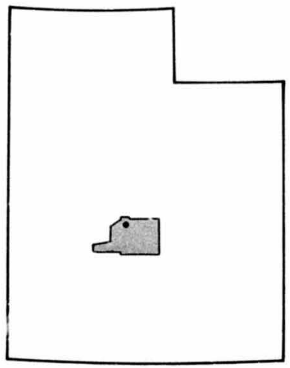
1986

Flood Insurance Study, City of Salina, Utah, Sevier County

Federal Emergency Management Agency

FLOOD INSURANCE STUDY



CITY OF SALINA, UTAH
SEVIER COUNTY

SEPTEMBER 29, 1986

Federal Emergency Management Agency

COMMUNITY NUMBER - 490132

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

Page

FIGURES

TABLES

EXHIBITS

FLOOD INSURANCE STUDY

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the City of Salina, Sevier County, Utah, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound flood plain management. Minimum flood plain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, flood plain 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 Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by Rollins, Brown and Gunnell, Inc., for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-83-C-1174. This study was completed in December 1984.

1.3 Coordination

Streams requiring detailed study were identified at a meeting attended by representatives of the study contractor, FEMA, and the City of Salina in April 1983.

Requests for pertinent information were made to the City of Salina, U.S. Soil Conservation Service (SCS), U.S. Army Corps of Engineers (COE), U.S. Forest Service (USFS), Utah Division of Water Resources, Utah Department of Transportation, and Utah Water Research Laboratory.

Results of the hydrologic analyses were sent to the city, the SCS, and the State of Utah for review and comment. An intermediate meeting was held on October 31, 1984, with city officials to review preliminary delineations of the floodway and flood plain boundaries. City officials indicated that the preliminary delineations adequately depicted flood hazards and no revisions were necessary.

The final community coordination meeting was held on November 4, 1985, and attended by representatives of FEMA, the study contractor, and the community. All problems and concerns raised at that meeting have been addressed in this study.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated areas of the City of Salina, Sevier County, Utah. The area of study is shown on the Vicinity Map (Figure 1).

The flooding sources studied by detailed methods were Salina Creek, Trashpile Draw, and Cemetery Draw.

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 December 1989.

2.2 Community Description

The City of Salina is located in northern Sevier County, in central Utah. The city is situated on the eastern edge of the Sevier Valley in the Sevier River subbasin of the Great Basin. It is located at the mouth of Salina Canyon and two small drainages known as Trashpile Draw and Cemetery Draw.

The City of Salina is surrounded by unincorporated areas of Sevier County. Nearby communities include the Town of Redmond to the north and the Towns of Aurora and Sigurd and the City of Richfield to the south.

The economy of the area is based mainly on agriculture and livestock production. Other industries in the valley include coal mining, tourism, and manufacture of wallboard and other gypsum products. Development in and near the flood plain is largely residential with ongoing commercial development located near the Main Street bridge. New residential developments are under construction in the western portion of the city. The population of Salina in 1980 was approximately 1,922 (Reference 1).

Salina Creek, which emerges from Salina Canyon and flows through the city to the Sevier River, originates in the high elevations of

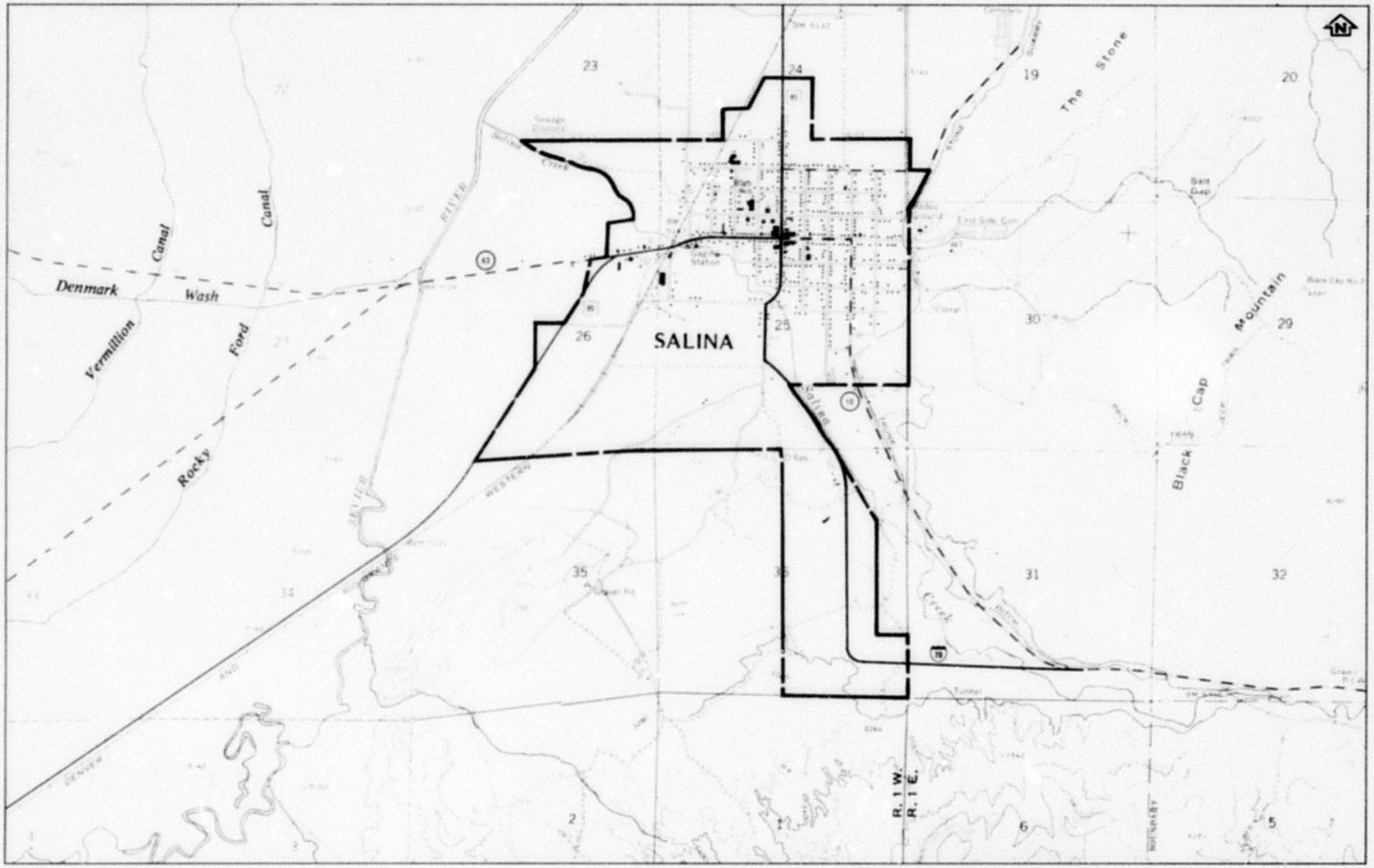


FIGURE 1	FEDERAL EMERGENCY MANAGEMENT AGENCY CITY OF SALINA, UT (SEVIER CO.)	APPROXIMATE SCALE 3000 0 3000 6000 9000 FEET VICINITY MAP

3

the Wasatch Plateau. It has a drainage area of approximately 295 square miles at its confluence with the Sevier River just downstream of Salina. Elevations of the watershed range from approximately 11,000 to 5,100 feet. Soils in the watershed are medium textured and well drained and vary from shallow to moderately deep with rock outcrop areas. Slopes vary from very steep (56 to 80 percent) to gentle (3 to 4 percent).

Vegetation in the area varies significantly with elevation, slope, and aspect. Aspen and conifer forest exists generally in the high elevations, juniper and sagebrush exist generally in the middle elevations, while the vegetation in the lower elevations consists mainly of sagebrush and desert grasses. Strands of cottonwoods and willows can be found along Salina Creek as it emerges into the valley area.

The climate in Salina is semiarid; the annual precipitation is 10.3 inches.

The Salina Creek watershed has suffered severe erosion in the past 100 years. Early Salina residents reported good fishing in Salina Creek. The banks of the creek were covered with a heavy growth of willows and sod. The water was clear most of the time. Grass was plentiful in the canyon bottoms, and there were no washes. Since that time, heavy grazing and other abuses of the watershed have caused deep washes to form. Much of the Salina Creek stream channel now has unstable vertical banks that slough off during periods of high runoff and cause sediment and debris problems for the residents of the city.

Cemetery and Trashpile Draws are two small drainages immediately to the east of Salina. They have drainage areas of 0.95 to 0.67 square mile, respectively. Their stream channels are ephemeral and only carry flow during and shortly after heavy cloudbursts. Although floods from these drainages are rare, they were responsible for the most damaging flood on record in the city.

The elevations of the two watersheds range from approximately 6,600 feet to approximately 5,200 feet at the main irrigation canal above the city. Trashpile Draw has a mean elevation of approximately 5,685 feet, and Cemetery Draw has a mean elevation of approximately 5,580 feet. The upper portion of the watersheds is basaltic rock with a thin mantle of soil that supports a sparse growth of juniper, grass, and sagebrush. The lower portion of the Cemetery Draw watershed has very little soil cover and consists mainly of Arapien shale, which is nearly devoid of vegetation. The soils on both watersheds are erodible and have very low infiltration rates; therefore, runoff is quite rapid.

2.3 Principal Flood Problems

Precipitation in the Salina area originates from two major sources. Moisture-laden polar Pacific air entering the area from the west or northwest during the winter produces large general storms, which most often result in heavy snowfall in the upper elevations and either snowfall or moderate-intensity rainfall in the lower elevations.

The second major source of precipitation in the area arises from tropical airmasses entering from the Gulf of Mexico from the south and southwest during the summer. These airmasses cause high-intensity convective or cloudburst storms, which are augmented by the orographic lifting that occurs as the airmasses pass over the mountains immediately east of Salina.

Flooding in the Salina area can result either from heavy spring snowmelt or from summer cloudburst storms. Large floods from both cloudbursts and spring snowmelt have occurred on Salina Creek, while on Cemetery and Trashpile Draws floods have resulted solely from cloudburst-type storms.

Records of floods affecting the City of Salina date as far back as 1903. Damaging floods are known to have occurred prior to that time; however, records are vague. Since 1903, major floods affecting Salina have occurred on the average of once every 3 years.

Flooding from Salina Creek has frequently caused damage to residences, structures, and other property. The largest flood occurred in 1909 and had an estimated peak discharge of 2,200 cubic feet per second (cfs). This flood was the result of a summer cloudburst. The largest snowmelt floods on record occurred just recently and peaked at 1,400 cfs on May 27, 1983, and at approximately 2,000 cfs in May 1984. These floods damaged the westbound lanes of Interstate Highway 70, put the Salina sewer plant in danger, and flooded the northwestern and southeastern sections of town. The dates, estimated peak flows, and estimated return periods of major floods on Salina Creek (Reference 2) are given in Table 1.

The most damaging flood on record for the City of Salina from Trashpile and Cemetery Draws occurred on August 20, 1970. A cloudburst that lasted 20 to 30 minutes resulted in a flood that affected a five-block-wide area through the city. Newspaper accounts describe the flood as creating a 6-inch deep stream down Main Street. Damage from the flood was in excess of $100,000. Total 24-hour precipitation at the Salina rain gage was 1.1 inches, most of which fell during the 20- to 30-minute period. For Trashpile Draw and Cemetery Draw, the U.S. Geological Survey (USGS) estimated peak discharges of 1,030 and 470 cfs, respectively. The USGS estimates would give return periods of approximately 100 and 25 years, respectively.

Table 1. Major Floods Affecting Salina

Date	Peak Flow (cfs)	Approximate Return Period (Years)
October 1903	1,000[1]	8
August 1909	2,200[1]	100
July 24, 1925	1,600[1]	31
August 21, 1928	820[1]	5
August 2-3, 1930	1,150[1]	12
August 20, 1930	900[1]	6
August 14, 1931	750[1]	4
August 11, 1933	800[1]	5
July 21, 1934	800[1]	5
1937	750[1]	4
August 6, 1943	715[1]	4
August 7, 1943	804[1]	5
May 15, 1944	697[1]	4
May 14, 1945	742[1]	4
August 2, 1945	655[1]	3
August 20, 1947	756[1]	4
May 3, 1952	856[1]	6
July 7, 1953	1,640[1]	33
February 11, 1962	891[1]	6
May 21, 1965	526[1]	2.4
May 22, 1968	567[1]	2.9
May 7, 1969	509[1]	2.4
August 20, 1970	1,030[2]	100
August 20, 1970	470[3]	25
August 26, 1970	1,800[1]	43
July 19, 1971	650[1]	3
May 19, 1973	1,100[1]	10

Table 1. Major Floods Affecting Salina (Cont'd)

Date	Peak Flow[1] (cfs)	Approximate Return Period (Years)
May 10, 1974	1,070[1]	10
May 20, 1975	702[1]	4
May 22, 1980	563[1]	2.9
May 24, 1982	546[1]	2.7
May 27, 1983	1,400[1]	20
May 1984	2,000[4]	67

[1] Along Salina Creek
[2] At Mouth of Trashpile Draw
[3] At Mouth of Cemetery Draw
[4] Estimated from High-Water Marks

2.4 Flood Protection Measures

A number of debris basins and erosion-control structures have been built in the Salina Creek watershed. However, these structures were designed to control local soil-erosion problems and have only a small effect on the total flood potential of the entire watershed. Most of these structures were built in the 1930s before streamflow records were kept on a continuous basis. Thus, streamflow records on Salina Creek should be representative of present conditions.

Irrigation diversions exist just upstream of the canyon mouth and can have a significant effect on the flood peak discharges actually experienced in Salina. Many historical accounts of floods on Salina Creek indicate that flood peaks at Salina were reduced by irrigation diversions upstream. However, other historical accounts of floods state that the diversion works were destroyed by the floods. Thus, the flood-control value of the diversion works for major floods is questionable.

During floods in the spring of 1983 and the spring of 1984 on Salina Creek, attempts were made to reduce damage to property by dredging the channel and placing rock riprap and earthfill in critical areas.

No flood-control structures that affect peak discharges from Trashpile or Cemetery Draws exist.

A number of flood-related projects have been conducted by various governmental agencies in the Salina area dating as far back as the early 1930s. In the early 1930s, Civilian Conservation Corps crews constructed a large rock check dam on Salina Creek approximately 3 miles upstream from Salina. This check dam was constructed to help control severe erosion that was occurring in the stream during major floods.

The USFS has investigated watershed conditions in the Salina Creek drainage basin at intervals during the past 40 years and implemented a number of projects designed to control erosion and reduce runoff. However, no significant projects or studies are in progress.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail 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 which 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 flood plain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, 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 the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

The records at two gaging stations on Salina Creek yield pertinent information concerning floods affecting the City of Salina. The Salina Creek Above Diversions stream gage near Salina was operated from 1959 through 1974. This station was a crest-stage-type gage located immediately below a check dam approximately 3 miles upstream from Salina.

The Salina Creek at Salina stream gage is located within the corporate limits and is a continuous-recording-type gage. It has records for 1914, 1915, 1919, 1943-1955, and 1960-1983. Peak discharge estimates for nine historical floods were also available from the SCS (Reference 3) and were included in the analyses.

Floodflow-frequency analyses of the streamflow records were conducted in accordance with the U.S. Water Resources Council Bulletin 17B (Reference 4). The log-Pearson Type III probability distribution was assumed and a regional skew of -0.1 was used in the calculations.

The USGS performed a floodflow-frequency analysis for the Salina Creek gage records (Reference 5) using gage data through 1980. Because major floods occurred in 1983 and 1984 on Salina Creek, a new frequency analysis was needed for the Salina Creek at Salina gage record. However, the new analysis, which also included the available historical flood estimates, produced almost identical results to those obtained by the USGS; therefore, the USGS frequency curve was adopted. The USGS report did not provide peak discharge estimates for the 500-year flood. These were estimated by deriving synthetic statistics for the frequency curves according to methods outlined in Appendix 5 of U.S. Water Resources Council Bulletin 17B (Reference 4) and calculating the 500-year flood discharges using the appropriate log-Pearson Type III values.

The Salina Creek Above Diversions gage record is representative of the natural flood potential of the watershed without the effect of the irrigation diversion works that exist at the canyon mouth. The Salina Creek at Salina gage record includes the combined effect of irrigation diversions and the attenuation due to increased channel storage on peak discharge. This gage record is the most representative of the flood potential of Salina Creek within Salina; thus, flood plain analyses were based on this gage record.

Floodflow-frequency estimates for Trashpile and Cemetery Draws were obtained from the most recent USGS regional floodflow-frequency report applicable to the area (Reference 5). This report provides regression equations for the various hydrologic subregions of Utah for the prediction of up to the 100-year flood based on the area and mean elevation of a watershed.

Trashpile and Cemetery Draws are near the defined boundaries of four hydrologic subregions: High Plateaus, Low Plateaus, Great Basin High Elevation, and Great Basin Low Elevation. The regression equations for the High Plateaus and Low Plateaus were the most applicable. Peak discharge estimates were obtained using equations from both of these regions. The discharges were averaged according to procedures given in the report to provide the best estimates for each watershed. The 500-year flood was obtained by extrapolation assuming the log-Pearson Type III distribution and regional skew of -0.1.

Peak discharge-drainage area relationships for Salina Creek, Trashpile Draw, and Cemetery Draw are shown in Table 2.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross sections for the backwater analyses of Salina Creek were obtained using photogrammetric methods. Aerial photographs of Salina were taken during March 1984 (Reference 6), and cross sections were obtained at various points along the stream using a photogrammetric digitizer. Cross sections at bridges and bridge geometries were obtained through actual field survey.

Cross sections for Trashpile and Cemetery Draws were taken from topographic maps at a scale of 1:4,800, with a contour interval of 4 feet (Reference 7) produced from the aerial photographs used for obtaining cross section data on Salina Creek (Reference 6).

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments

Table 2. Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Year	50-Year	100-Year	500-Year
Salina Creek At Salina	290	1,100[1]	1,860[1]	2,220[1]	3,180[1]
Salina Creek Above Diversions	280	1,240	2,110	2,560	4,170
Trashpile Draw At Mouth	0.67	230	715	1,055	1,560
Cemetery Draw At Mouth	0.95	290	860	1,275	1,840

[1] Decrease in Discharge With Increase in Drainage Area Due to Overbank Storage and Upstream Diversions

for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Boundary and Floodway Map (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 flood plain areas. Roughness values for the main channel of Salina Creek ranged from 0.033 to 0.040, while flood plain roughness values ranged from 0.060 to 0.070 for all floods.

Water-surface elevations of floods of the selected recurrence intervals were computed through the use of the COE HEC-2 step-backwater computer program (Reference 8).

Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. Starting water-surface elevations for Salina Creek were calculated using the slope-area method.

Flood plain boundaries and flood depths for areas subject to flooding from Trashpile and Cemetery Draws were determined from normal-depth calculations and comparison to accounts of historical flooding from these drainages. FEMA does not require the preparation of profiles in areas studied by shallow flooding methods. Therefore, no profiles were prepared for Trashpile and Cemetery Draws.

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 elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study produces maps designed to assist communities in developing flood plain management measures.

4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by the FEMA as the base flood for flood plain 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 in detail, the 100- and 500-year flood plain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4,800, with a contour interval of 4 feet (Reference 8).

The 100- and 500-year flood plain boundaries are shown on the Flood Boundary and Floodway Map (Exhibit 2). In cases where the 100- and 500-year flood plain boundaries are close together, only the 100-year flood plain boundary has been shown. Small areas within the flood plain 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.

4.2 Floodways

Encroachment on flood plains, 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 flood plain management involves balancing the economic gain from flood plain 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 flood plain management. Under this concept, the area of the 100-year flood plain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment so that the 100-year 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.

Because the concept of a floodway is not applicable for alluvial fans, no floodways were computed for Cemetery and Trashpile Draws.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the flood plain. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 3).

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway boundaries were computed at cross sections. Between cross sections, the boundaries were interpolated. In cases where the floodway and 100-year flood plain boundaries are either close together or collinear, only the floodway boundary has been shown.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE
Salina Creek								
A	2,955	365	671	3.3	5,131.6	5,131.6	5,132.6	1.0
B	5,080	77	316	7.0	5,143.6	5,143.6	5,144.6	1.0
C	8,260	78	310	7.2	5,162.0	5,162.0	5,162.2	0.2
D	9,080	139	373	5.9	5,166.6	5,166.6	5,166.9	0.3

[1] Feet Above Confluence With Sevier River

TABLE 3	FEDERAL EMERGENCY MANAGEMENT AGENCY CITY OF SALINA, UT (SEVIER CO.)	FLOODWAY DATA SALINA CREEK

The area between the floodway and 100-year flood plain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 2.

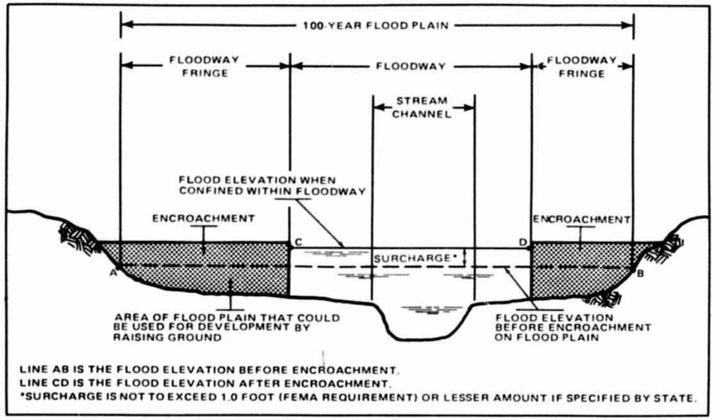


Figure 2. Floodway Schematic

5.0 INSURANCE APPLICATION

To establish actuarial insurance rates, data from the engineering study must be transformed into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors, and flood insurance zone designations for each flooding source studied in detail affecting the City of Salina.

5.1 Reach Determinations

Reaches are defined as sections of flood plain that have relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This

difference may not have a variation greater than that indicated in the following table for more than 20 percent of the reach:

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The locations of the reaches determined for the flooding sources of Salina are shown on the Flood Profiles (Exhibit 1) and summarized in Table 4.

5.2 Flood Hazard Factors

The Flood Hazard Factor (FHF) is used to establish relationships between depth and frequency of flooding in any reach. This relationship is then used with depth-damage relationships for various classes of structures to establish actuarial insurance rate tables.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations rounded to the nearest one-half foot, multiplied by 10, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10-and 100-year flood water-surface elevations is greater than 10.0 feet, it is rounded to the nearest whole foot.

5.3 Flood Insurance Zones

Flood insurance zones and zone numbers are assigned based on the type of flood hazard and the FHF, respectively. A unique zone number is associated with each possible FHF, and varies from 1 for a FHF of 005 to a maximum of 30 for a FHF of 200 or greater.

Zone A0: Special Flood Hazard Areas inundated by types of 100-year shallow flooding where depths are between 1.0 and 3.0 feet; depths are shown, but no FHFs are determined.

Zone A2: Special Flood Hazard Areas inundated by the 100-year flood; with base flood elevations shown, and zones subdivided according to FHFs.

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3] (FEET NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
Salina Creek Reach 1	**0001**	**-1.2**	**-0.3**	**0.9**	**010**	**A2**	**Varies - See Map**
Trashpile Draw and Cemetery Draw Shallow Flooding	**0001**	**N/A**	**N/A**	**N/A**	**N/A**	**A0**	**Depth 1**

[1]Flood Insurance Rate Map Panel [2]Weighted Average [3]Rounded to Nearest Foot

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF SALINA, UT
(SEVIER CO.)

FLOOD INSURANCE ZONE DATA

SALINA CREEK-TRASHPILE DRAW AND CEMETERY DRAW

Zone B: Areas between the Special Flood Hazard Areas and the limits of the 500-year flood; areas that are protected from the 100- or 500-year floods by dike, levee, or other local water-control structure; areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.

Zone C: Areas of minimal flood hazard; not subdivided.

The flood elevation differences, FHFs, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community are summarized in Table 4.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the City of Salina is, for insurance purposes, the principal product of the Flood Insurance Study. This map contains the official delineation of flood insurance zones and base flood elevations. Base flood elevation lines show the locations of the expected whole-foot water-surface elevation of the base (100-year) flood. The base flood elevations and zone numbers are used by insurance agents, in conjunction with structure elevations and characteristics, to assign actuarial insurance rates to structures and contents insured under the NFIP.

6.0 OTHER STUDIES

The SCS has prepared a fairly comprehensive history of floods in the Sevier River basin (Reference 3) that documents historical accounts and provides peak discharge estimates for floods that have occurred on Salina Creek as far back as 1903. That report is in general agreement with this study.

The USGS, in cooperation with the U.S. Bureau of Land Management, recently prepared a method for estimating peak discharges and flood plain boundaries in Utah (Reference 5). Their study included a floodflow-frequency analysis for most gaged streams in Utah, and provides peak discharge estimates for the 2-, 5-, 10-, 25-, 50-, and 100-year floods on Salina Creek. These discharges were adopted for use in this study.

A flood-control study of Trashpile and Cemetery draws was conducted by Schick International, Inc., in 1979 (Reference 2) for the City of Salina and the Utah State Soil Conservation Commission. That study evaluated

the flood potential of these two drainages and proposed the construction of a debris basin in Cemetery Draw to protect the city from future floods. This facility has not been built, and there are no plans to construct the flood-control project.

It is difficult to compare the frequency estimates of this study for Trashpile and Cemetery Draws to that given by Schick International, Inc. The Schick analysis combined discharges from both basins and involved a smaller drainage area (1.23 square miles combined) than that identified for this study (1.615 square miles combined). However, both analyses estimated that the flood that occurred from Trashpile Draw on August 20, 1970, was near the 100-year-frequency flood.

Because of the more detailed analysis performed, this Flood Insurance Study supersedes the previous published Flood Hazard Boundary Maps for the City of Salina and Sevier County, Utah (References 9 and 10, respectively).

7.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, Denver Federal Center, Building 710, Box 25267 Denver, Colorado 80225-0267.

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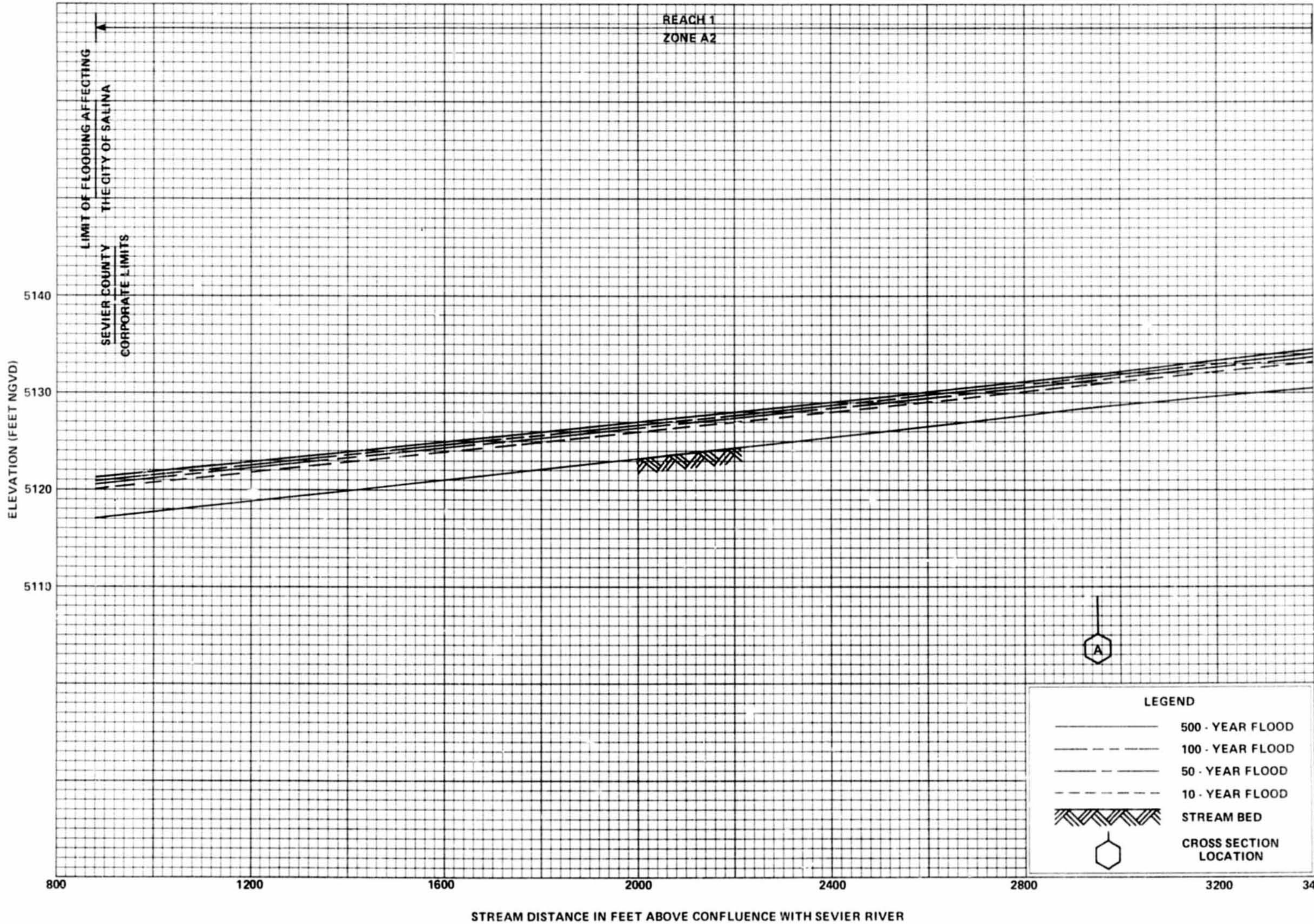


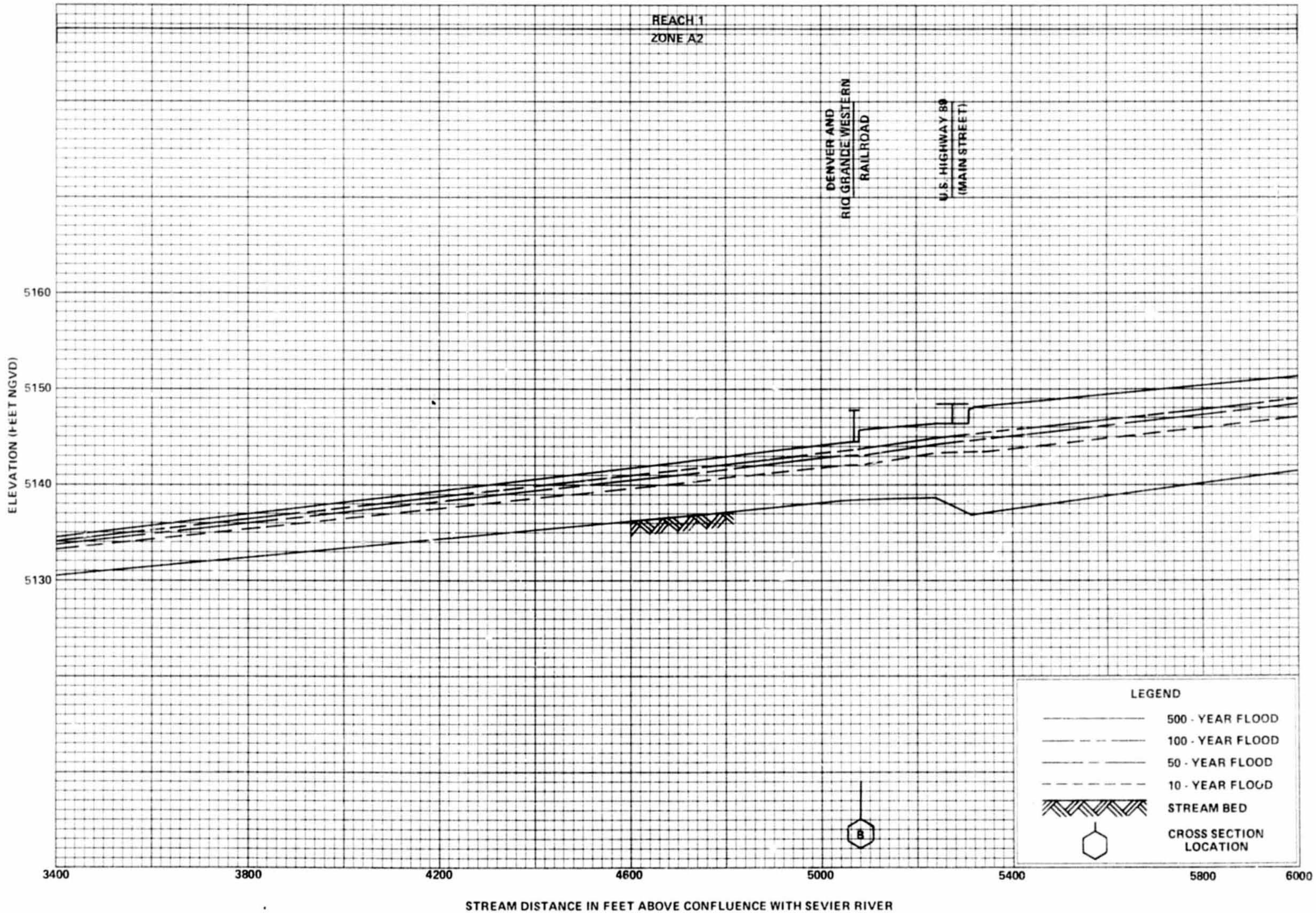
FLOOD PROFILES

SALINA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF SALINA, UT
(SEVIER COUNTY)

01P



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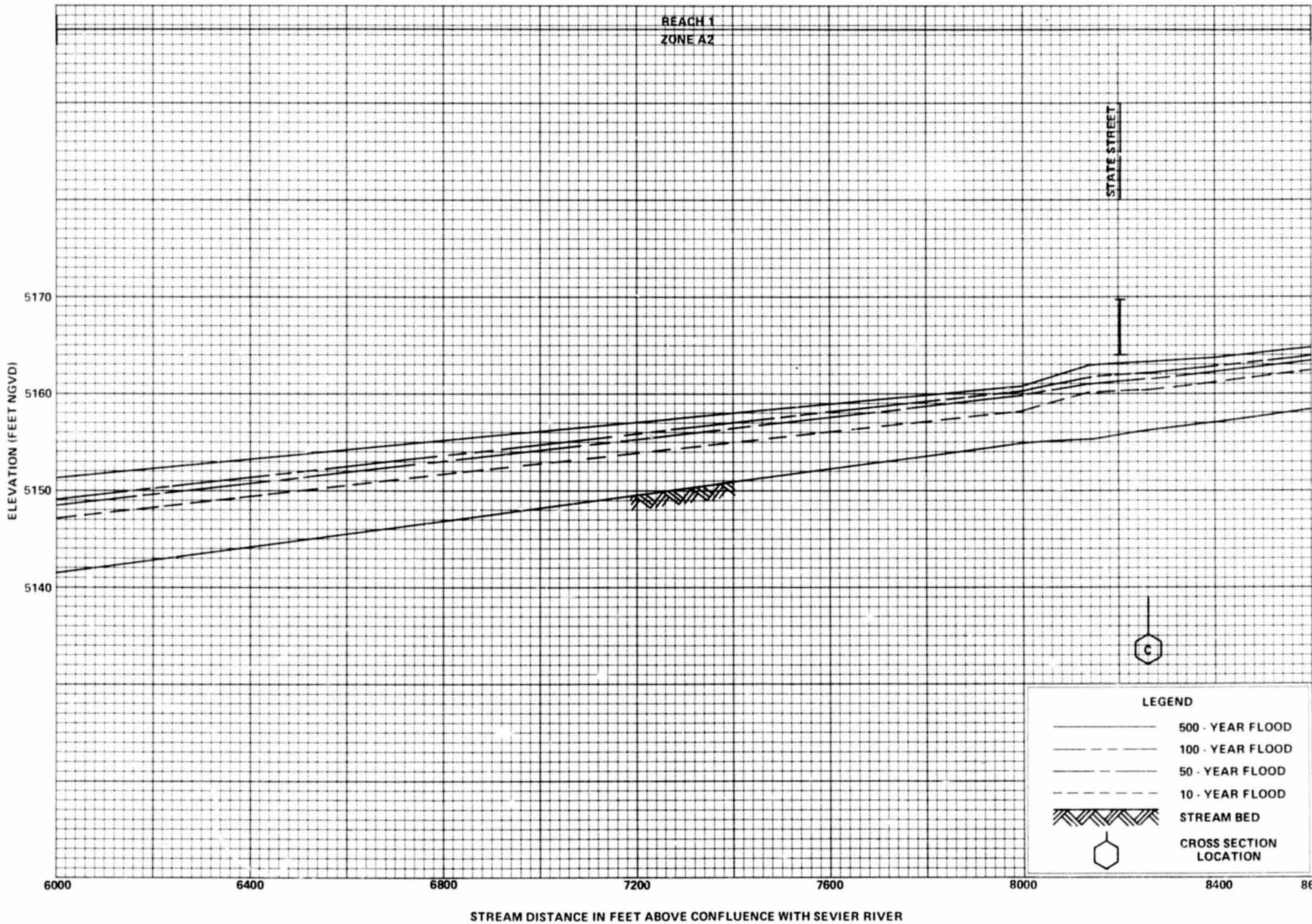

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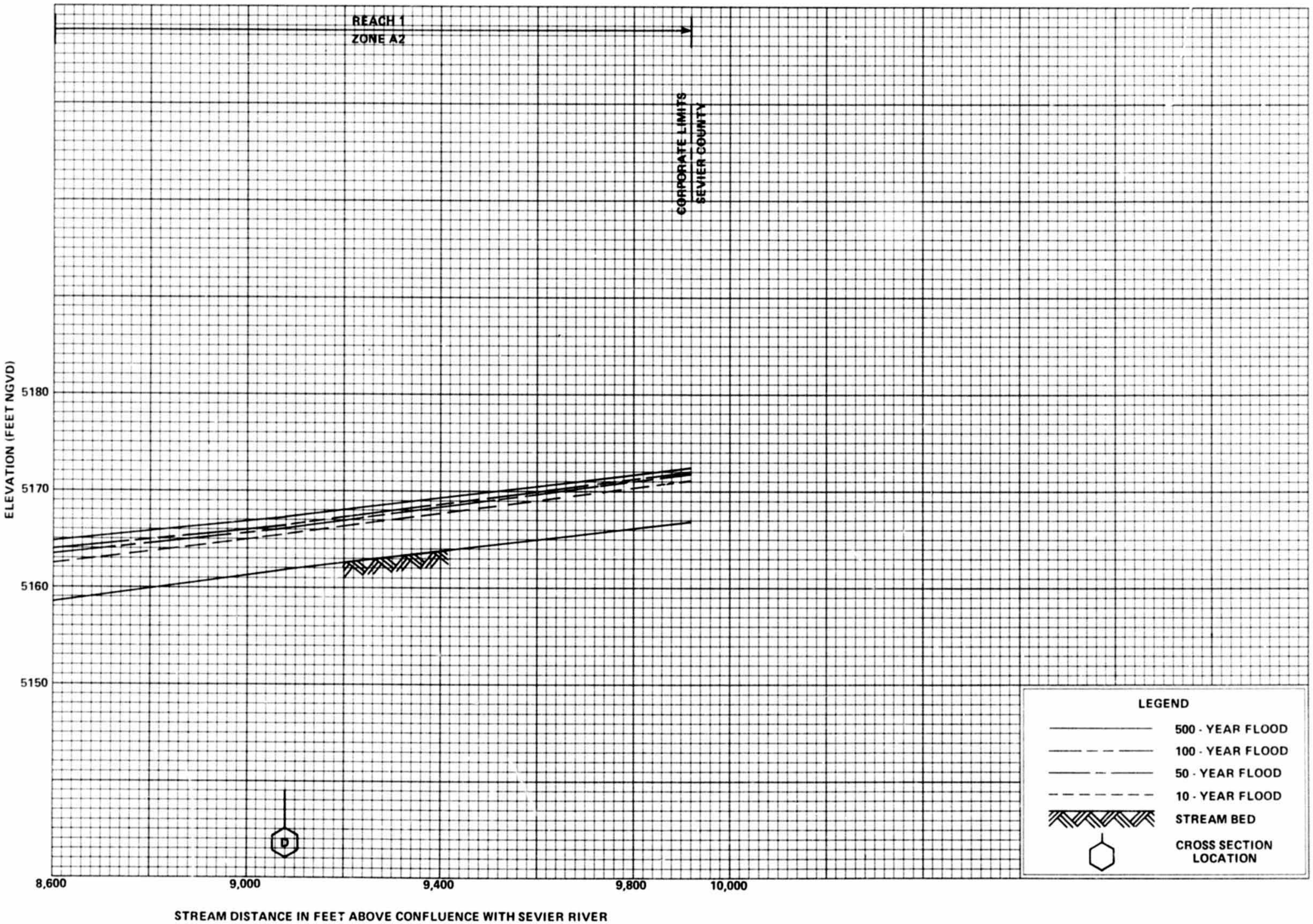

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