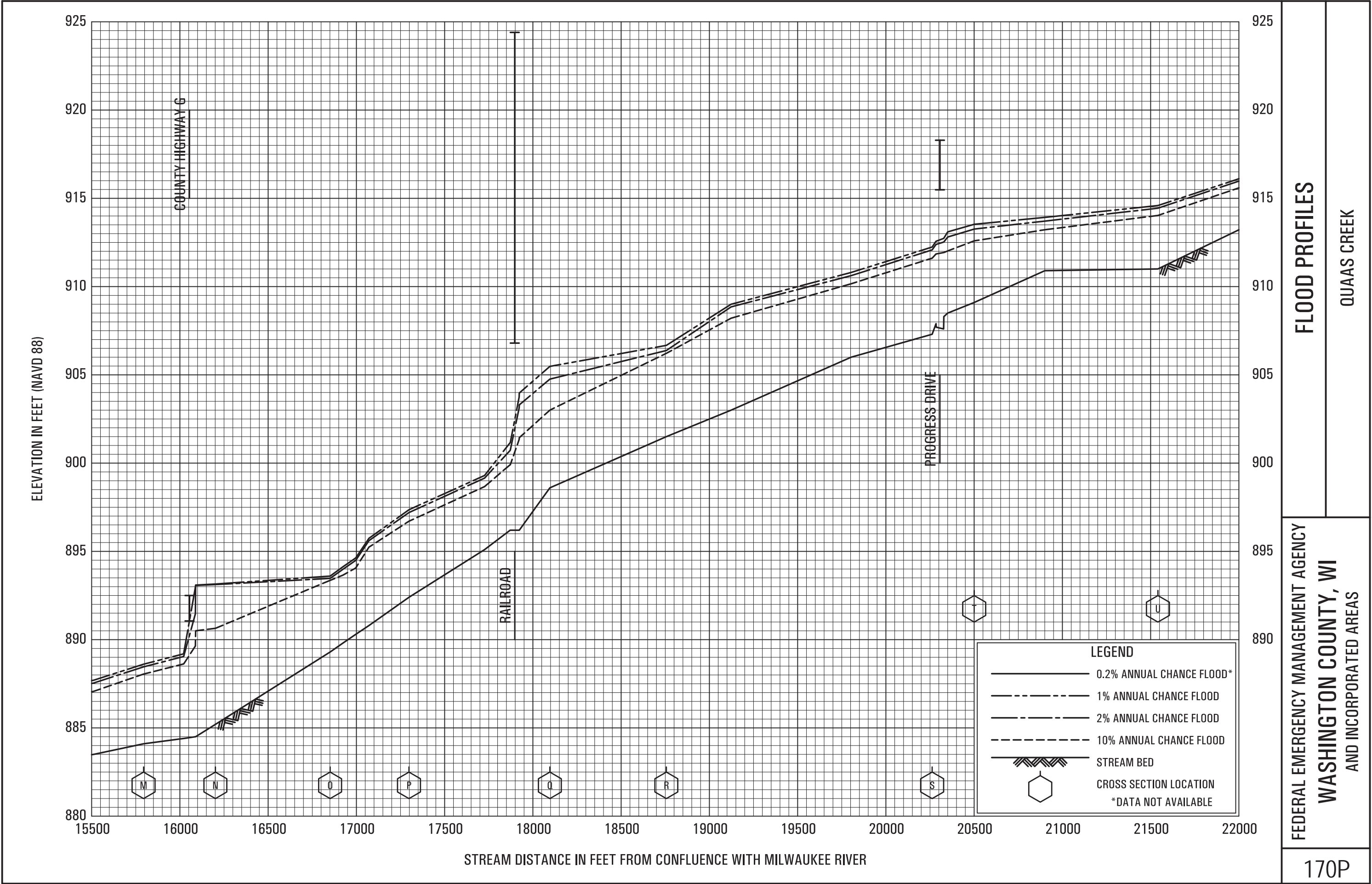




FLOOD PROFILES

**WASHINGTON COUNTY, WI
AND INCORPORATED AREAS**

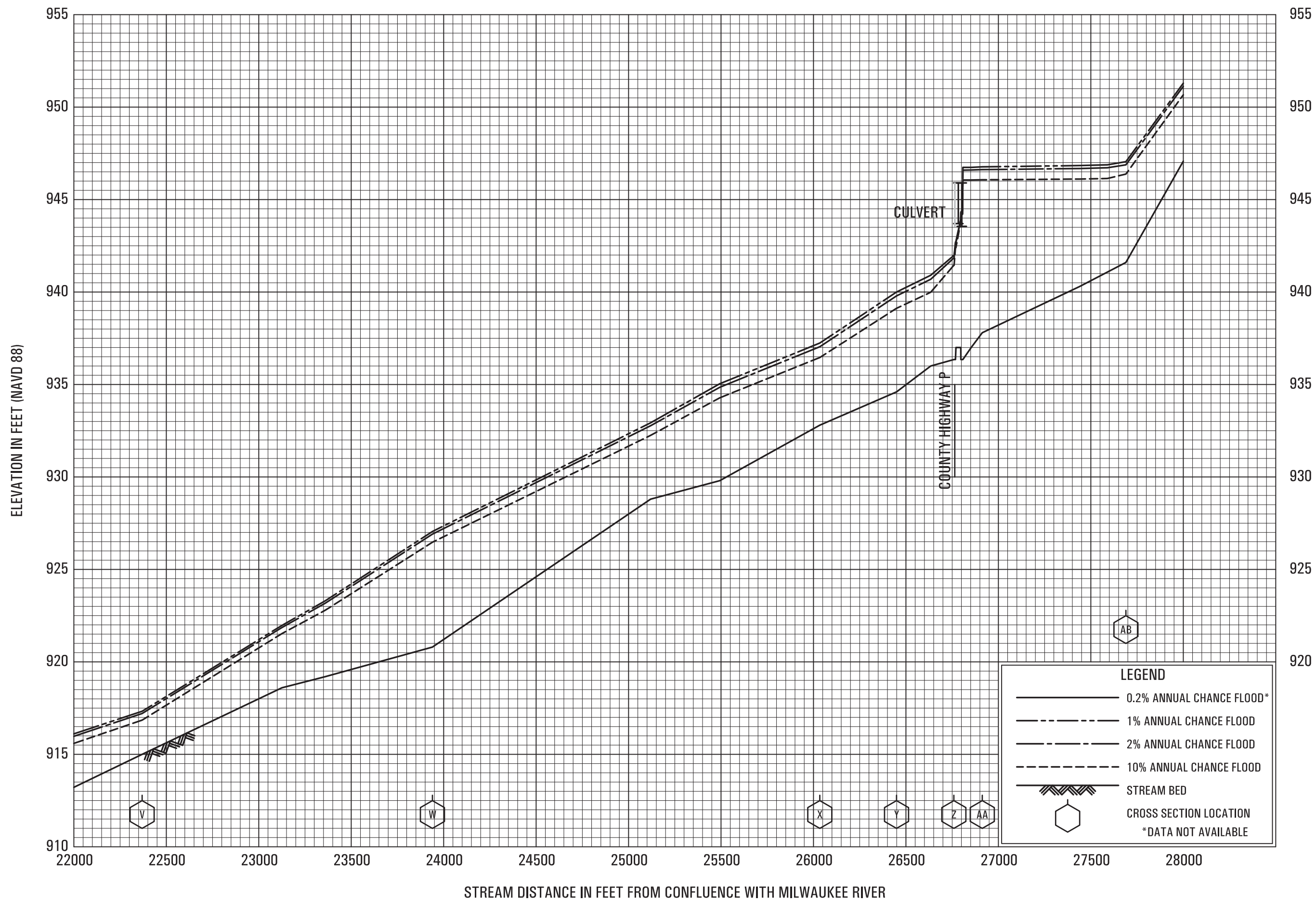
169P



FLOOD PROFILES

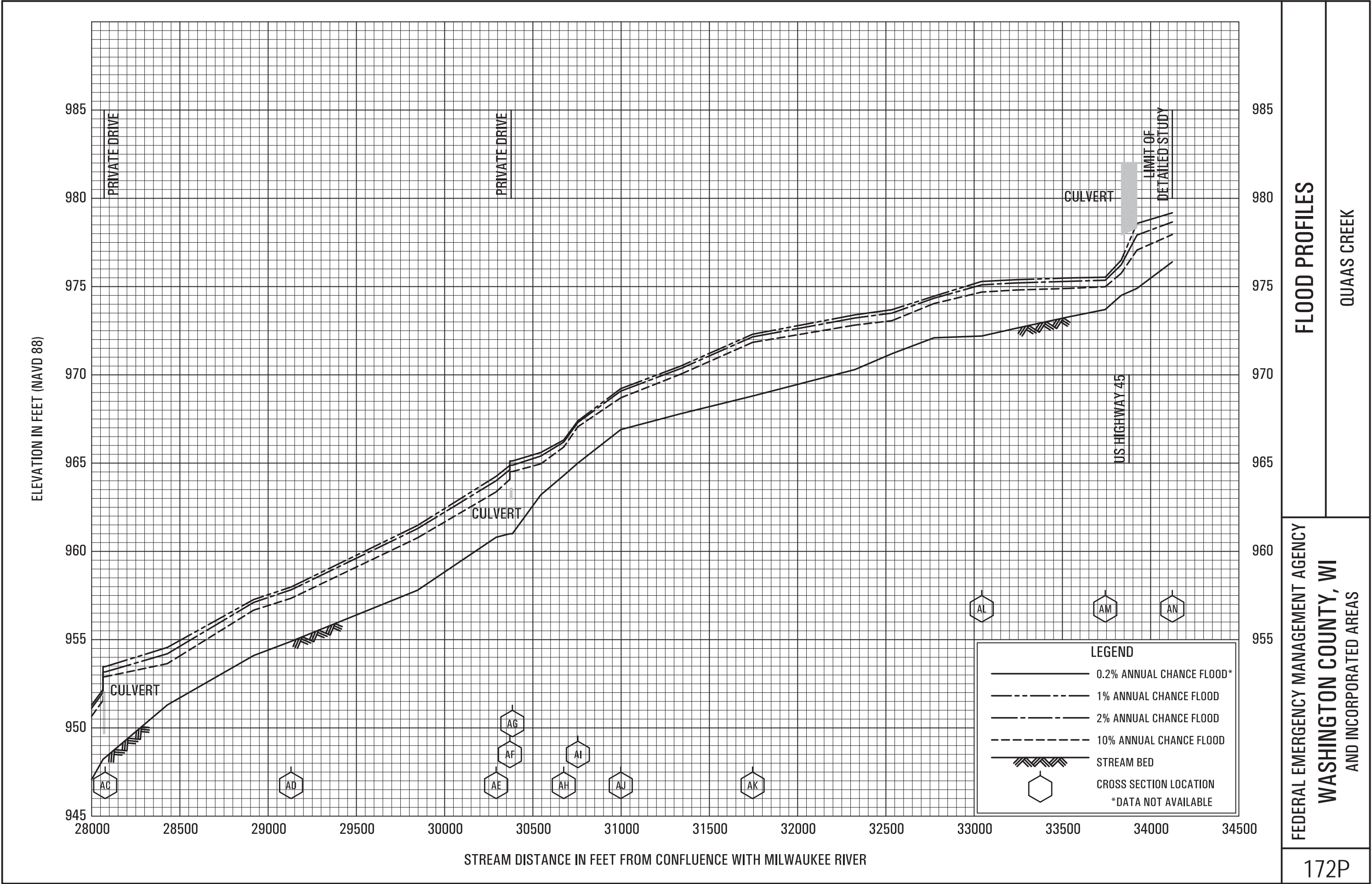
QUAAS CREEK

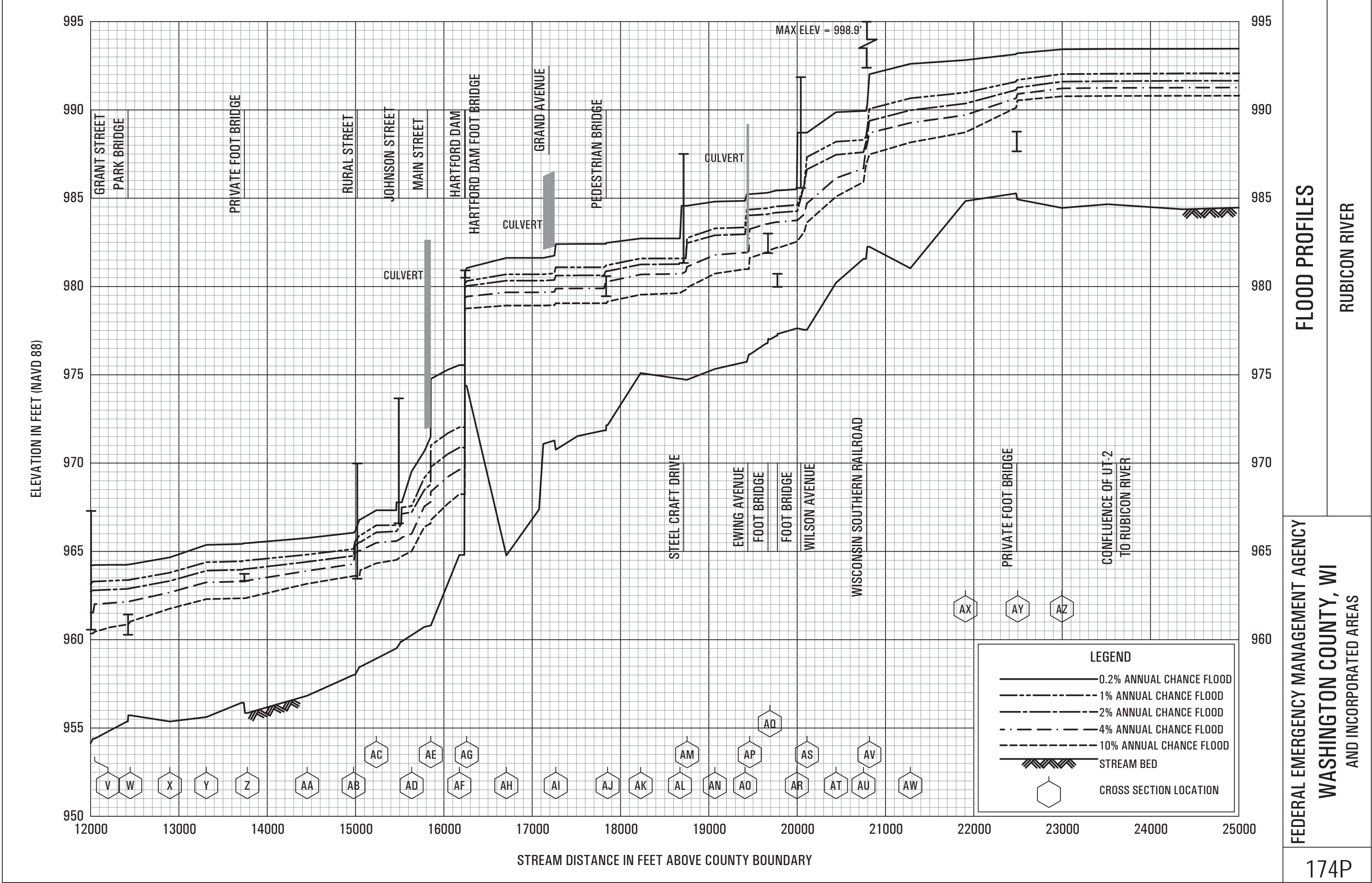
FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS

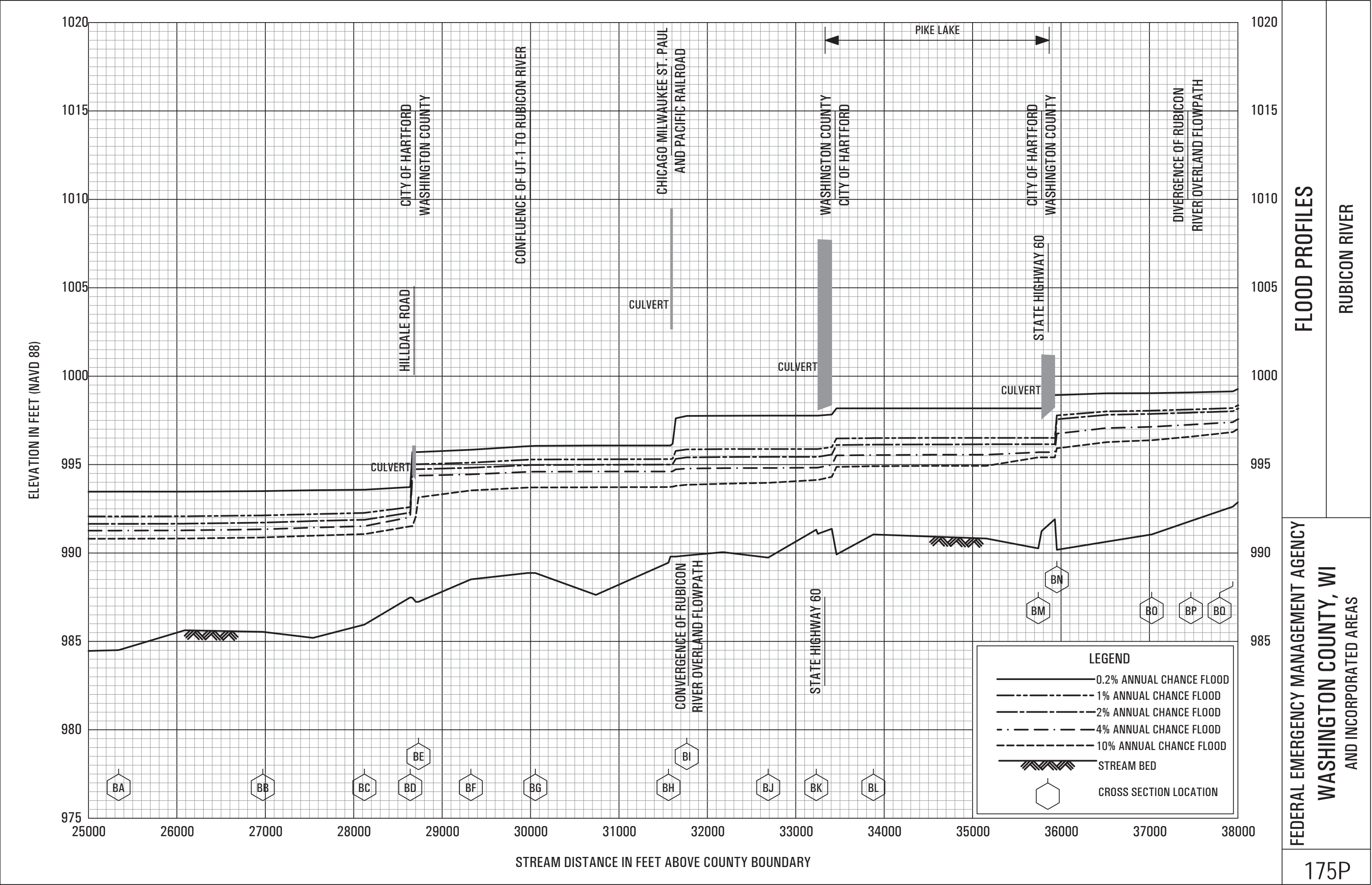


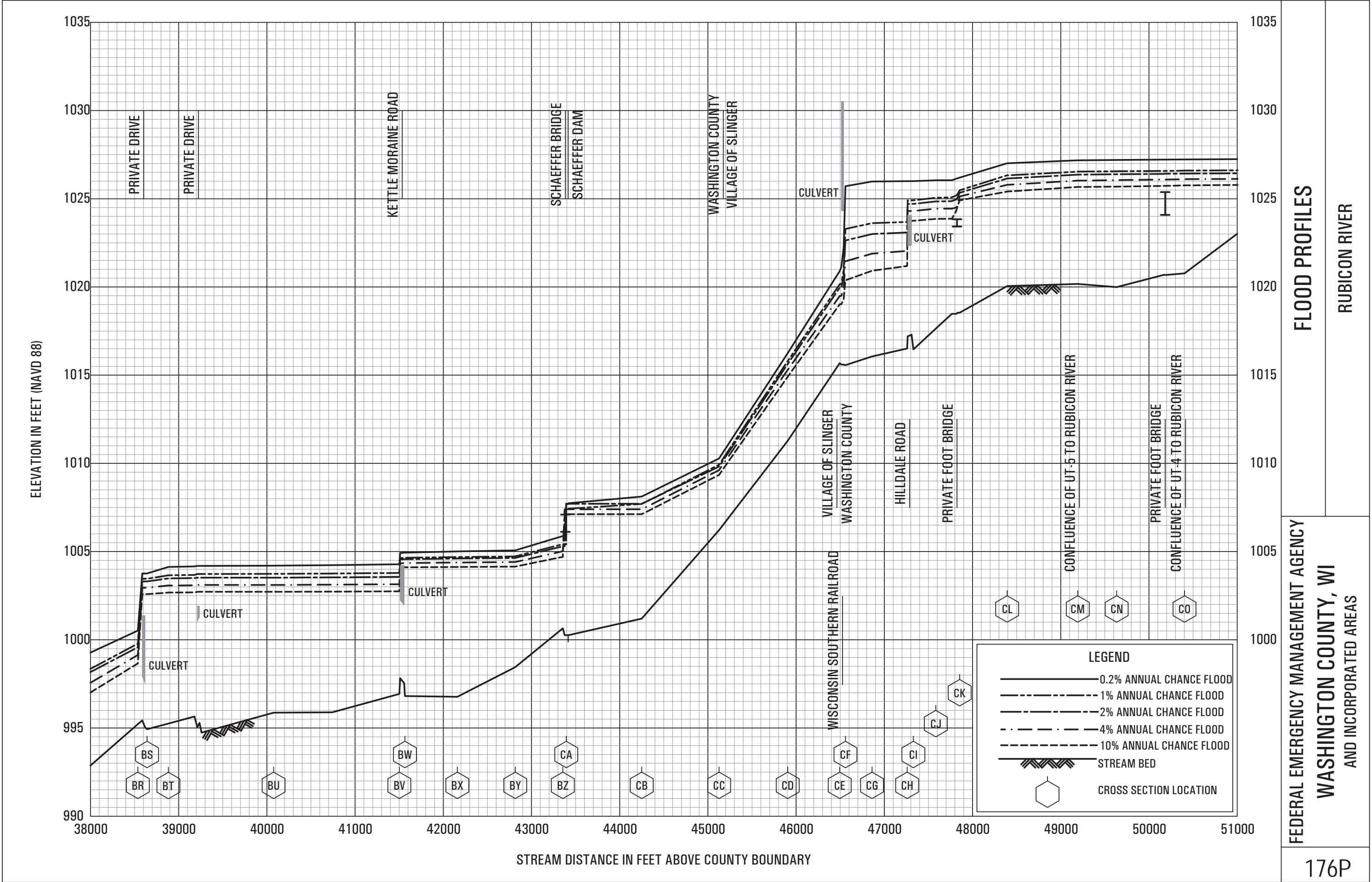
FLOOD PROFILES

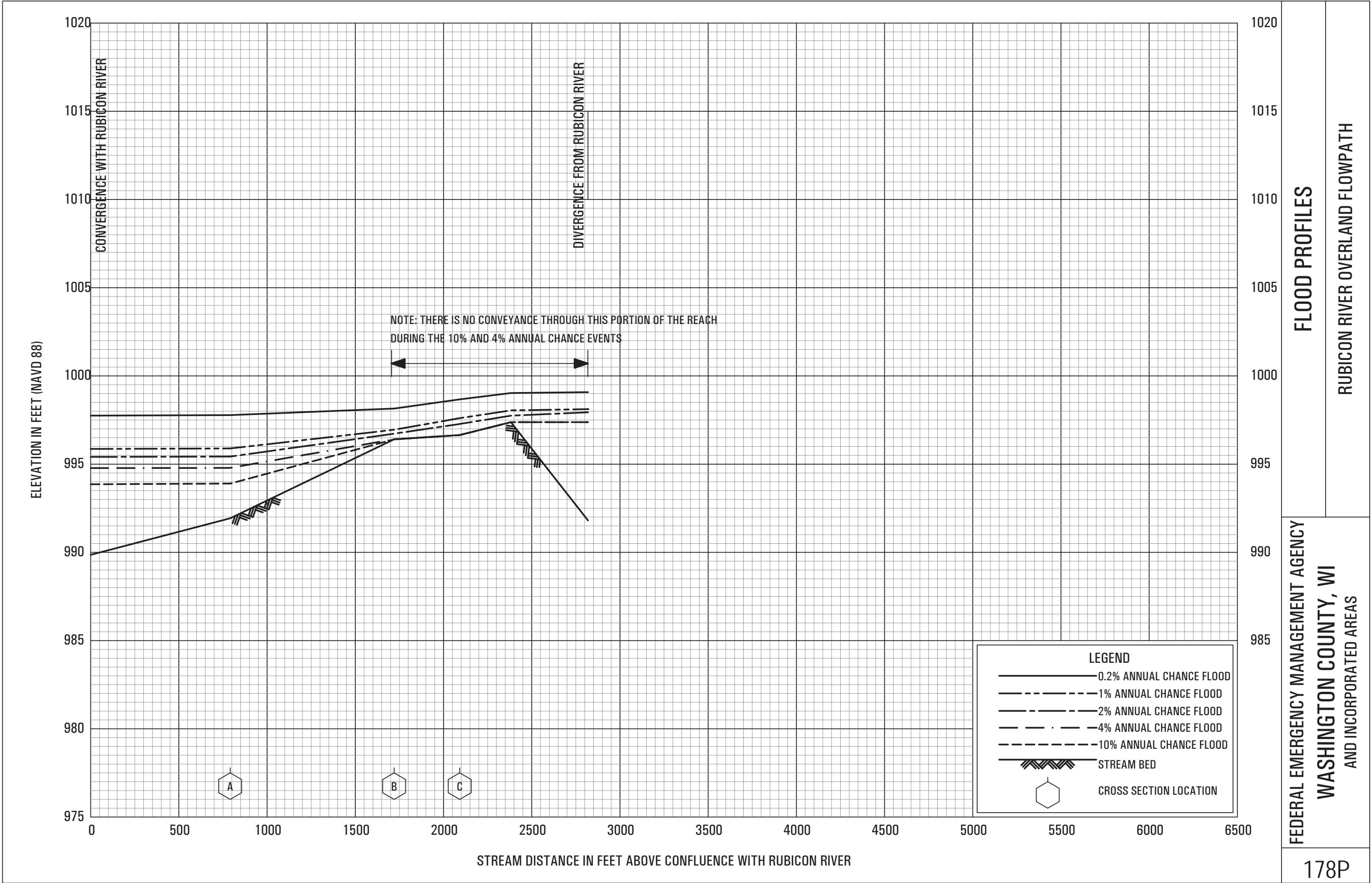
QUAAS CREEK

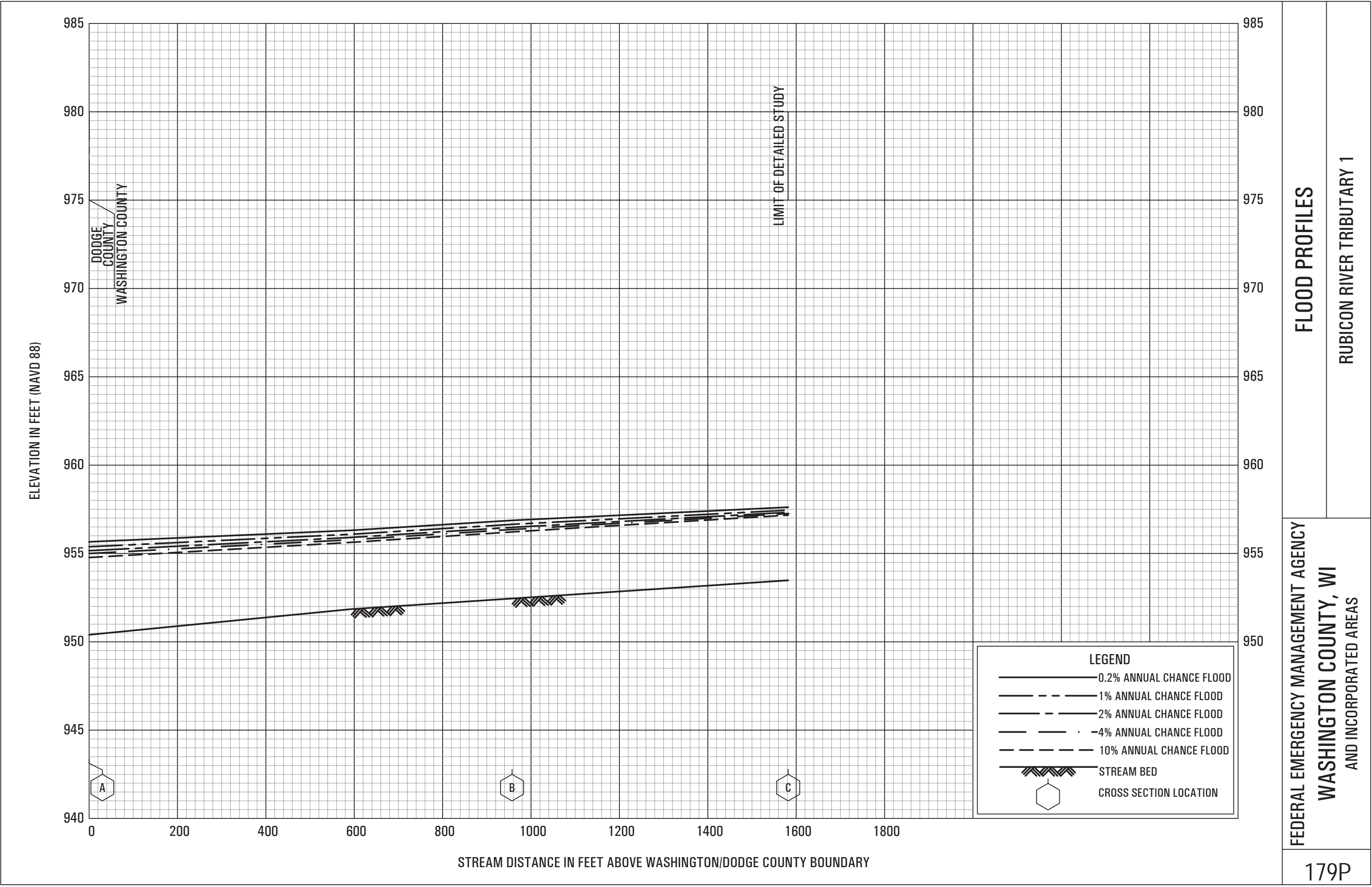


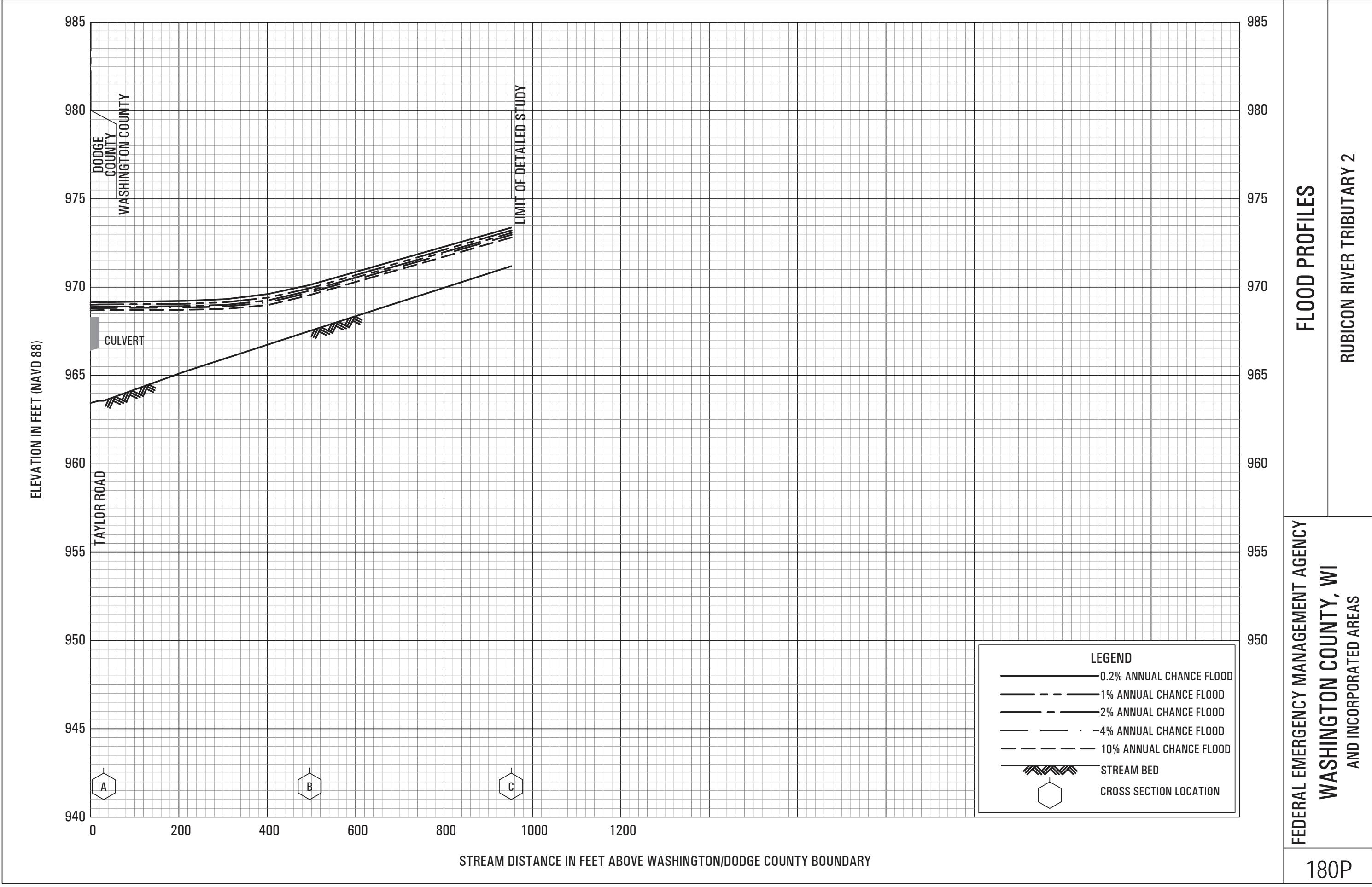








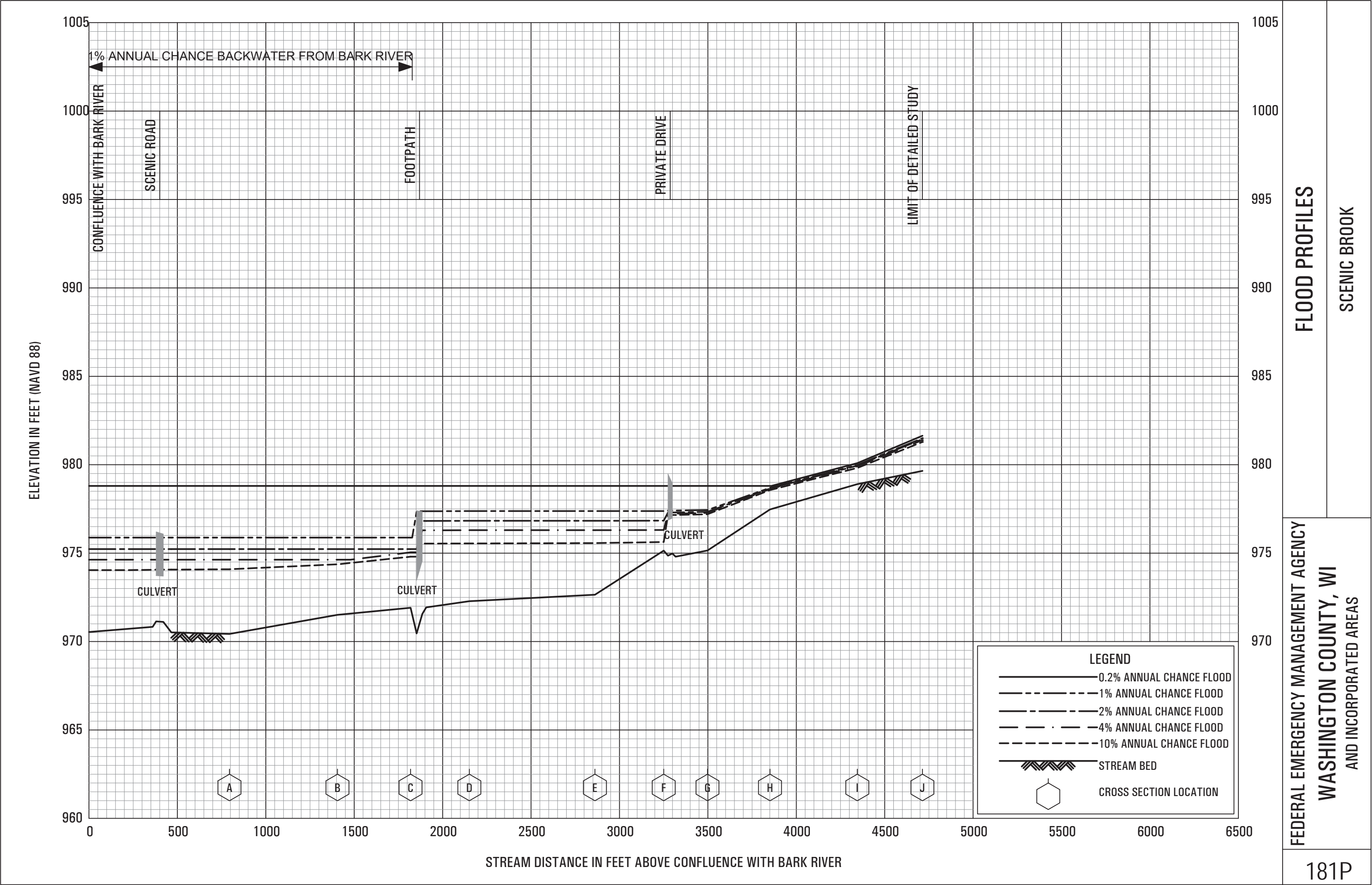




FLOOD PROFILES

RUBICON RIVER TRIBUTARY 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS



FLOOD PROFILES

SCENIC BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON COUNTY, WI
AND INCORPORATED AREAS