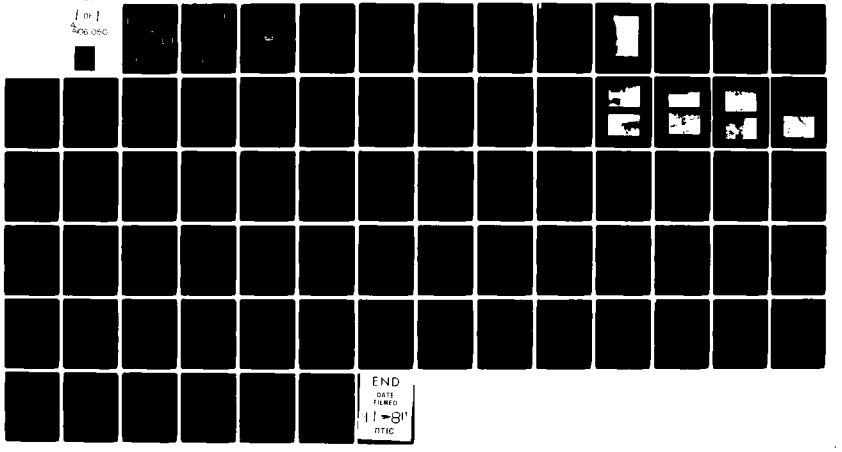
AD-A106 050 NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13
NATIONAL DAM SAFETY PROGRAM. GENEGANTSLET LAKE DAM (INVENTORY N--ETC(U)
MAR 81 G KOCH DACW51-79-C-0001
UNCLASSIFIED NL



AD A106050

DTIC FILE COPY

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
	AD-A106 050	

4. TITLE (and Subtitle)
Phase I Inspection Report
Genegantslet Lake Dam
Susquehanna River Basin, Chenango County, N.Y.
Inventory No. 846

5. TYPE OF REPORT & PERIOD COVERED
Phase I Inspection Report
National Dam Safety Program

6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s)
GEORGE KOCH

8. CONTRACT OR GRANT NUMBER(s)
DACW51-79-C-0001

9. PERFORMING ORGANIZATION NAME AND ADDRESS
New York State Department of Environmental Conservation 50 Wolf Road
Albany, New York 12233

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS

11. CONTROLLING OFFICE NAME AND ADDRESS
Department of the Army
26 Federal Plaza New York District, CofE
New York, New York 10287

12. REPORT DATE
31 Mar 1981

13. NUMBER OF PAGES
74

14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)
Department of the Army
26 Federal Plaza New York District, CofE
New York, NY 10287

15. SECURITY CLASS. (of this report)
UNCLASSIFIED

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

LEVEL

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; Distribution unlimited.

DTIC ELECTED S OCT 22 1981 H

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

*Original contains color plates: All DTIC reproductions will be in black and white

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)
Dam Safety
National Dam Safety Program
Visual Inspection
Hydrology, Structural Stability
Genegantslet Lake Dam
Chenango County
Susquehanna River Basin

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which need to be evaluated and remedied.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

cont

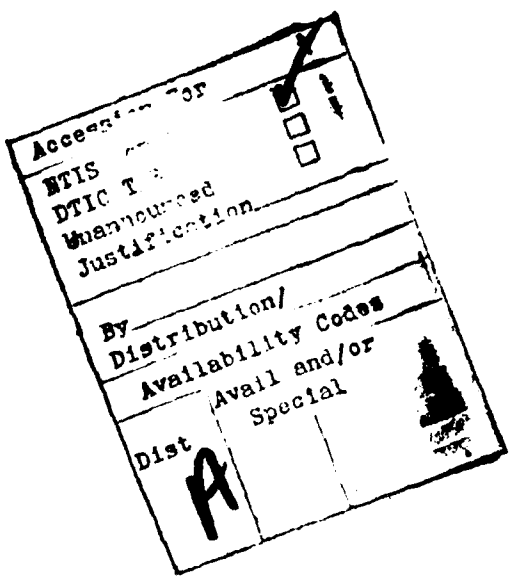
Using the Corps of Engineers' Screening Criteria for initial review of spillway adequacy, it has been determined that the dam would be overtopped by all storms exceeding 5% of the Probable Maximum Flood (PMF) inflows. While this dam has withstood overtopping in the past, it cannot be assumed that overtopping will not eventually cause the dam to fail. Since failure of the dam would increase the hazard to downstream residents, the spillway capacity is adjudged as seriously inadequate and the dam is assessed as "unsafe, non emergency".

The classification of "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to loss of downstream of the dam.

Inspection of the dam also revealed that there was a seepage problem on this structure. Seepage was exiting on the downstream slope and at the toe in the embankment section at the right end of the dam. There were also several locations where leakage was noted through the laid up stone portion of the dam.

It is recommended that within 3 months of the date of notification of the owner, a hydrologic/hydraulic investigation of the structure should be commenced. Investigation into the seepage problem should also be commenced within 3 months. Mitigating measures deemed necessary as a result of these investigations should be completed within 18 months.

Several other deficiencies were noted on this structure. These should be corrected within 12 months of the date of notification. Among the items which should be corrected are the eroded area on the downstream slope at the leftend of the dam, gaps between sections of pipe which need to be filled with mortar, displaced stones on the laid up stone portion of the dam, brush and small trees growing on the embankment, an outlet channel from the spillway



SUSQUEHANNA RIVER BASIN

GENEGANTSLET LAKE DAM

CHENANGO COUNTY, NEW YORK
INVENTORY NO. N.Y. 846

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

NEW YORK DISTRICT CORPS OF ENGINEERS

FEBRUARY, 1981

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
GENEGANTSLET LAKE DAM
SUSQUEHANNA RIVER BASIN
CHENANGO COUNTY, NEW YORK

TABLE OF CONTENTS

Phase I Inspection Report
National Dam Safety Program

Name of Dam:	Genegantslet Lake Dam (I.D. NY 846)
State Located:	New York
County :	Chenango
Watershed:	Susquehanna River Basin
Stream:	Unnamed tributary of Gengegantslet Creek
Date of Inspection:	October 22, 1980

ASSESSMENT

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which need to be evaluated and remedied.

Using the Corps of Engineers' Screening Criteria for initial review of spillway adequacy, it has been determined that the dam would be overtopped by all storms exceeding 5% of the Probable Maximum Flood (PMF) inflows. While this dam has withstood overtopping in the past, it cannot be assured that overtopping will not eventually cause the dam to fail. Since failure of the dam would increase the hazard to downstream residents, the spillway capacity is adjudged as seriously inadequate and the dam is assessed as "unsafe, non emergency".

The classification of "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classificacion applied for a structural deficiency. It does mean that there appears to be a serious deficiency in spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to loss of downstream of the dam.

Inspection of the dam also revealed that there was a seepage problem on this structure. Seepage was exiting on the downstream slope and at the toe in the embankment section at the right end of the dam. There were also several locations where leakage was noted through the laid up stone portion of the dam.

It is recommended that within 3 months of the date of notification of the owner, a hydrologic/hydraulic investigation of the structure should be commenced. Investigation into the seepage problem should also be commenced within 3 months. Mitigating measures deemed necessary as a result of these investigations should be completed within 18 months.

Several other deficiencies were noted on this structure. These should be corrected within 12 months of the date of notification. Among the items which should be corrected are the eroded area on the downstream slope at the left end of the dam, gaps between sections of pipe which need to be filled with mortar, displaced stones on the laid up stone portion of the dam, brush and small trees growing on the embankment, an outlet channel from the spillway

conduit which runs along the [illegible]
[illegible]

George Koch
Chief, Dam Safety Section
New York State Department
of Environmental Conservatation
NY License No. 45937

Approved by:

Col. W. M. Smith, Jr.
New York District Engineer

Date: 31 MAR 1981

OVERVIEW
GENEGANTSLET LAKE DAM
I.D. No. NY 846

Phase I Inspection Report
National Dam Safety Program
Genegantslet Lake Dam
I.D. No. Ny 846
#94D-3437
Susquehanna River Basin
Chenango County, New York

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam

The Genegantslet Lake Dam is an earth fill and laid up stone dam with a drop inlet spillway and a conduit passing through the embankment.

The dam is approximately 300 feet long and about 10 feet high. The upstream slope of the dam is composed of earth fill. The laid up stone is exposed on the center portion of the downstream face. The earth fill extends over the top of the laid up stone, forming the crest along the entire dam. Earth and rock fill form the downstream slope at either end of the structure.

The spillway consists of a 48 inch reinforced concrete pipe flowing into the base of a drop inlet structure. There are wooden stop logs in the center of the structure which are used to control the water level in the lake. When the stop logs are in place, water must flow over them and then to the outlet pipe. If the stop logs are removed, the 48 inch pipe would act as a resevoir drain.

The top of the drop inlet structure is open to permit flow. The crest on the upstream face is 2 feet below the top of the structure providing additional capacity. All of the openings have screens to prevent debris from entering the drop inlet.

There is a 48 inch concrete outlet pipe leading from the base of the drop inlet to a concrete manhole 25 feet downstream. Another 48 inch pipe extends 116 feet from the manhole to a headwall at the outlet.

b. Location

This dam is located in the Town of Mc Donough, off Moon Hill Road on an unnamed tributary of the Genegantslet Creek. The dam is approximately 3/4 mile north of the village of Mc Donough.

c. Size Classification
The dam is 9.5 feet high and has a storage capacity of 2,000 acre-feet. Therefore, the dam is in the small size category as defined by the "Recommended Guidlines for Safety Inspection of Dams".

d. Hazard Classification
The dam is classified as "high" hazard due to the presence of one house immediately downstream of the dam and 6 additional houses plus one trailer located near the stream channel in the Village of Mc Donough.

e. Ownership
The dam is owned by the Genegantslet Lake Association, Inc. The secretary-treasurer of the association is Frank Ulrichs, 127 South Broad Street, Norwich, New York 13815. Mr. Ulrich's telephone number is (607) 334-3789.

f. Purpose of Dam
The dam is used to maintain the water surface of Genegantslet Lake for recreational purposes.

g. Design and Construction History
This dam was constructed around 1900. No information was available concerning the original design or construction of the dam. In 1947, the owner contracted with Les Strong Construction Company of Whitney Point, New York to perform work designed to reduce the leakage through the dam. This same company made further repairs in 1955. The 1955 work included placing shale fill on the upstream slope to again reduce leakage. A 36 inch iron pipe through the dam was sealed as part of this work, since it was considered to be a major source of the leakage.

Major modifications to the structure were made in 1965. At that time, clay fill was placed on the upstream face and the new conduit was installed to provide some control over the lake level. The design engineer for these modifications was Mr. Carl Crandall, P.E, of Ithaca, New York.

h. Normal Operating Procedures
Stop logs to within about ½ foot of the lower crest of the drop inlet maintain the water surface at approximately this elevation from April thru October. In October, three stop logs (2 inch by 12 inch) are removed to lower the water surface during the winter months.

1.3 PERTINENT DATA

a. Drainage Area (sq. mi.)	5.04
b. Discharge at Dam (cfs)	
Water Surface at Top of Dam	55
c. Elevations- (Plan Datum)	
Top of Dam and Top of Drop Inlet	101.3
Crest of Drop Inlet	99.3
Invert of Inlet Pipe	90.3
Invert of Outlet of Pipe	90.3

d. Resevoir-Surface Area (acres)

Top of Dam	114
Crest of Drop Inlet	105

e. Storage Capacity (acre-feet)

Top of Dam	1969
Crest of Drop Inlet	1750

f. Dam

Type: Laid up stone and earth embankment

Dam Length (ft)	300
Crest Width (ft)	35

g. Spillway

Type: Concrete drop inlet approximately 6 ft. by 6 ft, rising 11 feet above the invert of 48 inch diameter concrete pipes on both upstream and downstream ends. Stop logs in center of structure can be used to control water surface.

Weir length (ft):	low level	6.1
Conduit length (ft):	upstream of drop inlet	31
	downstream of drop inlet	142

h. Resevoir Drain

Type: 48 inch concrete conduit into drop inlet

Control: Stop logs can be removed down to invert elevation.

SECTION 2: ENGINERRING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Genegantslet Lake Dam is located in the Glaciated Allegheny Plateau of physiographic province of New York State. This plateau is underlaid by a great thickness of sedimentary rocks from the Devonian Era which lie almost horizontal. Severe trenching by streams and glacial erosion has carved the upland into a rugged terrain. The Susquehanna Hills rise to elevations of up to 1700 feet between the rolling, relatively narrow valleys. The surficial soils and features of the area are the result of glaciations during the Cenzoic Era, the last of which was the Wisconsin glaciation.

A review of the "Brittle Structures Map of the State of New York" indicated that there are no faults in the immediate vicinity of the dam.

b. Subsurface Investigations

No records of any subsurface investigations performed for this structure were available. The only subsurface information available was from a 1925 inspection report which stated that the foundation of the dam consisted of clay and hardpan.

2.2 DESIGN RECORDS

No records were available concerning the original design of this structure. An engineer's report and plans for the modifications made to the structure in 1965 were available. This design work was performed by Mr. Carl Crandall, P.E., of Ithaca, New York.

2.3 CONSTRUCTION RECORDS

No records exist for the original construction of this structure. A contract between the owner and the Les Strong Construction Company of Whitney Point, New York was available, and it described the repairs made to the dam in 1947. The same company made additional repairs in 1955. There were several photographs in the files which were taken during this construction. The only records from the 1965 modifications were the plans prepared by Mr. Crandall and photographs taken during construction.

2.4 OPERATION RECORDS

There are no regular operation records maintained for this structure.

2.5 EVALUATION OF DATA

Data available for the preparation of this report was somewhat limited. In addition, several of the dimensions shown on the plans, such as the size of the riser did not agree with the actual dimensions measured during the inspection.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Genegantslet Lake Dam was conducted on October 22, 1980. The weather was overcast and the temperature was in the forties. The water surface at the time of the inspection was 2.5 feet below the top of the drop inlet structure. Water was flowing over the stop logs inside the drop inlet.

b. Dam

Several deficiencies were observed on this structure. The most serious deficiency noted was the seepage exiting both on the downstream slope and at the toe. The most concentrated seepage was in the embankment section between the right abutment and the center of the dam where the laid up stone face is exposed. There was also leakage through the laid up stone portion in several locations.

Another deficiency noted was erosion of embankment material on the downstream slope at the left end of the dam near the headwall for the spillway conduit. This erosion was probably caused by flow over the top of the dam.

Brush and saplings growing on the embankment and some displaced stones on the laid up stone segment were other deficiencies noted on this structure.

c. Spillway

The drop inlet and the outlet conduits were in good condition. Trash racks over all openings on the drop inlet prevented debris from entering the spillway. These trash racks were properly maintained and there was no accumulation of debris around the drop inlet.

The outlet conduits were composed of sections of reinforced concrete pipe which were 4 feet long. Inspection of the pipe revealed that the individual sections were not fit together tightly. Furthermore, only the bottom third of the joints between sections had been mortared. There was no mortar in the remainder of each of the joints. There was some seepage into the pipe through several of the joints. The joints where seepage was observed were approximately midway between the outlet of the pipe and the buried manhole which is downstream of the drop inlet.

The conduit upstream of the drop inlet structure extends into the lake. It was submerged and could not be observed.

d. Reservoir

There was no indication of soil instability in the reservoir area.

e. Downstream Channel

The outlet channel from the spillway conduit ran along the downstream toe of the dam. This fact may have contributed to the erosion problem beyond the head wall. The channel contained riprap but the toe of the dam was not well protected.

3.2 EVALUATION OF OBSERVATIONS

Visual inspection of the dam revealed several deficiencies. The following items were noted:

1. Seepage both through the embankment section at the right end of the dam and the laid up stone section.

2. Erosion of embankment material on the downstream slope at the left end of the dam.

3. There were gaps between sections of the outlet pipe. Motar had been placed only in the bottom third of these joints.

4. There was some brush and small trees growing on the embankment.

5. There were some displaced stones on the laid up stone portion of the dam.

6. The outlet channel from the spillway ran along the toe of the dam.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The only operating procedures for this structure involve the removal and replacement of stop logs in the drop inlet structure. Three stop logs each about (2 inch by 12 inch) are removed in October to lower the water surface during the winter months. In April, after the ice has gone out of the pond, the stop logs are replaced. When these stop logs are in place, the normal water level in the pond is ab out 1/2 foot below the crest of the drop inlet structure.

4.2 MAINTENANCE OF DAM

There are no formal maintenance procedures for this structure. Mr. Ulrichs of the Genegantslet Lake Association reported that brush and weeds are cleared annually.

4.3 WARNING SYSTEM IN EFFECT

No apparent warning system for evacuation of downstream residents is present.

4.4 EVALUATION

The operation procedures on this dam are generally satisfactory. The deficiencies noted on the structure are evidence of the need for additional maintenance efforts.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

Delineation of the watershed draining into the reservoir pool area was made using the 7 1/2 minute USGS quadrangle sheet for Pitcher, New York. The 5.04 square mile drainage area consists of wooded lands and open fields. Hilltops at the boundary of the drainage area range from elevation 1660 to elevation 1840. Relief within the drainage area is moderate to steep with steeper slopes in the eastern portion.

5.2 ANALYSIS CRITERIA

The analysis of the floodwater retarding capability of this dam was performed using the Crops of Engineers HEC-1 computer program, Dam Safety version. This program uses the Snyder Synthetic Unit hydrograph method and the "Modified Puls" flood routing procedure. The spillway design flood selected for analysis was the Probable Maximum Flood (PMF) in accordance with the recommended guidelines for the U.S. Army Corps of Engineers.

5.3 SPILLWAY CAPACITY

The spillway consists of a drop inlet structure with 48 inch pipes going into and out of it. Wood stop logs in the center of the drop inlet structure provide some control over the level of the lake.

The spillway capacity was calculated assuming that all of the stop logs were in place. The elevation of the stop log crest was thus the same as the upstream riser crest. The crest of the remainder of the riser was two feet higher and was assumed to be equal to the top of dam elevation. The total spillway capacity for a water surface at the top of the dam was 55 cfs.

5.4 RESERVOIR CAPACITY

Normal storage capacity of the reservoir with the water surface at the spillway crest and the top of the dam is an additional 219 acre feet which is equivalent to a direct runoff depth of 0.81 inches over the drainage area.

5.5 FLOODS OF RECORD

There was no data concerning the occurence of the maximum known flood. It was stated in the Engineer's report, prepared for the 1965 modifications, that three feet of water flowed over the dam during a flood in the mid-thirties.

5.6 OVERTOPPING POTENTIAL

Analyses using the PMF and one half the PMF indicates that the dam does not have sufficient spillway capacity. The inflow from the PMF is 11741 cfs and the outflow is 11449 cfs. The dam would be overtopped to a computed depth of 5.91 feet for this storm event. For the peak outflow of one-half the PMF (5612 cfs), the depth of overtopping would be 3.63 feet. All storms exceeding 5% of the PMF will result in the dam being overtopped. It was apparent from the visual inspection that the dam is overtopped frequently.

5.7 EVALUATION

Using the Corps of Engineer's screening criteria for initial review of spillway adequacy, it has been determined that the dam would be overtopped by all storms exceeding 5% of the PMF. While the dam has withstood overtopping in the past, the fact that the structure is composed of earth fill and laid up stone makes overtopping undesireable. The very limited spillway capacity results in frequent overtopping and it cannot be assumed that this will not eventually cause the failure of the dam. Since a failure would increase the hazard to downstream residents over that which would exist just prior to the failure, the spillway capacity is adjudged to be seriously inadequate.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Visual observations revealed that there were several deficiencies on this structure which could affect the stability. Seepage through the dam at the right end and in the laid up stone portion was the most serious deficiency. Erosion of the embankment material on the downstream slope near the outlet to the spillway conduit was also noted. It appears that this erosion was caused by flow over the top of the dam. The outlet channel from the spillway flows along the toe of the embankment creating a potential stability problem.

b. Stability Evaluation

This structure is composed of earth fill and laid up stone The earth completely covers the laid up stone at both ends of the dam, but in the center, the stone is exposed on the downstream face.

Due to the nature of the composition of this structure, a stability analysis was not considered to be feasible.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase 1 inspection of the Genegantslet Lake Dam revealed that the spillway capacity is seriously inadequate and outflows from all storms exceeding 5% of the Probable Maximum Flood would overtop the dam. While the dam has withstood overtopping in the past, this regarded as undesirable. Failure of the dam would increase the hazard to downstream residents. Therefore, this is assessed as unsafe, non-emergency.

In addition to the spillway inadequacy, other deficiencies were noted which affect the safety of the structure. The most serious of these was seepage through the dam exiting along a substantial portion of the downstream toe. There was also some erosion, probably caused by flow over the top of the dam.

b. Adequacy of Information

The information available for the preparation of this report was somewhat limited. Plans for the 1965 modifications were used, but some of the dimensions shown on these plans did not agree with measurements made at the time of the inspection.

c. Need for Additional Investigations

Since the spillway has been assessed as seriously inadequate, additional hydrologic/hydraulic investigations are required to more accurately determine the site specific characteristics of the watershed. Analysis will then be required to determine how to provide the additional spillway capacity needed.

Investigation into the seepage is also required. A method of either eliminating or controling the seepage should be devised.

d. Urgency

The additional hydrologic and hydraulic investigations which are needed should be commenced within 3 months of the date of notification of the owner. Investigation into the seepage problem should also be commenced within 3 months.

Mitigating measures deemed necessary as a result of the investigation should be completed within 18 months of the date of notification. Other deficiencies should be corrected within 12 months.

7.2 RECOMMENDED MEASURES

a. After the hydrologic/hydraulic investigation has been completed, mitigating measures dealing with the seriously inadequate spillway should be undertaken.

b. After the investigation into the seepage problem has been completed, appropriate remedial actions should be taken.

c. The eroded area on the downstream slope at the left end of the dam should be refilled with compacted embankment material.

d. Gaps between sections of the outlet pipe should be filled with mortar.

e. The outlet channel from the spillway conduit should either be relocated away from the toe of the dam or lined with riprap to better protect the downstream toe.

f. Displaced stones on the laid up stone portion of the dam should be replaced.

g. Brush and small trees growing on the embankment should be cut.

h. An emergency action plan for the notification of downstream residents should be developed and implemented.

APPENDIX A

PHOTOGRAPHS

Crest of embankment

View Looking Along Crest; Exposed Laid-up Stone on Downstream Face

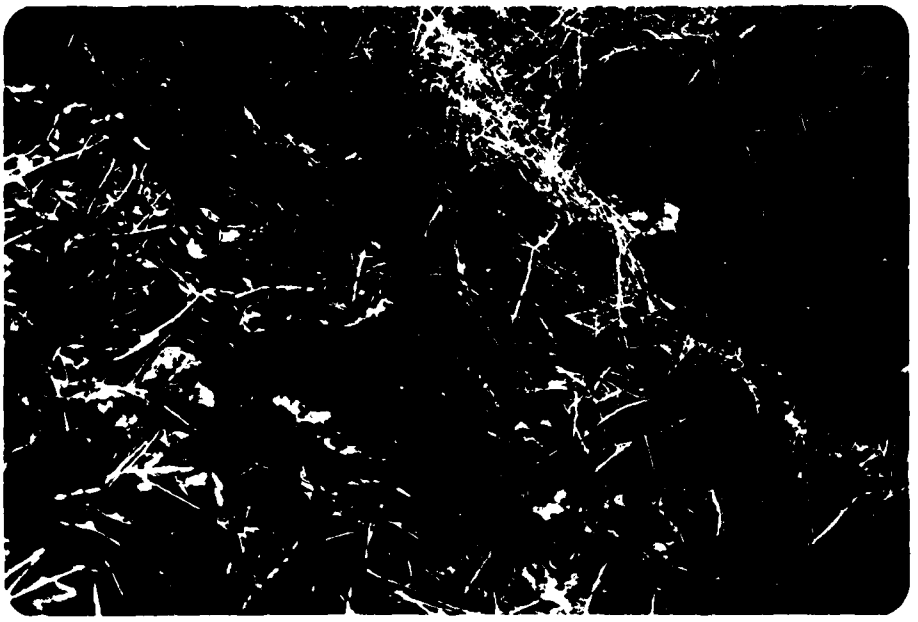
Laid up Stone Exposed on Downstream Face

Laid up Stone Exposed on Downstream Face

Erosion Adjacent to Wingwall on
Spillway Conduit

Channel Leading From Spillway Conduit;
Flowing along Downstream Toe

Seeo



Seepage Emerging on Downstream Face Near
Right End of Structure

APPENDIX B

VISUAL INSPECTION CHECKLIST

93-15-3(9/80)

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam GENEGANTSLET DAM

Fed. I.D. # 846 DEC Dam No. 94D-3437

River Basin SUSQUEHANNA

Location: Town McDONOUGH County CHENANGO

Stream Name UNNAMED

Tributary of GENEGANTSLET CREEK

Latitude (N) 42° 31.5' Longitude (W) 75° 46.3'

Type of Dam EARTH & LAID UP STONE

Hazard Category C

Date(s) of Inspection 10/22/80

Weather Conditions 45° OVERCAST

Reservoir Level at Time of Inspection 2.45' BELOW TOP OF DROP INLET

b. Inspection Personnel R. WARRENDER W. LYNICK

c. Persons Contacted (Including Address & Phone No.)

GENEGANTSLET LAKE ASSOC.
SEC-TRES FRANK ULRICHS
127 BROAD ST. (607) 334-3789
NORWICH, N.Y.

d. History:

Date Constructed ≈ 1900 Date(s) Reconstructed 1947-1955
1965

Designer 1965- CARL CRANDAL PE

Constructed By 1947&55 LES STRONG CO.

Owner GENEGANTSLET LAKE ASSOCIATION

93-15-3(9/80)

2) Embankment

a. Characteristics

(1) Embankment Material VARIABLE - EARTH & ROCK

(2) Cutoff Type NONE

(3) Impervious Core NONE

(4) Internal Drainage System NONE

(5) Miscellaneous GRASS & SMALL BRUSH COVER

b. Crest

(1) Vertical Alignment SOMEWHAT IRREGULAR - MIDDLE HALF IS LOWER THAN ENDS

(2) Horizontal Alignment CURVILINEAR

(3) Surface Cracks NONE - SOME RIVULETS WHERE MATERIAL HAS BEEN REMOVED DURING OVERTOPING

(4) Miscellaneous APPEARS TO HAVE BEEN OVERTOPPED RECENTLY - POSSIBLY SPRING OF 1980 *

c. Upstream Slope

(1) Slope (Estimate) (V:H) 1:5 OR FLATTER

(2) Undesirable Growth or Debris, Animal Burrows SOME CAT TAILS

(3) Sloughing, Subsidence or Depressions NO

* DISCUSSION WITH F. ULRICHS - HE SAID THAT LAST TIME DAM WAS OVERTOPPED WAS POSSIBLY FALL OF 1978

(4) Slope Protection VERY SMALL STONE ON SLOPE

(5) Surface Cracks or Movement at Toe NONE

d. Downstream Slope

(1) Slope (Estimate - V:H) VARIES 1:2 ON RIGHT END TO 1:5 OR FLATTER ON LEFT

(2) Undesirable Growth or Debris, Animal Burrows BRUSH & SAPLINGS SPARSE GRASS - MORE LIKE WEEDS & MOSS

(3) Sloughing, Subsidence or Depressions ERODED AREAS NEAR RCP OUTLET AT LEFT END - PROBABLY CAUSED BY OVERTOPPING.

(4) Surface Cracks or Movement at Toe NONE

(5) Seepage ENTIRE RIGHT END NEAR & AT TOE FROM ABUTMENT TO ■ LAID UP STONE SECTION - ALSO SOME DOWNSTREAM OF MASONRY SECTION

(6) External Drainage System (Ditches, Trenches; Blanket) NONE

(7) Condition Around Outlet Structure ADDITIONAL RIP RAP NEEDED SOME SCOUR AT LEFT SIDE OF HEADWALL

(8) Seepage Beyond Toe NO - OUTLET STREAM RUNS ALONG TOE.

e. Abutments - Embankment Contact

LEFT END SATISFACTORY

(1) Erosion at Contact SOME MINOR EROSION AT RIGHT END

(2) Seepage Along Contact - RIGHT ABUTMENT - ENTIRE TOE IS WET, PONDED

3) Drainage System

a. Description of System NONE

b. Condition of System

c. Discharge from Drainage System

4) Instrumentation (Momumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.)

NONE

5) Reservoir

a. Slopes WOODED TO EDGE OF LAKE

b. Sedimentation NOT NOTICIBLE

c. Unusual Conditions Which Affect Dam

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) 1 HOUSE 750' DOWNSTREAM OF DAM - HOME ON STREAM BANK - 1 TRAILER & 6 HOUSES JUST UPSTREAM OF STATE RTE 220

b. Seepage, Unusual Growth

c. Evidence of Movement Beyond Toe of Dam NONE

d. Condition of Downstream Channel BEYOND POINT WHERE IT TURNS AWAY FROM DAM IT IS OKAY

7) Spillway(s) (Including Discharge Conveyance Channel)

SUBMERGED RESERVOIR INLET - LEADING TO DROP INLET WITH STOP LOGS 4' RCP CONDUIT

a. General SATISFACTORY CONDITION - DROP INLET OPENINGS ARE FULLY PROTECTED WITH TRASH RACKS
CONDUIT WENT FROM D.I. TO A MANHOLE ABOUT 30', THEN WENT 120' TO OUTLET. THERE WAS SLIGHT BEND IN PIPE AT ABOUT 60' FROM MANHOLE

b. Condition of Service Spillway CONDUIT JOINTS ARE SEVERAL INCHES WIDE - (SECTIONS NOT FIT TOGETHER TIGHTLY) THERE WAS NO MORTAR IN THE JOINTS IN THE UPPER PORTION - ONLY THE BOTTOM 1/3 HAD BEEN MORTARED. THERE WAS SEEPAGE INTO PIPE ON SEAMS 9 & 10 FROM MANHOLE INTO CONDUIT

c. Condition of Auxiliary Spillway NONE

d. Condition of Discharge Conveyance Channel RAN ALONG DOWNSTREAM TOE OF DAM - RIPRAPPED NEAR OUTLET PIPE ALTHOUGH MORE RIPRAP WAS NEEDED
BECOMES NATURAL CHANNEL 20' BOTTOM WIDTH W/ 1:3 SS DEPTH 4' ROCK/BOULDER INVERT

8) Reservoir Drain/Outlet

Type: Pipe √ Conduit _____ Other _____

Material: Concrete √ Metal _____ Other _____

Size: 48" Length _____

Invert Elevations: Entrance 90.3 Exit 90

Physical Condition (Describe): Unobservable √

Material: _____

Joints: _____ Alignment _____

Structural Integrity: _____

Hydraulic Capability: GOOD FOR A DRAIN

Means of Control: Gate _____ Valve _____ ~~Uncontrolled~~ STOP LOGS √

Operation: Operable √ Inoperable _____ Other _____

Present Condition (Describe): SATISFACTORY - THIS CAN BE USED AS RES. DRAIN BY REMOVING ALL STOP LOGS

9) Structural

a. Concrete Surfaces SATISFACTORY - ONLY CONCRETE ON D.I. & HEADWALL

MASONRY - (CENTER SECTION) - SOME STONE DISPLACED - VEGETATION GROWING THROUGH

b. Structural Cracking NONE

c. Movement - Horizontal & Vertical Alignment (Settlement) NONE

d. Junctions with Abutments or Embankments N/A

e. Drains - Foundation, Joint, Face NONE

f. Water Passages, Conduits, Sluices SATISFACTORY

g. Seepage or Leakage SOME SEEPAGE THROUGH LAID UP STONE SEGMENT

h. Joints - Construction, etc. N/A

i. Foundation N/A

j. Abutments N/A

k. Control Gates N/A

l. Approach & Outlet Channels N/A

m. Energy Dissipators (Plunge Pool, etc.) RIPRAP AT PLUNGE POOL OKAY BUT COULD USE MORE - COULD USE MORE ROCK ALONG ENTIRE TOE OF DAM

n. Intake Structures SATISFACTORY

o. Stability

p. Miscellaneous

APPENDIX C

HYDROLOGIC/HYDRAULIC ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	101.3	114	1969
2) Design High Water (Max. Design Pool)			
3) Auxiliary Spillway Crest			
4) Pool Level with Flashboards			
5) Service Spillway Crest	99.3	105	1750

DISCHARGES

	Volume (cfs)
1) Average Daily	UNKNOWN
2) Spillway @ Maximum High Water	55
3) Spillway @ Design High Water	N/A
4) Spillway @ Auxiliary Spillway Crest Elevation	N/A
5) Low Level Outlet	N/A
6) Total (of all facilities) @ Maximum High Water	55
7) Maximum Known Flood	UNKNOWN
8) At Time of Inspection	

CREST: ELEVATION: 101.3

Type: EARTH & LAID UP STONE

Width: 35' Length: 300'

Spillover NONE

Location

SPILLWAY:

SERVICE		AUXILIARY
99.3	Elevation	
DROP INLET	Type	
6ft x 6ft	Width	
	Type of Control	
✓	Uncontrolled	
	Controlled:	
	Type (Flashboards; gate)	
	Number	
	Size/Length	
	Invert Material	
	Anticipated Length of operating service	
	Chute Length	
	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	

HYDROMETEROLOGICAL GAGES:

Type : NONE

Location: _____

Records:

Date - NONE

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

_____

Method of Controlled Releases (mechanisms):

REMOVE STOP LOGS DOWN TO BOTTOM OF RISER STRUCTURE

DRAINAGE AREA: 5.04 Sq. mi.

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: FOREST & FIELD

Terrain - Relief: ROLLING HILLS

Surface - Soil: GLACIAL TILL

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

NONE

Potential Sedimentation problem areas (natural or man-made; present or future)

NONE

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

Location: _____

Elevation: _____

Reservoir:

Length @ Maximum Pool _____ (Miles)

Length of Shoreline (@ Spillway Crest) _____ (Miles)

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

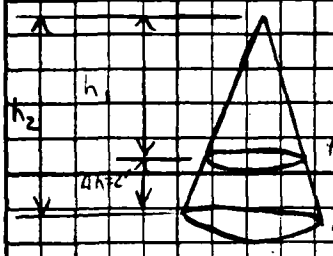
PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
GENEGANTSLET LAKE DAM	1		
SUBJECT		**COMPUTED BY**	**DATE**
HYDROLOGIC / HYDRAULIC COMPUTATIONS		RLW	12/8/80

DRAINAGE AREA - PLANIMETER FROM PITCHER N.Y. QUAD

$35.12\ in^2\ (91.83\ Ac/in^2) = 3225\ Ac = 5.04\ Sq.\ Mi.$

SURFACE AREA - PLANIMETERED = 105 ACRES



$A_1 = \pi R^2 \Rightarrow R = \sqrt{\frac{A}{\pi}} = \sqrt{\frac{105(43560)}{\pi}} = 1207$

$V_1 = \frac{\pi R^2}{3} h = \frac{(105)}{3}(50) = 1750\ Ac\text{-}Ft$

$H/V = \frac{1207}{50} = 24\ Ft/Ft$

$R_2 = 1207 + 2(24) = 1255$

$A_2 = \pi R^2 = \pi (1255)^2 = 113.6\ Acres$

$V_2 = \frac{A}{3} h = \frac{113.6}{3}(52) = 1969\ Ac\text{-}Ft$

SNYDER SYNTHETIC UNIT HYDROGRAPH

$L = 3.45\ mi$ $\quad L_{CA} = 1.1\ mi$ $\quad C_T \rightarrow$ USE 2.0

$t_p = C_T (L \cdot L_{CA})^{.3} = 2.0\,[(3.45)(1.1)]^{.3} = 2.98\ Hours$

$t_r = \frac{2.98}{5.5} = .54$ $\quad$ USE $\frac{1}{2}$ HOUR

$t_{pR} = t_p + .25(t_r - t_r) = 2.98 + .25(.5 - .54) = 2.97$

$TRSPC = T.F. = 1 - \frac{.3005}{(5.04)^{.3718}} = .774$

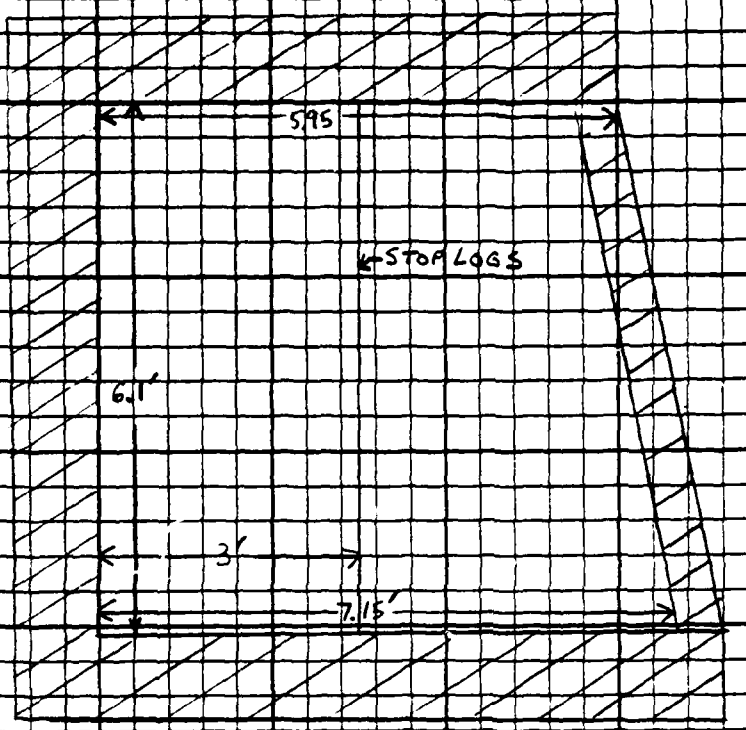
00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
GENEGANTSLET LAKE DAM	2		
SUBJECT		**COMPUTED BY**	**DATE**
HYDROLOGIC / HYDRAULIC COMPUTATIONS		RLW	12/9/80

COMPUTED SPILLWAY CAPACITY



ELEVATIONS - USING PLAN DATUM

TOP OF DAM & TOP OF RISER 101.3

LOWER CREST OF RISER & TOP OF STOP LOGS 99.3

THREE FLOW CONDITIONS

1. FLOW OVER STOP LOGS
2. FLOW OVER BACK PORTION OF INTAKE STRUCTURE
3. FLOW THROUGH OUTLET PIPE

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
GENEGANSLET LAKE DAM	3		
SUBJECT		**COMPUTED BY**	**DATE**
HYDRAULIC COMPUTATIONS		RLW	12/9/80

1. FLOW OVER STOP LOGS ASSUME SHARP CREST-ED WEIR C=3.2

$Q = CLH^{3/2} = (3.2)(6.1)(H)^{3/2}$

W.S. ELEV.	H	Q
99.3	0	—
99.7	.4	4.9 cfs
100	.7	11
100.5	1.2	26
101	1.7	43
101.3	2	55
102	2.7	87
103	3.7	139

2. FLOW OVER BACK PORTION OF INTAKE STRUCTURE
WEIR LENGTH $L = 3 + 3 + 6.1 = 12.1'$

$Q = CLH^{3/2} = 3.1(12.1)(H)^{3/2}$ ASSUME SHARP CREST-ED WEIR C=3.1

W.S. ELEV.	H	Q
101.3	0	—
102	0.7	22 cfs
103	1.7	83

ASSUME FULL CONDUIT FLOW FOR DROP INLET RISER
ASSUME INVERT OF OUTLET = 98

3. FLOW THROUGH OUTLET PIPE - 48" PIPE
$A = \pi r^2 = \pi(2)^2 = 12.57 ft^2$

$Q = A\sqrt{\frac{2gH}{1+K_e+K_b+K_pL}} = 12.57\sqrt{\frac{2(32.2)H}{1+.5+.45+(.0065)(148)}} =$

W.S. ELEV	H	Q
99.3	7.3	159 cfs
99.7	7.7	164
100	8	167
100.5	8.5	172
101	9	177
101.3	9.3	180
102	10	187
103	11	196
104	12	204
105	13	213

107 15 229

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
GENEGANTSLET LAKE DAM	4		
SUBJECT		**COMPUTED BY**	**DATE**
HYDRAULIC COMPUTATIONS		RLW	12/9/80

STAGE - DISCHARGE TABLE

STAGE	DISCHARGE
99.3	0 cfs
99.7	4.9
100	11
100.5	26
101	43
101.3	55
102	109
103	196 ← PIPE FLOW CONTROLS
104	204
105	213
107	229

FOR FLOW OVER TOP OF DAM ASSUME WEIR FLOW

$Q = C L H^{3/2}$

ASSUME BROAD CRESTED WEIR $C = 2.6$

CREST WIDTH = 35

KING & BRATER (SEE APPENDIX D) TABLE 5-3 p. 5-46

```
**********                                                    **********
FLOOD HYDROGRAPH PACKAGE (HEC-1)                              NEW YORK STATE
DAM SAFETY VERSION      JULY 1978                             DEPT OF ENVIRONMENTAL CONSERVATION
  LAST MODIFICATION  26 FEB 79                                FLOOD PROTECTION BUREAU
  MODIFIED FOR HONEYWELL APR 79
**********                                                    **********
```

1	A1	GENEGANTSLET LAKE DAM										
2	A2	PMF WITH RATIOS										
3	A3	OVERTOPPING ANALYSIS										
4	B	200	0	30	0	0	0	0	2	0	0	
5	B1	5										
6	J	1	3	1								
7	J1	.05	.5	1.0								
8	K	0	1					1				
9	K1	INFLOW HYDROGRAPH										
10	H	1	1	5.04	0	5.04	1			1		
11	P	0	20.5	111	123	132	142					
12	T							1	.1			
13	W	2.97	.625									
14	X	10	10	1								
15	K	1	1					1				
16	K1	ROUTED HYDROGRAPH										
17	Y				1	1						
18	Y1	1						-99.3	-1			
19	Y4	99.3	99.7	100	100.5	101	101.3	102	103	104	107	
20	Y5	0	5	11	26	43	55	109	196	204	229	
21	$S	0	1750	1969								
22	$E	90.3	99.3	101.3								
23	$I	99.3										
24	$D	101.3	2.6	1.5	300							
25	K	99										
26	A											
27	A											
28	A											
29	A											
30	A											

****
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79
MODIFIED FOR HONEYWELL APR 79
****

****
NEW YORK STATE
DEPT OF ENVIRONMENTAL CONSERVATION
FLOOD PROTECTION BUREAU
****

RUN DATE 05/11/81

CENECA TSLET LAKE DAM
PMF WITH RATIOS
OVERTOPPING ANALYSIS

JOB SPECIFICATION

NC	NHR	NMIN	IDAY	IHR	ISIN	METRC	IPLT	IPRT	NSTAN
200	0	30	0	0	0	0	2	0	0

JOPER	NRT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 3 LRTIO= 1
RTIOS= 0.05 0.50 1.00

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	5.04	0.	5.04	1.00	0.	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.	20.50	111.00	123.00	132.00	142.00	0.	0.

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.	0.	1.00	0.	0.	1.00	1.00	0.10	0.	0.

UNIT HYDROGRAPH DATA
TP= 2.97 CP=0.63 NTA= 0

RECESSION DATA
STRTQ= 10.00 QRCSN= 10.00 RTIOR= 1.00
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 6.73 AND R= 5.36 INTERVALS

UNIT HYDROGRAPH 32 END-OF-PERIOD ORDINATES, LAG= 2.95 HOURS, CP= 0.63 VOL= 1.00

45.	104.	225.	495.	627.	697.	680.	592.	491.	407.
338.	290.	232.	192.	161.	132.	110.	91.	75.	63.
52.	43.	36.	30.	25.	20.	17.	14.	12.	10.
8.	7.								

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	0.30	1	0.00	0.	0.00	10.	1.03	2.30	101	0.	0.	0.	1092.
1.01	1.00	2	0.00	0.	0.00	10.	1.03	3.00	102	0.	0.	0.	912.
1.01	1.30	3	0.00	0.	0.00	10.	1.03	3.30	103	0.	0.	0.	758.

1.01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1.01	3.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.03	3.00	166	0.	0.	425.
1.01	3.30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.03	3.30	167	0.	0.	347.
1.01	4.00	5	0.03	0.	0.00	10.	1.03	4.00	168	0.	0.	282.
1.01	4.30	9	0.03	0.	0.00	10.	1.03	4.30	169	0.	0.	227.
1.01	5.00	10	0.02	0.	0.02	10.	1.03	5.00	170	0.	0.	181.
1.01	5.30	11	0.01	0.	0.01	10.	1.03	5.30	171	0.	0.	140.
1.01	6.00	12	0.00	0.	0.00	10.	1.03	6.00	172	0.	0.	82.
1.01	6.30	13	0.02	0.	0.02	10.	1.03	6.30	173	0.	0.	62.
1.01	7.00	14	0.02	0.	0.02	10.	1.03	7.00	174	0.	0.	44.
1.01	7.30	15	0.02	0.	0.02	10.	1.03	7.30	175	0.	0.	32.
1.01	8.00	16	0.02	0.	0.02	10.	1.03	8.00	176	0.	0.	21.
1.01	8.30	17	0.02	0.	0.02	10.	1.03	8.30	177	0.	0.	19.
1.01	9.00	18	0.02	0.	0.02	10.	1.03	9.00	178	0.	0.	17.
1.01	9.30	19	0.02	0.	0.02	10.	1.03	9.30	179	0.	0.	16.
1.01	10.00	20	0.02	0.	0.02	10.	1.03	10.00	180	0.	0.	15.
1.01	10.30	21	0.02	0.	0.02	10.	1.03	10.30	181	0.	0.	14.
1.01	11.00	22	0.02	0.	0.02	10.	1.03	11.00	182	0.	0.	13.
1.01	11.30	23	0.02	0.	0.02	10.	1.03	11.30	183	0.	0.	12.
1.01	12.00	24	0.02	0.	0.02	10.	1.03	12.00	184	0.	0.	12.
1.01	12.30	25	0.09	0.	0.09	10.	1.03	12.30	185	0.	0.	11.
1.01	13.00	26	0.09	0.	0.09	10.	1.03	13.00	186	0.	0.	11.
1.01	13.30	27	0.10	0.	0.10	10.	1.03	13.30	187	0.	0.	10.
1.01	14.00	28	0.10	0.	0.10	10.	1.03	14.00	188	0.	0.	10.
1.01	14.30	29	0.13	0.	0.13	10.	1.03	14.30	189	0.	0.	10.
1.01	15.00	30	0.13	0.	0.13	10.	1.03	15.00	190	0.	0.	10.
1.01	15.30	31	0.16	0.03	0.13	11.	1.03	15.30	191	0.	0.	10.
1.01	16.00	32	0.50	0.45	0.05	34.	1.03	16.00	192	0.	0.	10.
1.01	16.30	33	0.12	0.07	0.05	95.	1.03	16.30	193	0.	0.	10.
1.01	17.00	34	0.12	0.07	0.05	153.	1.03	17.00	194	0.	0.	10.
1.01	17.30	35	0.09	0.04	0.05	264.	1.03	17.30	195	0.	0.	10.
1.01	18.00	36	0.09	0.04	0.05	377.	1.03	18.00	196	0.	0.	10.
1.01	18.30	37	0.01	0.	0.01	441.	1.03	18.30	197	0.	0.	10.
1.01	19.00	38	0.01	0.	0.01	460.	1.03	19.00	198	0.	0.	10.
1.01	19.30	39	0.01	0.	0.01	435.	1.03	19.30	199	0.	0.	10.
1.01	20.00	40	0.01	0.	0.01	389.	1.03	20.00	200	0.	0.	10.
1.01	20.30	41	0.01	0.	0.01	339.	1.03	20.30	201	0.	0.	10.
1.01	21.00	42	0.01	0.	0.01	289.	1.03	21.00	202	0.	0.	10.
1.01	21.30	43	0.01	0.	0.01	242.	1.03	21.30	203	0.	0.	10.
1.01	22.00	44	0.01	0.	0.01	203.	1.04	0.	204	0.	0.	10.
1.01	22.30	45	0.01	0.	0.01	170.	1.04	0.30	205	0.	0.	10.
1.01	23.00	46	0.01	0.	0.01	143.	1.04	1.00	206	0.	0.	10.
1.01	23.30	47	0.01	0.	0.01	120.	1.04	1.30	207	0.	0.	10.
1.02	0.	48	0.01	0.	0.01	101.	1.04	2.00	208	0.	0.	10.
1.02	0.30	49	0.06	0.01	0.05	86.	1.04	2.30	209	0.	0.	10.
1.02	1.00	50	0.06	0.01	0.05	75.	1.04	3.00	210	0.	0.	10.
1.02	1.30	51	0.06	0.01	0.05	68.	1.04	3.30	211	0.	0.	10.
1.02	2.00	52	0.06	0.01	0.05	65.	1.04	4.00	212	0.	0.	10.
1.02	2.30	53	0.06	0.01	0.05	65.	1.04	4.30	213	0.	0.	10.
1.02	3.00	54	0.06	0.01	0.05	67.	1.04	5.00	214	0.	0.	10.
1.02	3.30	55	0.06	0.01	0.05	69.	1.04	5.30	215	0.	0.	10.
1.02	4.00	56	0.06	0.01	0.05	72.	1.04	6.00	216	0.	0.	10.
1.02	4.30	57	0.06	0.01	0.05	74.	1.04	6.30	217	0.	0.	10.
1.02	5.00	58	0.06	0.01	0.05	76.	1.04	7.00	218	0.	0.	10.
1.02	5.30	59	0.06	0.01	0.05	78.	1.04	7.30	219	0.	0.	10.
1.02	6.00	60	0.06	0.01	0.05	79.	1.04	8.00	220	0.	0.	10.
1.02	6.30	61	0.21	0.16	0.05	86.	1.04	8.30	221	0.	0.	10.
1.02	7.00	62	0.21	0.16	0.05	111.	1.04	9.00	222	0.	0.	10.
1.02	7.30	63	0.21	0.16	0.05	158.	1.04	9.30	223	0.	0.	10.
1.02	8.00	64	0.21	0.16	0.05	227.	1.04	10.00	224	0.	0.	10.
1.02	8.30	65	0.21	0.16	0.05	318.	1.04	10.30	225	0.	0.	10.
1.02	9.00	66	0.21	0.16	0.05	418.	1.04	11.00	226	0.	0.	10.
1.02	9.30	67	0.21	0.16	0.05	516.	1.04	11.30	227	0.	0.	10.
1.02	10.00	68	0.21	0.16	0.05	602.	1.04	12.00	228	0.	0.	10.
1.02	10.30	69	0.21	0.16	0.05	673.	1.04	12.30	229	0.	0.	10.

1.02	12.00	72	0.21	0.10	0.05	921.	1.04	12.00	172	0.	0.	0.	10.
1.02	12.30	73	1.11	1.09	0.05	957.	1.04	12.30	173	0.	0.	0.	10.
1.02	13.00	74	1.11	1.09	0.05	1.[illegible]	1.04	13.00	174	0.	0.	0.	10.
1.02	13.30	75	1.37	1.32	0.05	1414.	1.04	13.30	175	0.	0.	0.	10.
1.02	14.00	76	1.37	1.32	0.05	1922.	1.04	14.00	176	0.	0.	0.	10.
1.02	14.30	77	1.71	1.66	0.05	2624.	1.04	14.30	177	0.	0.	0.	10.
1.02	15.00	78	1.71	1.66	0.05	3456.	1.04	15.00	178	0.	0.	0.	10.
1.02	15.30	79	2.09	2.03	0.05	4372.	1.04	15.30	179	0.	0.	0.	10.
1.02	16.00	80	6.37	6.32	0.05	5323.	1.04	16.00	180	0.	0.	0.	10.
1.02	16.30	81	1.54	1.54	0.05	6253.	1.04	16.30	181	0.	0.	0.	10.
1.02	17.00	82	1.53	1.54	0.05	7077.	1.04	17.00	182	0.	0.	0.	10.
1.02	17.30	83	1.25	1.20	0.05	10463.	1.04	19.30	183	0.	0.	0.	10.
1.02	18.00	84	1.25	1.20	0.05	11170.	1.04	20.00	184	0.	0.	0.	10.
1.02	18.30	85	0.09	0.04	0.05	11741.	1.04	20.30	185	0.	0.	0.	10.
1.02	19.00	86	0.09	0.04	0.05	11574.	1.04	21.00	186	0.	0.	0.	10.
1.02	19.30	87	0.09	0.04	0.05	11759.	1.04	21.30	187	0.	0.	0.	10.
1.02	20.00	88	0.09	0.04	0.05	9622.	1.04	22.00	188	0.	0.	0.	10.
1.02	20.30	89	0.09	0.04	0.05	8391.	1.04	22.30	189	0.	0.	0.	10.
1.02	21.00	90	0.09	0.04	0.05	7156.	1.04	23.00	190	0.	0.	0.	10.
1.02	21.30	91	0.09	0.04	0.05	6017.	1.04	23.30	191	0.	0.	0.	10.
1.02	22.00	92	0.09	0.04	0.05	5036.	1.05	0.	192	0.	0.	0.	10.
1.02	22.30	93	0.09	0.04	0.05	4226.	1.05	0.30	193	0.	0.	0.	10.
1.02	23.00	94	0.09	0.04	0.05	3552.	1.05	1.00	194	0.	0.	0.	10.
1.02	23.30	95	0.09	0.04	0.05	2993.	1.05	1.30	195	0.	0.	0.	10.
1.03	0.	96	0.09	0.04	0.05	2530.	1.05	2.00	196	0.	0.	0.	10.
1.03	0.30	97	0.	0.	0.	2144.	1.05	2.30	197	0.	0.	0.	10.
1.03	1.00	98	0.	0.	0.	1816.	1.05	3.00	198	0.	0.	0.	10.
1.03	1.30	99	0.	0.	0.	1541.	1.05	3.30	199	0.	0.	0.	10.
1.03	2.00	100	0.	0.	0.	1301.	1.05	4.00	200	0.	0.	0.	10.
									SUM	29.11	25.36	3.75	166089.
										(739.)	(644.)	(95.)	(4703.12)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	11741.	8947.	3315.	1150.	166083.
CMS	332.	253.	94.	33.	4703.
INCHES		16.51	24.48	25.46	25.54
MM		419.45	621.70	646.69	648.94
AC-FT		4437.	6576.	6640.	6683.
THOUS CU M		5473.	8111.	8437.	8465.

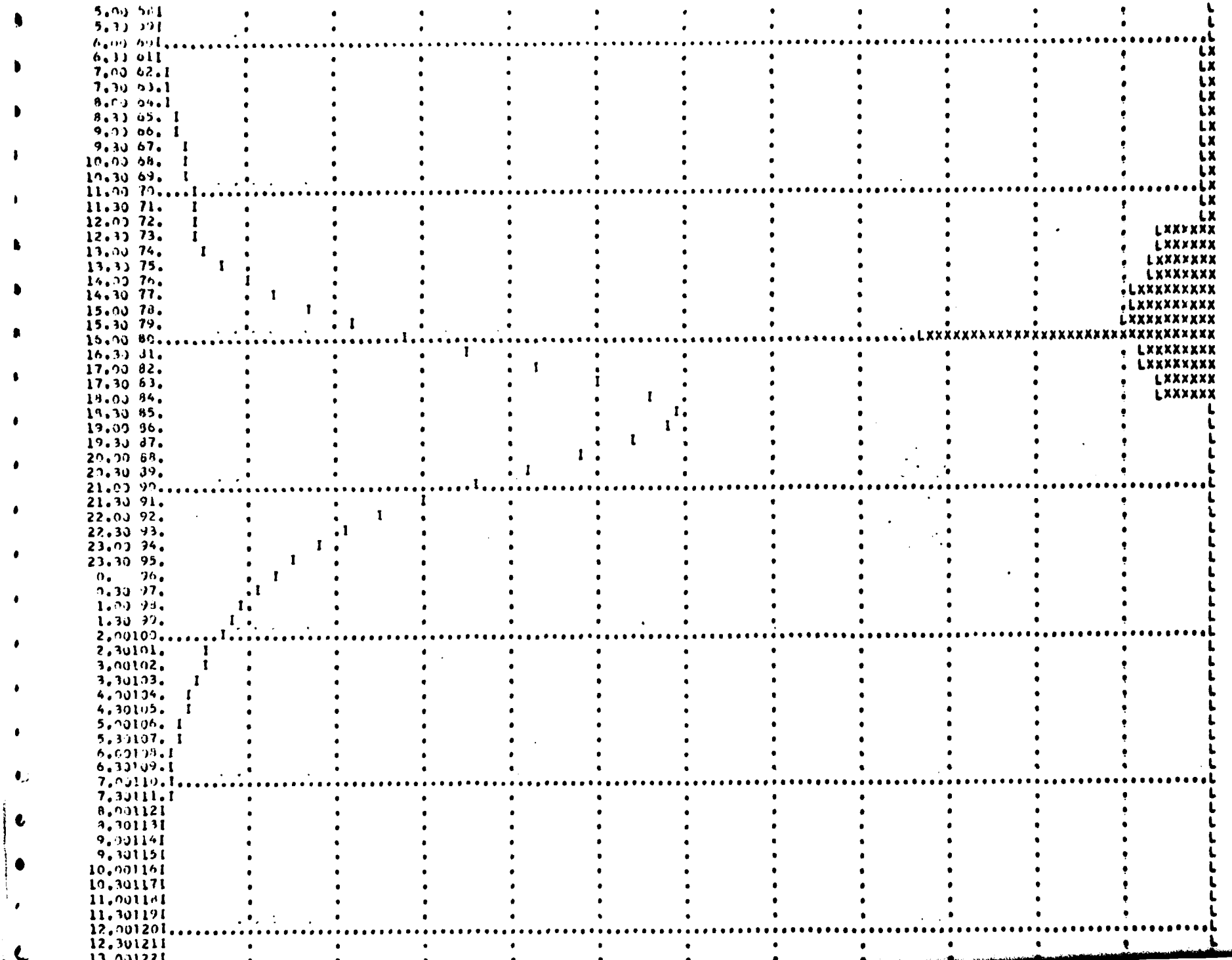
DIVE

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

PRECIP(L) AND EXCESS(X)

	0.	2000.	4000.	6000.	8000.	10000.	12000.	0.	0.	0.	0.	0.	0.
	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	4.	2.	0.
0.30	1I												L
1.00	2I												L
1.30	3I												L
2.00	4I												L
2.30	5I												L
3.00	6I												L
3.30	7I												L
4.00	8I												L
4.30	9I												L
5.00	10I												L
5.30	11I												L
6.00	12I												L
6.30	13I												L
7.00	14I												L
7.30	15I												L
8.00	16I												L
8.30	17I												L
9.00	18I												L
9.30	19I												L
10.00	20I												L
10.30	21I												L
11.00	22I												L
11.30	23I												L
12.00	24I												L
12.30	25I												L
13.00	26I												L
13.30	27I												LX
14.00	28I												LX
14.30	29I												LX
15.00	30I												LX
15.30	31I												LX
16.00	32I												LXX
16.30	33I												LX
17.00	34.I												LX
17.30	35.I												O
18.00	36. I												L
18.30	37. I												O
19.00	38. I												L
19.30	39. I												O
20.00	40..I												L
20.30	41. I												O
21.00	42.I												L
21.30	43.I												O
22.00	44.I												L
22.30	45.I												O
23.00	46.I												L
23.30	47.I												O
0.	48.I												L
0.30	49I												L
1.00	50I												L
1.30	51I												L
2.00	52I												L
2.30	53I												L
3.00	54I												L
3.30	55I												L
4.00	56I												L
4.30	57I												L



0/N

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	2.	5.	9.	14.	19.	22.	23.	22.	19.
17.	14.	12.	10.	[illegible]	7.	6.	5.	4.	4.
3.	3.	3.	3.	[illegible]	4.	4.	4.	4.	4.
4.	6.	9.	11.	15.	21.	26.	30.	34.	37.
39.	41.	45.	54.	71.	97.	131.	173.	219.	276.
357.	429.	503.	560.	587.	579.	538.	481.	420.	356.
331.	252.	211.	176.	150.	127.	107.	91.	77.	65.
55.	46.	38.	31.	26.	21.	17.	14.	11.	9.
7.	4.	3.	2.	2.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	587.	447.	166.	57.	8304.
CMS	17.	13.	5.	2.	235.
INCHES		0.83	1.22	1.27	1.28
MM		20.97	31.08	32.33	32.44
AC-FT		222.	329.	342.	343.
THOUS CU M		274.	406.	422.	423.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
6.	17.	48.	91.	142.	188.	220.	230.	218.	195.
170.	144.	121.	101.	65.	71.	60.	51.	43.	38.
34.	32.	32.	33.	35.	36.	37.	38.	39.	39.
43.	55.	79.	114.	159.	209.	258.	301.	336.	366.
390.	411.	448.	539.	707.	966.	1312.	1728.	2186.	2762.
3497.	4248.	5031.	5595.	5671.	5767.	5379.	4811.	4196.	3579.
3009.	2519.	2113.	1776.	1497.	1265.	1072.	909.	770.	650.
546.	456.	379.	315.	259.	213.	174.	141.	113.	90.
70.	41.	31.	22.	16.	11.	10.	9.	8.	7.
7.	6.	6.	6.	6.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5871.	4474.	1658.	575.	83041.
CMS	166.	127.	47.	16.	2351.
INCHES		8.26	12.24	12.73	12.77
MM		209.73	310.85	323.35	324.42
AC-FT		2218.	3288.	3420.	3431.
THOUS CU M		2736.	4056.	4219.	4233.

HYDROGRAPH AT STA   FOR PLAN 1, RTIO 3

10.	10.	10.	10.	10.	10.	10.	10.	10.	10.
10.	10.	10.	10.	10.	10.	10.	10.	10.	10.
10.	10.	10.	10.	10.	10.	10.	10.	10.	10.
11.	34.	95.	163.	265.	377.	441.	460.	435.	389.
339.	239.	242.	203.	170.	143.	120.	101.	86.	75.
69.	65.	63.	67.	69.	72.	74.	74.	78.	79.
86.	111.	156.	227.	313.	410.	516.	602.	673.	732.
780.	821.	987.	1177.	1419.	1932.	2624.	3456.	4377.	5523.
6993.	9577.	10683.	11192.	11741.	11574.	10759.	9627.	8391.	7156.
6017.	5037.	4226.	3552.	2993.	2530.	2144.	1819.	1541.	1301.
1092.	912.	758.	630.	513.	425.	347.	282.	227.	181.
140.	82.	62.	44.	32.	21.	19.	17.	16.	15.
14.	13.	12.	12.	11.	11.	10.	10.	10.	10.
10.	10.	10.	10.	10.	10.	10.	10.	10.	10.
10.	10.	10.	10.	10.	10.	10.	10.	10.	10.
10.	10.	10.	10.	10.	10.	10.	10.	10.	10.
10.	10.	10.	10.	10.	10.	10.	10.	10.	10.
10.	10.	10.	10.	10.	10.	10.	10.	10.	10.
10.	10.	10.	10.	10.	10.	10.	10.	10.	10.
10.	10.	10.	10.	10.	10.	10.	10.	10.	10.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	11741.	8947.	3315.	1150.	166083.
CMS	332.	253.	94.	33.	4703.
INCHES		16.51	24.46	25.46	25.54
MM		419.45	621.70	646.69	648.64
AC-FT		4437.	6576.	6840.	6863.
THOUS CU M		5473.	8111.	8437.	8465.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTED HYDROGRAPH

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP		LSTR
0.	0.	0.	1	1	0	0		0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.	0.	0.	-99.	-1

STAGE	99.30	99.70	100.00	100.50	101.00	101.30	102.00	103.00	104.00	107.00
FLOW	0.	5.00	11.00	26.00	43.00	55.00	109.00	196.00	204.00	229.00

CAPACITY=	0.	1750.	1969.
ELEVATION=	90.	99.	101.

CREL	SPWID	COQW	EXPW	ELEVL	COOL	CAREA	EXPL
99.3	0.	0.	0.	0.	0.	0.	0.

DAM DATA

TOPEL	COQD	EXPD	DAMWID
101.3	2.6	1.5	300.

STATION 1, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	2.	2.	2.	2.
2.	2.	2.	3.	3.	3.	4.	5.	6.	8.
11.	14.	19.	24.	31.	39.	45.	52.	77.	130.
172.	198.	204.	202.	191.	180.	166.	152.	138.	125.
113.	102.	92.	83.	75.	69.	63.	58.	55.	54.
54.	53.	52.	52.	51.	50.	49.	49.	47.	47.
47.	46.	45.	45.	44.	43.	43.	42.	42.	41.
41.	40.	40.	39.	39.	38.	38.	37.	37.	36.
36.	35.	35.	34.	34.	34.	33.	33.	32.	32.
32.	31.	31.	30.	30.	30.	29.	29.	29.	28.
28.	27.	27.	27.	26.	26.	26.	25.	25.	25.
25.	24.	24.	24.	24.	23.	23.	23.	23.	22.
22.	22.	22.	21.	21.	21.	21.	20.	20.	20.
20.	20.	19.	19.	19.	19.	19.	18.	18.	18.

STORAGE

1750.	1750.	1750.	1750.	1750.	1750.	1750.	1750.	1750.	1750.
1750.	1750.	1750.	1750.	1750.	1750.	1750.	1750.	1750.	1750.
1750.	1750.	1750.	1750.	1750.	1751.	1751.	1751.	1751.	1751.
1751.	1751.	1751.	1751.	1752.	1752.	1753.	1754.	1755.	1756.
1756.	1757.	1758.	1758.	1759.	1759.	1759.	1759.	1759.	1759.
1759.	1759.	1760.	1760.	1760.	1760.	1760.	1760.	1760.	1760.
1760.	1761.	1761.	1761.	1762.	1762.	1763.	1764.	1766.	1767.
1768.	1770.	1772.	1774.	1775.	1779.	1784.	1790.	1798.	1808.
1820.	1836.	1856.	1876.	1894.	1921.	1942.	1961.	1977.	1989.
1996.	2000.	2001.	2001.	2001.	1998.	1995.	1993.	1990.	1988.
1986.	1983.	1981.	1979.	1977.	1975.	1973.	1971.	1969.	1967.
1966.	1964.	1962.	1960.	1959.	1956.	1954.	1952.	1950.	1948.
1946.	1944.	1942.	1940.	1938.	1937.	1935.	1933.	1932.	1930.
1928.	1927.	1925.	1923.	1922.	1920.	1919.	1917.	1916.	1914.
1913.	1911.	1910.	1909.	1907.	1906.	1904.	1903.	1902.	1900.
1899.	1898.	1897.	1895.	1894.	1893.	1892.	1891.	1889.	1888.
1887.	1886.	1885.	1884.	1883.	1882.	1881.	1880.	1879.	1878.
1877.	1876.	1875.	1874.	1874.	1872.	1871.	1870.	1869.	1868.
1867.	1866.	1865.	1865.	1864.	1863.	1862.	1861.	1860.	1859.
1859.	1858.	1857.	1856.	1856.	1855.	1854.	1853.	1853.	1852.

STAGE

99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3
99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3
99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3
99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.4
99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4
99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4
99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.5
99.5	99.5	99.5	99.5	99.5	99.6	99.6	99.7	99.7	99.8
99.9	100.1	100.3	100.4	100.7	100.9	101.1	101.2	101.4	101.5
101.5	101.6	101.6	101.6	101.6	101.6	101.5	101.5	101.5	101.5
101.5	101.4	101.4	101.4	101.4	101.4	101.3	101.3	101.3	101.3
101.3	101.3	101.2	101.2	101.2	101.2	101.2	101.1	101.1	101.1
101.1	101.1	101.1	101.0	101.0	101.0	101.0	101.0	101.0	100.9
100.9	100.9	100.9	100.9	100.9	100.9	100.8	100.8	100.8	100.8
100.8	100.8	100.8	100.7	100.7	100.7	100.7	100.7	100.7	100.7
100.7	100.7	100.6	100.6	100.6	100.6	100.6	100.6	100.6	100.6
100.6	100.5	100.5	100.5	100.5	100.5	100.5	100.5	100.5	100.5
100.5	100.4	100.4	100.4	100.4	100.4	100.4	100.4	100.4	100.4
100.4	100.4	100.4	100.3	100.3	100.3	100.3	100.3	100.3	100.3
100.3	100.3	100.3	100.3	100.3	100.3	100.3	100.2	100.2	100.2

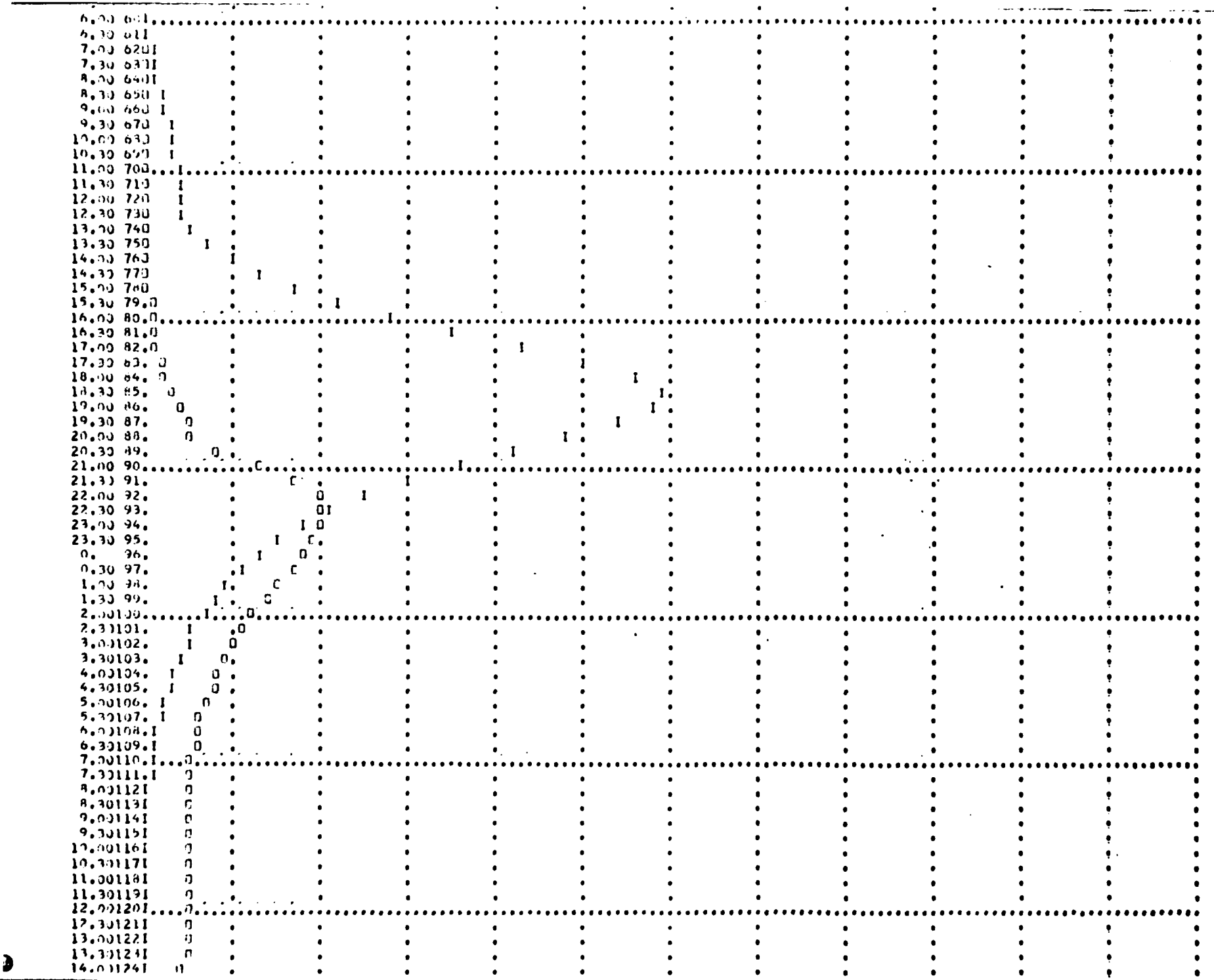
	PEAK	[illegible]	[illegible]	[illegible]	TOTAL VOLUME
CFS	2[illegible].	1[illegible].	1.	[illegible].	5[illegible].
GMS	6.	5.	2.	1.	166.
INCHES		0.3[illegible]	0.60	0.9[illegible]	0.90
MM		7.66	15.22	24.[illegible]1	22.[illegible]8
AC-FT		[illegible]1.	101.	241.	242.
THOUS CU M		100.	199.	29[illegible].	299.

OVF

SECTION 1

INFLOW(I), OUTFLOW(O) AND RESERVED FLOW(*)

	0.	100.	200.	300.	400.	500.	600.	0.	0.	0.	0.	0.	0.
0.30	1I												
1.00	2I												
1.30	3I												
2.00	4I												
2.30	5I												
3.00	6I												
3.30	7I												
4.00	8I												
4.30	9I												
5.00	10I												
5.30	11I												
6.00	12I												
6.30	13I												
7.00	14I												
7.30	15I												
8.00	16I												
8.30	17I												
9.00	18I												
9.30	19I												
10.00	20I												
10.30	21I												
11.00	22I												
11.30	23I												
12.00	24I												
12.30	25I												
13.00	26I												
13.30	27I												
14.00	28I												
14.30	29I												
15.00	30I												
15.30	31I												
16.00	32I												
16.30	33I												
17.00	340I												
17.30	350I												
18.00	360 I												
18.30	370 I												
19.00	380 I												
19.30	390 I												
20.00	400.I												
20.30	410 I												
21.00	420I												
21.30	430I												
22.00	440I												
22.30	450I												
23.00	460I												
23.30	470I												
0.	480I												
0.30	49I												
1.00	50I												
1.30	51I												
2.00	52I												
2.30	53I												
3.00	54I												
3.30	55I												
4.00	56I												
4.30	57I												
5.00	58I												



STATION 1, PLAN 1, RATIO 2

[illegible]-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	2.	2.	3.	5.	6.	7.
9.	10.	11.	12.	13.	13.	14.	14.	15.	15.
15.	16.	16.	16.	16.	16.	17.	17.	17.	17.
17.	17.	17.	19.	21.	22.	25.	29.	32.	36.
40.	45.	51.	71.	175.	340.	585.	927.	1345.	1840.
2442.	3169.	3956.	4712.	5301.	5612.	5595.	5301.	4839.	4302.
3759.	3230.	2767.	2367.	2027.	1771.	1481.	1771.	1094.	943.
812.	695.	601.	517.	446.	392.	328.	281.	241.	207.
179.	151.	128.	109.	94.	81.	72.	64.	59.	55.
54.	54.	53.	52.	52.	51.	50.	50.	49.	48.
47.	47.	46.	46.	45.	45.	44.	43.	43.	42.
42.	41.	41.	40.	40.	40.	39.	39.	38.	38.
37.	37.	37.	36.	36.	35.	35.	35.	34.	34.
34.	33.	33.	32.	32.	32.	31.	31.	31.	30.
30.	30.	29.	29.	29.	29.	28.	28.	28.	27.
27.	27.	27.	26.	26.	26.	26.	25.	25.	25.
25.	24.	24.	24.	24.	24.	23.	23.	23.	23.

STORAGE

1750.	1750.	1751.	1751.	1751.	1751.	1751.	1752.	1752.	1752.
1752.	1752.	1753.	1753.	1753.	1753.	1753.	1754.	1754.	1754.
1754.	1754.	1755.	1755.	1755.	1755.	1755.	1755.	1756.	1756.
1756.	1756.	1758.	1761.	1765.	1772.	1780.	1790.	1799.	1807.
1814.	1820.	1825.	1829.	1833.	1835.	1837.	1839.	1840.	1842.
1842.	1843.	1844.	1845.	1845.	1846.	1847.	1848.	1849.	1850.
1851.	1852.	1854.	1857.	1862.	1869.	1877.	1888.	1900.	1913.
1927.	1942.	1957.	1975.	1994.	2020.	2048.	2079.	2113.	2150.
2190.	2235.	2281.	2321.	2351.	2367.	2366.	2351.	2328.	2300.
2270.	2239.	2211.	2186.	2162.	2142.	2124.	2104.	2094.	2081.
2069.	2059.	2049.	2041.	2031.	2025.	2019.	2013.	2007.	2002.
1997.	1993.	1989.	1985.	1981.	1978.	1976.	1973.	1971.	1969.
1967.	1965.	1963.	1961.	1960.	1958.	1956.	1954.	1952.	1950.
1949.	1947.	1945.	1944.	1942.	1940.	1939.	1937.	1936.	1934.
1932.	1931.	1929.	1928.	1927.	1925.	1924.	1922.	1921.	1920.
1918.	1917.	1916.	1914.	1913.	1912.	1911.	1909.	1908.	1907.
1906.	1905.	1903.	1902.	1901.	1900.	1899.	1898.	1897.	1896.
1895.	1894.	1893.	1892.	1891.	1890.	1889.	1888.	1887.	1886.
1885.	1884.	1883.	1882.	1881.	1880.	1880.	1879.	1878.	1877.
1876.	1876.	1875.	1874.	1873.	1872.	1872.	1871.	1870.	1869.

STAGE

99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3
99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3
99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.4	99.4
99.4	99.4	99.4	99.4	99.4	99.5	99.6	99.7	99.7	99.8
99.9	99.9	100.0	100.0	100.1	100.1	100.1	100.1	100.1	100.1
100.1	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2
100.2	100.2	100.2	100.3	100.3	100.4	100.5	100.6	100.7	100.8
100.9	101.0	101.2	101.4	101.5	101.8	102.0	102.3	102.6	103.0
103.3	103.7	104.1	104.5	104.8	104.9	104.9	104.8	104.6	104.3
104.0	103.8	103.5	103.3	103.1	102.9	102.7	102.6	102.4	102.3
102.2	102.1	102.0	102.0	101.9	101.8	101.8	101.7	101.6	101.6
101.6	101.5	101.5	101.4	101.4	101.4	101.4	101.3	101.3	101.3

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
101.0	101.0	[illegible]	[illegible]	[illegible]	100.7	100.9	100.9	100.8	100.8
100.8	[illegible]	[illegible]	[illegible]	100.8	[illegible]	100.8	[illegible]	100.7	100.7
100.7	100.7	100.7	100.7	100.7	100.7	100.7	100.6	100.6	100.6
100.6	100.6	100.6	100.6	100.6	100.6	100.6	100.6	100.5	100.5
100.5	[illegible]	[illegible]	[illegible]	100.5	100.5	100.5	100.5	100.5	100.5
100.5	100.4	100.4	100.4	100.4	100.4	100.4	100.4	100.4	100.4

PEAK OUTFLOW IS 5012. AT TIME 44.00 HOURS

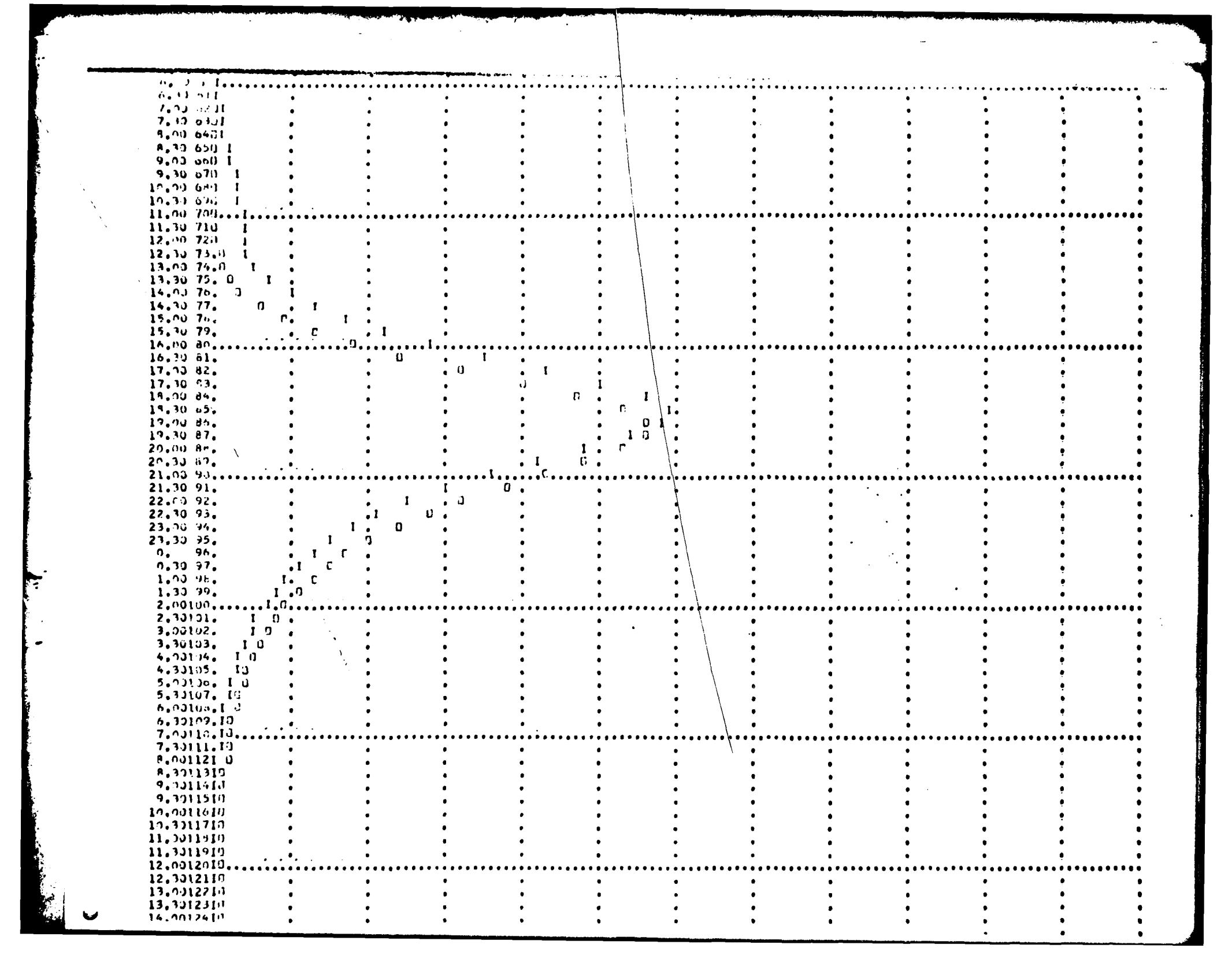
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5012.	4374.	1598.	559.	8618.
CMS	159.	124.	45.	16.	244.
INCHES		6.05	11.00	12.29	12.33
MM		204.50	299.76	312.27	313.25
AC-FT		2164.	3171.	3303.	3313.
THOUS CU M		2669.	3911.	4074.	4087.

OVF

SECTION 1

INFLOW(I), OUTFLOW(I) AND OBSERVED FLOW (*)

	C.	1000.	2000.	3000.	4000.	5000.	6000.	C.	C.	C.	C.	C.	C.
0.30	1I												
1.00	2I												
1.30	3I												
2.00	4I												
2.30	5I												
3.00	6I												
3.30	7I												
4.00	8I												
4.30	9I												
5.00	10I												
5.30	11I												
6.00	12I												
6.30	13I												
7.00	14I												
7.30	15I												
8.00	16I												
8.30	17I												
9.00	18I												
9.30	19I												
10.00	20I												
10.30	21I												
11.00	22I												
11.30	23I												
12.00	24I												
12.30	25I												
13.00	26I												
13.30	27I												
14.00	28I												
14.30	29I												
15.00	30I												
15.30	31I												
16.00	32I												
16.30	33I												
17.00	34OI												
17.30	35OI												
18.00	36O I												
18.30	37O I												
19.00	38O I												
19.30	39O I												
20.00	40O.I												
20.30	41O I												
21.00	42OI												
21.30	43OI												
22.00	44OI												
22.30	45OI												
23.00	46OI												
23.30	47OI												
0.	48OI												
0.30	49I												
1.00	50I												
1.30	51I												
2.00	52I												
2.30	53I												
3.00	54I												
3.30	55I												
4.00	56I												
4.30	57I												



OVER

STATION 1, PLOT 1, RATIO 3

PROBABLE MAXIMUM FLOOD HYDROGRAPH ESTIMATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	2.	2.	3.	5.	8.	12.	17.	21.
25.	29.	31.	34.	37.	47.	39.	37.	40.	41.
41.	41.	42.	42.	42.	43.	43.	43.	44.	45.
45.	46.	47.	49.	53.	70.	137.	233.	341.	448.
546.	632.	712.	812.	977.	1259.	1703.	2319.	3105.	4063.
5319.	6810.	8411.	9886.	10963.	11448.	11251.	10517.	9491.	8355.
7221.	6173.	5254.	4472.	3811.	3256.	2790.	2394.	2061.	1788.
1552.	1299.	1105.	943.	803.	674.	581.	494.	420.	356.
301.	251.	207.	172.	143.	120.	102.	89.	78.	70.
63.	58.	55.	54.	54.	53.	53.	52.	51.	51.
50.	49.	49.	49.	48.	47.	47.	46.	46.	45.
45.	44.	44.	43.	43.	42.	42.	41.	41.	41.
40.	40.	39.	39.	39.	39.	38.	38.	37.	37.
37.	36.	36.	36.	35.	35.	35.	34.	34.	34.
33.	33.	33.	32.	32.	32.	32.	31.	31.	31.
31.	30.	30.	30.	30.	29.	29.	29.	29.	29.
28.	28.	28.	27.	27.	27.	27.	27.	26.	26.

STORAGE

1750.	1751.	1751.	1752.	1752.	1752.	1753.	1753.	1754.	1754.
1754.	1755.	1755.	1756.	1755.	1756.	1757.	1757.	1758.	1758.
1758.	1759.	1759.	1759.	1760.	1760.	1760.	1761.	1761.	1762.
1762.	1763.	1765.	1771.	1781.	1794.	1811.	1829.	1847.	1863.
1877.	1889.	1899.	1907.	1913.	1918.	1922.	1925.	1927.	1928.
1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1939.	1940.
1942.	1944.	1948.	1953.	1963.	1975.	1990.	2006.	2020.	2032.
2044.	2052.	2060.	2069.	2084.	2107.	2140.	2182.	2232.	2288.
2352.	2423.	2494.	2555.	2593.	2617.	2609.	2580.	2539.	2492.
2442.	2394.	2349.	2309.	2273.	2241.	2213.	2187.	2165.	2144.
2124.	2106.	2084.	2061.	2069.	2057.	2047.	2036.	2030.	2022.
2015.	2008.	2002.	1996.	1991.	1987.	1983.	1980.	1978.	1975.
1973.	1971.	1969.	1967.	1965.	1964.	1962.	1961.	1959.	1957.
1956.	1954.	1952.	1951.	1949.	1948.	1946.	1945.	1943.	1942.
1940.	1939.	1938.	1936.	1935.	1933.	1932.	1931.	1930.	1928.
1927.	1926.	1925.	1923.	1922.	1921.	1920.	1919.	1918.	1917.
1915.	1914.	1913.	1912.	1911.	1910.	1909.	1908.	1907.	1906.
1905.	1904.	1903.	1902.	1901.	1900.	1900.	1899.	1898.	1897.
1896.	1895.	1894.	1894.	1893.	1892.	1891.	1890.	1890.	1889.
1888.	1887.	1887.	1886.	1885.	1885.	1884.	1883.	1882.	1882.

STAGE

99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3
99.3	99.3	99.3	99.4	99.4	99.4	99.4	99.4	99.4	99.4
99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4
99.4	99.4	99.4	99.5	99.6	99.7	99.9	100.0	100.2	100.3
100.5	100.6	100.7	100.7	100.8	100.8	100.9	100.9	100.9	100.9
100.9	101.0	101.0	101.0	101.0	101.0	101.0	101.0	101.0	101.0
101.1	101.1	101.1	101.2	101.2	101.4	101.5	101.6	101.8	101.9
102.0	102.1	102.1	102.2	102.3	102.6	102.9	103.2	103.7	104.2
104.8	105.4	106.1	106.7	107.3	107.2	107.1	106.9	106.5	106.1
105.6	105.2	104.7	104.3	104.1	103.9	103.5	103.3	103.1	102.9
102.7	102.5	102.4	102.3	102.2	102.1	102.0	101.9	101.9	101.8
101.7	101.7	101.6	101.5	101.5	101.5	101.4	101.4	101.4	101.4

101.2	[illegible]	[illegible]	[illegible]	[illegible]	101.1	[illegible]	[illegible]	[illegible]	[illegible]
101.0	[illegible]	[illegible]	[illegible]	[illegible]	101.0	101.0	101.0	100.9	100.9
100.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	100.9	100.9	[illegible]	[illegible]
100.8	[illegible]	[illegible]	100.8	100.8	100.8	100.8	100.8	100.7	100.7
100.7	100.7	100.7	100.7	100.7	100.7	100.7	100.7	100.6	100.6
100.6	100.6	100.6	100.6	100.6	100.6	100.6	100.6	100.6	100.6
100.6	[illegible]	[illegible]	[illegible]	[illegible]	100.5	100.5	100.5	100.5	100.5

PEAK OUTFLOW IS 11449. AT TIME 43.00 HOURS

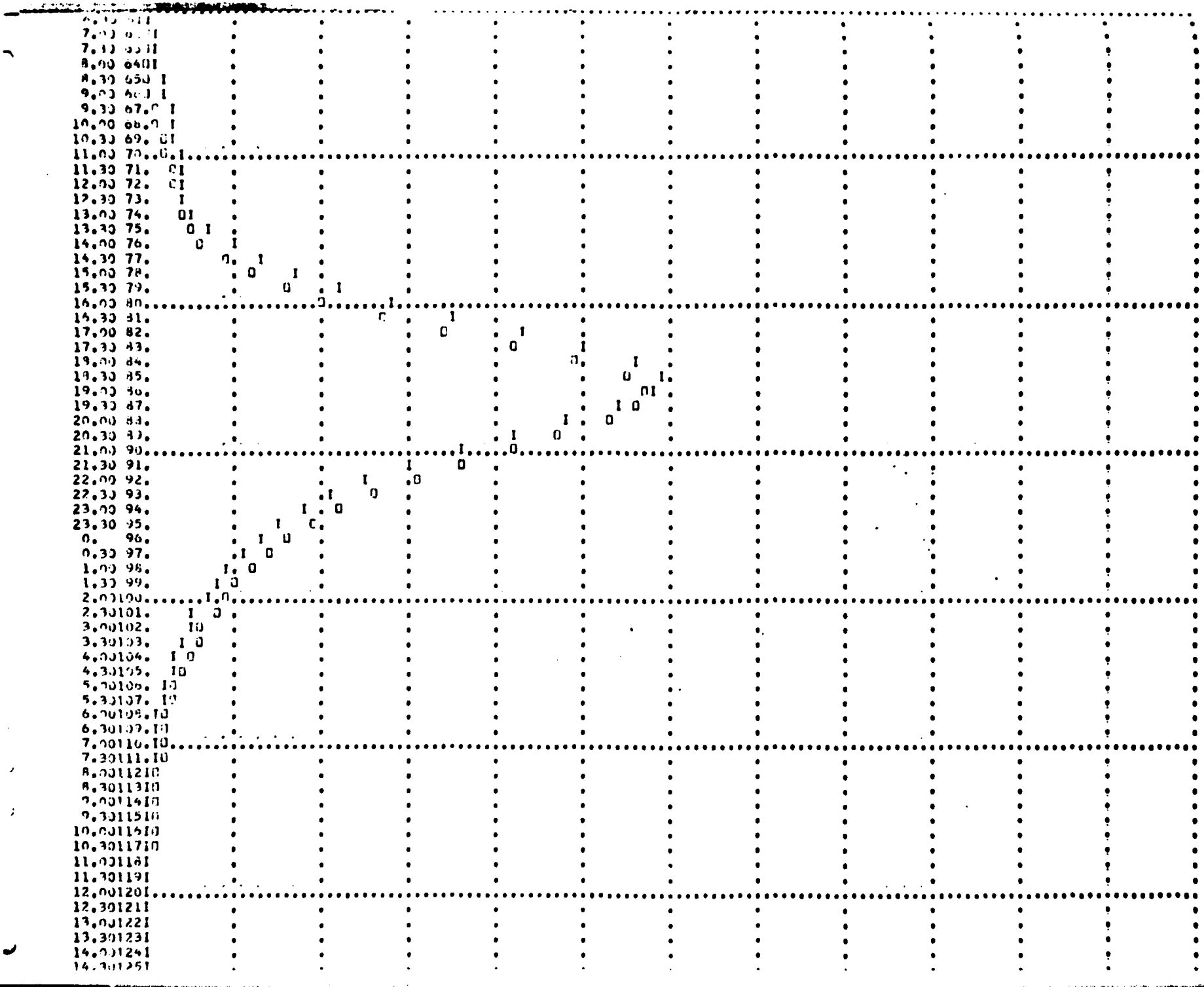
	PEAK	[illegible]	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	11449.	8418.	2294.	1134.	162921.
CMS	324.	250.	93.	32.	4613.
INCHES		16.2	24.32	24.98	25.06
MM		413.41	617.61	634.46	636.49
AC-FT		4373.	6533.	6711.	6732.
THOUS CU M		5394.	8058.	8278.	8304.

OVF

STATION 1

INFLOW (I), OUTFLOW (O) AND RESERVOIR FLOW (*)

	0.	2000.	4000.	6000.	8000.	10000.	12000.	C.	D.	C.	C.	C.	D.
0.30	1I												
1.00	2I												
1.30	3I												
2.00	4I												
2.30	5I												
3.00	6I												
3.30	7I												
4.00	8I												
4.30	9I												
5.00	10I												
5.30	11I												
6.00	12I												
6.30	13I												
7.00	14I												
7.30	15I												
8.00	16I												
8.30	17I												
9.00	18I												
9.30	19I												
10.00	20I												
10.30	21I												
11.00	22I												
11.30	23I												
12.00	24I												
12.30	25I												
13.00	26I												
13.30	27I												
14.00	28I												
14.30	29I												
15.00	30I												
15.30	31I												
16.00	32I												
16.30	33I												
17.00	34OI												
17.30	35OI												
18.00	36O I												
18.30	37O I												
19.00	38O I												
19.30	39O I												
20.00	40O.I												
20.30	41O I												
21.00	42OI												
21.30	43OI												
22.00	44OI												
22.30	45OI												
23.00	46OI												
23.30	47OI												
0.	48OI												
0.30	49I												
1.00	50I												
1.30	51I												
2.00	52I												
2.30	53I												
3.00	54I												
3.30	55I												
4.00	56I												
4.30	57I												
5.00	58I												



PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS		
				RATIO 1 0.05	RATIO 2 0.50	RATIO 3 1.00
HYDROGRAPH AT	1	5.04 (0.3CE 19)	1	537. (16.62)(	5871. 166.24)(	11741. 332.48)(
ROUTED TO	1	5.04 (0.3CE 19)	1	204. (5.78)(	5612. 158.92)(	11449. 324.19)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	99.30	99.30	101.30
STORAGE	1750.	1750.	1969.
OUTFLOW	0.	0.	55.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.05	101.00	0.30	2001.	204.	10.50	46.50	0.
0.50	104.93	3.63	2367.	5612.	23.50	43.00	0.
1.00	107.21	5.91	2617.	11449.	29.00	43.00	0.

APPENDIX D
REFERENCES

APPENDIX D

REFERENCES

1) U.S. Department of Commerce; Weather Bureau; Hydrometeorological Report No. 33 - Seasonal Variation of the Probable Maximum Precipitation East of the 105th Meridian for Areas from 10 to 1,000 Square Miles and Durations of 6, 12, 24, and 48 Hours, April 1956.

2) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition, McGraw-Hill, 1963.

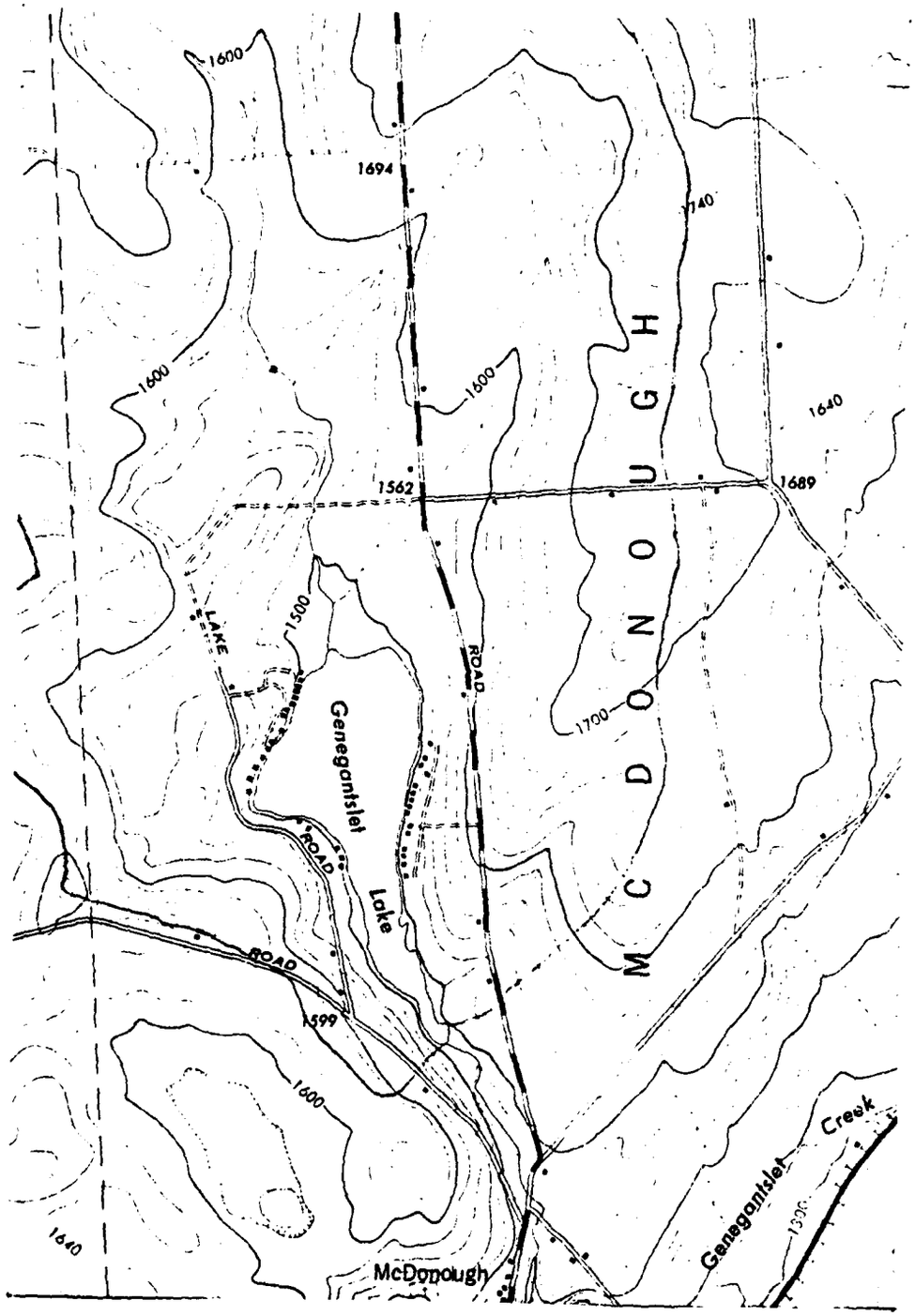
3) University of the State of New York, Geology of New York, Education Leaflet 20, Reprinted 1973.

4) Elwyn E. Seelye, Design, 3rd edition, John Wiley and Sons, Inc., 1960.

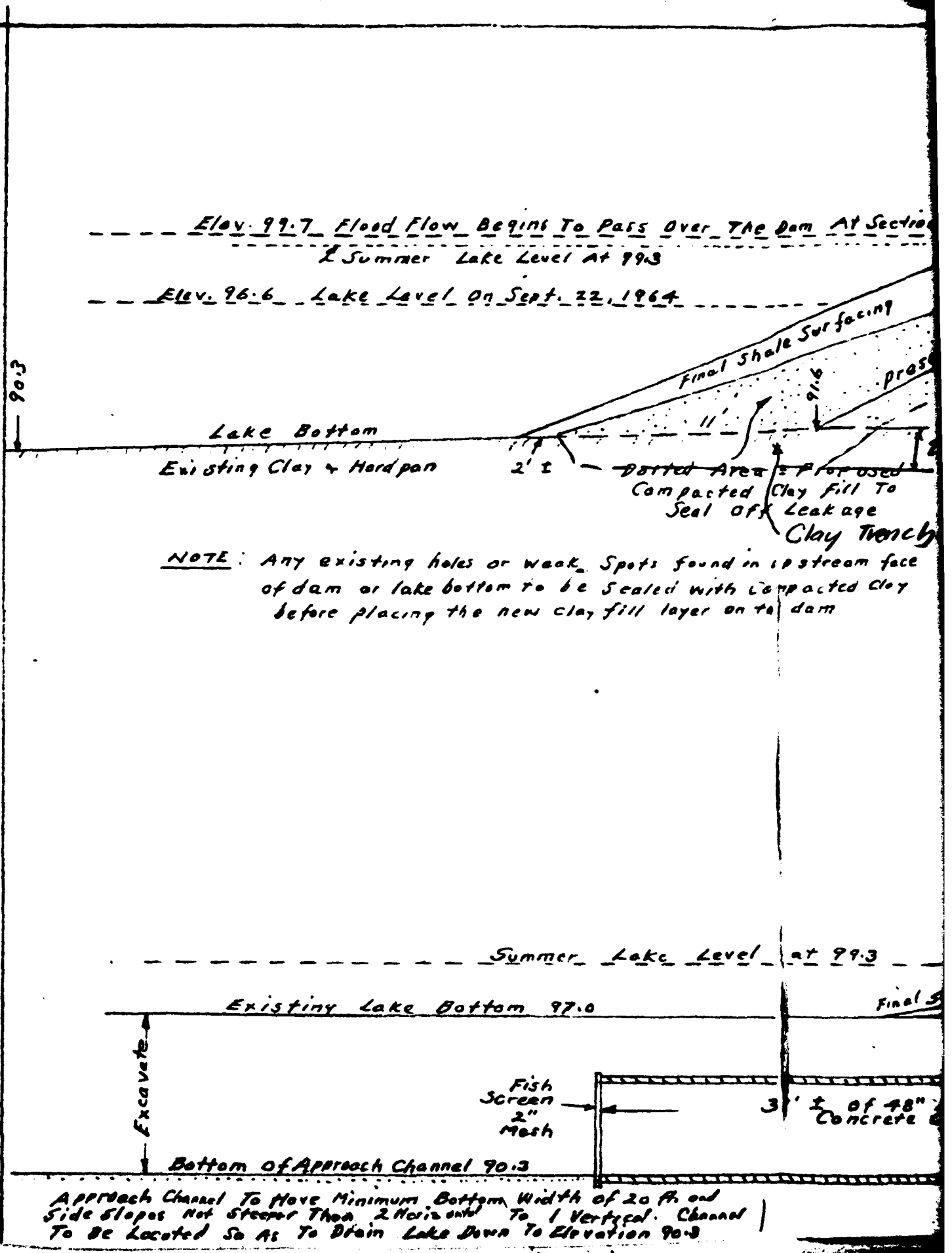
5) U.S. Department of the Interior, Bureau of Reclamations; Design of Small Dams, 2nd edition (rev. reprint), 1977.

APPENDIX E
DRAWINGS

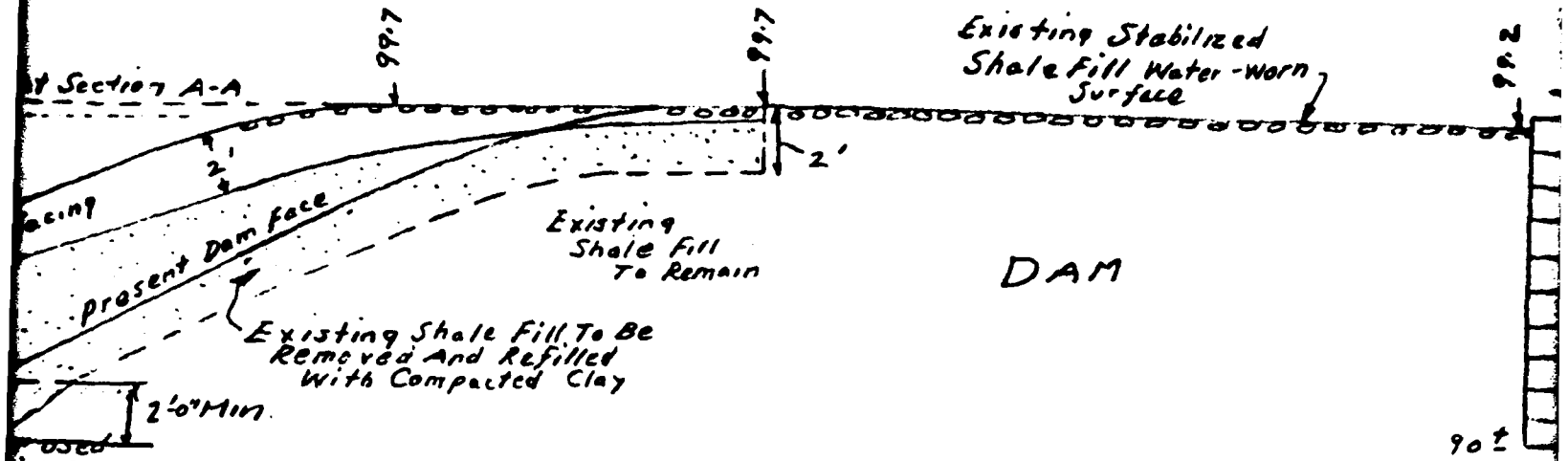
VICINITY MAP
GENEGANTSLET LAKE DAM
I.D. No. NY 846

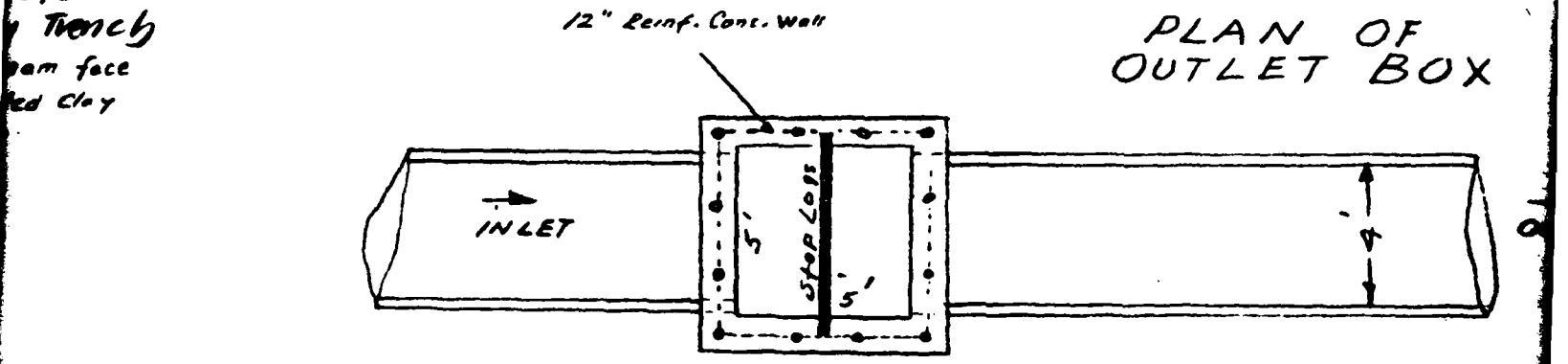


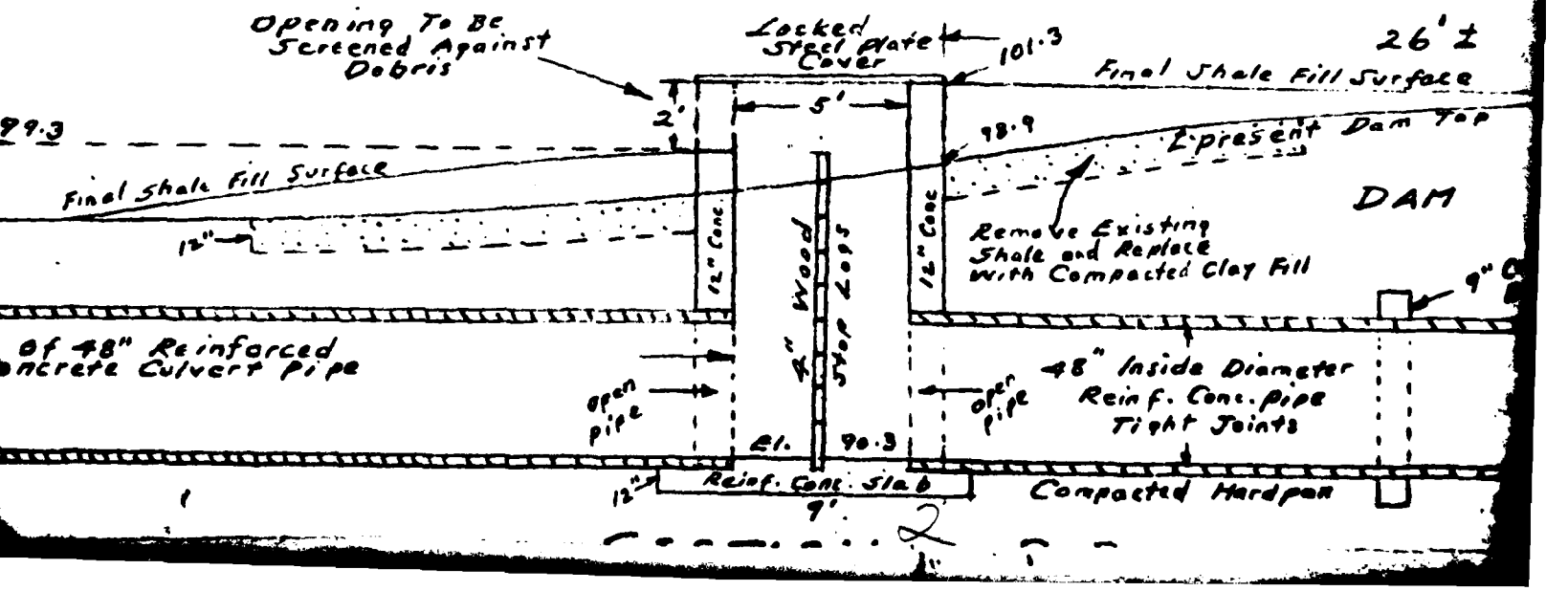
TOPOGRAPHIC MAP
GENEGANTSLET LAKE DAM
I.D. No. NY 846


Elev. 99.7 Flood Flow Begins To Pass Over The Dam At Sectio
℄ Summer Lake Level At 99.3
Elev. 96.6 Lake Level On Sept. 22, 1964
90.3
Final Shale Surfacing
91.6
pros
Lake Bottom
11'
Existing Clay + Hardpan
2' ±
Dotted Area = Proposed
Compacted Clay Fill To
Seal Off Leakage
Clay Trench
NOTE: Any existing holes or weak Spots found in upstream face of dam or lake bottom to be Sealed with Compacted Clay before placing the new clay fill layer on to dam
Summer Lake Level at 99.3
Existing Lake Bottom 97.0
Final S
Excavate
Fish Screen 2" Mesh
3' ± of 48"
Concrete
Bottom of Approach Channel 90.3
Approach Channel To Have Minimum Bottom Width of 20 ft. and Side Slopes Not Steeper Than 2 Horizontal To 1 Vertical. Channel To Be Located So As To Drain Lake Down To Elevation 90.3

SECTION A-A


99.7
99.7
Existing Stabilized Shale Fill Water-Worn Surface
Section A-A
2'
2'
present Dam face
Existing Shale Fill To Remain
DAM
Existing Shale Fill To Be Removed And Refilled With Compacted Clay
2'-0" Min.
90±


12" Reinf. Conc. Wall
PLAN OF OUTLET BOX
INLET
5'
Step Logs
5'
4'


Opening To Be Screened Against Debris
Locked Steel Plate Cover
101.3
26'±
Final Shale Fill Surface
2'
5'
99.3
98.9
Present Dam Top
Final Shale Fill Surface
DAM
12"
12" Conc.
4" Wood Step Logs
12" Conc.
Remove Existing Shale and Replace With Compacted Clay Fill
9" C
of 48" Reinforced Concrete Culvert Pipe
open pipe
open pipe
48" Inside Diameter Reinf. Conc. pipe Tight Joints
El. 90.3
12"
Reinf. Conc. slab
9'
Compacted Hardpan

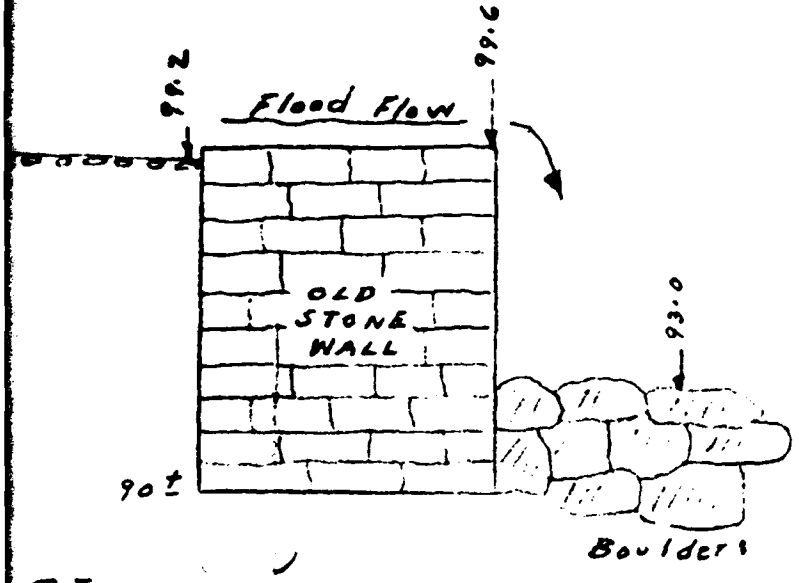
GENEGANTSLET LAKE DAM
McDONOUGH, N.Y.
PROPOSED REPAIRS AND IMPROVEMENTS

SCALE 1" = 5' Horiz. and Vertical

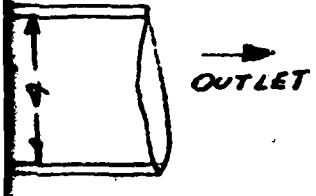
Oct. 10, 1964 - Revised July 22, 1965

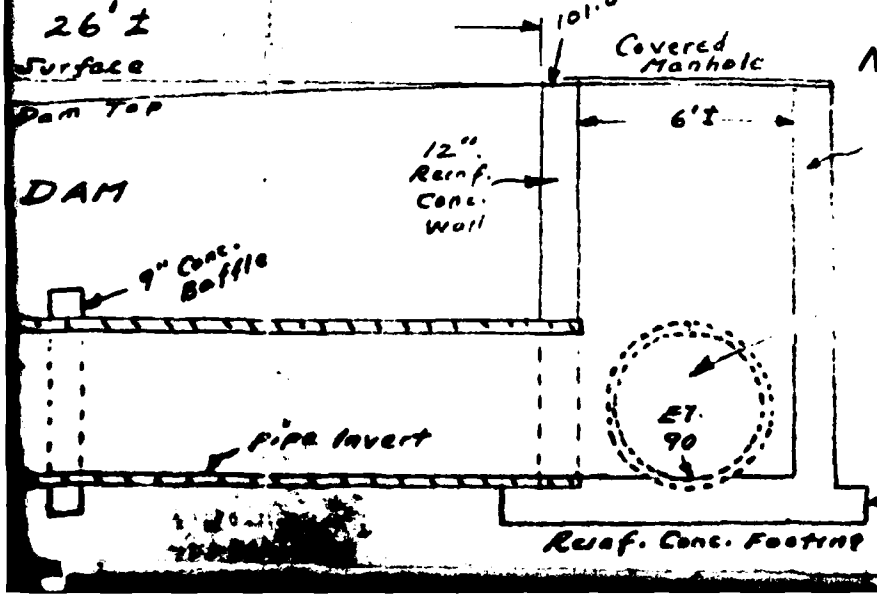
DRAWN BY Carl Crandall, C.E.
Ithaca, N.Y.

See Also Survey Map
Exhibit No. 9



OF BOX





STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS
SUBDIVISION OF WATERWAY OPERATION AND MAINTENANCE
ALBANY, N. Y. 12226

New DESIGNATION NO. 94D-3457 (orig #495)

WATERSHED Susquehanna River

Pursuant to the provisions of Section 948 of the Conservation Laws the design, details and specifications for the [illegible] construction of the structure shown on these plans are hereby approved. Date. August 12, 19[illegible]

Reviewed by Julius E. Peck
Senior Civil Engineer

APPROVED by E.C. Hudowalski
Assistant Superintendent

END

DATE
FILMED

1-81

DTIC