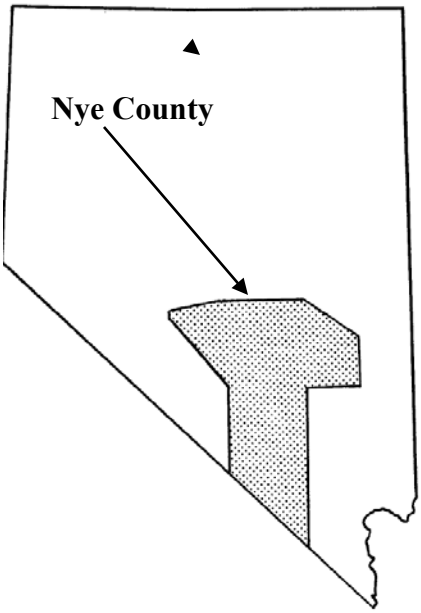
# FLOOD INSURANCE STUDY

# NYE COUNTY, NEVADA

**ALL JURISDICTIONS**

| Community Name | Community Number |
|---|---|
| NYE COUNTY, | |
| UNINCORPORATED AREAS | 320018 |




**Revised Preliminary**
**April 15, 2016**

## Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
32023CV000B

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.

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

| Old Zone | New Zone |
|---|---|
| A1 through A30 | AE |
| B | X (Shaded) |
| C | X (Unshaded) |

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.

Initial Countywide FIS Effective Date: February 17, 2010
Revised Countywide FIS Effective Date: Month ##, 2017

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| Pahrump Wash | Panels 17P – 18P |
| Shadow Mountain Wash | Panels 19P – 20P |
| Slime Wash | Panels 21P – 27P |
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| | |
|---|---|
| PUBLISHED SEPARATELY: | Flood Insurance Rate Map Index<br>Flood Insurance Rate Map |

# FLOOD INSURANCE STUDY
# NYE COUNTY, NEVADA 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) in the geographic area of Nye County, Nevada, including the unincorporated areas (hereinafter referred to collectively as Nye County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates. This information will also be used by Nye County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the NFIP are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than those on which this federally supported study is based. These criteria take precedence over the minimum Federal criteria for purposes of regulating development in the flood plain, as set forth in the Code of Federal Regulations at 44 CFR, 60.3(c). In such cases, however, it shall be understood that the State (or other jurisdictional agency) shall be able to explain these requirements and criteria.

### 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 FIS was prepared to include the unincorporated areas of, and incorporated areas, within Nye County in a countywide format. Information on the authority and acknowledgements for each jurisdiction included in this countywide FIS, as compiled from their previously printed FIS reports, is shown below.

The original hydrologic and hydraulic analyses for this study were performed by James M. Montgomery, Consulting Engineers, Inc., for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-83-C-1197. This study was completed in September 1985.

A restudy for hydrologic and hydraulic analyses of Slime Wash was conducted by the U. S. Geological Survey (USGS) under Interagency Agreement Nos. EMW-91-E-3535 and EMW-92-E-3847. This study was completed in June 1998.

In February 2009, HDR Engineering Inc. completed a countywide DFIRM and FIS for the County of Nye. HDR Engineering Inc. was hired as a study contractor for FEMA Region IX under contract number EMF-2003-CO-0045, Task Order 28. The DFIRM process included digitizing flood zone boundaries from the effective paper FIRM panels and fitting them to a digital base map, thus converting the existing manually produced FIRM panels to a digitally produced FIRM, referred to as a DFIRM.

For this update, a new study of reaches in Nye County included hydrologic and hydraulic analyses performed by BakerAECOM for the Federal Emergency Management Agency (FEMA) under contract number HSFEHQ-09-D-0368, task order number HSFE09-09-J-0002. BakerAECOM was contracted in September 2010, to create a FIRM map revision within Nye County on panels 8720, 8725, 8740, 8750, 8805, 8815, 8825, 8850, 8895, 8915, 8930, and 8940. New detailed studies were performed on Front Sight Wash and Shadow Mountain Wash replacing Zone A areas. A new detailed study was performed on Pahrump Wash revising Zone AO areas.

Planimetric base map information was provided in digital format for FIRM panels. Public Land Survey System (PLSS) and information on roads and political boundaries were provided by Nye County. National Agricultural Imagery Program (NAIP) aerial imagery was provided by U.S. Department of Agriculture (USDA). Aerial imagery was used to verify road locations. Users of this FIRM should be aware that minor adjustments may have been made to specific base map.

The coordinate system used for the production of this FIRM is Universal Transverse Mercator (UTM), North American Datum of 1983 (NAD 83), and GRS 1980 spheroid. Corner coordinates shown on the FIRM are in latitude and longitude referenced to NAD 83. Differences in datum and spheroid used in the production of FIRMs for adjacent counties may result in slight positional differences in map features and at the county boundaries. These differences do not affect the accuracy of information shown on the FIRM.

## 1.3 Coordination

Consultation Coordination Officer's (CCO) meetings may be held for each jurisdiction in this countywide FIS. An initial CCO meeting is held typically with representatives of FEMA, the community, and the study contractor to explain the nature and purpose of a FIS, and to identify the streams to be studied by detailed methods. A final CCO meeting is typically held with the representatives of FEMA, the community, and the study contractor to review the results of the study.

For the original study of Nye County, flooding sources requiring study by detailed methods were identified at a meeting attended by representatives of the study contractor, FEMA, and Nye County on April 15 and 16, 1983.

Results of the hydrologic analyses were coordinated with the Natural Resources Conservation Service (NRCS), formerly known as U.S. Soil Conservation Service (SCS), Nye County Planning Department, and Pahrump Conservation District, U.S. Army Corps of Engineers (USACE), State of Nevada Division of Emergency Management, and the USGS.

On August 15, 1989, the results of the study were reviewed at a final meeting attended by representatives of Nye County, FEMA, and the study contractor.

This study was revised on June 8, 1998 to provide detailed flood-hazard information for Slime Wash along U.S. Highway 95, from the Nye-Esmeralda County line to approximately 0.2 mile upstream of U.S. Highway 6.

An initial CCO meeting was held on July 24, 1991 to identify areas requiring detailed flooding analyses. This meeting was attended by representatives of FEMA, the USGS, the study contractor, and the community.

An intermediate CCO meeting was held on September 26, 1995 to discuss the results of the study. This meeting was attended by representatives of FEMA, the study contractor, and the community.

The results of this revision were reviewed at a final CCO meeting held on May 7, 1997, and attended by representatives of FEMA, Nye County, and the study contractor. All problems raised at that meeting have been addressed in this restudy.

The dates of the initial and final CCO meetings held for Nye County and the incorporated communities in its boundaries are shown in Table 1, "Initial and Final CCO Meetings."

**Table 1 – Initial and Final CCO Meetings**

| Community Name | Initial CCO Date | Final CCO Date |
|---|---|---|
| Nye County, | April 15 & 16, 1983 | August 15, 1989 |
| (Unincorporated Areas) | July 24, 1991 | May 7, 1997 |

In 2008, the Community of Gabbs disincorporated from the NFIP and mapping for this area is shown under the unincorporated areas of Nye County.

On June 5, 2008, the initial CCO meeting for the Nye countywide DFIRM and FIS was held. Attending the meeting were representatives of FEMA Region IX, HDR Engineering Inc. the study contractor, and Nye County.

For this map revision, a final CCO meeting took place on September 20, 2012, and was attended by representatives of FEMA, the community, and the study contractor.

## 2.0 AREA STUDIED

### 2.1 Scope of Study

This FIS covers the geographic area of Nye County, NV, including the incorporated communities. The scope and methodologies used in preparation of this FIS were agreed upon in joint consultation between FEMA and Nye County. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

Floods caused by the overflow of the Amargosa River from U.S. Highway 95, upstream 2.7 miles to the border between Sections 5 and 6 of Township 12 South, Range 45 East were studied by detailed methods. Shallow flooding in the East and West Pahrump Valley and alluvial fan flooding on Wheeler Wash, Peak Springs, and Unnamed Western Wash were also studied.

In June of 1998, a restudy was completed to provide detailed flood-hazard information for Slime Wash along U.S. Highway 95 from the Nye-Esmeralda County line to approximately 0.2 mile upstream of U.S. Highway 6.

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through September 1994.

All or portions of the flooding sources listed in Table 2, "Flooding Sources Studied by Detailed Methods," were studied by detailed methods. Limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM.

**Table 2 – Flooding Sources Studied By Detailed Methods**

| | |
|---|---|
| Amargosa River | Pahrump Wash |
| Front Sight Wash North | Peak Springs Wash |
| Front Sight Wash Central | Shadow Mountain Wash |
| Front Sight Wash South | Slime Wash |
| Gamebird Road Channel | Yucca Springs Channel |
| Mountain Falls Lane Split | |

Approximate analyses were used to study only those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and Nye County. All or portions of the flooding sources listed in Table 3, "Flooding Sources Studied by Approximate Methods," were studied by approximate methods.

**Table 3 – Flooding Sources Studied By Approximate Methods**

| | | |
|---|---|---|
| Adams-McGill Reservoir | Amargosa River | Bald Mountain Wash |
| Barley Creek | Beatty Wash | Big Spring Wash |
| Blackrock Canyon Creek | Bonnie Claire Lake | Box Canyon Creek |
| Bull Creek | Carson Slough | Clear Creek |
| Clover Creek | Cockalorum Wash | Conejo Canyon Creek |
| Craig Canyon Creek | Currant Creek | Dacey Reservoir |
| Danville Creek | Dry Canyon Creek | Dry Lake |
| Duck Water Creek | Ellsworth Canyon Creek | Fluorspar Canyon |
| Fortymile Wash | Gabbs Wash | Germany Canyon Creek |
| Hay Meadow Reservoir | Hicks Station Wash | Hot Creek |
| Hunts Canyon Creek | Indian Creek | Jumbled Wash |
| Lebeau Creek | Little Smokey Valley | Lunar Lake |
| Luther Waddles Wash | Marble Falls Canyon Creek | Meadow Creek |
| Milton Canyon Creek | Mission Canyon Creek | Moon River |

| | | |
|---|---|---|
| Moores Station Wash | Mosquito Creek | Mountain View Canyon Creek |
| Mud Lake | Orange Lichen Creek | Pahrump Valley Wash |
| Pahrump Wash | Pine Creek | Pritchards Canyon Creek |
| Reece River | Rock Valley Wash | Sand Springs Wash |
| Savory Creek | Sevenmile Wash | Silver Creek |
| Snowball Creek | Spanish Canyon Creek | Stargo Creek |
| Sunnyside Creek | The Big Wash | Topopah Wash |
| Tulle Creek | Tulle Field Reservoir | Twin Spring Slough |
| Tybo Creek | West Pahrump Valley Wash | Wheeler Wash |
| White River | White River Pass Canyon Creek | Willow Creek |

## 2.2 Community Description

Nye County is located in southern Nevada and is bordered by Churchill, Lander, and Eureka Counties on the north; White Pine, Lincoln, and Clark Counties on the east; Mineral and Esmeralda Counties on the west; and Inyo County, California, on the south. Tonopah, located 207 miles northwest of the City of Las Vegas, is the county seat. The Cities of Beatty and Pahrump are 112 miles and 59 miles from the City of Las Vegas, respectively. The majority of the development in Nye County has occurred in the Pahrump Valley, in the Beatty area, and in the Tonopah area. These regions are located in the southeastern, southwestern, and west-central part of the county, respectively.

The weather in the area is arid, characterized by sparse rainfall, low humidity, and wide extremes in daily temperatures. Winter storms in the area are regional in nature. These storms are associated with broad low-pressure systems that develop over the Pacific Ocean and move easterly. Precipitation from these storms is generally widespread and is intense only on rare occasions.

Summer storms, however, occur as localized thunderstorms and can be intense. These local convective storms are associated with moisture from the Gulf of California and the southern Pacific Ocean that move northeasterly. Floods occurring in the valley are generally associated with precipitation from the summer convective thunderstorms in the mountains, occurring mainly during the cooler months (September through March) (U.S. Department of the Interior, 1832, 1967 and U.S. Department of the Interior, Geological Survey, 1980).

Due to the aridity of the desert in which Nye County is located, the area is dry except during and shortly after a storm. When a major storm does move into the area, water collects rapidly as

surface runoff and reaches the area in a short period of time. Consequently, resultant flood flows are of the flash type, having sharp peaks and short durations.

The unincorporated community of Pahrump is situated in the north-central part of the Pahrump Valley, with the majority of the approximately 125 square miles of the township having developed west of State Highway 160. According to the 1980 census (U.S. Department of Commerce, Bureau of the Census, 1980, 1981), an estimated 1,375 people populated the township of Pahrump. The estimated population of the unincorporated areas of Nye County was 16,170 as of July 1988 (U. S. Department of Commerce, Bureau of the Census, July 1988). In 2000, the population was 32,485 (U.S. Census Bureau 2000) and estimated to be 42,693 in 2006 (U.S. Census Bureau 2000).

Up until the late 1960s, agriculture was the primary base of the economy, with cotton and alfalfa being the principal crops. Since then, much of the land has been taken out of agricultural production and subdivided for real estate development, which is presently a major factor in the economy of the Pahrump Valley (U.S. Department of the Interior, Geological Survey, 1982). Commercial development is made up mainly of lumber yards, hardware stores, gas stations, restaurants, and motels along the highways. Residential development, consisting primarily of retirement homes, is occurring around the Pahrump Valley.

According to the National Weather Service records for the climatological station maintained by the University of Nevada at the Pahrump Ranch since 1958, temperatures in the Pahrump Valley have ranged from a high of 106°F in July to a low of 17 ºF in January. The average monthly temperature is 62°F. Total rainfall in the area ranges from approximately 1 to 10 inches per year. The annual average rainfall is 4.3 inches. There has been no measurable snowfall recorded in the valley (U. S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Climatological Data, State of Nevada).

The topography along the southern part of the Pahrump Valley differs markedly from that along the north. The southeast side of the valley is characterized by large alluvial fans; the northwest by playas, or "dry lakes". Soils in the valley are derived from the unconsolidated and partly consolidated deposits which form the valley fill. This includes boulders, gravel, sand, silt, clay, and mudflow debris (U.S. Department of the Interior, Geological Survey, 1982).

Natural vegetation in the valley is typical of the Mojave Basin desert region and includes creosote bush, a variety of yuccas, mesquite, and sagebrush.

## 2.3 Principal Flood Problems

Floodwater in the Pahrump Valley originates in the mountains surrounding the valley. Accumulated water drains in a southwesterly direction into the valley. Because of the presence of the alluvial fans surrounding the Town of Pahrump, flowpaths in the valley lack definition. Analyses of topography patterns reveal that shallow flooding may occur all around the valley, particularly in the eastern, central, and western portions.

The last major flood occurred in August 1983. Water from a storm in excess of a 75-year event originated in the north and flooded approximately 14 miles of State Highway 160, and then

flowed through the western side of the township of Pahrump (State of Nevada, Department of Transportation, August 18, 1983, October 1983).

### 2.4 Flood Protection Measures

The township of Pahrump has not adopted any ordinances delineating areas of potential flood hazards. Structural measures installed in the area include pipe culverts located at regular intervals along State Highways 160 and 372 in order to enable water originating in the mountains to flow southwesterly through the valley. However, the capacities of these culverts can easily be exceeded, resulting in sheet flooding by the overflow.

## 3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood-hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 2-, 1-, or 0.2-percent annual chance 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 annual 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 shorter intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedance) in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

### 3.1 Hydrologic Analyses

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

Nye County has a previously printed FIS report. The hydrologic analyses described in that report is summarized below.

The initial approach for modeling the hydrology of the Pahrump Valley watershed involved the USGS regional regression equations. However, investigations showed that available USGS methods applicable to many regions in Nevada were not applicable to the study area due to lack of reliable regression relationships, or to limitations on the range of parameters (e.g., drainage area) allowed by particular equations. Because of this, a TR-20 analysis of the Pahrump Valley completed by the Las Vegas Office of the NRCS in 1984 was evaluated (U.S. Department of Agriculture, Soil Conservation Service, 1982). Since the NRCS flows appeared to be based on more reliable data (watershed area, time of concentration, curve number), the TR-20 modeling approach of the NRCS was used to estimate the peak flows for this restudy. Data from USGS topographic maps, the NOAA Precipitation Atlas (U. S. Department of Commerce, National Oceanic and Atmospheric Administration, 1973), and the existing TR-20 model of the Pahrump

Valley provided by the Las Vegas Office of the NRCS were incorporated into the analysis of the hydrology for this study.

For the Amargosa River watershed, the proposed method for modeling its hydrology also involved the USGS regional regression equations. As with the Pahrump Valley hydrologic analysis, the regression equations were not applicable to the study area. The size of the drainage area (459 square miles) also precluded the use of the TR-55 graphical or tabular hydrograph methods for the Amargosa River watershed. Thus, a TR-20 model of the Amargosa River above Beatty was developed using data from USGS topographic maps, and the NOAA Precipitation Atlas (U. S. Department of Commerce, National Oceanic and Atmospheric Administration, 1973).

In the June 1998 restudy, Hydrologic analyses were carried out to establish peak discharge frequency relationships for Slime Wash. Drainage-basin parameters for the watershed were determined using USGS 7. 5-minute series topographic maps (U. S. Department of the Interior, 1987). Precipitation data were obtained from the following National Oceanic and Atmospheric Administration (NOAA) publications: "Climatological Summary, Tonopah, Nevada" (U. S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Climatological Summary, Tonopah, Nevada); NOAA Atlas 2, "Precipitation-Frequency Atlas of the Western United States, Volume VII-Nevada" (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1973); and "Hourly Precipitation Data, Nevada" (U. S. Department of Commerce, National Oceanic and Atmospheric Administration, Hourly Precipitation Data, Nevada). Additional information for the flood-frequency analyses was provided by the USGS with OpenFile Reports 80-963, "Flood Potential of Topopah Wash and Tributaries, Eastern Part of Jackass Flats, Nevada Test Site, Southern Nevada," and 93-419, "Methods for Estimating Magnitude and Frequency of Floods in the Southwestern United States" (U.S. Department of the Interior, 1980 and U.S. Department of the Interior, 1994, respectively).

Estimates of the 1-percent annual chance flood-frequency value for the study area were performed using a Log-Pearson Type III analysis (U. S. Department of Commerce, 1982) of the annual peak record from 12 area stations. This analysis resulted in a peak discharge-frequency relationship and included regression analyses of drainage area vs. peak discharge. One estimate of discharge was 950 cubic feet per second (cfs), while another was 2,900 cfs (U.S. Department of the Interior, Geological Survey, 1983 and Arteaga, F.E., Unpublished, 1994, respectively).

For the June 1998 restudy, the USACE HEC-l computer program (U.S. Department of the Army, Corps of Engineers, 1981) was used to develop the hydrograph and routing for the watershed. Using HEC-l, the discharge was determined to be 2,300 cfs at the downstream limit of the watershed. Discharges computed using the HEC-l computer program were used in the hydraulic analyses for this restudy.

For this update, Hydrologic analyses were performed to establish peak discharge-frequency relationships for each of the restudied streams. These discharges were developed as part of the "Hydrologic Analysis, Pahrump Valley PMR, Nye County, Nevada," prepared by BakerAECOM. Flood hydrographs and peak discharge values for the aforementioned flood events were performed using the US Army Corps of Engineers (USACE) HEC-HMS, version 3.5, computer modeling program.

This hydrologic analysis includes hydrologic modeling of the Pahrump Valley watershed upstream of the Nevada/California boundary, where flows affect development near the City of Pahrump, Nevada. The total contributing area of the watershed modeled is approximately 531 square miles.

Precipitation values were taken from the National Oceanic and Atmospheric Agency's (NOAA) Atlas 2. NOAA Atlas 14 data was also considered, but was ultimately disregarded when preliminary analysis showed that peak discharges were being overestimated for high elevation subbasins. Due to the large size of the watershed, depth area reduction factors were used.

Precipitation losses were calculated using the SCS Curve Number method. Land use types were taken from the USDA/NRCS National Land Cover Dataset (NLCD) and hydrologic soil group values were taken from the USDA soil surveys.

The SCS Unit Hydrograph method was used to model runoff transformation. Lag time calculations were based on recommendations from the Clark County, Nevada, Regional Flood Control District Drainage Manual.

Channel routing was modeled using the Muskingum-Cunge routing method. Parameters for channel characteristics were estimated using two-foot contour data and aerial imagery provided by Nye County.

A summary of the drainage area-peak discharge relationships for all the streams studied by detailed methods is shown in Table 4, "Summary of Peak Discharges."

**Table 4 - Summary of Peak Discharges**

| Flooding Source and Location | Drainage Area (sq. mi.) | Peak Discharges (cfs) 10-Percent-Annual-Chance | 2-Percent-Annual-Chance | 1-Percent-Annual-Chance | 0.2-Percent-Annual-Chance |
|---|---|---|---|---|---|
| Amargosa River | | | | | |
| At Beatty | 459.0 | 7,490 | 15,000 | 18,400 | 27,000 |
| Bell Vista Fan | | | | | |
| At Fan Apex | 1.8 | 70 | 232 | 223 | 1,120 |
| First Chance Fan | | | | | |
| At Fan Apex | 0.2 | 35 | 76 | 98 | 210 |
| At N. Corbin Street | 1.0 | 143 | 308 | 384 | 820 |
| Front Sight Wash | | | | | |
| At State Hwy 16 | 63.7 | 2,429 | 4,545 | 5,623 | 10,600 |
| At Nevada-California state line | 64.9 | 2,437 | 4,566 | 5,632 | 10,600 |
| High Peak Fan | | | | | |
| At Fan Apex | 0.8 | 112 | 256 | 334 | 760 |

**Table 4 - Summary of Peak Discharges, continued**

| Flooding Source and Location | Drainage Area (sq. mi.) | Peak Discharges (cfs) 10-Percent-Annual-Chance | 2-Percent-Annual-Chance | 1-Percent-Annual-Chance | 0.2-Percent-Annual-Chance |
|---|---|---|---|---|---|
| At N. Warren Street | 2.5 | 147 | 383 | 538 | 1,390 |
| Approximately 600 feet upstream of N. Murphy Street | 3.9 | 147 | 424 | 605 | 1,730 |
| Irene Wash | | | | | |
| Approximately 1,300 feet upstream of Irene Street | 0.4 | 17 | 60 | 86 | 290 |
| Last Chance Fan | | | | | |
| At Fan Apex | 1.0 | 122 | 259 | 332 | 700 |
| At Jarvis Road | 2.4 | 185 | 452 | 594 | 1,460 |
| Pahrump Wash | | | | | |
| At Hwy 372 | 224.9 | 7,277 | 14,944 | 20,038 | 41,900 |
| Approximately 2,400 feet downstream of Hwy 372 | 232.9 | 7,264 | 14,965 | 19,994 | 41,700 |
| At Nevada-California state line | 233.4 | 7,232 | 14,878 | 19,938 | 41,500 |

**Table 4 - Summary of Peak Discharges, continued**

| Flooding Source and Location | Drainage Area (sq. mi.) | Peak Discharges (cfs) 10-Percent-Annual-Chance | 2-Percent-Annual-Chance | 1-Percent-Annual-Chance | 0.2-Percent-Annual-Chance |
|---|---|---|---|---|---|
| Peak Springs Fan | | | | | |
| At Fan Apex | 9.7 | 1,094 | 2,268 | 2,971 | 6,100 |
| Approximately 7,200 feet upstream of Hafen Ranch Road | 45.8 | 2,098 | 4,459 | 6,484 | 14,200 |
| Shadow Mountain Wash | | | | | |
| Approximately 1.9 miles upstream of N. Corbin Road | 4.6 | 393 | 906 | 1,192 | 2,750 |
| Upstream of N. Corbin Road | 6.1 | 413 | 997 | 1,344 | 3,250 |
| Downstream of N. Corbin Road | 10.3 | 652 | 1,652 | 2,202 | 5,500 |
| Slime Wash | | | | | |
| Approximately 1,500 feet downstream of the Nye-Esmeralda County Line | 3.29 | --[1] | --[1] | 2300 | --[1] |
| Approximately 1,100 feet upstream of the Nye-Esmeralda County Line | 2.15 | --[1] | --[1] | 1530 | --[1] |
| Approximately 2,000 feet upstream of the Nye-Esmeralda County Line | 1.84 | --[1] | --[1] | 1360 | --[1] |
| At Florence Ave | 1.45 | --[1] | --[1] | 1130 | --[1] |
| At Magnolia Ave | 0.87 | --[1] | --[1] | 700 | --[1] |

[1]Data Not Computed

**Table 4 - Summary of Peak Discharges, continued**

| Flooding Source and Location | Drainage Area (sq. mi.) | Peak Discharges (cfs) 10-Percent-Annual-Chance | 2-Percent-Annual-Chance | 1-Percent-Annual-Chance | 0.2-Percent-Annual-Chance |
|---|---|---|---|---|---|
| Wheeler Wash Fan | | | | | |
| At Fan Apex | 79.08 | 10,206 | 19,032 | 22,660 | 30,752 |

[1]Data Not Computed

## 3.2 Hydraulic Analyses

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

Cross sections were determined from topographic maps and field surveys. All bridges, dam, and culverts were field surveyed to obtain elevation data and structural geometry. All topographic mapping used to determine cross sections are referenced in Section 4.1.

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

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

All qualifying bench marks within a given jurisdiction that are cataloged by the National Geodectic Survey (NGS) and entered into the National Spatial Reference System (NSRS) as First of Second Order Vertical and have a vertical stability classification of A, B, or C are shown and labeled on the Firm with their 6-character NSRS Permanent Identifier.

Bench marks cataloged by the NGS and entered into the NSRS vary widely in vertical stability classifications. NSRS vertical stability classifications are as follows:

- Stability A: Monuments of the most reliable nature, expected to hold position/elevation well (e.g., mounted in bedrock)
- Stability B: Monuments which generally hold their position/elevation well (e.g., concrete bridge abutment)
- Stability C: Monuments which may be affected by surface ground movements (e.g., concrete monument blow frost line)
- Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

In addition to NSRS bench marks, the FIRM may also show vertical control monuments established by a local jurisdiction; these monuments will be shown on the FIRM with the appropriate designations. Local monuments will only be placed on the FIRM in the community has requested that they be included, and if the monuments meet the aforementioned NSRS inclusion criteria.

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

Nye County has a previously printed FIS report. The hydraulic analyses described in that report is summarized below.

Cross sections for the backwater analyses for Amargosa River were obtained from an aerial survey conducted in May 1984. This information was augmented by relative channel sections obtained by field measurements.

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations of the stream and floodplain areas. Roughness values for the main channel of Amargosa River ranged from 0.030 to 0.040, while floodplain values ranged from 0.030 to 0.045.

Water-surface elevations of floods of the selected recurrence intervals were computed through the use of the USACE HEC-2 step-backwater computer program (U.S. Department of the Army, Corps of Engineers, September 1982).

Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. The starting water-surface elevation for Amargosa River was calculated using the slope-area method. The initial hydraulic analysis indicated that certain portions of Amargosa River will experience supercritical flows. However, for flood insurance purposes the water-surface elevations shown in the Flood Profiles (Exhibit 1) represent the subcritical analyses.

The FEMA alluvial fan methodology was used to determine the flood depths and velocities on the Wheeler Wash alluvial fan (Federal Emergency Management Agency, Office of Natural and Technological Hazards, 1982). For portions of this fan, it was determined that flood events consist of multiple channels. Therefore, the methodology for multiple flood channels was used to analyze the multiple channel regions.

For the shallow flooding areas of East and West Pahrump Valley, the preliminary hydraulic analyses indicated that 1-percent annual chance flooding consisted of sheetflow with average depths of 3.0 feet or less. Depths or elevations of shallow flooding in these areas were computed using backwater analyses performed utilizing the USACE HEC-2 computer program (U.S. Department of the Army, Corps of Engineers, Hydrologic Engineering Center, 1982), normal depth calculations, topographic data, and historical information. Computed flow paths and flood depths were compared with accounts of historical flooding and the results of previous studies whenever possible.

Shallow flooding is often characterized by highly unpredictable flow directions, caused by low relief or shifting channels and high debris loads. Where such conditions exist, the entire area susceptible to this unpredictable flow was delineated as a zone of equal risk. Small-scale topographic variations were averaged across inundated areas to determine flood depths.

Approximate Zone A areas were determined based on historical records of flooding, and using engineering judgment. Areas studied by approximate methods include: Peak Springs, Unnamed Western Wash fans, and an area approximately 4 miles southwest of the Town of Pahrump.

For the June 1998 restudy, hydraulic analyses were performed using the Federal Highway Administration WSPRO computer program (U.S. Department of Transportation, Federal Highway Administration, 1988) for the purpose of determining 1-percent annual chance base flood elevations along Slime Wash.

Cross sections for the WSPRO program were obtained from an aerial survey conducted in July 1992 (Boundy Land Surveying, Aerial Photographs: 1992 and Federal Emergency Management Agency 1990).

Roughness factors (Manning's "n" values) used in the hydraulic computations were chosen by engineering judgment and based on observations of channel and floodplain areas as shown on the aerial photographs. Roughness values for the main channel and overbanks ranged from 0.025 to 0.045. Obstructions in overbank areas were noted and given considerably higher "n" values, as high as 0.500.

New Hydraulic Analyses Included in This Revision

Terrain data for hydraulic modeling was based on Digital Elevation Models (DEMs) and contours provided by Nye County. The terrain data is based on Light Detection and Ranging (LiDAR) data collected by Aero-Graphic, Inc. on October 25, 2010. Field survey data for channels and structures was collected by Harned Surveying and Engineering, Inc. in March 2011. All topographic data is referenced to the North American Vertical Datum of 1988 (NAVD 1988).

For Front Sight Wash, Pahrump Wash, and Shadow Mountain Wash, hydraulic analysis was performed using USACE's computer modeling program HEC-RAS, version 4.1. Manning's "n" roughness values were set to 0.035 for most cross section locations, indicative of the mostly arid, sandy terrain with little to no vegetation. Higher manning's "n" roughness values (0.045 or 0.055) were used in areas with light or moderate vegetation. Normal depth was used as the downstream boundary condition.

Preliminary analysis on Front Sight Wash indicated that flooding, even during large storm events, would be separated into three distinct channels (Front Sight Wash North, Front Sight Wash Central, and Front Sight Wash South). These three channels were analyzed separately. The North and South Washes eventually confluence with Front Sight Wash Central in a flat, unconfined area approximately 2,000 feet upstream of the Nevada-California state line.

Floodways were calculated for Front Sight Wash, Pahrump Wash, and Shadow Mountain Wash using the equal conveyance reduction method. Floodway delineation was created using engineering judgment between modeled cross sections.

Bell Vista Wash, First Chance Wash, High Peak Wash, and Last Chance Wash all exhibit signs of active alluvial fan flooding. The FAN computer modeling program was used to calculate average flooding depths and velocities for the 1-percent-annual-chance flooding event. Avulsion factors of 1.0 and 1.5, manning's "n" values of 0.035 and 0.05, and multiple and single channel conditions were modeled to determine applicability of resulting flood hazard determinations based on field conditions. Modeled slopes were determined from terrain data.

Hydraulic analysis of the Shadow Mountain Wash alluvial plain was performed using the FLO-2D computer modeling program, version 2009.06. Grid cells 50 feet were used for Shadow Mountain Wash. Precipitation and precipitation losses were determined using methods consistent with the hydrologic analysis for this area. Width reduction factors were applied where large structures spanned more than half of a grid cell. The levee option was used to model hydraulic impacts of masonry fences, with failure criteria set to an adjacent flow depth of 2.5 feet. Model simulation duration was extended to capture peak discharge at all outflow cells. A maximum allowable Froude number was set to 0.8-0.9 to maintain subcritical flow throughout the model domain. Flood hydrographs for the 1-percent-annual-chance flooding event were evenly distributed across representative inflow cells. Outflow cells were assigned to the down gradient boundary of the model domain.

The starting water-surface elevation was determined using critical depth. Hydraulic analyses indicate that portions of the flood-hazard area will experience supercritical flows. However, for flood insurance purposes, areas of supercritical flow are plotted at critical depth on the flood profiles.

Hydraulic analysis of the Peak Springs Wash alluvial plain was performed using the FLO-2D computer modeling program, version 2009.06. Grid cells of 150 feet were used for undeveloped or single lot development areas. Grid cells of 15 feet were used in developed areas where drainage infrastructure exists. Within the overall Peak Springs Wash area, Gamebird Road Channel, Yucca Springs Channel, and Mountain Falls Lane Split were identified as distinct detailed reaches. Precipitation and precipitation losses were determined using methods consistent with the hydrologic analysis for this area. Width reduction factors were applied where large structures spanned more than half of a grid cell. The levee option was used to model hydraulic impacts of masonry fences, with failure criteria set to an adjacent depth of 2.5 feet. Model simulation duration was extended to capture peak discharge at all outflow cells. A maximum allowable Froude number was set to 0.8-0.9 to maintain subcritical flow throughout the model domain. Flood hydrographs for the 1-percent-annual-chance flooding event were evenly distributed across representative inflow cells. Outflow cells were assigned the down gradient boundary of the model domain.

Exhibit 1, "Flood Profiles," was also revised to reflect changes as a result of the restudy

A summary of Manning's "n" values used in this countywide FIS study is contained in Table 5, "Manning's "n" Values."

**Table 5 – Manning's "n" Values**

| Stream | Left Overbank "n" | Channel "n" | Right Overbank "n" |
|---|---|---|---|
| Amargosa River | 0.030-0.045 | 0.030-0.040 | 0.030-0.045 |
| Front Site Wash | 0.035 | 0.035 | 0.035 |
| Pahrump Wash | 0.035 | 0.035-0.055 | 0.035 |
| Shadow Mountain Wash | 0.035 | 0.035 | 0.035 |
| Slime Wash | 0.025-0.500 | 0.025-0.045 | 0.025-0.500 |

Embankments Hazard Analysis

Some flood hazard information presented in prior FIRM panels and in prior FIS reports for Nye County and its incorporated communities was based on flood protection provided by embankments. Based on the information available and the mapping standards of the NFIP at the time that the prior FISs and FIRM panels were prepared, FEMA accredited the embankments as providing protection from the flood that has a 1-percent-chance of being equaled or exceeded in any given year. For FEMA to continue to accredit the identified embankments with providing protection from the base flood, the embankments must meet the criteria of the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10), titled "Mapping of Areas Protected by Levee Systems."

On August 22, 2005, FEMA issued *Procedure Memorandum No. 34 - Interim Guidance for Studies Including Levees*. The purpose of the memorandum was to help clarify the responsibility of community officials or other parties seeking recognition of an embankment by providing information identified during a study/mapping project. Often, documentation regarding levee design, accreditation, and the impacts on flood hazard mapping is outdated or missing altogether. To remedy this, *Procedure Memorandum No. 34* provides interim guidance on procedures to minimize delays in near-term studies/mapping projects, to help our mapping partners properly assess how to handle embankment mapping issues.

While 44 CFR Section 65.10 documentation is being compiled, the release of more up-to-date FIRM panels for other parts of a community or county may be delayed. To minimize the impact of the embankment recognition and certification process, FEMA issued *Procedure Memorandum No. 43 - Guidelines for Identifying Provisionally Accredited Levees* on March 16, 2007. These guidelines will allow issuance of preliminary and effective versions of FIRMs while the embankment owners or communities are compiling the full documentation required to show compliance with 44 CFR Section 65.10. The guidelines also explain that preliminary FIRMs can be issued while providing the communities and embankment owners with a specified timeframe to correct any maintenance deficiencies associated with an embankment and to show compliance with 44 CFR Section 65.10.

Table 6, "List of Embankments Requiring Flood Hazard Revisions" lists all Embankments shown on the FIRM for which corresponding flood hazard revisions were made.

Approximate analyses of "behind embankment" flooding were conducted for all the embankments in Table 6 to indicate the extent of the "behind embankment" floodplains. The methodology used in these analyses is discussed below.

The approximate embankment analysis was conducted using information from existing hydraulic models (where applicable) and USGS topographic maps.

The extent of the 1-percent-annual-chance flood in the event of embankment failure was determined. Base flood elevations and topographic information (where available) were used to estimate an approximate 1-percent-annual-chance floodplain and traced along the contour line representing the base flood elevation. If base flood elevations were not available they were estimated from effective FIRM maps and available information. Topographic features such as highways, railroads, and high ground were used to refine approximate floodplain boundary limits.

**Table 6 - List of Embankments Requiring Flood Hazard Revisions**

| Community | Flood Source | Embankment Inventory ID | Coordinates Latitude/Longitude | FIRM Panel | USACE Levee |
|---|---|---|---|---|---|
| Nye County | Hicks Station Wash | 10 | 38.83/-116.24<br>38.81/-116.24 | 32023C1950E | No |
| Nye County | The Big Wash | 18 | 38.64/-115.59<br>38.68/-115.55 | 32023C2675E | No |
| Nye County | Paveline Creek | 21a | 38.55/-117.26<br>38.53/-117.26 | 32023C2900E | No |
| Nye County | Undetermined | 24 | 38.50/-116.94<br>38.52/-116.93 | 32023C2975E | No |
| Nye County | Hunts Canyon Creek | 35 | 38.49/-116.83<br>38.49/-116.82 | 32023C3550E | No |
| Nye County | Undetermined | 36 | 38.48/-116.05<br>38.47/-116.03 | 32023C3700E | No |
| Nye County | Undetermined | 39 | 38.38/-117.47<br>38.33/-117.47 | 32023C3425E<br>32023C3950E | No |
| Nye County | Twin Springs Slough | 45 | 38.19/-116.16<br>38.16/-116.13 | 32023C2700E | No |
| Nye County | Undetermined | 47 | 37.97/-116.82<br>37.98/-116.82 | 32023C5500E | No |
| Nye County | Undetermined | 51 | 37.06/-116.78<br>37.06/-116.77 | 32023C7425E | No |
| Nye County | Amargosa River | 54a | 36.92/-116.75<br>36.92/-116.75 | 32023C7695E | No |
| Nye County | Undetermined | 57a | 36.49/-116.16<br>36.49/-116.15 | 32023C8600E | No |
| Nye County | Undetermined | 61 | 36.18/-116.08<br>36.19/-116.06 | 32023C8825E | No |
| Nye County | Undetermined | 65 | 38.85/-117.93<br>38.87/-117.92 | 32023C1600E | No |

**Table 6 - List of Embankments Requiring Flood Hazard Revisions, continued**

| Community | Flood Source | Embankment Inventory ID | Coordinates Latitude/Longitude | FIRM Panel | USACE Levee |
|---|---|---|---|---|---|
| Nye County | Undetermined | 66 | 38.87/-117.92<br>38.87/-117.91 | 32023C1600E | No |
| Nye County | Undetermined | 67 | 38.87/-117.91<br>38.87/-117.90 | 32023C1600E | No |
| Nye County | Undetermined | 68 | 36.70/-116.58<br>36.69/-116.56 | 32023C8200E | No |
| Nye County | Wheeler Wash | 69 | 36.18/-115.93<br>36.16/-115.91 | 32023C8850E | No |

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

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD. Structure and ground elevations in the community must, therefore, be referenced to NAVD. It is important to note that adjacent communities may be referenced to NGVD. This may result in differences in Base (1-percent-annual-chance) Flood Elevations (BFEs) across the corporate limits between the communities.

The conversion factor for each stream studied by detailed methods is shown below in Table 7, "Stream Conversion Factors."

**Table 7 - Stream Conversion Factor**

| Stream Name | Elevation (feet NAVD above NGVD) |
|---|---|
| Amargosa River | +2.9 |
| Slime Wash | +4.0 |

These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the NGVD and NAVD, visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

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

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

## 4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS provides 1-percent annual chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent annual chance flood elevations; delineations of the 1-percent annual chance 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, 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 Flood Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 1- and 0.2-percent annual chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using rectified photo-topographic maps at a scale of 1:4,800, with a contour interval of 4 feet (Cooper Aerial of Nevada, 1983). Shallow and alluvial fan flooding boundaries were delineated using the same set of maps.

For the flooding sources studied by approximate methods, the boundaries of the 1-percent annual chance floodplains were delineated using topographic maps taken from the previously printed FIS reports, FHBMs, and/or FIRMS for all of the incorporated and unincorporated jurisdictions within Nye County.

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

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

### 4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent annual chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any

adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent annual chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. Floodways are presented to local agencies as minimum standards that can be adopted directly or used as a basis for additional floodway studies.

Floodways are normally computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain.

Floodway widths are normally computed at cross sections. Between cross sections, the floodway boundaries are interpolated. In cases where the floodway and 1-percent annual chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body. Therefore, “Without Floodway” elevations normally presented for certain downstream cross sections are lower than the regulatory flood elevations in that area, which must take into account the 1-percent annual chance flooding due to backwater from other sources.

Encroachment into areas subject to inundation by floodwater having hazardous velocities aggravates the risk of flood damage, and heightens potential flood hazards by further increasing velocities. In order to reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside floodway.

The area between the floodway and the boundary of the 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 by 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.

Because of the high velocities which were computed for the Amargosa River 1-percent annual chance flood-condition, no encroached floodway was computed, and the entire 1-percent annual chance year floodplain has been designated as floodway.

No floodways were computed for Slime Wash during the June 1998 restudy because the majority of flow through the Town of Tonopah is channeled along U.S. Highway 95. Much of this area already has undergone extensive development.

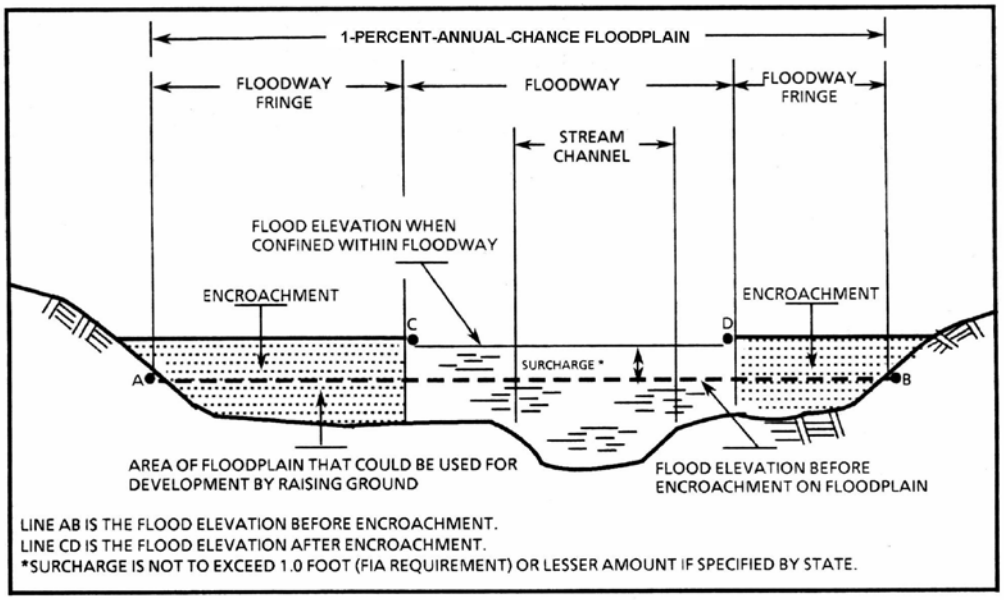


**Figure 1 – Floodway Schematic**

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| Front Sight Wash Central | | | | | | | | |
| A | 906 | 419 | 930 | 6.1 | 2,612.1 | 2,612.1 | 2,613.1 | 1.0 |
| B | 2,317 | 181 | 658 | 8.6 | 2,625.9[2] | 2,625.9 | 2,626.5 | 0.6 |
| C | 3,380 | 80 | 186 | 3.5 | 2,644.0[2] | 2,633.8 | 2,633.8 | 0.0 |
| D | 4,388 | 65 | 169 | 3.8 | 2,644.4[2] | 2,644.3 | 2,644.4 | 0.1 |
| E | 5,479 | 60 | 142 | 4.5 | 2,653.6 | 2,653.6 | 2,653.7 | 0.1 |
| F | 6,712 | 30 | 99 | 6.5 | 2,667.5 | 2,667.5 | 2,667.6 | 0.1 |
| G | 8,252 | 40 | 127 | 5.1 | 2,684.7 | 2,684.7 | 2,684.9 | 0.2 |
| H | 9,258 | 44 | 145 | 4.4 | 2,695.7 | 2,695.7 | 2,695.8 | 0.1 |
| I | 10,847 | 61 | 340 | 1.9 | 2,708.5 | 2,708.5 | 2,708.5 | 0.0 |
| J | 11,402 | 32 | 74 | 8.7 | 2,787.8 | 2,787.8 | 2,787.8 | 0.0 |
| K | 12,244 | 34 | 76 | 8.4 | 2,801.0 | 2,801.0 | 2,801.0 | 0.0 |
| L | 13,644 | 138 | 189 | 3.4 | 2,825.0 | 2,825.0 | 2,825.0 | 0.0 |
| M | 14,824 | 85 | 178 | 3.6 | 2,835.8 | 2,835.8 | 2,835.9 | 0.1 |
| N | 15,963 | 95 | 179 | 3.6 | 2,845.7 | 2,845.7 | 2,845.8 | 0.1 |
| O | 17,077 | 214 | 321 | 3.1 | 2,857.1 | 2,857.1 | 2,857.1 | 0.0 |
| P | 18,073 | 225 | 206 | 3.1 | 2,866.1 | 2,866.1 | 2,866.1 | 0.0 |
| Q | 19,213 | 109 | 149 | 4.3 | 2,878.2 | 2,878.2 | 2,878.2 | 0.0 |
| R | 20,625 | 93 | 172 | 3.8 | 2,895.3 | 2,895.3 | 2,895.3 | 0.0 |

[1]Stream distance in feet above Nevada State Boundary

[2]Water surface elevations controled by Front Sight Wash South

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

**NYE COUNTY, NEVADA AND INCORPORATED AREAS**

**FLOODWAY DATA**

**FRONT SIGHT WASH CENTRAL**

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| Front Sight Wash North | | | | | | | | |
| A | 2,278 | 24 | 56 | 4.5 | 2,623.3 | 2,623.3 | 2,623.6 | 0.3 |
| B | 3,682 | 35 | 60 | 4.2 | 2,636.9 | 2,636.9 | 2,637.0 | 0.1 |
| C | 5,401 | 29 | 66 | 3.8 | 2,653.0 | 2,653.0 | 2,653.3 | 0.3 |
| D | 7,638 | 25 | 43 | 5.9 | 2,672.7 | 2,672.7 | 2,672.9 | 0.2 |
| E | 9,520 | 20 | 54 | 4.7 | 2,697.6 | 2,697.6 | 2,698.0 | 0.4 |
| F | 10,863 | 30 | 62 | 4.0 | 2,717.0 | 2,717.0 | 2,717.4 | 0.4 |
| G | 11,915 | 15 | 31 | 8.2 | 2,748.0 | 2,748.0 | 2,748.0 | 0.0 |
| H | 12,214 | 20 | 82 | 3.7 | 2,784.1 | 2,784.1 | 2,784.1 | 0.0 |
| I | 15,144 | 30 | 65 | 3.9 | 2,818.3 | 2,818.3 | 2,818.7 | 0.4 |
| J | 17,117 | 34 | 68 | 3.7 | 2,836.9 | 2,836.9 | 2,837.4 | 0.5 |
| K | 18,121 | 30 | 61 | 4.1 | 2,846.8 | 2,846.8 | 2,847.2 | 0.4 |

[1]Stream distance in feet above Nevada State Boundary

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

**NYE COUNTY, NEVADA**
**AND INCORPORATED AREAS**

**FLOODWAY DATA**

**FRONT SIGHT WASH NORTH**

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| Front Sight Wash South | | | | | | | | |
| A | 1,747 | 164 | 735 | 7.1 | 2,633.2 | 2,633.2 | 2,633.3 | 0.1 |
| B | 3,188 | 115 | 656 | 8.0 | 2,651.2 | 2,651.2 | 2,651.4 | 0.2 |
| C | 4,626 | 80 | 472 | 11.1 | 2,666.2 | 2,666.2 | 2,666.3 | 0.1 |
| D | 6,352 | 144 | 672 | 7.8 | 2,687.6 | 2,687.6 | 2,687.6 | 0.0 |
| E | 7,954 | 94 | 489 | 10.7 | 2,708.2 | 2,708.2 | 2,708.4 | 0.2 |
| F | 10,183 | 90 | 424 | 12.4 | 2,749.7 | 2,749.7 | 2,749.7 | 0.0 |
| G | 10,804 | 107 | 568 | 11.5 | 2,802.2 | 2,802.2 | 2,802.2 | 0.0 |
| H | 13,717 | 255 | 886 | 5.9 | 2,837.2 | 2,837.2 | 2,837.3 | 0.1 |
| I | 15,135 | 313 | 1,073 | 5.6 | 2,851.0 | 2,851.0 | 2,851.0 | 0.0 |
| J | 16,833 | 190 | 710 | 7.4 | 2,870.6 | 2,870.6 | 2,870.6 | 0.0 |
| K | 18,036 | 76 | 558 | 13.1 | 2,888.9 | 2,888.9 | 2,888.9 | 0.0 |
| L | 19,759 | 152 | 920 | 8.0 | 2,912.2 | 2,912.2 | 2,912.2 | 0.0 |

[1]Stream distance in feet above Nevada State Boundary

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

**NYE COUNTY, NEVADA**
**AND INCORPORATED AREAS**

**FLOODWAY DATA**

**FRONT SIGHT WASH SOUTH**

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| Pahrump Valley Wash | | | | | | | | |
| A | 199 | 378 | 2,480 | 8.1 | 2,499.5 | 2,499.5 | 2,500.1 | 0.6 |
| B | 1,100 | 301 | 1,877 | 10.7 | 2,502.7 | 2,502.7 | 2,502.8 | 0.1 |
| C | 2,005 | 395 | 2,239 | 9.0 | 2,507.3 | 2,507.3 | 2,507.3 | 0.0 |
| D | 2,908 | 600 | 2,544 | 7.9 | 2,511.8 | 2,511.8 | 2,512.1 | 0.3 |
| E | 3,815 | 1108 | 4,229 | 4.7 | 2,515.3 | 2,515.3 | 2,515.7 | 0.4 |
| F | 4,716 | 612 | 2,761 | 7.3 | 2,517.1 | 2,517.1 | 2,517.5 | 0.4 |
| G | 5,646 | 451 | 3,614 | 5.5 | 2,520.5 | 2,520.5 | 2,521.1 | 0.6 |
| H | 6,532 | 972 | 5,269 | 3.8 | 2,521.5 | 2,521.5 | 2,522.3 | 0.8 |
| I | 7,509 | 1064 | 6,920 | 2.9 | 2,522.6 | 2,522.6 | 2,523.5 | 0.9 |
| J | 8,329 | 1274 | 6,761 | 3.0 | 2,523.3 | 2,523.3 | 2,524.0 | 0.7 |

[1]Stream distance in feet above Nye County Corporate Limits

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

**NYE COUNTY, NEVADA AND INCORPORATED AREAS**

**FLOODWAY DATA**

**PAHRUMP WASH**

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| Shadow Mountain Wash | | | | | | | | |
| A | 235 | 68 | 157 | 8.5 | 2,638.8 | 2,638.8 | 2,639.1 | 0.3 |
| B | 714 | 68 | 157 | 8.6 | 2,646.3 | 2,646.3 | 2,647.1 | 0.8 |
| C | 1,367 | 66 | 155 | 8.7 | 2,656.9 | 2,656.9 | 2,657.3 | 0.4 |
| D | 1,794 | 63 | 156 | 8.6 | 2,664.4 | 2,664.4 | 2,665.1 | 0.7 |
| E | 2,202 | 97 | 178 | 7.6 | 2,671.4 | 2,671.4 | 2,672.0 | 0.6 |
| F | 2,773 | 143 | 209 | 6.4 | 2,680.1 | 2,680.1 | 2,680.9 | 0.8 |
| G | 3,512 | 66 | 155 | 8.6 | 2,692.8 | 2,692.8 | 2,693.6 | 0.8 |
| H | 4,500 | 118 | 214 | 6.3 | 2,707.7 | 2,707.7 | 2,708.0 | 0.3 |
| I | 5,156 | 119 | 209 | 6.4 | 2,718.8 | 2,718.8 | 2,719.0 | 0.2 |
| J | 6,475 | 115 | 209 | 6.4 | 2,739.5 | 2,739.5 | 2,739.6 | 0.1 |
| K | 7,489 | 120 | 205 | 6.6 | 2,754.6 | 2,754.6 | 2,754.7 | 0.1 |
| L | 8,437 | 80 | 164 | 8.2 | 2,769.7 | 2,769.7 | 2,770.3 | 0.6 |
| M | 9,750 | 65 | 158 | 8.5 | 2,790.7 | 2,790.7 | 2,790.7 | 0.0 |
| N | 10,731 | 66 | 155 | 8.7 | 2,807.3 | 2,807.3 | 2,807.3 | 0.0 |

[1]Stream distance in feet above North Corbin Street

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

**NYE COUNTY, NEVADA**
**AND INCORPORATED AREAS**

**FLOODWAY DATA**

**SHADOW MOUNTAIN WASH**

## 5.0 INSURANCE APPLICATION

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

Zone A

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

Zone AE

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

Zone AH

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

Zone AO

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

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2-percent annual chance floodplain, areas within the 0.2-percent annual chance floodplain, areas of 1-percent annual chance flooding where average depths are less than 1 foot, areas of 1-percent annual chance flooding where the contributing drainage area is less than 1 square mile, 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 area 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 rate zones as described in Section 5.0 and, in the 1-percent annual chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use 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 Nye County. Previously, FIRMs were prepared for each incorporated community and the unincorporated areas of the county identified as flood-prone. The countywide FIRM also includes flood hazard information that was presented separately on Flood Boundary and Floodway Maps (FBFMs), where applicable. Historical data relating to the maps prepared for each community are presented in Table 10, "Community Map History."

## 7.0 OTHER STUDIES

Information pertaining to revised and unrevised flood hazards for each jurisdiction within Nye County has been compiled into this FIS. Therefore, this FIS supersedes all previously printed FIS Reports, FBFMs, and FIRMs for all of the incorporated and unincorporated jurisdictions within Nye County.

A Flood Insurance Study has been prepared for Clark County, Nevada (Federal Emergency Management Agency, September 6, 1989), to the east of Nye County. The results of this study are in agreement with the results of the Clark County study.

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

| COMMUNITY NAME | INITIAL IDENTIFICATION | FLOOD HAZARD BOUNDARY MAP REVISION DATE(S) | FLOOD INSURANCE RATE MAP EFFECTIVE DATE | FLOOD INSURANCE RATE MAP REVISION DATE(S) |
|---|---|---|---|---|
| Nye County (Unincorporated Areas) | October 18, 1974 | October 24, 1978 | April 12, 1983 | September 28, 1990<br>June 8, 1998 |

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

**NYE COUNTY, NV**

**AND INCORPORATED AREAS**

**COMMUNITY MAP HISTORY**

## 8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting FEMA, Region IX, Federal Insurance and Mitigation Administration, 1111 Broadway, Suite 1200, Oakland, California 94607-4052.

## 9.0 BIBLIOGRAPHY AND REFERENCES


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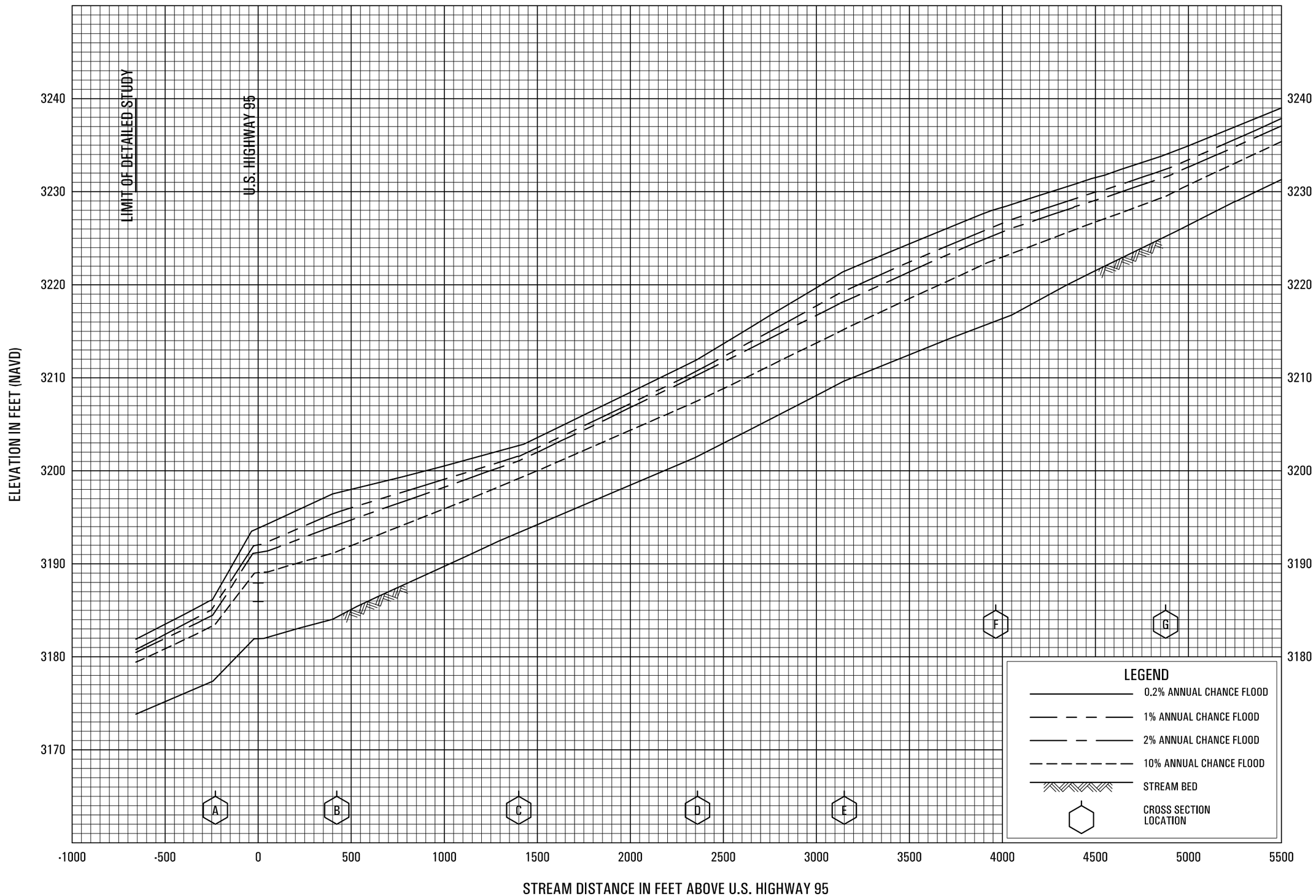


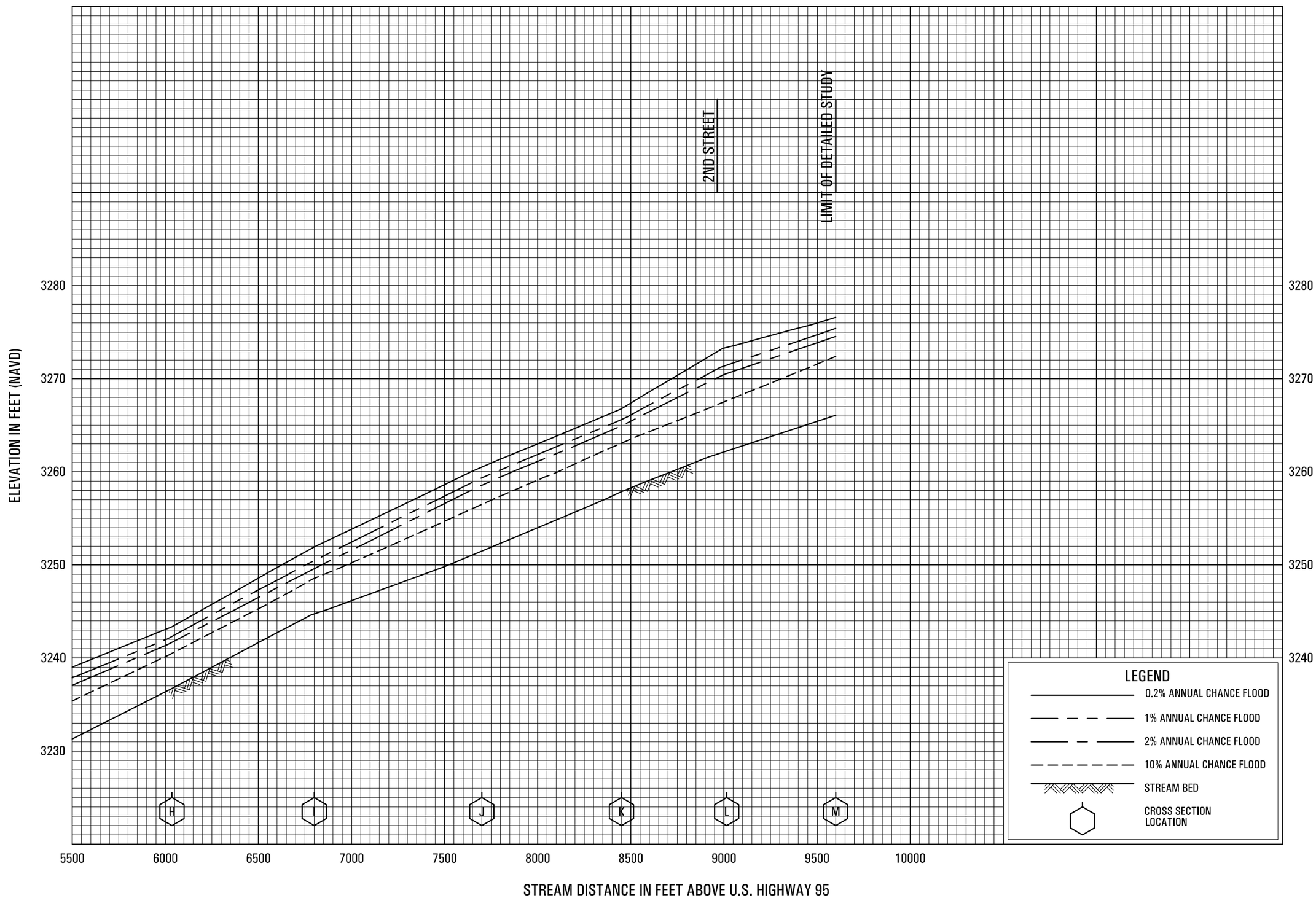

FLOOD PROFILES

AMARGOSA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS




FLOOD PROFILES

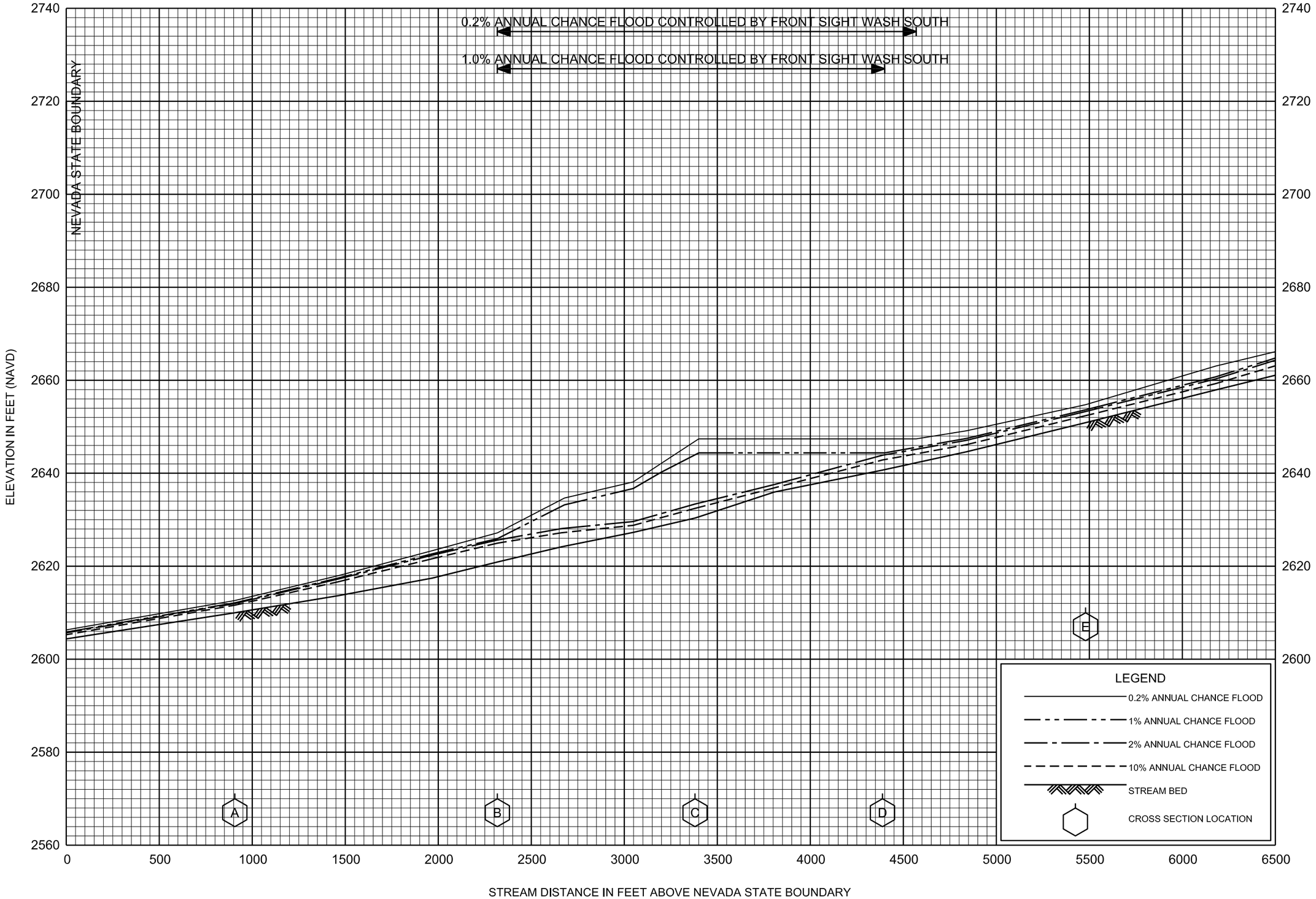
AMARGOSA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS

02P




FLOOD PROFILES

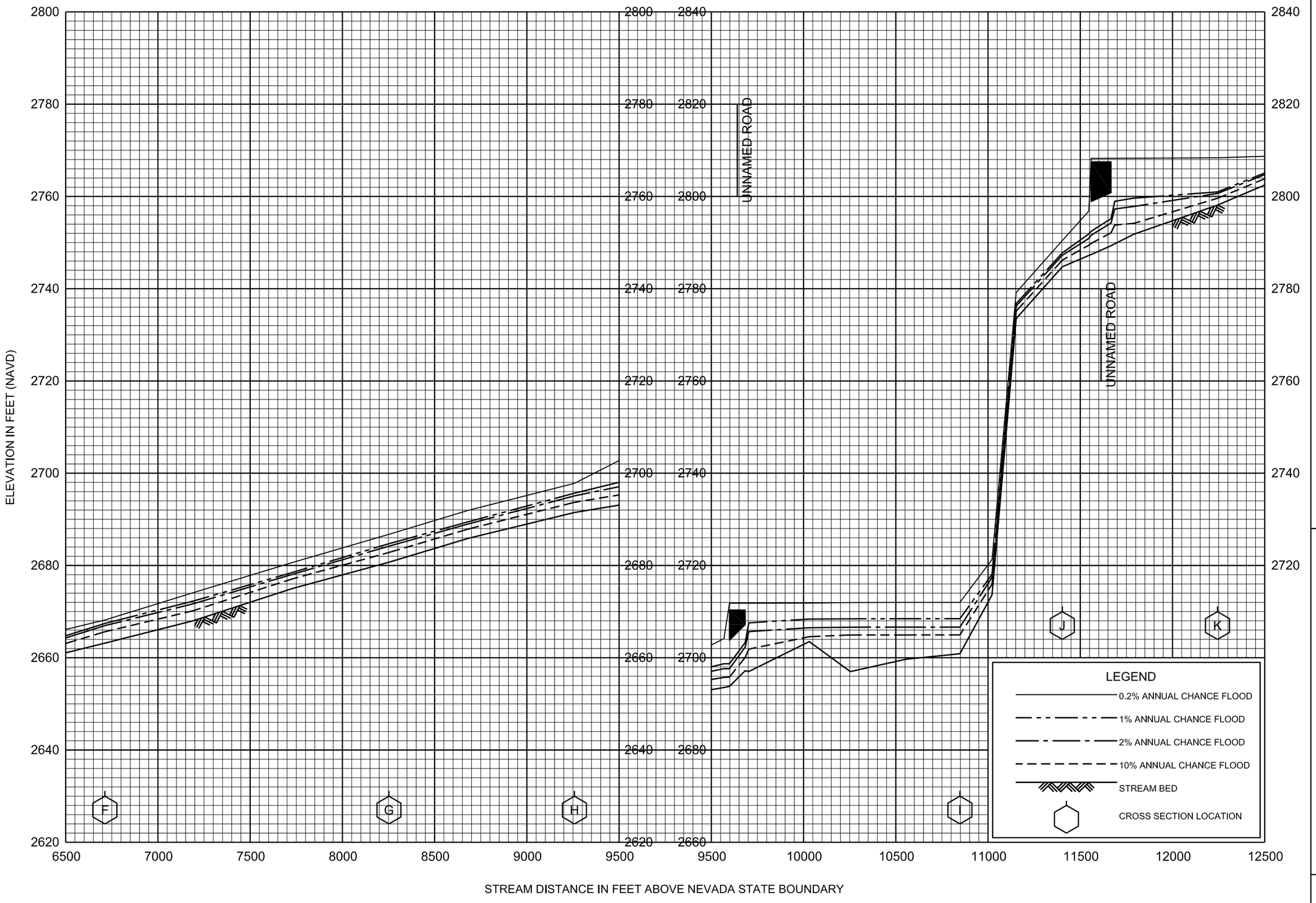
FRONT SIGHT WASH CENTRAL

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS

03P




FLOOD PROFILES

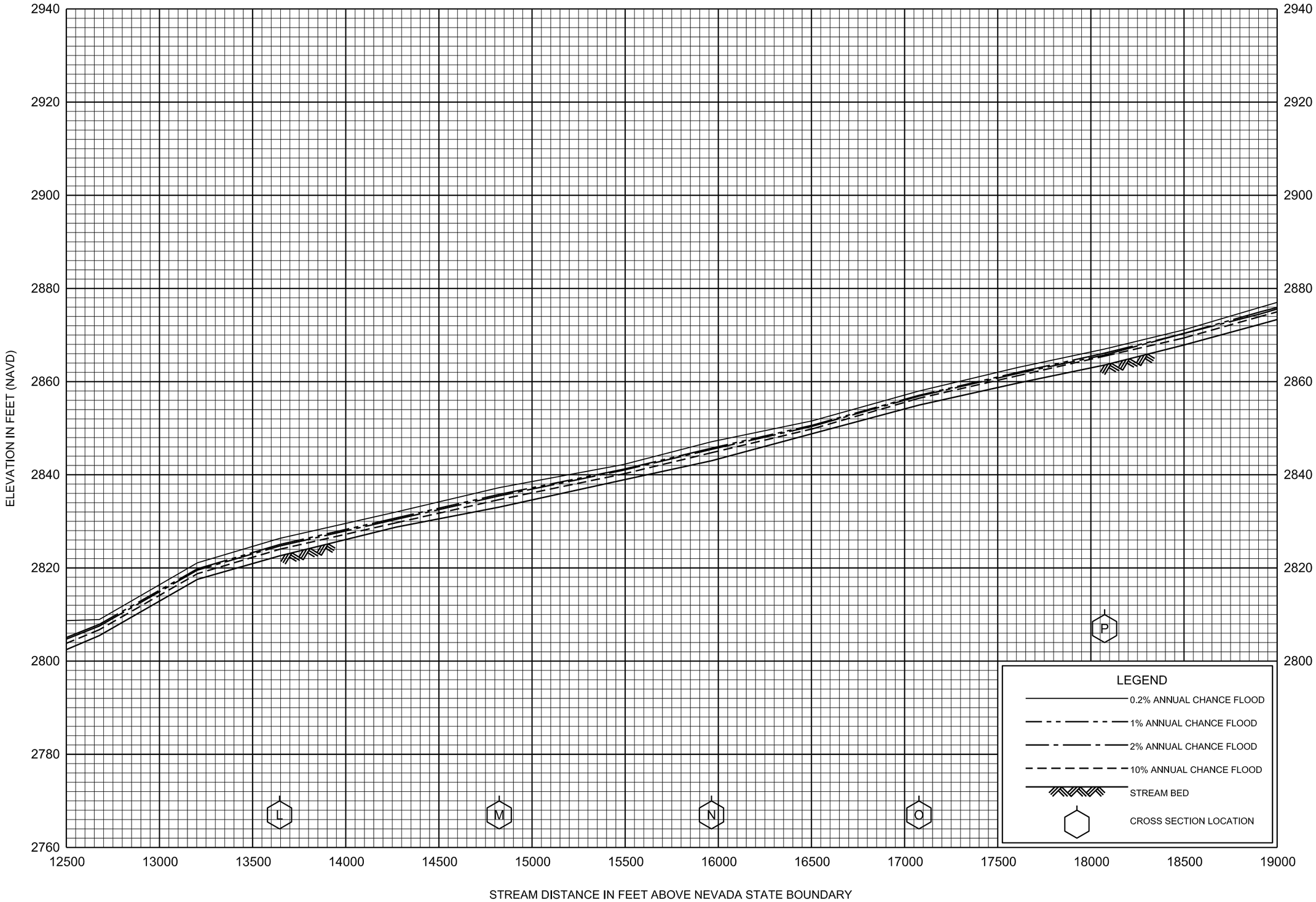
FRONT SIGHT WASH CENTRAL

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS

04P




FLOOD PROFILES

FRONT SIGHT WASH CENTRAL

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS

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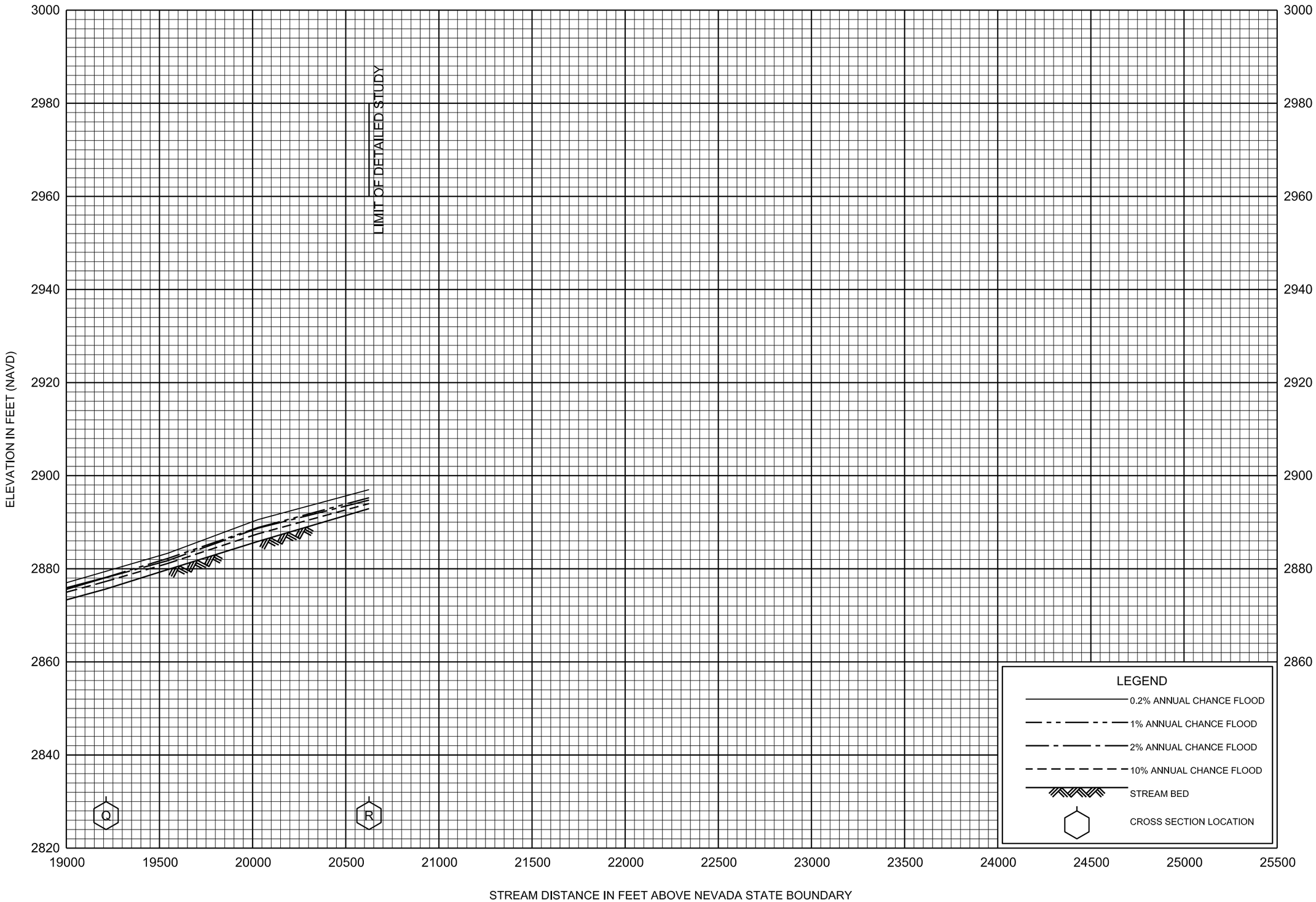


FLOOD PROFILES

FRONT SIGHT WASH CENTRAL

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS

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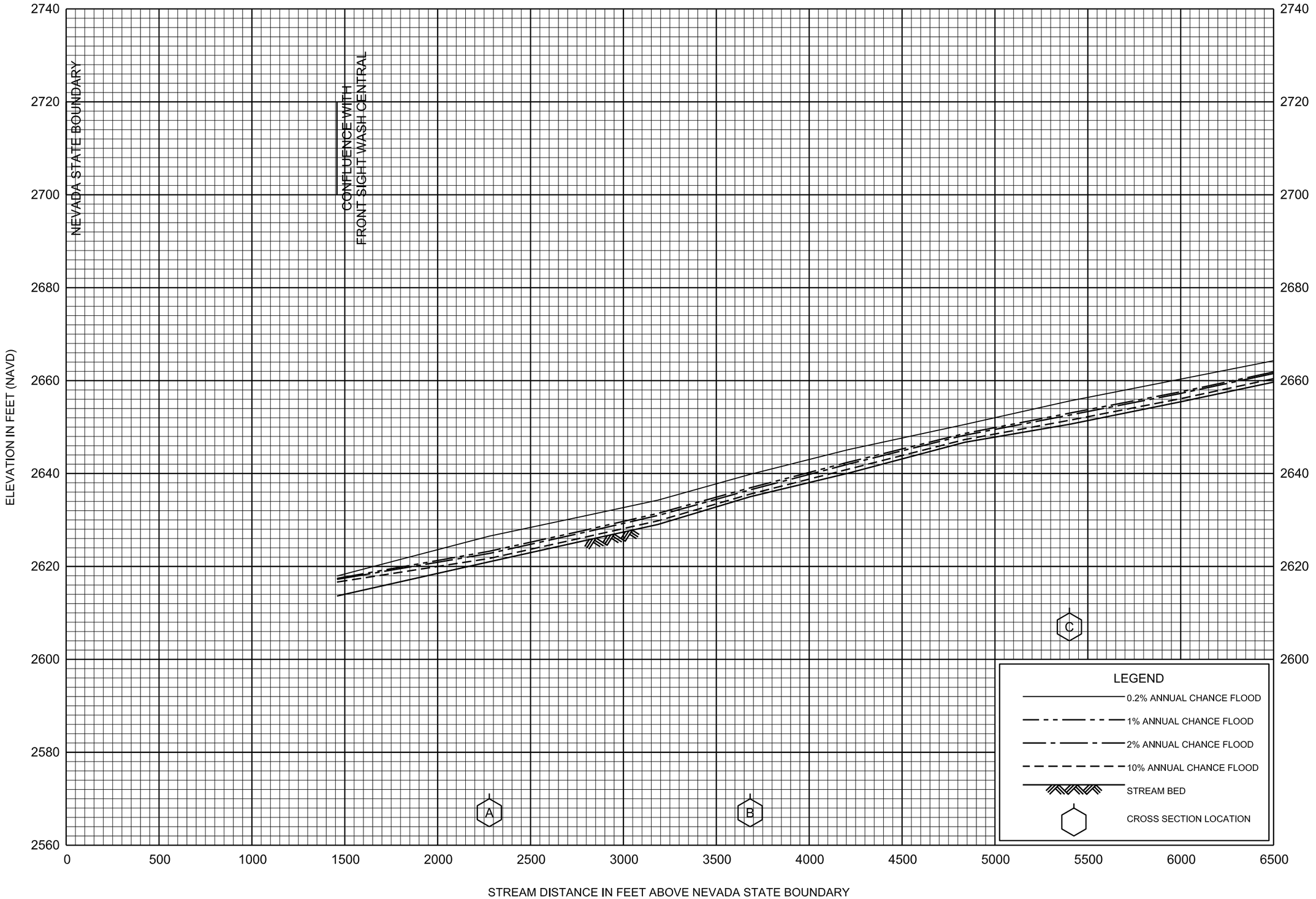
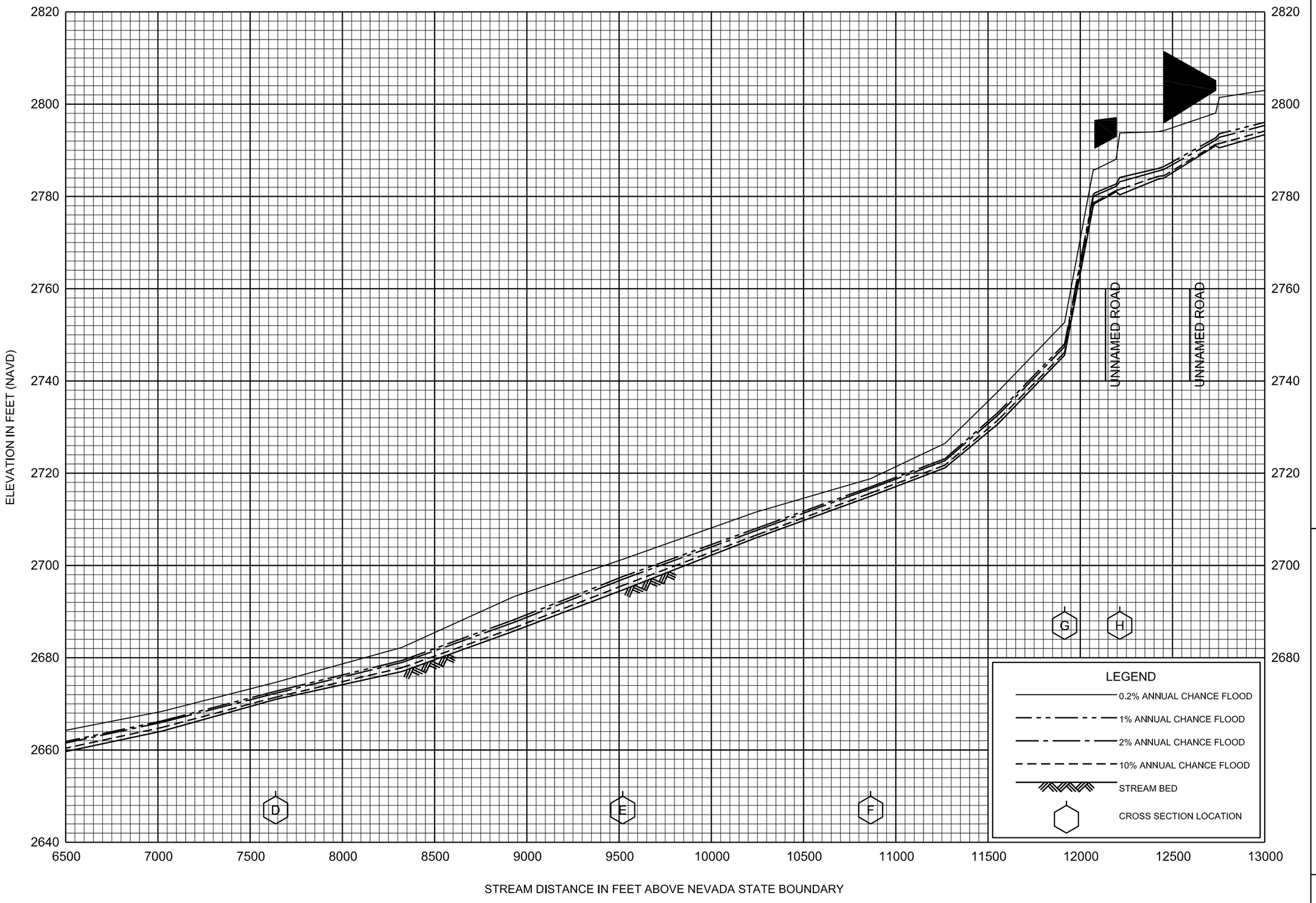



FLOOD PROFILES

FRONT SIGHT WASH NORTH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV
AND INCORPORATED AREAS



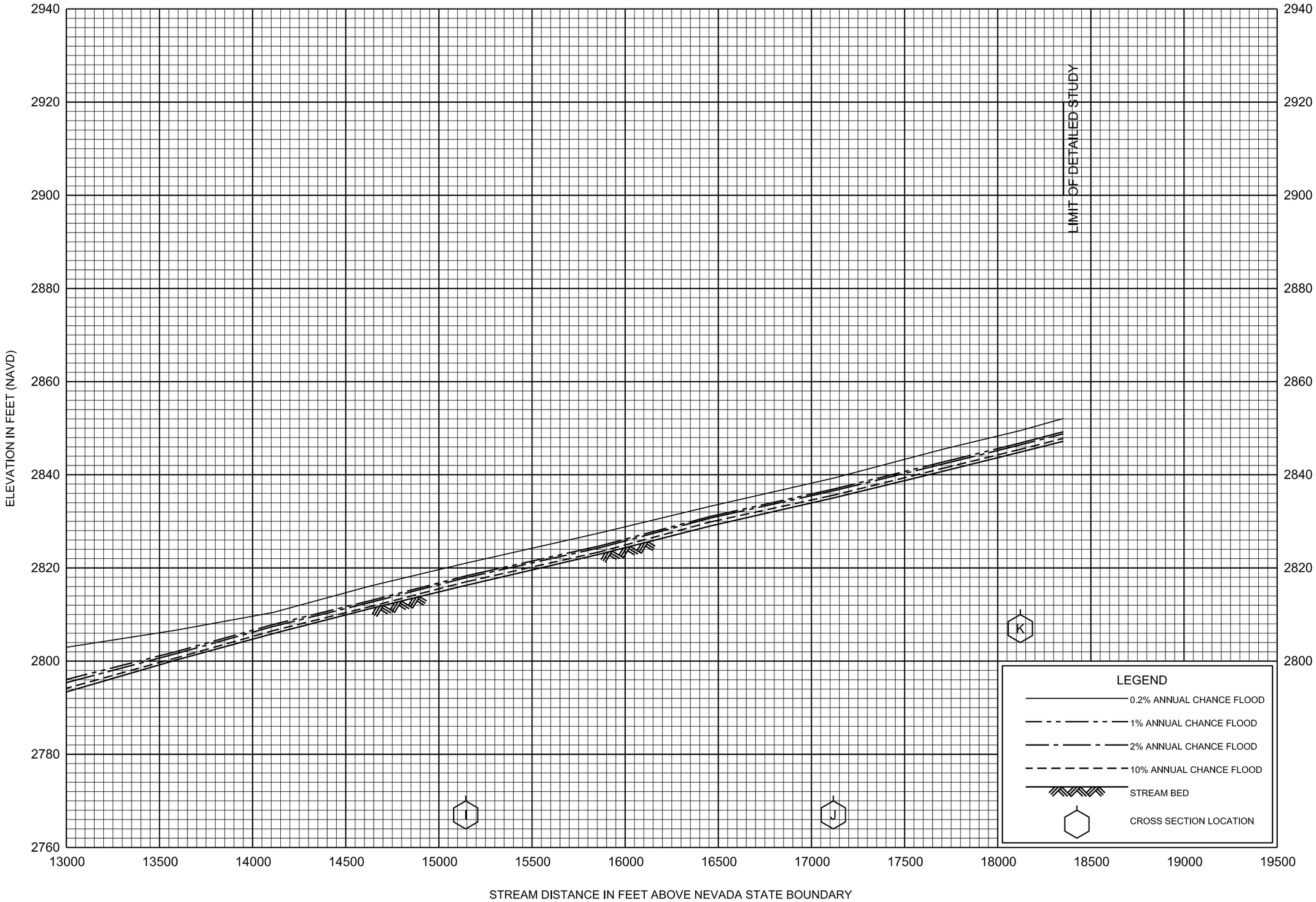

FLOOD PROFILES

FRONT SIGHT WASH NORTH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS



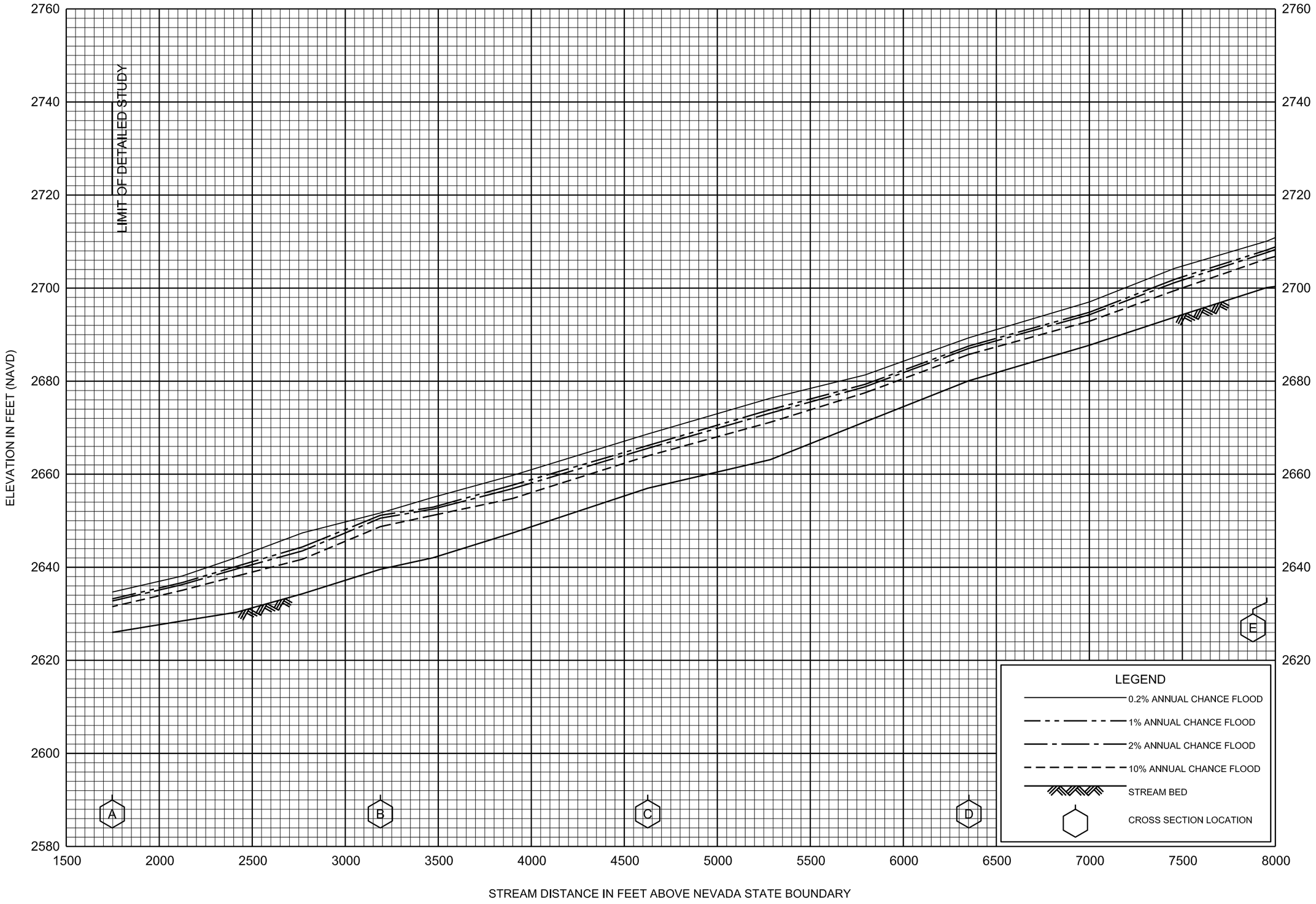

FLOOD PROFILES

FRONT SIGHT WASH NORTH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS



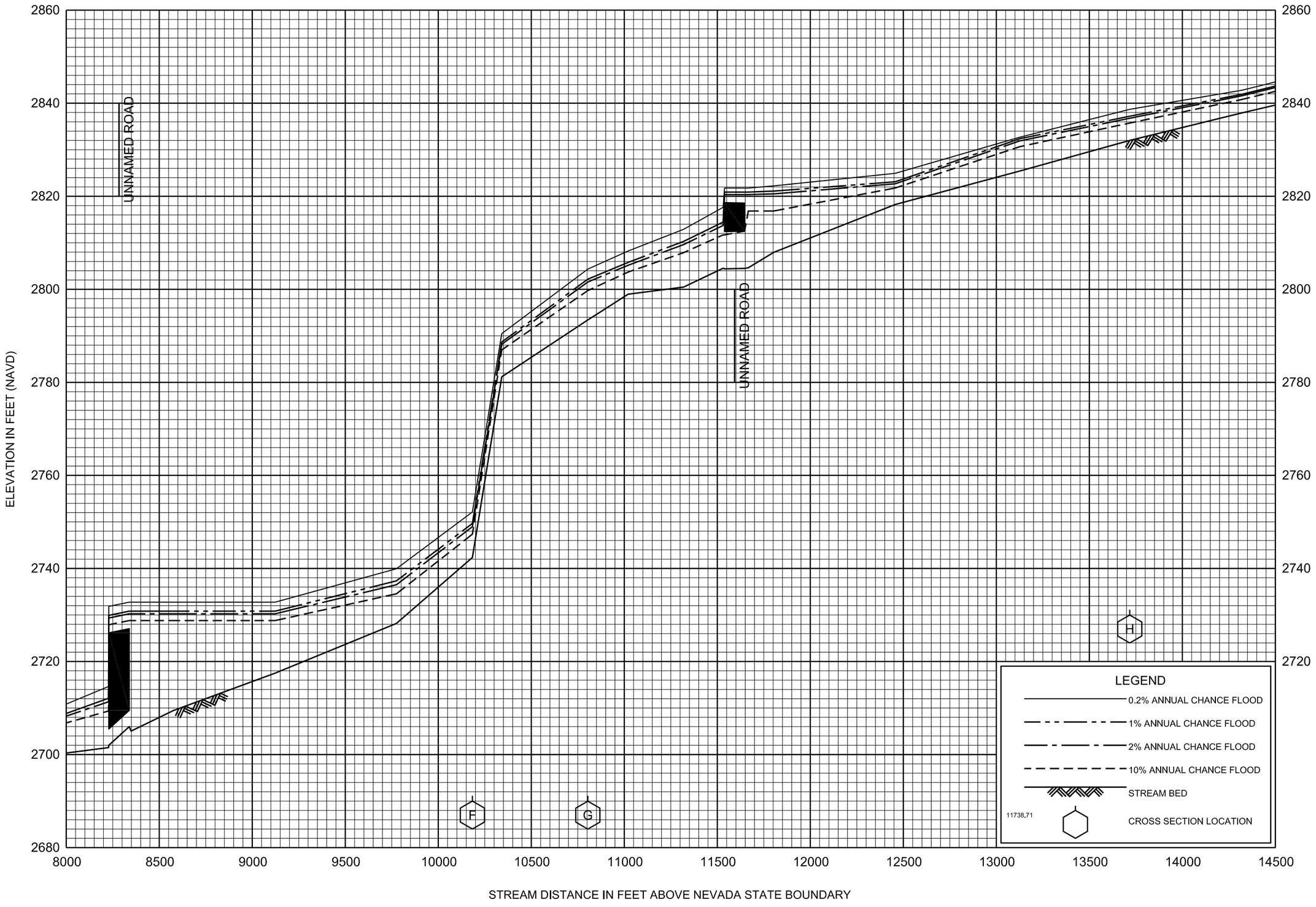

FLOOD PROFILES

FRONT SIGHT WASH SOUTH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS



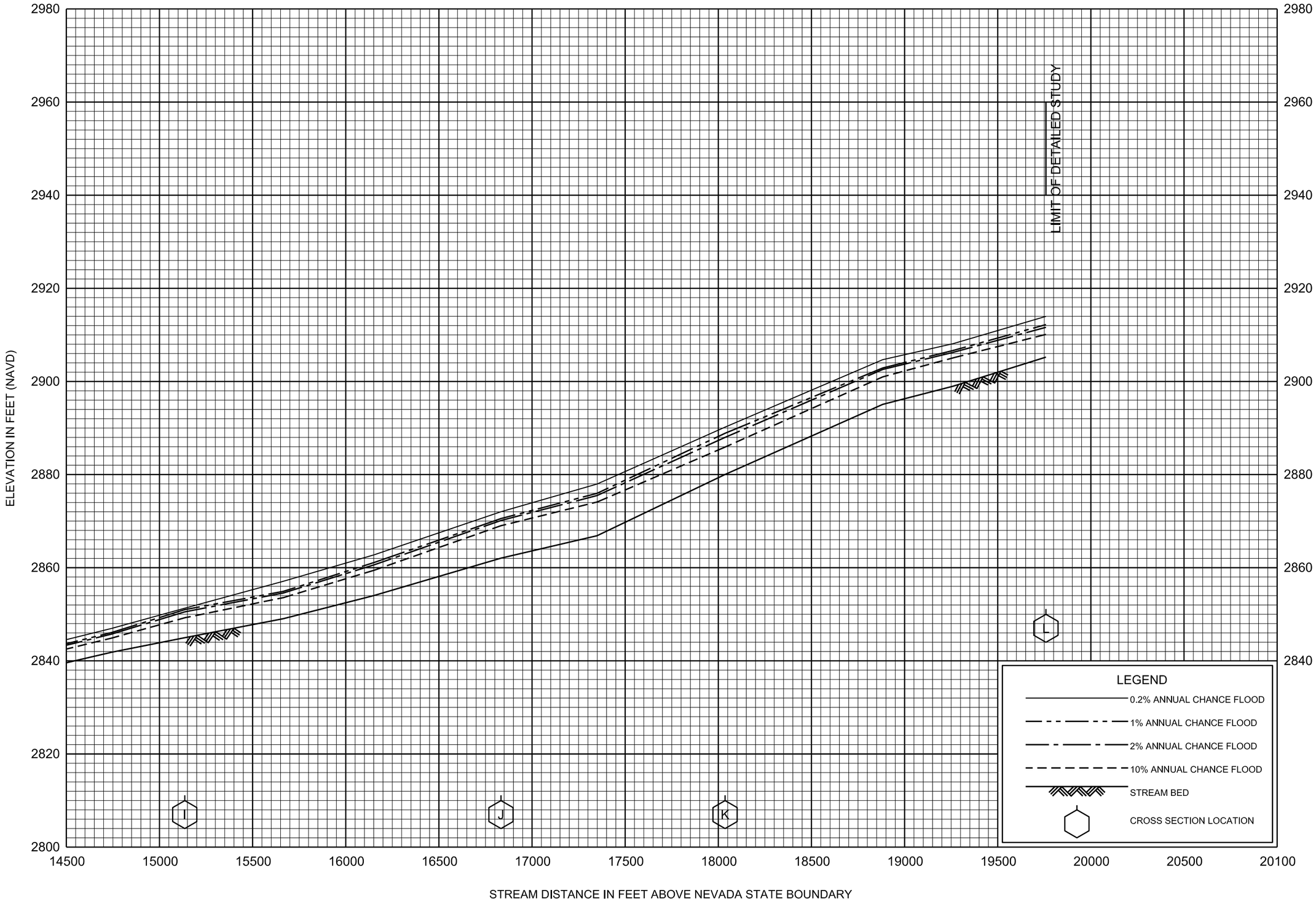

FLOOD PROFILES

FRONT SIGHT WASH SOUTH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS



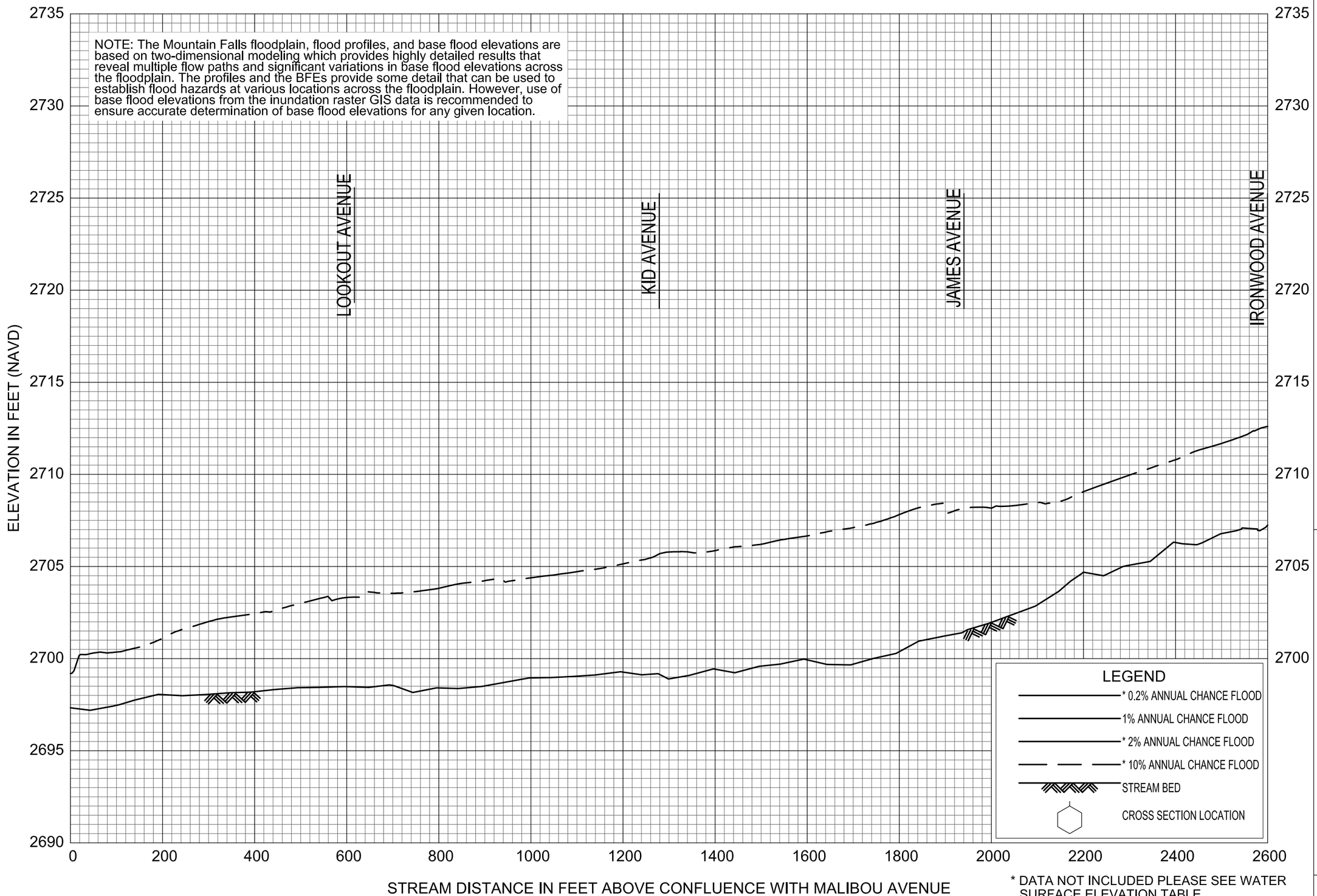

FLOOD PROFILES

FRONT SIGHT WASH SOUTH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS




* DATA NOT INCLUDED PLEASE SEE WATER SURFACE ELEVATION TABLE

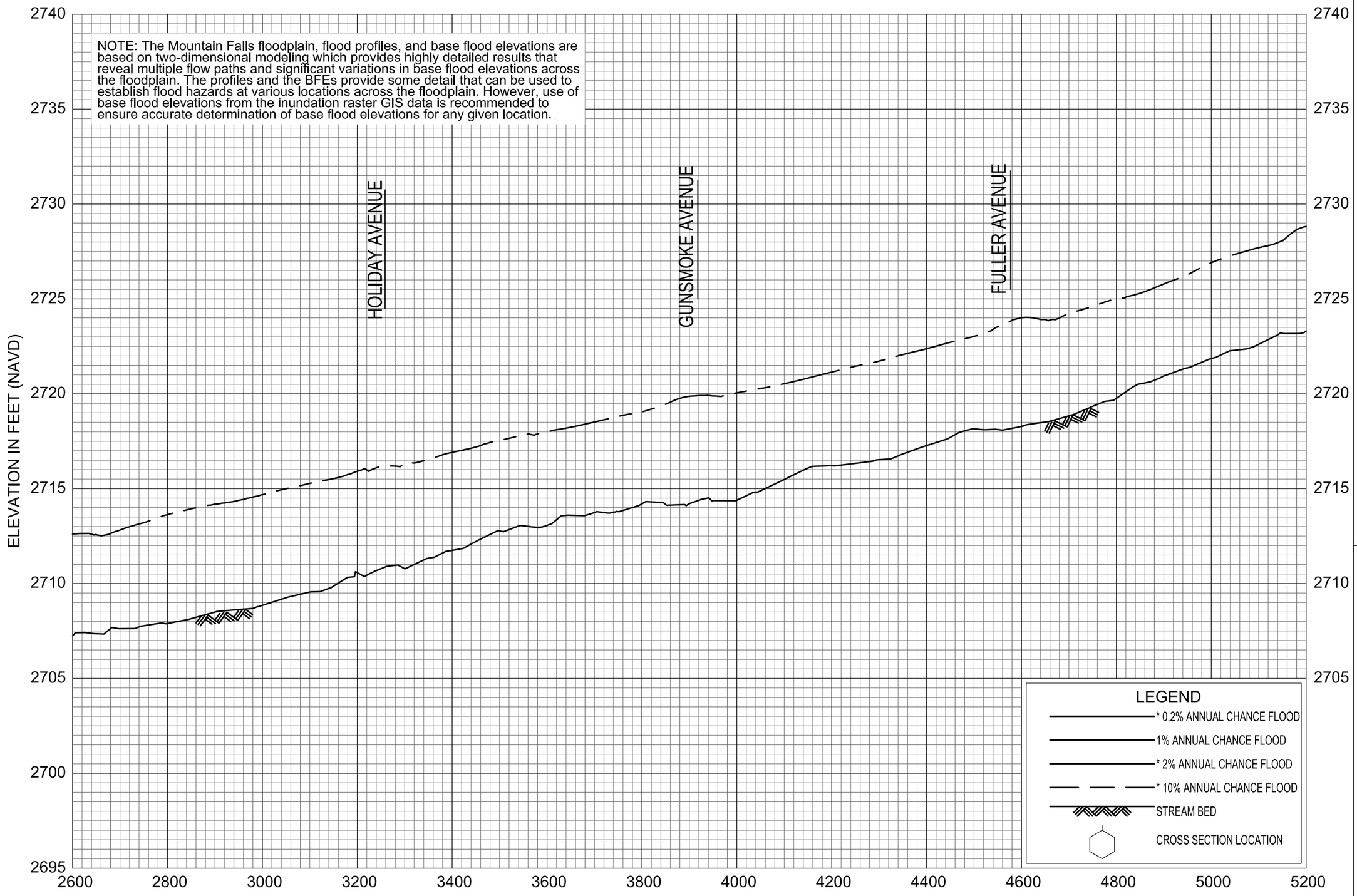
# FLOOD PROFILES

## GAMEBIRD ROAD CHANNEL

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS




* DATA NOT INCLUDED PLEASE SEE WATER SURFACE ELEVATION TABLE

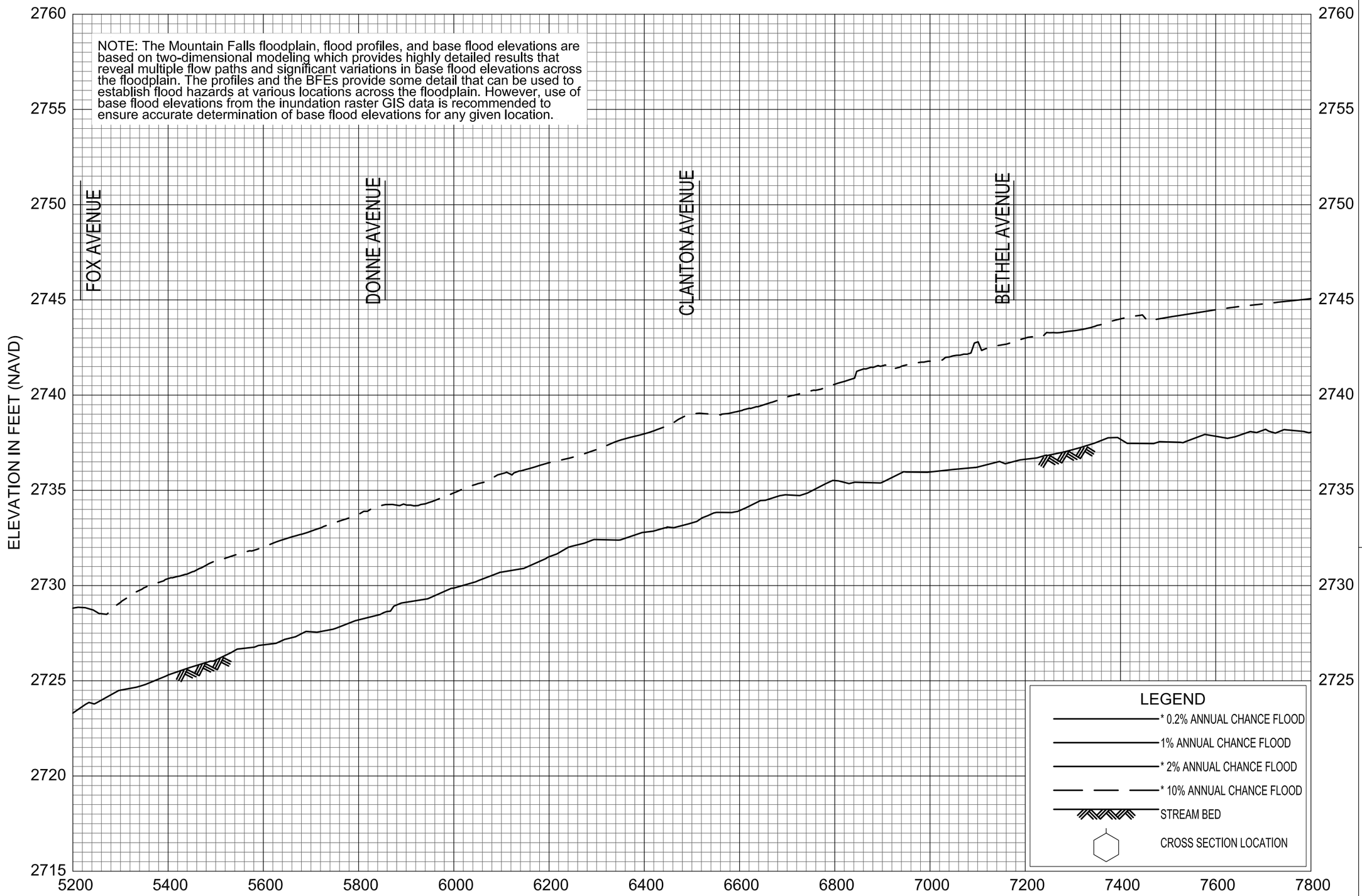
FLOOD PROFILES

GAMEBIRD ROAD CHANNEL

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS




* DATA NOT INCLUDED PLEASE SEE WATER SURFACE ELEVATION TABLE

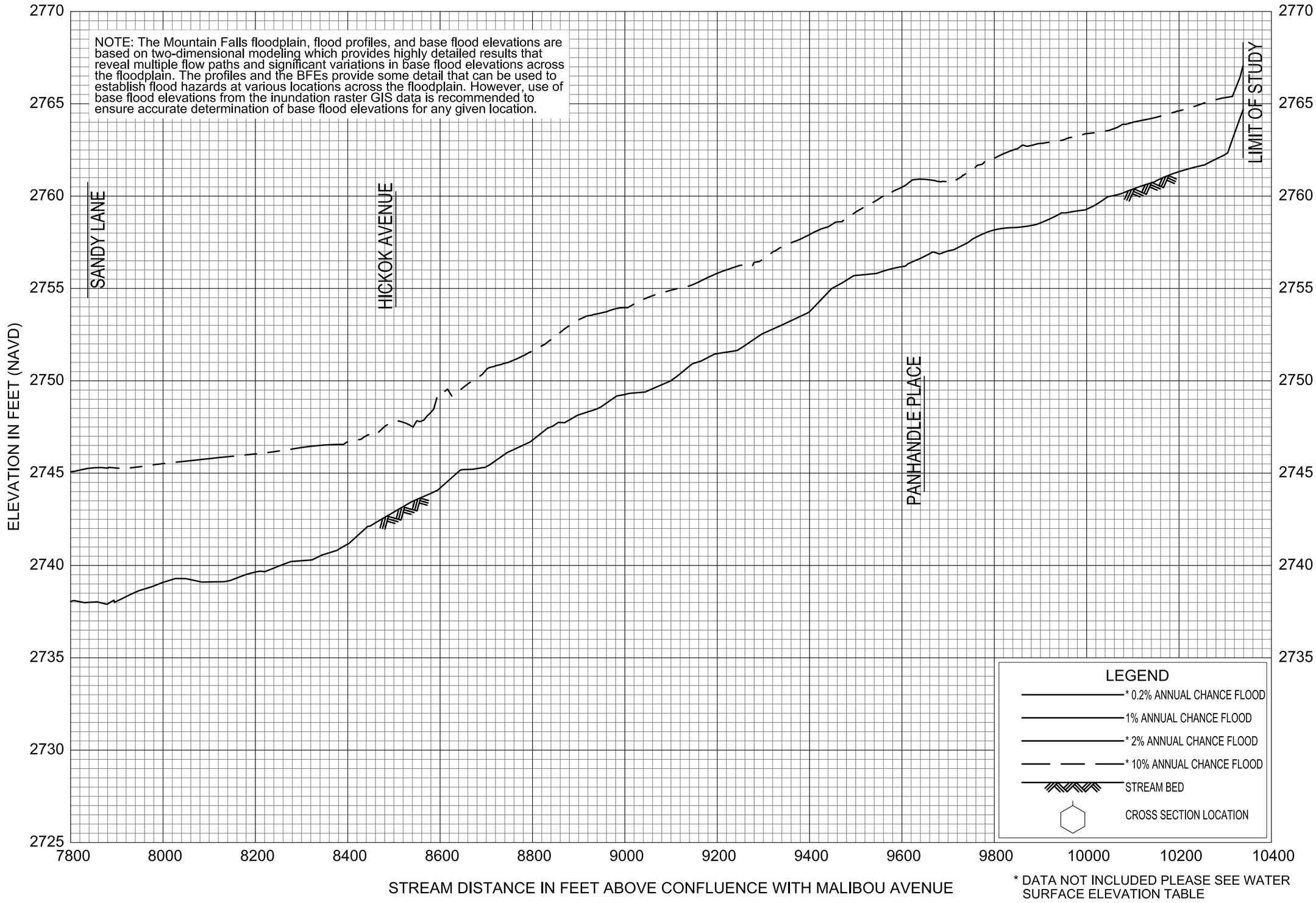
# FLOOD PROFILES

## GAMEBIRD ROAD CHANNEL

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS




* DATA NOT INCLUDED PLEASE SEE WATER SURFACE ELEVATION TABLE

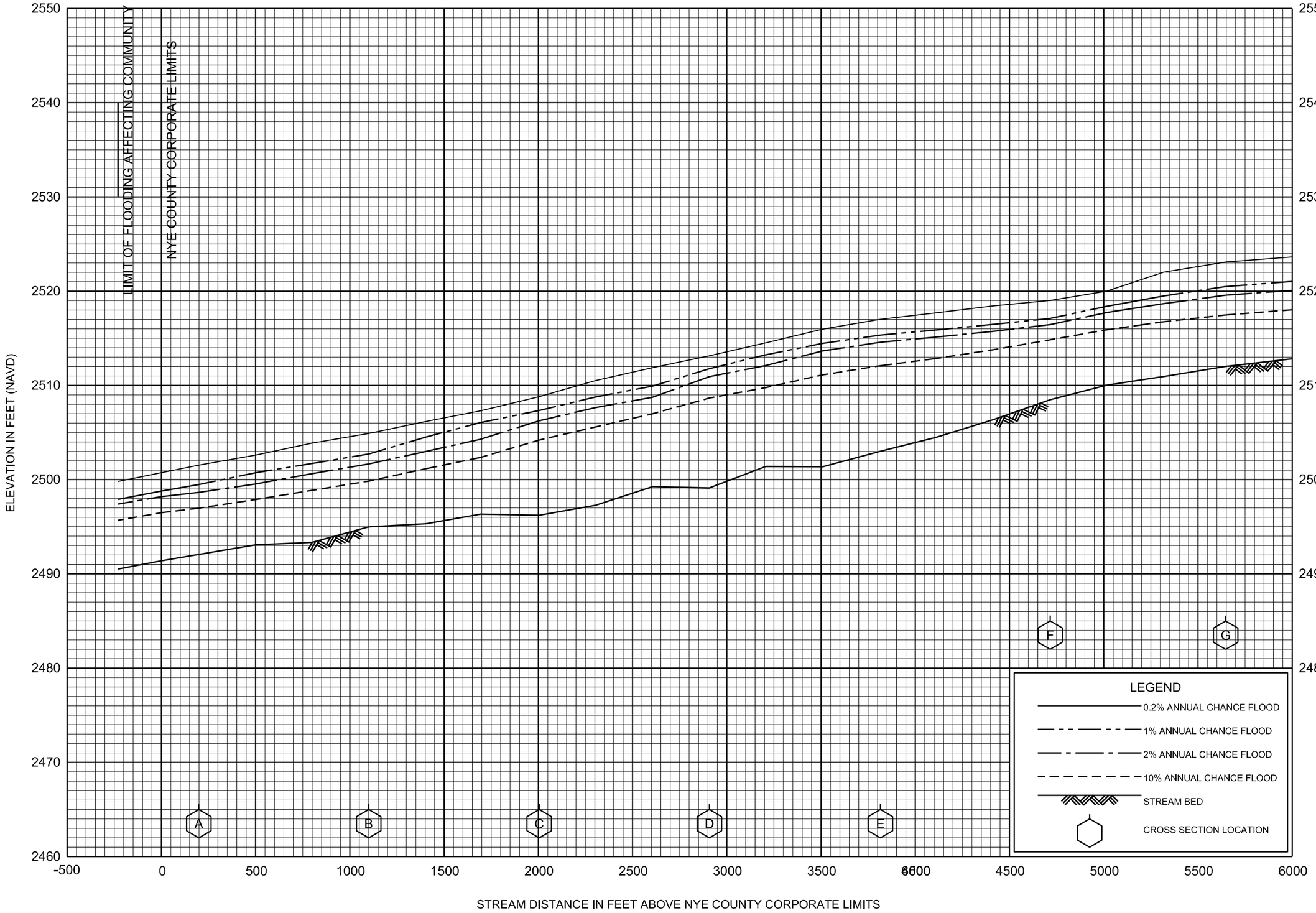
FLOOD PROFILES

GAMEBIRD ROAD CHANNEL

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS



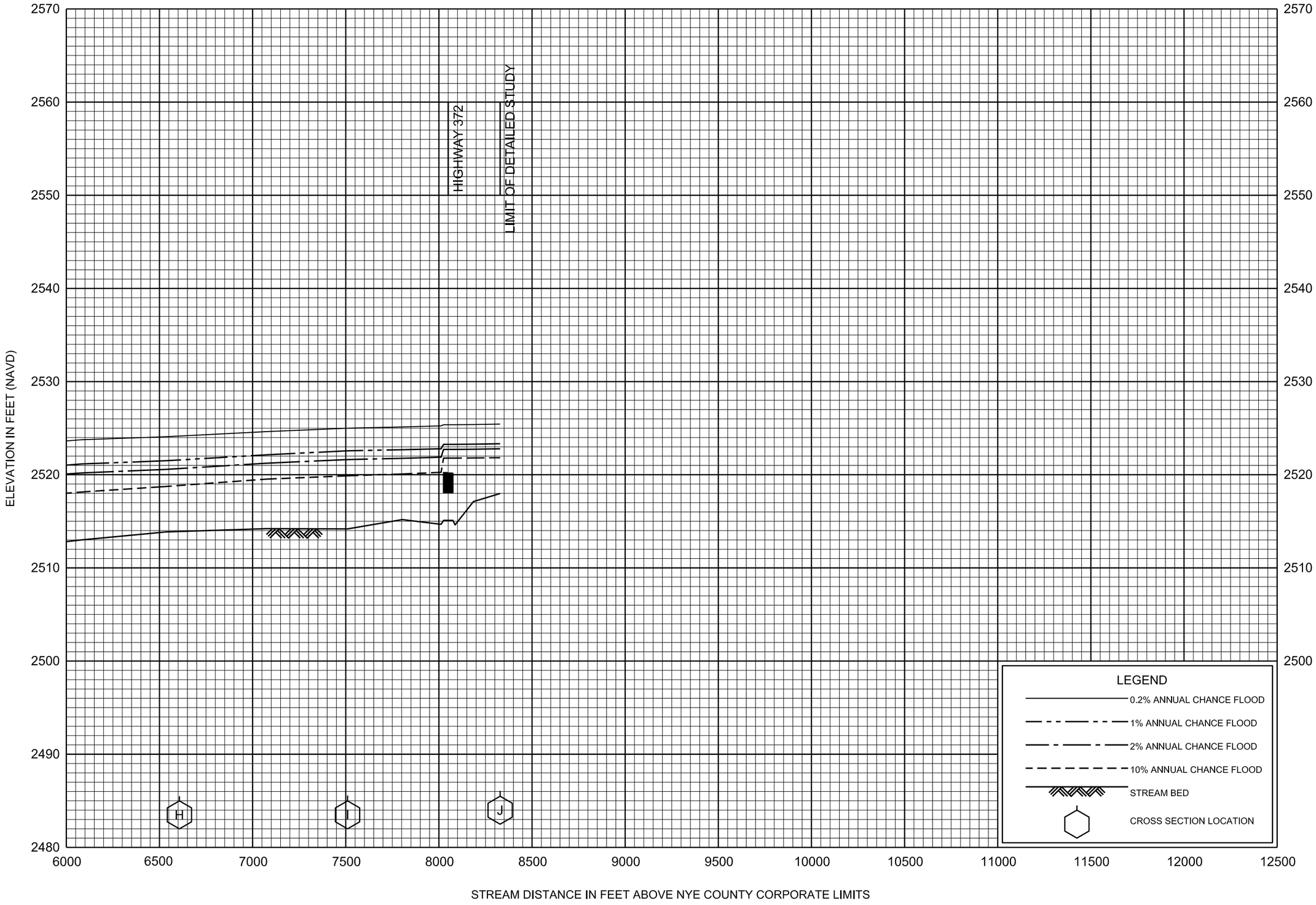

FLOOD PROFILES

PAHRUMP WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS



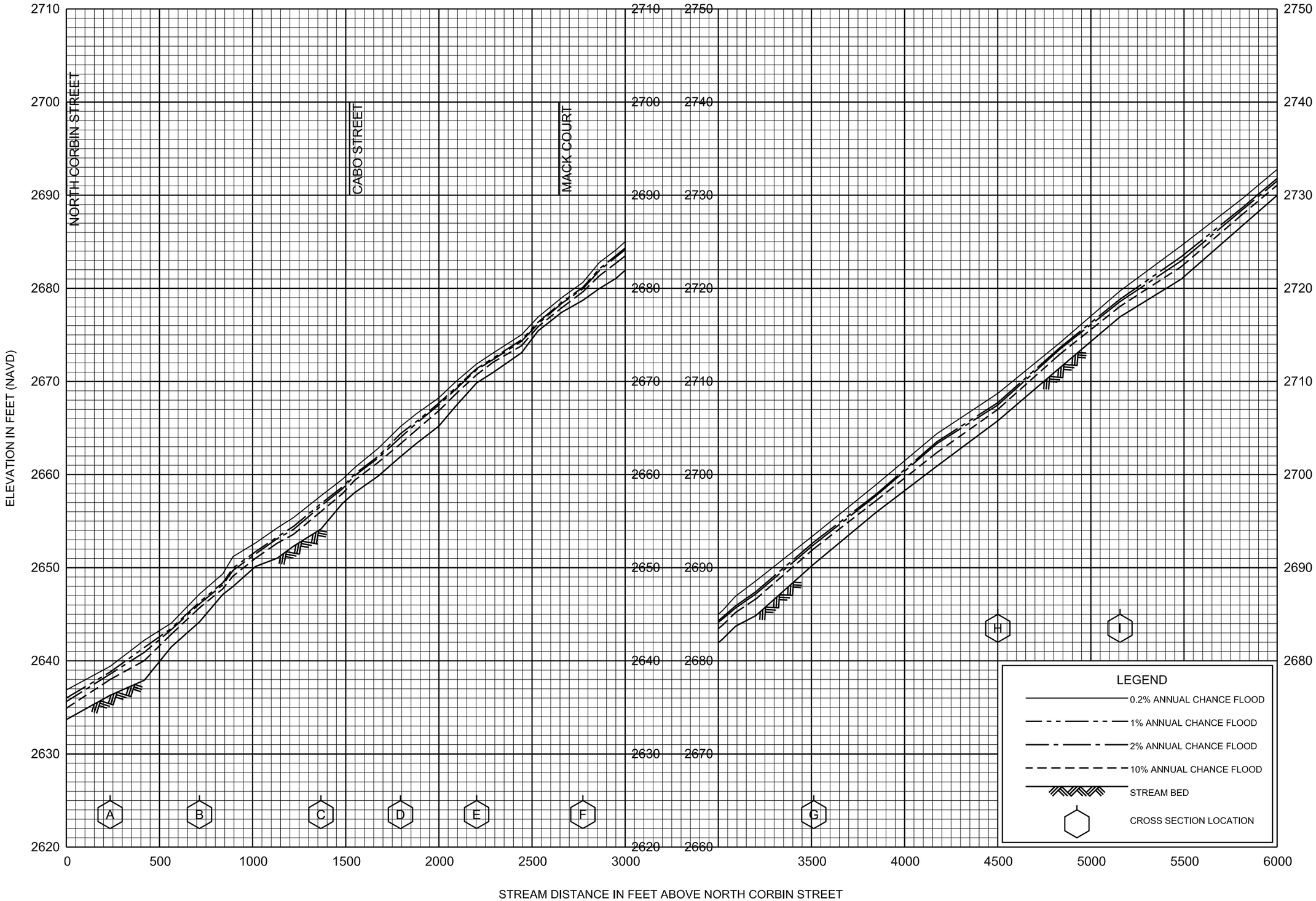

FLOOD PROFILES

PAHRUMP WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS



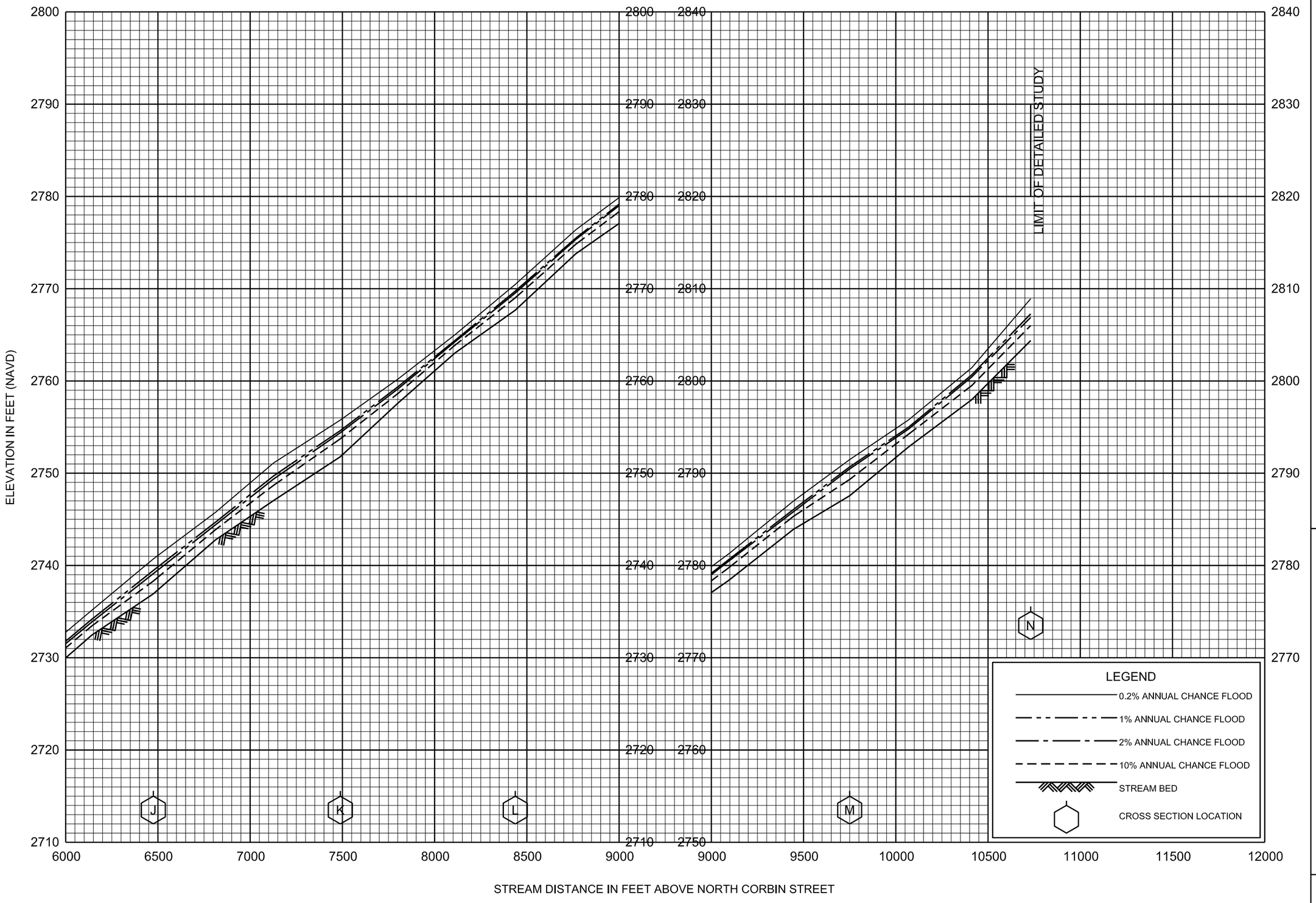

FLOOD PROFILES

SHADOW MOUNTAIN WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS



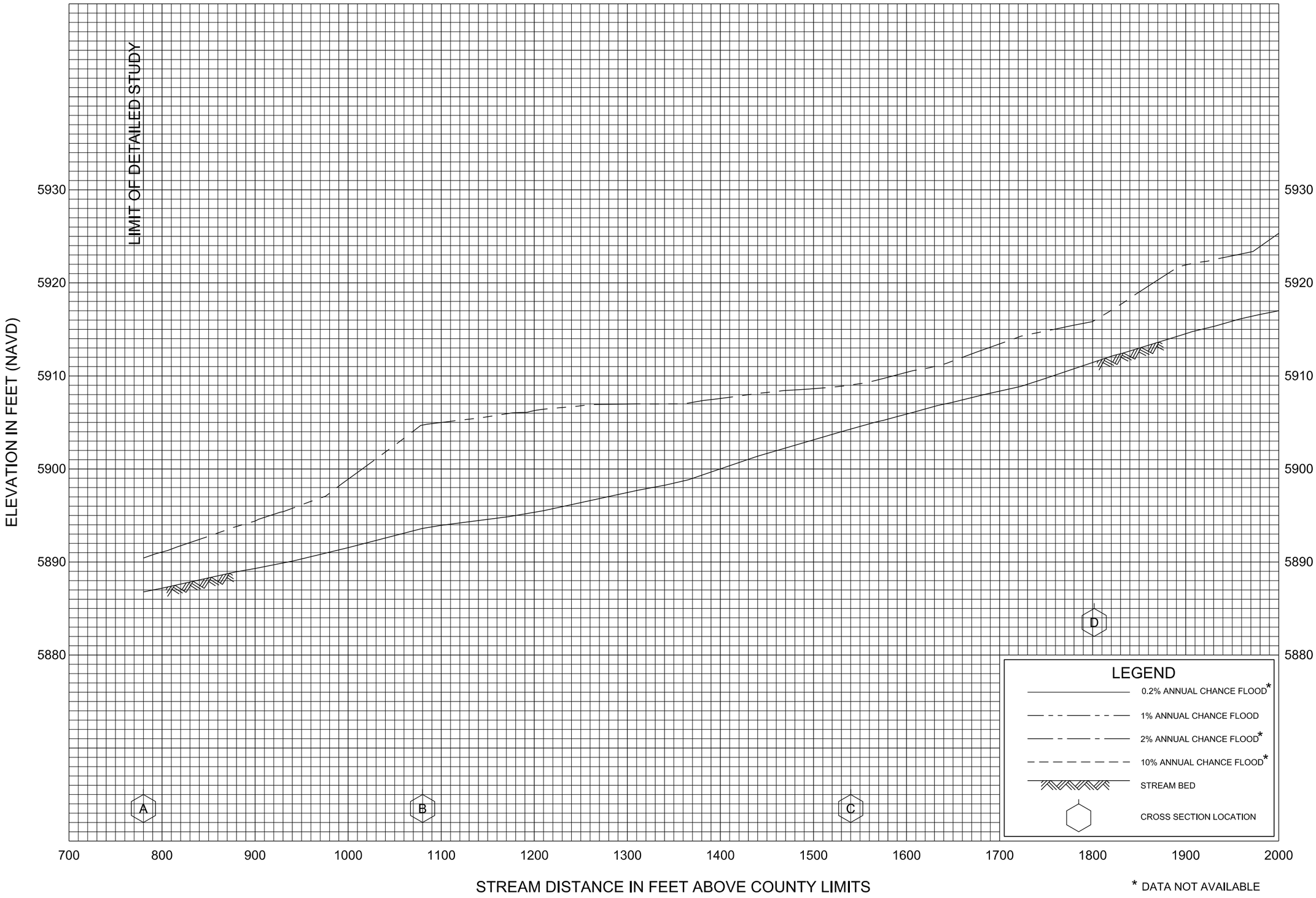

FLOOD PROFILES

SHADOW MOUNTAIN WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS




* DATA NOT AVAILABLE

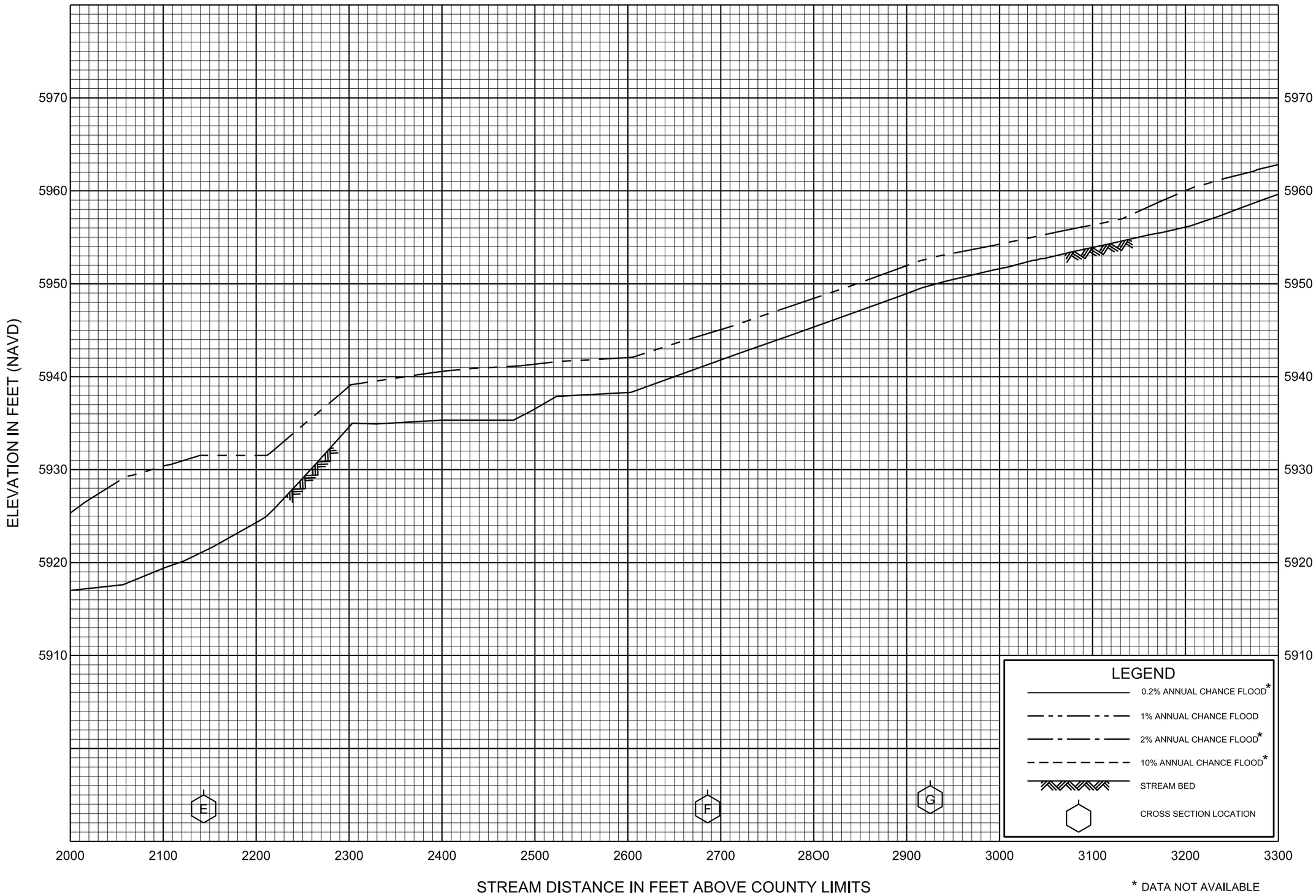
FLOOD PROFILES

SLIME WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS



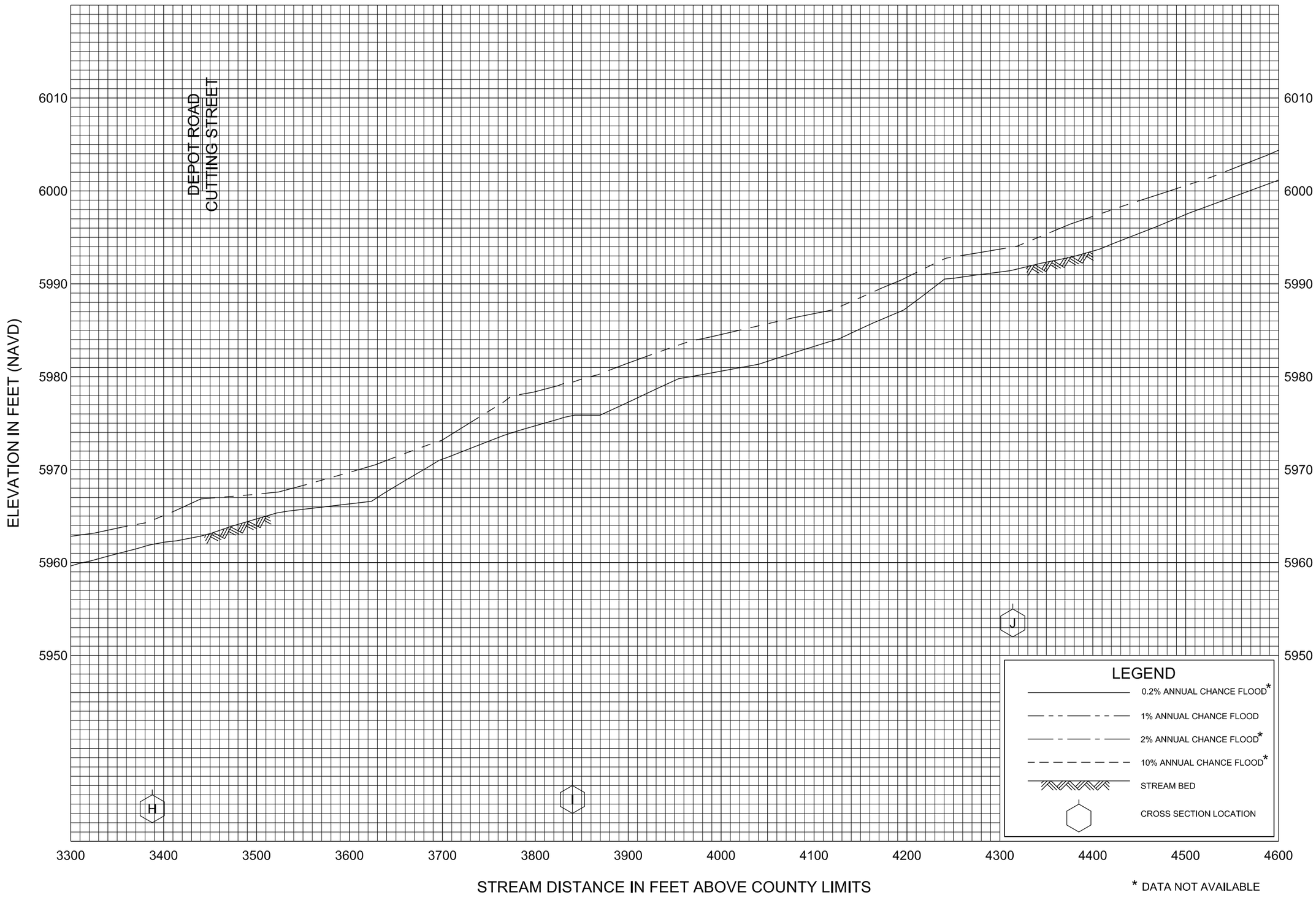

FLOOD PROFILES

SLIME WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS



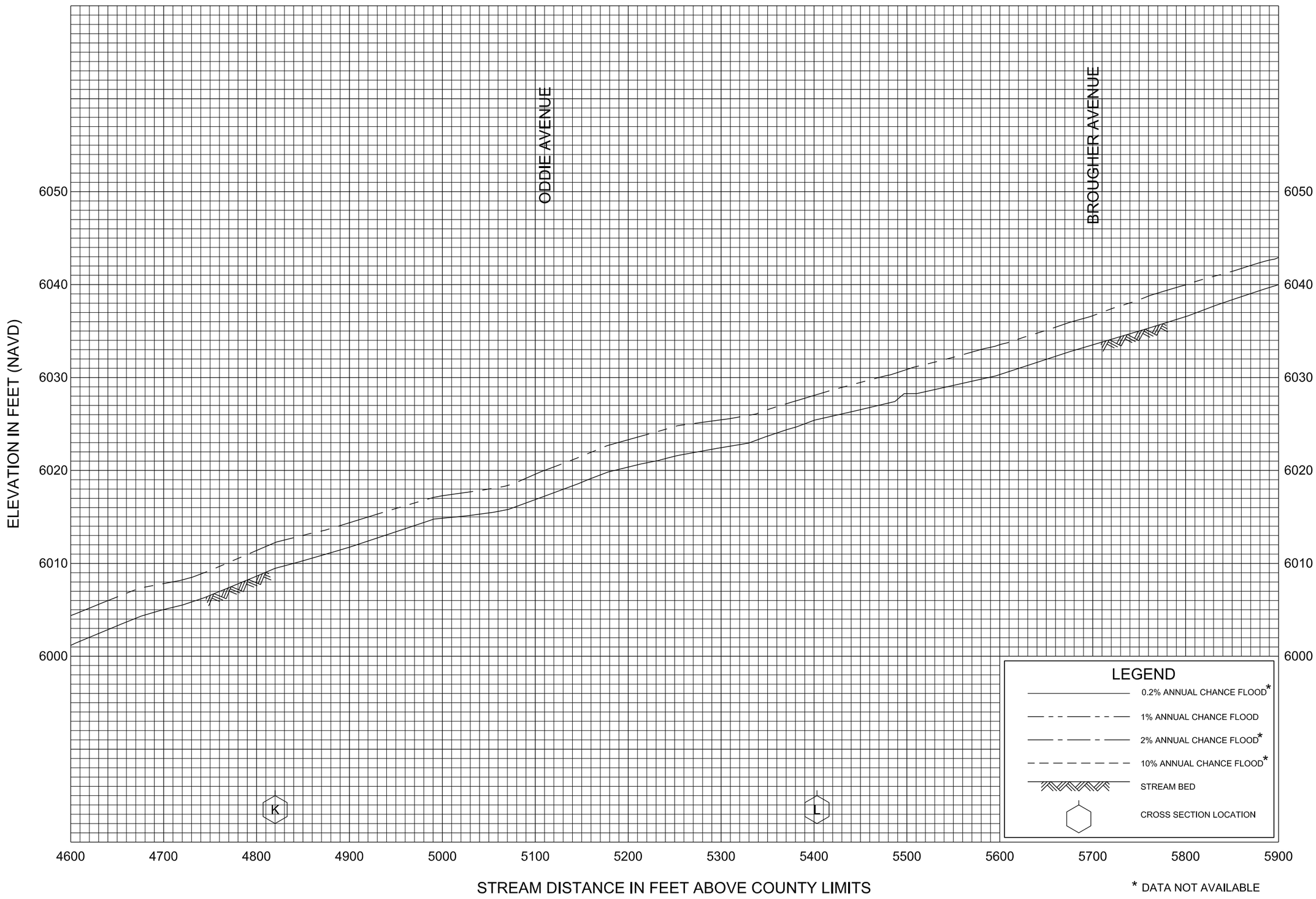

FLOOD PROFILES

SLIME WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS




FLOOD PROFILES

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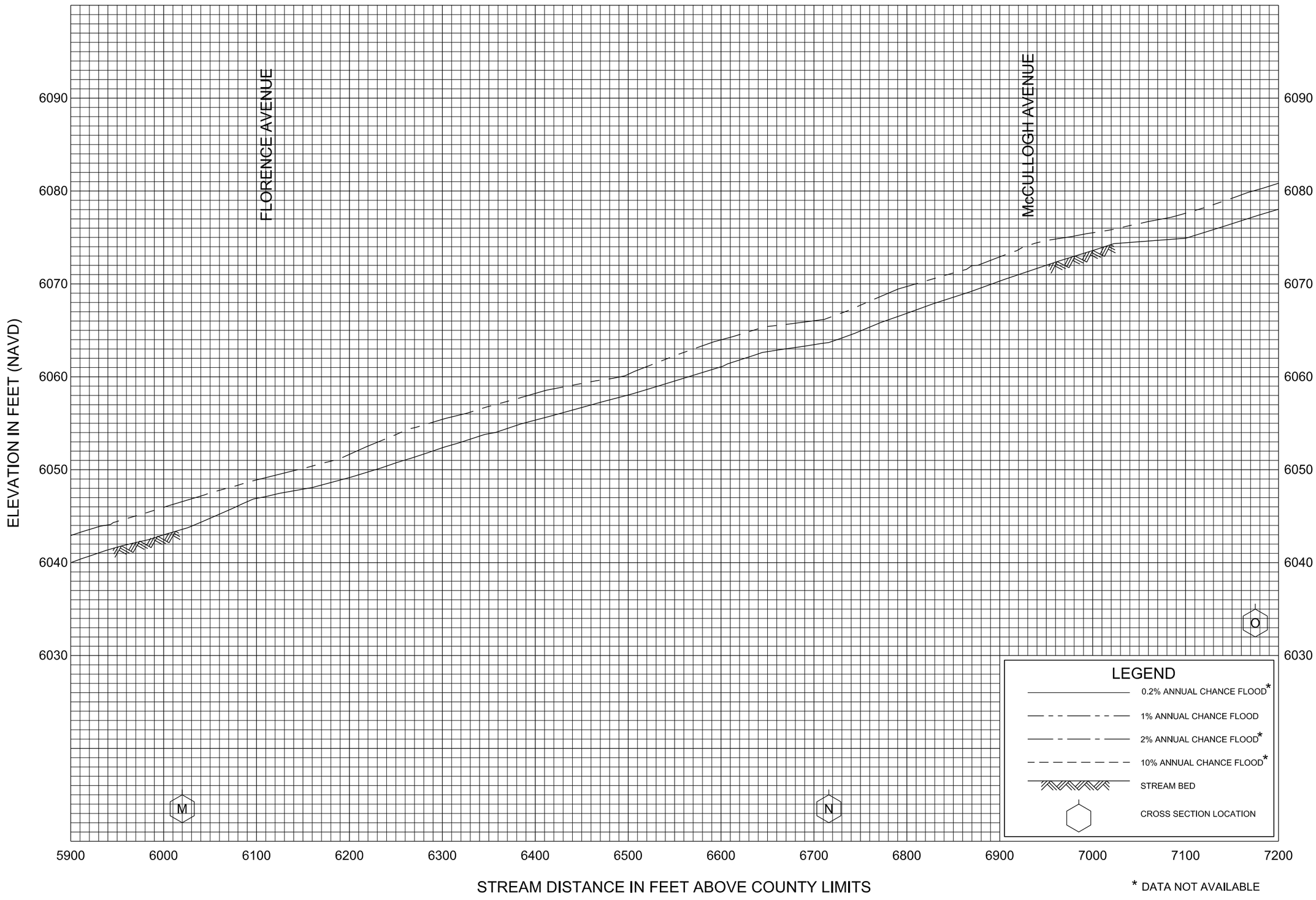


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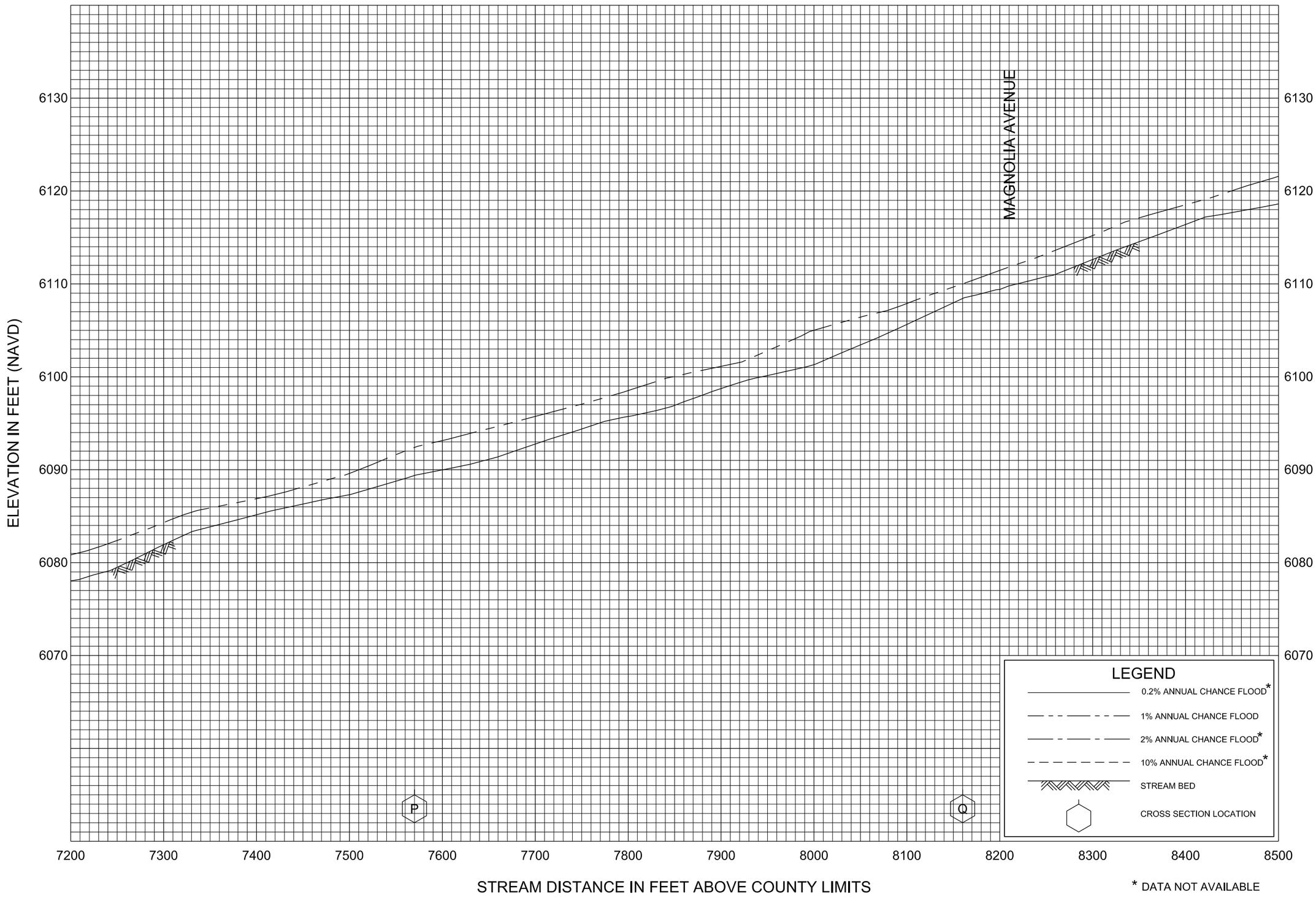


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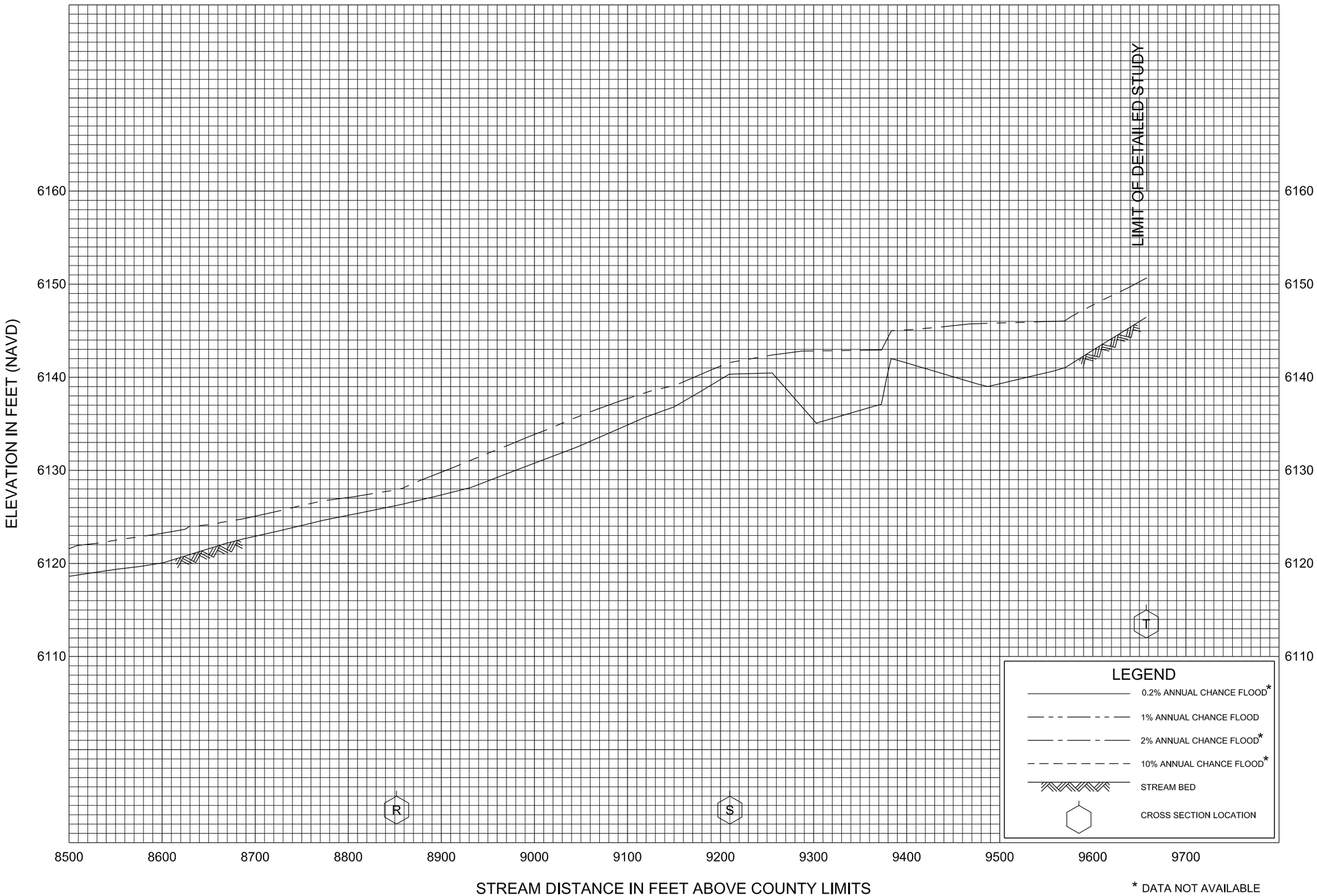


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FLOOD PROFILES

SLIME WASH

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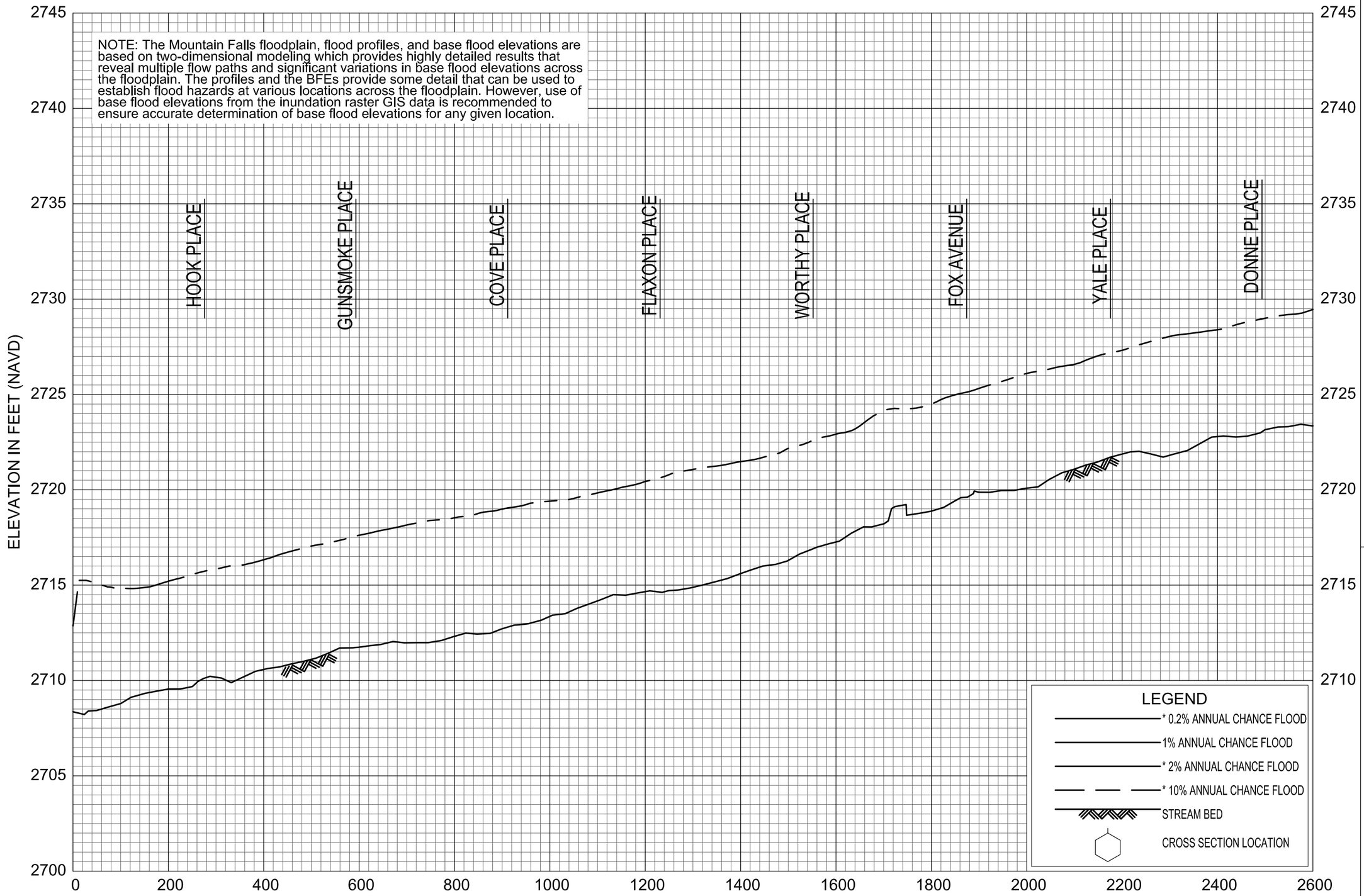



* DATA NOT INCLUDED PLEASE SEE WATER SURFACE ELEVATION TABLE

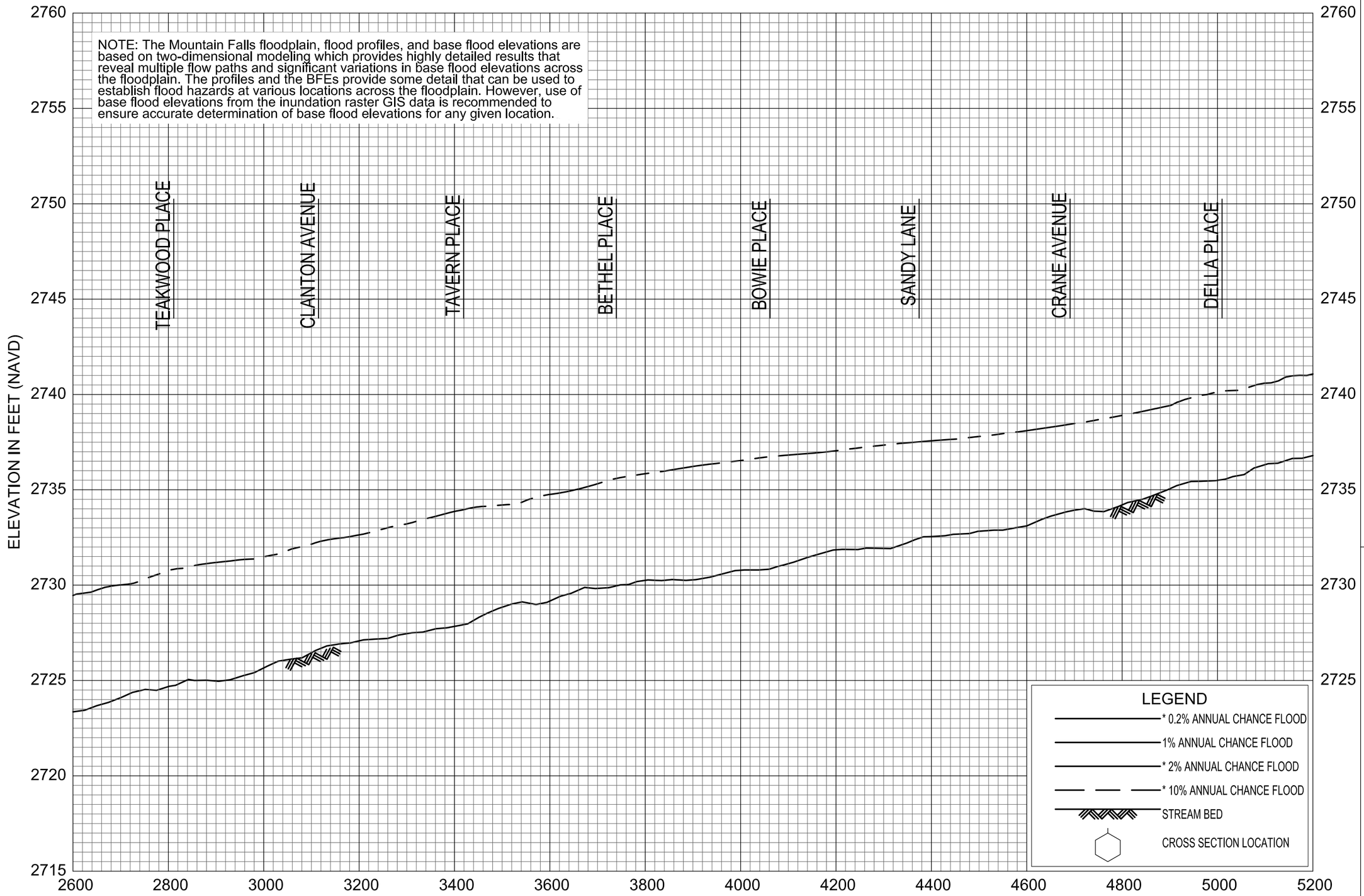
# FLOOD PROFILES

## YUCCA SPRINGS CHANNEL

FEDERAL EMERGENCY MANAGEMENT AGENCY

NYE COUNTY, NV

AND INCORPORATED AREAS

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FLOOD PROFILES

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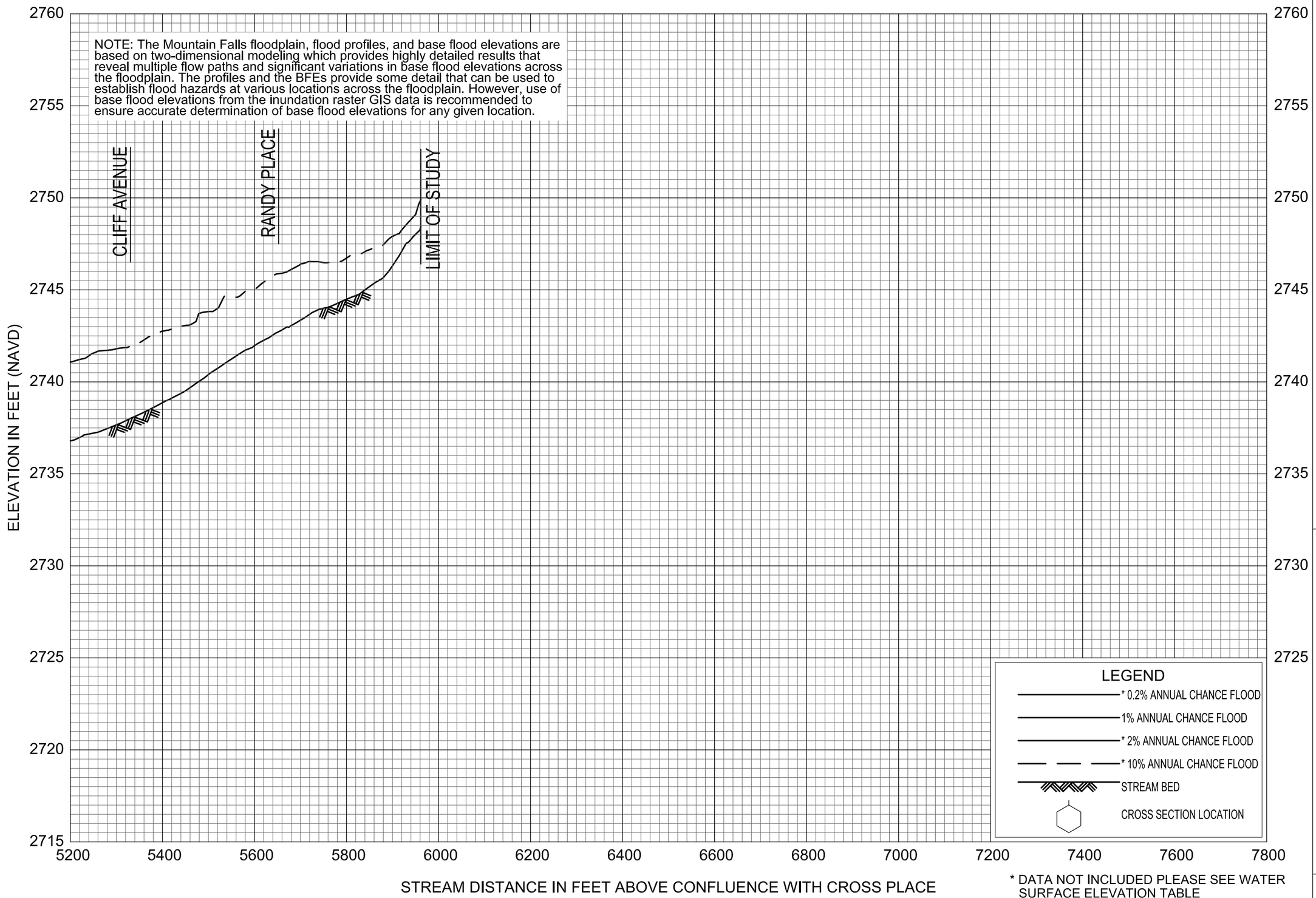


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FLOOD PROFILES

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