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NATIONAL DAM SAFETY PROGRAM. MARIAVILLE LAKE DAM (INVENTORY NUM--ETC(U)
SEP 81 G KOCH DACW51-79-C-0001

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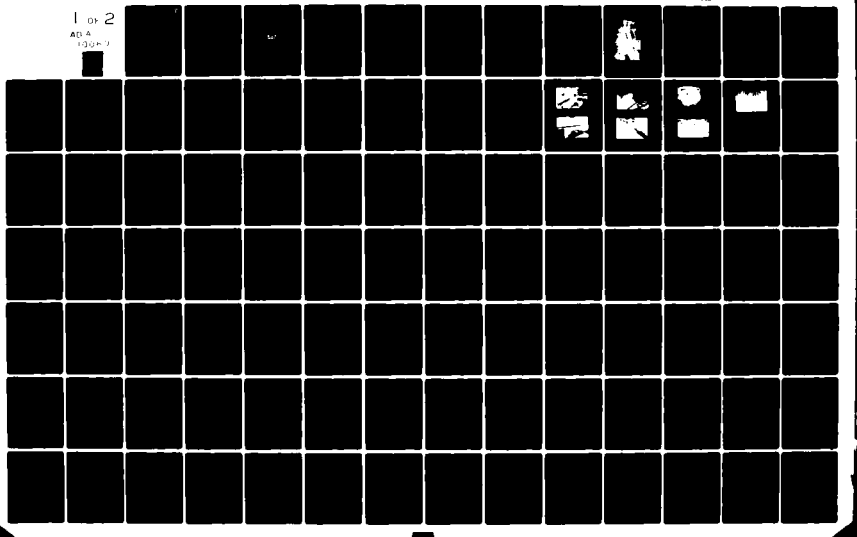

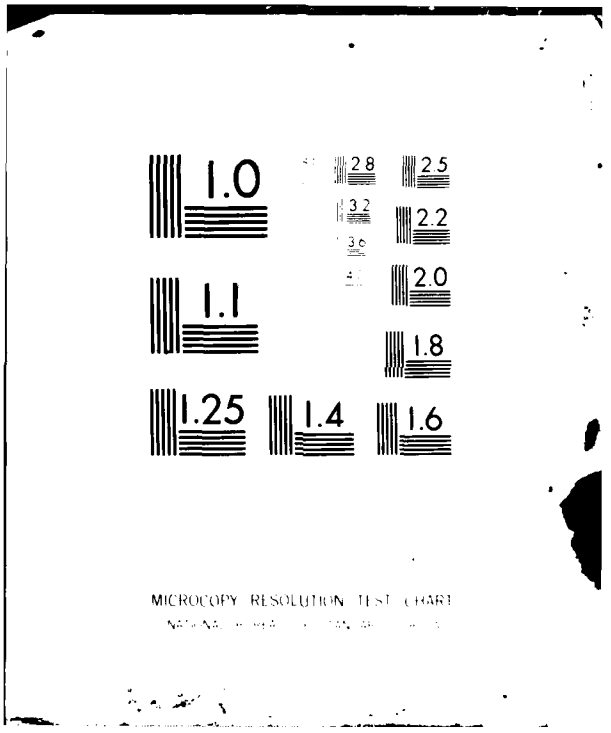
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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

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Mariaville Lake Dam
Schenectady County
Lower Hudson River Basin

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

This report provides information and analysis of the physical condition of the dam. Information contained in this report is based on visual examination of the dam and on information provided by the performing organization.

The examination of documents and the visual inspection of Mariaville Lake Dam did not reveal conditions which would constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

Using the Corps of Engineers' "screening criteria" for the initial review of spillway adequacy, it has been determined that the embankment would be overtopped for all storms in excess of 10% of the Probable Maximum Flood (PMF). The spillway is, therefore, 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 life downstream of the dam.

It is, therefore, recommended that within 3 months of notification to the owner, detailed hydrological hydraulic investigations of the structure should be undertaken to more accurately determine the site specific characteristics of the watershed and their affect upon the overtopping potential of the dam. The results of these investigations will determine the appropriate remedial measures which will be required to achieve a spillway capacity adequate to discharge the outflow from at least the 1/2 PMF. In the interim, a detailed emergency action plan must be developed and implemented during periods of unusually heavy precipitation. Also, around-the-clock surveillance of the structure must be provided during these periods.

Seepage found in and around the spillway during the inspection was of major concern. An investigation into the source of this seepage and the extent of deterioration of the masonry portion of the dam is required. The investigation will determine the type and extent of remedial measures required.

MOHAWK RIVER BASIN

MARIAVILLE LAKE DAM

SCHENECTADY COUNTY, NEW YORK
INVENTORY NO. N.Y. 169

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

NEW YORK DISTRICT CORPS OF ENGINEERS

AUGUST, 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.

MOHAWK RIVER BASIN
MARIAVILLE LAKE DAM
N.Y. 169
PHASE I INSPECTION REPORT

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APPENDICES

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Mariaville Lake (I.D. No. NY 169)
State Located:	New York
County Located:	Schenectady
Stream:	South Branch of Chuctanunda Creek (Tributary of Chuctanunda Creek and Mohawk River)
Date of Inspection:	October 30, 1980

ASSESSMENT

The examination of documents and the visual inspection of Mariaville Lake Dam did not reveal conditions which would constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action.

Using the Corps of Engineers' "screening criteria" for the initial review of spillway adequacy, it has been determined that the embankment would be overtopped for all storms in excess of 10% of the Probable Maximum Flood (PMF). The spillway is, therefore, 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 life downstream of the dam.

It is recommended that within 3 months of notification to the owner, detailed hydrological/hydraulic investigations of the structure should be undertaken to more accurately determine the site specific characteristics of the watershed and their effect upon the overtopping potential of the dam. The results of these investigations will determine the appropriate remedial measures which will be required to achieve a spillway capacity adequate to discharge the outflow from at least the 1/2 PMF. In the interim, a detailed emergency action plan must be developed and implemented during periods of unusually heavy precipitation. Also, around-the-clock surveillance of the structure must be provided during these periods.

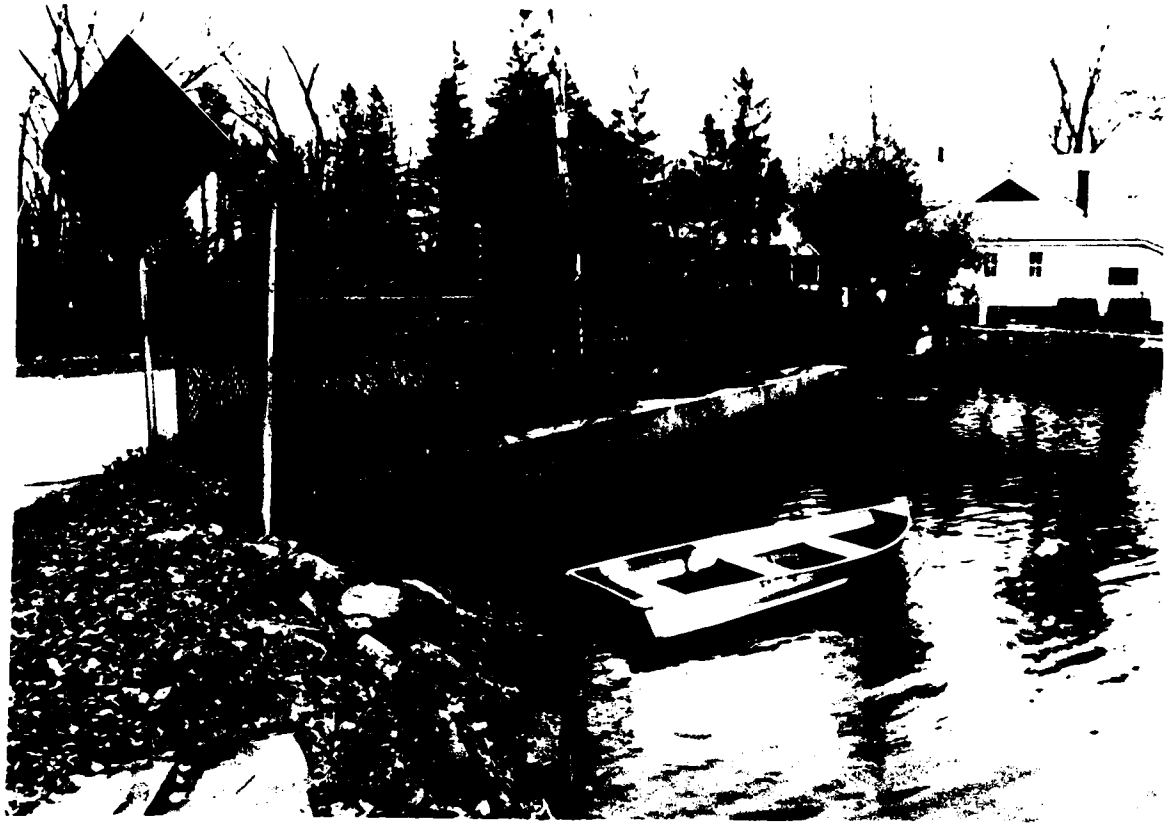
Seepage found in and around the spillway during the inspection was of major concern. An investigation into the source of this seepage and the extent of deterioration of the masonry portion of the dam is required. The investigation will determine the type and extent of remedial measures required.

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

pproved By:

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

ate: 14 Sept



OVERVIEW - MARIAVILLE DAM

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
DEC # 189C-224 MOHAWK RIVER BASIN
SCHENECTADY COUNTY, NEW YORK

SECTION I: 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

Evaluation of the existing conditions of the subject dam to identify deficiencies and hazardous conditions, determine if they constitute hazards to human life and property and recommend remedial measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

Mariaville Lake Dam consists of a concrete capped masonry drop spillway 9 feet long at the upstream face and 7 feet long at the downstream face and is adjacent to 90 feet long compacted earth embankment. The maximum height of the dam is 11 feet. The earth embankment has a slope of 1 vertical on 2 horizontal on the downstream side but has a vertical concrete face on the upstream side. The first 40 feet of the outlet channel, as it goes underneath Route 159, is a rectangular concrete conduit. Two 24 inch diameter wood stave pipes entered through the embankment and into the spillway, serving as the reservoir drains.

b. Location

The dam is located on the South Branch of Chuctanunda Creek, a tributary of Chuctanunda Creek and Mohawk River just above Route 159 in the Village of Mariaville, Town of Duanesburg, County of Schenectady.

c. Size

The dam is 11 feet high and impounds approximately 562 acre-feet. The dam is classified as "small" in size (storage 50 to 1000 acre-feet).

d. Hazard Classification

The dam is classified as high hazard, because of its location within the Village of Mariaville where several homes located along the banks of the downstream channel face a potential threat in case of a dam failure.

e. Ownership

The dam is owned and operated by Mariaville Civic Association (current President: Mr. Ray Englehart, Spring Road, Mariaville, NY. Telephone number is (518) 864-5548.)

f. Purpose of the Dam

The dam provides storage for recreation.

g. Design and Construction

No information or data concerning design and construction of this dam could be located.

h. Normal Operating Procedures
All flows are discharged over the spillway. Only one of the two reservoir drains is reported operable for maintenance purposes. The other one is inoperable.

1.3 PERTINENT DATA

a. Drainage Area (sq. mi.)	3.12
Dam Height (ft.)	11.
b. Discharge at Dam Site (cfs.)	
Maximum known flood	No records available
Spillway at maximum pool (el. 1276.5)	85.
Maximum capacity of reservoir drain	25.
Total discharge, max., pool	110.
Average daily	6.
c. Elevations (ft. above MSL, USGS)	
Top of dam	1276.5
Spillway crest	1274.0
Original stream bed	1265.5
d. Reservoir	
Length of shoreline at spillway crest (mi.)	4.22
Surface area at spillway crest (acres)	198.5
e. Storage (acre-feet)	
Top of dam	880.
Spillway crest	562.
f. Dam	
Type: Compacted earth embankment with vertical upstream face of concrete.	
Height (ft)	11.
Length (ft)	90.
Upstream Slope	Vertical(concrete face)
Downstream Slope	2:1
g. Spillway	
Type: Masonry, drop section	
Length (ft.)	8.

h. Reservoir Drain
Two 24" diameter wood stave pipes, Valve on upstream side. Only one pipe reported operable.

SECTION 2: ENGINEERING DATA

2.1 GEOLOGY

The Mariaville Lake Dam is located in the Hudson-Mohawk lowlands physiographic province of New York State. The general topography has resulted from erosion along outcrop belts of weak rocks. Most of the province has low relief and elevation. Topography in the vicinity of the dam is of low relief and moderately high elevation. Bedrock in the vicinity of the dam is Ordovician shale (500 to 435 million years ago) which has been exposed by the southward and westward stripping - off of Silurian and Devonian Limestones.

Glacial cover has resulted from deposition during the Wisconsin glaciation, approximately 11,000 years ago.

The "Preliminary Brittle Structures Map of New York" developed by Yngvar W. Isachsen and William G. McKendrea (dated 1977) indicates the presence of two topographic linear features observed on one or more of the following: topographic map, Landsat (ERTS), Skylab, or U-2 photographic product, running in a nearly east-west direction on both sides of the reservoir. In addition, a normal fault is indicated on the east side of the reservoir approximately 3 kilometers east of the dam. This fault has a dip of 30^{o} to 150^{o} with the relatively downthrown side on the east.

2.2 SUBSURFACE INVESTIGATION

No subsurface investigation could be located for the design of the structure. The "General Soil Map of New York State" prepared by Cornell University Agriculture Experiment Station indicates that the surficial soils in the vicinity of the dam are the Burdett and Darien series of glacial till origin. Burdett soils are highly variable deposits, generally containing a few stones. Darian soils are formed on glacial till from dominantly shale with some limestone, and generally occur on glacial till uplands; a few areas are morainic. The soils are shale,silt,and clay with a trace of sand. The depth to bedrock is variable. The permeability of the soil is slowly permeable. A seasonal perched water table occurs.

2.3 DAM AND APPURTENANT STRUCTURES

Correspondence in the NYS DEC files, dated December 1912, indicates that the dam had been in existance for 150 years and probably longer. No information could be located concerning the design and construction. The dam was originally used to power a gristmill and has been repaired on numerous occasions.

2.4 CONSTRUCTION RECORDS

No construction records are available.

2.5 OPERATIONAL RECORDS

No operation records are maintained for the dam.

2.6 EVALUATION OF DATA

The data presented in this report, while extremely limited, appears adequate and reliable for Phase 1 Inspection purposes. Information concerning recent (since 1912) repairs can be found in the NYS DEC files.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of Mariaville Dam and the surrounding watershed was conducted on October 30, 1980. The weather was cloudy and the temperature ranged in the thirties. The reservoir level at the time of the inspection was approximately 1 inch below the crest of the spillway.

b. Embankment

The earth embankment also serves to support a paved highway. No signs of major distress were observed and no evidence of seepage, sloughing or depressions were noted. The upstream face of the embankment is composed of a vertical concrete wall which is cracked and deteriorated, particularly at the water line. The maximum depth of deterioration is approximately 5 inches. Voids were observed below the waterline on the left side of the spillway but could not be measured. The downstream face is composed of an earth slope and vertical concrete and masonry walls. These walls are the wingwalls of the rectangular outlet conduit, (see Photo #6), and are cracked and deteriorated. Two weeps were observed on the right wingwall near the base. One was seeping at a rate of less than 1 gpm. Other weeps may be located beneath the rubble. Trees and brush were noted along the upstream edge of the embankment crest.

c. Spillway

The spillway is a concrete capped masonry drop structure. The overall condition of the masonry portion is poor. Extensive seepage was observed emanating from the walls of the spillway on the downstream face. Seepage from the right wall is estimated to be 10 to 15 gpm. Seepage on the left wall is estimated to be 15 to 20 gpm. Additional seepage through the 2-24 inch diameter reservoir drains is in excess of 100 gpm, which may be related to deterioration of the masonry joints and/or partial opening of the reservoir drain gate. During observation of the reservoir drains, voids were noted in the masonry construction approximately 5 feet from downstream end. The size of the voids could not be determined, but appeared to be extensive. Seepage from the voids above the drains is estimated to be 5 to 10 gpm.

The seepage from the left spillway wall was emanating from a void 2.5 feet wide by 1.5 feet high by 3 feet deep, near the base of the wall. Drain tile was noted behind the void which extended through the wall prior to formation of the void. This void also extends behind the face of the wall approximately 2 feet toward the spillway. Seepage from the reservoir drains may be emanating from this void. Seepage was also observed from the cracks in the concrete of the outlet conduit adjacent to the void. The walls of the spillway were damp above the seepage areas and reservoir drains. The remainder of the walls were dry, but the joints of the masonry are significantly deteriorated.

The concrete cap on the spillway crest appeared to be in good condition. A 4 inch diameter pipe on the right spillway wall near the base was damp. The brackets holding the stoplogs in place are also deteriorated.

d. Outlet Conduit

The rectangular concrete outlet conduit, which extends beneath the embankment, is cracked, deteriorated and spalling. Dampness was noted on the walls approximately 1 to 2 feet from the floor. The reinforcing steel at the inlet and outlet ends is exposed and rusting. Calcification at the construction joints was observed, particularly along the roof joints. Voids were observed in the roof and walls of the conduit, primarily the left side where reinforcing is exposed. The maximum depth of deterioration in the roof was approximately 3 inches. The concrete of the walls was primarily deteriorated near the bottom of the conduit.

e. Reservoir Drain

The 2-24 inch diameter reservoir drains were wood stave pipes surrounded by the concrete and masonry of the spillway. The wood staves have deteriorated, particularly on the right side. Examination of the surrounding concrete and masonry does not reveal movement due to loss of support from the wood deterioration at the outlet and of the drains. The aforementioned internal voids may be related to this deterioration. While some debris was observed in the spillway area and at the outlet of the drains, the drain system appears capable of functioning. The gate system was reported to be operational.

f. Downstream Channel

The downstream channel is narrow with very steep side slopes and is heavily vegetated. Considerable debris was noted in the channel.

g. Reservoir

No sediment or instability problems were reported within the reservoir area.

3.2 EVALUATION OF OBSERVATIONS

The problem areas observed during the inspection and the recommended remedial measures are as follows:

1. The extensive seepage and deterioration noted in the spillway, reservoir drains and outlet conduit requires investigation and repair.

2. The voids, deterioration, and exposed reinforcing of the spillway, downstream walls, reservoir drains, upstream concrete wall, and outlet conduit require repair.

3. Dampness was noted on the walls of the spillway and the outlet conduit. These surfaces should be monitored periodically for changes in seepage quantities. If significant increases are observed, investigation and repair will be required.

4. Monitor the calcification of the outlet conduit construction joints and repair as required.

5. The joints of the masonry construction are substantially deteriorated. Repoint all joints and recaulk all construction joints.

6. The stop log restraining brackets are deteriorated and require repair.

7. Remove the debris in the spillway area, outlet conduit and

downstream channel. Provide a program of periodic inspection and removal.

8. Remove the tree and brush growth on the embankment and in the downstream channel. Provide a program of periodic inspection and removal.

9. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain system. Document this information for future reference. Also develop an emergency action plan for notification of downstream residents and the proper governmental authorities.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface elevation is approximated by the crest of the spillway. The reservoir drain system may be operated to reduce water levels below the spillway crest.

4.2 MAINTENANCE OF THE DAM

Maintenance of the dam is provided by the owner, Mariaville Civic Association. Maintenance of the dam is considered unsatisfactory as evidenced by the seepage and overall deterioration of the dam. In addition trees and brush require trimming, debris in the spillway and downstream channel requires removal, and the stop log brackets need repair.

4.3 WARNING SYSTEM

There is no warning system in effect or in preparation.

4.4 EVALUATION

The dam and appurtenances have been maintained in unsatisfactory condition as noted in "Section 3: Visual Inspection".

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The total drainage area is 3.12 square miles. The basin is rather swampy with mild slopes and was treated as a single basin for analysis purposes.

5.2 ANALYSIS CRITERIA

The analysis of the spillway capacity of the dam and storage of the reservoir was performed using the Corps of Engineers HEC-1 computer program incorporating the "Snyder Synthetic Unit Hydrograph" method and the "Modified Puls" flood routing procedure. The floods selected for analysis were the PMF and 1/2 PMF in accordance with the recommended guidelines of the Corps of Engineers.

5.3 SPILLWAY CAPACITY

The spillway has a capacity of 85 cfs. For the 1/2 PMF the peak inflow will be 2655 cfs and the peak outflow will be 1837 cfs. During this event the dam will be overtopped by 3.2 feet of water. For the PMF the peak inflow will be 5310 cfs and the peak outflow will be 4352 cfs. During this event the dam will be overtopped by about 5.9 feet of water.

5.4 RESERVOIR CAPACITY

Capacity to normal water elevation is 562 acre-feet. Surcharge storage to top of dam is an additional 318 acre-feet, creating a total storage of 880 acre-feet. The surcharge storage between spillway and dam crest is equivalent to 1.91 inches of runoff.

5.5 FLOODS OF RECORD

No records of past floods for the subject stream are available.

5.6 OVERTOPPING POTENTIAL

Our analysis indicates the dam will be overtopped by 5.9 feet during the PMF and by 3.2 feet during a flood of the magnitude of 1/2 the PMF causing widespread flooding to many homes downstream in each case. Even a flood as small as 20% of the PMF will overtop the dam by about 0.9 feet and is expected to cause flooding to some of the low lying homes in Mariaville.

5.7 EVALUATION

The spillway is inadequate to pass all floods exceeding 11% of the PMF. The spillway, therefore, is adjudged as "seriously inadequate" and the dam is assessed as unsafe, non emergency.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

No signs of major distress were observed in connection with the earth embankment. The spillway is substantially deteriorated and seeping significantly. Voids were observed internally in the reservoir drain system of the masonry spillway. Voids were also observed in the spillway walls, and the ends, roof and wall of outlet conduit. The capacity of the spillway is inadequate to discharge the outflow from the 1/2 PMF event.

b. Design and Construction Data

No design or construction data could be located concerning the structural stability of the dam.

c. Post Construction Changes

The dam was repaired about 1915 by repointing the upstream face, installing a 10 feet by 2 feet spillway and increasing the thickness of the spillway wall about 3 feet. About 1917, an upstream concrete wall was installed to control leakage observed between 1912 and 17. No other information could be located.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase 1 Inspection of Mariaville Lake Dam did not reveal any conditions which constitute an immediate hazard to human life or property. The embankment portion of the dam is not considered unstable. The spillway was determined to be "seriously inadequate: based on the Corps of Engineers "screening criteria", and outflows from any storm in excess of 10% of the PMF will overtop the dam. This overtopping could cause breaching of the dam, and the resulting flood-wave would significantly increase the hazard to downstream residents. For these reasons, the dam has been assessed as "unsafe, non-emergency."

In addition, the seepage and general deterioration of the concrete and masonry portions of the spillway and appurtenances requires investigation and remedial action.

b. Adequacy of Information

The information reviewed is considered adequate for Phase 1 Inspection purposes.

c. Need for Additional Investigations

Since the spillway is considered "seriously inadequate", additional hydrologic/hydraulic investigations are required to more accurately determine the site specific characteristics of the watershed. After completion of these investigations, remedial measures must be initiated to provide spillway capacity sufficient to discharge the outflow from the 1/2 PMF event. In addition, an investigation is required concerning the seepage and general deterioration of the concrete masonry portions of the spillway and appurtenances with remedial actions as a result of this investigation.

d. Urgency

The hydrologic/hydraulic and seepage/deterioration investigations must be initiated within 3 months from notification, completed within 1 year, and remedial measures as a result of these investigations completed within 2 years from notification. In the interim, develop an emergency action plan for notification of downstream residents and the proper governmental authorities in the event of overtopping, and provide around-the-clock surveillance of the dam during periods of extremely heavy run-off. The other problem areas listed below must be corrected within 1 year from notification.

7.2 RECOMMENDED MEASURES

1. The results of the aforementioned investigations will determine the type and extent of remedial measures required.
2. Monitor all damp surfaces of the spillway and outlet conduit. If significant increases are observed, investigate and repair.
3. Monitor the calcification of the outlet conduit construction joints and repair as required.
4. Repoint all joints of the masonry construction. Recaulk all construction joints as necessary.

5. Repair the deteriorated stop log brackets.

6. Remove the debris in the spillway area, outlet conduit, and downstream channel. Provide a program of periodic inspection and removal.

7. Remove the tree and brush growth on the embankment and in the downstream channel. Provide a program of periodic cutting and mowing of these surfaces.

8. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain system. Document this information for future reference. The emergency action plan described in section 7. 1 d should be maintained and periodically updated during the life of the structure.

APPENDIX A

PHOTOGRAPHS

PHOTO #1 UPSTREAM FACE OF DAM
NOTE: DETERIORATION OF CONCRETE

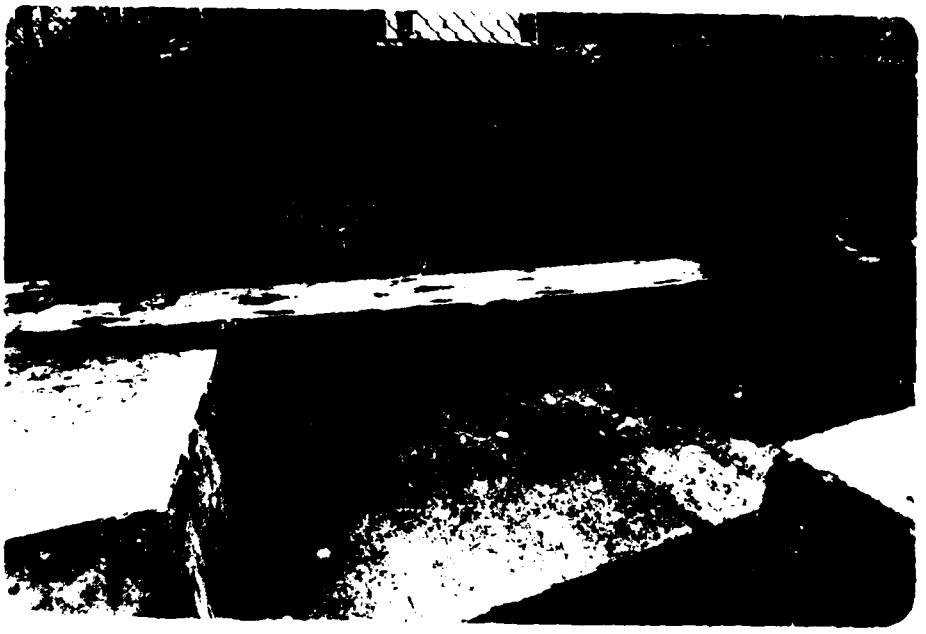


PHOTO #2 SPILLWAY CREST
DROP INLET TO OUTLET CONDUIT THROUGH EMBANKMENT

PHOTO #3 DROP INLET AND ENTRANCE TO OUTLET CONDUIT
NOTE: SEEPAGE ON RIGHT WALL & DEBRIS

PHOTO #4 SEEPAGE FROM DROP INLET WALL

PHOTO #5 RESERVOIR DRAIN, FROM THE DROP INLET

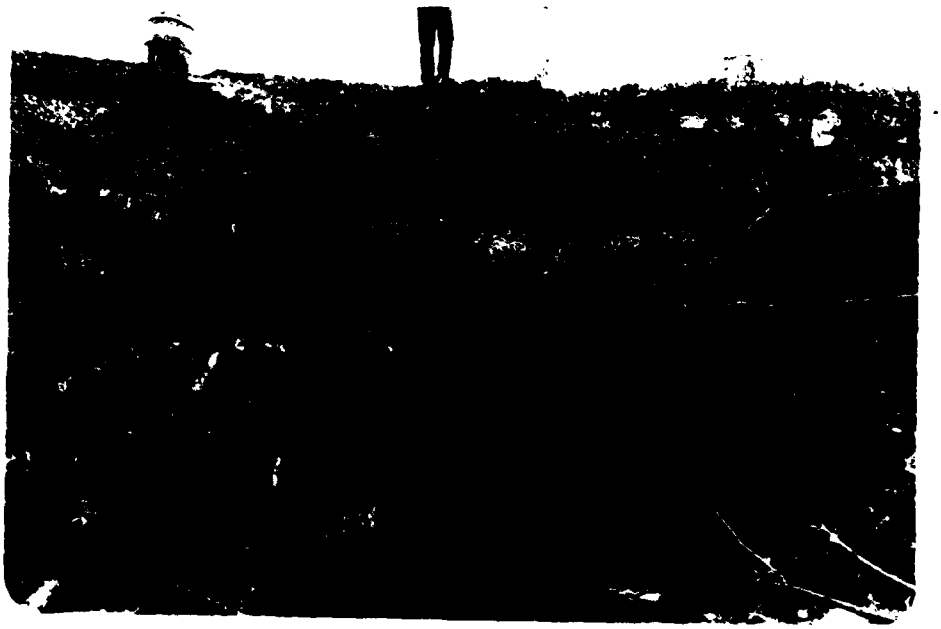


PHOTO #6 OUTLET OF CONDUIT
NOTE: DETERIORATION OF CONCRETE RETAINING WALL

PHOTO #7 DOWNSTREAM CHANNEL

APPENDIX B

VISUAL INSPECTION CHECKLIST

93-15-3(9/80)

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Marianville Lake

Fed. I.D. # NY 224 DEC Dam No. 189C-224

River Basin Mohawk

Location: Town Duanesburg County Schenectady

Stream Name South Branch of Chuctanunda Creek

Tributary of Chuctanunda Creek & Mohawk River

Latitude (N) 42° 49.8' Longitude (W) 74° 8.2'

Type of Dam Masonry Drop Spillway 8'. Earth embankment 90'

Hazard Category "C" High

Date(s) of Inspection Oct. 30. 1980

Weather Conditions Cloudy, thirties

Reservoir Level at Time of Inspection 1" ± below spillway

b. Inspection Personnel J.C. Veitch, R.P. Mc Carty

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

d. History:

Date Constructed 1925 Date(s) Reconstructed

Designer

Constructed By

Owner Marianville Civic Association

93-15-3(9/80)

2) Embankment

a. Characteristics

(1) Embankment Material Earth

(2) Cutoff Type –

(3) Impervious Core –

(4) Internal Drainage System None

(5) Miscellaneous

b. Crest

(1) Vertical Alignment good

(2) Horizontal Alignment good

(3) Surface Cracks None evident

(4) Miscellaneous

c. Upstream Slope

(1) Slope (Estimate) (V:H) Vertical Concrete face

(2) Undesirable Growth or Debris, Animal Burrows none evident

(3) Sloughing, Subsidence or Depressions Some cracks & deterioration. Max. depth of deterioration about 5". Some voids observed in left embankment.

(4) Slope Protection Concrete face

(5) Surface Cracks or Movement at Toe unobservable

d. Downstream Slope

(1) Slope (Estimate - V:H) 1:2

(2) Undesirable Growth or Debris, Animal Burrows Some growth of Trees & brush

(3) Sloughing, Subsidence or Depressions none evident

(4) Surface Cracks or Movement at Toe none evident

(5) Seepage Some seepage observed near the base.

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

(7) Condition Around Outlet Structure Wingwalls cracked and deteriorated

(8) Seepage Beyond Toe Some seepage observed beneath the rubble.

e. Abutments - Embankment Contact

93-15-3(9/80)

(1) Erosion at Contact _____

(2) Seepage Along Contact Two weeps observed on right wingwall near the base. One was seeping at less than 1 gpm. Additional weeps observed beneath the rubble.

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

93-15-3(9/80)

5) Reservoir

a. Slopes appear stable

b. Sedimentation none evident

c. Unusual Conditions Which Affect Dam

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) Several homes located at or near the banks of downstream channel

b. Seepage, Unusual Growth some minor seepage and trees

c. Evidence of Movement Beyond Toe of Dam None evident

d. Condition of Downstream Channel adequate

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

a. General Concrete capped masonry drop structure

b. Condition of Service Spillway Condition of masonry portion is poor. Seepage from right wall estimated as 10 to 15 gpm and from left wall 15 to 20 gpm. The concrete cap on the spillway crest appears to be in good condition.

c. Condition of Auxiliary Spillway _____

none

d. Condition of Discharge Conveyance Channel _____

adequate

8) Reservoir Drain/Outlet

Type: Pipe _____ Conduit ✓ Other _____

Material: Concrete ✓ Metal _____ Other _____

Size: _____ Length _____

Invert Elevations: Entrance _____ Exit _____

Physical Condition (Describe): Unobservable _____

Material: Concrete cracked & deteriorated. Reinf. steel exposed & rusty

Joints: Calcification observed Alignment _____

Structural Integrity: _____

Hydraulic Capability: _____

Means of Control: Gate _____ Valve _____ Uncontrolled ✓

Operation: Operable _____ Inoperable _____ Other _____

Present Condition (Describe): _____

9) Structural

a. Concrete Surfaces The upstream concrete face of the embankment is cracked & deteriorated.

b. Structural Cracking Concrete cap of spillway appears in good condition, but masonry portion is in poor condition.

c. Movement - Horizontal & Vertical Alignment (Settlement) none evident

d. Junctions with Abutments or Embankments Adjacent. Some deterioration of concrete

e. Drains - Foundation, Joint, Face The two wood staves have deteriorated. Only one is reported operable.

f. Water Passages, Conduits, Sluices The concrete outlet conduit is cracked & deteriorated. The reinf. steel is exposed at the inlet & outlet ends and is rusting.

g. Seepage or Leakage Extensive seepage observed in the spillway, reservoir drains and outlet conduit.

h. Joints - Construction, etc. minor deterioration.

i. Foundation assumed to be bedrock for spillway

j. Abutments Wingwalls cracked & deteriorated

k. Control Gates Valve for draining upstream pool.

l. Approach & Outlet Channels Adequate. Some debris and tree growth in outlet channel.

m. Energy Dissipators (Plunge Pool, etc.) none

n. Intake Structures none

o. Stability Appears stable

p. Miscellaneous

10) Appurtenant Structures (Power House, Lock, Gatehouse, Other)

a. Description and Condition

none

11) Operation Procedures (Lake Level Regulation):

Lake unregulated except for one wood stave reported operable as a drain pi

APPENDIX C

HYDROLOGIC/HYDRAULIC

ENGINEERING DATA AND COMPUTATIONS

M[illegible] (No. [illegible])

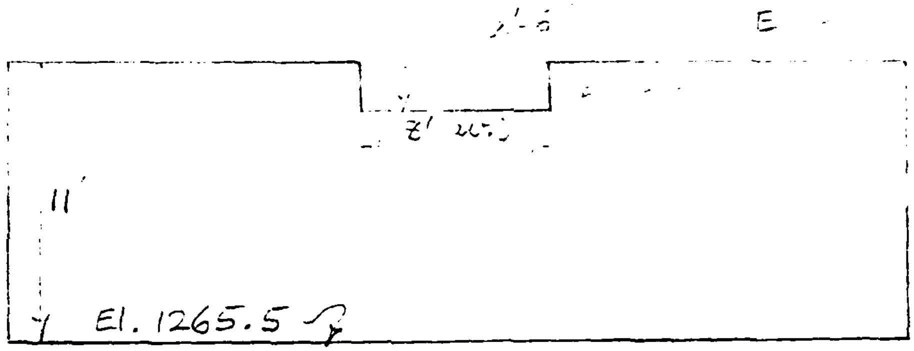
Data [illegible] file and Gaze[illegible]

Spillway crest Elev. = 1274 ft.

Pond area @ crest elev. = 0.31 mi^2

Area of drainage basin = 3.12 mi^2 ([illegible])

Dam 11 ft. high.



E[illegible] Area [illegible] planimeter[illegible] [illegible] quad

Elev.	Area (acres)
1274	198.5
1280	262.6
1290	528.0

Elevation vs. Capacity

El. 1274: capacity = $\frac{1}{3} \times 198.5 \times 8.5 =$ 562.4 acre-ft

El. 1280: capacity = $\frac{198.5 + 262.6}{2} \times 6 + 562.4$

$= 1383.3 + 562.4 =$ 1945.7 acre-ft

El. 1290: capacity = $\frac{262.6 + 523.2}{2} \times 10 + 1945.7$

$= 3953 + 1945.7 =$ 5898.7 acre-ft

Extrapolated from curve

Elev.	Capacity	Elev.	Capacity
1265.5	0	1271	255
1268	100	1272	340
1270	195	1273	435

Elevation vs. Discharge

Assume broad-crested weir with C = 2.7

L = 8'. Crest El. = 1274.0

$Q = CLH^{3/2}$

Elevation	H	$H^{3/2}$	C	Q cfs
1275	1	1	21.6	21.6
1276	2	2.83	"	61.1
1276.5	2.5	3.95		85.4
1277	3	5.20	"	112.2
1278	4	8.00	"	172.8
1279	5	11.18	"	241.5
1280	6	14.70	"	317.5
1281	7	18.52	"	400.0
1282	8	22.63	"	488.8

Snyder Unit Hydrograph

$DA = 3.12 \text{ mi}^2$

$L = 13,800 \text{ ft.} = 2.61 \text{ mi}$

$L_{ca} = 4,300 \text{ ft.} = 0.81 \text{ "}$

Assume $C_t = 2.5$

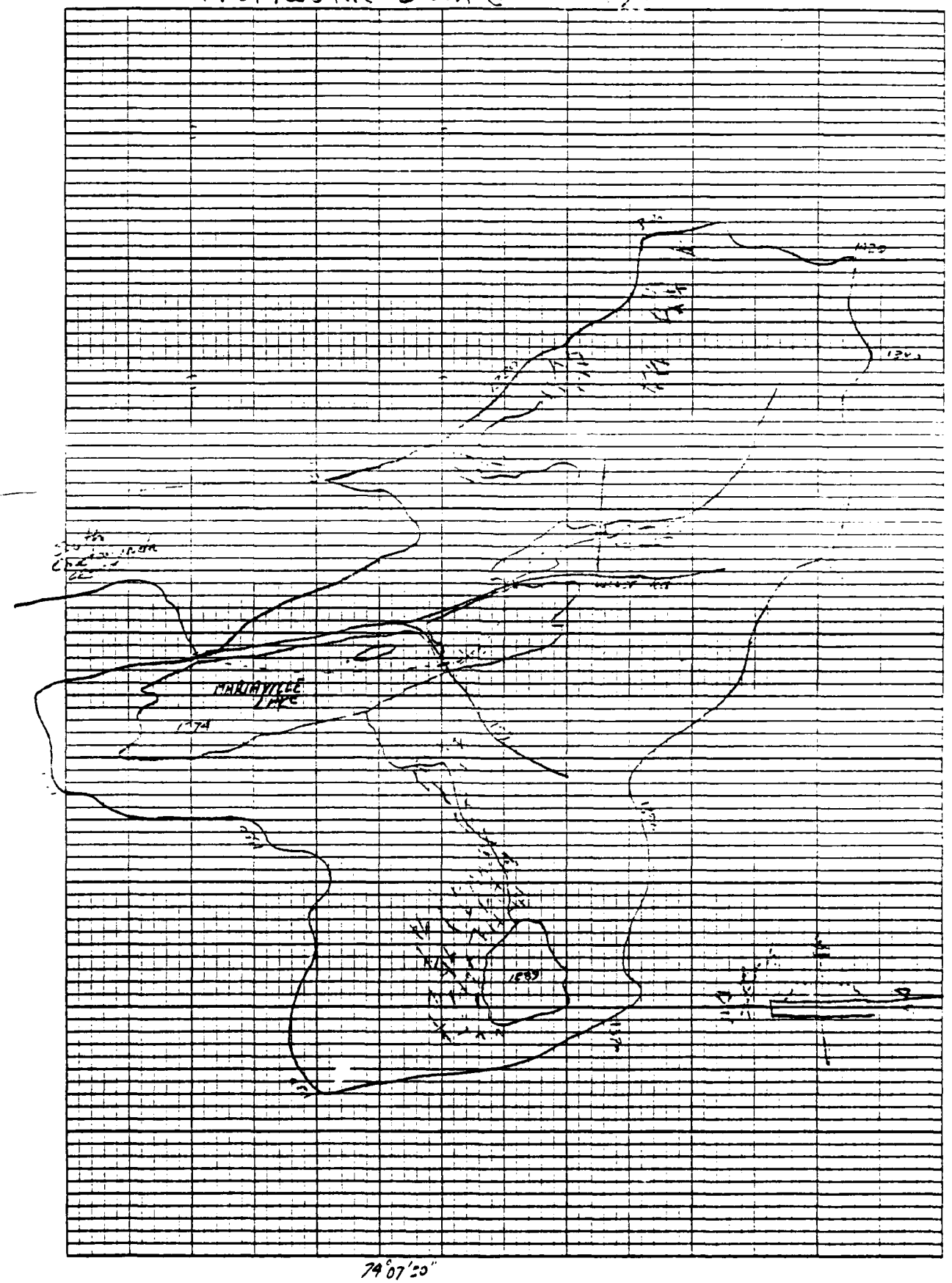
$$t_p = C_t (L \times L_{ca})^{0.3}$$
$$= 2.5 (2.61 \times 0.81)^{0.3}$$
$$= 3.13 \text{ hrs.}$$

$$t_r = \frac{t_p}{5.5} = \frac{3.13}{5.5} = 0.57 \text{ hours}$$

$t_R = 0.5$ hours.

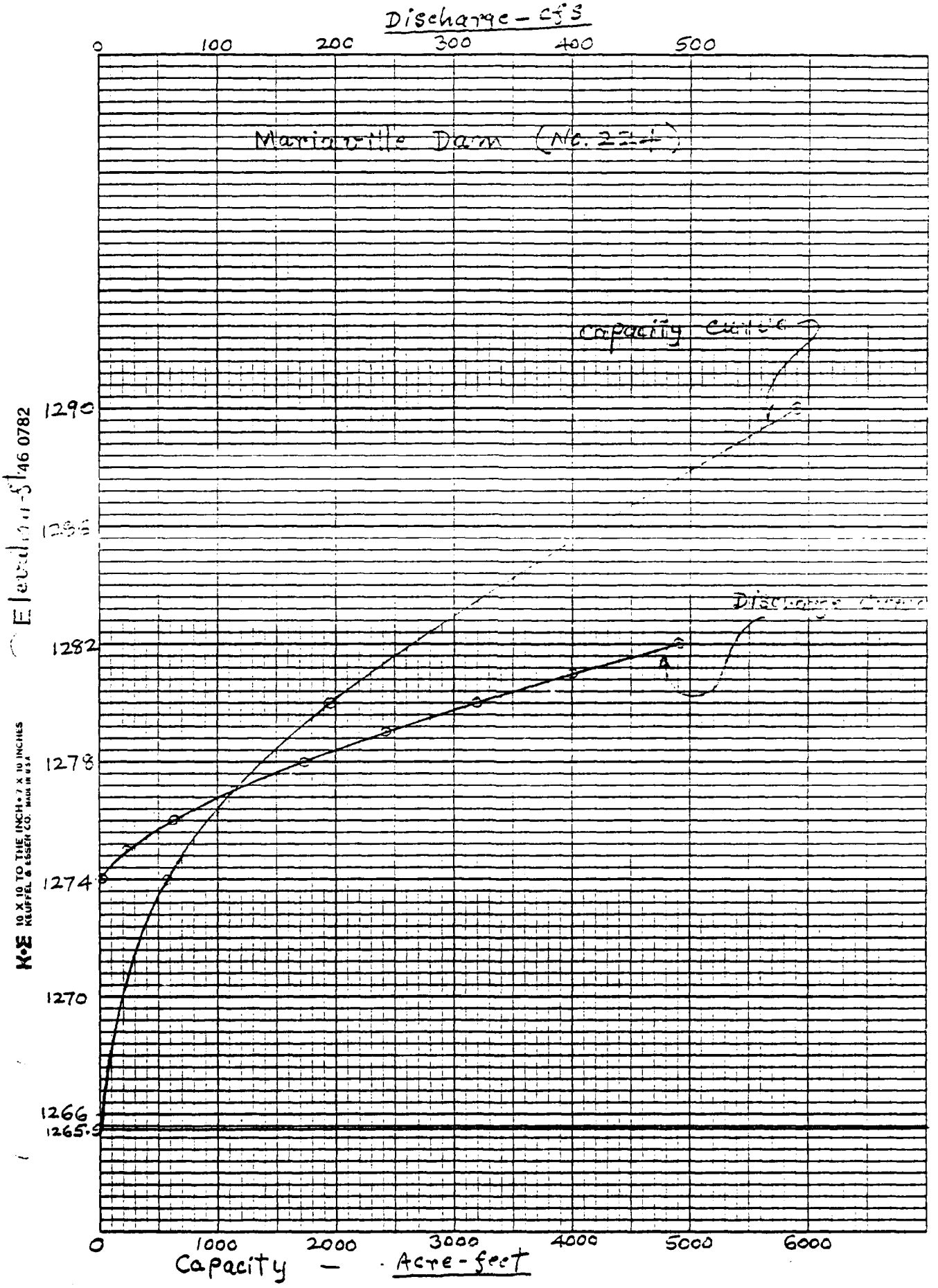
$$T_p = t_p + 0.25 (t_R - t_r)$$
$$= 3.13 + 0.25 (0.5 - 0.57)$$
$$= 3.13 - 0.25 \times 0.07$$
$$= 3.13 - 0.02$$
$$= 3.11 \text{ hours}$$

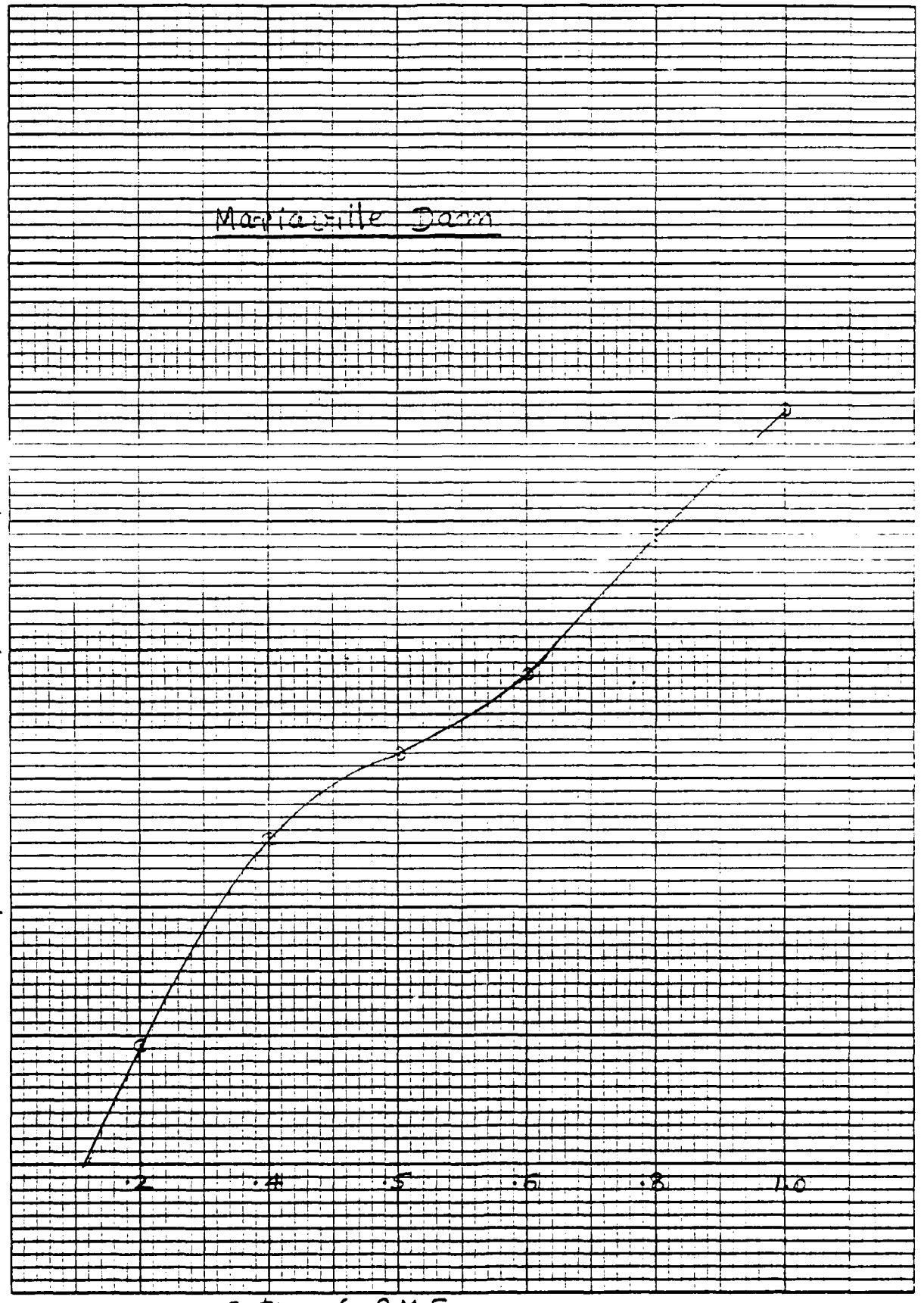
Mariaville Dam (No. 224)



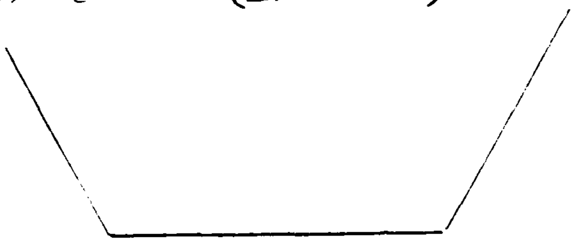
79°07'30"

46 0782


Discharge - cfs
0
100
200
300
400
500
Marinaville Dam (No. 22-4)
Capacity Curve
Discharge Curve
Elevation - ft
1290
1286
1282
1278
1274
1270
1266
1265.5
0
1000
2000
3000
4000
5000
6000
Capacity — Acre-feet
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 0782



DOWNSTREAM CHANNEL (BACK WATER)



~ 40'

$n = .045$

$S =$ [illegible]

from SCS Engineering Handbk. Section 5 ES-34 Sh. 1

d.	A	from chart n = .045	V	Q
1 ft.	≈ 40 ft.^{2}	$S =$ [illegible]	1.05 f/s.	[illegible] cfs
2	≈ 80		1.55	124. cfs.

∴ N [illegible] section @ [illegible] cfs. ([illegible]).

0	1	2	3	4	5	6	7	8	9	10
A1	MARI	AVILLE R	ESERVOIR							
A2	PHAS	E II								
A3	PMF		30							
B	2100	0	(15)	0	0			0	0	0
B1	5									
J	1	6	1							
J1	.2	1.4	1.5	1.6	1.8	1				
K	0	1			2		1			
K1	INF	LOW FROM	BASIN							
M	1	1	3.12							
P		21	111	123	133	142				
T							1	1		
W	3.11	.625								
X	-2.0	-.05	1							
K	1	1			2	1	1			
K1	ROUT	E THROU	GH RESERVOIR							
Y				1	1					
Y1	1						-1274.0	-1		
Y4	1274	1276	1276.5	1277	1278	1280	1282			
Y5		61	185	1112	1173	1318	4101			
$S		100	195	[illegible]	340	[illegible]	[illegible]			
$E	1265.5	1268	1270	1271	1272	1273	1274			
$$	1274									
$D	1276.5	3.0	11.5	40						
K	99									
A										
A										
A1										
A										
A										

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	1276.5	278.6	880
2) Design High Water (Max. Design Pool)	NA		
3) Auxiliary Spillway Crest	NA		
4) Pool Level with Flashboards	NA		
5) Service Spillway Crest	1274.0	198.5	562

DISCHARGES

	Volume (cfs)
1) Average Daily	6.4
2) Spillway @ Maximum High Water	85
3) Spillway @ Design High Water	NA
4) Spillway @ Auxiliary Spillway Crest Elevation	NA
5) Low Level Outlet	NA
6) Total (of all facilities) @ Maximum High Water	85
7) Maximum Known Flood	NA
8) At Time of Inspection	None

CREST: ELEVATION: 1276.5

Type: COMPACTED EARTH

Width: 40' Length: 90'

Spillover

Location

SPILLWAY:

SERVICE		AUXILIARY
1274.0	Elevation	NONE
MASONRY DROP	Type	
8' (AVERAGE)	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 - _____

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

_____

Method of Controlled Releases (mechanisms):

NONE

_____

DRAINAGE AREA: 3.12 mi^2

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: Woods, open field, Some residential development

Terrain - Relief: Single basin, rather swampy, mild slopes

Surface - Soil: Burdett & Darien Series soils of glacial till origin

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

No alterations planned or anticipated

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

None evident

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

Many homes & cottages close to and along Mariaville Lake

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

Location: None

Elevation: _____

Reservoir:

Length @ Maximum Pool _____ (Miles)

Length of Shoreline (@ Spillway Crest) 4.22 (Miles)

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

Marlaville (F)

NEW YORK STATE
DEPT OF ENVIRONMENTAL CONSERVATION
FLOOD PROTECTION BUREAU

```
  1  A1  MARIAVILLE RESERVOIR
  2  A2  PHASE 1
  3  A3  PMF
  4  B   200      0      30       0       0       0       0       0       0       0
  5  H1    5
  6  J     1      6       1
  7  J1   .2     .4      .5      .6      .8       1
  8  K     0      1                       2       1       1
  9  K1  INFLOW FROM BASIN
 10  M     1      1    5.12
 11  P           19.5     111     123     133     142
 12  T                                                   1      .1
 13  W   3.11   .625
 14  X   -2.0   -.05       1
 15  K     1      1                       2       1       1
 16  K1  ROUTE THROUGH RESERVOIR
 17  Y                              1       1
 18  Y1    1                                         -1274.0    -1
 19  Y4 1274   1276  1276.5    1277    1278    1280    1282
 20  Y5          61      85     112     173     318     489
 21  SS         100     135     255     340     435     562
 22  SE1265.5   1268    1270    1271    1272    1273    1274
 23  SS 1274
 24  SD1276.5    3.0     1.5      90
 25  K    .55
 26  A
 27  A
 28  A
 29  A
 30  A
```

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	1
END OF NETWORK	

```
*********************************                                    *********************************
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
*********************************                                    *********************************

RUN  DATE 08/12/81
                     MARIAVILLE RESERVOIR
                     PHASE 1
                     PMF

                                         JOB SPECIFICATION
           NQ      NHR     NMIN     IDAY     IHR     IMIN    METRC      IPLT      IPRT     NSTAN
          200        0       30        0       0        0        0         0         0         0
                                   JOPER     NWT    LROPT    TRACE
                                       5       0        0        0

                              MULTI-PLAN ANALYSES TO BE PERFORMED
                                 NPLAN= 1 NRTIO= 6 LRTIO= 1
                 RTIOS=   0.20   1.40   0.50   0.60   0.80   1.00

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

                                   SUB-AREA RUNOFF COMPUTATION

            INFLOW FROM BASIN
                         ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                             1       0       0       0       2       1       1       0       0

                                        HYDROGRAPH DATA
            IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
                1       1    3.12      0.    3.12      0.      0.       0       0       0

                                          PRECIP DATA
                        SPFE     PMS      R6     R12     R24     R48     R72     R96
                          0.   15.50  111.00  123.00  133.00  142.00     0.      0.
TRSPC COMPUTED BY THE PROGRAM IS 0.800

                                          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=  3.11     CP=0.63     NTA=  0

                                         RECESSION DATA
                       STRTQ=   -2.00     QRCSN=   -0.05     RTIOR= 1.00
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 7.21 AND R= 5.51 INTERVALS

            UNIT HYDROGRAPH 34 END-OF-PERIOD ORDINATES, LAG=   3.10 HOURS, CP= 0.63  VOL= 1.00
          24.      88.     175.     259.     350.     399.     411.     376.     316.     265.
         211.     185.     155.     129.     108.      91.      76.      63.      53.      44.
          37.      31.      26.      22.      18.      15.      13.      11.       9.       7.
           6.       5.       4.       4.

     0                                    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	6.	1.03	2.30	101	0.	0.	0.	571.
1.01	1.00	2	0.00	0.	0.00	6.	1.03	3.00	102	0.	0.	0.	481.
1.01	1.30	3	0.00	0.	0.00	6.	1.03	3.30	103	0.	0.	0.	404.
1.01	2.00	4	0.00	0.	0.00	6.	1.03	4.00	104	0.	0.	0.	339.
1.01	2.30	5	0.00	0.	0.00	6.	1.03	4.30	105	0.	0.	0.	284.
1.01	3.00	6	0.00	0.	0.00	6.	1.03	5.00	106	0.	0.	0.	266.
1.01	3.30	7	0.00	0.	0.00	6.	1.03	5.30	107	0.	0.	0.	266.
1.01	4.00	8	0.00	0.	0.00	6.	1.03	6.00	108	0.	0.	0.	266.
1.01	4.30	9	0.00	0.	0.00	6.	1.03	6.30	109	0.	0.	0.	266.
1.01	5.00	10	0.00	0.	0.00	6.	1.03	7.00	110	0.	0.	0.	266.
1.01	5.30	11	0.00	0.	0.00	6.	1.03	7.30	111	0.	0.	0.	266.
1.01	6.00	12	0.00	0.	0.00	6.	1.03	8.00	112	0.	0.	0.	266.
1.01	6.30	13	0.01	0.	0.01	6.	1.03	8.30	113	0.	0.	0.	266.
1.01	7.00	14	0.01	0.	0.01	6.	1.03	9.00	114	0.	0.	0.	266.
1.01	7.30	15	0.01	0.	0.01	6.	1.03	9.30	115	0.	0.	0.	266.
1.01	8.00	16	0.01	0.	0.01	6.	1.03	10.00	116	0.	0.	0.	266.
1.01	8.30	17	0.01	0.	0.01	6.	1.03	10.30	117	0.	0.	0.	266.
1.01	9.00	18	0.01	0.	0.01	6.	1.03	11.00	118	0.	0.	0.	266.
1.01	9.30	19	0.01	0.	0.01	6.	1.03	11.30	119	0.	0.	0.	266.
1.01	10.00	20	0.01	0.	0.01	6.	1.03	12.00	120	0.	0.	0.	266.
1.01	10.30	21	0.01	0.	0.01	6.	1.03	12.30	121	0.	0.	0.	266.
1.01	11.00	22	0.01	0.	0.01	6.	1.03	13.00	122	0.	0.	0.	266.
1.01	11.30	23	0.01	0.	0.01	6.	1.03	13.30	123	0.	0.	0.	266.
1.01	12.00	24	0.01	0.	0.01	6.	1.03	14.00	124	0.	0.	0.	266.
1.01	12.30	25	0.06	0.	0.06	6.	1.03	14.30	125	0.	0.	0.	266.
1.01	13.00	26	0.06	0.	0.06	6.	1.03	15.00	126	0.	0.	0.	266.
1.01	13.30	27	0.07	0.	0.07	6.	1.03	15.30	127	0.	0.	0.	266.
1.01	14.00	28	0.07	0.	0.07	6.	1.03	16.00	128	0.	0.	0.	266.
1.01	14.30	29	0.09	0.	0.09	6.	1.03	16.30	129	0.	0.	0.	266.
1.01	15.00	30	0.09	0.	0.09	6.	1.03	17.00	130	0.	0.	0.	266.
1.01	15.30	31	0.11	0.	0.11	6.	1.03	17.30	131	0.	0.	0.	266.
1.01	16.00	32	0.34	0.04	0.30	7.	1.03	18.00	132	0.	0.	0.	266.
1.01	16.30	33	0.08	0.03	0.05	11.	1.03	18.30	133	0.	0.	0.	266.
1.01	17.00	34	0.08	0.03	0.05	17.	1.03	19.00	134	0.	0.	0.	266.
1.01	17.30	35	0.06	0.01	0.05	26.	1.03	19.30	135	0.	0.	0.	266.
1.01	18.00	36	0.06	0.01	0.05	36.	1.03	20.00	136	0.	0.	0.	266.
1.01	18.30	37	0.01	0.	0.01	46.	1.03	20.30	137	0.	0.	0.	266.
1.01	19.00	38	0.01	0.	0.01	53.	1.03	21.00	138	0.	0.	0.	266.
1.01	19.30	39	0.01	0.	0.01	56.	1.03	21.30	139	0.	0.	0.	266.
1.01	20.00	40	0.01	0.	0.01	55.	1.03	22.00	140	0.	0.	0.	266.
1.01	20.30	41	0.01	0.	0.01	51.	1.03	22.30	141	0.	0.	0.	266.
1.01	21.00	42	0.01	0.	0.01	45.	1.03	23.00	142	0.	0.	0.	266.
1.01	21.30	43	0.01	0.	0.01	39.	1.03	23.30	143	0.	0.	0.	266.
1.01	22.00	44	0.01	0.	0.01	34.	1.04	0.	144	0.	0.	0.	266.
1.01	22.30	45	0.01	0.	0.01	29.	1.04	0.30	145	0.	0.	0.	266.
1.01	23.00	46	0.01	0.	0.01	26.	1.04	1.00	146	0.	0.	0.	266.
1.01	23.30	47	0.01	0.	0.01	22.	1.04	1.30	147	0.	0.	0.	266.
1.02	0.	48	0.01	0.	0.01	20.	1.04	2.00	148	0.	0.	0.	266.
1.02	0.30	49	0.05	0.00	0.05	18.	1.04	2.30	149	0.	0.	0.	266.
1.02	1.00	50	0.05	0.00	0.05	16.	1.04	3.00	150	0.	0.	0.	266.
1.02	1.30	51	0.05	0.00	0.05	15.	1.04	3.30	151	0.	0.	0.	266.
1.02	2.00	52	0.05	0.00	0.05	14.	1.04	4.00	152	0.	0.	0.	266.
1.02	2.30	53	0.05	0.00	0.05	14.	1.04	4.30	153	0.	0.	0.	266.
1.02	3.00	54	0.05	0.00	0.05	13.	1.04	5.00	154	0.	0.	0.	266.
1.02	3.30	55	0.05	0.00	0.05	14.	1.04	5.30	155	0.	0.	0.	266.
1.02	4.00	56	0.05	0.00	0.05	14.	1.04	6.00	156	0.	0.	0.	266.
1.02	4.30	57	0.05	0.00	0.05	14.	1.04	6.30	157	0.	0.	0.	266.
1.02	5.00	58	0.05	0.00	0.05	14.	1.04	7.00	158	0.	0.	0.	266.
1.02	5.30	59	0.05	0.00	0.05	14.	1.04	7.30	159	0.	0.	0.	266.
1.02	6.00	60	0.05	0.00	0.05	14.	1.04	8.00	160	0.	0.	0.	266.
1.02	6.30	61	0.16	0.11	0.05	17.	1.04	8.30	161	0.	0.	0.	266.

1.02	7.00	62	0.16	0.11	0.05	26.	1.04	9.00	162	0.	0.	0.	266.
1.02	7.30	63	0.16	0.11	0.05	44.	1.04	9.30	163	0.	0.	0.	266.
1.02	8.00	64	0.16	0.11	0.05	72.	1.04	10.00	164	0.	0.	0.	266.
1.02	8.30	65	0.16	0.11	0.05	108.	1.04	10.30	165	0.	0.	0.	266.
1.02	9.00	66	0.16	0.11	0.05	150.	1.04	11.00	166	0.	0.	0.	266.
1.02	9.30	67	0.16	0.11	0.05	192.	1.04	11.30	167	0.	0.	0.	266.
1.02	10.00	68	0.16	0.11	0.05	231.	1.04	12.00	168	0.	0.	0.	266.
1.02	10.30	69	0.16	0.11	0.05	264.	1.04	12.30	169	0.	0.	0.	266.
1.02	11.00	70	0.16	0.11	0.05	292.	1.04	13.00	170	0.	0.	0.	266.
1.02	11.30	71	0.16	0.11	0.05	315.	1.04	13.30	171	0.	0.	0.	266.
1.02	12.00	72	0.16	0.11	0.05	334.	1.04	14.00	172	0.	0.	0.	266.
1.02	12.30	73	0.87	0.82	0.05	368.	1.04	14.30	173	0.	0.	0.	266.
1.02	13.00	74	0.87	0.82	0.05	444.	1.04	15.00	174	0.	0.	0.	266.
1.02	13.30	75	1.04	0.99	0.05	583.	1.04	15.30	175	0.	0.	0.	266.
1.02	14.00	76	1.04	0.99	0.05	799.	1.04	16.00	176	0.	0.	0.	266.
1.02	14.30	77	1.30	1.25	0.05	1092.	1.04	16.30	177	0.	0.	0.	266.
1.02	15.00	78	1.30	1.25	0.05	1451.	1.04	17.00	178	0.	0.	0.	266.
1.02	15.30	79	1.58	1.53	0.05	1861.	1.04	17.30	179	0.	0.	0.	266.
1.02	16.00	80	5.00	4.95	0.05	2378.	1.04	18.00	180	0.	0.	0.	266.
1.02	16.30	81	1.21	1.16	0.05	3028.	1.04	18.30	181	0.	0.	0.	266.
1.02	17.00	82	1.21	1.16	0.05	3727.	1.04	19.00	182	0.	0.	0.	266.
1.02	17.30	83	0.95	0.90	0.05	4399.	1.04	19.30	183	0.	0.	0.	266.
1.02	18.00	84	0.95	0.90	0.05	4945.	1.04	20.00	184	0.	0.	0.	266.
1.02	18.30	85	0.08	0.03	0.05	5265.	1.04	20.30	185	0.	0.	0.	266.
1.02	19.00	86	0.08	0.03	0.05	5310.	1.04	21.00	186	0.	0.	0.	266.
1.02	19.30	87	0.08	0.03	0.05	5047.	1.04	21.30	187	0.	0.	0.	266.
1.02	20.00	88	0.08	0.03	0.05	4578.	1.04	22.00	188	0.	0.	0.	266.
1.02	20.30	89	0.08	0.03	0.05	4047.	1.04	22.30	189	0.	0.	0.	266.
1.02	21.00	90	0.08	0.03	0.05	3502.	1.04	23.00	190	0.	0.	0.	266.
1.02	21.30	91	0.08	0.03	0.05	2978.	1.04	23.30	191	0.	0.	0.	266.
1.02	22.00	92	0.08	0.03	0.05	2512.	1.05	0.	192	0.	0.	0.	266.
1.02	22.30	93	0.08	0.03	0.05	2120.	1.05	0.30	193	0.	0.	0.	266.
1.02	23.00	94	0.08	0.03	0.05	1793.	1.05	1.00	194	0.	0.	0.	266.
1.02	23.30	95	0.08	0.03	0.05	1518.	1.05	1.30	195	0.	0.	0.	266.
1.03	0.	96	0.08	0.03	0.05	1289.	1.05	2.00	196	0.	0.	0.	266.
1.03	0.30	97	0.	0.	0.	1096.	1.05	2.30	197	0.	0.	0.	266.
1.03	1.00	98	0.	0.	0.	933.	1.05	3.00	198	0.	0.	0.	266.
1.03	1.30	99	0.	0.	0.	794.	1.05	3.30	199	0.	0.	0.	266.
1.03	2.00	100	0.	0.	0.	675.	1.05	4.00	200	0.	0.	0.	266.

SUM 22.15 18.48 3.67 58859.
(563.)(469.)(93.)(2799.38)

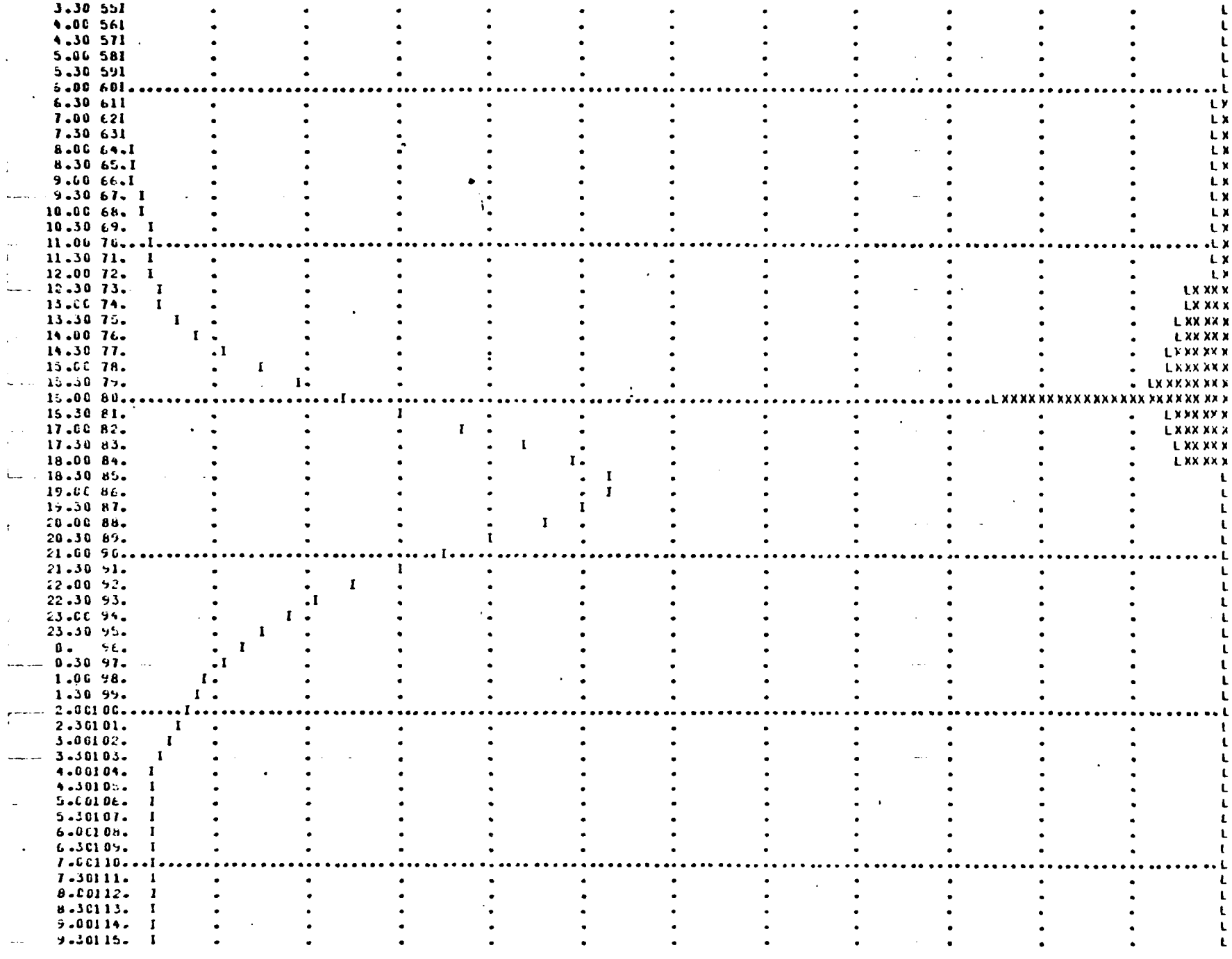
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5310.	4106.	1557.	679.	58859.
CMS	150.	116.	44.	19.	2774.
INCHES		12.94	18.57	24.30	24.52
MM		310.94	471.65	617.26	622.78
AC-FT		2030.	3088.	4042.	4078.
THOUS CU M		2511.	3809.	4985.	5030.

•JWF•

STATION 1

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

	0.	1000.	2000.	3000.	4000.	5000.	6000.	0.	0.	0.	0.	0.	0.
											PRECIP(L) AND EXCESS(X)		
	0.	0.	0.	0.	0.	0.	0.	0.	0.	6.	4.	2.	0.
0.30	11												L
1.00	21												L
1.30	31												L
2.00	41												L
2.30	51												L
3.00	61												L
3.30	71												L
4.00	81												L
4.30	91												L
5.00	101												L
5.30	111												L
6.00	121												L
6.30	131												L
7.00	141												L
7.30	151												L
8.00	161												L
8.30	171												L
9.00	181												L
9.30	191												L
10.00	201												L
10.30	211												L
11.00	221												L
11.30	231												L
12.00	241												L
12.30	251												L
13.00	261												L
13.30	271												L
14.00	281												L
14.30	291												L
15.00	301												L
15.30	311												LX
16.00	321												LLX
16.30	331												L
17.00	341												L
17.30	351												L
18.00	361												L
18.30	371												L
19.00	381												L
19.30	391												L
20.00	401												L
20.30	411												L
21.00	421												L
21.30	431												L
22.00	441												L
22.30	451												L
23.00	461												L
23.30	471												L
0.	481												L
0.30	491												L
1.00	501												L
1.30	511												L
2.00	521												L
2.30	531												L
3.00	541												L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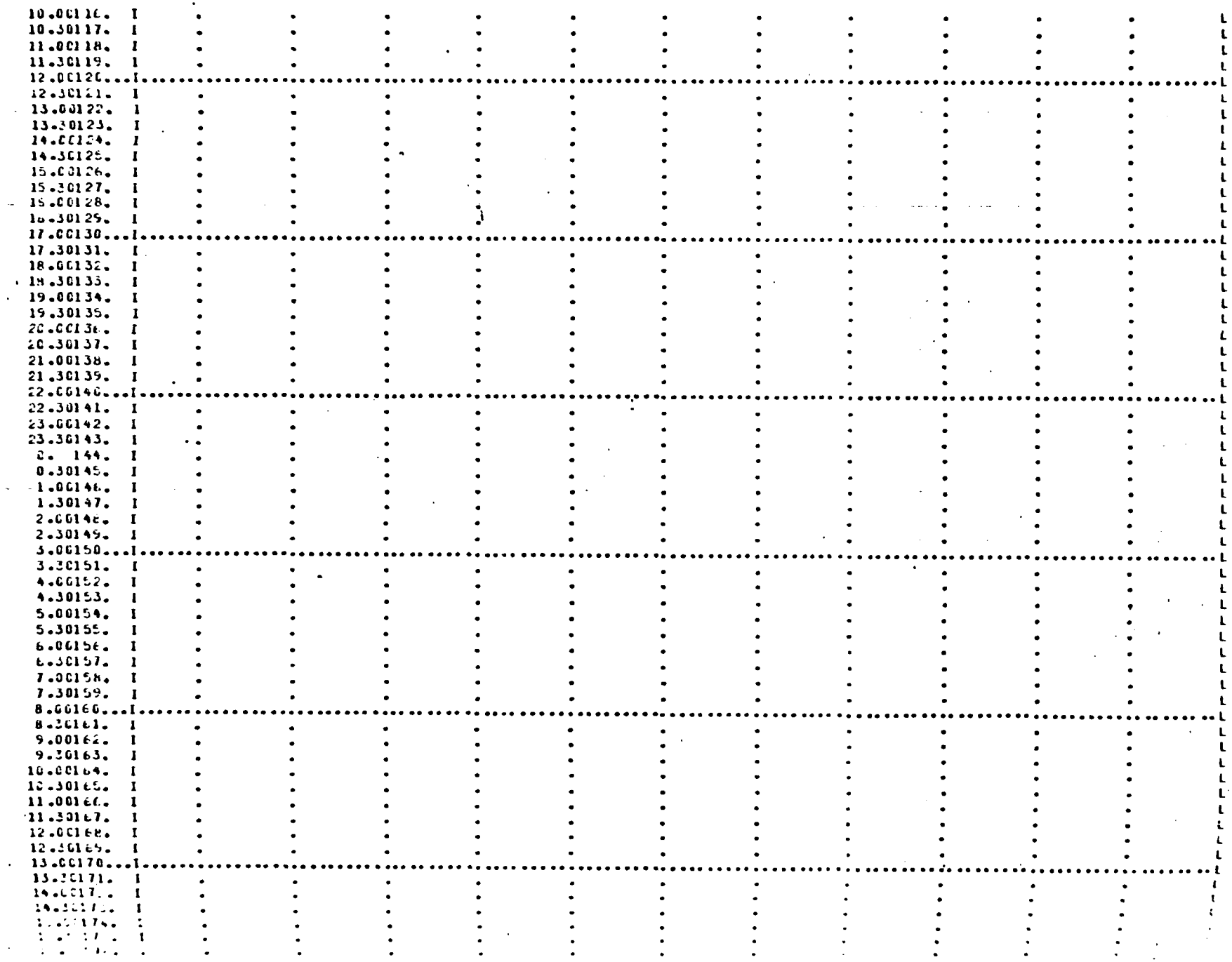

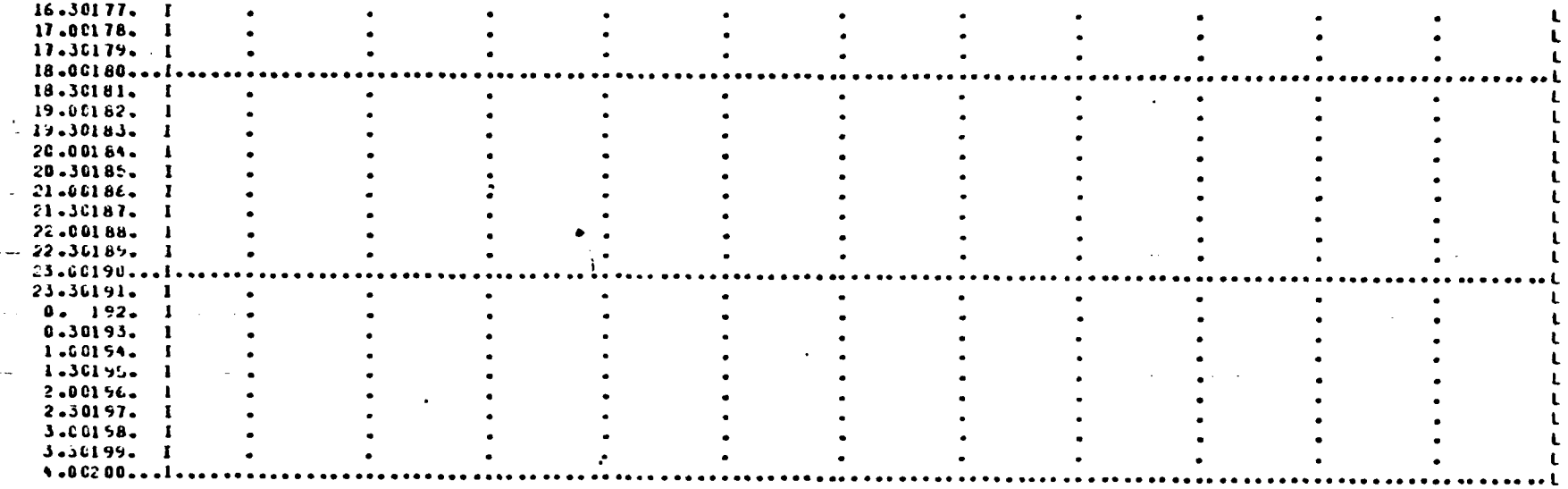
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0. 192.
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1.00194.
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2.30197.
3.00198.
3.30199.
4.00200.

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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.	1.	2.	3.	5.	7.	9.	11.	11.	11.
10.	9.	8.	7.	6.	5.	4.	4.	4.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	5.	9.	14.	22.	30.	38.	46.	53.	58.
63.	67.	74.	89.	117.	160.	218.	290.	372.	476.
606.	745.	880.	989.	1053.	1062.	1009.	913.	809.	700.
596.	502.	424.	359.	304.	258.	213.	187.	159.	135.
114.	96.	81.	68.	57.	53.	53.	53.	53.	53.
53.	53.	53.	53.	53.	52.	53.	53.	53.	53.
53.	53.	53.	53.	53.	53.	53.	53.	53.	53.
53.	53.	53.	53.	53.	53.	53.	53.	53.	53.
53.	53.	53.	53.	53.	53.	53.	53.	53.	53.
53.	53.	53.	53.	53.	52.	53.	53.	53.	53.
53.	53.	53.	53.	53.	53.	53.	53.	53.	53.
53.	53.	53.	53.	53.	53.	53.	53.	53.	53.
53.	53.	53.	53.	53.	53.	53.	53.	53.	53.
53.	53.	53.	53.	53.	53.	53.	53.	53.	53.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1062.	831.	311.	130.	19737.
CMS	30.	23.	9.	4.	559.
INCHES		2.45	3.71	4.86	4.90
MM		62.19	94.33	123.45	124.56
AC-FT		407.	618.	808.	816.
THOUS CU M		502.	762.	997.	1006.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	3.	4.	7.	10.	15.	19.	21.	23.	22.
20.	18.	16.	14.	12.	10.	9.	8.	7.	6.
6.	6.	5.	5.	5.	5.	6.	6.	6.	6.
7.	10.	18.	29.	43.	60.	77.	93.	106.	117.
125.	134.	147.	177.	233.	319.	437.	580.	744.	951.
1211.	1491.	1760.	1978.	2106.	2124.	2017.	1831.	1619.	1401.
1191.	1005.	848.	717.	607.	516.	439.	373.	318.	270.
228.	193.	162.	136.	114.	106.	106.	106.	106.	106.
106.	106.	106.	106.	106.	106.	106.	106.	106.	106.
106.	106.	106.	106.	106.	106.	106.	106.	106.	106.
106.	106.	106.	106.	106.	106.	106.	106.	106.	106.
106.	106.	106.	106.	106.	106.	106.	106.	106.	106.
106.	106.	106.	106.	106.	106.	106.	106.	106.	106.
106.	106.	106.	106.	106.	106.	106.	106.	106.	106.
106.	106.	106.	106.	106.	106.	106.	106.	106.	106.
106.	106.	106.	106.	106.	106.	106.	106.	106.	106.
106.	106.	106.	106.	106.	106.	106.	106.	106.	106.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2124.	[illegible]	623.	272.	[illegible]
CMS	60.	47.	18.	8.	1118.
INCHES		[illegible]	7.43	9.72	9.81
MM		[illegible]	[illegible]	[illegible]	249.11
AC-FT		[illegible]	[illegible]	[illegible]	[illegible]

THOUS CU M			1005.	1524.	1594.		2012.		

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 3

3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	4.	5.	8.	13.	18.	23.	27.	28.	28.
25.	23.	20.	17.	15.	13.	11.	10.	9.	8.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
8.	13.	22.	36.	54.	75.	95.	116.	132.	145.
158.	167.	184.	222.	292.	399.	546.	726.	930.	1189.
1514.	1864.	2200.	2472.	2632.	2655.	2523.	2259.	2023.	1751.
1489.	1256.	1060.	898.	759.	644.	548.	467.	397.	337.
286.	241.	202.	169.	142.	133.	133.	133.	133.	133.
133.	133.	133.	133.	133.	133.	133.	133.	133.	133.
133.	133.	133.	133.	133.	133.	133.	133.	133.	133.
133.	133.	133.	133.	133.	133.	133.	133.	133.	133.
133.	133.	133.	133.	133.	133.	133.	133.	133.	133.
133.	133.	133.	133.	133.	133.	133.	133.	133.	133.
133.	133.	133.	133.	133.	133.	133.	133.	133.	133.
133.	133.	133.	133.	133.	133.	133.	133.	133.	133.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2655.	2013.	779.	340.	49342.
CMS	75.	58.	22.	10.	1397.
INCHES		6.12	9.28	12.15	12.26
MM		155.47	235.83	308.63	311.39
AC-FT		1018.	1544.	2021.	2049.
THOUS CU M		1256.	1905.	2493.	2519.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 4

4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	6.	10.	16.	22.	28.	32.	34.	33.
31.	27.	24.	20.	18.	15.	13.	12.	11.	10.
9.	8.	8.	8.	8.	8.	8.	8.	8.	9.
10.	15.	26.	43.	65.	90.	115.	139.	159.	175.
189.	201.	221.	256.	350.	479.	655.	871.	1117.	1427.
1817.	2236.	2639.	2957.	3159.	3186.	3028.	2747.	2428.	2101.
1787.	1507.	1272.	1076.	911.	773.	658.	560.	477.	405.
343.	289.	243.	203.	170.	159.	159.	159.	159.	159.
159.	159.	159.	159.	159.	159.	159.	159.	159.	159.
159.	159.	159.	159.	159.	159.	159.	159.	159.	159.
159.	159.	159.	159.	159.	159.	159.	159.	159.	159.
159.	159.	159.	159.	159.	159.	159.	159.	159.	159.
159.	159.	159.	159.	159.	159.	159.	159.	159.	159.
159.	159.	159.	159.	159.	159.	159.	159.	159.	159.
159.	159.	159.	159.	159.	159.	159.	159.	159.	159.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3186.	2413.	934.	409.	59210.
CMS	90.	68.	26.	12.	1677.
INCHES		7.34	11.14	14.58	14.71
MM		186.56	282.99	370.35	373.67

AC-FT	12[illegible].	1853.	2420.	2447.
THOUS CU M	1507.	2286.	2591.	3018.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 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.	6.	8.	14.	21.	25.	37.	43.	45.	44.
41.	36.	31.	27.	24.	20.	18.	16.	14.	13.
12.	11.	11.	11.	11.	11.	11.	11.	11.	11.
13.	21.	35.	58.	87.	120.	154.	185.	212.	234.
252.	267.	294.	355.	466.	635.	873.	1151.	1489.	1503.
2423.	2982.	3519.	3936.	4212.	4248.	4037.	3552.	3238.	2801.
2382.	2010.	1696.	1434.	1215.	1031.	877.	747.	636.	540.
457.	385.	323.	271.	227.	212.	212.	212.	212.	212.
212.	212.	212.	212.	212.	212.	212.	212.	212.	212.
212.	212.	212.	212.	212.	212.	212.	212.	212.	212.
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212.	212.	212.	212.	212.	212.	212.	212.	212.	212.
212.	212.	212.	212.	212.	212.	212.	212.	212.	212.
212.	212.	212.	212.	212.	212.	212.	212.	212.	212.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4248.	3285.	1246.	543.	78047.
CMS	120.	93.	35.	15.	2236.
INCHES		9.79	14.86	15.44	19.62
MM		248.75	377.32	393.41	498.22
AC-FT		1623.	2471.	3235.	3252.
THOUS CU M		2009.	3047.	3588.	4024.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 6

6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
6.	7.	11.	17.	26.	36.	46.	53.	56.	55.
51.	45.	39.	34.	29.	26.	22.	20.	18.	16.
15.	14.	14.	13.	14.	14.	14.	14.	14.	14.
17.	26.	44.	72.	108.	150.	192.	231.	264.	252.
315.	334.	368.	444.	583.	799.	1092.	1431.	1861.	2378.
3028.	3727.	4399.	4945.	5265.	5310.	5047.	4578.	4047.	3502.
2978.	2512.	2120.	1793.	1518.	1285.	1056.	933.	754.	675.
571.	481.	404.	339.	284.	266.	266.	256.	266.	266.
266.	266.	266.	256.	266.	266.	266.	256.	266.	266.
266.	266.	266.	256.	266.	266.	266.	256.	266.	266.
266.	266.	266.	256.	266.	266.	266.	256.	266.	266.
266.	266.	266.	256.	266.	266.	266.	256.	266.	266.
266.	266.	256.	256.	266.	266.	266.	256.	266.	266.
266.	266.	266.	256.	266.	266.	266.	256.	266.	266.
266.	266.	266.	256.	266.	266.	266.	256.	266.	266.
266.	266.	266.	256.	266.	266.	266.	256.	266.	266.
[illegible]	[illegible]	[illegible]	256.	266.	266.	[illegible]	[illegible]	[illegible]	[illegible]

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

MM	310.94	471.65	617.26	624.71
AC-FT	2035.	3088.	4042.	4078.
THOUS CU M	2511.	3809.	4985.	5030.

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

HYDROGRAPH ROUTING

ROUTE THROUGH RESERVOIR

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	2	1	1	0	0

ROUTING DATA

GLOSS	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.	-1274.	-1

STAGE	1274.00	1276.00	1276.50	1277.00	1278.00	1280.00	1282.00
FLOW	0.	61.00	85.00	112.00	173.00	318.00	489.00
CAPACITY=	0.	100.	195.	265.	340.	435.	562.
ELEVATION=	1266.	1268.	1270.	1271.	1272.	1273.	1274.

CREL	SPWID	COGW	EXPW	ELEVL	COGL	CAREA	EXPL
1274.0	0.	0.	0.	0.	0.	0.	0.

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1276.5	3.0	1.5	50.

WARNING *** TOP OF DAM, BOTTOM OF BREACH, OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
BOTTOM OF RESERVOIR ASSUMED TO BE AT 1266.50
STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 1274.00

STATION 1, PLAN 1, RATIO 1

END-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.	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.	2.
2.	2.	2.	2.	2.	2.	2.	3.	3.	4.
4.	5.	6.	6.	7.	9.	10.	13.	16.	20.
25.	32.	39.	48.	58.	71.	87.	146.	215.	277.
324.	353.	368.	371.	366.	354.	339.	321.	302.	283.
264.	245.	228.	211.	195.	181.	169.	158.	149.	141.
134.	127.	122.	117.	112.	108.	105.	101.	99.	96.
94.	92.	90.	88.	87.	86.	85.	85.	84.	84.
83.	83.	82.	82.	81.	81.	80.	80.	80.	79.
79.	78.	78.	78.	77.	77.	76.	76.	76.	75.
75.	75.	74.	74.	74.	73.	73.	73.	72.	72.

72.	72.	71.	71.	71.	70.	70.	70.	70.	69.
69.	65.	69.	68.	68.	68.	68.	68.	67.	67.
67.	67.	66.	66.	66.	66.	66.	65.	65.	65.
65.	65.	64.	64.	64.	64.	64.	64.	63.	63.

STORAGE

562.	562.	562.	562.	562.	562.	562.	562.	562.	562.
563.	563.	563.	563.	563.	563.	563.	563.	563.	563.
563.	563.	563.	563.	563.	563.	563.	563.	563.	563.
563.	563.	563.	564.	564.	564.	564.	565.	565.	565.
565.	566.	567.	567.	567.	567.	567.	568.	568.	568.
568.	568.	568.	568.	568.	568.	568.	568.	568.	568.
568.	568.	569.	569.	570.	571.	572.	574.	576.	578.
580.	583.	585.	588.	592.	598.	605.	615.	628.	645.
666.	653.	725.	762.	802.	843.	883.	918.	946.	967.
981.	990.	994.	995.	993.	990.	986.	980.	975.	969.
963.	956.	950.	944.	938.	933.	928.	923.	919.	915.
912.	909.	906.	903.	901.	898.	896.	894.	892.	890.
888.	887.	885.	884.	882.	881.	880.	878.	877.	876.
874.	873.	872.	871.	870.	869.	867.	866.	865.	864.
863.	862.	861.	860.	859.	858.	857.	856.	855.	854.
853.	852.	851.	851.	850.	849.	848.	847.	846.	846.
845.	844.	843.	843.	842.	841.	840.	840.	839.	838.
838.	837.	836.	836.	835.	834.	834.	833.	833.	832.
831.	831.	830.	830.	829.	825.	828.	828.	827.	827.
826.	826.	825.	825.	824.	824.	823.	823.	823.	822.

STAGE

1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1
1274.1	1274.2	1274.2	1274.2	1274.2	1274.3	1274.3	1274.4	1274.5	1274.7
1274.8	1275.0	1275.3	1275.6	1275.9	1276.2	1276.5	1276.8	1277.0	1277.2
1277.3	1277.4	1277.4	1277.4	1277.4	1277.4	1277.3	1277.3	1277.2	1277.2
1277.2	1277.1	1277.1	1277.0	1277.0	1276.9	1276.9	1276.8	1276.8	1276.8
1276.8	1276.7	1276.7	1276.7	1276.7	1276.6	1276.6	1276.6	1276.6	1276.6
1276.6	1276.6	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5	1276.5
1276.5	1276.5	1276.4	1276.4	1276.4	1276.4	1276.4	1276.4	1276.4	1276.4
1276.4	1276.4	1276.4	1276.3	1276.3	1276.3	1276.3	1276.3	1276.3	1276.3
1276.3	1276.3	1276.3	1276.3	1276.3	1276.3	1276.3	1276.2	1276.2	1276.2
1276.2	1276.2	1276.2	1276.2	1276.2	1276.2	1276.2	1276.2	1276.2	1276.2
1276.2	1276.2	1276.2	1276.2	1276.1	1276.1	1276.1	1276.1	1276.1	1276.1
1276.1	1276.1	1276.1	1276.1	1276.1	1276.1	1276.1	1276.1	1276.1	1276.1
1276.1	1276.1	1276.1	1276.1	1276.1	1276.1	1276.1	1276.1	1276.1	1276.0

PEAK OUTFLOW IS 371. AT TIME 47.00 HOURS

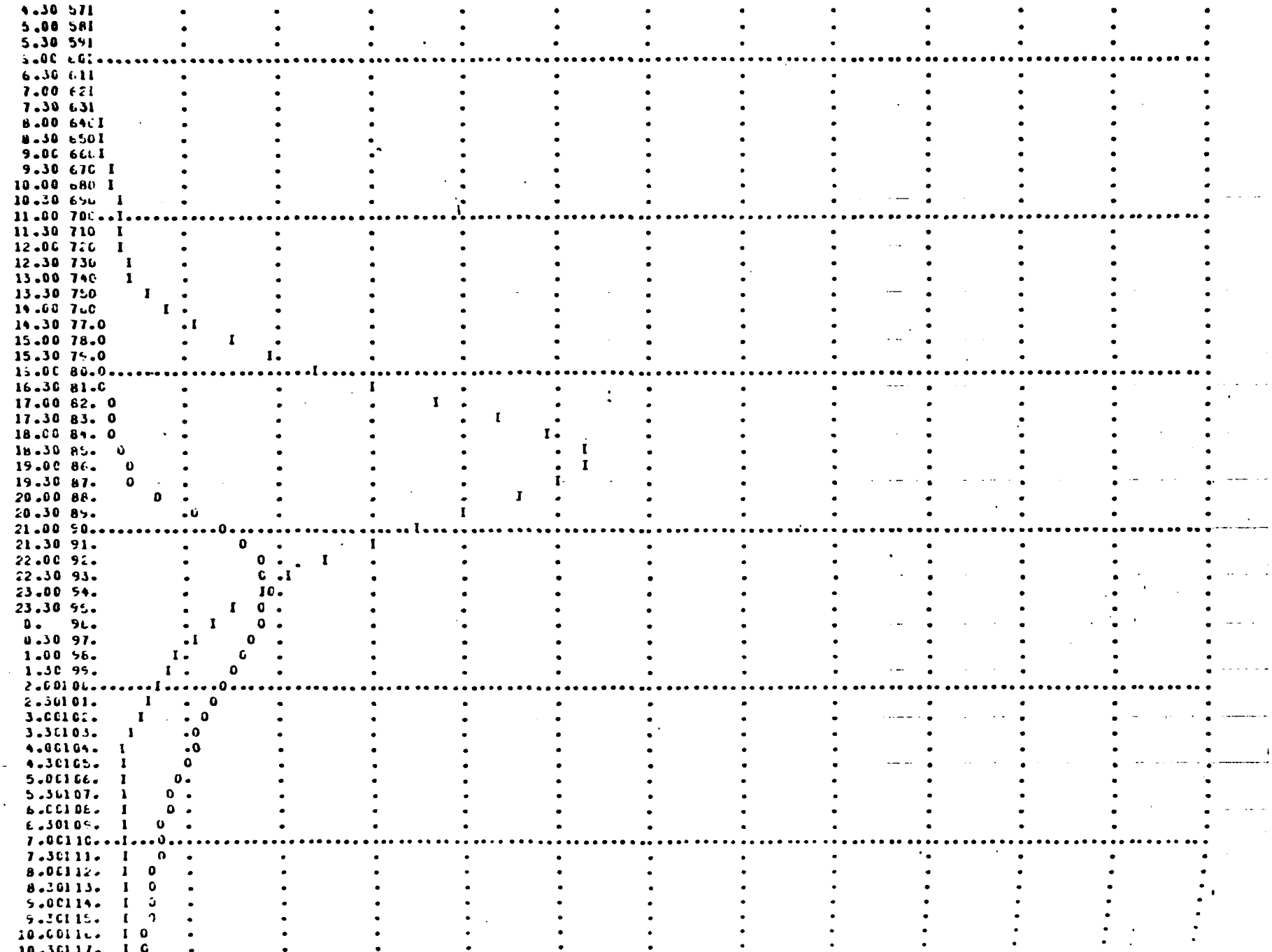
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	371.	325.	174.	93.	13445.
CMS	11.	9.	5.	3.	381.
INCHES		0.97	2.08	3.33	3.34
MM		24.56	52.82	84.66	84.85
AC-FT		161.	346.	554.	556.
THOUS CU M		199.	427.	684.	685.

•OVF•

STATION 1

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

	0.	200.	400.	600.	800.	1000.	1200.	0.	0.	0.	0.	0.	0.
0.30	11												
1.00	21												
1.30	31												
2.00	41												
2.30	51												
3.00	61												
3.30	71												
4.00	81												
4.30	91												
5.00	101												
5.30	111												
6.00	121												
6.30	131												
7.00	141												
7.30	151												
8.00	161												
8.30	171												
9.00	181												
9.30	191												
10.00	201												
10.30	211												
11.00	221												
11.30	231												
12.00	241												
12.30	251												
13.00	261												
13.30	271												
14.00	281												
14.30	291												
15.00	301												
15.30	311												
16.00	321												
16.30	331												
17.00	341												
17.30	351												
18.00	361												
18.30	371												
19.00	381												
19.30	391												
20.00	401												
20.30	411												
21.00	421												
21.30	431												
22.00	441												
22.30	451												
23.00	461												
23.30	471												
0.	481												
0.30	491												
1.00	501												
1.30	511												
2.00	521												
2.30	531												
3.00	541												
3.30	551												
4.00	561												



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11.00118.  I O
11.30119.  I O
12.00120...I.O.....
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13.00122.  I O
13.30123.  IO
14.00124.  IO
14.30125.  IO
15.00126.  IO
15.30127.  IO
16.00128.  IO
16.30129.  IO
17.00130...IO.....
17.30131.  IO
18.00132.  IO
18.30133.  IO
19.00134.  IO
19.30135.  IO
20.00136.  IO
20.30137.  IO
21.00138.  IO
21.30139.  IO
22.00140...IO.....
22.30141.  IO
23.00142.  IO
23.30143.  IO
 0.  144.  IO
 0.30145.  IO
 1.00146.  IO
 1.30147.  IO
 2.00148.  IO
 2.30149.  IO
 3.00150...IO.....
 3.30151.  IO
 4.00152.  IO
 4.30153.  IO
 5.00154.  IO
 5.30155.  IO
 6.00156.  IO
 6.30157.  IO
 7.00158.  IO
 7.30159.  IO
 8.00160...IO.....
 8.30161.  IO
 9.00162.  IO
 9.30163.  IO
10.00164.  IO
10.30165.  IO
11.00166.  IO
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13.00170...I.....
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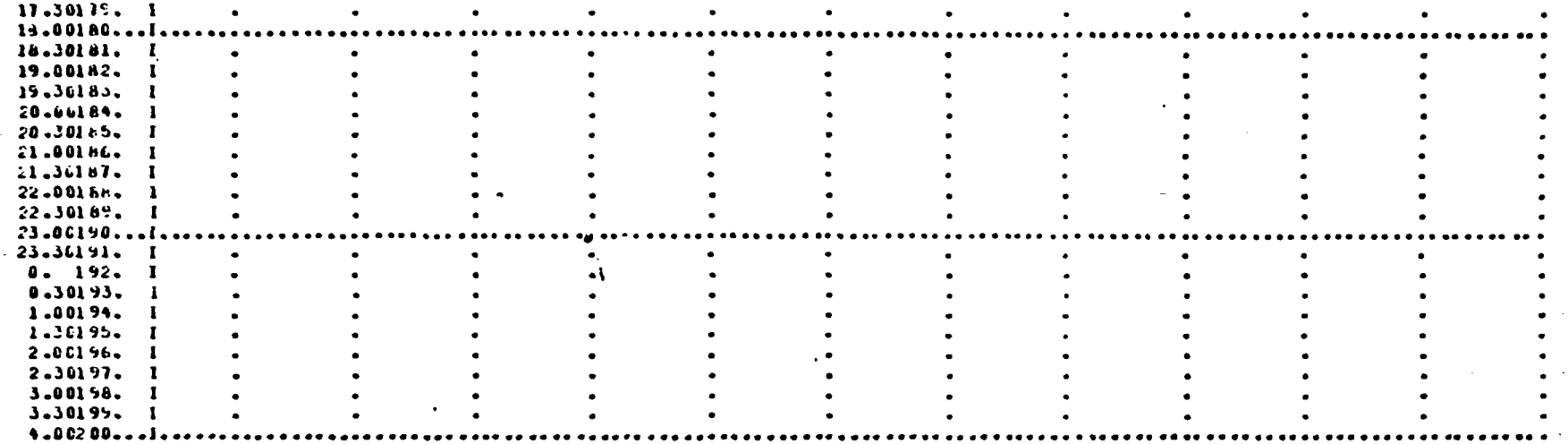
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0.30193. I
1.00194. I
1.30195. I
2.00196. I
2.30197. I
3.00198. I
3.30199. I
4.00200. I

•DVN•

WARNING *** TOP OF DAM, BOTTOM OF BREACH, OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
BOTTOM OF RESERVOIR ASSUMED TO BE AT 1275.50
STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 1274.00

STATION 1, PLAN 1, RATIO 2

END-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.	1.	1.	1.	1.	1.	2.
2.	2.	2.	2.	2.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	4.	4.	5.	6.	7.	8.
9.	10.	11.	13.	15.	17.	21.	26.	32.	40.
50.	64.	94.	251.	492.	756.	998.	1140.	1291.	1337.
1328.	1280.	1208.	1123.	1032.	943.	856.	775.	700.	632.
571.	515.	464.	419.	378.	342.	311.	286.	264.	246.
230.	216.	204.	194.	185.	178.	171.	166.	159.	155.
150.	146.	143.	140.	137.	135.	132.	130.	128.	127.
125.	124.	122.	121.	120.	119.	118.	117.	116.	116.
115.	114.	114.	113.	113.	112.	112.	112.	111.	111.
111.	110.	110.	110.	109.	109.	109.	109.	109.	109.
108.	108.	108.	108.	108.	108.	108.	108.	107.	107.
107.	107.	107.	107.	107.	107.	107.	107.	107.	107.
107.	107.	107.	107.	107.	107.	107.	107.	107.	107.
106.	106.	106.	106.	106.	106.	106.	106.	106.	106.

STORAGE

562.	562.	562.	562.	563.	563.	563.	563.	563.	563.
563.	563.	563.	563.	563.	564.	564.	564.	564.	564.
564.	564.	564.	564.	564.	564.	564.	565.	565.	565.
565.	565.	565.	565.	565.	566.	567.	567.	568.	569.
570.	571.	571.	572.	572.	572.	573.	573.	573.	573.
574.	574.	574.	574.	574.	574.	574.	574.	574.	574.
575.	575.	575.	576.	577.	579.	582.	585.	589.	594.
598.	603.	609.	615.	623.	633.	648.	664.	695.	728.
771.	824.	888.	958.	1027.	1089.	1138.	1173.	1193.	1201.
1200.	1191.	1178.	1162.	1145.	1127.	1110.	1093.	1077.	1062.
1047.	1033.	1020.	1008.	997.	987.	977.	970.	963.	956.
951.	946.	942.	938.	935.	931.	929.	926.	924.	922.
920.	918.	916.	915.	914.	912.	911.	910.	909.	908.
908.	907.	906.	906.	905.	904.	904.	903.	903.	903.
902.	902.	901.	901.	901.	901.	900.	900.	900.	900.
900.	899.	899.	899.	899.	899.	899.	899.	898.	898.
898.	898.	898.	898.	898.	898.	898.	898.	898.	898.
898.	898.	898.	898.	897.	897.	897.	897.	897.	897.
897.	897.	897.	897.	897.	897.	897.	897.	897.	897.
897.	897.	897.	897.	897.	897.	897.	897.	897.	897.

STAGE

1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.1
1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1
1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1

1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.2	1274.2	1274.2	1274.2
1274.3	1274.3	1274.4	1274.4	1274.5	1274.6	1274.7	1274.8	1275.0	1275.3
1275.6	1276.1	1276.6	1277.1	1277.7	1278.1	1278.5	1278.9	1279.0	1279.0
1279.0	1279.0	1278.9	1278.7	1278.6	1278.5	1278.3	1278.2	1278.1	1277.9
1277.8	1277.7	1277.6	1277.5	1277.4	1277.3	1277.3	1277.2	1277.2	1277.1
1277.1	1277.0	1277.0	1277.0	1276.9	1276.9	1276.9	1276.8	1276.8	1276.8
1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.7	1276.7	1276.7
1276.7	1276.7	1276.7	1276.7	1276.7	1276.7	1276.7	1276.7	1276.7	1276.7
1276.7	1276.7	1276.7	1276.7	1276.7	1276.7	1276.7	1276.7	1276.7	1276.7
1276.7	1276.7	1276.7	1276.7	1276.7	1276.7	1276.7	1276.7	1276.6	1276.6
1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6
1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6
1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6
1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6	1276.6

PEAK OUTFLOW IS 1337. AT TIME 45.00 HOURS

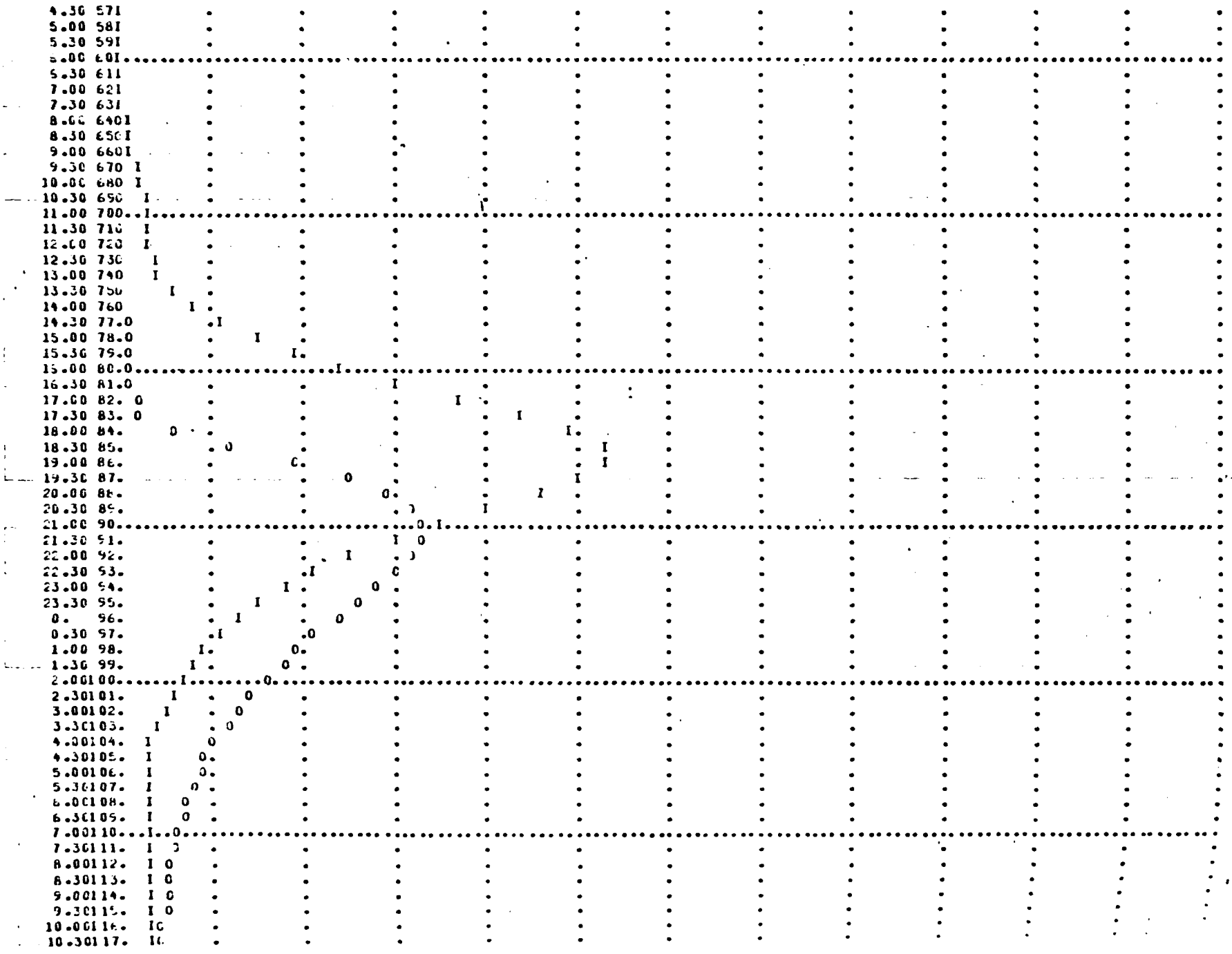
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1337.	1112.	486.	217.	31358.
CMS	38.	31.	14.	6.	888.
INCHES		3.31	5.79	7.78	7.79
MM		84.19	147.13	197.58	197.86
AC-FT		501.	963.	1294.	1296.
THOUS CU M		680.	1188.	1596.	1599.

DWF

STATION 1

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

	0.	400.	800.	1200.	1600.	2000.	2400.	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	34I												
17.30	35I												
18.00	36I												
18.30	37I												
19.00	38OI												
19.30	39OI												
20.00	40OI												
20.30	41OI												
21.00	42I												
21.30	43I												
22.00	44I												
22.30	45I												
23.00	46I												
23.30	47I												
0.	48I												
0.30	49I												
1.00	50I												
1.30	51I												
2.00	52I												
2.30	53I												
3.00	54I												
3.30	55I												
4.00	56I												



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14.30125.  I
15.00126.  I
15.30127.  I
16.00128.  I
16.30129.  I
17.00130...I.....
17.30131.  I
18.00132.  I
18.30133.  I
19.00134.  I
19.30135.  I
20.00136.  I
20.30137.  I
21.00138.  I
21.30139.  I
22.00140...I.....
22.30141.  I
23.00142.  I
23.30143.  I
 0.  144.  I
 0.30145.  I
 1.00146.  I
 1.30147.  I
 2.00148.  I
 2.30149.  I
 3.00150...I.....
 3.30151.  I
 4.00152.  I
 4.30153.  I
 5.00154.  I
 5.30155.  I
 6.00156.  I
 6.30157.  I
 7.00158.  I
 7.30159.  I
 8.00160...I.....
 8.30161.  I
 9.00162.  I
 9.30163.  I
10.00164.  I
10.30165.  I
11.00166.  I
11.30167.  I
12.00168.  I
12.30169.  I
13.00170...I.....
13.30171.  I
14.00172.  I
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15.00174.  I
15.30175.  I
16.00176.  I
16.30177.  I
17.00178.  I
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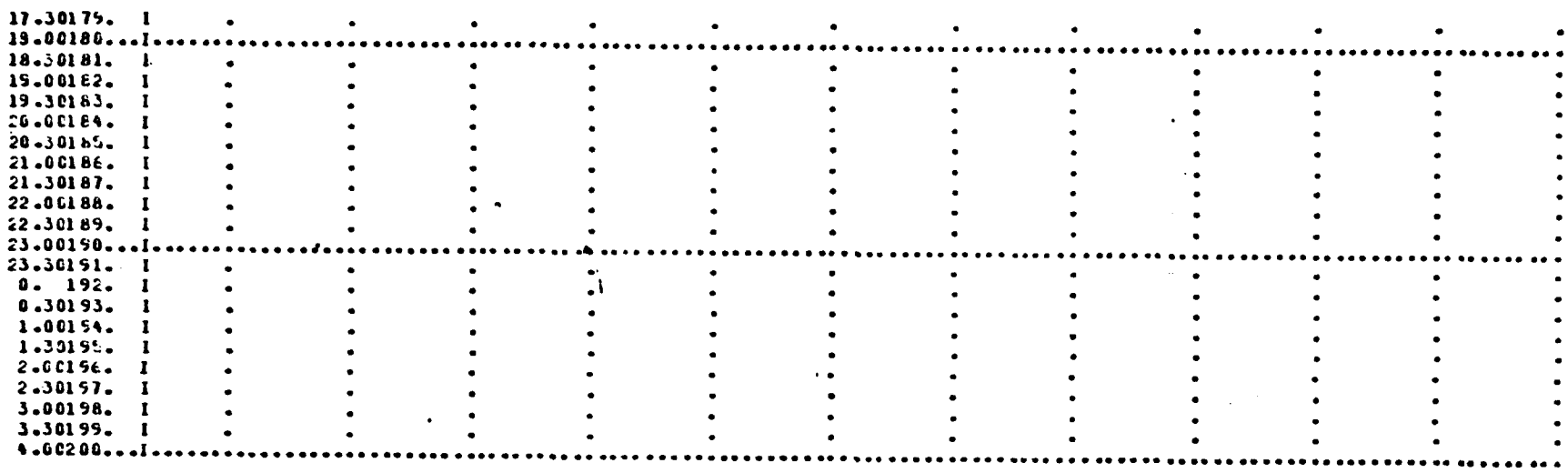
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21.30187. I
22.00188. I
22.30189. I
23.00190. I
23.30191. I
0. 192. I
0.30193. I
1.00194. I
1.30195. I
2.00196. I
2.30197. I
3.00198. I
3.30199. I
4.00200. I

•DAM•

WARNING *** TOP OF DAM, BOTTOM OF BREACH, OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
BOTTOM OF RESERVOIR ASSUMED TO BE AT 1265.50
STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 1274.00

STATION 1, PLAN 1, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

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.	2.	2.	2.
2.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	5.	5.	6.	7.	8.	9.
11.	12.	14.	16.	18.	21.	26.	32.	40.	50.
69.	95.	275.	553.	906.	1246.	1530.	1724.	1822.	1837.
1787.	1694.	1575.	1446.	1315.	1190.	1072.	963.	864.	775.
699.	622.	558.	501.	450.	405.	368.	337.	310.	288.
259.	253.	239.	227.	217.	208.	200.	193.	187.	182.
177.	173.	169.	165.	162.	160.	157.	155.	153.	151.
150.	148.	147.	146.	145.	144.	143.	142.	141.	140.
140.	139.	139.	138.	138.	137.	137.	137.	136.	136.
136.	135.	135.	135.	135.	135.	135.	134.	134.	134.
134.	134.	134.	134.	134.	134.	134.	133.	133.	133.
133.	133.	133.	133.	133.	133.	133.	133.	133.	133.
133.	133.	133.	133.	133.	133.	133.	133.	133.	133.
133.	133.	133.	133.	133.	133.	133.	133.	133.	133.

STORAGE

562.	562.	562.	563.	563.	563.	563.	563.	563.	563.
563.	563.	564.	564.	564.	564.	564.	564.	564.	564.
564.	565.	565.	565.	565.	565.	565.	565.	565.	563.
565.	566.	566.	566.	566.	567.	568.	569.	570.	571.
572.	573.	573.	574.	575.	575.	575.	576.	576.	576.
576.	577.	577.	577.	577.	577.	577.	577.	577.	578.
578.	578.	579.	580.	581.	584.	587.	591.	596.	601.
607.	613.	620.	628.	638.	651.	670.	695.	728.	770.
823.	850.	866.	1045.	1120.	1185.	1235.	1257.	1283.	1285.
1277.	1262.	1242.	1220.	1197.	1175.	1153.	1132.	1112.	1093.
1076.	1059.	1044.	1030.	1017.	1005.	994.	985.	977.	970.
964.	959.	954.	950.	946.	943.	940.	938.	935.	933.
931.	929.	928.	926.	925.	924.	923.	922.	921.	920.
919.	918.	918.	918.	917.	917.	916.	916.	915.	915.
915.	915.	914.	914.	914.	914.	914.	913.	913.	913.
913.	913.	913.	913.	913.	912.	912.	912.	912.	912.
912.	912.	912.	912.	912.	912.	912.	912.	912.	912.
912.	912.	912.	912.	912.	912.	912.	912.	912.	912.
912.	912.	912.	912.	912.	912.	912.	912.	912.	912.
912.	912.	912.	912.	912.	912.	912.	912.	912.	912.

STAGE

1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.1	1274.1	1274.1
1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1
1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1

1274.1	1274.1	1274.1	1274.1	1274.2	1274.2	1274.2	1274.2	1274.3	1274.3
1274.4	1274.4	1274.5	1274.5	1274.6	1274.7	1274.8	1275.0	1275.3	1275.6
1276.1	1276.6	1277.2	1277.8	1278.4	1278.9	1279.3	1279.6	1275.7	1279.7
1279.6	1279.5	1279.4	1279.2	1279.0	1278.8	1278.7	1278.5	1278.3	1278.2
1278.0	1277.9	1277.8	1277.7	1277.6	1277.5	1277.4	1277.3	1277.3	1277.2
1277.2	1277.1	1277.1	1277.1	1277.0	1277.0	1277.0	1277.0	1276.9	1276.9
1276.9	1276.9	1276.9	1276.9	1276.9	1276.8	1276.8	1275.8	1276.8	1276.8
1276.8	1276.8	1276.8	1275.8	1276.8	1276.6	1276.8	1275.8	1276.8	1276.8
1276.8	1276.8	1276.8	1275.8	1276.8	1276.8	1276.8	1275.8	1276.8	1276.8
1276.8	1276.8	1276.8	1275.8	1276.8	1276.8	1276.8	1275.8	1276.8	1276.8
1276.8	1276.8	1276.8	1275.8	1276.8	1276.8	1276.8	1275.8	1276.8	1276.8
1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1275.8	1276.8	1276.8
1276.8	1276.8	1276.8	1275.8	1276.8	1276.8	1276.8	1275.8	1276.8	1276.8
1276.8	1276.8	1276.8	1275.8	1276.8	1276.8	1276.8	1275.8	1276.8	1276.8

PEAK OUTFLOW IS 1837. AT TIME 45.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1837.	1513.	643.	283.	40888.
CMS	52.	43.	18.	8.	1158.
INCHES		4.51	7.67	10.14	10.15
MM		114.56	194.91	257.56	258.03
AC-FT		750.	1276.	1686.	1690.
THOUS CU M		925.	1574.	2080.	2084.

.OVF.

STATION 1

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

```
          0.      400.      800.     1200.     1600.     2000.     2400.     2800.       0.       0.       0.       0.       0.
 0.30  11I
 1.00  21I
 1.30  31I
 2.00  41I
 2.30  51I
 3.00  61I
 3.30  71I
 4.00  81I
 4.30  91I
 5.00 101I.....................................................................................................
 5.30 111I
 6.00 121I
 6.30 131I
 7.00 141I
 7.30 151I
 8.00 161I
 8.30 171I
 9.00 181I
 9.30 191I
10.00 201I.....................................................................................................
10.30 211I
11.00 221I
11.30 231I
12.00 241I
12.30 251I
13.00 261I
13.30 271I
14.00 281I
14.30 291I
15.00 301I.....................................................................................................
15.30 311I
16.00 321I
16.30 331I
17.00 341I
17.30 351I
18.00 361I
18.30 371I
19.00 381I
19.30 391I
20.00 401I.....................................................................................................
20.30 411I
21.00 421I
21.30 431I
22.00 441I
22.30 451I
23.00 461I
23.30 471I
 0.    481I
 0.30 491I
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 3.00 541I
 3.30 551I
 4.00 561I
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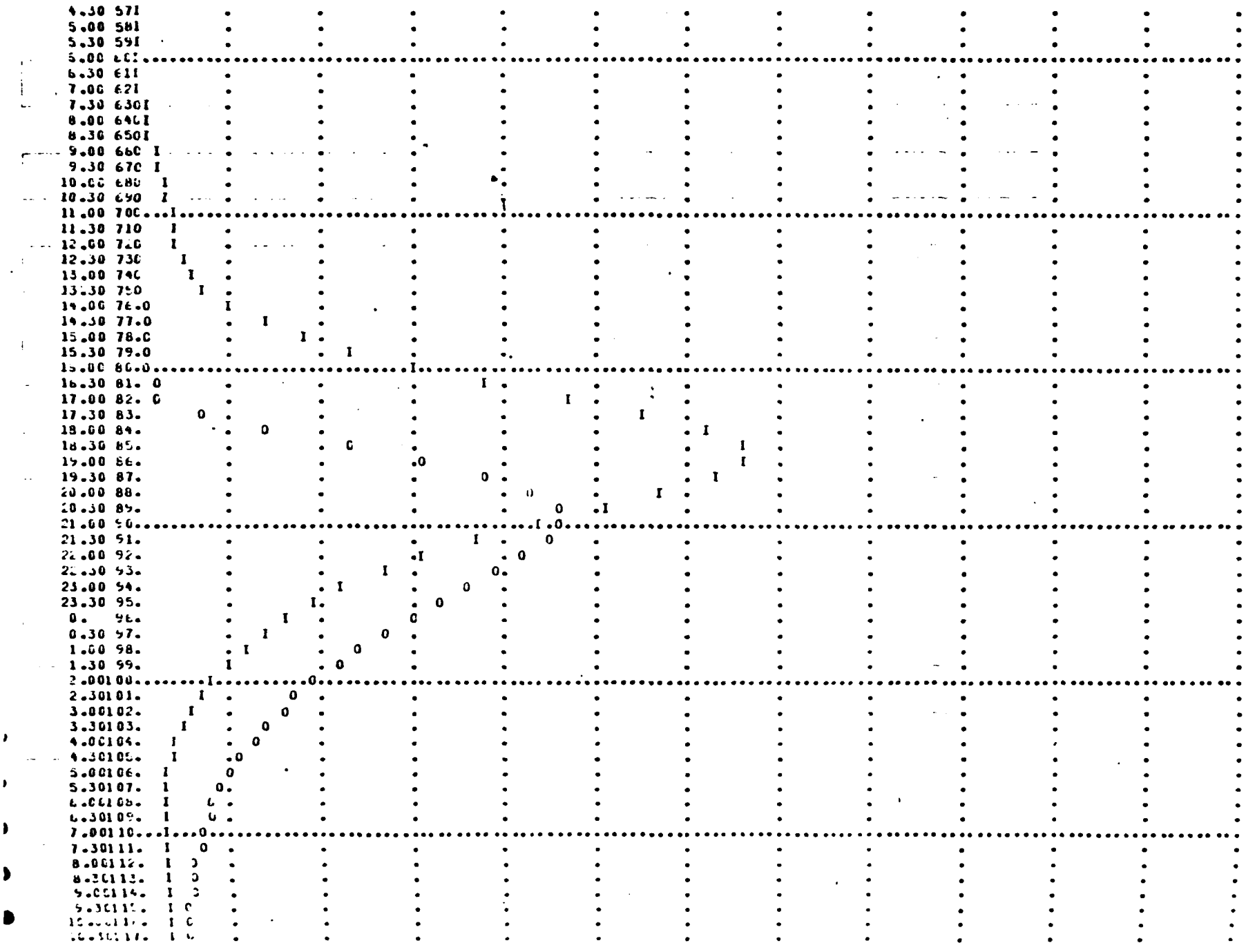

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16.30129.  IO
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17.30131.  IO
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19.00134.  IO
19.30135.  IO
20.00136.  IO
20.30137.  IO
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21.30139.  IO
22.00140...IO.....
22.30141.  I
23.00142.  I
23.30143.  I
 0. 144.   I
 0.30145.  I
 1.00146.  I
 1.30147.  I
 2.00148.  I
 2.30149.  I
 3.00150...I.....
 3.30151.  I
 4.00152.  I
 4.30153.  I
 5.00154.  I
 5.30155.  I
 6.00156.  I
 6.30157.  I
 7.00158.  I
 7.30159.  I
 8.00160...I.....
 8.30161.  I
 9.00162.  I
 9.30163.  I
10.00164.  I
10.30165.  I
11.00166.  I
11.30167.  I
12.00168.  I
12.30169.  I
13.00170...I.....
13.30171.  I
14.00172.  I
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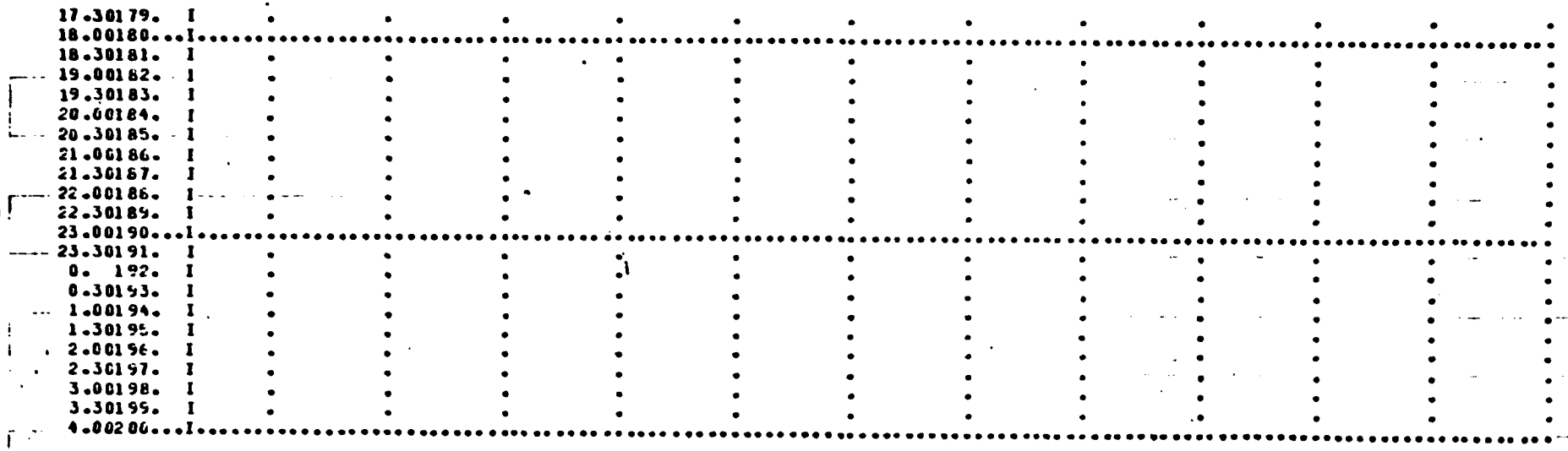
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23.00190. I
23.30191. I
0. 192. I
0.30193. I
1.00194. I
1.30195. I
2.00196. I
2.30197. I
3.00198. I
3.30199. I
4.00200. I

•OVN•

WARNING *** TOP OF DAM, BOTTOM OF BREACH, OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
BOTTOM OF RESERVOIR ASSUMED TO BE AT 1265.50
STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 1274.00

STATION 1, PLAN 1, RATIO 4

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

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.	2.	2.	2.	3.
3.	3.	3.	3.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	5.
5.	5.	5.	5.	6.	6.	7.	8.	10.	11.
13.	15.	17.	19.	22.	26.	31.	38.	48.	60.
83.	234.	531.	921.	1346.	1744.	2059.	2261.	2342.	2322.
2229.	2087.	1923.	1751.	1582.	1422.	1274.	1139.	1018.	909.
811.	723.	646.	578.	517.	464.	420.	384.	353.	328.
306.	288.	272.	259.	247.	237.	228.	221.	214.	208.
203.	199.	195.	191.	188.	185.	182.	180.	178.	176.
175.	173.	172.	171.	170.	169.	168.	167.	166.	166.
165.	164.	164.	154.	163.	163.	162.	162.	162.	162.
161.	161.	161.	151.	161.	161.	161.	150.	160.	160.
160.	160.	160.	150.	160.	160.	160.	150.	160.	160.
160.	160.	160.	160.	160.	160.	159.	159.	159.	159.
159.	159.	159.	159.	159.	159.	159.	159.	159.	159.
159.	159.	159.	159.	159.	159.	159.	159.	159.	159.

STORAGE

562.	562.	562.	553.	563.	563.	563.	563.	563.	563.
564.	564.	564.	554.	564.	564.	564.	565.	565.	565.
565.	565.	565.	555.	565.	566.	566.	556.	566.	566.
566.	566.	566.	557.	567.	568.	569.	570.	571.	573.
574.	575.	576.	577.	577.	578.	578.	579.	579.	579.
579.	579.	580.	580.	580.	580.	580.	580.	581.	581.
581.	581.	582.	583.	585.	588.	592.	597.	603.	609.
616.	624.	632.	641.	653.	665.	691.	722.	761.	811.
875.	952.	1037.	1123.	1203.	1270.	1320.	1350.	1362.	1359.
1345.	1324.	1299.	1271.	1244.	1216.	1190.	1165.	1142.	1121.
1101.	1082.	1065.	1049.	1036.	1020.	1009.	999.	990.	982.
976.	970.	965.	961.	957.	954.	950.	948.	945.	943.
941.	940.	938.	937.	935.	934.	933.	932.	932.	931.
930.	930.	929.	929.	928.	928.	927.	927.	927.	926.
926.	926.	926.	926.	925.	925.	925.	925.	925.	925.
925.	925.	925.	924.	924.	924.	924.	924.	924.	924.
924.	924.	924.	924.	924.	924.	924.	924.	924.	924.
924.	924.	924.	924.	924.	924.	924.	924.	924.	924.
924.	924.	924.	924.	924.	924.	924.	924.	924.	924.
924.	924.	924.	924.	924.	924.	924.	924.	924.	924.

STAGE

1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.1	1274.1	1274.1	1274.1
1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1
1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1

1274.1	1274.2	1274.2	1274.2	1274.2	1274.2	1274.2	1274.3	1274.3	1274.4
1274.4	1274.5	1274.5	1274.6	1274.7	1274.8	1275.0	1275.3	1275.6	1276.0
1276.5	1277.1	1277.7	1278.4	1279.0	1279.6	1280.0	1280.2	1280.3	1280.3
1280.2	1280.0	1279.8	1279.6	1279.4	1279.2	1278.9	1278.8	1278.6	1278.4
1278.2	1278.1	1278.0	1277.8	1277.7	1277.6	1277.5	1277.4	1277.4	1277.3
1277.3	1277.2	1277.2	1277.1	1277.1	1277.1	1277.1	1277.0	1277.0	1277.0
1277.0	1277.0	1277.0	1277.0	1276.9	1276.9	1276.9	1276.9	1276.9	1276.9
1276.9	1276.9	1276.9	1276.9	1276.9	1276.9	1276.9	1276.9	1276.9	1276.9
1276.9	1276.9	1276.9	1276.9	1276.9	1276.9	1276.9	1276.9	1276.9	1276.9
1276.9	1276.9	1276.9	1276.9	1276.9	1276.9	1276.9	1276.9	1276.9	1276.9
1276.9	1276.9	1276.9	1276.9	1276.9	1276.9	1276.8	1276.8	1276.8	1276.8
1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.8
1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.8
1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.8	1276.8

PEAK OUTFLOW IS 2342. AT TIME 44.50 HOURS

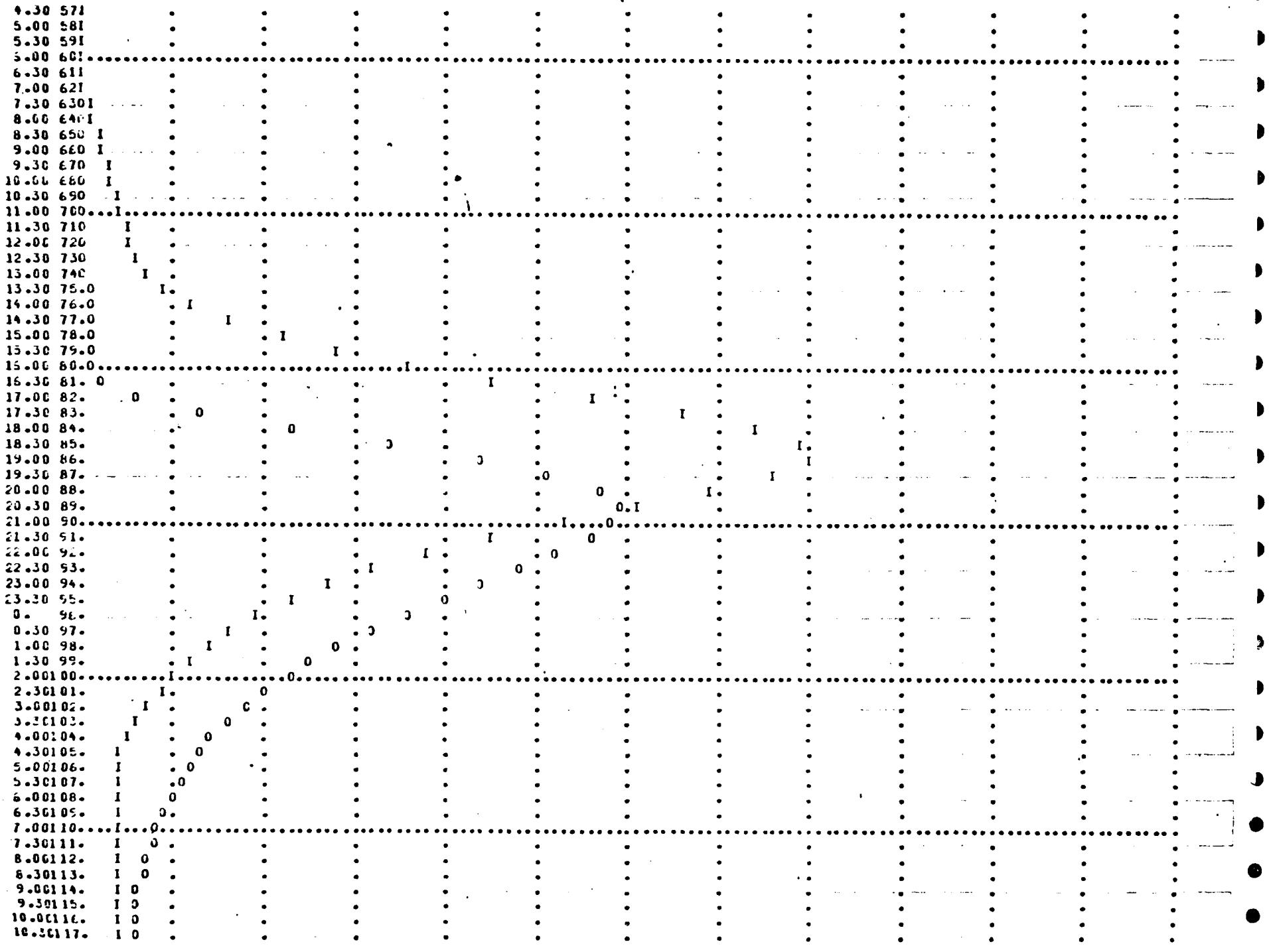
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2342.	1919.	801.	350.	5045.
CMS	66.	54.	23.	10.	142.9.
INCHES		5.72	9.56	12.52	12.54
MM		145.36	242.79	317.88	318.45
AC-FT		952.	1590.	2081.	2085.
THOUS CU M		1174.	1961.	2567.	2572.

DWF

STATION 1

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

	0.	400.	800.	1200.	1600.	2000.	2400.	2800.	3200.	0.	0.	0.	0.
0.30	11												
1.00	21												
1.30	31												
2.00	41												
2.30	51												
3.00	61												
3.30	71												
4.00	81												
4.30	91												
5.00	101												
5.30	111												
6.00	121												
6.30	131												
7.00	141												
7.30	151												
8.00	161												
8.30	171												
9.00	181												
9.30	191												
10.00	201												
10.30	211												
11.00	221												
11.30	231												
12.00	241												
12.30	251												
13.00	261												
13.30	271												
14.00	281												
14.30	291												
15.00	301												
15.30	311												
16.00	321												
16.30	331												
17.00	341												
17.30	351												
18.00	360I												
18.30	370I												
19.00	380I												
19.30	390I												
20.00	400I												
20.30	410I												
21.00	420I												
21.30	430I												
22.00	440I												
22.30	451												
23.00	461												
23.30	471												
0.	481												
0.30	491												
1.00	501												
1.30	511												
2.00	521												
2.30	531												
3.00	541												
3.30	551												
4.00	561												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6.00 60
6.30 61
7.00 62
7.30 630
8.00 640
8.30 650
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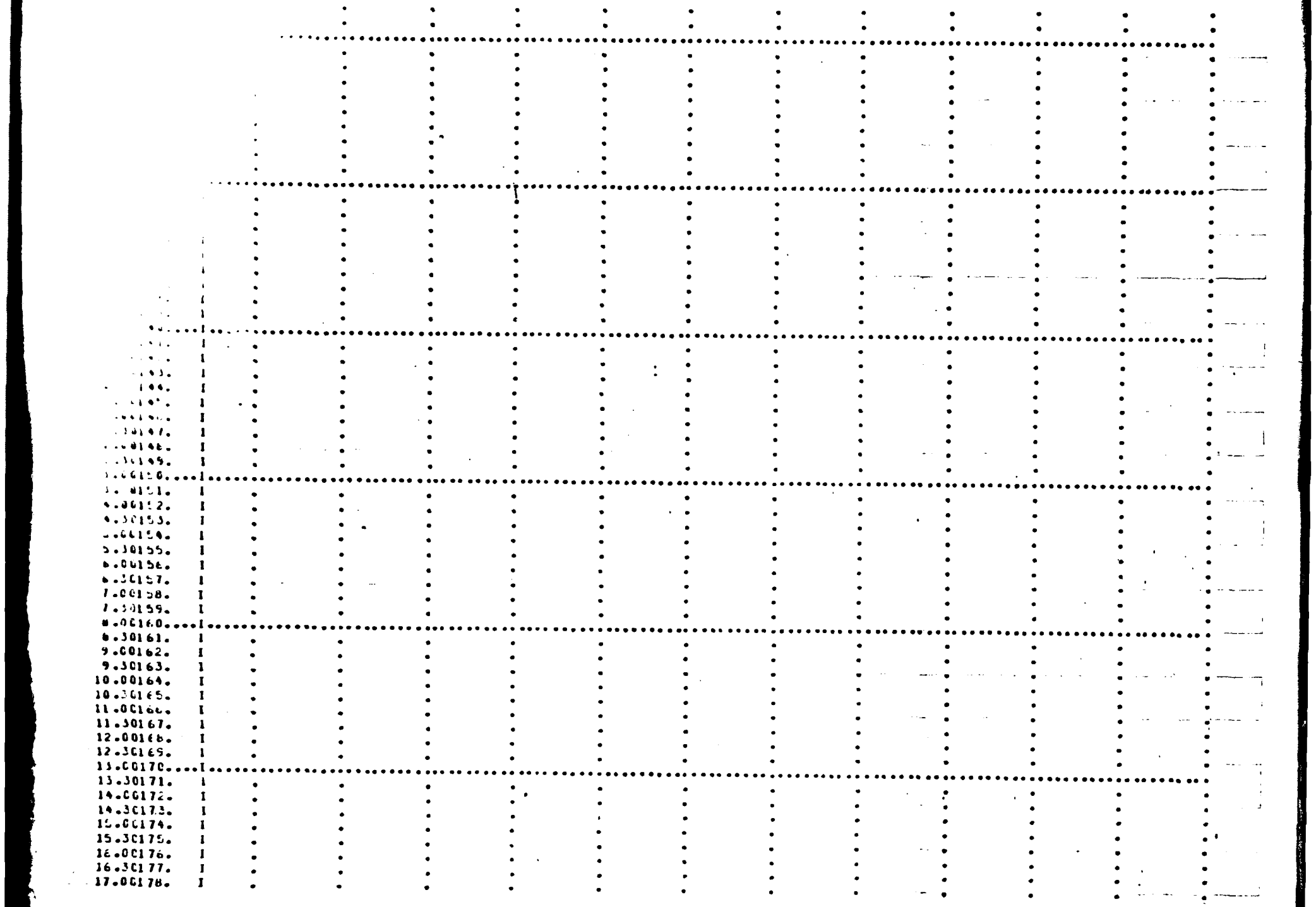
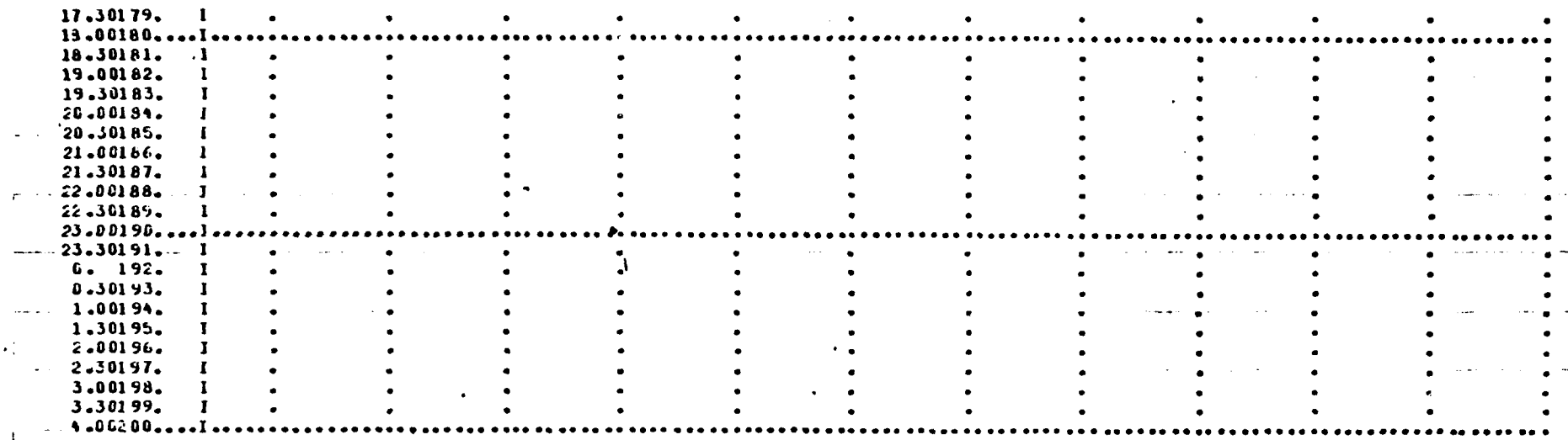
9.30 670
10.00 680
10.30 690
11.00 700
11.30 710
12.00 720
12.30 730
13.00 740
13.30 750
14.00 760
14.30 770
15.00 780
15.30 790
16.00 800
16.30 810
17.00 820
17.30 830
18.00 840
18.30 850
19.00 860
19.30 870
20.00 880
20.30 890
21.00 900
21.30 910
22.00 920
22.30 930
23.00 940
23.30 950
0. 960
0.30 970
1.00 980
1.30 990
2.00 1000
2.30 1010
3.00 1020
3.30 1030
4.00 1040
4.30 1050
5.00 1060
5.30 1070
6.00 1080
6.30 1090
7.00 1100
7.30 1110
8.00 1120
8.30 1130
9.00 1140
9.30 1150
10.00 1160
10.30 1170

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22.00188.
22.30189.
23.00190.
23.30191.
0. 192.
0.30193.
1.00194.
1.30195.
2.00196.
2.30197.
3.00198.
3.30199.
4.00200.

•DVN•

WARNING *** TOP OF DAM, BOTTOM OF BREACH, OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
BOTTOM OF RESERVOIR ASSUMED TO BE AT 1265.50
STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 1274.00

STATION 1, PLAN 1, RATIO 5

END-OF-PERIOD HYDROGRAPH ORDINATES

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.	1.	2.	2.	2.	2.	3.	3.	3.
4.	4.	4.	5.	5.	5.	5.	5.	5.	5.
6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
6.	6.	6.	7.	7.	8.	10.	11.	13.	15.
17.	20.	22.	25.	29.	34.	41.	51.	65.	101.
302.	654.	1132.	1693.	2246.	2749.	3119.	3317.	3354.	3262.
3081.	2845.	2588.	2330.	2083.	1859.	1654.	1470.	1305.	1159.
1029.	914.	811.	720.	641.	573.	517.	471.	434.	402.
376.	354.	335.	319.	306.	294.	284.	275.	268.	261.
255.	250.	246.	242.	239.	236.	233.	231.	229.	227.
225.	224.	223.	221.	220.	220.	219.	218.	217.	217.
216.	216.	216.	215.	215.	215.	214.	214.	214.	214.
214.	214.	213.	213.	213.	213.	213.	213.	213.	213.
213.	213.	213.	213.	213.	213.	213.	213.	213.	213.
213.	213.	213.	212.	212.	212.	212.	212.	212.	212.
212.	212.	212.	212.	212.	212.	212.	212.	212.	212.
212.	212.	212.	212.	212.	212.	212.	212.	212.	212.

STORAGE

562.	562.	563.	563.	563.	563.	563.	564.	564.	564.
564.	564.	565.	565.	565.	565.	565.	566.	566.	566.
566.	566.	566.	566.	567.	567.	567.	567.	567.	567.
568.	568.	568.	568.	569.	570.	571.	573.	574.	576.
578.	579.	580.	581.	582.	583.	584.	584.	584.	585.
585.	585.	586.	586.	586.	586.	586.	587.	587.	587.
587.	586.	589.	590.	593.	597.	602.	609.	616.	625.
634.	644.	655.	668.	683.	705.	735.	776.	827.	894.
975.	1067.	1164.	1260.	1348.	1419.	1469.	1495.	1500.	1488.
1464.	1433.	1397.	1350.	1324.	1289.	1255.	1224.	1196.	1169.
1144.	1122.	1101.	1081.	1064.	1048.	1034.	1022.	1012.	1004.
996.	990.	985.	980.	976.	972.	969.	966.	964.	962.
960.	958.	957.	955.	954.	953.	952.	951.	951.	950.
949.	949.	948.	948.	948.	947.	947.	947.	947.	946.
946.	946.	946.	946.	946.	946.	946.	946.	945.	945.
945.	945.	945.	945.	945.	945.	945.	945.	945.	945.
945.	945.	945.	945.	945.	945.	945.	945.	945.	945.
945.	945.	945.	945.	945.	945.	945.	945.	945.	945.
945.	945.	945.	945.	945.	945.	945.	945.	945.	945.
945.	945.	945.	945.	945.	945.	945.	945.	945.	945.

STAGE

1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.1	1274.1	1274.1	1274.1	1274.1	1274.1
1274.1	1274.1	1274.1	1274.2	1274.2	1274.2	1274.2	1274.2	1274.2	1274.2
1274.2	1274.2	1274.2	1274.2	1274.2	1274.2	1274.2	1274.2	1274.2	1274.2

1274.2	1274.2	1274.2	1274.2	1274.2	1274.3	1274.3	1274.4	1274.4	1274.5
1274.6	1274.6	1274.7	1274.8	1275.0	1275.1	1275.4	1275.7	1276.1	1276.6
1277.2	1278.0	1278.7	1279.5	1280.2	1280.8	1281.1	1281.4	1281.4	1281.3
1281.1	1280.9	1280.6	1280.3	1280.0	1279.7	1279.5	1279.2	1279.0	1278.8
1278.6	1278.4	1278.2	1278.1	1277.9	1277.8	1277.7	1277.6	1277.5	1277.5
1277.4	1277.4	1277.3	1277.3	1277.3	1277.2	1277.2	1277.2	1277.2	1277.1
1277.1	1277.1	1277.1	1277.1	1277.1	1277.1	1277.1	1277.1	1277.1	1277.1
1277.1	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0
1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0
1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0
1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0
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1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0
1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0	1277.0

PEAK OUTFLOW IS 3354. AT TIME 44.50 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3354.	2729.	1118.	483.	69690.
CMS	95.	77.	32.	14.	1973.
INCHES		8.14	13.34	17.29	17.32
MM		206.65	338.72	439.04	439.80
AC-FT		1353.	2218.	2875.	2890.
THOUS CU M		1669.	2736.	3546.	3552.

•JVF•

STATION 1

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

	0.	500.	1000.	1500.	2000.	2500.	3000.	3500.	4000.	4500.	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	34I												
17.30	35I												
18.00	36OI												
18.30	37OI												
19.00	38OI												
19.30	39OI												
20.00	40OI												
20.30	41OI												
21.00	42OI												
21.30	43OI												
22.00	44OI												
22.30	45I												
23.00	46I												
23.30	47I												
0.	48I												
0.30	49I												
1.00	50I												
1.30	51I												
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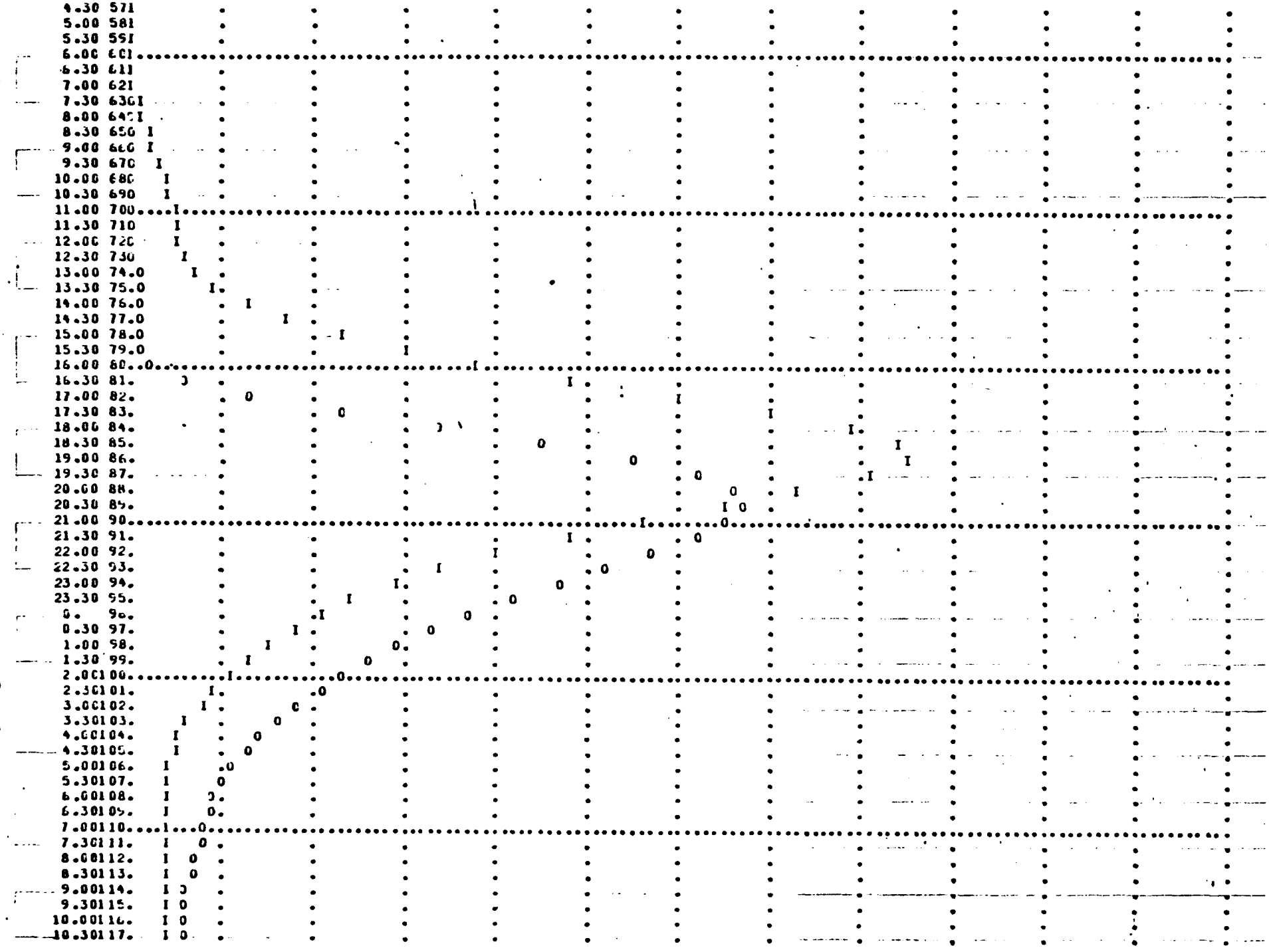
4.00	56I												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9.00 660
9.30 670
10.00 680
10.30 690
11.00 700
11.30 710
12.00 720
12.30 730
13.00 740
13.30 750
14.00 760
14.30 770
15.00 780
15.30 790
16.00 800
16.30 810
17.00 820
17.30 830
18.00 840
18.30 850
19.00 860
19.30 870
20.00 880
20.30 890
21.00 900
21.30 910
22.00 920
22.30 930
23.00 940
23.30 950
0. 960
0.30 970
1.00 980
1.30 990
2.00 1000
2.30 1010
3.00 1020
3.30 1030
4.00 1040
4.30 1050
5.00 1060
5.30 1070
6.00 1080
6.30 1090
7.00 1100
7.30 1110
8.00 1120
8.30 1130
9.00 1140
9.30 1150
10.00 1160
10.30 1170

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22.00188.   I
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23.00190....I.....
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 1.00194.   I
 1.30195.   I
 2.00196.   I
 2.30197.   I
 3.00198.   I
 3.30199.   I
 4.00200....I.....
```

•DVN•

WARNING *** TOP OF DAM, BOTTOM OF BREACH, OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
BOTTOM OF RESERVOIR ASSUMED TO BE AT 1255.50
STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 1274.00

STATION 1, PLAN 1, RATIO 6

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

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.	2.	2.	2.
2.	2.	2.	2.	2.	2.	3.	3.	4.	4.
5.	5.	6.	6.	6.	6.	6.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	8.
8.	8.	8.	8.	9.	10.	12.	14.	16.	19.
22.	25.	28.	32.	36.	43.	52.	65.	100.	265.
645.	1148.	1772.	2459.	3159.	3745.	4161.	4352.	4340.	4174.
3904.	3575.	3227.	2816.	2567.	2274.	2012.	1742.	1577.	1395.
1235.	1093.	967.	856.	758.	675.	608.	553.	509.	473.
442.	417.	396.	378.	363.	350.	339.	329.	321.	314.
309.	302.	298.	294.	290.	287.	285.	282.	280.	278.
277.	275.	274.	273.	272.	271.	271.	270.	270.	269.
269.	268.	268.	268.	267.	267.	267.	267.	267.	267.
266.	266.	266.	266.	266.	266.	266.	266.	266.	266.
266.	266.	266.	266.	266.	266.	266.	266.	266.	266.
266.	266.	266.	266.	266.	266.	266.	266.	266.	266.
266.	266.	266.	266.	266.	266.	266.	266.	266.	266.

STORAGE

562.	563.	563.	563.	563.	564.	564.	564.	564.	564.
565.	565.	565.	565.	566.	566.	566.	566.	566.	567.
567.	567.	567.	568.	568.	568.	568.	568.	568.	569.
569.	569.	569.	570.	571.	572.	573.	575.	578.	580.
582.	583.	585.	586.	587.	588.	589.	590.	590.	590.
591.	591.	591.	592.	592.	592.	592.	593.	593.	593.
594.	594.	595.	597.	601.	606.	612.	620.	630.	641.
652.	665.	678.	694.	714.	741.	778.	828.	893.	972.
1065.	1167.	1275.	1390.	1475.	1550.	1601.	1624.	1623.	1603.
1570.	1529.	1484.	1438.	1394.	1352.	1313.	1276.	1243.	1212.
1183.	1157.	1132.	1110.	1090.	1071.	1056.	1043.	1032.	1022.
1015.	1008.	1002.	997.	993.	989.	986.	983.	980.	978.
976.	975.	973.	972.	971.	970.	969.	968.	968.	967.
967.	966.	966.	965.	965.	965.	965.	964.	964.	964.
964.	964.	964.	964.	964.	964.	963.	963.	963.	963.
963.	963.	963.	963.	963.	963.	963.	963.	963.	963.
963.	963.	963.	963.	963.	963.	963.	963.	963.	963.
963.	963.	963.	963.	963.	963.	963.	963.	963.	963.
963.	963.	963.	963.	963.	963.	963.	963.	963.	963.
963.	963.	963.	963.	963.	963.	963.	963.	963.	963.

STAGE

1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0
1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.0	1274.1	1274.1
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1274.7	1274.8	1274.9	1275.0	1275.2	1275.4	1275.7	1276.1	1276.6	1277.2
1278.0	1278.8	1279.6	1280.4	1281.2	1281.8	1282.2	1282.4	1282.4	1282.2
1281.9	1281.6	1281.3	1280.9	1280.6	1280.2	1279.5	1279.6	1279.4	1279.1
1278.9	1278.7	1278.5	1278.3	1278.2	1278.0	1277.9	1277.8	1277.7	1277.6
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1277.2	1277.2	1277.2	1277.2	1277.2	1277.2	1277.2	1277.2	1277.2	1277.2

PEAK OUTFLOW IS 4352. AT TIME 44.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4352.	3533.	1435.	617.	88988.
CMS	123.	100.	41.	17.	2520.
INCHES		10.55	17.12	22.07	22.11
MM		268.00	434.78	560.64	561.59
AC-FT		1755.	2847.	3671.	3677.
THOUS CU M		2165.	3512.	4528.	4536.

•OVF•

STATION 1

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

	0.	1000.	2000.	3000.	4000.	5000.	6000.	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	34I												
17.30	35I												
18.00	36I												
18.30	37I												
19.00	38O I												
19.30	39O I												
20.00	40O I												
20.30	41O I												
21.00	42I												
21.30	43I												
22.00	44I												
22.30	45I												
23.00	46I												
23.30	47I												
0.	48I												
0.30	49I												
1.00	50I												
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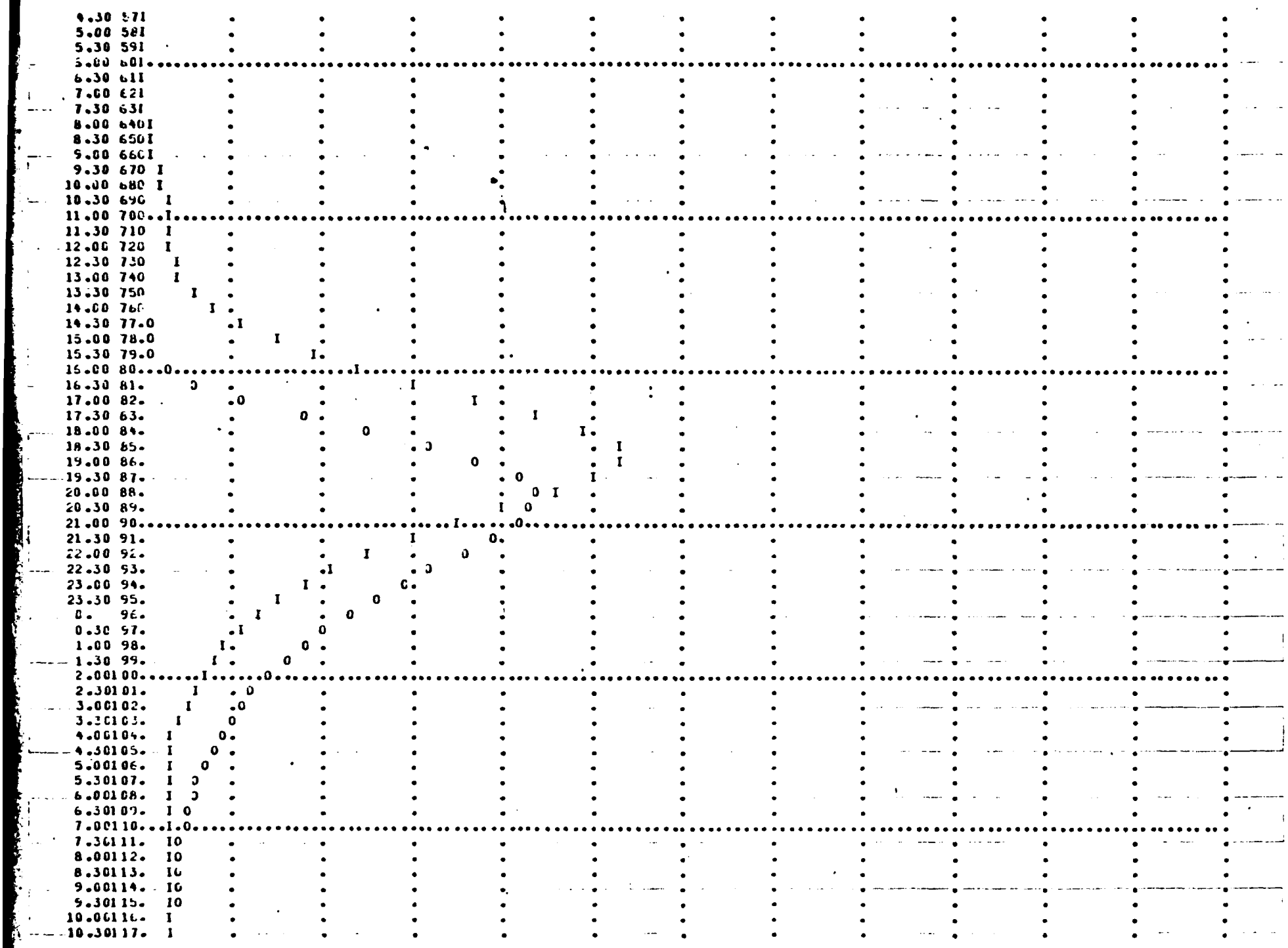

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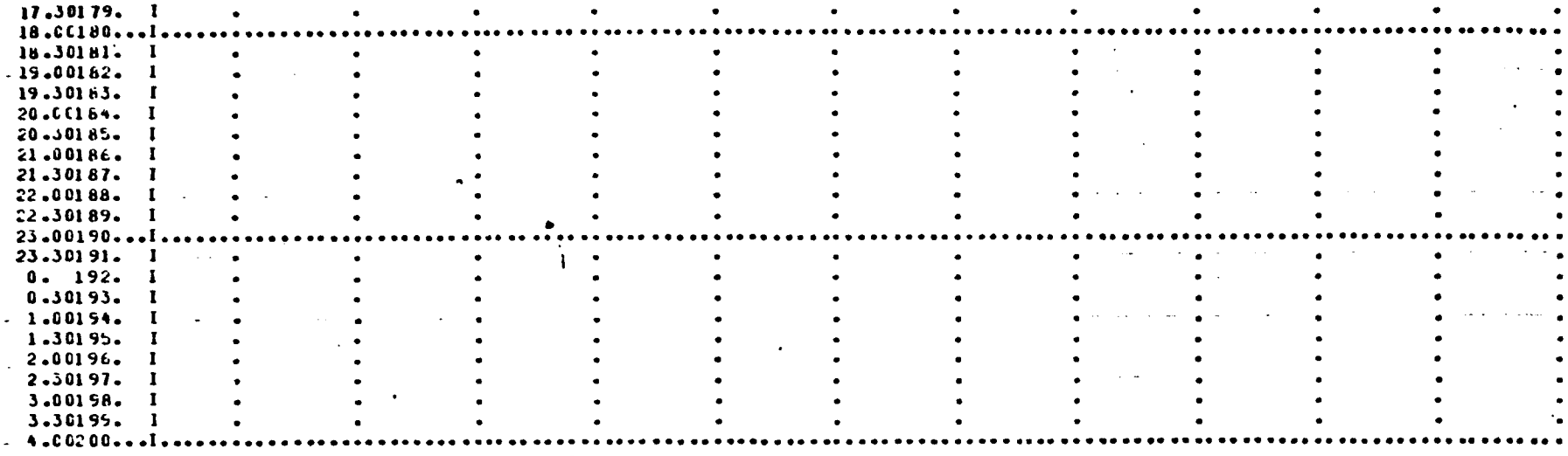
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0. 192.
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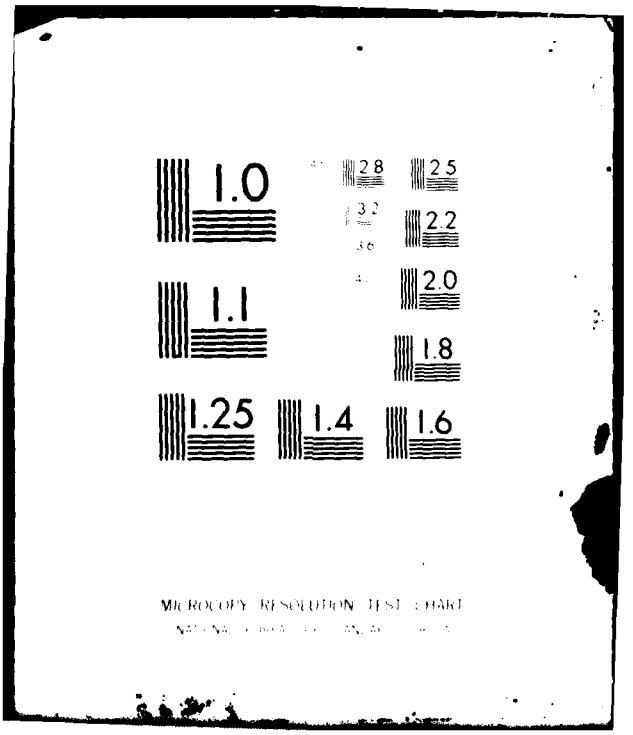
3.30199.
4.00200.

AD-A110 060 NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13
NATIONAL DAM SAFETY PROGRAM. MARIAVILLE LAKE DAM (INVENTORY NUM--ETC(U)
SEP 81 G KOCH DACW51-79-C-0001

UNCLASSIFIED NL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2.8
2.5
3.2
2.2
3.6
2.0
1.8
MICROCOPY RESOLUTION TEST CHART

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

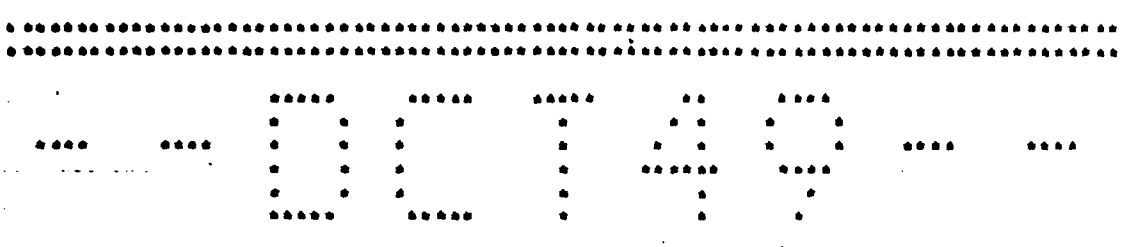
OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS					
				RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6
				0.20	0.40	0.50	0.60	0.80	1.00
HYDROGRAPH AT	1	3.12	1	1062.	2124.	2655.	3186.	4248.	5310.
		(11272.00)		(30.07)(	60.15)(	75.18)(	90.22)(	120.29)(	150.36)(
ROUTED TO	1	3.12	1	371.	1337.	1837.	2342.	3354.	4352.
		(11272.00)		(10.51)(	37.85)(	52.01)(	66.31)(	94.97)(	123.24)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1274.00	1274.00	1276.50
STORAGE	562.	562.	880.
OUTFLOW	0.	0.	85.

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
0.20	1277.41	0.91	955.	371.	20.50	47.00	0.
0.40	1279.03	2.53	1201.	1337.	59.00	45.00	0.
0.50	1279.69	3.19	1285.	1837.	59.50	45.00	0.
0.60	1280.30	3.80	1362.	2342.	59.50	44.50	0.
0.80	1281.39	4.89	1500.	3354.	60.50	44.50	0.
1.00	1282.36	5.86	1624.	4352.	61.00	44.00	0.



-- 3 0 -- DATE 08-12-81 TIME 10.575 ID = AJ NYSOGS

APPENDIX D

REFERENCES

APPENDIX D

REFERENCES

1) U.S. Department of Commerce, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, May 1961.

2) U.S. Department of Commerce, 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.

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

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6) W.D. Thornbury, Principles of Geomorphology, John Wiley and Sons, 1969.

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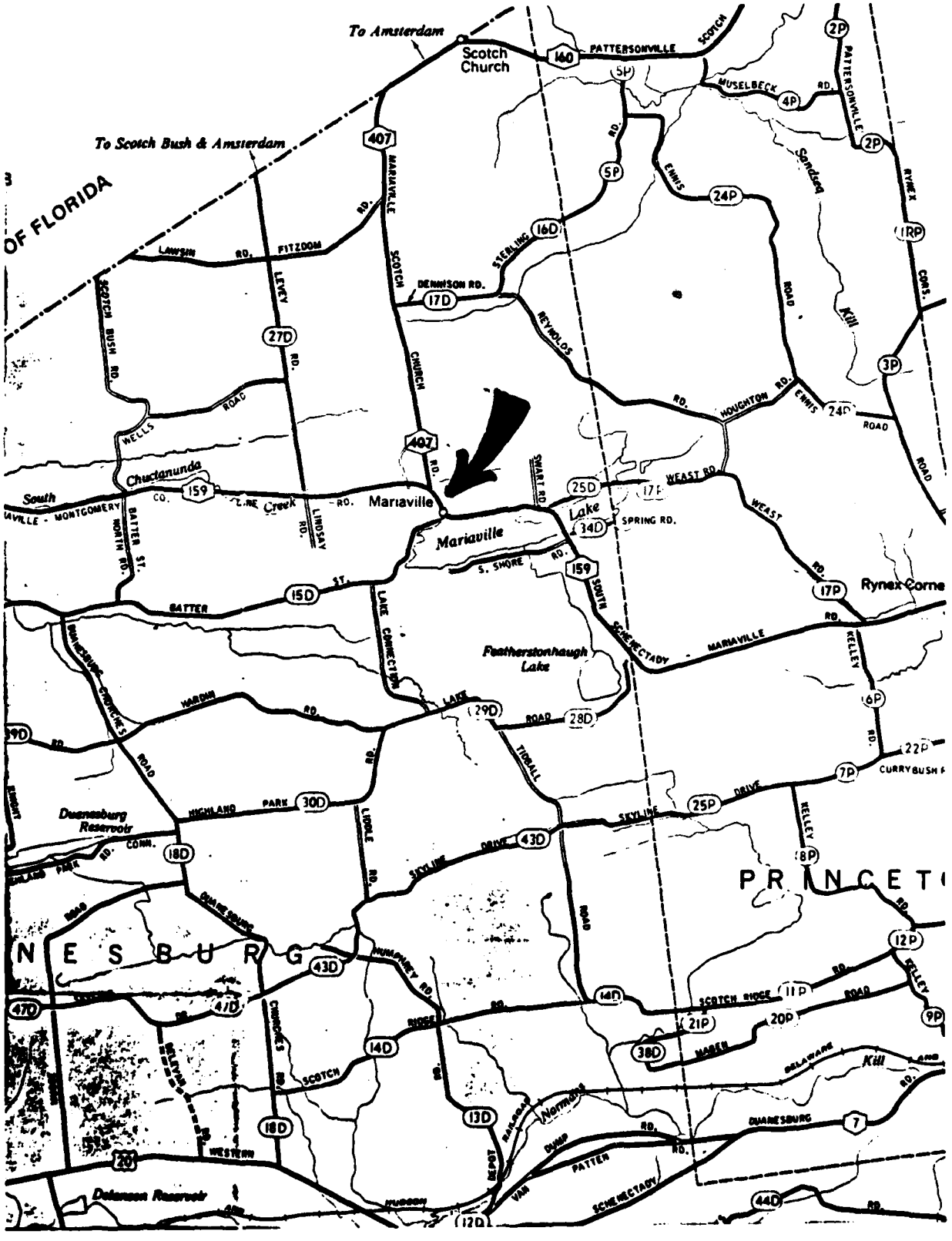
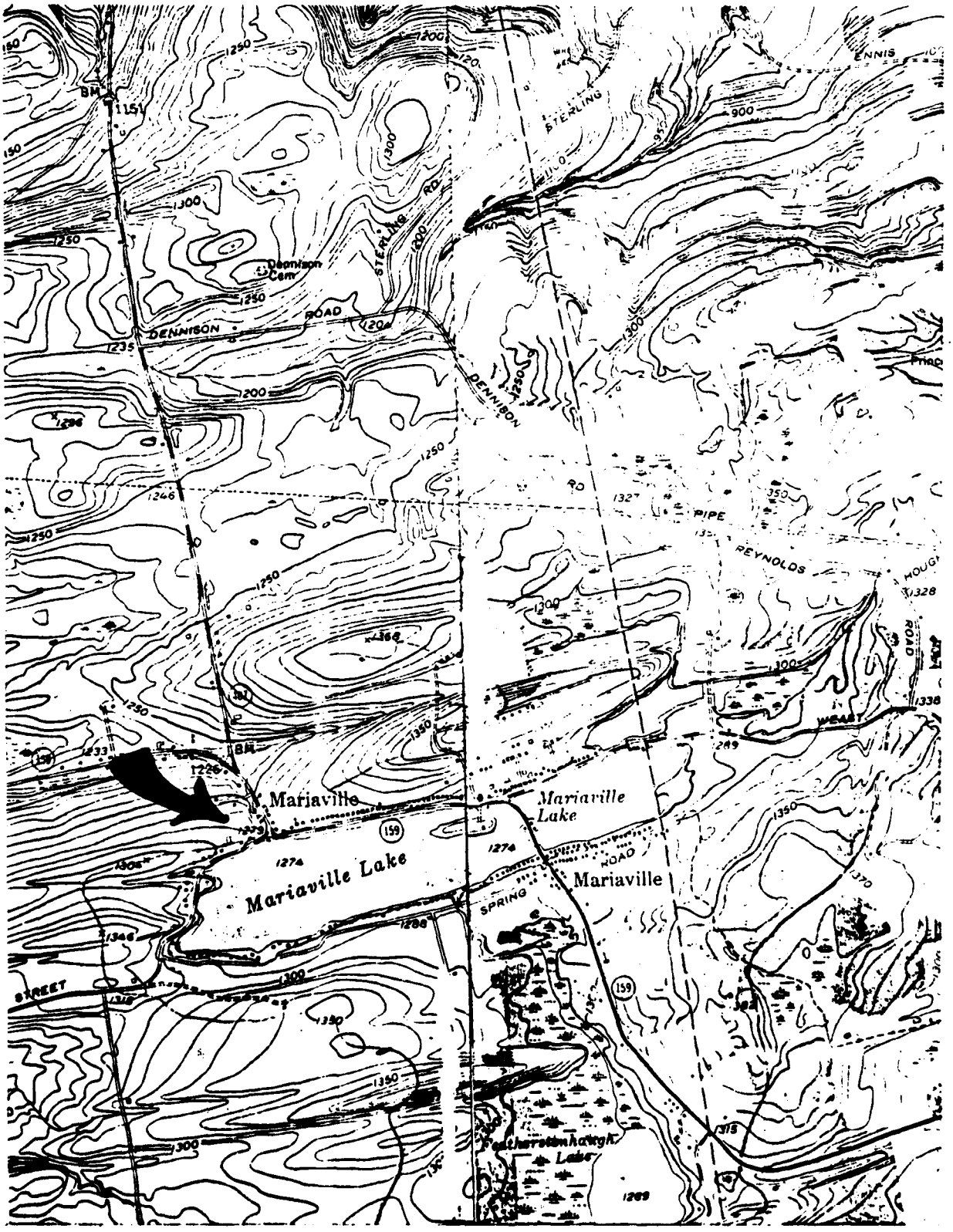
APPENDIX E

DRAWINGS



VICINITY MAP



TOPOGRAPHIC MAP


ATE
LME