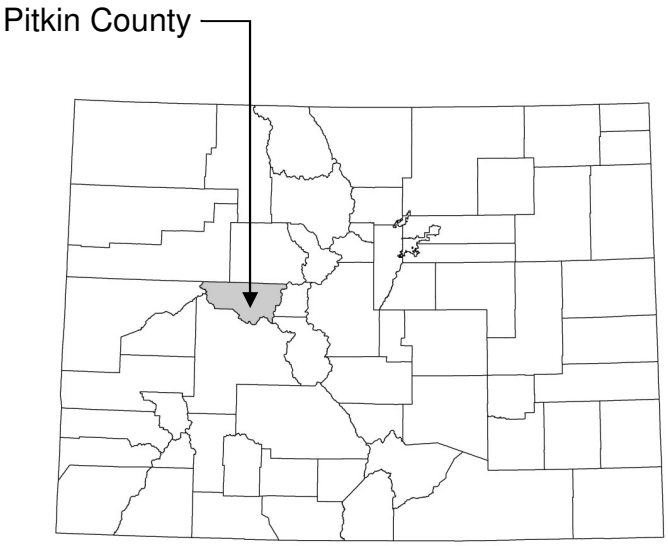
FLOOD INSURANCE STUDY

PITKIN COUNTY, COLORADO, AND INCORPORATED AREAS

VOLUME 1 OF 3

COMMUNITY NAME	COMMUNNITY NUMBER
ASPEN, CITY OF	080143
BASALT, TOWN OF	080052
PITKIN COUNTY (UNINCORPORATED AREAS)	080287
SNOWMASS VILLAGE, TOWN OF	080312



Preliminary

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
08097CV001A

PRELIMINARY

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) 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 may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS. 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 components.

This FIS report was revised on TBD. Users should refer to Section 10.0, Revision Descriptions, for further information. Section 10.0 is intended to present the most up-to-date information for specific portions of this FIS report. Therefore, users of this report should be aware that the information presented in Section 10.0 may supersede some of the information in Sections 1.0 through 9.0 of this FIS report.

This Flood Insurance Study report and Flood Insurance Rate Map cover Pitkin County and Incorporated Areas, including the portion of the Town of Basalt located in Pitkin County. The flood hazard information for the portion of the Town of Basalt located in Eagle County is shown in the Eagle County and Incorporated Areas Flood Insurance Study.

Initial Countywide FIS Effective Date: September 30, 1988

Revised Countywide FIS Dates: October 19, 2004
TBD

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FLOOD INSURANCE STUDY
PITKIN COUNTY, COLORADO AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and supersedes the FIS reports and/or Flood Insurance Rate Maps (FIRMs) [/Flood Boundary and Floodway Maps] in the geographic area of Pitkin County, Colorado, including: the City of Aspen, the Town of Snowmass Village, and unincorporated areas of Pitkin County (hereinafter referred to collectively as Pitkin County), and the Roaring Fork River through the Town of Basalt.

This FIS 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 county that will be used to establish actuarial flood insurance rates. This information will also be used by Pitkin County and the incorporated communities 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.

Please note that the Town of Basalt is geographically located in both Pitkin and Eagle Counties. The portion of the Roaring Fork River in Pitkin County that runs through the Town of Basalt is included in this FIS report. Flooding information for the Town of Basalt is included in its entirely in the Eagle County FIS report (Reference 29).

This Countywide FIS was prepared by compiling pertinent information for the flood hazard areas in both the incorporated and unincorporated areas of Pitkin 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 FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for the 2004 FIS for Pitkin County were performed by Denver Engineering Corporation (DEC), for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-C-1184. This study was completed in April 1985.

As part of the Risk MAP Digital Flood Insurance Rate Map (DFIRM) map maintenance project for Pitkin County, the following rivers were studied using detailed methods in 2011 by the Risk MAP Contractor, Anderson Consulting Engineers, Inc. (ACE) of Fort Collins, CO under contract to the Colorado Water Conservation Board (CWCB):

- 11 river miles of the Roaring Fork River from Tagert Lake downstream through the City of Aspen to Cemetery Lane Road crossing;
- 7.5 river miles of the Roaring Fork River from the Smith Hill Road crossing downstream to the confluence with Snowmass Creek at Old Snowmass;
- 3.2 river miles of the Crystal River in the vicinity of Redstone from Antelope Drive downstream to the Redstone Boulevard North road crossing;
- 5.0 river miles of the Crystal River from the confluence with Nettle Creek downstream to the Pitkin County/Garfield County line;
- 0.9 river miles of Coal Creek in the vicinity of Redstone from the confluence with the Crystal River upstream for 0.9 miles;
- 3.6 river miles of Castle Creek from the Midnight Mine Road crossing downstream to the confluence with the Roaring Fork River; and
- 1.0 river miles of Maroon Creek from Highway 82 downstream to the confluence with the Roaring Fork River.

Except as noted below, the vector base map for Pitkin County was provided by Pitkin County and the City of Aspen. Specifically, the Pitkin County data was provided in 2010 by the Pitkin County/City of Aspen GIS Department located at 455 Rio Grande Place, Aspen, CO 81611, phone (970) 920-5453. The base map data consists of a series of shape files based on the NAD83 horizontal datum, using the UTM Zone 13 North projection and includes the following:

(a) Transportation coverage – Included in this information is the road centerline and airport information within the county. Road centerline information was obtained from the Pitkin County/City of Aspen GIS Department. Airports were digitized from the 2009 NAIP aerial photo of the county, which was obtained from the United States Geological Survey (USGS);

(b) Political boundaries – These data include all incorporated community, military and Federal facility, National Forest, and State Park boundaries. These data were obtained from the Pitkin County/City of Aspen GIS Department and were aligned to the Public Land Survey System (PLSS) lines for the County;

(c) Public Land Survey System - These data were obtained from the Bureau of Land Management and includes all section, township, and range information for the County;

(d) Hydrography - These data were initially obtained from the Pitkin County/City of Aspen GIS Department, then corrected by Anderson Consulting Engineers, Inc. to coincide with the stream centerlines visible on the 2009 NAIP aerial photograph. For areas where new detailed hydraulic studies were conducted for the DFIRM conversion project the stream centerline was replaced with the profile baseline utilized in the respective hydraulic study;

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

(f) United States Geological 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; and

(g) New FIRM panel boundaries – This data set was created by Anderson Consulting Engineers, Inc., and displays the outlines of the new DFIRM panels for the county.

The hydraulic structure layer, including bridges and culverts within the extents of the effective hydraulic models, along with dams, weirs, and levees that are present within the county were obtained from the respective hydraulic studies. Dams, weirs, and levees 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 Universal Transverse Mercator referenced to the North American Datum of 1983 and the GRS 80 spheroid, Western Hemisphere.

1.3 Coordination

The initial community base map for the Town of Basalt was selected and streams requiring detailed study were identified in a meeting attended by representatives of FEMA, the Colorado Water Conservation Board (CWCB), the Town of Basalt, and the Study Contractor (SC) on June 8, 1977.

For the remaining areas, the community base map was selected and streams requiring detailed study were identified in a meeting attended by representatives of DEC, FEMA, CWCB, the City of Aspen, and Pitkin County on April 20, 1983.

During the course of work done by the SC in the early 1980's, flood information was coordinated with the U.S. Army Corps of Engineers (USACE), CWCB, the City of Aspen, the Town of Basalt, and Pitkin County.

The results of the original study for the Town of Basalt were reviewed at a final community coordination meeting held on February 7, 1979, and attended by representatives of FEMA, the SC, and the community. No significant problems were raised at the meeting.

The results of the original study for the City of Aspen were reviewed at a final community coordination meeting held on January 29, 1985, and attended by representatives of the City of Aspen, FEMA, DEC, CWCB, and the Aspen/Pitkin County Planning Department. A memorandum from the City of Aspen was presented at that meeting that described an improvement project for the Roaring Fork River completed in December 1984. The information provided was subsequently incorporated into the study for the City of Aspen and is included in this study.

The final community coordination meeting for Pitkin County was held on June 9, 1986, and was attended by representatives of FEMA, CWCB, DEC, the City of Aspen, the Towns of Basalt and Snowmass Village, and Pitkin County. As a result of that meeting, it was decided that flood hazard information for all of Pitkin County, including the incorporated communities, would be shown in one FIS report.

A pre-scoping meeting for the Pitkin County Risk MAP map maintenance project was conducted in April 2010 at the Pitkin County Courthouse in Aspen. The meeting was attended by representatives of Pitkin County, CWCB, and Anderson Consulting Engineers, Inc. (ACE), the Risk MAP contractor.

On TBD the results of the Pitkin County Risk MAP map maintenance project were presented and reviewed at a final community coordination meeting attended by representatives of FEMA, CWCB, Pitkin County, the City of Aspen, and the Towns of Snowmass Village and Basalt. All concerns raised during this meeting have been resolved.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Pitkin County, Colorado.

As part of the initial countywide study in 1988, areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through April 1990.

As part of the Risk MAP Map Maintenance project in 2011, several streams were studied by detailed methods, a number of which have superseded the initial countywide study. The flooding sources studied by detailed methods and their study limits for this FIS are shown in Table 1, with the year of the latest study date listed after each flooding source. Flooding sources listed with a 2004 date contain data reflective of the 2004 countywide FIS; flooding sources listed with a 2011 date contain data reflective of the current revised countywide FIS.

Approximate methods were used to evaluate flooding from the following sources: Brush Creek, Capitol Creek, Castle Creek, East Sopris Creek, Maroon Creek, West Sopris Creek, and Woody Creek. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards.

As part of the Risk MAP Map Maintenance project in 2011, the majority of the effective Zone A approximate floodplains in Pitkin County were re-delineated to align with the best available topography and aerial photography.

2.2 Community Description

Pitkin County is located in west-central Colorado. It is bordered by Garfield and Eagle Counties to the north, Mesa County to the west, Gunnison County to the south, and Chaffee and Lake Counties to the east.

The City of Aspen is a mountain resort community situated in east-central Pitkin County, and is the county seat. Historically, mining provided employment in Pitkin County. Since the late 1940s, however, tourism has provided an increasing amount of income to Pitkin County. The areas near the City of Aspen and Snowmass Village have benefited considerably from the ski and summer resort-related industry.

The Town of Basalt is located in southwestern Eagle County and north-central Pitkin County approximately 20 miles southeast of Glenwood Springs. The economy of Basalt depends on government, or local business, recreation, tourism, and the service industry that supports it, and the construction industry, with less dependence on ranching and farming (Reference 1).

Population and development have increased steadily since World War II, particularly in those areas affected by the ski industry. According to the U.S. Census Bureau, the population of the City of Aspen grew from 1,101 in 1960 to 6,658 in 2010; for the Town of Basalt, the population increased from 213 in 1960 to 3,857 in 2010; for the Town of Snowmass Village, the population increased from 1,397 in 1980 to 2,826 in 2010; and for Pitkin County, the population increased from 2,381 in 1960 to 17,148 in 2010 (Reference 2).

Table 1. Streams Studied by Detailed Methods

Flooding Source	Reach Studied
Brush Creek (2004)	Confluence with the Roaring Fork River upstream to approximately 650 feet east of corporate limits of Snowmass Village
Castle Creek (2011)	Confluence with the Roaring Fork River upstream approximately 3.6 river miles to the Midnight Mine Road crossing
Coal Creek (2011)	Confluence with the Crystal River in the vicinity of Redstone upstream approximately 0.9 river miles
Crystal River (Lower, 2011)	Pitkin County/Garfield County boundary upstream approximately 5.0 river miles to the confluence with Nettle Creek
Crystal River (2004)	Confluence with Nettle Creek upstream approximately 7.4 river miles to the Redstone Boulevard North road crossing
Crystal River (Upper, 2011)	Redstone Boulevard North road crossing upstream approximately 3.2 river miles to the Antelope Drive road crossing
Crystal River (2004)	Antelope Drive road crossing upstream approximately 3.6 river miles to the Pitkin County/Gunnison County boundary
Hunter Creek (2004)	Confluence with the Roaring Fork River upstream approximately 850 feet upstream of Red Mountain Road
Maroon Creek (2011)	Confluence with the Roaring Fork River upstream approximately 1.0 river miles to Highway 82

Table 1. Streams Studied by Detailed Methods (cont.)

Flooding Source	Reach Studied
Maroon Creek (2004)	Highway 82 upstream approximately 0.65 river miles
Roaring Fork River (2004)	Eagle County/Garfield County boundary upstream approximately 9.1 river miles to the confluence with Snowmass Creek at Old Snowmass
Roaring Fork River (Lower, 2011)	Confluence with Snowmass Creek at Old Snowmass upstream approximately 8.9 river miles to the Smith Hill Road crossing near Snowmass Village
Roaring Fork River (2004)	Smith Hill Road crossing near Snowmass Village upstream approximately 4.2 river miles to the Cemetery Lane Road crossing
Roaring Fork River (Upper, 2011)	Cemetery Lane Road crossing upstream through the City of Aspen approximately 10.5 river miles to Tagerts Lake
Snowmass Creek (2004)	Confluence with the Roaring Fork River upstream to approximately 0.25 mile upstream of western corporate limits of Snowmass Village

The Town of Basalt is located at the confluence of the Roaring Fork and Fryingpan Rivers. The Roaring Fork River originates in the Sawatch Mountain Range at an elevation above 14,000 feet, then flows approximately 37 miles to the Town of Basalt. At the confluence of the Roaring Fork and Fryingpan Rivers, 53 percent of the total drainage area of the Fryingpan and Roaring Fork River basins has been collected (Reference 3). The Roaring Fork River is the major drainageway through the City of Aspen and collects flow from tributary streams on both sides of the valley.

The Fryingpan River originates in the Sawatch Mountain Range above timberline and flows southwesterly to the Town of Basalt, where it empties into the Roaring Fork River on the western side of town. The Fryingpan River comprises approximately 19 percent of the total flow of the Roaring Fork River (Reference 3). Development in the floodplains of the Roaring Fork and Fryingpan Rivers is scattered.

The soils in and around the Town of Basalt are variably textured, water-deposited, sandy, and loamy, with varying amounts of cobble and gravel occurring in the valley bottoms and benches. The mountains vary from colluvial to the north, basalt lava to the southwest, and sandstone and shale to the east and west.

The watercourses in the City of Aspen have steep, well-defined channels, with heavily vegetated overbanks. Channel bottoms are covered with cobbles and boulders.

The average annual precipitation for Pitkin County is approximately 18.9 inches (Reference 4). On average, 129.6 inches of snow falls annually in Pitkin County. Temperature extremes range from average January lows of approximately 7°F to average July highs of approximately 80°F.

2.3 Principal Flood Problems

Flooding from streams in Pitkin County usually occurs during May through August, with the principal cause of flood-flows being snowmelt runoff. Summer rains do not cause major floods in this area. Thunderstorm activity creates major floods only on small tributary streams because of the short duration of storms.

Major floods on the Roaring Fork River result from rapid melting of mountain snowpack during the period from late May through early July. These snowmelt floods are characterized by moderate peak flows, large volumes, long durations, and marked diurnal fluctuations in flow. Rainfall on melting snow may accelerate the rate of the snowmelt, thus augmenting flood flows.

The largest discharge recorded on the Roaring Fork River was in July 1957, with a peak of 19,000 cubic feet per second (cfs). A USACE letter report (Reference 5) describes the 1957 flood as follows:

Floods on the Roaring Fork result from snowmelt and occur principally during the month of June. The flood of July 1, 1957 had an instantaneous peak discharge of 18,700 cfs at the Glenwood Springs gage. This flood was the maximum of 49 years of record, and its magnitude has an estimated frequency of occurrence of once in approximately 60 years.
The river in the problem area is characterized by low banks, braided channels, and a considerable amount of gravel, cobbles, and snags deposited on gravel bars.

The river carries a large bed load of gravel and cobbles, some of the latter being more than 6 inches in diameter. The capacity of the channel has been reduced by this sediment. In some instances, where channel changes took place during the flood, the original channels were so filled with sediment that nearly all of the present flows are discharging through the new channels. Generally, however, the new channels are old watercourses abandoned by the river in previous years. The littered condition of the channels, and the increased danger of bank erosion, inundation, and resultant channel changes constitute the present flood problem.

No urban areas are affected by floods. The principal items damaged by the 1957 flood were the agricultural lands and roads and bridges adjacent to, or over the river. A few farm buildings were flooded. The total known damages in all categories in this reach amounted to slightly more than $45,000.

A common type of damage from the 1957 flood was bank erosion. The slope of the stream ranges from 65 feet per mile above Basalt, to 40 feet per mile below Basalt. Velocities probably in excess of 10 feet per second occurred during the 1957 flood. The banks are composed largely of sand, gravel, and cobbles overlain by a comparatively thin mantle of soil, and are quite erodible. Spoil-type dikes, constructed by local interests with material bulldozed in the process of channel clearing, proved to be very erodible.

A substantial percentage of the total damages was due to overtopping of the low banks and the inundation of pasture and croplands. The banks in most instances range from only 2 feet to 5 feet in height. In 2 locations, where old channel areas have been reclaimed, considerable volumes of overflow and widespread flooding resulted from bank overtopping at the upper ends of the areas.

More than one-half of the known damages in the 1957 flood were caused to roads and bridges in the area, with nearly $24,000 of damages being caused to 3 bridges and their abutments. Two of these were public bridges and have since been restored. A third bridge, which was private, was completely destroyed and has not been replaced.

The City of Aspen is known to have a long history of flooding, the earliest occurring in 1880 (Reference 6). The flood of June-July 1917 is considered the most severe in the Aspen area, with a peak discharge of 3,170 cfs on the Roaring Fork River. The largest recorded flood on Castle Creek near the City of Aspen occurred in 1918, with a peak flow of 1,090 cfs; on Hunter Creek, the largest flood occurred in 1953 with a peak flow of 1,010 cfs. The highest peak flow on the Crystal River above its confluence with Avalanche Creek was 3,980 cfs, recorded in 1957. A peak of 836 cfs for Maroon Creek was recorded in 1980 (Reference 7). In 1983 and 1984, large snow depths in the area resulted in unusually high snowmelt floods.

Flood losses can include damage to grazing lands, irrigation systems, and fences, residential and commercial buildings, parks and other recreational facilities, roads, bridges, and public utilities. Stream channels may be subject to severe erosion.

2.4 Flood Protection Measures

There are several small lakes and reservoirs in Pitkin County, mostly located within the upper watersheds of the Roaring Fork River. The Twin Lakes diversion reservoir controls flows from only a 15-square-mile drainage area and is intended to provide storage for irrigation and water supply. The above measures are insufficient for flood protection. A few temporary or localized flood protection works, including berms, levees, and bank protection works, are scattered near developed areas. An earthen berm, locally named the Redstone Dike, exists on the right bank of the Crystal River in the vicinity of Redstone. The berm was constructed of excavated earthen material in the 1980's to provide flood protection for the Redstone area, although the berm is not currently certified as a levee on the effective FIRM panels for Pitkin County.

The Roaring Fork River exists in a deep channel. No authorized flood-control structures are in the local study area, and none are under investigation.

The only substantial structure that affects the flow of the Fryingpan River is the Ruedi Dam, located approximately 17 miles east of the Town of Basalt. The Ruedi Dam is part of the Fryingpan-Arkansas Project to divert water from the Colorado River basin to the Arkansas River basin. The dam was designed for an inflow design flood of 17,500 cfs at a 15-day volume of 110,000 acre-feet. The probable maximum discharge is 5,540 cfs from the spillway, and 1,810 cfs from the outlet structure. The total probable maximum discharge from the outlet structure and spillway is 7,350 cfs, approximating the 500-year flood in the Town of Basalt (Reference 8).

A 500-foot reach of the Roaring Fork River, located approximately 800 feet upstream of North Mill Street in the City of Aspen, was widened in December 1984.

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 FIS. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 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

2004 Revision

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

Hydrologic analyses for the detailed study areas on the Roaring Fork River below its confluence with the Fryingpan River were carried out by the USACE, Sacramento District (Reference 9), using the methodology detailed below.

The hydrologic techniques used are fully documented in a separate report, *Hydrology Report for City of Aspen and Pitkin County (Unincorporated Areas)* (Reference 7).

Data from a large number of stream gaging stations located within the homogenous watershed area similar to Pitkin County area were analyzed. These gages are located within Pitkin County and nearby Summit, Eagle, Garfield, Mesa, Delta, and Gunnison Counties. The streamflow data were separated into snowmelt and rainfall peaks and analyzed separately.

Snowmelt peaks from a total of 40 gages, and rainfall peaks from 25 gages, were analyzed to obtain individual and regional statistical parameters of mean, standard deviation, and skew for the two flow peak types. In many instances, the rainfall peaks were of very small magnitude. Several stream gages did not show any significant peaks caused by rainfall.

Using log-Pearson Type III distribution as described in U.S. Water Resources Council *Bulletin 17A* (Reference 10), the discharge-frequency information was developed separately for the snowmelt peaks and the rainfall peaks for the 10-, 50-, 100-, and 500-year recurrence intervals. These two distributions were combined to obtain the overall peak discharge-frequency relationship for each stream.

For ungaged streams, the values of regional statistical parameters were used and the discharge-drainage area curves were developed for the 10-, 50-, 100-, and 500-year recurrence intervals.

Peak discharge-drainage area relationships for the streams studied in Pitkin County are shown in Table 2. Only 100-year frequency discharges are reported for the reaches to be studied by approximate methods.

Current Revision

Discharges for the 10-, 2-, 1-, and 0.2-percent annual chance recurrence storms from the effective FIS for Pitkin County were utilized by Anderson Consulting Engineers, Inc. for the re-study of Castle Creek, Coal Creek, the Crystal River, Maroon Creek, and the Roaring Fork River (Reference 36).

3.2 Hydraulic Analyses

2004 Revision

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.

Water-surface elevations (WSELs) were computed using the USACE HEC-2 step-backwater computer program (Reference 11).

Cross-section data for the backwater analysis of streams within Pitkin County were obtained from topographic maps as follows: Roaring Fork River (References 12 and 13); Maroon Creek (Reference 3); Hunter Creek and Castle Creek (Reference 12); Brush Creek (Reference 14); and Crystal River and Coal Creek (Reference 18). Cross sections for the Fryingpan River, Snowmass Creek, and portions of the Crystal and Roaring Fork Rivers were digitized from aerial photographs (References 17, 18, 19, and 20). Parts of Brush Creek and the Roaring Fork and Fryingpan Rivers were field surveyed to obtain additional cross

Table 2. Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet Per Second) 10-Year	50-Year	100-Year	500-Year
Brush Creek					
At Mouth	16.0	350	440	490	600
Downstream of Confluence with East Fork Brush Creek	10.0	300	375	420	515
Upstream of Confluence with East Fork Brush Creek	6.8	265	330	370	450
Downstream of Confluence with West Fork Brush Creek	3.3	205	260	290	355
Upstream of Confluence with West Fork Brush Creek	1.0	140	175	195	240
Capitol Creek					
At Mouth	37.0	--[1]	--[1]	900	--[1]
Upstream of Confluence with Little Elk Creek	27.0	--[1]	--[1]	725	--[1]
Upstream of Confluence with Nickelson Creek	14.0	--[1]	--[1]	440	--[1]
Castle Creek					
At Mouth	72.0	850	1,100	1,300	1,800
Downstream of Confluence with Conundrum Creek (USGS Gage No. 09075000)	62.0	--[1]	--[1]	1,150	--[1]
Upstream of Confluence with Sandy Creek (USGS Gage No. 09074800)	32.2	--[1]	--[1]	700	--[1]
Downstream of Confluence with Waterfall Gulch	24.0	--[1]	--[1]	575	--[1]
Coal Creek					
At Mouth	27.0	850	1,100	1,350	2,300

[1]Not computed

Table 2. Summary of Discharges (cont.)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet Per Second) 10-Year	50-Year	100-Year	500-Year
Crystal River					
At Pitkin-Garfield County Line	323.0	5,200	6,400	7,200	10,700
Downstream of Confluence with Thompson Creek	312.0	5,000	6,200	7,100	10,600
Upstream of Confluence with Thompson Creek	235.0	3,950	4,900	5,600	9,200
Near Redstone (USGS Gage No. 09082500)	229.0	3,900	4,850	5,500	9,100
Downstream of Confluence with Avalanche Creek	212.0	3,700	4,700	5,200	8,600
Upstream of Confluence with Avalanche Creek	168.0	3,100	3,850	4,400	7,100
Upstream of Confluence with Avalanche Creek near Redstone (USGS Gage No. 09081600)	167.0	3,100	3,850	4,400	7,100
Downstream of Confluence with Coal Creek	158.0	3,000	3,700	4,200	6,800
Upstream of Confluence with Coal Creek	131.0	2,600	3,200	3,650	6,000
Near Placita (USGS Gage No. 09081550)	107.0	2,200	2,750	3,150	5,200
At Pitkin-Gunnison County Line	102.0	2,080	2,600	3,050	5,000
East Sopris Creek					
At Mouth	44.0	--[1]	--[1]	1,040	--[1]
Upstream of Confluence with West Sopris Creek	27.0	--[1]	--[1]	1,040	--[1]
At Upper Limit of Study	16.0	--[1]	--[1]	490	--[1]
Hunter Creek					
At Mouth	41.3	1,250	1,550	1,700	2,000
Maroon Creek					
At Mouth	58.6	1,500	2,100	2,300	2,990
Downstream of Confluence with Willow Creek	54.0	--[1]	--[1]	2,150	--[1]

[1]Not computed

Table 2. Summary of Discharges (cont.)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet Per Second) 10-Year	50-Year	100-Year	500-Year
Roaring Fork River					
Above Garfield County Line, below Sopris Creek	870.0	7,300	9,800	10,800	14,700
Above Sopris Creek, below Fryingpan River	850.0	7,100	9,400	10,400	14,300
At Pitkin-Eagle County Line, above Fryingpan River	510.0	6,100	8,500	9,400	12,200
At Snowmass Creek	400.0	5,400	7,500	8,300	10,800
Upstream of Confluence with Woody Creek	320.0	4,400	6,000	6,700	8,700
Upstream of Confluence with Maroon Creek	230.0	3,700	5,100	5,700	7,400
Upstream of Confluence with Castle Creek	155.0	2,900	4,100	4,600	5,800
Upstream of Confluence with Hunter Creek at Aspen (USGS Gage No. 09073500)	109.0	2,100	2,900	3,300	4,200
Upstream of Confluence with McFarlane Creek	93.0	1,800	2,500	2,850	3,600
Upstream of Confluence with Difficult Creek	76.0	1,500	2,100	2,400	3,050
Snowmass Creek					
At Mouth	100.0	1,400	1,750	1,900	2,350
Upstream of Confluence with Capitol Creek	61.0	960	1,210	1,320	1,600
Upstream of Confluence with Wildcat Creek	51.0	850	1,075	1,170	1,420
Downstream of Confluence with Hunter Creek	46.5	800	1,000	1,100	1,330
Upstream of Confluence with Hunter Creek	43.0	750	950	1,040	1,260
Downstream of Confluence with East Snowmass Creek	39.0	690	875	950	1,160
Upstream of Confluence with East Snowmass Creek	32.0	600	750	820	1,000
West Sopris Creek					
At Mouth	17.0	--[1]	--[1]	520	--[1]
At Upper Limit of Study	6.0	--[1]	--[1]	230	--[1]
Woody Creek					
At Mouth	47.0	--[1]	--[1]	1,100	--[1]
Downstream of Confluence with Collins Creek	35.0	--[1]	--[1]	875	--[1]
Near Lenado	19.0	--[1]	--[1]	560	--[1]

[1]Not computed

-section data. All bridges and culverts were field surveyed to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses were shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations were also shown on the Flood Insurance Rate Map (FIRM) (Exhibit 2).

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations of the streams and floodplain areas. The ranges of roughness values for detailed-study streams is listed in Table 3.

Table 3. Summary of Manning's "n" Values (2004 Revision)

Stream Name	Manning's "n" Values	
	Channel	Overbank
Brush Creek	0.040-0.050	0.060-0.070
Castle Creek	0.045	0.080-0.100
Coal Creek	0.040-0.050	0.060-0.080
Crystal River	0.035-0.055	0.050-0.085
Hunter Creek	0.040	0.080
Maroon Creek	0.045	0.060-0.080
Roaring Fork River	0.035-0.045	0.045-0.150
Snowmass Creek	0.040-0.045	0.060-0.070
Fryingpan River	0.035-0.080	0.035-0.100

Starting WSELs for the Crystal River and Castle Creek were taken at their confluence with the Roaring Fork River. Starting WSELs for Maroon, Snowmass, Coal, and Hunter Creeks were determined by the critical depth method. The starting water surface elevation for the Roaring Fork River as part of the original study was obtained by the slope-area method. The starting water surface elevation for the Fryingpan River was taken from a 1978 Floodplain Information Report (Reference 15).

The hydraulic analyses for the 2004 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.

Hydraulic analyses of approximate study areas were based on normal depth computations and information obtained from available topographic maps and field reconnaissance.

An area of shallow flooding exists along the southern bank of Coal Creek. This area is specified as a shallow flooding source in the Floodplain Information Report for the Crystal River and Coal Creek (Reference 16).

All elevations were referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation Reference Marks (ERMs) used in the 2004 study were shown on the maps; the descriptions of the marks were presented in ERMs (Exhibit 3).

Current Revision

Water-surface elevations as part of the Risk MAP project in 2011 were computed using the USACE River Analysis System (HEC-RAS) computer program (Reference 37).

Cross-section data for the backwater analysis of streams within Pitkin County as part of the Risk MAP project in 2011 were obtained from topographic mapping provided by the City of Aspen, Pitkin County, and Fugro, Inc. of Rapid City, SD (Reference 36). All bridges and culverts were field surveyed to obtain elevation data and structural geometry (Reference 36).

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Insurance Rate Map (FIRM) (Exhibit 2).

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations of the streams and floodplain areas. The ranges of roughness values for detailed-study streams is listed in Table 4. Roughness values from reaches studied as part of the 2004 revision are listed in the table as well.

Starting WSELs as part of the Risk MAP project in 2011 for both reaches of the Roaring Fork River and both reaches of the Crystal River were obtained from the published Base Flood Elevations (BFEs) and the flood profiles found in the 2004 effective FIRMs and FIS for Pitkin County, CO. For each of these four reaches, a cross section from the effective study was included in the 2011 hydraulic models at the downstream end of each reach with the respective published WSELs imposed at each cross section. Starting WSELs for Coal Creek, Castle Creek, and Maroon Creek were determined using normal flow conditions.

The hydraulic analyses for the current study are 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.

Table 4. Summary of Manning's "n" Values (Current Revision)

Stream Name	Manning's "n" Values Channel	Overbank
Brush Creek (2004)	0.040-0.050	0.060-0.070
Castle Creek (2011)	0.060-0.115	0.020-0.112
Coal Creek (2011)	0.054-0.096	0.047-0.096
Crystal River (2004)	0.035-0.055	0.050-0.085
Crystal River (Lower, 2011)	0.054-0.091	0.020-0.100
Crystal River (Upper, 2011)	0.044-0.106	0.020-0.106
Hunter Creek (2004)	0.040	0.080
Maroon Creek (2004)	0.045	0.060-0.080
Maroon Creek (2011)	0.074-0.090	0.020-0.101
Roaring Fork River (2004)	0.035-0.045	0.045-0.150
Roaring Fork River (Lower, 2011)	0.020-0.075	0.037-0.106
Roaring Fork River (Upper, 2011)	0.020-0.106	0.020-0.139
Snowmass Creek (2004)	0.040-0.045	0.060-0.070

3.3 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FIS reports 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 NAVD88. Structure and ground elevations in the community should be referenced to NAVD88 if possible. It is important to note that adjacent communities may be referenced in either NAVD88 or NGVD29. Depending upon the area, this may result in differences in Base Flood Elevations (BFEs) across the corporate limits between communities. Ground, structure, and flood elevations within Pitkin County and Incorporated Areas may be compared and/or referenced to NGVD29 by subtracting the applicable vertical datum conversion factor from the associated elevation in NAVD88. Regardless of area, the applicable datum is clearly marked for all tables and panels in the FIS report and FIRM.

Bench marks shown on the FIRM represent those used during the preparation of this and previous FIS reports. Users should be aware that these elevations may have changed since the publication of this FIS report. To obtain up-to-date elevation information on National Geodetic Survey (NGS) bench marks shown on this map, please contact the Information Services Branch of the NGS at

(301) 713-3242, or visit their website at www.ngs.noaa.gov. Map users should seek verification of non-NGS bench mark monument elevations when using these elevations for construction or floodplain management purposes.

For the current revision, a vertical datum conversion was completed for each studied reach. The range of conversion factors was prohibitively high; therefore, a standard conversion factor was not applied for the entire community. The Profile Panel and FDT conversion from NGVD29 to NAVD88 was carried out in accordance to the procedure outlined in the FEMA document *Map Modernization – Guidelines and Specifications for Flood Hazard Mapping Partners Appendix B: Guidance for Converting to the North American Vertical Datum of 1988*.

Using the multiple conversion factor approach, an average conversion factor for each flooding source was developed by establishing separate conversion factors at the upstream end, at the downstream end, and at an intermediate point of the studied reach. From this data, the average conversion factors for each reach were developed. In some cases, it was necessary to divide each reach into multiple sections in order for the maximum offset from the average conversion factor to be less than or equal to 0.25 feet.

For more information on NAVD88, see the FEMA publication entitled *Converting the National Flood Insurance Program to the North American Vertical Datum of 1988* (FEMA, 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.

Conversion factors for each studied reach are shown in Table 5. It should be noted that for the reach of the Lower Crystal River from the Pitkin County/Garfield County boundary upstream 5.0 river miles to the confluence with Nettle Creek (2011) and the Lower Roaring Fork River from the confluence with Snowmass Creek upstream 8.9 river miles to the Smith Hill Road crossing near Snowmass Village (2011), a datum conversion was not necessary as the studies were completed in the NAVD88 datum.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 1-percent-annual-chance flood

Table 5. Vertical Datum Conversion Factors

Stream/Reach	Minimum Conversion	Maximum Conversion	Average Conversion	Maximum Offset	Downstream Station		Upstream Station
Brush Creek	5.0	5.2	5.1	0.1		Entire Reach	
Castle Creek	5.2	5.6	5.4	0.2		Entire Reach	
Coal Creek	5.0	5.2	5.1	0.1		Entire Reach	
Crystal River (2004)	4.9	5.1	5.0	0.1	Upstream of Nettle Creek		Redstone Boulevard North Road crossing
Crystal River (Upper, 2011)	5.1	5.2	5.1	0.0	Redstone Boulevard North Road crossing		Antelope Drive Road crossing
Crystal River (2004)	5.1	5.4	5.3	0.1	Antelope Drive Road crossing		Pitkin County/Gunnison County boundary
Hunter Creek	5.3	5.3	5.3	0.0		Entire Reach	
Maroon Creek	5.2	5.3	5.2	0.0		Entire Reach	
Roaring Fork River (2004)	4.7	5.0	4.8	0.1	Pitkin County/Eagle County boundary		Downstream of Snowmass Creek
Roaring Fork River (2004)	5.0	5.2	5.1	0.1	Smith Hill Road crossing		Cemetery Lane Road crossing
Roaring Fork River (2011)	5.2	5.4	5.3	0.1	Cemetery Lane Road crossing		Stillwater Drive Road crossing

Table 5. Vertical Datum Conversion Factors (cont.)

Stream/Reach	Minimum Conversion	Maximum Conversion	Average Conversion	Maximum Offset	Downstream Station	Upstream Station
Roaring Fork River (2011)	5.4	5.9	5.7	0.2	Stillwater Drive Road crossing	Approximately 4,210 feet upstream of confluence with Roaring Fork River – Middle Split Flow Path (Difficult Creek)
Roaring Fork River (2011)	5.8	5.9	5.8	0.1	Approximately 4,210 feet upstream of confluence with Roaring Fork River – Middle Split Flow Path (Difficult Creek)	Tagerts Lake
Snowmass Creek	4.8	5.1	4.9	0.2	Confluence with Roaring Fork River	Downstream of Hunter Creek
Snowmass Creek	5.1	5.5	5.3	0.2	Downstream of Hunter Creek	Upstream Limit of Detailed Study

elevations and 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

To provide a national standard without regional discrimination, the 1-percent-annual-chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. As part of the studies completed for the 2004 revision, the boundaries were interpolated between cross sections using topographic maps at scales of 1:600 and 1:1,200, with a contour interval of 2 feet (Reference 12); 1:2,400, with contour intervals of 2 feet (References 13 and 16) and 5 feet (References 6 and 21); 1:4,800, with contour intervals of 5 feet and 40 feet (References 14 and 22, respectively); and 1:24,000, with a contour interval of 2 feet (Reference 23). As part of the studies completed for the Risk MAP project, boundaries were interpolated between cross sections using topographic maps at a scale of 1:200, with contour intervals of 1 foot and 2 feet (Reference 36).

The 1- 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, AR, A99, shaded Zone X, and D), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards (shaded Zone X). In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM (Exhibit 2).

Approximate 1-percent-annual-chance floodplain boundaries in some portions of the study area were taken directly from the Flood Hazard Boundary Map (FHBM) for Pitkin County (Reference 24). As part of the 2011 Risk MAP map maintenance project, the 1-percent-annual-chance approximate floodplain boundaries were re-delineated on the available topography from Pitkin County and from the USGS quad maps for Pitkin County (Reference 36).

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 floodways presented in this FIS and on the FIRM were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations have been tabulated for selected cross sections (Table 6). The computed floodways are shown on the FIRM (Exhibit 2). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

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.

5.0 INSURANCE APPLICATIONS

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

Zone A

Zone A is the flood insurance 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 in this zone.

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
Brush Creek								
A	100	26	60	6.5	7346.6	7346.6	7347.1	0.5
B	505	18	43	8.9	7405.9	7405.9	7405.9	0.0
C	865	13	39	9.9	7465.4	7465.4	7465.6	0.2
D	1,000	20	115	2.9	7476.1	7476.1	7476.2	0.1
E	1,140	118	107	4.6	7481.9	7481.9	7481.9	0.0
F	2,450	55	80	6.1	7501.7	7501.7	7501.7	0.0
G	2,530	141	226	2.2	7502.0	7502.0	7502.4	0.4
H	5,305	19	58	8.5	7534.1	7534.1	7534.1	0.0
I	6,205	52	86	5.7	7549.3	7549.3	7549.6	0.3
J	6,540	89	506	1.0	7560.4	7560.4	7560.7	0.3
K	6,610	45	285	1.7	7560.5	7560.5	7560.7	0.2
L	7,055	27	63	7.8	7564.5	7564.5	7564.8	0.3
M	7,880	38	96	5.1	7578.6	7578.6	7579.0	0.4
N	8,210	30	88	5.6	7582.5	7582.5	7582.8	0.3
O	9,115	29	63	7.7	7598.6	7598.6	7598.8	0.2
P	9,930	40	99	5.0	7612.8	7612.8	7613.0	0.2
Q	10,710	27	68	6.7	7624.8	7624.8	7625.1	0.3
R	12,440	26	60	7.5	7655.9	7655.9	7656.0	0.1
S	13,210	30	67	6.8	7672.1	7672.1	7672.2	0.1
T	13,890	24	73	6.2	7687.2	7687.2	7687.7	0.5
U	14,830	22	57	8.0	7711.2	7711.2	7711.4	0.2
V	15,340	36	82	5.6	7724.2	7724.2	7724.4	0.2
W	16,380	15	50	9.0	7745.2	7745.2	7745.5	0.3
X	17,270	14	49	9.3	7765.0	7765.0	7765.3	0.3

[1]Feet Above Confluence with Roaring Fork River.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BRUSH 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
Brush Creek (cont.)								
Y	18,110	29	63	7.3	7783.7	7783.7	7783.8	0.1
Z	18,810	40	64	7.1	7802.3	7802.3	7802.3	0.0
AA	19,580	22	73	6.3	7813.0	7813.0	7813.2	0.2
AB	20,480	25	54	7.7	7827.3	7827.3	7827.5	0.2
AC	20,580	25	52	8.1	7830.7	7830.7	7830.8	0.1
AD	20,640	170	1,425	0.3	7844.3	7844.3	7844.6	0.3
AE	21,440	30	79	5.3	7846.4	7846.4	7846.7	0.3
AF	22,290	24	57	7.3	7869.2	7869.2	7869.5	0.3
AG	22,360	36	58	7.2	7872.1	7872.1	7872.1	0.0

[1]Feet Above Confluence with Roaring Fork River.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BRUSH 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
Castle Creek								
A	446	90	211	6.2	7759.8	7759.8	7759.8	0.0
B	1,105	174	238	5.5	7773.6	7773.6	7773.6	0.0
C	1,856	117	306	4.3	7792.7	7792.7	7792.7	0.0
D	2,477	77	242	5.4	7805.6	7805.6	7805.6	0.0
E	3,081	64	241	5.4	7820.5	7820.5	7820.5	0.0
F	3,844	97	351	4.8	7840.1	7840.1	7840.1	0.0
G	4,071	37	172	7.6	7843.4	7843.4	7843.5	0.1
H	4,686	51	162	8.0	7857.3	7857.3	7857.3	0.0
I	5,638	38	218	6.0	7879.0	7879.0	7879.2	0.2
J	6,217	42	157	8.3	7893.9	7893.9	7893.9	0.0
K	6,980	64	261	5.0	7922.3	7922.3	7922.3	0.0
L	7,621	44	148	8.8	7946.3	7946.3	7946.3	0.0
M	8,266	56	158	8.2	7970.3	7970.3	7970.3	0.0
N	8,918	60	300	4.3	7986.8	7986.8	7986.8	0.0
O	9,301	60	260	5.0	7997.1	7997.1	7997.6	0.5
P	9,969	68	328	4.0	8011.9	8011.9	8011.9	0.0
Q	10,512	58	260	5.0	8022.6	8022.6	8022.7	0.1
R	11,166	111	292	4.5	8034.6	8034.6	8035.0	0.4
S	12,078	43	214	6.1	8059.0	8059.0	8059.0	0.0
T	12,577	117	201	7.9	8072.7	8072.7	8072.7	0.0
U	13,653	63	243	5.4	8094.6	8094.6	8094.6	0.0
V	14,223	55	233	5.6	8105.3	8105.3	8105.8	0.5
W	14,764	67	198	6.6	8116.0	8116.0	8116.1	0.1
X	15,480	202	794	2.2	8132.5	8132.5	8133.0	0.5

[1] Feet Above Confluence with Roaring Fork River.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CASTLE 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
Castle Creek (cont.)								
Y	16,095	115	342	3.8	8141.7	8141.7	8141.7	0.0
Z	16,689	272	331	3.9	8156.0	8156.0	8156.0	0.0
AA	17,310	89	250	5.2	8168.0	8168.0	8168.0	0.0
AB	17,883	66	267	4.9	8180.8	8180.8	8180.9	0.1
AC	18,250	52	242	5.4	8188.9	8188.9	8188.9	0.0
AD	18,872	74	240	5.4	8200.1	8200.1	8200.1	0.0
AE	19,551	41	248	5.3	8214.2	8214.2	8214.2	0.0
AF	20,091	37	175	7.4	8226.6	8226.6	8226.9	0.3
AG	20,719	40	229	5.7	8238.3	8238.3	8238.5	0.2
AH	21,111	77	471	2.8	8249.2	8249.2	8249.2	0.0
AI	21,314	72	338	3.9	8249.7	8249.7	8249.2	0.0

[1] Feet Above Confluence with Roaring Fork River.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CASTLE 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
Coal Creek								
A	189	52	151	8.9	7173.4	7173.4	7173.4	0.0
B	1,293	145	263	5.1	7197.7	7197.7	7198.0	0.3
C	2,737	70	159	8.5	7233.9	7233.9	7234.3	0.4
D	4,023	162	293	4.6	7272.7	7272.7	7272.7	0.0
E	5,165	107	186	7.3	7310.3	7310.3	7310.3	0.0

[1] Feet Above Confluence with Crystal River.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COAL 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
Crystal River								
A	217	98	608	11.9	6260.6	6260.6	6261.4	0.8
B	1,410	120	891	8.1	6271.0	6271.0	6271.1	0.1
C	2,786	170	968	7.4	6281.0	6281.0	6281.1	0.1
D	3,730	113	891	8.1	6288.2	6288.2	6288.2	0.0
E	4,782	96	771	9.3	6296.3	6296.3	6296.3	0.0
F	5,803	121	789	9.1	6304.9	6304.9	6304.9	0.0
G	6,649	113	975	7.4	6315.5	6315.5	6315.7	0.2
H	7,718	139	953	7.6	6321.4	6321.4	6321.5	0.1
I	9,051	115	1,055	6.7	6332.8	6332.8	6332.9	0.1
J	10,106	174	1,084	6.6	6343.1	6343.1	6343.3	0.2
K	11,089	125	904	7.9	6350.9	6350.9	6350.9	0.0
L	12,516	152	1,181	6.0	6360.4	6360.4	6360.7	0.3
M	13,987	288	1,072	5.2	6371.7	6371.7	6372.0	0.3
N	14,952	152	831	6.7	6380.3	6380.3	6380.4	0.1
O	15,907	206	879	6.4	6387.3	6387.3	6387.3	0.0
P	16,971	324	1,377	4.1	6397.5	6397.5	6397.5	0.0
Q	17,934	155	758	7.3	6405.2	6405.2	6405.6	0.4
R	19,043	186	1,336	5.5	6419.7	6419.7	6420.2	0.5
S	20,038	65	621	8.9	6430.3	6430.3	6430.3	0.0
T	21,131	85	739	7.4	6440.6	6440.6	6440.7	0.1
U	22,618	126	652	8.4	6452.6	6452.6	6452.7	0.1
V	23,614	90	658	8.4	6464.9	6464.9	6465.0	0.1
W	25,084	87	638	8.6	6477.8	6477.8	6477.8	0.0
X	26,093	83	663	8.3	6488.0	6488.0	6488.0	0.0

[1] Feet Above Garfield County Line.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CRYSTAL 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
Crystal River (cont.)								
Y	26,875	67	722	7.8	6501.6	6501.6	6502.1	0.5
Z	27,544	97	589	8.8	6505.9	6505.9	6506.0	0.1
AA	28,229	232	736	6.8	6512.3	6512.3	6512.3	0.0
AB	29,119	184	616	8.1	6523.3	6523.3	6523.5	0.2
AC	29,819	55	348	14.4	6538.6	6538.6	6538.7	0.1
AD	31,049	95	566	8.8	6556.7	6556.7	6557.7	1.0
AE	31,809	69	387	12.9	6566.7	6566.7	6566.7	0.0
AF	31,919	47	372	13.5	6568.0	6568.0	6568.1	0.1
AG	32,159	57	414	12.1	6571.7	6571.7	6571.7	0.0
AH	33,089	80	529	9.4	6584.0	6584.0	6584.1	0.1
AI	33,559	115	735	6.8	6587.8	6587.8	6588.0	0.2
AJ	33,859	120	732	6.8	6589.2	6589.2	6589.8	0.6
AK	34,649	68	408	12.2	6595.8	6595.8	6596.7	0.9
AL	35,069	106	733	6.8	6602.1	6602.1	6603.1	1.0
AM	36,079	87	415	12.1	6615.7	6615.7	6615.7	0.0
AN	37,539	63	466	10.1	6638.9	6638.9	6639.0	0.1
AO	37,639	70	641	7.3	6642.7	6642.7	6642.9	0.2
AP	38,299	90	444	10.6	6647.4	6647.4	6647.7	0.3
AQ	38,829	88	567	8.3	6654.4	6654.4	6655.2	0.8
AR	39,389	58	421	11.2	6660.6	6660.6	6661.3	0.7
AS	39,889	306	1,470	3.2	6665.1	6665.1	6666.0	0.9
AT	40,389	247	607	7.7	6669.4	6669.4	6670.2	0.8
AU	40,809	309	889	5.3	6674.5	6674.5	6675.4	0.9
AV	41,609	164	506	9.3	6683.9	6683.9	6684.3	0.4

[1] Feet Above Garfield County Line.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CRYSTAL 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
Crystal River (cont.)								
AW	42,749	109	569	8.3	6698.3	6698.3	6699.2	0.9
AX	43,539	260	667	7.0	6707.5	6707.5	6707.7	0.2
AY	44,349	170	537	8.8	6717.5	6717.5	6718.2	0.7
AZ	45,749	92	459	10.2	6738.9	6738.9	6739.1	0.2
BA	45,879	107	764	6.2	6741.6	6741.6	6741.6	0.0
BB	46,319	45	312	15.0	6747.4	6747.4	6747.6	0.2
BC	46,799	85	573	8.2	6755.3	6755.3	6756.1	0.8
BD	47,729	130	432	10.9	6766.4	6766.4	6766.5	0.1
BE	48,229	69	461	10.2	6772.5	6772.5	6773.4	0.9
BF	48,659	135	564	6.9	6777.8	6777.8	6778.5	0.7
BG	49,569	210	532	7.3	6788.1	6788.1	6788.1	0.0
BH	50,139	93	397	9.8	6796.7	6796.7	6797.6	0.9
BI	52,419	65	313	12.5	6861.9	6861.9	6862.0	0.1
BJ	54,309	76	330	11.8	6910.5	6910.5	6910.6	0.1
BK	55,009	52	446	8.7	6918.4	6918.4	6918.9	0.5
BL	55,879	108	851	4.6	6921.1	6921.1	6921.7	0.6
BM	56,259	84	522	7.5	6922.4	6922.4	6923.0	0.6
BN	56,649	170	739	5.3	6925.1	6925.1	6925.7	0.6
BO	57,049	95	541	7.2	6926.9	6926.9	6927.6	0.7
BP	57,569	109	560	7.0	6930.1	6930.1	6931.0	0.9
BQ	58,209	315	994	3.9	6934.4	6934.4	6934.9	0.5
BR	58,709	304	1,105	3.5	6936.2	6936.2	6936.4	0.2
BS	59,279	180	458	8.5	6940.2	6940.2	6940.2	0.0
BT	60,139	200	779	5.0	6949.4	6949.4	6950.3	0.9

[1] Feet Above Garfield County Line.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CRYSTAL 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
Crystal River (cont.)								
BU	60,739	168	420	8.8	6956.4	6956.4	6956.4	0.0
BV	61,559	75	395	9.4	6970.8	6970.8	6971.0	0.2
BW	61,679	103	584	6.3	6974.6	6974.6	6974.6	0.0
BX	62,129	82	333	11.1	6981.9	6981.9	6981.9	0.0
BY	62,229	96	576	6.4	6985.6	6985.6	6985.6	0.0
BZ	62,709	85	329	11.2	6989.7	6989.7	6989.8	0.1
CA	63,369	75	454	8.2	6999.2	6999.2	7000.1	0.9
CB	63,789	100	495	7.5	7002.1	7002.1	7003.1	1.0
CC	64,169	81	331	11.2	7012.3	7012.3	7012.3	0.0
CD	64,299	65	306	12.1	7014.1	7014.1	7014.2	0.1
CE	64,659	71	310	11.9	7025.0	7025.0	7025.2	0.2
CF	66,089	50	283	13.1	7106.7	7106.7	7107.1	0.4
CG	66,719	69	469	7.9	7115.1	7115.1	7116.1	1.0
CH	67,688	54	381	11.5	7123.0	7123.0	7123.2	0.2
CI	68,620	151	1,106	4.0	7130.6	7130.6	7130.7	0.1
CJ	69,770	93	483	9.1	7138.7	7137.8	7138.3	0.5
CK	70,638	324	1,393	3.2	7142.5	7142.0	7142.2	0.2
CL	71,747	212	1,332	3.3	7147.0	7146.6	7147.0	0.4
CM	73,130	379	1,274	3.5	7154.6	7153.9	7154.3	0.4
CN	73,875	307	940	4.7	7159.3	7158.6	7158.9	0.3
CO	74,649	276	1,019	4.1	7165.8	7165.6	7165.7	0.1
CP	75,231	135	641	6.6	7172.0	7172.0	7172.0	0.0
CQ	76,201	100	746	4.9	7180.1	7180.1	7180.1	0.0
CR	77,001	104	396	9.2	7184.1	7184.1	7184.1	0.0

[1] Feet Above Garfield County Line.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CRYSTAL 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
Crystal River (cont.)								
CS	78,162	238	920	4.0	7194.9	7194.9	7195.1	0.2
CT	79,706	177	527	6.9	7208.1	7208.1	7208.1	0.0
CU	80,649	231	782	4.7	7219.0	7219.0	7219.2	0.2
CV	81,547	123	555	6.6	7229.1	7229.1	7229.3	0.2
CW	82,683	83	326	11.2	7254.7	7254.7	7254.7	0.0
CX	83,925	123	685	5.3	7273.4	7273.4	7273.6	0.2
CY	84,698	160	520	8.3	7281.9	7281.9	7281.9	0.0
CZ	85,190	124	354	8.5	7286.6	7286.6	7286.8	0.2
DA	86,030	50	262	11.5	7298.7	7298.7	7298.9	0.2
DB	86,660	43	233	12.9	7319.1	7319.1	7319.1	0.0
DC	87,160	72	565	5.3	7323.9	7323.9	7324.0	0.1
DD	88,260	40	226	13.3	7334.7	7334.7	7334.7	0.0
DE	88,880	74	459	6.5	7342.4	7342.4	7342.6	0.2
DF	89,040	50	332	9.0	7344.2	7344.2	7344.4	0.2
DG	90,200	45	236	12.7	7357.7	7357.7	7357.7	0.0
DH	92,330	77	415	6.6	7380.7	7380.7	7381.0	0.3
DI	93,950	56	255	10.8	7395.0	7395.0	7395.0	0.0
DJ	94,090	47	376	7.3	7400.0	7400.0	7400.0	0.0
DK	94,870	60	361	7.6	7403.7	7403.7	7404.0	0.3
DL	96,360	71	292	9.4	7418.8	7418.8	7418.9	0.1
DM	96,900	369	1,018	2.7	7422.5	7422.5	7422.6	0.1
DN	97,560	151	343	8.0	7427.0	7427.0	7427.4	0.4
DO	98,170	210	705	3.9	7431.7	7431.7	7432.4	0.7
DP	99,250	154	608	4.5	7434.6	7434.6	7435.0	0.4

[1] Feet Above Garfield County Line.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CRYSTAL 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
Crystal River (cont.)								
DQ	99,750	261	700	3.9	7438.6	7438.6	7438.9	0.3
DR	100,700	248	576	4.8	7444.5	7444.5	7444.9	0.4
DS	101,820	140	431	6.4	7452.8	7452.8	7453.2	0.4
DT	103,380	88	340	8.1	7467.5	7467.5	7467.8	0.3

[1] Feet Above Garfield County Line.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CRYSTAL 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
Hunter Creek								
A	150	32	141	12.1	7831.0	7831.0	7831.0	0.0
B	205	27	135	12.6	7832.2	7832.2	7832.2	0.0
C	230	27	134	12.7	7832.9	7832.9	7832.9	0.0
D	295	35	190	9.0	7834.8	7834.8	7835.1	0.3
E	485	40	169	10.1	7838.7	7838.7	7838.9	0.2
F	605	39	151	11.3	7841.4	7841.4	7841.4	0.0
G	665	48	132	12.9	7841.5	7841.5	7841.5	0.0
H	880	25	130	13.0	7847.1	7847.1	7847.3	0.2
I	1,115	161	279	6.1	7855.1	7855.1	7855.2	0.1
J	1,405	61	176	9.7	7864.6	7864.6	7864.6	0.0
K	1,535	46	185	9.2	7870.6	7870.6	7871.0	0.4

[1]Feet Above Confluence with Roaring Fork River.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

HUNTER 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
Maroon Creek								
A	102	117	390	5.9	7640.9	7640.9	7641.4	0.5
B	697	58	257	8.9	7657.2	7657.2	7657.2	0.0
C	1,593	60	241	9.5	7679.5	7679.5	7679.8	0.3
D	2,482	54	294	7.8	7701.5	7701.5	7701.5	0.0
E	3,232	110	321	7.2	7723.7	7723.7	7723.7	0.0
F	4,017	70	333	7.0	7744.0	7744.0	7744.4	0.4
G	5,006	130	542	4.2	7762.4	7762.4	7762.8	0.4
H	6,088	120	580	4.0	7786.9	7786.9	7786.9	0.0
I	6,442	74	237	9.7	7791.6	7791.6	7791.6	0.0
J	7,392	64	218	10.5	7814.6	7814.6	7814.6	0.0
K	8,132	60	213	10.8	7830.8	7830.8	7830.8	0.0
L	8,722	60	223	10.3	7842.5	7842.5	7842.6	0.1
M	9,462	55	207	11.1	7860.1	7860.1	7860.1	0.0

[1]Feet Above Confluence with Roaring Fork River.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

MAROON 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
Roaring Fork River								
O	21,275	112/100[2]	741	14.0	6533.6	6533.6	6533.6	0.0
P[3]	23,183	346	1,032	10.1	6543.5	6543.5	6543.5	0.0
Q[3]	24,952	444	2,029	5.1	6556.3	6556.3	6556.3	0.0
R[3]	26,178	605	2,196	4.7	6567.2	6567.2	6567.2	0.0
S[3]	28,358	522	1,437	7.2	6584.4	6584.4	6584.4	0.0
T[4]	29,219	610/310[2]	2,381	4.4	6593.4	6593.4	6593.5	0.1
U	30,144	295	1,288	7.3	6604.5	6604.5	6604.5	0.0
V	31,507	289	921	10.2	6620.3	6620.3	6620.3	0.0
W	33,910	481	1,186	7.9	6652.0	6652.0	6652.0	0.0
X	35,200	440	978	9.6	6667.9	6667.9	6667.9	0.0
Y	36,405	405	1,088	9.4	6682.0	6682.0	6682.0	0.0
Z	37,525	406	1,344	7.0	6700.0	6700.0	6700.0	0.0
AA	38,245	200	754	12.5	6708.2	6708.2	6708.2	0.0
AB	39,975	137	944	10.0	6730.8	6730.8	6730.8	0.0
AC	41,087	144	809	11.6	6741.3	6741.3	6741.4	0.1
AD	41,668	106	691	13.6	6746.2	6746.2	6746.3	0.1
AE	42,199	100	1,669	6.8	6761.5	6761.5	6762.2	0.7
AF	42,880	222	958	9.8	6766.5	6766.5	6766.5	0.0
AG	43,140	234	962	9.8	6768.8	6768.8	6768.8	0.0
AH	43,372	270	982	9.6	6771.7	6771.7	6771.7	0.0
AI	43,970	142	897	10.5	6779.3	6779.3	6779.3	0.0
AJ	44,337	163	841	11.2	6783.7	6783.7	6783.7	0.0
AK	44,597	175	864	11.4	6786.4	6786.4	6786.4	0.0
AL	44,702	201	1,061	8.9	6788.0	6788.0	6788.0	0.0

[1] Feet Above Eagle-Garfield County Line.
[2] Total width/width in Pitkin County.
[3] Located outside of Pitkin County.
[4] Shown without consideration of lateral flow.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

ROARING FORK 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
Roaring Fork River (cont.)								
AM	44,923	144	853	13.3	6790.5	6790.5	6790.5	0.0
AN	45,321	157	813	11.7	6794.8	6794.8	6794.9	0.1
AO	45,962	181	831	11.3	6800.9	6800.9	6800.9	0.0
AP	46,220	106	679	13.9	6803.6	6803.6	6803.6	0.0
AQ	46,757	141	826	11.4	6808.8	6808.8	6808.8	0.0
AR	48,164	165	826	11.4	6826.2	6826.2	6826.4	0.2
AS	50,097	111	699	11.9	6848.6	6848.6	6848.6	0.0
AT	50,666	78	710	11.7	6857.9	6857.9	6858.2	0.3
AU	52,145	119	750	11.1	6874.4	6874.4	6874.8	0.4
AV	53,115	64	714	11.6	6886.8	6886.8	6887.3	0.5
AW	54,483	126	893	9.3	6903.5	6903.5	6903.9	0.4
AX	55,952	503	2,049	4.1	6920.8	6920.8	6921.1	0.3
AY	57,559	334	1,533	5.4	6940.1	6940.1	6940.6	0.5
AZ	58,266	357	1,444	5.7	6947.7	6947.7	6948.1	0.4
BA	59,319	282	1,529	5.4	6960.6	6960.6	6961.1	0.5
BB	60,423	377	1,524	5.4	6970.2	6970.2	6970.5	0.3
BC	61,755	331	1,465	5.7	6983.8	6983.8	6984.3	0.5
BD	63,049	249	1,224	6.8	6996.2	6996.2	6996.4	0.2
BE	64,068	135	989	8.4	7007.9	7007.9	7008.3	0.4
BF	65,010	92	832	10.0	7017.5	7017.5	7017.8	0.3
BG	66,453	61	595	13.9	7031.5	7031.5	7031.5	0.0
BH	67,843	84	746	11.1	7045.9	7045.9	7046.2	0.3
BI	69,005	128	1,021	8.1	7057.5	7057.5	7057.9	0.4
BJ	70,114	89	810	10.2	7069.9	7069.9	7070.1	0.2

[1] Feet Above Eagle-Garfield County Line.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

ROARING FORK 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
Roaring Fork River (cont.)								
BK	70,973	102	997	8.3	7077.9	7077.9	7078.0	0.1
BL	71,897	94	834	10.0	7086.4	7086.4	7086.9	0.5
BM	72,815	95	811	10.2	7095.7	7095.7	7096.1	0.4
BN	73,730	99	871	9.5	7105.5	7105.5	7105.8	0.3
BO	74,638	88	806	10.3	7115.0	7115.0	7115.3	0.3
BP	75,771	234	2,152	3.9	7128.3	7128.3	7128.6	0.3
BQ	76,786	173	1,104	7.5	7135.8	7135.8	7136.0	0.2
BR	77,440	125	903	9.2	7142.6	7142.6	7143.1	0.5
BS	78,223	210	1,374	6.0	7151.7	7151.7	7152.2	0.5
BT	79,322	122	1,007	8.2	7163.3	7163.3	7163.8	0.5
BU	80,246	152	1,143	7.3	7173.6	7173.6	7174.0	0.4
BV	81,123	127	1,149	7.2	7182.3	7182.3	7182.6	0.3
BW	81,931	90	811	10.2	7189.6	7189.6	7190.0	0.4
BX	82,987	88	676	12.3	7199.4	7199.4	7199.8	0.4
BY	83,979	121	1,099	7.5	7212.1	7212.1	7212.5	0.4
BZ	84,904	113	948	8.8	7221.3	7221.3	7221.7	0.4
CA	85,760	108	753	11.0	7230.2	7230.2	7230.6	0.4
CB	86,784	120	900	9.2	7246.2	7246.2	7246.6	0.4
CC	87,722	105	895	9.3	7260.2	7260.2	7260.5	0.3
CD	88,635	112	849	7.9	7271.9	7271.9	7271.9	0.0
CE	89,656	118	750	8.9	7280.9	7280.9	7281.4	0.5
CF	90,638	135	950	7.1	7291.1	7291.1	7291.5	0.4
CG	91,611	139	998	6.7	7300.1	7300.1	7300.6	0.5
CH	92,490	126	790	8.5	7310.5	7310.5	7310.7	0.2

[1] Feet Above Eagle-Garfield County Line.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

ROARING FORK 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
Roaring Fork River (cont.)								
CI	93,391	107	947	7.1	7322.6	7322.6	7323.0	0.4
CJ	94,771	90	790	8.5	7336.9	7336.9	7337.4	0.5
CK	96,114	65	657	10.2	7350.6	7350.6	7350.7	0.1
CL	97,044	129	702	9.5	7357.6	7357.6	7358.0	0.4
CM	98,449	120	549	12.2	7375.2	7375.2	7375.2	0.0
CN	99,859	94	508	13.2	7394.1	7394.1	7394.1	0.0
CO	101,354	145	632	10.6	7409.7	7409.7	7409.7	0.0
CP	102,794	69	457	14.7	7434.9	7434.9	7434.9	0.0
CQ	104,374	106	535	12.5	7451.9	7451.9	7451.9	0.0
CR	106,074	130	565	11.9	7482.0	7482.0	7482.0	0.0
CS	107,284	131	568	11.8	7502.7	7502.7	7502.7	0.0
CT	108,134	90	498	13.5	7516.2	7516.2	7516.2	0.0
CU	109,589	70	458	14.6	7547.0	7547.0	7547.0	0.0
CV	110,989	112	536	12.5	7565.3	7565.3	7565.3	0.0
CW	111,659	121	552	12.1	7574.6	7574.6	7574.6	0.0
CX	112,004	117	612	10.9	7578.2	7578.2	7578.2	0.0
CY	112,599	150	708	9.5	7582.9	7582.9	7583.0	0.1
CZ	113,134	90	501	13.4	7587.6	7587.6	7587.6	0.0
DA	114,534	114	572	11.7	7601.6	7601.6	7601.7	0.1
DB	114,679	150	1,184	5.7	7612.0	7612.0	7612.0	0.0
DC	115,224	95	507	13.2	7621.3	7621.3	7621.3	0.0
DD	116,154	80	509	13.2	7635.4	7635.4	7635.4	0.0
DE	116,984	76	418	13.6	7652.1	7652.1	7652.1	0.0
DF	117,934	67	406	14.1	7669.0	7669.0	7669.0	0.0

[1] Feet Above Eagle-Garfield County Line.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

ROARING FORK RIVER

FLOODING SOURCE		FLOODWAY			BASE 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
Roaring Fork River (cont.)								
DG	119,164	90	448	12.7	7690.1	7690.1	7690.1	0.0
DH	120,101	73	365	12.6	7710.7	7710.7	7710.7	0.0
DI	120,470	96	691	6.7	7717.4	7717.4	7717.6	0.2
DJ	121,741	144	779	5.9	7729.5	7729.5	7729.7	0.2
DK	122,673	89	486	9.5	7739.9	7739.9	7740.1	0.2
DL	123,990	127	610	5.4	7756.0	7756.0	7756.1	0.1
DM	124,709	119	582	5.7	7764.4	7764.4	7764.6	0.2
DN	125,343	137	549	6.0	7771.8	7771.8	7772.1	0.3
DO	126,358	88	575	5.7	7787.0	7787.0	7787.2	0.2
DP	127,215	111	544	6.1	7798.1	7798.1	7798.1	0.0
DQ	127,845	139	512	6.5	7809.0	7809.0	7809.0	0.0
DR	128,290	110	427	7.7	7816.0	7816.0	7816.4	0.4
DS	129,101	202	589	5.6	7825.7	7825.7	7826.2	0.5
DT	129,770	197	579	4.9	7834.7	7834.7	7835.2	0.5
DU	130,012	87	431	6.6	7840.3	7840.3	7840.3	0.0
DV	130,705	193	708	4.0	7848.3	7848.3	7848.3	0.0
DW	130,948	72	416	6.9	7851.1	7851.1	7851.1	0.0
DX	131,549	186	420	6.8	7857.9	7857.9	7857.9	0.0
DY	132,277	102	298	9.6	7865.8	7865.8	7865.9	0.1
DZ	132,997	81	359	7.9	7879.7	7879.7	7879.7	0.0
EA	133,438	140	643	4.5	7887.8	7887.8	7887.8	0.0
EB	134,144	115	658	4.3	7900.7	7900.7	7900.7	0.0
EC	134,620	64	347	8.2	7908.1	7908.1	7908.4	0.3
ED	135,326	74	595	4.8	7925.6	7925.6	7925.8	0.2

[1] Feet Above Eagle-Garfield County Line.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

ROARING FORK RIVER

FLOODING SOURCE		FLOODWAY			BASE 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
Roaring Fork River (cont.)								
EE	136,018	116	794	4.0	7945.0	7945.0	7945.0	0.0
EF	136,766	85	330	8.6	7956.2	7956.2	7956.2	0.0
EG	137,461	77	418	6.8	7974.5	7974.5	7974.6	0.1
EH	138,109	87	712	4.0	7985.1	7985.1	7985.1	0.0
EI	138,545	73	331	8.6	7990.0	7990.0	7990.1	0.1
EJ	139,585	564	2,270	1.3	7993.6	7993.6	7994.0	0.4
EK	140,249	245	877	3.7	7994.4	7994.4	7994.8	0.4
EL	141,080	179	556	5.1	8004.7	8004.7	8005.1	0.4
EM	141,778	173	780	3.8	8030.1	8030.1	8030.6	0.5
EN	143,078	134	953	3.0	8033.2	8033.2	8033.6	0.4
EO	143,642	114	968	3.3	8034.0	8034.0	8034.5	0.5
EP	144,172	478	3,573	0.8	8034.3	8034.3	8034.8	0.5
EQ	145,133	862	6,206	0.5	8034.4	8034.4	8034.9	0.5
ER	146,258	1,448	11,384	0.3	8034.4	8034.4	8034.9	0.5
ES	147,406	1,330	9,330	0.3	8034.4	8034.4	8034.9	0.5
ET	148,853	1,169	7,506	0.4	8034.5	8034.5	8034.9	0.4
EU	149,451	1,237	6,218	0.5	8034.5	8034.5	8035.0	0.5
EV	152,562	829	3,010	0.9	8034.5	8034.5	8035.0	0.5
EW	154,012	475	1,741	1.6	8035.2	8035.2	8035.7	0.5
EX	154,872	187	849	3.4	8037.0	8037.0	8037.5	0.5
EY	155,846	750	2,530	1.2	8038.1	8038.1	8038.6	0.5
EZ	156,909	847	2,762	1.0	8038.5	8038.5	8039.0	0.5
FA	157,822	698	1242	2.4	8041.3	8041.3	8041.6	0.3
FB	158,844	220	848	3.4	8043.4	8043.4	8043.6	0.2

[1] Feet Above Eagle-Garfield County Line.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

ROARING FORK RIVER

FLOODING SOURCE		FLOODWAY			BASE 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
Roaring Fork River (cont.)								
FC	159,754	114	676	4.2	8059.6	8059.6	8059.6	0.0
FD	160,853	135	963	3.0	8082.2	8082.2	8082.2	0.0
FE	162,081	199	675	4.2	8085.0	8085.0	8085.1	0.1
FF	163,123	102	125	4.5	8090.4	8090.4	8090.4	0.0
FG	164,037	92	139	4.0	8101.5	8101.5	8101.6	0.1
FH	165,420	65	255	11.2	8139.2	8139.2	8139.2	0.0
FI	166,206	98	391	7.3	8175.1	8175.1	8175.1	0.0
FJ	166,784	62	240	10.0	8211.6	8211.6	8211.6	0.0
FK	167,529	112	353	6.8	8265.7	8265.7	8265.7	0.0
FL	168,019	67	230	10.4	8313.8	8313.8	8313.8	0.0
FM	168,553	100	262	9.2	8372.5	8372.5	8372.6	0.1
FN	169,296	59	220	10.9	8418.3	8418.3	8418.3	0.0
FO	169,885	88	252	9.5	8475.4	8475.4	8475.4	0.0
FP	170,670	72	235	10.2	8533.3	8533.3	8533.3	0.0
FQ	171,639	127	488	4.9	8570.8	8570.8	8570.8	0.0
FR	172,141	590	1,254	1.9	8573.1	8573.1	8573.1	0.0
FS	173,215	161	356	3.7	8579.6	8579.6	8579.6	0.0
FT	174,271	258	471	4.5	8588.2	8588.2	8588.2	0.0
FU	175,370	153	606	4.0	8604.8	8604.8	8605.2	0.4

[1] Feet Above Eagle-Garfield County Line.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

ROARING FORK RIVER

FLOODING SOURCE		FLOODWAY			BASE 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
Roaring Fork River – Middle Split Flow Path								
A	269	147	302	7.6	8087.0	8087.0	8087.1	0.1
B	1,165	143	311	7.5	8092.3	8092.3	8092.5	0.2
C	1,659	215	344	6.7	8101.1	8101.1	8101.4	0.3

[1] Feet Above Confluence with Roaring Fork River.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

ROARING FORK RIVER – MIDDLE SPLIT FLOW PATH

FLOODING SOURCE		FLOODWAY			BASE 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
Roaring Fork River – Upper Split Flow Path								
A	235	435	297	4.3	8574.0	8574.0	8574.1	0.1
B	964	150	121	4.0	8579.4	8579.4	8579.4	0.0
C	1,352	155	75	3.4	8584.0	8584.0	8584.0	0.0
D	2,250	348	70	3.6	8592.6	8592.6	8592.6	0.0
E	2,540	285	132	1.1	8598.2	8598.2	8598.2	0.0

[1] Feet Above Confluence with Roaring Fork River.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

ROARING FORK RIVER – UPPER SPLIT FLOW PATH

FLOODING SOURCE		FLOODWAY			BASE 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
Snowmass Creek								
A	120	40	188	10.1	6852.6	6852.6	6853.1	0.5
B	225	47	188	10.1	6857.6	6857.6	6858.3	0.7
C	640	59	182	10.4	6869.6	6869.6	6869.6	0.0
D	1,100	77	205	9.3	6883.9	6883.9	6883.9	0.0
E	1,760	53	180	10.6	6902.3	6902.3	6902.3	0.0
F	2,530	48	175	10.9	6922.7	6922.7	6922.7	0.0
G	3,275	100	245	7.8	6942.0	6942.0	6942.0	0.0
H	4,060	32	153	12.4	6958.5	6958.5	6958.5	0.0
I	4,345	45	266	7.1	6966.0	6966.0	6966.1	0.1
J	5,650	29	147	12.9	6996.1	6996.1	6996.1	0.0
K	6,370	45	171	11.1	7012.1	7012.1	7012.1	0.0
L	6,770	45	172	11.1	7019.6	7019.6	7019.6	0.0
M	6,820	39	289	6.6	7021.4	7021.4	7021.4	0.0
N	7,100	105	225	8.4	7030.5	7030.5	7030.5	0.0
O	7,725	72	196	9.7	7047.0	7047.0	7047.0	0.0
P	7,935	88	215	8.8	7051.2	7051.2	7051.2	0.0
Q	8,025	14	91	14.5	7053.6	7053.6	7053.6	0.0
R	8,490	86	156	8.4	7066.2	7066.2	7066.2	0.0
S	8,920	55	142	9.3	7073.6	7073.6	7073.6	0.0
T	9,985	50	137	9.6	7100.9	7100.9	7101.0	0.1
U	10,825	60	146	9.1	7124.1	7124.1	7124.1	0.0
V	11,550	40	129	10.2	7144.3	7144.3	7144.3	0.0
W	12,180	39	128	10.3	7159.7	7159.7	7159.7	0.0
X	12,915	67	153	8.6	7179.1	7179.1	7179.1	0.0

[1] Feet Above Confluence with Roaring Fork River.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

SNOWMASS CREEK

FLOODING SOURCE		FLOODWAY			BASE 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
Snowmass Creek (cont.)								
Y	12,955	33	121	10.9	7181.6	7181.6	7181.6	0.0
Z	12,990	33	172	7.7	7183.1	7183.1	7183.1	0.0
AA	13,410	41	130	10.2	7193.7	7193.7	7193.7	0.0
AB	13,925	63	150	8.8	7205.9	7205.9	7205.9	0.0
AC	14,615	54	143	9.3	7222.2	7222.2	7222.2	0.0
AD	15,360	61	149	8.9	7241.3	7241.3	7241.3	0.0
AE	16,200	49	138	9.6	7260.0	7260.0	7260.0	0.0
AF	16,325	29	115	11.4	7265.2	7265.2	7265.2	0.0
AG	16,365	29	166	8.0	7266.9	7266.9	7266.9	0.0
AH	16,455	93	171	7.7	7268.4	7268.4	7268.4	0.0
AI	17,260	27	113	11.7	7289.2	7289.2	7289.2	0.0
AJ	17,915	42	131	10.1	7308.6	7308.6	7308.6	0.0
AK	18,710	51	140	9.4	7330.6	7330.6	7330.8	0.2
AL	19,420	70	151	8.7	7359.1	7359.1	7359.1	0.0
AM	20,120	82	145	9.1	7381.0	7381.0	7381.0	0.0
AN	20,950	45	135	9.8	7410.2	7410.2	7410.2	0.0
AO	21,690	33	121	10.9	7436.1	7436.1	7436.1	0.0
AP	22,375	27	113	11.7	7457.0	7457.0	7457.0	0.0
AQ	23,185	44	133	9.9	7485.3	7485.3	7485.3	0.0
AR	24,080	49	127	9.2	7518.5	7518.5	7518.5	0.0
AS	24,780	37	116	10.0	7544.3	7544.3	7544.3	0.0
AT	24,820	31	141	8.3	7548.4	7548.4	7548.4	0.0
AU	25,510	36	115	10.2	7576.6	7576.6	7576.6	0.0
AV	26,410	35	114	10.3	7608.6	7608.6	7608.6	0.0

[1] Feet Above Confluence with Roaring Fork River.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

SNOWMASS CREEK

FLOODING SOURCE		FLOODWAY			BASE 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
Snowmass Creek (cont.)								
AW	27,080	33	111	10.5	7632.1	7632.1	7632.1	0.0
AX	27,985	32	110	10.6	7663.8	7663.8	7663.8	0.0
AY	28,750	33	111	10.5	7688.7	7688.7	7688.7	0.0
AZ	29,510	37	116	10.1	7712.8	7712.8	7712.8	0.0
BA	30,160	40	119	9.8	7728.7	7728.7	7728.7	0.0
BB	30,740	28	105	11.1	7747.5	7747.5	7747.5	0.0
BC	30,820	37	165	7.1	7750.9	7750.9	7750.9	0.0
BD	31,300	38	117	10.0	7760.6	7760.6	7760.6	0.0
BE	31,865	31	109	10.7	7780.4	7780.4	7780.4	0.0
BF	32,655	46	125	9.4	7801.4	7801.4	7801.4	0.0
BG	33,680	43	147	8.0	7818.6	7818.6	7818.7	0.1
BH	34,645	40	119	9.9	7834.8	7834.8	7834.8	0.0
BI	35,505	54	159	6.9	7848.8	7848.8	7848.9	0.1
BJ	36,555	55	123	8.9	7865.0	7865.0	7865.4	0.4
BK	38,185	35	109	10.1	7903.5	7903.5	7903.5	0.0
BL	39,000	35	117	9.4	7920.1	7920.1	7920.2	0.1
BM	39,830	42	142	7.8	7933.0	7933.0	7933.0	0.0
BN	40,560	38	117	9.4	7943.1	7943.1	7943.4	0.3
BO	41,620	90	176	6.2	7959.5	7959.5	7960.0	0.5
BP	42,600	35	128	8.1	7971.8	7971.8	7972.2	0.4
BQ	43,400	50	131	8.0	7982.3	7982.3	7982.7	0.4
BR	44,350	32	147	7.1	7992.7	7992.7	7992.8	0.1
BS	45,095	44	115	9.0	8002.8	8002.8	8003.2	0.4
BT	46,015	31	125	8.4	8017.9	8017.9	8018.1	0.2

[1] Feet Above Confluence with Roaring Fork River.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

SNOWMASS CREEK

FLOODING SOURCE		FLOODWAY			BASE 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
Snowmass Creek (cont.)								
BU	46,770	42	134	7.8	8027.7	8027.7	8027.9	0.2
BV	47,780	26	102	10.2	8043.0	8043.0	8043.0	0.0
BW	48,500	35	143	7.3	8052.4	8052.4	8052.6	0.2
BX	49,120	47	122	8.5	8060.2	8060.2	8060.2	0.0
BY	50,200	60	189	5.5	8080.1	8080.1	8080.1	0.0
BZ	50,240	60	212	4.9	8080.5	8080.5	8080.5	0.0
CA	50,450	88	272	3.8	8081.5	8081.5	8081.5	0.0
CB	51,000	68	132	7.9	8095.2	8095.2	8095.2	0.0
CC	51,610	69	167	6.2	8105.4	8105.4	8105.5	0.1
CD	51,750	47	193	5.4	8106.7	8106.7	8106.8	0.1
CE	51,780	47	202	5.1	8106.9	8106.9	8107.0	0.1
CF	53,100	19	88	11.8	8135.3	8135.3	8135.4	0.1
CG	53,115	20	116	9.0	8136.9	8136.9	8136.9	0.0
CH	53,185	61	375	2.8	8138.3	8138.3	8138.3	0.0
CI	53,760	42	112	9.3	8150.1	8150.1	8150.1	0.0
CJ	54,400	82	180	5.8	8161.0	8161.0	8161.2	0.2
CK	55,130	112	167	6.2	8172.1	8172.1	8172.1	0.0
CL	55,980	34	106	9.8	8190.9	8190.9	8191.0	0.1
CM	56,775	60	126	8.3	8209.7	8209.7	8209.7	0.0
CN	57,300	56	124	8.4	8223.7	8223.7	8223.7	0.0
CO	58,000	75	147	7.1	8238.8	8238.8	8238.8	0.0
CP	58,560	64	128	8.1	8251.0	8251.0	8251.0	0.0
CQ	59,215	59	144	7.2	8263.4	8263.4	8263.6	0.2
CR	59,520	37	109	8.7	8268.5	8268.5	8268.5	0.0

[1] Feet Above Confluence with Roaring Fork River.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

SNOWMASS CREEK

FLOODING SOURCE		FLOODWAY			BASE 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
Snowmass Creek (cont.)								
CS	59,850	25	103	9.2	8273.6	8273.6	8273.8	0.2
CT	59,950	34	164	5.8	8284.6	8284.6	8284.6	0.0

[1] Feet Above Confluence with Roaring Fork River.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

SNOWMASS CREEK

FLOODING SOURCE		FLOODWAY			BASE 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 Side Split – Roaring Fork River								
C	1,310	120/30[2]	373	3.3	6563.0	6563.1	6563.1	0.0
D	1,890	358/295[2]	420	2.9	6567.1	6567.2	6567.2	0.0
E	3,140	285	1,495	2.5	6585.5	6585.6	6585.6	0.0
F	4,277	483	1,696	2.2	6592.5	6592.6	6592.6	0.0
G	5,423	810	1,055	3.6	6603.0	6603.1	6603.1	0.0
H	5,706	855	1,166	3.5	6608.5	6608.6	6608.6	0.0
I	6,586	855	1,075	4.1	6616.6	6616.7	6616.7	0.0
J	7,523	525	729	6.0	6626.3	6626.4	6626.4	0.0
K	8,248	435	977	4.5	6637.9	6638.0	6638.0	0.0

[1] Feet Above Confluence with Roaring Fork River.
[2] Total Width/Width within Pitkin County.

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

SOUTH SIDE SPLIT FLOW – ROARING FORK RIVER

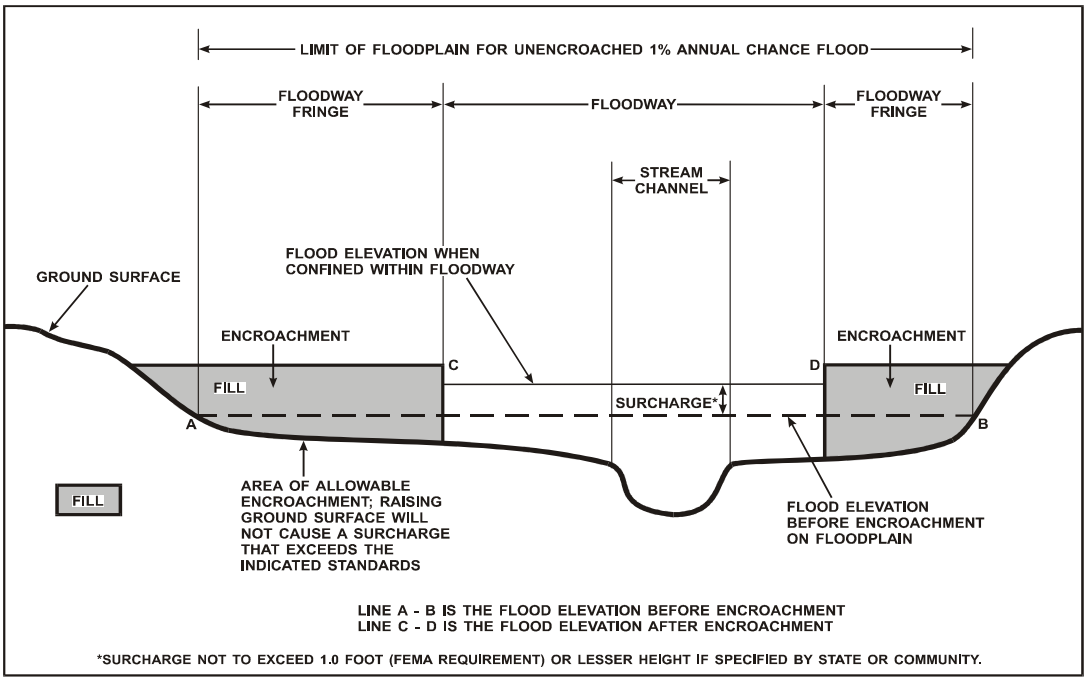

Figure 1 – Floodway Schematic

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. 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-foot 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-foot 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 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 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 Pitkin County. Previously, separate FHBMs and/or FIRMs were prepared for each identified flood-prone incorporated community and the unincorporated areas of the county. Historical data relating to the maps prepared for the City of Aspen, the Town of Basalt, the Town of Snowmass Village, and the unincorporated areas of Pitkin County are presented in Table 7.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FIRM EFFECTIVE DATE	FIRM REVISION DATE(S)
Aspen, City of	February 15, 1974	December 24, 1976	December 4, 1985	June 4, 1987
Basalt, Town of	June 28, 1974	N/A	March 18, 1980	June 4, 1987 October 19, 2004
Snowmass Village, Town of	June 4, 1987	N/A	June 4, 1987	September 30, 1988
Pitkin, County of (Unincorporated Areas)	August 7, 1975	October 25, 1977	June 4, 1987	October 19, 2004

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

The results of the current study are in agreement with the results of the FIS reports for the unincorporated areas of Garfield, Chaffee, and Mesa Counties (References 25, 26, and 27, respectively), and a FHBM for the unincorporated areas of Gunnison County (Reference 28). The current study is based on a more recent detailed analysis for the Roaring Fork River than what is presented in the FIS report for the unincorporated areas of Eagle County (Reference 29); therefore, the studies do not agree.

Because of the more detailed analysis performed for the current study, it supersedes the previously published FHBM for the unincorporated areas of Pitkin County (Reference 24). The current FIS report either supersedes or is compatible with all previous studies on streams studied in this report and should be considered authoritative for purposes of the NFIP. Table 8 contains all determination of letters issued by FEMA resulting in map changes (Letter of Map Revision [LOMR], Special Response [SR], Letter of Map Amendment [LOMA]) that have been incorporated into the FIS since the previous effective date.

Table 8 Incorporated Letters of Map Change

Community	Flooding Source(s) and Project Identifier	Case Number	Effective Date	Type
Pitkin County, CO (Unincorporated Areas)	Brush Creek Tributary to Roaring Fork River	05-08-0310P	August 15, 2005	LOMR

Table 9 contains all determination of letters issued by FEMA that have been superseded (Letter of Map Revision [LOMR], Special Response [SR], Letter of Map Amendment [LOMA]).

Table 9 Superseded Letters of Map Change

LOMC	Case No.	Date Issued	Project Identifier	Reason Determination Will be Superseded
CITY OF ASPEN				
102	199106232FIA	11/15/1990	N/A	4
PITKIN COUNTY				
LOMR-FW	08-08-0797A	09/30/2008	SPAROVIC LOT SPLIT SUBDIV, LOT 1A – 42520 EAST HIGHWAY 82	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.

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

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2. U.S. Census Bureau, Population Estimates, July 1, 2000, http://www.census.gov/population/www/estimates/popest.html

3. Wright-McLaughlin Engineers, Flood Plain Information Report, Roaring Fork River, Aspen to Basalt, Pitkin County, Colorado, August 1976.

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5. U.S. Department of the Army, Corps of Engineers, Los Angeles District, Investigation of Flood Problems on Roaring Fork River, Colorado, 1958.
6. U.S. Department of the Army, Corps of Engineers, Sacramento District, Flood Plain Information, Aspen, Colorado, 1983

7. Denver Engineering Corporation, Hydrology Report for City of Aspen and Pitkin County (Unincorporated Areas) Flood Insurance Studies, January 1984

8. U.S. Department of the Interior, Bureau of Reclamation, Document No. DC-6110, Specifications for Ruedi Dam, Lakewood, Colorado, June 1964

9. U.S. Department of the Army, Corps of Engineers, Sacramento District, Internal Memorandum, Basalt, Colorado Hydrology, August 1976

10. U.S. Water Resources Council, Guidelines for Determining Flood Flow Frequency, *Bulletin 17A,* 1978

11. U.S. Department of the Army, Corps of Engineers, Hydrologic Engineering Center, Computer Program 723-X6-L202A, HEC-2 Water-Surface Profiles, Davis, California, March 1982, with updates

12. Cooper Aerial Survey Company, Topographic Maps, Scale 1:1,200 and 1:600, Contour Interval 2-feet: Aspen, Colorado

13. Bell Mapping Company, Topographic Maps, Scale 1:2,400, Contour Interval 2-feet: Basalt Area, Eagle and Pitkin Counties, Colorado (October 19,1981)

14. Centennial Engineering, Inc., Topographic Maps, Scale 1:1,200, Contour Interval 2-feet: Brush Creek Road Improvement Project, Colorado (May 1982)

15. Wright-McLaughlin Engineers, Flood Plain Information, Roaring Fork and Fryingpan Rivers, Eagle County, Colorado, February 1978

16. Wright-McLaughlin Engineers, Flood Plain Information, Crystal River and Coal Creek, prepared for Pitkin County and the Colorado Water Conservation Board, 1979

17. Air Photo Surveys, Aerial Photographs, Basalt, Colorado, Scale 1:7,200, November 11, 1975

18. Benchmark Mapping Services, Topographic Maps, Scale 1:2,400, Contour Interval 2-feet: Crystal River and Coal Creek, Colorado (May 19, 1978)

19. Air Photo Surveys, Inc., Topographic Maps, Scale 1:4,800, Contour Interval 5-feet: Roaring Fork Valley Area, Colorado (1973)

20. Falcon Air Maps, Inc., Topographic Maps, Scale 1:2,400, Contour Interval 5-feet: Aspen Area, Colorado (1964) modified by the U.S. Army Corps of Engineers (1973)

21. Nichols Associates, Inc., Topographic Maps, Scale 1:2,400, Contour Interval 5-feet: Pitkin County Area, Colorado (July 1984)

22. U.S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 40-feet: Highland Peak, Colorado (1960)

23. U.S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps. Scale 1:24,000, Contour Interval 2-feet: Basalt, Colorado (1961 and 1987)

24. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Pitkin County, Colorado (Unincorporated Areas), Revised October 25, 1977

25. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Garfield County, Colorado (Unincorporated Areas), Revised January 3, 1986

26. Federal Emergency Management Agency, Flood Insurance Study, Chaffee County, Colorado (Unincorporated Areas), March 4, 1987

27. Federal Emergency Management Agency, Flood Insurance Study, Mesa County, Colorado (Unincorporated Areas), Revised December 4, 1985

28. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Gunnison County, Colorado (Unincorporated Areas), Revised August 9, 1977

29. Federal Emergency Management Agency, Flood Insurance Study, Eagle County, Colorado and Incorporated Areas, December 4, 2007.

30. U.S. Department of the Army, Corps of Engineers, Hydrologic Engineering Center, HEC-RAS River Analysis System Computer Program, Version 2.2, August 1998.

31. Matrix Design Group, Inc., Flood Plain Information Report, Roaring Fork River, Town of Basalt, Eagle and Pitkin Counties, Colorado, July 24, 2000.

32. Matrix Design Group, Inc., Flood Plain Information Report, Roaring Fork River, Town of Basalt, Eagle and Pitkin Counties, Colorado, November 14, 2001.

33. Federal Emergency Management Agency, Flood Insurance Study, Pitkin County, Colorado and Incorporated Areas, Revised September 30, 1988

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36. Anderson Consulting Engineers, Inc., Hydraulic Evaluation and Floodplain Mapping for Castle Creek, Coal Creek, Crystal River, Maroon Creek, and the Roaring Fork River as part of the FEMA RiskMAP Map Maintenance Project for Pitkin County, Colorado, prepared for the Colorado Water Conservation Board, March 2012.

37. U.S. Department of the Army, Corps of Engineers, Hydrologic Engineering Center, HEC-RAS River Analysis System Computer Program, Version 4.0, March 2008.

10.0 REVISIONS DESCRIPTIONS

This section has been added to provide information regarding significant revisions made since the original FIS report and FIRM were printed. Future revisions may be made that do not result in the republishing of the FIS report. To assure that any user is aware of all revisions, it is advisable to contact the community repository of flood hazard data located at the County Planning Engineer's Office, City Hall, 130 South Galena Street, Aspen, Colorado 81611.

10.1 First Revision

This study was revised on September 30, 1988, to add approximate Zone A flooding along Brush Creek from the Limit of Detailed Study at the corporate limit of the Town of Snowmass Village, Colorado, to a point approximately 2.5 miles upstream. The floodplain boundary delineations were developed by Denver Engineering Corporation, SC for the countywide study used in preparation of the effective FIS, using a topographic map at a scale of 1:400 and a contour interval of 5-feet.

10.2 Second Revision

This study was revised on October 19, 2004, to incorporate the effects of flooding on the Roaring Fork River as a result of channel instability from past floods, channel encroachment in and around the Town of Basalt caused by construction of the State Highway 82 (SH82) Bypass around the Town of Basalt and other development, reconstruction of the Wingo Bridge and Waterman Bridge, and construction of the Upper and Lower Basalt Bypass Bridges and the Midland Avenue Bridge.

FEMA realized that many changes had occurred in the river since the previous studies and that a new study was needed. From 1997 through 1999, J.F. Sato & Associates, Inc., was contracted by FEMA under Contract No. EMD-96-CO-0020 to redefine the 1-percent-annual-chance floodplain and floodway, beginning at the Garfield/Eagle County line and extending upstream through the Wingo Bridge. A HEC-RAS model was developed and floodplain mapping was prepared for submittal to FEMA (Reference 30).

The Town of Basalt contracted with McLaughlin Water Engineers, Ltd., to review and modify a HEC-RAS model in the reach between the Lower and Upper Basalt Bypass Bridges as part of a river master plan for the town. The Town of Basalt also contracted with Matrix Design Group, Inc., to review and modify the HEC-RAS model in the reach between Willits Lane and the Lower Basalt Bypass Bridge, including the River Oaks subdivision. The reach between the Wingo Bridge and the Upper Basalt Bypass Bridge had been modeled by the Roaring Fork Club for its river restoration project, and the Letter of Map Revision was accepted by the CWCB and FEMA in 1998. In 2000, Pitkin

County contracted with Matrix Design Group, Inc., to model the reach from the Wingo Bridge upstream to the confluence with Snowmass Creek. The Town of Basalt then contracted with Matrix Design Group, Inc., in 2000 to coordinate and finalize the four floodplain studies, and to model the 10-, 2- and 0.2-percent-annual-chance floodplains in one complete document entitled "Floodplain Information Report," dated July 24, 2000 (Reference 31).

The Floodplain Information Report was republished on November 14, 2001, to include detailed floodplain mapping with BFEs in the area south of the Town of Basalt known as the South Side, where floodwaters split at the Upper Basalt Bypass Bridge and flow overland (Reference 32). This report includes new topographic mapping obtained for the Town of Basalt area in January 2001 from Aero-Metric, Inc. It also includes a floodway delineation that was not included in the earlier edition.

The original FIS for the Roaring Fork River in Pitkin County incorporated detailed study methods from the Eagle/Pitkin County line to Tagerts Lake (Reference 33).

The results of the 2000 Floodplain Information Report for Basalt were reviewed by the CWCB and adopted at its board meeting held in Gunnison, Colorado, on July 24 and 25, 2000.

A final Town of Basalt Board of Trustees community meeting was held on July 25, 2000, to adopt the 2000 Floodplain Information Report. The meeting was attended by representatives of CWCB, Matrix Design Group, Inc., McLaughlin Water Engineers, the Town of Basalt, and Pitkin County. No significant problems were raised at the meeting.

Meetings were held on September 25, 2001, with both the Board of County Commissioners of Pitkin County and the Town of Basalt Board of Trustees to present the revised Floodplain Information Report, which reflected a more stringent floodway delineation for the portions of this Roaring Fork River study that fall within their respective jurisdictions. A similar workshop meeting was held with the Eagle County Board of County Commissioners on November 13, 2001, to review the floodway delineation.

The results of the restudy were revised at the final Consultation and Coordination Officer meeting held on May 29, 2003. All problems raised at that meeting were addressed in this restudy.

Hydrologic Analysis

The hydrologic analysis for this study was completed by the USACE (Reference 9). A regional analysis of stream data taken at gages in the Roaring Fork Basin was performed and natural flow frequency curves were developed. The peak

flows determined for the 10-, 2-, 1- and 0.2-percent-annual-chance floods were used to determine the flood profiles and the 1-percent-annual-chance floodplain for this report. Table 2, entitled "Summary of Discharges," was updated to show the peak discharges for these floods on the Roaring Fork River.

Hydraulic Analysis

The WSELs for floods of the selected recurrence intervals were computed using the USACE HEC-RAS backwater computer program (Reference 30). Channel roughness (Manning's "n") factors for these computations were assigned on the basis of field inspection of the floodplain areas (Reference 34).

Starting WSELs for the Roaring Fork River were calculated at the beginning and end of the study using critical depth. This is a reasonable assumption because of the river's steep gradient.

The hydraulic analyses for this study were based on unobstructed flow. The BFEs shown on the profiles are therefore considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

Lazy Glen Trailer Court

Lazy Glen Trailer Court, located upstream of the SH82 bridge, is in a historic floodplain. Fill and small dikes have been placed to control flooding. Detailed analysis shows that the smaller floods such as the 20- or 10-percent-annual-chance flood would not flood any portion of Lazy Glen, but the 1-percent-annual-chance flood would overflow into the area at two points. Only one ranch building occupies the floodplain in the reach above the Lazy Glen Trailer Court. The upstream reach of the study area is largely confined within well-defined natural banks.

South Side Flow Split

The construction of SH82 through the Town of Basalt effectively divided the Roaring Fork River and its floodplain between the north and the south channels. The main channel is included in the north channel and carries normal flows. The resulting south channel is considered active only during flood flows and has no distinguished or established natural channel or centerline.

New topographic mapping of the Town of Basalt (available after J.F. Sato's floodplain study) was used to cut cross sections and delineate the regulatory floodplain. The new aerial photography allowed the team to locate buildings, roads, and other features that obstructed the floodplain.

South Side HEC-RAS Model

Wright-McLaughlin Engineers cut a total of 53 cross sections from the split at the Upper Basalt Bypass Bridge on SH82 to the confluence of the South Side split flow and the main-stem river. This confluence is located downstream of the wastewater treatment plant. The average centerline distance between cross sections was roughly 215 feet. All cross sections were cut perpendicular to flow. Flow obstructions (such as buildings and roads) were coded directly into the cross-sectional geometry. Manning's "n" values ranged from 0.18 to 0.035; 0.08 was the most frequent estimate of roughness in the floodplain. Cross Section 62 (Cross Section AB on the Roaring Fork River profile) from the main-stem model was used as the downstream limit of the South Side split-flow model. Manning's "n" values were adjusted in certain sections to account for effective conveyance areas between cross sections.

After initially running backwater calculations on the South Side, it was determined that flow would spill over SH82 and into the main-stem floodplain at two locations. (These flow splits were not identified on the previous mapping by J.F. Sato.) The first location was near the downstream limit of the original South Side model. Cross sections were cut across the highway to model the flow as it reached the north side of the highway.

The second flow split was much farther upstream and was modeled using lateral (side-spill) weirs in HEC-RAS 3.0 (Reference 35). Subsequently, other lateral weirs were placed at locations where significant flows would spill over the highway. The crest of each weir was set as the elevation at which flow would begin to spill. Lateral weirs were also placed at the downstream limits of the study where flow can split as it spills over the highway near the wastewater treatment plant. It was found that approximately 2,400 cfs flows out of the limits of the cross sections to the east of the wastewater treatment plant, leaving roughly 1,200 cfs to join the main-stem floodplain west of the treatment plant.

Highway Spill Model

Modeling of the South Side indicated that approximately 600 cfs spills over SH82 and flows back into the main-stem floodplain upstream of the Midland Avenue Bridge. To model this flow, seven cross sections were cut between the flow split over the highway and Cross Section 76.38 (upstream of the Midland Avenue Bridge) on the main-stem model. After re-running the main-stem model without the split flow, the WSEL of Cross Section 76.38 (upstream of the Midland Avenue Bridge) was used as the downstream boundary condition in the new highway spill model. The average centerline distance between cross sections was 190 feet.

Manning's "n" values ranged from 0.035 to 0.3.

Trailers and some other obstructions were modeled using higher roughness values, thus the upper limit of 0.3 for Manning's "n" values was determined. Lateral weirs were also used in this model to calculate the amount of flow spilling into zones beyond the limits of each cross section. The elevation of each lateral weir was set as the elevation at which flow would spill without returning to the main flow. Locations on the cross sections that corresponded to the energy head at critical spill elevations were used to locate the lateral weirs along the cross-section ends. Approximately 145 cfs splits away from the downstream spill over SH82 and flows west on both the north and south sides of the highway.

Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM. The flood hazard information shown on this FIS and FIRM for the Town of Basalt is shown in NAVD88. For additional Town of Basalt flood hazard information located in Eagle County, see the separately published FIS report and FIRM for Eagle County.

All elevations are referenced to NAVD88. To obtain up-to-date elevation information on National Geodetic Survey (NGS) ERMs shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov. Map users should seek verification of non-NGS ERM monument elevations when using these elevations for construction or floodplain management purposes.

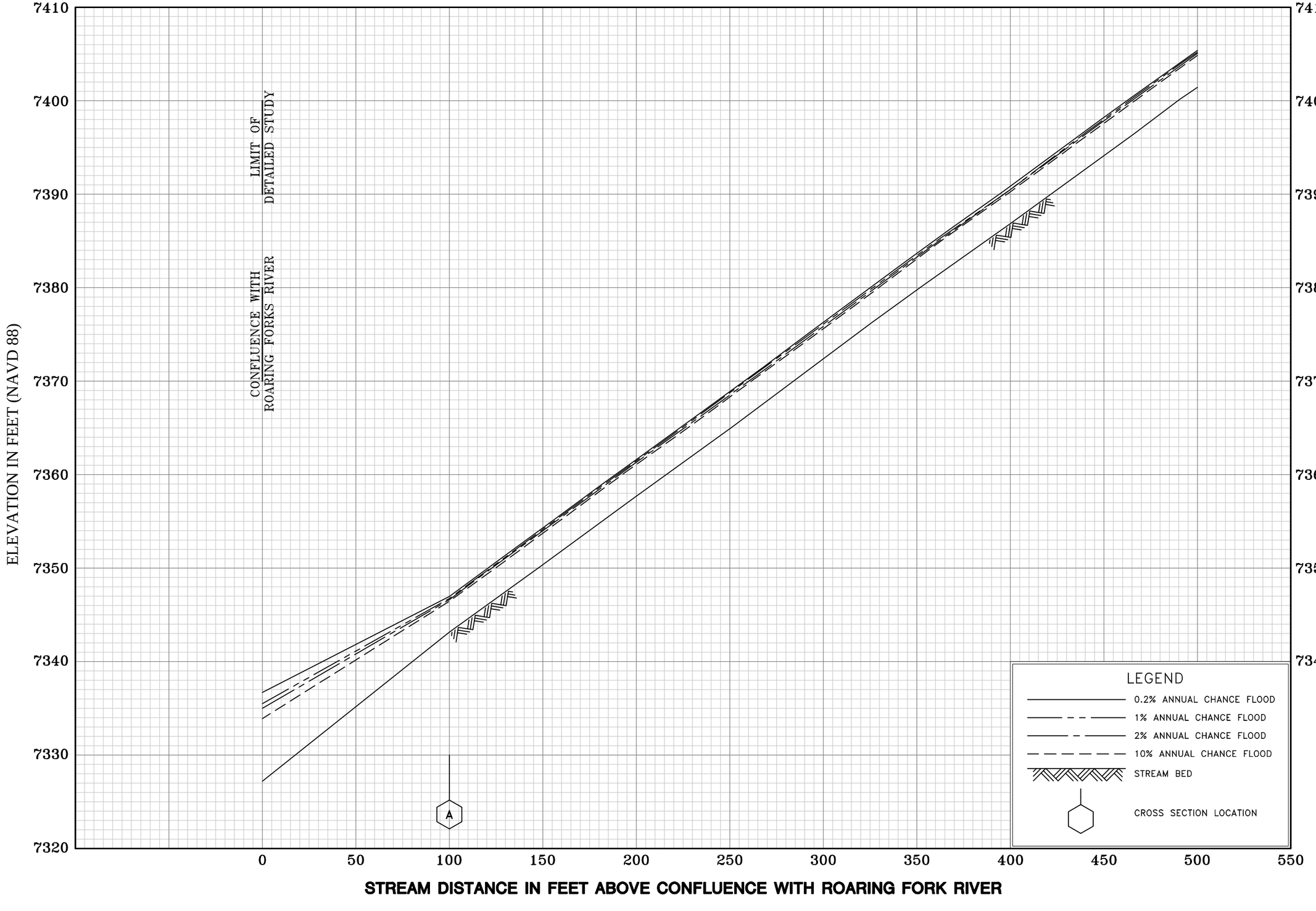
Table 2, Summary of Discharges, and Table 6, Floodway Data, were revised to reflect the results of the restudy.

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-, 2- 1-, and 0.2-percent-annual-chance flood elevations; delineations of the 1- and 0.2-percent-annual-chance floodplains; and 1-percent-annual-chance floodway. This information is presented on the FIRM and in many components of the FIS, including Flood Profiles and Floodway Data 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.

10.3 Third Revision

The current study was revised on TBD, to incorporate detailed flood hazard mapping performed as part of a 2011 study by Anderson Consulting Engineers, Inc. (Reference 36). Effective information from streams that were not restudied as part of the 2011 study (i.e., streams that were studied as part of the second (2004) revision) was retained for the current FIS and is found in Table 1. Effective Zone A floodplain mapping delineated as part of the 2004 revision was redelineated as part of the 2011 study on digital representations of USGS quadrangle mapping.



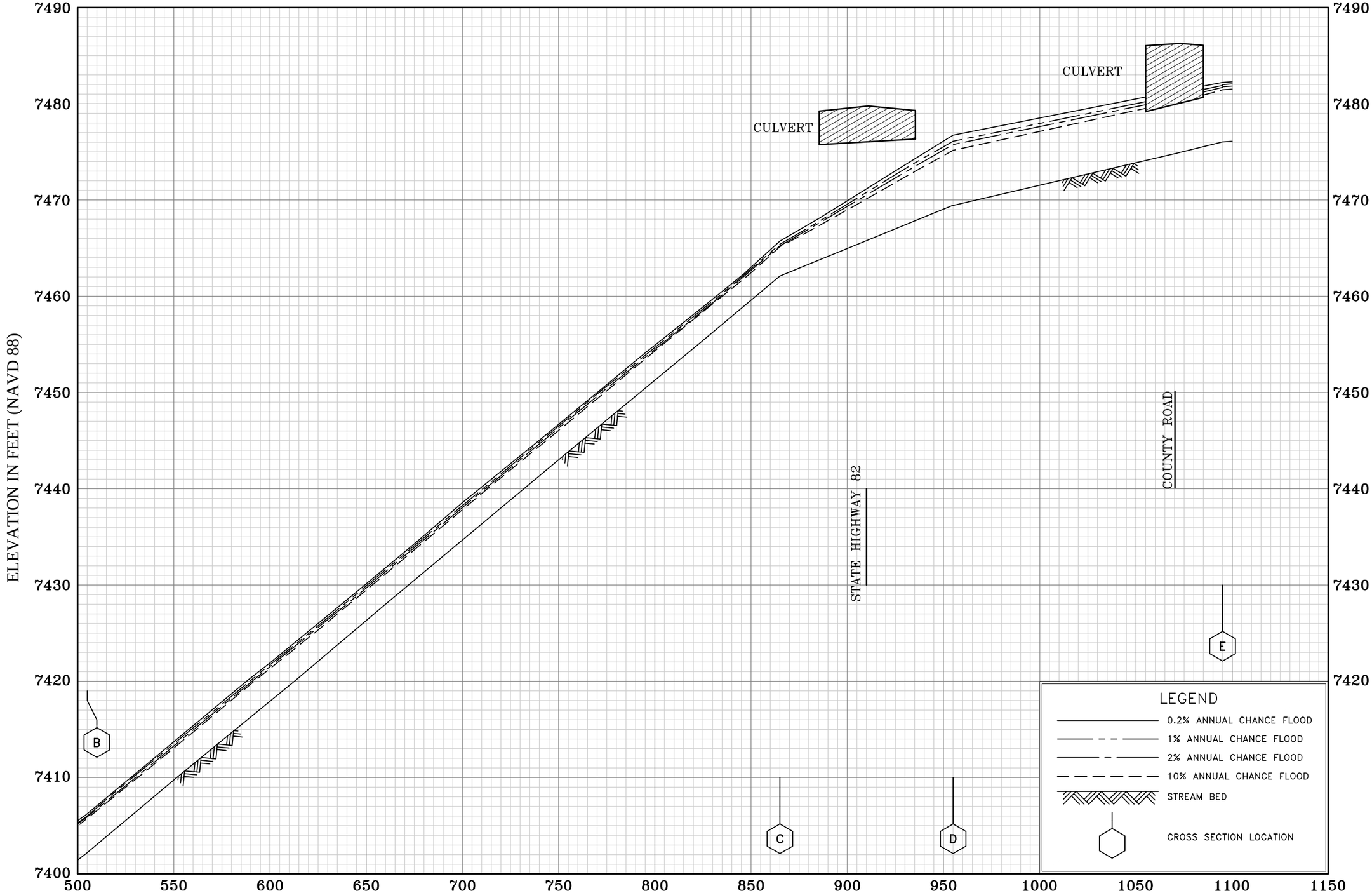
FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

01P



FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO

AND INCORPORATED AREAS

02P

NOTE:
CHANGE IN SCALES BOTH HORIZONTAL AND VERTICAL FROM PREVIOUS SHEETS

ELEVATION IN FEET (NAVD 88)

7515
7510
7505
7500
7495
7490
7485
7480
7475
7470

1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH ROARING FORK RIVER

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

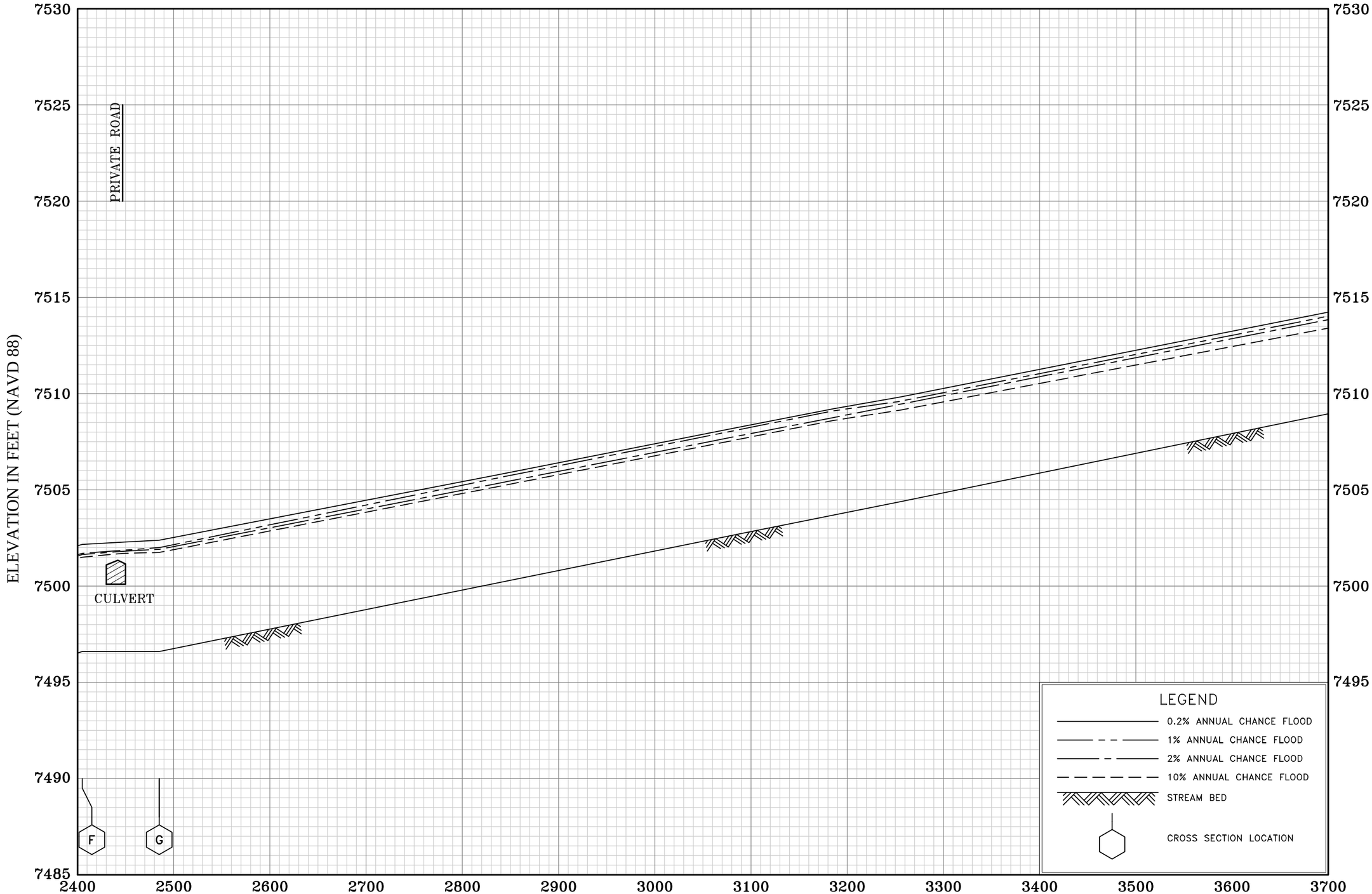
FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

03P



FLOOD PROFILES

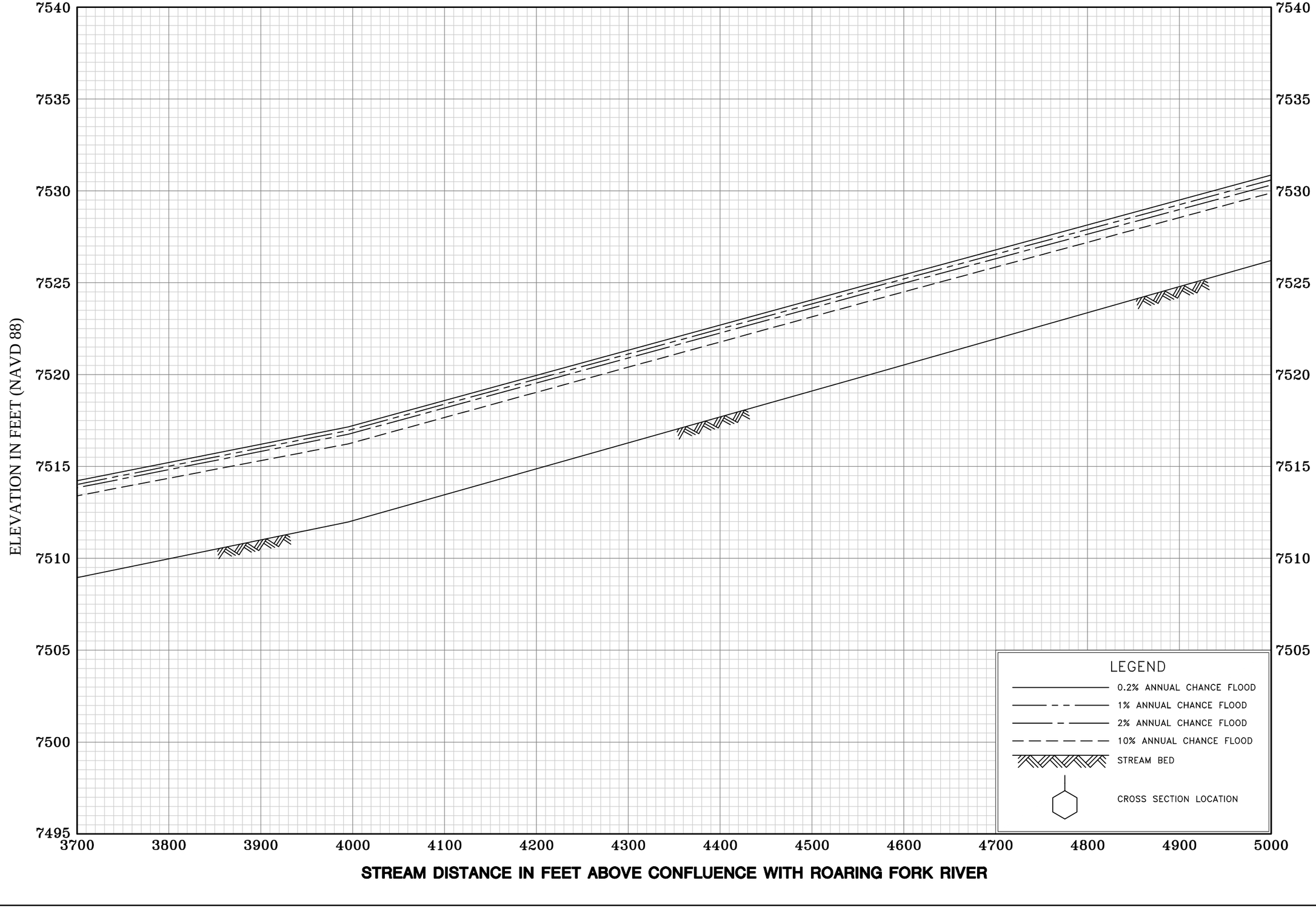
BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO

AND INCORPORATED AREAS

04P



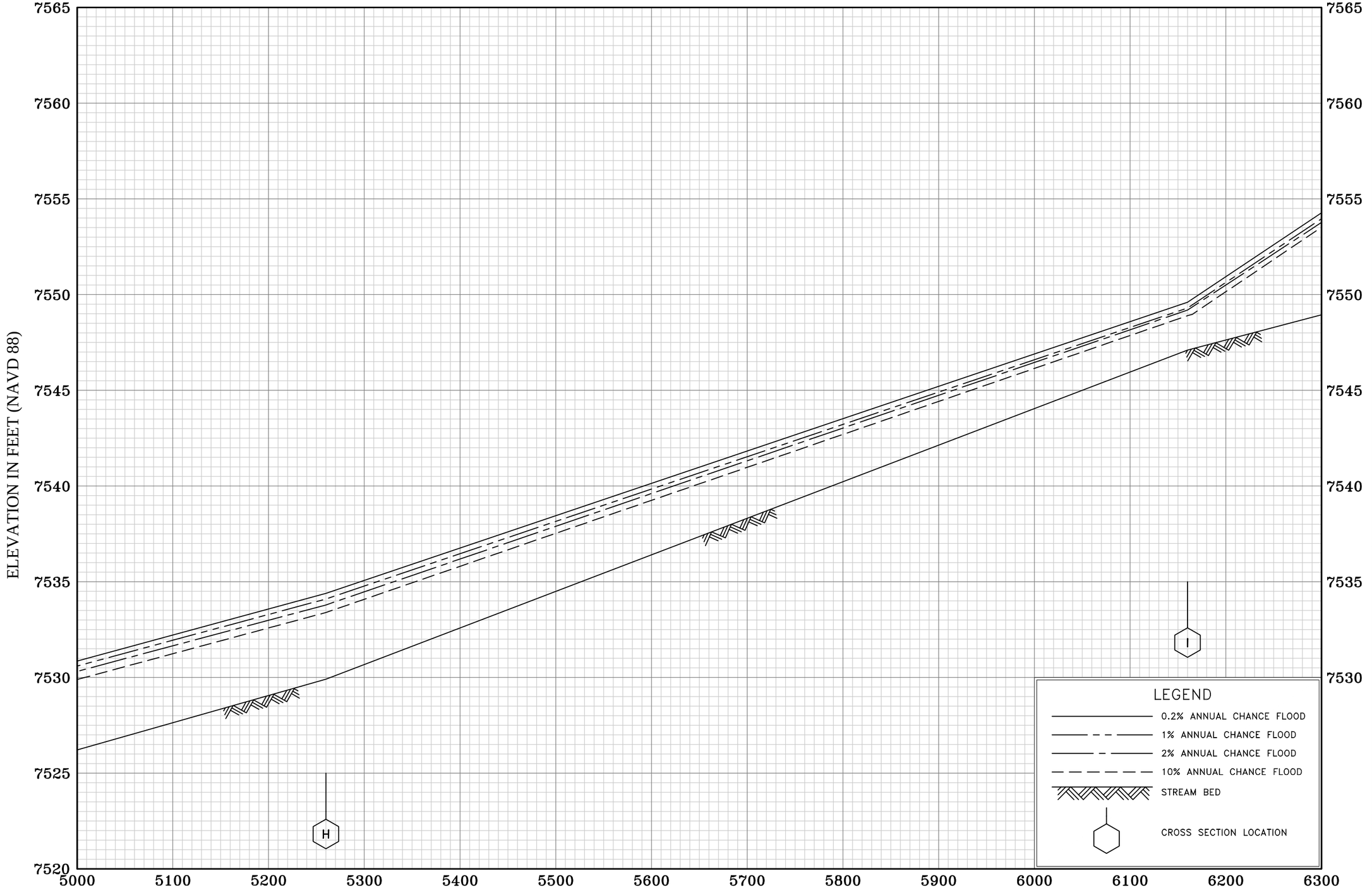
FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

05P



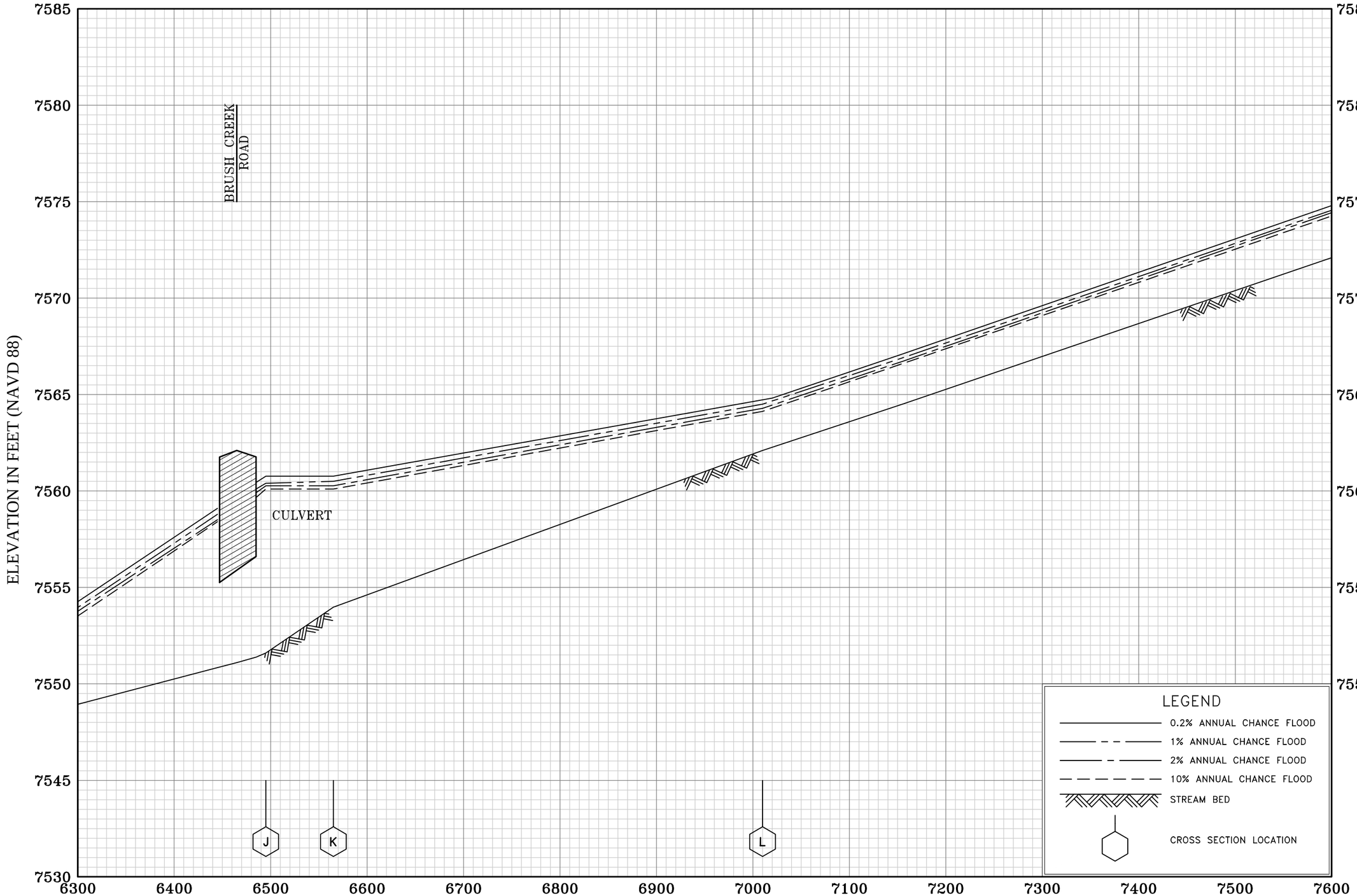
FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

06P



FLOOD PROFILES

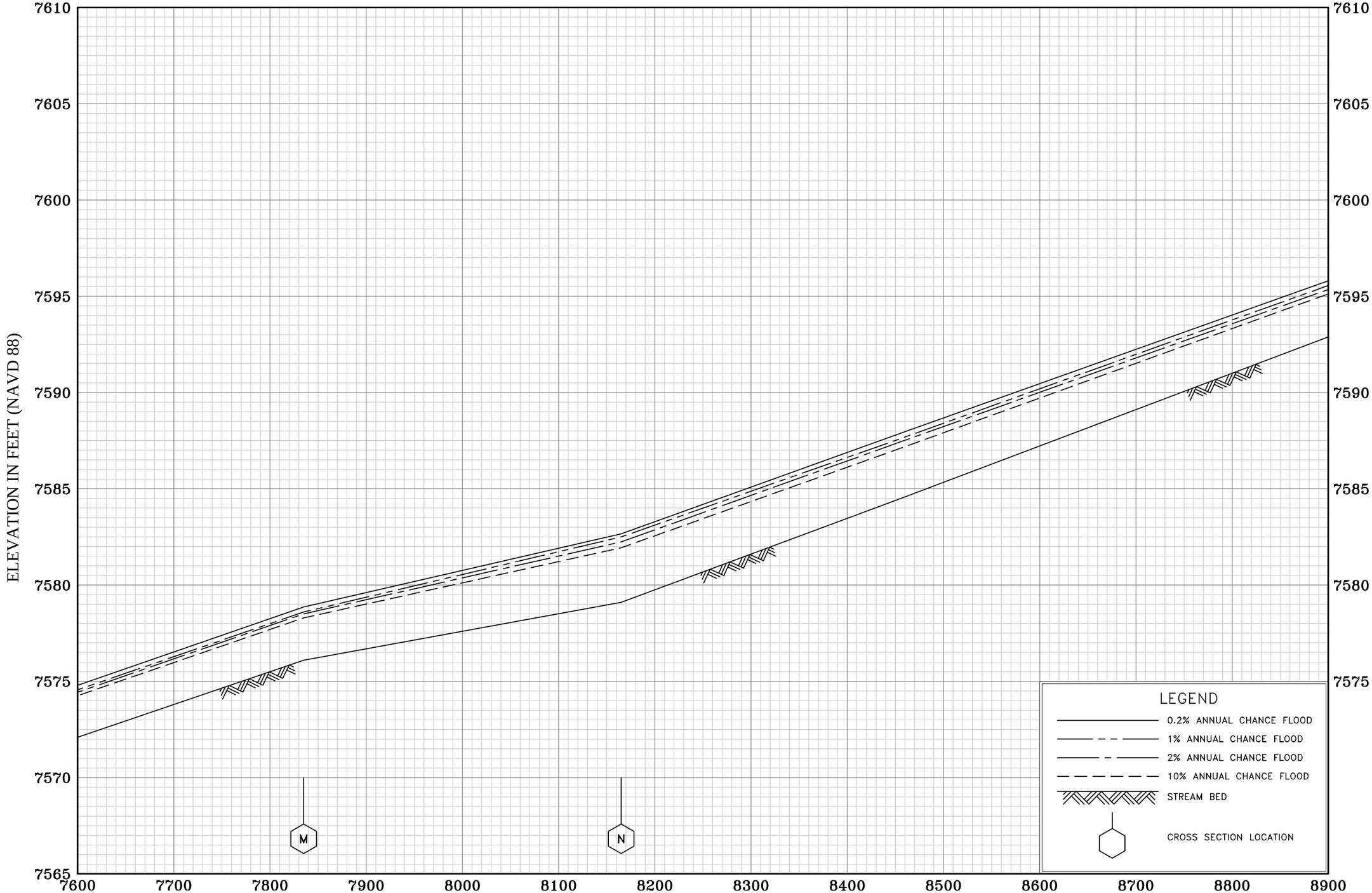
BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO

AND INCORPORATED AREAS

07P



STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH ROARING FORK RIVER

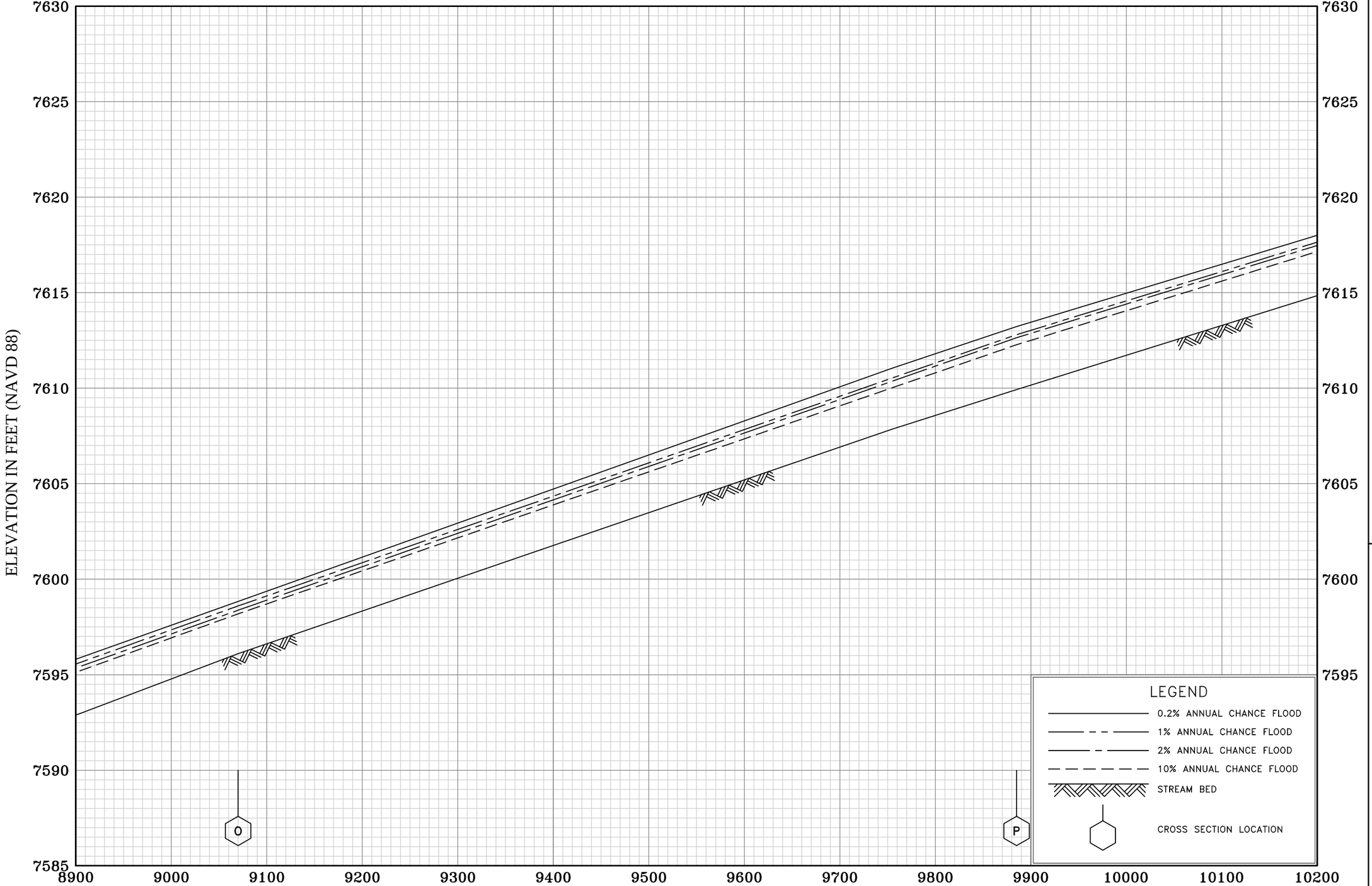
FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

08P



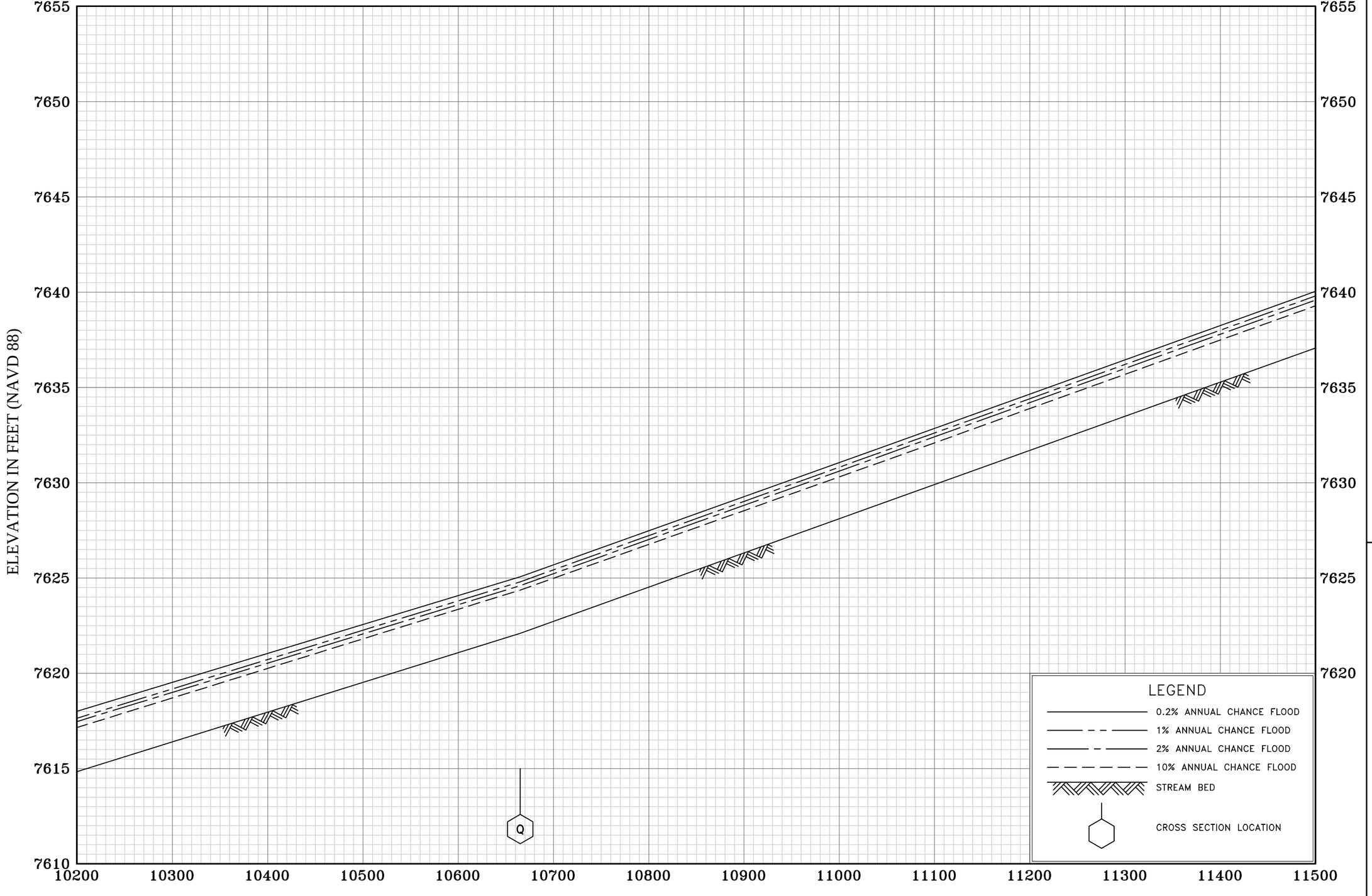
FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

09P



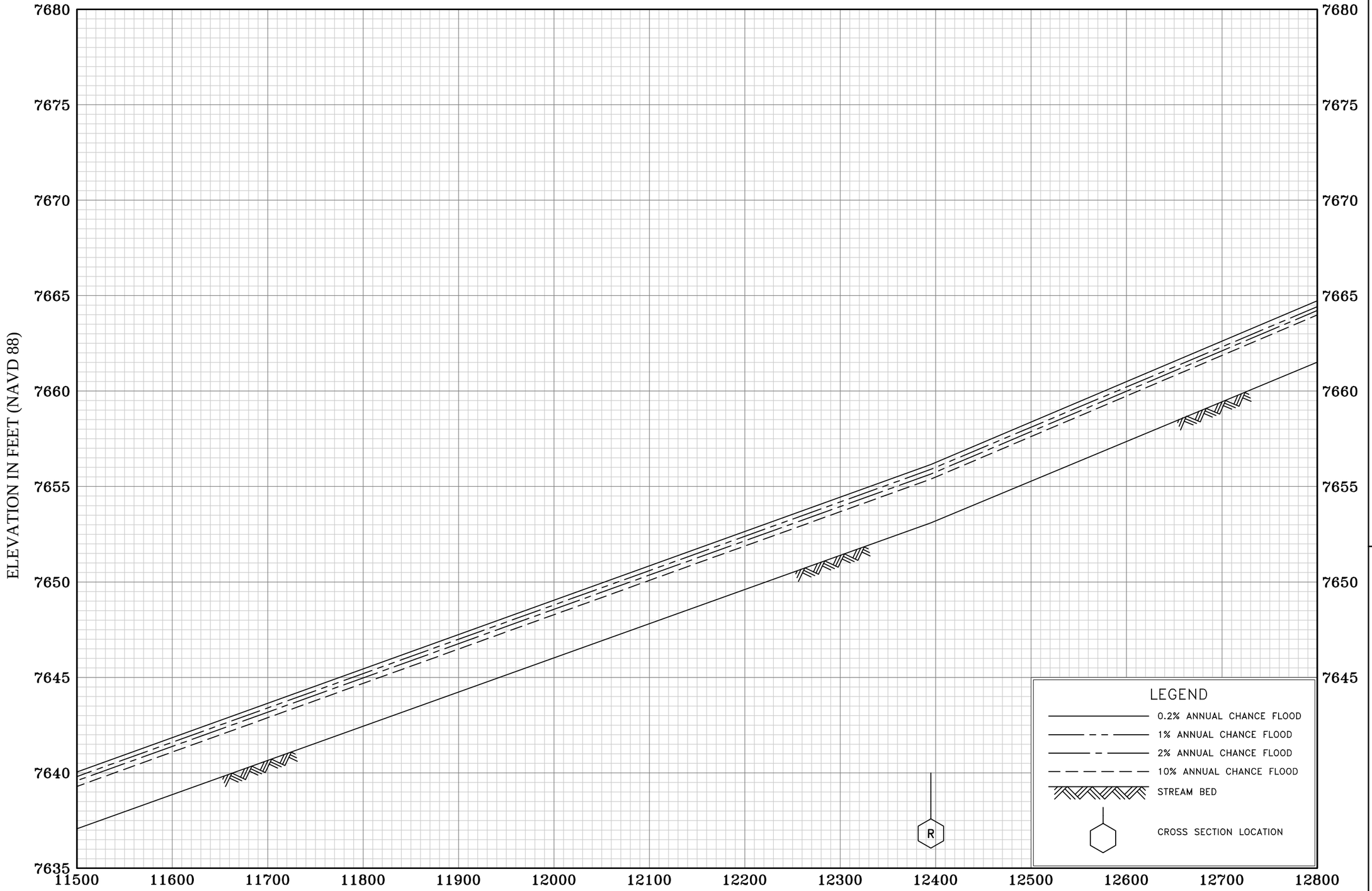
FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

10P



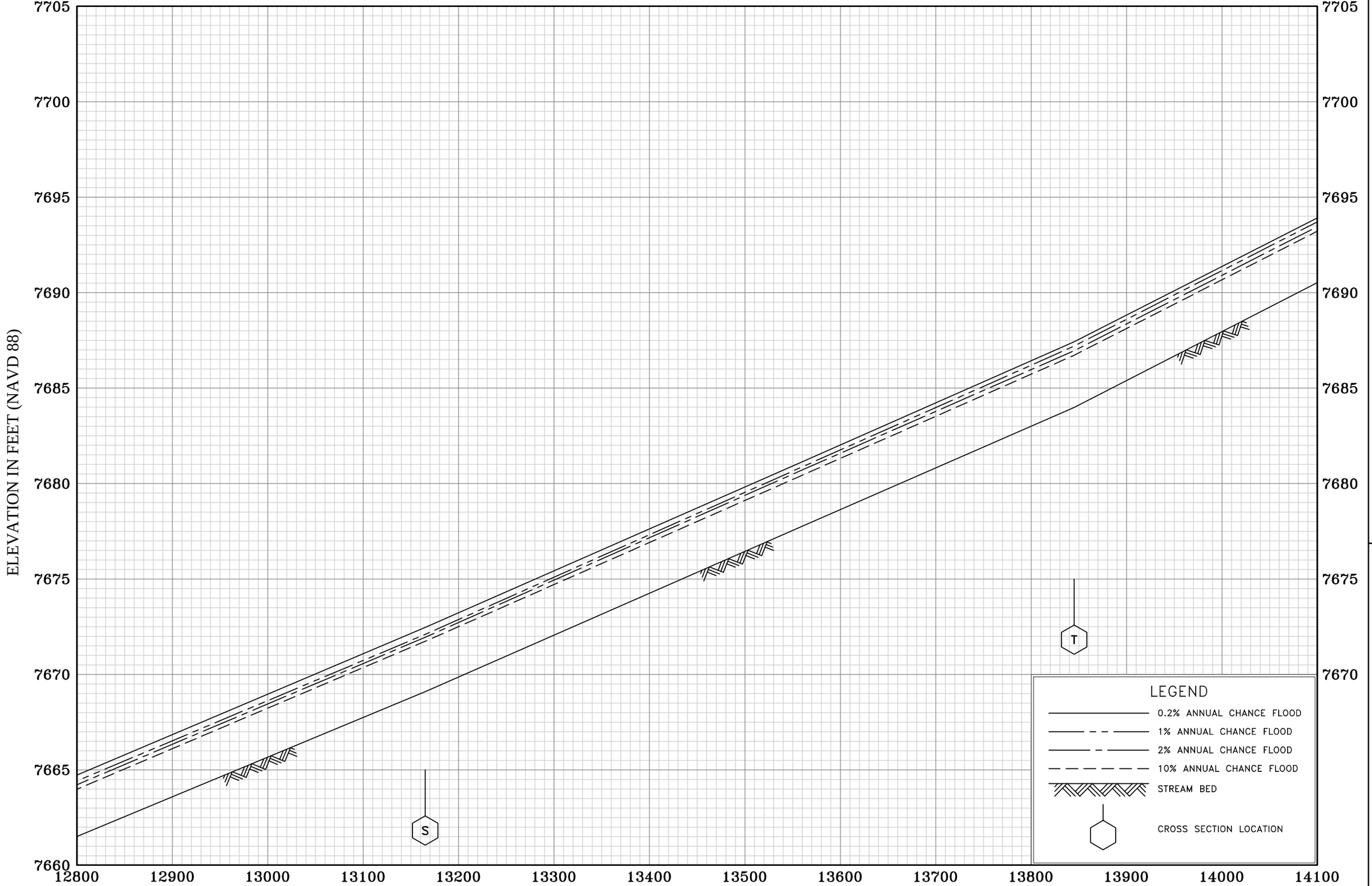
FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

11P



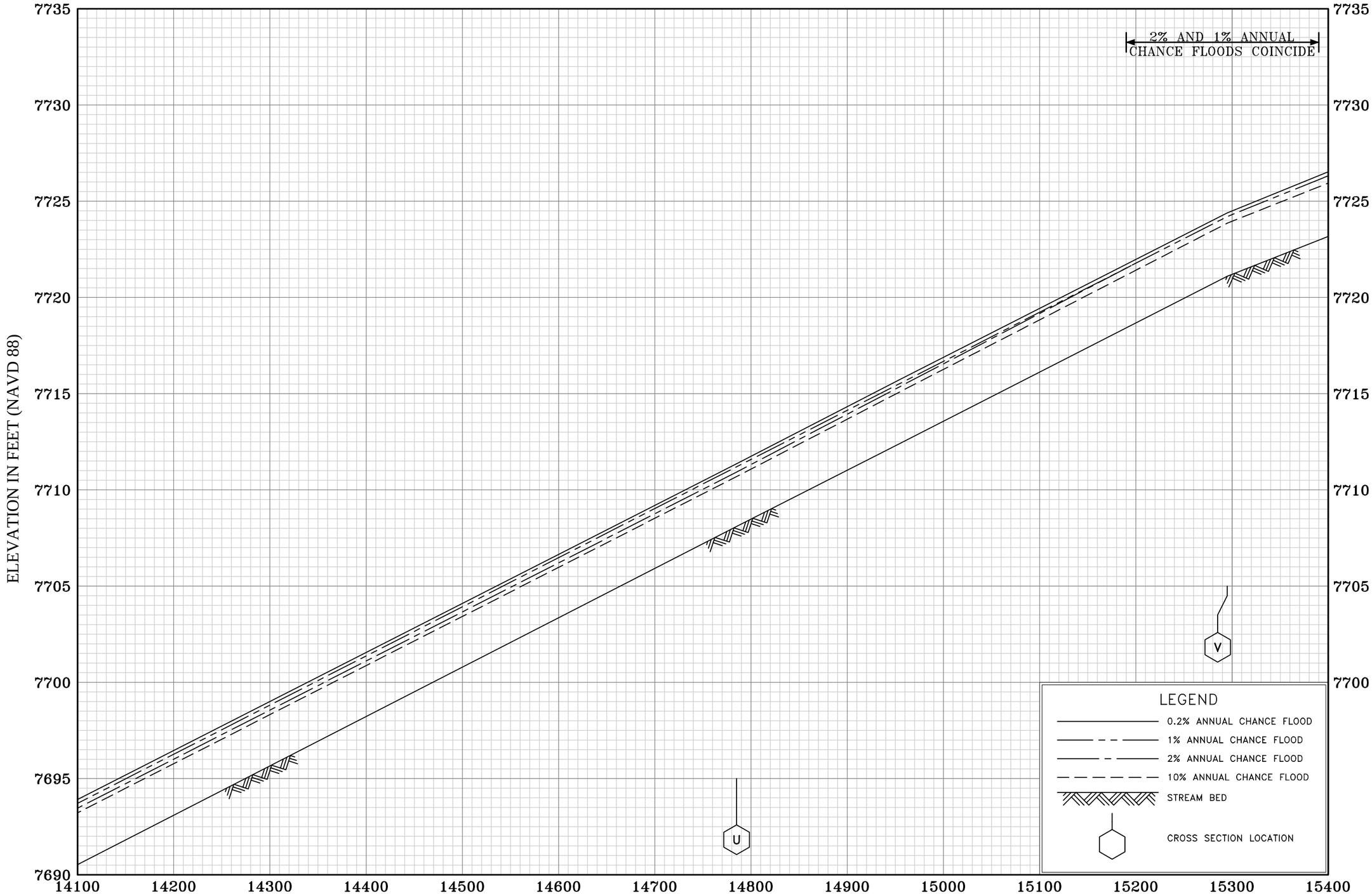
FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

12P



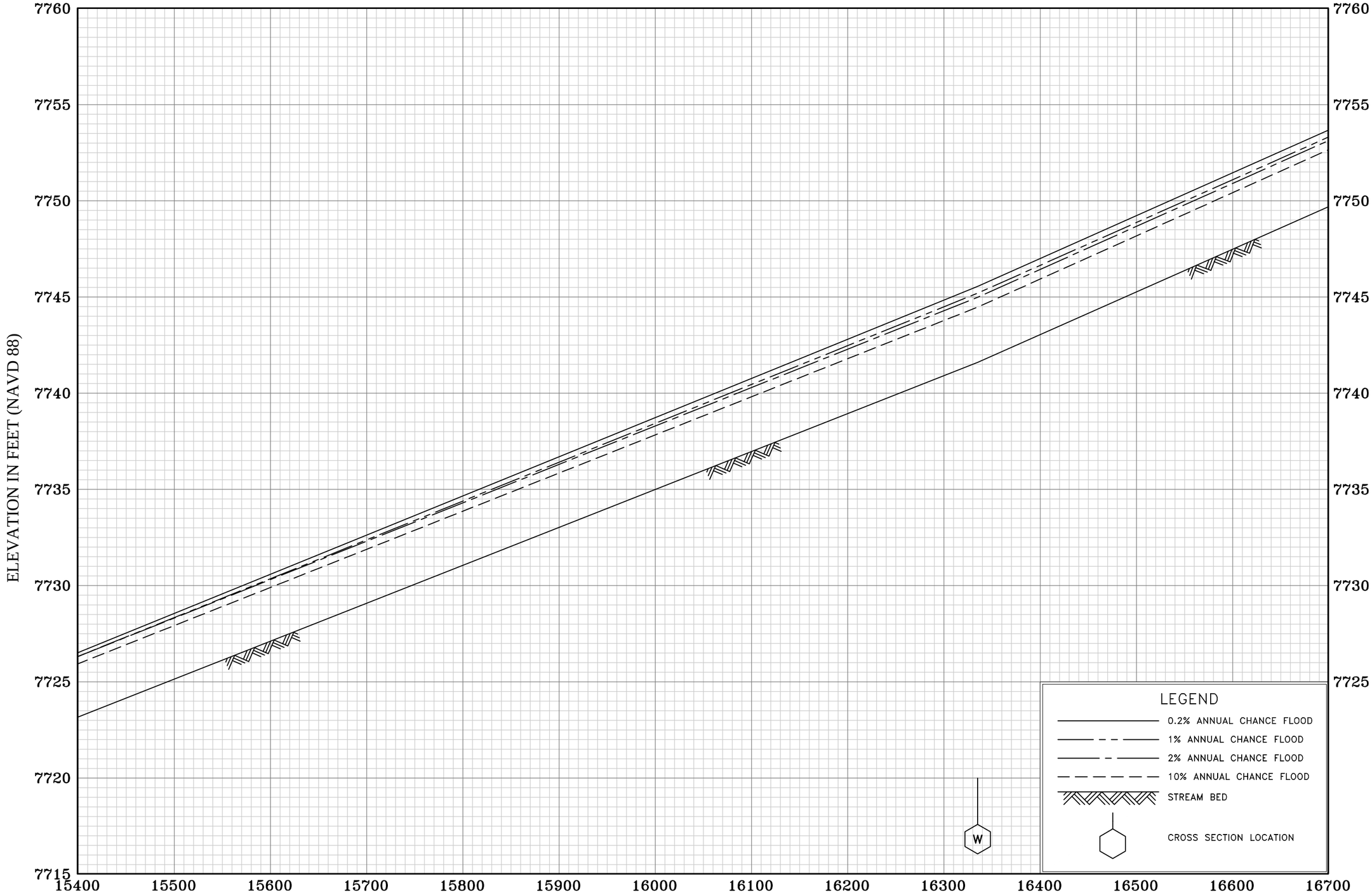
FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

13P



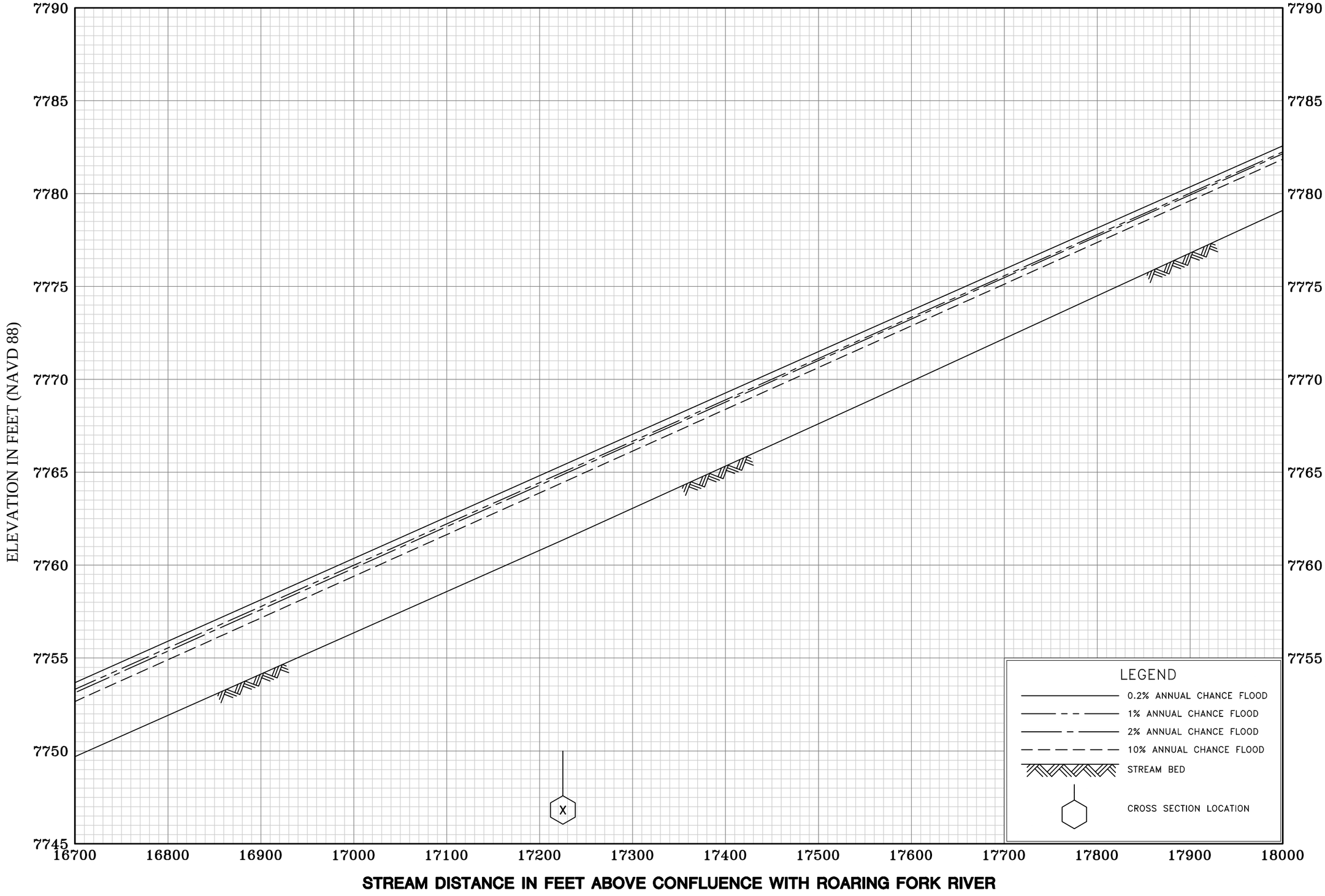
FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

14P



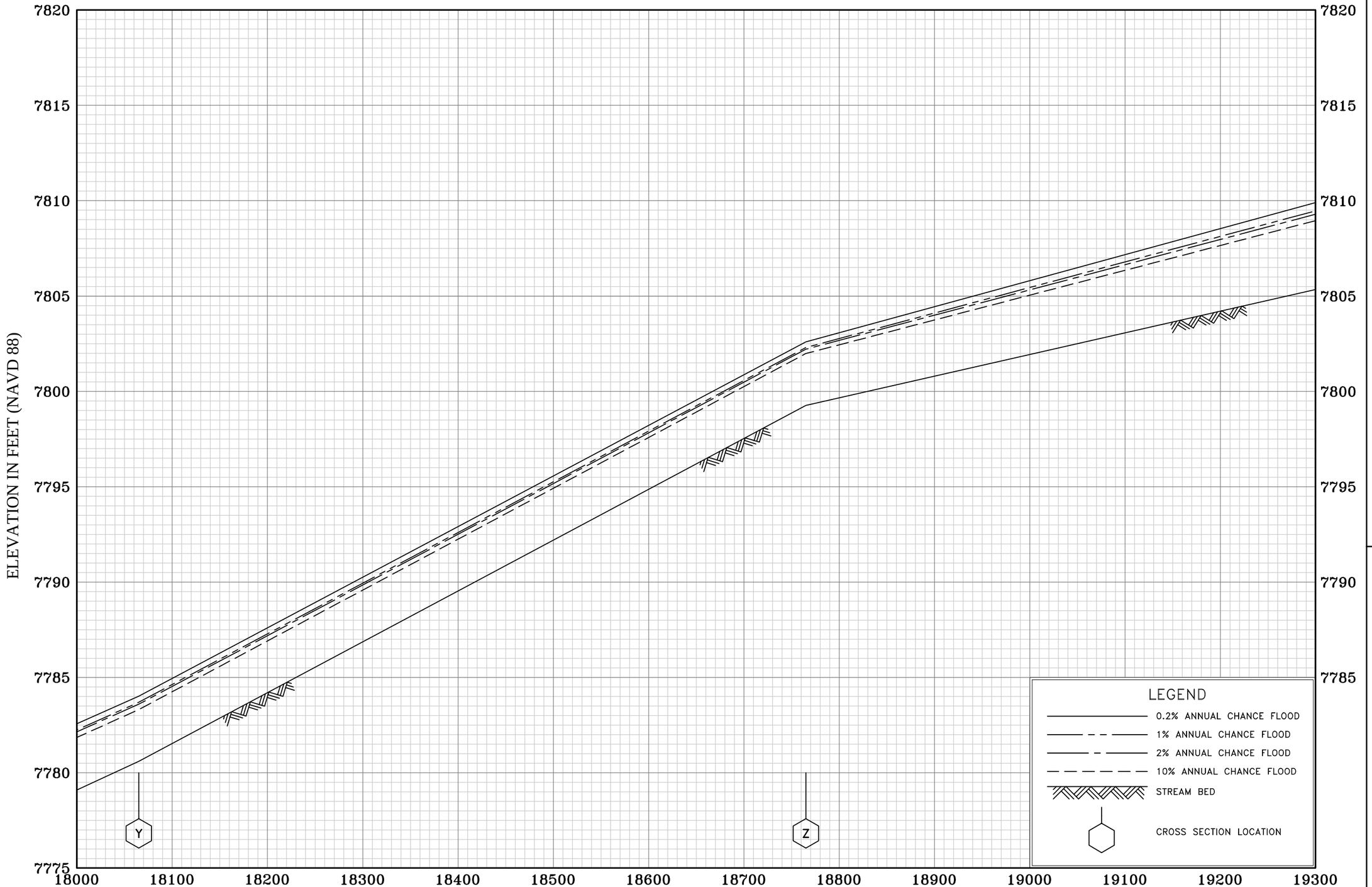
FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

15P



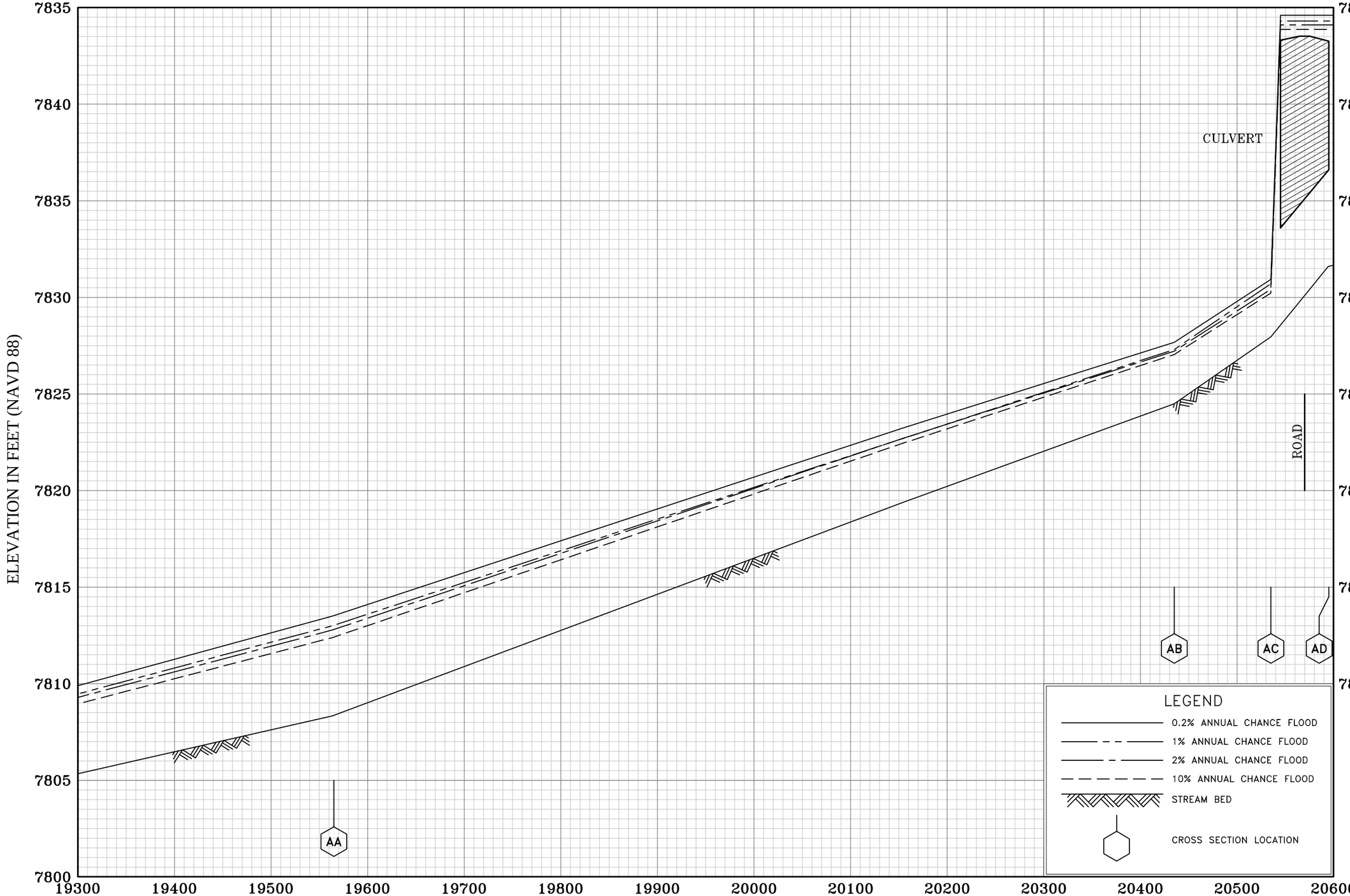
FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

16P



FLOOD PROFILES

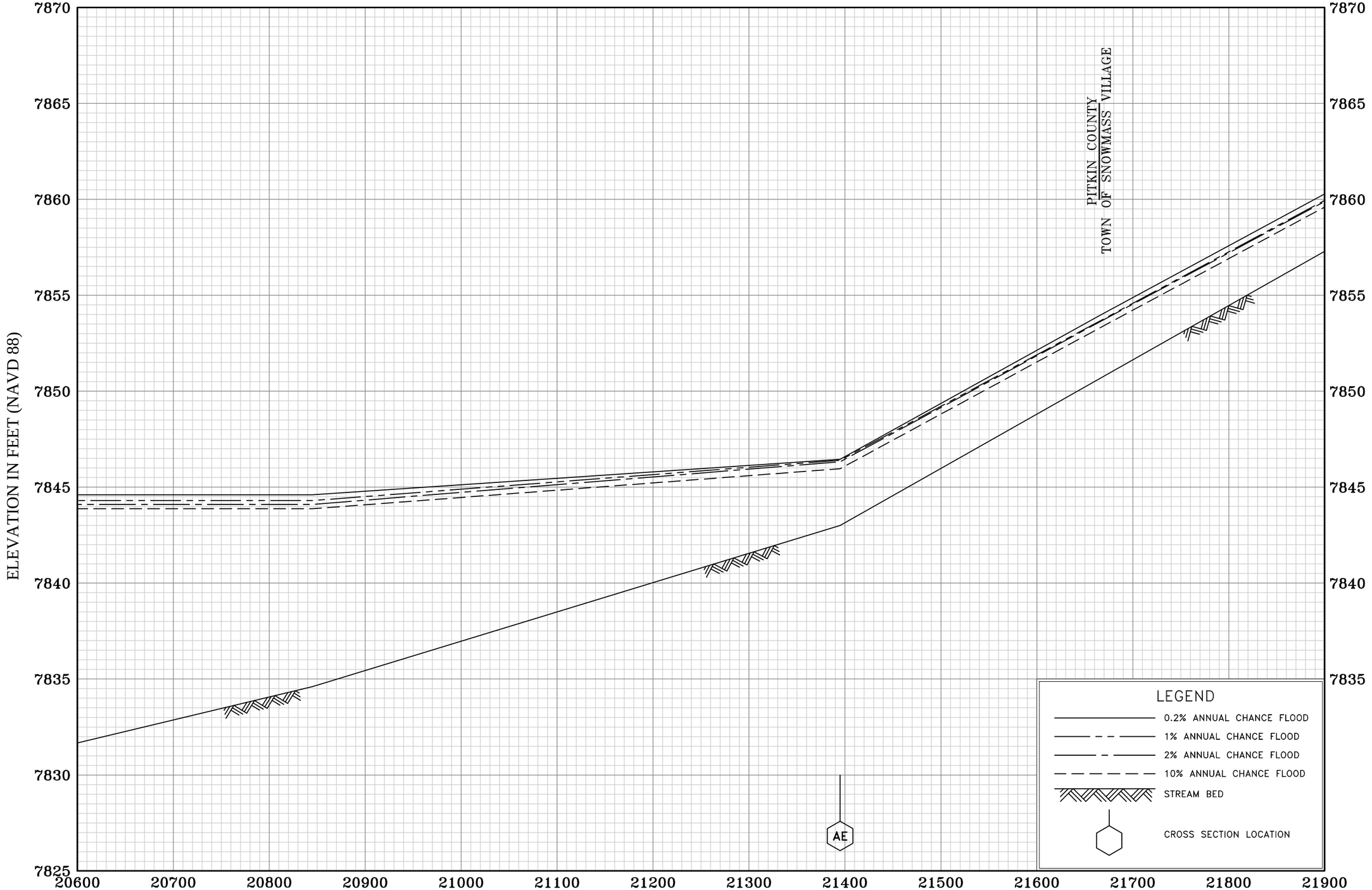
BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO

AND INCORPORATED AREAS

17P



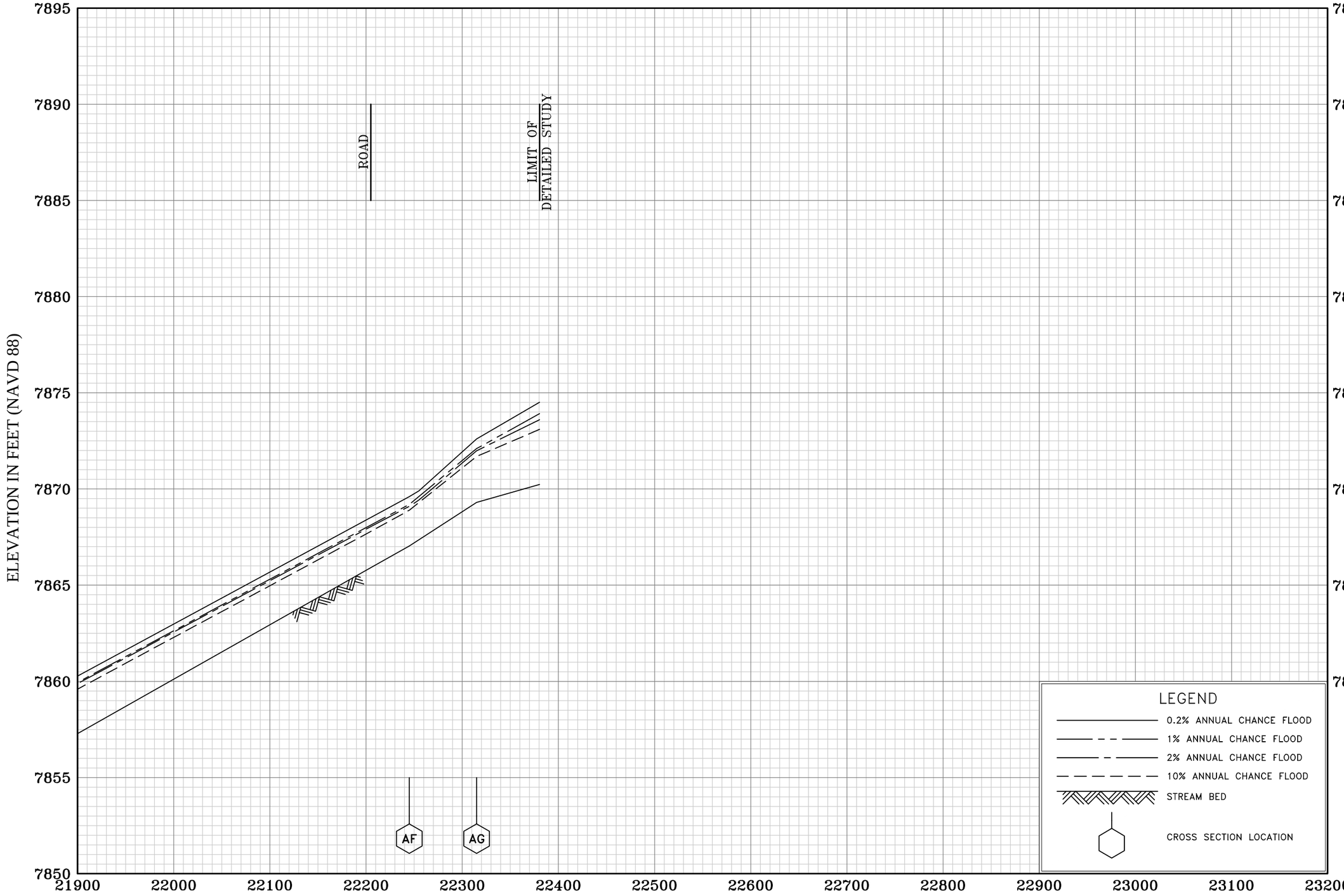
FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS

18P



FLOOD PROFILES

BRUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
(AND INCORPORATED AREAS)

19P

ELEVATION IN FEET (NAVD 88)

7820
7810
7800
7790
7780
7770
7760
7750
7740
7730

CONFLUENCE WITH ROARING FORK RIVER

LIMIT OF DETAILED STUDY

A

B

LEGEND

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

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300

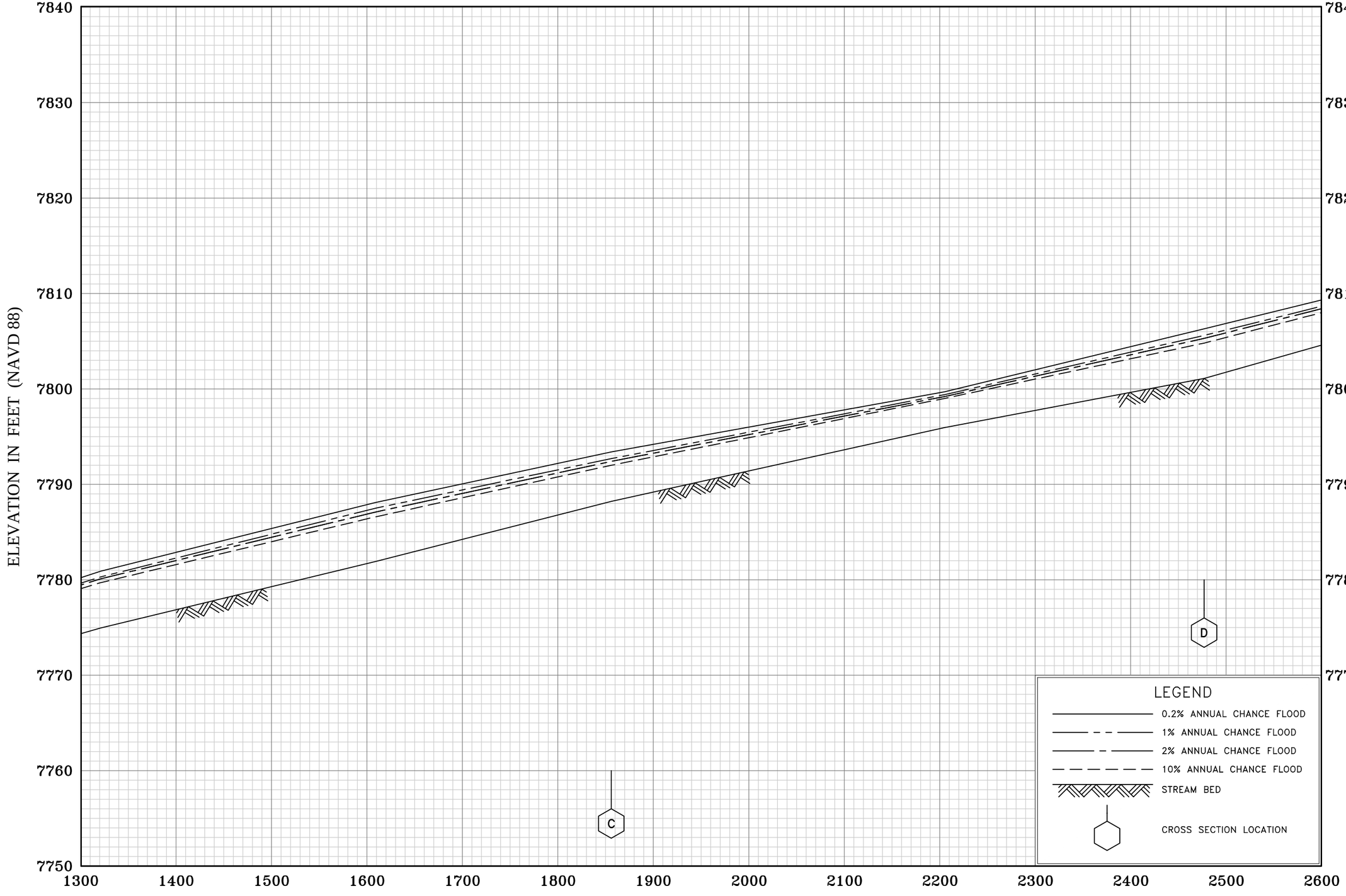
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH ROARING FORK RIVER

FLOOD PROFILES

CASTLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO
AND INCORPORATED AREAS



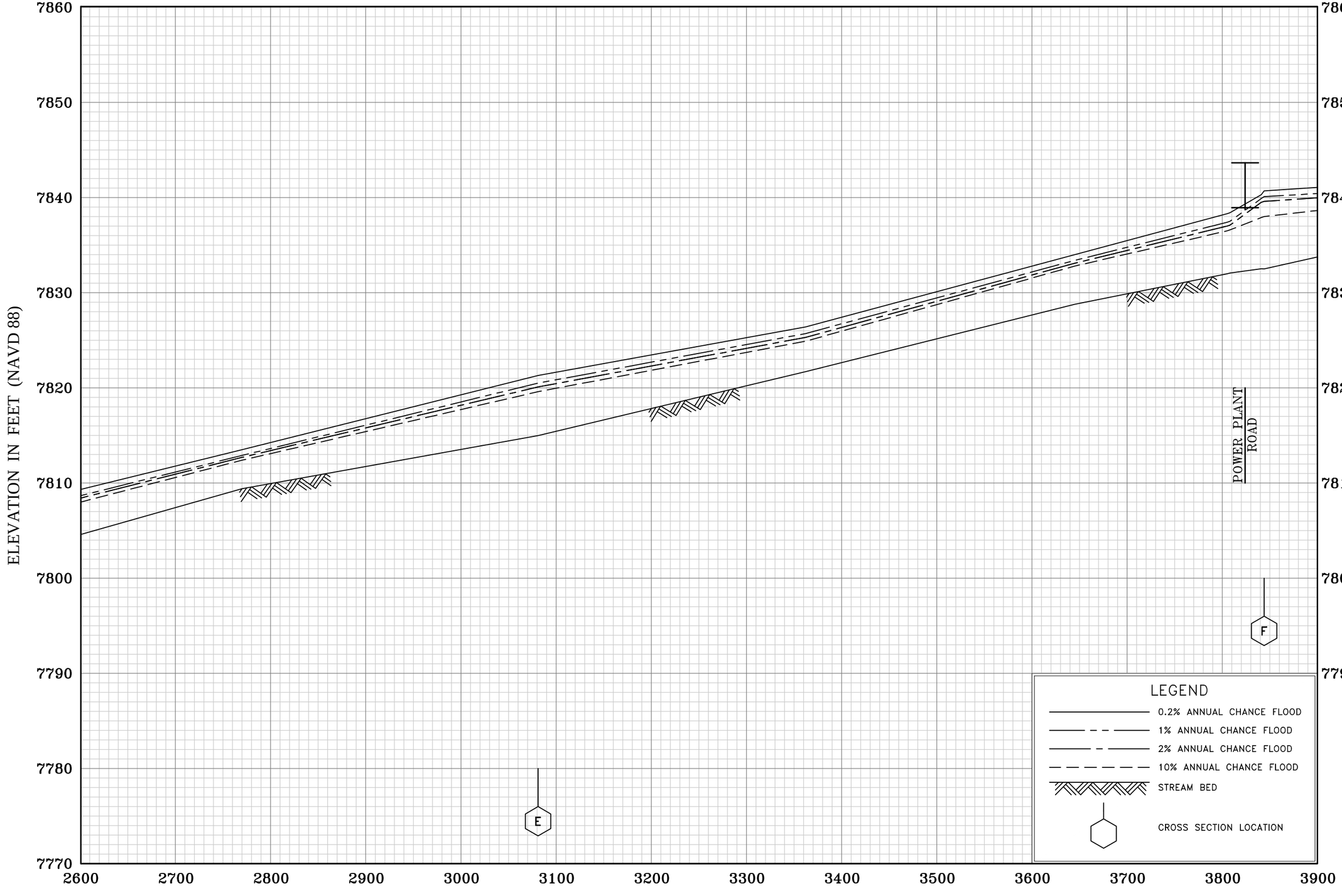
FLOOD PROFILES

CASTLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO

AND INCORPORATED AREAS



FLOOD PROFILES

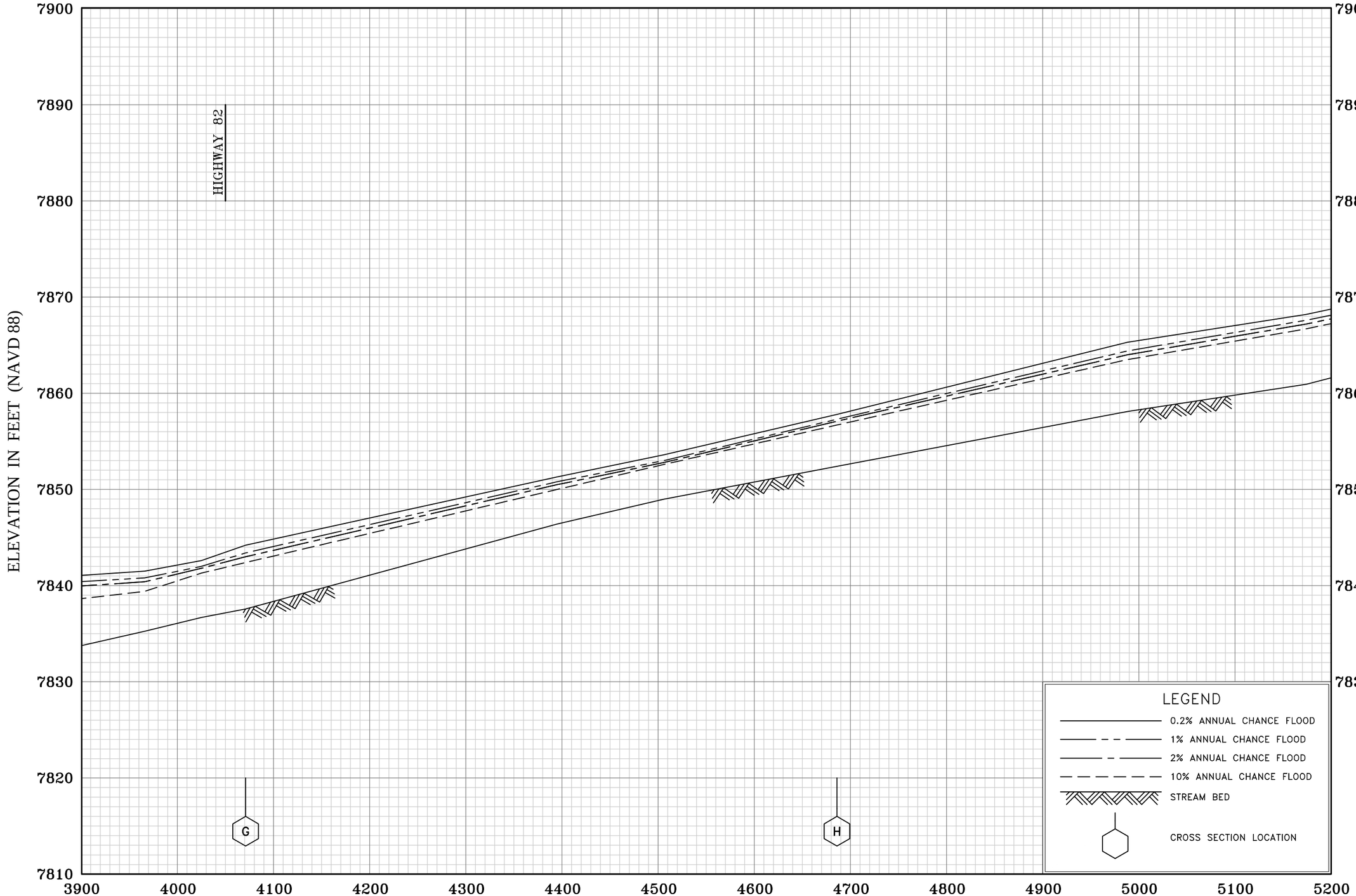
CASTLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO

AND INCORPORATED AREAS

22P



FLOOD PROFILES

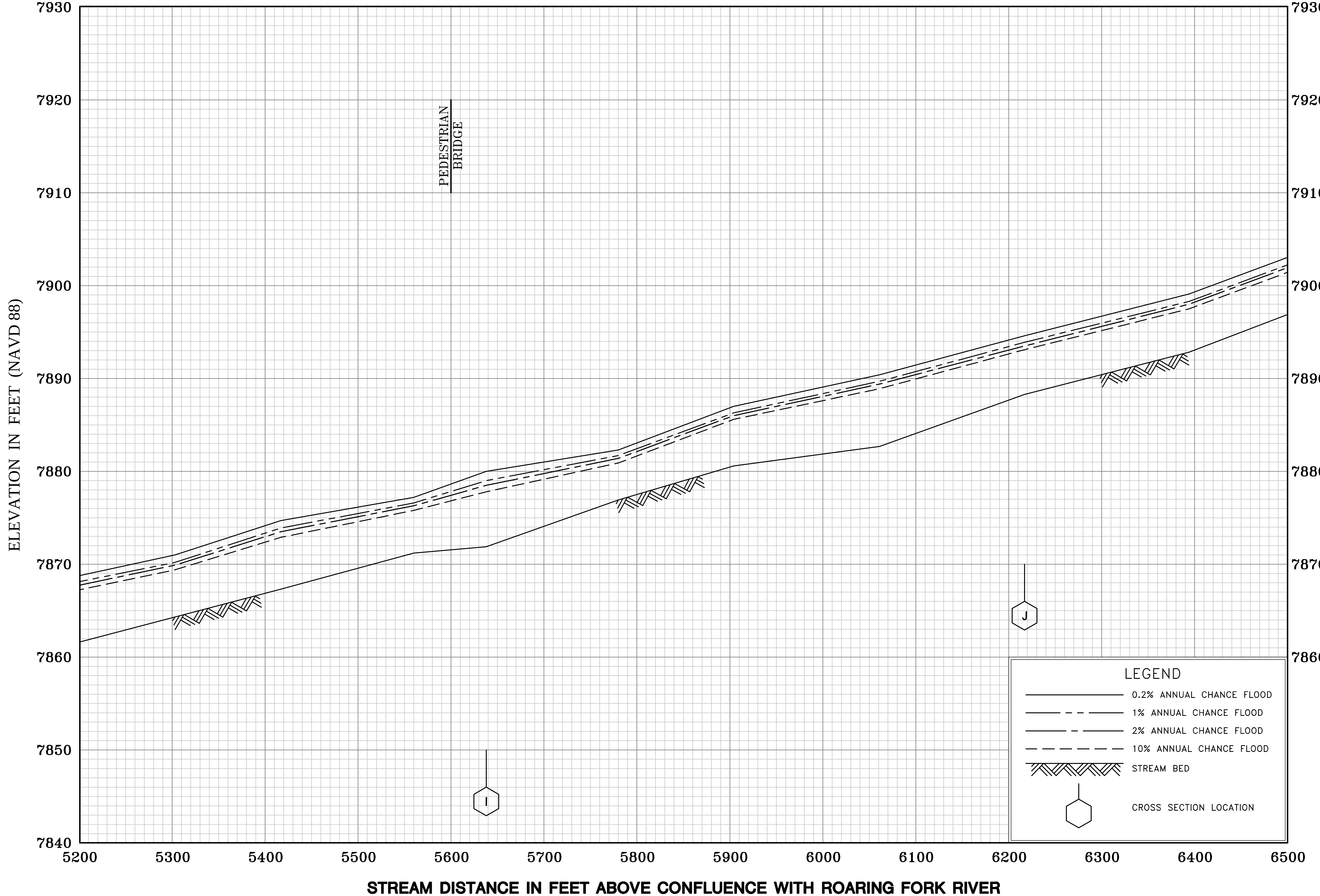
CASTLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO

AND INCORPORATED AREAS

23P



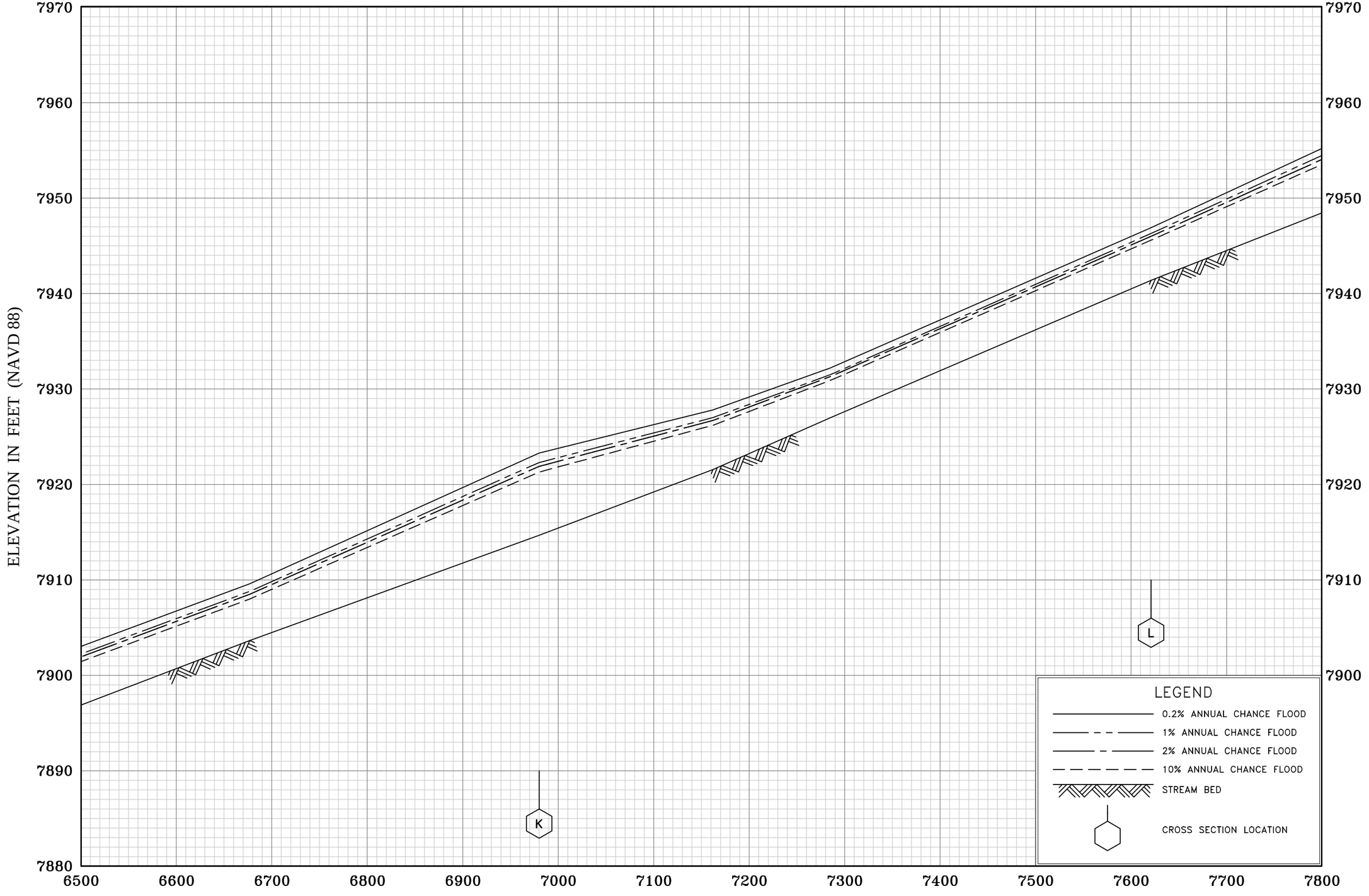
FLOOD PROFILES

CASTLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO

AND INCORPORATED AREAS



FLOOD PROFILES

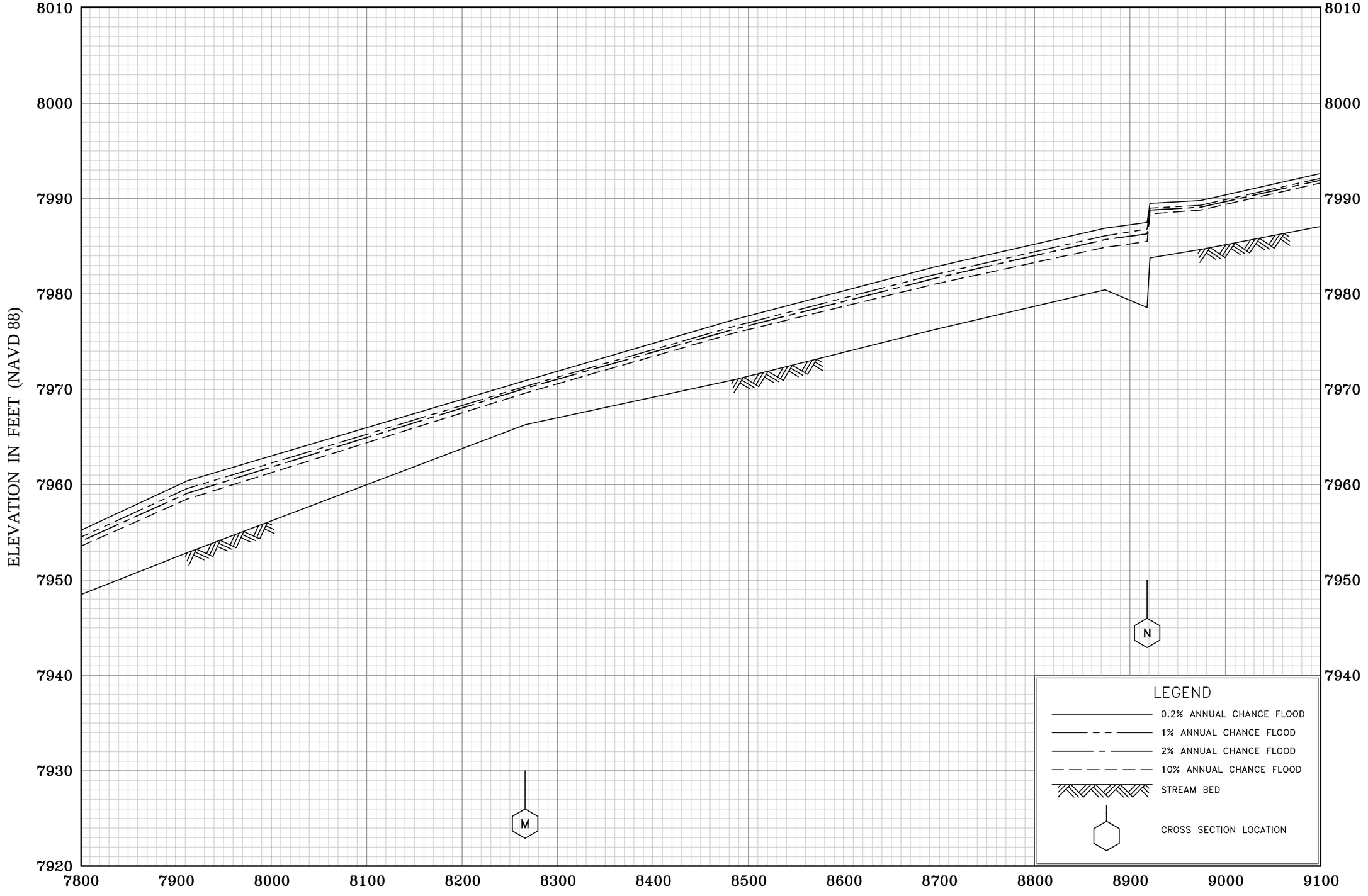
CASTLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO

AND INCORPORATED AREAS

25P



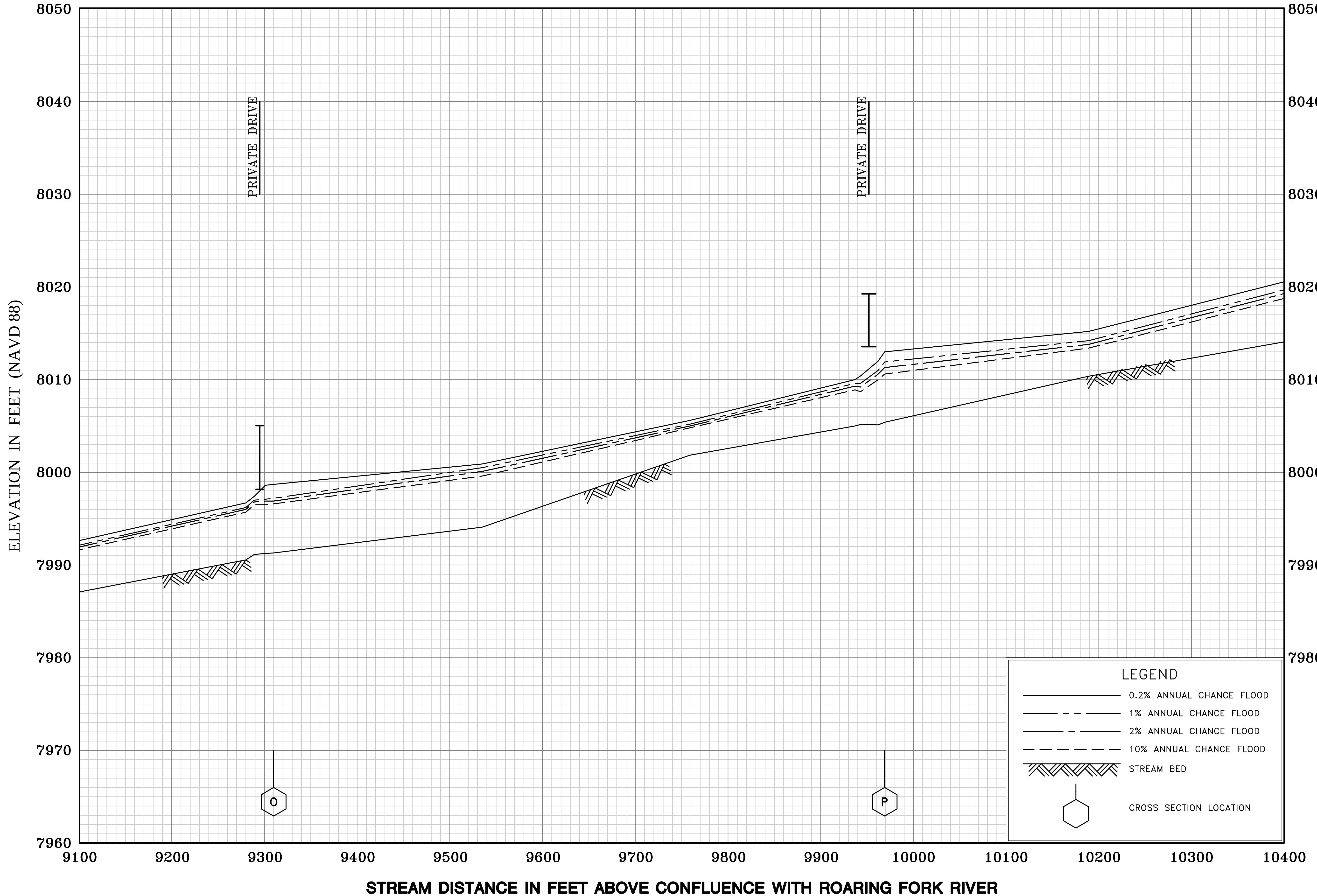
FLOOD PROFILES

CASTLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO

AND INCORPORATED AREAS



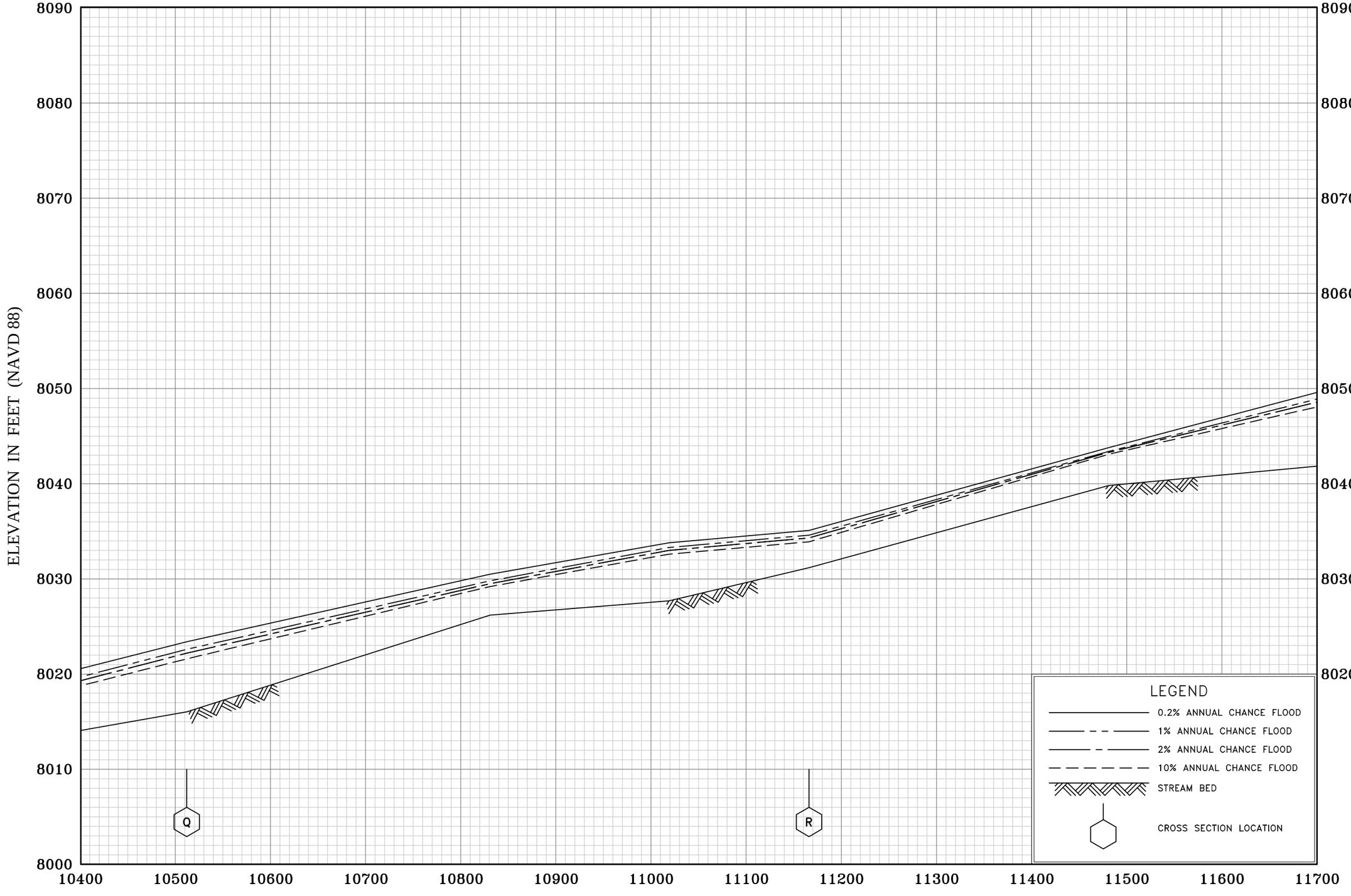
FLOOD PROFILES

CASTLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO

AND INCORPORATED AREAS



FLOOD PROFILES

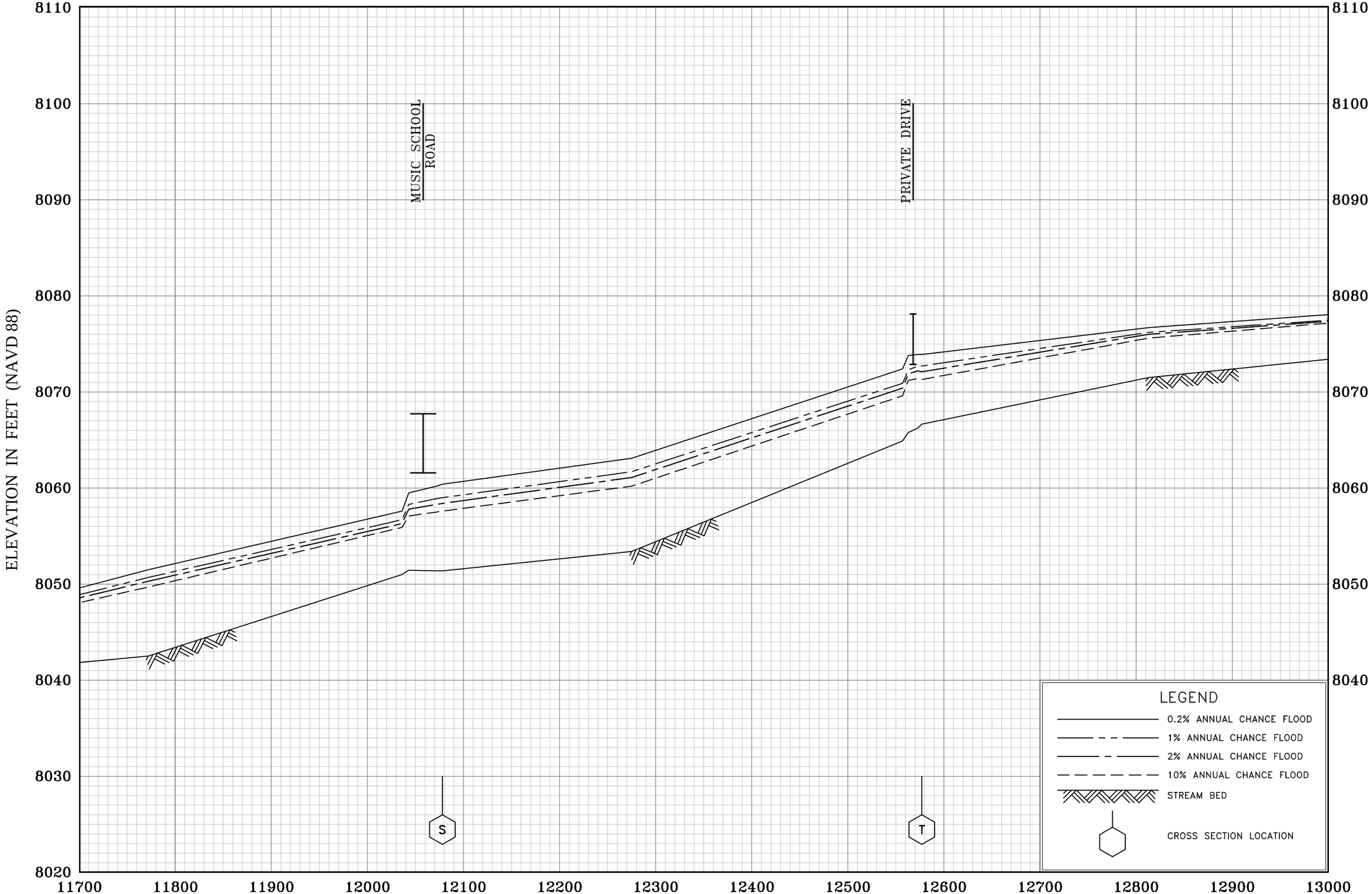
CASTLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO

AND INCORPORATED AREAS

28P



FLOOD PROFILES

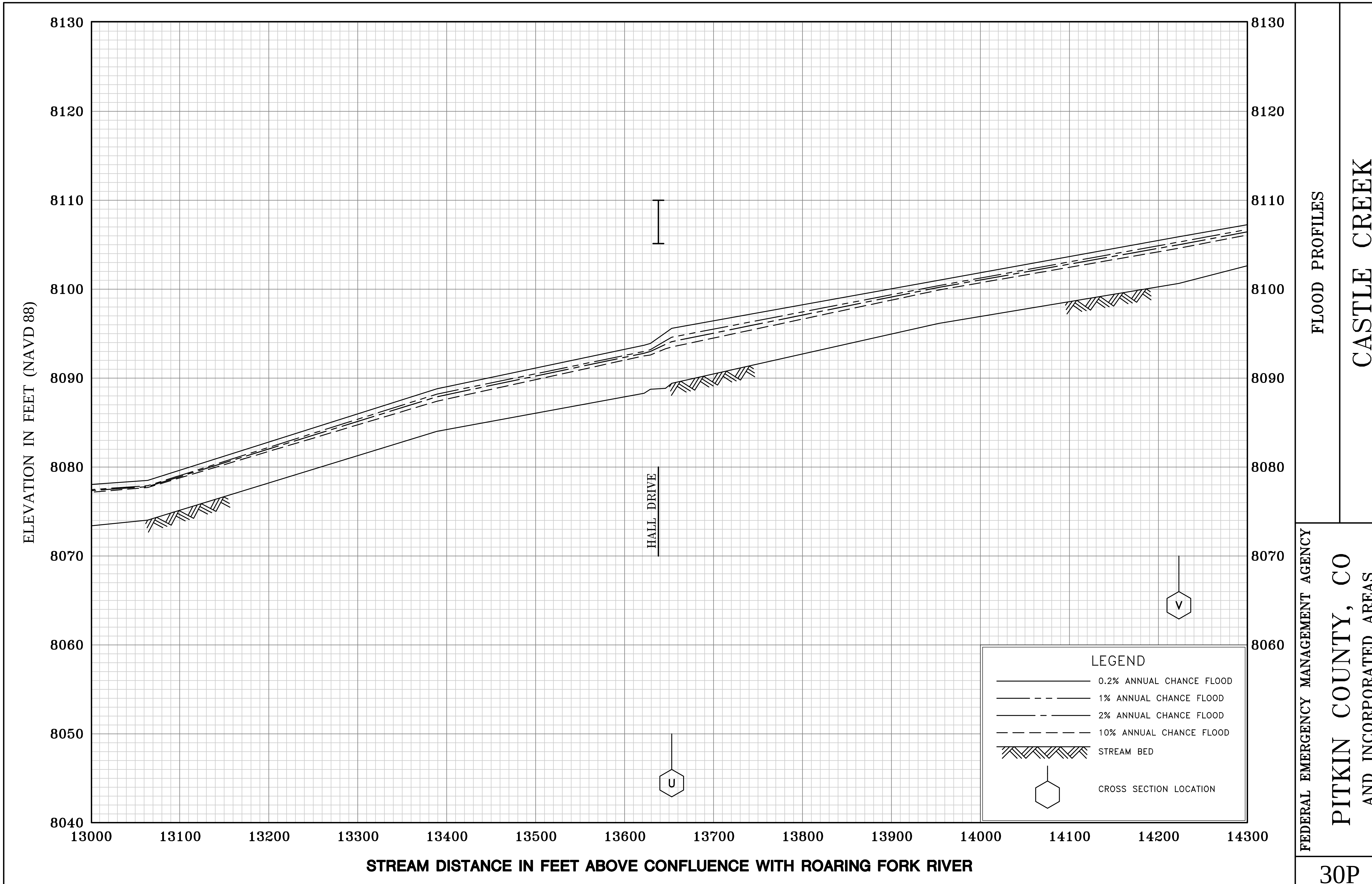
CASTLE CREEK

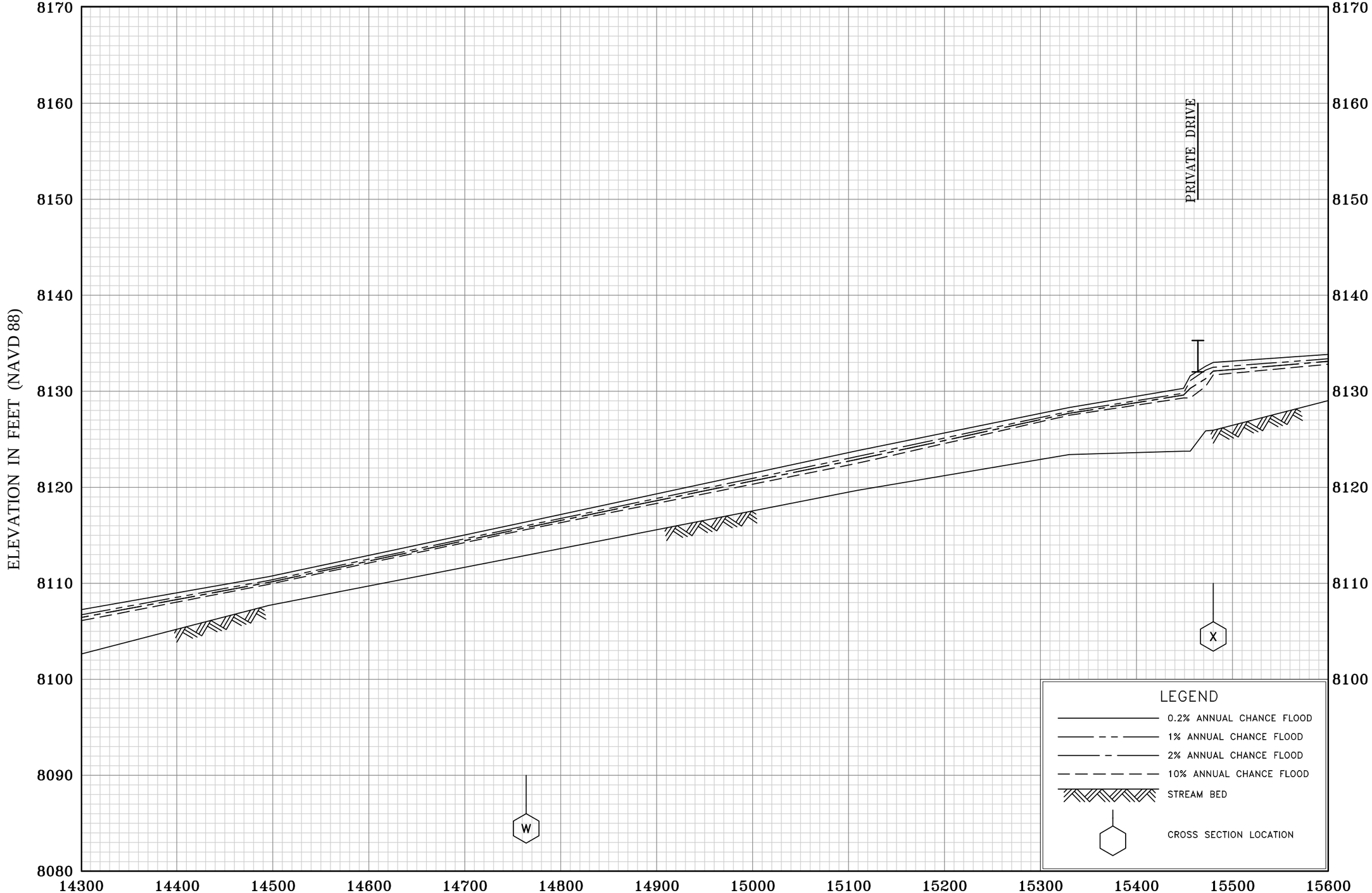
FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO

AND INCORPORATED AREAS

29P


8130
8120
8110
8100
8090
8080
8070
8060
8050
8040
ELEVATION IN FEET (NAVD 88)
13000
13100
13200
13300
13400
13500
13600
13700
13800
13900
14000
14100
14200
14300
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH ROARING FORK RIVER
HALL DRIVE
U
V
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
CASTLE CREEK
FEDERAL EMERGENCY MANAGEMENT AGENCY
PITKIN COUNTY, CO
AND INCORPORATED AREAS
30P



FLOOD PROFILES

CASTLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

PITKIN COUNTY, CO

AND INCORPORATED AREAS