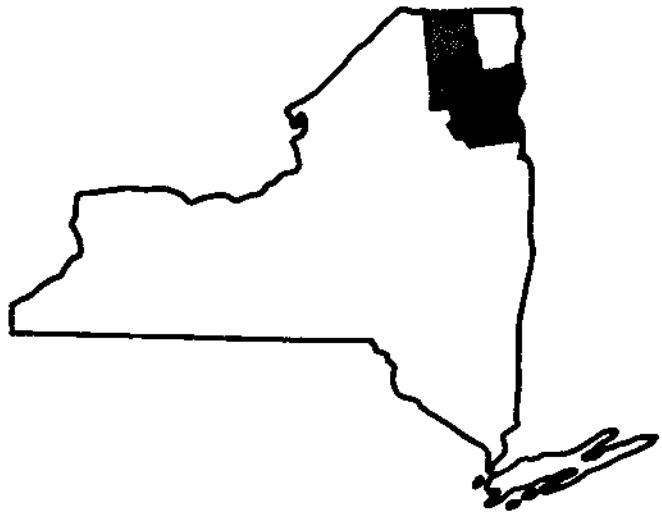
FLOOD INSURANCE STUDY

VILLAGE OF SARANAC LAKE, NEW YORK
ESSEX AND FRANKLIN COUNTIES



REVISED:
JANUARY 2, 1992

Federal Emergency Management Agency

COMMUNITY NUMBER - 360273

NOTICE TO
FLOOD INSURANCE STUDY USERS

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

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision (LOMR) 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 FIS Effective Date: FIS report - November 1, 1984
Flood Insurance Rate Map - May 1, 1985

Revised FIS Date: January 2, 1992

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FLOOD INSURANCE STUDY
VILLAGE OF SARANAC LAKE, ESSEX AND FRANKLIN COUNTIES, NEW YORK

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study revises and updates a previous Flood Insurance Study/Flood Insurance Rate Map for the Village of Saranac Lake, Essex and Franklin Counties, New York. This information will be used by the Village of Saranac Lake to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). The information will also be used by local and regional planners to further promote sound land use and floodplain development.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this 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 the original study were prepared by C. T. Male Associates, P. C., for the Federal Emergency Management Agency (FEMA). That work was completed in September 1980. In this revision, the hydrologic and hydraulic analyses for Saranac Lake were prepared by the New York State Department of Environmental Conservation. This work was completed in November 1990.

1.3 Coordination

On May 24, 1982, the results of the study were reviewed at a final Consultation and Coordination Officer's meeting attended by representatives of the village, the U. S. Army Corps of Engineers (COE), and FEMA.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Village of Saranac Lake, Essex and Franklin Counties, New York. The area of study is shown on the Vicinity Map (Figure 1).

In both the original study and this revision, the Saranac River was studied by detailed methods for its entire length within the community. Limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the Flood Insurance Rate Map (Exhibit 2). 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.

2.2 Community Description

The Village of Saranac Lake is located in both Essex and Franklin Counties in northeastern New York. It is bordered by the Towns of St. Armand to the northeast; North Elba to the southeast; and Harrietstown to the north, west, and south.

The majority of the village is fairly well developed. The estimated population was 5,958 in 1978 (Reference 1).

The Saranac River flows north through the village. It has a drainage area of 185 square miles above the Hamlet of Trudeau near the downstream study limit.

The floodplain areas consist primarily of residential and commercial development in and around Saranac Lake. To the north of the village, there are some residential areas, the village sewage treatment plant, and uninhabited wooded and swampy areas in the floodplain.

The terrain of the Saranac River watershed is hilly, and there are many relatively gentle gradient streams. There are also many miles of stillwater as the river passes through numerous lakes and ponds. The land consists mostly of floodplain, marsh, and swampy areas. The river valley slopes from level to moderately steep.

The climate of the village is typical of mountainous northeastern New York, with long and severe winters. The mean temperature for January and February is among the lowest in the state. The average annual temperature is 43.8 degrees Fahrenheit. The annual precipitation varies from 30 to 35 inches and is evenly distributed throughout the year (Reference 2).

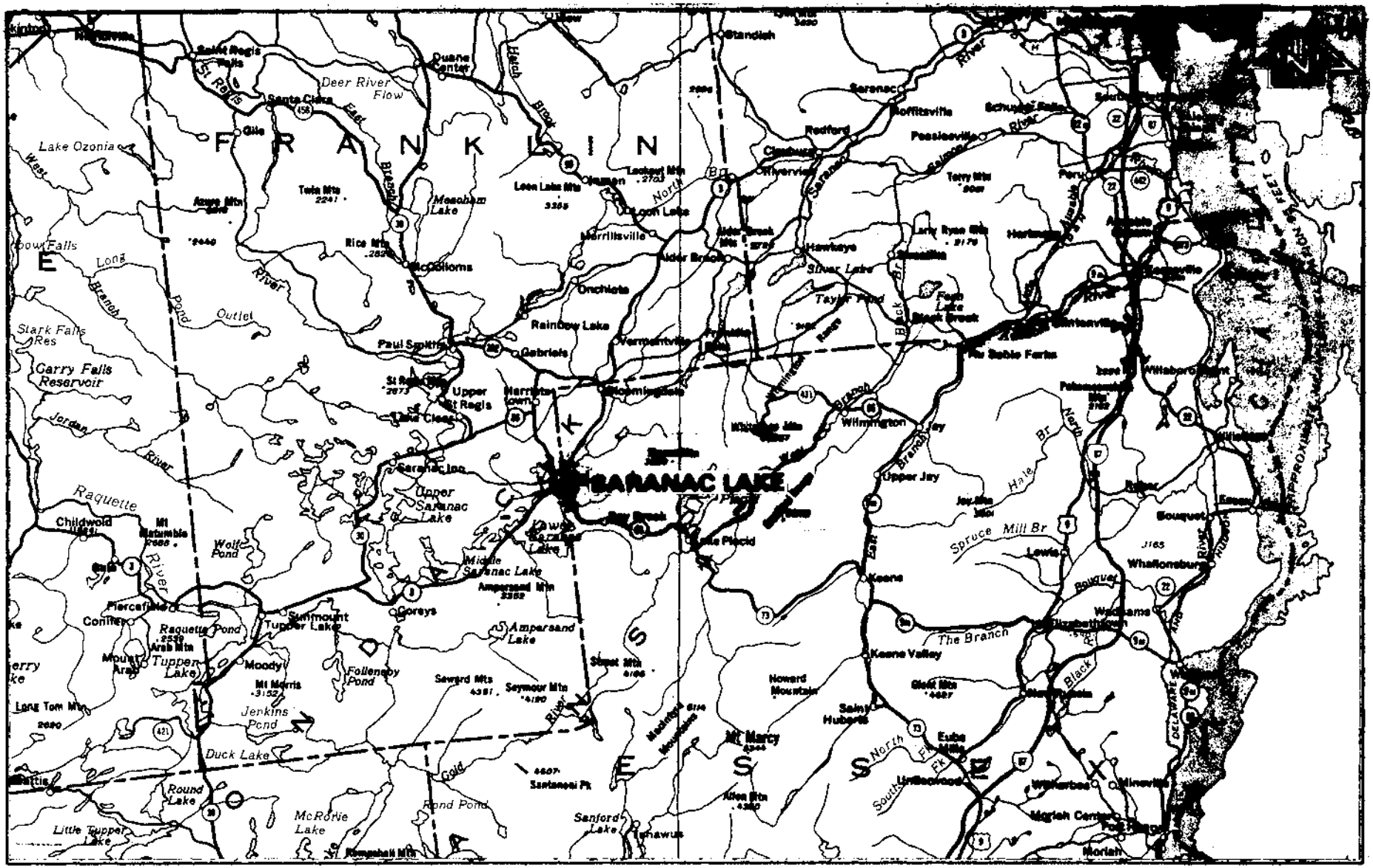


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF SARANAC LAKE, NY

(ESSEX AND FRANKLIN COS.)

APPROXIMATE SCALE

4 0 4 8 12 MILES

VICINITY MAP

2.3 Principal Flood Problems

The primary source of flooding for the Village of Saranac Lake is the Saranac River.

2.4 Flood Protection Measures

A dam, located on Lake Flower, provides some flood protection for the village.

3.0 ENGINEERING METHODS

For the flooding source 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 floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood 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 the flooding source studied in detail affecting the community.

In the original study, discharges for the Saranac River were determined at Trudeau for the 10-, 50-, 100-, and 500-year floods and the October 17, 1977 flood. The drainage area at Trudeau was obtained from a congressional report for the Saranac River (Reference 3). A prior study on the Saranac River was used as a basis for developing a model of the watershed above Trudeau. This model was used with the COE HEC-1 computer program for the various

frequency floods after necessary adjustments were made to make it more applicable to its particular location (Reference 4). The use of a regression analysis was made for the subject location using an applicable procedure (Reference 5). The model was then calibrated to the results of this regional frequency study analysis.

In this revision, discharges for the 10-, 50-, 100-, and 500- year floods were calculated using a New York regional equation the U. S. Geological Survey's Water Resources Investigations 79-83 . The discharges were then routed through Lake Flower using the Quick Hydrograph Computer Program and the POND2 Computer Program with the hydrograph method (Reference 5a).

A summary of the drainage area-peak discharge relationships for the stream studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
SARANAC RIVER					
Above the Hamlet of Trudeau	185	1,990	2,320	2,400	2,700

3.2 Hydraulic Analyses

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

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

In both the original study and this revision, water-surface elevations of floods of the selected recurrence intervals were computed using the COE HEC-2 step-backwater computer program (Reference 6). Starting water-surface elevations were determined using critical depth. Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

Channel roughness factors (Manning's "n") used in the hydraulic computations were determined from field inspection and by engineering judgment. It was not possible to determine roughness factors by reproducing the floodmarks for a large historic flood, due to the unavailability of data for any such event. The channel "n" value for the Saranac River was 0.030 and the overbank "n" value was 0.040.

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, and their descriptions, are shown on the maps.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the stream studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4,800 with a contour interval of 20 feet (Reference 7).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundaries correspond to the boundaries of the areas of special flood hazard (Zone AE), and the 500-year floodplain boundaries correspond to the boundaries of areas of moderate flood hazard. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundaries have been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

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 National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year 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 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 floodway in this study is presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodway presented in this study was computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 2). The computed floodway is shown on the Flood Insurance Rate Map (Exhibit 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown. Portions of the floodway width of the Saranac River extend beyond the corporate limits.

The area between the floodway and 100-year 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 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 floodplain development are shown in Figure 2.

5.0 INSURANCE APPLICATIONS

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

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not

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	WITH FLOODWAY	INCREASE
					(FEET NGVD			
Saranac River								
A	-125	243[2]	1,637	1.5	1,516.7	1,516.7	1,517.6	0.9
B	993	148[2]	1,158	2.1	1,516.8	1,516.8	1,517.7	0.9
C	1,493	190[2]	1,243	1.9	1,516.9	1,516.9	1,517.8	0.9
D	2,043	344[2]	1,960	1.2	1,517.0	1,517.0	1,517.9	0.9
E	4,763	297[2]	1,653	1.5	1,517.2	1,517.2	1,518.1	0.9
F	5,263	111[2]	827	2.9	1,517.2	1,517.2	1,518.1	0.9
G	5,753	91[2]	725	3.3	1,517.3	1,517.3	1,518.2	0.9
H	6,253	85[2]	736	3.3	1,517.4	1,517.4	1,518.3	0.9
I	6,703	93[2]	663	3.6	1,517.6	1,517.6	1,518.5	0.9
J	7,103	118[2]	843	2.8	1,517.8	1,517.8	1,518.7	0.9
K	7,328	145[2]	1,122	2.1	1,517.8	1,517.8	1,518.7	0.9
L	7,480	128[2]	746	3.2	1,517.8	1,517.8	1,518.8	1.0
M	7,607	88[2]	538	4.5	1,518.7	1,518.7	1,519.4	0.7
N	8,093	162[2]	1,121	2.1	1,519.7	1,519.7	1,520.2	0.5
O	8,526	101	796	3.0	1,519.7	1,519.7	1,520.2	0.5
P	8,760	71	504	4.8	1,520.2	1,520.2	1,520.6	0.4
Q	8,927	72	607	4.0	1,520.5	1,520.5	1,520.9	0.4
R	9,202	64	638	3.8	1,520.9	1,520.9	1,521.2	0.3
S	9,368	90	647	3.7	1,521.0	1,521.0	1,521.3	0.3
T	9,643	76	688	3.5	1,521.7	1,521.7	1,521.9	0.2
U	10,156	83	730	3.3	1,522.1	1,522.1	1,522.3	0.2
V	10,533	140	1,174	2.0	1,522.2	1,522.2	1,522.4	0.2
W	10,753	54	789	3.0	1,522.6	1,522.6	1,523.6	1.0

[1]Feet from downstream corporate limits
[2]Width extends beyond corporate limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF SARANAC LAKE, NY
(FRANKLIN AND ESSEX COS.)

FLOODWAY DATA

SARANAC RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD			
Saranac River (continued)								
X	10,973	93	519	4.6	1,522.6	1,522.6	1,523.4	0.8
Y	11,164	160	1,353	1.8	1,534.1	1,534.1	1,534.1	0.0
Z	12,343	750	798	0.3	1,534.1	1,534.1	1,534.1	0.0
AA	13,243	990	10,181	0.2	1,534.1	1,534.1	1,534.1	0.0
AB	14,293	317	3,495	0.7	1,534.1	1,534.1	1,534.1	0.0
AC	15,893	1,182[2]	14,282	0.2	1,534.1	1,534.1	1,534.1	0.0

[1]Feet from downstream corporate limits
[2]Width extends beyond corporate limits

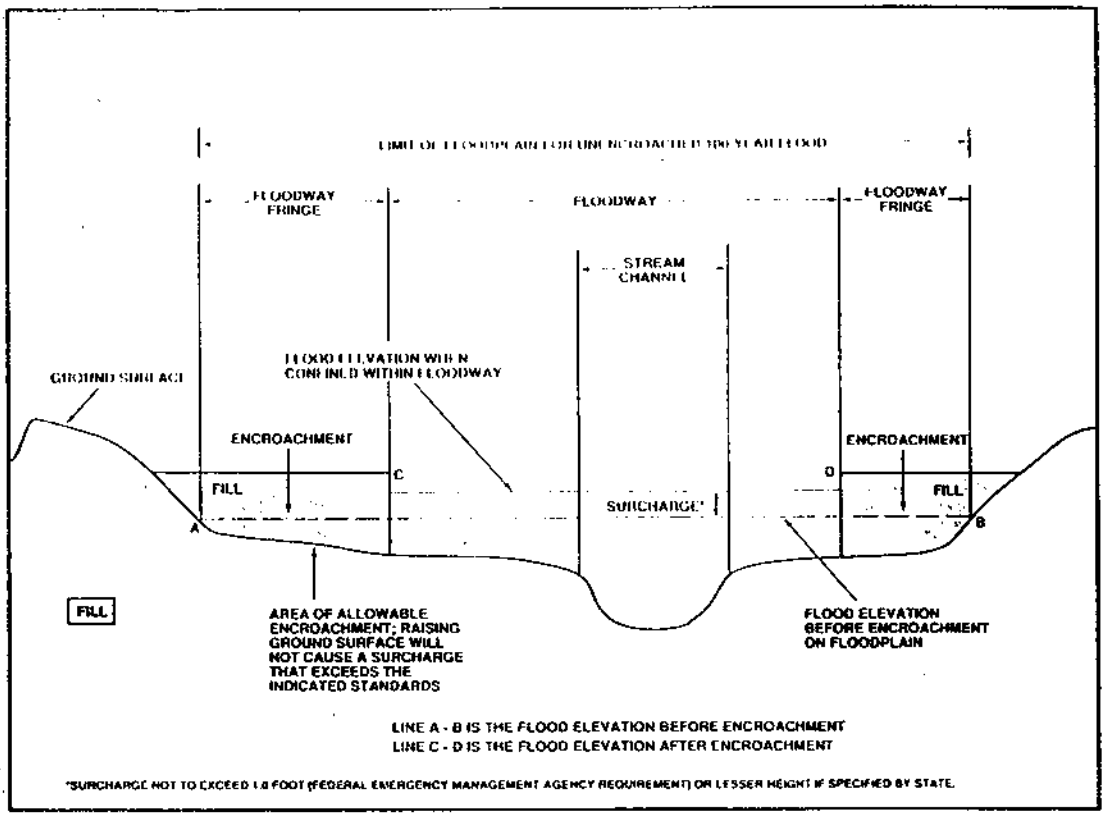
TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF SARANAC LAKE, NY
(FRANKLIN AND ESSEX COS.)

FLOODWAY DATA

SARANAC RIVER



FLOODWAY SCHEMATIC Figure 2

performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

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

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map (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 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations 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 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable. The FIRM includes flood hazard information that was presented separately on the Flood Boundary and Floodway Map in the previously printed Flood Insurance Study for the Village of Saranac Lake.

7.0 OTHER STUDIES

Flood Insurance Studies have been prepared for the Towns of Harrietstown, and St. Armand (References 8 and 9).

Because it is based on more up-to-date analyses, this Flood Insurance Study supersedes the previously printed Flood Insurance Study for the Village of Saranac Lake (Reference 10).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, 26 Federal Plaza, Room 1351, New York, New York 10278.

9.0 BIBLIOGRAPHY AND REFERENCES

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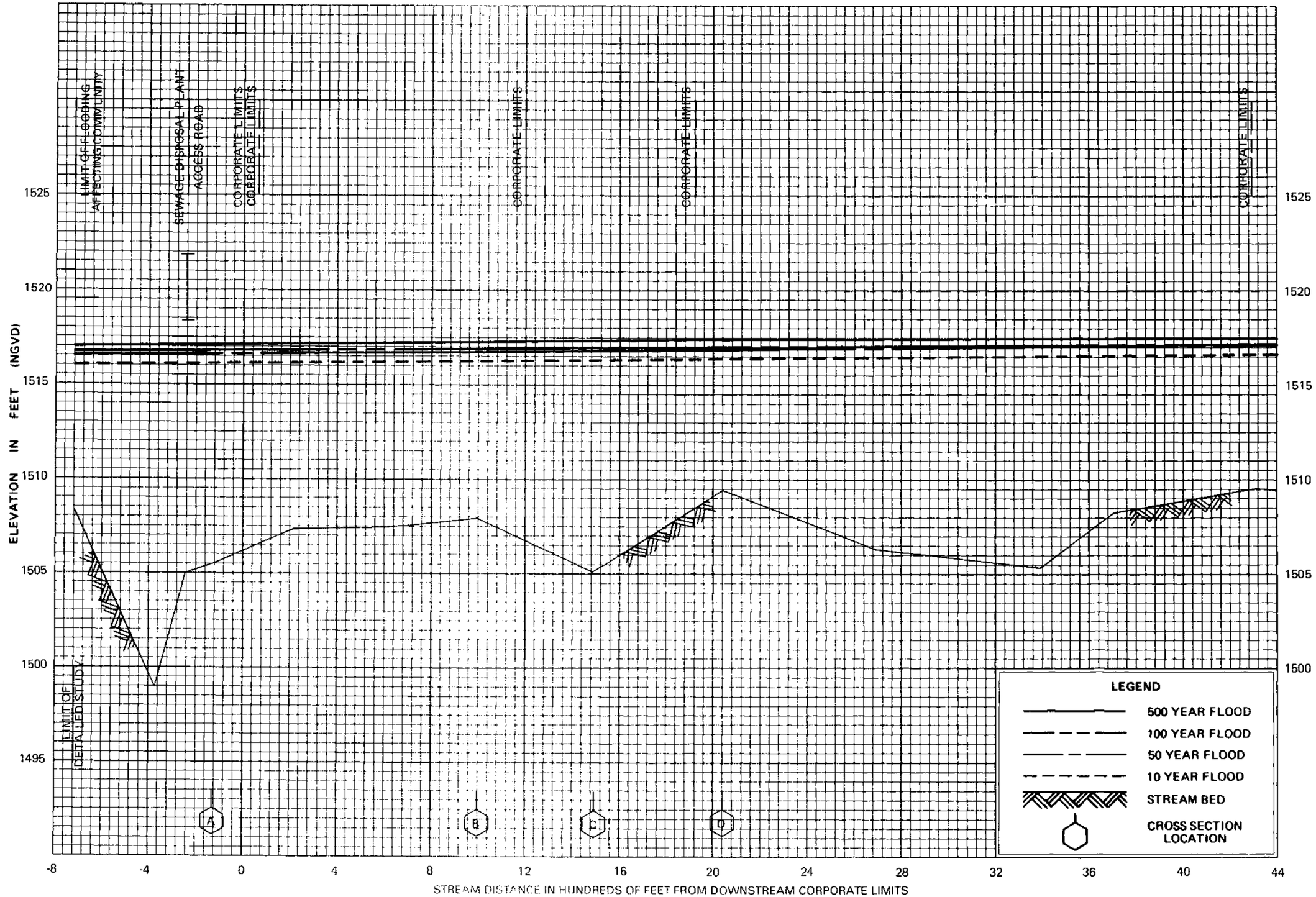

FLOOD PROFILES

SARANAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF SARANAC LAKE, NY

[ESSEX AND FRANKLIN COS.]

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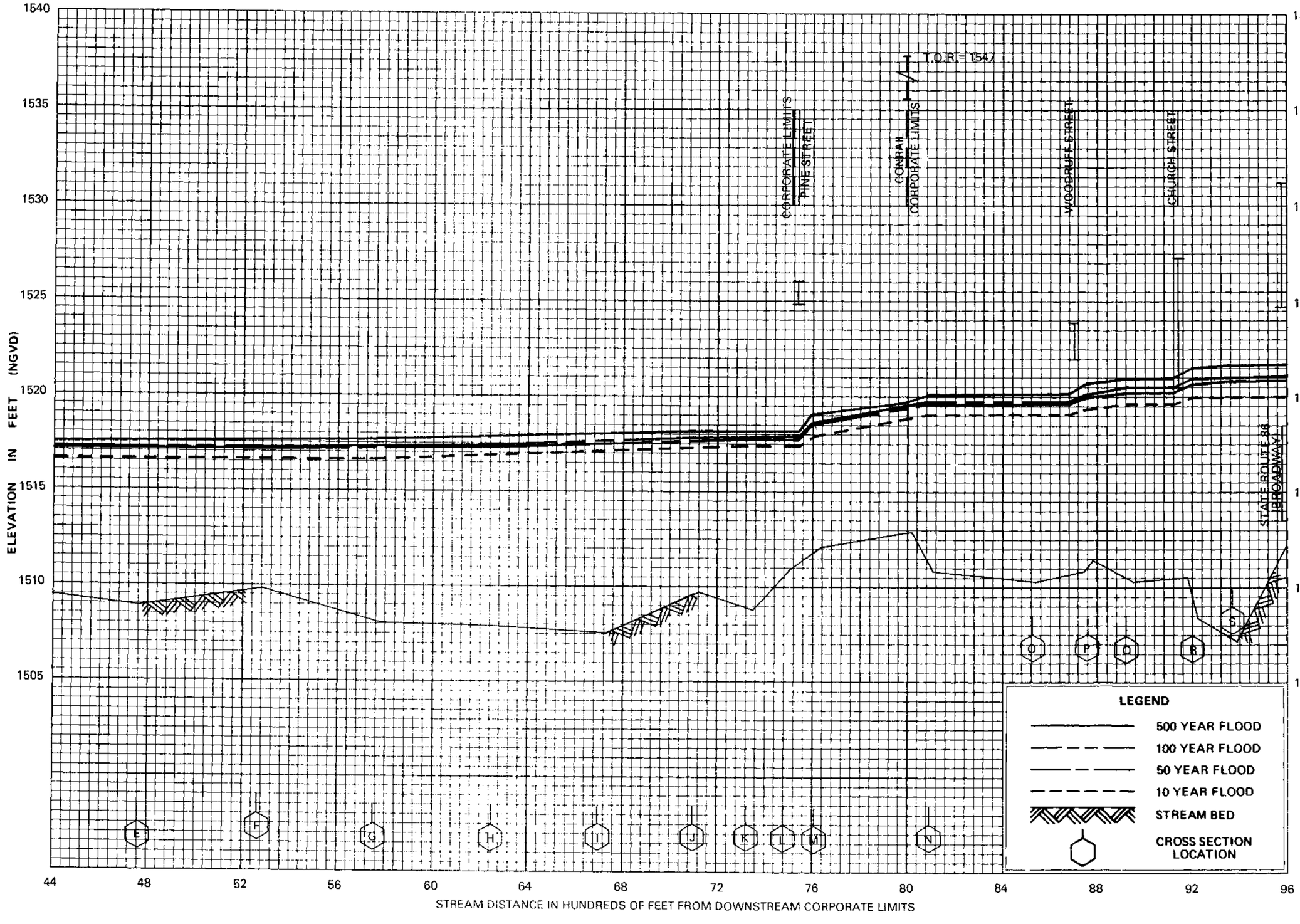

FLOOD PROFILES

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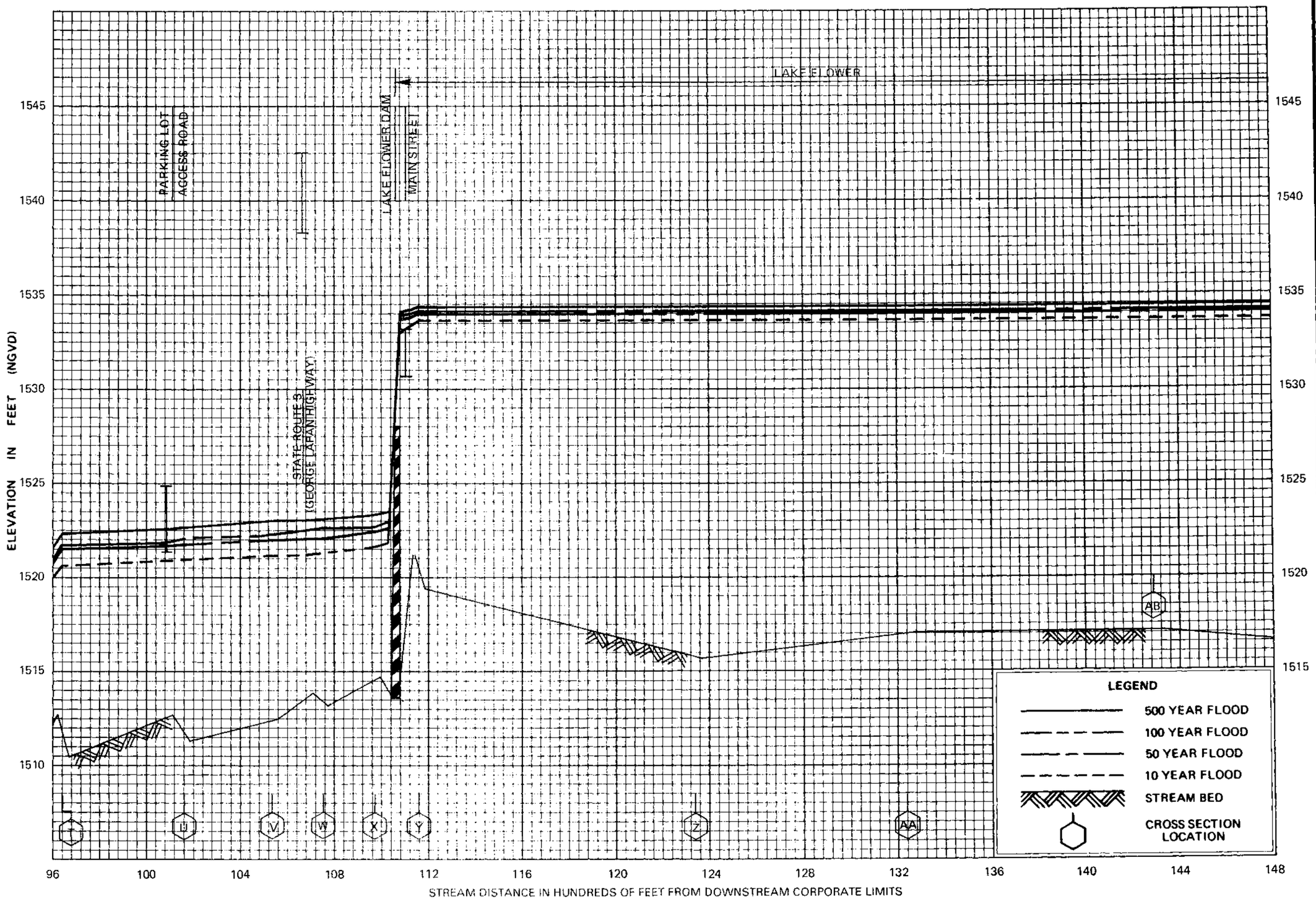

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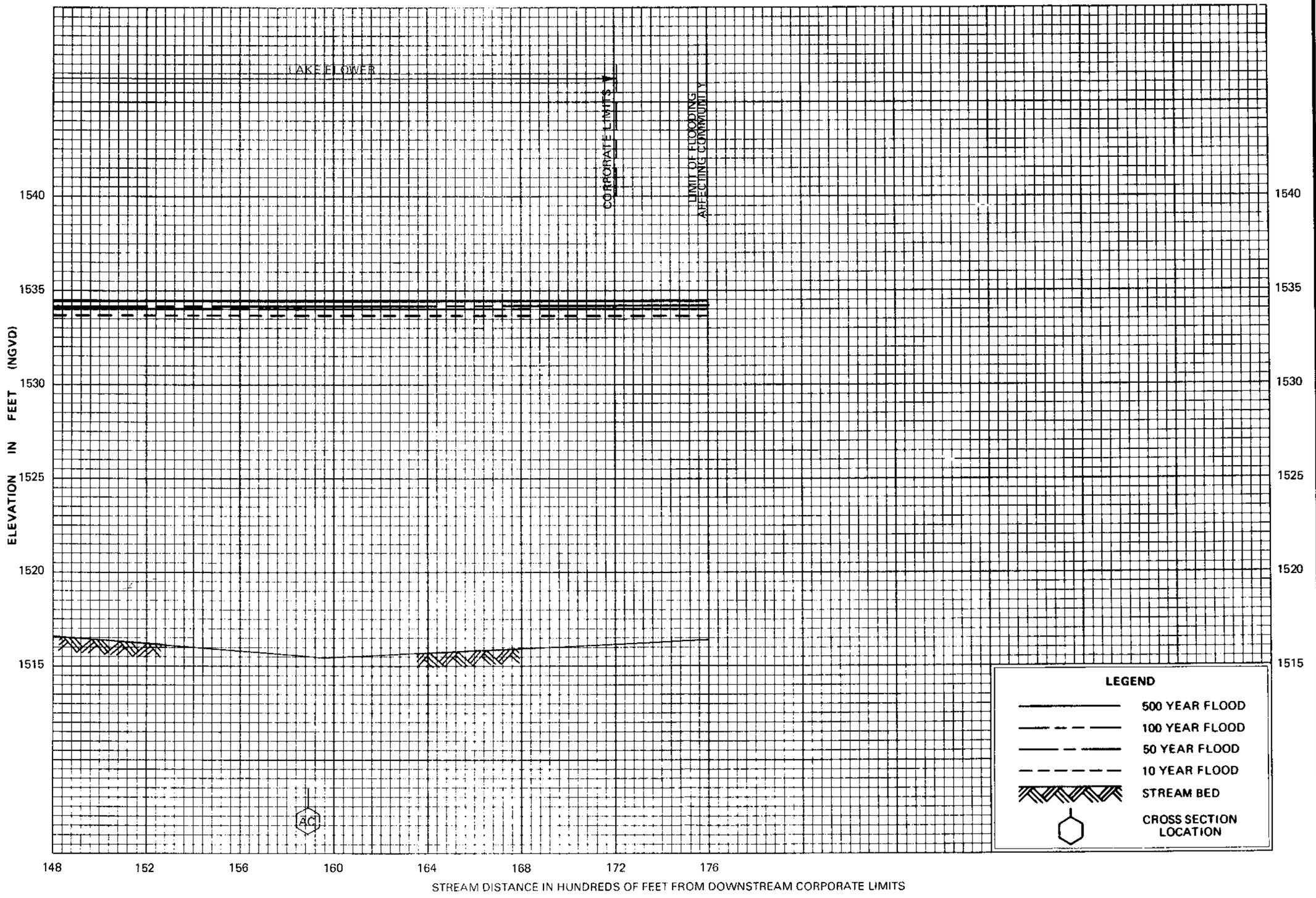

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