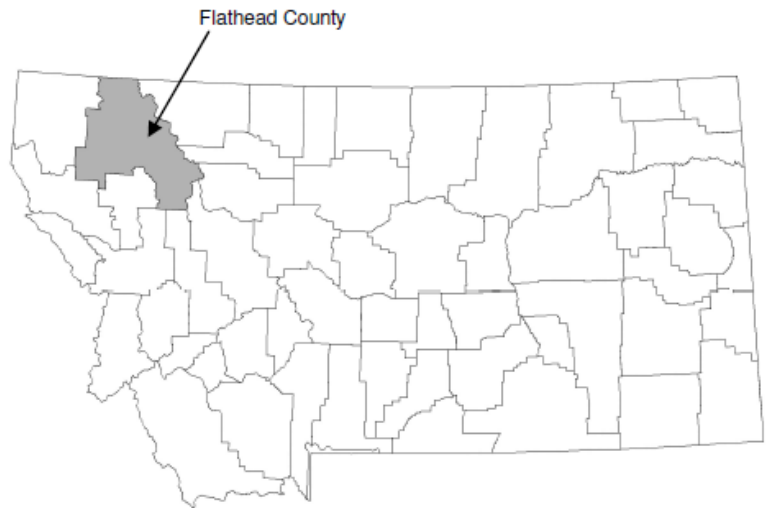


# FLOOD INSURANCE STUDY



## FLATHEAD COUNTY, MONTANA AND INCORPORATED AREAS VOLUME 2 OF 2

COMMUNITY NAME	COMMUNITY NUMBER
COLUMBIA FALLS, CITY OF	300024
FLATHEAD COUNTY (UNINCORPORATED AREAS)	300023
KALISPELL, CITY OF	300025
WHITEFISH, CITY OF	300026



Revised: November 4, 2015



**Federal Emergency Management Agency**

FLOOD INSURANCE STUDY NUMBER  
30029CV002C

**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.

Initial Countywide FIS Report Effective Date: September 28, 2007

First Revised Countywide FIS Report Effective Date: June 18, 2013

Second Revised Countywide FIS Report Effective Date: November 4, 2015

## TABLE OF CONTENTS

### Volume 1

	<u>Page</u>
1.0 INTRODUCTION .....	1
1.1 Purpose of Study .....	1
1.2 Authority and Acknowledgments .....	1
1.3 Coordination .....	2
2.0 AREA STUDIED .....	4
2.1 Scope of Study .....	4
2.2 Community Description .....	5
2.3 Principal Flood Problems .....	12
2.4 Flood Protection Measures .....	18
3.0 ENGINEERING METHODS .....	20
3.1 Hydrologic Analyses .....	20
3.2 Hydraulic Analyses .....	30
3.3 Vertical Datum .....	40
4.0 FLOODPLAIN MANAGEMENT APPLICATIONS .....	42
4.1 Flood Boundaries .....	42
4.2 Floodways .....	43
5.0 INSURANCE APPLICATIONS .....	74
6.0 FLOOD INSURANCE RATE MAP .....	75
7.0 OTHER STUDIES .....	77
8.0 LOCATION OF DATA .....	81
9.0 BIBLIOGRAPHY AND REFERENCES .....	82
10.0 REVISION DESCRIPTIONS .....	87
10.1 First Revision .....	87
10.2 Second Revision .....	88

TABLE OF CONTENTS (Continued)

Volume 1 (Continued)

Page

FIGURES

Figure 1 – Floodway Schematic ..... 45

TABLES

Table 1 – Streams Studied by Detailed Methods ..... 5

Table 2 – Historic Flood Elevations on Flathead River ..... 14

Table 3 – Summary of Discharges ..... 26

Table 4 – Summary of Stillwater Elevations..... 29

Table 5 – Datum Conversion Factors ..... 41

Table 6 – Floodway Data ..... 46

Table 7 – Community Map History..... 76

Table 8 – Summary of LOMCs ..... 81

TABLE OF CONTENTS (Continued)

Volume 2

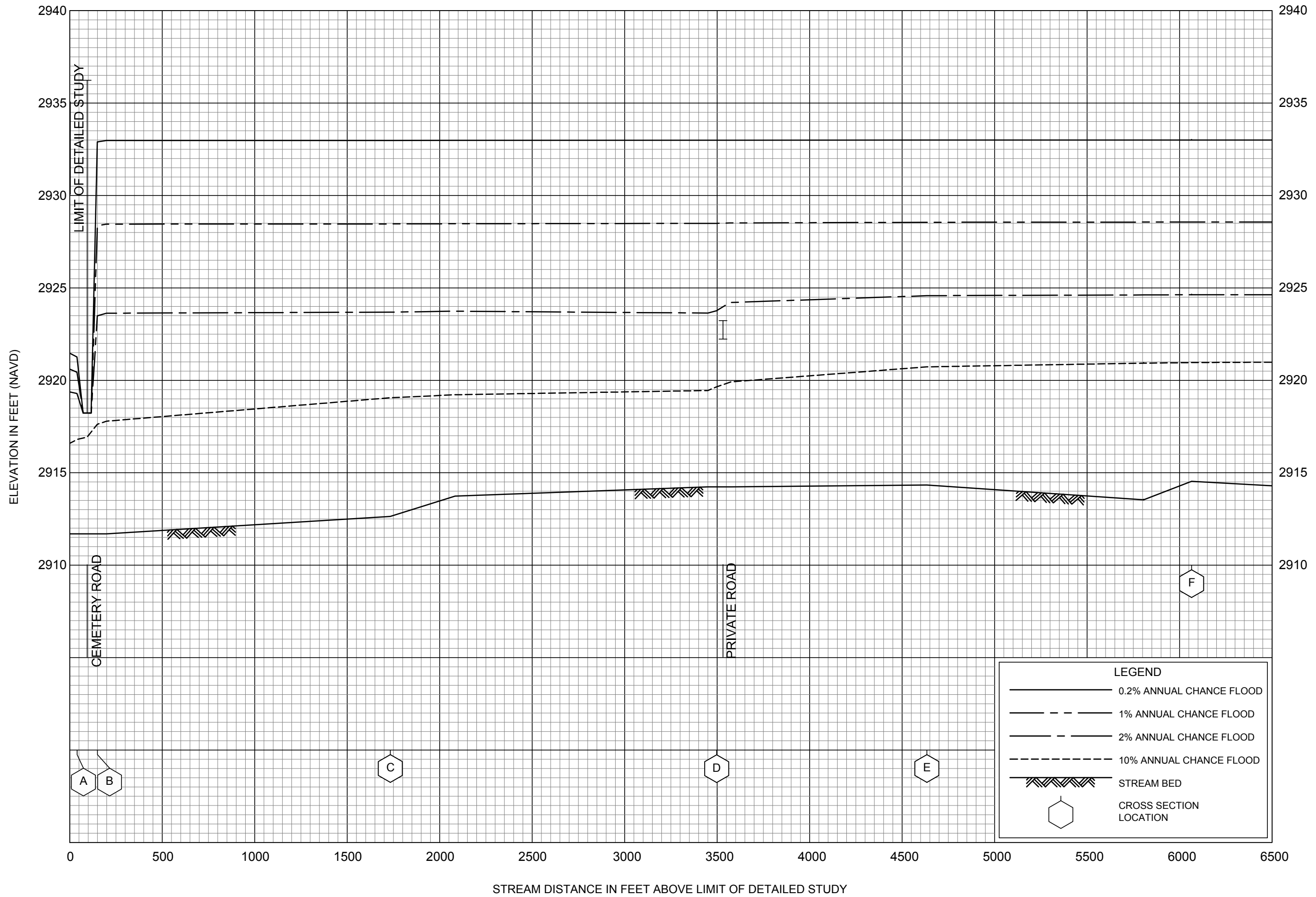
EXHIBITS

Exhibit 1 – Flood Profiles

Ashley Creek	Panels	01P - 07P
Bear Creek	Panels	08P - 11P
Blaine Creek	Panel	12P
Cow Creek at Whitefish	Panels	13P - 16P
Flathead River	Panels	17P - 33P
Lazy Creek	Panel	34P
Middle Fork Flathead River at Nyack	Panels	35P - 37P
Middle Fork Flathead River at West Glacier	Panel	38P
North Tributary to Ashley Creek	Panel	39P
Stillwater River above Spring Prairie Road	Panel	40P
Stillwater River near Kalispell	Panels	41P - 45P
Stillwater River near Olney	Panel	46P
Swan River	Panels	47P - 50P
Swan River at Bigfork	Panel	51P
Swift Creek	Panel	52P
Unnamed Tributary to Bowser Creek	Panel	53P
Unnamed Tributary to Bowser Creek Diverted Flow	Panel	54P
West Spring Creek	Panels	55P - 56P
West Spring Creek Tributary	Panel	57P
Whitefish River at Whitefish	Panels	58P - 60P
Whitefish River near Kalispell	Panels	61P - 69P

Exhibit 2 – Flood Insurance Rate Map Index

Flood Insurance Rate Map

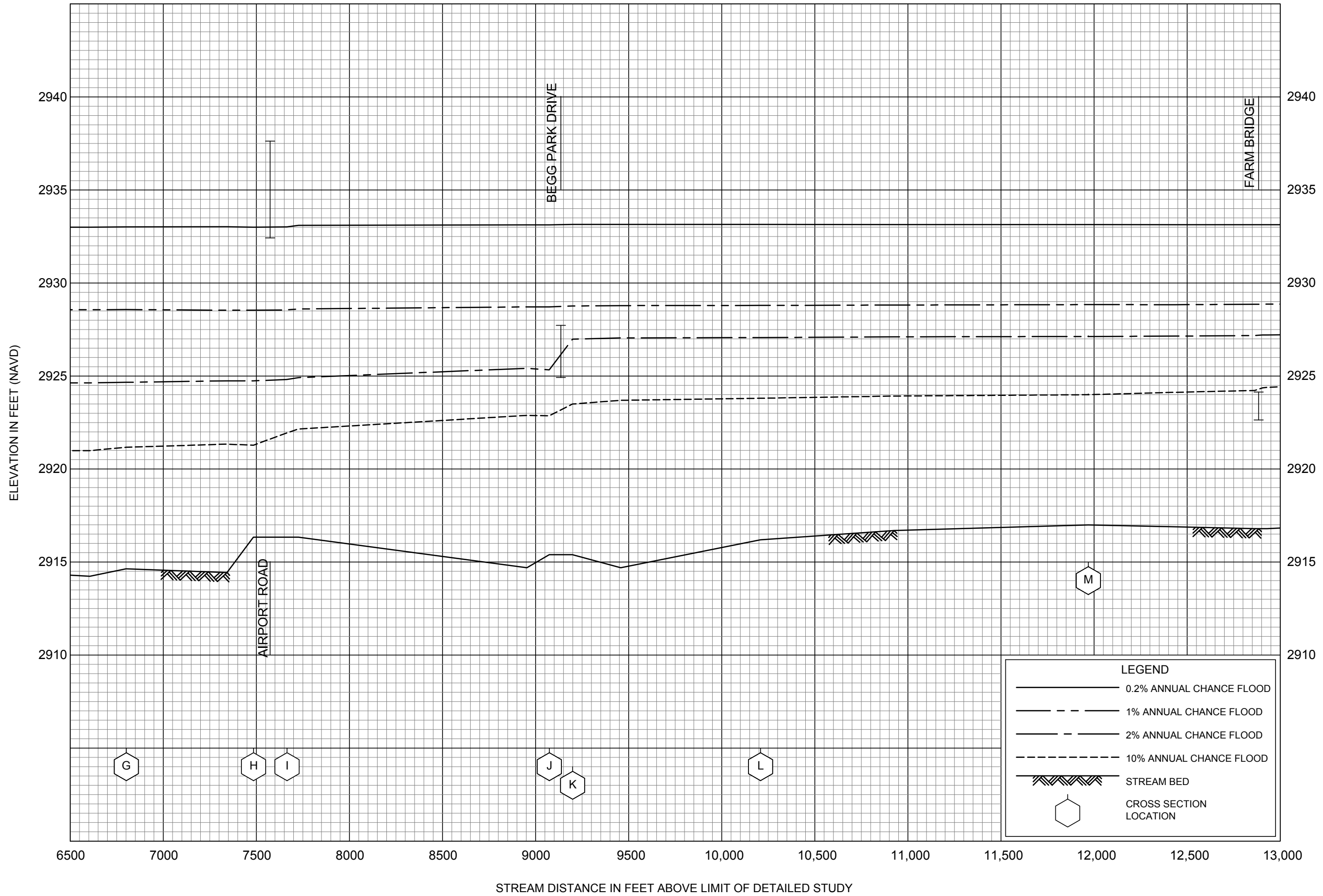


FLOOD PROFILES

ASHLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS

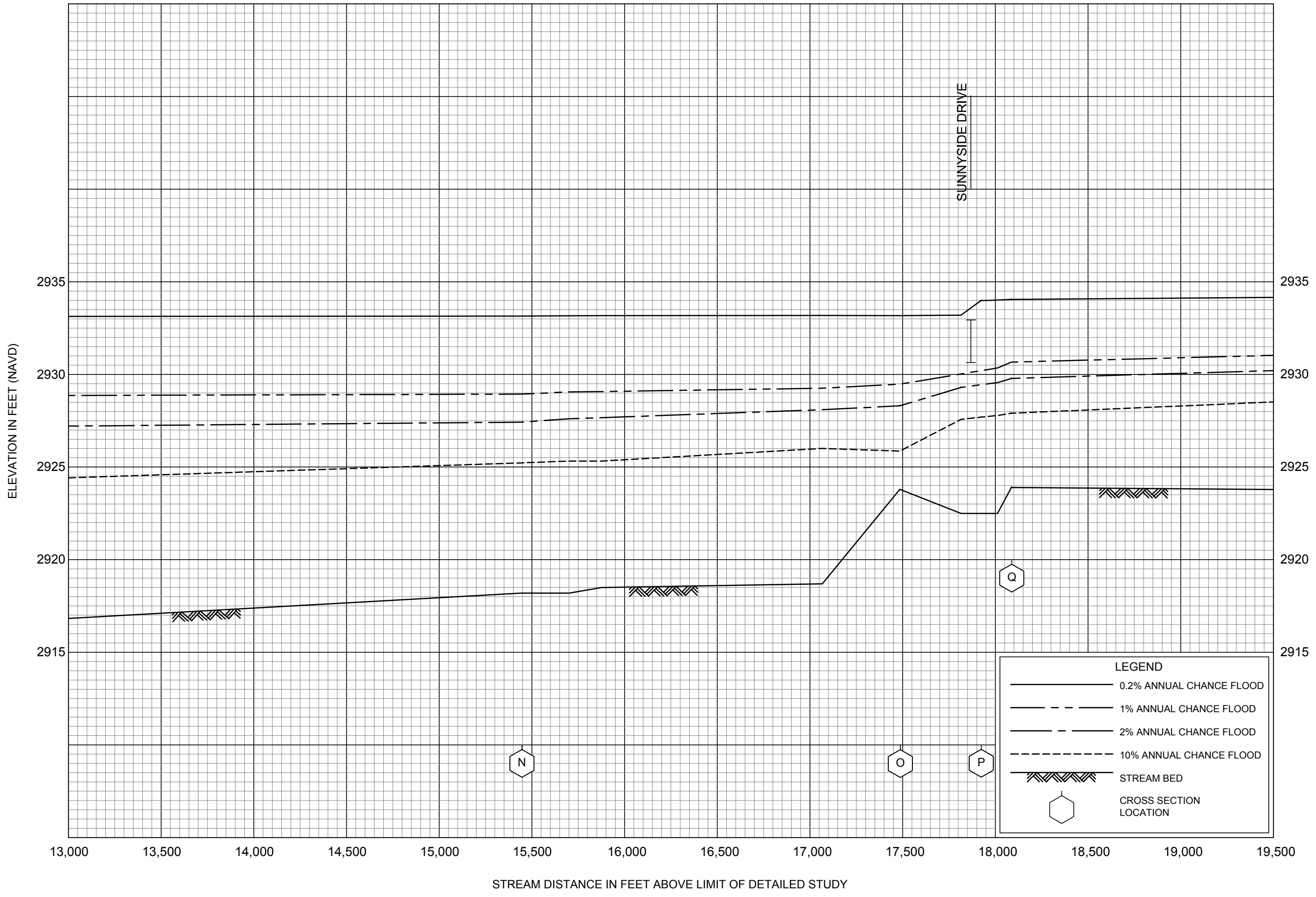


FLOOD PROFILES

ASHLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES

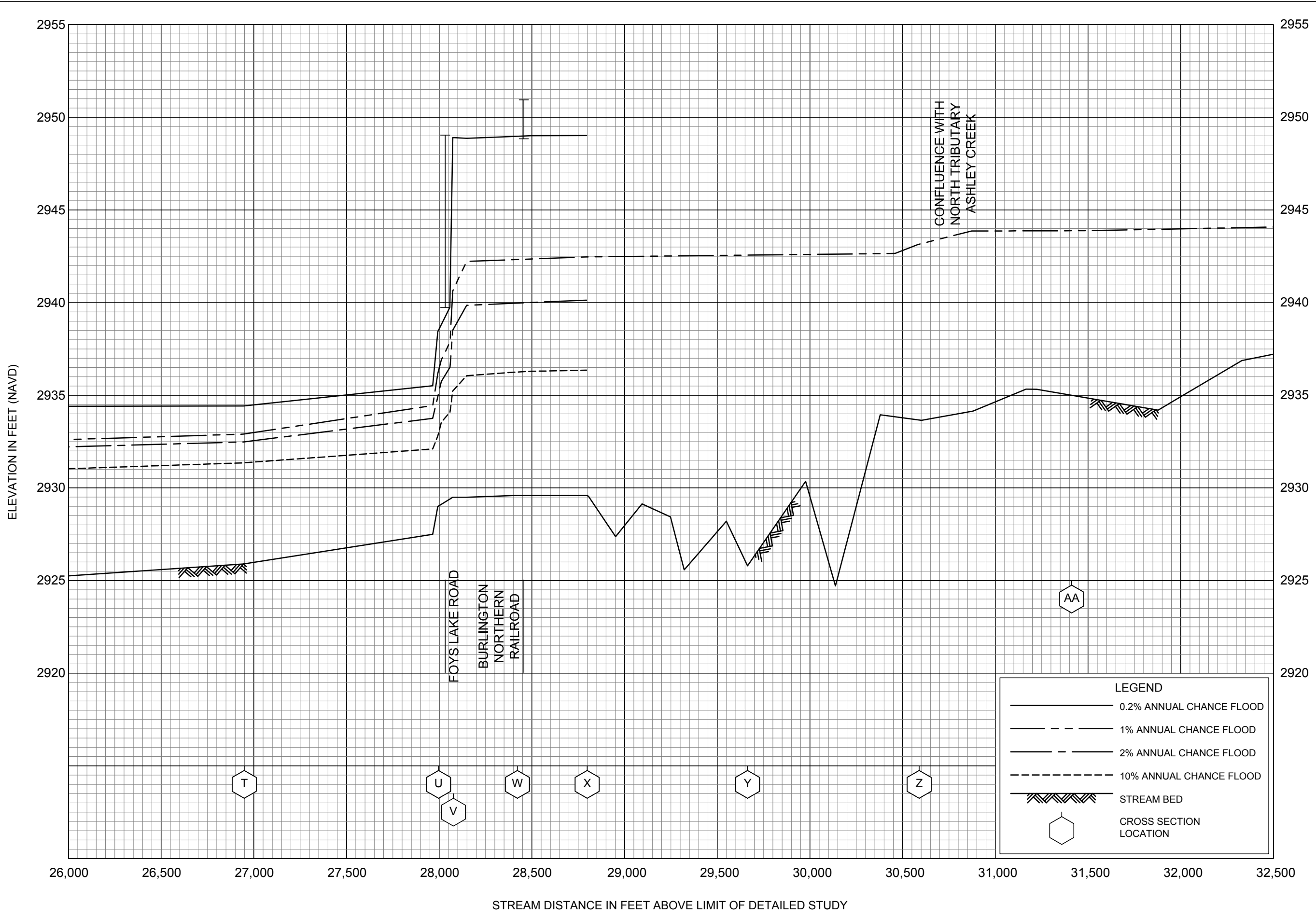
ASHLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS





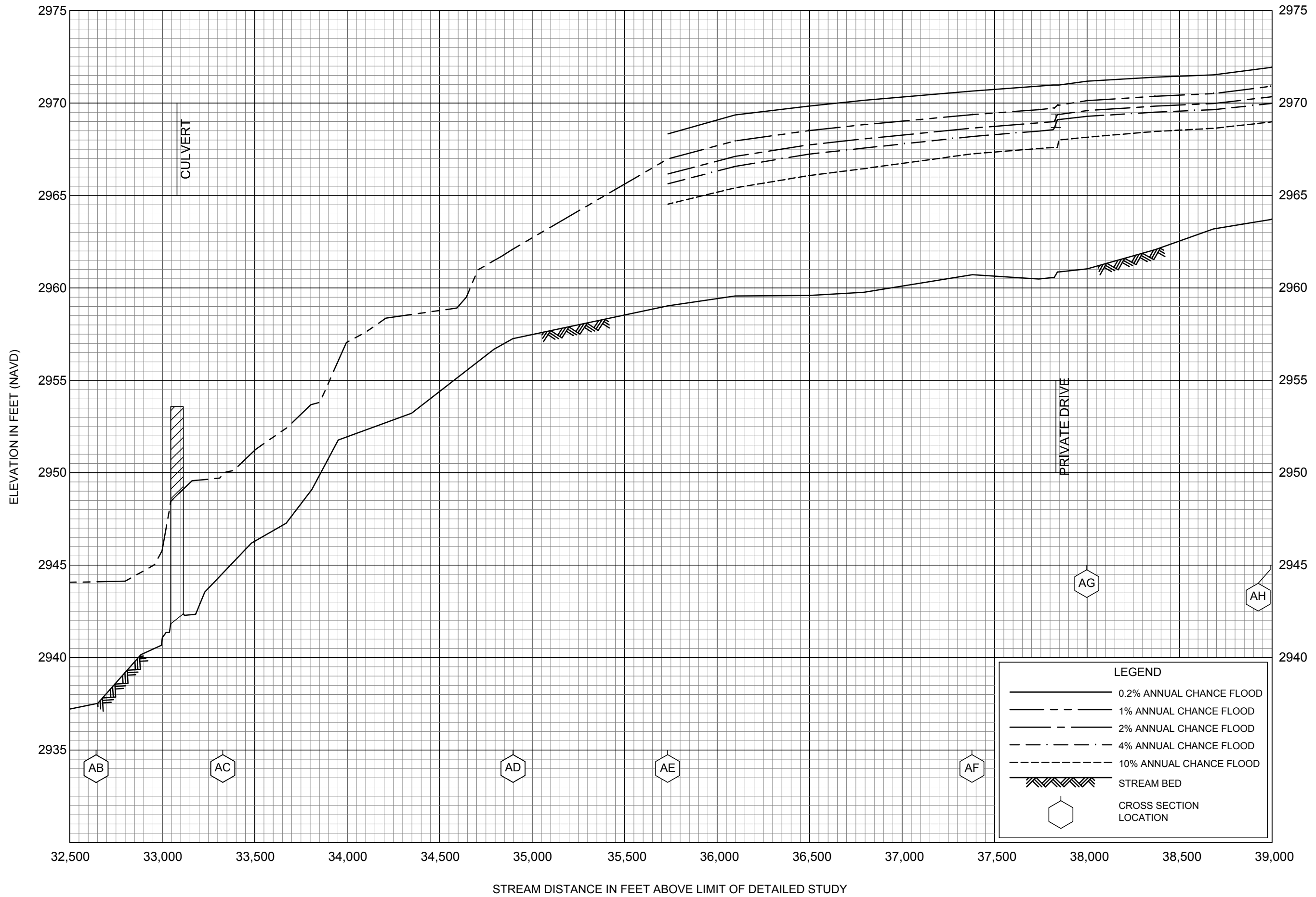


FLOOD PROFILES

ASHLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS

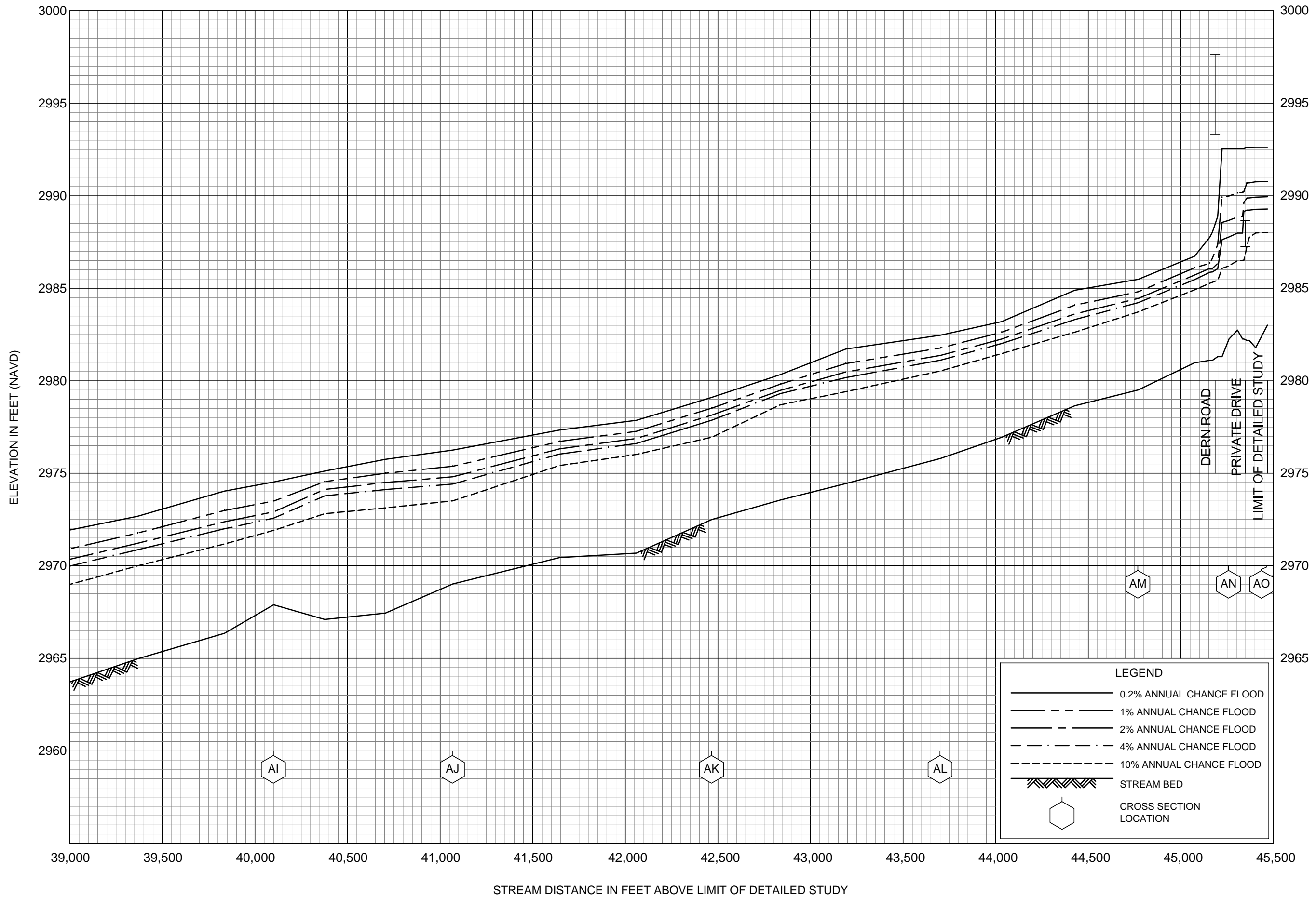


FLOOD PROFILES

ASHLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS

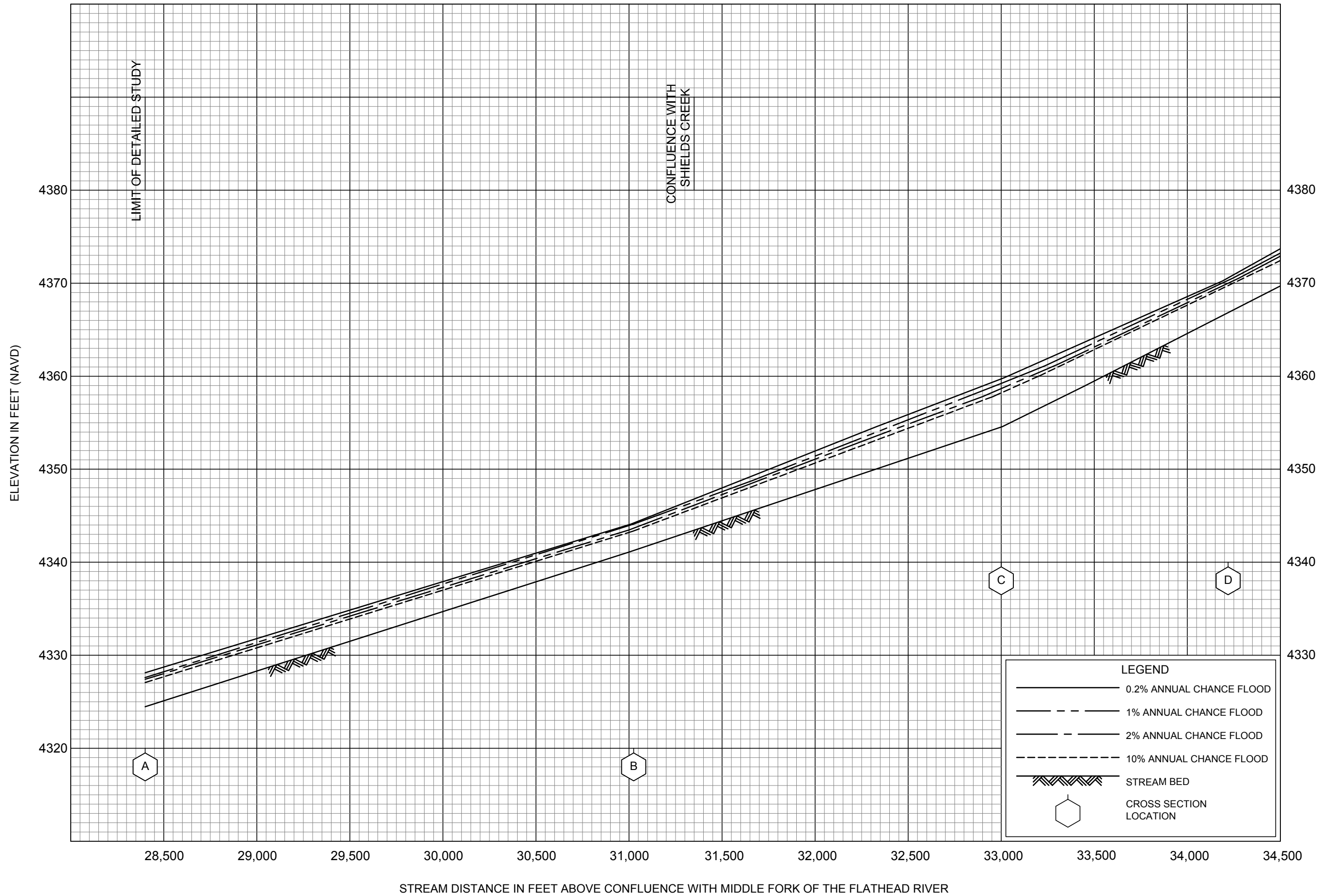


FLOOD PROFILES

ASHLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

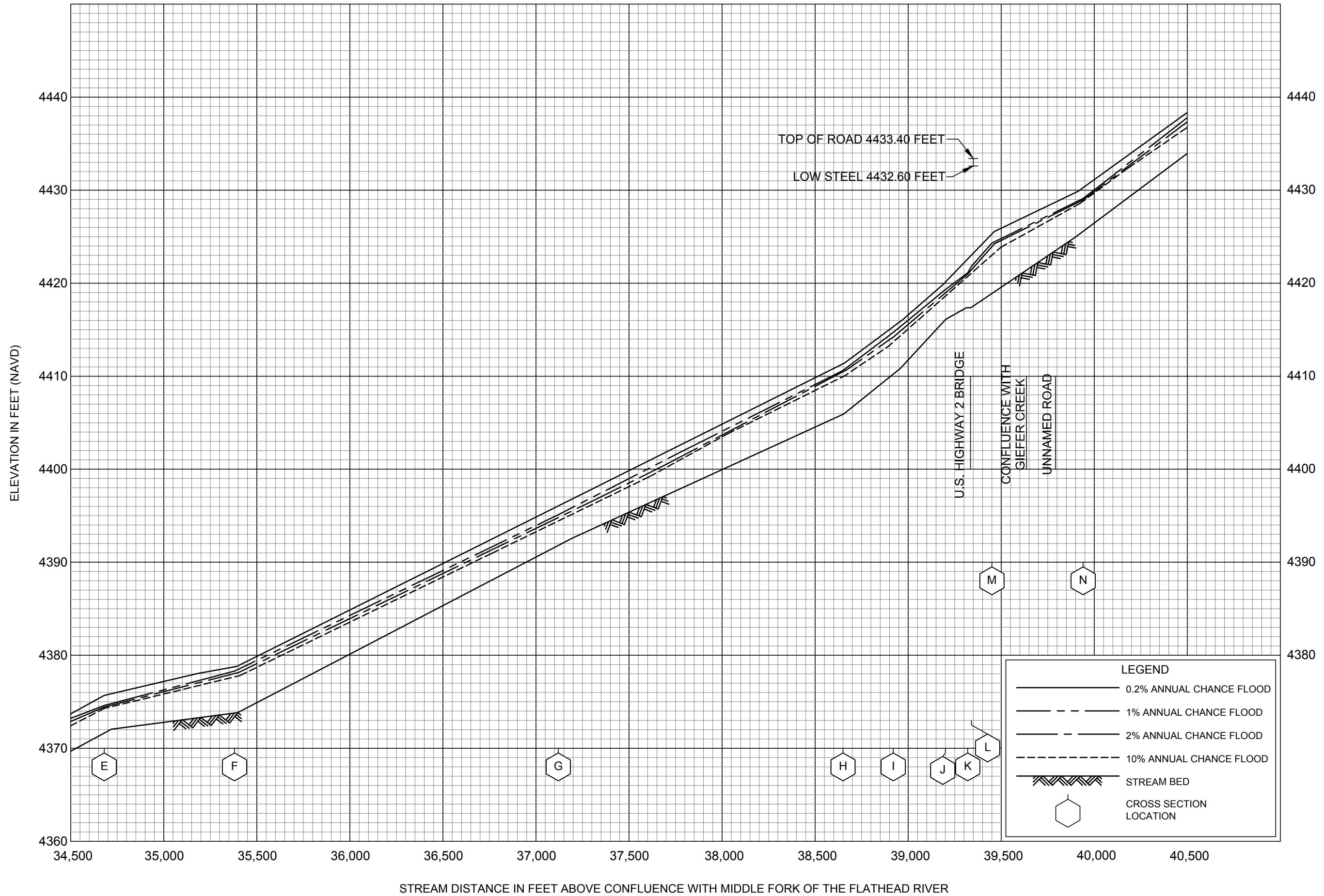
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES

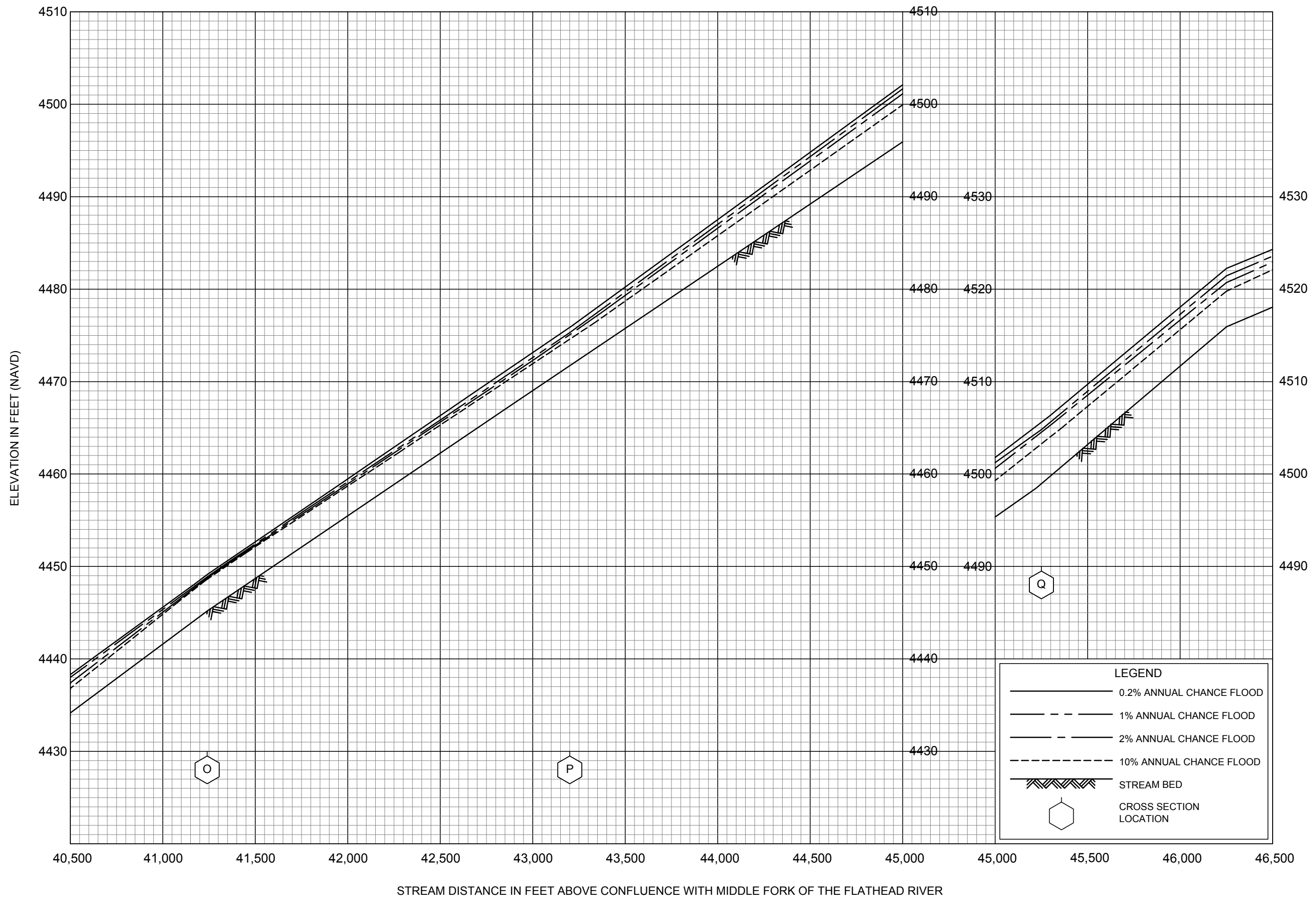
BEAR CREEK







FEDERAL EMERGENCY MANAGEMENT AGENCY  
 FLATHEAD COUNTY, MT  
 AND INCORPORATED AREAS



FLOOD PROFILES  
BEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



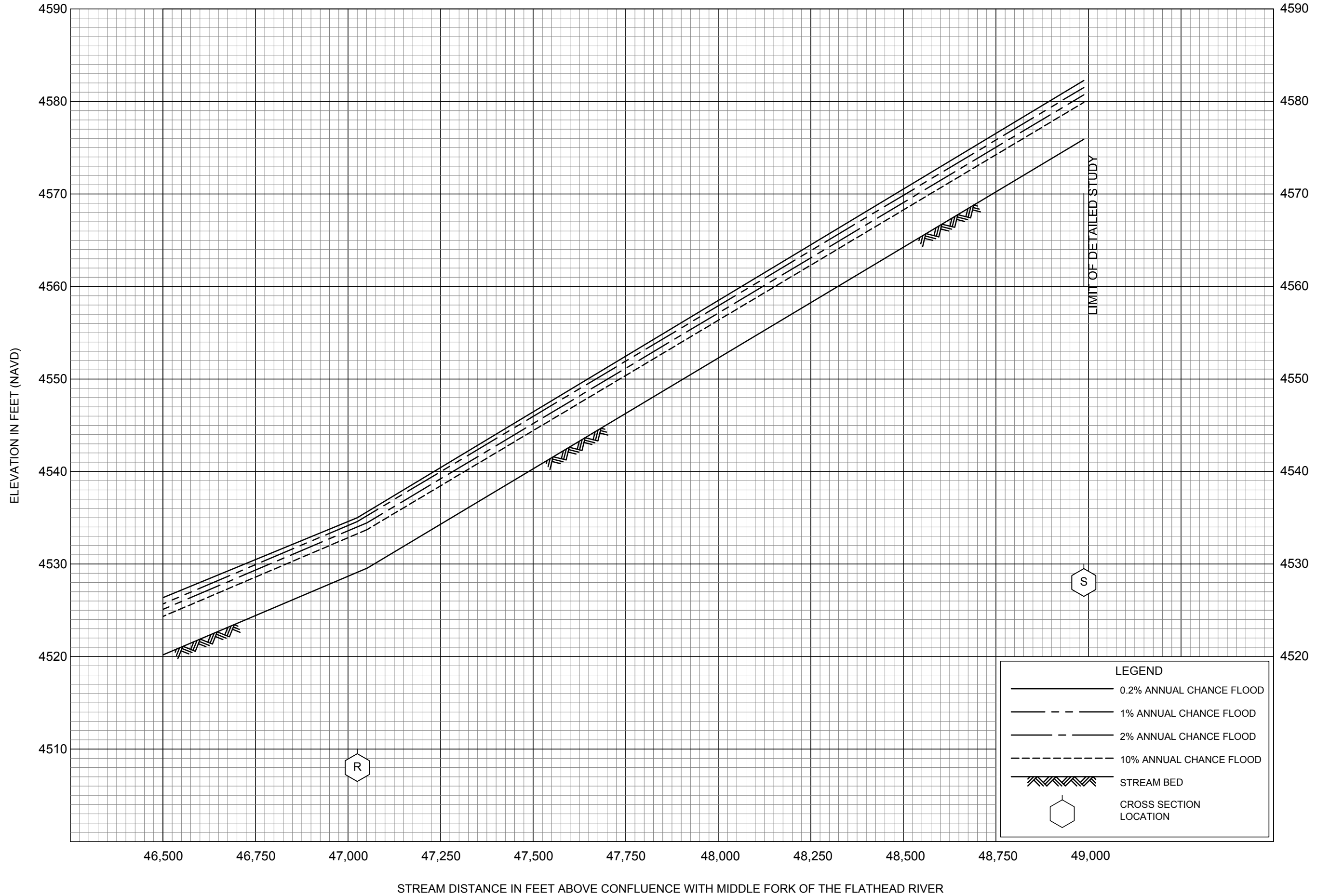
LEGEND	
	0.2% ANNUAL CHANCE FLOOD
	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION

FLOOD PROFILES

BEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS

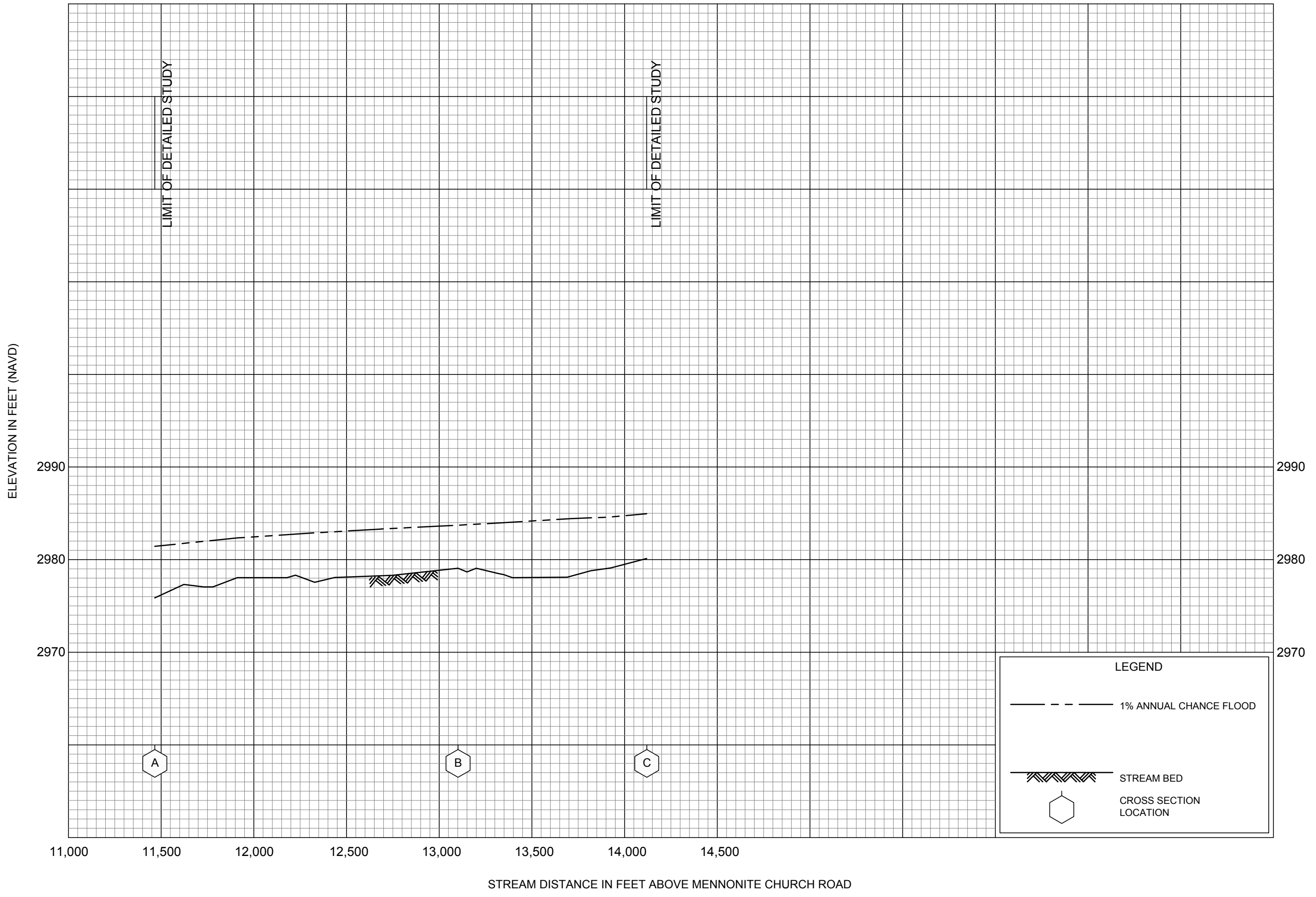


FLOOD PROFILES

BEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY  
 FLATHEAD COUNTY, MT  
 AND INCORPORATED AREAS



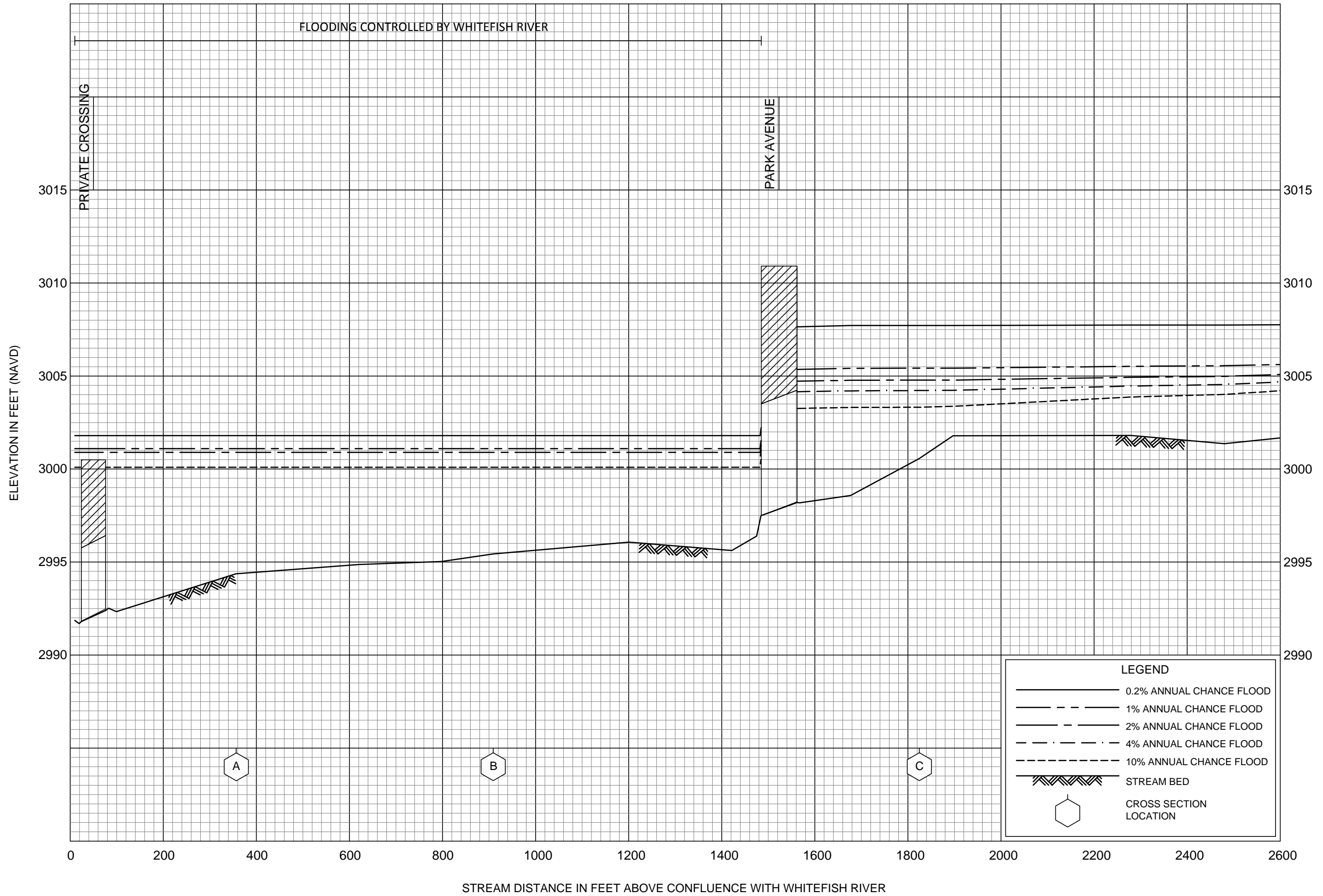


FLOOD PROFILES

BLAINE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS

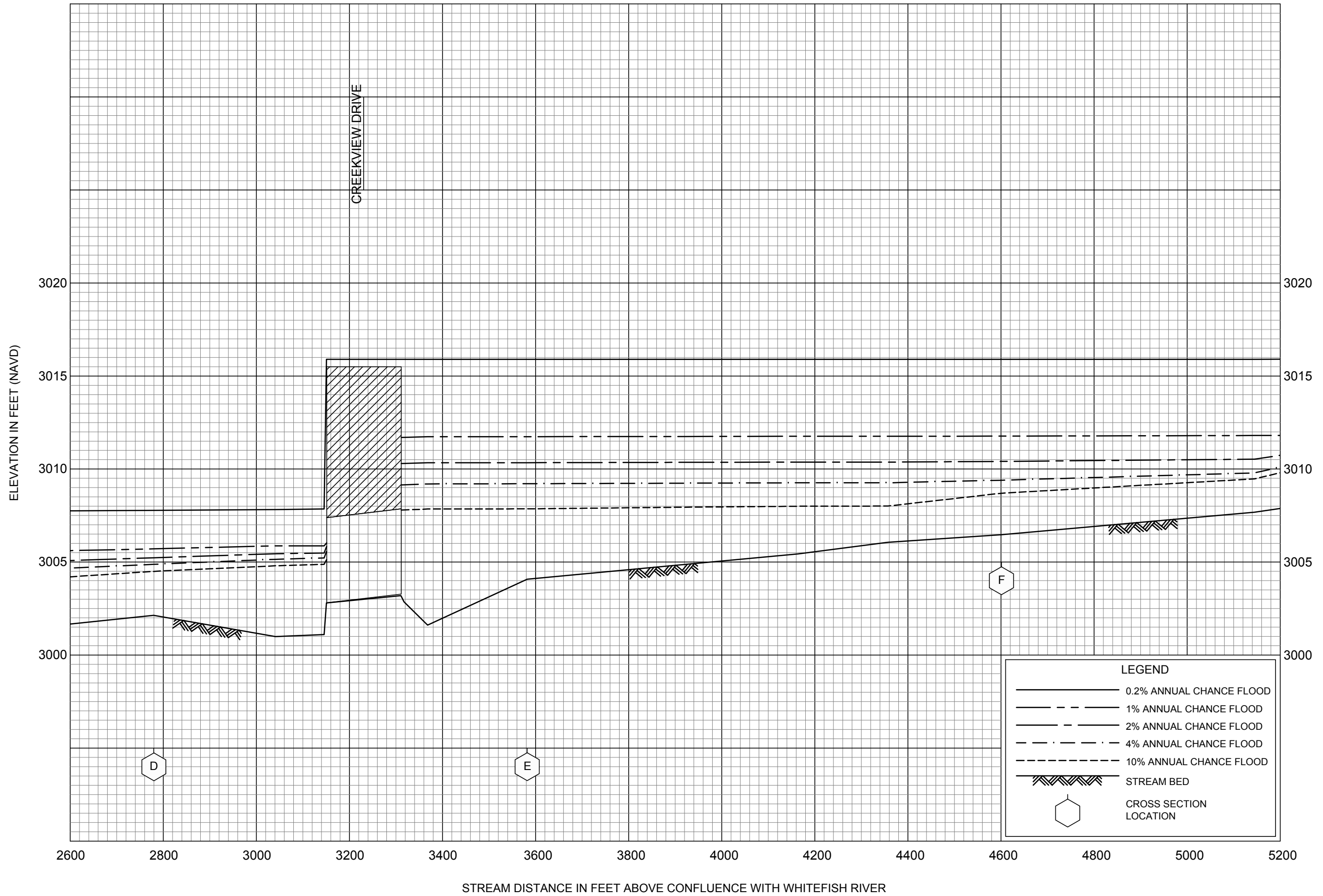


FLOOD PROFILES

COW CREEK AT WHITEFISH

FEDERAL EMERGENCY MANAGEMENT AGENCY

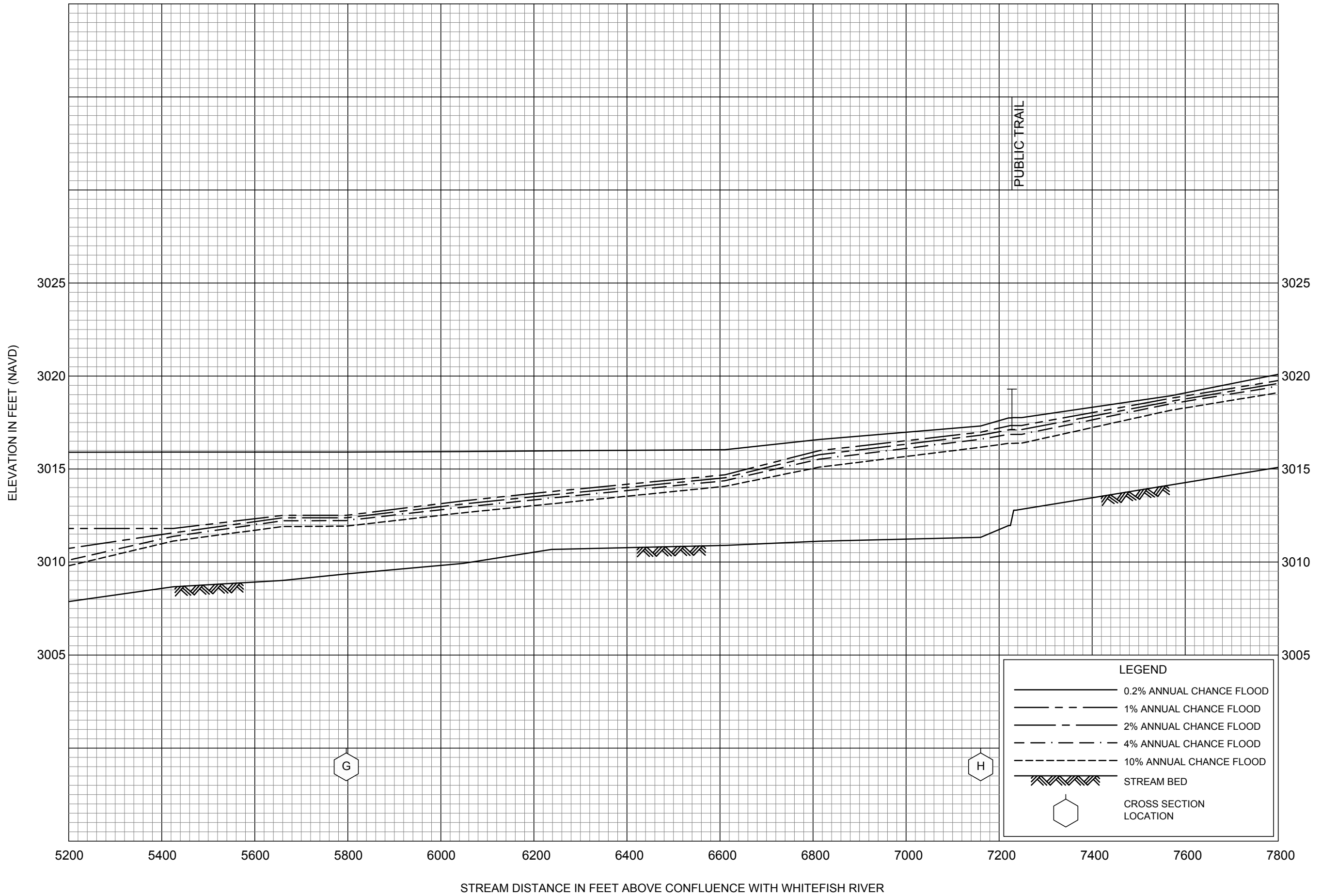
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES

COW CREEK AT WHITEFISH

FEDERAL EMERGENCY MANAGEMENT AGENCY  
 FLATHEAD COUNTY, MT  
 AND INCORPORATED AREAS

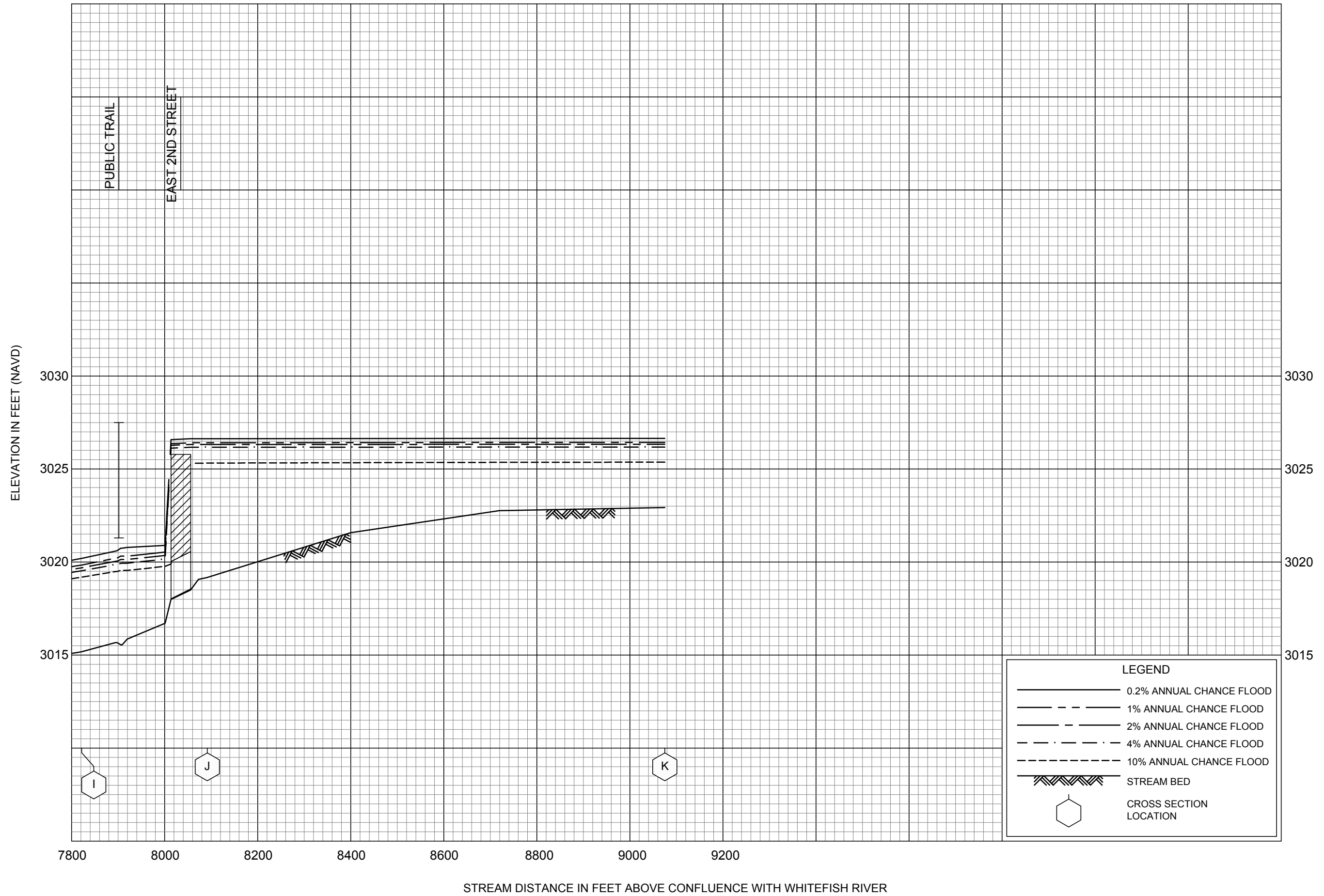


FLOOD PROFILES

COW CREEK AT WHITEFISH

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS

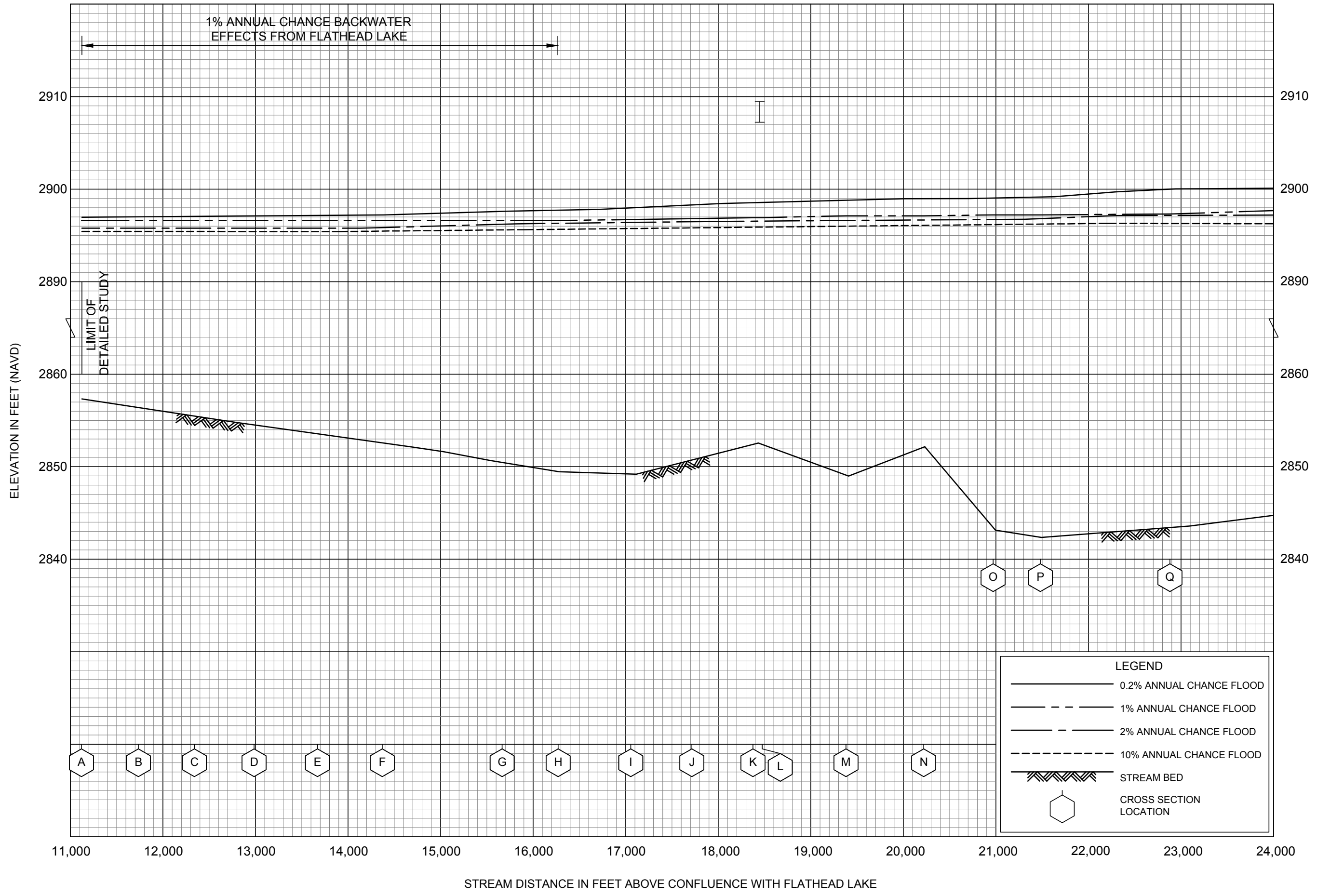


FLOOD PROFILES

COW CREEK AT WHITEFISH

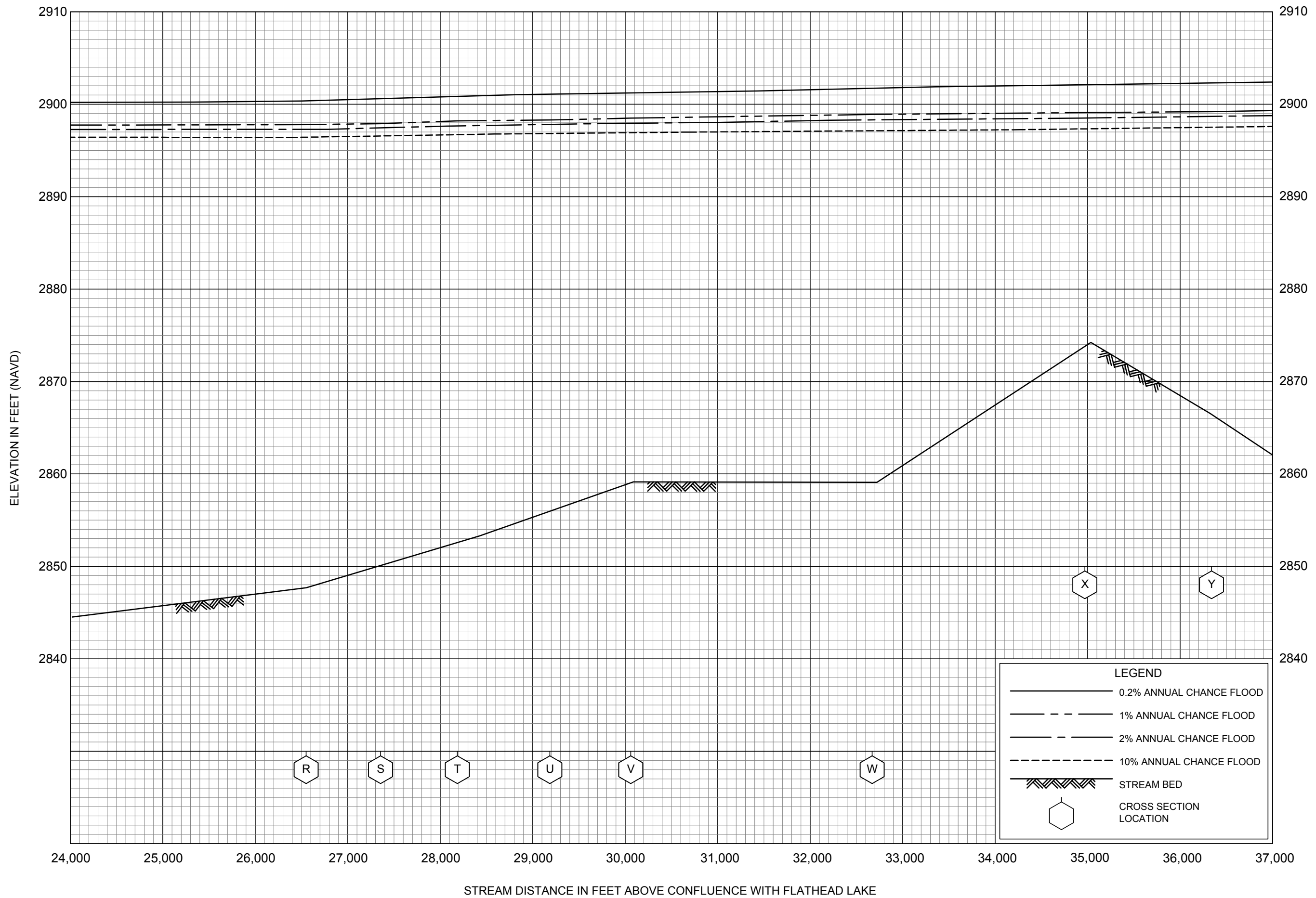
FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



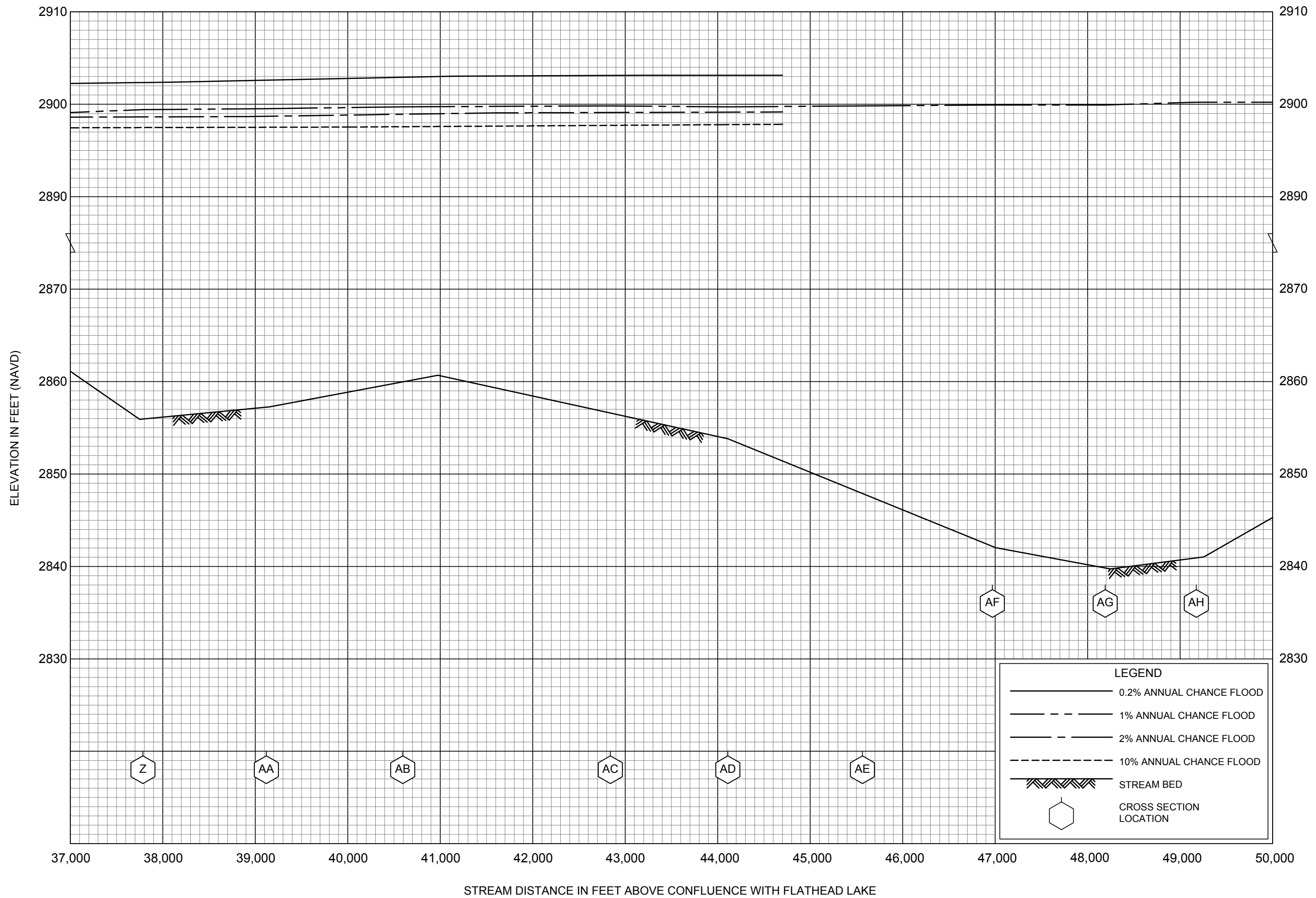
FLOOD PROFILES  
FLATHEAD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES  
FLATHEAD RIVER

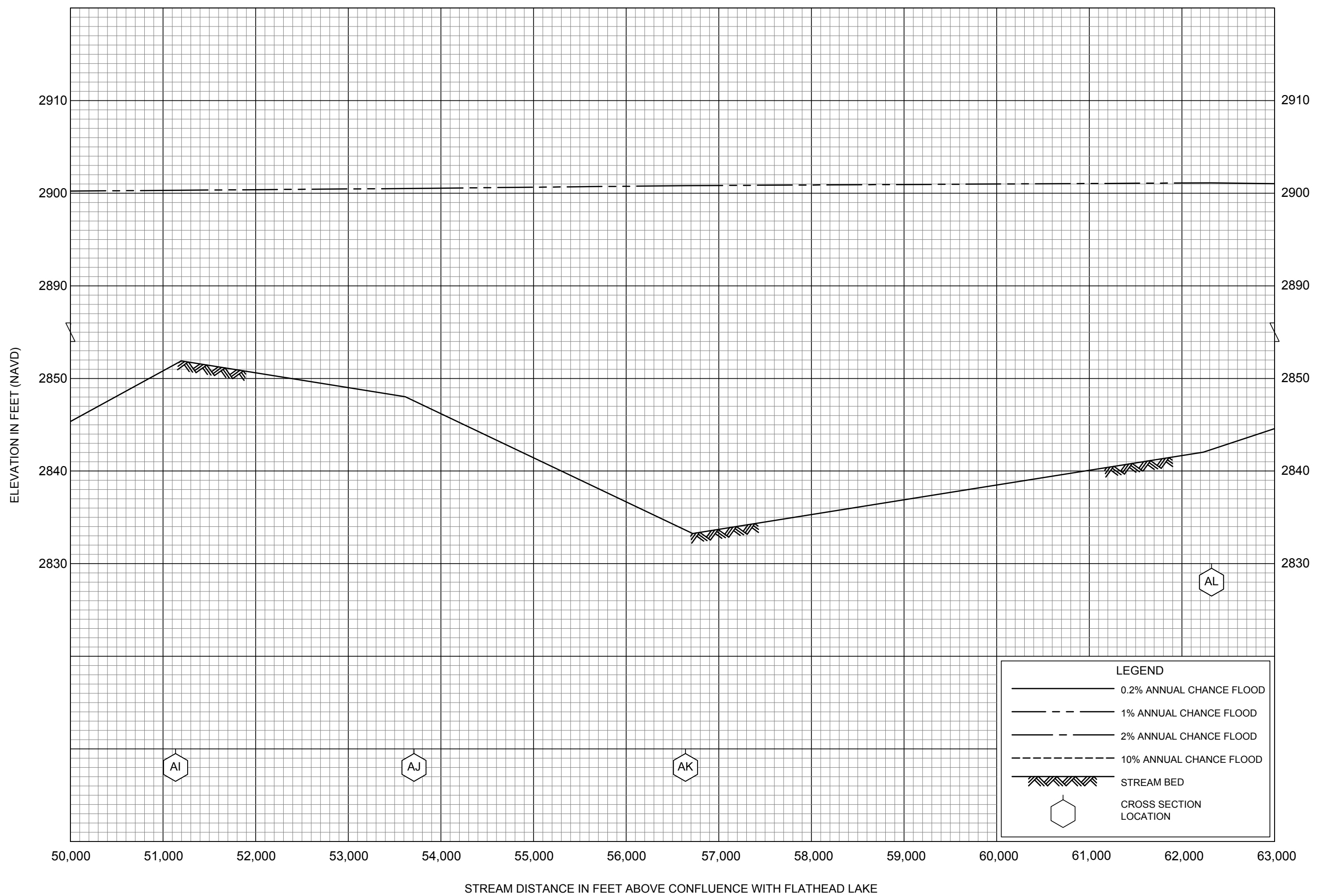
FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES  
FLATHEAD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS





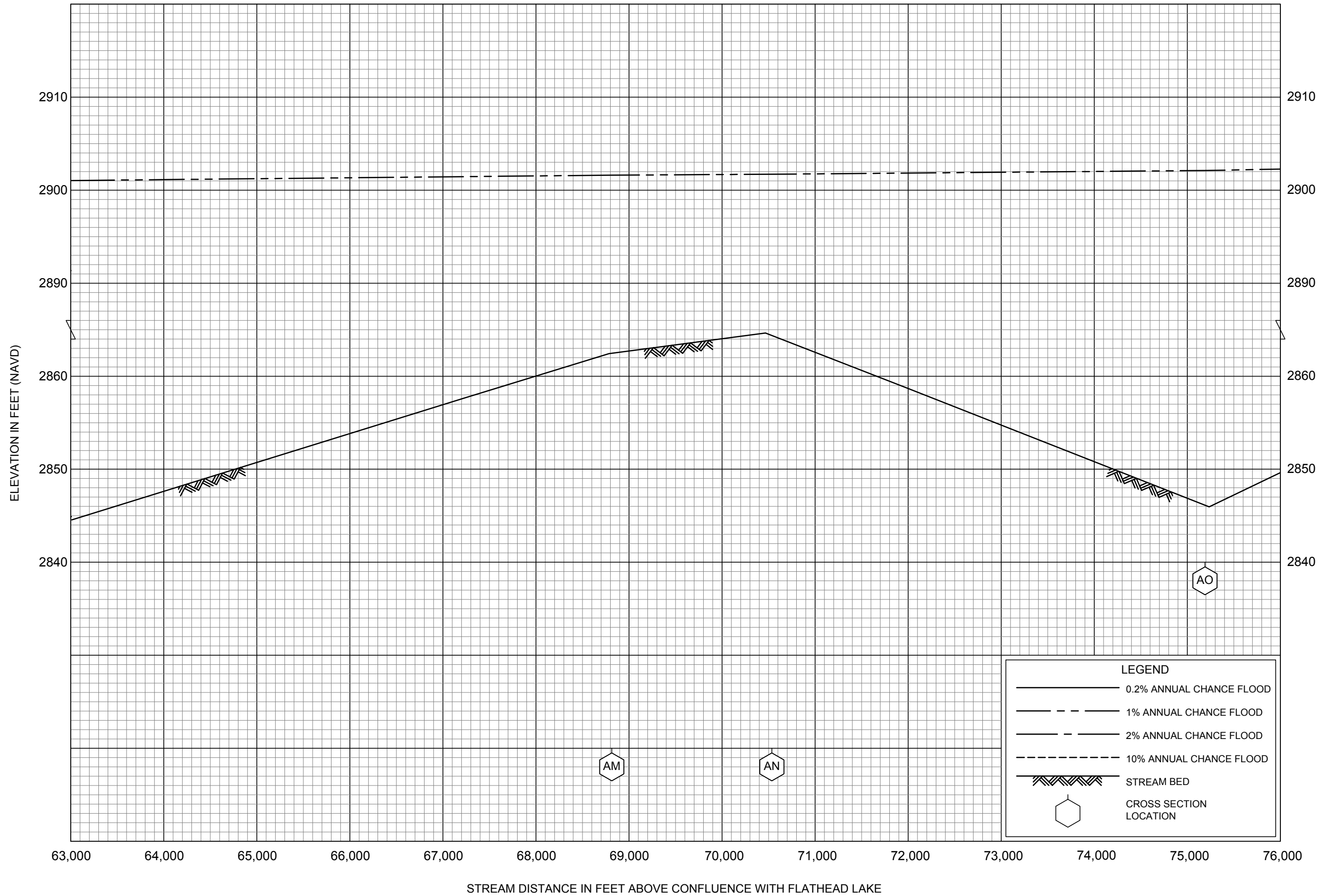
FLOOD PROFILES

FLATHEAD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT

AND INCORPORATED AREAS

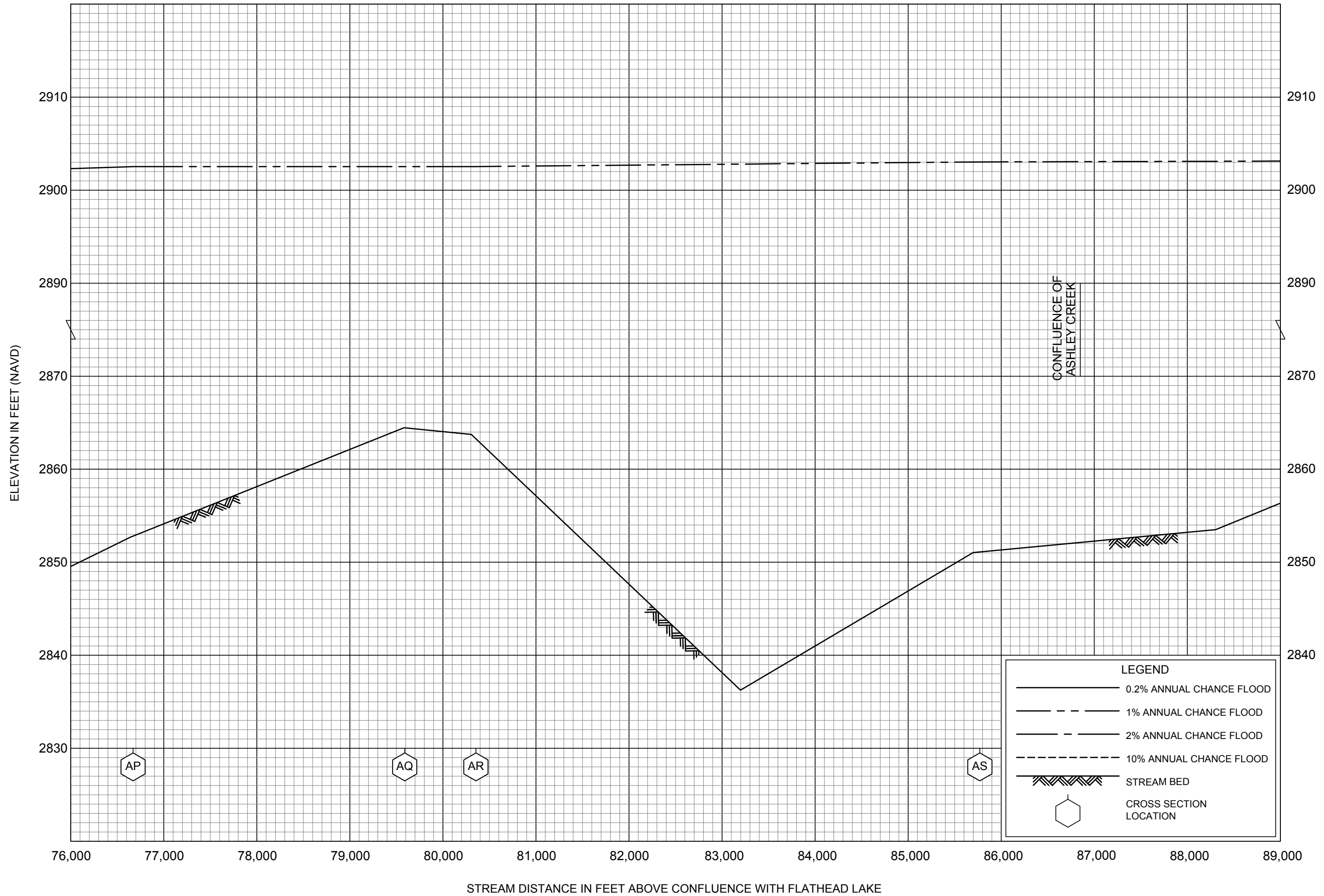


FLOOD PROFILES

FLATHEAD RIVER

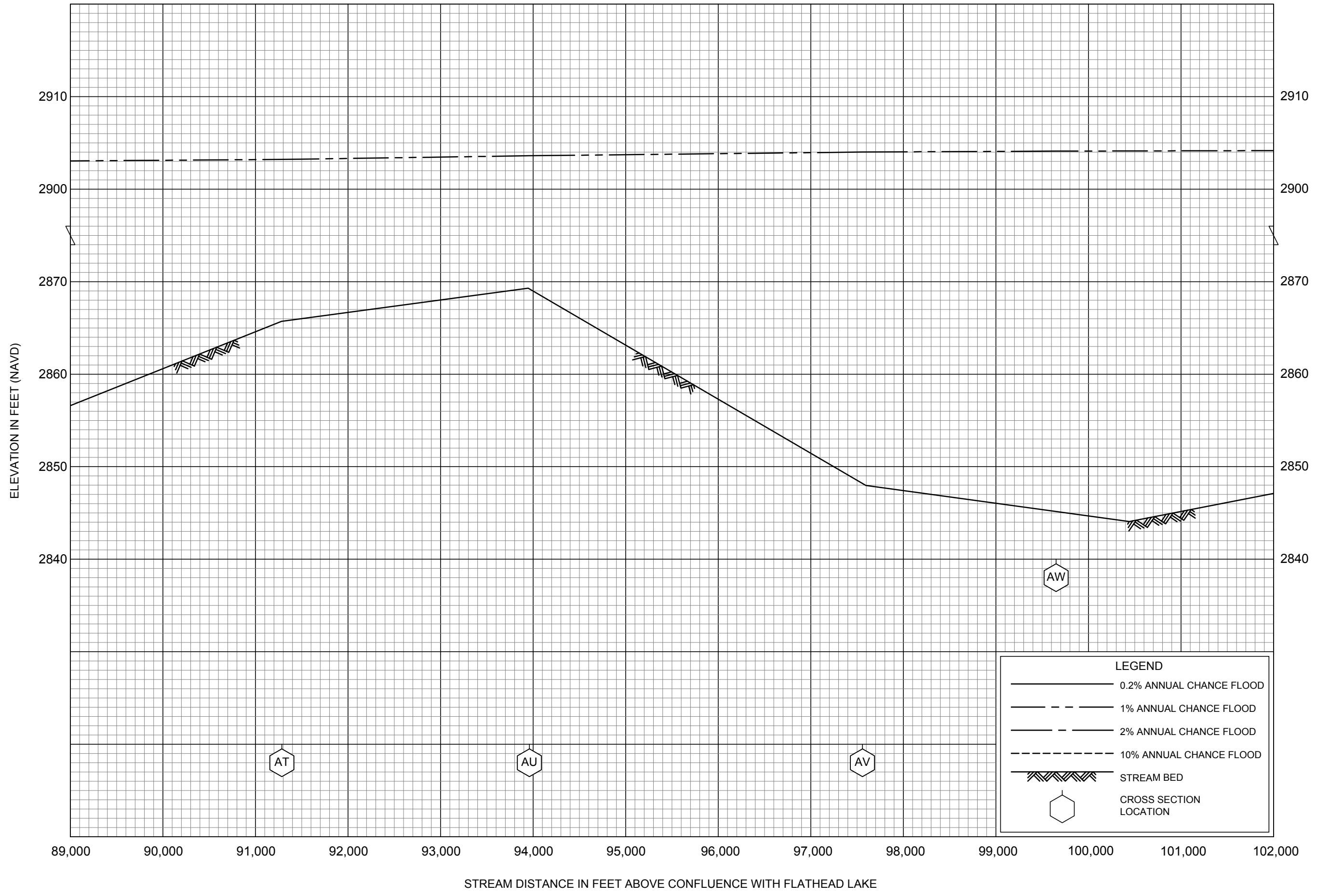
FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



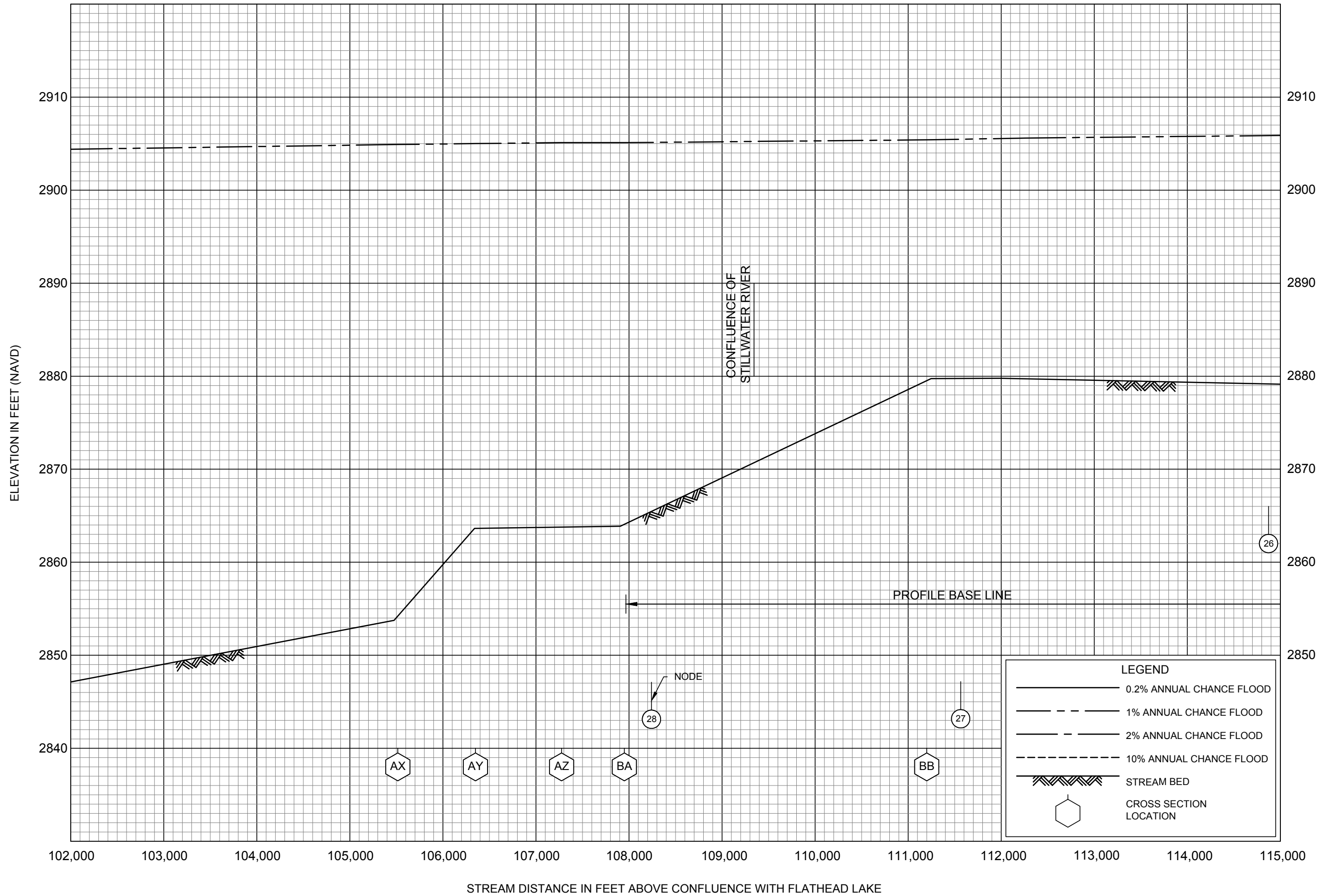
FLOOD PROFILES  
FLATHEAD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES  
FLATHEAD RIVER

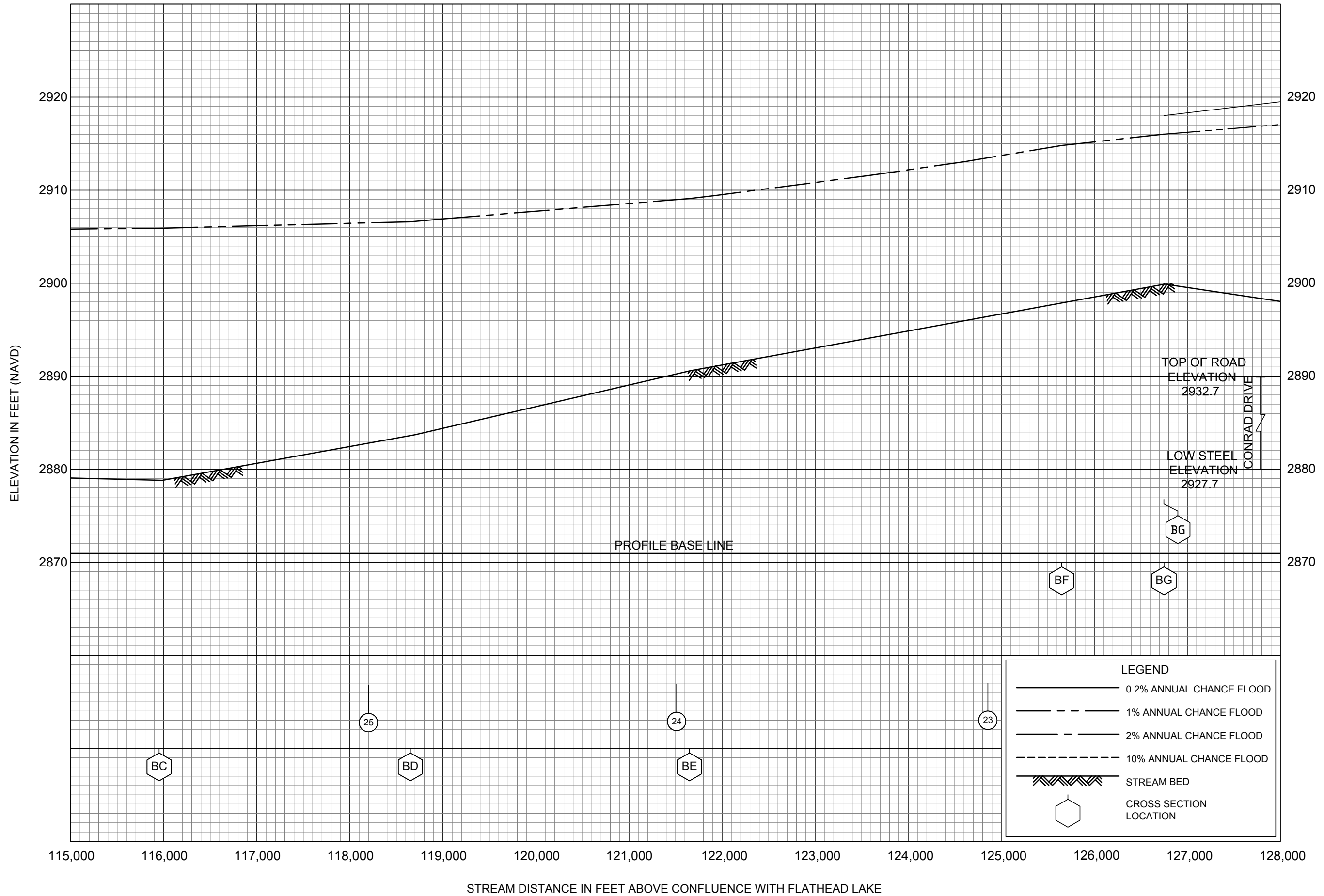
FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES  
FLATHEAD RIVER

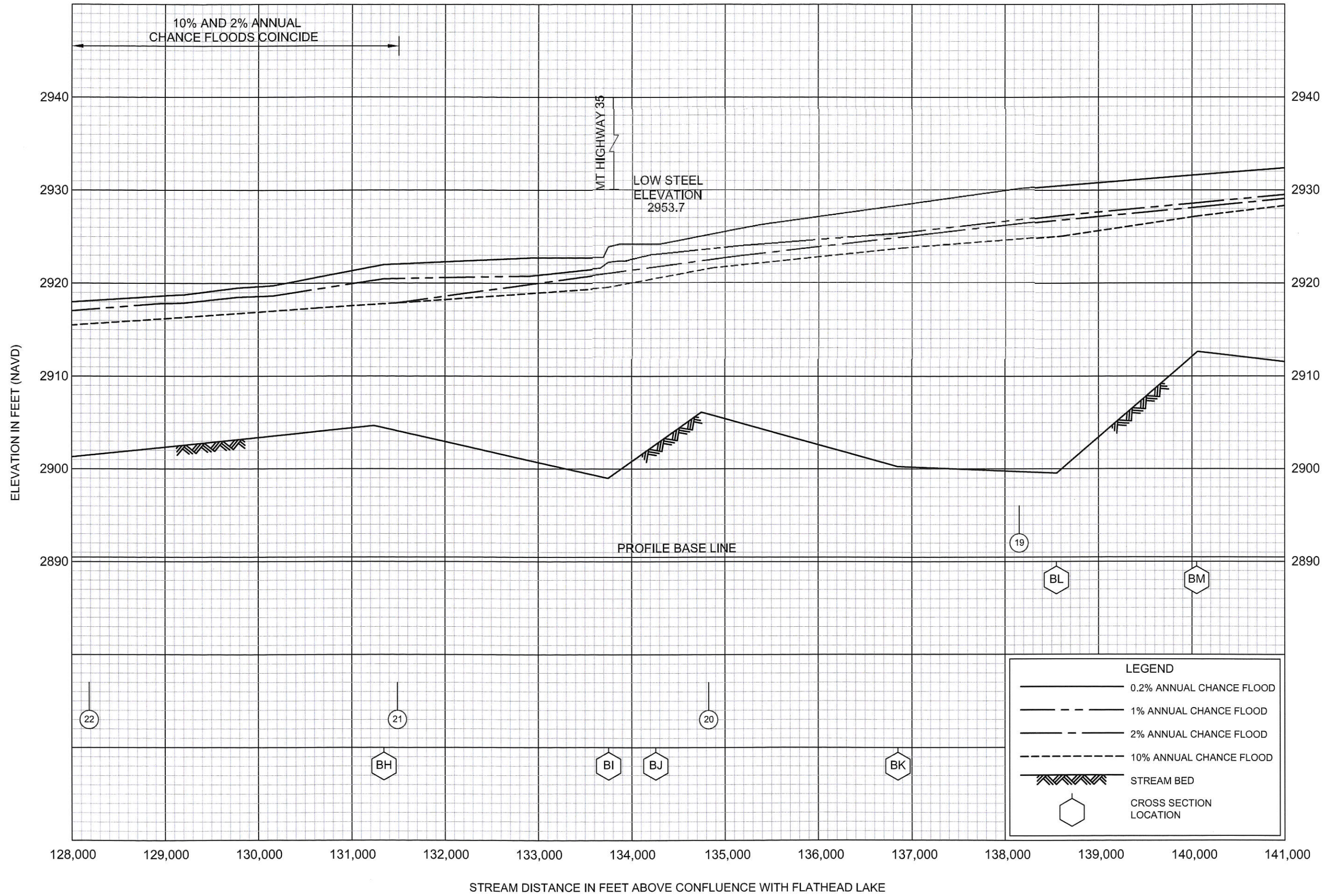
FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS

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



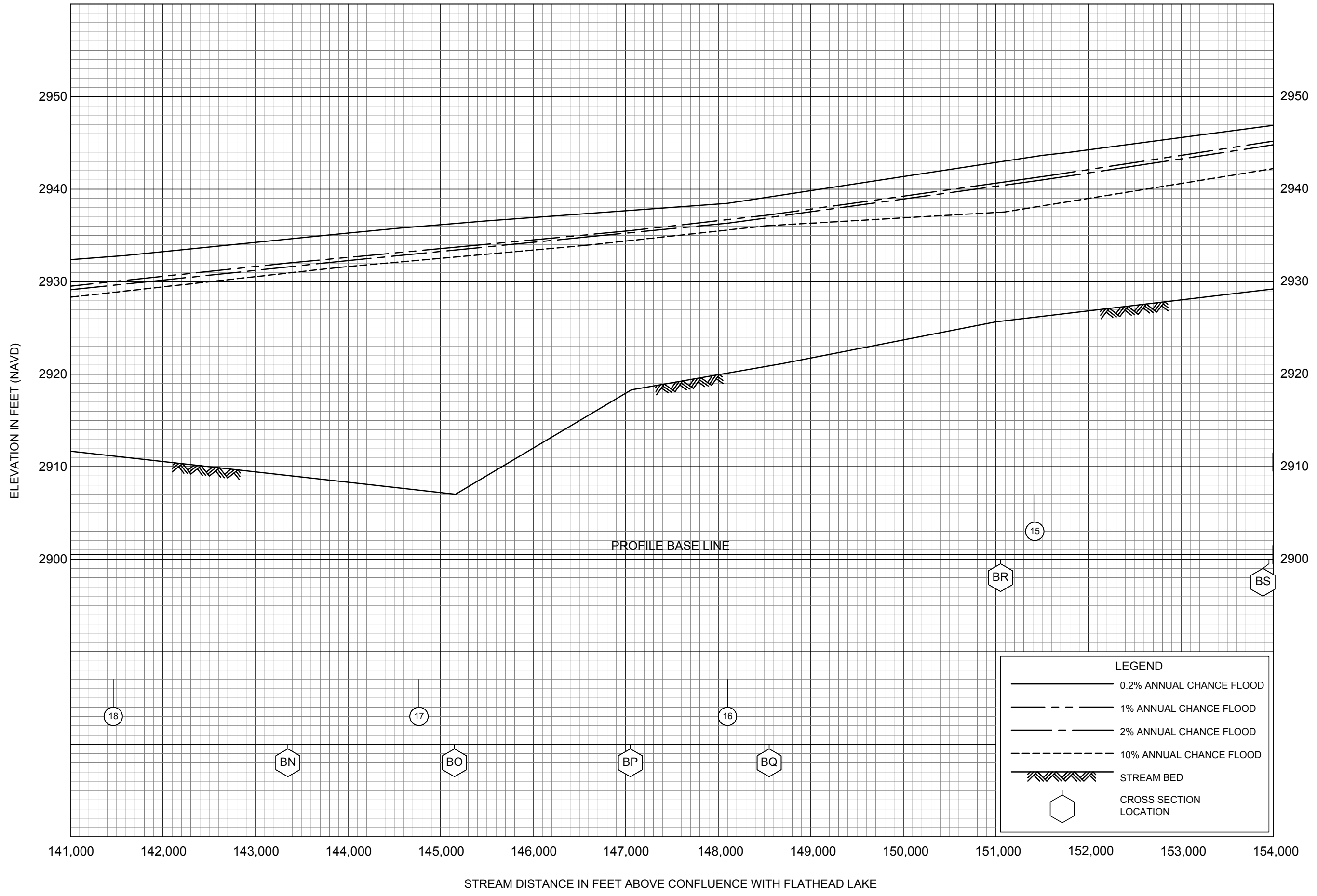
FLOOD PROFILES  
FLATHEAD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES  
FLATHEAD RIVER

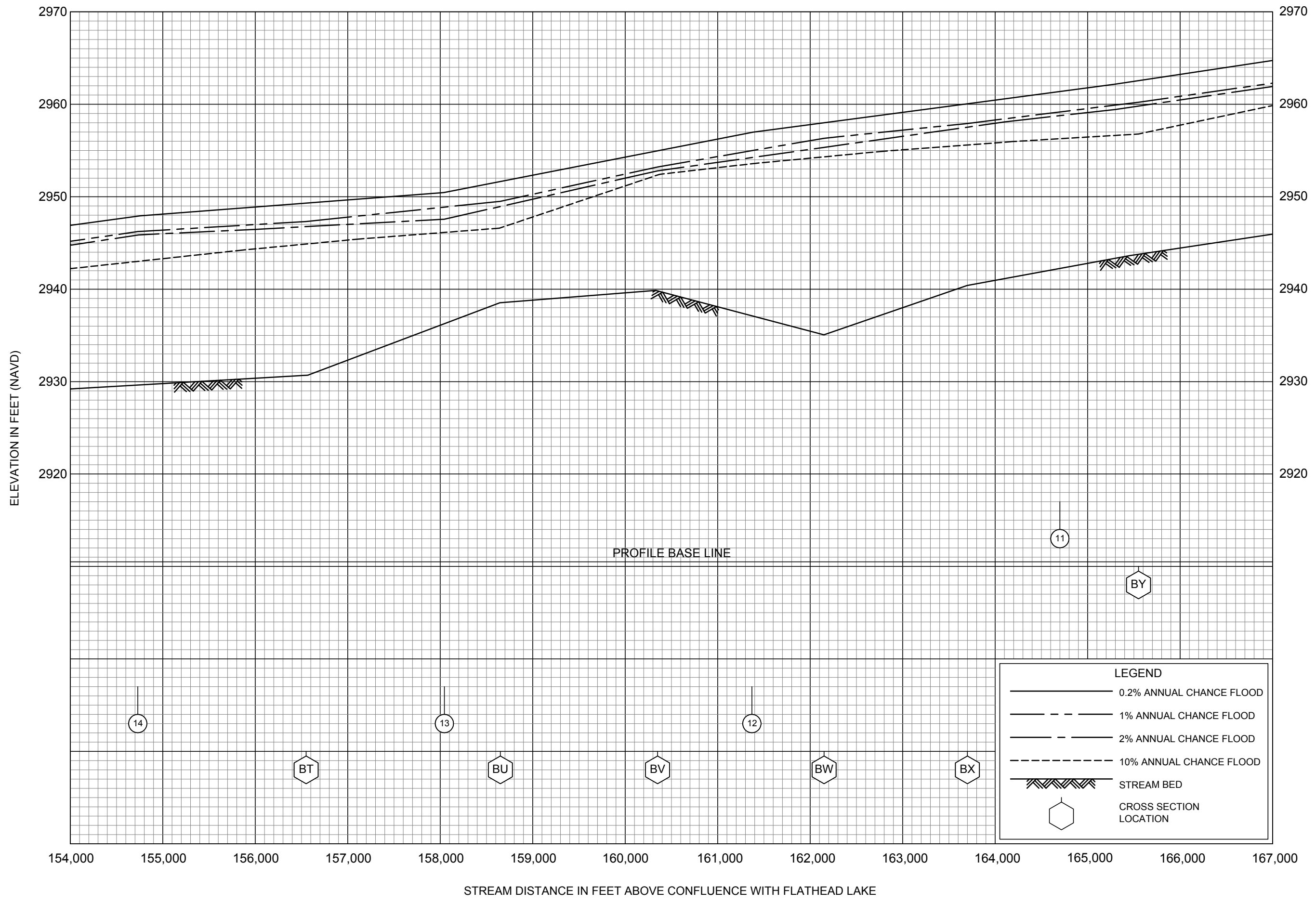
FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES  
FLATHEAD RIVER

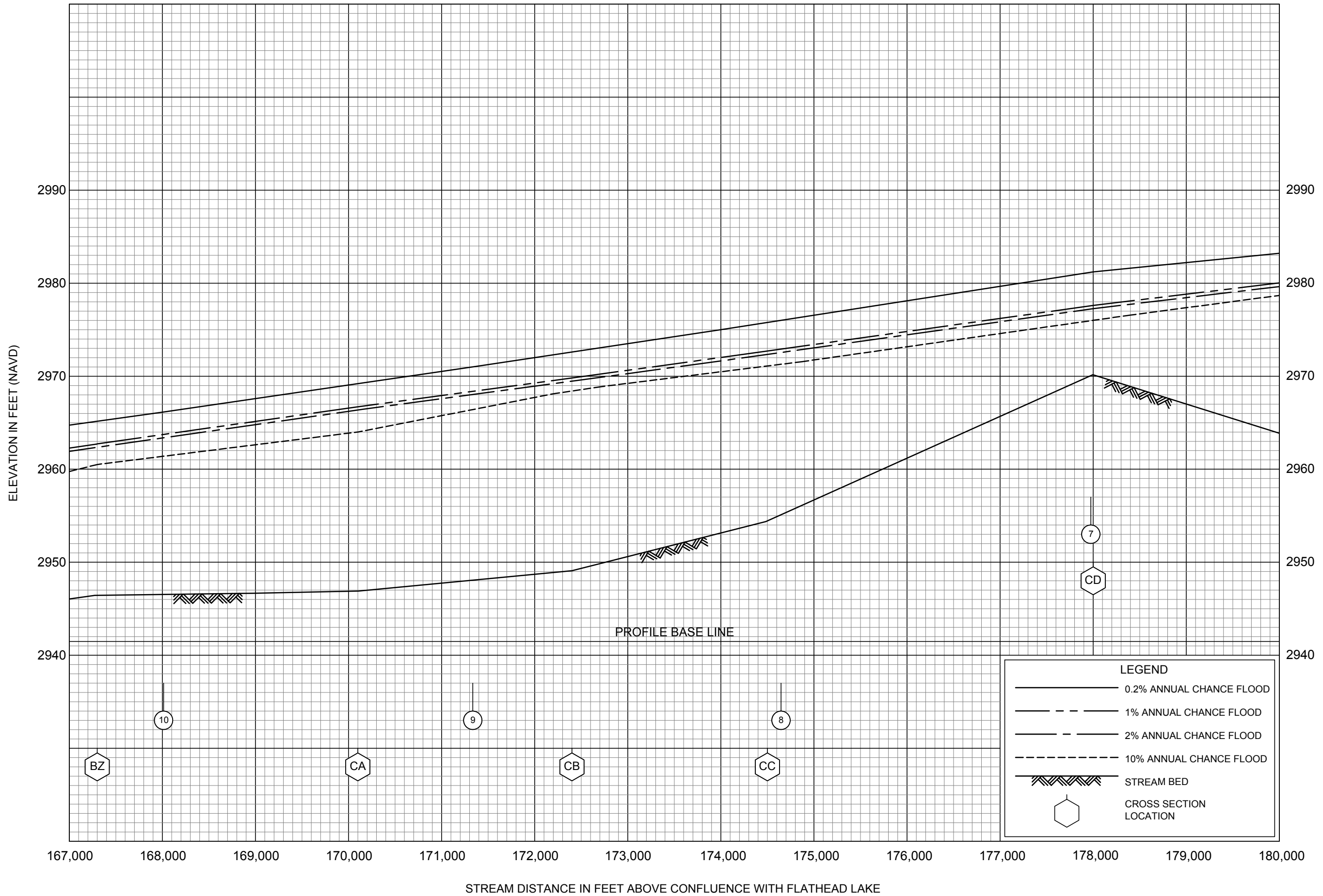
FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS





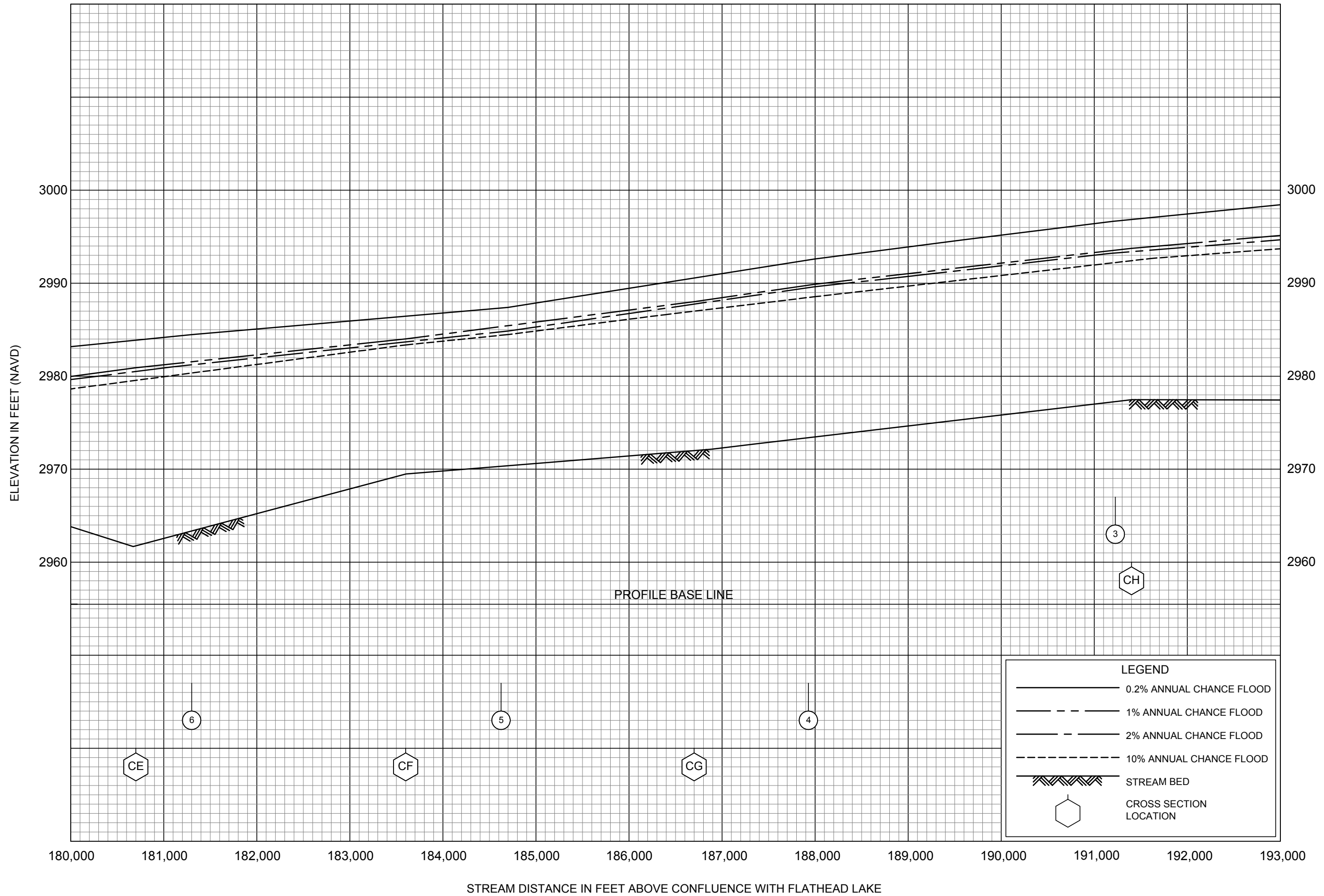
FLOOD PROFILES  
FLATHEAD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES  
FLATHEAD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS

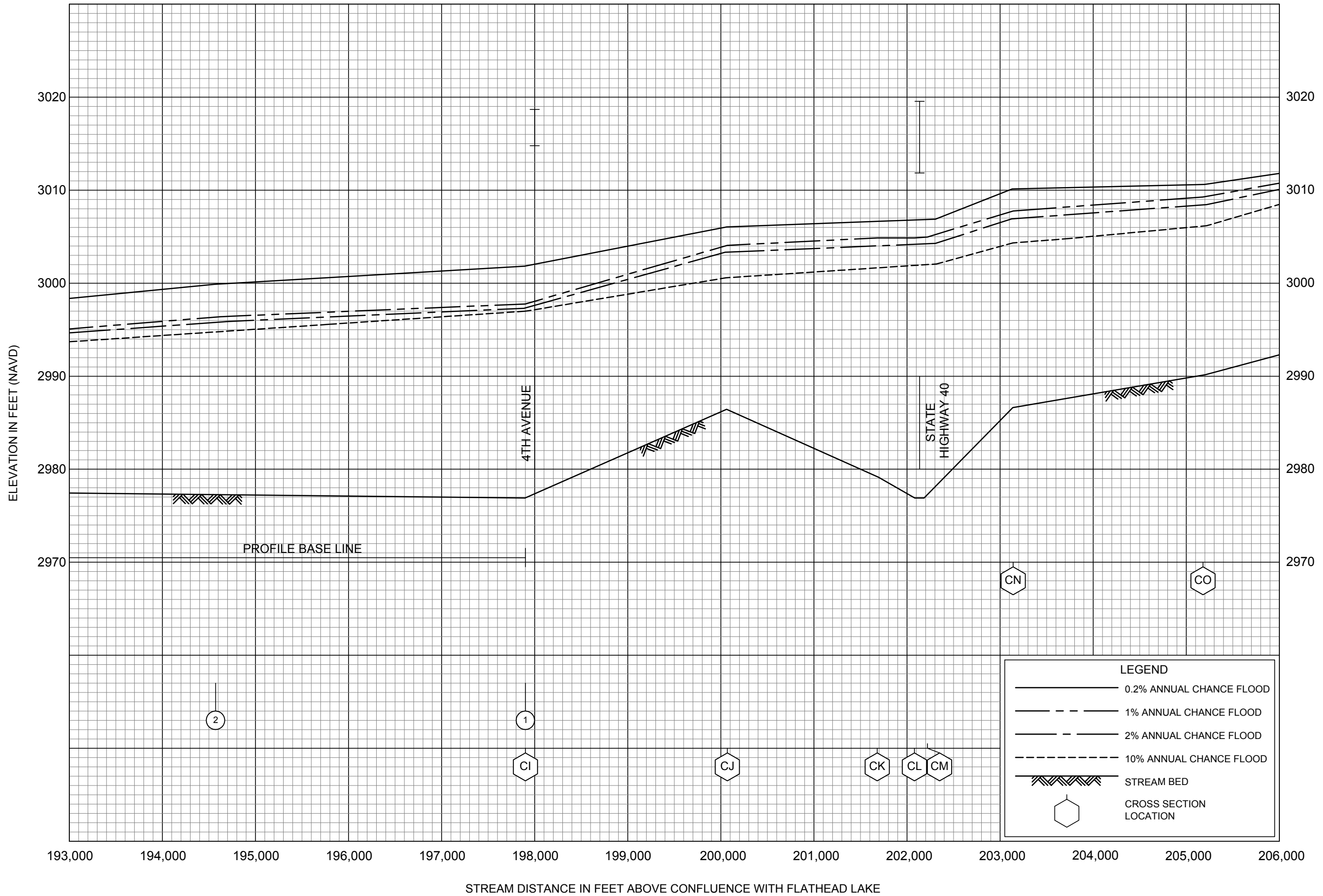


**FLOOD PROFILES  
FLATHEAD RIVER**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**FLATHEAD COUNTY, MT**  
AND INCORPORATED AREAS

**LEGEND**

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

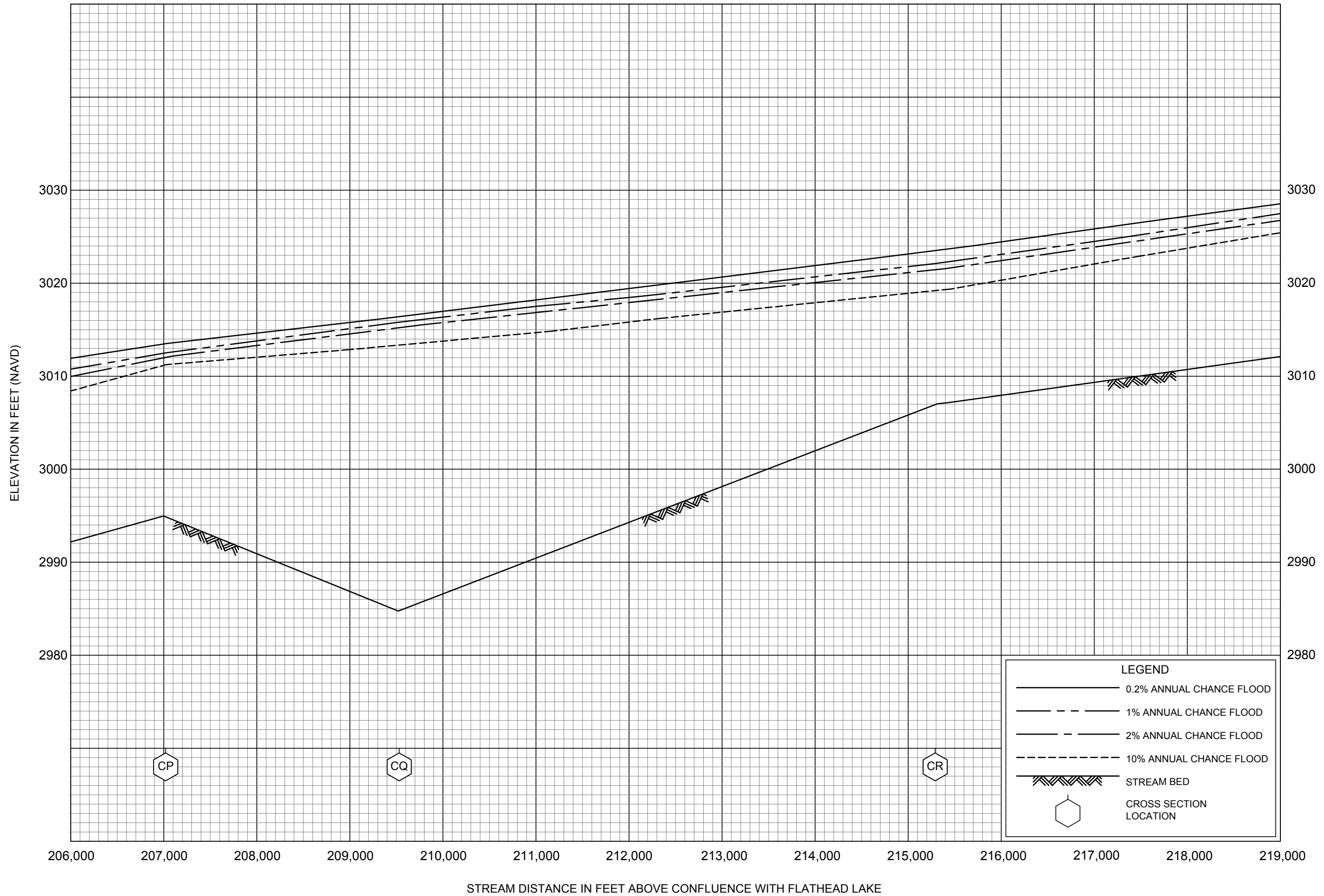


FLOOD PROFILES

FLATHEAD RIVER

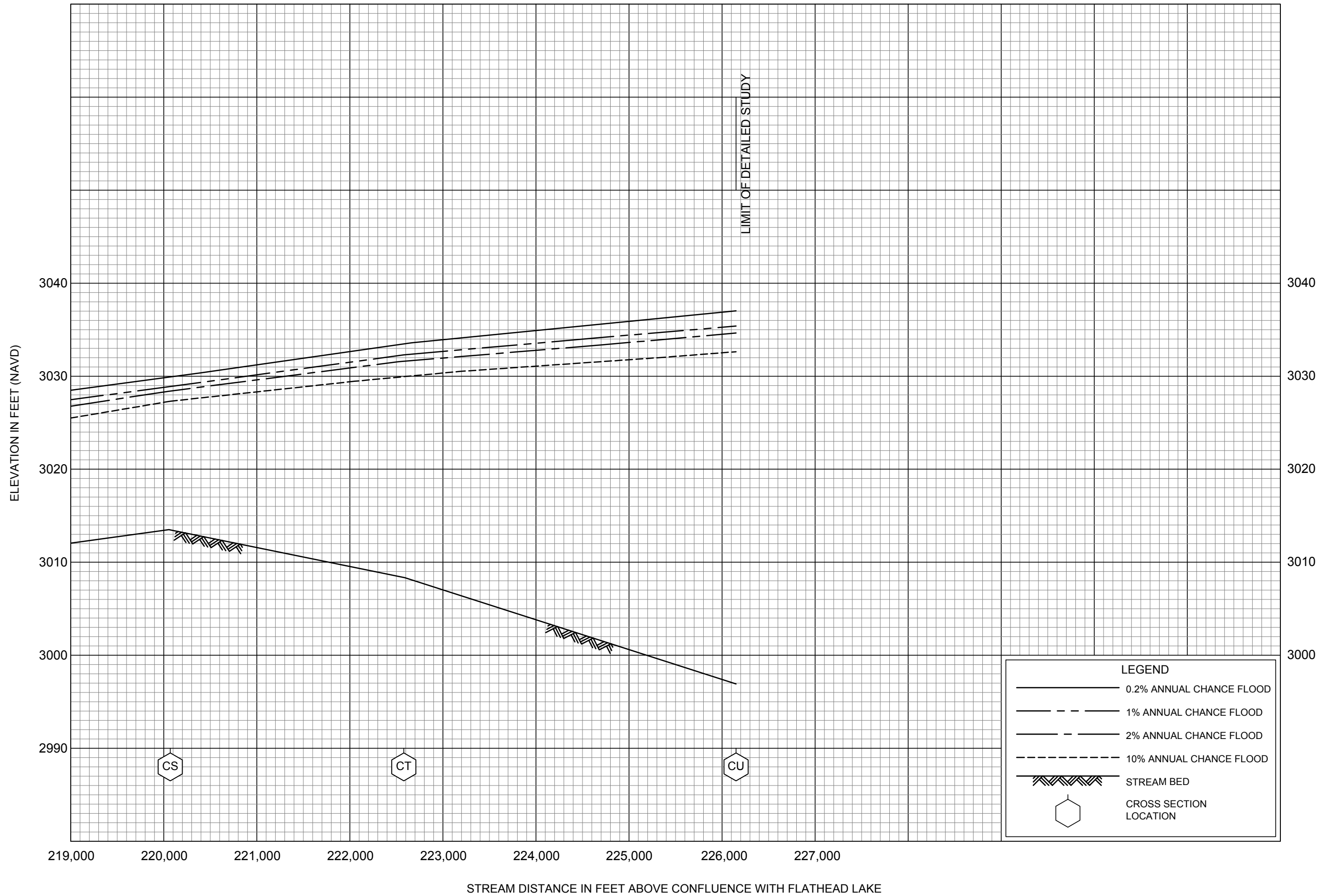
FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES  
FLATHEAD RIVER

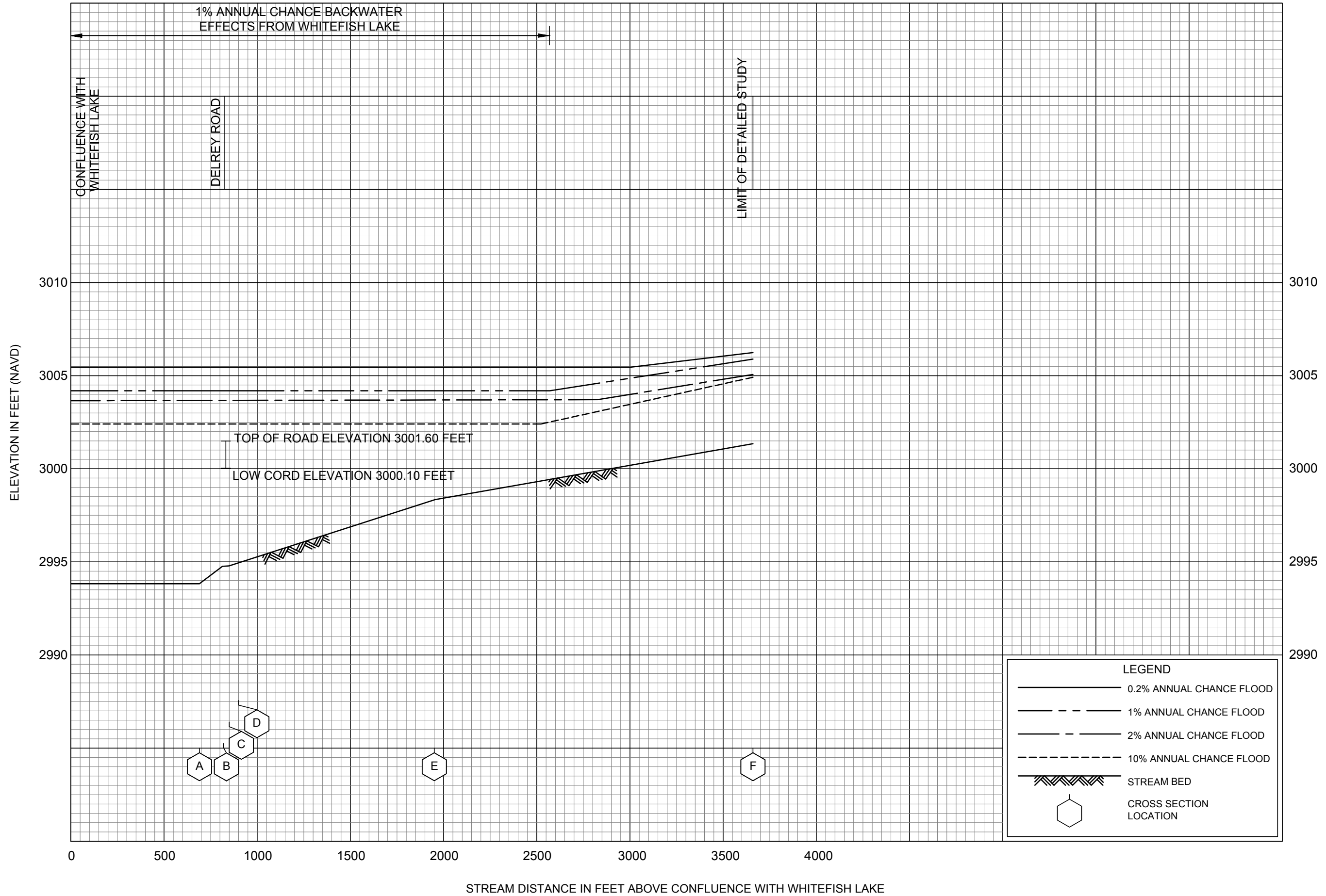
FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES

FLATHEAD RIVER

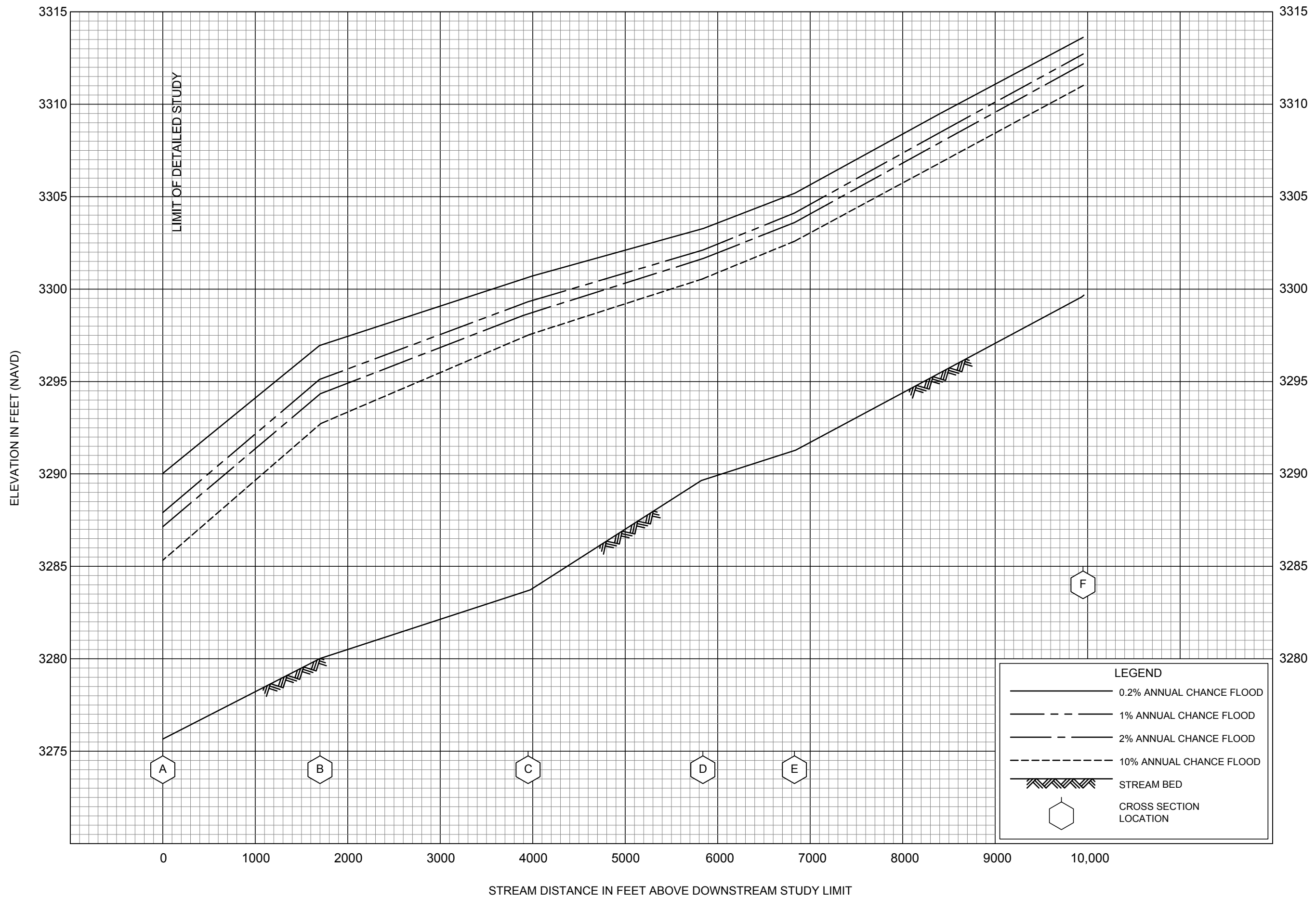
FEDERAL EMERGENCY MANAGEMENT AGENCY  
**FLATHEAD COUNTY, MT**  
 AND INCORPORATED AREAS



FLOOD PROFILES

LAZY CREEK

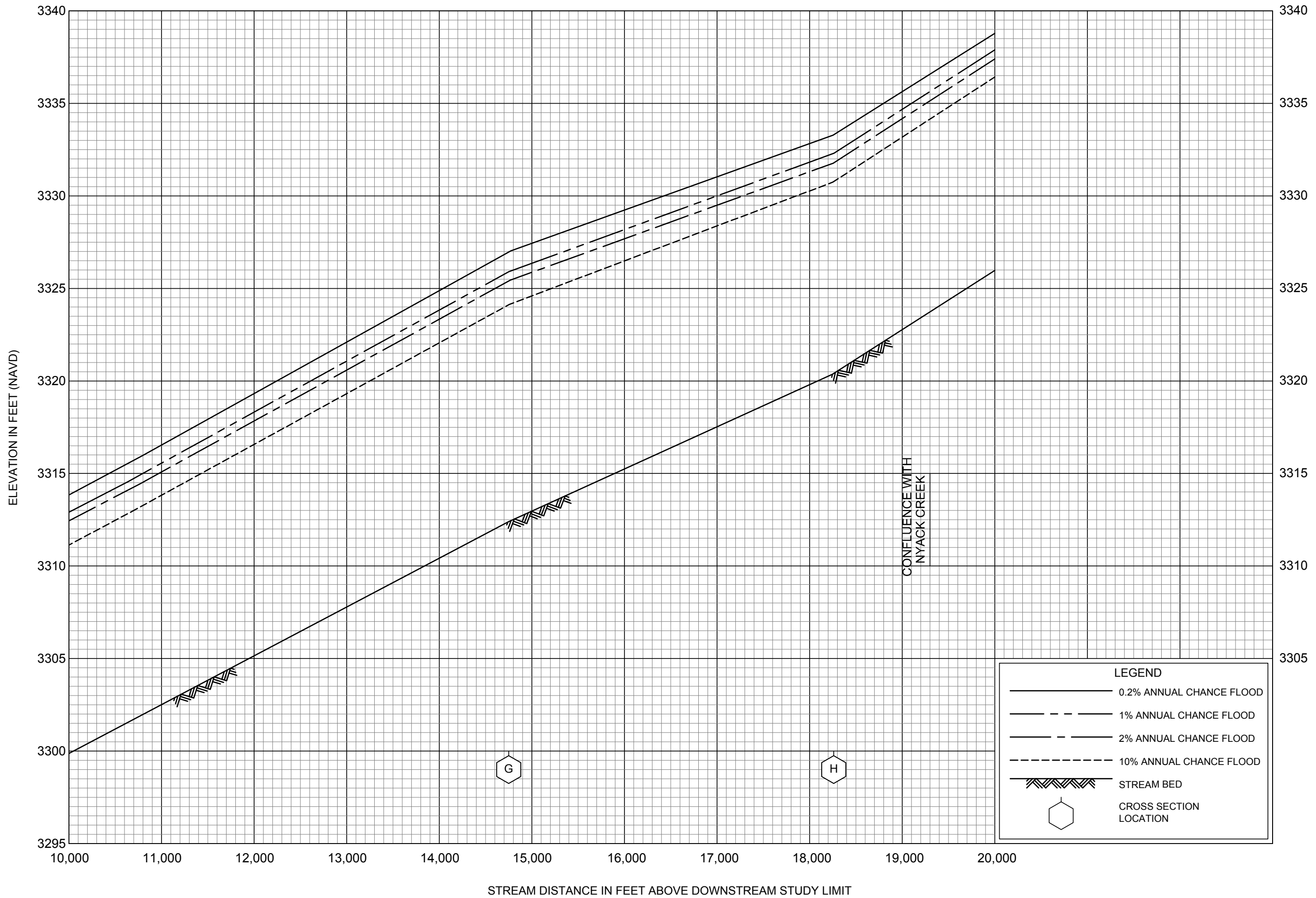
FEDERAL EMERGENCY MANAGEMENT AGENCY  
 FLATHEAD COUNTY, MT  
 AND INCORPORATED AREAS



FLOOD PROFILES  
MIDDLE FORK FLATHEAD RIVER AT NYACK

FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS

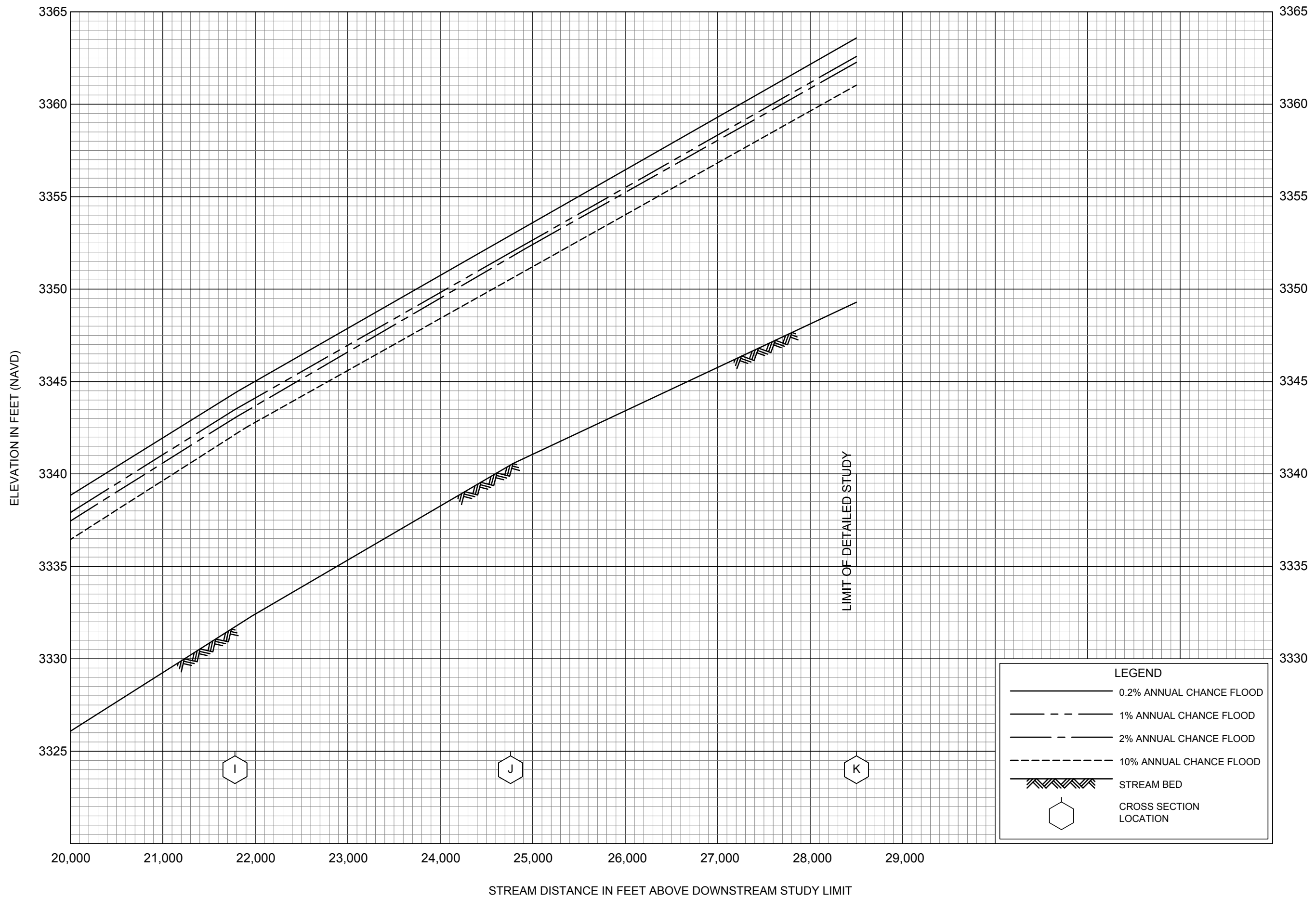




FLOOD PROFILES

MIDDLE FORK FLATHEAD RIVER AT NYACK

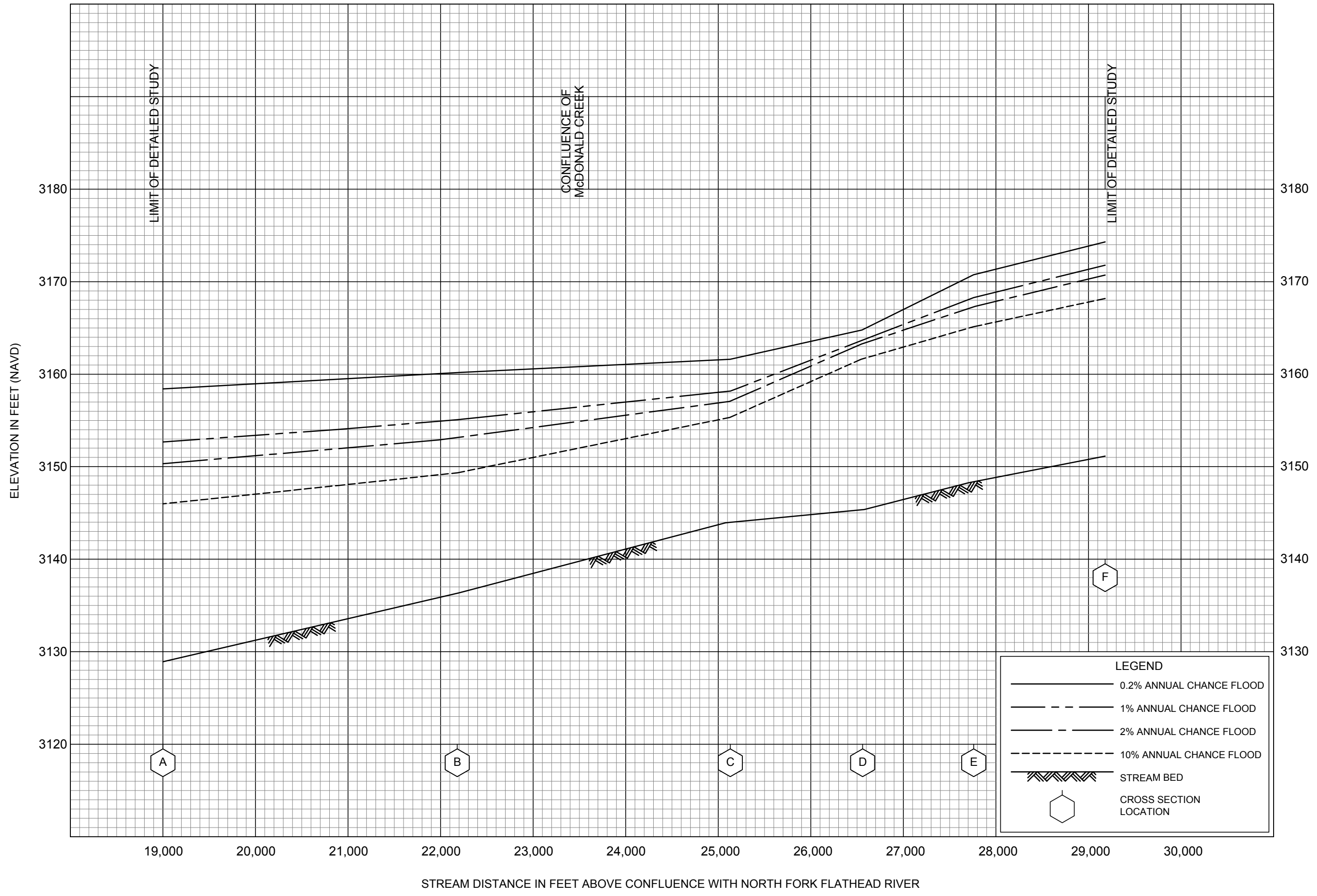
FEDERAL EMERGENCY MANAGEMENT AGENCY  
 FLATHEAD COUNTY, MT  
 AND INCORPORATED AREAS



**FLOOD PROFILES**

MIDDLE FORK FLATHEAD RIVER AT NYACK

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**FLATHEAD COUNTY, MT**  
 AND INCORPORATED AREAS

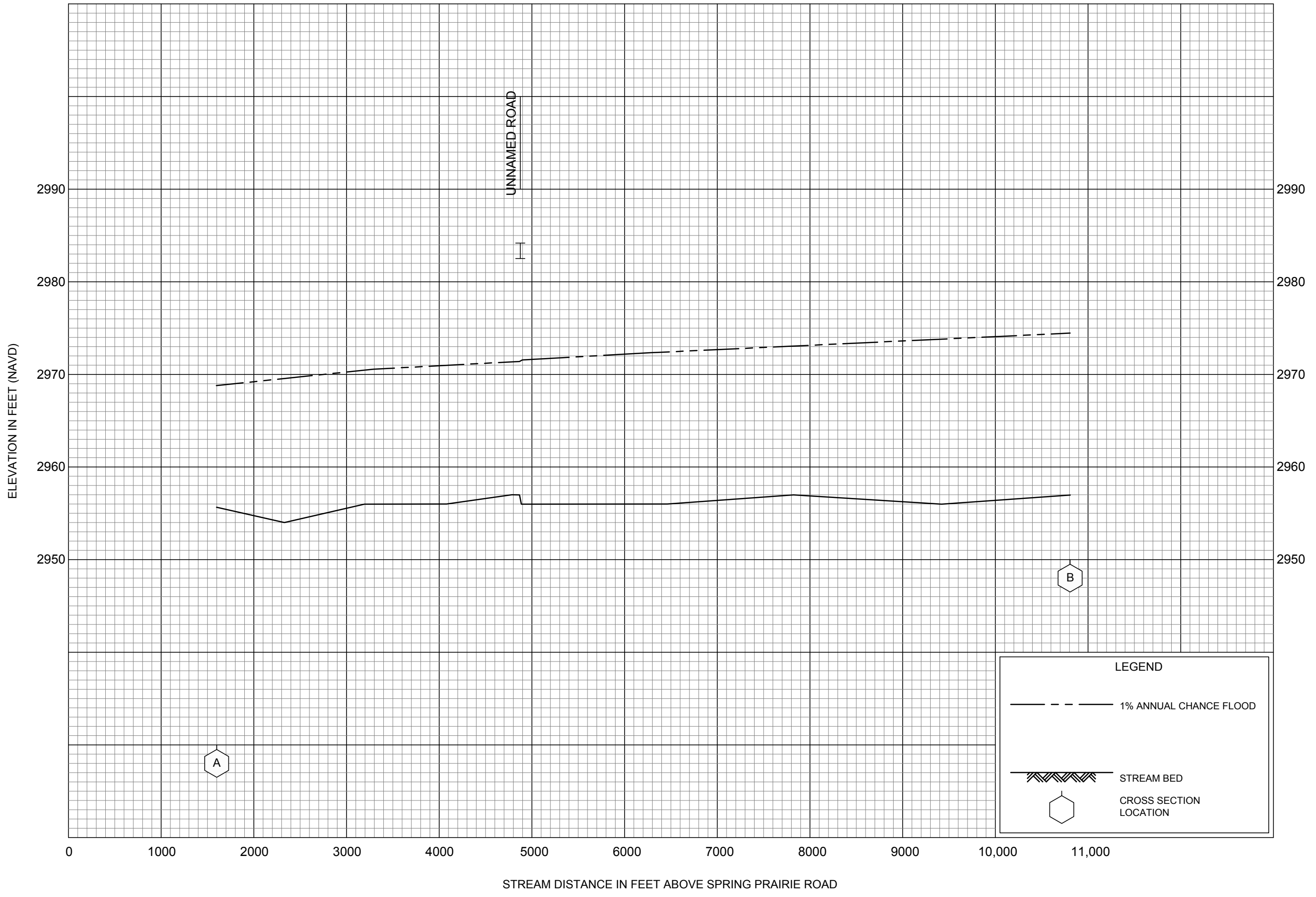


**FLOOD PROFILES**

MIDDLE FORK FLATHEAD RIVER AT WEST GLACIER

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**FLATHEAD COUNTY, MT**  
 AND INCORPORATED AREAS

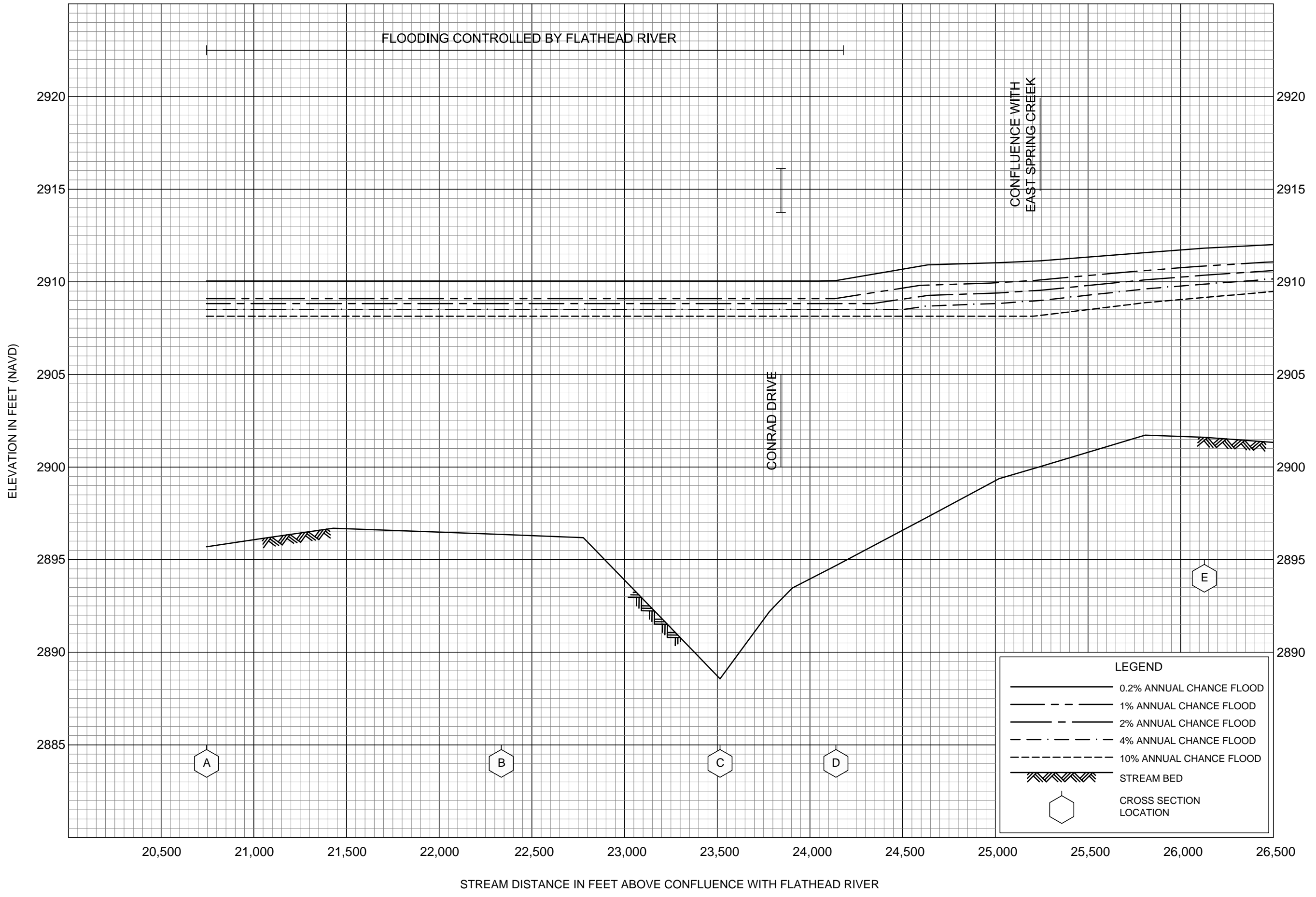




FLOOD PROFILES

STILLWATER RIVER ABOVE SPRING PRAIRIE ROAD

FEDERAL EMERGENCY MANAGEMENT AGENCY  
 FLATHEAD COUNTY, MT  
 AND INCORPORATED AREAS

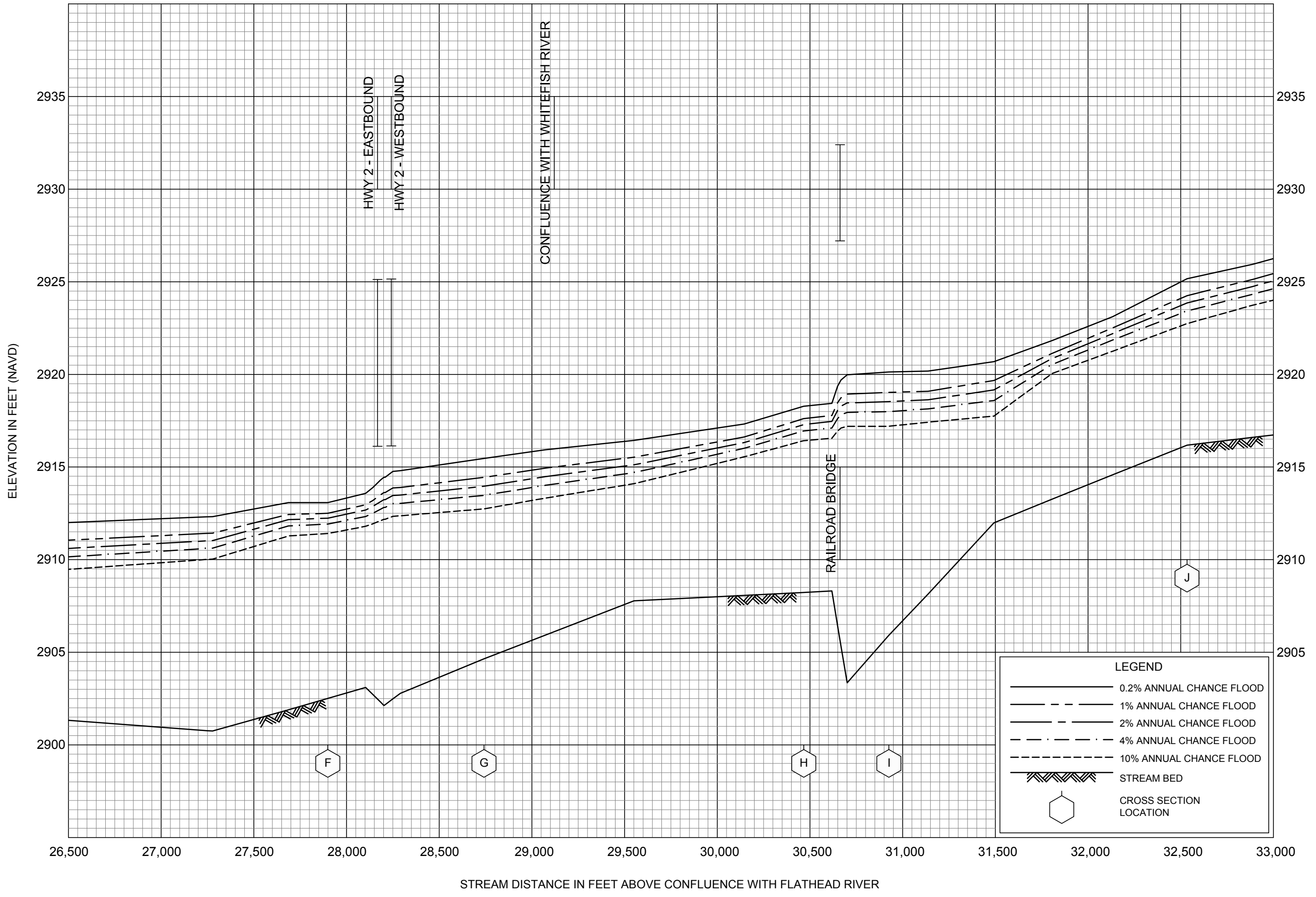


**FLOOD PROFILES**

**STILLWATER RIVER NEAR KALISPELL**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**FLATHEAD COUNTY, MT**  
AND INCORPORATED AREAS

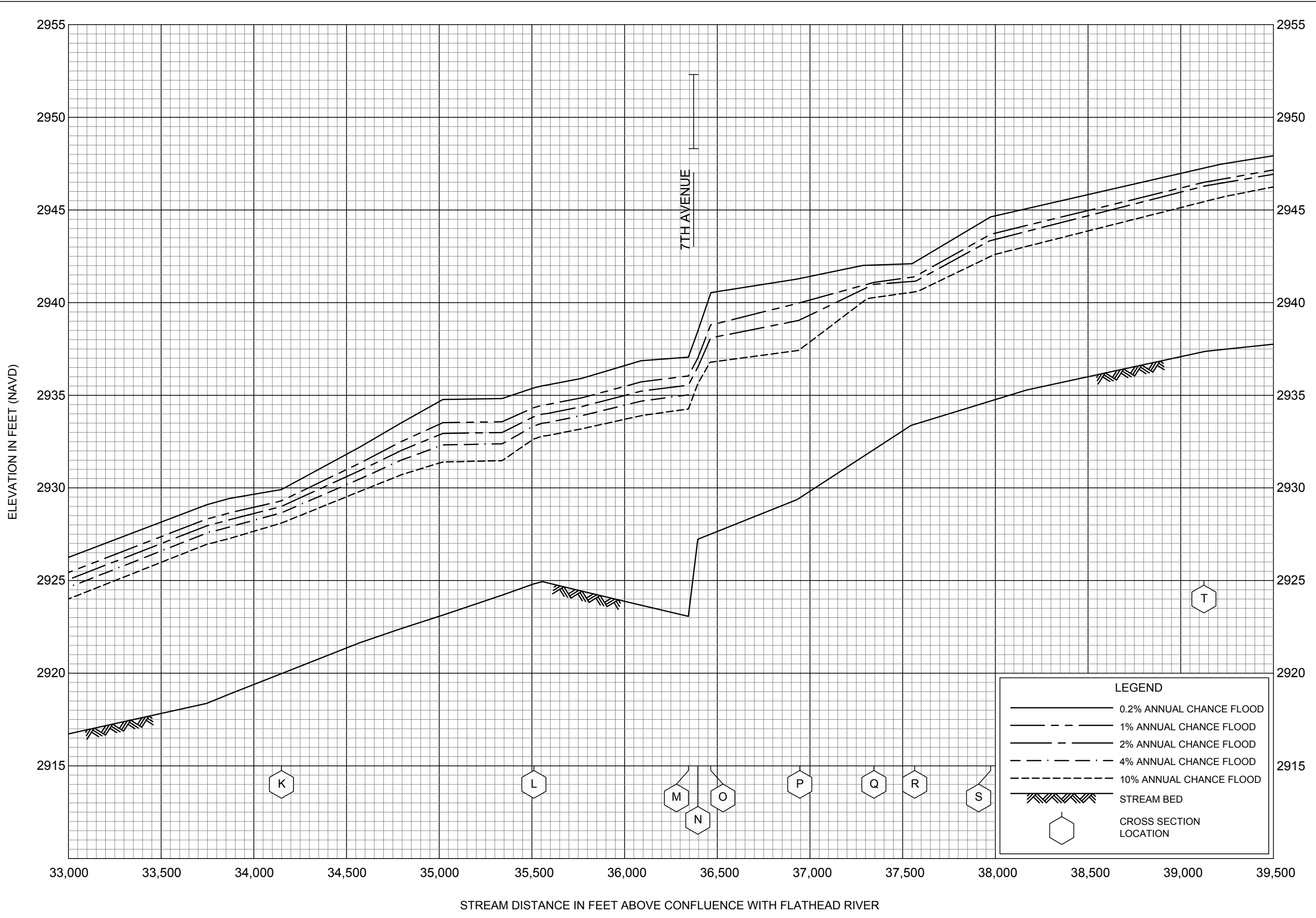


FLOOD PROFILES

STILLWATER RIVER NEAR KALISPELL

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



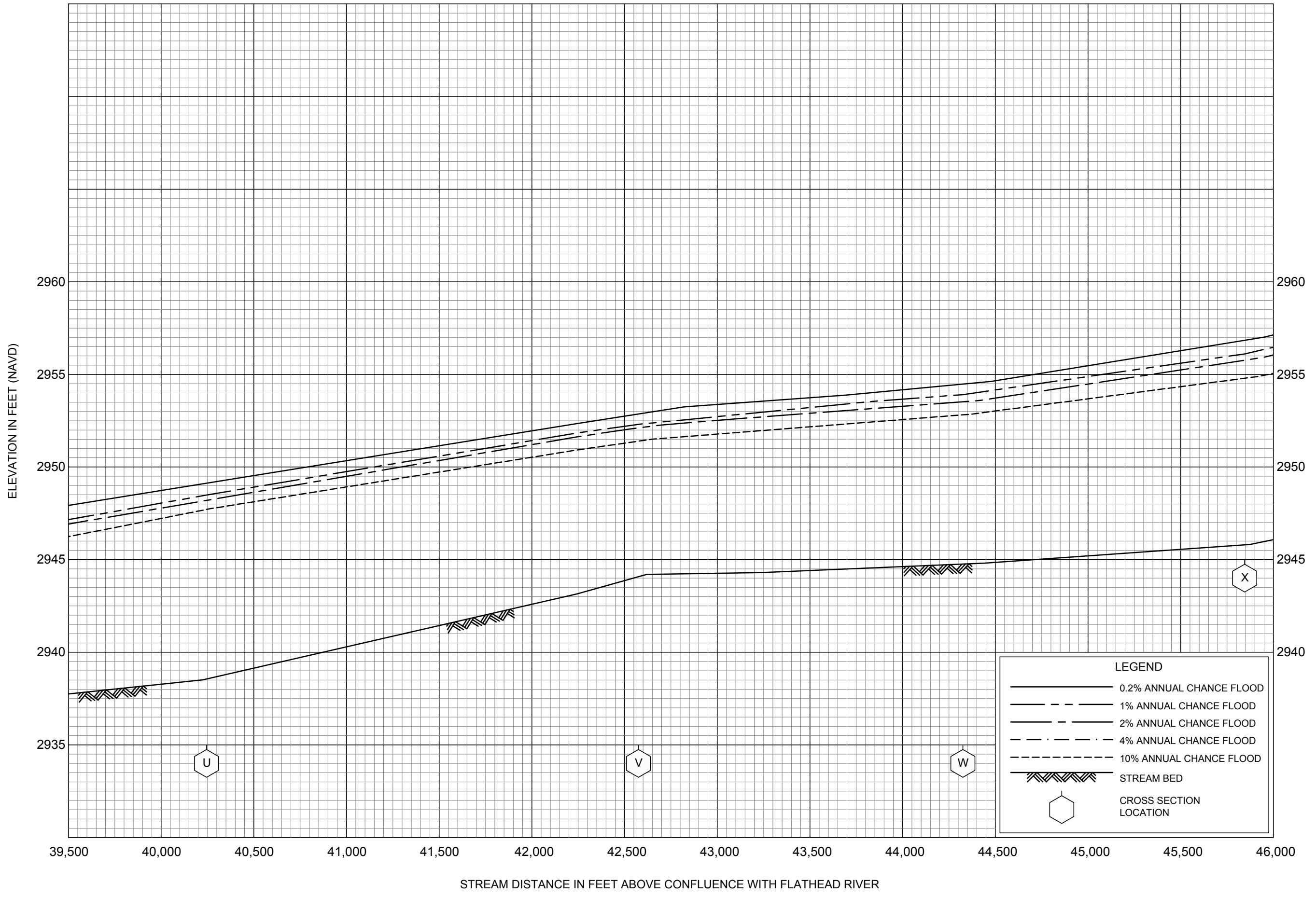
FLOOD PROFILES

STILLWATER RIVER NEAR KALISPELL

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



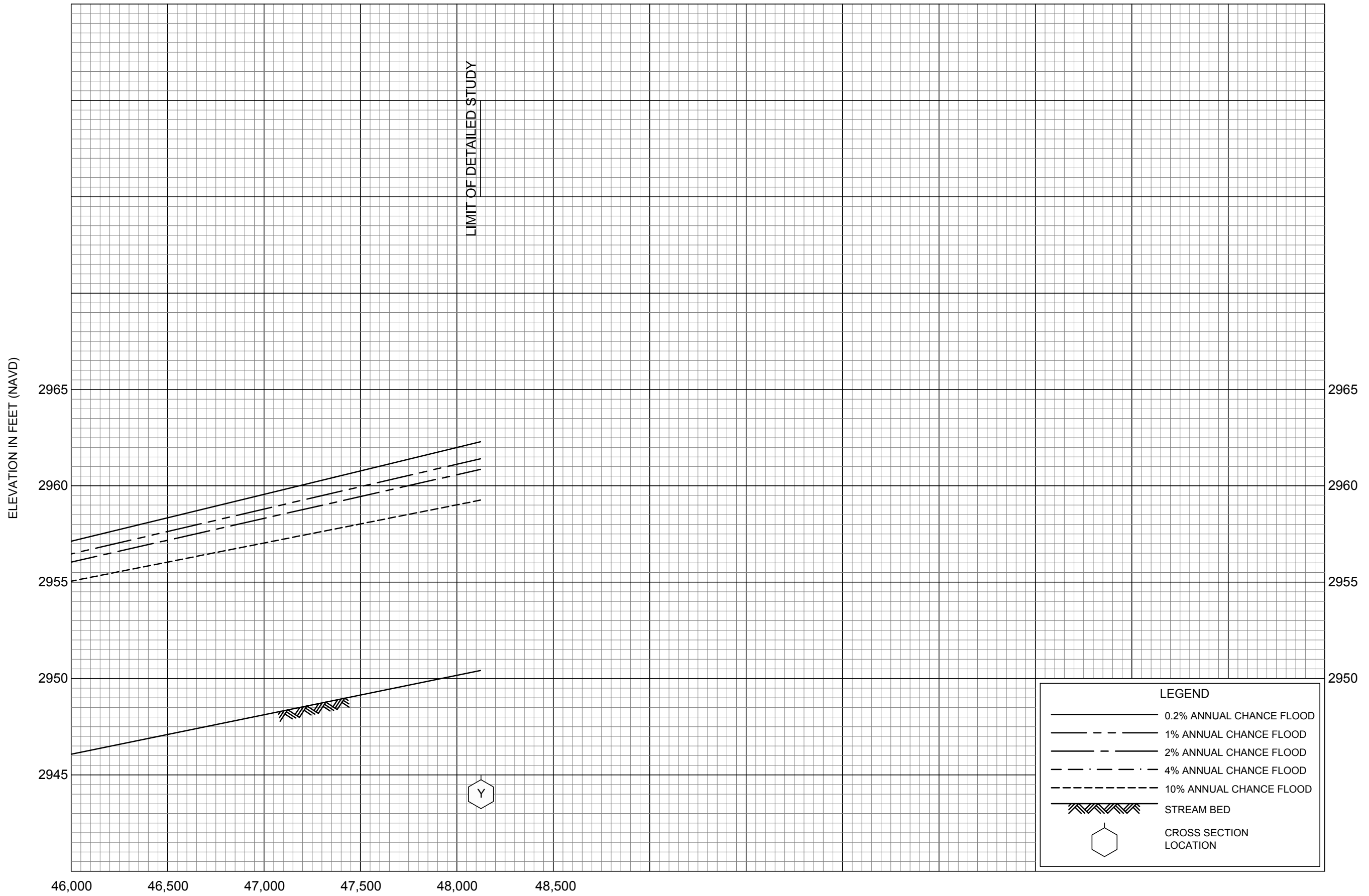


FLOOD PROFILES

STILLWATER RIVER NEAR KALISPELL

FEDERAL EMERGENCY MANAGEMENT AGENCY

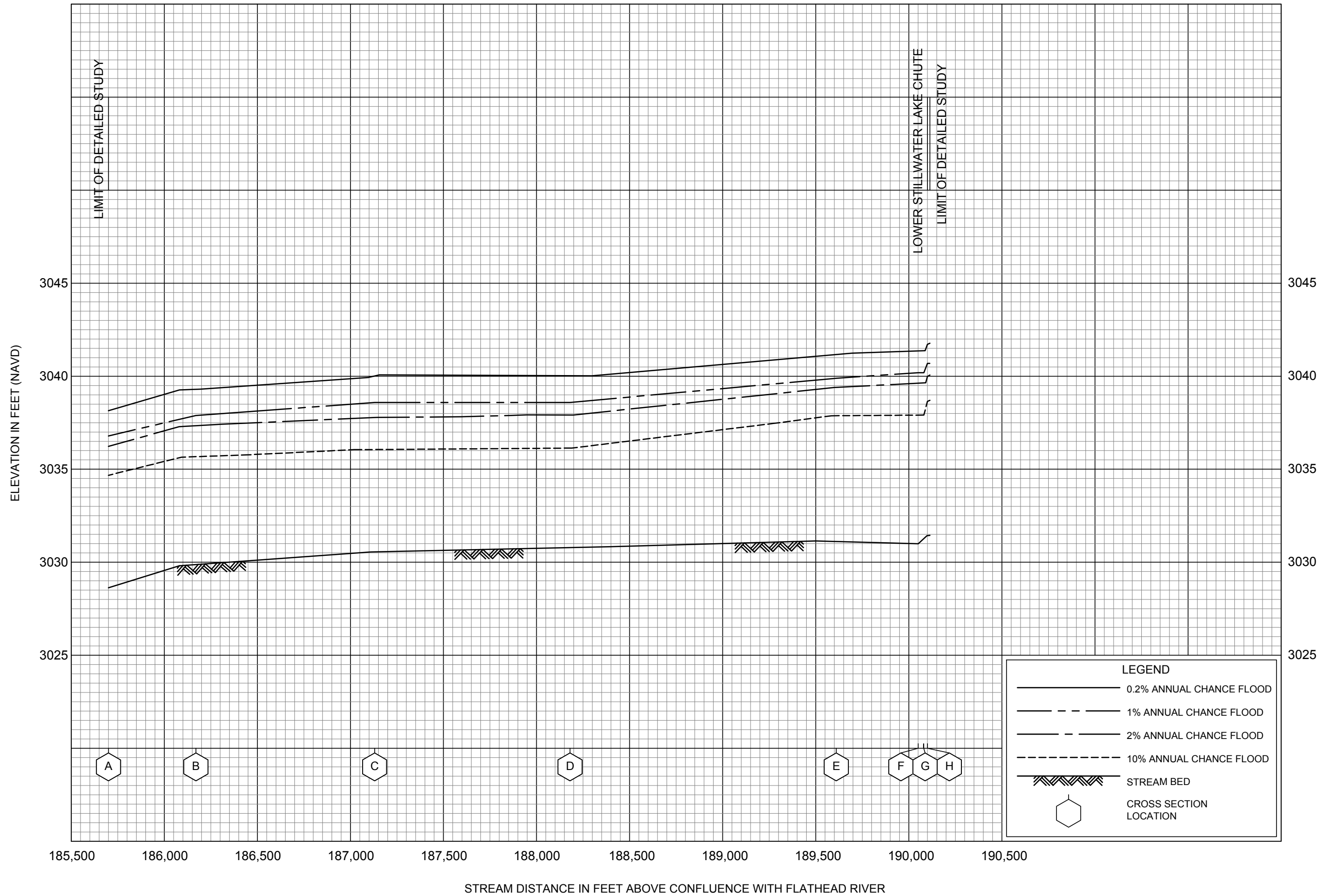
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



LEGEND	
	0.2% ANNUAL CHANCE FLOOD
	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	4% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION

FLOOD PROFILES  
STILLWATER RIVER NEAR KALISPELL

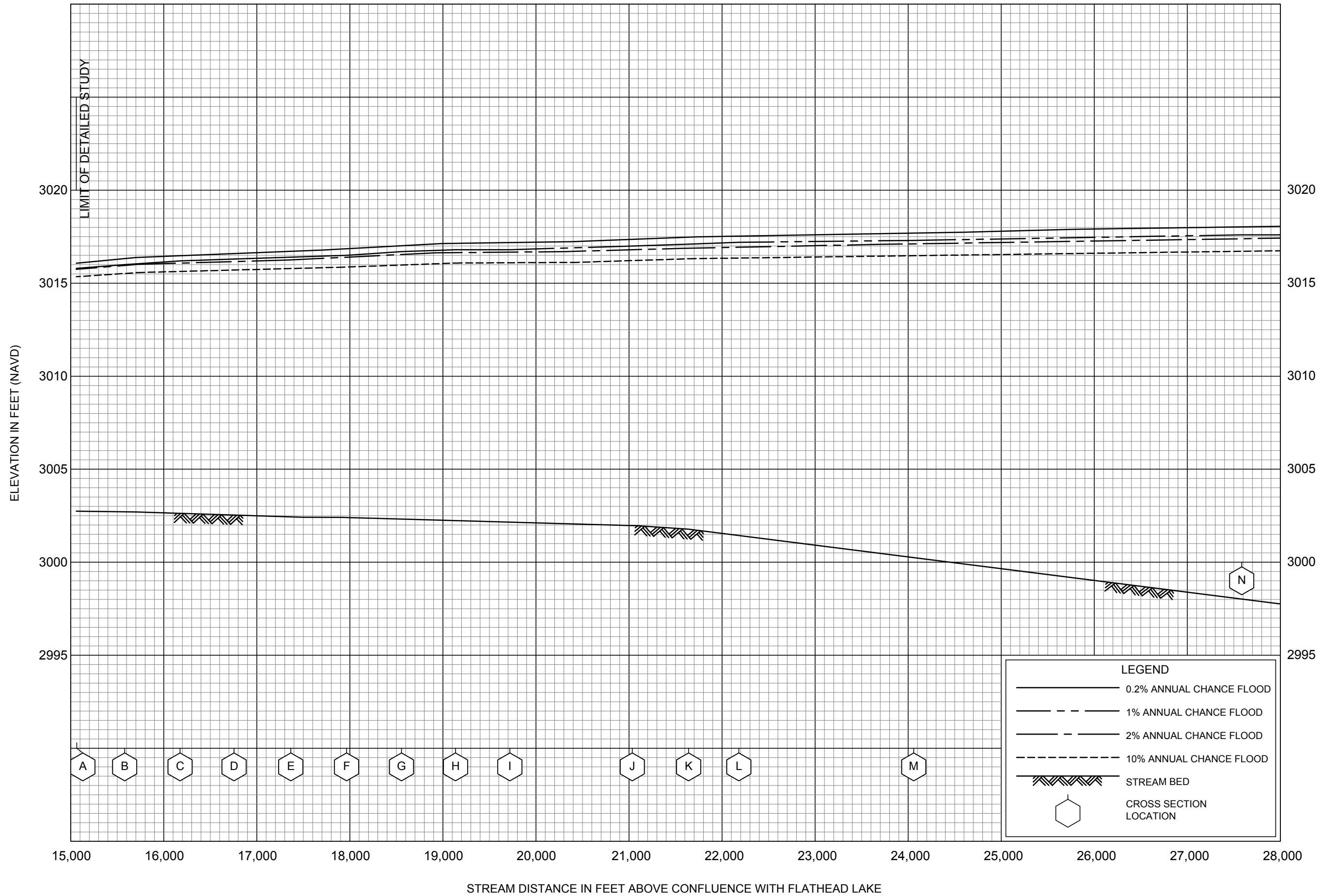
FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES

STILLWATER RIVER NEAR OLNEY

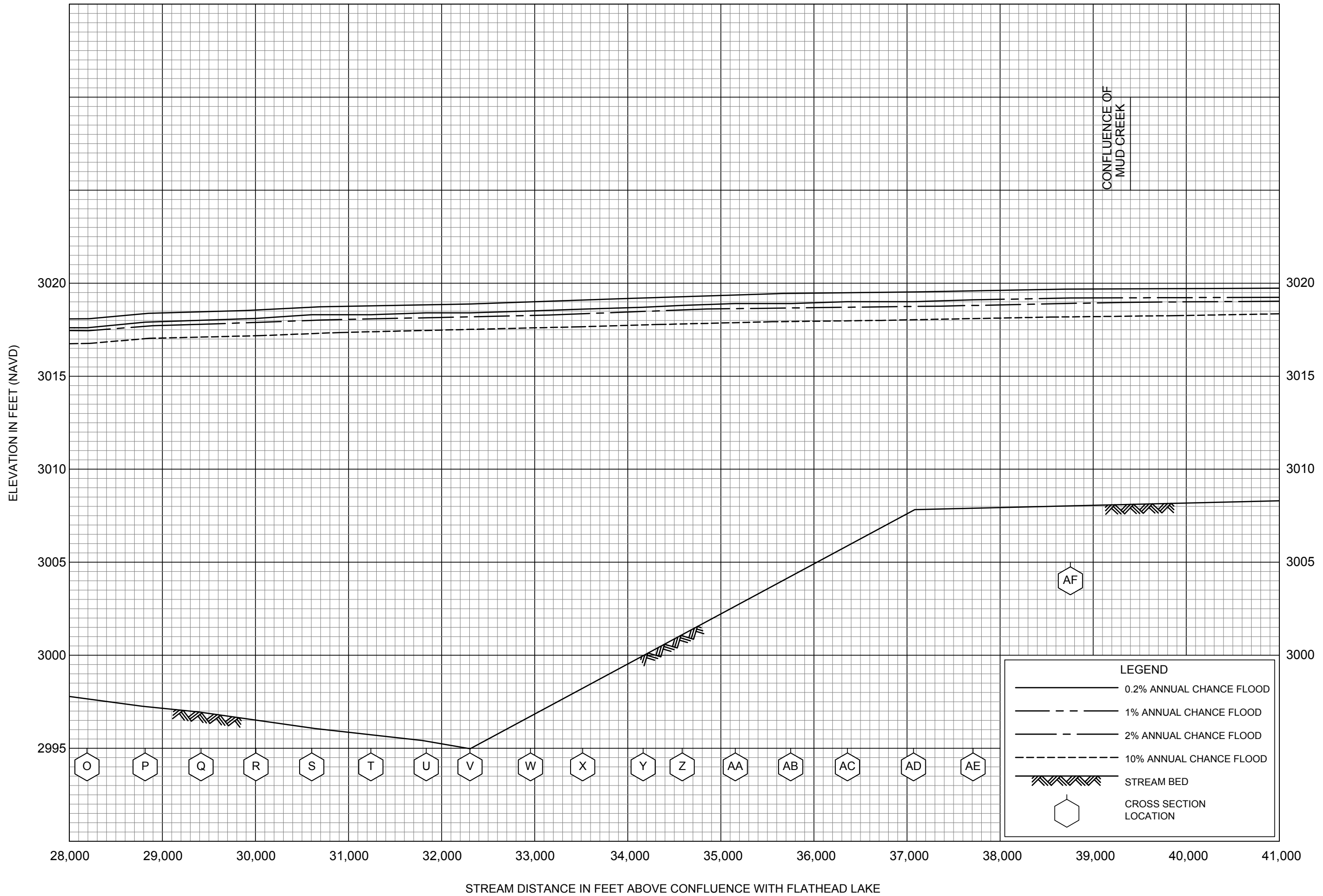
FEDERAL EMERGENCY MANAGEMENT AGENCY  
 FLATHEAD COUNTY, MT  
 AND INCORPORATED AREAS



**FLOOD PROFILES**

SWAN RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**FLATHEAD COUNTY, MT**  
 AND INCORPORATED AREAS



FLOOD PROFILES

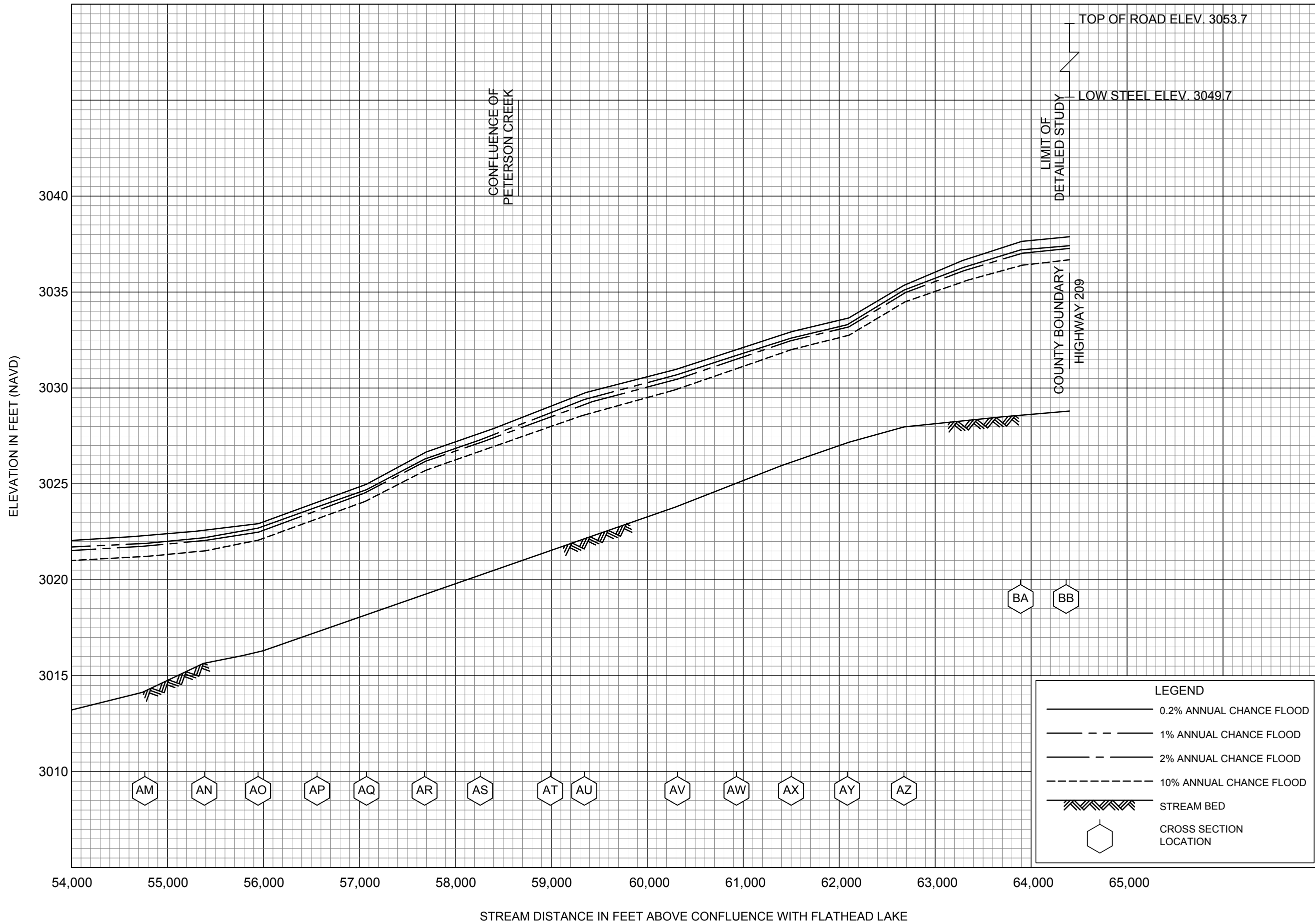
SWAN RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT

AND INCORPORATED AREAS

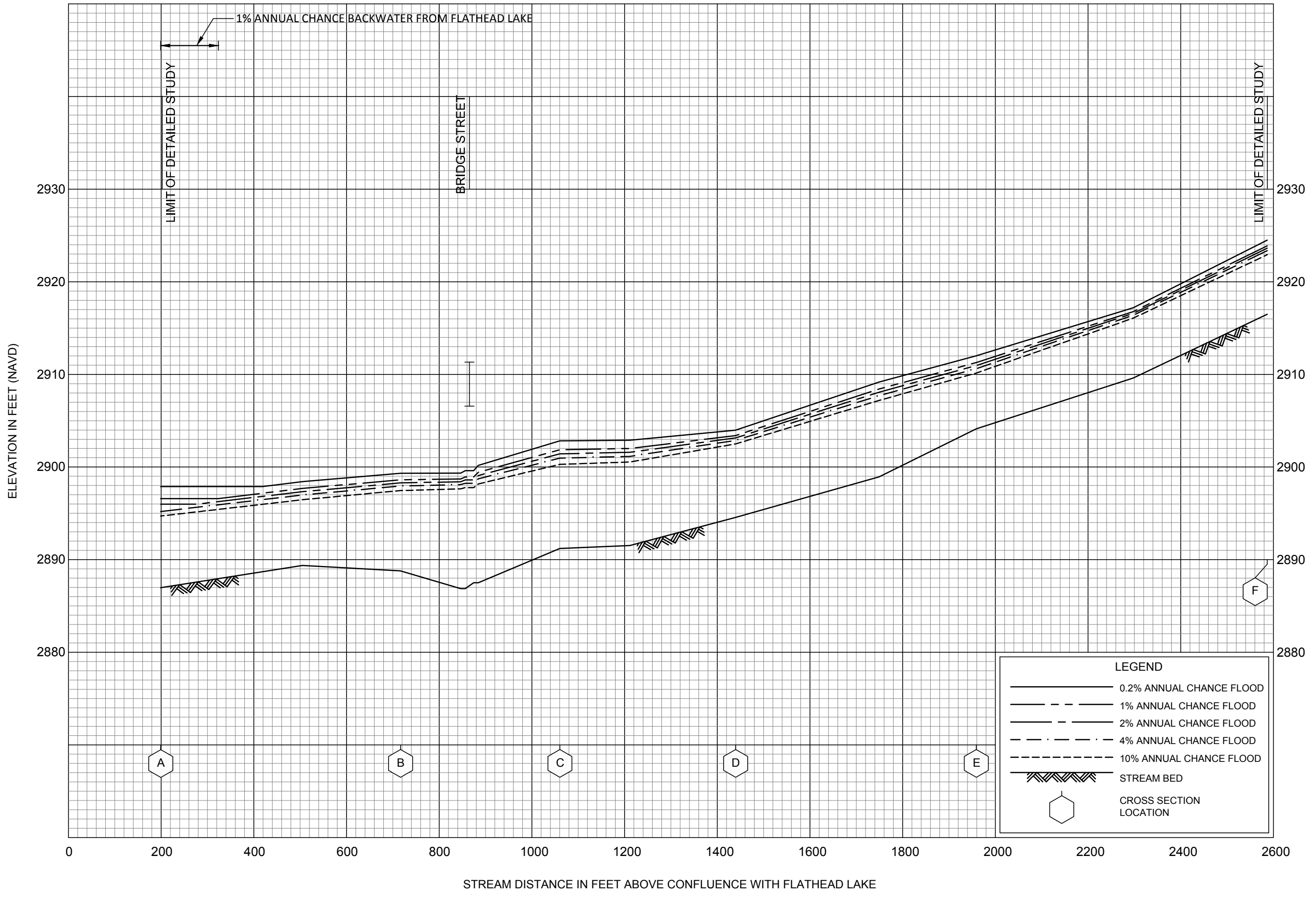




FLOOD PROFILES

SWAN RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY  
 FLATHEAD COUNTY, MT  
 AND INCORPORATED AREAS



FLOOD PROFILES

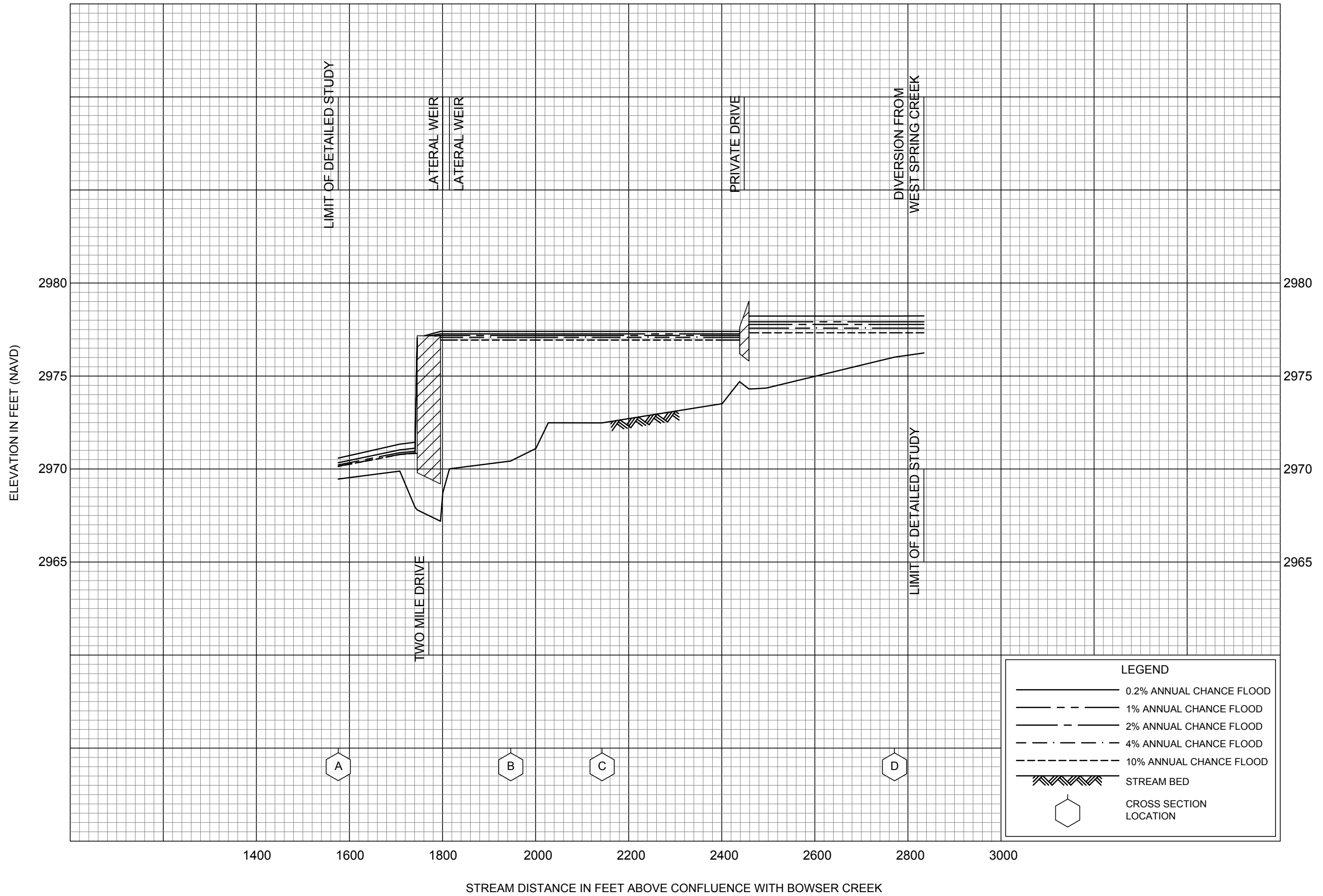
SWAN RIVER AT BIGFORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS

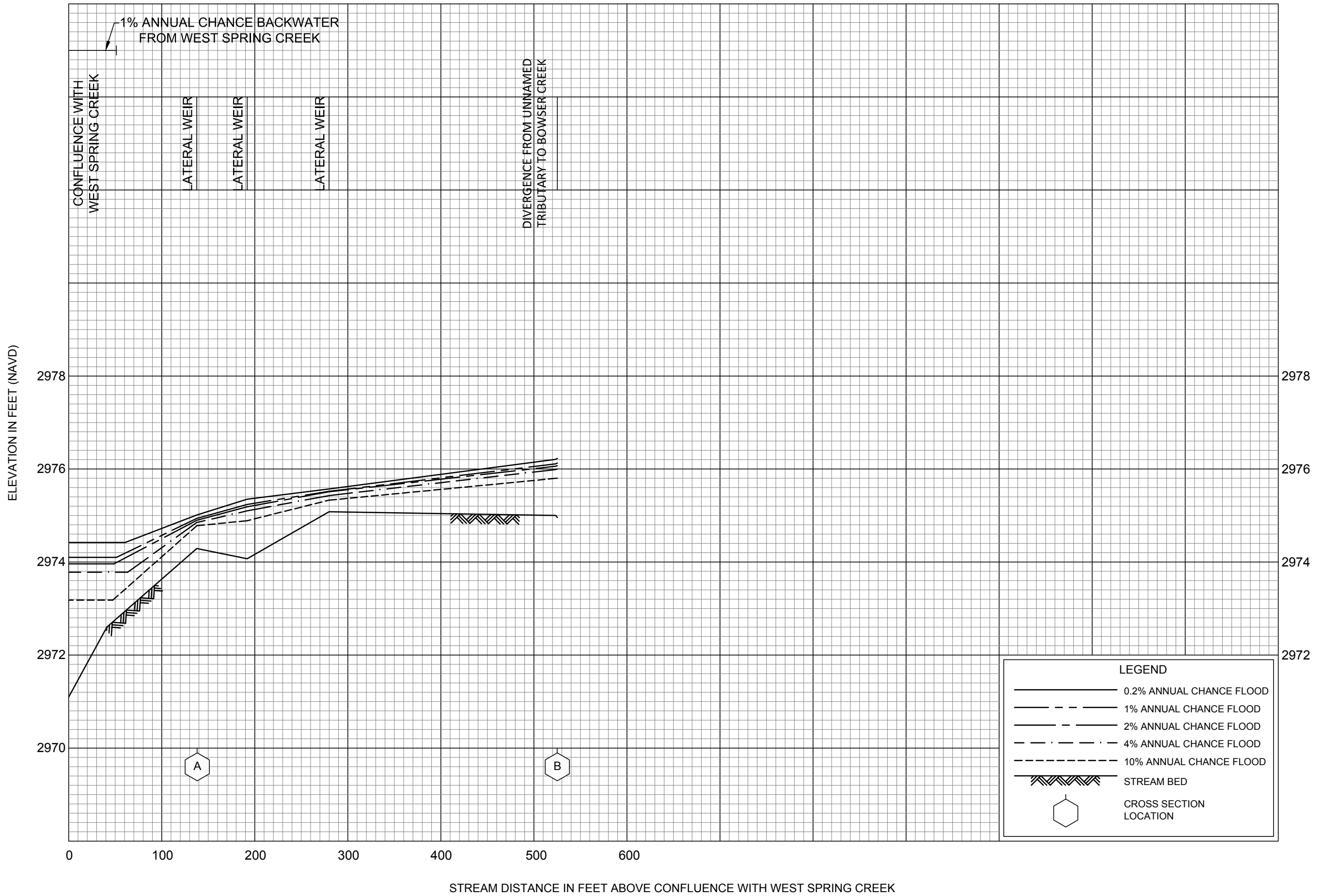






FEDERAL EMERGENCY MANAGEMENT AGENCY  
**FLATHEAD COUNTY, MT**  
 AND INCORPORATED AREAS

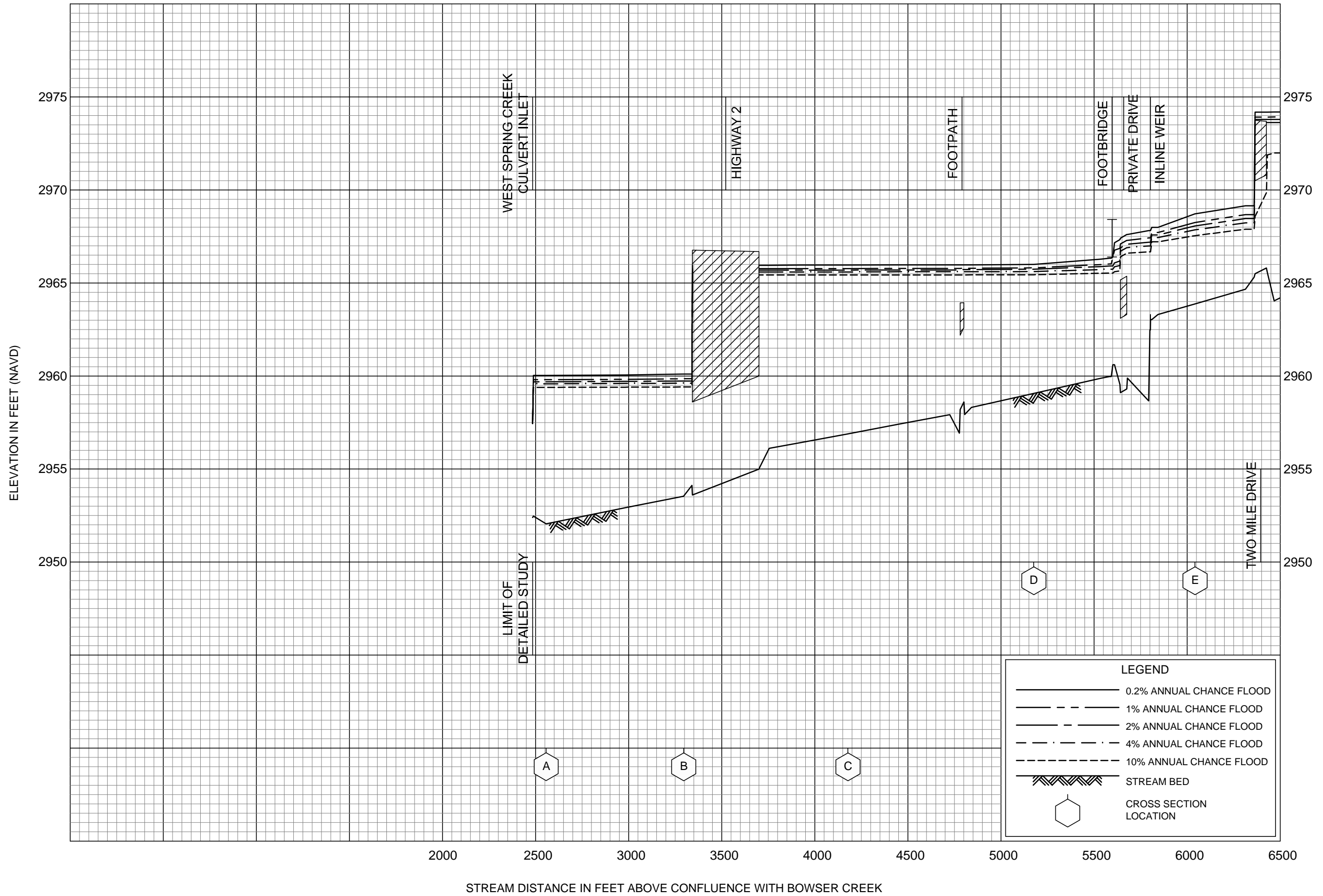
**FLOOD PROFILES**  
 UNNAMED TRIBUTARY TO BOWSER CREEK



FLOOD PROFILES

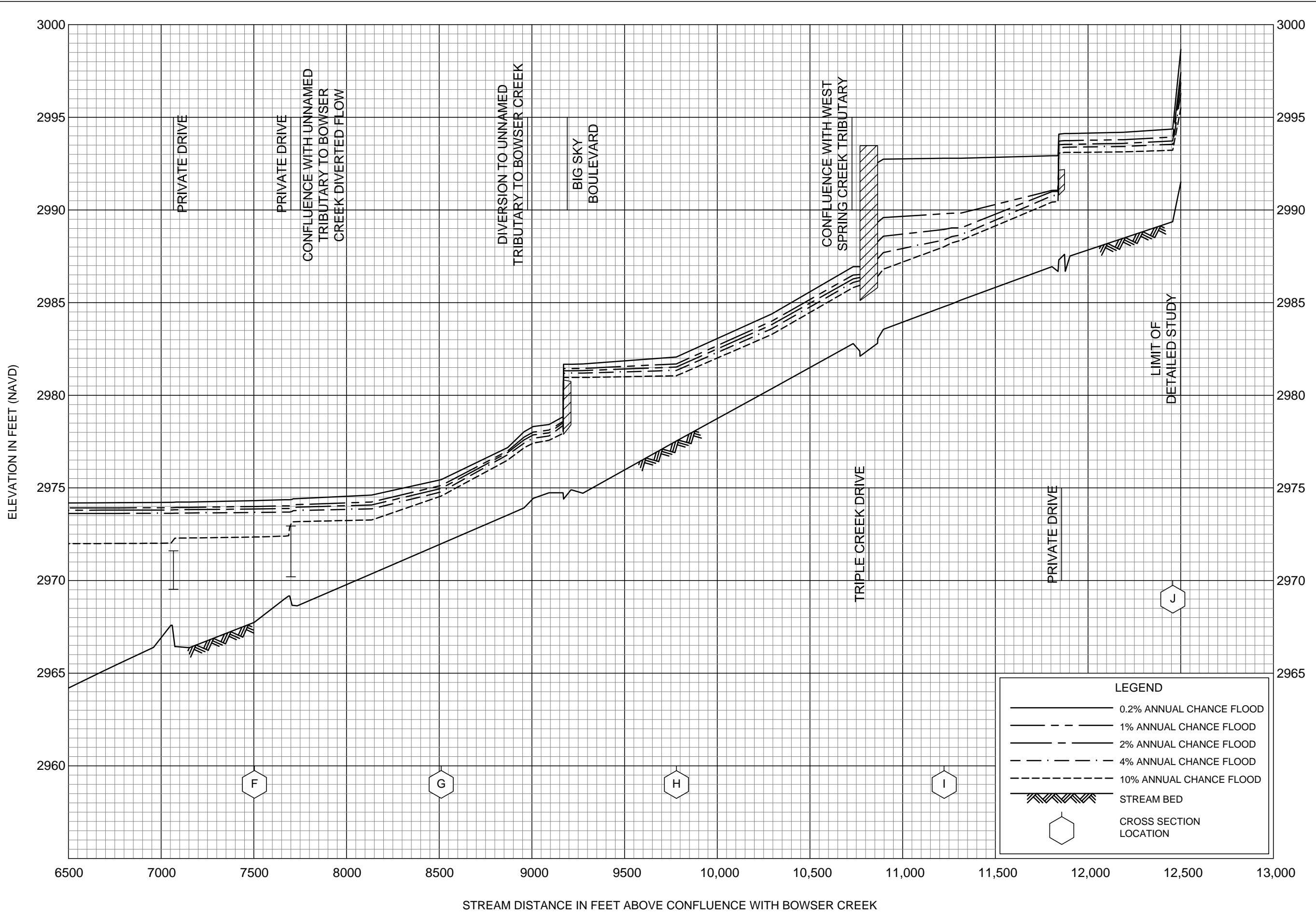
UNNAMED TRIBUTARY TO BOWSER CREEK DIVERTED FLOW

FEDERAL EMERGENCY MANAGEMENT AGENCY  
 FLATHEAD COUNTY, MT  
 AND INCORPORATED AREAS



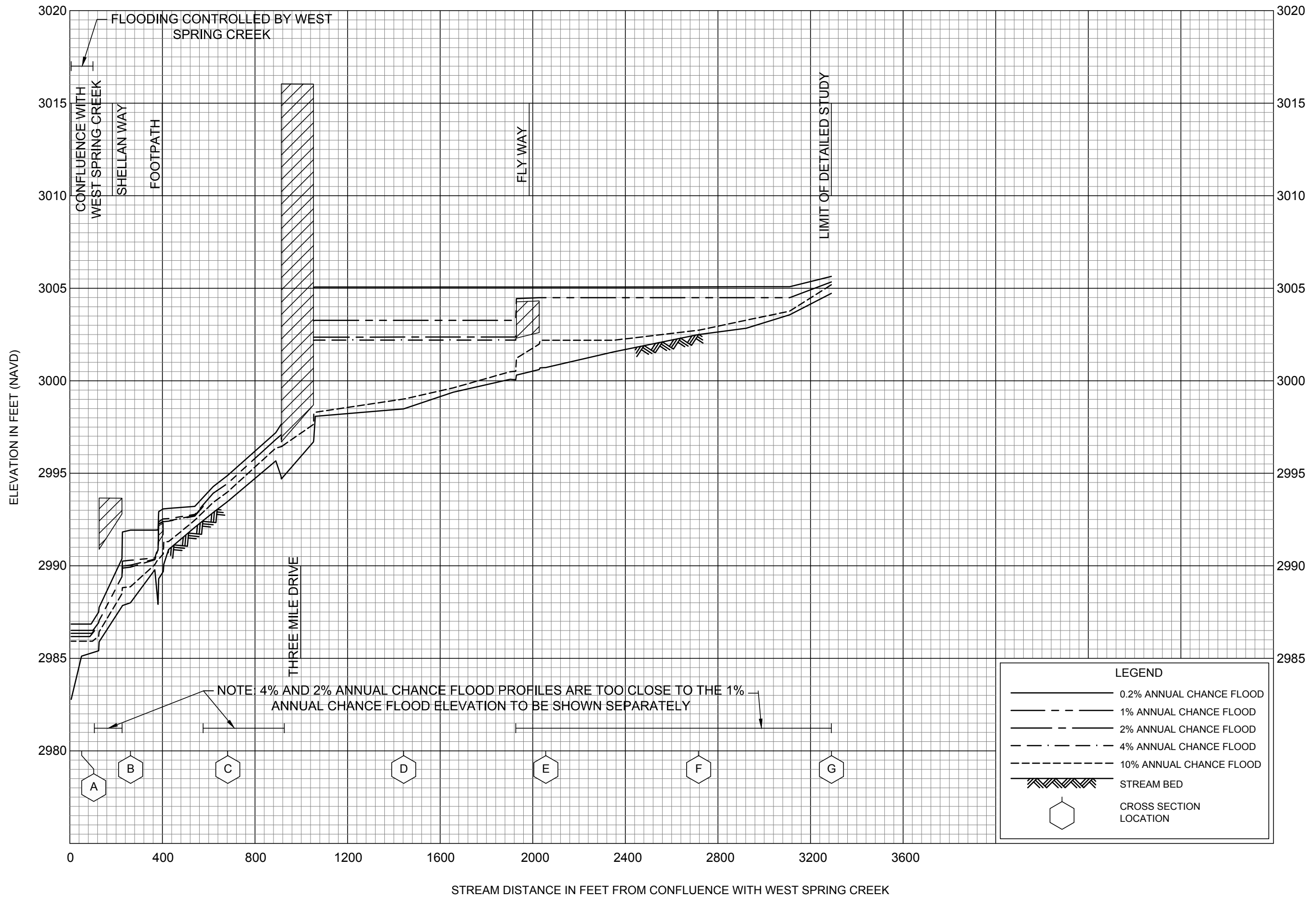
FLOOD PROFILES  
WEST SPRING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES  
WEST SPRING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS

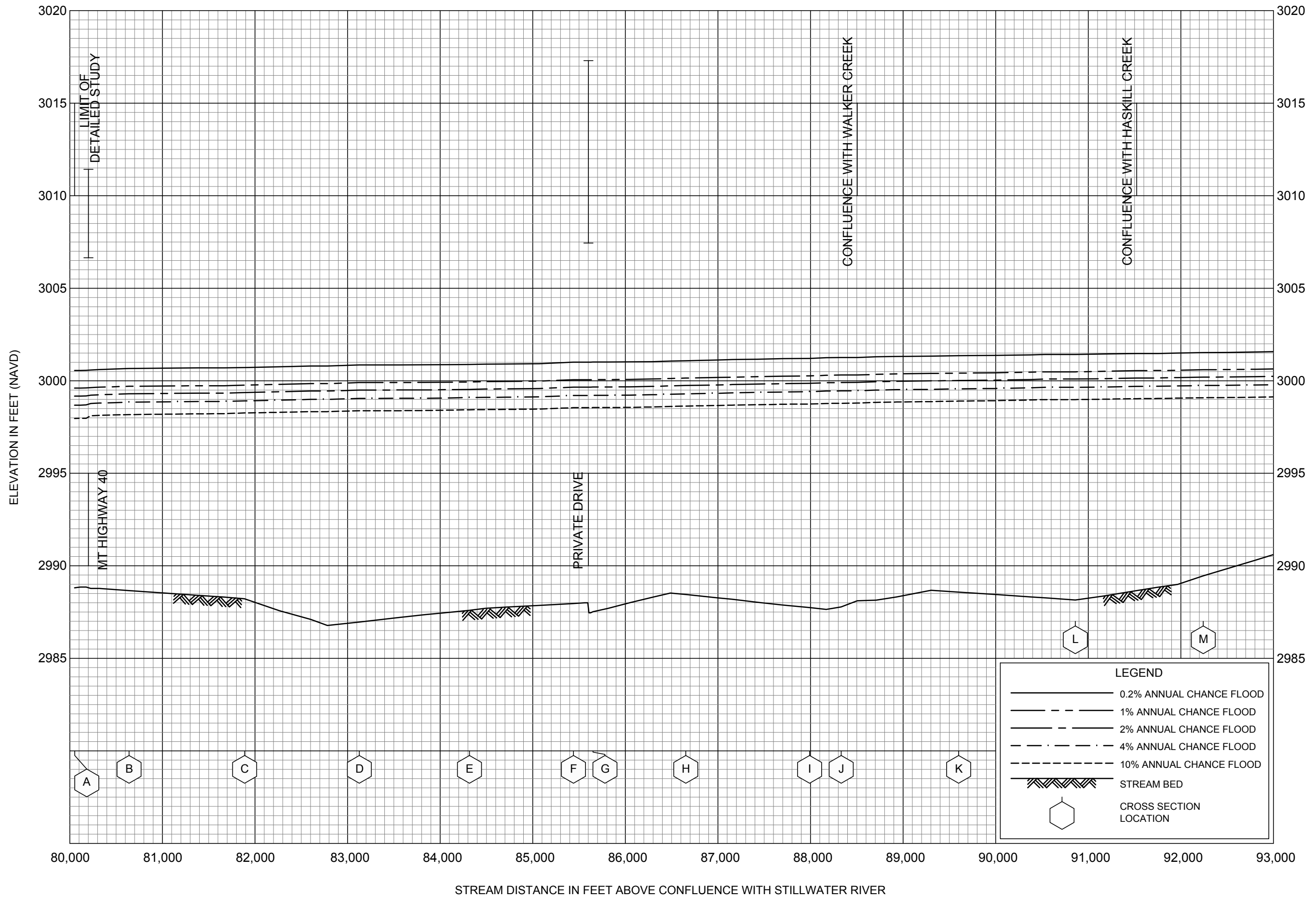


FLOOD PROFILES

WEST SPRING CREEK TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS

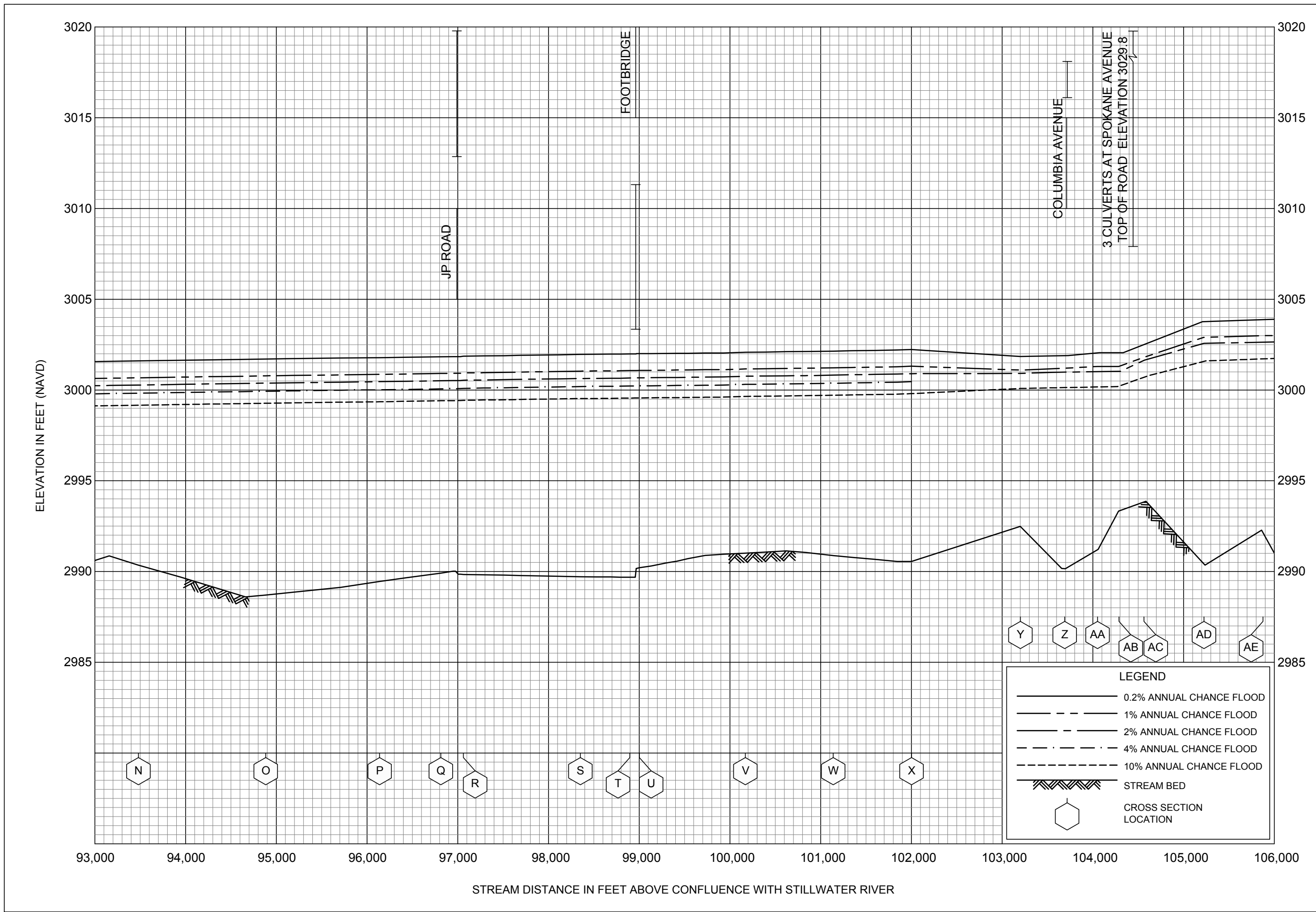


**FLOOD PROFILES**

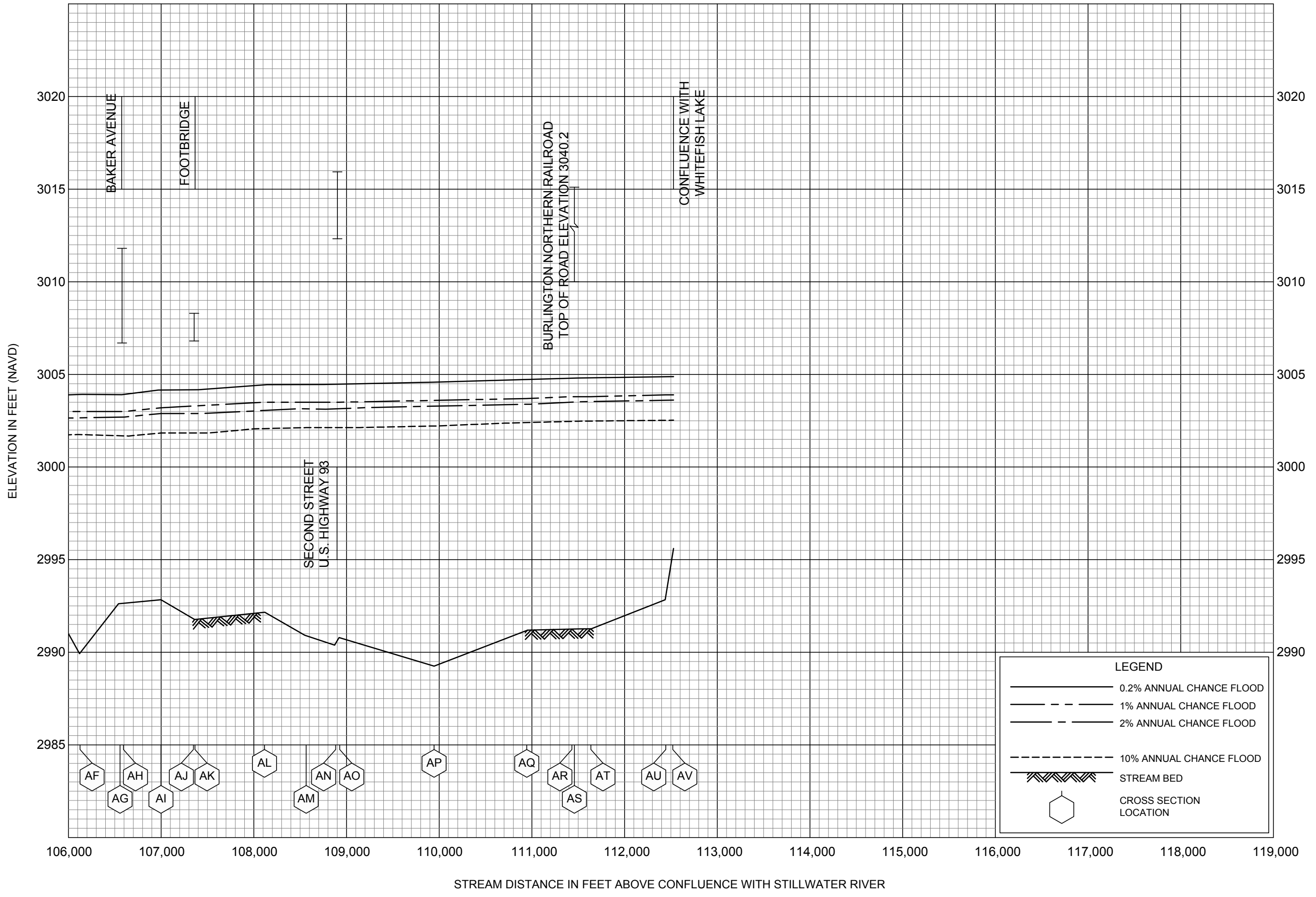
**WHITEFISH RIVER AT WHITEFISH**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**FLATHEAD COUNTY, MT**  
AND INCORPORATED AREAS





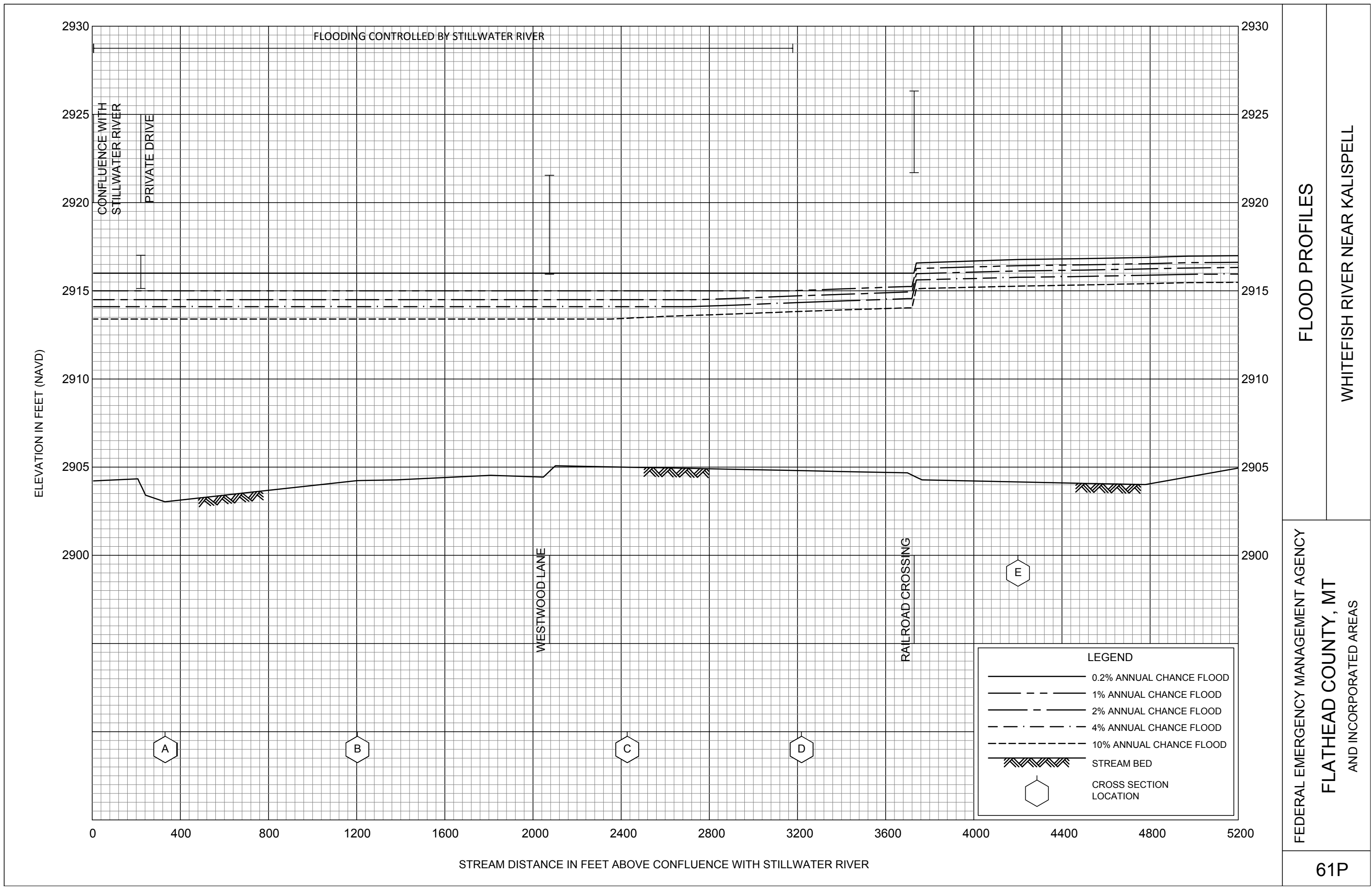


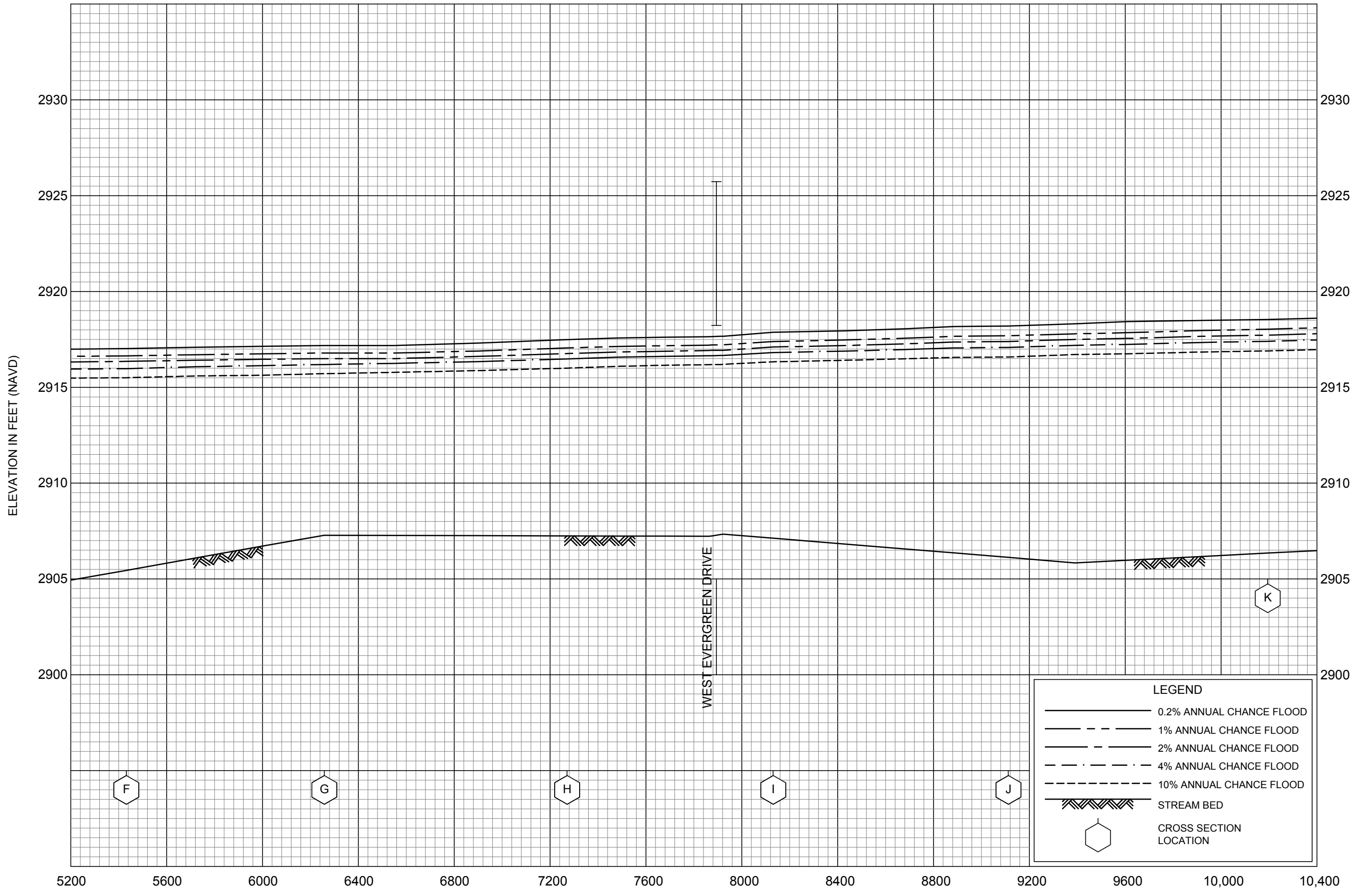
FLOOD PROFILES

WHITEFISH RIVER AT WHITEFISH

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



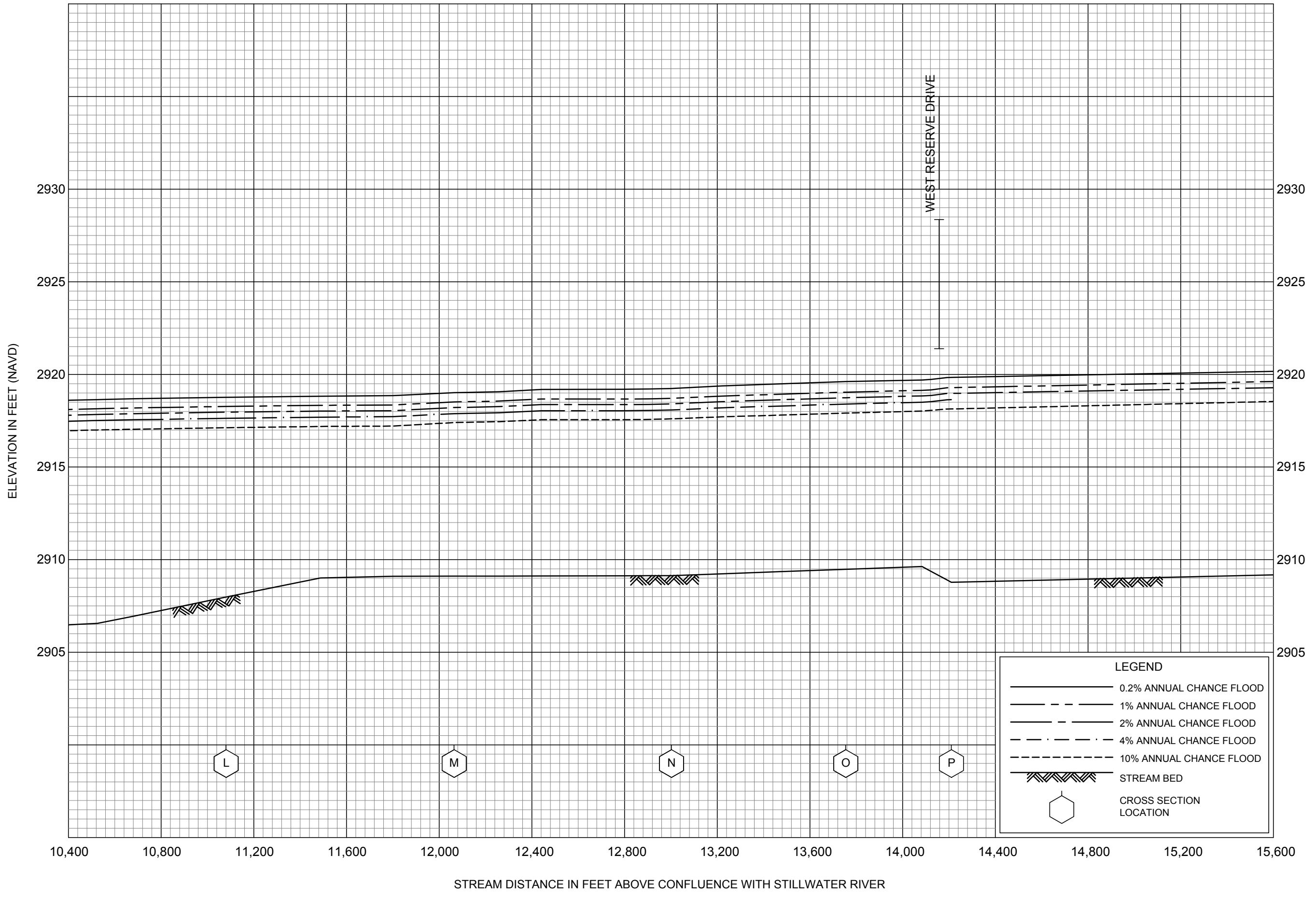


FLOOD PROFILES

WHITEFISH RIVER NEAR KALISPELL

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



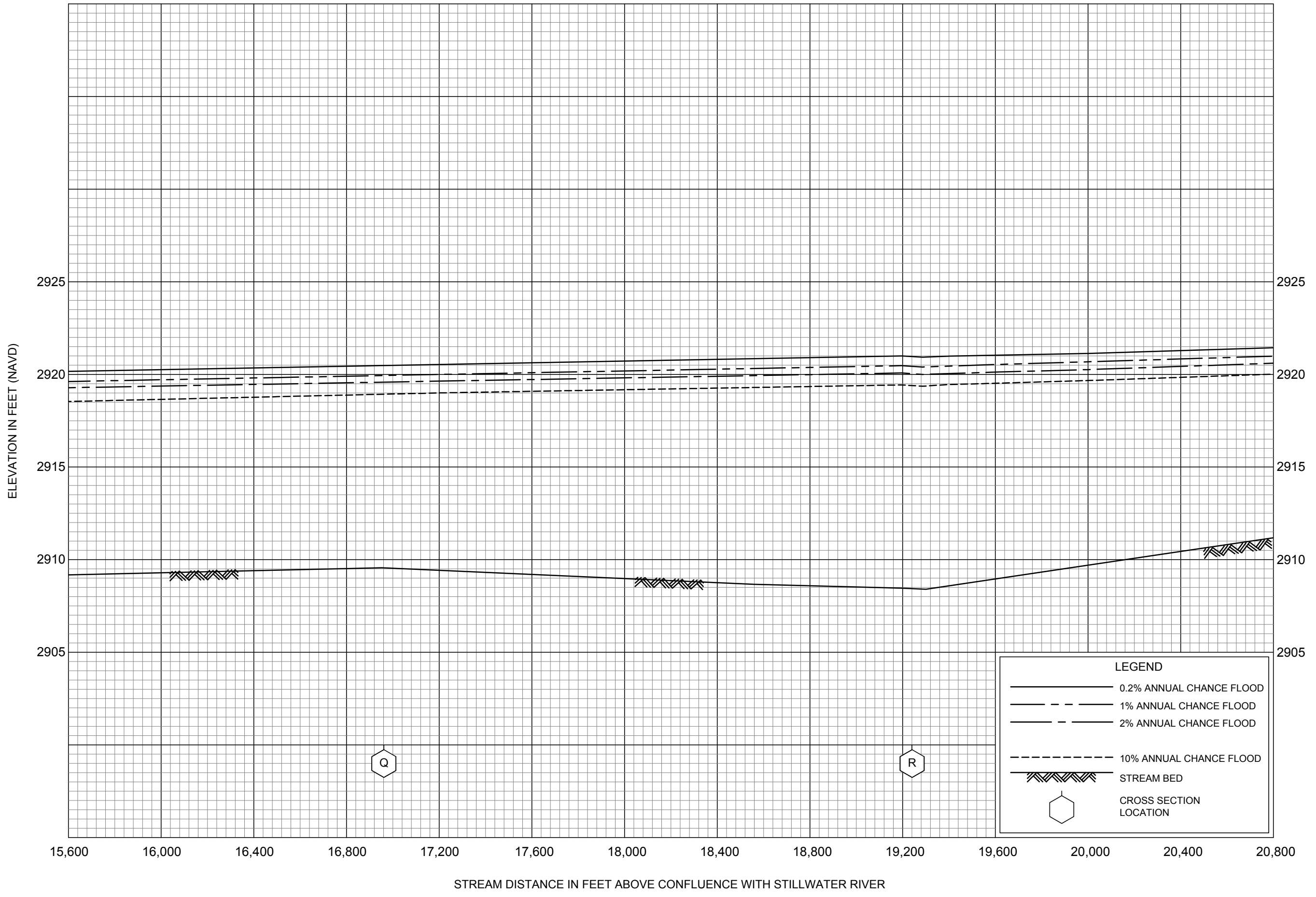
LEGEND	
	0.2% ANNUAL CHANCE FLOOD
	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	4% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION

FLOOD PROFILES

WHITEFISH RIVER NEAR KALISPELL

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS

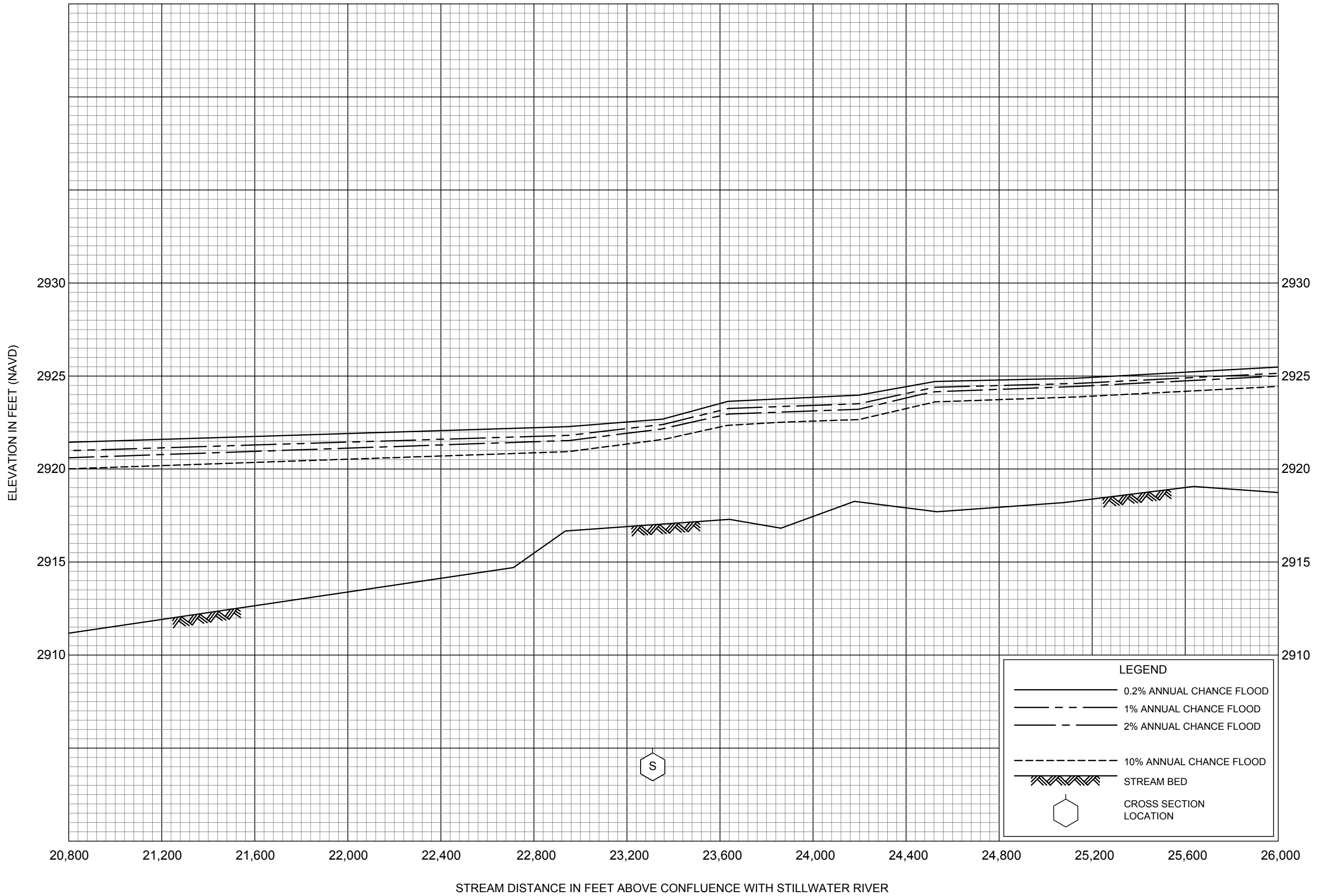


FLOOD PROFILES

WHITEFISH RIVER NEAR KALISPELL

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS

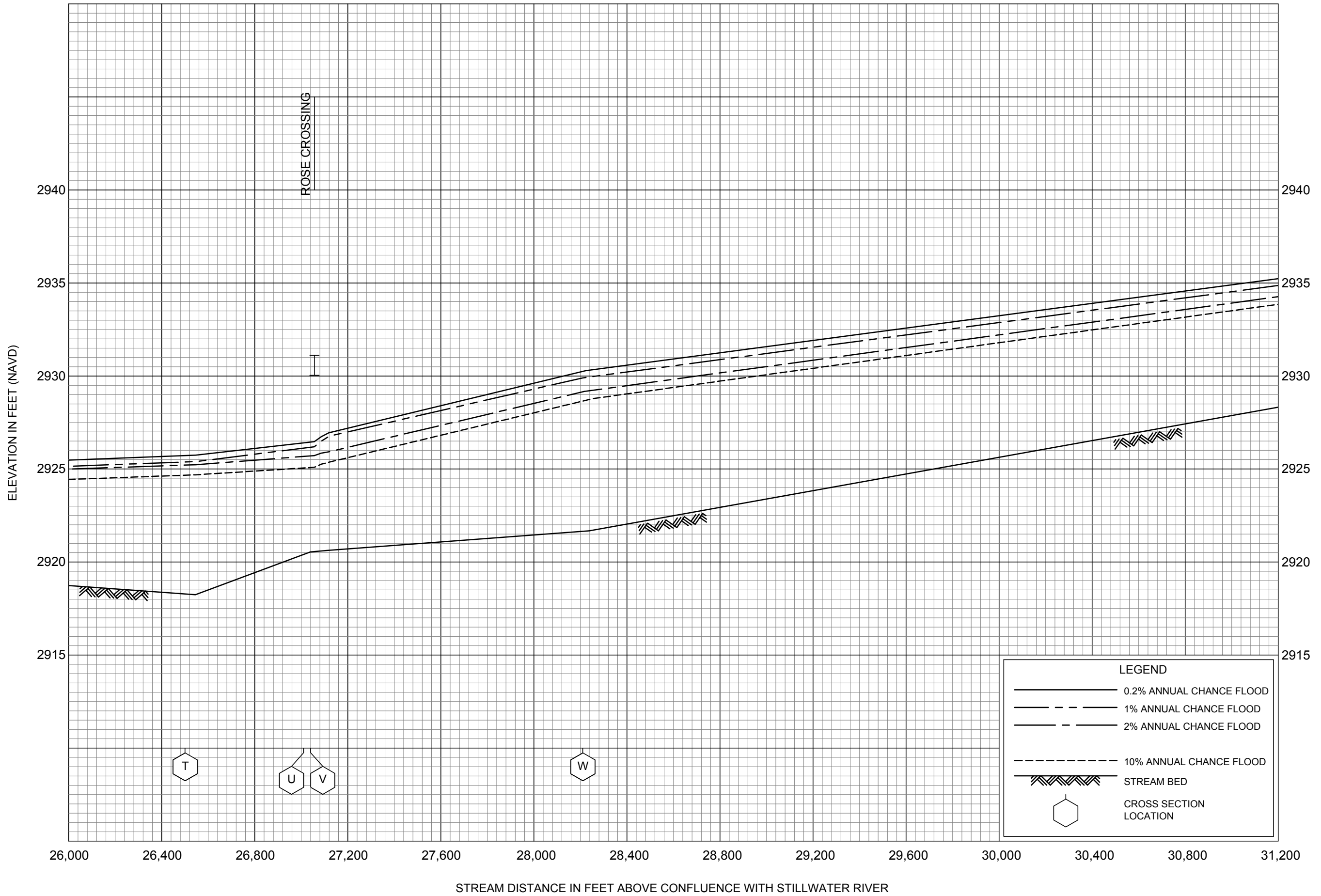


FLOOD PROFILES

WHITEFISH RIVER NEAR KALISPELL

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



FLOOD PROFILES

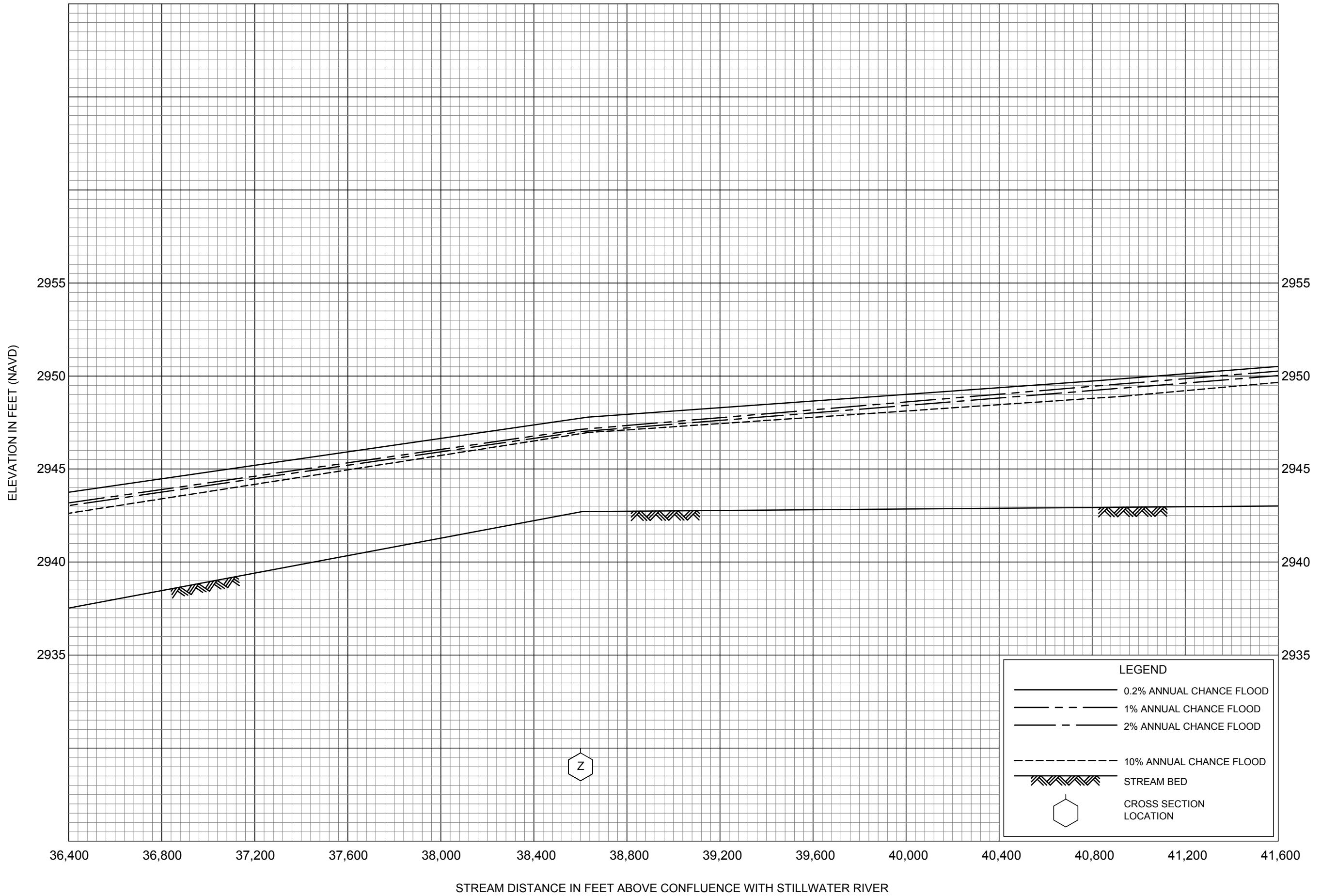
WHITEFISH RIVER NEAR KALISPELL

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS





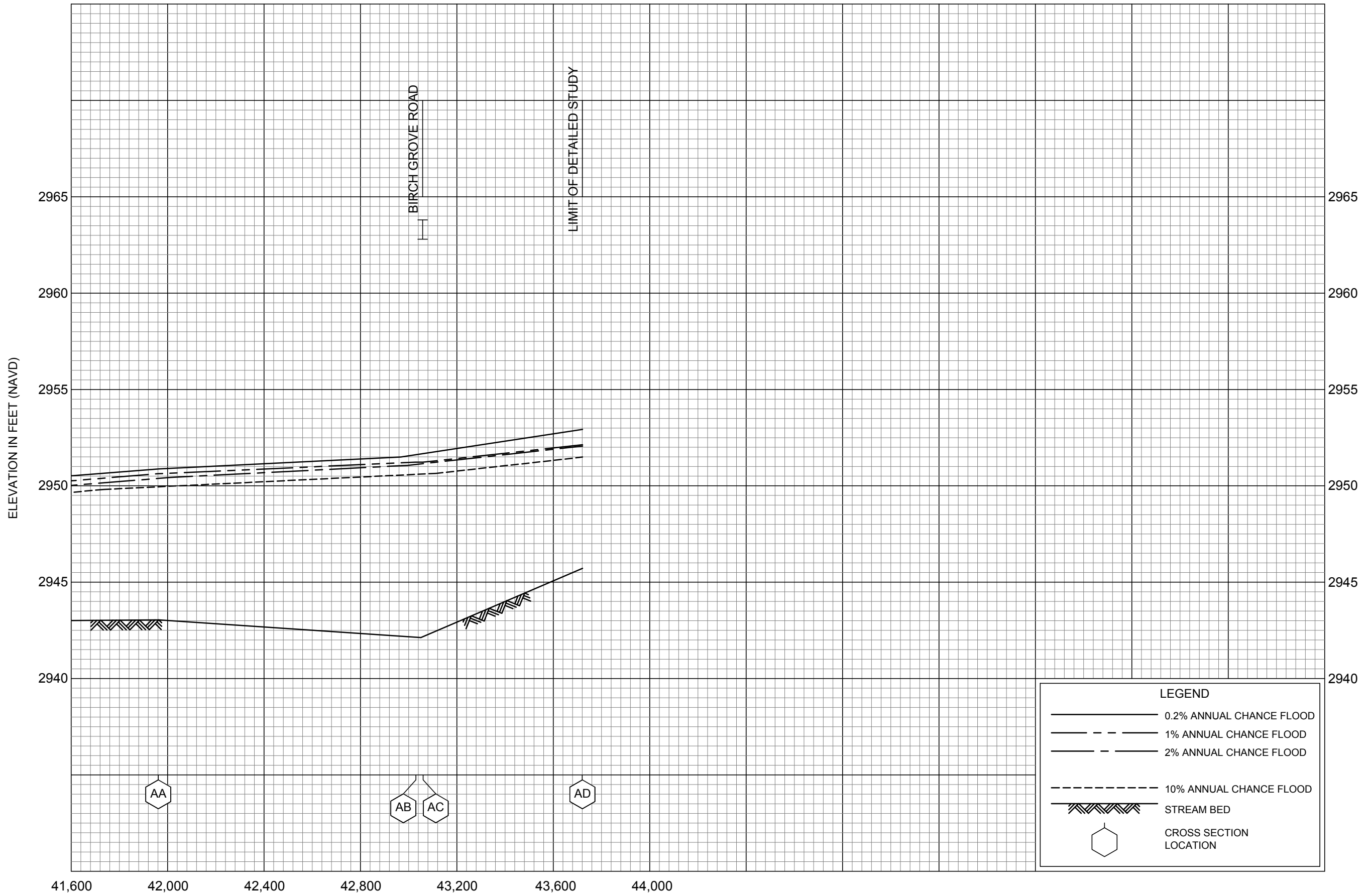


FLOOD PROFILES

WHITEFISH RIVER NEAR KALISPELL

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLATHEAD COUNTY, MT  
AND INCORPORATED AREAS



**LEGEND**

- 0.2% ANNUAL CHANCE FLOOD
- - - 1% ANNUAL CHANCE FLOOD
- · - 2% ANNUAL CHANCE FLOOD
- - - - 10% ANNUAL CHANCE FLOOD
- ▨ STREAM BED
- ⬡ CROSS SECTION LOCATION

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**FLATHEAD COUNTY, MT**  
 AND INCORPORATED AREAS

**FLOOD PROFILES**  
 WHITEFISH RIVER NEAR KALISPELL