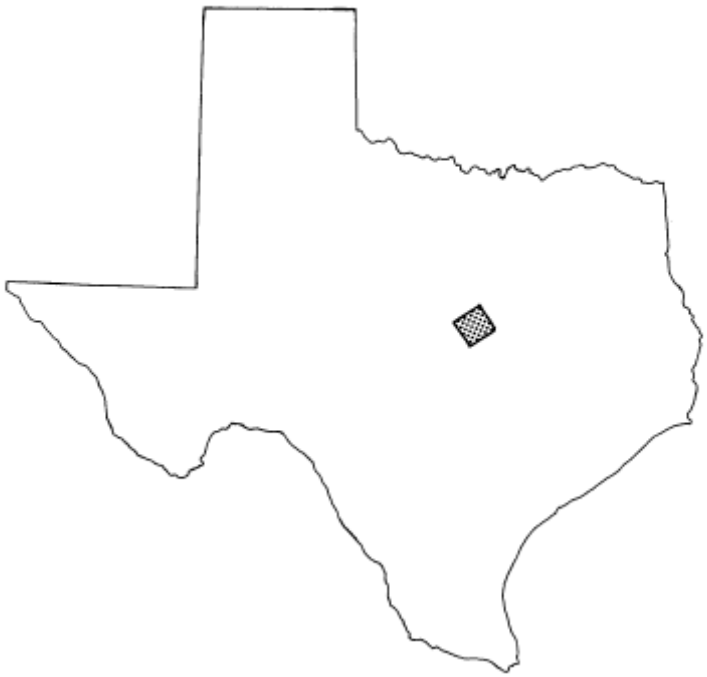
FLOOD INSURANCE STUDY

CORYELL COUNTY, TEXAS
AND INCORPORATED AREAS

Community Name	Community Number
CORYELL COUNTY UNINCORPORATED AREAS	480768
COPPERAS COVE, CITY OF	480155
EVANT, CITY OF	480316
GATESVILLE, CITY OF	480156
MCGREGOR, CITY OF	480459
OGLESBY, CITY OF	480769
SOUTH MOUNTAIN, CITY OF	480317



Effective February 17, 2010

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
48099CV000A

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 Flood Insurance Rate Map 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.

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FLOOD INSURANCE STUDY
CORYELL 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 Coryell County, including the Cities of Copperas Cove, Evant, Gatesville, McGregor, Oglesby, and South Mountain; and the unincorporated areas of Coryell County (referred to collectively herein as Coryell 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.

Please note that the City of Copperas Cove is geographically located in Bell, Coryell, and Lampasas County. The City of McGregor is geographically located in Coryell and McLennan County. The City of Evant is geographically located in Coryell and Hamilton County.

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.

The communities and their respective community FIS report data are listed below:

Coryell County

The hydrologic and hydraulic analyses for this study were performed by Albert H. Halff Associates, Inc. for the Federal Insurance Administration (FIA), under Contract No. H-4648. This study was completed in April 1980. This work was completed March 30, 1981 (Reference 1).

City of Copperas Cove

The hydrologic and hydraulic analyses for this study were performed by Albert H. Halff Associates, Inc. for the FIA, under Contract No. H-4648. This study was completed in April 1980. This work was completed November 6, 1996 (Reference 2).

City of Gatesville

The hydrologic and hydraulic analyses for this study were performed by Albert H. Halff Associates, Inc. for the FIA, under Contract No. H-4648. This study was completed in April 1980. This work was completed March 30, 1981 (Reference 3).

City of McGregor

The hydrologic and hydraulic analyses for this study were performed by URS/Forrest and Cotton, Incorporated for the FIA under Contract No. H-3972. This work, which was completed in April 1977, covered all significant flooding sources in the City of McGregor. This work was completed September 1978 (Reference 4).

Authority and acknowledgements for the Cities of Evant, Oglesby, and South Mountain were not available because no FIS report texts were ever published for the communities.

1.3 Coordination

The initial Consultation Coordination Officer (CCO) meeting was held on May 14, 2007 and attended by representatives of FEMA, Halff Associates, Inc., City of Gatesville, City of Copperas Cove, Central Texas Council of Governments, and Coryell County.

The results of the study were reviewed at the final CCO meeting held on September 23, 2008, and attended by representatives of FEMA, Halff Associates, Inc., City of Gatesville, City of Oglesby, Texas Water Development Board, and Coryell County. 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 Coryell 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 April 2008.

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 Federal Emergency Management Agency (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	Upstream Limit	Length (Mi)
Redelineation Detailed Study Streams			
Clark Creek	Confluence with Clear Creek	Approximately 800 feet upstream of the Coryell/Lampasas County line	1.31
Clear Creek	Approximately 550 feet upstream of the Coryell/Bell County line	U.S. Highway 190	2.76
House Creek	Farm-to-Market (FM) 116	Approximately 1,700 feet upstream of Atchison Topeka and Santa Fe Railway	1.97
Leon River	Approximately 8400 feet downstream of State Highway 36	Just upstream of the confluence with Stillhouse Branch	14.35
Stillhouse Branch	Confluence with Leon River	Confluence with Stream CG-4	2.30
Stream CC-1	Confluence with House Creek	Approximately 2,900 upstream of confluence with House Creek	0.51
Stream CC-2	Confluence with Clear Creek	21st Street	1.92
Stream CG-1	Confluence with Leon River	Farm-to-Market (FM) 107	2.05
Stream CG-2	Confluence with Leon River	State Highway 36	1.53
Stream CG-4	Confluence with Stillhouse Branch	Farm-to-Market 929	0.79
Turkey Run	Approximately 550 feet downstream of Copperas Cove Road	Bowen Avenue	2.05

2.2 Community Description

Coryell County is located in central Texas, covering an area of 1,057 square miles. It is bordered by the unincorporated areas of McLennan County to the east; Bell County to the southeast, Lampasas County to the southwest; Hamilton County to the northwest, and Bosque County to the north. The county seat is located in the City of Gatesville. The major north-south route in Coryell County is State Highway 36. The major west-east route is Highway 84.

According to the United States Census 2000 figures, the population of Coryell County was 74,978. This represents an increase in population of 14.4% since the 1990 census. The 2007 estimate of Coryell County population was 72,156. The county contains much of Fort Hood and has grown in recent years as a result of the influx of military personnel to the military base. There are six incorporated communities in the county; their 2006 population estimates are as follows: City of Copperas Cove (29,727), City of Evant (377), City of Gatesville (15,489), City of McGregor (4,845), City of Oglesby (424), and City of South Mountain (381) (Reference 5).

The climate in Central Texas is semi-arid. Summer and winter average maximum and minimum temperatures range from 97°F (July) to 32°F (January) respectively. Average annual precipitation is 32 inches. Precipitation is variable (Reference 6).

The Leon River, a tributary of the Brazos River, dominates drainage features in the Gatesville area. The Leon River drains 2,342 square miles of central Texas at the Gatesville stream gaging stations. Lake Proctor partially regulates flows on the Leon River at Gatesville. This lake, plus 18 flood retarding structures have some degree of control over 1,300 square miles of the Leon River basin (Reference 7). Development along and near the Leon River is taking place west of State Highway 36 and north of the river near Fort Gates. Development is also relatively heavy north of Gatesville along the river.

Stream CG-1 is 3.9 miles long and has a drainage area of 3.2 square miles at its confluence with the Leon River. Development along Stream CG-1 is scattered.

Stream CG-2, also a tributary of the Leon River, drains 5.2 square miles and is 5.2 miles long. New development is scattered, but is heaviest in the area north of the stream and west of Straws Mill Road.

Stillhouse Branch drains 9.0 miles into the Leon River north of Gatesville. It is 6 miles long. A tributary of Stillhouse Branch, Stream CG-4, is 3.9 miles long and has a drainage area of 2.7 square miles. Development is heaviest just west of these tributaries, along State Highway 36.

House Creek drains the southwest portion of Copperas Cove. Its drainage area upstream of FM 116 is 6.3 square miles. The land immediately adjacent to House Creek is primarily a combination of rural and park area. Development in the vicinity of House Creek includes a trailer park above the confluence of Stream CC-1 and House Creek and houses upstream of the Atchison Topeka and Santa Fe Railway near the headwaters of House Creek.

Turkey Run is located in the northeast section of Copperas Cove. Its drainage area at the beginning of the study area downstream of Copperas Cove Road is 2.8 square miles. The land adjoining Turkey Run is primarily residential upstream of U.S. Highway 190 and, primarily rural and park downstream of U.S. Highway 190.

Clear Creek and its major tributary, Stream CC-2, drain a total of 8.3 square miles. Development along Clear Creek is scattered but growing. In contrast, the land bordering Stream CC-2 is almost entirely residential.

Clark Creek drains 2.6 square miles into Clear Creek. Most of the land bordering the creek is in its natural condition, rural and wooded.

2.3 Principal Flood Problems

Flood problems in Coryell County are mainly associated with the urban areas. In 1908, heavy rains produced record floods in the middle and upper Leon River. This flood was the greatest known to have occurred on the Leon River at Gatesville since at least 1854 (Reference 7). The peak discharge for this flood at Gatesville was 70,000 cubic feet per second (cfs) (Reference 3). This compares to the 1-percent chance annual flood peak discharge of 60,400 cfs and 500-year flood peak discharge of 105,000 cfs. Another large flood occurred on October 4, 1959, when a discharge of 51,200 cfs was recorded at the Gatesville gage (Reference 8). This compares with a 50-year flood peak discharge of 46,200 cfs at that location.

The tributaries of the Leon River are steep and fast-rising. Flood problems in recent years have been limited to overtopped crossings, flooded vehicles and washed out fences. For instance, a seven inch rain falling September 8 and 9, 1966, caused Stillhouse Branch to overtop the State Highway 36 Bridge. Damage was limited to the destruction of fences and a few cars.

Since 1974, Copperas Cove experienced rainfalls of 6 inches or more on at least five occasions. For example, on April 21, 1977, the Copperas Cove Press reported, "heavy rains that pelted the area caused many roads to be closed due to rapidly rising creeks and rivers. Fences were washed away, and one vehicle was reported to have been driven into high water. No injuries were sustained…." as a result of an eight-inch rain (Reference 9).

The most severe flood problems occur along the developed reaches of Turkey Run and Stream CC-2. Severe flooding is reported to have occurred in 1957 on Turkey Run upstream of the Atchison Topeka and Santa Re Railway. In addition, previous studies indicate that Stream CC-2 experiences severe flood water problems…" within the corporate limits of Copperas Cove (Reference 10)

Clear Creek, Clark Creek, House Creek, and Stream CC-1 are in rapidly urbanizing areas. Currently, flood problems are minor in these areas. The rapidly rising streams often caused roads to be closed and fences to be washed away. The increased development pressure on these areas could result in future flood problems without effective management of the flood plains of Clear Creek, Clark Creek, House Creek, and Stream CC-1.

2.4 Flood Protection Measures

Nonstructural measures of flood protection are being utilized to aid in the prevention of future flood damage. These methods include flood insurance and floodplain zoning. Flood insurance under Public Law 73-234 is now available to Coryell County. The cities of Gatesville and Copperas Cove complied with the act and passed a floodplain zoning ordinance. The regulations are used to control floodplain development and prevent future flood damage. Coryell County consults emergency flood hazard maps prior to issuing building permits in flood-prone areas.

Two major reservoirs are located on the Leon River upstream of Gatesville. Proctor Lake near Proctor, Texas controls runoff from 1,259 square miles of Leon River watershed. The lake is operated for flood control and water conservation. Leon Reservoir near Ranger, Texas was built for water supply (Reference 7).

3.0 ENGINEERING METHODS

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

3.1 Hydrologic Analyses

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

3.1.1 Redelineated Detailed Study Streams

The redelineated streams were initially studied by detailed methods. These flooding sources include all those listed in Table 1 unless identified otherwise below.

Hydrologic evaluations in the previous FIS reports for Coryell County and its incorporated areas were based on the following methods:

The 10-, 1-, and 0.2-percent annual discharges on the Leon River at Gatesville were determined by statistical analysis of stream flow data at the United States Geological Survey (USGS) gage called “Leon River at Gatesville” (References 8 and 11).

For the detailed study of Leon River tributaries in Gatesville, the hydrologic analysis was a modification of USGS procedures (Reference 12). This procedure relates stream basin characteristics to flood frequency curves for basins in Texas. Flood frequency curves for gaged streams are calculated using the standard Log Pearson Type III method as outlined by the Water Resources Council (Reference 13). The resulting flood flow frequency curves are related by regression analysis to basin characteristics such as drainage area, stream length and slope (Reference 14). The resulting empirical equations for each flood frequency are used for areas that are not gaged.

Discharges for Clear Creek, Clark Creek, Stream CC-1, Stream CC-2 downstream of Lynn Lane, and Turkey Run downstream of the Atchison Topeka and Santa Fe Railway were determined by rainfall-runoff analysis based on unit hydrograph theory and employing Soil Conservation Service dimensionless unit hydrograph and curve number theory (References 15 and 16). Rainfall amounts for the 10, 2, and 1 percent annual flood frequency floods are from National Oceanic and Atmospheric Administration data (Reference 17). The 0.2-percent annual discharges are estimated by extrapolating frequency curves based on the computed 10-, 2-, and 1-percent annual discharges. A reservoir routing was performed on House Creek at the Atchison Topeka and Santa Fe Railway due to floodwater storage behind the railway

embankment. All the parameters used in this program were as recommended by the Soil Conservation Service (SCS) National Engineering Handbook.

Overbank may cause decreases in upstream discharges on House Creek, Stillhouse Branch, and Stream CG-2.

Discharges for drainage areas smaller than one square mile in the upper portions of Turkey Run and Stream CC-2 were determined by the rational method (Reference 18).

Peak discharge-drainage area relationships for Coryell County are shown in Table 2, "Summary of Discharges."

Table 2 – 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
Redelineation Detailed Study Streams					
CLARK CREEK					
Just upstream of confluence with Clear Creek	2.6	2,330	3,600	4,270	6,000
Approximately 600 feet downstream of Coryell/Lampasas County Line	1.8	2,030	3,170	3,770	5,150
CLEAR CREEK					
Just 500 feet upstream of Coryell/Bell County line	8.3	8,600	13,100	15,400	21,500
Just downstream of Clark Creek	6.0	7,100	10,900	12,900	17,300
Just upstream of Clark Creek	3.4	4,300	6,500	7,650	10,500
Just downstream of stream CC-2	2.8	4,200	6,450	7,600	10,200
At FM 3046	1.4	2,150	3,350	3,950	5,500
Approximately 2,500 feet downstream of U.S. Highway 190	1.2	1,850	2,850	3,400	4,700
At U.S. Highway 190	0.9	1,550	2,400	2,900	3,950
HOUSE CREEK					
At Farm Market (FM) 116	6.3	4,835	7,365	8,685	12,000
Just downstream of Stream CC-1	5.7	5,045	7,705	9,095	12,400
Just upstream of Stream CC-1	2.8	1,855	2,795	3,280	4,450
Approximately 2,000 feet upstream of Stream CC-1	2.4	1,645	2,490	2,920	4,100
Approximately 1,600 feet downstream FM 1113	1.6	1,335	1,680	1,870	2,230
Atchison Topeka and Santa Fe Railway	1.4	1,200	1,520	1,680	1,950
At private road about 1,000 feet upstream of Atchison Topeka and Santa Fe Railway	1.1	2,125	3,165	3,700	4,900

Table 2 – Summary Of Discharges (cont.)

Flooding Source And Location	Drainage Area (Sq. Mile)	Peak Discharges (cfs) 10% Annual Chance	2 % Annual Chance	1% Annual Chance	0.2% Annual Chance
LEON RIVER					
USGS gaging station 08100500 labeled "Leon River at Gatesville"	2,390	22,300	46,200	60,400	105,000
STILLHOUSE BRANCH					
At confluence with Leon River	9.0	5,440	10,900	13,830	22,230
Just downstream of confluence with Tributary	8.1	5,340	10,900	13,830	22,230
Just upstream of confluence with Tributary	6.6	4,900	10,530	13,630	22,730
Just downstream of confluence with Stream CG-4	6.0	4,750	10,640	13,640	22,730
STREAM CC-1					
Just upstream of House Creek	2.9	3,090	4,870	5,750	8,000
Approximately 2,800 feet upstream of House Creek	2.8	3,000	4,620	5,470	7,500
STREAM CC-2					
Just upstream of confluence with Clear Creek	1.4	2,000	2,950	3,450	4,500
Approximately 1,500 feet downstream of Lynn Lane	1.0	1,800	2,700	3,150	4,200
At Deorsam Drive	0.7	1,570	2,340	2,750	3,630
At Randa Street	0.4	860	1,250	1,510	1,980
Approximately 1,400 feet upstream of Georgetown Road	0.3	610	870	1,070	1,400
At 21st Street	0.1	320	450	560	740
STREAM CG-1					
At the confluence with Leon River	3.2	3,480	7,010	9,120	14,290
Just downstream of confluence with its Tributary	3.0	3,280	6,860	8,840	14,290
Just upstream of confluence with its Tributary	2.2	2,870	5,760	7,320	11,820
At the limit of detailed study	1.6	2,350	5,380	7,180	11,820
STREAM CG-2					
At the confluence with Leon River	4.2	4,260	8,260	10,290	18,210
Just downstream of Strawmill Road	4.0	4,060	8,060	10,130	15,890
At the limit of detailed study	3.7	3,780	7,840	10,040	16,410
STREAM CG-4					
At the confluence with Stillhouse Branch	2.2	3,120	6,140	7,690	12,030
At the limit of detailed study	1.9	2,850	5,800	7,360	11,830

Table 2 – Summary Of Discharges (cont.)

Flooding Source And Location	Drainage Area (Sq. Mile)	Peak Discharges (cfs) 10% Annual Chance	2 % Annual Chance	1% Annual Chance	0.2% Annual Chance
TURKEY CREEK					
Approximately 550 feet downstream of Copperas Cove Road	2.8	3,740	5,570	6,500	8,600
Approximately 1,000 feet upstream of Copperas Cove Road	1.7	2,560	3,740	4,350	5,790
At footbridge, 2,600 feet downstream of Atchison Topeka and Santa Fe Railway	1.4	2,100	3,160	3,720	5,000
Atchison Topeka and Santa Fe Railway	0.6	1,370	2,010	2,430	3,200
At Robertson Avenue	0.4	860	1,240	1,530	1,980
At Amothor Avenue	0.3	660	940	1,170	1,510
At Bowen Avenue	0.3	460	660	820	1,040

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 Flood Insurance Rate Maps 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 select cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computer (Section 4.2), selected cross sections locations are also shown on the FIRM.

The hydraulic analyses for these studies 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. Redelineated Detailed Study Streams

The analyses for the redelineated study streams were taken from the prior FIS for Coryell County. The base flood elevations (BFEs) from the profiles were plotted on the best available topographic data to define the special flood hazard areas. The redelineated streams are identified in Table 1.

Cross sections for backwater analyses on the water courses in Copperas Cove were obtained by photogrammetric methods from aerial photographs flown in November 1978. Bridge openings and other structures were surveyed in 1979 with a check of a sample of the photogrammetric cross sections. Limited topographic information was obtained from United States Geological Survey (USGS) 7.5-minute series maps entitled "Copperas Cove, Texas, Twin Mountains, Texas, and McMillan Mountains, Texas" (Reference 19).

Cross sections for backwater analyses on the water courses in Gatesville were obtained by field survey and photogrammetric methods from aerial photographs flown in November, 1978. Bridge openings and other structures were surveyed in 1979 along with a check of a sample of the photogrammetric cross sections. Limited topographic information was obtained from USGS 7 ½ minute series maps, titled, Gatesville East, Texas and Gatesville West, Texas (Reference 19).

For all other flooding sources studied by detailed methods, the cross sections were field surveyed. Cross sections were located at close intervals above and below bridges and culverts in order to compute the significant backwater effects of these structures.

Water-surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (Reference 20). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. The starting water-surface elevation for the Brazos River was determined using a known elevation at the Granbury Dam. The starting water-surface elevations for House Creek, Clear Creek, Clark Creek, and Turkey Run were calculated using critical depth. The starting water-surface elevations for all other flooding sources were determined using the slope/area method.

Channel roughness factors (Manning's "n") used in hydraulic analyses were based on observations. Table 3, "Summary of Roughness Coefficients," lists channel and overbank "n" values for the streams studied by detailed methods.

Table 3 – Summary Of Roughness Coefficients
Stream Reaches Studied by Detailed Methods

Stream Name	Channel "N" Value	Overbank "N" Value
Clark Creek	0.025-0.055	0.02-0.088
Clear Creek	0.03-0.045	0.02-0.088
House Creek	0.02-0.085	0.02-0.088
Leon River	0.05-0.065	0.045-0.10
Stillhouse Branch	0.04-0.045	0.045-0.10
Stream CC-1	0.05	0.02-0.088
Stream CC-2	0.03-0.055	0.02-0.088
Stream CG-1	0.05-0.06	0.045-0.10
Stream CG-2	0.045-0.06	0.045-0.10
Stream CG-4	0.045-0.055	0.045-0.10
Turkey Run	0.02-0.06	0.02-0.088

3.3 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929

(NGVD). With the completion of the North American Vertical Datum of 1988 (NAVD), many FIS reports and FIRMs are now prepared using NAVD as the referenced vertical datum.

Flood elevations shown in this FIS report and on the FIRM are referenced to the NAVD. 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 Coryell County is 0.24 feet.

For information regarding conversion between the NGVD and NAVD, 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
1315 East-West Highway
Silver Spring, MD 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 maps at a scale of 1" = 2000' (1:24,000), with a contour interval of 10 feet (Reference 19).

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 4, 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			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET, NAVD 88)	WITHOUT FLOODWAY (FEET, NAVD 88)	WITH FLOODWAY (FEET, NAVD 88)	INCREASE
Clark Creek								
A	325	94	371	11.5	960.8	960.8	960.8	0.0
B	3,700	97	537	7.9	993.3	993.3	993.9	0.6
C	6,130	183	652	5.8	1018.9	1018.9	1019.5	0.6

[1]Feet above confluence

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

CLARK CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET, NAVD 88)	WITHOUT FLOODWAY (FEET, NAVD 88)	WITH FLOODWAY (FEET, NAVD 88)	INCREASE
Clear Creek								
A	2,900	205	1,193	12.9	946.4	946.4	946.4	0.0
B	6,000	109	624	12.3	968.2	968.2	968.2	0.0
C	8,660	209	984	7.8	989.4	989.4	990.2	0.8
D	11,190	104	450	8.8	1017.9	1017.9	1017.9	0.0
E	13,880	146	509	6.7	1049.5	1049.5	1050.0	0.5

[1] Feet above Coryell County/Bell County line

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

CLEAR CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET, NAVD 88)	WITHOUT FLOODWAY (FEET, NAVD 88)	WITH FLOODWAY (FEET, NAVD 88)	INCREASE
House Creek								
A	1,560	137	932	9.8	969.0	969.0	969.0	0.0
B	4,810	97	426	6.9	987.8	987.8	988.2	0.4
C	5,900	121	405	7.2	999.2	999.2	999.2	0.0
D	10,560	183	545	6.8	1048.0	1048.0	1048.5	0.5

[1]Feet above Fort Hood Military Reservation boundary

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

HOUSE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET, NAVD 88)	WITHOUT FLOODWAY (FEET, NAVD 88)	WITH FLOODWAY (FEET, NAVD 88)	INCREASE
Leon River								
A	100	1,639	13,759	4.4	715.3	715.3	716.3	1.0
B	12,170	1,108	18,478	3.3	723.8	723.8	724.6	0.8
C	22,510	1,377	17,673	3.4	732.3	732.3	733.2	0.9
D	30,450	795	10,494	5.8	738.0	738.0	738.9	0.9
E	52,000	790	11,033	5.5	750.6	750.6	751.5	0.9
F	62,620	1,311	14,591	4.1	756.0	756.0	756.9	0.9
G	68,450	1,741	21,402	2.8	760.9	760.9	761.8	0.9

[1] Feet above a point 8,400 feet downstream of State Highway 36

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

LEON RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET, NAVD 88)	WITHOUT FLOODWAY (FEET, NAVD 88)	WITH FLOODWAY (FEET, NAVD 88)	INCREASE
Stillhouse Branch								
A	5,690	707	2,969	4.7	763.7	763.7	764.3	0.6
B	8,620	655	3,316	4.1	778.6	778.6	779.1	0.5
C	10,550	700	2,711	5.0	783.7	783.7	784.1	0.4

[1]Feet above confluence

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

STILLHOUSE BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET, NAVD 88)	WITHOUT FLOODWAY (FEET, NAVD 88)	WITH FLOODWAY (FEET, NAVD 88)	INCREASE
Stream CC-1								
A	2,100	145	769	7.2	990.2	990.2	991.2	1.0
B	2,870	123	683	8.0	996.9	996.9	997.3	0.4

[1]Feet above confluence

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

STREAM CC-1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET, NAVD 88)	WITHOUT FLOODWAY (FEET, NAVD 88)	WITH FLOODWAY (FEET, NAVD 88)	INCREASE
Stream CC-2								
A	600	114	356	9.7	1002.5	1002.5	1003.5	1.0
B	2,814	70	347	9.1	1029.3	1029.3	1029.3	0.0
C	5,722	38	208	7.2	1061.1	1061.1	1061.1	0.0
D	8,880	174	287	3.7	1103.0	1103.0	1103.6	0.6

[1]Feet above confluence with Clear Creek

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

STREAM CC-2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET, NAVD 88)	WITHOUT FLOODWAY (FEET, NAVD 88)	WITH FLOODWAY (FEET, NAVD 88)	INCREASE
Stream CG-1								
A	2,090	114	872	10.5	733.3	733.3	733.7	0.4
B	8,640	603	1,781	4.1	792.7	792.7	793.3	0.6

[1]Feet above confluence

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

STREAM CG-1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET, NAVD 88)	WITHOUT FLOODWAY (FEET, NAVD 88)	WITH FLOODWAY (FEET, NAVD 88)	INCREASE
Stream CG-2 A	1,900	167	950	10.8	741.9	741.9	741.9	0.0

[1]Feet above confluence

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

STREAM CG-2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET, NAVD 88)	WITHOUT FLOODWAY (FEET, NAVD 88)	WITH FLOODWAY (FEET, NAVD 88)	INCREASE
Stream CG-4 A	1,720	765	1,662	4.6	794.3	794.3	794.7	0.4

[1]Feet above confluence

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

STREAM CG-4

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET, NAVD 88)	WITHOUT FLOODWAY (FEET, NAVD 88)	WITH FLOODWAY (FEET, NAVD 88)	INCREASE
Turkey Run								
A	0	115	768	8.5	967.1	967.1	968.1	1.0
B	2,140	140	771	5.6	993.2	993.2	993.9	0.7
C	3,820	75	409	9.1	1011.0	1011.0	1011.4	0.4
D	10,520	35	90	9.6	1100.4	1100.4	1100.4	0.0

[1]Feet above a point 550 feet downstream of Copperas Cove Road

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

FLOODWAY DATA

TURKEY RUN

The area between the floodway and 1-percent annual chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation (WSEL) of the 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.

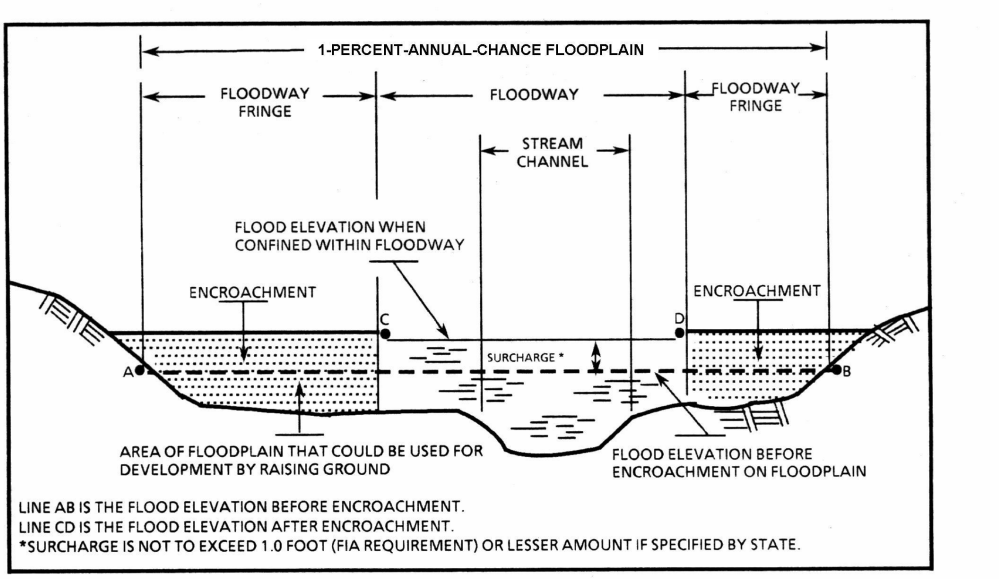

Figure 1. Floodway Schematic

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.

5.0 INSURANCE APPLICATION

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

Zone A

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

Zone AE

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

Zone X

Zone X is the flood insurance 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 square mile (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 Coryell 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 5, "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
Coryell County and Unincorporated Areas	December 6, 1977	None	September 30, 1981	None
Copperas Cove, City of	April 5, 1974	August 6, 1976	November 21, 1978	September 30, 1981 August 1, 1983 November 6, 1996
Evant, City of	September 30, 1981	None	September 30, 1981	None
Gatesville, City of	April 5, 1974	January 2, 1976	September 30, 1981	None
McGregor, City of	February 22, 1974	None	February 1, 1979	None
Oglesby, City of	November 12, 1976	November 12, 1976	November 1, 2007	None
South Mountain, City of	September 30, 1981	None	September 30, 1981	None

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER 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 Federal Insurance and Mitigation Division, FEMA Region VI, Federal Regional Center, FRC 800 North Loop 288, Denton, Texas 76209-3698.

9.0 BIBLIOGRAPHY AND REFERENCES

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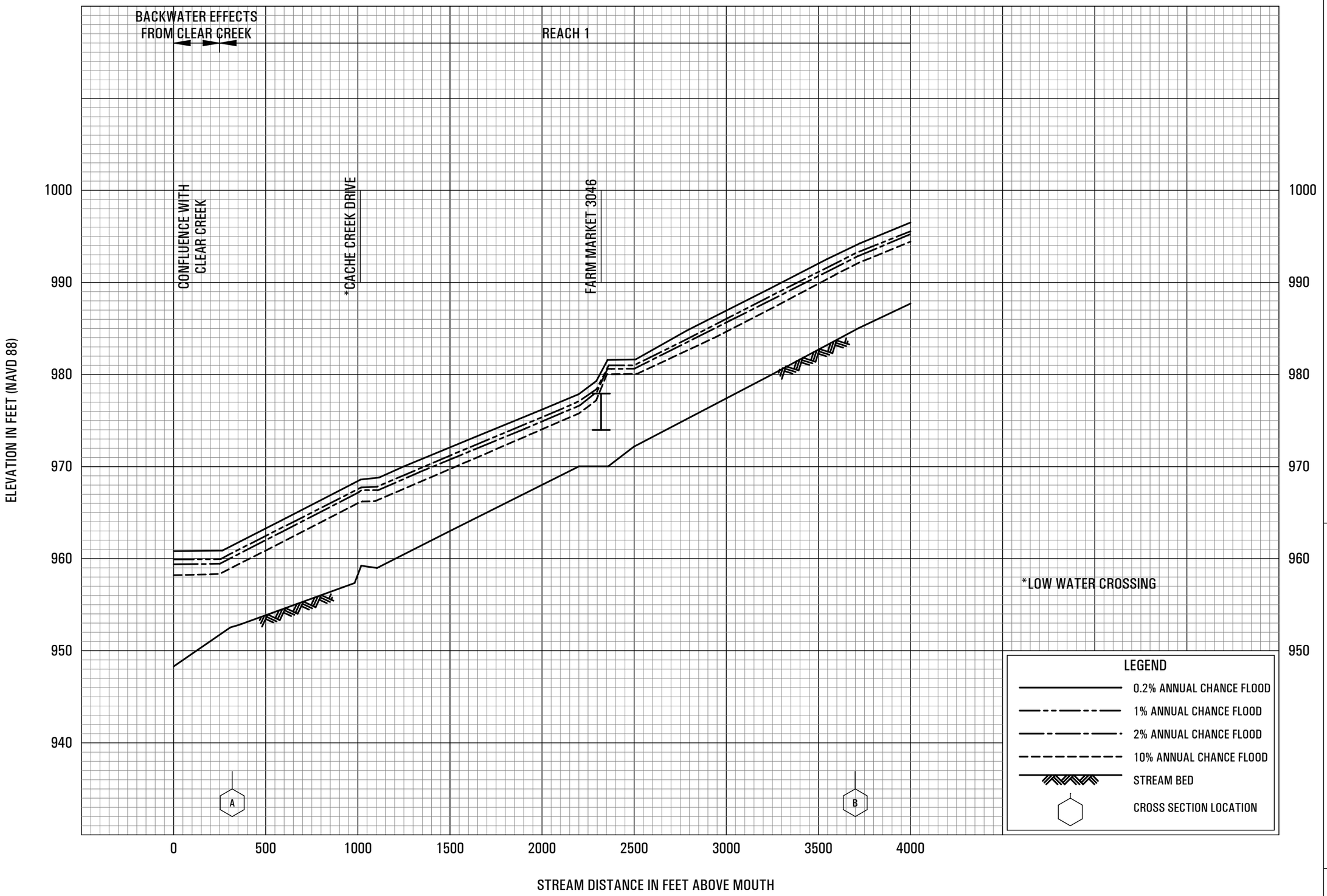
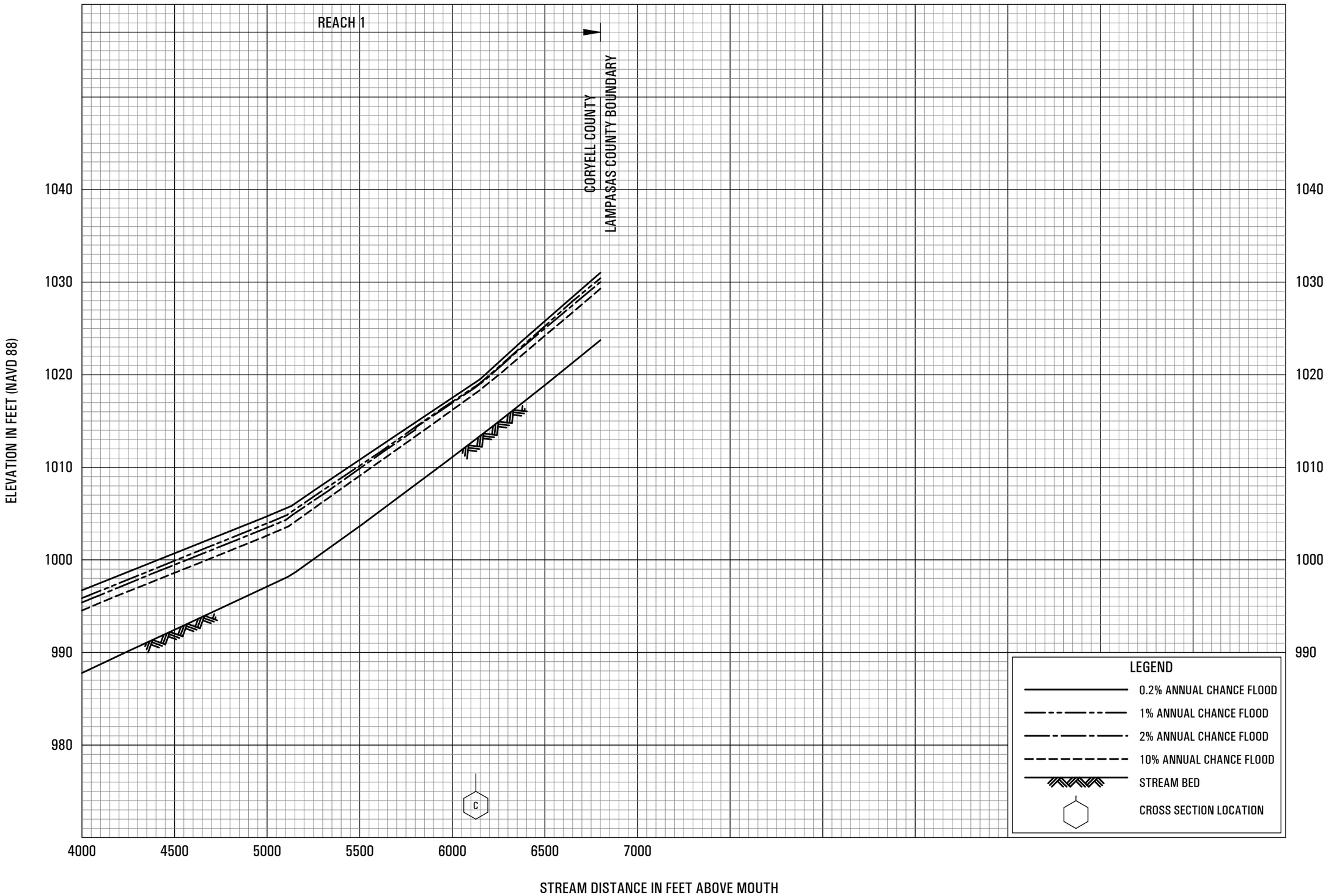


FLOOD PROFILES

CLARK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS

01P

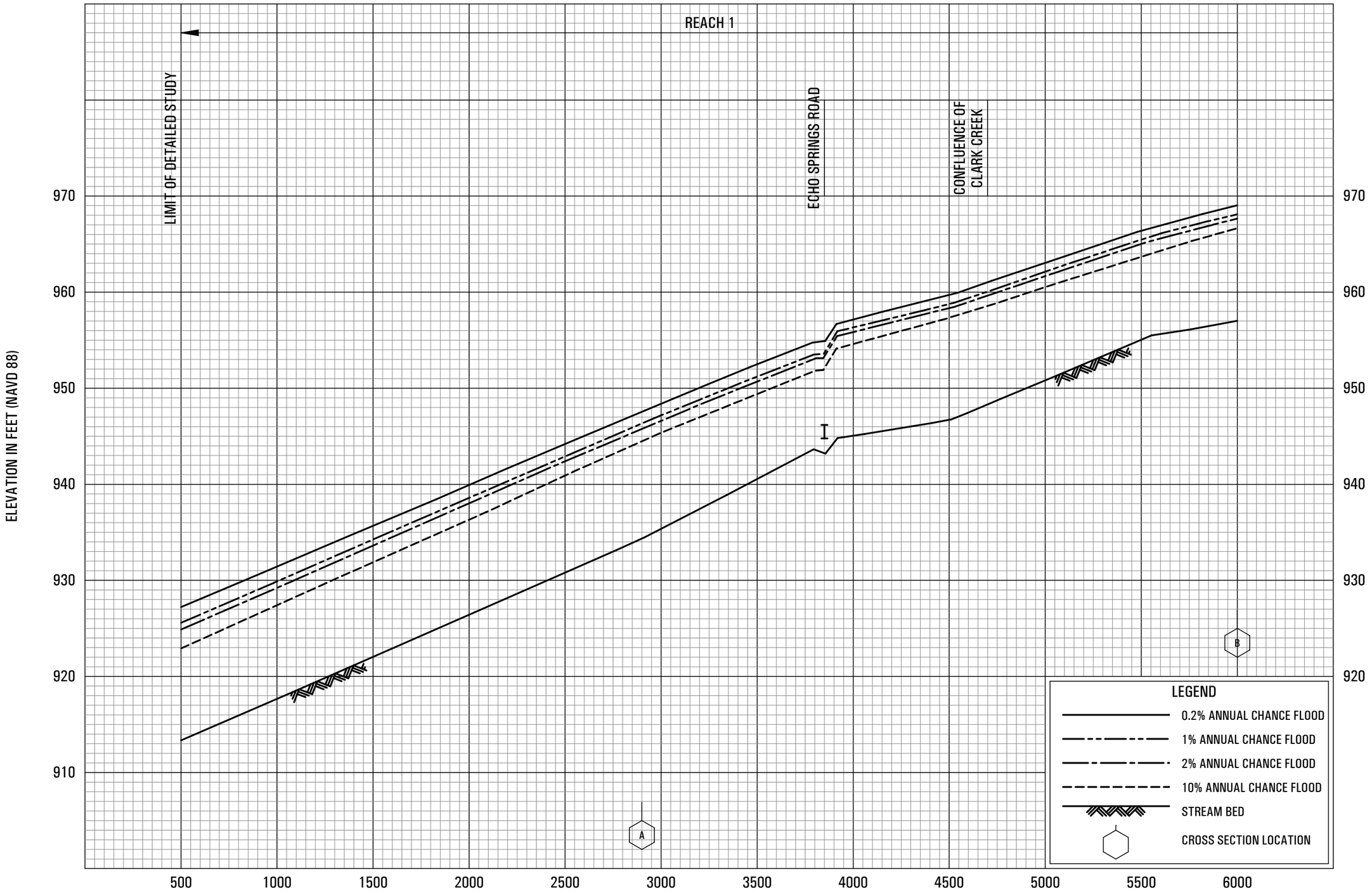


FLOOD PROFILES

CLARK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS

02P



ELEVATION IN FEET (NAVD 88)

STREAM DISTANCE IN FEET ABOVE CORYELL/BELL COUNTY LINE

FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS

REACH 1

REACH 2

BRINEGAR ROAD

CONFLUENCE OF STREAM CG-2

FARM MARKET 3046

COPPERAS COVE CORPORATE LIMITS

COPPERAS COVE CORPORATE LIMITS

H

C

D

LEGEND

0.2% ANNUAL CHANCE FLOOD

1% ANNUAL CHANCE FLOOD

2% ANNUAL CHANCE FLOOD

10% ANNUAL CHANCE FLOOD

STREAM BED

CROSS SECTION LOCATION

ELEVATION IN FEET (NAVD 88)

1040
1030
1020
1010
1000
990
980
970
960
950

6000
6500
7000
7500
8000
8500
9000
9500
10000
10500
11000
11500
12000

STREAM DISTANCE IN FEET ABOVE CORYELL/BELL COUNTY LINE

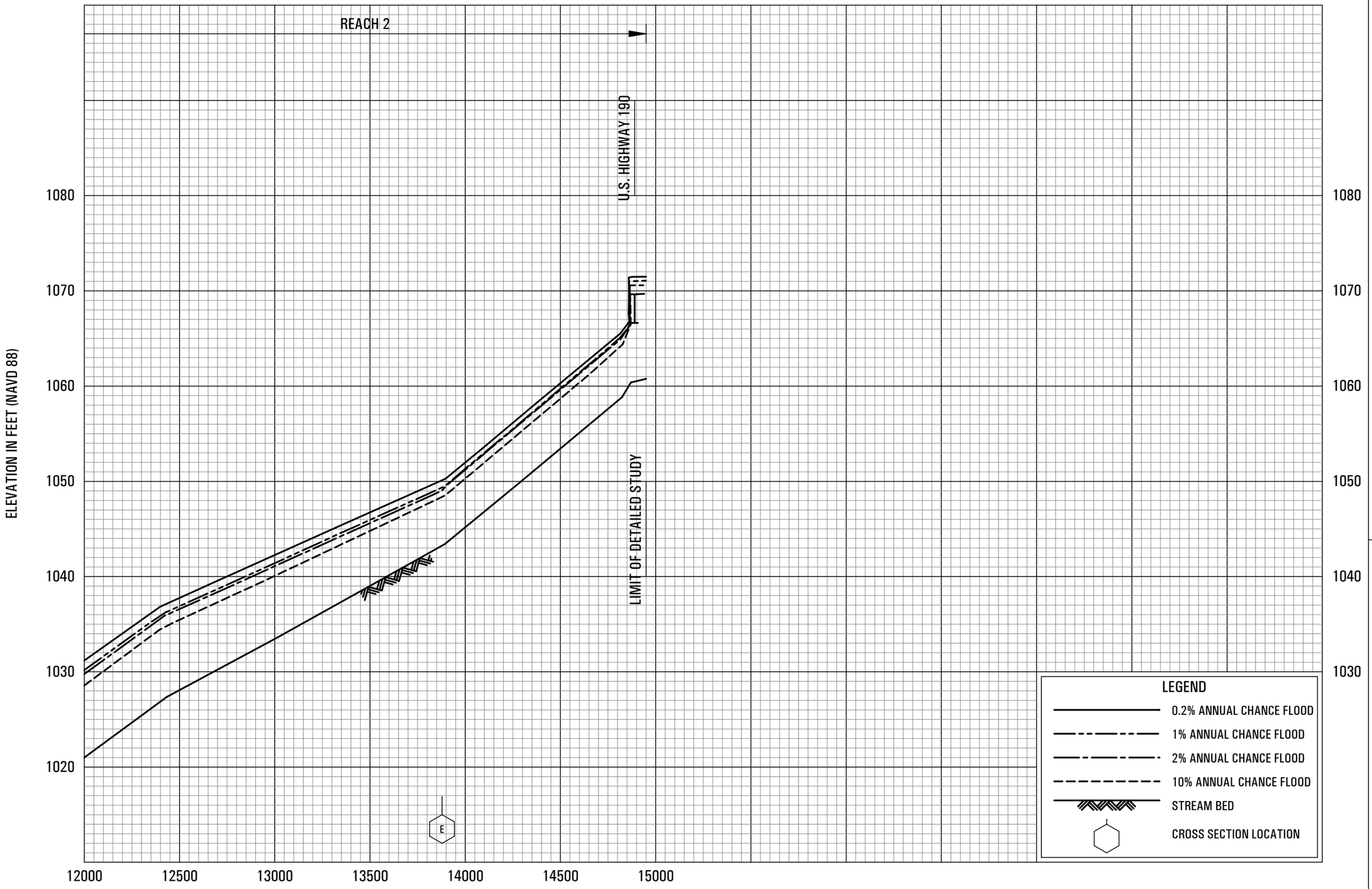
FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

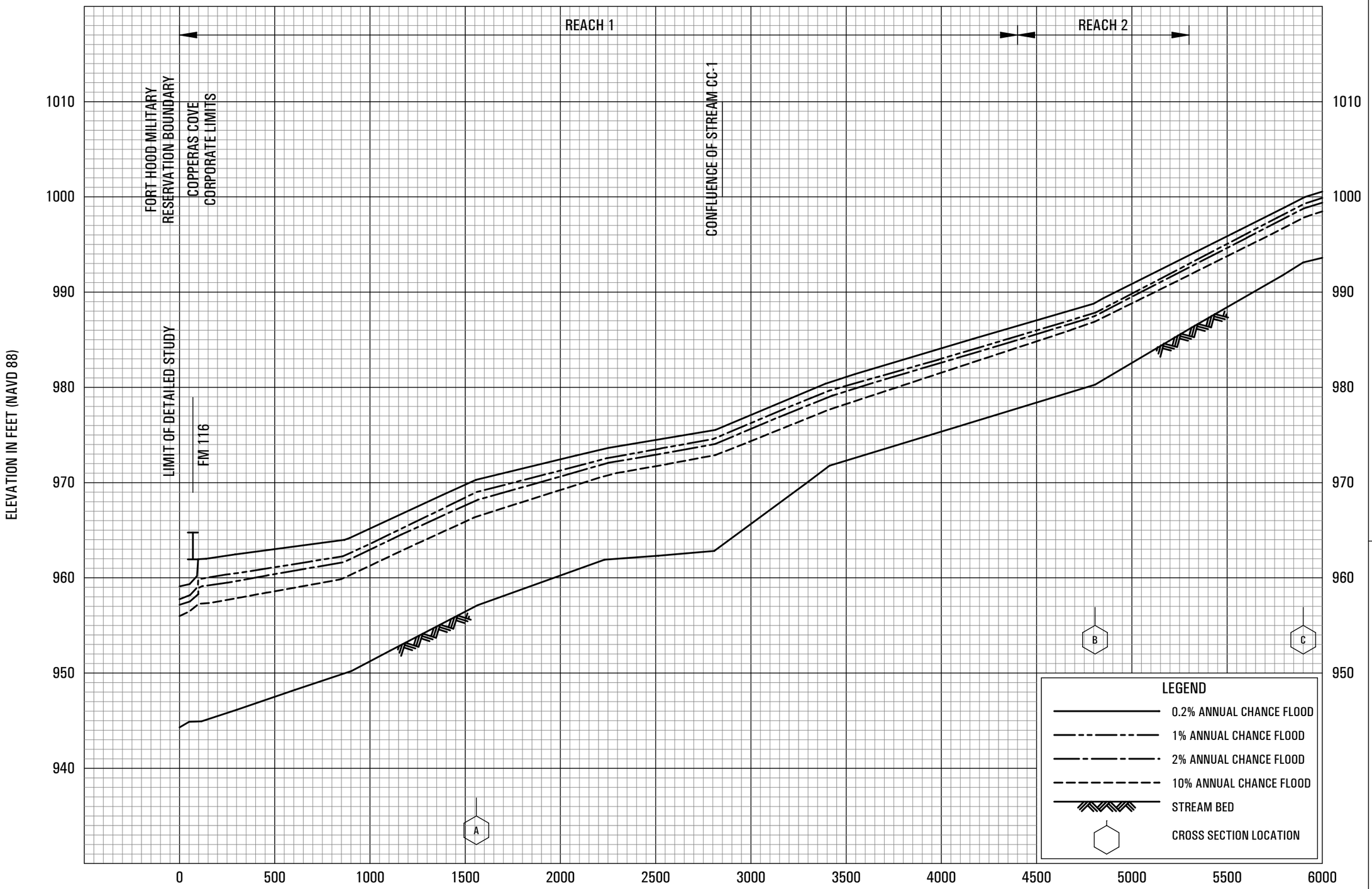


FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS

05P

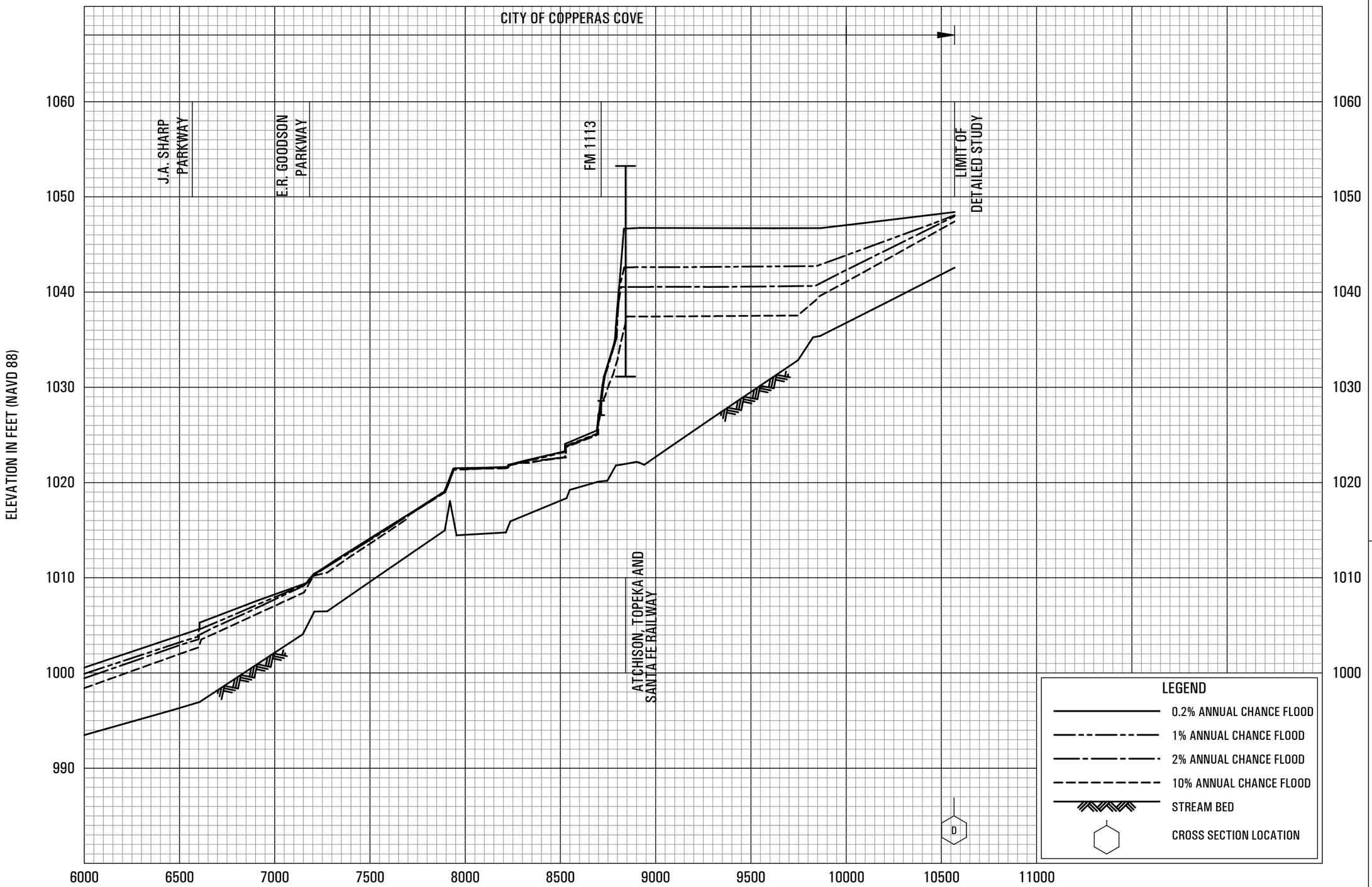


FLOOD PROFILES

HOUSE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS

06P

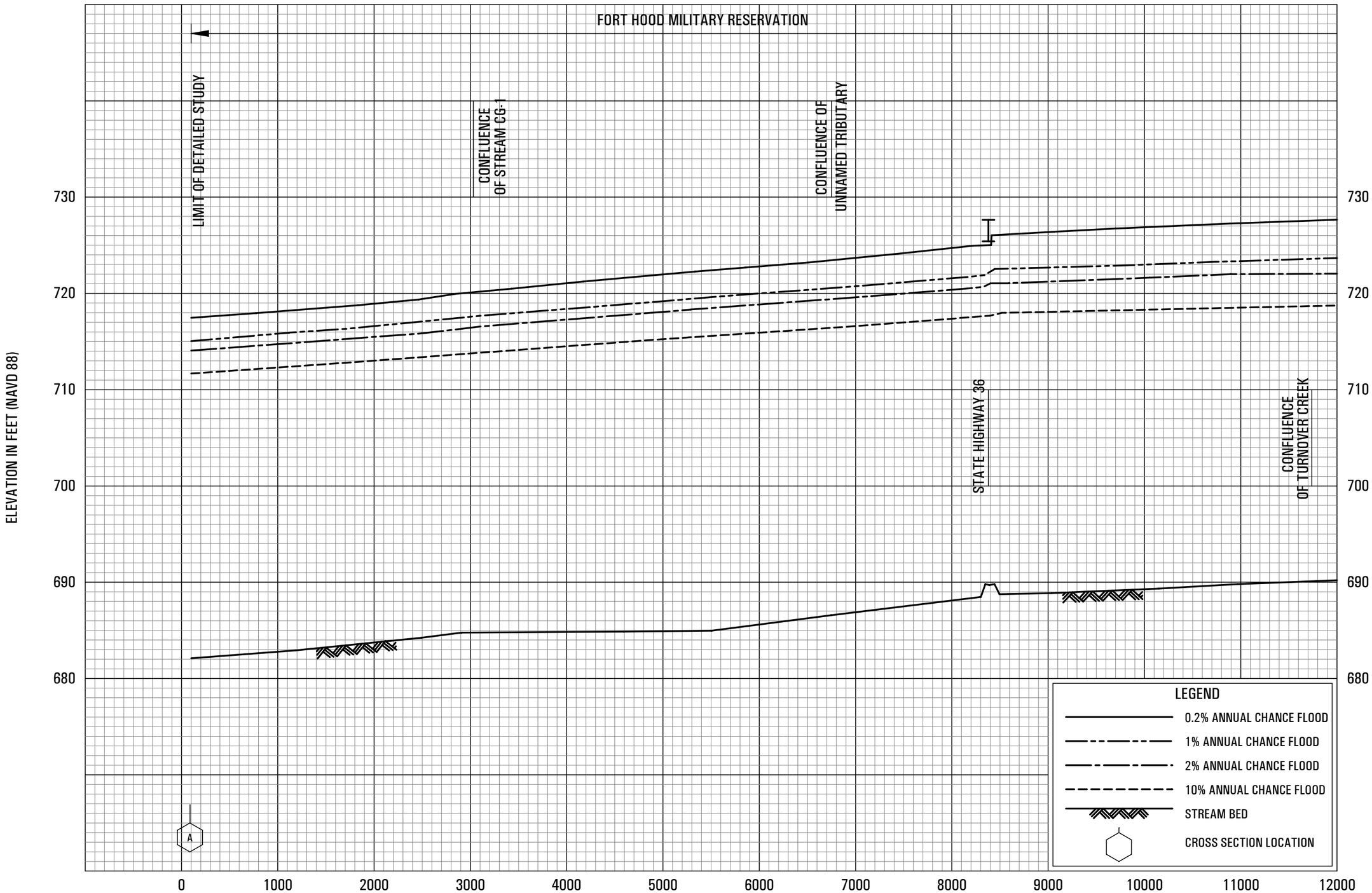


FLOOD PROFILES

HOUSE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS

07P

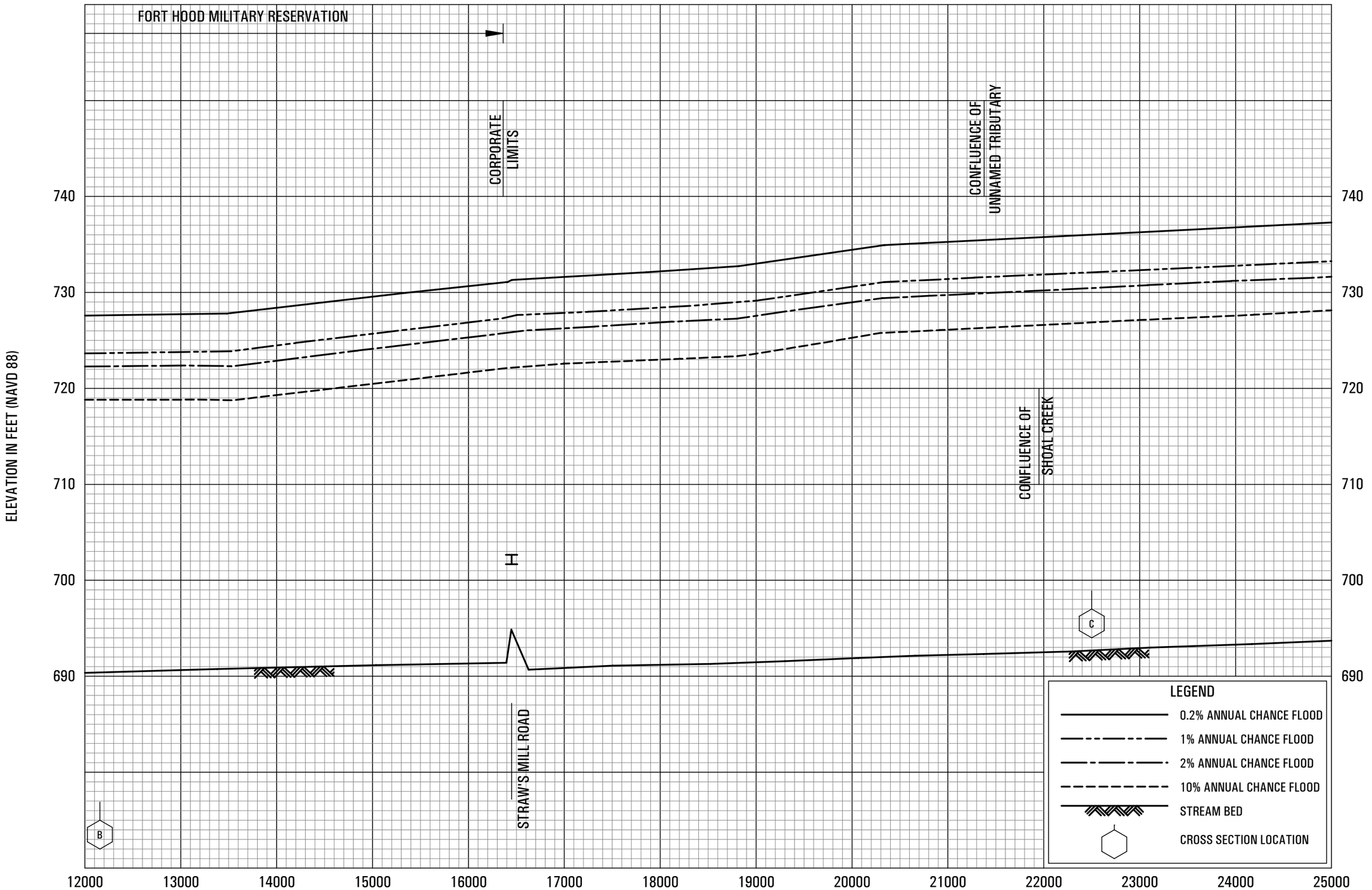


FLOOD PROFILES

LEON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS

08P

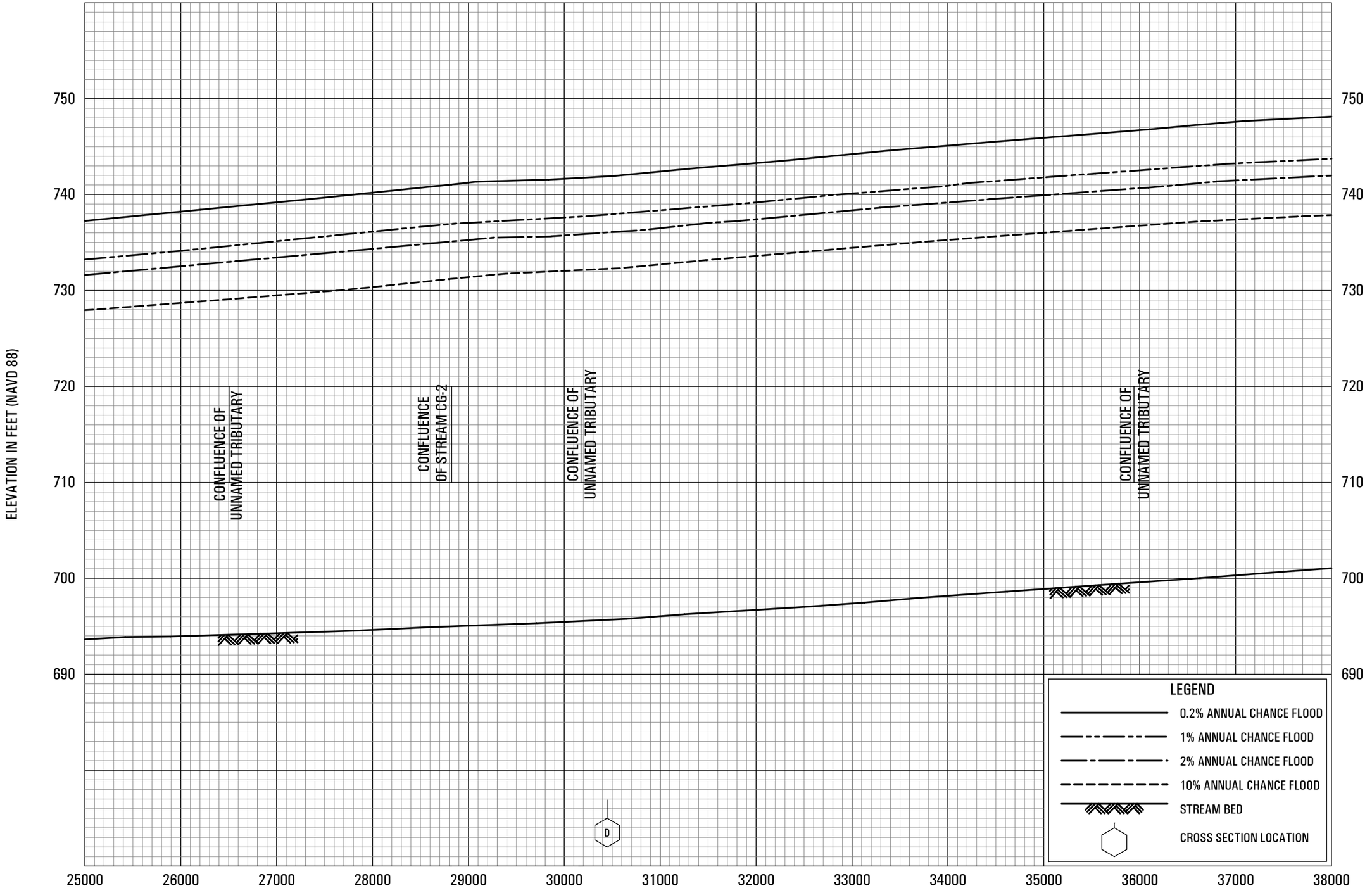


FLOOD PROFILES

LEON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS

09P



FLOOD PROFILES

LEON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
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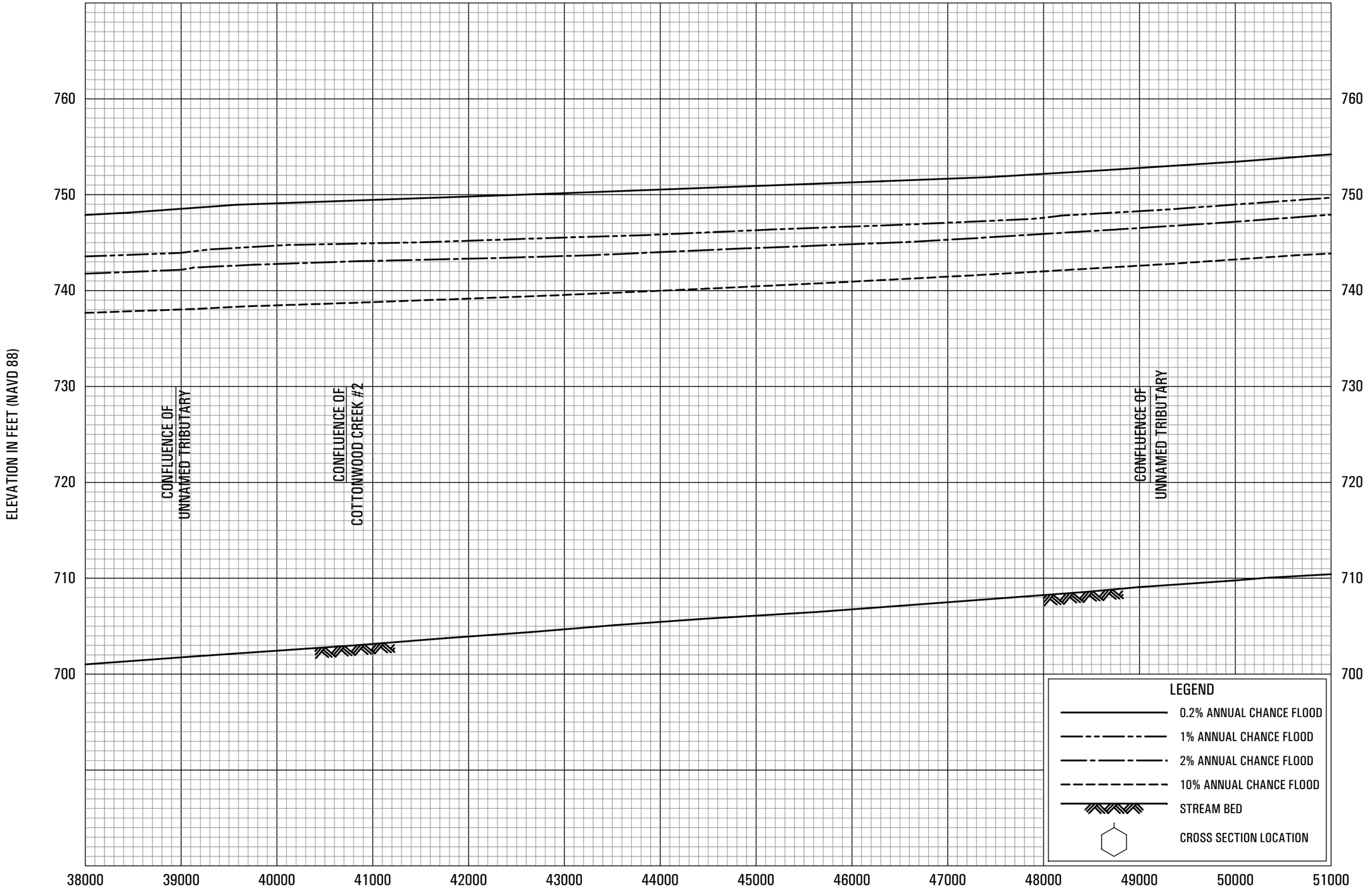

FLOOD PROFILES

LEON RIVER

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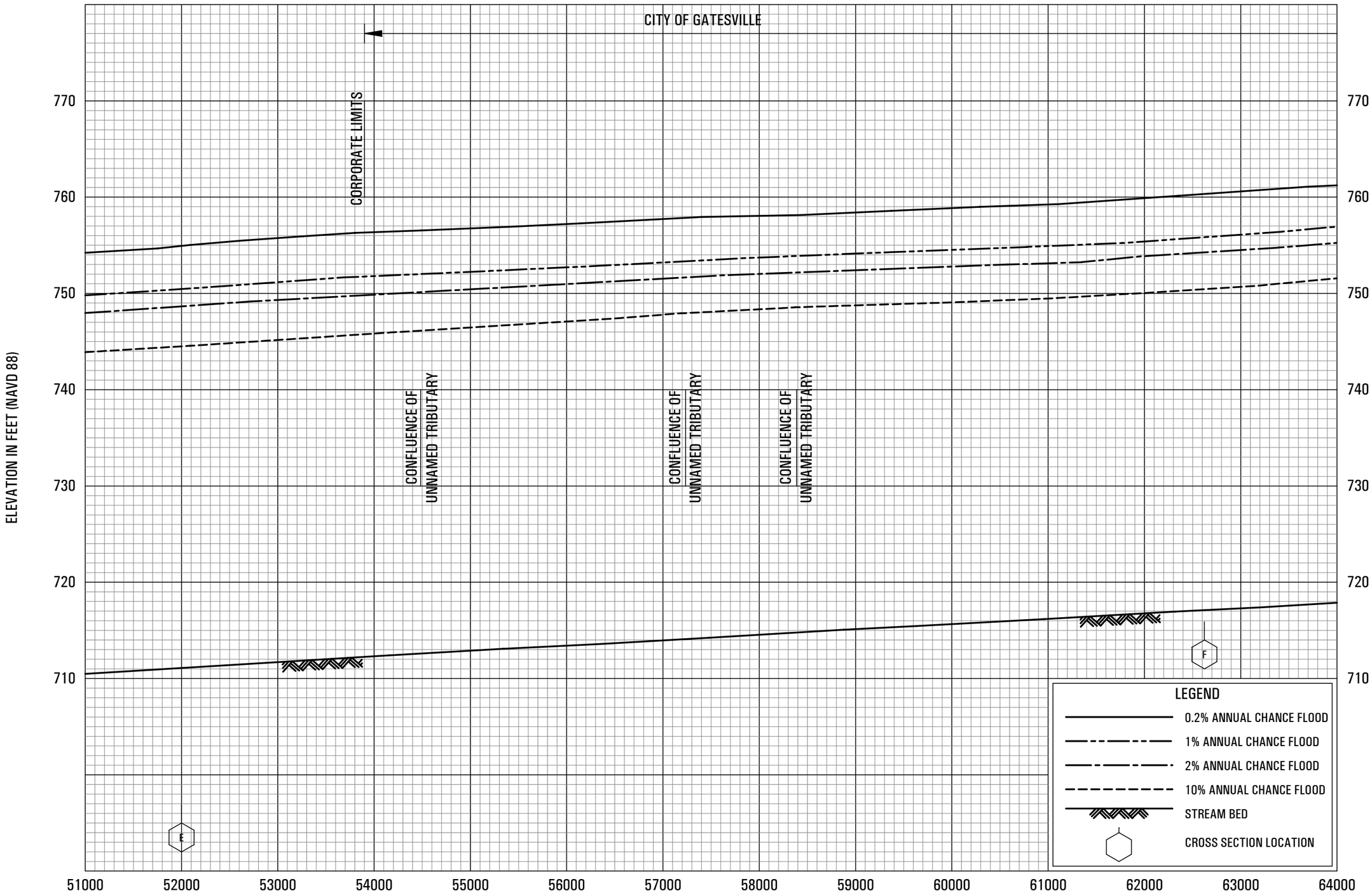
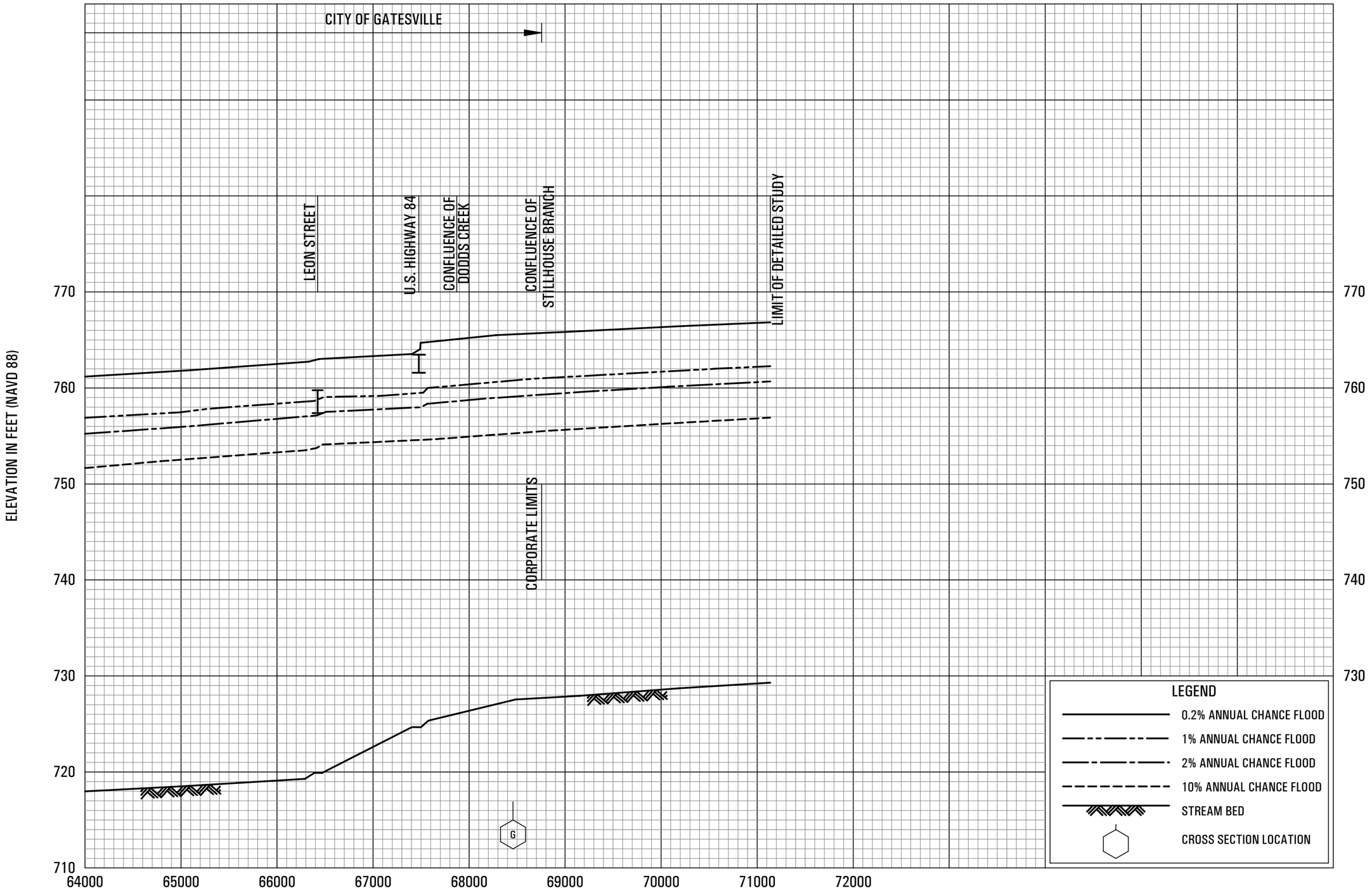


FLOOD PROFILES

LEON RIVER

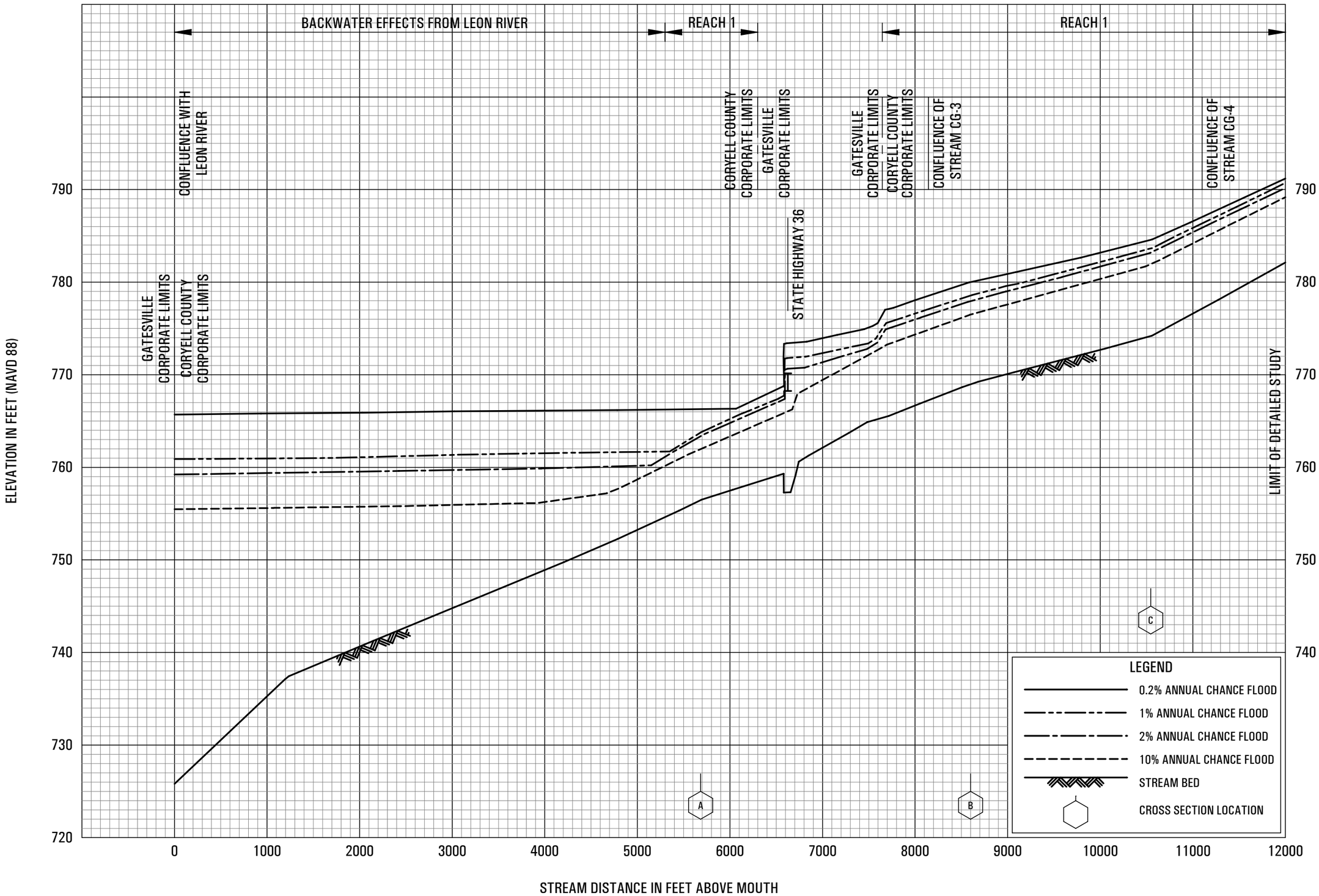
FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS



FLOOD PROFILES

LEON RIVER

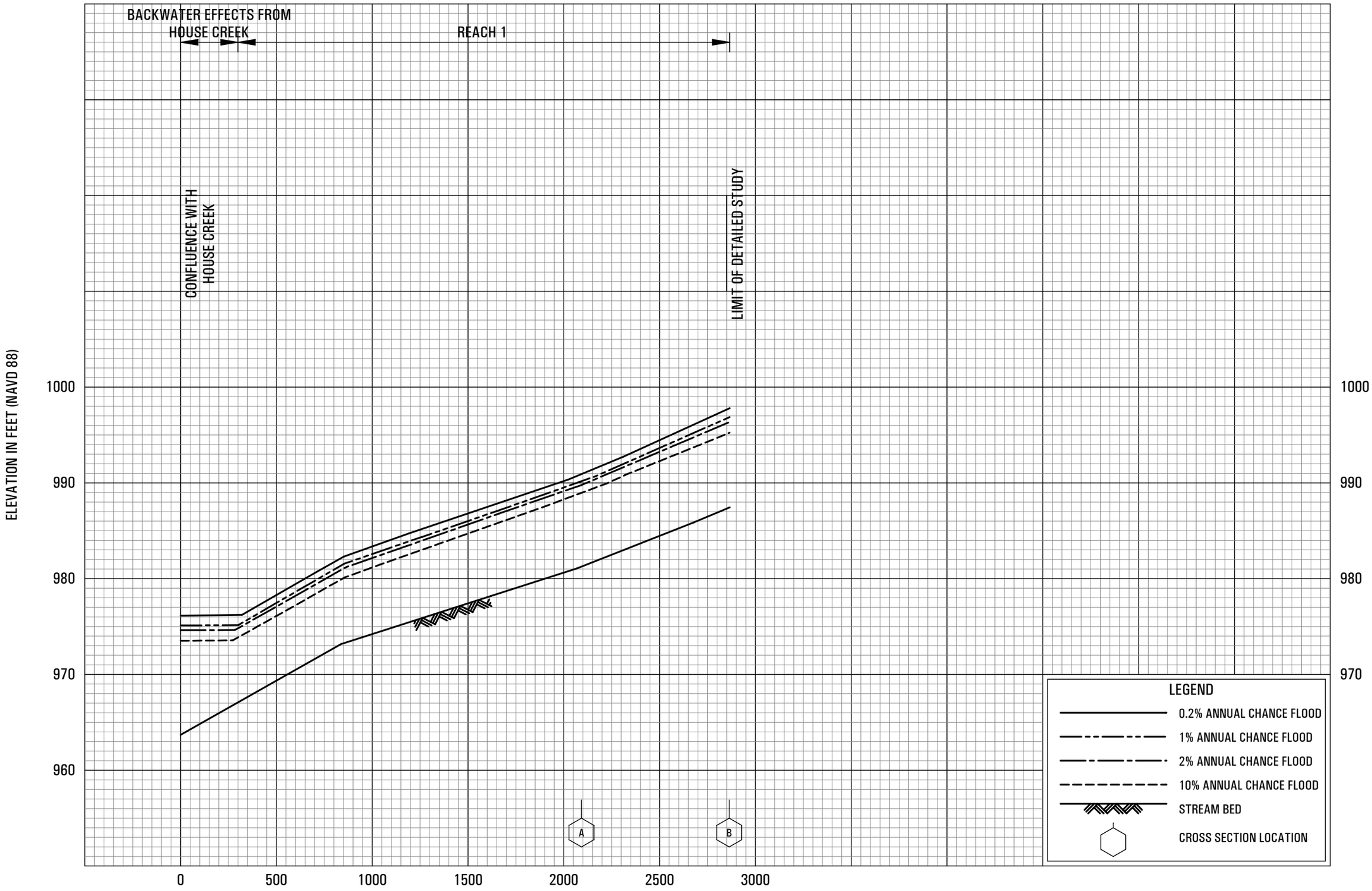
FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS



FLOOD PROFILES

STILLHOUSE BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS



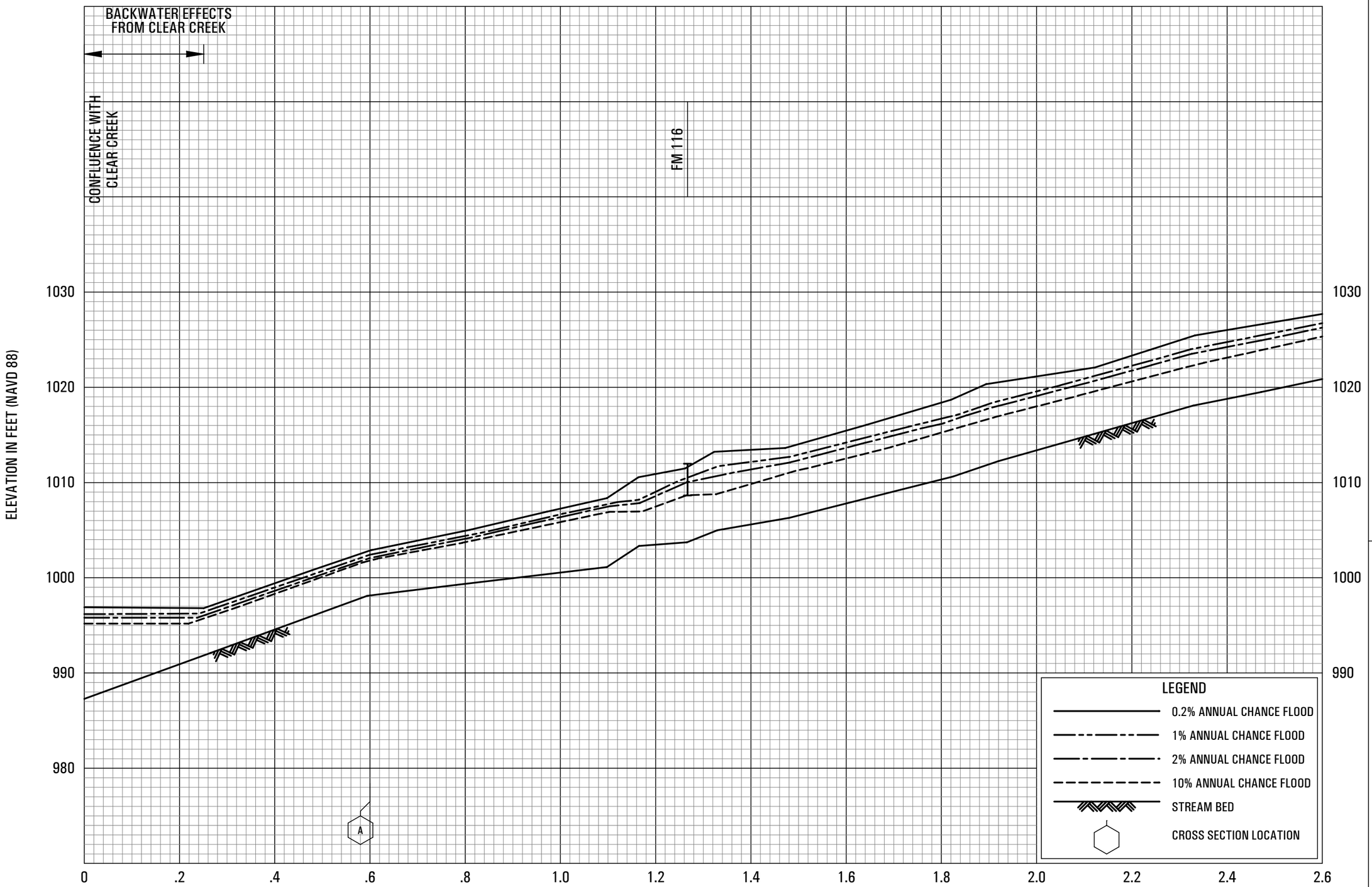
FLOOD PROFILES

STREAM CC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS



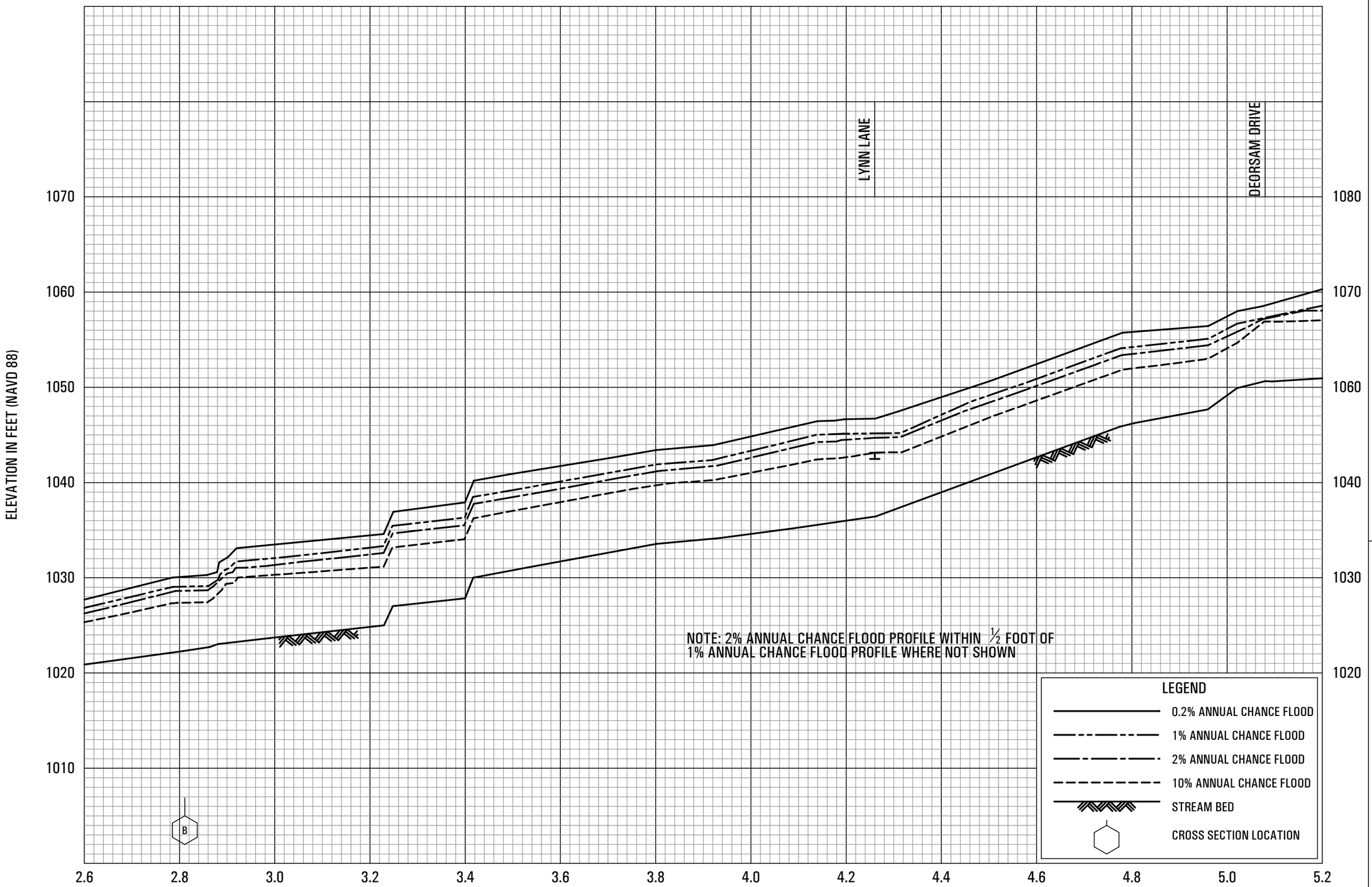
ELEVATION IN FEET (NAVD 88)

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CONFLUENCE WITH CLEAR CREEK

FLOOD PROFILES

STREAM CC-2

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS



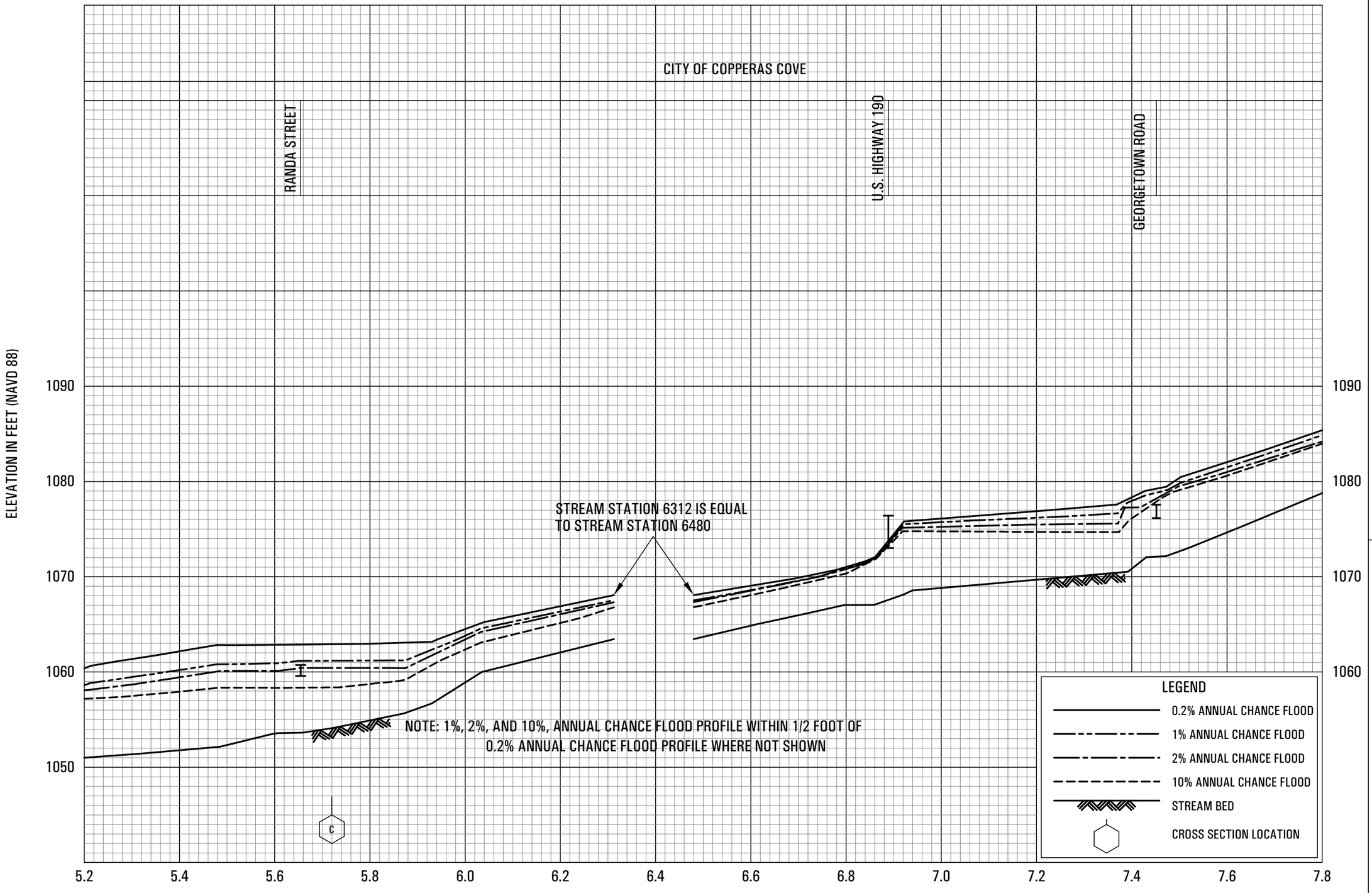
ELEVATION IN FEET (NAVD 88)

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CONFLUENCE WITH CLEAR CREEK

FLOOD PROFILES

STREAM CC-2

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS



FLOOD PROFILES

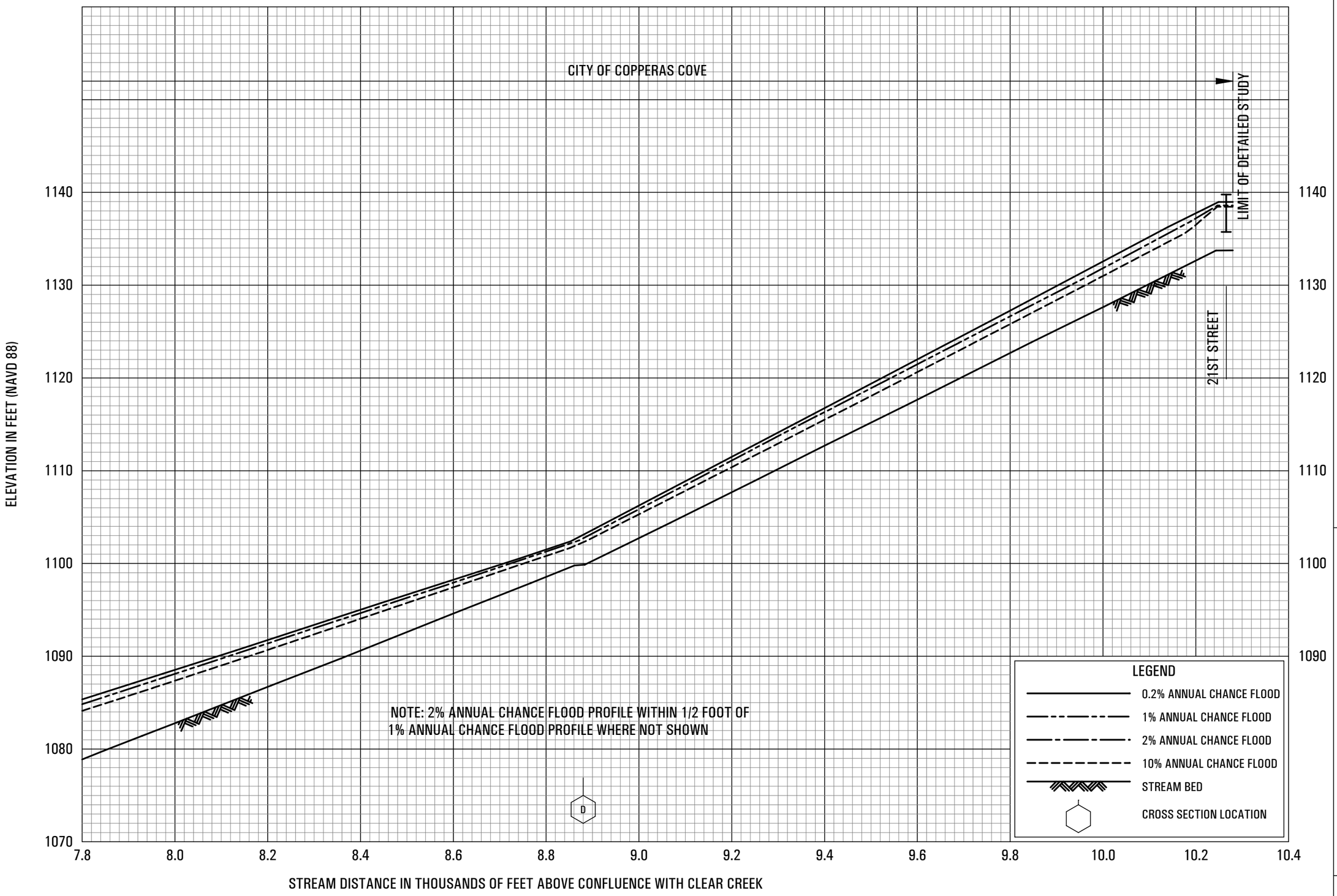
STREAM CC-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

18P



FLOOD PROFILES

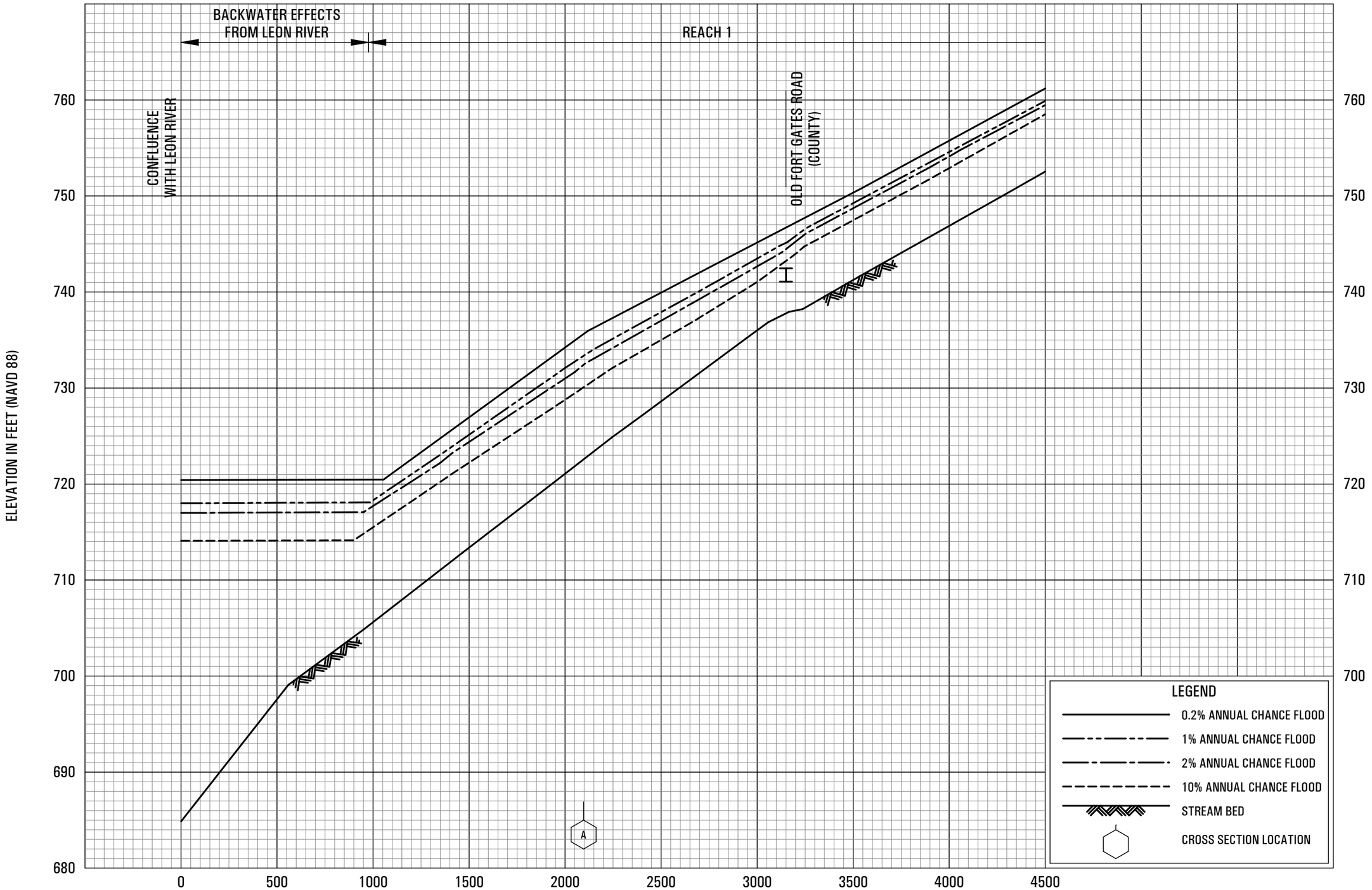
STREAM CC-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

19P



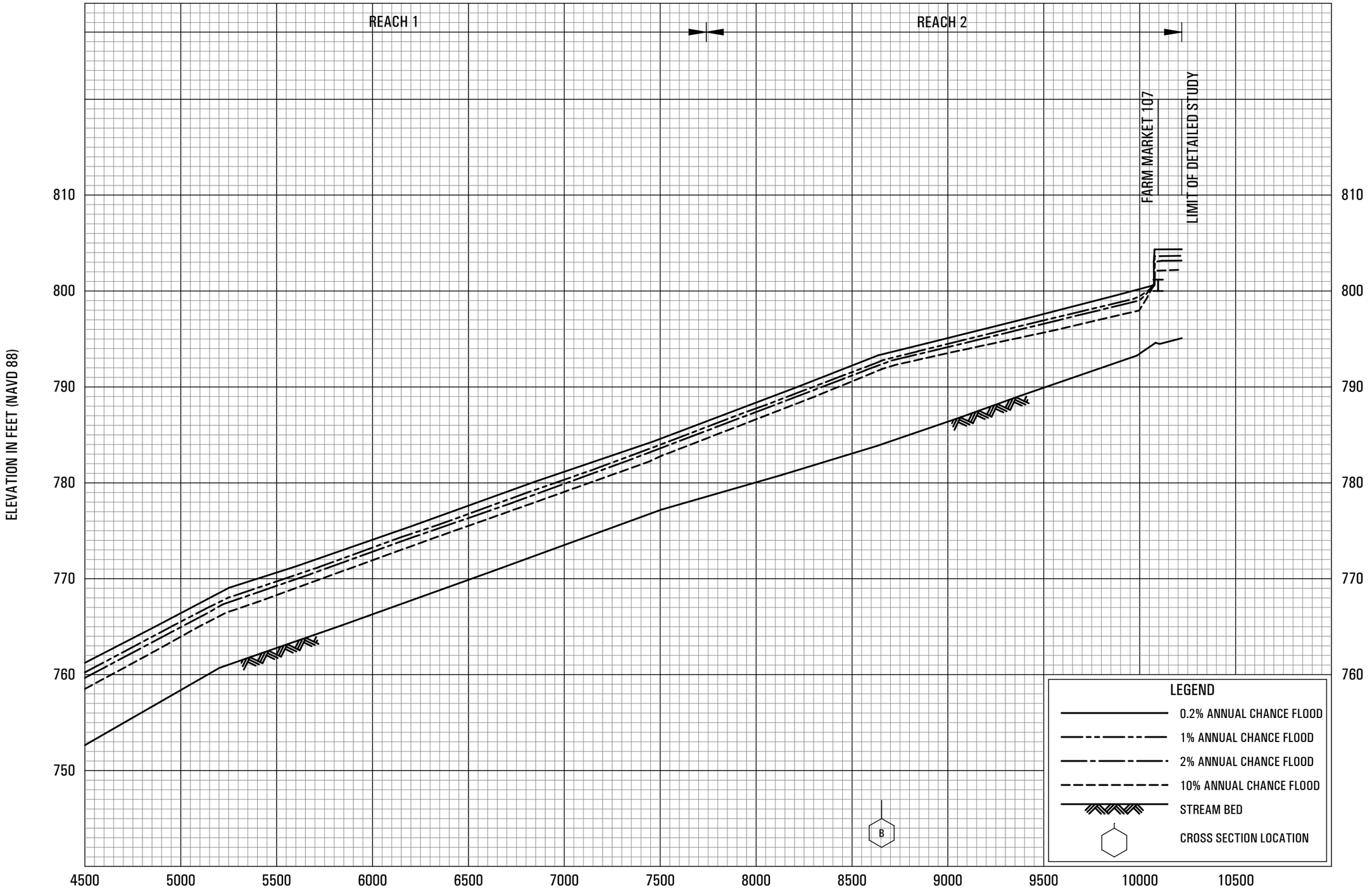
FLOOD PROFILES

STREAM CG-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

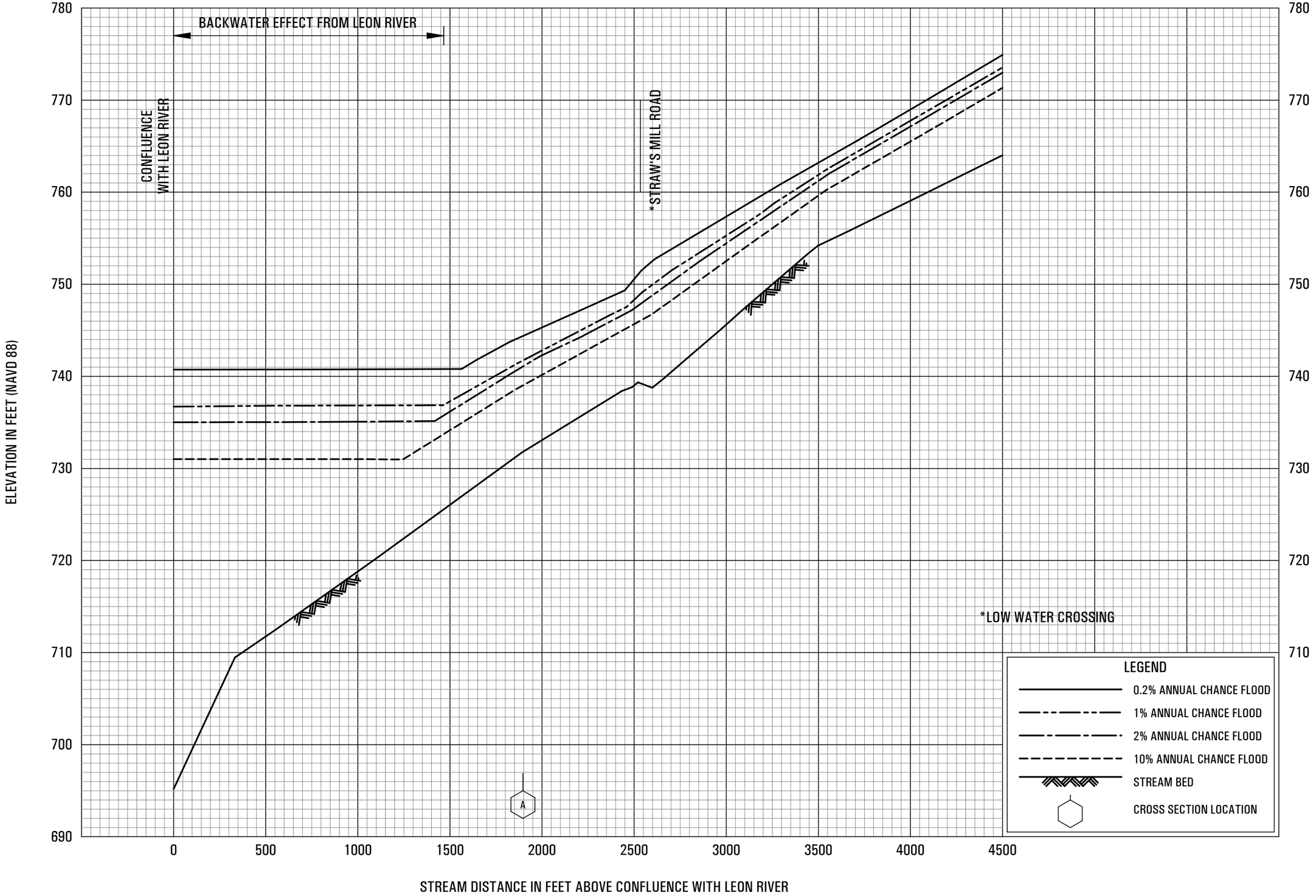


FLOOD PROFILES

STREAM CG-1

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS

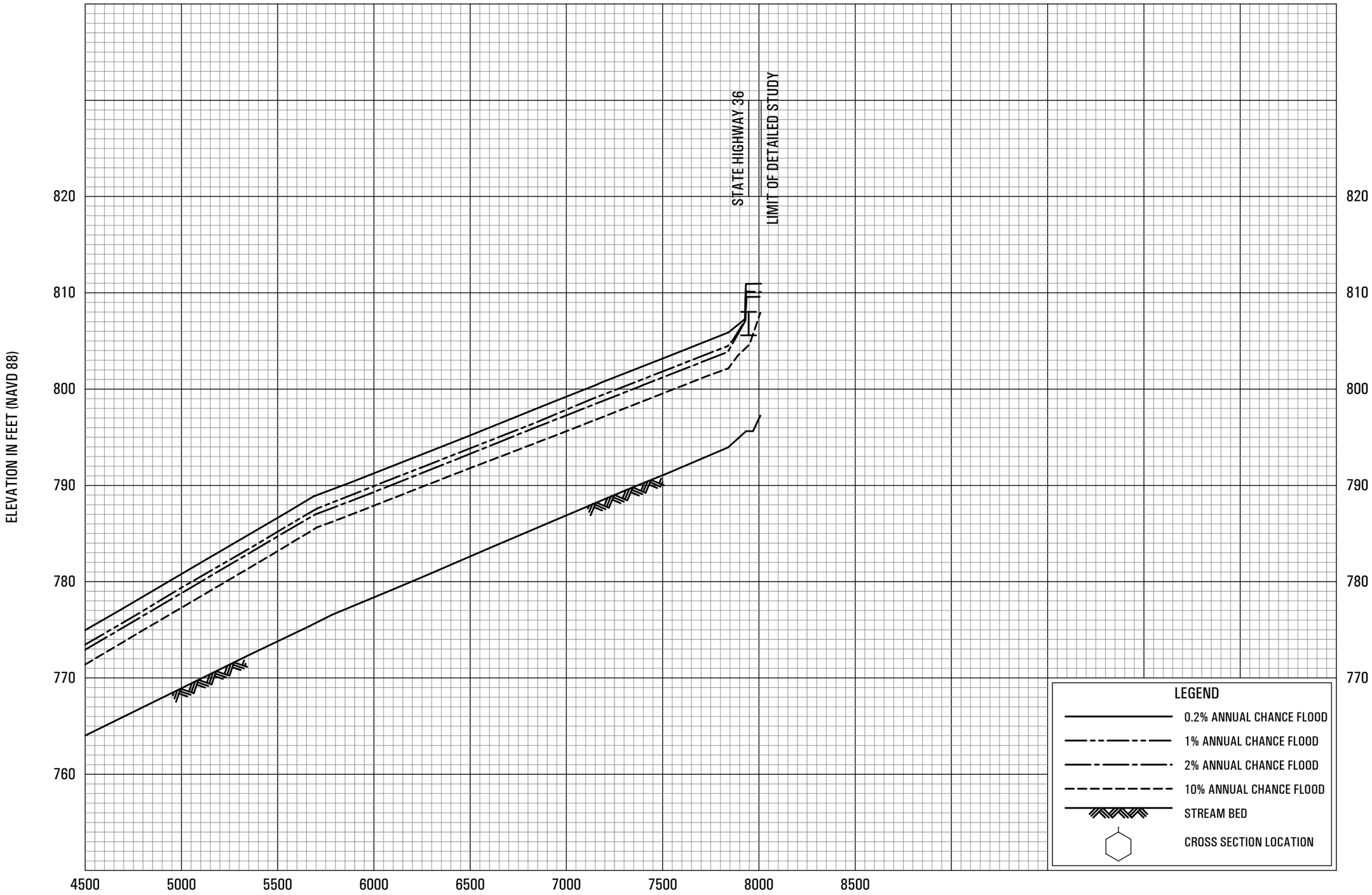
21P



FLOOD PROFILES

STREAM CG-2

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS



FLOOD PROFILES

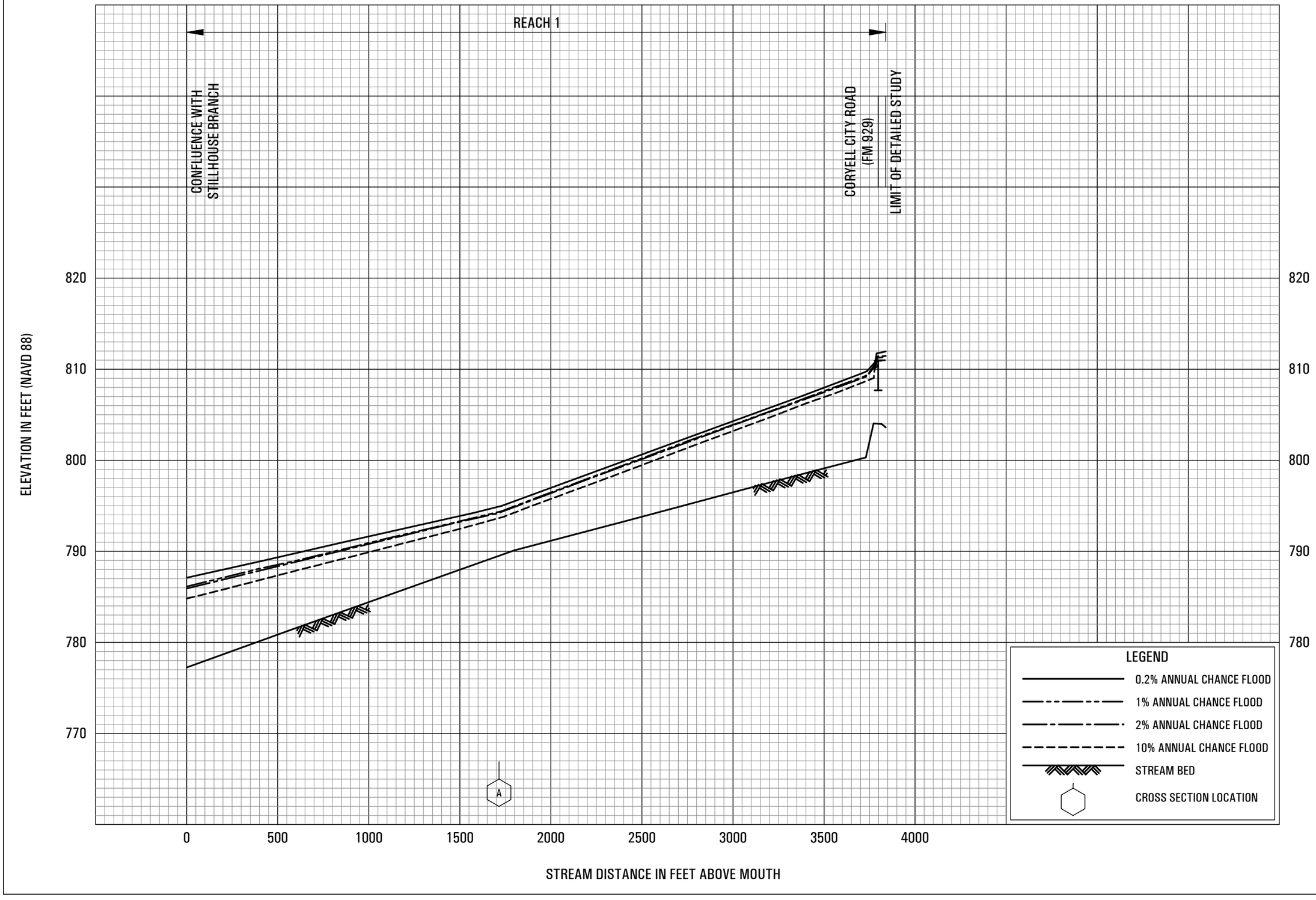
STREAM CG-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CORYELL COUNTY, TX

AND INCORPORATED AREAS

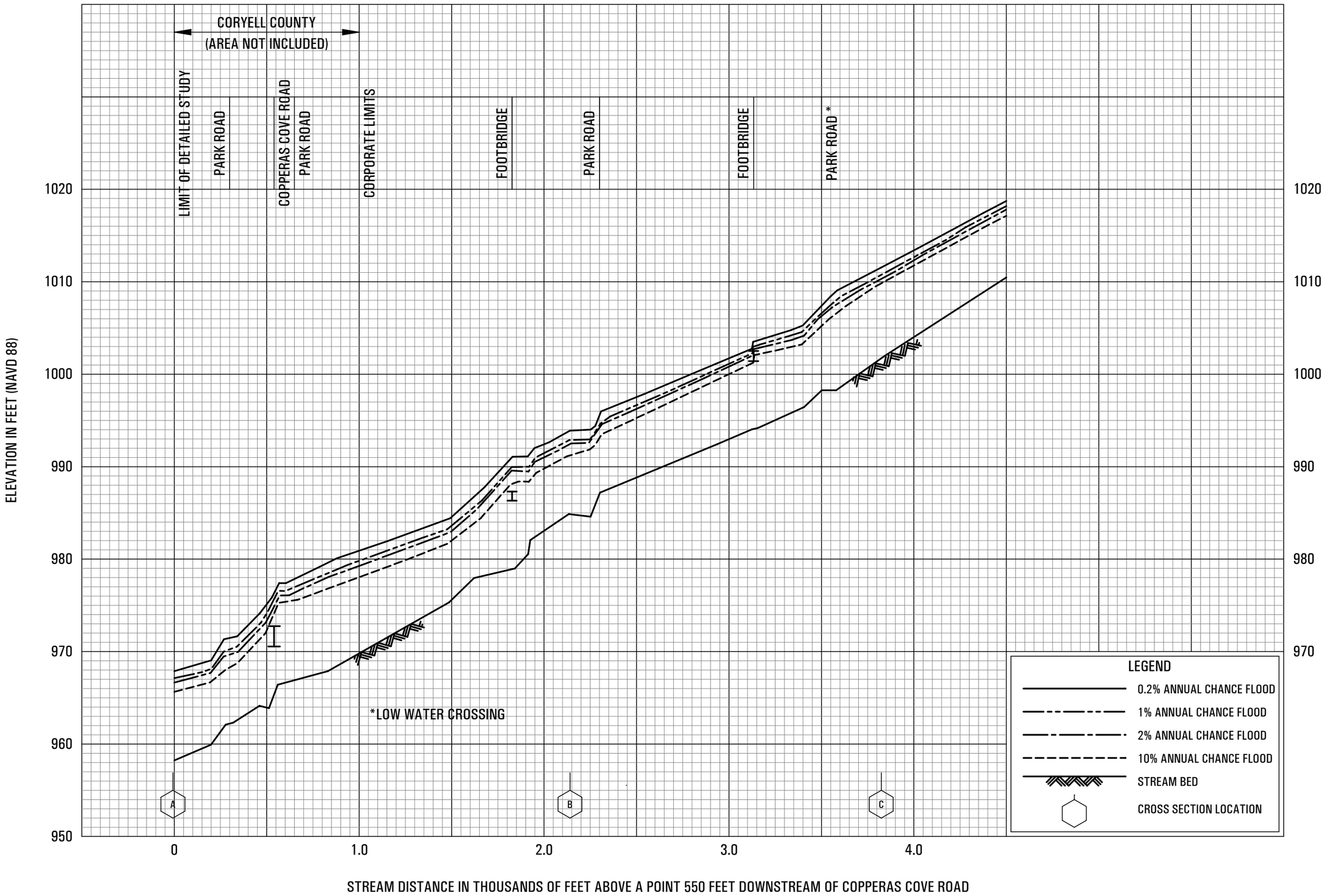
23P



FLOOD PROFILES

STREAM CG-4

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS

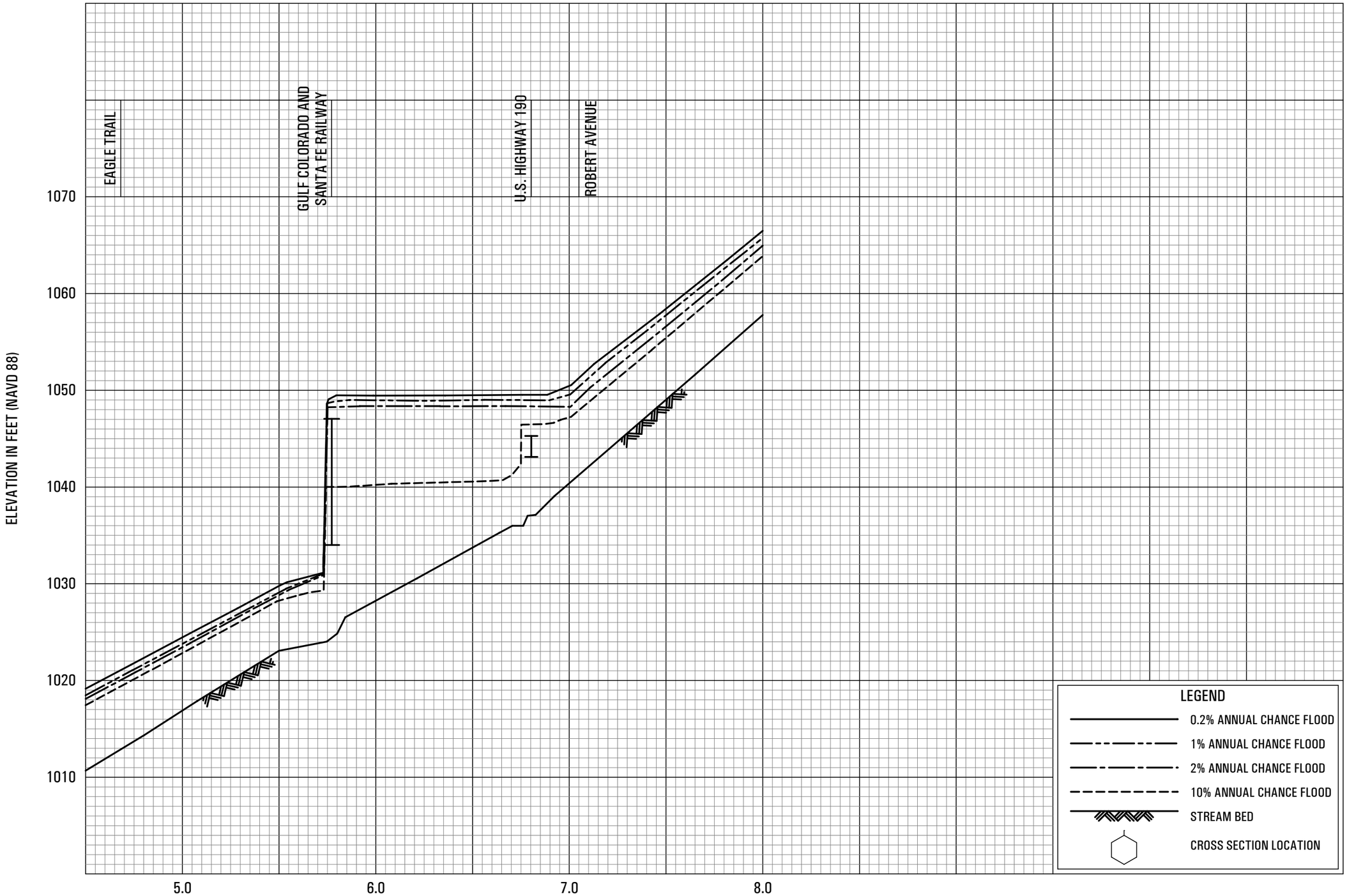


FLOOD PROFILES

TURKEY RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS

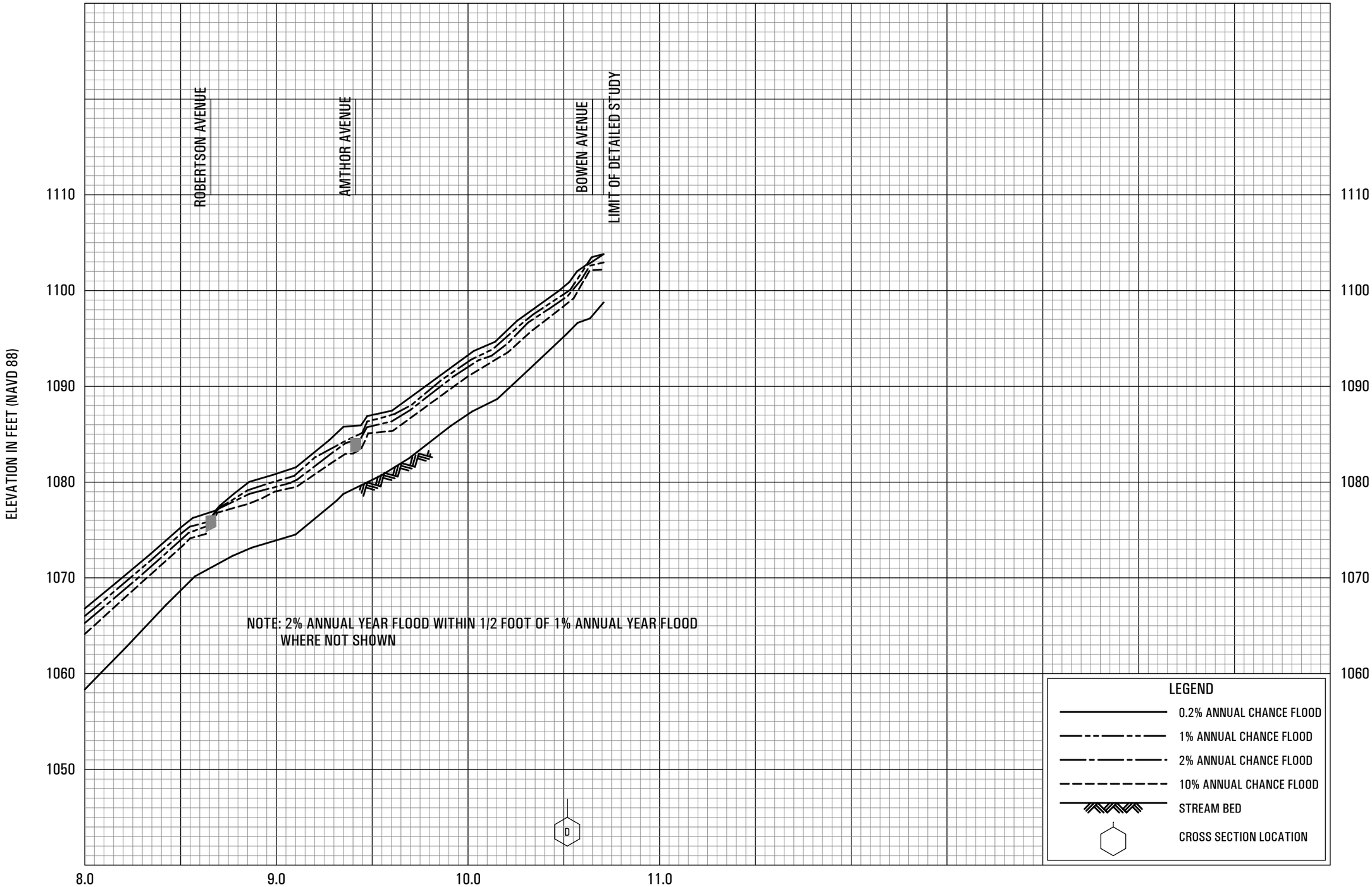
25P



FLOOD PROFILES

TURKEY RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS



FLOOD PROFILES

TURKEY RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY
CORYELL COUNTY, TX
AND INCORPORATED AREAS