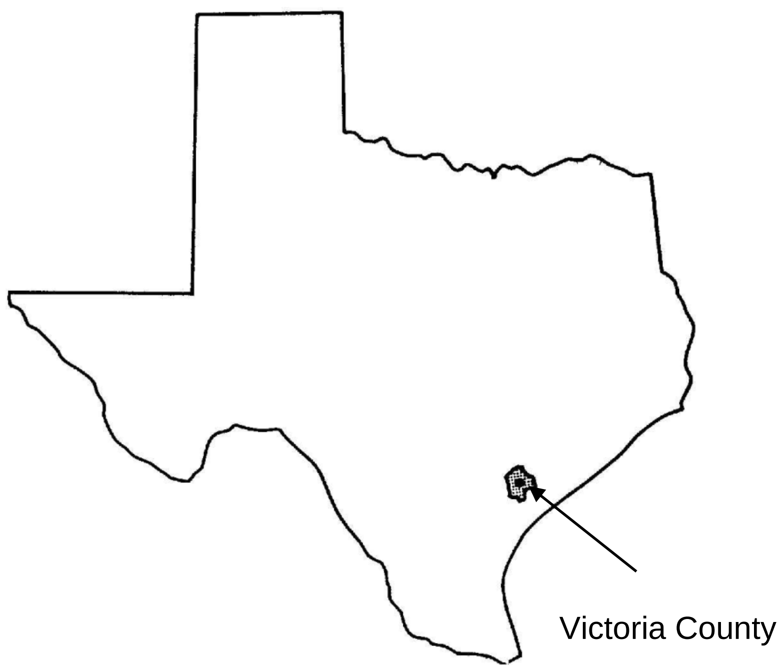
FLOOD INSURANCE STUDY

VICTORIA COUNTY, TEXAS
AND INCORPORATED AREAS
VOLUME 1 OF 2



Community Name	Community Number
VICTORIA COUNTY UNINCORPORATED AREAS	480637
VICTORIA, CITY OF	480638

REVISED PRELIMINARY

APRIL 30, 2020

Effective: Month, Date, Year

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
48469CV001A

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 may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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

Old Zone	New Zone
A1 through A30	AE
V1 through V30	VE
B	X
C	X

Part or all of this Flood Insurance Study may be revised and republished at any time. In addition, part of this Flood Insurance Study may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the Flood Insurance Study. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current Flood Insurance Study components.

Initial Countywide FIS Effective Date: Month, Date, Year

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FLOOD INSURANCE STUDY
VICTORIA COUNTY, TEXAS AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of Victoria County, including the City of Victoria; and the unincorporated areas of Victoria County (referred to collectively herein as Victoria County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (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 Acknowledgments

The sources of authority for this FIS report are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

Victoria County

The hydrologic and hydraulic analyses for the study effective September 18, 1987 were prepared by Albert H. Halff Associates, Inc., for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-84-C-1619. The work for that study was completed in March 1985 (Reference 1).

For the revision effective May 17, 1990, updated hydrologic and hydraulic analyses for Whispering Creek and interbasin flow between Whispering Creek and Lone Tree Creek were prepared by Dewberry & Davis under agreement with FEMA. The work for that study was completed in February 1989 (Reference 1).

For the revision effective November 20, 1998, the hydraulic analyses for Coleto Creek from approximately 60 feet upstream of F.M. 446 to approximately 1.1 miles upstream of U.S. Highway 59 and for Whispering Creek from the upstream side of John Stockbauer Drive (located in the City of Victoria) to approximately 3,640 feet upstream of Zac Lentz Parkway were performed for FEMA by the U.S. Geological Survey (USGS), Water Resources Division, under Contract No. EMW-94-E-4433. No new hydrologic analyses were performed as part of that study. That study was completed in October 1995 (Reference 1).

City of Victoria

The hydrologic and hydraulic analyses for the study effective August 4, 1987 were prepared by Albert H. Halff Associates, Inc., for FEMA, under Contract No. EMW-84-C-1619. The work for that study was completed in March 1985 (Reference 2).

For the revision effective May 17, 1990, updated hydrologic and hydraulic analyses for Whispering Creek and interbasin flow between Whispering Creek and Lone Tree Creek were prepared by Dewberry & Davis under agreement with FEMA. The work for that study was completed in February 1989 (Reference 2).

For the revision effective May 17, 1990, the hydraulic analysis for Spring Creek was prepared by Albert H. Halff Associates, Inc. That work was completed in April 1987 (Reference 2).

For the revision effective July 21, 1999, the hydraulic analysis for Whispering Creek from the upstream side of John Stockbauer Drive to approximately 3,640 feet upstream of Zac Lentz Parkway (located in Victoria County) was performed for FEMA by the USGS, Water Resources Division, under Contract No. EMW-94-E-4433. No new hydrologic analyses were performed as part of that study. That study was completed in October 1995 (Reference 2).

Countywide Study

For this revision, hydrologic analysis for the Guadalupe River was computed by the USGS, Water Resources Division completed in October 2006. Hydraulic analysis for the Guadalupe River was prepared for FEMA by Halff Associates, Inc., under Contract No. EMT-2002-CO-0051 completed in August 2008. The Levee Analysis and Mapping Process was completed by RAMPP under Contract No. HSFEHQ-09-D-0369 for the Channel to Victoria Protection Levee and Guadalupe River. RAMPP incorporated coastal analysis completed by Taylor Engineering, under FEMA IDIQ Contract EMT–2002–CO–0051, and completed in May, 2012.

Base map files were provided in digital format by the U.S. Geological Survey (USGS 1989), National Geodetic Survey (NGS 2004), U.S. Census Bureau TIGER files 2019, Texas Natural Resources Information System (TNRIS 2019), and the City of Victoria (2020).

This data is referenced to the State Plane Coordinate System, Texas, South Central (FIPS Zone 4204). Horizontal distances are measured in feet using the North American Datum of 1983 (NAD83), GRS80 spheroid. Differences in the datum and spheroid used in the production of FIRMs for adjacent county may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of information shown on the FIRM.

1.3 Coordination

The initial Consultation Coordination Officer (CCO) meeting was held on April 5, 2006, and attended by representatives of FEMA, AES Consulting Engineers, the City of Victoria, Guadalupe-Blanco River Authority, Landtech Consultants, Urban Engineering, Victoria County, Victoria County Appraisal District, and Halff Associates, Inc.

The results of the study were reviewed at the final CCO meeting held on January 27, 2011 and attended by representatives of Victoria County and the City of Victoria. All problems raised at that meeting have been addressed in this study.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS report covers the geographic area of Victoria County, Texas, including the incorporated communities listed in Section 1.1. The areas studied by detailed methods were selected with priority given to all known flood hazards and areas of projected development or proposed construction through June 2010.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA and community officials.

The flooding sources studied by detailed methods along with the limits of study are shown in Table 1, "Scope of Study."

Table 1 - Scope of Study Stream Reaches Studied by Detailed Methods

Stream Name	Downstream Limit	Downstream Limit	Length (mi)
New Detailed Study Streams			
Guadalupe River	Victoria County/ Refugio and Calhoun Counties	Victoria County/ DeWitt County	67.05
Redelineated Detailed Study Streams			
Coleto Creek	Confluence with Guadalupe River	1.06 miles upstream of U.S. Highway 59	12.69
Crescent Valley Creek	Confluence of Spring bayou	950 feet upstream on Union Pacific Railroad	2.08
Dry Creek	Confluence with Guadalupe River	110 feet upstream of Coletoville Road	12.20
East Branch Lone Tree Creek	Confluence with Lone Tree Creek	0.52 miles upstream of Colony Creek Drive	1.03
Garcitas Creek	1,330 feet downstream of F.M. 444	340 feet upstream of Benbow Road	15.34
Jim Branch Outfall	Confluence with Cypress Bayou	340 feet upstream of Benbow Road	3.02
Lone Tree Creek	170 feet downstream on F.M. 1686	John Stockbauer Road	13.54

Table 1 - Scope of Study Stream Reaches Studied by Detailed Methods (Continued)

Stream Name	Downstream Limit	Downstream Limit	Length (mi)
North Outfall	Confluence with Spring Creek	Divergence from Whispering Creek	9.47
Spring Creek	Confluence with Guadalupe River	1,960 feet upstream of Railroad	12.50
U.S. Route 77 Outfall	Confluence with North Outfall	U.S. Highway 77	0.62
West Outfall	Confluence with Guadalupe River	90 feet upstream of U.S. Business Highway 77	1.78
Whispering Creek	Confluence with Spring Creek	0.69 miles upstream of Zac Lentz Parkway	3.17

This FIS also incorporates, where applicable, the determinations of letters issued by FEMA resulting in map changes (Letters of Map Revision [LOMR], and Letter of Map Revision Based on Fill [LOMR-F]). Letters of Map Revision incorporated as part of this PMR have been shown in Table 3, Letters of Map Revision incorporated as part of this PMR have been shown in Table 2, "Letters of Map Revision," and are reflected in Table X, "Floodway Data," and Exhibit 1, "Flood Profiles."

Table 2- Letters of Map Revision

Case Number	Effective Date	Flooding Sources	Community Name	Panel Number
11-06-1656P	03/09/2012	Lone Tree Creek	City of Victoria	48469C0305H
12-06-0680X	06/01/2012	Lone Tree Creek East Branch Lone Tree Creek	City of Victoria	48469C0305H
13-06-3977P	05/30/2014	Whispering Creek	City of Victoria Victoria County	48469C0305H

2.2 Community Description

Victoria County, located in southeast Texas, has a land area of 570,000 square miles, of which approximately 2,300 acres are covered with water. It is bordered by Jackson County to the northeast, Calhoun County to the southeast, Refugio County to the southwest, Goliad County to the west, and DeWitt County to the northwest (Reference 1).

According to U.S. Census 2000 figures, the population of Victoria County was 84,088. This represents an increase in population of 13.1% since the 1990 census. The July 2008 estimate of Victoria County population was 86,755. The City of Victoria is the only incorporated community in the county; the 2008 population estimate was 62,558 (Reference 3).

Agriculture has been economically successful in Victoria County since Spanish missionaries began herding cattle in the area in the early 18th century. Cattle ranching is the main agricultural enterprise in the county; grain, sorghum, rice and corn are the main crops grown. The growing season for most crops falls between April and September (Reference 1).

The major land uses in the county are cattle ranching and farming. According to the 1982 Soil Survey of Victoria County, Texas, soil land use in the county is made up of rangeland (68 percent), cropland (21 percent), pastureland and hay land (4 percent), urban and water areas (4 percent), and idle land (3 percent) (Reference 4).

A large underground reservoir, several tributaries and major rivers, and Coleto Creek Reservoir supply water to meet residential, industrial, and recreational demands. Commercial production of oil and natural gas has continued since the 1930s. Sand and gravel are mined in areas along the Guadalupe River and transported to other coastal areas through the Victoria Barge Canal and Intracoastal Canal System. The canal was completed in 1967, and continues to contribute to the area's economy as an inexpensive method of waterway transportation. The canal parallels the Guadalupe River through the southern part of the county to the San Antonio Bay and the Intracoastal Waterways (Reference 1).

Soil conditions are a concern in Victoria County. The county lies in the Gulf Coast Prairies and Texas Claypan Major Land Resource areas. The soils in the Gulf Coast Prairies are predominantly dark, loamy, and clayey. The soils in the Texas Claypan area are predominantly light, loamy and sandy. The main concern for management is lack of slope for these soils. The nearly level areas are often seasonally wet and need adequate drainage outlets. Other unprotected areas are susceptible to sheet and gully erosion (Reference 1).

Elevations range from zero feet in the southern portion of the county to over 200 feet in the northern and northwestern portions of the county (Reference 1).

The mean temperature ranges from 43.6 degrees Fahrenheit in winter to 93.4 degrees Fahrenheit in summer (Reference 5).

The mean annual rainfall in the City of Victoria is 40.1 inches for the past 30 years of record. Six months of the year recorded average total rainfalls of approximately 3 inches or more during May through October. The wettest month is May with an average rainfall of 5.12 inches. The driest month is February, having an average rainfall of 2.04 inches (Reference 5).

2.3 Principal Flood Problems

Flooding problems in the county have been aggravated by the flatness of the terrain and the predominance of clayey and loamy soils that are poorly drained and not very permeable. Tropical storms also have affected Victoria County's flooding problems. An example of this is Hurricane Beulah, which produced heavy flooding in September 1967 (Reference 1).

A tabulation of the six USGS gaging stations that are located on streams in the county is shown in Table 3, "USGS Stream Gaging Stations Period of Record" (References 6 and 7).

Table 3 - USGS Stream Gaging Stations Period of Record

Stream Name	Location	Gage No.	Period of Record
Coleto Creek	Near Coleto Creek Dam	08177400	1980–present
Coleto Creek*	U.S. Highway 59	08177500	1939–1954 and 1978–present
Coleto Creek	Near Arnold Road	08176900	1930–1933 and 1953–present
Garcitas Creek	U.S. Highway 59	08164600	1970–present
Guadalupe River	U.S. Business Highway 59	08176500	1934–present
Placedo Creek	Near Placedo, TX	08164800	1970–present

*In 1980, the Coleto Creek Dam was constructed upstream of this gage, and regulates flow through the gage.

The historical floods on Coleto Creek and Garcitas Creek were recorded on the gages located at U.S. Highway 59 on both streams. For the Guadalupe River, the historical flood was recorded on U.S. Business Highway 59 (References 6 and 8).

Major historical floods have been recorded on Coleto Creek, Garcitas Creek, and the Guadalupe River. The dates and discharges of the major recorded historical floods in Victoria, Texas, are shown in Table 4, ‘‘Major Historical Floods’’ (References 6 and 7).

Table 4 - Major Historical Floods

Stream Name	Date of Record	Recorded Peak Discharge (cfs)	Approximate Frequency Event
Coleto Creek	1946	89,000	4%
	1967	236,000	0.2%
Garcitas Creek	1978	17,000	10%
	1981	19,700	4%
	1991	19,100	4%
	1995	18,900	4%
Guadalupe River*	1833**	179,000	1%
	1929**	79,000	10%
	1936	179,000	1%
	1967	70,000	10%
	1981	105,000	4%
	1987	83,400	4%
	1991	61,500	10%
	1998	466,000	***
	2002	71,700	10%
	2004	102,000	4%

* Canyon Lake Dam completed in 1964
** Before gage was in operation
*** Greater than 0.2 percent-annual-chance flood event

2.4 Flood Protection Measures

A major dam, located within Victoria County, is the Coleto Creek Dam on Coleto Creek, approximately 1.6 miles upstream of U.S. Highway 59 (Reference 9). The dam is used for industrial water-supply purposes and for a cooling pond for an electric generating station. Canyon Lake Dam, located on the Guadalupe River in Comal County approximately 110 miles northwest of the City of Victoria, is a U.S. Army Corps of Engineers (USACE) flood-control project, and affects flood discharges on the Guadalupe River. Considerable channel improvement projects have been undertaken within the City of Victoria. The North Outfall has been channelized and check dams have been utilized to prevent erosion (Reference 10). The North Outfall also acts as a diversion channel for

Whispering Creek. U.S. Route 77 Outfall has been channelized and realigned as have Jim Branch Outfall and the West Outfall (References 11 and 12). Each of these streams has also had new bridges or culverts built at several road crossings. Lone Tree Creek and its tributary, East Branch, have also been channelized. The channel improvements are primarily earthen channels, with concrete structures (constructed since 1983) that are maintained by the city (Reference 13). All of these channel improvement projects have been considered in the hydraulic analysis for this study (References 1 and 2).

A levee exists along the current wastewater treatment plant facility located on the east bank of the Guadalupe River, just north of U.S. Highway 59 and above the confluence of the Jim Branch Outfall. A portion of that levee, adjacent to the old wastewater treatment plant, continues to be maintained by the Guadalupe-Blanco River Authority (GBRA). The Application for Approval of Levee Project Report stated that the levee has been constructed to an elevation of 52.0 feet (Reference 14). FEMA specifies that all levees must have minimum 3-foot freeboard against the 1-percent-annual-chance flooding to be considered a safe flood protection structure. In this study, the calculated 1-percent-annual-chance water surface elevations (WSELs) for the Guadalupe River at the wastewater treatment plant are approximately 50 feet. Analysis has shown that less than 3.0 feet of freeboard on the 1-percent-annual-chance flood exists along this levee. Therefore, for the purpose of computing WSELs on the Guadalupe River in this area, it was assumed that the area behind the levee was ineffective for flood conveyance. Since the levee has inadequate freeboard, the 1-percent-annual-chance flood elevation is projected behind the levee for the purposes of the Flood Insurance Rate Map (FIRM) (References 1 and 2).

The Victoria Barge Canal levee is located along the east side of the Guadalupe River just south of the City of Victoria. The levee exists to provide capacity for navigation of the canal. Analysis has shown that less than 3.0 feet of freeboard on the 1-percent-annual-chance flood exists along this levee. Therefore, for the purpose of computing water surface elevations on the Guadalupe River in this area, the 1-percent-annual-chance water surface elevations on the unprotected side (riverside) of the levee were computed with the levee in place, while the 1-percent-annual-chance water surface elevations on the landward side of the levee were computed as if the levee did not exist. The FIRM shows the 1-percent-annual-chance computed water surface elevations for both the riverside and landward side of the levee.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that is expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent-chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1-year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent-annual-chance flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the county.

3.1.1 New Detailed Study Streams

The USGS prepared a new hydrologic flood frequency analysis for the Guadalupe River to determine the 10-, 2-, 1-, and 0.2-percent-annual-chance flood frequency-discharges (Reference 15). The flood frequency analysis was based on the stream gage located on the Guadalupe River at U.S. Business Highway 59 at Victoria, Texas (No. 08176500). The USGS has maintained the gage at Victoria since 1934. Canyon Lake Dam was constructed above New Braunfels in 1964. The drainage area above the dam is 1,432 square mile (sq. mi.) (about 28 percent of the total drainage area at Victoria). However, evaluation of the flood peaks for the periods 1935–1963 and 1964–2005 indicates no identifiable reduction in flood magnitude or frequency. Additionally, at the Guadalupe River above the Comal River at New Braunfels, three of the five highest peaks for the period 1928–2005 have occurred since the construction of Canyon Lake Dam. Therefore, flood-peak discharges for the entire period of record (1935–2005) were used to compute station flood frequency. In addition, the 1936 flood was reported to be higher than any prior flood since 1833. Therefore, a historical record length of 173 years was used in the analyses. Station flood frequency was computed using methods presented in the "Guidelines for Determining Flood-Flow Frequency," Bulletin 17B of the Interagency Advisory Committee on Water Data (Reference 16), as recommended in "Guidelines and Specifications for Flood Hazard Mapping Partners", prepared by FEMA (Reference 17). Regional flood frequency discharges were developed in 2005 as a function of mean annual precipitation, basin slope, and a power transformation of drainage area (Reference 18). The station flood frequency discharges compared well with the regional estimates. The discharges utilized for the study were derived by weighting the station and the regional estimates (Reference 15).

3.1.2 Redelineated Detailed Study Streams

The redelineated streams were initially studied by detailed methods. These flooding sources include all those listed in Table 1, "Scope of Study," under the "Redelineation Detailed Study Streams" heading.

For Coleto Creek, the computer program NUDALLAS was calibrated to data from the gage (No. 08176900) located near Schroeder, and was used to obtain inflow hydrographs into the Coleto Creek Reservoir (Reference 19). The hydrographs were then routed through the reservoir using the gate opening information from the GBRA (Reference 20).

For the remaining streams studied by detailed methods, a synthetic unit hydrograph analysis was used. The U.S. Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) Technical Release No. 20 (TR-20) computer program was used to perform this analysis (Reference 21). Topographic maps were used to determine drainage areas and to determine stream lengths (References 22 and 23). Runoff curve numbers were based on the USDA-NRCS soil survey for Victoria County, Texas (Reference 4). Routing coefficients were based on velocity assumptions of 2 to 4 feet per second. U.S. Weather Bureau (USWB) Technical Paper No. 40 was used to determine the rainfall depth for the 10-, 2-, and 1-percent-annual-chance frequency storms (Reference 24). The 0.2-percent-annual-chance event was based on extrapolated data; a 24-hour duration storm was assumed. The hydrologic coefficients used on these streams were developed on Garcitas Creek where the TR-20 model was calibrated to a statistical gage analysis. This gage analysis was performed by the USGS on the gage located on Garcitas Creek at U.S. Highway 59 using the USGS J407 program (References 6 and 25). The analysis was based on 13 years of systematic record.

Whispering Creek has two diversions. For the first diversion, the discharge values decreased despite an increase in drainage area because of the diversion of flow from Whispering Creek to the North Outfall diversion. The amount of flow that was diverted was determined by splitting the flow between the two streams so that the energy grade line of the streams matched at the point of divergence (Reference 2).

For the second diversion located near the upstream limit of Whispering Creek, the decrease in discharge with no change in drainage area is due to the diversion of flow from Whispering Creek into the Lone Tree Creek drainage basin. The flow dissipates before entering Lone Tree Creek; thus creating no increase in discharges for Lone Tree Creek. The amount of flow that was diverted was determined using the split-flow analysis option of the USACE Hydrologic Engineering Center (HEC) HEC-2 step-backwater computer program (Reference 26).

For the revision effective November 20, 1998, following a survey down the centerline of Salem Road, it was determined that a split-flow analysis for Whispering Creek was necessary. In the analysis for Whispering Creek, the split-flow was divided into three sections to reflect more accurately the amount of discharge and velocity of flow over Salem Road. Due to improvements to Salem Road, the amount of spill over Salem Road decreased since the study effective May 17, 1990. Since the November 20, 1998 restudy was performed only upstream of John Stockbauer Drive, the discharge values shown in Table 4, “Summary of Discharges," downstream of John Stockbauer Drive for Whispering Creek represent the discharges that would occur prior to the improvements made to Salem Road; and, thus, do not agree with the revised discharge values shown upstream of John Stockbauer Road. The discharge values for North Outfall also represent the discharge values prior to the Salem Road improvements and were not revised as part of the November 20, 1998 restudy. These discrepancies will be resolved during the next revision that impacts North Outfall and the downstream portion of Whispering Creek (References 1 and 2).

Peak discharge-drainage area relationships for the streams studied by detailed methods are shown in Table 5, “Summary of Discharges.”

Table 5 - Summary of Discharges

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. mile)	PEAK DISCHARGES (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
COLETO CREEK					
At confluence with Guadalupe River	541.0	53,600	118,300	131,500	207,400
CRESCENT VALLEY CREEK					
At confluence of Spring Bayou	8.3	2,200	3,170	3,690	4,760
At point approximately 1 mile upstream of Turning Basin	7.1	1,970	2,820	3,280	4,230
At Old Bloomington Road	6.4	1,860	2,670	3,110	4,020
At F.M. 175	4.6	1,300	1,880	2,190	2,830
DRY CREEK					
At confluence with Guadalupe River	19.0	5,420	7,840	9,150	11,850
At U.S. Highway 59	17.1	5,140	7,430	8,660	11,220
At point approximately 1 mile upstream of Old Goliad Road	13.8	4,700	6,820	7,960	10,330
At point approximately 2 miles upstream of Old Goliad Road	10.1	3,550	5,160	6,030	7,830
At Coletoville Road	3.6	1,460	2,120	2,480	3,220
EAST BRANCH LONE TREE CREEK					
Downstream of John Stockbauer Drive	3.6	1,000	1,440	1,690	2,190
GARCITAS CREEK					
Upstream of confluence of Marcado Creek	172.7	23,200	34,000	39,900	52,200
At Holub Road	149.1	20,600	30,200	35,500	46,500
At confluence of Casa Blanca Creek	136.9	20,300	29,800	35,000	45,800
Upstream of confluence of Casa Blanca Creek	105.0	16,700	24,700	29,000	38,100
At U.S. Highway 59 gage station	102.4	16,700	24,700	29,100	38,100
GUADALUPE RIVER					
At U.S. Business Highway 59	5,200.0	65,700	145,000	192,000	347,000

Table 5 – Summary of Discharges (Continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. mile)	PEAK DISCHARGES (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
JIM BRANCH OUTFALL					
At confluence with Cypress Bayou	4.7	2,050	2,900	3,400	4,350
At Hand Road	4.1	1,950	2,750	3,200	4,100
At Callis Street	3.5	1,600	2,300	2,650	3,400
At Ben Jordan Outfall	2.4	1,000	1,400	1,650	1,200
At Hanselman Road	0.4	300	450	500	650
LONE TREE CREEK					
At F.M. 1686	28.5	7,440	10,650	12,380	15,970
At Menke Road	24.8	6,840	9,810	11,410	14,740
At Wood Hi Road	21.4	6,160	8,850	10,310	13,330
At F.M. 2615	17.2	5,270	7,590	8,840	11,430
At Interstate Route 175	13.1	4,280	6,160	7,180	9,280
At Southern Pacific Railroad	8.8	3,200	5,004	5,965	8,335
At confluence of East Branch	7.3	2,898	4,631	5,513	7,473
At Airline Road	4.3	2,583	3,554	4,064	5,029
At a point approximately 1,200 feet upstream of Ben Jordan Street	2.8	1,633	2,261	2,536	3,246
NORTH OUTFALL					
At confluence with the Spring Creek	7.3	1,650	2,300	2,600	3,350
At confluence with U.S. Route 77 Outfall	5.0	900	1,200	1,350	1,750
SPRING CREEK					
At confluence with Guadalupe River	53.3	10,100	14,650	17,100	22,250
At confluence of Whispering Creek	52.7	9,950	14,250	16,600	21,400
At confluence of North Outfall	46.4	8,950	13,050	15,300	19,900
At Clark School Road	35.8	8,450	12,300	14,400	18,800
At Parsons Road	31.6	7,900	11,600	13,600	17,700
At Oliver Road	25.5	6,700	9,800	11,500	15,000
At Raab Road	18.7	5,100	7,400	8,700	11,350
At U.S. Highway 87	11.3	3,400	4,950	5,800	7,600

Table 5 – Summary of Discharges (Continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. mile)	PEAK DISCHARGES (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
U.S. ROUTE 77 OUTFALL					
At confluence with North Outfall	2.3	715	1,030	1,200	1,550
At U.S. Route 77	1.9	610	880	1,020	1,310
WEST OUTFALL					
At confluence with Guadalupe River	3.2	1,760	2,500	2,900	3,730
At Red River Street	2.7	1,590	2,230	2,580	3,290
At Main Street	2.3	1,390	1,940	2,230	2,830
At Navarro Street	1.7	1,070	1,490	1,720	2,180
WHISPERING CREEK					
At confluence with Spring Creek	5.9	1,150	1,750	2,050	2,700
At private drive approximately 0.33 miles upstream of confluence with Spring Creek	5.3	900	1,400	1,650	2,200
At Country Club Drive	5.1	850	1,300	1,550[1]	2,050[1]
At confluence of North Outfall	4.7	778	1,259	1,574[1]	2,183[1]
At John Stockbauer Drive	4.1	*	*	1,757[2]	2,325[2]
At point approximately 0.93 miles upstream of John Stockbauer Drive	4.1	1,550	2,250	2,650	3,450

* Data not available
[1] Decrease in flow with increase in area is result of spill
[2] Decrease in flow without change in area is result of spill

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

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

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

3.2.1 New Detailed Study Streams

A hydraulic model was prepared for the Guadalupe River to compute water surface elevations for the 10-, 2-, 1- and 0.2-percent-annual-chance flood events using the HEC River Analysis System (HEC-RAS) Version 4.0 (Reference 27). Cross sections were extracted from a terrain data set composed of the 2006 Texas Natural Resources Information System (TNRIS) Light Detection and Ranging (LiDAR) topography (Reference 28), supplemented with field surveys conducted during the winter of 2006–2007. Bridge data was obtained from field surveys and as-built plans. Starting water surface elevations were based on the slope/area method. Channel roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations and 2004 digital orthophotos (Reference 29) of the stream and the floodplain areas. The model was calibrated to historical storms from October 1998, July 2002, and November 2004. Additional highwater marks acquired from the GBRA were also incorporated into the calibration effort. Flood profiles were drawn showing computed water surface elevation for floods of the selected recurrence intervals.

As part of the Levee Analysis and Mapping Procedure (LAMP) for the Channel to Victoria Protection Levee, a two-dimensional model was used to map the unaccredited levee on the landward side of the levee for the Channel to Victoria Protection Levee (Reference 34). This natural valley modeling produced lower BFEs on the landward side of the levee than the riverward side of the levee. The LAMP project is already incorporated in Caloun and Refugio County FIRMs and FIS.

3.2.2 Redelineated Detailed Study Streams

The analyses for the redelineated study streams were taken from the prior FIS for Victoria County and the City of Victoria (References 1 and 2). The Base (1-percent- annual-chance) Flood Elevations (BFEs) from the profiles were plotted on the best available topographic data to better define the special flood hazard areas. The redelineated streams are identified in Section 2.1.

Cross sections for the backwater analysis were obtained by two methods. Synthetic sections were developed from topographic maps compiled from aerial photographs at a scale of 1:4,800 with a contour interval of 2 feet encompassing the streams studied by detailed methods (Reference 22). Cross sections were field surveyed for portions of those streams. Bridge data and dimensions of other hydraulic structures were obtained by field measurements, bridge plans from the Texas Department of Transportation (TxDOT), Union Pacific Railroad, and construction plans from various bridge culvert or channel improvement projects (References 1 and 2).

For the study effective November 20, 1998, a new cross section along Coleto Creek was placed approximately 800 feet below the railroad crossing. The U.S. Highway 59 Northbound Bridge was replaced with a new bridge since the study effective May 17, 1990; therefore, the estimated northbound downstream and upstream cross sections and the estimated northbound bridge hydraulics were replaced by surveyed cross section data (References 1 and 2).

Since the study effective May 17, 1990 was issued, a set of four box culverts was constructed on Whispering Creek to accommodate the crossing of Zac Lentz Parkway. For the study effective November 20, 1998, new cross sections and culvert hydraulics were added to the hydraulic analyses at Zac Lentz Parkway (References 1 and 2).

Water surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (Reference 26).

Flood profiles were drawn showing computed water surface elevations for floods of the selected recurrence intervals. Starting water surface elevations for East Branch Lone Tree Creek were based on the coincident peak method; starting water surface elevations for all other streams studied were based on the slope/area method (Reference 2).

Channel roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations of the streams and floodplain areas. Channel and overbank "n" values for the streams studied by detailed methods are shown in Table 6, ''Summary of Roughness Coefficients.''

Table 6 - Summary of Roughness Coefficients
Stream Reaches Studied by Detailed Methods

Stream Name	Channel "n" Value	Overbank "n" Value
Coleto Creek	0.025-0.045	0.045-0.120
Crescent Valley Creek	0.035-0.085	0.050-0.090
Dry Creek	0.025-0.100	0.050-0.100
East Branch Lone Tree Creek	0.015-0.070	0.050-0.150
Garcitas Creek	0.035	0.050-0.100
Guadalupe River	0.065	0.050-0.150
Jim Branch Outfall	0.015-0.035	0.045-0.090
Lone Tree Creek	0.035-0.075	0.030-0.150
North Outfall	0.015-0.090	0.035-0.045
Spring Creek	0.050-0.120	0.035-0.120
U.S. Route 77 Outfall	0.015-0.040	0.075-0.150
West Outfall	0.020-0.080	0.035-0.150
Whispering Creek	0.015-0.090	0.030-0.120

3.3 Coastal Analysis

The hydraulic characteristics of coastal flood sources were analyzed to provide estimates of flood elevations for selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown in the coastal data tables and flood profiles provided in the FIS Report.

3.3.1 Storm Surge Analysis and Modeling

For areas subject to coastal flood effects, the 10-, 2-, 1-, and 0.2-percent-annual-chance stillwater elevations were taken directly from a detailed storm surge study documented in *Flood Insurance Study: Coastal Counties, Texas Intermediate Submission 2 – Scoping and Data Review* prepared by the U.S. Army Corps of Engineers (USACE, 2011). This storm surge study was completed in November 2011.

The Advanced Circulation (ADCIRC) model for coastal and ocean hydrodynamics was applied by the U.S. Army Corps of Engineers (USACE) to calculate stillwater elevations for coastal Texas. The ADCIRC model uses an unstructured grid and is a finite element long wave model. It has the capability to simulate tidal circulation and storm surge propagation over large areas and is able to provide highly detailed resolution in areas of interest along shorelines, open coasts and inland bays. It solves three dimensional equations of motion, including tidal potential, Coriolis, and non-linear terms of the governing equations. The model is formulated from the depth-averaged shallow water equations for conservation of mass and momentum which result in the generalized wave continuity equation.

In performing the coastal analyses, nearshore waves were required as inputs to wave runup and overland wave propagation calculations, and wave momentum (radiation stress) was considered as contribution to elevated water levels (wave setup). The Steady State Spectral Wave (STWAVE) model was used to generate and transform waves to the shore for the Texas Joint Storm Surge (JSS) Study. STWAVE is a finite difference model that calculates wave spectra on a rectangular grid. The model outputs zero-moment wave height (Hs), peak wave period (Tp), and mean wave direction at all grid points and two-dimensional spectra at selected grid points. STWAVE includes an option to input spatially variable wind and storm surge field. Storm surge significantly alters wave transformation and generation for the hurricane simulations in shallow-flooded areas.

STWAVE was applied on five grids for the Texas JSS: NE, CE, SW, NEn, and CEn. Three large grids (NE, CE, SW) with offshore boundaries at depths near 100 feet (30 meters) encompassed the entire coast of Texas and applied the efficient half-plane version of STWAVE (which must approximately align with the shoreline). Two nested grids (NEn and CEn) covered Galveston Bay and Corpus Christi Bay and applied the fullplane version of STWAVE to allow generation of wind waves in all directions. Notably, memory requirements for the full-plane model precluded its use for the large grids with offshore boundaries. The input for each grid includes the bathymetry (interpolated from the ADCIRC domain), surge fields (interpolated from ADCIRC surge fields), and wind fields (interpolated from the ADCIRC wind fields, which apply land effects to the base wind fields). The wind and surge applied in STWAVE are spatially and temporally variable for all domains. STWAVE was run at 30-minute intervals for 93 quasi-time steps (46.5 hours).

The ADCIRC model computational domain and the geometric/topographic representation developed for the Joint Coastal Surge effort was designated as the TX2008 mesh. This provided a common domain and mesh from the Texas-Mexico border to western Louisiana, extends inland across the floodplains of Coastal Texas (to the 30- to 75-foot contour NAVD88), and extends over the entire Gulf of Mexico to the deep Atlantic Ocean. The TX2008 domain boundaries were selected to ensure the correct development, propagation, and attenuation of storm surge without necessitating nesting solutions or specifying ad hoc boundary conditions for tides or storm surge. The TX2008 computational mesh contains more than 2.8 million nodes and nodal spacing varies significantly throughout the mesh. Grid resolution varies from approximately 12 to15 miles in the deep Atlantic Ocean to about 100 ft. in Texas. Further details about the terrain data as well as the ADCIRC mesh creation and grid development process can be found in

Flood Insurance Study: Coastal Counties, Texas Intermediate Submission 2 – Scoping and Data Review (USACE, 2011).

3.3.2 Statistical Analysis

The Joint Probability Method (JPM) is a simulation methodology that relies on the development of statistical distributions of key hurricane input variables such as central pressure, radius to maximum wind speed, maximum wind speed, translation speed, track heading, etc., and sampling from these distributions to develop model hurricanes. The resulting simulation results in a family of modeled storms that preserve the relationships between the various input model components, but provides a means to model the effects and probabilities of storms that historically have not occurred.

Due to the excessive number of simulations required for the traditional JPM method, the JPM-Optimum Sampling (JPM-OS) was utilized to determine the stillwater elevations associated with tropical events. JPM-OS is a modification of the JPM method and is intended to minimize the number of synthetic storms that are needed as input to the ADCIRC model. The methodology entails sampling from a distribution of model storm parameters (e.g., central pressure, radius to maximum wind speed, maximum wind speed, translation speed, and track heading) whose statistical properties are consistent with historical storms impacting the region, but whose detailed tracks differ. The methodology inherently assumes that the hurricane climatology over the past 60 to 65 years (back to 1940) is representative of the past and future hurricanes likely to occur along the Texas coast.

A set of 446 storms (two sets of 152 low frequency storms + two sets of 71 higher frequency storms) was developed by combining the "probable" combinations of central pressure, radius to maximum winds, forward speed, angle of track relative to coastline, and track. Tracks were defined by five primary tracks and four secondary tracks. Storm parameters for synthetic storms are provided in Table 11 of *Flood Insurance Study: Coastal Counties, Texas Intermediate Submission 2 – Scoping and Data Review* (USACE, 2011). The estimated range of storm frequencies using the selected parameters was between the 10%- and 0.2%-annual-chance storm events. The ADCIRC-STWAVE modeling system was validated using five historic storms: Hurricanes Carla (1961), Allen (1980), Bret (1999), Rita (2005), and Ike (2008).

3.3.3 Wave Height Analysis

Using storm surge study results, wave height analysis was performed to identify areas of the coastline subject to overland wave propagation or wave runup hazards. Figure 1 shows a cross section for a typical coastal analysis transect, illustrating the effects of energy dissipation and regeneration of wave action over inland areas. This figure shows the wave crest elevations being decreased by obstructions; such as buildings, vegetation, and rising ground elevations; and being increased by open, unobstructed wind fetches. Figure 1 also illustrates the relationship between the local stillwater elevations, the ground profile, and the location of the Zone VE/AE boundary at the limit of 3 feet breaking waves. This inland limit of the coastal high hazard area is delineated to ensure that adequate insurance rates apply and appropriate construction standards are imposed, should local agencies permit building in this coastal high hazard area.

It has been shown in laboratory tests and observed in field investigations that wave heights as little as 1.5 feet can cause damage to and failure of typical Zone AE construction. Therefore, for advisory purposes only, a Limit of Moderate Wave Action (LiMWA) boundary has been added in coastal areas subject to wave action. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave.

The effects of wave hazards in the Zone AE between the Zone VE (or shoreline in areas where Zones VE are not identified) and the limit of the LiMWA boundary are similar to, but less severe than, those in Zone VE where 3-foot breaking waves are projected during a 1-percent-annual-chance flooding event.

In areas where wave runup elevations dominate over wave heights, such as areas with steeply sloped beaches, bluffs, and/or shore-parallel flood protection structures, there is no evidence to date of significant damage to residential structures by runup depths less than 3 feet. However, to simplify representation, the LiMWA was continued immediately landward of the VE/AE boundary in areas where wave runup elevations dominate. Similarly, in areas where the Zone VE designation is based on the presence of a primary frontal dune or wave overtopping, the LiMWA was also delineated immediately landward of the Zone VE/AE boundary.

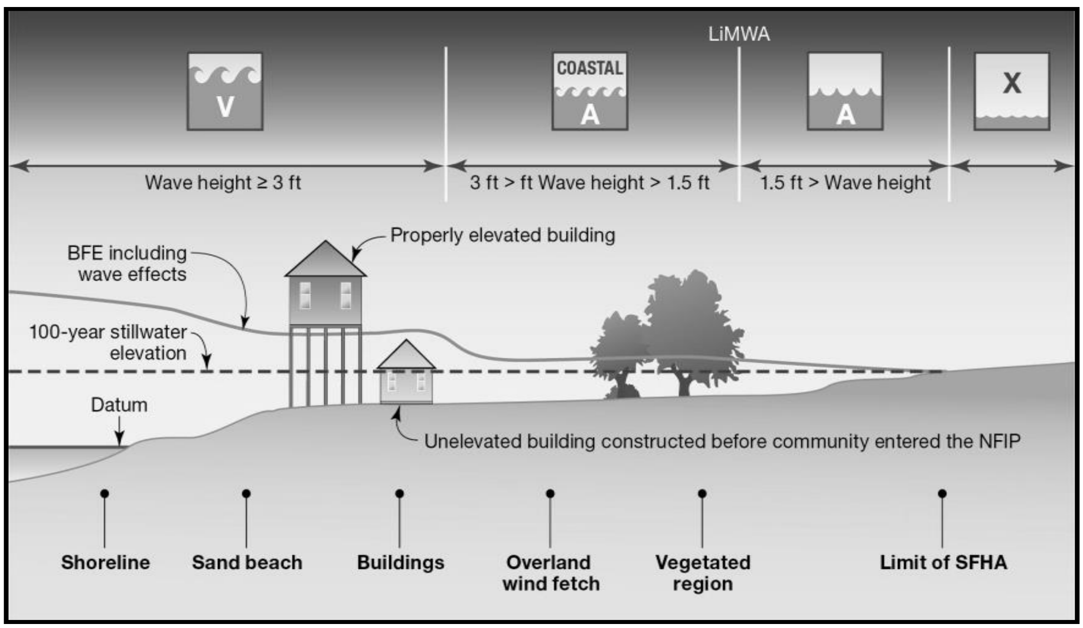

Figure 1: Transect Schematic

No LiMWA was developed for this Victoria County countywide FIS.

Transect locations and spacing is determined by considerations of physical and land-use characteristics of the coast. The transects are located to adequately represent the dominant direction of overland wave propagation. The transects are closely spaced in areas of changing topography or land use and, conversely, spread further apart in areas of similar topography or land use. Transects are also located in areas where unique flooding existed and in areas where computed wave heights varied significantly between adjacent transects. Where transects crossed, the largest wave height value was delineated on the FIRM panel. Transects are shown on the respective FIRM panels for the county.

Figure 2, "Transect Location Map" shows the transect layout used for the overland wave analyses. Along each transect, wave envelopes were computed considering the combined effects of changes in ground elevation, stillwater surface elevation (including wave setup), vegetation, and physical features. Between transects, elevations were interpolated using LiDAR topographic data, land-use and land-cover data, and engineering judgment to determine the aerial extent of flooding. The transect data for each transect in the county, including the flood hazard zone, base flood elevations, transect location description, 10-, 2-, 1-, and 0.2-percent-annual-chance stillwater elevations at the start of the transect and the range found along the length of the transect is provided in the Victoria County Coastal Technical Support Data Notebook (TSDN).

This study applied topographic data from LiDAR data collected by FEMA in 2006 under a subcontract with Sanborn. (Reference 27). In 2011 National Oceanographic and Atmospheric Administration (NOAA) modified and updated some areas of the data. The topographic data is referenced to NAVD88.

The combination of three land use data sources comprised the data used to identify areas of vegetative cover (forest, marsh grass, etc), buildings (density and spacing), and open water. The three sources are: aerial photos from the U.S. Department of Agriculture (Reference 28), U.S. Fish and Wildlife Service's National Wetland Inventory maps (Reference 29), and NOAA's *Coastal Change Analysis Program* (*C-CAP*) data (Reference 30). Complete metadata for these data are found in the Technical Support Data Notebook (TSDN). In addition, Taylor Engineering collected detailed information about the features, such as building types, density, and vegetation types during a ground field reconnaissance.

No storm-induced erosion analysis was performed for this study. Primary frontal dune mapping was not applied.

Wave height calculation used in this study follows the methodology described in the *Atlantic Ocean and Gulf of Mexico Coastal Guidelines Update*, 2007 (Reference 31). Calculations of overland wave height propagation, using WHAFIS 4.0, included both the 1-percent and the 0.2-percent-annual-chance events. The 0.2-percent wave height results are not included on the FIRMs but are provided as wave-transect profiles in the TSDN.

Each transect calculates wave heights based on stillwater elevations (from the 1-percent surge modeling), ground elevations at each station along a transect, and land-use properties. Wave setup was not calculated separately because wave setup was included in the base stillwater elevations from the storm surge analysis.

This study used default WHAFIS initial wave conditions based on fetch for each transect. Open water transects (primarily along the open Gulf) used the maximum 24 miles of open fetch and interior transects used measured fetch lengths.

The Transect Location Map (Figure 2) shows the transect layout used for the overland wave analyses. Along each transect, wave envelopes were computed considering the combined effects of changes in ground elevation, stillwater surface elevation (including wave setup), vegetation, and physical features. Between transects, elevations were interpolated using LiDAR topographic data, land-use and land-cover data, and engineering judgment to determine the aerial extent of flooding. The transect data for each transect in the county, including the flood hazard zone, base flood elevations, transect location description, 10-, 2-, 1-, and 0.2-percent annual chance stillwater elevations at the start of the transect and the range found along the length of the transect is provided in the TSDN. Table 6 presents a summary of stillwater elevations along each transect.

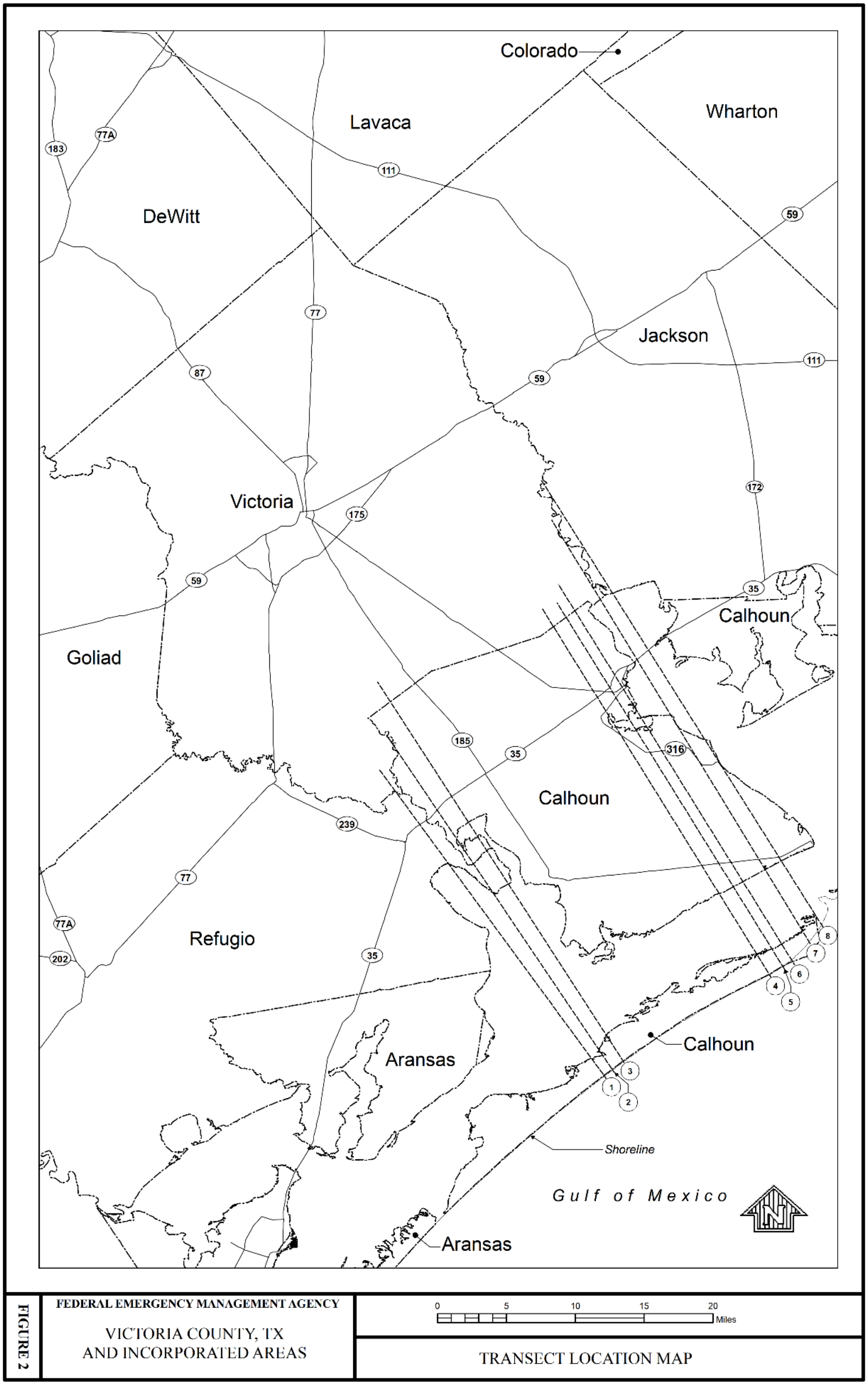

Figure 2: Transect Location Map

3.3.4 Stillwater Elevations

The results of the ADCIRC model and JPM-OS provided 10-, 2-, 1-, and 0.2-percent-annual-chance stillwater elevations which include wave setup effects. Stillwater elevations are assigned at individual ADCIRC mesh nodes throughout the Texas coast. Triangular Irregular Networks (TINs) and raster datasets were built from these nodes for use in wave analysis and floodplain mapping.

An Independent Technical Review (ITR) was performed on the overall storm surge study process. This review process was performed in accordance with USACE regulations. The ITR team was composed of experts in the fields of coastal engineering and science, and was engaged throughout the study. Appendix K of Flood Insurance Study: Coastal Counties, Texas Intermediate Submission 2 – Scoping and Data Review includes all comments received from the ITR panel, as well as responses to those comments (USACE, 2011).

Table 7, "Coastal Data," contains a summary of the stillwater elevations per transect.

Table 7 - Coastal Data

Transect	Description	Latitude & longitude at Start of Transect	Starting Stillwater Elevations (feet NAVD 88) Range of Stillwater Elevations (feet NAVD 88)				Zone Designation and BFE (feet NAVD 88)
			10%-Annual-Chance	2%-Annual-Chance	1%-Annual-Chance	0.2%-Annual-Chance	
1	From the Gulf of Mexico extends inland across San Antonio Bay and Hynes Bay	96°39'25.255"W 28°12'20.822"N	5.2* **	8.3* **	10.2* **	12.8* **	A AE
2	From the Gulf of Mexico extends inland across San Antonio Bay	96°38'50.206"W 28°12'43.533"N	5.2* **	8.3* **	10.2* **	12.9* **	AE
3	From the Gulf of Mexico extends inland across San Antonio Bay	96°38'2.54"W 28°13'13.759"N	5.2* **	8.3* **	10.1* 8.8 - 14.5	12.9* 16.5 - 21.8	AE
4	From the Gulf of Mexico extends inland across Espiritu Santo Bay	96°27'30.288"W 28°18'31.274"N	5.3* **	8.0* **	9.8* 9.5 - 9.5	13.0* 16.5 - 16.8	A
5	From the Gulf of Mexico extends inland across Espiritu Santo Bay	96°26'32.402"W 28°19'1.353"N	5.3* 6.0 - 6.1	8.1* 10.3 - 10.4	9.8* 13.5 - 13.5	12.7* 18.3 - 18.8	AE14
6	From the Gulf of Mexico extends inland across Espiritu Santo Bay	96°25'55.09"W 28°19'26.394"N	5.3* 59. - 7.1	8.1* 10.2 - 10.5	9.8* 8.8 - 13.6	12.7* 16.5 - 19.1	AE14-15
7	From the Gulf of Mexico extends inland across Espiritu Santo Bay	96°24'37.421"W 28°20'33.06"N	5.4* 5.7 - 7.0	8.3* 7.8 - 10.6	9.8* 11.7 - 14.5	13.0* 17.2 - 21.8	AE15 VE17-18
8	From the Gulf of Mexico extends inland across Espiritu Santo Bay	96°23'43.613"W 28°21'37.187"N	5.5* **	8.3* **	10.0* **	12.9* **	A

* Length of transect within county is above stillwater elevations

3.4 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 the National Geodetic Vertical Datum of 1929 (NGVD29). With the completion of the North American Vertical Datum of 1988 (NAVD88), many FIS reports and FIRMs are now prepared using NAVD88 as the referenced vertical datum.

Flood elevations shown in this FIS report and on the FIRM are referenced to the NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. Some of the data used in this revision were taken from the prior effective FIS reports and FIRMs and adjusted to NAVD88. The datum conversion factor from NGVD29 to NAVD88 in Victoria County is -0.30 feet.

For information regarding conversion between the NGVD29 and NAVD88, visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

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

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

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

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

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

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic data from 2006 LiDAR based mass points suitable for a contour interval of 2 feet (Reference 28).

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM. On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 0.2-percent- annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations, but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

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

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the base flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

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 (see Table 8, "Floodway Data"). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Coleto Creek								
A	8,590	4,200	47,509	2.8	46.7	46.7	47.7	1.0
B	ll,090	3,500	50,309	2.6	49.1	49.1	50.0	0.9
C	14,080	1,420	21,036	6.3	51.7	51.7	52.4	0.7
D	14,260	1,249	21,117	6.2	52.2	52.2	52.8	0.6
E	15,340	3,210	39,958	3.3	53.7	53.7	54.2	0.5
F	21,570	4,130	67,456	1.9	57.6	57.6	58.5	0.9
G	28,600	3,750	49,282	2.7	60.3	60.3	61.1	0.8
H	32,566	1,642	24,286	5.4	65.8	65.8	66.3	0.5
I	35,090	2,895	40,818	3.2	68.5	68.5	69.4	0.9
J	40,500	1,000	20,308	6.5	72.5	72.5	72.7	0.2
K	43,200	680	16,903	7.8	73.8	73.8	74.3	0.5
L	46,150	550	12,853	10.2	75.5	75.5	75.8	0.3
M	55,650	430	13,626	9.7	79.7	79.7	80.2	0.5
N	60,400	649	15,687	8.4	81.8	81.8	82.5	0.7
O	61,579	700	19,064	6.9	84.4	84.4	84.9	0.5
P	66,999	900	19,734	6.7	86.1	86.1	87.1	1.0

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

Table 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

COLETO CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Crescent Valley Creek								
A	4,500	150	1,034	3.2	40.4	32.8[2]	33.8	1.0
B	6,100	131	679	4.8	40.4	35.7[2]	36.5	0.8
C	7,900	323	1,302	2.5	40.7	39.3[2]	40.1	0.8
D	8,900	590	2,015	1.5	40.8	40.1[2]	40.9	0.8
E	10,000	172	750	2.9	40.9	40.6[2]	41.4	0.8

[1]Stream distance in feet above confluence of Spring Bayou
[2]Elevation computed without consideration of backwater effects from Guadalupe River

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

CRESCENT VALLEY CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Dry Creek								
A	21,440	320	2,414	3.8	53.6	50.1[2]	51.1	1.0
B	23,436	238	1,868	4.9	54.9	54.9	55.8	0.9
C	23,565	205	1,808	5.1	56.0	56.0	56.7	0.7
D	25,085	469	4,059	2.3	57.8	57.8	58.7	0.9
E	27,085	431	3,307	2.8	60.3	60.3	61.3	1.0
F	29,610	308	3,064	2.8	64.8	64.8	65.6	0.8
G	32,030	401	5,593	1.5	68.9	68.9	69.4	0.5
H	33,120	350	4,599	1.9	69.1	69.1	69.7	0.6
I	35,495	338	2,909	3.0	70.5	70.5	71.5	1.0
J	35,744	128	1,343	6.4	73.0	73.0	73.6	0.6
K	37,765	114	1,281	6.8	75.7	75.7	76.6	0.9
L	38,920	349	2,538	3.1	79.3	79.3	80.2	0.9
M	43,530	159	1,501	4.0	83.7	83.7	84.7	1.0
N	48,330	560	3,063	2.0	92.5	92.5	93.5	1.0
O	51,925	135	1,353	4.5	99.7	99.7	100.6	0.9
P	54,025	303	2,531	1.0	102.0	102.0	103.0	1.0
Q	60,475	54	217	11.4	108.7	108.7	108.7	0.0
R	62,524	915	2,448	1.0	118.1	118.1	118.6	0.5
S	64,224	270	856	2.9	119.6	119.6	120.2	0.6
T	64,324	559	2,790	0.9	121.1	121.1	122.0	0.9

[1]Stream distance in feet above confluence with Guadalupe River
[2]Elevation computed without consideration of backwater effects from Guadalupe River

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

DRY CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
East Branch Lone Tree Creek								
A	930	270	1,185	1.4	94.7	94.7	95.7	1.0
B	1,820	90	664	2.5	95.1	95.1	96.0	0.9
C	2,510	145	1,175	1.4	95.9	95.9	96.8	0.9
D	3,280	122	882	1.9	96.4	96.4	97.4	1.0
E	4,245	97	529	3.2	97.0	97.0	97.9	0.9
F	5,310	114	612	2.8	98.2	98.2	98.7	0.5

[1]Stream distance in feet above confluence with Lone Tree Creek

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

EAST BRANCH LONE TREE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Garcitas Creek								
A	10,100	1,126	16,322	2.4	27.7	27.7	28.7	1.0
B	19,500	989	14,059	2.5	30.0	30.0	31.0	1.0
C	22,800	1,986	24,588	1.4	30.5	30.5	31.5	1.0
D	27,200	800	9,473	3.7	31.1	31.1	32.0	0.9
E	30,700	700	9,892	3.6	34.6	34.6	35.2	0.6
F	36,600	1,134	10,557	3.3	37.1	37.1	38.0	0.9
G	43,200	593	7,528	4.6	42.9	42.9	43.7	0.8
H	44,800	980	14,833	2.0	44.9	44.9	45.9	1.0
I	45,700	1,028	15,563	1.9	45.1	45.1	46.1	1.0
J	46,700	1,020	13,609	2.1	45.2	45.2	46.2	1.0
K	49,200	563	6,158	4.7	45.4	45.4	46.3	0.9
L	56,200	566	7,023	4.1	55.4	55.4	56.2	0.8
M	59,000	853	12,272	2.4	56.9	56.9	57.9	1.0
N	64,832	1,534	14,204	2.0	61.4	61.4	62.1	0.7
O	66,932	1,407	12,746	2.3	62.0	62.0	62.7	0.7
P	69,232	413	6,266	4.6	63.1	63.1	63.9	0.8
Q	73,032	686	11,464	2.5	65.7	65.7	66.7	1.0
R	76,232	605	7,027	4.1	66.9	66.9	67.8	0.9
S	82,632	295	4,312	6.7	69.1	69.1	70.0	0.9

[1] Stream distance in feet above confluence of Arenosa Creek

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

GARCITAS CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)				
					REGULATORY				
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	RIVER SIDE (NAVD)	LAND SIDE[4] (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Guadalupe River									
A	19,876	1, 018[2] /16,349[3]	166,273	1.2	15.3	--[5]	15.3	15.9	0.6
B	34,228	2,413[2] /8,861[3]	123,965	1.6	16.5	--[5]	16.5	17.1	0.6
C	40,565	2,104[2] /6,965[3]	104,461	2.0	18.0	--[5]	18.0	18.6	0.6
D	51,662	4,732[2] /3,932[3]	101,548	1.9	20.2	--[5]	20.2	21.1	0.9
E	56,161	1,739[2] /6,584[3]	103,039	1.9	20.8	--[5]	20.8	21.8	1.0
F	61,077	115[2] /6,025[3]	92,788	2.1	23.3	15.2	15.2	24.3	1.0
G	69,173	5,745	96,909	2.0	26.2	18.0	18.0	27.2	1.0
H	72,995	7,468	118,978	1.6	27.1	19.2	19.2	28.0	0.9
I	74,173	6,267	97,583	2.0	27.9	20.3	20.3	28.7	0.8
J	79,266	7,410	110,108	1.7	28.8	21.3	21.3	29.6	0.8
K	84,164	10,204	158,651	1.2	29.2	21.9	21.9	30.1	0.9
L	93,173	10,998	148,238	1.3	30.0	22.7	22.7	30.9	0.9
M	101,401	13,541	185,746	1.0	30.4	23.4	23.4	31.3	0.9
N	105,992	13,083	181,948	1.1	30.9	24.7	24.7	31.8	0.9
O	108,176	14,606	205,583	0.9	31.1	26.4	26.4	32.0	0.9
P	113,108	14,978	180,707	1.1	31.5	28.6	28.6	32.4	0.9
Q	116,601	14,306	151,589	1.3	32.6	30.7	30.7	33.4	0.8
R	133,359	17,550	160,156	1.2	34.7	32.0	32.0	35.4	0.7
S	155,706	14,962	141,101	1.4	37.5	33.2	33.2	38.0	0.5
T	157,308	17,436	191,536	1.4	38.0	38.0	38.0	38.5	0.5

[1]Stream distance in feet above State Highway 35
[2]Width of floodway in Victoria County
[3]Width of floodway in Calhoun County
[4]Land side elevations were calculated with the assumption that no flood protection will be provided by the levee
[5]Land side elevation in Calhoun County only

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

GUADALUPE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Guadalupe River (Continued)								
U	163,516	13,271	124,163	1.6	40.0	40.0	40.3	0.3
V	169,666	11,823	127,039	1.5	40.5	40.5	40.8	0.3
W	184,033	16,097	115,609	1.8	41.4	41.4	41.6	0.2
X	190,965	14,513	100,330	1.9	43.3	43.3	44.1	0.8
Y	195,423	12,856	86,155	2.2	45.7	45.7	46.3	0.6
Z	206,523	13,450	116,751	2.0	48.4	48.4	49.1	0.7
AA	207,638	12,083	120,708	2.0	49.8	49.8	50.5	0.7
AB	223,137	11,893	114,811	1.7	52.5	52.5	53.5	1.0
AC	229,566	11,175	89,473	2.2	53.7	53.7	54.6	0.9
AD	235,001	10,488	82,395	2.3	54.7	54.7	55.7	1.0
AE	238,890	10,507	93,510	2.1	55.6	55.6	56.4	0.8
AF	240,356	10,148	75,478	2.5	57.1	57.1	58.0	0.9
AG	240,623	10,018	75,259	2.6	60.0	60.0	60.6	0.6
AH	242,198	10,300	81,313	2.4	61.6	61.6	62.0	0.4
AI	245,089	9,112	95,886	2.0	63.2	63.2	63.8	0.6
AJ	248,872	10,501	87,073	2.2	64.3	64.3	64.9	0.6
AK	252,106	10,706	89,865	2.1	65.9	65.9	66.6	0.7
AL	260,132	11,814	129,148	1.9	67.3	67.3	68.2	0.9
AM	271,214	13,232	100,227	1.9	71.7	71.7	72.1	0.4
AN	277,396	12,825	106,660	1.8	72.8	72.8	73.5	0.7
AO	280,462	9,532	81,525	2.4	74.2	74.2	74.8	0.6
AP	283,283	7,816	67,582	2.8	76.1	76.1	77.0	0.9
AQ	287,885	6,800	78,569	2.4	80.8	80.8	81.5	0.7

[1] Stream distance in feet above State Highway 35

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

GUADALUPE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Guadalupe River (Continued)								
AR	289,623	4,740	59,984	3.2	82.5	82.5	83.5	1.0
AS	294,994	5,261	63,101	3.0	85.6	85.6	86.5	0.9
AT	305,744	4,400	71,443	2.7	91.8	91.8	92.4	0.6
AU	311,669	4,902	78,941	2.4	94.5	94.5	95.3	0.8
AV	317,449	4,847	69,025	2.8	96.8	96.8	97.7	0.9
AW	324,319	5,241	72,987	2.6	99.2	99.2	100.1	0.9
AX	326,089	4,630	54,093	3.6	99.9	99.9	100.8	0.9
AY	329,439	3,475	42,918	4.5	102.8	102.8	103.7	0.9
AZ	334,783	7,505	91,861	2.1	105.5	105.5	106.3	0.8
BA	337,461	5,793	70,361	2.7	106.8	106.8	107.6	0.8
BB	340,023	3,606	52,997	3.6	108.7	108.7	109.4	0.7
BC	340,141	4,056	55,668	3.5	109.0	109.0	109.7	0.7
BD	343,191	5,701	60,741	3.2	110.8	110.8	111.5	0.7
BE	347,254	5,221	52,713	3.6	112.9	112.9	113.8	0.9
BF	352,784	4,471	52,692	3.6	115.6	115.6	116.6	1.0
BG	356,434	5,401	67,224	2.9	118.2	118.2	119.2	1.0
BH	360,193	3,280	38,316	5.0	120.6	120.6	121.6	1.0
BI	366,218	4,198	53,813	3.6	125.5	125.5	126.4	0.9

[1] Stream distance in feet above State Highway 35

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

GUADALUPE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Jim Branch Outfall								
A	2,665	1,448	4,344	0.7	52.3	47.9[2]	48.9	1.0
B	3,745	983	2,303	1.4	52.3	48.1[2]	49.1	1.0
C	5,265	60	348	9.2	52.3	50.8[2]	51.7	0.9
D	6,080	79	536	6.0	54.6	54.6	54.6	0.0
E	6,485	97	777	3.4	55.1	55.1	55.1	0.0
F	7,785	95	522	5.1	65.7	65.7	66.4	0.7
G	8,185	92	491	5.4	66.2	66.2	67.0	0.8
H	8,375	107	688	3.9	68.6	68.6	69.2	0.6
I	9,390	98	569	4.7	69.7	69.7	70.1	0.4
J	10,100	90	469	5.7	70.7	70.7	71.1	0.4
K	11,465	82	515	3.2	74.6	74.6	74.8	0.2
L	12,130	96	500	3.3	74.6	74.6	74.9	0.3
M	12,490	53	323	5.1	75.6	75.6	75.9	0.3
N	13,295	52	292	5.7	77.0	77.0	77.2	0.2
O	14,250	90	525	3.1	79.4	79.4	79.6	0.2
P	15,950	75	376	1.3	79.8	79.8	80.0	0.2

[1]Stream distance in feet above confluence with Cypress Bayou
[2]Elevation computed without consideration of backwater effects from Guadalupe River

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

JIM BRANCH OUTFALL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lone Tree Creek								
A	99,400	2,620	8,024	1.5	62.1	62.1	63.1	1.0
B	107,800	1,847	6,185	2.0	66.2	66.2	66.8	0.6
C	110,380	364	2,905	3.9	68.5	68.5	69.1	0.6
D	111,900	1,154	4,919	2.3	69.6	69.6	70.2	0.6
E	114,600	1,522	5,829	2.0	70.6	70.6	71.3	0.7
F	116,600	1,274	3,798	3.0	71.5	71.5	72.2	0.7
G	119,400	1,384	5,566	2.1	73.0	73.0	73.7	0.7
H	122,900	679	4,694	2.2	75.9	75.9	76.3	0.4
I	124,100	926	3,721	2.8	76.3	76.3	76.7	0.4
J	133,690	2,230	7,312	1.4	80.8	80.8	81.7	0.9
K	134,500	2,421	7,615	1.4	81.0	81.0	81.9	0.9
L	141,600	2,650	6,120	1.4	85.1	85.1	85.1	0.0
M	143,060	1,403	5,030	1.8	85.5	85.5	85.8	0.3
N	145,900	980	3,499	2.1	86.7	86.7	87.1	0.4
O	146,640	813	4,063	1.8	88.1	88.1	88.5	0.4
P	152,150	475	2,673	1.8	91.1	91.1	92.0	0.9
Q	153,220	574	2,898	1.7	91.5	91.5	92.4	0.9
R	154,933	188	1,684	3.6	93.2	93.2	94.2	1.0
S	156,597	1,110	6,416	2.0	94.8	94.8	95.7	0.9
T	157,709	639	3,853	2.7	94.9	94.9	95.8	0.9
U	159,465	902	5,392	1.0	95.0	95.0	95.9	0.9
V	161,354	207	2,664	1.3	95.0	95.0	95.9	0.9
W	161,664	304	2,772	1.4	95.0	95.0	96.0	1.0
X	164,406	211	1,300	2.4	97.5	97.5	97.8	0.3

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

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

LONE TREE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lone Tree Creek (Continued)								
Y	166,308	190	853	3.1	98.7	98.7	98.9	0.2
Z	166,893	209	1,167	2.2	99.1	99.1	99.2	0.1
AA	167,547	140	919	2.6	99.7	99.7	99.9	0.2
AB	169,596	100	463	3.5	101.5	101.5	101.9	0.4
AC	170,457	69	336	4.8	102.9	102.9	103.3	0.4

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

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

LONE TREE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
North Outfall								
A	670	128	869	3.0	79.0	75.8[2]	76.7	0.9
B	810	92	505	5.1	79.0	79.2[2]	79.2	0.0
C	1,060	92	504	5.2	82.4	82.4	82.4	0.0
D	1,281	92	504	5.2	85.5	85.5	85.5	0.0
E	1,560	126	834	3.1	88.9	88.9	88.9	0.0
F	2,005	144	1,131	2.3	94.9	94.9	94.9	0.0
G	2,700	140	1,066	2.4	95.0	95.0	95.0	0.0
H	3,000	139	1,056	1.3	95.1	95.1	95.1	0.0
I	3,450	134	719	1.9	95.2	95.2	95.2	0.0
J	3,650	128	660	2.0	95.2	95.2	95.2	0.0
K	4,100	158	785	1.7	95.4	95.4	95.4	0.0

[1]Stream distance in feet above confluence with Spring Creek
[2]Elevation computed without consideration of backwater effects from Spring Creek

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

NORTH OUTFALL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Spring Creek								
A	6,270	1,080	5,000	3.4	74.7	74.7	75.7	1.0
B	7,480	945	8,470	2.0	76.4	76.4	77.3	0.9
C	9,320	560	8,603	1.9	78.8	78.8	79.7	0.9
D	11,800	830	8,194	2.0	79.0	79.0	79.9	0.9
E	13,500	615	7,443	2.1	80.9	80.9	81.5	0.6
F	16,560	450	3,714	4.1	83.8	83.8	84.7	0.9
G	19,000	535	5,106	2.8	88.5	88.5	89.5	1.0
H	21,640	575	5,776	2.5	92.2	92.2	93.1	0.9
I	23,150	555	5,038	2.9	94.0	94.0	94.9	0.9
J	24,500	500	4,713	3.1	95.7	95.7	96.7	1.0
K	27,100	750	6,218	2.3	98.1	98.1	99.0	0.9
L	29,025	575	4,732	2.9	99.4	99.4	100.3	0.9
M	32,200	410	4,047	3.4	104.1	104.1	105.0	0.9
N	34,000	415	5,004	2.7	106.0	106.0	106.8	0.8
O	37,180	335	3,188	3.6	107.4	107.4	108.3	0.9
P	39,565	280	3,074	3.7	109.9	109.9	110.7	0.8
Q	40,790	310	3,660	3.1	111.2	111.2	112.2	1.0
R	42,740	405	4,536	2.5	112.8	112.8	113.7	0.9
S	44,500	360	3,795	3.0	113.2	113.2	114.1	0.9
T	46,365	445	4,519	1.9	113.7	113.7	114.6	0.9
U	47,460	370	3,744	2.3	113.9	113.9	114.8	0.9
V	49,415	460	3,025	2.9	114.9	114.9	115.7	0.8
W	51,300	325	2,896	3.0	118.2	118.2	118.9	0.7

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

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

SPRING CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Spring Creek (Continued)								
X	55,250	380	2,753	2.8	123.0	123.0	123.5	0.5
Y	59,475	1,805	8,163	0.9	124.2	124.2	125.0	0.8
Z	61,880	1,270	7,786	0.7	126.6	126.6	127.5	0.9
AA	64,150	325	2,315	2.5	130.0	130.0	130.1	0.1
AB	66,000	525	2,428	1.7	130.7	130.7	131.2	0.5

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

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

SPRING CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
U.S. Route 77 Outfall								
A	346	100	452	2.7	95.1	93.6[2]	94.6	1.0
B	846	97	452	2.7	95.1	94.1[2]	94.9	0.8
C	1,372	90	406	3.0	95.1	94.5[2]	95.1	0.6
D	1,869	101	481	2.5	95.3	95.3	95.9	0.6
E	2,357	71	255	4.7	95.9	95.9	96.3	0.4
F	3,100	98	502	1.8	96.6	96.6	96.9	0.3

[1]Stream distance in feet above confluence with North Outfall
[2]Elevation computed without consideration of backwater effects from North Outfall

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

U.S. ROUTE 77 OUTFALL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
West Outfall								
A	150	119	1,426	2.0	64.5	59.0[2]	60.0	1.0
B	900	182	1,225	2.4	65.1	61.0[2]	62.0	1.0
C	1,240	301	1,579	1.8	65.3	61.1[2]	62.1	1.0
D	1,830	122	908	2.8	65.8	61.1[2]	62.1	0.9
E	2,240	118	839	3.1	66.2	61.1[2]	62.1	0.9
F	2,950	108	705	3.7	67.4	61.3[2]	62.3	0.2
G	3,480	494	2,422	1.1	67.5	61.6[2]	62.5	0.0
H	4,120	328	1,345	1.9	67.7	61.7[2]	62.6	0.0
I	4,650	600	2,241	1.2	67.9	61.9[2]	62.8	0.0
J	5,360	91	492	4.5	68.4	62.7[2]	62.9	0.0
K	5,970	78	349	6.4	68.5	62.9[2]	63.1	1.0
L	6,550	67	257	8.7	68.7	63.5[2]	63.6	1.0
M	6,770	77	350	6.4	71.7	71.7	71.7	1.0
N	6,940	77	348	6.4	71.9	71.9	71.9	0.9
O	7,480	89	469	4.8	75.1	75.1	75.1	0.9
P	7,940	84	417	4.1	75.4	75.4	75.4	0.2
Q	8,770	76	422	4.1	83.5	83.5	83.5	0.0
R	9,030	71	403	4.3	84.5	84.5	84.5	0.0
S	9,410	82	463	3.7	90.0	90.0	90.0	0.0

[1]Stream distance in feet above confluence with Guadalupe River
[2]Elevation computed without consideration of backwater effect from Guadalupe River

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY
VICTORIA COUNTY, TX
AND INCORPORATED AREAS

FLOODWAY DATA

WEST OUTFALL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Whispering Creek								
A	730	170	665	3.1	77.7	72.8[2]	73.8	1.0
B	1,280	59	554	3.7	77.7	72.9[2]	73.8	0.9
C	1,435	105	423	4.8	77.7	74.2[2]	74.2	0.0
D	1,860	79	383	4.3	77.7	76.6[2]	76.9	0.3
E	2,310	72	438	3.8	78.9	78.9	79.5	0.6
F	3,240	121	974	1.7	84.8	84.8	85.5	0.7
G	3,800	90	736	2.1	85.2	85.2	85.9	0.7
H	4,250	107	696	2.2	86.4	86.4	87.3	0.9
I	5,120	38	245	6.3	89.1	89.1	89.6	0.5
J	5,590	151	985	1.6	92.5	92.5	93.3	0.8
K	6,255	54	401	3.9	92.7	92.7	93.6	0.9
L	6,895	160	1,046	1.5	95.4	95.4	95.6	0.2
M	7,600	100	502	3.1	95.6	95.6	96.3	0.7
N	8,040	178	417	3.8	96.6	96.6	97.1	0.5
O	8,215	40	249	6.3	97.1	97.1	97.5	0.4
P	9,000	192	360	4.4	100.7	100.7	100.8	0.1
Q	9,950	206	460	3.4	105.0	105.0	105.4	0.4
R	10,600	134	252	5.1	106.7	106.7	106.9	0.2
S	11,342	139	654	4.1	109.3	109.3	110.3	1.0
T	11,753	102	507	5.2	109.6	109.6	110.6	1.0
U	13,972	330	613	4.3	115.1	115.1	115.6	0.5
V	14,200	430	1,280	2.1	115.7	115.7	116.7	1.0
W	15,200	447	1,265	2.1	117.2	117.2	118.2	1.0
X	16,000	550	2,467	1.1	118.0	118.0	119.0	1.0
Y	16,720	200	608	4.4	117.9	117.9	118.9	1.0

[1]Stream distance in feet above confluence with Spring Creek
[2]Elevation computed without consideration of backwater effect from Spring Creek

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

WHISPERING CREEK

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

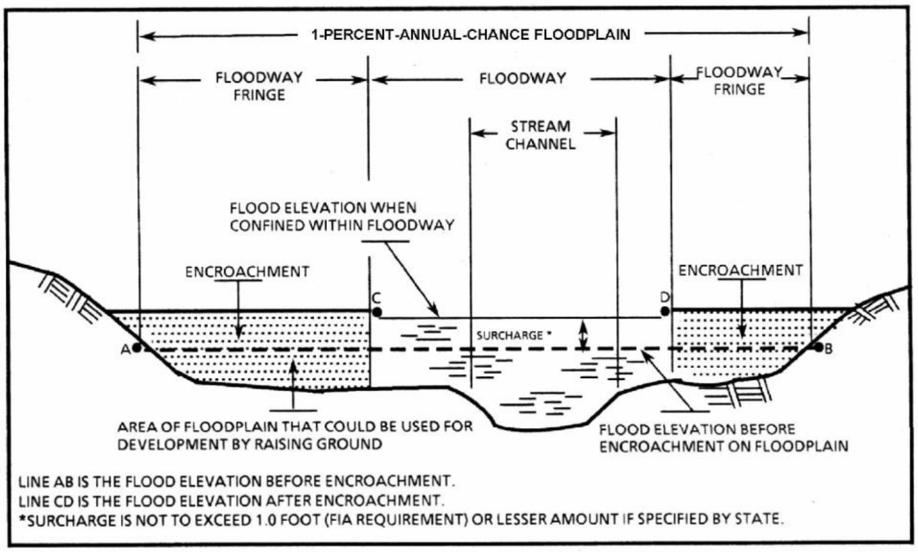

Figure 3: Floodway Schematic

In the case of redelineation, effort was made to maintain the prior effective regulatory floodway width and shape. However, due to updated topographic data, some modifications were made to contain the floodway within the limits of the 1-percent-annual-chance floodplain. Most modifications to the prior effective regulatory floodway boundaries are due to topographic changes that have occurred along the streams.

For the study effective May 17, 1990, the floodway along Whispering Creek was calculated using the reduced discharges as reflected in the split-flow analysis performed as part of that study (prior to the Salem Road improvements). Thus, the with and without floodway water surface elevations and floodway widths, as shown in Table 6, "Floodway Data," were computed based on the discharges reflected in the split-flow analysis, for that study. For the November 20, 1998 FIS restudy, these water surface elevations and floodway widths upstream of John Stockbauer Drive were calculated based on the most current FEMA standards at the time of that study. The without floodway water surface elevations are based on the discharges reflected in the revised split-flow analysis, while the with floodway water surface elevations are based on the total flow without considering the split-flow. The floodway widths were then developed using a maximum allowable surcharge of 1-foot (References 1 and 2). The floodway portion of the Guadalupe River adjacent to the Victoria Barge Canal levee was calculated per Section 12.2 of FEMA's Operating Guidance 12-13 Non-Accredited Levee Analysis and Mapping Guidance (Reference 33).

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, "Floodway Data," for certain downstream cross sections of Crescent Valley Creek, Dry Creek, Jim Branch Outfall, North Outfall, U.S. Route 77 Outfall, West Outfall, and Whispering 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.

5.0 INSURANCE APPLICATIONS

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

Zone A

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

Zone AE

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

Zone X

Zone X is the flood insurance rate 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 sq. mi., and areas protected from the base flood by levees. No BFEs or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

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

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

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

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

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISIONS DATE
Victoria, City of	May 22, 1970	None	July 23, 1971	July 1, 1974 August 22, 1976 August 12, 1977 March 1, 1984 March 18, 1985 August 4, 1987 May 17, 1990 July 21, 1999
Victoria County Unincorporated Areas	May 2, 1978	None	September 18, 1987	May 17, 1990 November 20, 1998

Table 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

The preparation of updated Flood Insurance Studies is on-going for the Incorporated and Unincorporated Areas of Calhoun, Jackson, and Refugio Counties, Texas. An updated FIS has been prepared for the Incorporated and Unincorporated Areas of DeWitt, Goliad, and Lavaca Counties. The Victoria County Study is in agreement with these studies.

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

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting FEMA Region VI, Federal Insurance and Mitigation Division, 800 North Loop 288, Denton, Texas 76209.

9.0 BIBLIOGRAPHY AND REFERENCES

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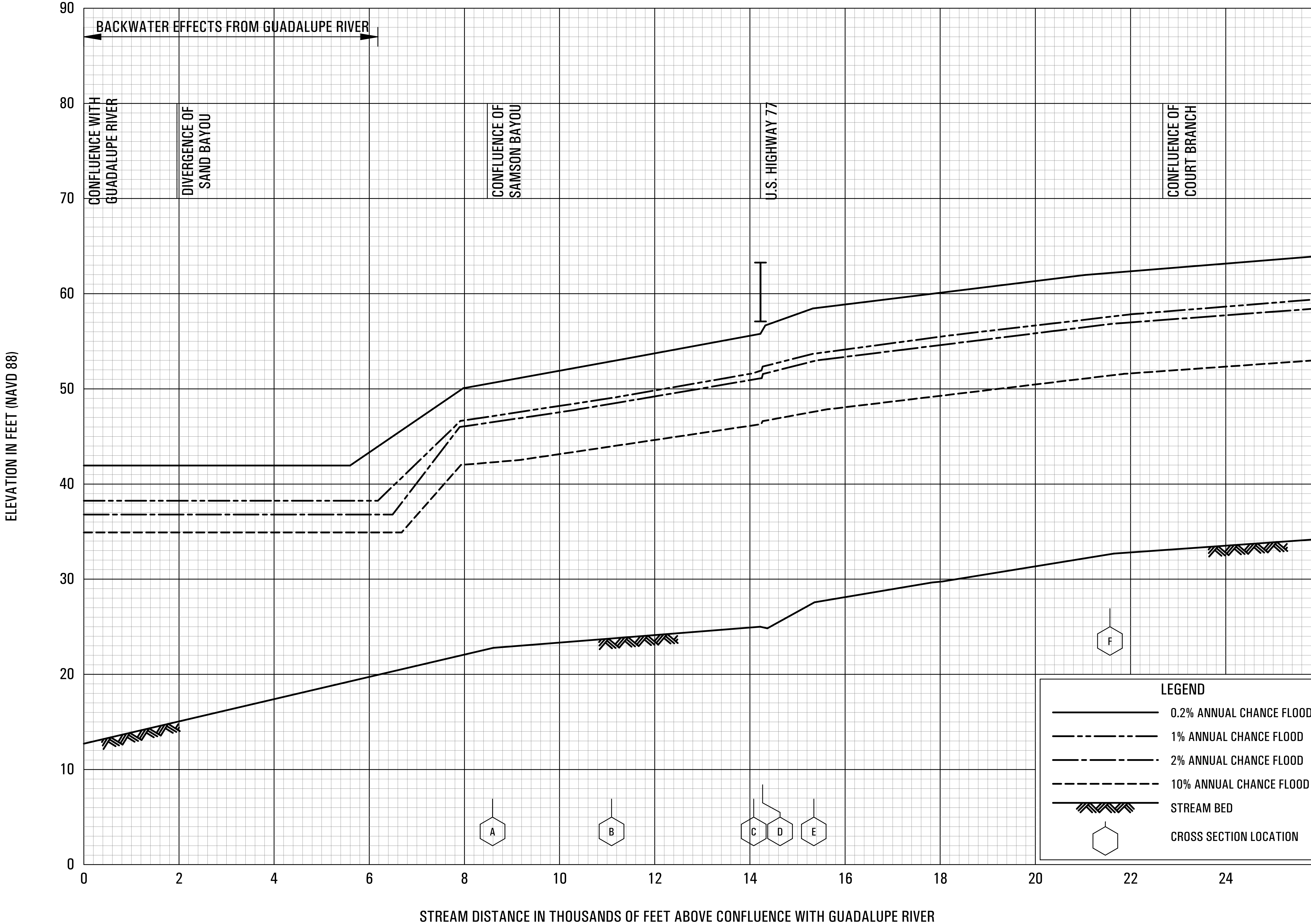

FLOOD PROFILES

COLETO CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

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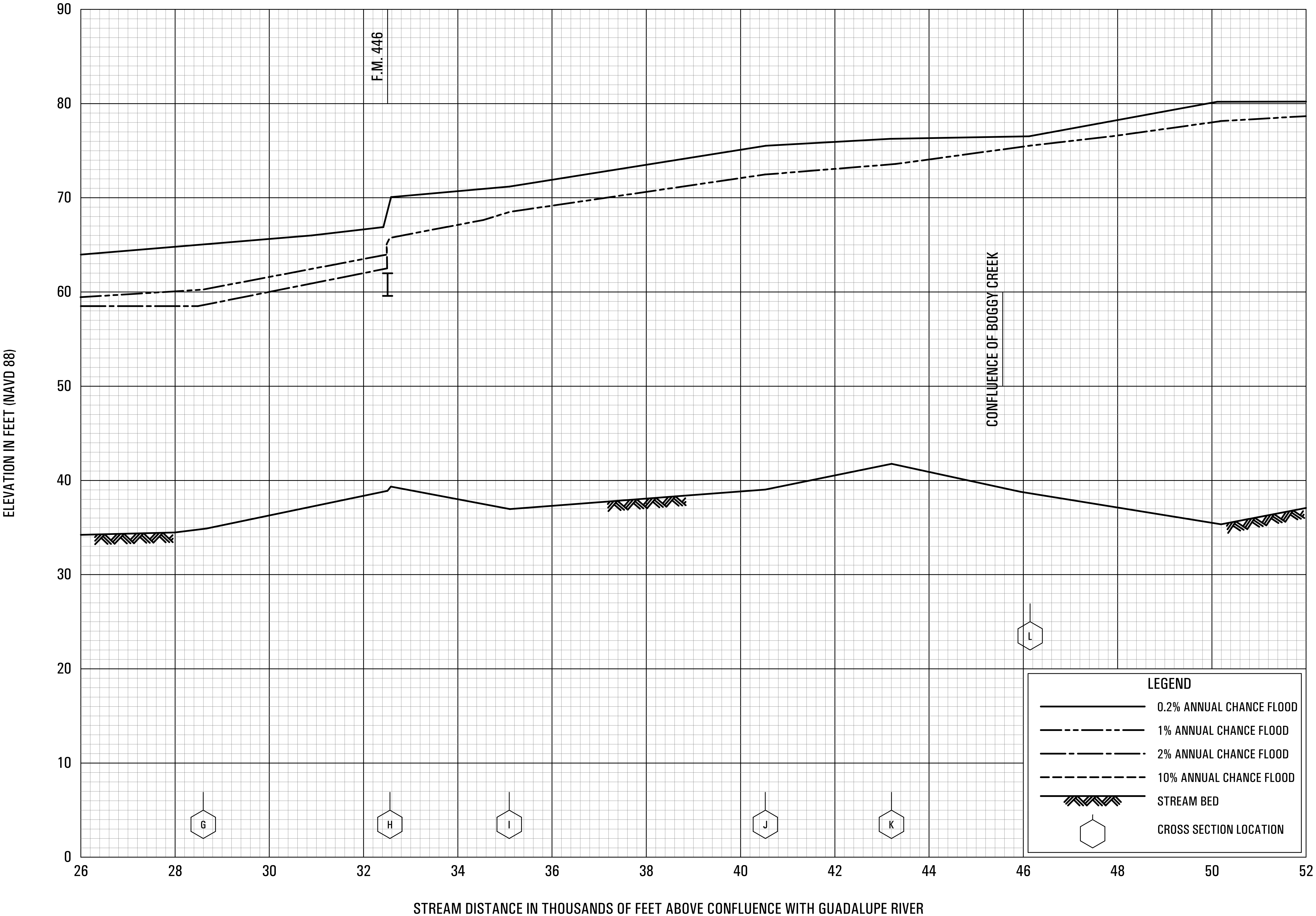

FLOOD PROFILES

COLETO CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

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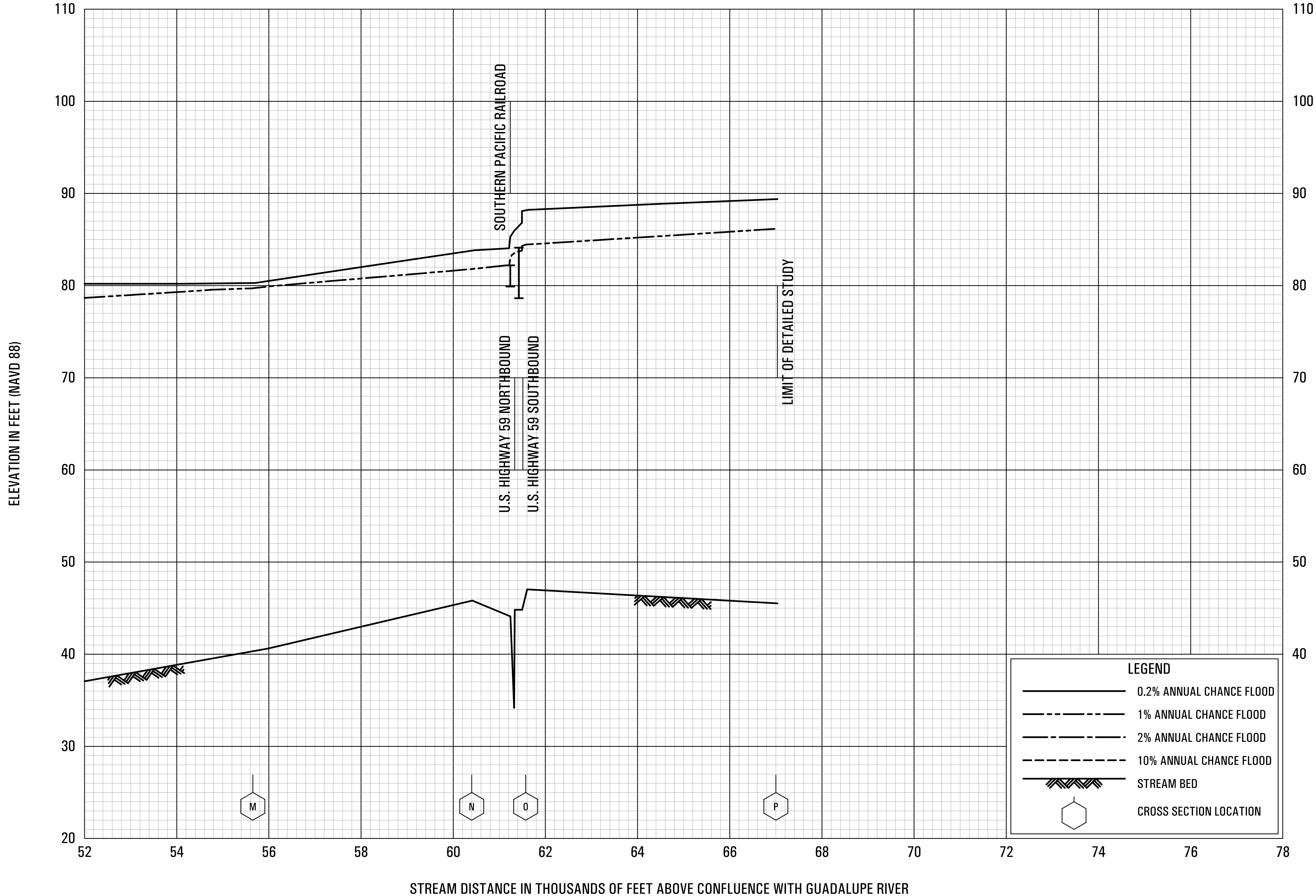

FLOOD PROFILES

COLETO CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

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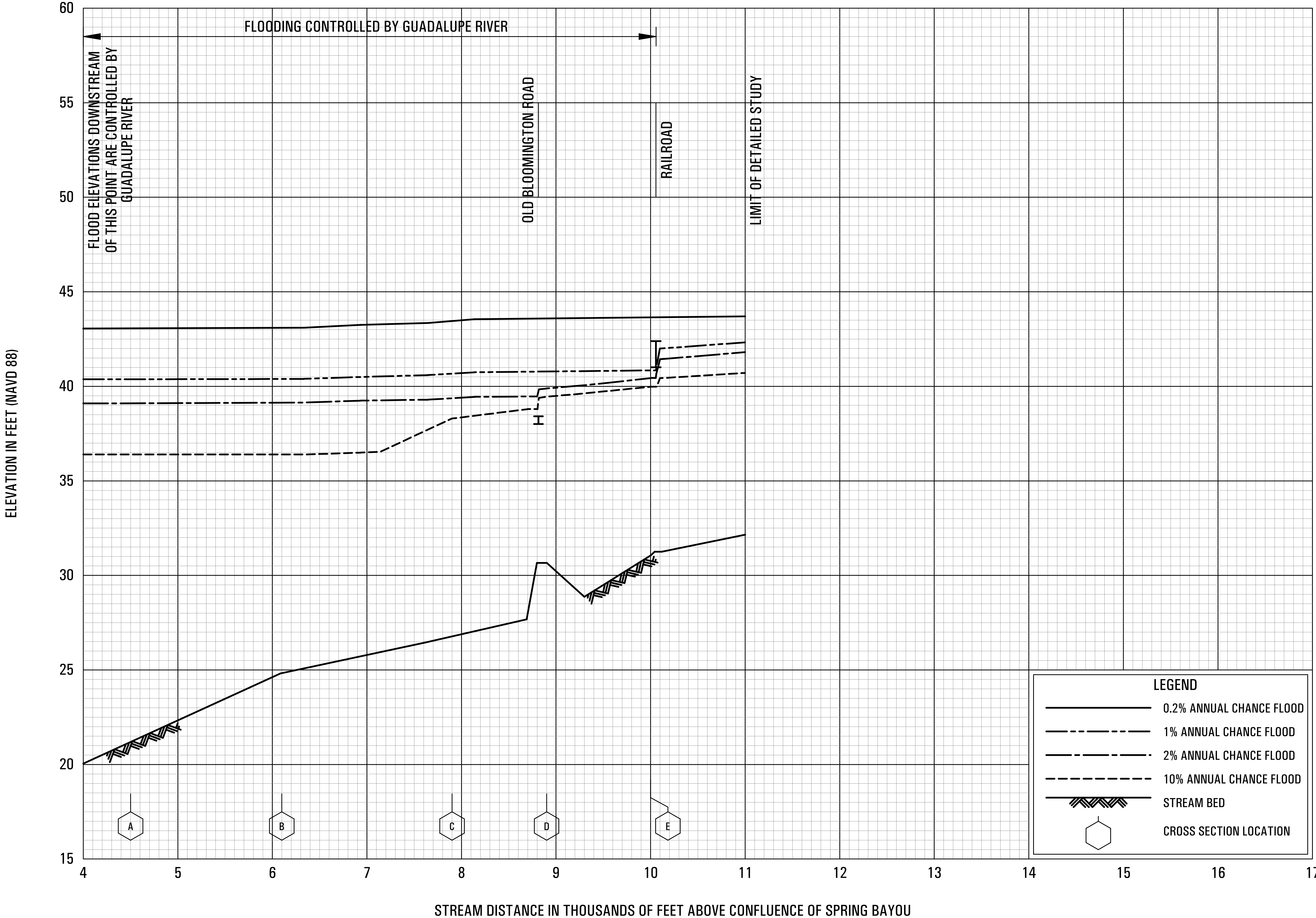

FLOOD PROFILES

CRESCENT VALLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

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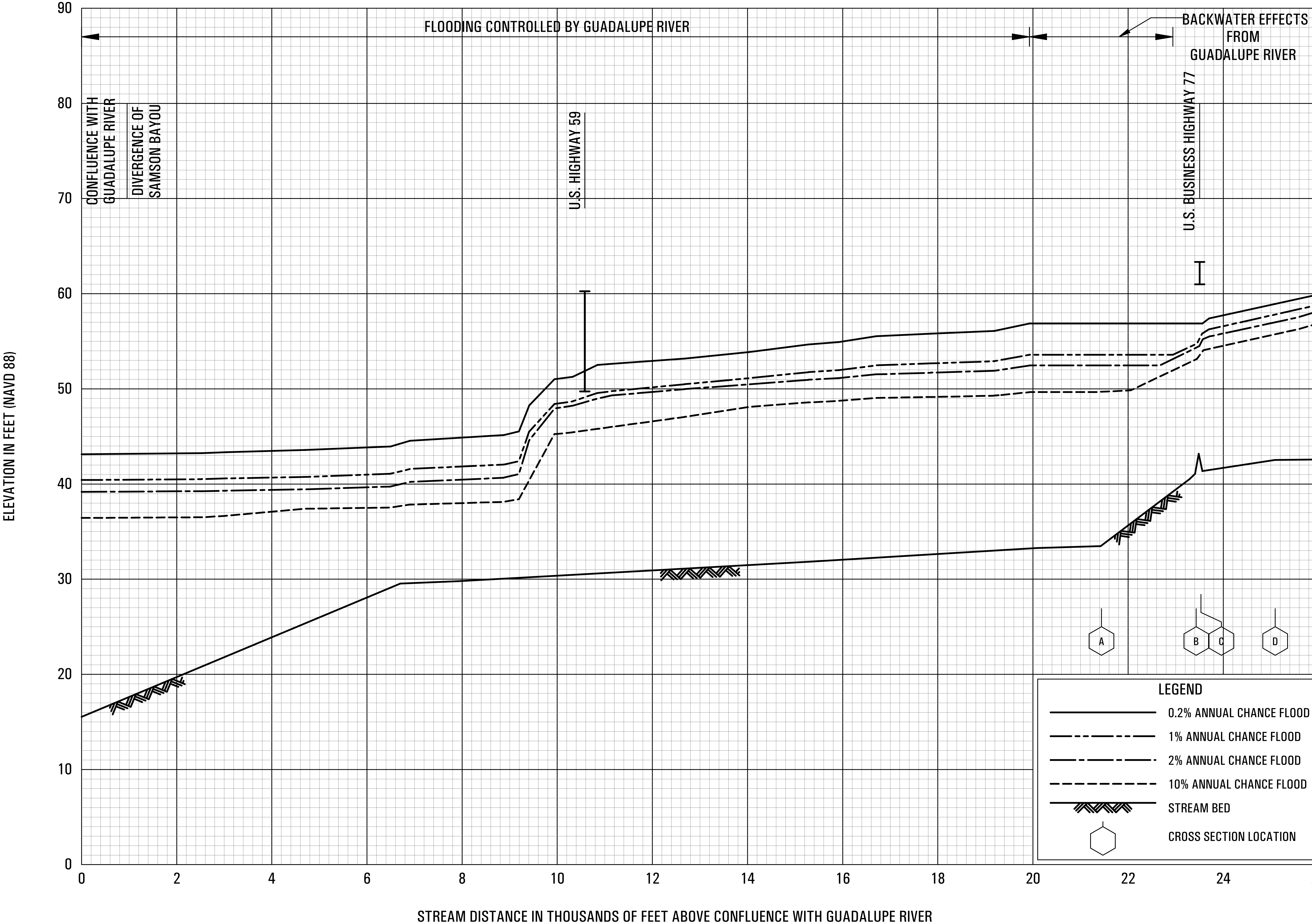

FLOOD PROFILES

DRY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

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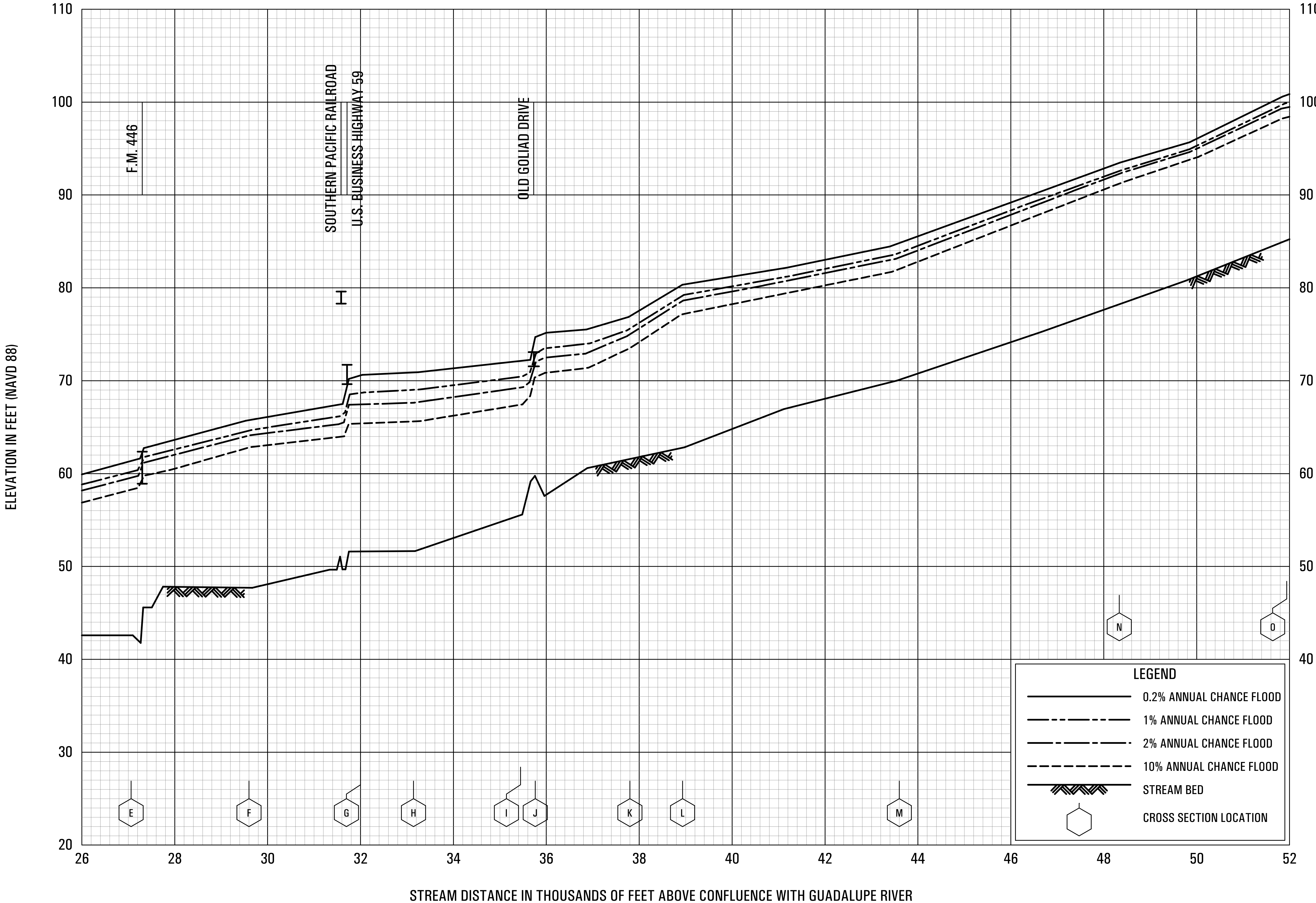

FLOOD PROFILES

DRY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

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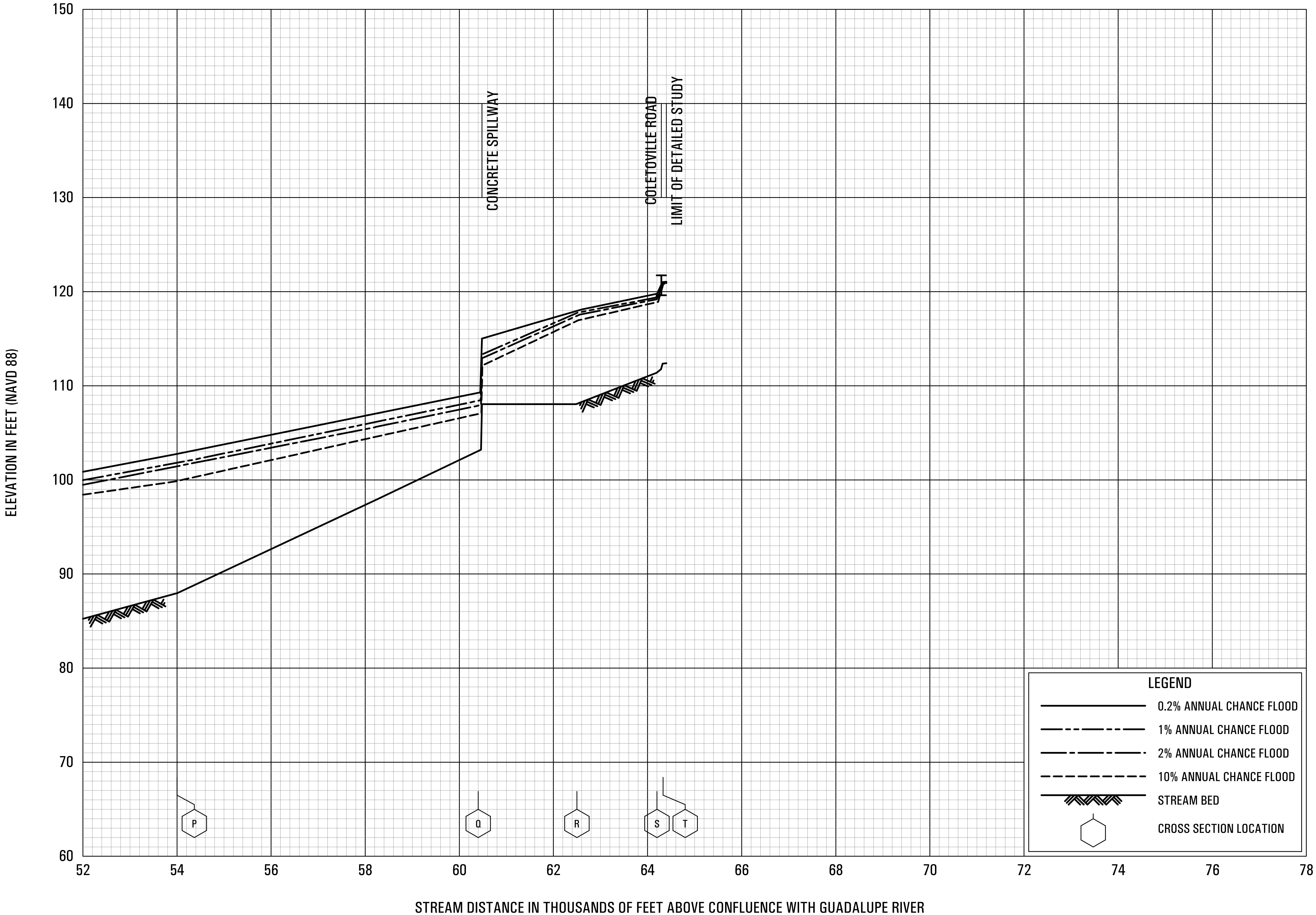

FLOOD PROFILES

DRY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

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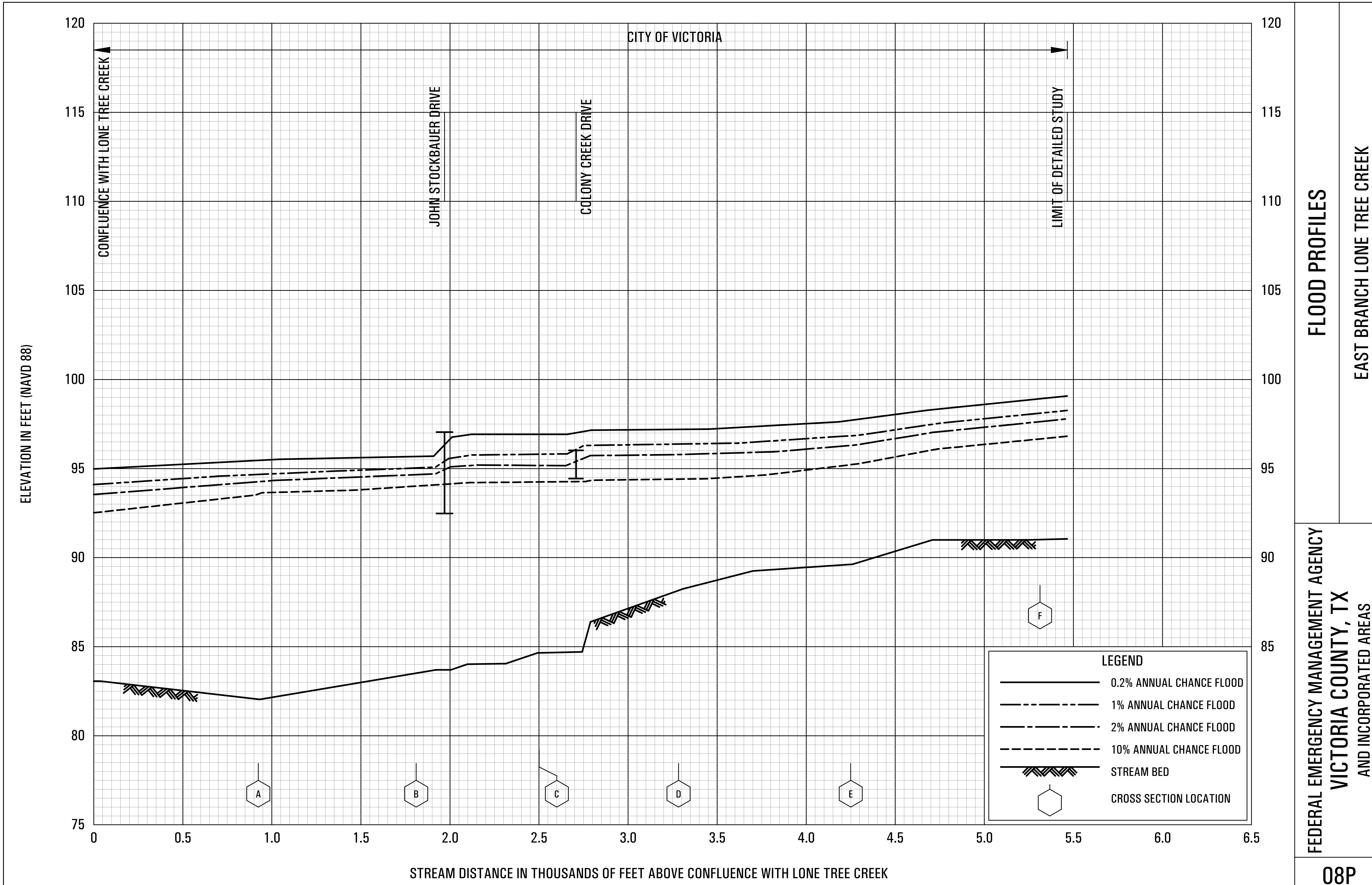
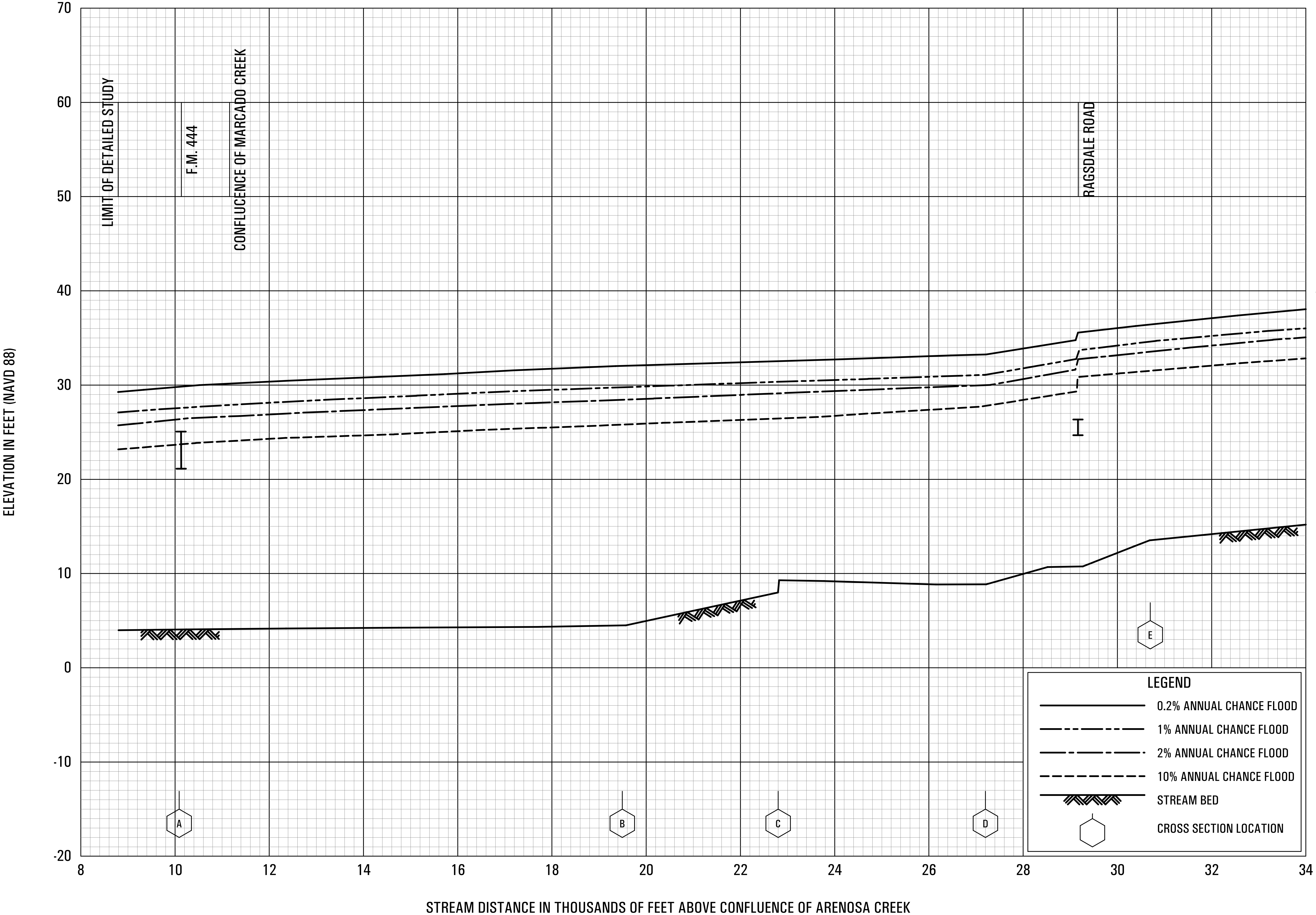


CITY OF VICTORIA
CONFLUENCE WITH LONE TREE CREEK
JOHN STOCKBAUER DRIVE
COLONY CREEK DRIVE
LIMIT OF DETAILED STUDY
ELEVATION IN FEET (NAVD 88)
120
115
110
105
100
95
90
85
80
75
0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
A
B
C
D
E
F
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CONFLUENCE WITH LONE TREE CREEK
FLOOD PROFILES
EAST BRANCH LONE TREE CREEK
FEDERAL EMERGENCY MANAGEMENT AGENCY
VICTORIA COUNTY, TX
AND INCORPORATED AREAS
08P



FLOOD PROFILES

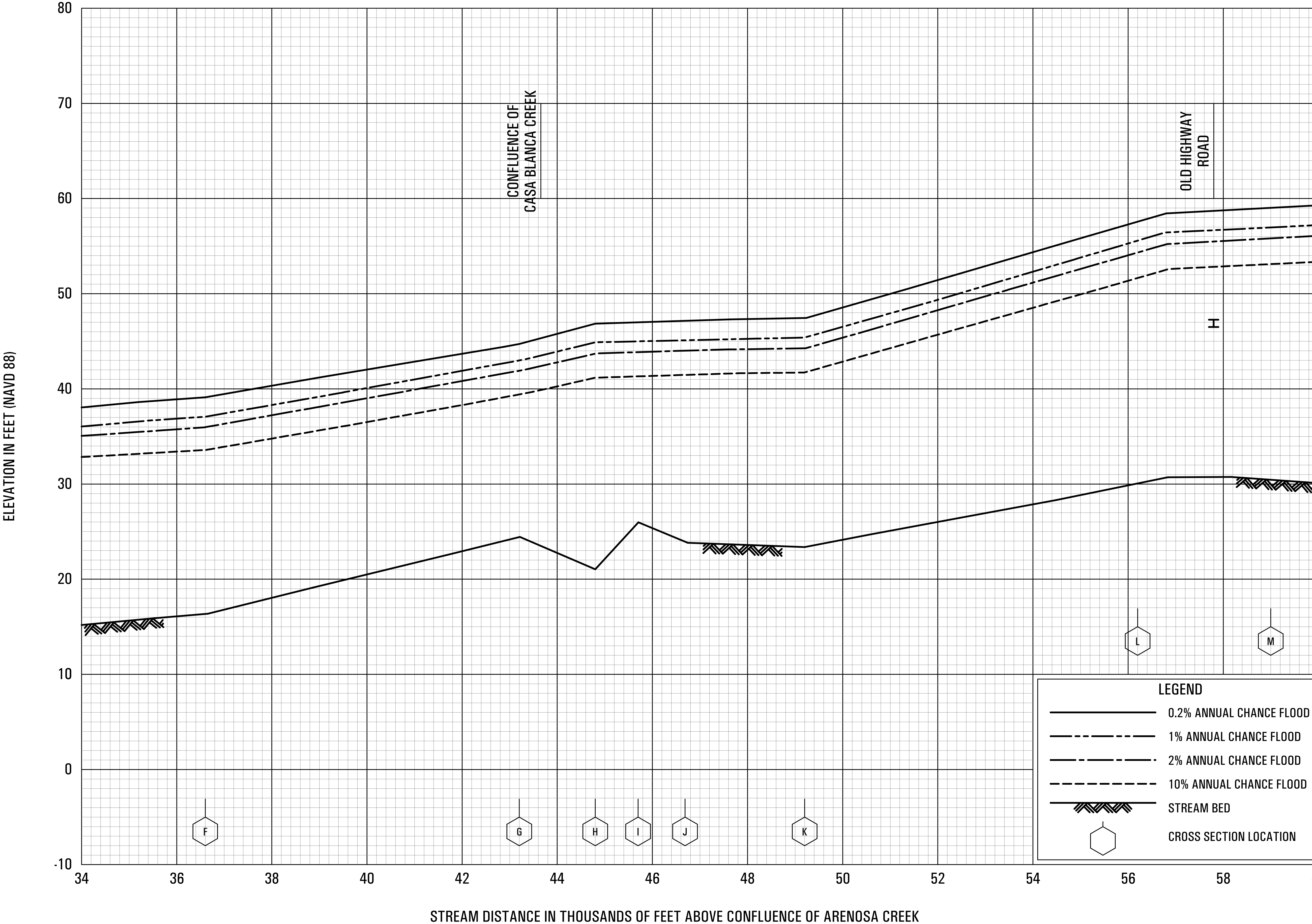
GARCITAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

09P



FLOOD PROFILES

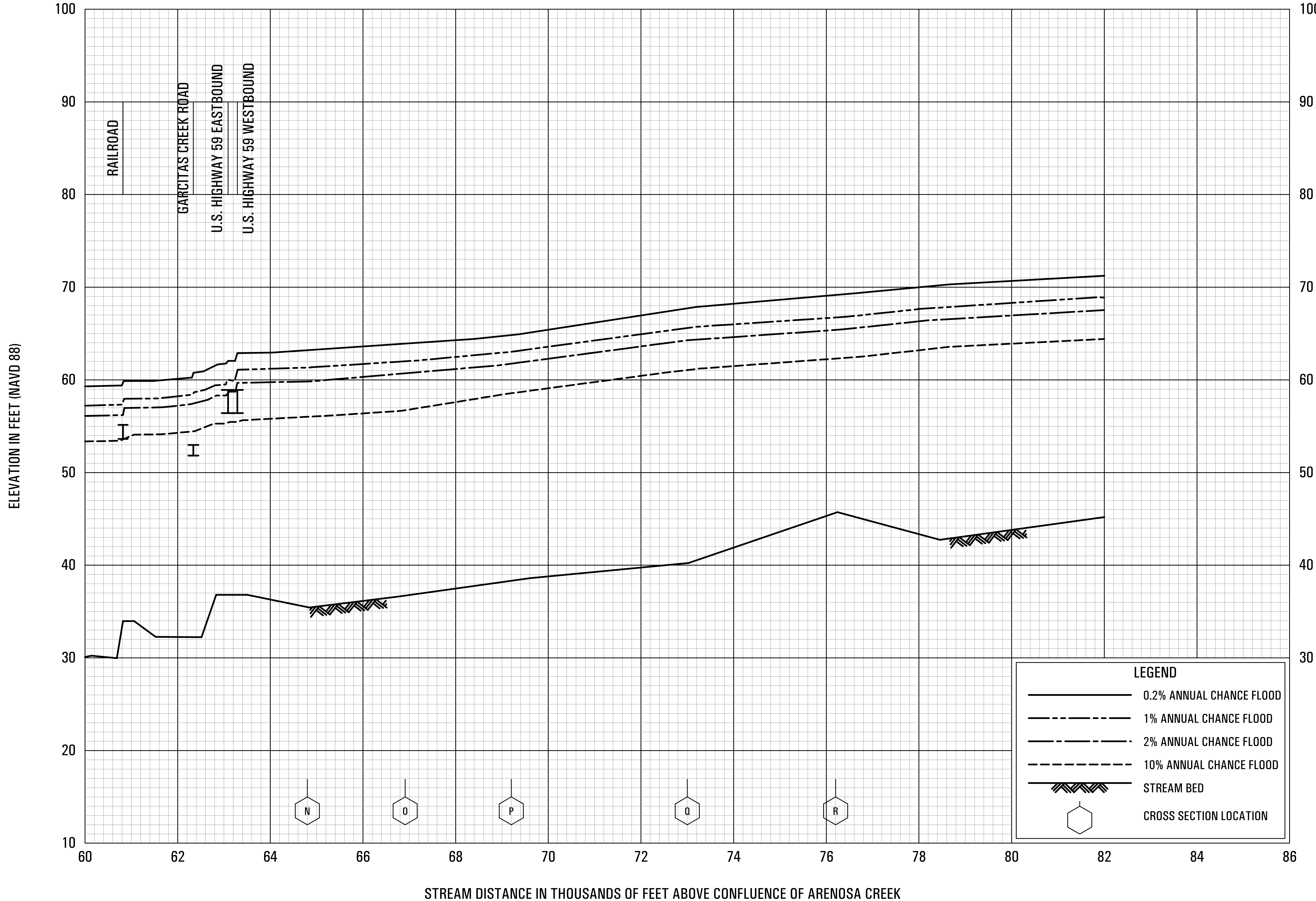
GARCITAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

10P



FLOOD PROFILES

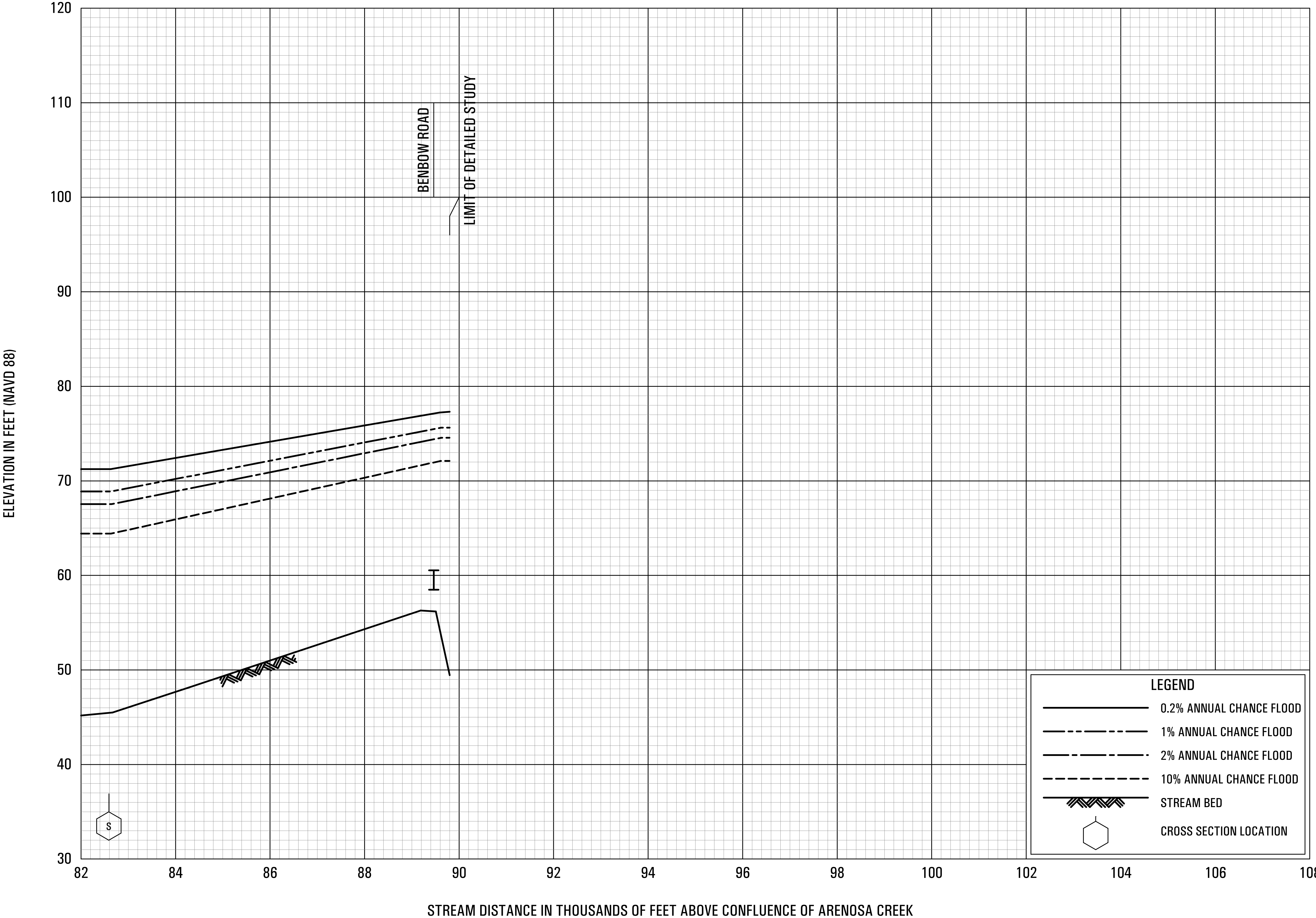
GARCITAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

11P



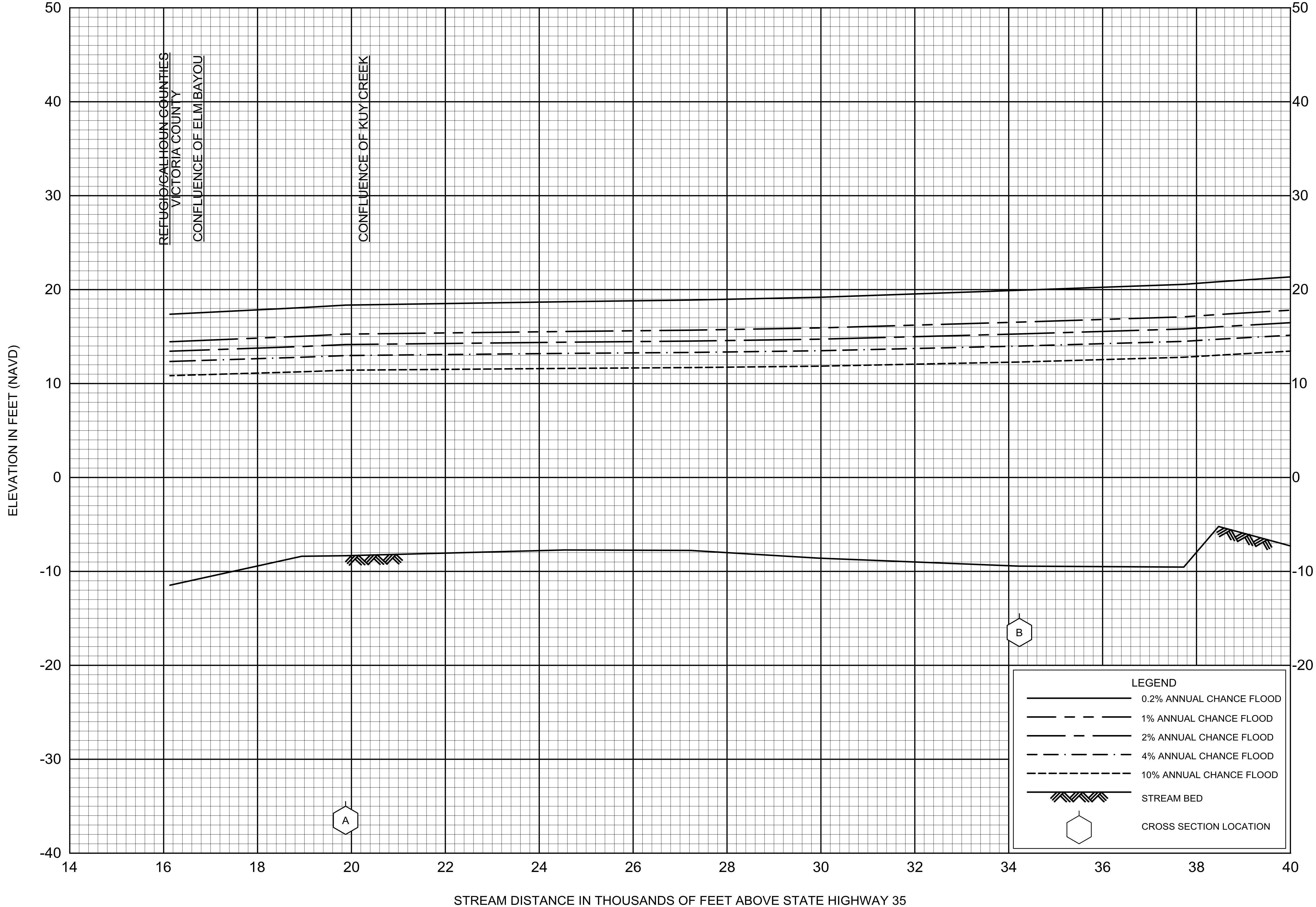
FLOOD PROFILES

GARCITAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



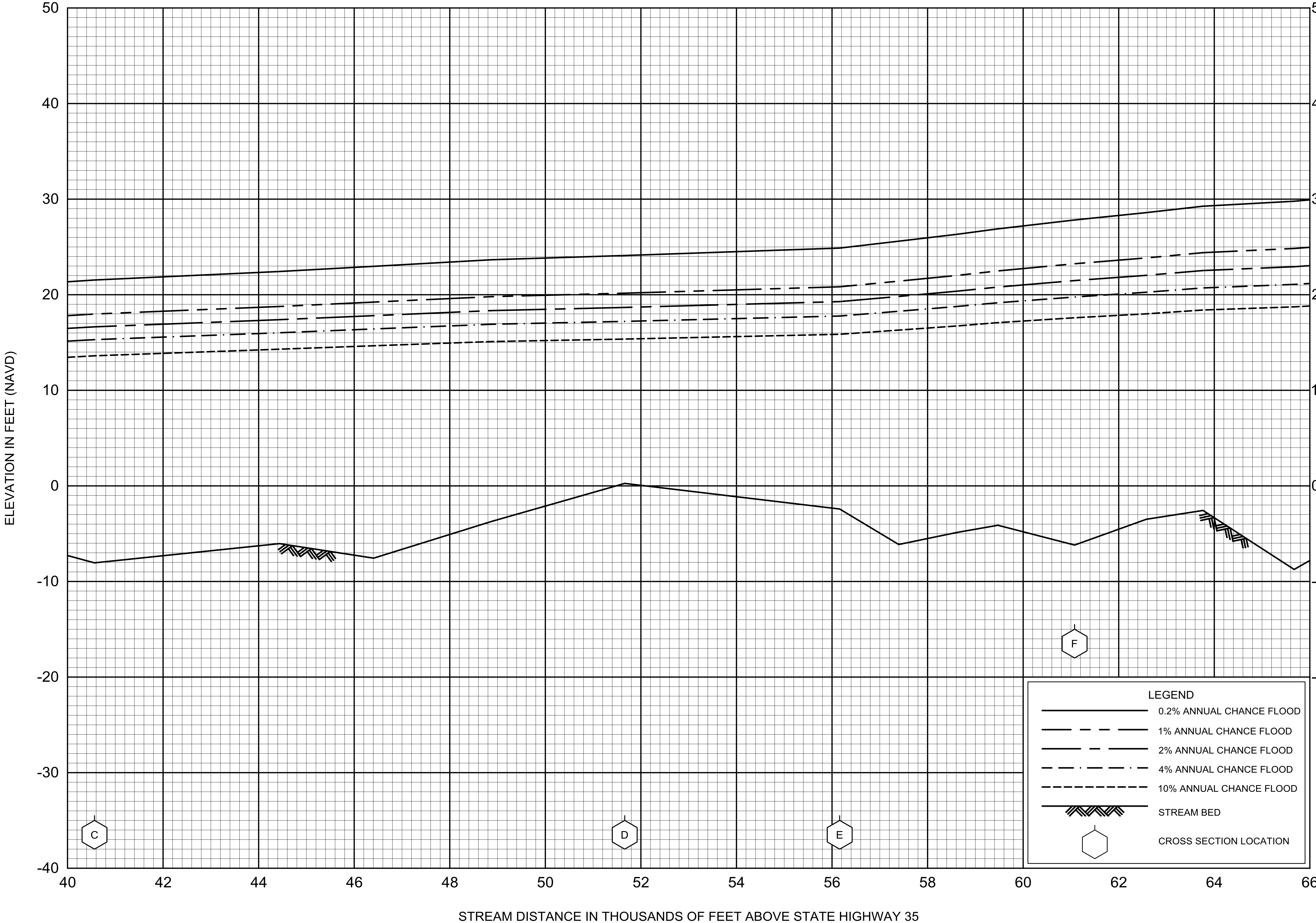
FLOOD PROFILES

GUADALUPE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



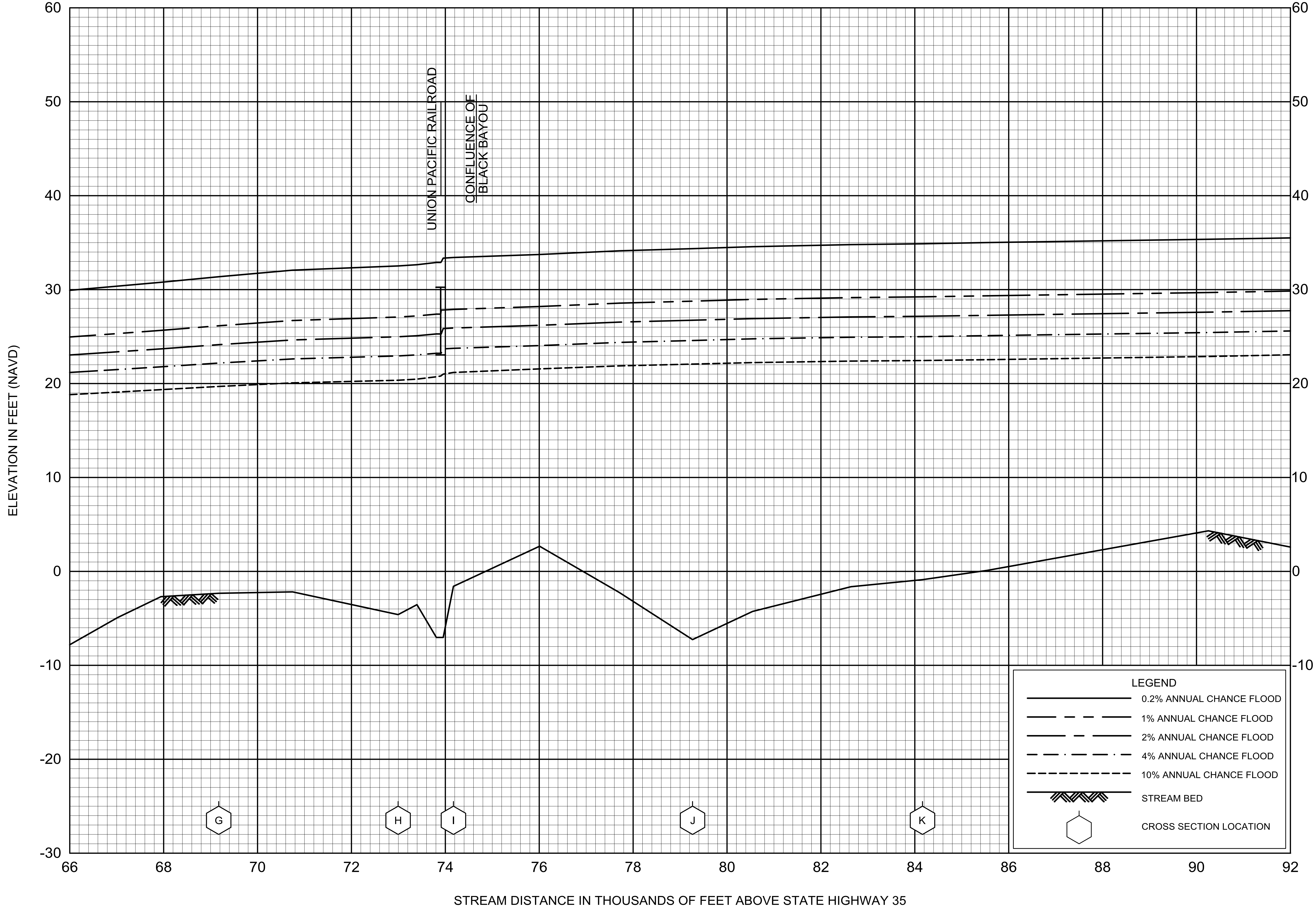
FLOOD PROFILES

GUADALUPE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



FLOOD PROFILES

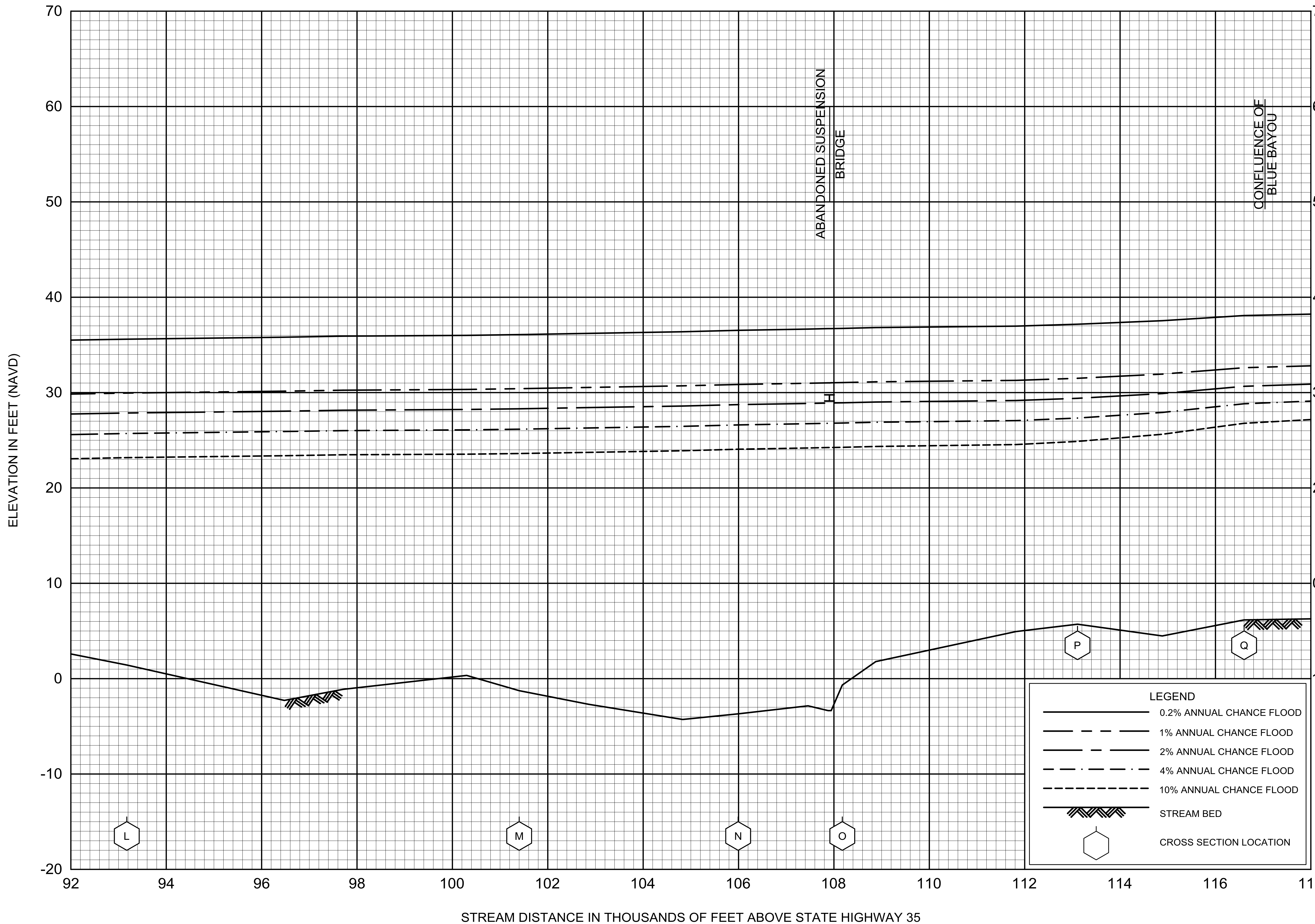
GUADALUPE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

15P



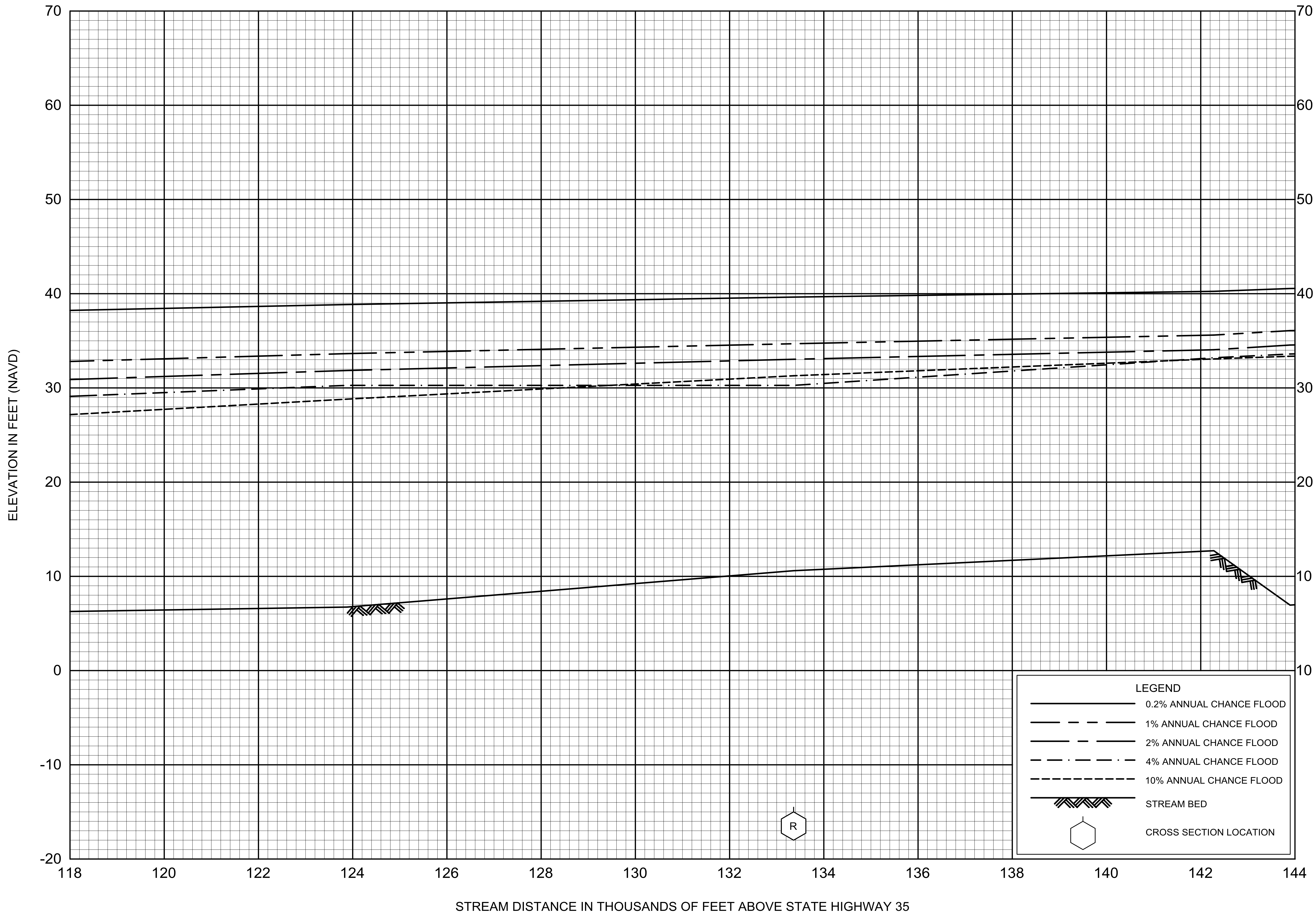
FLOOD PROFILES

GUADALUPE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



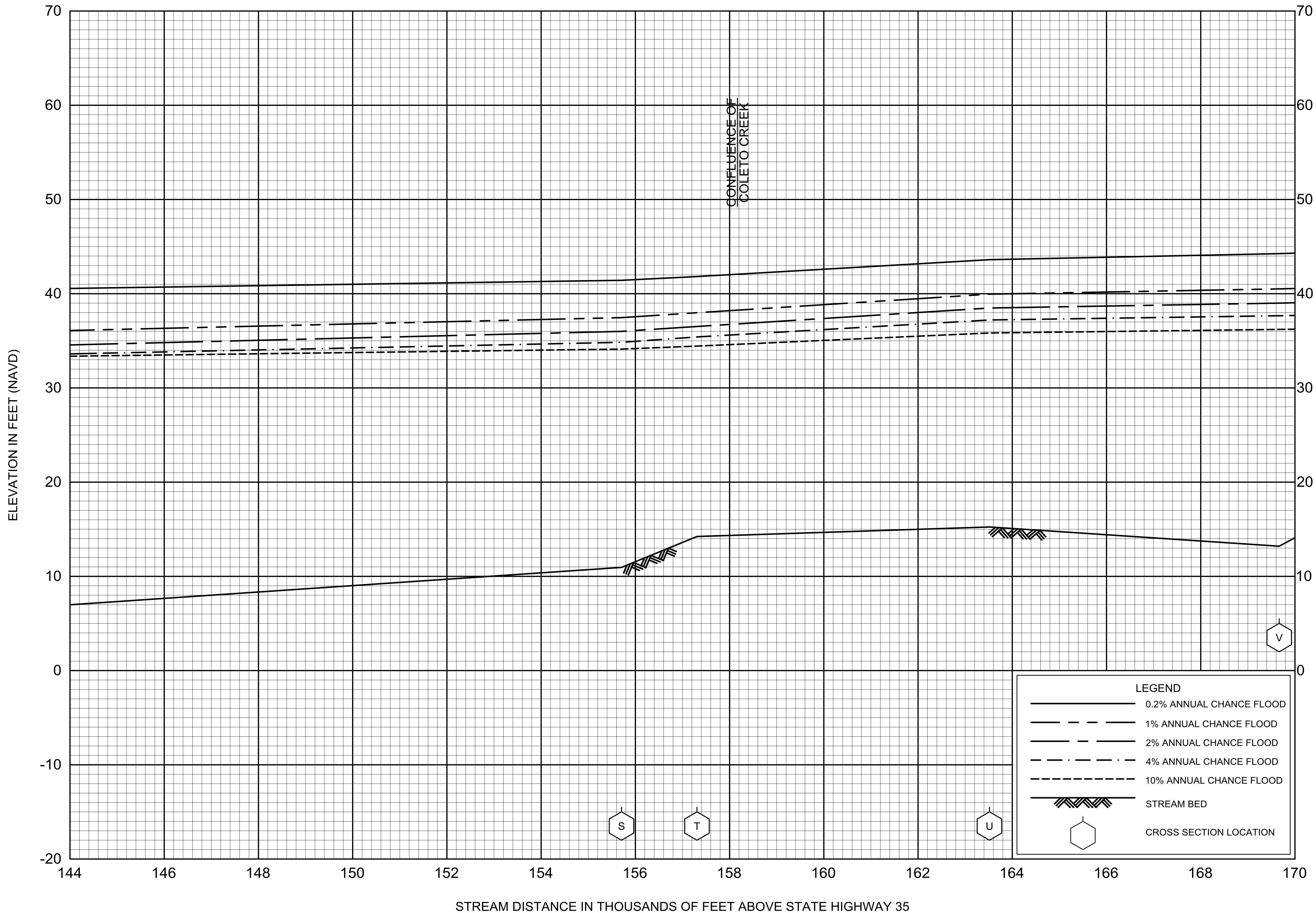
FLOOD PROFILES

GUADALUPE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



FLOOD PROFILES

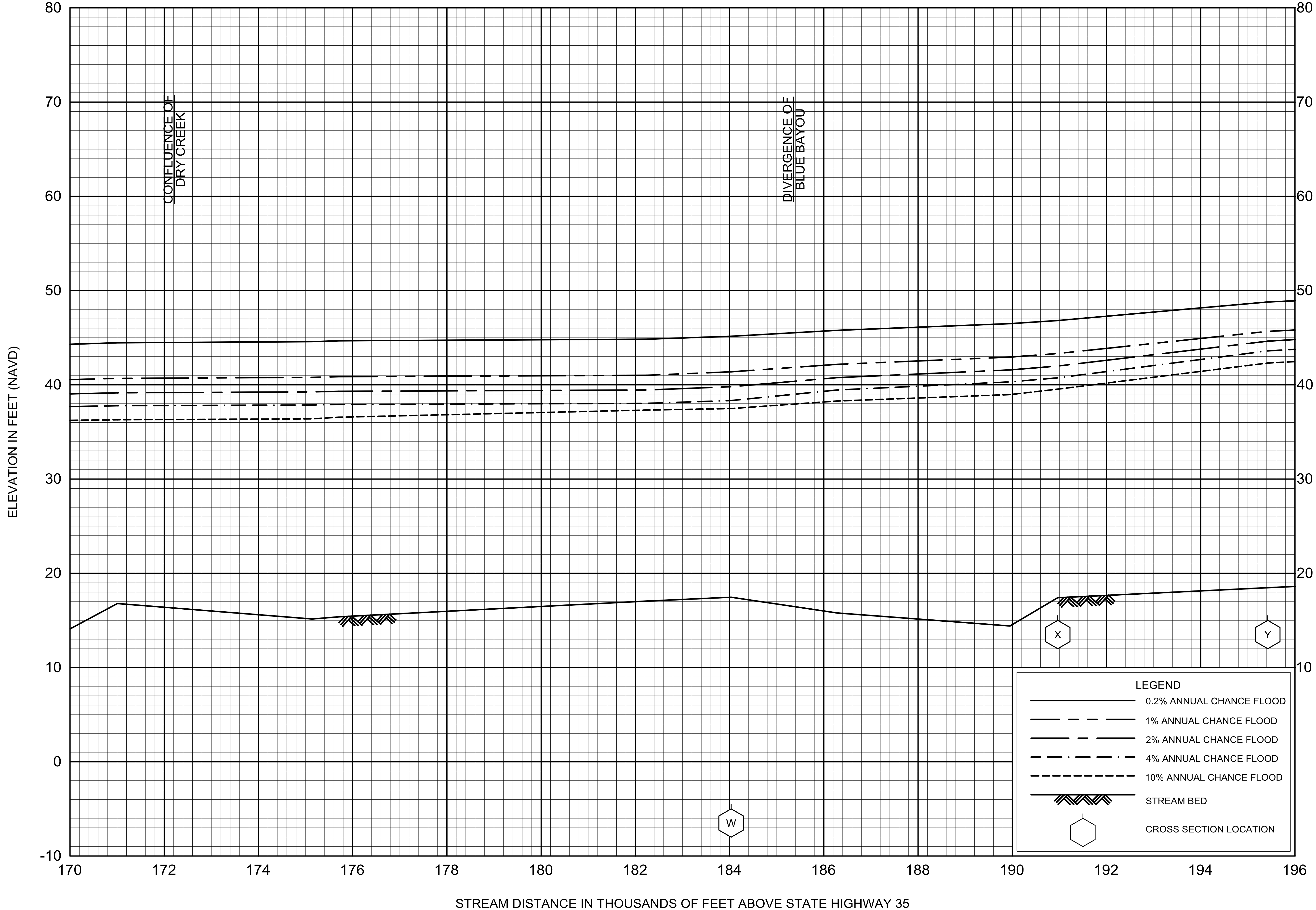
GUADALUPE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

18P



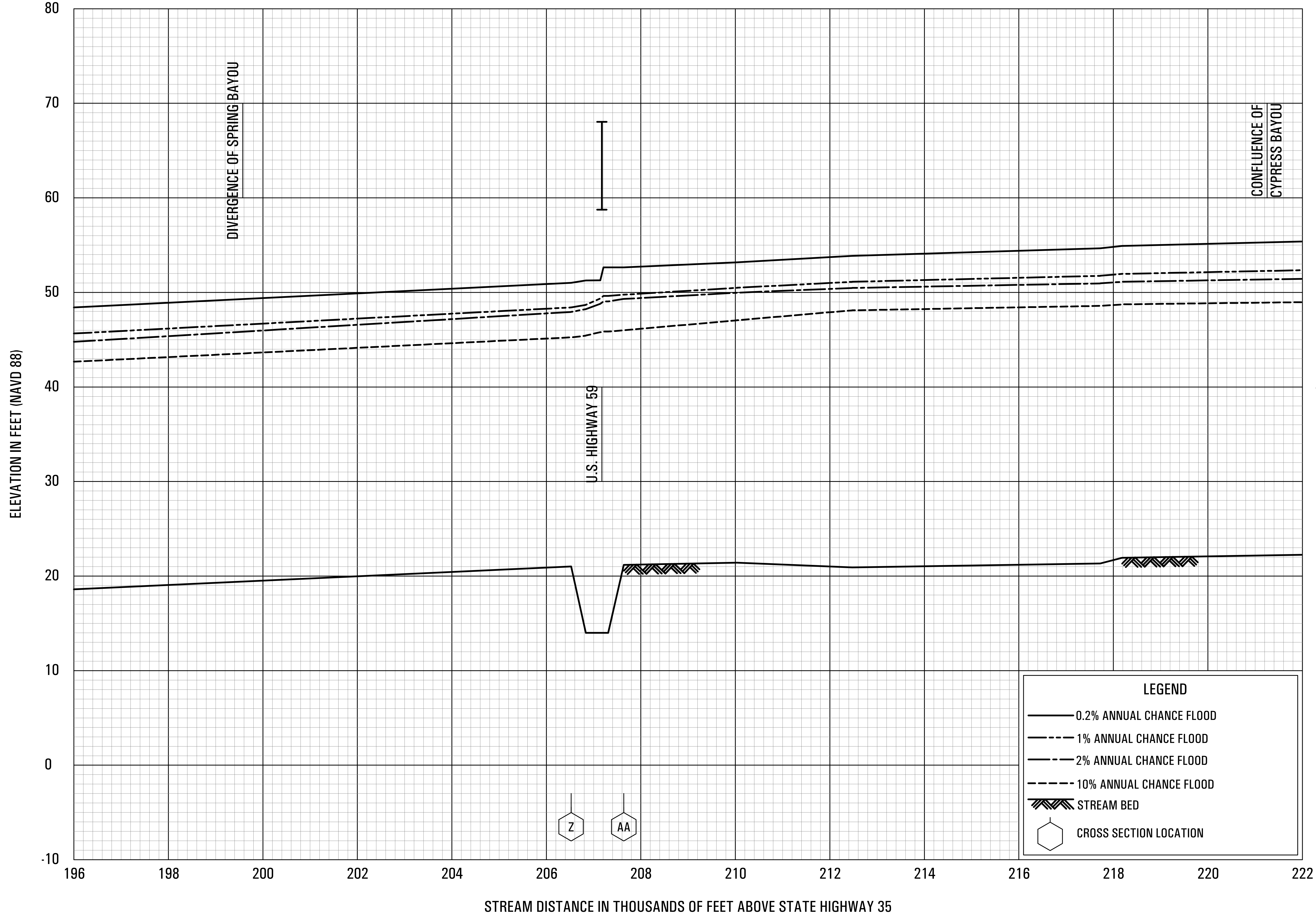
FLOOD PROFILES

GUADALUPE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



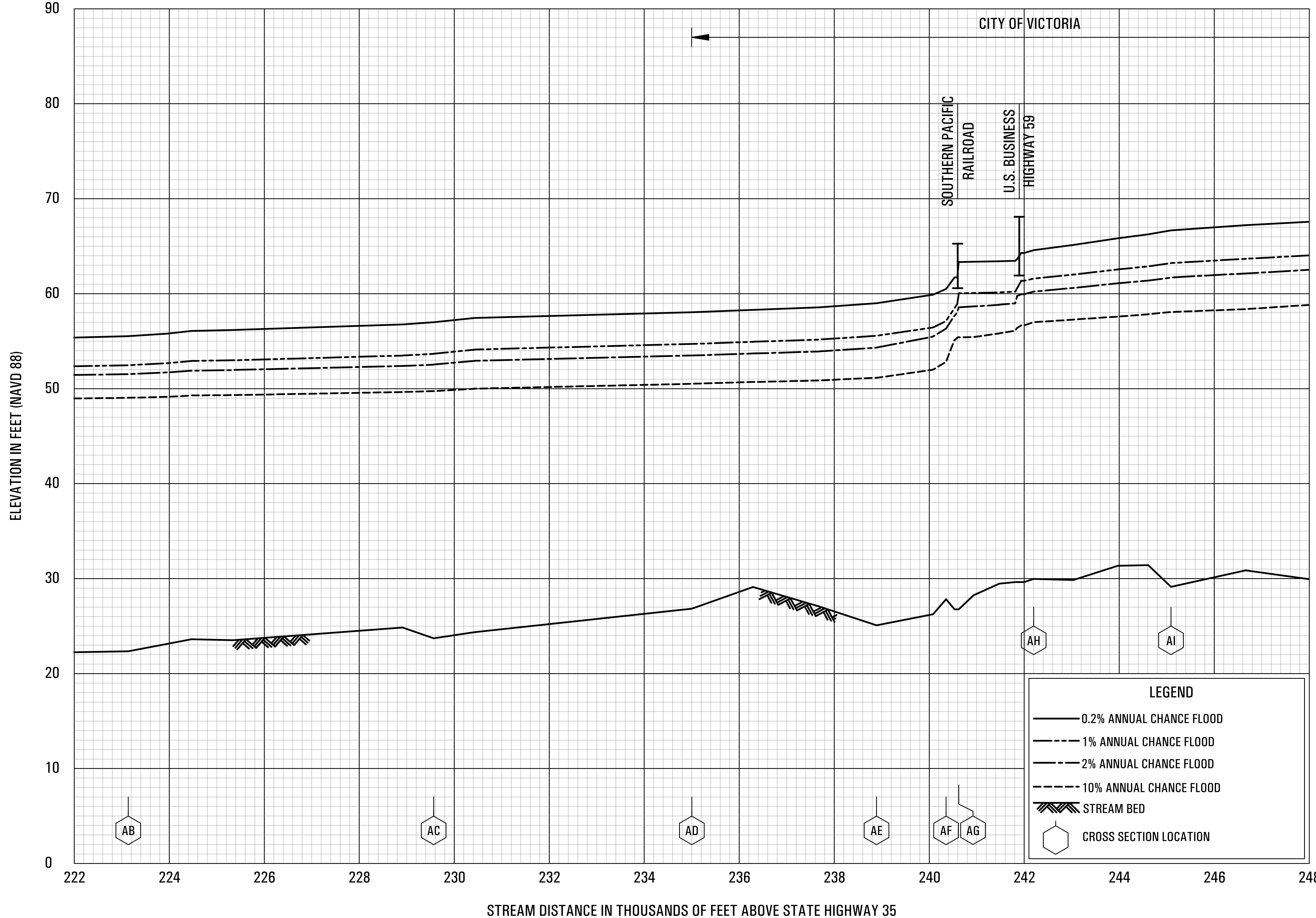
FLOOD PROFILES

GUADALUPE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



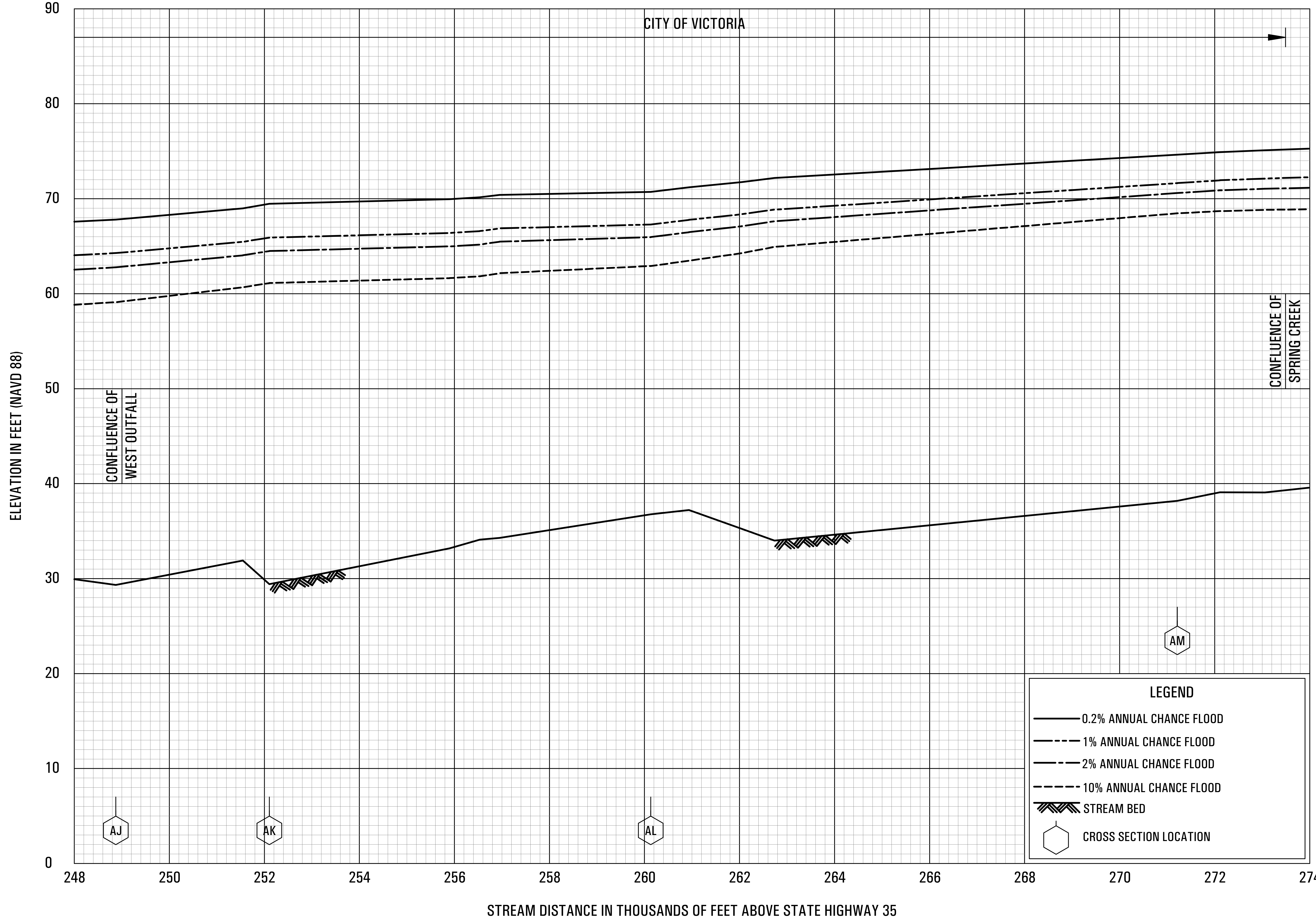
FLOOD PROFILES

GUADALUPE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



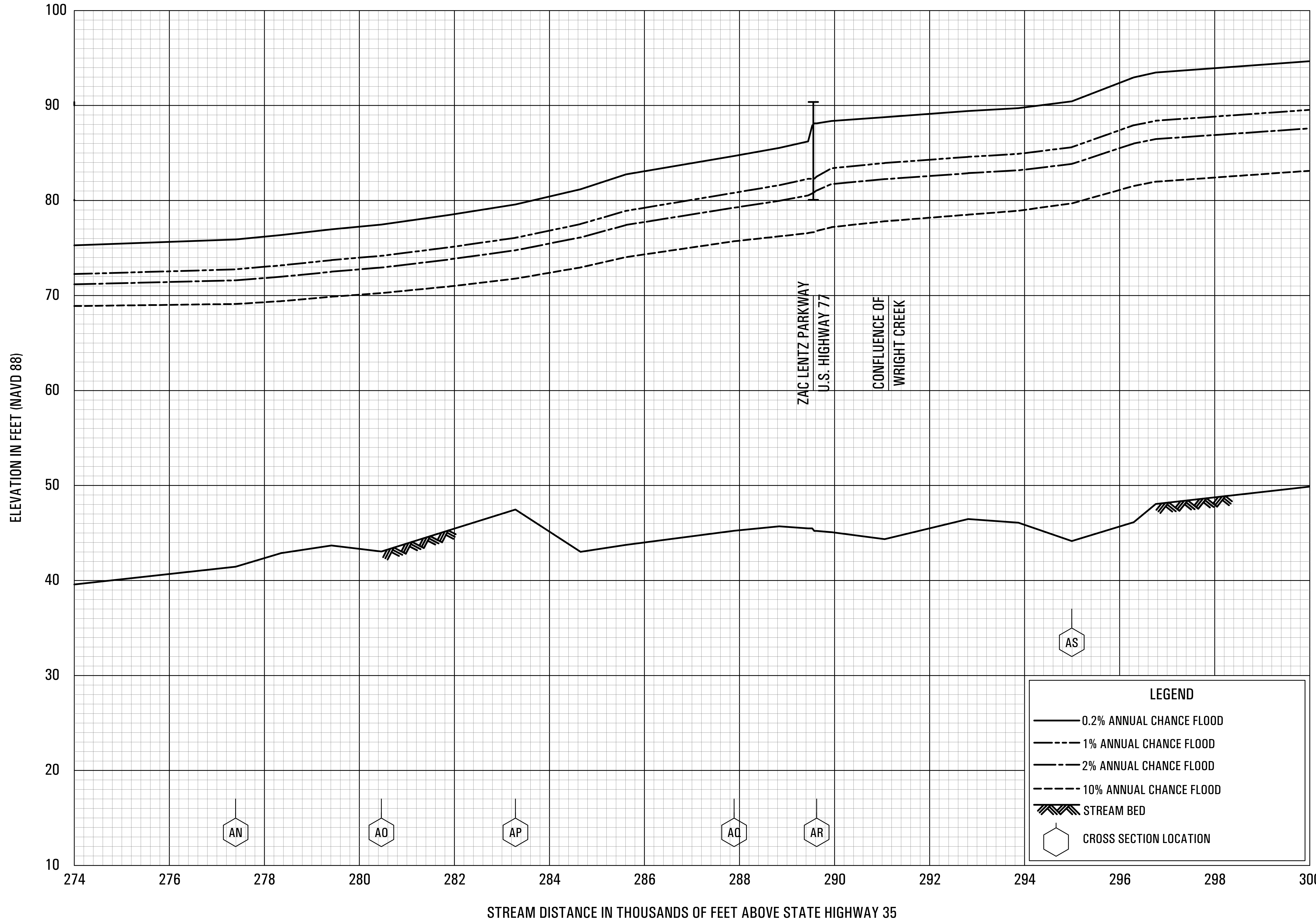
FLOOD PROFILES

GUADALUPE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



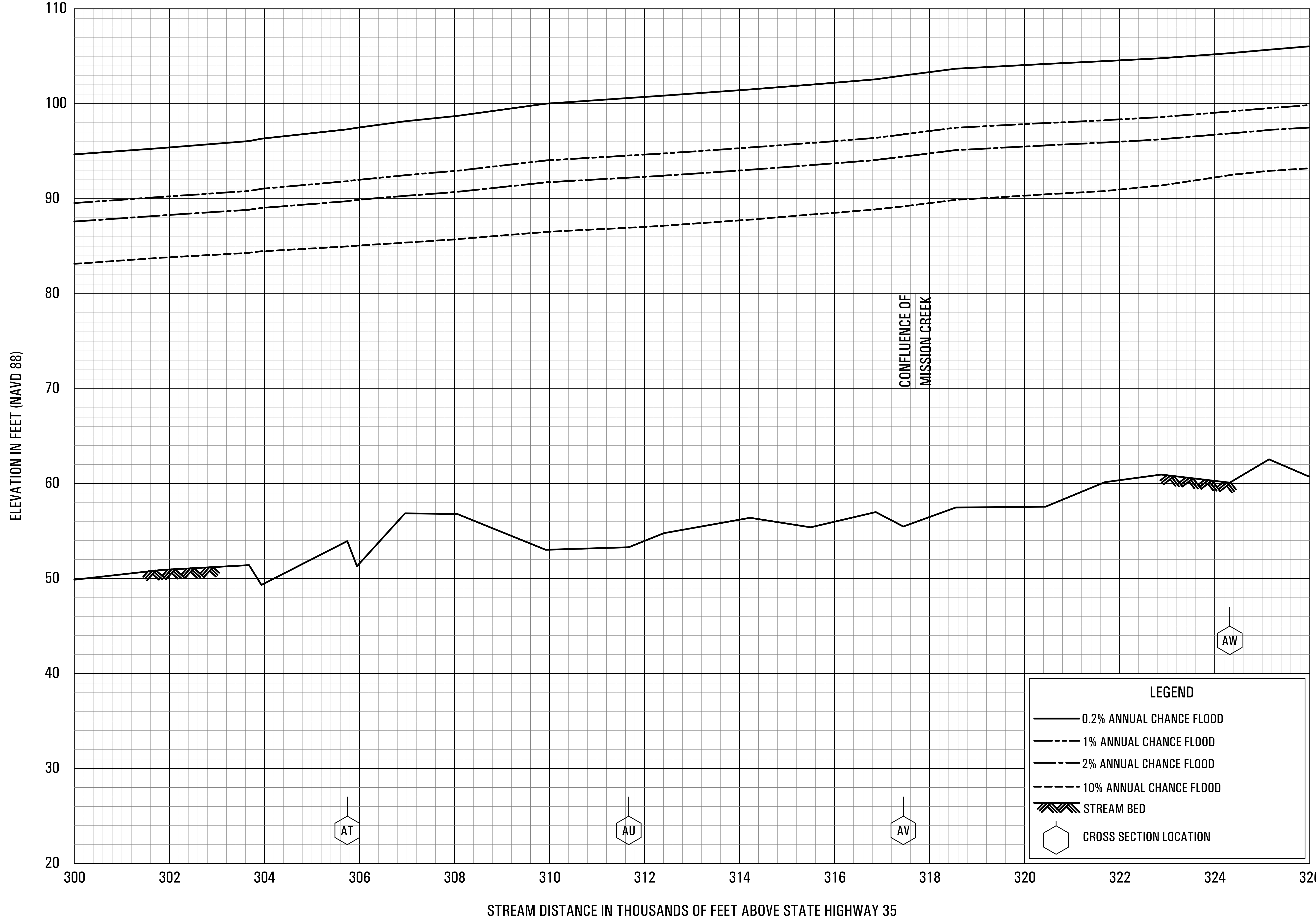
FLOOD PROFILES

GUADALUPE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



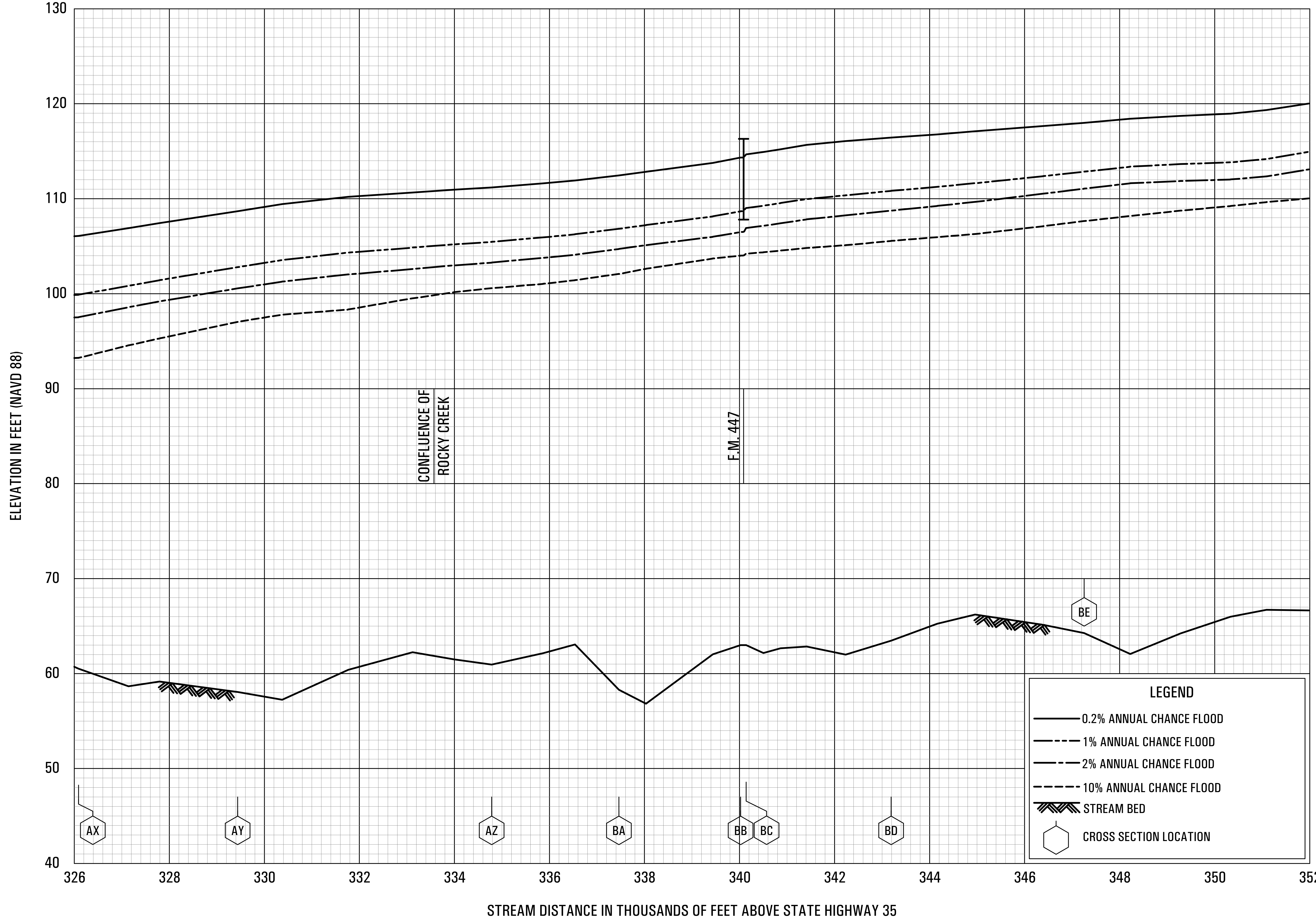
FLOOD PROFILES

GUADALUPE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

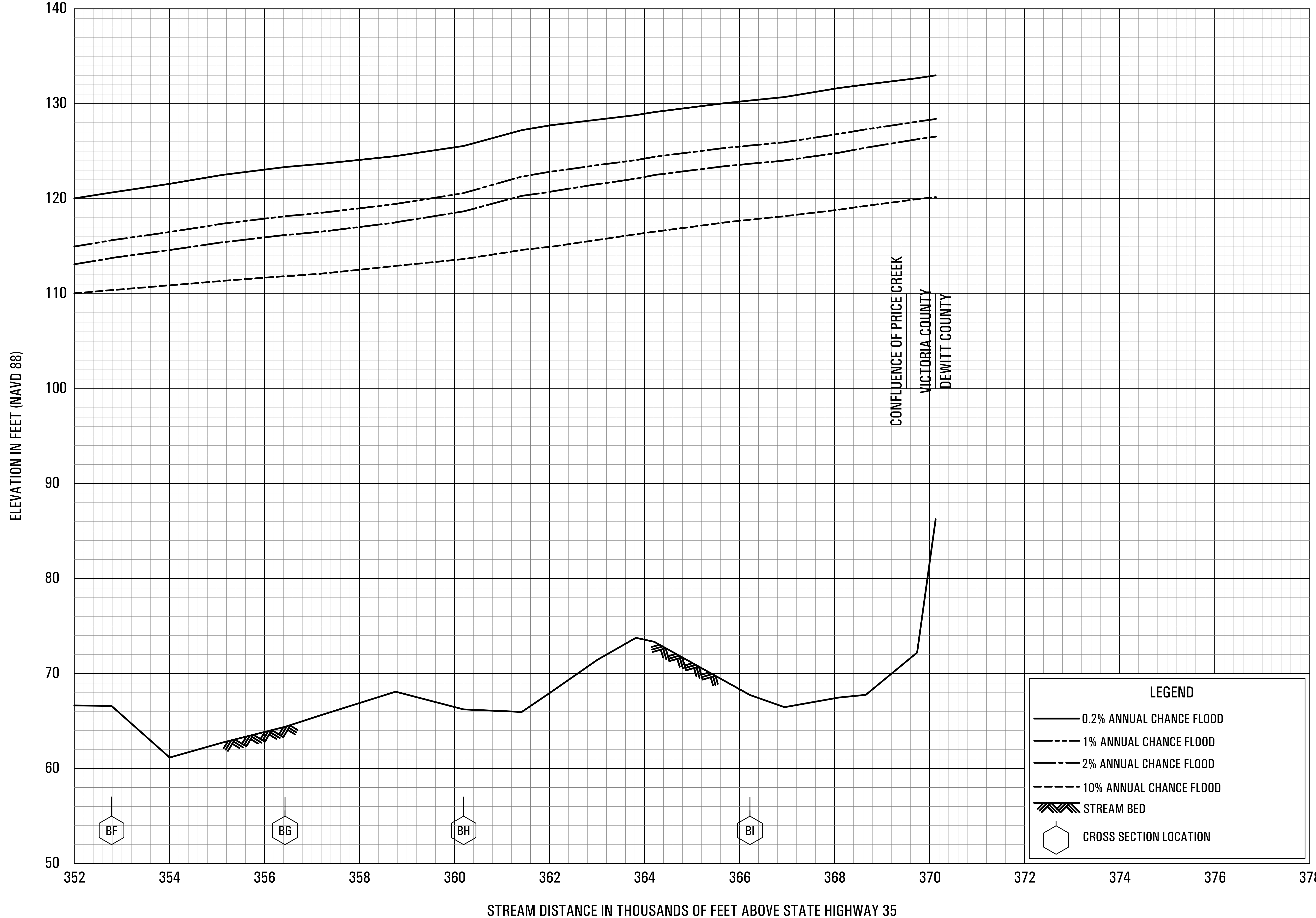


FLOOD PROFILES

GUADALUPE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX AND INCORPORATED AREAS



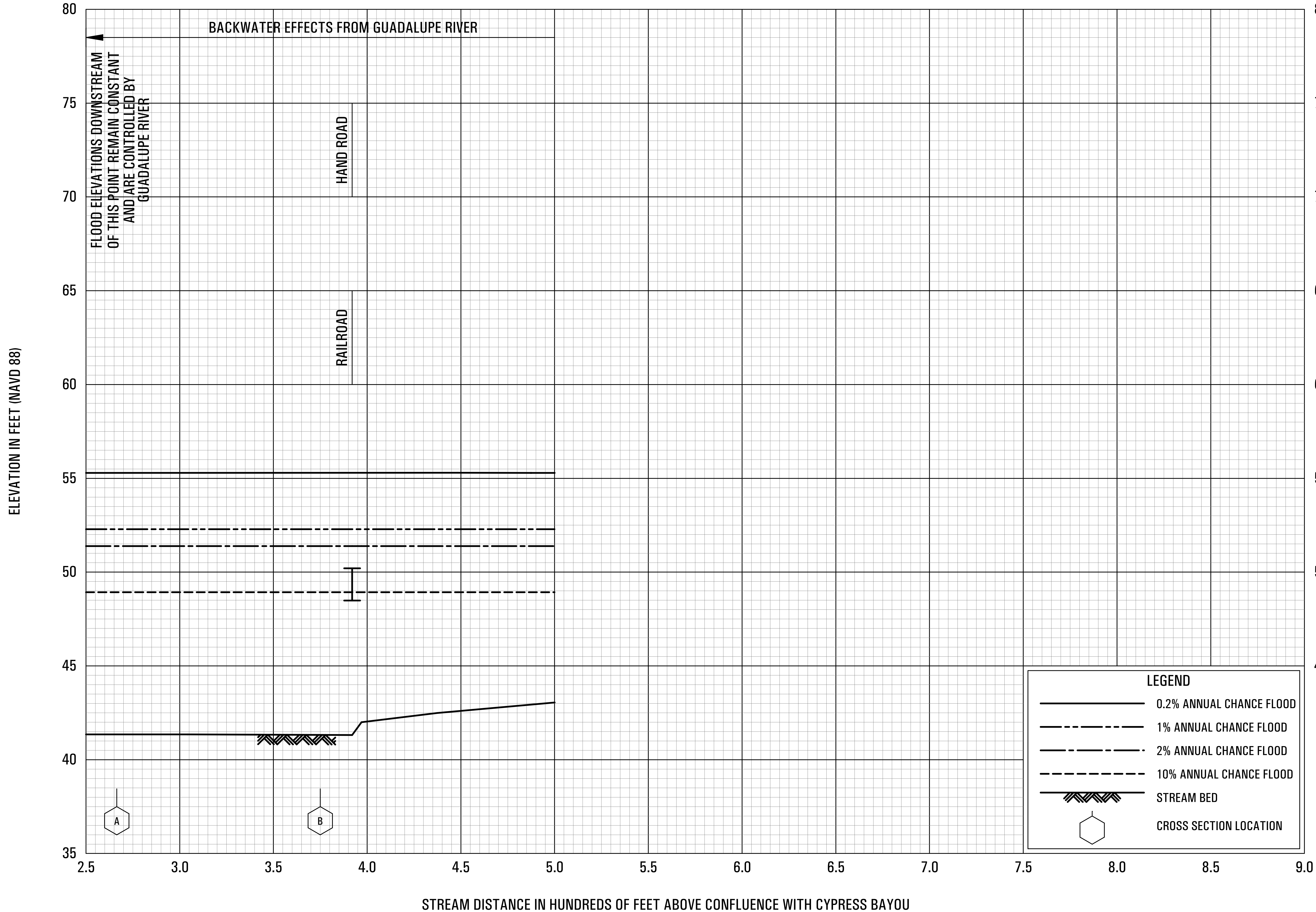
FLOOD PROFILES

GUADALUPE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



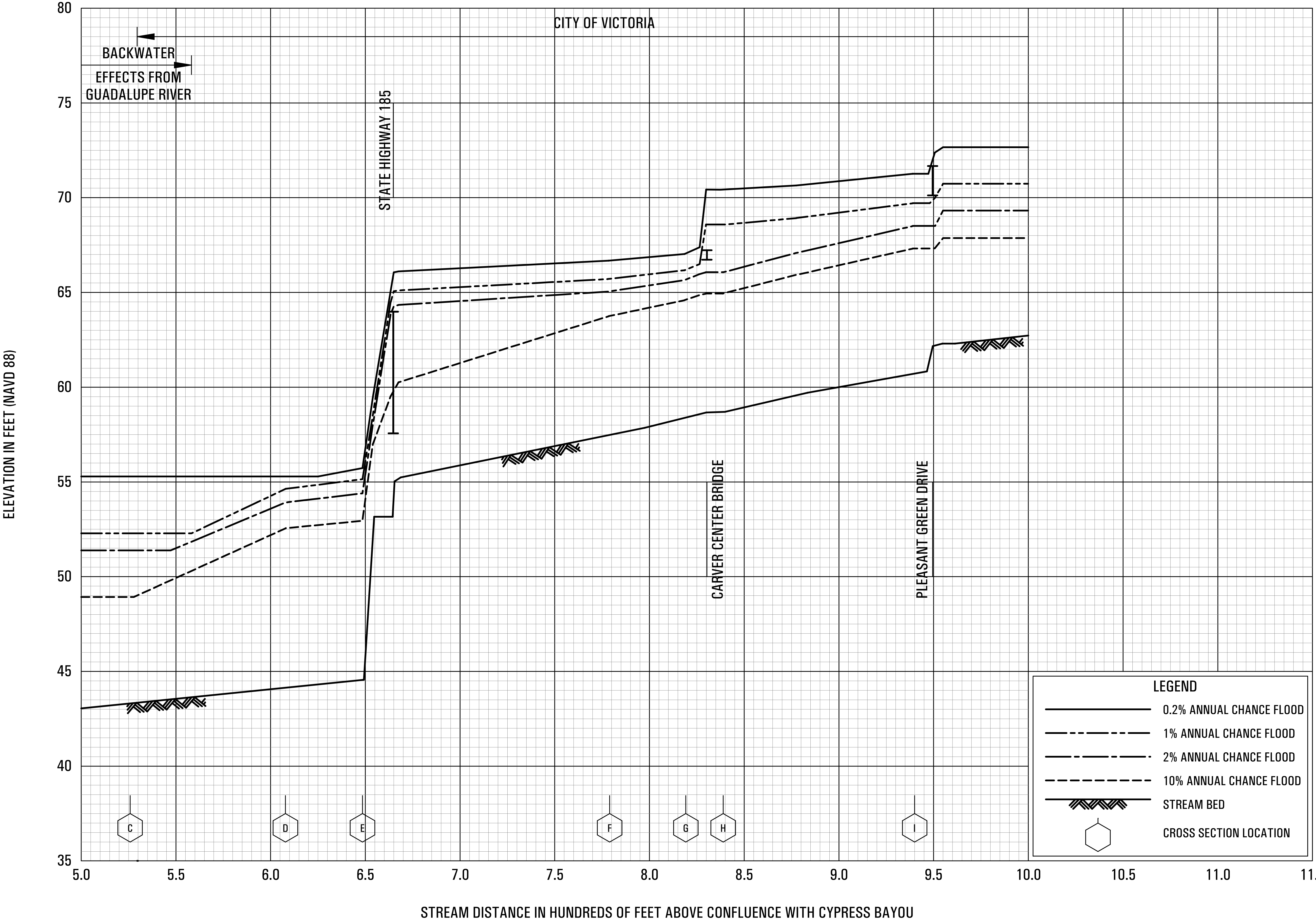
FLOOD PROFILES

JIM BRANCH OUTFALL

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



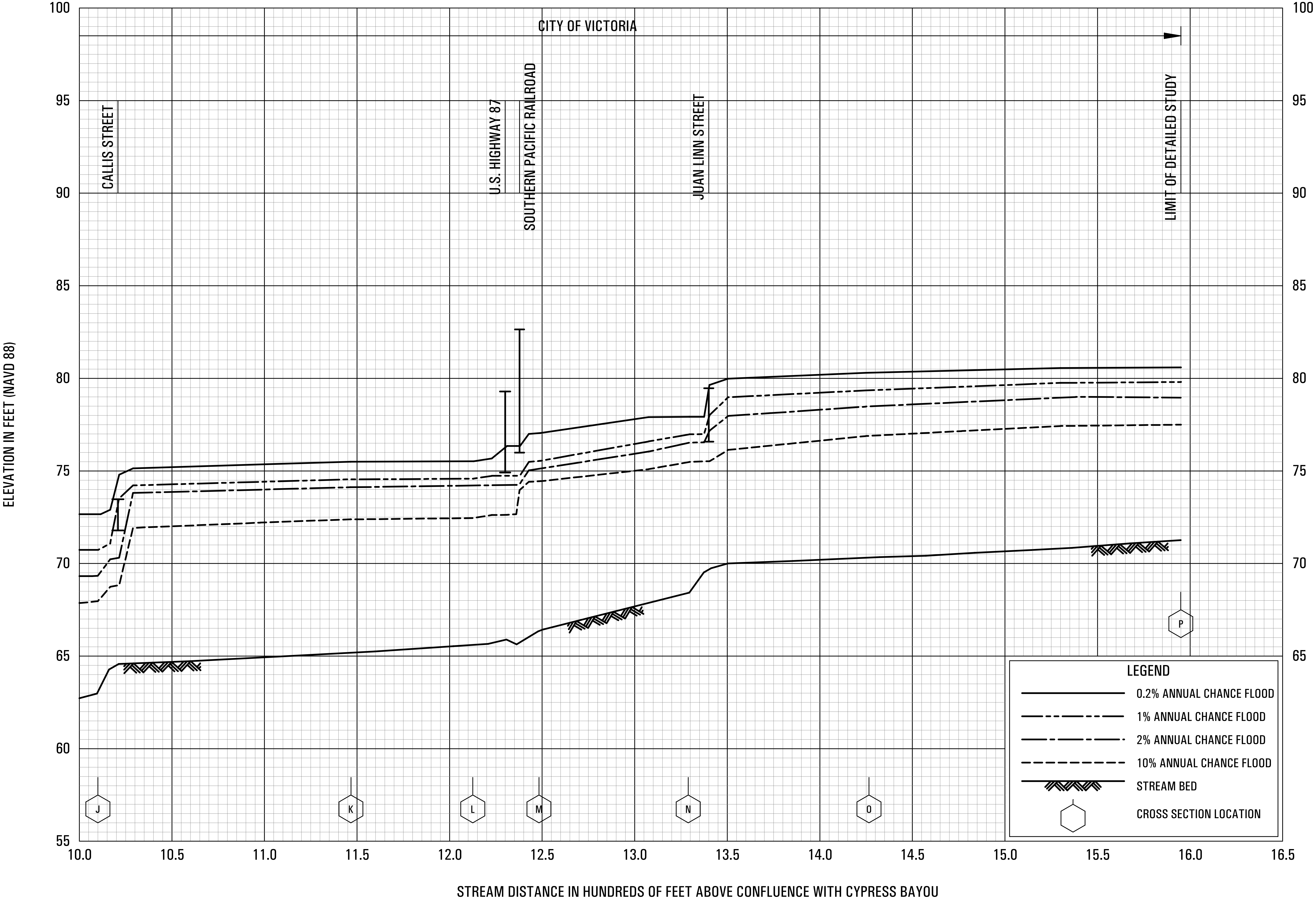
FLOOD PROFILES

JIM BRANCH OUTFALL

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



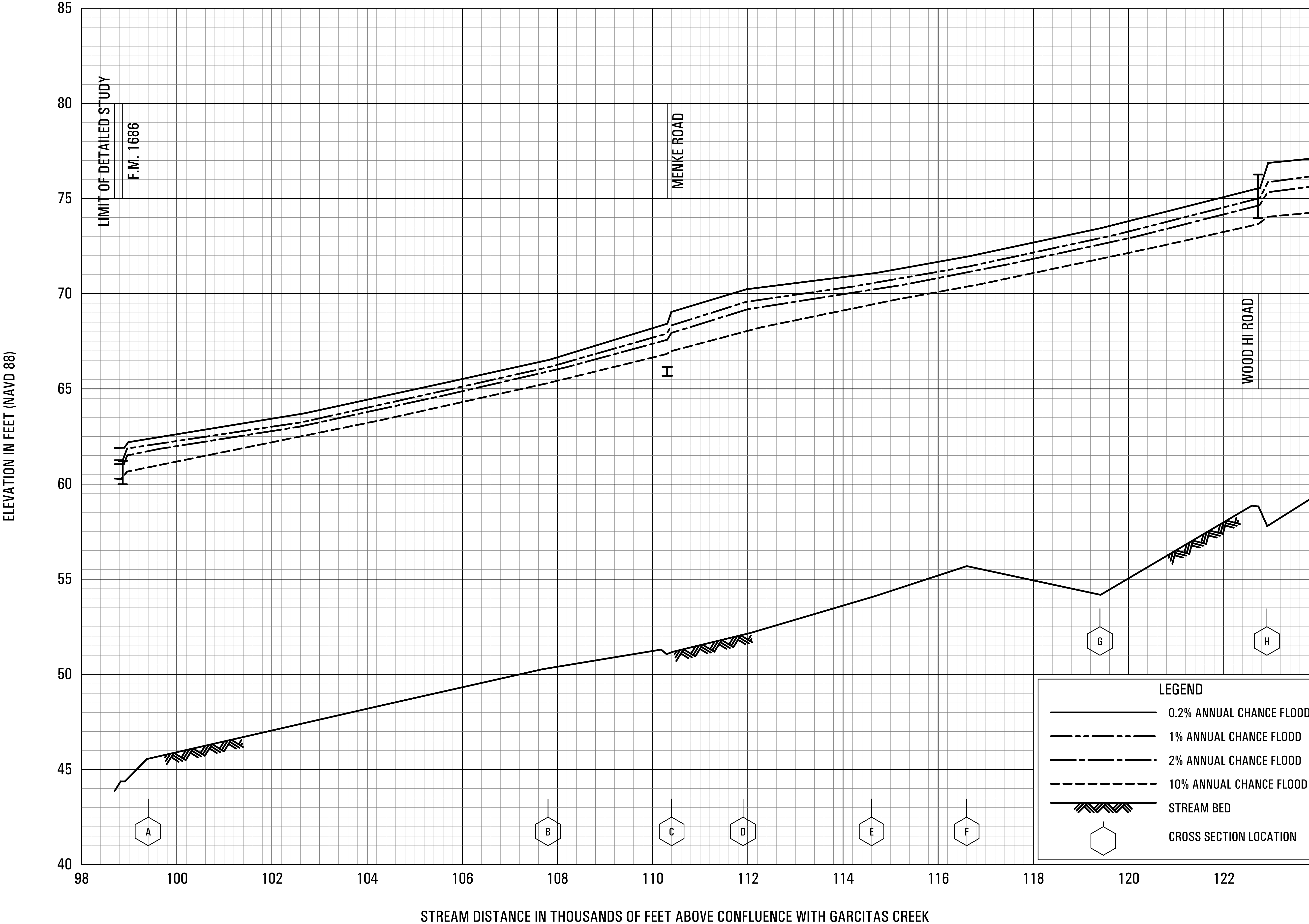
FLOOD PROFILES

JIM BRANCH OUTFALL

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



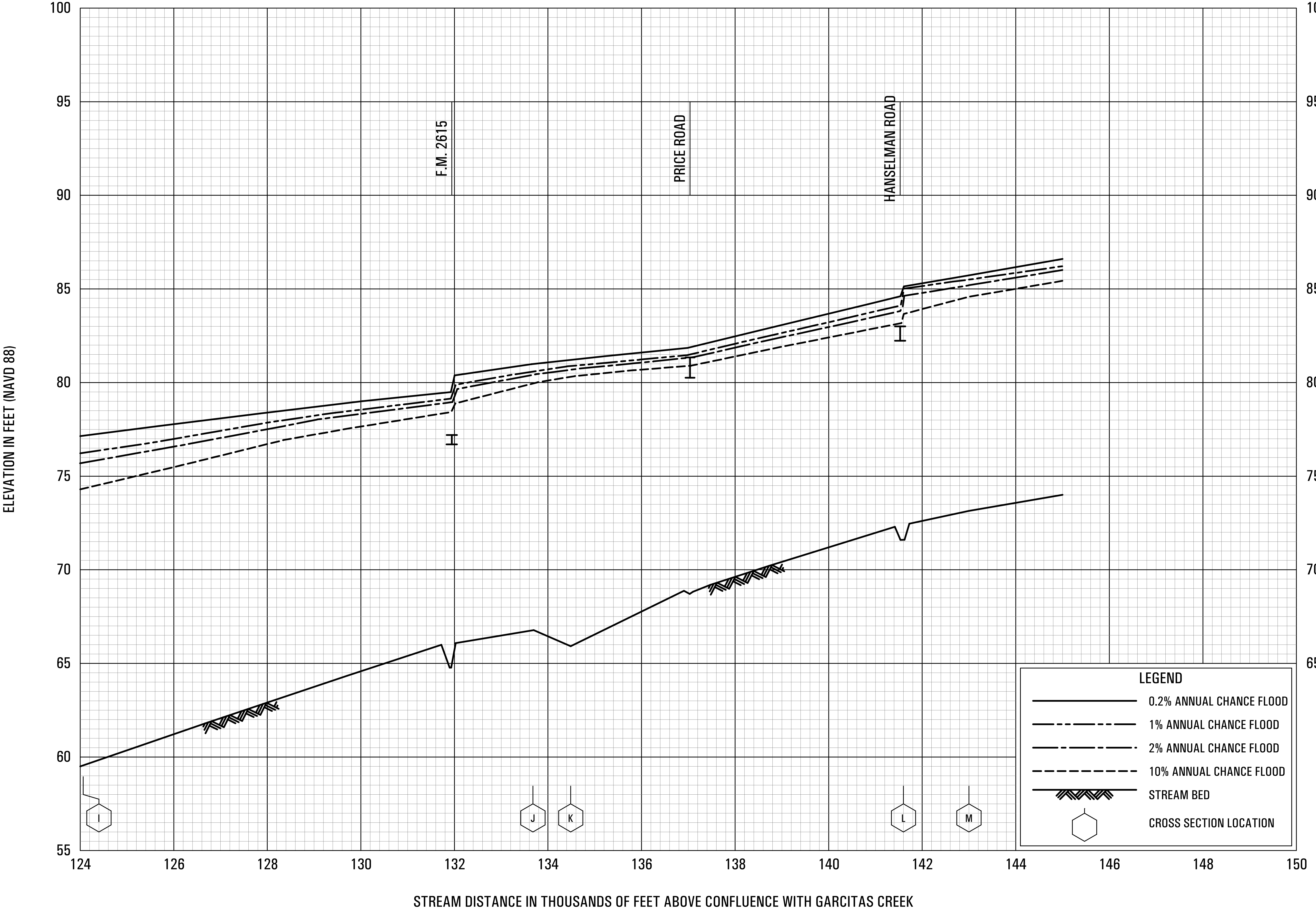
FLOOD PROFILES

LONE TREE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



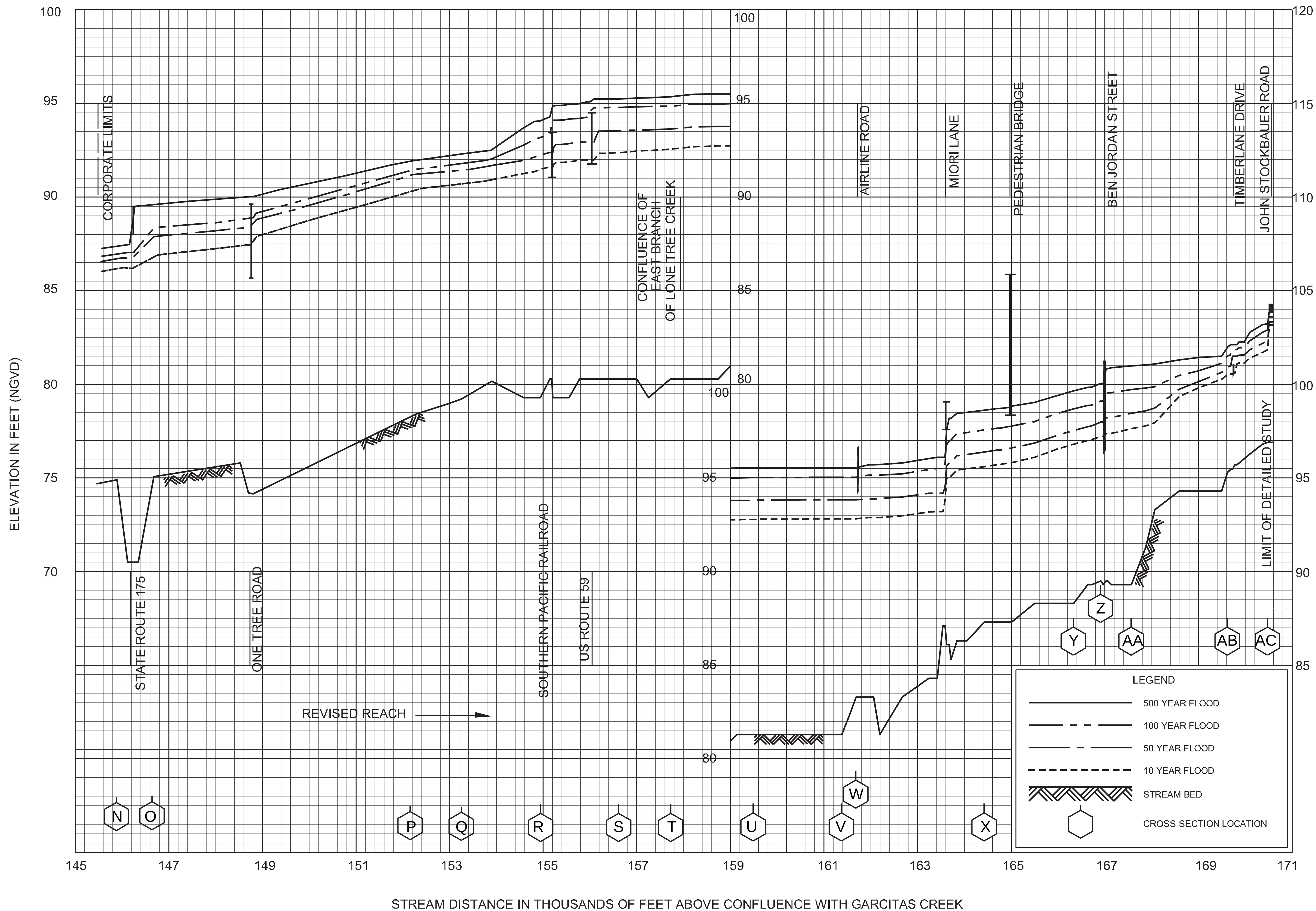
FLOOD PROFILES

LONE TREE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



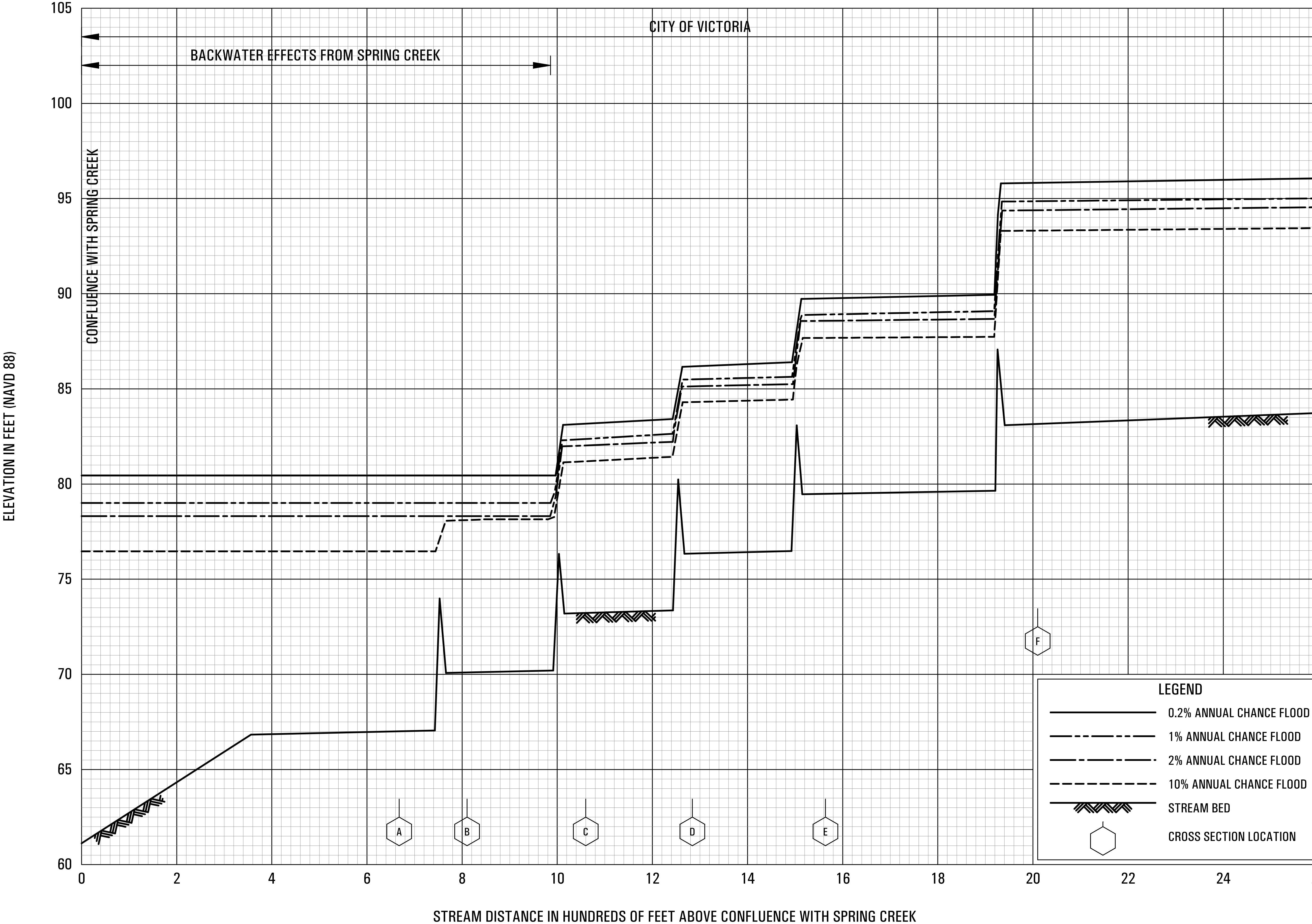
FLOOD PROFILES

LONE TREE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



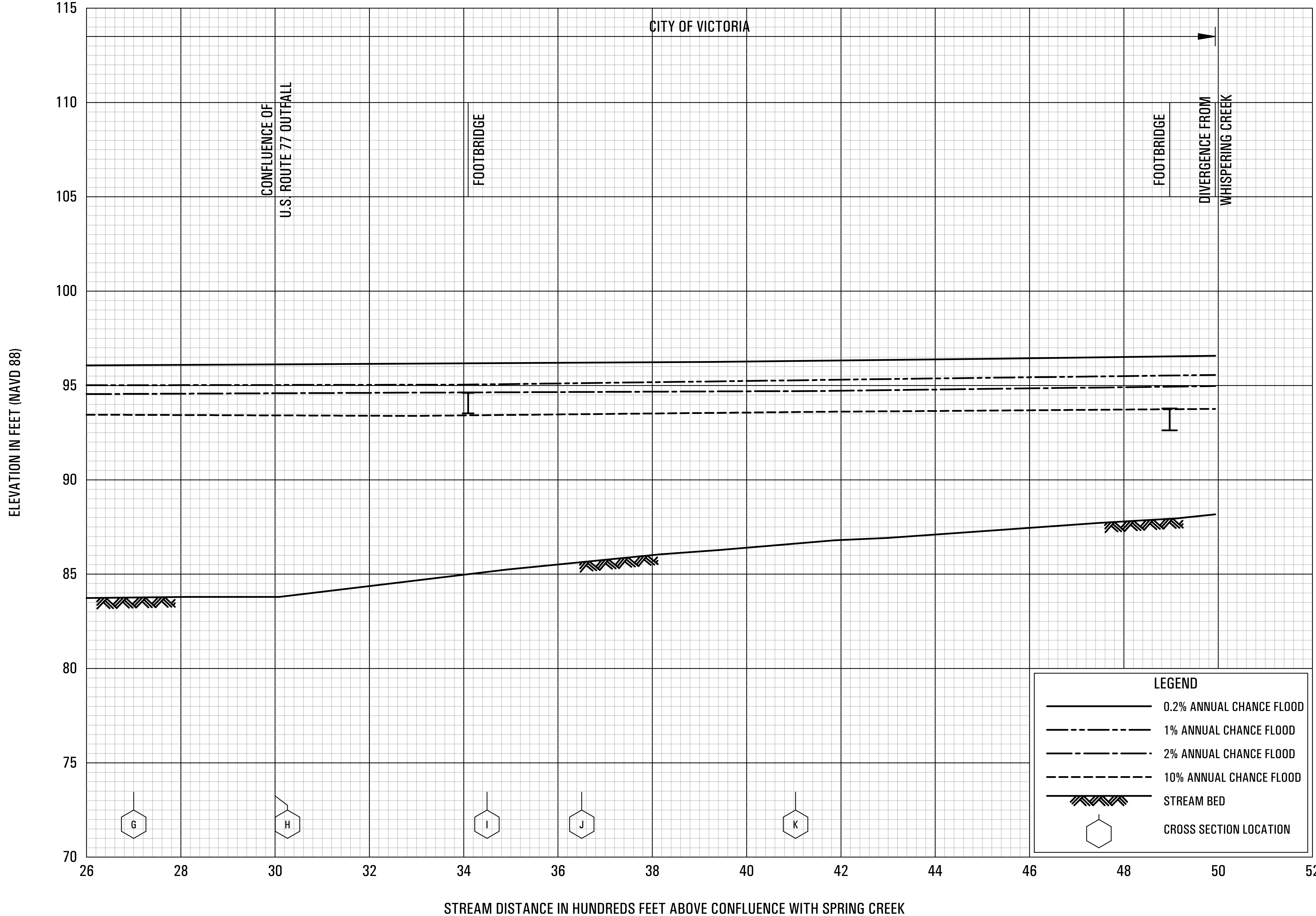
FLOOD PROFILES

NORTH OUTFALL

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



FLOOD PROFILES

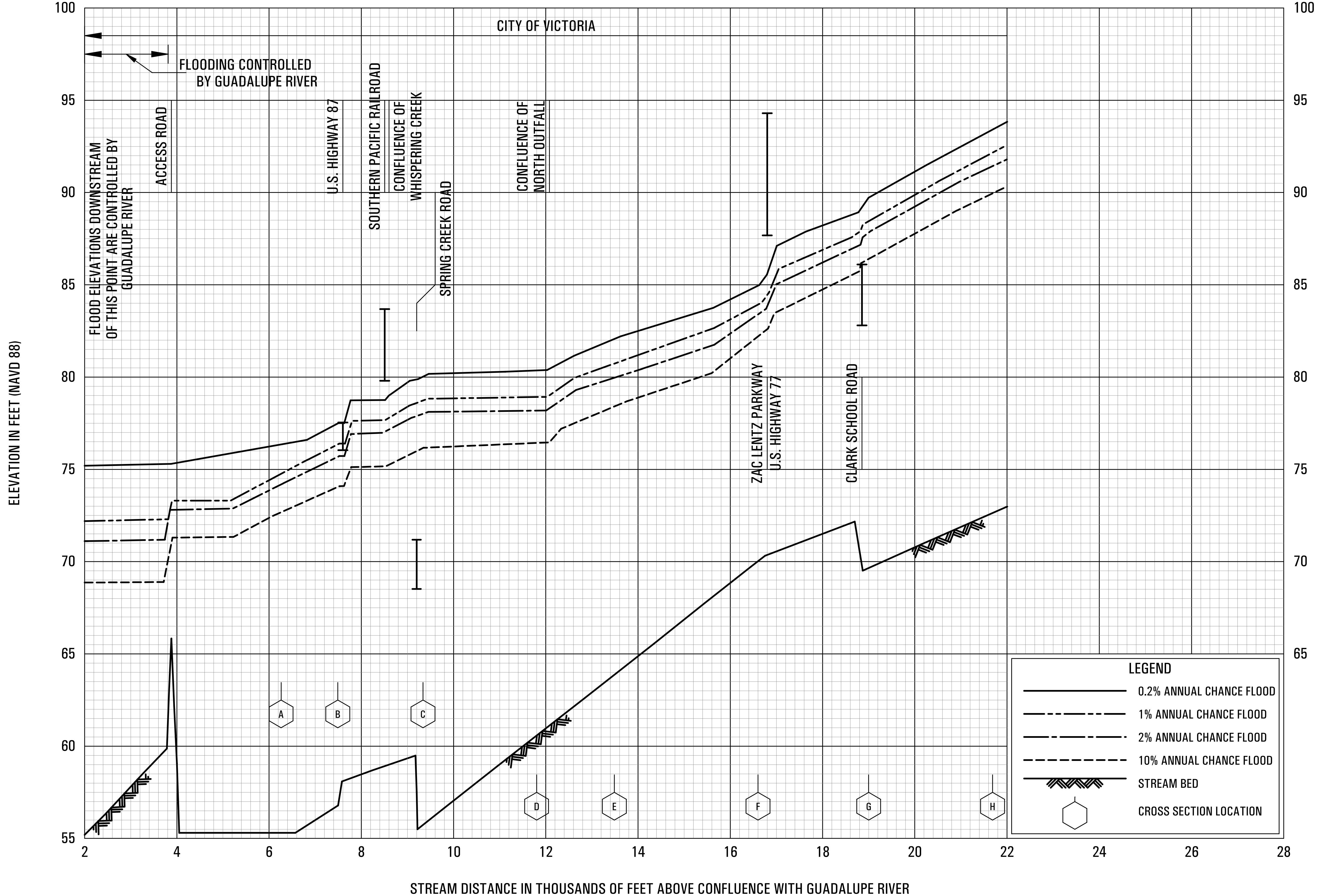
NORTH OUTFALL

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

34P



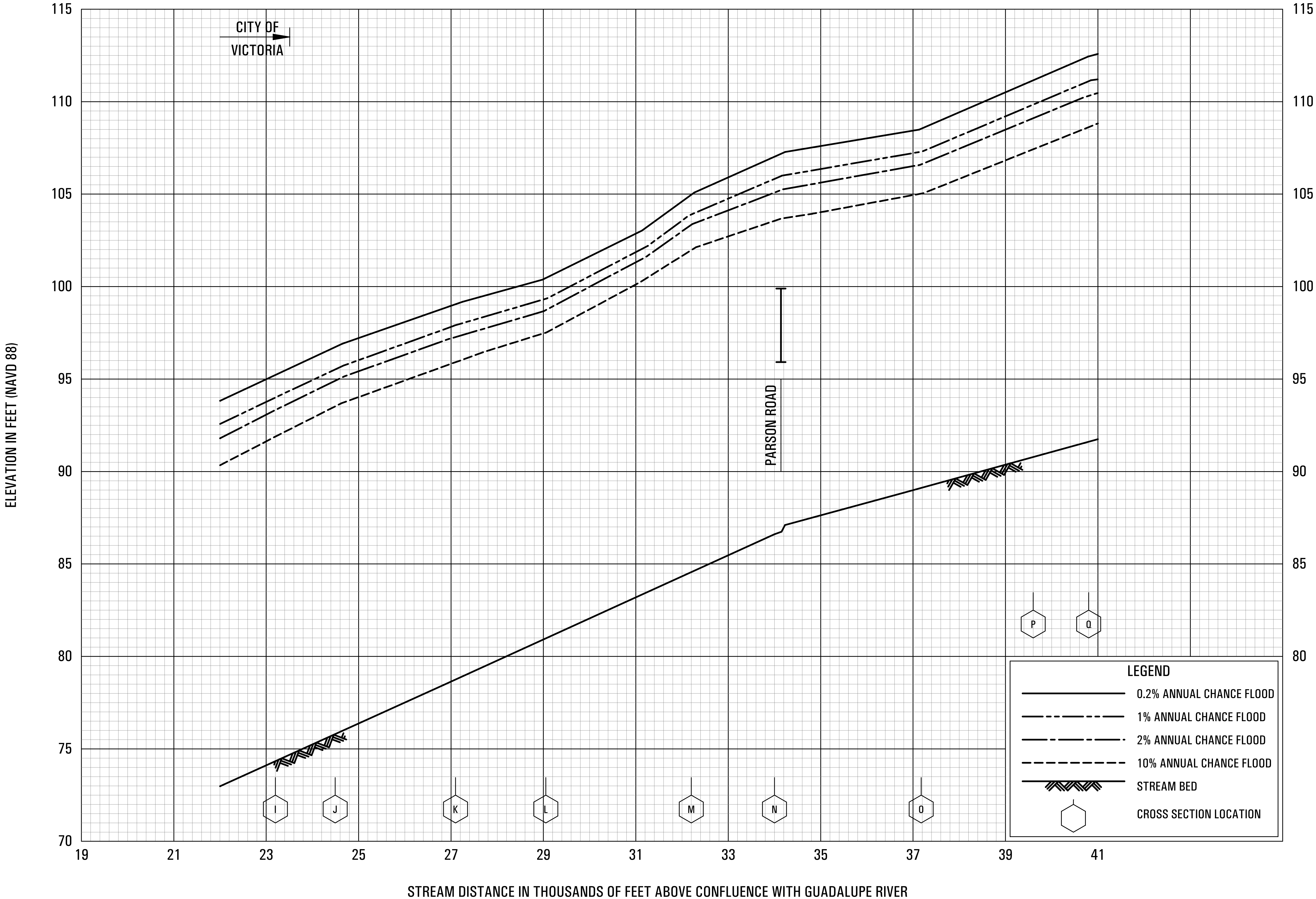
FLOOD PROFILES

SPRING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



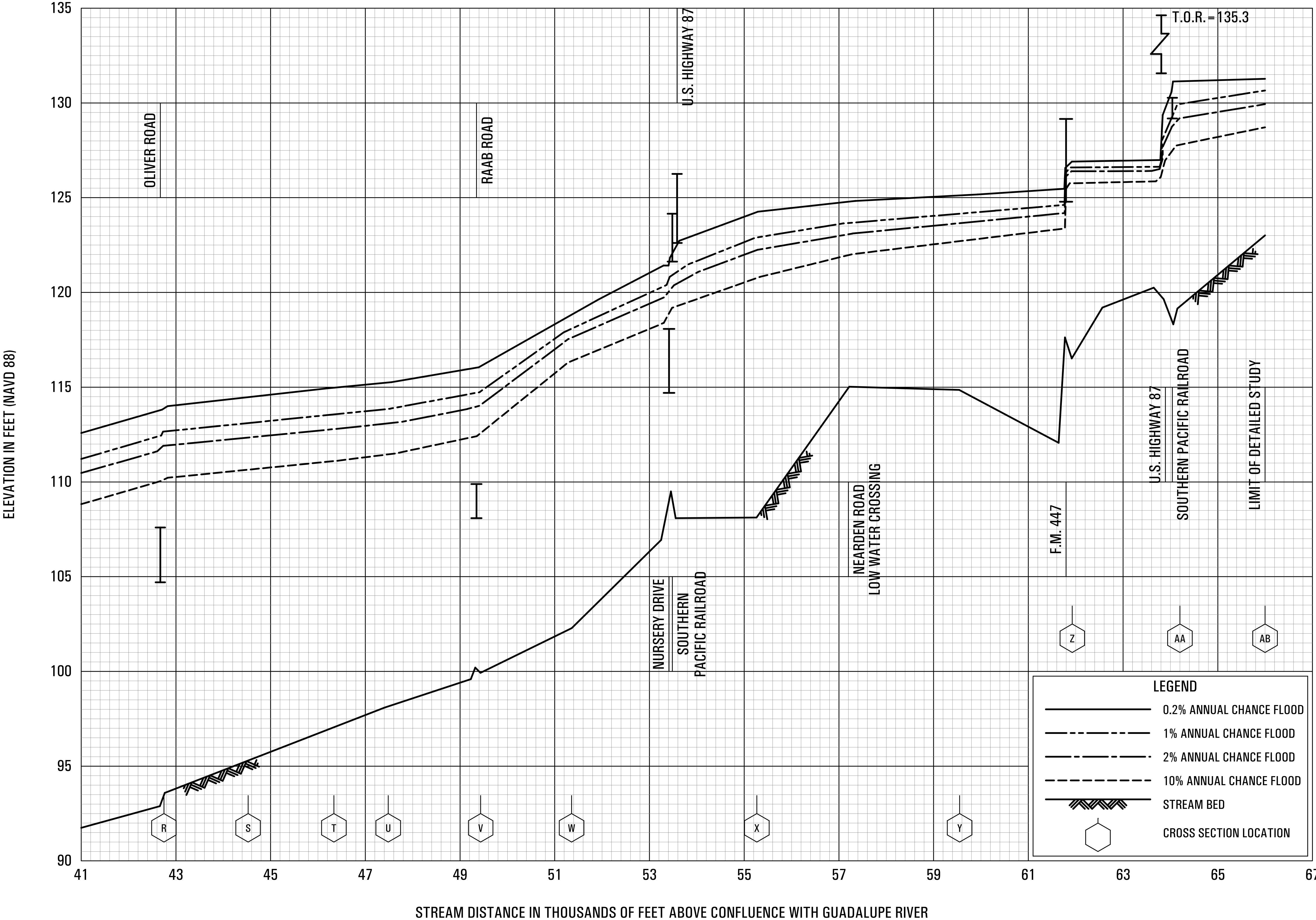
FLOOD PROFILES

SPRING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



FLOOD PROFILES

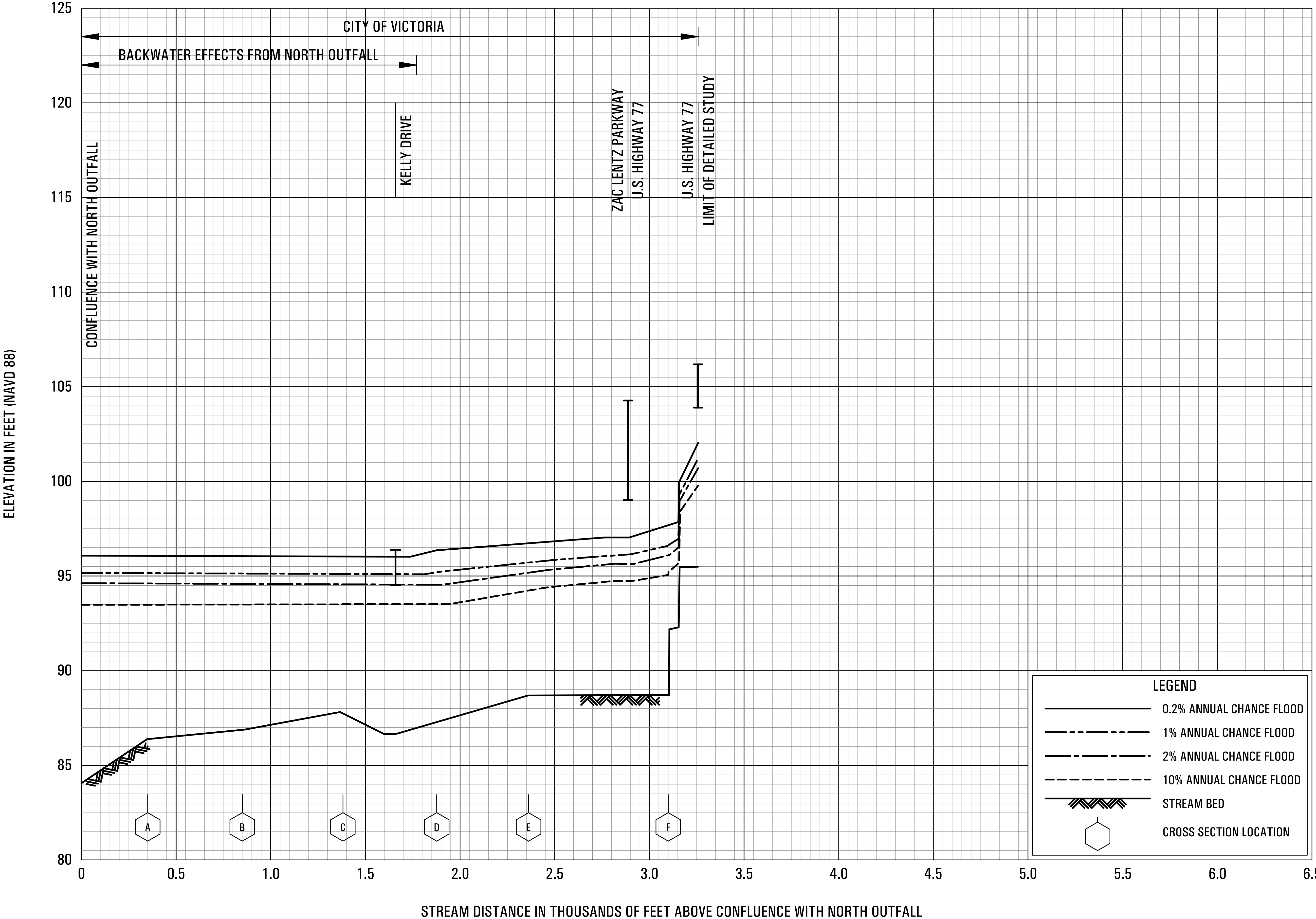
SPRING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

37P



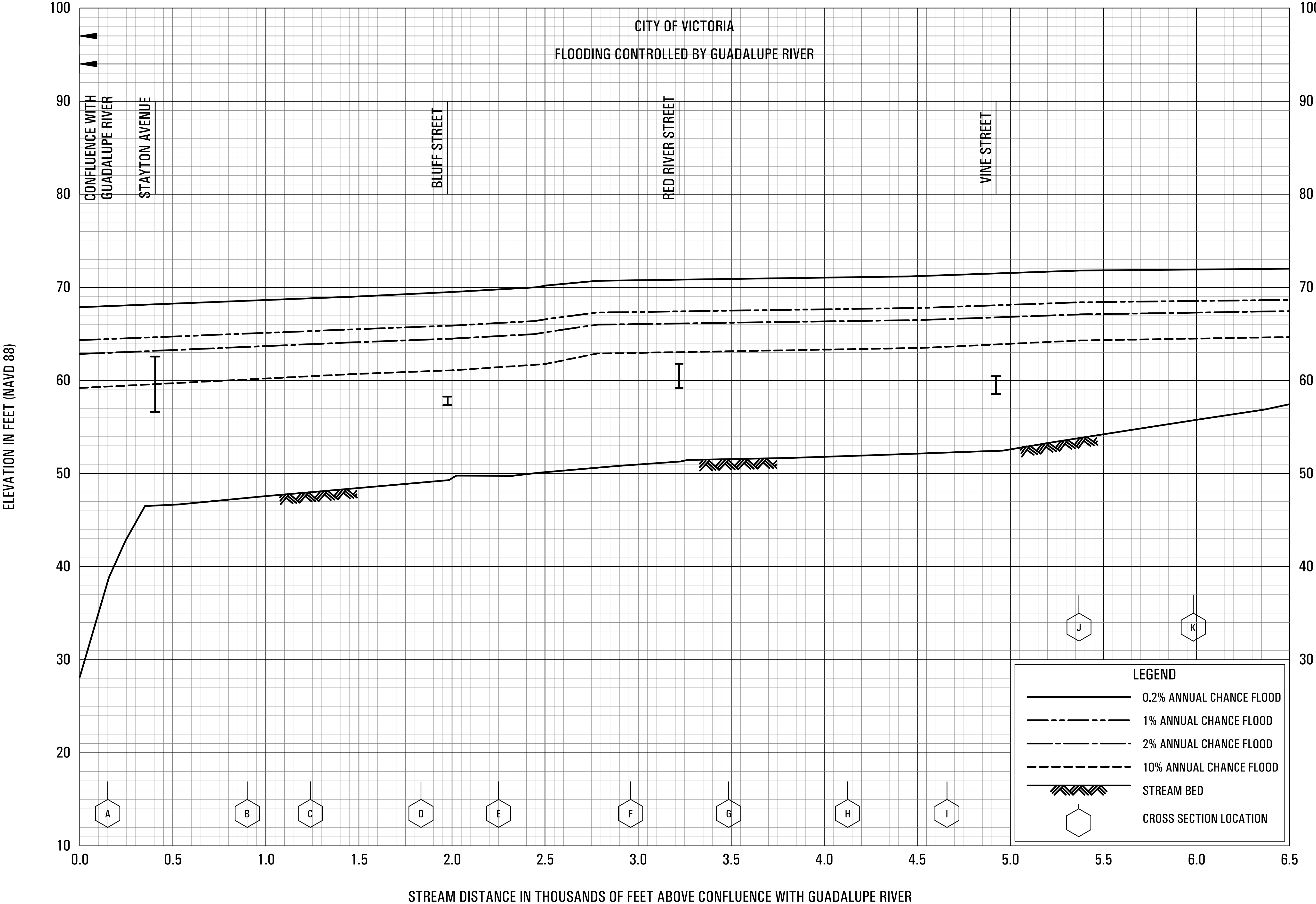
FLOOD PROFILES

U.S. ROUTE 77 OUTFALL

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



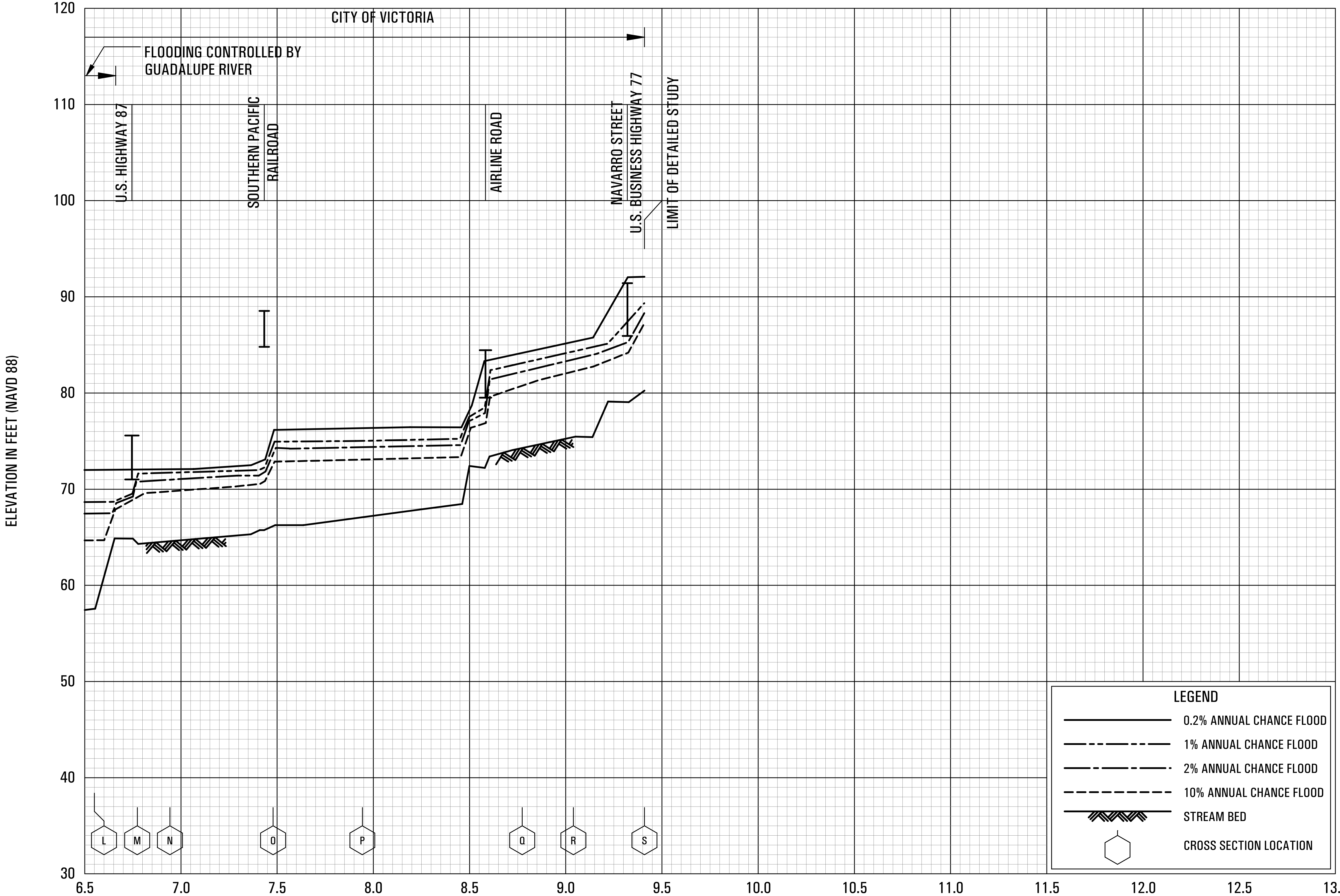
FLOOD PROFILES

WEST OUTFALL

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



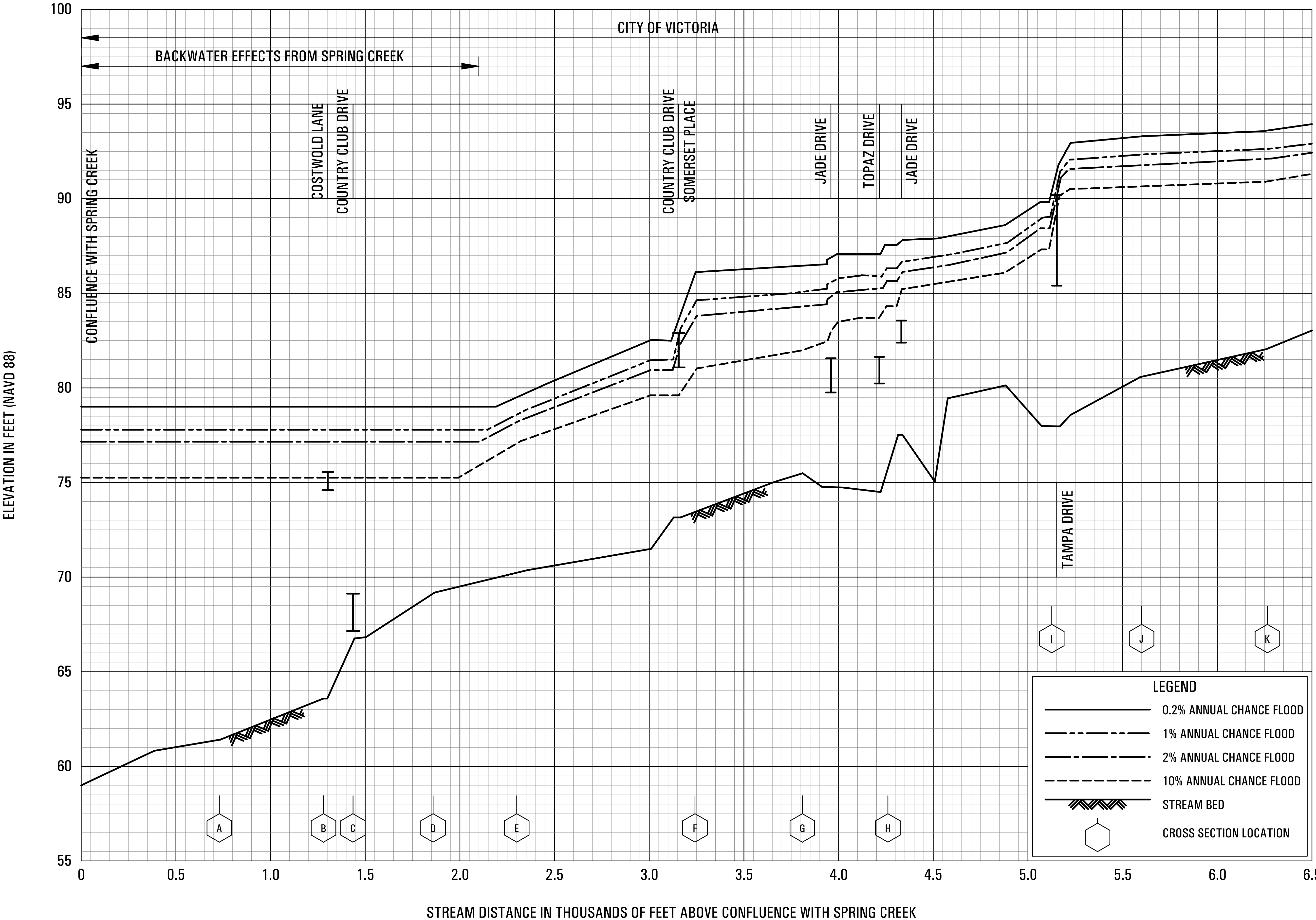
FLOOD PROFILES

WEST OUTFALL

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



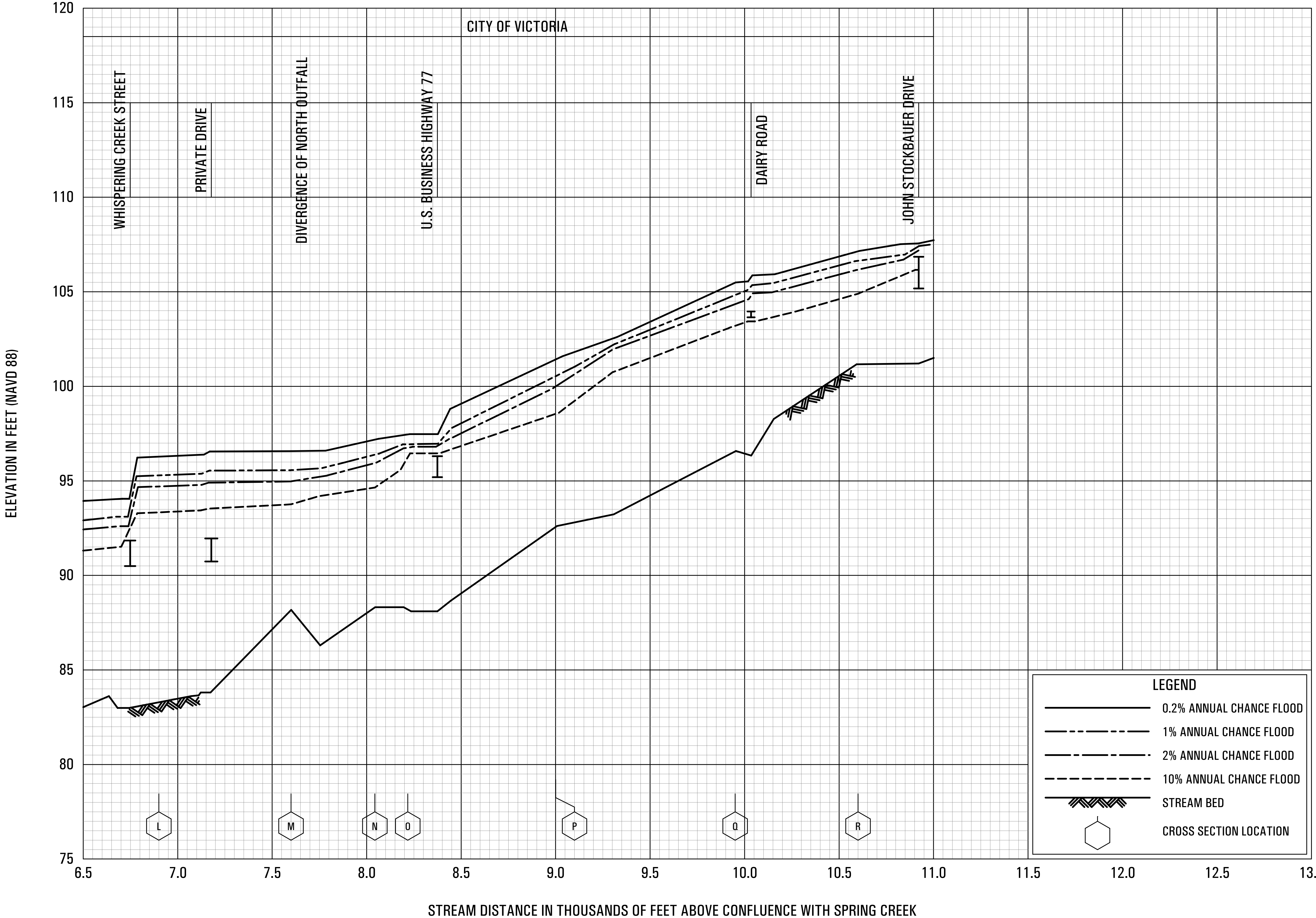
FLOOD PROFILES

WHISPERING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS



FLOOD PROFILES

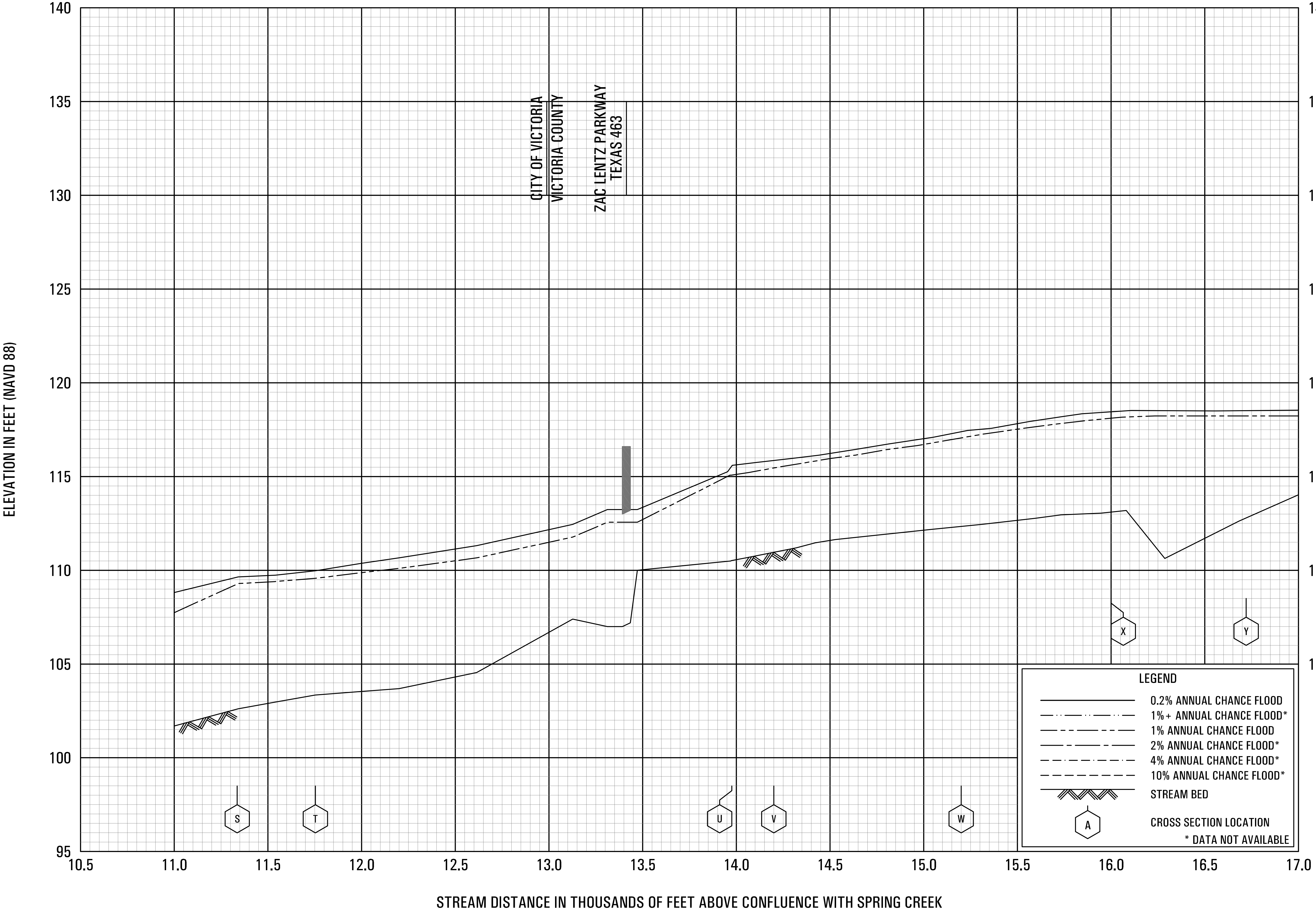
WHISPERING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS

42P



FLOOD PROFILES

WHISPERING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VICTORIA COUNTY, TX

AND INCORPORATED AREAS