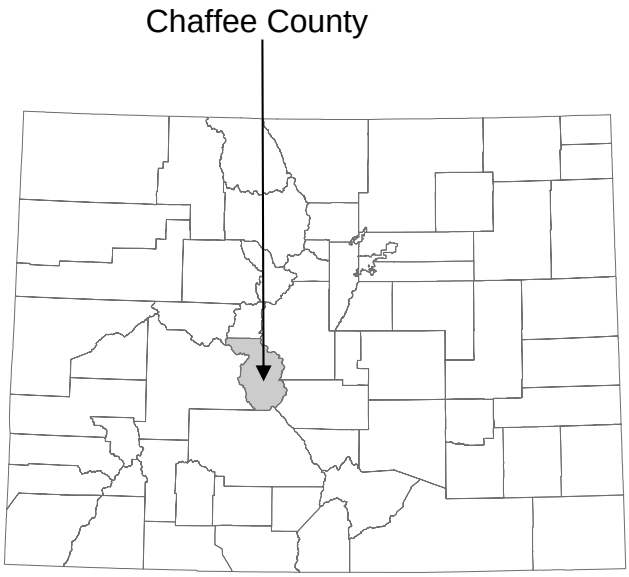
FLOOD INSURANCE STUDY

CHAFFEE COUNTY, COLORADO, AND INCORPORATED AREAS

VOLUME 1 OF 2

COMMUNITY NAME	COMMUNNITY NUMBER
BUENA VISTA, TOWN OF	080030
CHAFFEE COUNTY (UNINCORPORATED AREAS)	080269
PONCHA SPRINGS, TOWN OF	080220
SALIDA, CITY OF	080031



Preliminary

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
08015CV001A

PRELIMINARY
April 15, 2015

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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

Effective FIS Date:	March 4, 1987	Chaffee County, Colorado
	March 30, 1982	Town of Buena Vista, Colorado
	February 19, 1987	Town of Poncha Springs, Colorado
	March 30, 1982	City of Salida, Colorado

Initial Countywide FIS Date: TBD

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FLOOD INSURANCE STUDY
CHAFFEE COUNTY, COLORADO, AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and supercedes the FIS reports and/or Flood Insurance Rate Maps (FIRMs) (/Flood Boundary and Floodway Maps) in the geographic area of Chaffee County, Colorado, including the Towns of Buena Vista and Poncha Springs, the City of Salida, and unincorporated areas of Chaffee County (hereinafter referred to collectively as Chaffee 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. This information will also be used by Chaffee County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the NFIP are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

This Countywide FIS was prepared by compiling pertinent information for the flood hazard areas in both the incorporated and unincorporated areas of Chaffee County, Colorado, from existing technical and/or scientific data, and from new studies. This existing and new data was reviewed by the Federal Emergency Management Agency (FEMA) prior to its use in the development of this FIS to ensure compliance with NFIP regulations.

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 Countywide FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The initial hydrologic and hydraulic analyses for the Town of Buena Vista and the City of Salida were performed by the U.S. Department of Agriculture, Soil Conservation Service (SCS), Denver, Colorado and the Colorado Water Conservation Board (CWCB), respectively, and both were reviewed by Camp Dresser & McKee, Inc. for the Federal Insurance Administration (FIA) and FEMA under Contract No. EMW-C-0046. This study was completed in September of 1980.

The initial hydrologic and hydraulic analyses for the South Arkansas River and Poncha Creek in the Town of Poncha Springs and unincorporated areas of Chaffee County were performed by Water Resources Consultants, Inc. as reported in "Floodplain Information, South Arkansas River and Poncha Creek, Poncha Springs, Colorado" (Water Resources Consultants, Inc., March 1978) and "Floodplain Information Report, Lower South Arkansas River" (Water Resources Consultants, Inc., 1979).

The initial hydrologic and hydraulic analyses for Chalk and Cottonwood Creeks were performed by the U.S. Soil Conservation Service (SCS) as reported in "Flood Hazard Study, Chalk Creek" (USDA, SCS, 1980) and "Flood Hazard Analyses, Cottonwood Creek" (USDA, SCS, 1978), respectively.

As part of the Countywide Risk Mapping, Assessment & Planning (MAP), Digital Flood Insurance Rate Map (DFIRM) map maintenance, development, and conversion project for Chaffee County, revised hydrologic analyses for Chaffee County were performed by Anderson Consulting Engineers, Inc. under contract to the CWCB. The work was completed in January 2011.

As part of the Countywide Risk MAP DFIRM map maintenance, development, and conversion project for Chaffee County, Cottonwood Creek in the Town of Buena Vista and unincorporated Chaffee County and Poncha Creek in the Town of Poncha Springs and unincorporated Chaffee County (Anderson Consulting Engineers, Inc., 2013) were studied using detailed methods. In addition, the South Arkansas River in the City of Salida, the Town of Poncha Springs, the unincorporated towns of Maysville and Garfield, and unincorporated Chaffee County (Michael Baker Corporation, Inc. for Anderson Consulting Engineers, Inc., 2013) were also studied using detailed methods. Anderson Consulting Engineers, Inc. was the Risk MAP contractor and, with Michael Baker Corporation, Inc. as subcontractor, completed these analyses in April 2013 under contract to the CWCB.

Approximate floodplain analyses were performed in 2013 by Anderson Consulting Engineers, Inc. on the Arkansas River, Little Cochetopa Creek, Loggie Gulch, Pass Creek, Poncha Creek, Spruce Creek, and Ute Creek. The work was completed in April 2013 under contract to the CWCB.

The vector base map data for the county was compiled from various sources. The base map data consists of a series of shape files based on the NAD83 horizontal datum, using the UTM Zone 13N projection and includes the following:

(a) Transportation coverage – Included in this information is the road centerline and airport information within the county. Road centerline and airport information was digitized from the 2009 NAIP aerial photography of the county (USDA, 2009). This data is current as of 2009.

(b) Political boundaries – These data include all incorporated community, Wilderness Area, Wildlife Refuge, and National Forest boundaries. These

data were obtained from the Chaffee County GIS Department and were aligned to the Bureau of Land Management's (BLM) Public Land Survey System (PLSS) lines for Chaffee County. This data is current as of 2010.

(c) Public Land Survey System - These data were obtained from the Bureau of Land Management (BLM) and includes all section, township, and range information for Chaffee County. This data is current as of 2010.

(d) Hydrography - These data were digitized by Anderson Consulting Engineers, Inc., the DFIRM study contractor, to coincide with the stream centerlines visible on the 2009 NAIP aerial photograph, and to coincide with the most recent United States Geologic Survey (USGS) quadrangle maps. For areas where detailed studies were conducted, the stream centerline was replaced with the profile baseline utilized in the hydraulic study. This data is current as of 2009.

(e) National Geodetic Survey (NGS) benchmarks – The NGS benchmarks were downloaded from the National Geodetic Survey/National Oceanic and Atmospheric Administration website (NGS, 2010).

(f) United States Geologic Survey (USGS) Quad map index – These data were obtained from the USGS and includes the outline of all quad maps encompassed by the County boundary (USGS, 2010).

(g) New FIRM panel boundaries – These data were created by Anderson Consulting Engineers, Inc., and display the outlines of the new DFIRM panels for the county. This data is current as of 2010.

The hydraulic structure layer, including bridges and culverts within the extents of the effective hydraulic models, along with dams and weirs that are present within the county were obtained from the respective hydraulic studies. Dams and weirs along with the bridges and culverts in the effective hydraulic models that were visible on the 2009 aerial photograph were digitized by Anderson Consulting Engineers, Inc.

The coordinate system used for the production of the digital FIRM is Universe Transverse Mercator referenced to the North American Datum of 1983 and the GRS 80 spheroid, Western Hemisphere.

1.3 Coordination

An initial coordination meeting was held on June 26, 1979, attended by the Town of Buena Vista, the City of Salida, and county officials and representatives of the Federal Emergency Management Agency (FEMA), the Colorado Water Conservation Board (CWCB), acting as the State Coordination Agency, and Camp Dresser & Mckee Inc., the study contractor. The purpose of this meeting was to discuss the nature of the study that would become the 1982 Flood Insurance Studies for the Town of Buena Vista and the City of Salida, the scope and limits of work, and flood information currently available concerning the

community.

Second coordination meetings were held on October 25, 1979, attended by the City of Salida and county officials, and on October 26, 1979, attended by the Town of Buena Vista, longtime residents of Buena Vista, and county officials, respectively, and at both meetings the study contractor, Camp Dresser & McKee Inc. Camp Dresser & McKee Inc. informed the City of Salida and the Town of Buena Vista of their intentions and solicited any information on new developments or existing problems in the study area.

Legal notices were placed in the Chaffee County Times and the Mountain Mail one day a week, for three consecutive weeks, beginning October 23, 1979. This was to notify all interested persons of the beginning of the study and its objectives and to solicit any relevant facts and technical data concerning local flood hazards.

Federal, state, and local agencies were contacted regarding the availability of any reports, studies, or investigations which may contain information relative to flooding problems in the communities. Information was received from FEMA, CWCB, and SCS.

During the course of the studies for the Town of Buena Vista and the City of Salida, the results of hydrologic analyses and flood elevations and boundaries, in the form of a Flood Hazard Analysis for Cottonwood Creek, prepared by SCS in cooperation with CWCB, Chaffee County, and the Town of Buena Vista, and a Floodplain Information Report for the Lower South Arkansas River, prepared by Water Resources Consultants, Inc., were reviewed. As a result of these reviews and coordination with FEMA and CWCB, the information supplied was used in the 1982 FISs for the Town of Buena Vista and the City of Salida, respectively.

In March 1978, Water Resources Consultants, Inc., Denver, Colorado, published a Floodplain Information Report for the South Arkansas River and Poncha Creek in the Town of Poncha Springs.

On May 30, 1985, the FEMA Regional Office in Denver, Colorado, submitted the South Arkansas River and Poncha Creek Floodplain Information Report for use in preparing the 1987 FIS for the Town of Poncha Springs. The final community coordination meeting with representatives from FEMA and the Town of Poncha Springs was held on February 24, 1986. No problems were raised at that meeting.

On July 2, 1985, FEMA approved the preparation of a Flood Insurance Study for the unincorporated areas of Chaffee County, using data from six different reports and studies. The final community meeting was held on February 24, 1986. The final FIS was published in 1987. No problems were raised at that meeting.

A scoping meeting for the Chaffee Countywide DFIRM Conversion project was conducted in the City of Salida on September 22, 2009. The meeting was

attended by representatives of the CWCB, FEMA, Chaffee County, the City of Salida, the Towns of Buena Vista and Poncha Springs, and Anderson Consulting Engineers, Inc., the DFIRM study contractor.

On TBD, the results of the Countywide DFIRM Conversion project were presented and reviewed at a final Community Coordination (CCO) Meeting attended by representatives of the CWCB, FEMA, Anderson Consulting Engineers, Inc., Chaffee County, the Town of Buena Vista, the Town of Poncha Springs and the City of Salida. All concerns raised during this meeting have been resolved. An initial CCO meeting was held for Chaffee County in September 2009.

2.0 AREA STUDIED

2.1 Scope of Study

This Countywide FIS covers both the unincorporated and incorporated areas of Chaffee County, Colorado, including portions of the Brown's Canyon Wilderness Area, the Town of Buena Vista, the Town of Poncha Springs, and the City of Salida. The Buffalo Peaks Wilderness Area, the Collegiate Peaks Wilderness Area, and the Heckendorf Wildlife Refuge are excluded.

The four main sources of flooding in Chaffee County are Chalk Creek, Cottonwood Creek, Poncha Creek, and the South Arkansas River. As part of the 1982 and 1987 FIS reports, Chalk Creek was studied in detail from its confluence with the Arkansas River upstream approximately 11.9 miles. Cottonwood Creek was studied in detail in the vicinity of the Town of Buena Vista. Poncha Creek and the South Arkansas River were studied in detail in the vicinity of the Town of Poncha Springs, and the South Arkansas River was studied in detail in the vicinity of the City of Salida.

The limits of detailed study in the Town of Buena Vista and the City of Salida were determined by FEMA with community and study contractor consultation at the initial coordination meeting in June 1979.

The incorporated areas of the Town of Poncha Springs and the unincorporated areas of Chaffee County studied by detailed methods were selected based on the extent and validity of available hydrologic and hydraulic data for the 1987 FIS reports.

Floods caused by overflow of Cottonwood Creek within the corporate limits of Buena Vista and overflow of the South Arkansas River from the confluence with the Arkansas River to County Road 125 were studied in detail. The areas studied by detailed methods were selected with priority given to all known flood hazard areas, and areas of projected development or proposed construction for five years past the time of the study, through January, 1985.

Flooding caused by the South Arkansas River was studied in detail from a point approximately 0.45 mile downstream of its confluence with Harrington Ditch, upstream to Limit Street on the western corporate limit of the Town of Poncha Springs as part of the 1987 FIS report for the Town of Poncha Springs.

Poncha Creek was studied in detail from its confluence with the South Arkansas River, to a point approximately 0.5 mile upstream as part of the 1987 FIS report for the Town of Poncha Springs.

As part of the 1987 FIS report for unincorporated areas of Chaffee County, the South Arkansas River was studied by detailed methods from its confluence with the Arkansas River upstream to the Town of Poncha Springs. Poncha Creek was studied by detailed methods from the Town of Poncha Springs corporate limits upstream for approximately 0.3 miles. Chalk Creek was studied by detailed methods from its confluence with the Arkansas River upstream approximately 11.9 miles. Cottonwood Creek was studied by detailed methods from its confluence with the Arkansas River upstream approximately 6.0 miles, excluding a portion of this reach contained within the corporate limits of the Town of Buena Vista.

Floods caused by overflow of the Arkansas River were studied by approximate methods, within the corporate limits of the Town of Buena Vista and the City of Salida as part of the 1987 FIS reports. 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, the Town of Buena Vista, and the City of Salida.

Approximate methods were used to study a group of debris fans along the north side of Chalk Creek between approximately 6.9 and 11.7 miles above its mouth as part of the 1987 FIS report for unincorporated areas of Chaffee County. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards.

As part of the Countywide RiskMap DFIRM map maintenance, development, and conversion project in 2009, the following streams were studied by detailed methods:

- Cottonwood Creek from the confluence with the Arkansas River upstream 5.5 river miles, including 8.5 miles of distributary flow paths (Anderson Consulting Engineers, Inc., April 2013);

- Poncha Creek from the confluence with the South Arkansas River upstream 0.8 river miles, including 0.7 miles of distributary flow paths (Anderson Consulting Engineers, Inc., April 2013); and

- South Arkansas River from the confluence with the Arkansas River upstream along four separate reaches spanning 6.5 river miles (Michael Baker Corporation, Inc. for Anderson Consulting Engineers, Inc., April 2013).

As part of the Countywide RiskMap DFIRM map maintenance, development, and conversion project in 2009, the following streams were studied by approximate methods:

- Arkansas River from the southern boundary to the northern boundary of Chaffee County for 54 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Little Cochetopa Creek from the confluence with the South Arkansas River upstream 3.0 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Loggie Gulch from the confluence with the Arkansas River upstream 1.0 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Pass Creek from the confluence with Little Cochetopa Creek upstream 1.6 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Poncha Creek from the upstream limit of the detailed study upstream 5.0 river miles to Mears Junction (Anderson Consulting Engineers, Inc., April 2013);

- Spruce Creek from the confluence with Little Cochetopa Creek upstream 1.0 river miles (Anderson Consulting Engineers, Inc., April 2013); and

- Ute Creek from the confluence with the Arkansas River upstream 2.3 river miles (Anderson Consulting Engineers, Inc., April 2013).

As part of the Countywide RiskMap DFIRM map maintenance, development, and conversion project in 2009, the following effective Zone A flood hazard areas were redelineated:

- Alpine Reservoir located on Chalk Creek near the unincorporated area of Alpine (Anderson Consulting Engineers, Inc., April 2013);

- Browns Creek from the confluence with the Arkansas River upstream approximately 6.9 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Chalk Creek from the outlet of Alpine Reservoir downstream approximately 2.3 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Chalk Creek from downstream of the ghost town of St. Elmo upstream approximately 1.6 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Clear Creek from the inlet to Clear Creek Reservoir upstream approximately 4.6 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Clear Creek from roughly the confluence with Iowa Gulch upstream approximately 2.8 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Cottonwood Gulch from the confluence with the Arkansas River upstream approximately 0.6 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Cottonwood Lake located on South Cottonwood Creek upstream of the confluence with Spruce Gulch (Anderson Consulting Engineers, Inc., April 2013);

- Dead Horse Gulch from the confluence with the Arkansas River upstream approximately 0.9 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Eddy Creek from the confluence with Gas Creek upstream approximately 3.9 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Fourmile Creek from the confluence with Threemile Creek upstream approximately 2.0 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Gas Creek from the confluence with the Arkansas River upstream approximately 1.1 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Moltz Reservoir located on Trout Creek upstream of the confluence with Chinaman Gulch (Anderson Consulting Engineers, Inc., April 2013);

- North Fork South Arkansas River from the confluence with the South Arkansas River upstream approximately 2.6 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Raspberry Gulch from the confluence with Eddy Creek upstream approximately 2.6 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Sand Creek from the confluence with the Arkansas River upstream approximately 3.5 river miles (Anderson Consulting Engineers, Inc., April 2013);

- South Arkansas River from upstream of Limit Street in Poncha Springs upstream approximately 6.4 river miles (Anderson Consulting Engineers, Inc., April 2013);

- South Arkansas River from upstream of unincorporated Maysville upstream approximately 0.5 river miles (Anderson Consulting Engineers, Inc., April 2013);

- South Cottonwood Creek from the inlet to Cottonwood Lake upstream approximately 1.6 river miles (Anderson Consulting Engineers, Inc., April 2013);

- South Fork Lake Creek from the Lake County-Chaffee County boundary upstream approximately 1.9 rive miles (Anderson Consulting Engineers, Inc., April 2013);

- South Fork Lake Creek from the confluence with Sayres Gulch upstream approximately 2.8 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Squaw Creek from the confluence with the Arkansas River upstream approximately 1.3 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Sweetwater Gulch from the confluence with the Arkansas River upstream approximately 0.4 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Threemile Creek from the confluence with the Arkansas River upstream approximately 4.1 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Trout Creek downstream from the outlet of Moltz Reservoir approximately 4.3 river miles (Anderson Consulting Engineers, Inc., April 2013);

- Trout Creek from the confluence with the Arkansas River upstream approximately 3.2 river miles (Anderson Consulting Engineers, Inc., April 2013);

- an Unnamed Tributary from the confluence with Threemile Creek upstream approximately 3.0 river miles (Anderson Consulting Engineers, Inc., April 2013);

- an Unnamed Tributary from the confluence with Threemile Creek upstream approximately 0.8 river miles (Anderson Consulting Engineers, Inc., April 2013); and

- an Unnamed Tributary from the confluence with Threemile Creek near Hecla Junction upstream approximately 2.0 river miles (Anderson Consulting Engineers, Inc., April 2013).

This Countywide FIS also incorporates the determination of letters issued by FEMA resulting in map changes (Letter of Map Revision [LOMR], Special Response [SR], Letter of Map Amendment [LOMA]), as shown in Table 1.

Table 1 Incorporated Letters of Map Change

Community	Flooding Source(s) and Project Identifier	Case Number	Effective Date	Type
Chaffee County, CO (Unincorporated Areas)	Fourmile Creek Leonard Property	10-08-0144P	March 16, 2010	LOMR

This Countywide FIS also supersedes the determination of letters issued by FEMA resulting in map changes (Letter of Map Revision [LOMR], Special Response [SR], Letter of Map Amendment [LOMA]), as shown in Table 2.

Table 2 Superseded Letters of Map Change

LOMC	Case No.	Date Issued	Project Identifier	Reason Determination Will be Superseded
TOWN OF BUENA VISTA				
LOMA	05-08-0324A	05/02/2005	TURNER SUBDIV, LOT 6 & 7 -- 123 SOUTH SANGRE DE CRISTO AVE	2
LOMA	12-08-0682A	09/06/2012	STEINER LOT LINE ADJUST, LOT 6 - - 108 SHADY LANE	3

LOMA	14-08-0187A	11/22/2013	LOT 8A, BLOCK 51, TOWN OF BUENA VISTA SUBDIVISION – 215 NORTH SAN JUAN AVENUE	4
CHAFFEE COUNTY				
LOMA	09-08-0684A	06/18/2009	IVY LEAGUE SUBDIV, LOT 15 -- 15790 FAIRWAY DRIVE	2
LOMR	10-08-0639P	07/19/2010	DOLLY DAY	4
LOMR	11-08-0602P	04/29/2011	LEWIS RESIDENCE	4
LOMR-F	13-08-0890A	09/19/2013	SHELL-TER HOMES SUBDIVISION, LOTS 21 & 22 -- 24045 COUNTY ROAD 301A	4
TOWN OF PONCHA SPRINGS				
LOMA	13-08-0143A	01/22/2013	LITTLE RIVER RANCH II, A PORTION OF LOT 85 -- 1100 PINON DRIVE	4
LOMA	13-08-0323A	03/26/2013	LITTLE RIVER RANCH 2, PORTION OF LOTS 86-88 -- 1102, 1104, 1106 PINON DRIVE	4

1. Insufficient information available to make a determination.
2. Lowest Adjacent Grade and Lowest Finished Floor are below the proposed Base Flood Elevation.
3. Lowest Ground Elevation is below the proposed Base Flood Elevation.
4. Revised hydrologic and hydraulic analyses.
5. Revised topographic information.

2.2 Community Description

Chaffee County

Chaffee County is located in south-central Colorado. It is bordered on the north by Lake and Pitkin Counties, on the west by Gunnison County, on the south by Saguache County, on the southeast by Fremont County, and the northeast by Park County.

According to the U.S. Census Bureau, the population of Chaffee County was 10,162 in 1970 (U.S. Census Bureau, 1980) and has since increased to an estimated population of 18,510 in 2013 (U.S. Census Bureau, 2014).

The topography of Chaffee County is influenced by two major mountain ranges separated by a broad valley. These ranges, the Sawatch Range in the western part of the county and the Mosquito Range in the eastern part, and the intervening valley are the result of faulting. The Arkansas River occupies this down-dropped trough. The Continental Divide runs along the crest of the Sawatch Range. Elevations along the Continental Divide range from 11,000 to 13,000 feet.

All of the streams studied in detail as part of the 1987 FIS originated in the Sawatch Range and are tributaries to the South Arkansas River or Arkansas River. The upper sections of these tributary drainage basins are characterized by deep to moderately deep soils, with rock outcrops and good permeability, and overlaying metamorphic or granite rocks. Vegetation is typically native grasses, shrub, or forestland. The lowest elevations in the basins range from 7,000 to 7,900 feet. The lower reaches of these basins consist of relatively narrow floodplains separated by dry uplands. Floodplain vegetation is lush and diverse, consisting of cottonwood, willow, alder, pinion pine, ponderosa pine, and other trees, shrubs, and grasses. Upland vegetation is typically pinion pine, sage brush, and dry grasses.

The climate of Chaffee County is semiarid; however, variability is caused by the range of elevations in the County. The lower elevations are dry and mild. Annual precipitation averages approximately 11 inches with a normal mean temperature range of 25°F in January to 64°F in July. Higher elevations are cooler and wetter, with as much as 30 inches of precipitation falling mainly as snow.

As of 1987, the floodplains of the South Arkansas River, Poncha Creek, and Cottonwood Creek in the vicinity of Buena Vista were heavily developed with predominantly single-family homes. Some areas also contained commercial development. The floodplains of Chalk Creek and the upstream portions of Cottonwood Creek were relatively undeveloped. However, sections of the Chalk Creek floodplain upstream of Mt. Princeton Hot Springs were subdivided for home construction.

Town of Buena Vista

The Town of Buena Vista is located in south central Colorado in the central portion of Chaffee County approximately 90 miles west of Colorado Springs, Colorado. The total land area contained within the corporate boundaries is 3.4 square miles, and the population of the Town of Buena Vista increased from 2,064 in 1980 (Colorado Planning Demographic Division, 1979) to 2,736 in 2013 (City-Data, 2014). Economic activities of the area include cattle ranching and tourism. Also located in the area are the Buena Vista Correctional Facility and the molybdenum mine in Climax. A major ski area, Monarch Pass is southwest of Buena Vista. The Denver and Rio Grande Western Railroad main line passes through the town on its route along the Arkansas River. Traffic on this line is limited to freight and coal, and stops are not normally made at the Town of Buena Vista.

As of 1982, the Town of Buena Vista was an older town with a minimum of recent construction. Commercial development was concentrated along a single main street (U.S. Highway 24) with residential areas spreading beyond. The floodplains of all the flood sources considered in this study were essentially fully developed at that time with single family housing the predominant type. Therefore, increased encroachment was not anticipated in the future although the

character of development may change with time.

The climate of the study area includes low precipitation, low humidity, abundant sunshine, a wide daily temperature range, and generally low winds. The surrounding mountains act as a barrier preventing the northern cold air or eastern storms from penetrating the Upper Arkansas River Valley.

The upstream drainage area of Cottonwood Creek originates in the Sawatch Range of the Rocky Mountains at the top of the Continental Divide between the Arkansas and Gunnison River Basins. Elevations vary from more than 13,000 feet along the divide to 7,900 feet at the lower end of the study area. Geology in the upper reaches consists of metamorphic rock (crystalline), mostly granite and other igneous type rocks. Soils are deep to moderately deep with rock outcrops; and the permeability characteristics are moderate to moderately rapid. Ground cover consists of native grass, brush, and forestland. Cottonwood, pinion-juniper, and pine trees grow at the lower elevations. Topography has a significant effect on the semi-arid climate. Average annual precipitation varies from about 11 inches at the Town of Buena Vista to over 30 inches in the higher mountain elevations where most of the precipitation occurs as snow. Melting of the snowpack causes runoff during the spring and sustained flow in Cottonwood Creek. In the Town of Buena Vista, normal mean temperatures range from 25.6 degrees Fahrenheit in January to 64.3 degrees in July. The mean annual temperature is 44.0 degrees. More than 85 percent of the total drainage area is within the San Isabel National Forest. Land use includes recreation, grazing, and a small amount of lumbering. Development within the National Forest boundaries is under controlled conditions and will have minor effects on potential flooding in the downstream areas.

Town of Poncha Springs

The Town of Poncha Springs is located in south-central Chaffee County, in central Colorado. It is situated approximately 3 miles west of Salida, and approximately 6 miles southeast of Maysville.

According to the U.S. Census Bureau, the population of the Town of Poncha Springs was 763 in 2013 (City Data, 2014), an increase from 198 in 1970 (U.S. Census Bureau, 1980).

The South Arkansas River drainage basin above the downstream limit of the 1987 study encompasses approximately 135 square miles. Poncha Creek has a drainage area of approximately 60 square miles. The two drainage areas lie side by side on the east flank of the Continental Divide.

The South Arkansas River Basin and Poncha Creek Basin comprise the southern portion of the Upper Arkansas River Valley in Chaffee and Lake Counties. The valley occupies a narrow and long trough that was formed mainly by faulting. The main topographic features of this valley are the two great parallel north-south

mountain ranges that border the valley, the Sawatch Range on the west and the Mosquito Range on the east. The Mosquito Range merges with a low range of hills along the southern portion of the valley. The larger tributaries of the Arkansas River, including the South Arkansas River, originate in the Sawatch Range.

A number of irrigation ditches such as the North Fork Ditch, Cameron Ditch, and the Missouri Park Ditch, convey water across natural drainage boundaries into adjacent basins. The Larkspur Ditch conveys water from the headwaters of the Tomichi Creek Drainage Basin in the Colorado River Basin across the Continental Divide at Marshall Pass and into the Poncha Creek Basin.

The elevation of the confluence of the South Arkansas River and Poncha Creek is 7,438 feet above mean sea level (MSL). The highest point in the South Arkansas River Basin is 14,229 feet above MSL at Mt. Shavano. The highest point in the Poncha Creek Drainage Basin is 13,955 feet above MSL, the top of Mt. Ouray.

The 1987 South Arkansas River study reach had a defined channel with channel banks ranging from flat to steep slopes. The river reach meandered through the alluvial materials deposited by the streams and suggests a shift of the riverbed in the past in certain areas. The north bank, comprised of alluvial fans, sloped gently away from the river. The south bank, east of U.S. Highway 285, was comprised of long and narrow alluvial material bordered to the south by rough broken land consisting of sediments of the Dry Union Formation. The south bank, west of U.S. Highway 285, was comprised of alluvial fans similar in nature to the north bank. The average slope of the 1987 study reach was approximately 0.01484 ft/ft.

The 1987 Poncha Creek reach was comprised of wet alluvial land in the lower one-half of the reach, with a steep, well-defined terrace in the upper one-half. The average slope of the 1987 study reach was approximately 0.0267 ft/ft.

The study area climate is influenced by the westerly winds coming over the mountains. It is also influenced by less frequent but important moisture-bearing winds from the east during the summer. These climatic features are typical of a mountain valley on an eastern slope near the central portion of a large continent. They include low precipitation, low humidity, abundant sunshine, a wide daily temperature range, and generally low winds. The surrounding mountains act as a barrier preventing the northern cold air or eastern storms from penetrating the Upper Arkansas River Valley.

The records at the Salida Weather Station, elevation 7,060 feet, as of 1982 show an average annual precipitation of 10.87 inches. Precipitation varies at Salida from less than 8 inches once every 6 years to over 15 inches once every 6 years. The highest recorded annual precipitation was 17.92 inches in 1961. This was followed by the lowest annual precipitation on record, 4.91 inches in 1962. The monthly distribution of precipitation varies considerably each year. Dry months

(less than 0.25 inch of precipitation) are rare for April, July, and August. Wet months (more than 2 inches of precipitation) occur approximately once every 4 years in July, once every 5 years in April and August. Summer thunderstorms account for almost 59 percent of the annual precipitation, and account for local high flows. Hail falls occasionally in the study area.

Summers are cool in the study area with temperatures reaching into the 90°F range a few times each summer. A maximum temperature of 100°F was recorded in August 1902. Temperatures for the summer nights usually drop below 50°F. Winter temperatures, particularly in the daytime, are usually warmer than those found at similar or lower elevations. Periods of extreme cold are of short duration. The lowest temperature recorded at Salida as of 1987 was 30°F below zero in January 1919. The average annual temperature is 46.5°F, and the average summer temperature is 62.6°F. The average frost-free period is approximately 107 days.

Because of the climatic conditions, the irrigated land in the vicinity of the 1987 study area was in meadows, native hay, and alfalfa. The area is better adapted to livestock production than cultivation. Dry land farming is almost nonexistent in the upper reaches of the Arkansas River Basin.

Developments on the floodplains have historically been for range and wildlife, with limited improvements supporting ranching activities.

City of Salida

The City of Salida is located in south central Colorado in the eastern portion of Chaffee County approximately 90 miles west of Pueblo, Colorado. The total land area contained within the corporate boundaries is 2.6 square miles, and the population of the City of Salida decreased from 5,409 in 1979 (Colorado Planning Demographic Division, 1979) to 5,409 in 2013 (U.S. Census Bureau, 2014). Economic activities of the area include cattle ranching, tourism, and some small scale mining, primarily for coal. The Royal Gorge of the Arkansas River, a major tourist attraction, is located at Canon City, 50 miles to the east. A major ski area, Monarch Pass, is directly west of the City of Salida. The Denver and Rio Grande Western Railroad main line passes through the city on its route along the Arkansas River. Traffic on this line is limited to freight, and stops are not normally made at the City of Salida.

As of 1982, the City of Salida was an older city with a minimum of recent construction. Commercial development was concentrated along a single main street with residential areas spreading beyond. The floodplains of all the flood sources considered in this study were essentially fully developed at that time with single family housing the predominant type. Therefore, increased encroachment was not anticipated in the future although the character of development may change with time.

The climate of the study area includes low precipitation, low humidity, abundant sunshine, a wide daily temperature range, and generally low winds. The surrounding mountains act as a barrier preventing the northern cold air or eastern storms from penetrating the Upper Arkansas River Valley.

The records at the Salida Weather Station, elevation 7,060 feet, as of 1982 show an average annual precipitation of 10.87 inches. The highest recorded annual precipitation was 17.92 inches in 1961. This was followed by the lowest annual precipitation on record, 4.91 inches in 1962.

Summers are cool in the study area with temperatures reaching into the 90's a few times each summer. Temperatures for the summer nights usually drop below 50°F. Winter temperatures, particularly in the daytime, are usually warmer than those found at similar or lower elevations. Periods of extreme cold temperatures are of short duration.

The elevation of the South Arkansas River confluence with the Arkansas River is 6,985 feet. The headwaters of the river originate at the Continental Divide among mountain peaks ranging in elevation from 12,000 to 14,000 feet. The South Arkansas River main stem flows eastward from the Monarch Pass area to Poncha Springs where it meets Poncha Creek. Poncha Creek drains the southeastern portion of the basin from the Marshall Pass and Poncha Pass areas.

The South Arkansas River Basin and Poncha Creek Basin comprise the southern portion of the Upper Arkansas River Valley in Chaffee and Lake Counties. The valley occupies a narrow and long trough that was formed mainly by faulting. The main topographic features of this valley are the two great parallel north-south mountain ranges that border the valley, the Sawatch Range on the west and the Mosquito Range on the east. The Mosquito Range merges with a low range of hills along the southern portion of the valley. The larger tributaries of the Arkansas River, including the South Arkansas River, originate in the Sawatch Range.

Vegetation varies considerably according to elevation in the basin. Vegetation below the 8,000 feet elevation consists of semi-arid growth such as pinion pine, juniper, and sage with sparse grass ground cover. Increased precipitation supports dense pine and aspen forests above this elevation to timberline. Rock outcrops and tundra grasses predominate on the high mountain peaks where climatic conditions are too severe for forest growth.

A number of irrigation ditches such as the North Fork Ditch, Cameron Ditch, and the Missouri Park Ditch, convey water across natural drainage boundaries into adjacent basins. The Larkspur Ditch conveys water from the headwaters of Tomichi Creek in the Colorado River Basin across the Continental Divide at Marshall Pass and into the Poncha Creek Basin.

2.3 Principal Flood Problems

While slopes are steeper in the upper drainage basins, the dense vegetation in these areas serves to reduce rainfall runoff. A greater percentage of runoff is permitted by the sparse vegetation of the foothills and pasture land at the lower elevations. Consequently, the majority of the flood problems in the study areas of the Town of Buena Vista and the City of Salida are caused by rapid snowmelt. This type of flooding has a long duration runoff which results in a continuous rise in water level thus producing a high runoff volume.

Flood potential also exists from long and short duration rain storms. These types of floods are characterized by high peaks, small volumes and short duration. The potential for the most severe flooding is created by the combination of rapid snowmelt with long duration rainfall.

Documentation in regard to flood problems in the Town of Buena Vista area is meager. A search through newspaper accounts revealed little in respect to a history of flooding. According to the July 5, 1957, issue of the "Chaffee County Republican," the most notable flood occurred on July 1, 1957. This flood was described by many long-time residents as the worst in history. Damage to streets and bridge crossings was extensive. Numerous residences received lawn and garden damage and a few homes and buildings had water on the first floor. The 1957 flood had a frequency occurrence of greater than once in 100 years, as estimated from the Cottonwood Creek stream gage data.

Flooding problems within the Town of Buena Vista are aggravated by the restriction of drainage channels due to vegetation growth and accumulated debris.

Detailed information on floods within the City of Salida before the turn of the 20th century is very limited. Information on past flooding is based on newspaper accounts and interviews with longtime residents of the area. Large floods occurred at the City of Salida in 1901, 1923, 1924, 1947, 1948, 1957, and 1973. These floods have caused major damage, disrupting highway and railroad traffic and communication services, drowned livestock, destroyed agricultural lands, roads, bridges and buildings.

The flood of June, 1957, is considered the most severe flood known in the City of Salida. The South Arkansas River reached a record high of 8.1 feet. The flood was triggered by high temperatures over an extended period of time and melted the heavy snowpack of the previous winter. Diversion ditches from the South Arkansas River carried almost twice as much water as compared with other years. A farm bridge on the Hutchinson Ranch was lost and County Road 125 bridge was threatened. Other low-level private bridges and foot bridges were also lost.

Peak discharges have been estimated by correlation to other gaging stations since the gaging station on the South Arkansas River near the City of Salida was not in use from 1940 to 1971. The peak discharge was estimated at 1,841 cfs. This

discharge represents a recurrence interval of approximately 50 years.

Flooding problems within the City of Salida are aggravated by the restriction of drainage channels due to vegetation growth and accumulated debris.

Flood flows in the Upper Arkansas River Basin occur primarily during the May – July period. These high flows are caused basically by snowmelt and are augmented occasionally by rain.

Cloudburst storms over the South Arkansas River and Poncha Creek drainage basins are known to have occurred causing peak flows in the study reaches in the Town of Poncha Springs. Unfortunately, detailed information on such flood events were not recorded.

Recorded historical flows show maximum discharges of 1,110 and 307 cubic feet per second (cfs) respectively for the South Arkansas River at the Town of Poncha Springs and Poncha Creek at Poncha Streamflow Recording Stations. These flows were recorded on July 5, 1911 and May 27, 1912, respectively. Long-term streamflow records from nearby stations indicate that peak flows occurred in a number of years, particularly in 1957.

Longtime residents of the Town of Poncha Springs recall that in the spring of 1957, both the South Arkansas River and Poncha Creek reached flood stages. Because of a heavy late spring snowfall, followed by sudden unseasonably warm temperatures, a rapid snowmelt occurred, producing flooding conditions that lasted approximately 7 days.

Obstructions to flood flows within the study reaches in the Town of Poncha Springs include primarily natural obstructions such as vegetation, fallen trees, and to a lesser extent manmade structures, such as bridges, buildings, and roadways. These obstructions have the tendency of increasing the flood elevations upstream of the obstructions and the velocities downstream of the obstructions. In certain instances, debris accumulated against a structure does present a potential threat to the safety of the structure.

Flooding in Chaffee County can result from snowmelt runoff, general rains, and cloudburst storms. The runoff from snowmelt occurs from late May to early July. During this period, the streams are vulnerable to out-of-channel flows, especially if warmer than usual temperatures and a heavy snowmelt are augmented by rainfall. Runoff from snowmelt is characterized by moderate peak flows, long duration, and large volumes of water. Most of the annual rainfall occurs from July through October. The rainfall intensity from cloudburst storms is usually high and runoff is characterized by high peak flows of short duration with relatively small volumes of water.

The largest flood recorded on the streams studied in detail throughout Chaffee County occurred on July 1, 1957. Estimates on Cottonwood Creek indicate that this flood had a recurrence interval greater than 100 years. This flood, caused by a heavy, late spring snowfall, followed by abnormally warm weather, caused damage along most streams.

Significant flooding also occurred in 1901, 1911, 1921, 1923, 1924, 1947, 1952, 1957, 1958, 1965, and 1973. Streamflow records on Chalk Creek show that the June 10, 1952, and June 11, 1973, flows of 1,050 cfs and 1,260 cfs, respectively, approached the computed 100-year discharge.

Natural or manmade obstructions in the floodplain influence the depth and width of the area flooded. Trees and brush growing along the streambanks retard the out-of-channel flood flows, causing backwater and greater depths of flooding. Road crossings with inadequate culvert or bridge openings often become channel constrictions and obstruct flood flows. Elevated roads in the floodplain act as barriers which raise the water surface at some locations. Trees, brush, and debris washed out during high runoff are carried downstream to bridges and culverts. These obstructions act as dams, backing the water upstream, until the obstruction breaks loose, causing a sudden surge of water with additional destructive force. Backwater from clogged culverts are bridges results in a multitude of flow conditions which are unpredictable for any given flood event.

The Chalk Cliffs lie along the northern side of Chalk Creek on the upstream half of the 1987 detailed study reach. Between the base of these cliffs and the Chalk Creek floodplain lie a group of coalesced debris fans. The debris-flow hazard presented by these fans is distinct from that of the Chalk Creek floodplain.

The Chalk Cliffs are dissected by many short, steep canyons. Between major rainfall events, these canyons become choked with talus and colluvium. This material is saturated and mobilized by intense rainfall and flows down the canyon as a debris or mudflow. These flows have built active fans at the mouth of each canyon.

The hazard from these debris flows is difficult to predict because it is difficult to classify debris flows in terms of recurrence interval, since historical data on amounts and depths of flow are nonexistent; and because debris flows commonly change channel location on the fan between events or within a single event.

The debris-flow season coincides with the season of maximum rainfall, July through October. Most of this rain falls during intense cloudburst storms. Typically, two or three debris flows occur in this area each year; however, none were recorded between 1976 and 1980.

Damage from debris flows has been limited to the periodic closing of State Highway 162. With increased pressure for development in this locale, the

potential for damage and loss of life will increase.

2.4 Flood Protection Measures

The Town of Buena Vista has adopted the Federal Emergency Management Agency's regulations concerning Federal Flood Insurance in special flood hazard areas. The upper portion of Cottonwood Creek has been dredged out since the 1957 flood to permit more flow to stay in the main channel.

The City of Salida has no existing regulations or ordinances concerning flood management or protection measures. There is very little flood protection for the City of Salida. The main protection from the South Arkansas River is from a bluff on the north edge of the river. This protects the City from more frequent floods.

There are no known structural or non-structural flood protection measures for the Town of Poncha Springs.

There are no existing flood-control structures on the South Arkansas River, Poncha Creek, Chalk Creek, or Cottonwood Creek.

Chaffee County has adopted zoning regulations for the management of flood hazard areas.

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 Flood Insurance Study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 25-, 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-, 25-, 50-, 100-, and 500-year floods, have a 10-, 4-, 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 one 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 FIS. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Pre-Countywide

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for floods of the selected recurrence intervals for each flooding source studied by detailed methods affecting the community and were compared to results of previous studies as part of each individual FIS.

As part of the 1982 FIS for the Town of Buena Vista, the SCS performed a frequency analysis of Cottonwood Creek streamgage records that was made in accordance with Water Resources Council Bulletin 17. These values were then compared with data from Colorado Water Conservation Board Technical Manual No. 1. Technical Manual No. 1 discharges were slightly higher, however considering it accounted for effects of mixed snowmelt and rainfall data, Technical Manual No. 1 discharges were selected for use in their study.

The procedure provided necessary peak discharge frequency values at the Cottonwood Creek streamgage site. Values at other locations along the stream were determined from a procedure in the Colorado Water Conservation Board Technical Manual No. 1, Page 4 – Flood Information near Gaged Sites on the Same Stream.

The results of a regional analysis performed by CDM were compared to the results of the Flood Hazard Analyses for Cottonwood Creek. The 100-year discharge agreed within 5 percent of the Flood Hazard Analyses, and therefore the hydrologic analysis as presented in the previous study was adopted for use in estimating the flood boundaries for Cottonwood Creek.

Peak discharges for the various recurrence intervals as part of the 1982 FIS for the City of Salida for the South Arkansas River were taken from data prepared by CWCB for the Arkansas River Basin at Salida, Colorado.

Streamflow data from 11 measuring stations located within the Upper Arkansas River Basin was used as part of the 1982 analysis. This data is contained in U.S. Geological Survey Water Supply Papers for the Arkansas River Basin.

The peak flow figures for each frequency used in the hydraulic analyses of the 1982 FIS for the City of Salida and the 1987 FIS for the Town of Poncha Springs were estimated using a Regional Log-Pearson Type III Analysis (including the 1957 data point). The 1957 peak flow for the South Arkansas River was obtained from a set of correlations that resulted in a relationship obtained from the period of common records between the South Arkansas River near the City of Salida and the Arkansas River at the City of Salida.

The results of the regional analysis were compared to the results of the Floodplain Information Report for the Lower South Arkansas River. The

100-year discharge agreed within 5 percent of the Floodplain Information Report, and therefore the hydrologic analysis as presented in the previous study was adopted for use in estimating the flood boundaries for the South Arkansas River as part of the 1982 FIS for the City of Salida.

Peak discharges for the various recurrence intervals for the South Arkansas River and Poncha Creek were taken from data prepared by Water Resources Consultants, Inc. as part of the 1987 FIS for Unincorporated Areas of Chaffee County.

Peak discharges for the various recurrence intervals for Chalk and Cottonwood Creeks was taken from data prepared by the SCS as part of the 1987 FIS for Unincorporated Areas of Chaffee County.

Countywide

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

There are numerous active streamflow gaging stations in the Arkansas River Drainage Basin, with a large number located in Chaffee County and several in neighboring Lake County to the north.
Drainage area versus peak discharge curves were developed utilizing 15 streamflow gaging stations located in the Upper Arkansas River Basin. The curves were updated from previous analyses in order to reflect longer periods of record (in some cases, through 2009) and to supplement the existing data set with additional gage data where applicable. The curves were utilized in developing discharge profiles for detailed hydraulic analyses along Cottonwood Creek, Poncha Creek, and the South Arkansas River (Anderson Consulting Engineers, Inc., 2011).

Peak discharge-drainage area relationships for Chalk Creek, Cottonwood Creek, Poncha Creek, and the South Arkansas River are shown in Table 3.

Table 3 - Summary of Discharges

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second)				
		10-Percent Annual Chance	4-Percent Annual Chance	2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance

Chalk Creek						
At Confluence with Arkansas River	90	770	---	1,150	1,300	1,650
Cottonwood Creek						
At USGS Stream Gage	65	680	840	950	1,070	1,350
At Confluence with Arkansas River	105	930	1,130	1,280	1,420	1,780
Poncha Creek						
At Confluence with Arkansas River	56	620	760	870	980	1,240
South Arkansas River						
At Garfield	19	310	390	450	510	670
At Maysville	51	590	720	820	930	1,180
At Poncha Springs	140	1,120	1,350	1,520	1,690	2,100
At County Road 107	200	1,400	1,680	1,890	2,090	2,580
At Confluence with Arkansas River	210	1,440	1,730	1,940	2,160	2,650

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 Map (FIRM) represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data table in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS report in conjunction with the data shown on the FIRM.

Pre-Countywide

The SCS hydraulic analysis as part of the 1982 FIS for the Town of Buena Vista was performed using the WSP2 Computer Program (Technical Release No. 61, SCS, May 1976). Review of the analysis for Cottonwood Creek was carried out by CDM in order to check water surface elevations for floods of the selected recurrence intervals.

Water surface elevations as part of the 1982 FIS for the Town of Buena Vista for the 10-, 50-, 100-, and 500-year floods for Cottonwood Creek were checked using the Corps of Engineers HEC-2 Water Surface Profile Program. Cross sections for this analysis were obtained from aerial survey flown November 6, 1975, coupled with appropriate field verification. All bridges and culverts were measured in the field to obtain elevation data and structural geometry. As a result of the review by the study contractor, it was determined that the Soil Conservation Service hydraulic analysis should be used for the 1982 FIS for the Town of Buena Vista.

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 is

computed (Section 4.2), selected cross section locations are also shown on the FIRM (Exhibit 2).

Roughness factors (Manning's "n" values) were determined by field inspection. Ground level photography aided in the selection of roughness factors and aerial photography was used to determine the limits of each roughness zone. Typical roughness values for Cottonwood Creek as part of the 1982 FIS for the Town of Buena Vista ranged from 0.045 to 0.110.

Flood profiles were drawn showing computed water surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals. The flood profiles presented in the 1982 FIS for the Town of Buena Vista were based on the effects of flow through unobstructed hydraulic structures and area, thus, considered valid only if these structures do not fail and remain unobstructed. The starting water surface elevation for Cottonwood Creek was determined by means of the slope-area method. In the overflow areas of Cottonwood Creek, where shallow flooding exists, water surface elevations as part of the SCS hydraulic analysis were determined utilizing the WSP2 Computer Program. Cross sections were obtained from topographic mapping, along each of the overflow areas delineated.

A field check of the Arkansas River at Buena Vista was performed in May 1980. The banks of the river ranged from 30' to 50' in height. It was determined that a 100-year flood would not overtop the banks, inundating the Town of Buena Vista. USGS 7 1/2-minute quadrangle maps were used to delineate the approximate 100-year flood boundary for this reach of the Arkansas River in the Town of Buena Vista.

Horizontal control as part of the 1982 FIS for the Town of Buena Vista was based on Colorado State Plane Coordinate System South Zone 1929 USC & GS Sea Level Datum. Elevation reference marks used in the 1982 FIS for the Town of Buena Vista were shown on the maps.

Water surface elevations as part of the 1982 FIS for the City of Salida for the 10-, 50-, 100-, and 500-year floods for the South Arkansas River were computed using the Corps of Engineers HEC-2 Water Surface Profile Program. Topographic mapping and cross sections for this analysis were compiled from aerial photographs flown in May 1978, coupled with appropriate field verification. All bridges and culverts were measured in the field to obtain elevation data and structural geometry.

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 is computed (Section 4.2), selected cross section locations are also shown on the FIRM (Exhibit 2).

Roughness factors (Manning's "n" values) were determined by field inspection. Ground level photography as part of the 1982 FIS for the City of Salida aided in the selection of roughness factors and aerial photography was used to determine the limits of each roughness zone. Roughness values for the main channel of the South Arkansas River ranged from 0.038 to 0.040. Floodplain values ranged from 0.032 to 0.085 for all floods.

Flood profiles were drawn showing computed water surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals. The flood profiles presented in the 1982 FIS for the City of Salida were based on the effects of flow through unobstructed hydraulic structures and area, thus, considered valid only if these structures do not fail and remain unobstructed. Hydraulic analyses were conducted by CWCB and reviewed by the study contractor. Starting water surface elevations were determined by the slope-area method.

Horizontal control as part of the 1982 FIS for the City of Salida was based on Colorado State Plane Coordinate System South Zone 1929 USC & GS Sea Level Datum. Elevation reference marks used in the 1982 FIS for the City of Salida were shown on the maps.

The Flood Hazard Boundary Map (FHBM) for the Arkansas River in the City of Salida, was reviewed during the hydraulic analysis of the 1982 FIS for the City of Salida. The FHBM was prepared using 7 ½-minute USGS quadrangle maps for contour information. Channel cross-sections were field surveyed by the City of Salida, at several locations along this reach of the Arkansas River. These cross-sections were used to determine a normal depth at each section, and a new Zone A boundary was then delineated as shown on the Flood Insurance Rate Map (published separately), for the City of Salida.

Digitized cross section information as part of the 1987 FIS for the Town of Poncha Springs was provided by the Colorado Water Conservation Board in cooperation with Chaffee County. It was necessary to adjust the digitized cross sections to truly reflect the channel invert elevations. The minimum elevation given for the digitized cross sections is that of the water-surface elevation in the stream channel at the time the aerial photography was taken (November 4, 1975). The flows in the study reaches on November 4, 1975, were obtained from the streamflow records for the South Arkansas River near the Salida gaging station; and the ditch diversions for the Harrington, Murry, and Rosedale Ditches. Next, the average depth of flow at each cross section was computed based on the constructed streamflow for November 4, 1975. The computed values ranged from 0.1 to 0.6 feet with approximately 72 percent of the cross sections having an average value of 0.2 to 0.3 feet. This depth was subtracted from the minimum channel elevation given on the digitized cross sections to obtain the channel invert elevations that were incorporated into the digitized cross section information prior to its use for the computation of the water-surface profile.

Manning's roughness coefficients were determined as part of the 1987 FIS for the Town of Poncha Springs from photographs and field-survey data. The values ranged from 0.035 to 0.038 for the South Arkansas River channel. Values were 0.038 to 0.080 for the overbanks of the South Arkansas River. Values for Poncha Creek ranged from 0.038 to 0.045 for the channel. Values were 0.055 to 0.080 for the overbanks.

The water-surface elevations as part of the 1987 FIS for the Town of Poncha Springs for the 10-, 50-, 100-, and 500-year recurrence interval floods were computed using the U.S. Army Corps of Engineers HEC-2 step-backwater computer program. This program utilizes a solution to the one-dimensional energy equation to determine the shape of the profile between control sections where the water-surface elevation is known or can be assumed. The procedure for a steady flow profile calculation is called the "Standard Step Method." In this method, the distance from a downstream or upstream point, where the conditions are known, to the point, where the backwater effects are to be determined, is divided into reaches by cross sections at fixed locations along the river. Starting from one control point, calculations of the water-surface profile proceed, in steps, from one cross section to the next. The HEC-2 program is also capable of handling the effect of the various hydraulic structures which are located across the river.

The hydraulic analyses for the 1987 FIS for the Town of Poncha Springs 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.

All elevations associated with the 1987 FIS for the Town of Poncha Springs were referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks were shown on the maps; the description of the marks were presented in the 'Elevation Reference Marks' exhibit.

Water-surface elevations as part of the 1987 FIS for Unincorporated Areas of Chaffee County for the 10-, 50-, 100-, and 500-year flood recurrence intervals from the South Arkansas River and Poncha Creek were computed using the U.S. Army Corps of Engineers HEC-2 Water-Surface Profiles program.

Water-surface elevations as part of the 1987 FIS for Unincorporated Areas of Chaffee County for the 10-, 50-, 100-, and 500-year flood recurrence intervals for Chalk and Cottonwood Creeks were computed using the SCS WPS-2 computer program.

Approximately 0.4 mile downstream of County Road 361 on Cottonwood Creek, 100-year flood flows from the 1987 FIS for Unincorporated Areas of Chaffee County overtop the south bank and flow in older, poorly defined channels. These flows return to the main channel in the town of Buena Vista. This 100-year

flooding is shallow, with flow depths averaging less than 2 feet. The 100-year water surface elevations for these flows were computed using the SCS WSP-2 computer program.

Cross section data and bridge and culvert geometry were obtained from field surveys, topographic maps, and aerial photographs as part of the 1987 FIS for Unincorporated Areas of Chaffee County.

Roughness coefficients (Manning's "n") were determined using photographs and field inspection as part of the 1987 FIS for Unincorporated Areas of Chaffee County. Roughness values ranged from 0.032 to 0.110.

Starting water-surface elevations as part of the 1987 FIS for Unincorporated Areas of Chaffee County for the South Arkansas River, Poncha Creek, and Cottonwood Creek were determined using the slope-area method.

The hydraulic analyses for the 1987 FIS for Unincorporated Areas of Chaffee County 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.

All elevations were referenced to the NGVD as part of the 1987 FIS for Unincorporated Areas of Chaffee County. Elevation reference marks used were shown on the maps; the description of the marks were presented in the 'Elevation Reference Marks' exhibit.

Countywide

Water surface elevations as part of a 2013 study for the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance floods for Cottonwood Creek were determined using the U.S. Army Corps of Engineers' River Analysis System (HEC-RAS, Version 4.0). The analysis included 5.5 river miles of Cottonwood Creek and 8.5 river miles of distributary flow paths. Cross sections for this analysis were obtained from aerial LiDAR data collected in September and October 2010. All bridge and culvert information was measured in the field to obtain elevation data and structural geometry. Starting water surface elevations for Cottonwood Creek and one of its distributary flow paths was determined by normal depth.

Roughness factors (Manning's "n" values) were determined by field inspection. Ground level photography aided in the selection of roughness factors and aerial photography was used to determine the limits of each roughness zone. Typical roughness values for Cottonwood Creek as part of the 2013 study ranged from 0.020 to 0.080 (Anderson Consulting Engineers, Inc., 2013).

Flood profiles were drawn showing computed water surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals. The flood

profiles presented in the 2013 study were based on the effects of flow through unobstructed hydraulic structures and area, thus, considered valid only if these structures do not fail and remain unobstructed.

Vertical control for the 2013 study is based on the North American Vertical Datum of 1988 (NAVD88). Elevation reference marks, or bench marks, used in this study are shown on the maps. Users seeking additional information on the bench marks are directed on the FIRM panel to contact the National Geodetic Survey or visit the web site at http://www.ngs.noaa.gov.

Water surface elevations as part of a 2013 study for the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance floods for the South Arkansas River were determined using the U.S. Army Corps of Engineers' River Analysis System (HEC-RAS, Version 4.0). The analysis included 6.5 river miles of the South Arkansas River, of which approximately 3.4 miles is within or near the City of Salida. Cross sections for this analysis were obtained from aerial LiDAR data collected in September and October 2010. All bridge and culvert information was measured in the field to obtain elevation data and structural geometry. Starting water surface elevations for the South Arkansas River were determined by normal depth.

Roughness factors (Manning's "n" values) were determined by field inspection. Ground level photography as part of the 2013 study aided in the selection of roughness factors and aerial photography was used to determine the limits of each roughness zone. Roughness values for the main channel of the South Arkansas River ranged from 0.038 to 0.059 for the 2013 study. Floodplain values ranged from 0.040 to 0.080 for all floods for the 2013 study.

Flood profiles were drawn showing computed water surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals. The flood profiles presented in the 2013 study were based on the effects of flow through unobstructed hydraulic structures and area, thus, considered valid only if these structures do not fail and remain unobstructed.

Vertical control for the 2013 study is based on the North American Vertical Datum of 1988 (NAVD88). Elevation reference marks, or bench marks, used in this study are shown on the maps. Users seeking additional information on the bench marks are directed on the FIRM panel to contact the National Geodetic Survey or visit the web site at http://www.ngs.noaa.gov.

Water surface elevations as part of a 2013 study for the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance floods for Poncha Creek and the South Arkansas River were determined using the U.S. Army Corps of Engineers' River Analysis System (HEC-RAS, Version 4.0 and 4.1). The analysis included 0.8 river miles of Poncha Creek, 0.7 river miles of distributary flow paths from Poncha Creek, and 2.2 river miles of the South Arkansas River. Cross sections for this analysis were obtained from aerial LiDAR data collected in September and October 2010. All

bridge and culvert information was measured in the field to obtain elevation data and structural geometry. Starting water surface elevations for Poncha Creek, one of its distributary flow paths, and the South Arkansas River were determined by normal depth.

Manning's roughness coefficients were determined for the 2013 study based on field observations. The values ranged from 0.045 to 0.065 for the South Arkansas River channel for the 2013 study. Values were 0.043 to 0.076 for the overbanks of the South Arkansas River for the 2013 study. Values for Poncha Creek for the 2013 study ranged from 0.070 to 0.073 for the channel. Values were 0.069 to 0.076 for the overbanks for the 2013 study.

The hydraulic analyses for the 2013 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.

All elevations reference the NAVD as part of the 2013 study. Elevation reference marks, or bench marks, used in this study are shown on the maps. Users seeking additional information on the bench marks are directed on the FIRM panel to contact the National Geodetic Survey or visit the web site at http://www.ngs.noaa.gov.

Water surface elevations as part of a 2013 study for the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance floods for the South Arkansas River were determined using the U.S. Army Corps of Engineers' River Analysis System (HEC-RAS, Version 4.1). The analysis included 1.3 river miles of the South Arkansas River near unincorporated Maysville and 1.2 river miles of the South Arkansas River near unincorporated Garfield. Cross sections for this analysis were obtained from aerial LiDAR data collected in September and October 2010. All bridge and culvert information was measured in the field to obtain elevation data and structural geometry. Starting water surface elevations for both reaches of the South Arkansas River were determined by normal depth.

Roughness coefficients (Manning's "n") were determined based on field inspection as part of the 2013 study. Roughness values ranged from 0.020 to 0.083.

Seven stream reaches were studied by approximate methods, including 54.0 river miles of the Arkansas River, 3.0 river miles of Little Cochetopa Creek, 1.0 river miles of Loggie Gulch, 1.6 river miles of Pass Creek, 5.0 river miles of Poncha Creek, 1.0 river miles of Spruce Creek, and 2.3 river miles of Ute Creek. Normal depth was employed at the downstream end of each reach in order to determine starting water surface elevations.

The hydraulic analyses for the 2013 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. All elevations reference the NAVD as part of the 2013 study. Elevation reference marks, or bench marks, used in this study are shown on the maps. Users seeking additional information on the bench marks are directed on the FIRM panel to contact the National Geodetic Survey or visit the web site at http://www.ngs.noaa.gov.

3.3 Vertical Datum

All FISs 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 in use for newly created or revised FISs and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the finalization of the North American Vertical Datum of 1988 (NAVD88), many FIS reports and FIRMs are being prepared using NAVD88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to the NAVD88 vertical datum. Structure and ground elevations in the community must, therefore, be referenced to NAVD88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD29 by applying a standard conversion factor.

The factors to convert from NGVD29 to NAVD88 for the detailed study streams in this county are shown in Table 4. Poncha Creek is not included in this table as the entire stream was re-studied using a combination of detailed and approximate methods in NAVD88. A portion of the detailed 1987 study for Cottonwood Creek, near that stream's upstream study limit was retained as part of the current FIS, and therefore an offset value was included in the table. Chalk Creek was retained in its entirety from the 1987 Chaffee County FIS and converted according to the offset values listed below. A portion of the detailed 1987 study for the South Arkansas River between the City of Salida and the Town of Poncha Springs was retained as part of the current FIS, and therefore an offset value was included in the table. The elevations shown in the 1987 Chaffee County FIS report and on the FIRM were, therefore, converted to NAVD88 using a stream network approach. In this method, either a single average conversion or reach-by-reach conversions were established for each flooding source network and applied accordingly. The conversion factor for each flooding source in the community may be found in the following table, as well as on the FIRM.

Table 4 – Vertical Datum Conversion Factor Table

Flooding Source	Vertical Datum Offset (ft)
Cottonwood Creek	5.4
Lower Chalk Creek (confluence with Arkansas River upstream through Effective	5.1

Cross Section U)	
Middle-Lower Chalk Creek (Effective Cross Section V through Effective Cross Section AH)	5.6
Middle-Upper Chalk Creek (Effective Cross Section AI through Effective Cross Section AL)	6.0
South Arkansas River	4.9
Upper Chalk Creek (Effective Cross Section AM to Upstream Limit of Study)	6.3

Example: To convert Cottonwood Creek elevations to NAVD 88, 5.4 feet were added to the NGVD 29 elevations.

The Base Flood Elevations (BFEs) shown on the FIRM represent whole-foot rounded values. For example, a BFE of 7,960.4 will appear as 7,960 on the FIRM and 7,960.6 will appear as 7,961. Therefore, users that wish to convert the elevations in this Countywide study to NGVD29 should apply the stated conversion factor(s) to elevations shown on the Flood Profiles in the FIS report, which are shown to the nearest 0.5-foot.

For more information on NAVD88, see Converting the National Flood Insurance Program to the North American Vertical Datum of 1988, FEMA Publication FIA-20/June 1992, or contact the Vertical Network Branch, National Geodetic Survey, Coast and Geodetic Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland 20910 (Internet address http://www.ngs.noaa.gov/).

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.

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 provides 1-percent-annual-chance floodplain data, which may include a combination of the following: 10-percent, 4-percent, 2-percent, 1-percent, and 0.2-percent-annual-chance flood elevations; delineations of the 1- and 0.2-percent-annual-chance floodplain boundaries; and 1-percent annual chance floodway to assist communities in developing floodplain management measures. This information is presented on the FIRM and in many

components of the FIS, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS 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

The 1-percent and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, AH, AO, and D), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1-percent and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain 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 (Exhibit 2).

Approximate 100-year flood boundaries as part of the 1987 study in the Chalk Cliffs debris fan area were delineated using aerial photographs and field reconnaissance. No effort was made to determine depth or direction of flow in this area.

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 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The 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 of the 1-percent-annual-chance flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

According to the "Rules and Regulations for Regulatory Floodplains in Colorado" (Colorado Water Conservation Board, 2010), Rule 8(A) states "… when floodways are to be delineated through Physical Map Revisions involving local government participation, communities shall delineate floodways for the revised reaches based on ½-foot rise criteria". The half-foot rise floodways presented in this FIS report and on the FIRM were computed for the detailed study reach stream segments on the basis of equal conveyance reduction from each side of the floodplain. Half-foot rise floodway widths were computed at cross sections. Between cross sections, the half-foot rise floodway boundaries were interpolated. The results of the half-foot rise floodway computations have been tabulated for selected cross sections (Table 5). In cases where the half-foot rise floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the half-foot rise floodway boundary has been shown.

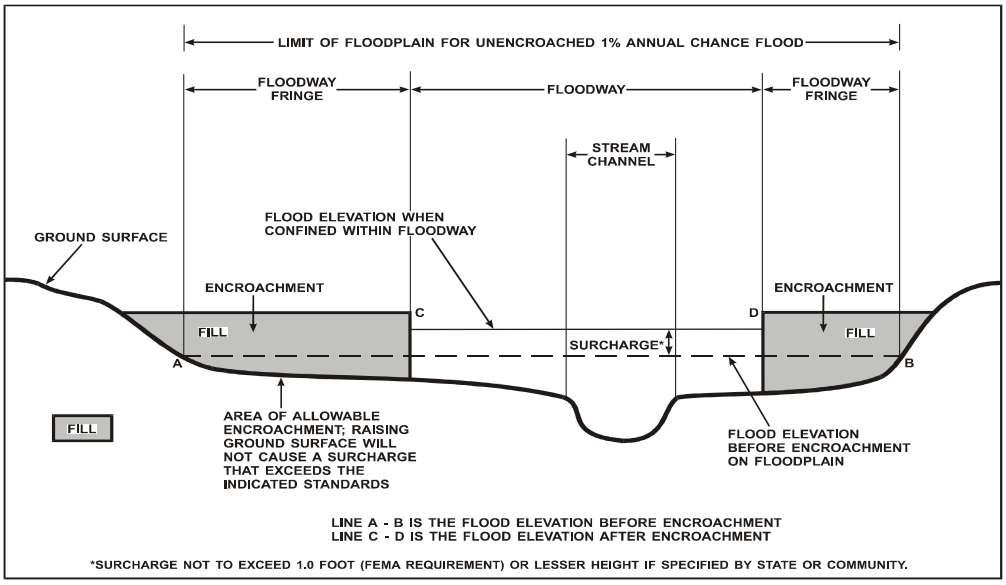


Figure 1 – Floodway Schematic

5.0 INSURANCE APPLICATIONS

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

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cottonwood Creek								
A	96	59	156	6.8	7885.1	7885.1	7885.1	0.0
B	420	307	1700	1.3	7904.9	7904.9	7905.4	0.5
C	938	67	614	1.7	7905.0	7905.0	7905.4	0.4
D	2036	94	209	5.1	7913.4	7913.4	7913.4	0.0
E	2949	66	174	6.1	7922.3	7922.3	7922.3	0.0
F	3779	60	137	7.1	7933.5	7933.5	7933.5	0.0
G	4219	63	233	4.9	7942.7	7942.7	7942.7	0.0
H	4633	40	112	10.4	7945.6	7945.6	7945.6	0.0
I	4762	29	95	10.3	7948.4	7948.4	7948.4	0.0
J	5067	39	115	8.5	7952.8	7952.8	7952.8	0.0
K	5307	59	255	2.5	7957.3	7957.3	7957.3	0.0
L	5716	120	292	3.3	7959.6	7959.6	7959.6	0.0
M	5852	51	157	4.1	7959.9	7959.9	7959.9	0.0
N	6168	34	152	7.1	7963.0	7963.0	7963.0	0.0
O	6603	68	119	5.4	7966.4	7966.4	7966.4	0.0
P	6935	46	166	5.1	7971.1	7971.1	7971.1	0.0
Q	7197	64	96	6.7	7974.9	7974.9	7974.9	0.0
R	7651	28	111	7.1	7980.3	7980.3	7980.3	0.0
S	8185	122	159	5.5	7986.7	7986.7	7986.7	0.0
T	9156	48	85	7.6	7995.0	7995.0	7995.0	0.0
U	9415	58	191	5.2	7996.9	7996.9	7996.9	0.0
V	9954	45	114	5.8	8001.1	8001.1	8001.2	0.1

[1] Feet Above Confluence With Arkansas River.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COTTONWOOD CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cottonwood Creek (continued)								
W	10172	45	163	4.1	8004.1	8004.1	8004.1	0.0
X	10455	176	172	3.7	8004.8	8004.8	8004.8	0.0
Y	10844	36	114	5.7	8007.2	8007.2	8007.2	0.0
Z	11057	39	78	8.2	8009.1	8009.1	8009.1	0.0
AA	11537	36	116	6.5	8013.8	8013.8	8013.8	0.0
AB	12008	62	122	5.3	8018.6	8018.6	8018.6	0.0
AC	12831	140	150	4.3	8028.1	8028.1	8028.1	0.0
AD	13653	40	55	6.4	8036.1	8036.1	8036.1	0.0
AE	14389	59	61	5.8	8045.4	8045.4	8045.4	0.0
AF	15258	100	76	4.7	8055.7	8055.7	8055.7	0.0
AG	16007	64	77	4.6	8064.6	8064.6	8064.6	0.0
AH	16811	56	83	4.9	8076.7	8076.7	8076.7	0.0
AI	17228	83	71	4.2	8081.6	8081.6	8081.6	0.0
AJ	17708	76	78	5.8	8086.5	8086.5	8086.5	0.0
AK	18357	63	94	4.8	8093.9	8093.9	8094.0	0.1
AL	18788	34	76	6.1	8098.3	8098.3	8098.3	0.0
AM	19531	79	92	4.9	8107.9	8107.9	8108.0	0.1
AN	19843	55	153	2.9	8112.8	8112.8	8112.8	0.0
AO	20259	32	58	7.7	8116.6	8116.6	8116.6	0.0
AP	20792	99	200	7.1	8126.8	8126.8	8127.2	0.4
AQ	21484	133	226	6.3	8135.6	8135.6	8135.7	0.1
AR	21936	210	297	4.8	8142.3	8142.3	8142.3	0.0
AS	22589	150	253	5.6	8151.2	8151.2	8151.3	0.1

[1] Feet Above Confluence With Arkansas River.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COTTONWOOD CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cottonwood Creek (continued)								
AT	22936	38	207	10.6	8157.9	8157.9	8157.9	0.0
AU	23718	65	162	8.8	8169.0	8169.0	8169.5	0.5
AV	24001	123	299	4.8	8174.7	8174.7	8174.9	0.2
AW	24247	182	266	5.3	8178.1	8178.1	8178.1	0.0
AX	24696	102	183	7.7	8186.4	8186.4	8186.4	0.0
AY	25326	165	511	4.7	8201.0	8201.0	8201.0	0.0
AZ	25791	94	190	7.5	8207.0	8207.0	8207.0	0.0
BA	26172	104	187	7.6	8214.1	8214.1	8214.1	0.0
BB	27078	63	95	4.2	8229.8	8229.8	8229.8	0.0
BC	27885	50	86	4.7	8244.7	8244.7	8244.7	0.0
BD	28290	106	297	4.8	8254.9	8254.9	8255.4	0.5
BE	28782	70	173	8.2	8265.0	8265.0	8265.4	0.4
BF	29837	97	136	7.3	8283.2	8283.2	8283.2	0.0

[1] Feet Above Confluence With Arkansas River.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COTTONWOOD CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cottonwood Creek - Downstream CR 331 Split Flow Path								
A	266	82	59	2.8	8007.1	8007.1	8007.1	0.0
B	861	93	81	2.1	8015.4	8015.4	8015.8	0.4
C	1471	79	48	3.5	8023.0	8023.0	8023.0	0.0

[1] Feet Above Confluence With Cottonwood Creek - South Split Flow Path.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COTTONWOOD CREEK – DOWNSTREAM CR 331 SPLIT FLOW PATH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cottonwood Creek - Middle Divergence Split Flow Path								
A	183	117	41	3.2	7962.0	7962.0	7962.0	0.0
B	428	128	86	1.5	7966.9	7966.9	7966.9	0.0
C	860	99	63	1.5	7972.4	7972.4	7972.5	0.1

[1] Feet Above Confluence With Cottonwood Creek - Middle Split Flow Path.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COTTONWOOD CREEK – MIDDLE DIVERGENCE SPLIT FLOW PATH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cottonwood Creek - Middle Split Flow Path								
A	155	43	20	4.5	7926.7	7926.7	7926.7	0.0
B	966	482	149	2.7	7946.2	7946.2	7946.3	0.1
C	1285	108	303	1.5	7947.3	7947.3	7947.3	0.0
D	1916	89	68	3.6	7954.1	7954.1	7954.1	0.0
E	2154	174	75	3.4	7958.4	7958.4	7958.4	0.0
F	2354	163	119	2.6	7960.2	7960.2	7960.2	0.0
G	2973	167	105	1.8	7966.8	7966.8	7966.8	0.0
H	3451	70	73	3.1	7973.7	7973.7	7973.7	0.0
I	3943	194	153	1.5	7976.7	7976.7	7976.7	0.0
J	4740	329	141	1.6	7984.5	7984.5	7984.5	0.0
K	5168	196	65	3.5	7989.8	7989.8	7989.8	0.0
L	5677	76	38	4.3	7995.0	7995.0	7995.0	0.0
M	6225	50	39	4.0	8000.5	8000.5	8001.0	0.5
N	6654	107	69	3.3	8006.8	8006.8	8006.8	0.0
O	7180	77	68	3.3	8011.8	8011.8	8011.8	0.0
P	7364	81	50	4.5	8014.8	8014.8	8014.8	0.0
Q	7803	70	49	4.6	8019.3	8019.3	8019.3	0.0
R	8777	148	96	3.8	8033.8	8033.8	8033.8	0.0
S	8977	85	69	5.3	8039.3	8039.3	8039.5	0.2
T	9561	100	75	4.9	8043.1	8043.1	8043.1	0.0
U	10240	88	83	4.9	8050.9	8050.9	8050.9	0.0
V	10707	186	90	3.0	8058.2	8058.2	8058.2	0.0

[1] Feet Above Confluence With Cottonwood Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COTTONWOOD CREEK – MIDDLE SPLIT FLOW PATH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cottonwood Creek - Middle Split Flow Path (continued)								
W	11456	181	175	2.1	8066.4	8066.4	8066.8	0.4
X	12842	208	114	4.2	8078.5	8078.5	8078.7	0.2
Y	13405	111	29	1.3	8086.1	8086.1	8086.1	0.0
Z	14048	86	1	0.1	8096.0	8096.0	8096.0	0.0

[1] Feet Above Confluence With Cottonwood Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COTTONWOOD CREEK – MIDDLE SPLIT FLOW PATH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cottonwood Creek – North Split Flow Path								
A	178	85	195	1.7	7960.2	7960.2	7960.2	0.0
B	520	159	90	4.9	7965.8	7965.8	7965.8	0.0
C	876	200	85	3.8	7971.3	7971.3	7971.3	0.0
D	1371	53	56	5.8	7975.0	7975.0	7975.0	0.0
E	1933	238	189	3.7	7982.2	7982.2	7982.2	0.0
F	2473	114	116	2.8	7986.1	7986.1	7986.2	0.1
G	2820	157	117	2.8	7990.8	7990.8	7990.8	0.0
H	3358	217	129	2.5	7996.1	7996.1	7996.1	0.0
I	3834	136	115	2.8	8000.3	8000.3	8000.3	0.0
J	4264	156	125	2.6	8006.5	8006.5	8006.5	0.0
K	4952	233	246	2.0	8017.1	8017.1	8017.1	0.0
L	5454	284	117	2.8	8022.8	8022.8	8022.8	0.0
M	6205	213	100	3.8	8034.3	8034.3	8034.5	0.2
N	6973	133	117	5.3	8041.5	8041.5	8041.5	0.0
O	7555	71	109	5.7	8048.5	8048.5	8048.5	0.0
P	7955	111	173	3.6	8054.4	8054.4	8054.4	0.0
Q	8623	72	103	2.4	8064.3	8064.3	8064.4	0.1
R	9144	126	96	1.9	8069.8	8069.8	8070.0	0.2
S	9933	196	104	1.5	8078.8	8078.8	8078.8	0.0

[1] Feet Above Confluence With Cottonwood Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COTTONWOOD CREEK – NORTH SPLIT FLOW PATH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cottonwood Creek – Railroad Split Flow Path								
A	52	82	47	3.9	7936.6	7936.6	7936.6	0.0
B	140	156	54	3.8	7938.7	7938.7	7938.7	0.0
C	238	112	87	2.9	7939.5	7939.5	7939.5	0.0
D	329	84	90	2.8	7939.9	7939.9	7940.0	0.1
E	421	41	90	2.8	7940.1	7940.1	7940.2	0.1
F	703	46	61	4.2	7940.6	7940.6	7941.0	0.4
G	1018	44	83	3.1	7941.6	7941.6	7941.9	0.3
H	1412	52	98	2.6	7942.0	7942.0	7942.4	0.4
I	1635	92	156	1.7	7942.2	7942.2	7942.6	0.4
J	1770	30	57	4.5	7942.4	7942.4	7942.5	0.1
K	1969	22	58	4.5	7942.9	7942.9	7943.2	0.3

[1] Feet Above Limit of Study.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COTTONWOOD CREEK – RAILROAD SPLIT FLOW PATH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cottonwood Creek – South of Main Street Split Flow Path								
A	422	117	53	3.9	7950.9	7950.9	7950.9	0.0
B	748	169	67	3.4	7955.4	7955.4	7955.4	0.0
C	1000	85	42	3.4	7960.3	7960.3	7960.3	0.0
D	1764	137	42	3.3	7969.8	7969.8	7969.8	0.0
E	2212	308	121	2.1	7974.3	7974.3	7974.3	0.0
F	2578	106	69	3.2	7978.8	7978.8	7978.8	0.0
G	2994	65	59	3.7	7984.0	7984.0	7984.0	0.0
H	3224	46	44	5.1	7987.4	7987.4	7987.4	0.0
I	3674	383	142	2.5	7998.3	7998.3	7998.3	0.0
J	4090	339	75	1.1	8002.4	8002.4	8002.4	0.0

[1] Feet Above Confluence With Cottonwood Creek - Middle Split Flow Path.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COTTONWOOD CREEK – SOUTH OF MAIN STREET SPLIT FLOW PATH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cottonwood Creek – South Split Flow Path								
A	137	85	22	2.9	7993.2	7993.2	7993.2	0.0
B	396	110	16	2.4	7996.2	7996.2	7996.2	0.0
C	780	84	71	4.4	8002.6	8002.6	8002.6	0.0
D	1176	24	13	4.1	8007.2	8007.2	8007.2	0.0
E	1609	56	19	2.9	8014.2	8014.2	8014.2	0.0
F	1721	59	24	2.3	8016.5	8016.5	8016.5	0.0
G	1991	144	36	1.6	8020.2	8020.2	8020.2	0.0
H	2724	111	42	1.3	8028.4	8028.4	8028.5	0.1
I	3080	179	118	0.5	8034.5	8034.5	8034.5	0.0
J	3571	116	202	3.4	8041.6	8041.6	8041.6	0.0
K	4265	57	30	1.6	8048.9	8048.9	8048.9	0.0
L	4720	39	26	4.4	8056.8	8056.8	8056.8	0.0
M	5056	55	56	3.7	8060.0	8060.0	8060.0	0.0
N	5883	74	74	2.8	8069.2	8069.2	8069.6	0.4
O	6468	80	63	3.3	8076.5	8076.5	8076.9	0.4
P	7010	206	277	3.3	8083.9	8083.9	8084.3	0.4
Q	7649	134	157	6.0	8093.4	8093.4	8093.4	0.0
R	8041	194	283	3.4	8097.6	8097.6	8097.8	0.2
S	8395	148	182	5.3	8102.9	8102.9	8102.9	0.0
T	8873	134	179	5.4	8109.6	8109.6	8109.6	0.0
U	9828	87	166	5.8	8124.5	8124.5	8124.6	0.1

[1] Feet Above Confluence With Cottonwood Creek - Middle Split Flow Path.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COTTONWOOD CREEK – SOUTH SPLIT FLOW PATH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cottonwood Creek – Upstream CR 338 Split Flow Path								
A	413	48	116	8.7	8225.2	8225.2	8225.2	0.0
B	1193	37	108	9.4	8237.8	8237.8	8238.1	0.3
C	1885	49	123	8.3	8250.7	8250.7	8251.1	0.4

[1] Feet Above Confluence With Cottonwood Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COTTONWOOD CREEK – UPSTREAM CR 338 SPLIT FLOW PATH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cottonwood Creek – Upstream of Main Split Flow Path								
A	86	80	88	3.9	7957.9	7957.9	7958.0	0.1
B	260	89	95	0.3	7958.7	7958.7	7958.7	0.0

[1] Feet Above Confluence With Cottonwood Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COTTONWOOD CREEK – UPSTREAM OF MAIN SPLIT FLOW PATH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Poncha Creek								
A	48	123	172	4.6	7447.8	7446.4[2]	7446.9[2]	0.5
B	369	47	103	6.0	7453.4	7453.4	7453.6	0.2
C	1,168	46	77	6.9	7471.2	7471.2	7471.3	0.1
D	1,431	24	131	4.4	7476.9	7476.9	7477.1	0.2
E	1,600	40	138	7.1	7481.8	7481.8	7482.3	0.5
F	1,850	41	127	7.7	7488.3	7488.3	7488.7	0.4
G	2,180	46	128	7.7	7497.9	7497.9	7498.4	0.5
H	2,399	27	109	9.0	7504.9	7504.9	7505.3	0.4
I	2,654	41	144	6.8	7512.7	7512.7	7513.1	0.4
J	3,010	40	138	7.1	7521.8	7521.8	7522.0	0.2
K	3,375	43	137	7.1	7531.5	7531.5	7532.0	0.5
L	3,653	53	145	6.8	7539.4	7539.4	7539.9	0.5
M	4,073	46	139	7.0	7551.8	7551.8	7552.3	0.5
N	4,376	48	124	7.9	7562.9	7562.9	7563.0	0.1
O	4,759	28	116	8.4	7577.0	7577.0	7577.5	0.5
P	5,065	35	148	6.6	7585.1	7585.1	7585.3	0.2
Q	5,371	157	193	5.1	7592.7	7592.7	7592.7	0.0
R	5,826	107	206	4.7	7604.5	7604.5	7604.9	0.4
S	6,094	115	170	5.8	7610.9	7610.9	7611.4	0.5
T	6,472	72	169	5.8	7622.3	7622.3	7622.8	0.5
U	6,974	56	134	7.3	7638.9	7638.9	7639.0	0.1

[1] Feet Above Confluence With South Arkansas River.
[2] Elevation Computed Without Consideration of Backwater Effects from South Arkansas River.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

PONCHA CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Poncha Creek – East Divided Flow Path								
A	238	61	48	3.8	7435.0	7435.0	7435.1	0.1
B	511	60	67	2.7	7441.6	7441.6	7441.7	0.1
C	958	67	69	2.6	7451.6	7451.6	7451.7	0.1
D	1,095	63	67	3.6	7454.8	7454.8	7454.8	0.0
E	1,549	126	93	1.9	7464.8	7464.8	7464.8	0.0

[1] Feet Above Confluence With South Arkansas River.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

PONCHA CREEK – EAST DIVIDED FLOW PATH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Poncha Creek – West Divided Flow Path								
A	174	75	103	1.8	7451.6	7451.6	7451.7	0.1
B	412	96	96	2.2	7459.0	7459.0	7459.0	0.0
C	772	85	97	4.6	7467.6	7467.6	7467.7	0.1
D	1,192	94	126	3.6	7477.1	7477.1	7477.4	0.3
E	1,227	134	103	4.3	7478.2	7478.2	7478.2	0.0

[1] Feet Above Confluence With Poncha Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

PONCHA CREEK – WEST DIVIDED FLOW PATH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
South Arkansas River								
A	439	153	326	6.6	7000.4	7000.4	7000.4	0.0
B	1463	108	266	8.1	7012.4	7012.4	7012.9	0.5
C	2260	88	285	7.6	7022.3	7022.3	7022.4	0.1
D	3152	153	396	5.5	7034.7	7034.7	7035.2	0.5
E	3893	194	358	6.0	7044.4	7044.4	7044.5	0.1
F	4660	145	293	7.4	7053.1	7053.1	7053.6	0.5
G	5319	92	235	9.2	7062.7	7062.7	7063.1	0.4
H	5832	184	363	6.0	7069.0	7069.0	7069.1	0.1
I	6102	252	432	5.0	7072.1	7072.1	7072.2	0.1
J	6705	95	285	7.6	7079.5	7079.5	7079.6	0.1
K	7537	61	214	10.1	7089.5	7089.5	7089.6	0.1
L	8319	203	419	5.2	7100.1	7100.1	7100.5	0.4
M	8986	200	368	5.9	7107.3	7107.3	7107.7	0.4
N	9836	81	279	7.7	7117.9	7117.9	7118.3	0.4
O	10573	242	395	5.5	7127.0	7127.0	7127.4	0.4
P	11253	112	415	5.2	7137.7	7137.7	7138.1	0.4
Q	11966	85	254	8.5	7147.4	7147.4	7147.6	0.2
R	12461	109	299	7.2	7154.9	7154.9	7155.2	0.3
S	13164	206	384	5.6	7162.5	7162.5	7163.0	0.5
T	13925	104	292	7.4	7172.5	7172.5	7172.8	0.3
U	14611	192	363	6.0	7183.1	7183.1	7183.4	0.3
V	15429	173	353	6.1	7194.7	7194.7	7195.2	0.5

[1] Feet Above Confluence With Arkansas River.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

SOUTH ARKANSAS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
South Arkansas River (cont.)								
W	16061	96	255	8.5	7203.4	7203.4	7203.6	0.2
X	16793	82	303	7.1	7214.0	7214.0	7214.5	0.5
Y	17444	189	341	6.3	7224.7	7224.7	7225.2	0.5
Z	18239	44	186	11.6	7234.9	7234.9	7235.0	0.1
1987 Study did not define a floodway from cross sections AA to AH								
AI	25851	57	219	9.5	7344.0	7344.0	7344.1	0.1
AJ	26649	74	244	8.6	7353.3	7353.3	7353.7	0.4
AK	27278	66	294	7.1	7362.8	7362.8	7362.9	0.1
AL	27883	50	250	8.4	7369.9	7369.9	7370.4	0.5
AM	29049	224	388	5.4	7382.8	7382.8	7382.9	0.1
AN	29717	210	442	4.7	7391.1	7391.1	7391.6	0.5
AO	30512	120	570	3.7	7403.5	7403.5	7403.7	0.2
AP	31198	75	296	7.1	7410.1	7410.1	7410.5	0.4
AQ	31887	187	445	4.7	7419.5	7419.5	7419.9	0.4
AR	32697	81	296	7.1	7430.5	7430.5	7430.9	0.4
AS	33407	115	388	5.4	7441.2	7441.2	7441.6	0.4
AT	34310	80	207	8.2	7454.5	7454.5	7454.6	0.1
AU	35213	90	280	6.0	7470.4	7470.4	7470.8	0.4

[1] Feet Above Confluence With Arkansas River.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

SOUTH ARKANSAS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
South Arkansas River (cont.)								
AV	35944	116	251	6.7	7483.1	7483.1	7483.3	0.2
AW	36682	135	303	5.6	7495.2	7495.2	7495.5	0.3
AX	37408	107	242	7.0	7509.0	7509.0	7509.0	0.0

[1] Feet Above Confluence With Arkansas River.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

SOUTH ARKANSAS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
South Arkansas River – Unincorporated Garfield								
A	102932	23	64	8.0	9311.2	9311.2	9311.6	0.4
B	103586	25	65	7.9	9347.0	9347.0	9347.4	0.4
C	104270	26	70	7.3	9382.4	9382.4	9382.6	0.2
D	104828	17	53	9.7	9413.5	9413.5	9413.7	0.2
E	105362	36	67	7.6	9448.8	9448.8	9449.0	0.2
F	105934	23	58	8.8	9482.6	9482.6	9482.6	0.0
G	106526	19	55	9.4	9520.8	9520.8	9520.8	0.0
H	107051	20	66	7.7	9552.4	9552.4	9552.8	0.4
I	107514	16	55	9.2	9579.2	9579.2	9579.6	0.4
J	108021	23	66	7.8	9617.2	9617.2	9617.5	0.3
K	108714	22	57	8.9	9682.9	9682.9	9683.0	0.1
L	109358	20	55	9.2	9751.6	9751.6	9752.0	0.4

[1] Feet Above Confluence with Arkansas River.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

SOUTH ARKANSAS RIVER – UNINCORPORATED GARFIELD

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
South Arkansas River – Unincorporated Maysville								
A	71747	43	156	6.0	8154.9	8154.9	8155.3	0.4
B	72454	23	86	10.9	8171.5	8171.5	8171.5	0.0
C	73146	57	191	4.9	8188.9	8188.9	8189.3	0.4
D	73795	33	97	9.6	8202.7	8202.7	8202.7	0.0
E	74541	35	108	8.6	8220.0	8220.0	8220.3	0.3
F	75267	44	117	8.0	8237.3	8237.3	8237.8	0.5
G	75799	36	122	7.7	8251.3	8251.3	8251.8	0.5
H	76525	42	107	8.7	8270.0	8270.0	8270.3	0.3
I	77059	100	193	4.8	8282.1	8282.1	8282.1	0.0
J	77669	45	137	6.8	8299.9	8299.9	8300.4	0.5
K	78347	23	86	10.9	8319.1	8319.1	8319.3	0.2

[1] Feet Above Confluence With Arkansas River.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

SOUTH ARKANSAS RIVER – UNINCORPORATED MAYSVILLE

Zone A

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

Zone AE

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

Zone AH

Zone AH is the flood insurance risk zone that corresponds to the areas of 1-percent-annual-chance shallow flooding (usually areas of ponding) where Average depths are between 1 and 3 feet. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance risk zone that corresponds to the areas of 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot base flood depths derived from the detailed hydraulic analyses are shown within this zone.

Zone AR

Zone AR is the flood insurance risk zone that corresponds to an area of special flood hazard formerly protected from the 1-percent-annual-chance flood event by a flood-control system that was subsequently decertified. Zone AR indicates that the former flood-control system is being restored to provide protection from the 1-percent-annual-chance or greater flood event.

Zone A99

Zone A99 is the flood insurance risk zone that corresponds to the areas of the 1-percent-annual-chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No BFEs or depths are shown within this zone.

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1-foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or base flood depths are shown within this zone.

Zone X (Future Base Flood)

Zone X (Future Base Flood) is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined based on future-conditions hydrology. No BFEs or base flood depths are shown within this zone.

Zone D

Zone D is the flood insurance risk zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

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

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

The current FIRM presents flooding information for the entire geographic area of Chaffee County, Colorado. Previously, separate Flood Hazard Boundary Maps (FHBMs) and/or FIRMs were prepared for each identified flood prone incorporated community and for the unincorporated areas of the county. Historical data relating the maps prepared for each flood prone community, prior to this Countywide FIS are presented in Table 6 “Community Map History.”

7.0 OTHER STUDIES

This FIS was prepared by compiling existing hydrologic and hydraulic technical and scientific data. The data was identified as the best available at the time of compilation of

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Buena Vista, Town of	May 3, 1974	February 6, 1976 July 31, 1979	September 30, 1982	
Chaffee County (Unincorporated Areas)	June 3, 1977	N/A	March 4, 1987	
Poncha Springs, Town of	August 29, 1975	N/A	February 19, 1987	
Salida, City of	May 3, 1974	January 30, 1976	September 30, 1982	

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

this FIS, and should depict the general conditions of the flooding sources with relative accuracy. FEMA performed a cursory review and accepted the data as valid for purposes of this FIS and the NFIP. However, if better information is known to exist or has been developed since the date of this report, the information should be immediately forwarded to FEMA, Federal Insurance and Mitigation Division, Denver Federal Center, Building 710, Box 25267, Denver, Colorado 80225-0267 for consideration of revision of this FIS.

Flood Insurance Studies have been published for the Town of Buena Vista, the Town of Poncha Springs, the City of Salida, and unincorporated areas of Chaffee County (Federal Emergency Management Agency, Town of Buena Vista, 1982; Federal Emergency Management Agency, Town of Poncha Springs, 1982; Federal Emergency Management Agency, City of Salida, 1987; and Chaffee County, Colorado – Unincorporated Areas, 1987). The information presented in those studies is in general agreement with this study.

This FIS either supersedes or is compatible with all previous studies on streams studied in this FIS and should be considered authoritative for 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, Federal Insurance and Mitigation Division, Denver Federal Center, Building 710, Box 25267, Denver, Colorado 80225-0267.

9.0 BIBLIOGRAPHY AND REFERENCES

Anderson Consulting Engineers, Inc., Chaffee County FEMA RiskMAP Project, Chaffee County, Colorado, Hydrologic Analyses Report, January 10, 2011.

Anderson Consulting Engineers, Inc., Detailed Hydraulic Evaluation and Floodplain Mapping for Cottonwood Creek, Poncha Creek, and the South Arkansas River as part of the FEMA RiskMAP Upper Arkansas River Watershed Study, Chaffee County, Colorado, April 2013.

Bell Mapping, Aerial Photographs of Buena Vista, Colorado, 1-inch to 200-foot Topographic Maps, November 6, 1975.

City-Data.com, http://www.city-data.com/city/Buena-Vista-Colorado.html.

City-Data.com, http://www.city-data.com/city/Poncha-Springs-Colorado.html.

Colorado Water Conservation Board, Department of Natural Resources, Rules and Regulations for Regulatory Floodplains in Colorado, November 2010.

Colorado Planning Demographic Division, Colorado Population Report Series CP-26 #79(C-1), October, 1979.

Delta Aerial Surveys, 2-foot contour interval topographic mapping, 1-inch to 400 feet horizontal scale, May 1978.

Federal Emergency Management, Agency, Flood Insurance Study, Chaffee County, Colorado, (Unincorporated Areas), March 4, 1987.Federal Emergency Management Agency, Flood Insurance Study, City of Salida, Colorado, March 30, 1982.

Federal Emergency Management Agency, Flood Insurance Study, Pitkin County, Colorado, (Unincorporated Areas), unpublished.

Federal Emergency Management Agency, Flood Insurance Study, Town of Buena Vista, Colorado, March 30, 1982.

Federal Emergency Management Agency, Flood Insurance Study, Town of Poncha Springs, Colorado, February 19, 1987.

Flood Hazard Boundary Map, City of Salida, Colorado, May 3, 1974.

Surface Water Supply of the United States, 1961-1970, Part 7, Lower Mississippi River Basin, USGS Water Supply Papers 1921 and 2121.

U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profile Program, 1979 Version.

U.S. Census Bureau, Chaffee County,
http://quickfacts.census.gov/qfd/states/08/08015.html.

U.S. Census Bureau, City of Salida,
http://quickfacts.census.gov/qfd/states/08/0867280.html.
U.S. Department of Agriculture, Soil Conservation Service, Flood Hazard Study, Chalk Creek, 1980.

U.S. Department of Agriculture, Soil Conservation Service, Denver, Colorado, in cooperation with the Colorado Water Conservation Board, Chaffee County, and the Town of Buena Vista, Flood Hazard Analyses, Cottonwood Creek in the Vicinity of Buena Vista, Chaffee County, Colorado, July 1978.

U.S. Department of Agriculture, Soil Conservation Service, Engineering Division, WSP-2 Water Surface Profiles, Computer Program, 1976.

U.S. Department of the Army, Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Davis, California, November 1976.

U.S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, Colorado, 1980.

U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Chaffee County, Colorado, (Unincorporated Areas), Scale 1:24,000, 1977.

U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Gunnison County, Colorado, (Unincorporated Areas), Scale 1:24,000, 1975.

U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Park County, Colorado, (Unincorporated Areas), Scale 1:24,000, 1975.

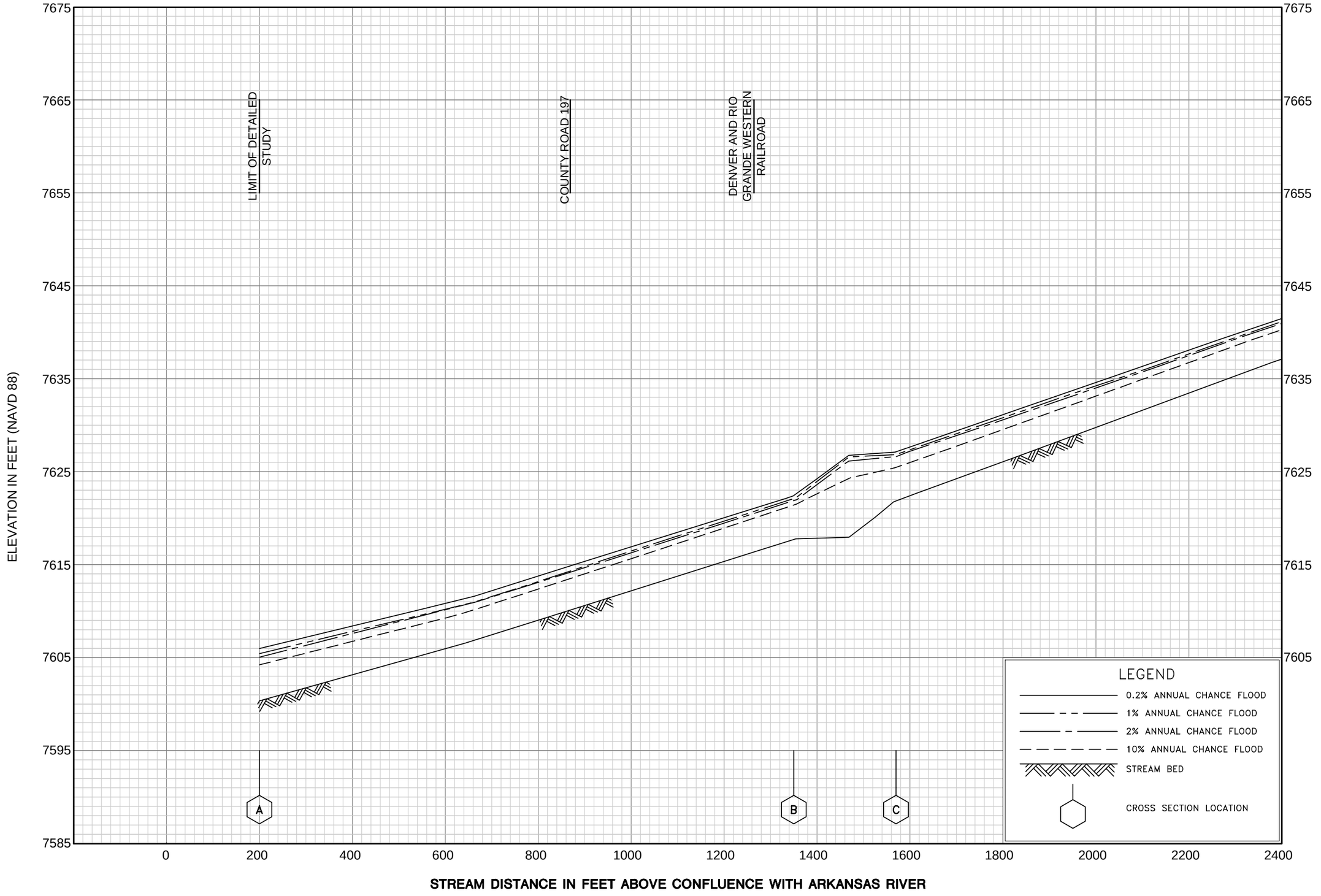
U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Town of Poncha Springs, Colorado, Scale 1:12,000, 1975.

United States Geological Survey, 15.0 Minute Series Topographic Maps, Scale 1:24,000 Contour Interval, 80 Feet; Buena Vista, Colorado.

Water Resources Consultants, Inc., prepared for Chaffee County and the Colorado Water Conservation Board, Floodplain Information Report, Lower South Arkansas River, April 1979.

Water Resources Consultants, Inc., Floodplain Information, South Arkansas River and Poncha Creek, Poncha Springs, Colorado, Denver, Colorado, March 1978.

Water Resource Data for Colorado, USGS, 1971-1978.



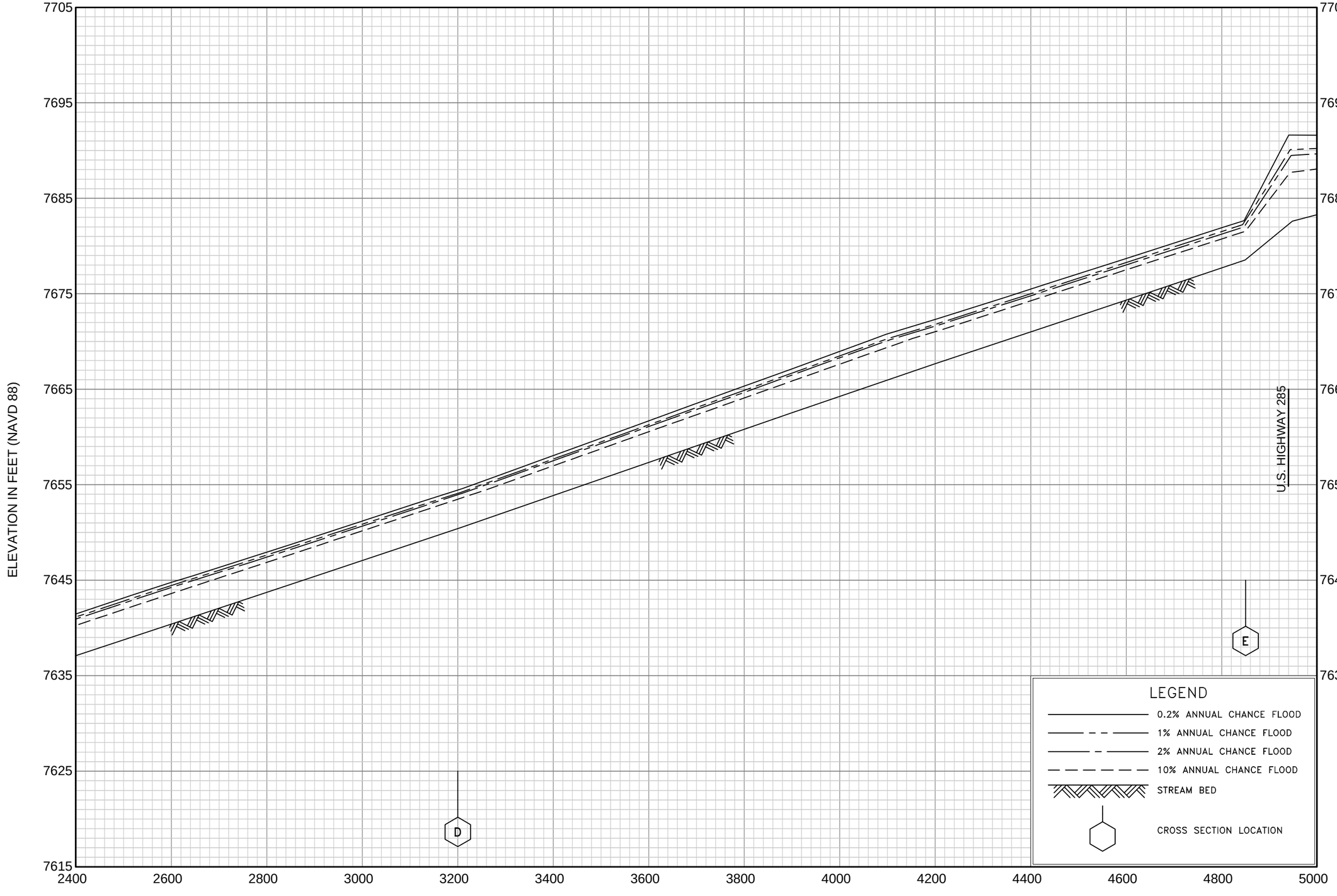
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

01P



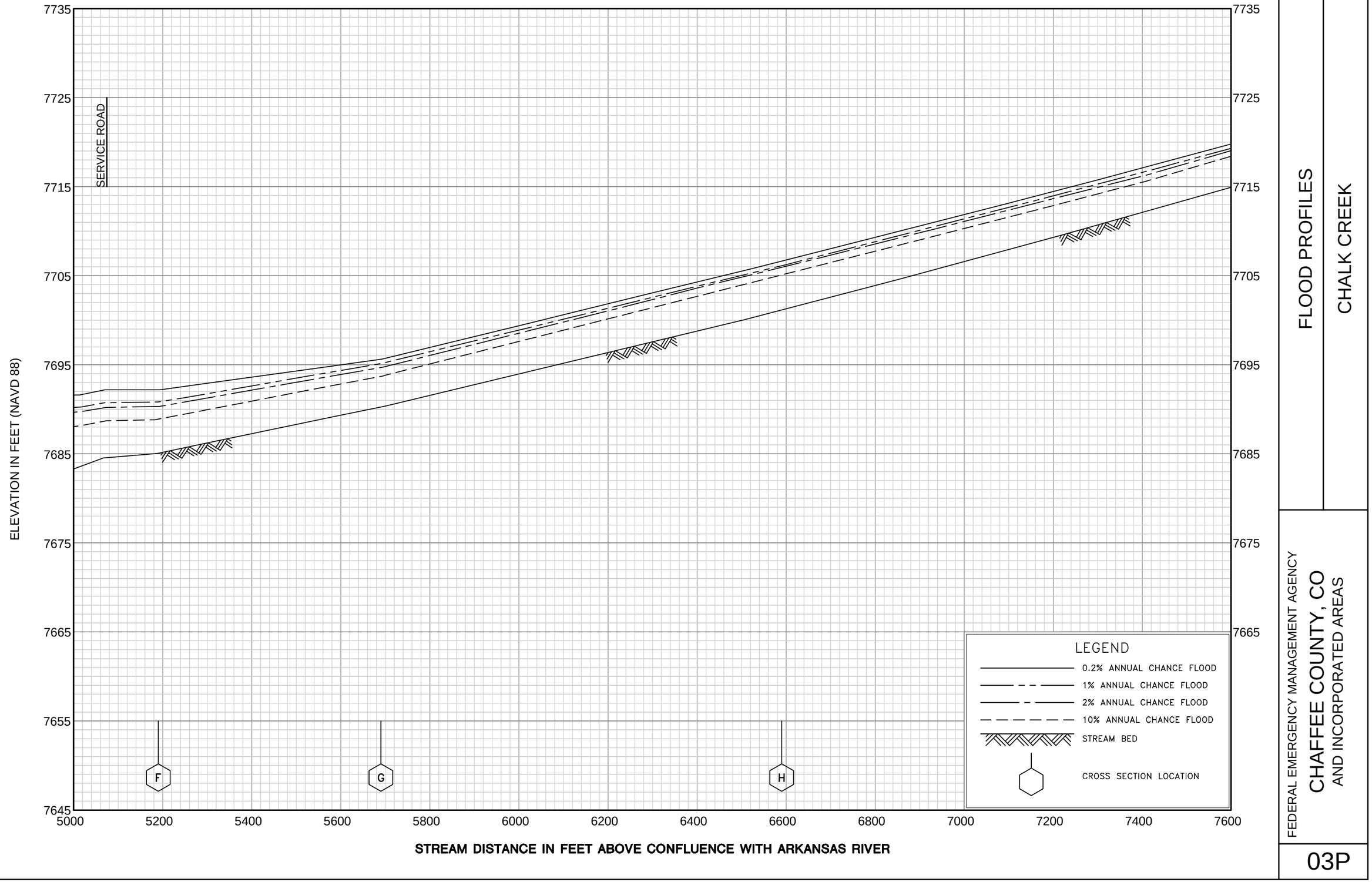
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

02P



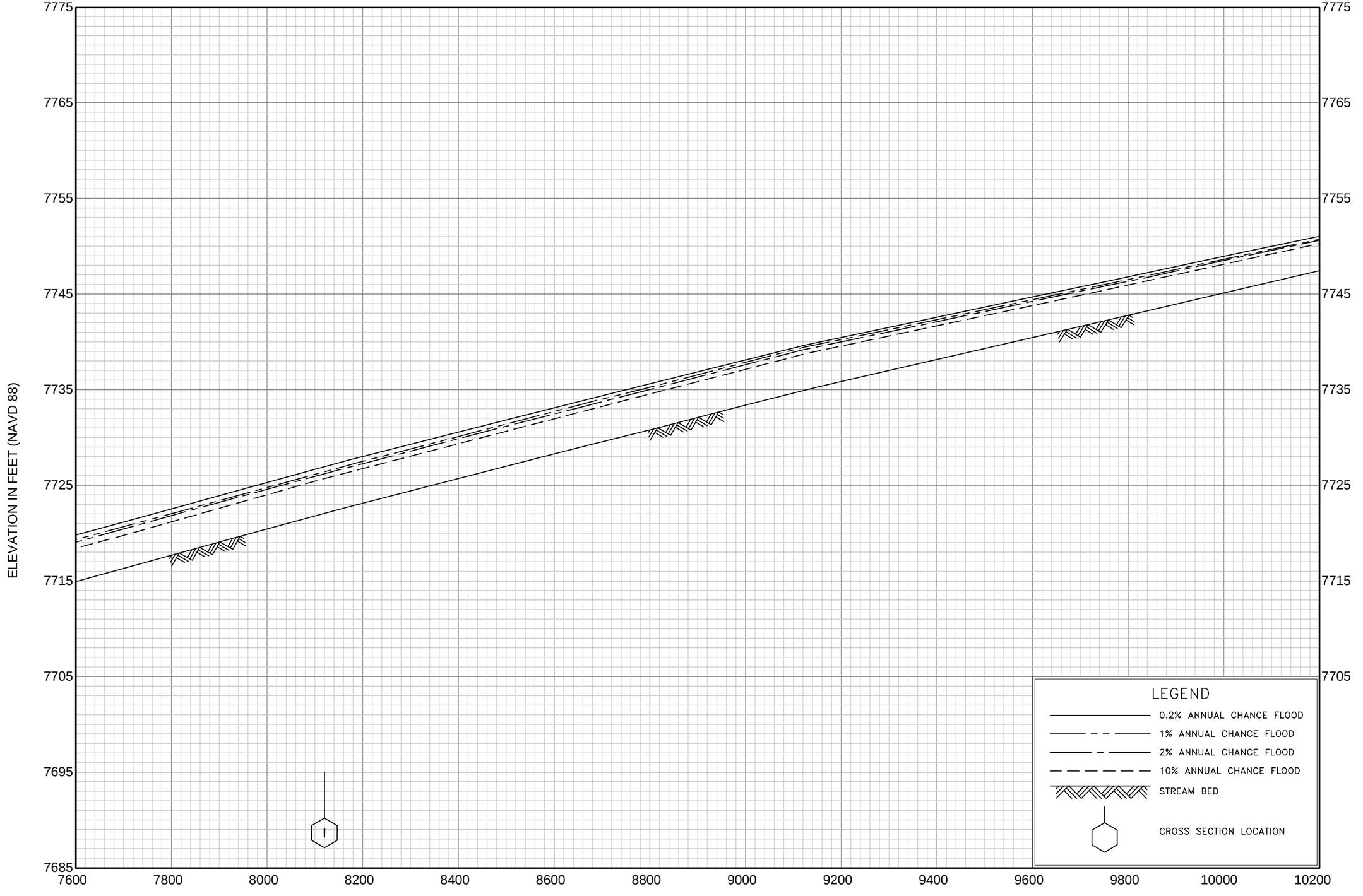
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

03P



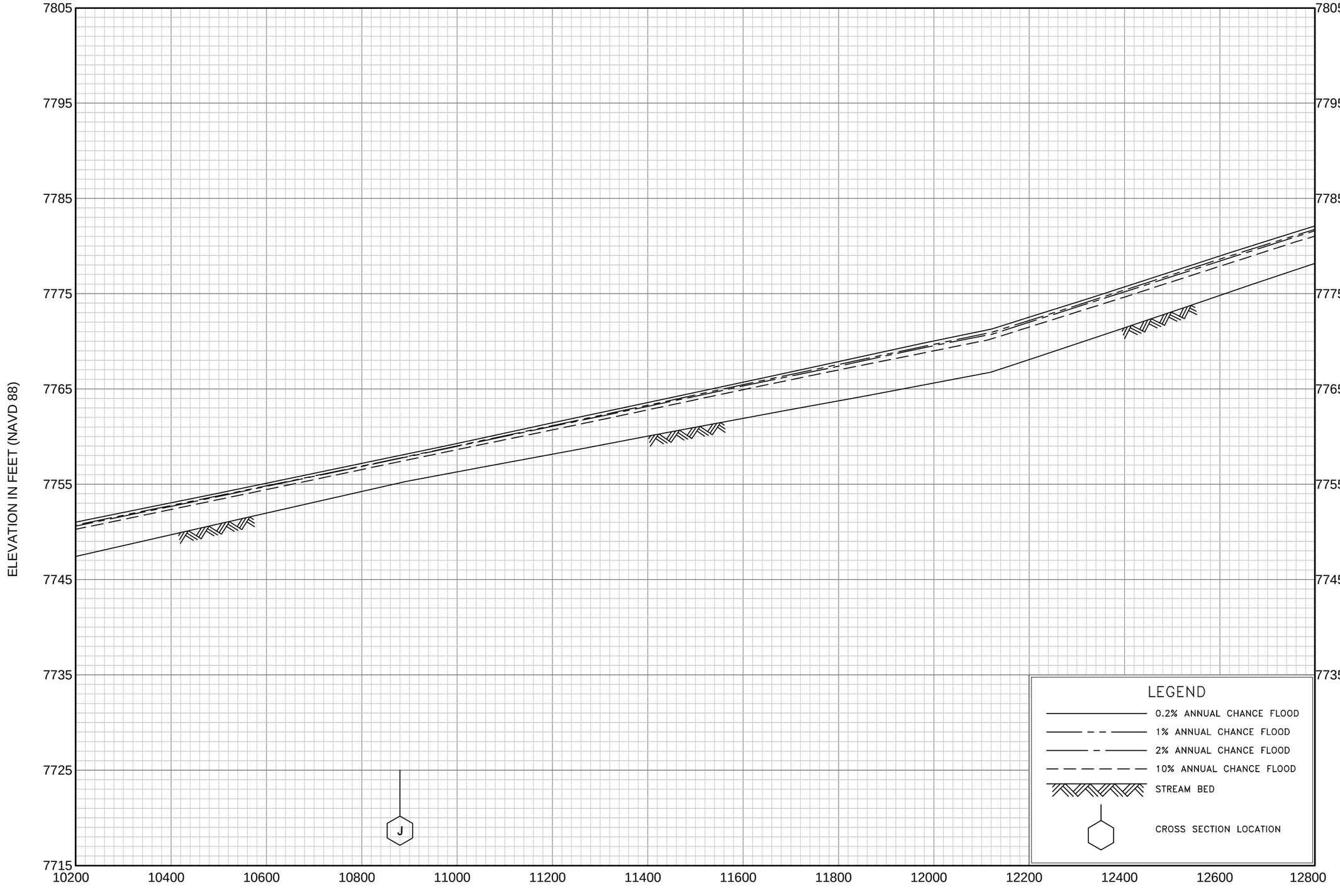
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

04P



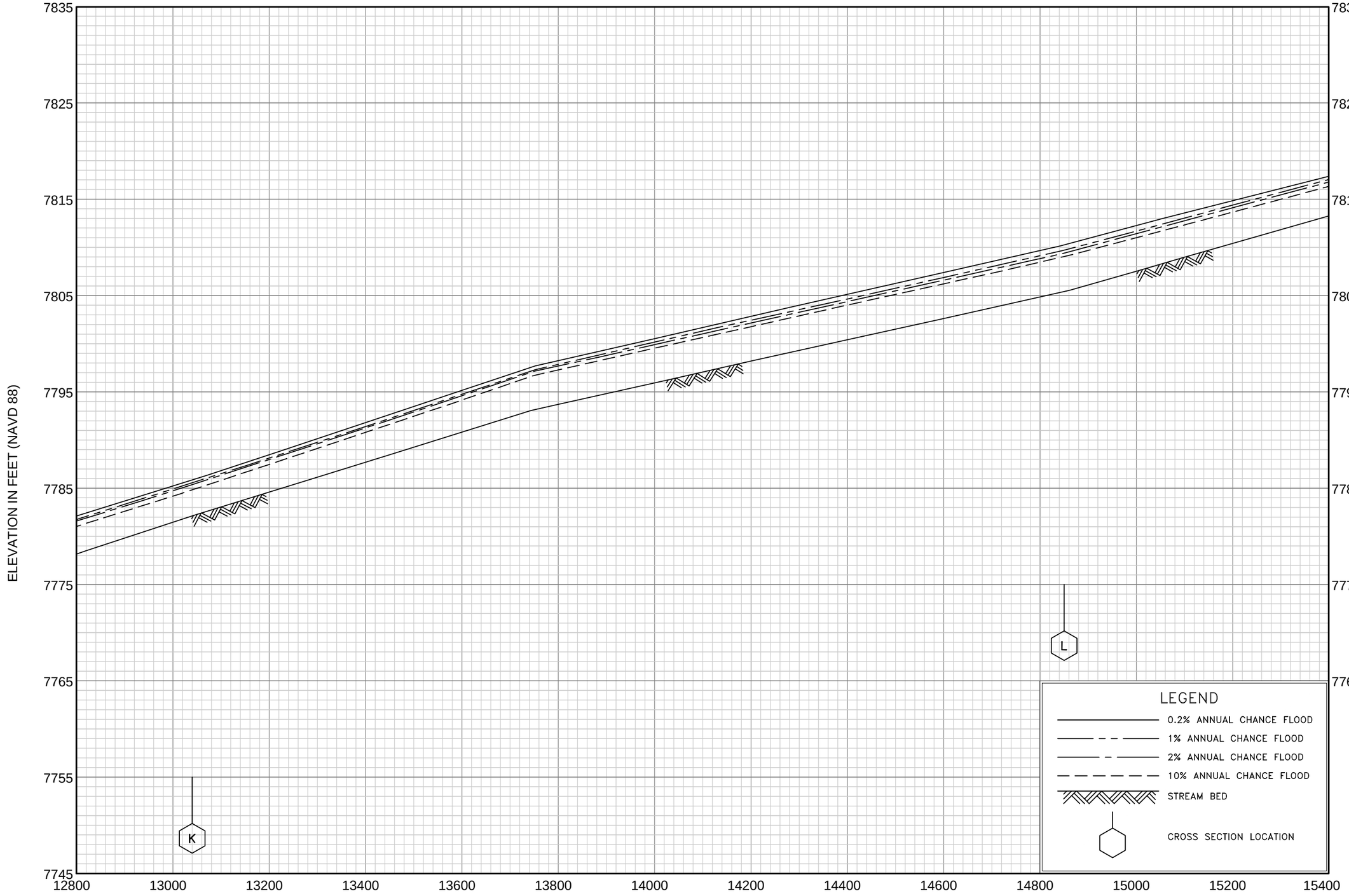
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

05P



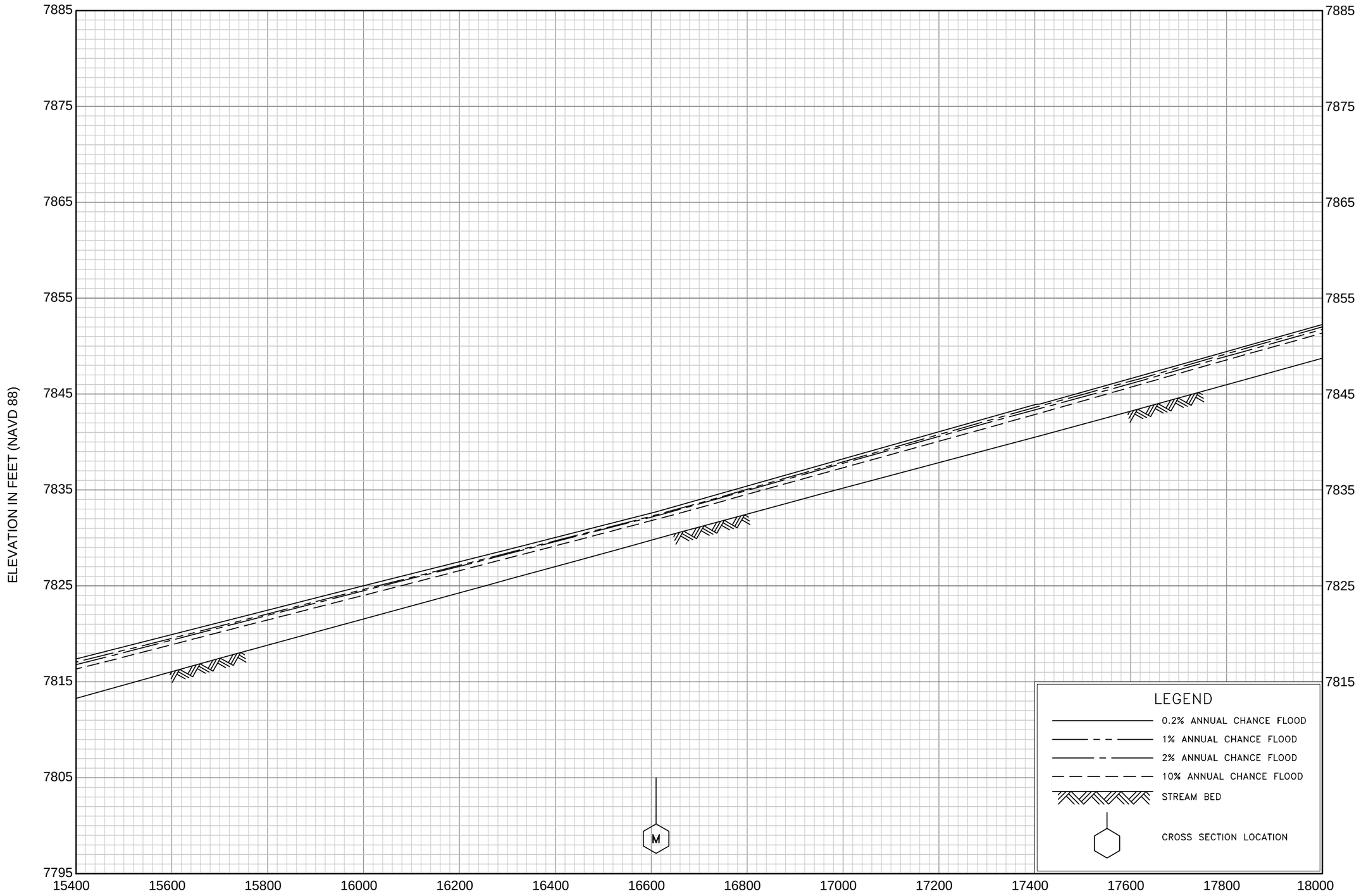
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

06P



FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

07P

ELEVATION IN FEET (NAVD 88)

7915
7905
7895
7885
7875
7865
7855
7845
7835
7825

18000 18200 18400 18600 18800 19000 19200 19400 19600 19800 20000 20200 20400 20600

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH ARKANSAS RIVER

N

O

LEGEND

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

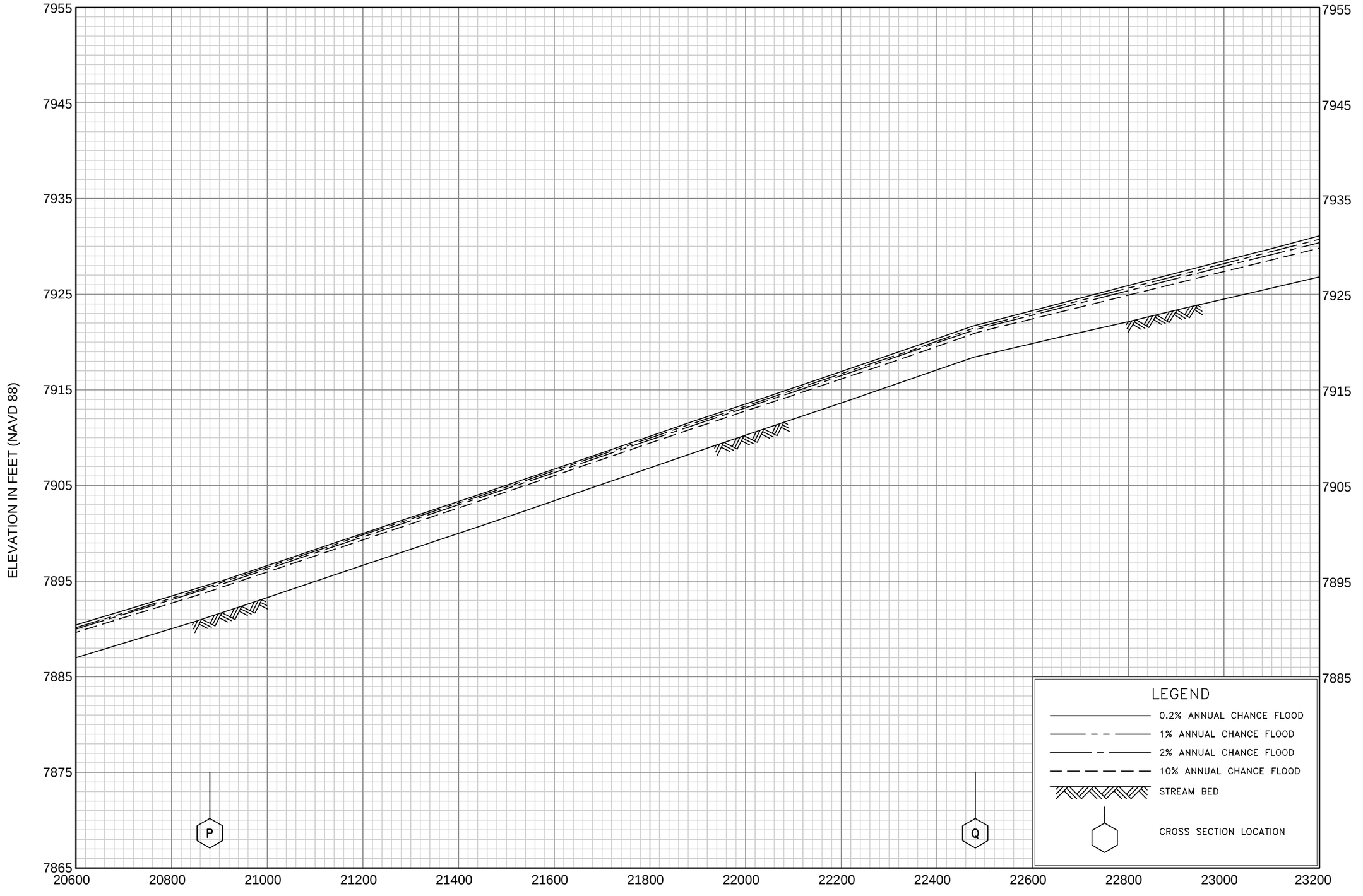
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

08P



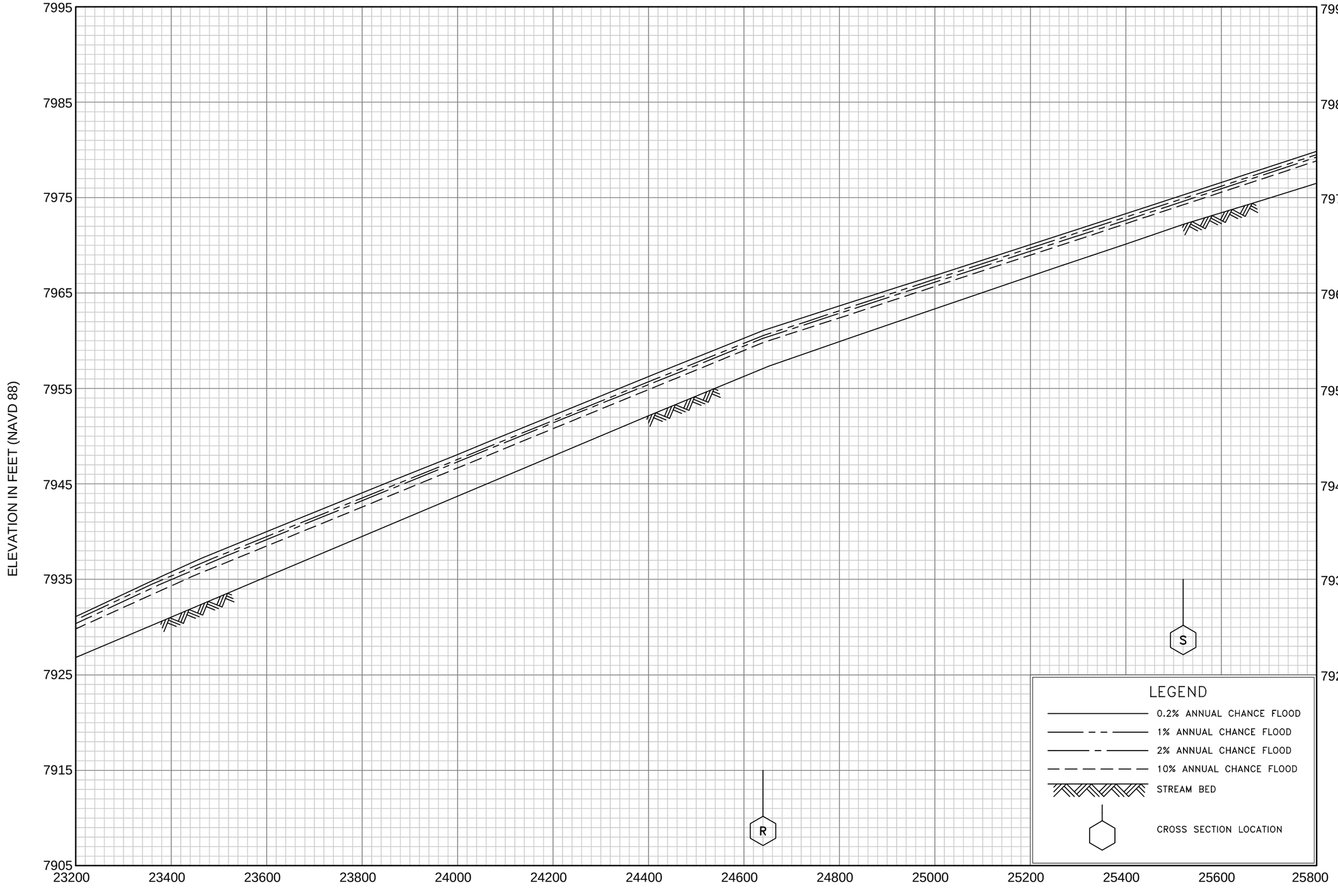
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

09P



FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

10P

ELEVATION IN FEET (NAVD 88)

8045
8035
8025
8015
8005
7995
7985
7975
7965
7955

25800 26000 26200 26400 26600 26800 27000 27200 27400 27600 27800 28000 28200 28400

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH ARKANSAS RIVER

T

LEGEND

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

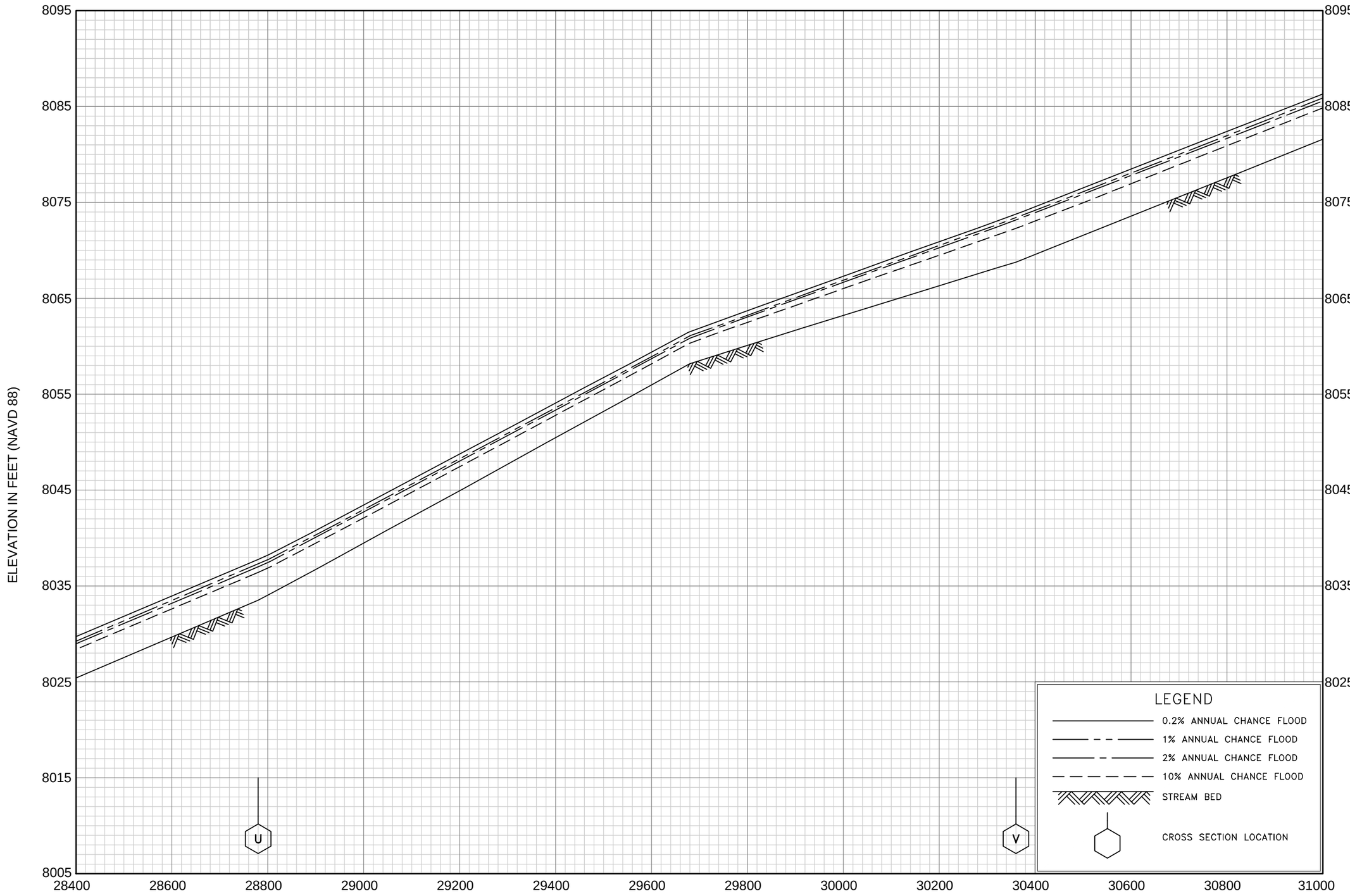
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

11P



STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH ARKANSAS RIVER

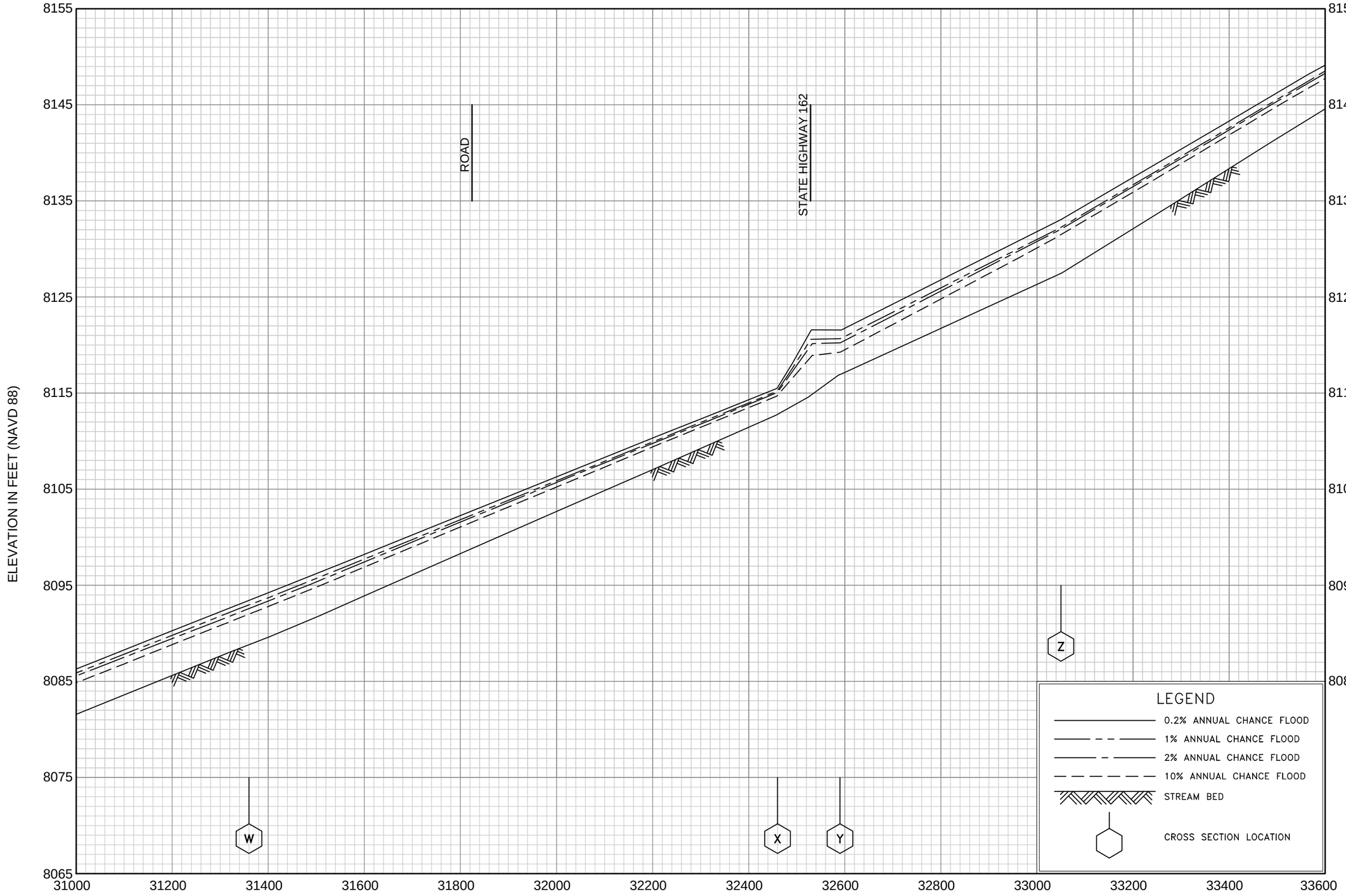
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

12P



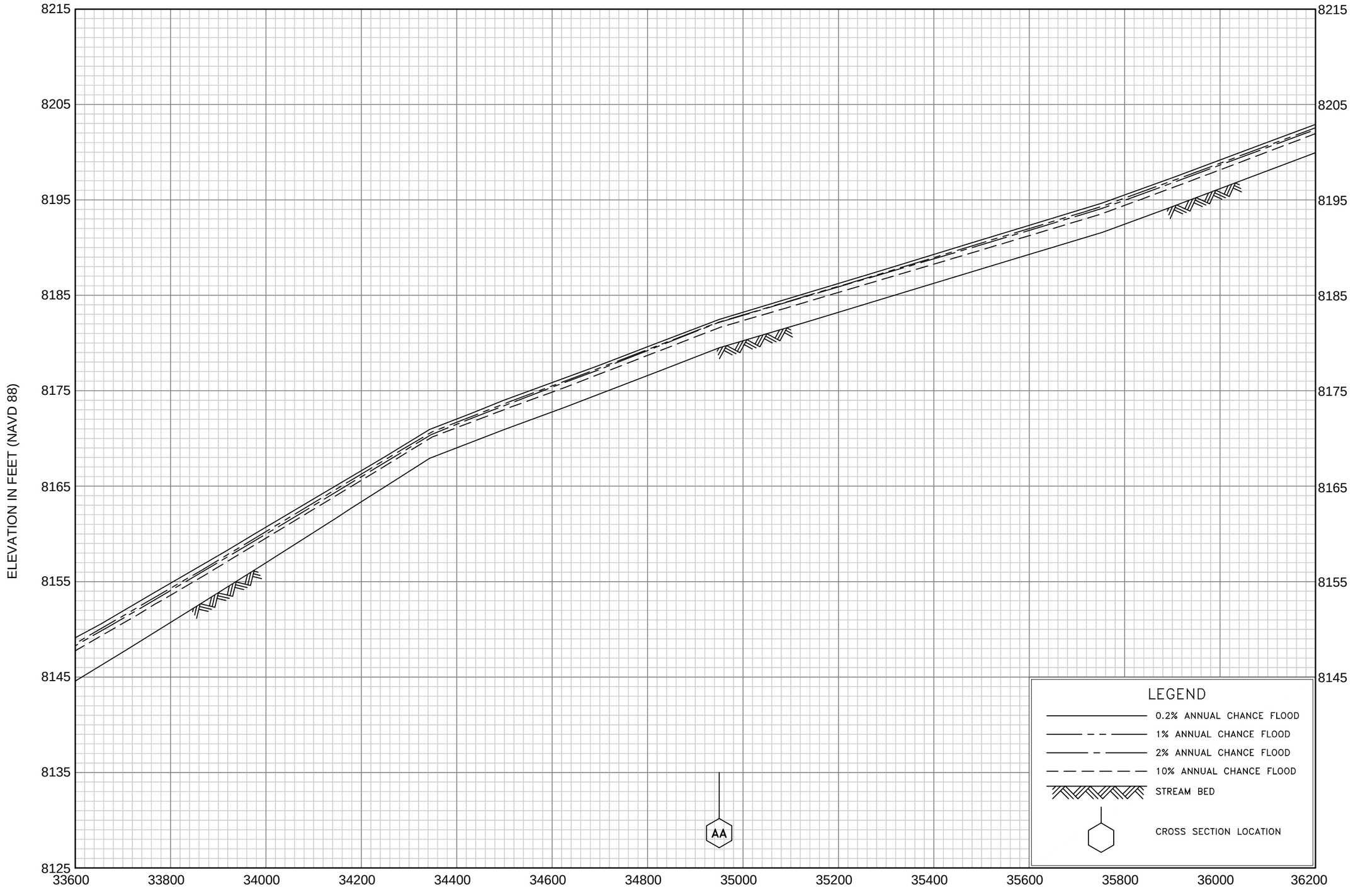
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

13P

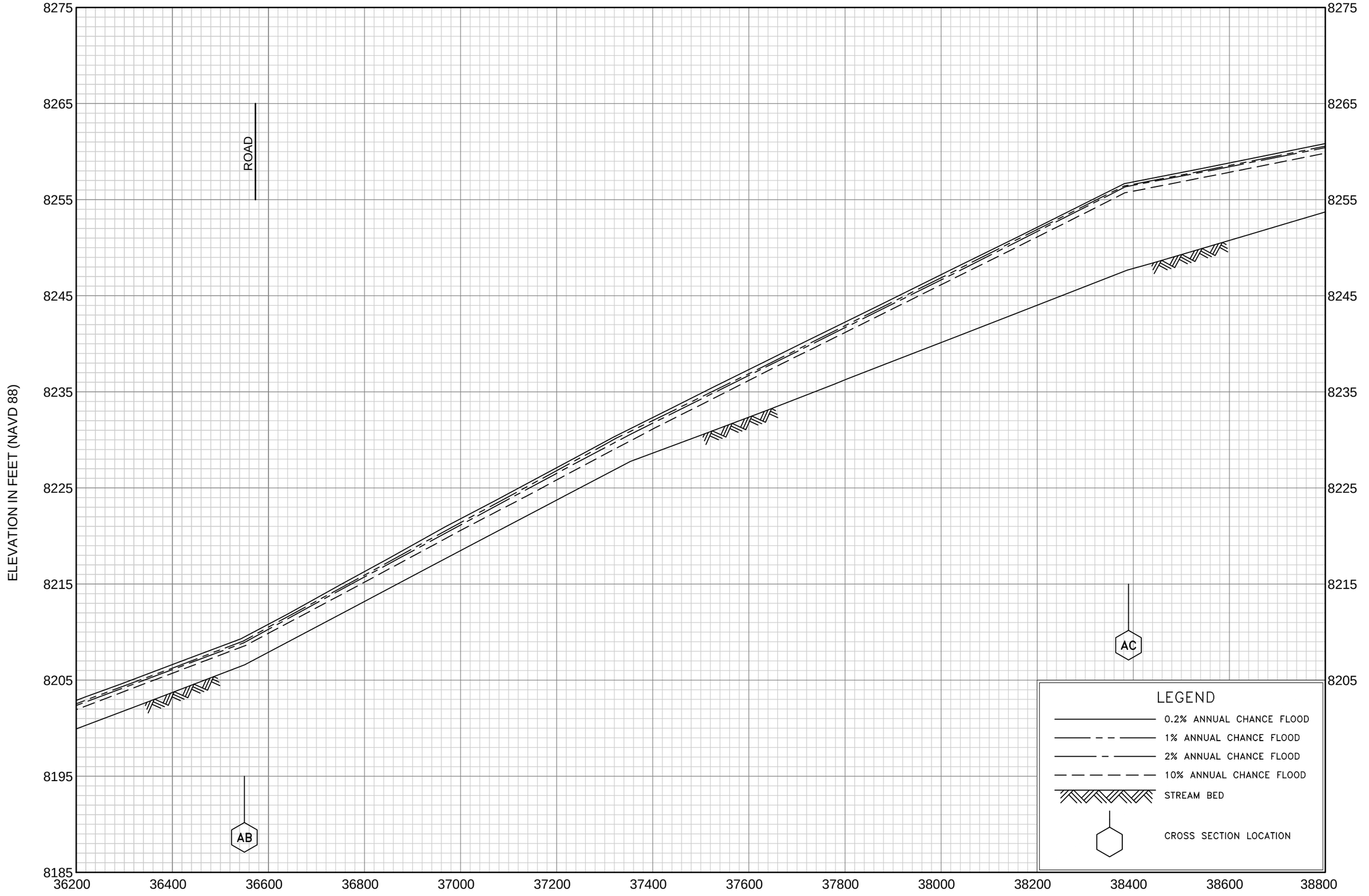


FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS



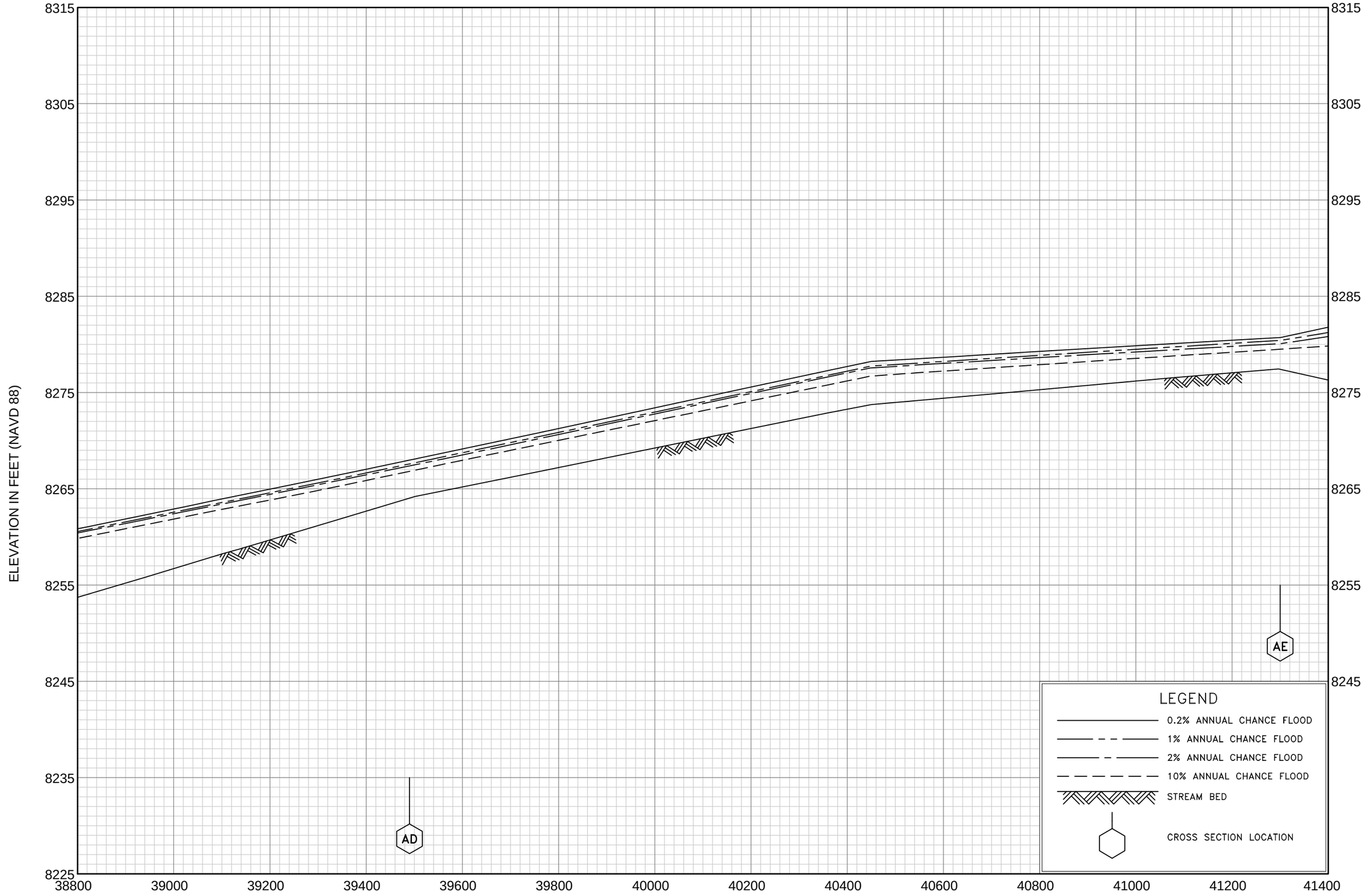
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

15P



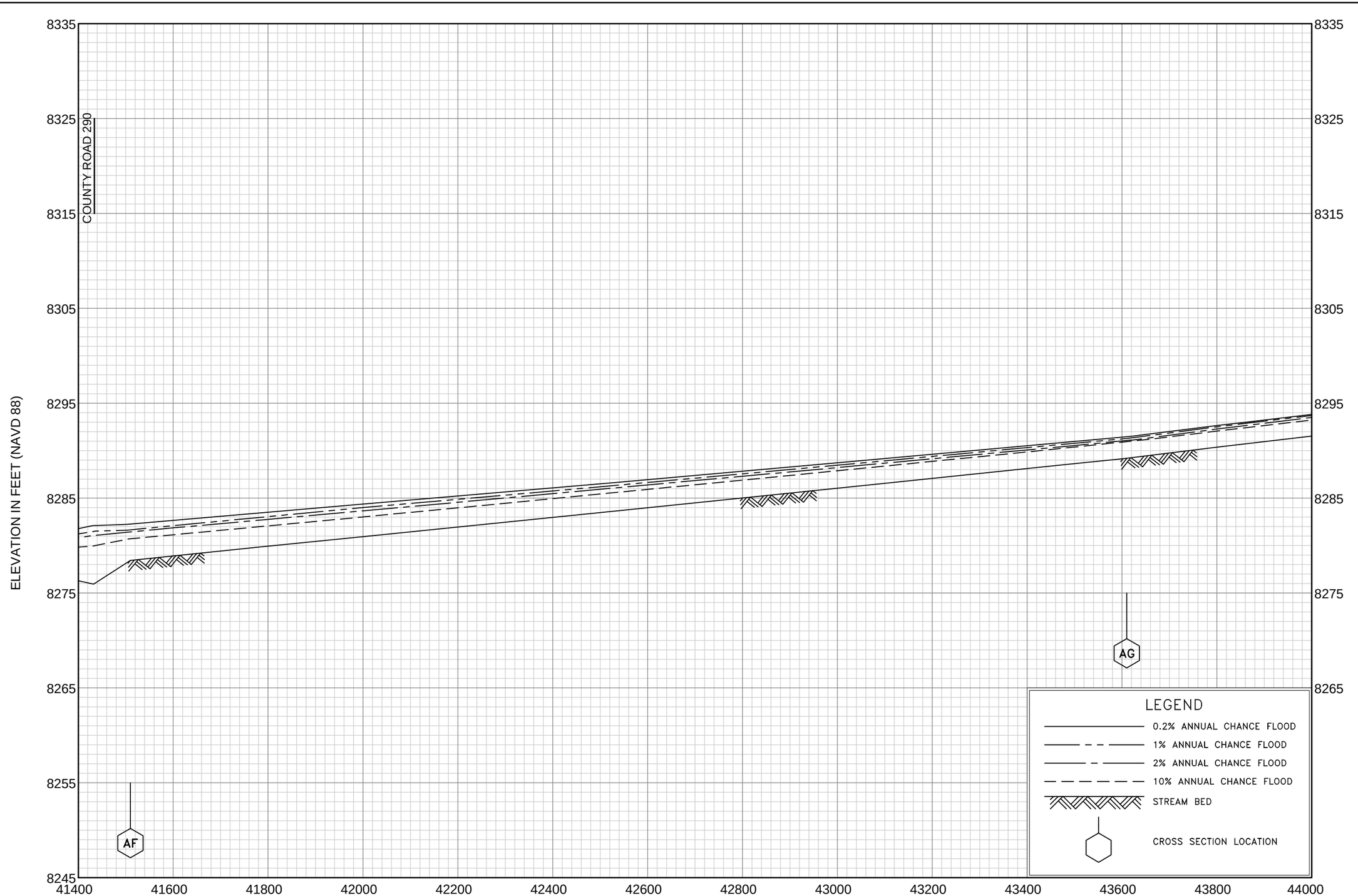
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

16P



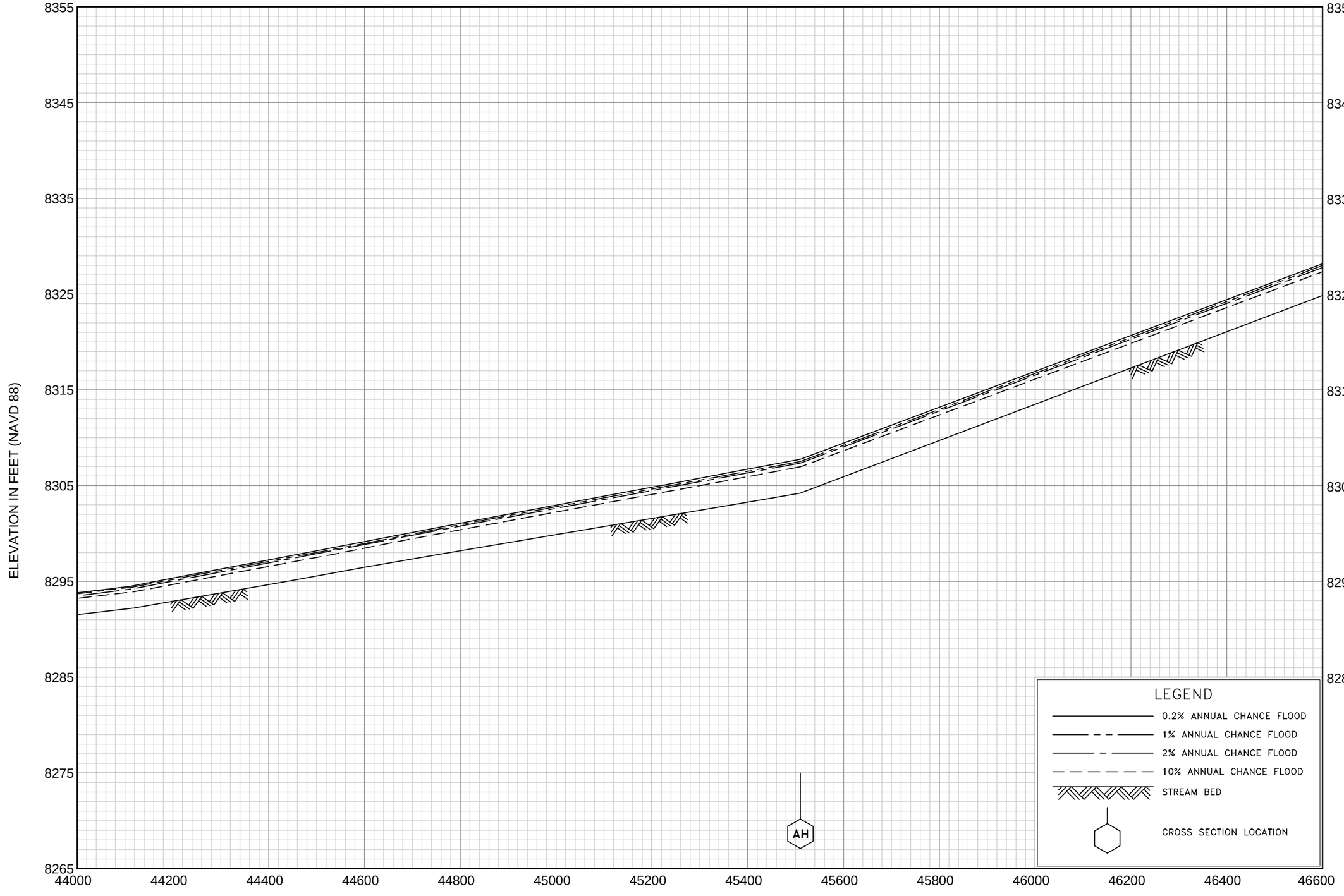
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

17P



FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

18P

NOTE:
CHANGE IN HORIZONTAL AND VERTICAL SCALE
FROM PREVIOUS SHEETS

ELEVATION IN FEET (NAVD 88)

8390
8380
8370
8360
8350
8340
8330
8320
8310
8300

46600 46700 46800 46900 47000 47100 47200 47300 47400 47500 47600 47700 47800 47900

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH ARKANSAS RIVER

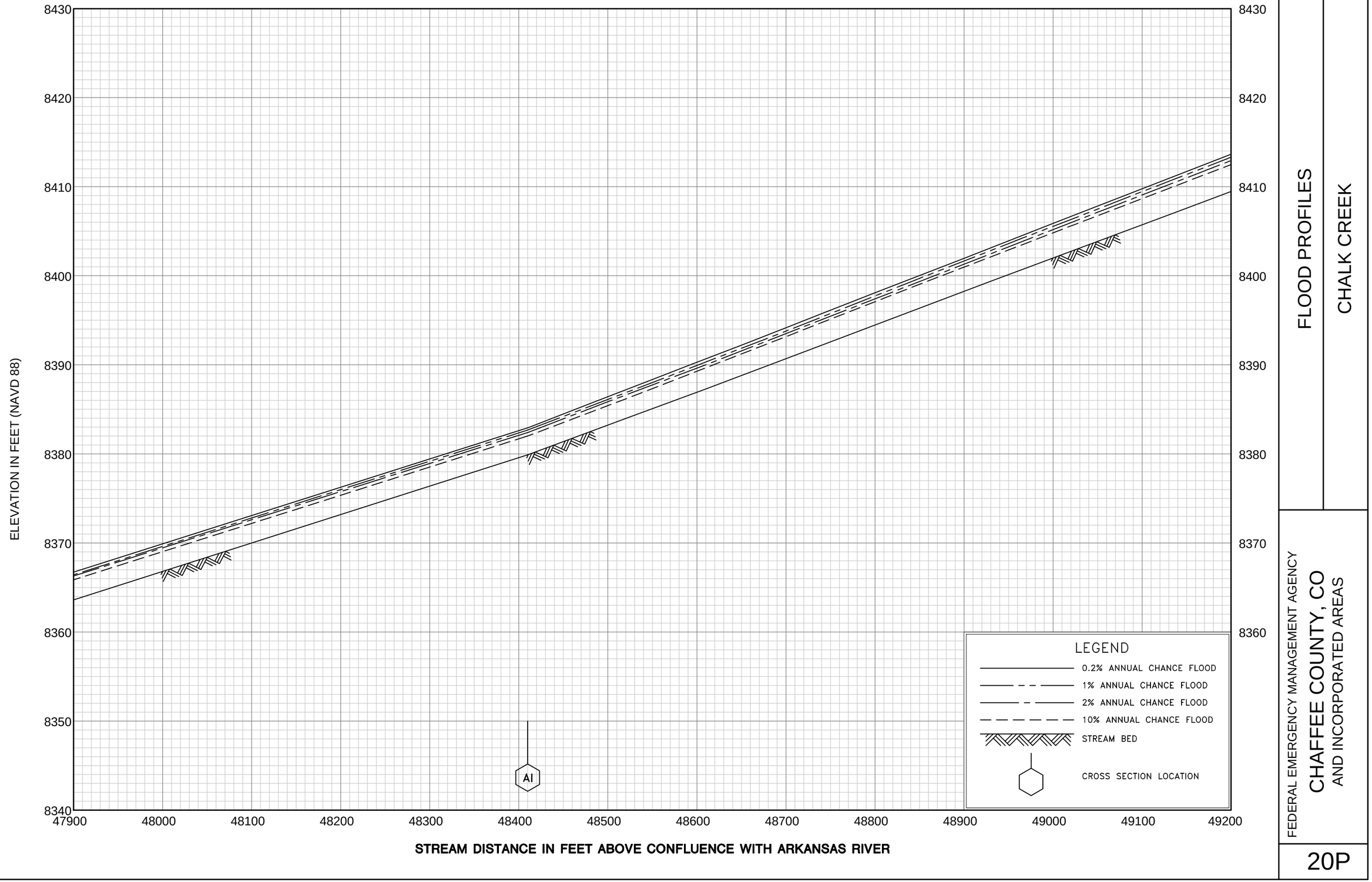
LEGEND
- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

19P



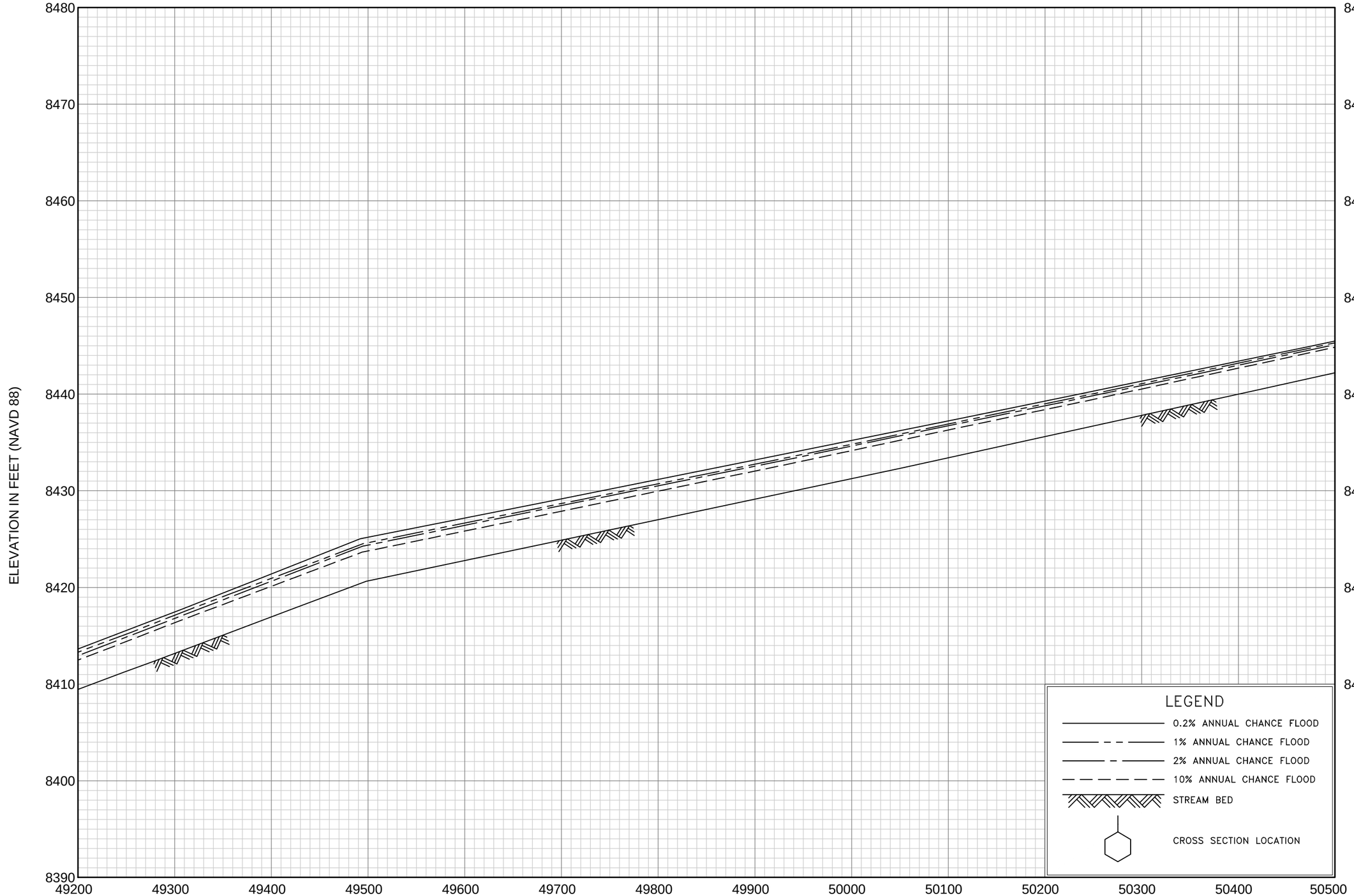
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

20P



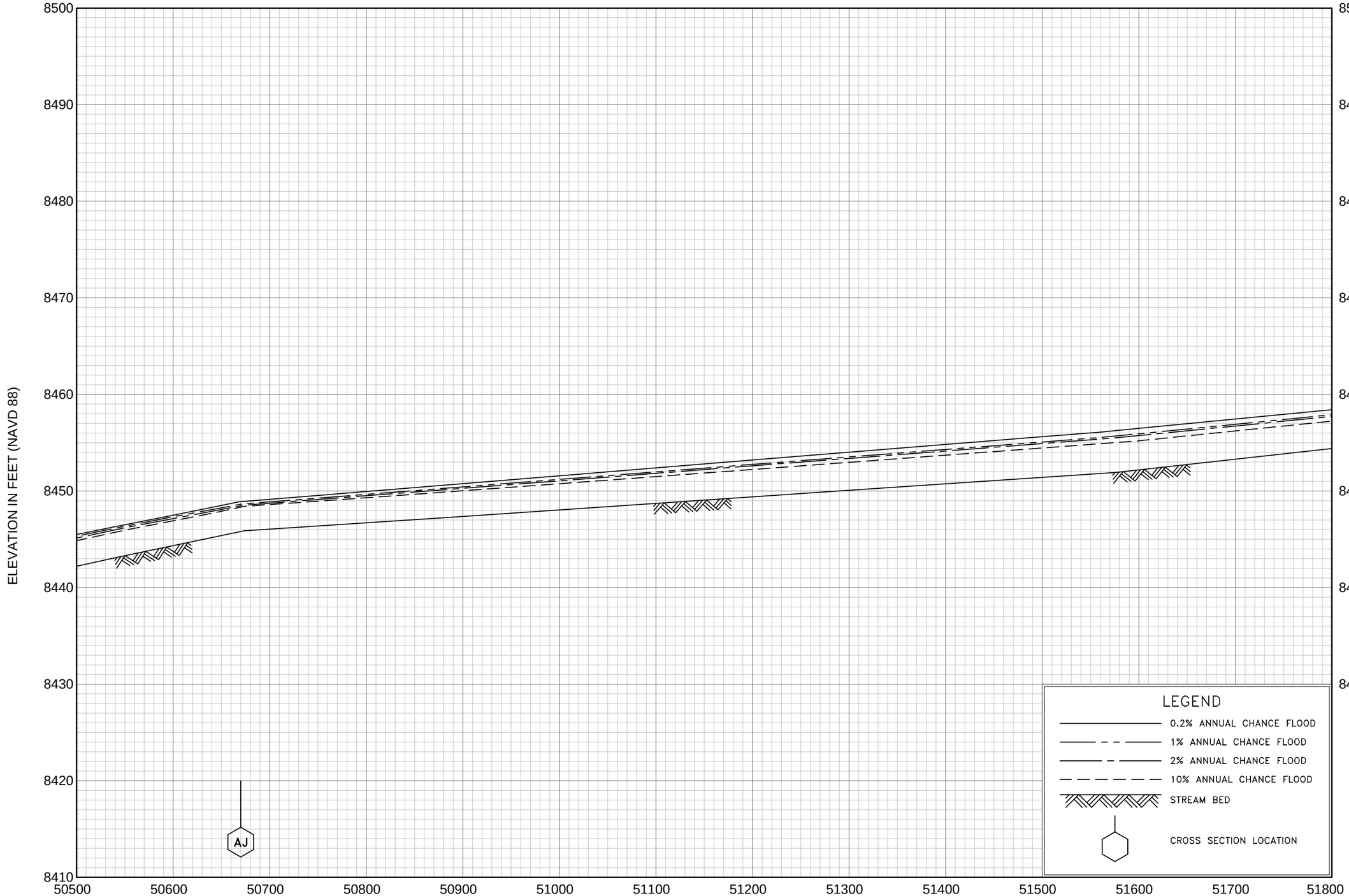
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

21P



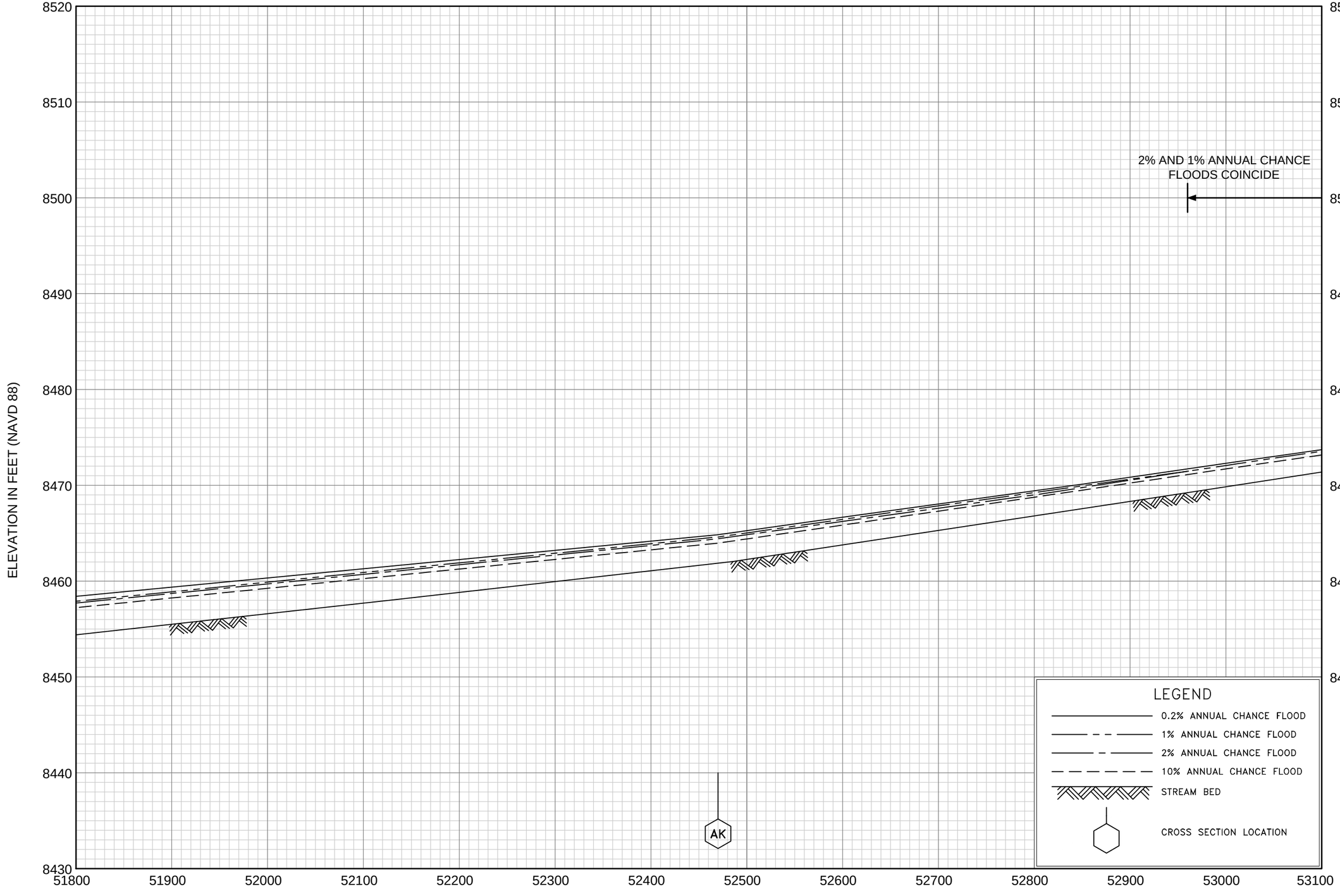
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

22P



FLOOD PROFILES

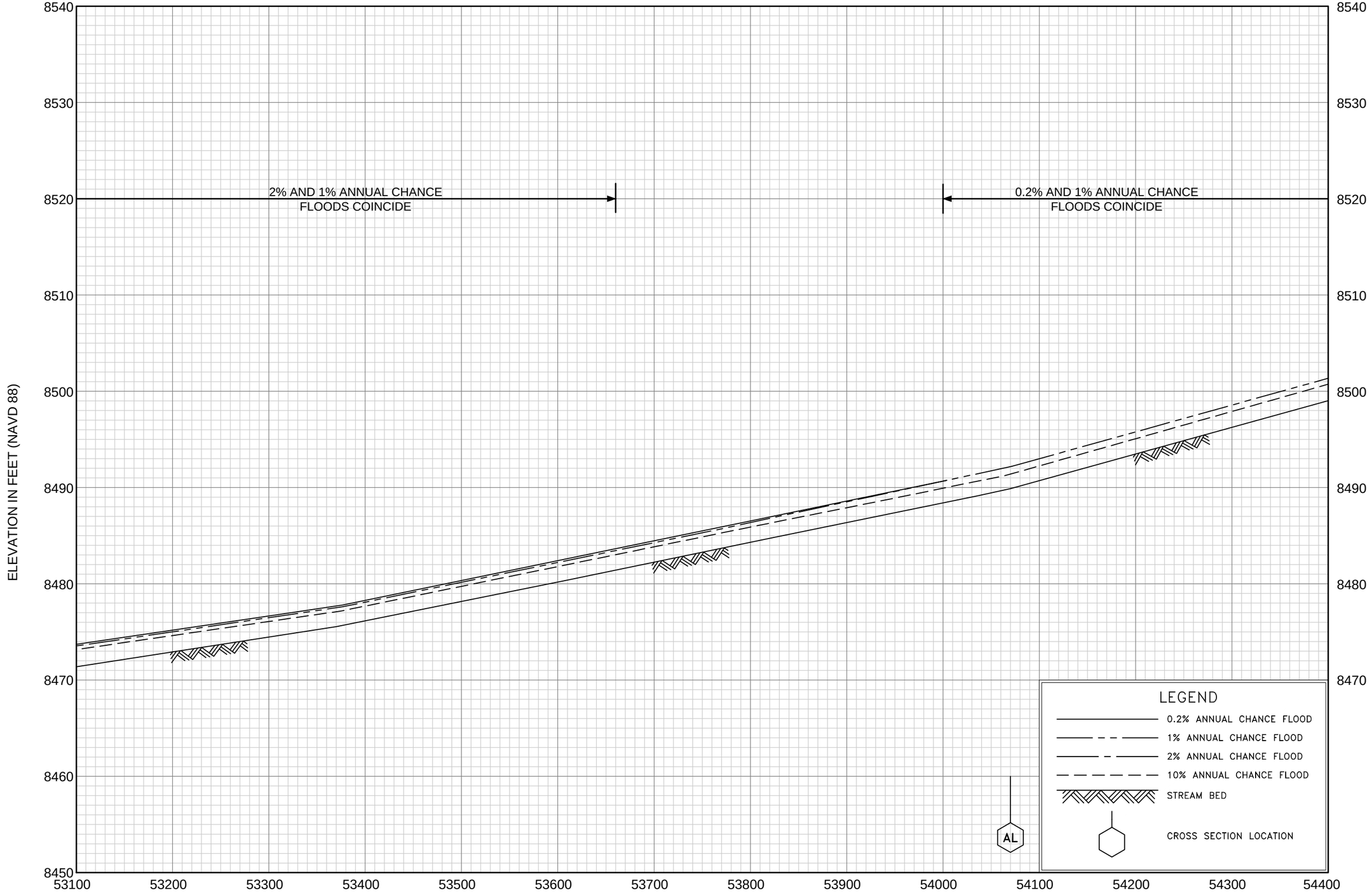
CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO

AND INCORPORATED AREAS

23P



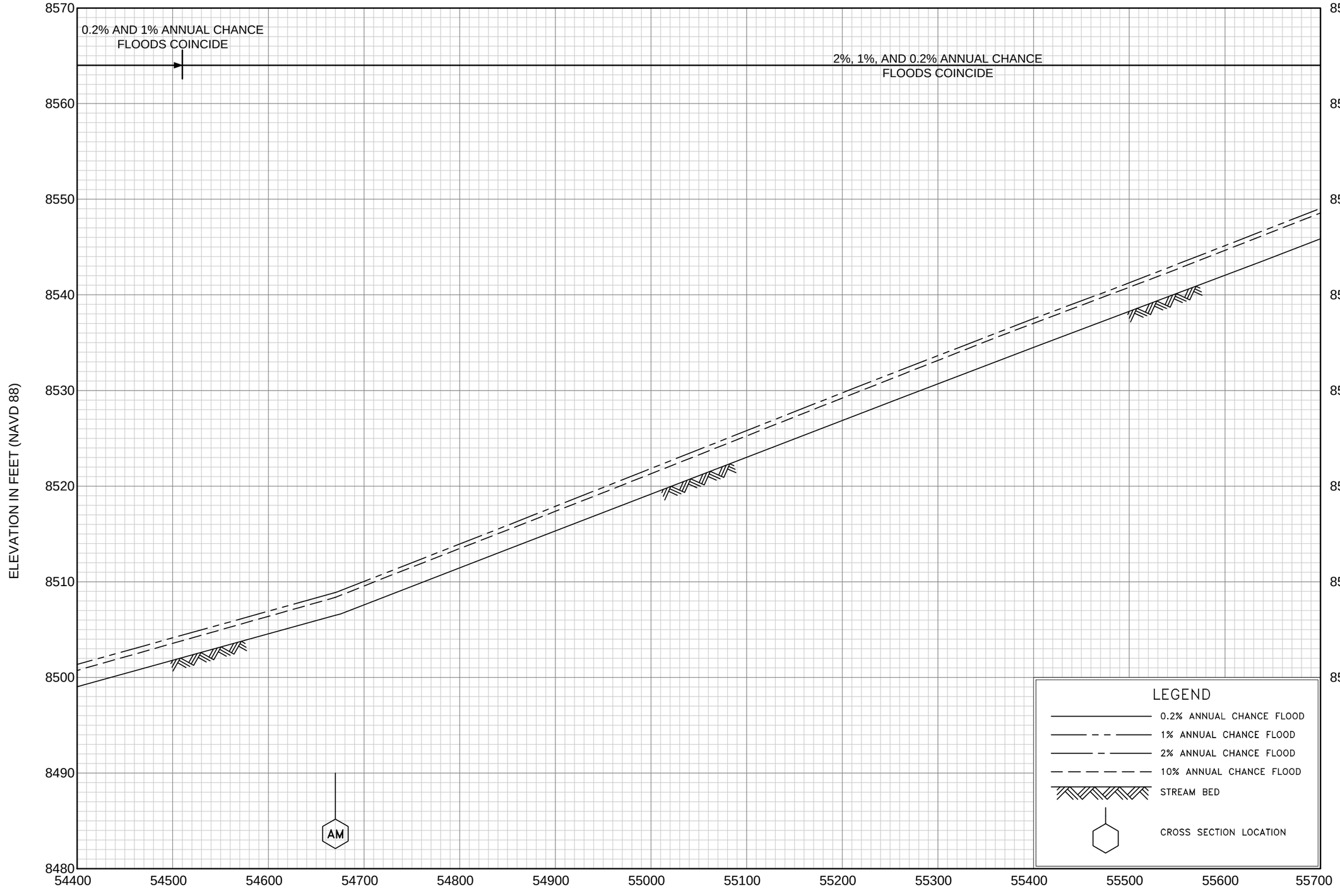
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

24P



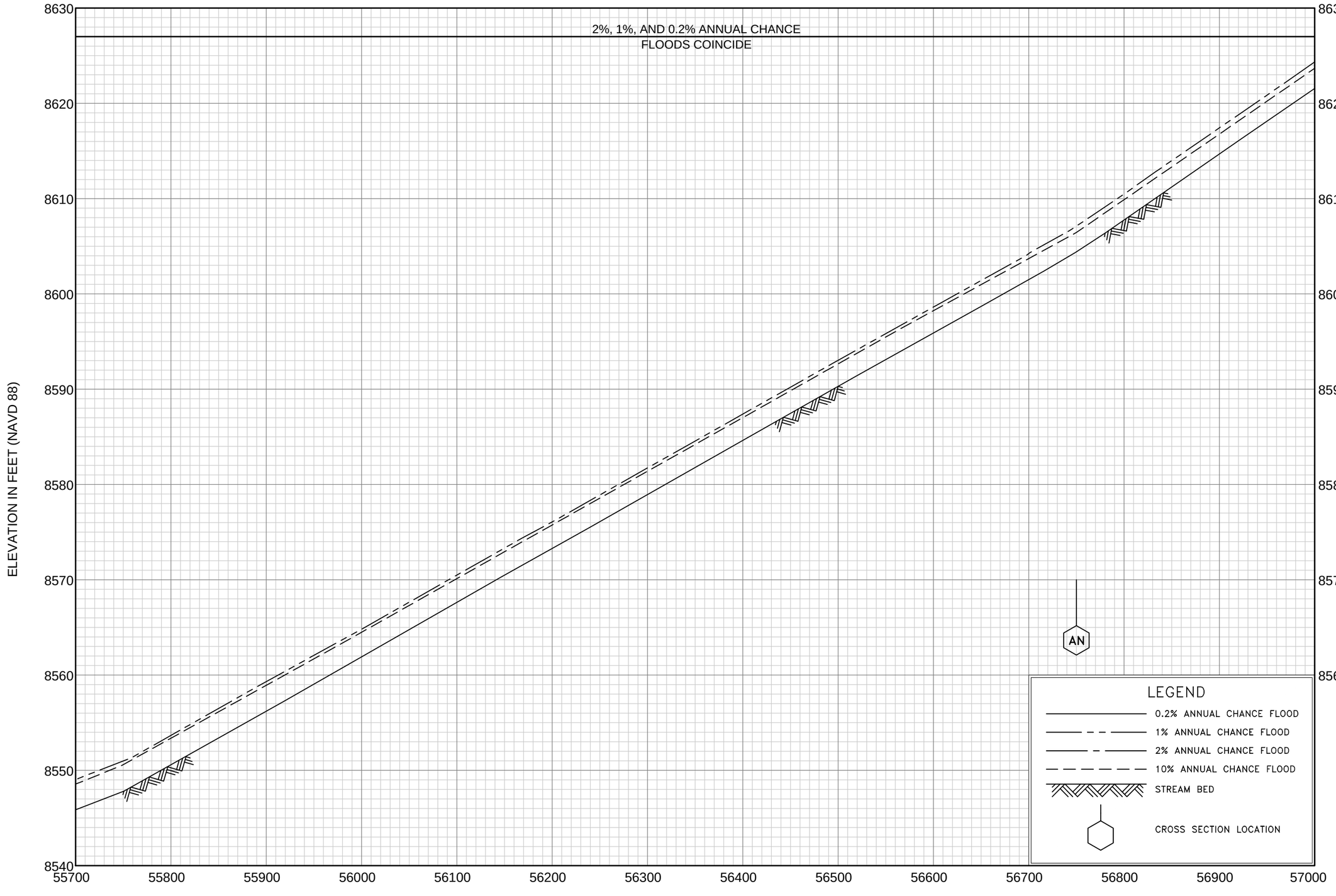
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

25P



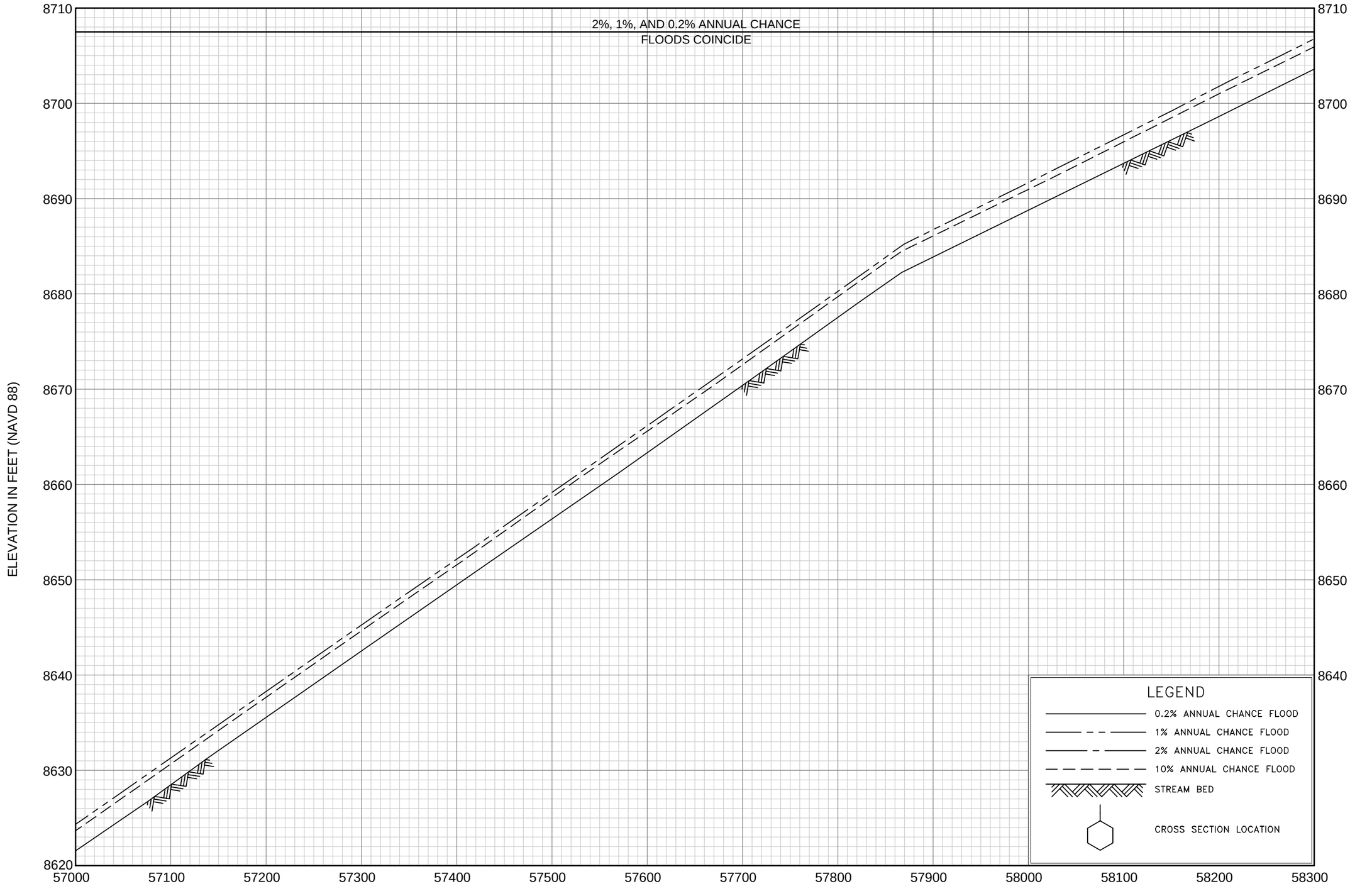
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

26P



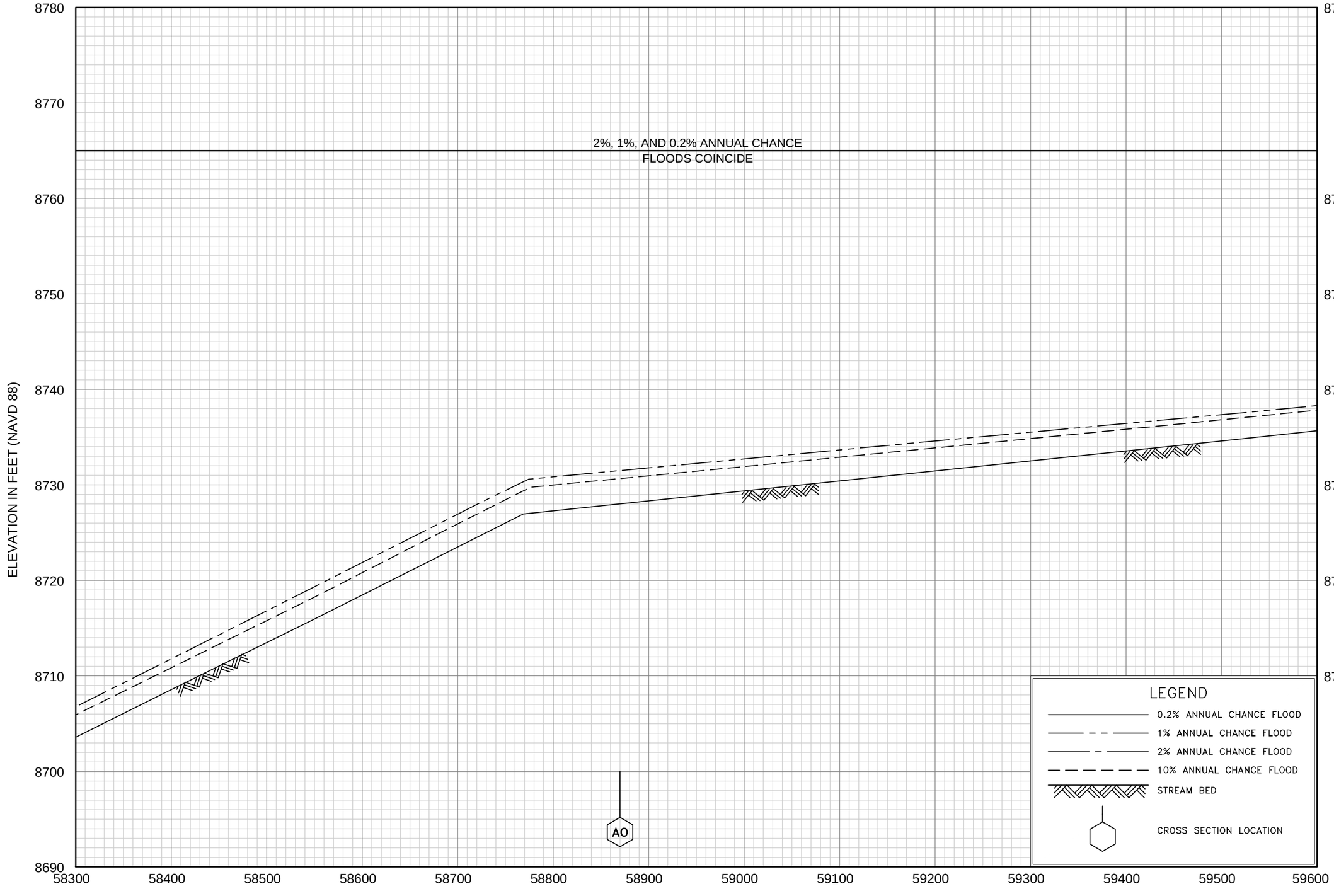
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

27P



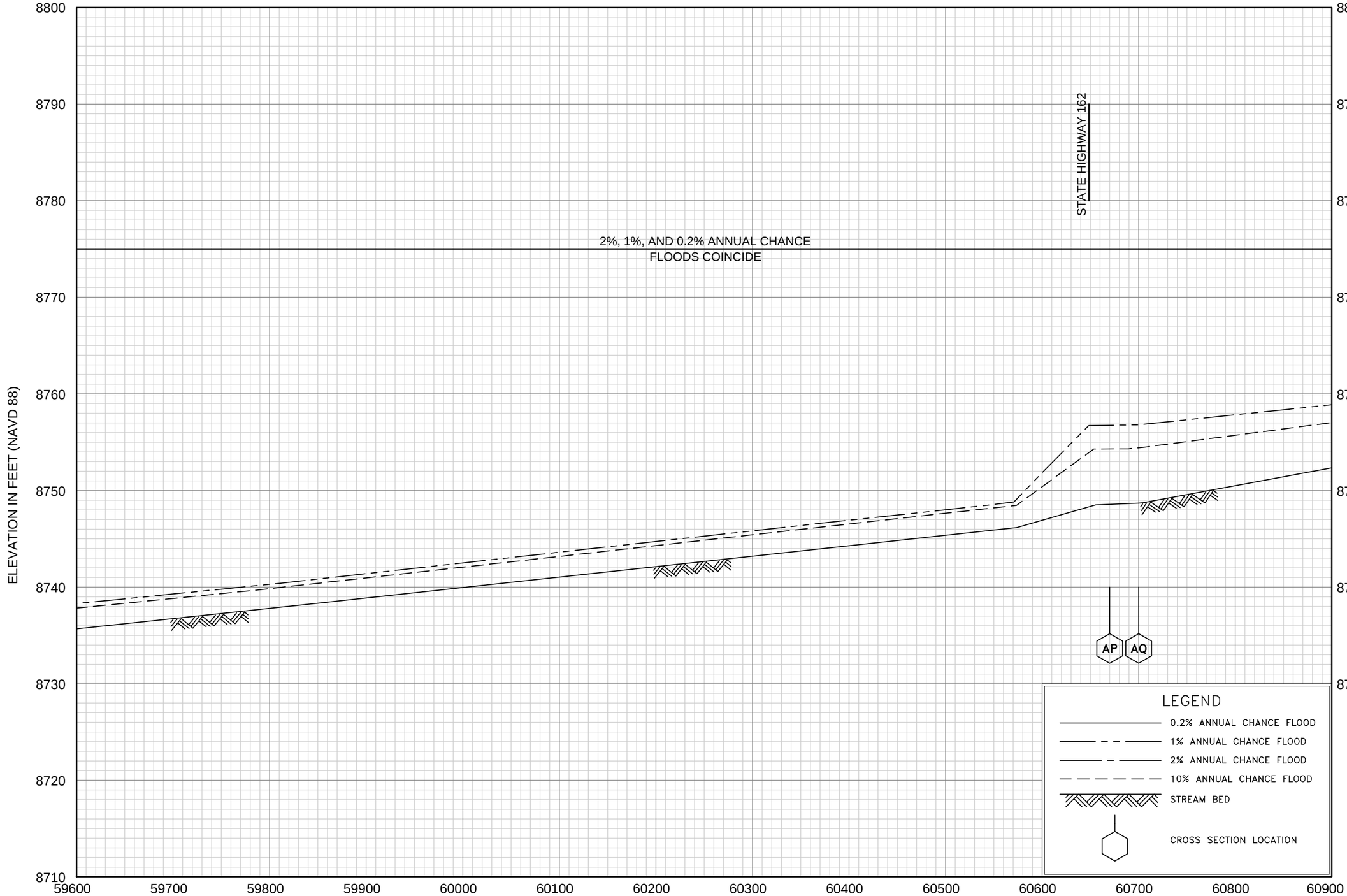
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

28P



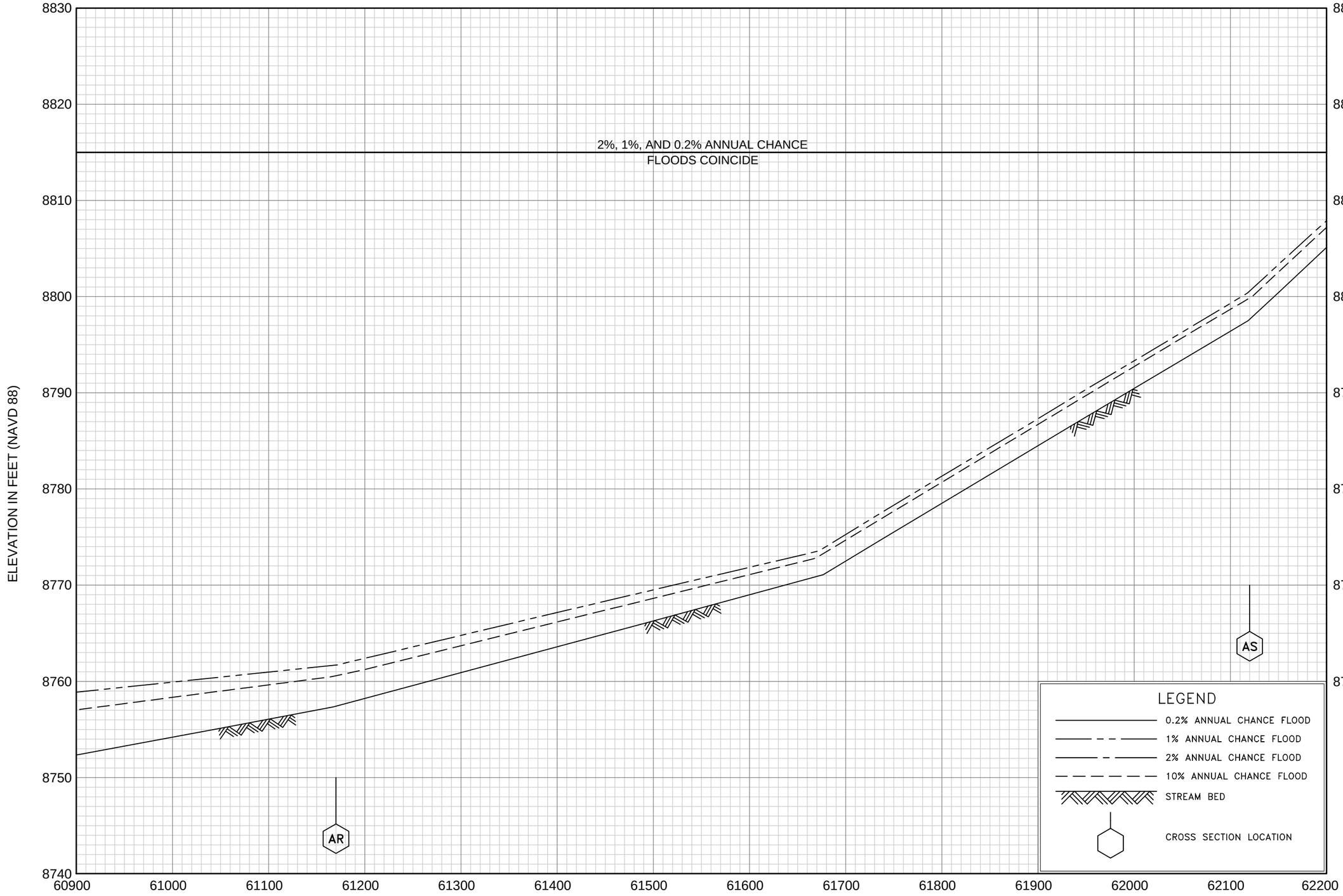
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

29P



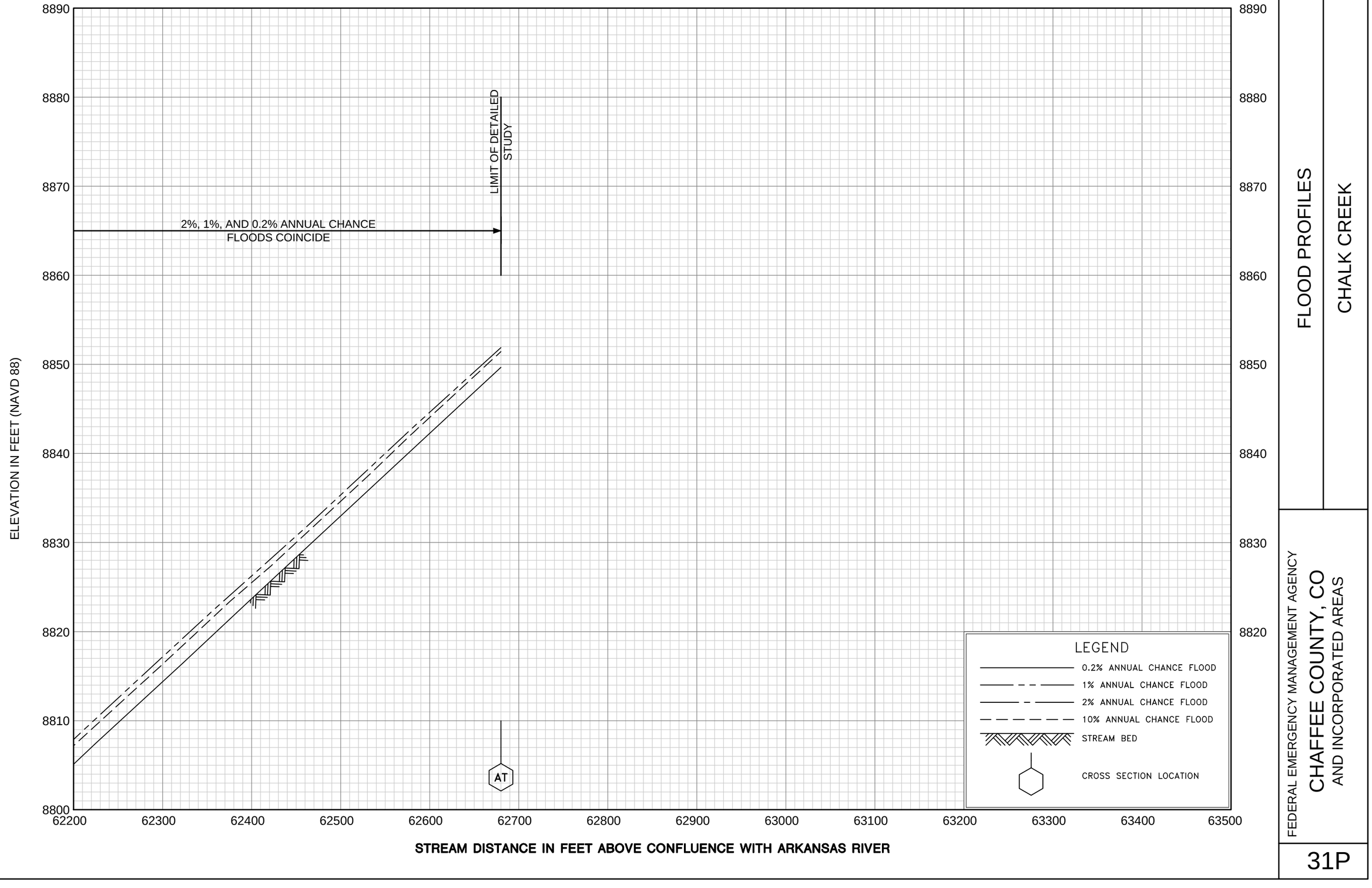
FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

30P



FLOOD PROFILES

CHALK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHAFFEE COUNTY, CO
AND INCORPORATED AREAS

31P