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NATIONAL DAM SAFETY PROGRAM. SAXTON FALLS DAM (NJ 00277), DELAW--ETC(U)
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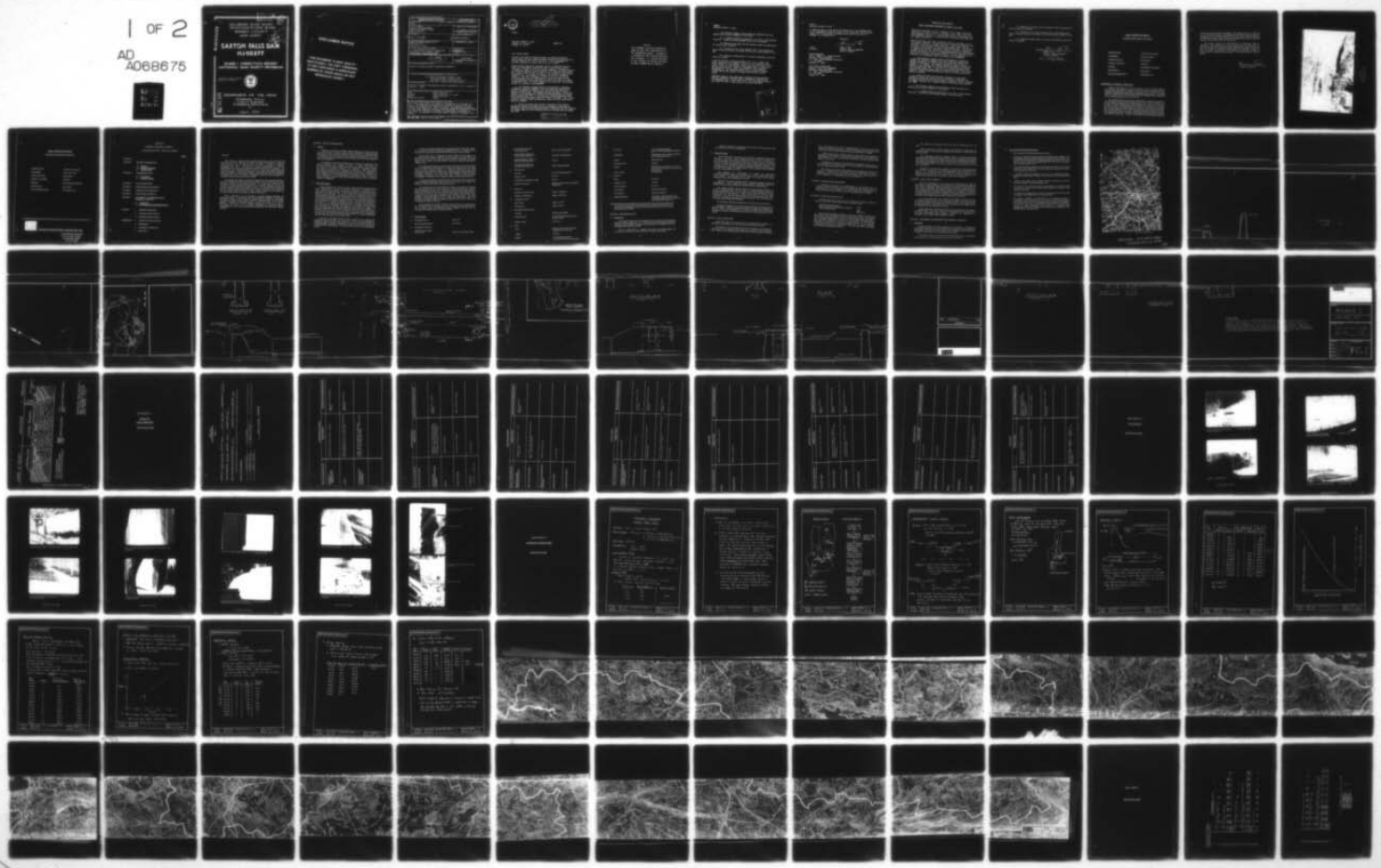

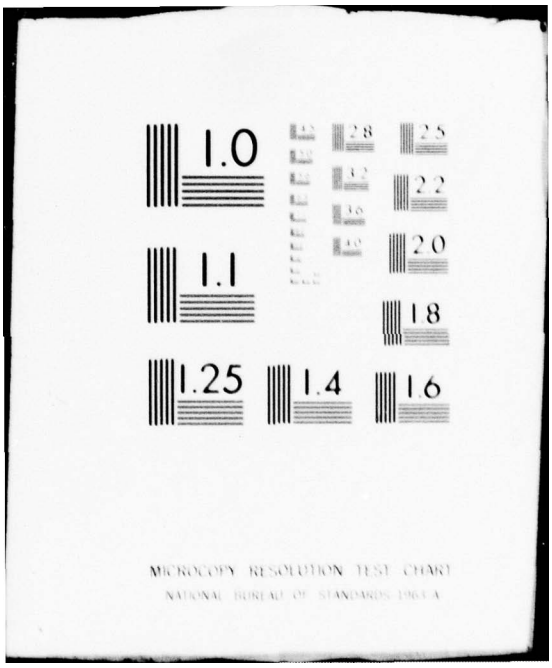
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DELAWARE RIVER BASIN
MUSCONETCONG RIVER
WARREN COUNTY
NEW JERSEY

DDC
MAY 16 1979

SAXTON FALLS DAM
NJ00277

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

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DEPARTMENT OF THE ARMY
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March, 1979

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REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER: NJ00277	2. GOVT ACCESSION NO.
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7. AUTHOR(s): (10) Dennis J. Leary, P.E.	8. CONTRACT OR GRANT NUMBER(s): (15) DACW61-78-C-0124
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Langan Engineering Assoc. Inc. 970 Clifton Ave. Clifton, N.J. 07013	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
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(6) National Dam Safety Program. Saxton Falls Dam (NJ ØØ277), Delaware River Basin, Musconetcong River, Warren County, New Jersey. Phase I Inspection Report.

18. SUPPLEMENTARY NOTES

Copies are obtainable from National Technical Information Service, Springfield, Virginia, 22151.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Dams	Visual Inspection
Spillway	National Dam Safety Act Report
Riprap	Saxton Falls Dam
Structural Analysis	Safety

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

This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report.

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DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT CORPS OF ENGINEERS
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PHILADELPHIA, PENNSYLVANIA 19106

IN REPLY REFER TO
NAPEN-D

Honorable Brendan T. Byrne
Governor of New Jersey
Trenton, NJ 08621

9 MAY 1979

Dear Governor Byrne:

Inclosed is the Phase I Inspection Report for Saxton Falls Dam in Warren County, New Jersey which has been prepared under authorization of the Dam Inspection Act, Public Law 92-367. A brief assessment of the dam's condition is given in the front of the report.

Based on visual inspection, available records, calculations and past operational performance, Saxton Falls Dam, a high hazard potential structure, is judged to be in fair overall condition. The dam's spillway is considered inadequate since 24 percent of the Spillway Design Flood-SDF - would overtop the dam. (The SDF, in this instance, is the Probable Maximum Flood). The decision to consider the spillway "inadequate" instead of "seriously inadequate" is based on the fact that failure from overtopping would not significantly increase the hazard to loss of life downstream from the dam from that which would exist just before overtopping failure. To insure adequacy of the structure, the following actions, as a minimum, are recommended:

a. The spillway's adequacy should be determined by a qualified professional consultant engaged by the owner using more sophisticated methods, procedures, and studies within six months from the date of approval of this report. Any remedial measures necessary to insure the adequacy of the spillway and to prevent overtopping should be initiated within calendar year 1980. In the interim, a detailed emergency operation plan and warning system, should be promptly developed. Also, during periods of unusually heavy precipitation, around the clock surveillance should be provided.

b. Within six months from the date of approval of this report, engineering studies and analyses should be performed to determine the spillway's condition and structural stability (especially the left sidewall). Any remedial measures found necessary should be initiated within calendar year 1980.

This document has been approved for public release and sale; its distribution is unlimited.

NOTICE

THIS DOCUMENT HAS BEEN REPRODUCED FROM THE BEST COPY FURNISHED US BY THE SPONSORING AGENCY. ALTHOUGH IT IS RECOGNIZED THAT CERTAIN PORTIONS ARE ILLEGIBLE, IT IS BEING RELEASED IN THE INTEREST OF MAKING AVAILABLE AS MUCH INFORMATION AS POSSIBLE.

c. The following remedial actions should be completed within six months from the date of approval of this report:

(1) A trashrack should be installed at the inlet to the gatehouse structure. Suitable hoisting equipment should also be provided.

(2) Erosion at the right and left abutment should be repaired and the area suitably riprapped.

(3) The valve of the 16-inch diameter pipe to the bathing pool should be made functional to increase the low level outlet capacity of the dam.

(4) Spalled and eroded areas on the dam and gatehouse structures should be repaired.

A copy of the report is being furnished to Mr. Dirk C. Hofman, New Jersey Department of Environmental Protection, the designated State Office contact for this program. Within five days of the date of this letter, a copy will also be sent to Congressman James A. Courter of the Thirteenth District. Under the provision of the Freedom of Information Act, the inspection report will be subject to release by this office, upon request, five days after the date of this letter.

Additional copies of this report may be obtained from the National Technical Information Services (NTIS), Springfield, Virginia 22161 at a reasonable cost. Please allow four to six weeks from the date of this letter for NTIS to have copies of the report available.

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NAPEN-D
Honorable Brendan T. Byrne

An important aspect of the Dam Safety Program will be the implementation of the recommendations made as a result of the inspection. We accordingly request that we be advised of proposed actions taken by the State to implement our recommendations.

Sincerely,

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

1 Incl
As stated

Copies furnished:
Dirk C. Hofman, P.E., Deputy Director
Division of Water Resources
N. J. Dept. of Environmental Protection
P. O. Box CN029
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Trenton, NJ 08625

SAXTON FALLS DAM (NJ00277)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 6 and 14 December 1978 by Langan Engineering Associates, Inc. under contract to the State of New Jersey. The state, under agreement with the U. S. Army Engineer District, Philadelphia, had this inspection performed in accordance with the National Dam Inspection Act, Public Law 92-367.

Saxton Falls Dam, a high hazard potential structure, is judged to be in fair overall condition. The dam's spillway is considered inadequate since 24 percent of the Spillway Design Flood--SDF - would overtop the dam. (The SDF, in this instance, is the Probable Maximum Flood). The decision to consider the spillway "inadequate" instead of "seriously inadequate" is based on the fact that failure from overtopping would not significantly increase the hazard to loss of life downstream from the dam from that which would exist just before overtopping failure. To insure adequacy of the structure, the following actions, as a minimum, are recommended:

a. The spillway's adequacy should be determined by a qualified professional consultant engaged by the owner using more sophisticated methods, procedures, and studies within six months from the date of approval of this report. Any remedial measures necessary to insure the adequacy of the spillway and to prevent overtopping should be initiated within calendar year 1980. In the interim, a detailed emergency operation plan and warning system, should be promptly developed. Also, during periods of unusually heavy precipitation, around the clock surveillance should be provided.

b. Within six months from the date of approval of this report, engineering studies and analyses should be performed to determine the spillway's condition and structural stability (especially the left sidewall). Any remedial measures found necessary should be initiated within calendar year 1980.

c. The following remedial actions should be completed within six months from the date of approval of this report:

(1) A trashrack should be installed at the inlet to the gatehouse structure. Suitable hoisting equipment should also be provided.

(2) Erosion at the right and left abutment should be repaired and the area suitably riprapped.

(3) The valve of the 16-inch diameter pipe to the bathing pool should be made functional to increase the low level outlet capacity of the dam.

(4) Spalled and eroded areas on the dam and gatehouse structures should be repaired.

APPROVED: _____
JAMES G. TON
Colonel, Corps of Engineers
District Engineer

DATE: 9 May 1979

PHASE I INSPECTION REPORT

NATIONAL DAM SAFETY PROGRAM

NAME OF DAM:	SAXTON FALLS DAM
ID NUMBER:	FED ID NO. 00277
STATE LOCATED:	NEW JERSEY
COUNTY LOCATED:	WARREN
STREAM:	MUSCONETCONG RIVER
RIVER BASIN:	DELAWARE
DATE OF INSPECTION:	DECEMBER 1978

ASSESSMENT OF GENERAL CONDITIONS

Saxton Falls Dam is 50 years old and in fair overall condition. Uncertainties concerning the behavior of the left sidewall and conditions of the spillway and downstream toe areas of the dam lead to the conclusion the dam should be considered to have less than conventional safety margins. The spillway capacity as determined by CE Screening criteria is inadequate. We estimate the dam can adequately pass only 23% of the PMF.

We recommend the crack in the left sidewall be investigated and repaired. The investigation should include borings and be made in such a manner as to provide information leading to an understanding of the cause of the crack and the type of repair and strengthening of the wall that is necessary. This should be done very soon. The present lake level should be lowered below the spillway crest to allow inspection of the downstream dam face, apron and toe area of the dam. This should be done very soon. A trashrack should be installed at the inlet to the gatehouse structure. Suitable hoisting equipment should also be provided. This should be done soon. Erosion at the right and left abutment should be

repaired and the area suitably riprapped. This should be done soon. The valve for the 16-in-dia CI pipe to the bathing pool should be made functional to increase the low level outlet capacity of the dam. This should be done soon. The spalled and eroded areas on the dam and gatehouse structures should be repaired. This should be done in the near future.

The spillway capacity, as determined by CE Screening criteria is inadequate. The actual capacity of the spillway and the SDF should be determined using more precise and sophisticated methods and procedures. The need for and type of mitigating measures should be determined. Around the clock surveillance during periods of unusually heavy precipitation should be provided, and a warning system established. This should be done in the near future.

Dennis J. Leary, P.E.

OVERVIEW

SAXTON FALLS DAM

1 DECEMBER 1978

PHASE I INSPECTION REPORT

NATIONAL DAM SAFETY PROGRAM

NAME OF DAM:	SAXTON FALLS DAM
ID NUMBER:	FED ID NO. 00277
STATE LOCATED:	NEW JERSEY
COUNTY LOCATED:	WARREN
STREAM:	MUSCONETCONG RIVER
RIVER BASIN:	DELAWARE
DATE OF INSPECTION:	DECEMBER 1978

LANGAN ENGINEERING ASSOCIATES, INC.

Consulting Civil Engineers
990 CLIFTON AVENUE
CLIFTON, NEW JERSEY
201-472-9366

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NATIONAL DAM SAFETY REPORT

SAXTON FALLS DAM FED ID No. NJ00277

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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. 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 continued care and inspection can there be any chance that unsafe conditions be detected.

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. 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.

SECTION 1 PROJECT INFORMATION

1.1 General

Authority to perform the Phase I Safety Inspection of Saxton Falls Dam was received from the State of New Jersey, Department of Environmental Protection, Division of Water Resources by letter dated 20 November 1978. This Authority was given pursuant to the National Dam Inspection Act, Public Law 920-367 and by agreement between the State and the US Army Engineers District, Philadelphia.

The purpose of the Phase I Investigation is to develop an assessment of the general conditions with respect to safety of Saxton Falls Dam and appurtenances based upon available data and visual inspection, and, determine any need for emergency measures and conclude if additional studies, investigations and analyses are necessary and warranted. The assessment is made using screening criteria established in Recommended Guidelines for Safety Inspection of Dams prepared by the Department of Army, Office of the Chief of Engineers. It is not the purpose of the inspection report to imply that a dam meeting or failing to meet the screening criteria, is per se, certainly adequate or inadequate.

1.2 Project Description

Saxton Falls Dam is a 50 year old dam located across the Musconetcong River. Saxton Lake is upstream of the dam. The dam is a 16-ft-high, 235 ft-long reinforced concrete dam having earth-fill abutment at both ends and a gatehouse at the right abutment. A 144-ft-long over-fall type spillway extends along the crest of the dam. A concrete cut-off wall is reported to exist in the right abutment through the filled canal lock and in a small portion of the left abutment immediately adjacent to the abutment wall. A steel sheet piling cut-off is reported to be below the spillway section. The sheeting is reported to have been driven to "refusal" at depths of 15 feet at the right end to 30 feet at the left end. It is reported that the spillway is 11-ft-high from the apron to the crest and has a 24-ft base width and a 5.5-ft top width. The earth-filled right abutment has relativley flat upstream and downstream slopes. The Delaware Lackawanna and Western Railroad situated on an embankment is located at about 35 ft south of the left abutment wall. The outlet works consist of a 4-ft by 6-ft sluice gate operated from the gatehouse and an underground 16-in-dia pipe with control valve which supplies water to a nearby bathing pool fountain. The sluice gate is maintained closed.

A portion of the Morris Canal has been converted into a bathing pool downstream and at the right side of the dam. Water for the bathing pool is supplied through the fountain, which obtains its water from the lake through the underground pipe. A spillway is provided to release excess flow and controls the water level of the bathing pool. At the time of our inspection, the bathing pool was dry.

The dam is located at Mount Olive Township, Morris County, New Jersey. It is at north latitude 40° 53.3' and west longitude 74° 47.9'. A regional vicinity map is given in Fig 1 and essential features of the dam are given in Fig 2.

Saxton Falls Dam is classified as being "Small" on the basis of its maximum reservoir storage volume of 770 ac-ft which is less than 1000 ac-ft, but more than 50 ac-ft. It is also classified as "Small" on the basis of its total height of 16 ft which is less than 40 feet. The dam is therefore, classified as "Small" in size.

In the National Inventory of Dams, Saxton Falls Dam has been classified as having "High Hazard Potential" on the basis that failure of the dam would cause excessive property damage to residences downstream, and could potentially cause more than a few deaths. Visual inspection of the downstream area shows that breach of the dam would cause damage to residences located immediately adjacent to the river about 800 to 2000 ft from the dam. Accordingly, it is proposed not to change the Hazard Classification Potential.

The owner of the dam is the State of New Jersey, Div. of Forests & Parks, Labor and Industry Bldg. Room 8061, P.O. Box 1420, Trenton, N.J. 08625. The purposes of the dam are flood control and recreation.

The existing dam was built about 80 ft below the location of a former Morris Canal dam that was in bad condition. The Morris Canal was chartered 1824 and opened for traffic 1831. The former dam was erected about 1830 as a feeder for 30.6 miles of the canal between this point and the Delaware River. An average of 34 cfs of water was taken for this purpose. This was drawn from storage in Lake Hopatcong, Cranberry Lake, and Bear Point. This land, including 3.33 miles of right of way, was acquired from Nathaniel Saxton. The new dam included increasing the length of spillway from 111 ft to 144 ft and increasing the height of the dam.

The existing dam was built in 1928 on the left side of a navigation lock for the Morris Canal. Cornelius Vermeule, Consulting and Directing Engineer for the Morris Canal and Banking Company designed the dam and the construction contractor was F.H. Clement and Co.

1 3 Pertinent Data

a.	Drainage Area is:	68.0 sq mi
	Area of Saxton Lake is:	63.5 Acres
b.	Discharge at Dam site	
	Maximum known flood at dam site:	2295 cfs on 6 February 1896

	Gated spillway capacity at pool elevation:	292 cfs (4 x 6 sluice gate)
	Gated spillway capacity at maximum pool elevation:	356 cfs (4 x 6 sluice gate)
	Ungated spillway capacity at maximum pool elevation:	5474 cfs
	Total spillway capacity at maximum pool elevation:	5870 cfs (gates opened)
c.	Elevation (ft)	
	Top dam:	El. 97.55 (End abutments)
	Spillway crest:	El. 92.55
	Streambed at centerline of dam:	El. 81.5
	Maximum tailwater:	Approx. El. 85 at time of inspection (Estimated)
d.	Reservoir	
	Length of maximum pool:	Approx. 10,000 feet
	Length of normal pool:	Approx. 9,500 feet
e.	Storage (acre-feet)	
	Top of dam:	Approx. 770 AF
	Normal pool:	Approx. 400 AF
f.	Reservoir Surface (acres)	
	Top dam:	86 Acres (estimated)
	Maximum pool:	86 Acres (estimated: assumed to be top of dam)
	Spillway crest:	63.5 Acres
g.	Dam	
	Type:	Reinforced concrete with earth embankments at two ends
	Length:	235 feet
	Height:	11 feet (spillway portion) 16 feet (end embankments portion)

	Top width:	5.5 feet (spillway portion) Approx. 40 feet (embankment portion)
	Side slopes:	Downstream 1 Hor to 2 Vert, upstream vertical (spillway portion)
	Zoning:	None observed
	Impervious core:	Unknown
	Cutoff:	Reported that sheet pile 15 ft to 30 ft below spillway and concrete cut-off wall at abutments.
	Grout curtain:	None observed
h.	Spillway	
	Type:	Over-fall
	Length of weir:	144 feet
	Crest elevation:	El. 92.55
	U/S Channel:	Musconetcong River
	D/S Channel:	Musconetcong River
i.	Regulating Outlet	Gatehouse at right abutment with rectangular sluices gate 4 ft wide 6 ft high, opening above El. 83.55

Note: All elevations were obtained from a field survey using a reference elevation of 97.55 at top of south abutment wall (See Fig 2). The reference elevation was obtained from drawings of the Morris Canal & Banking Co., Dover, N.J. office, dated November 20, 1926.

SECTION 2 ENGINEERING DATA

2.1 Introduction

The material observed in the foundation trench through which steel sheet piling was driven to depths of 15 ft to 30 ft below the dam has been described as hard gray sandy hardpan containing numerous boulders from cobbles up to 2 ft^3. No borings were made for the dam.

There is essentially no available information concerning design and construction of the dam. There is insufficient available information.

Operation consists of maintaining the sluice gate in the gatehouse closed and releasing all water over the spillway.

2.2 Regional Geology

Saxton Falls Dam is located in the New Jersey Highlands physiographic province. The New Jersey Highlands extend across the State in a northeast/southwest direction from the border of New York to the Delaware River and includes the northwest portions of Hunterdon, Passaic, and Morris Counties and the southeastern parts of Warren and Sussex Counties. This province is part of the New England Physiographic Province and lies between the Appalachian Ridge and Valley Province to the northwest and the Piedmont Province to the southeast, see Fig 3.

The Highlands are characterized by rounded and flat-topped northeast/southwest ridges and mountains up to 1,400 ft high separated by narrow valleys. The orientation of the valleys are usually, but not always, controlled by the underlying geologic structure.

Bedrock of the region is predominently Precambrian gneisses, schists, and matasediments. Some sedimentary strata, typically sandstones, shales and conglomerate have been infolded and infaulted into the valley bottoms.

The regional geologic structure reflects the very old age of bedrock. A number of regional faults cross the area in a northeast southwest direction, including the Ramapo Fault; the more than 30 mile long fault/scarp forms the eastern border of the province. Faults control many of the river valley orientations. The relatively uniform slope of the mountain elevations, from northwest to southeast, is a direct result of the faulting. The entire area is part of the now dissected Schooley Peneplain.

The Pleistocene Age Wisconsin glacier covered all of the dam site area.

The glacier stripped most of the existing overburden and weathered rock and uncovered the numerous hard bedrock knobs and ridges seen throughout the province. Most of the side-slopes in the area are covered with heavy boulder tills (ground moraine), whereas glacial outwash and recent alluvium cover the valleys.

SECTION 3 VISUAL INSPECTION

Saxton Falls Dam is 50 years old and is in generally fair condition. A small amount of erosion, 6-in to 12-in, has occurred at both abutments.

The sidewall at the left abutment of the dam appears to have settled a small amount at its upstream end, resulting in a vertical crack through the entire width of the sidewall approximately seven (7) feet upstream of the dam

face. The width of the crack is approximately 1/2 inch at the top of the wingwall and becomes narrower as it proceeds downwards. It has been repaired recently by a local resident and movement has occurred since its repair.

Deterioration of the concrete near the water surface has exposed the aggregate at the sidewall. In addition, the upstream end of the sidewall has minor spalled areas. The inlet and outlet structures of the outlet works are also spalled in a few areas.

The spillway structure for the bathing pool is spalled in many areas. In one area beneath the concrete walkway over the spillway, the reinforcing steel bars are exposed and heavily rusted.

The sluice gate operator stand appears well maintained and the gate is functional. Observation of the spillway apron and downstream toe was not possible as a result of water flow over the spillway. Our visual check list is given in Appendix 1 and photographs are given in Appendix 2.

SECTION 4 OPERATIONAL PROCEDURES

Operation of the dam is the responsibility of the N.J.D.E.P. Div. of Forests and Parks. Operation consists of keeping the sluice gate closed and releasing water over the spillway. The pipe feeding the bathing pool is no longer used and the valve has been closed. No warning system is in effect.

SECTION 5 HYDRAULIC/HYDROLOGIC

The flood discharge of the river was measured on 6 February 1896 and found to be 2295 cfs. The catchment areas are reported to be:

Above Lake Hopatcong Dam	25.4
Between Hopatcong and Musconetcong Dam	4.9
Free catchment below	37.7
	68.0 sq. mi.

The hydraulic/hydrologic evaluation is based on a Spillway Design Flood (SDF) equal to the full Probable Maximum Flood (PMF) chosen in accordance with the evaluation guidelines for dams classified as high hazard and Small in size. Hydrologic design data for this dam is not available. The PMF has been determined by developing a synthetic hydrograph based on the maximum probable precipitation of 22.4 inches (200 square mile - 24 hour). Hydrologic computations are presented in Appendix 3. The PMF peak inflow determined for the subject watershed is 24,141 cfs.

The capacity of the spillway is 5474 cfs which is significantly less than SDF.

Flood routing for the PMF indicates the abutments at both ends will overtop by 6.8 ft. We estimate with gates closed the dam can adequately pass 23% of the PMF.

The downstream potential damage centers are several residential dwellings located immediately adjacent to the river at a distance of 800 to 2000 ft from the dam. Based on our visual inspection of the immediately downstream topography and knowledge of the dam it is our opinion that dam failure resulting from overtopping would cause property damage and would potentially cause more than a few deaths.

Drawdown of the lake below spillway crest has been evaluated assuming the 4 ft by 6 ft sluice gate is functioning properly and is utilized for this purpose. Our calculations indicate the lake level could be lowered 3 ft in approximately 19 hours and 4 ft in about 2 days. We estimate the gate is not capable of lowering the lake by more than 4 feet below the spillway.

SECTION 6 STRUCTURAL STABILITY

Under the conditions at the time of our observations the dam and appurtenances appear stable with the exception of the left spillway sidewall. Our review of available design and construction information also indicate the dam is likely to be stable. The significant post construction condition observed is the cracking and movement of the left sidewall. It is important to note that no engineering data is available concerning the dam foundation and abutment conditions, and evaluation of the condition of the spillway and downstream toe area could not be made because of water flowing over the spillway.

It is our opinion the dam should be considered to have less than conventional safety margins and be potentially unstable under static loading until a) the condition of the dam and downstream to area can be evaluated with no water flowing over the spillway, and b) the behavior and condition of the left sidewall can be evaluated and corrected.

Saxton Falls Dam is located in Seismic Zone 1 of the Seismic Zone Map of Contiguous States. The static stability of the embankment is considered to be less than conventional safety margins. Therefore, the embankment is considered to be unstable under earthquake loadings.

SECTION 7 ASSESSMENT, RECOMMENDATIONS/REMEDIAL MEASURES

7.1 Assessment

Saxton Falls Dam is 50 years old and in fair condition. Uncertainties concerning the behavior of the left sidewall and conditions of the spillway and downstream toe areas of the dam lead to the conclusion the dam should be considered to have less than conventional safety margins.

The spillway capacity as determined by CE Screening criteria is inadequate. We estimate the dam can adequately pass only 23% of the PMF.

7.2 Recommendations/Remedial Measures

We recommend the following measures be taken:

1. The crack in the left sidewall should be investigated and repaired. The investigation should include borings and be made in such a manner as to provide information leading to an understanding of the cause of the crack and the type of repair and strengthening of the wall that is necessary. This should be done very soon.

2. The present lake level should be lowered below the spillway crest to allow inspection of the downstream dam face, apron and toe area of the dam. This should be done very soon.

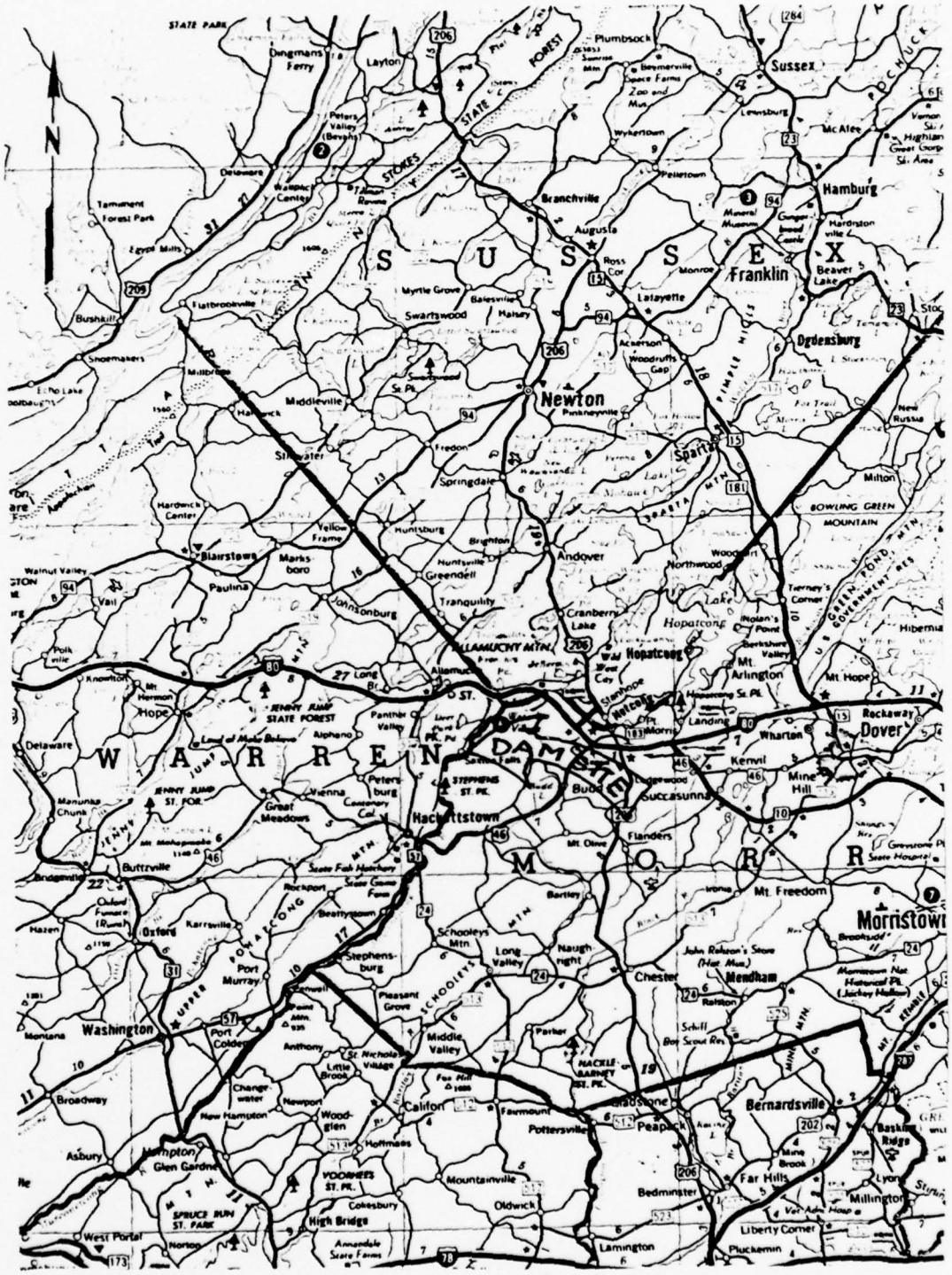
3. A trashrack should be installed at the inlet to the gatehouse structure. Suitable hoisting equipment should also be provided. This should be done soon.

4. Erosion at the right and left abutment should be repaired and the area suitably riprapped. This should be done soon.

5. The valve for the 16-in-dia CI pipe to the bathing pool should be made funcitonal to increase the low level outlet capacity of the dam. This should be done soon.

6. The spalled and eroded areas on the dam and gatehouse structures should be repaired. This should be done in the near future.

7. The spillway capacity as determined by CE Screening criteria is inadequate. The actual capacity of the spillway and the SDF should be determined using more precise and sophisticated methods and procedures. The need for and type of mitigating measures should be determined. Around the clock surveillance during periods of unusually heavy precipitation should be provided, and a warning system established. This should be done in the near future.


SUSSEX
WARREN
MORRIS
Newton
Hackettstown
Franklin
Dover
Morristown
Washington
Bernardsville
Hamburg
Sussex
Andover
Hopatcong
Lake Hopatcong
Mt. Arlington
Succasunna
Mendham
Chester
Gladstone
Peapack
Far Hills
Bedminster
Oxford
Belvidere
Phillipsburg
Lamington
Pluckemin
Liberty Corner
Millington
Basking Ridge
Mt. Freedom
Kenvil
Wharton
Rockaway
Sparta
Ogdensburg
Branchville
Blairstown
Hardwick
Frelinghuysen
Stephensburg
Port Colden
Broadway
Asbury
Hampton
Glen Gardner
High Bridge
Califon
Pottersville
Oldwick
Mountainville
Middle Valley
Long Valley
Schooleys Mtn
Stephens St. Pk.
Jenny Jump St. For.
Jenny Jump State Forest
Allamuchy Mtn.
Scott Mtn.
Musconetcong Mts.
Pohatcong Mts.
Kittatinny Mts.
Pimple Hills
Green Pond Mtn.
Bowling Green Mountain
Sparta Mtn.
Schooley's Mtn.
Naughright
Mine Hill
Flanders
Mt. Olive
Succasunna
Lake Musconetcong
Lake Hopatcong
Cranberry Lake
Lake Aeroflex
Stickles Pond
Swartswood
Stillwater
Newton
Andover
Sparta
Ogdensburg
Franklin
Hamburg
Sussex
Bernardsville
Morristown
Dover
Rockaway
Washington
Hackettstown
Belvidere
Phillipsburg
Lamington
Pluckemin
Liberty Corner
Millington
Basking Ridge
Mt. Freedom
Kenvil
Wharton
Mine Hill
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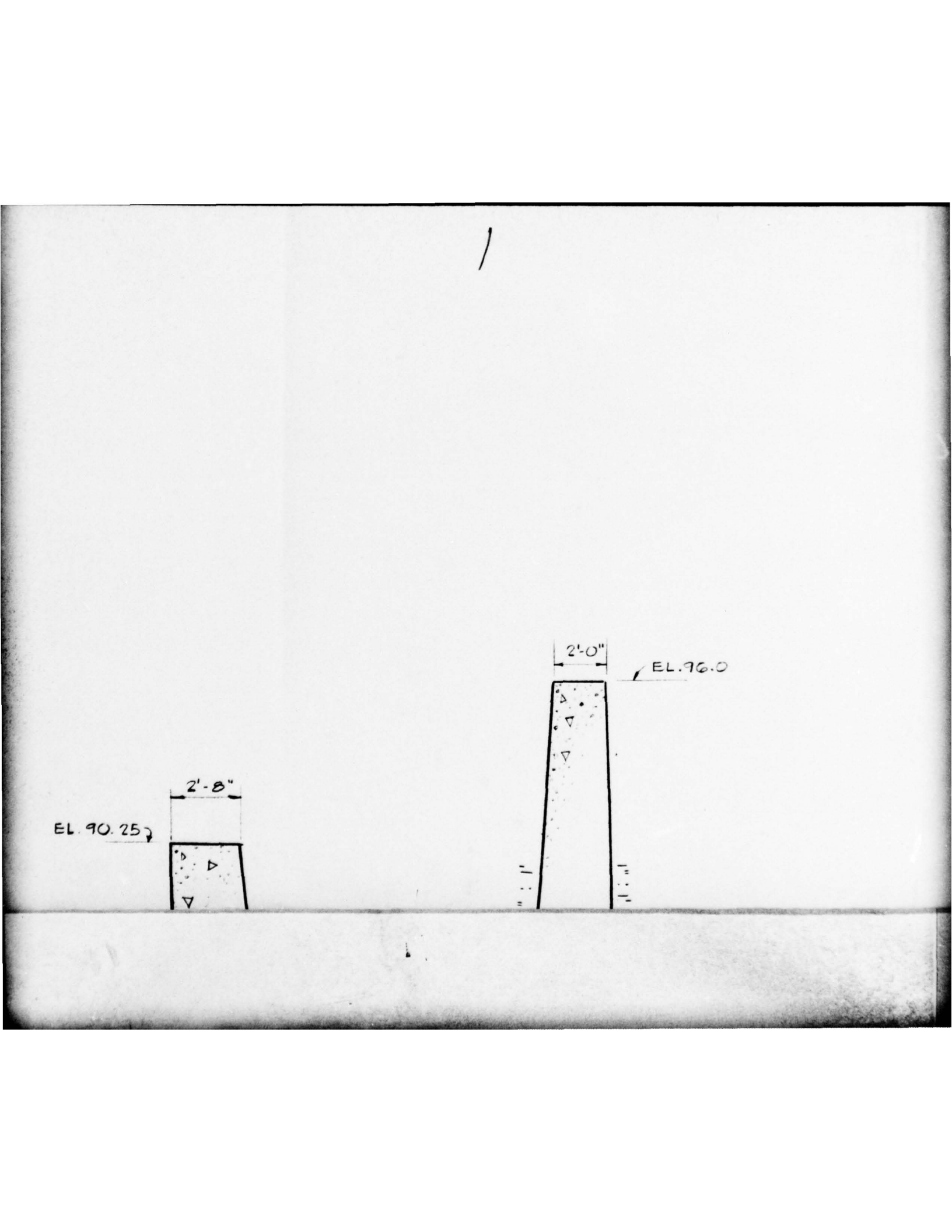
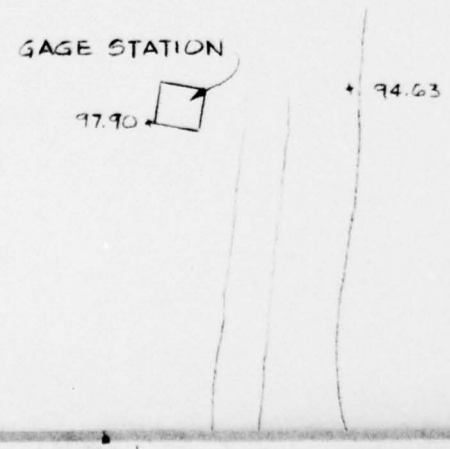
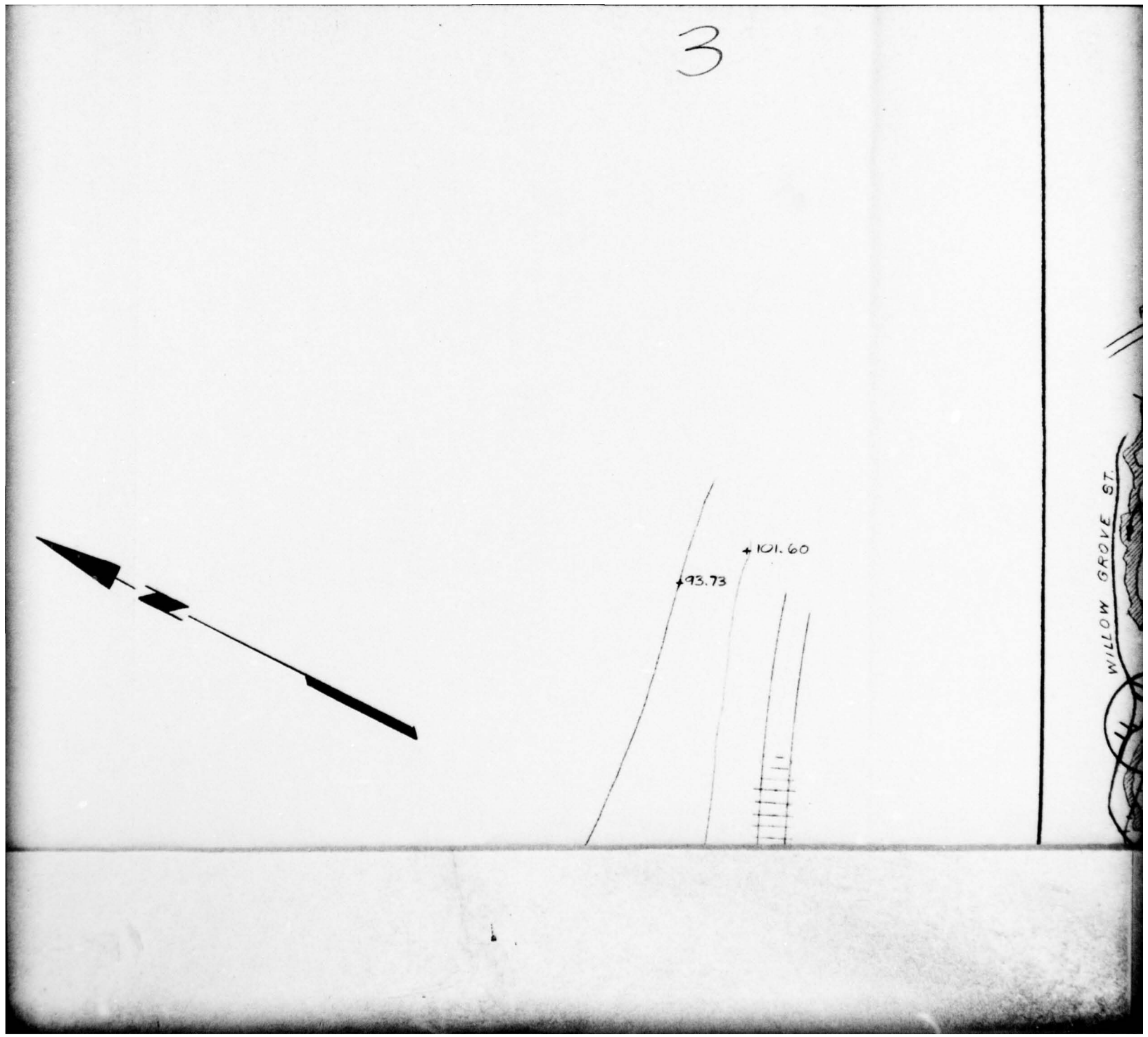
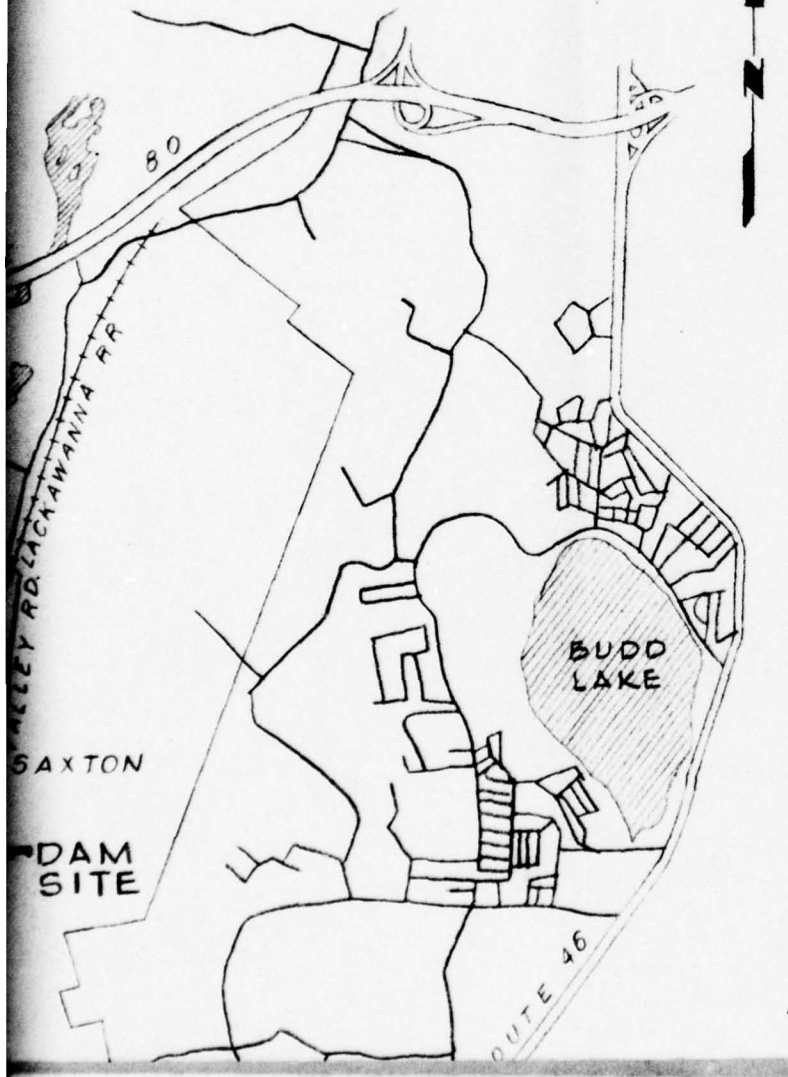
Mendham
Chester
Gladstone
Peapack
Far Hills
Bedminster
Oxford


2'-0"
EL. 96.0
2'-8"
EL. 90.25

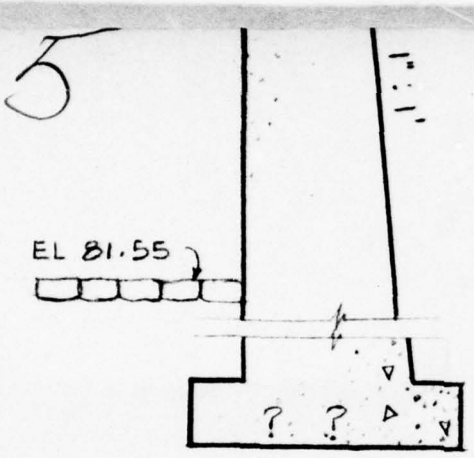

GAGE STATION
97.90
94.63


3
+101.60
+93.73
WILLOW GROVE ST.



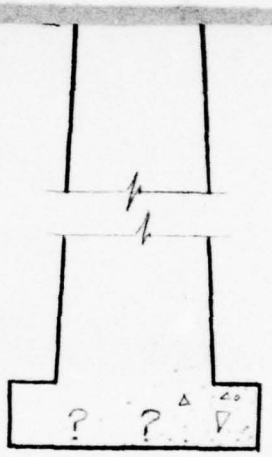
4

5



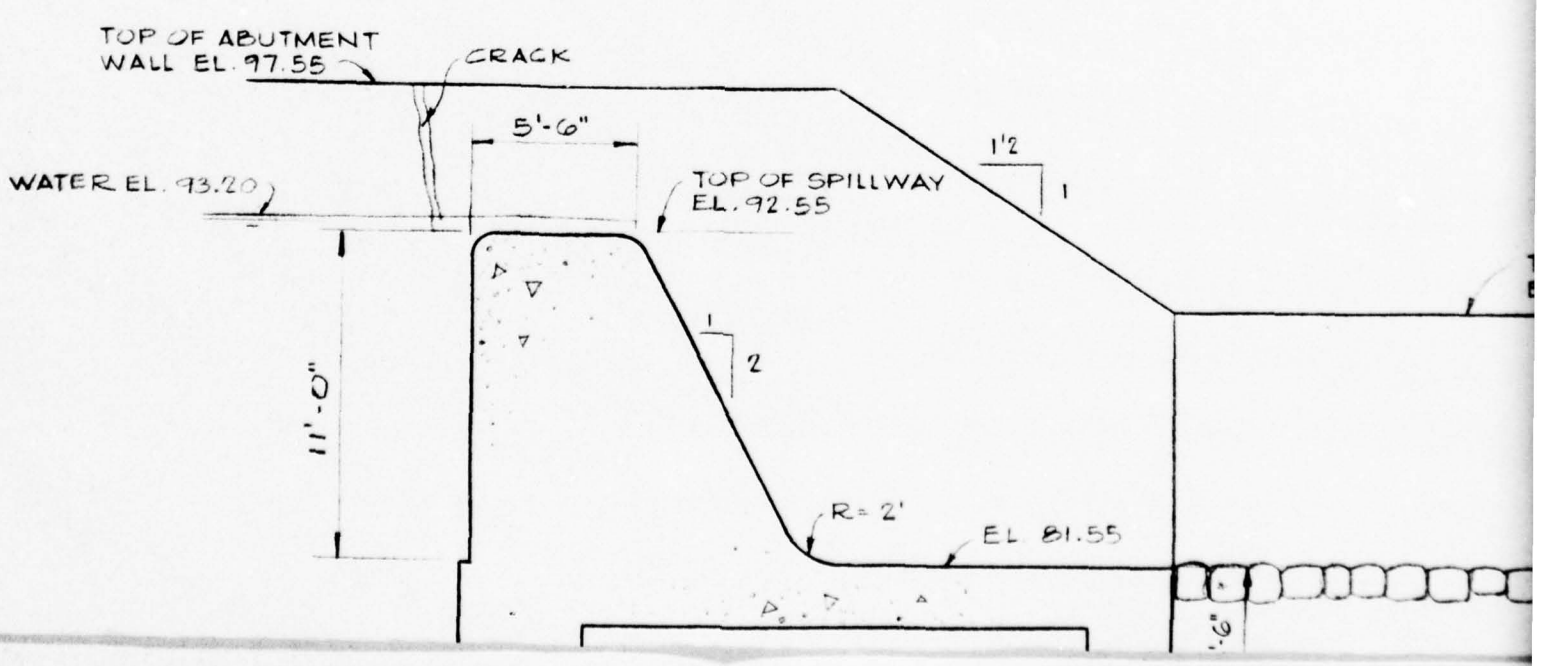
SECTION D-D

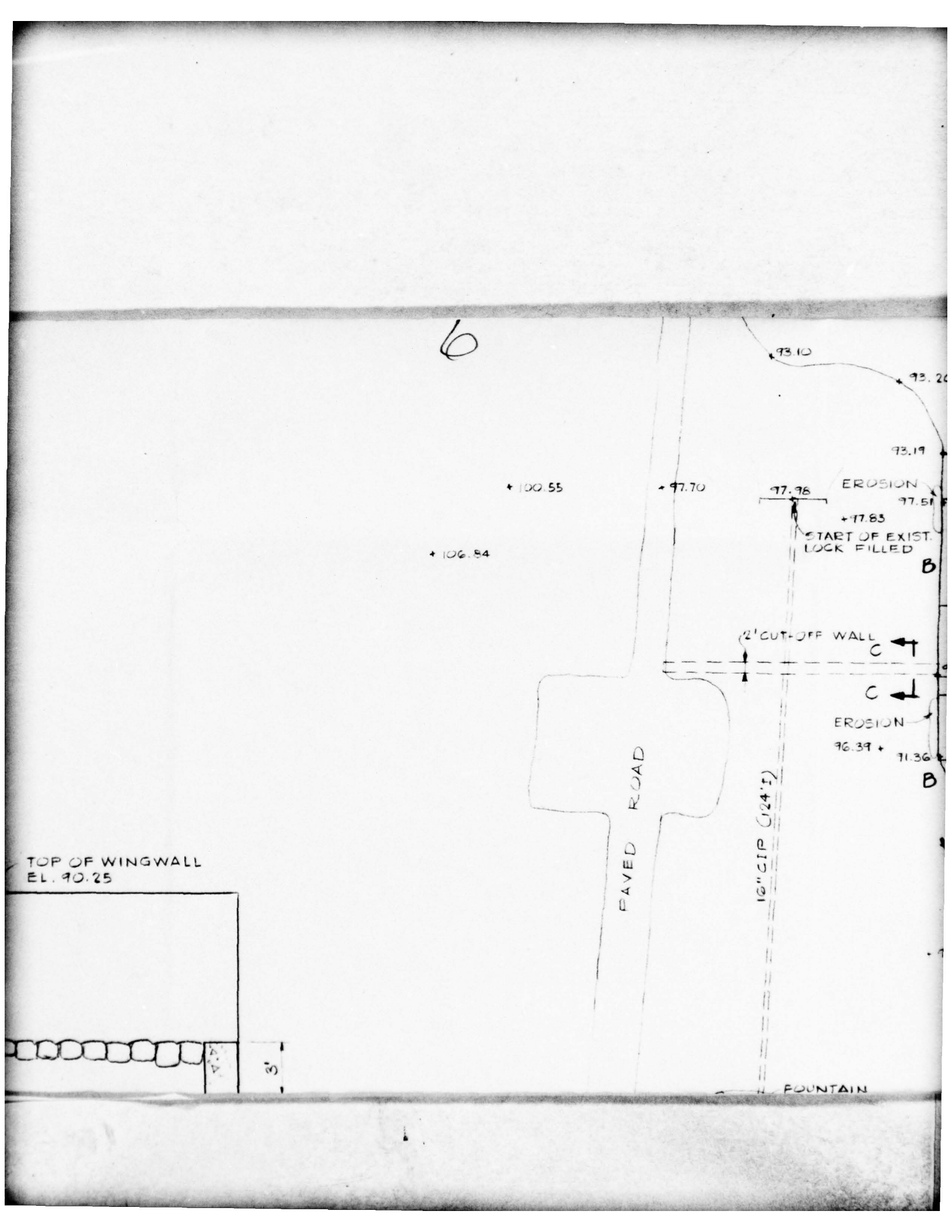
SCALE : 1" = 4'

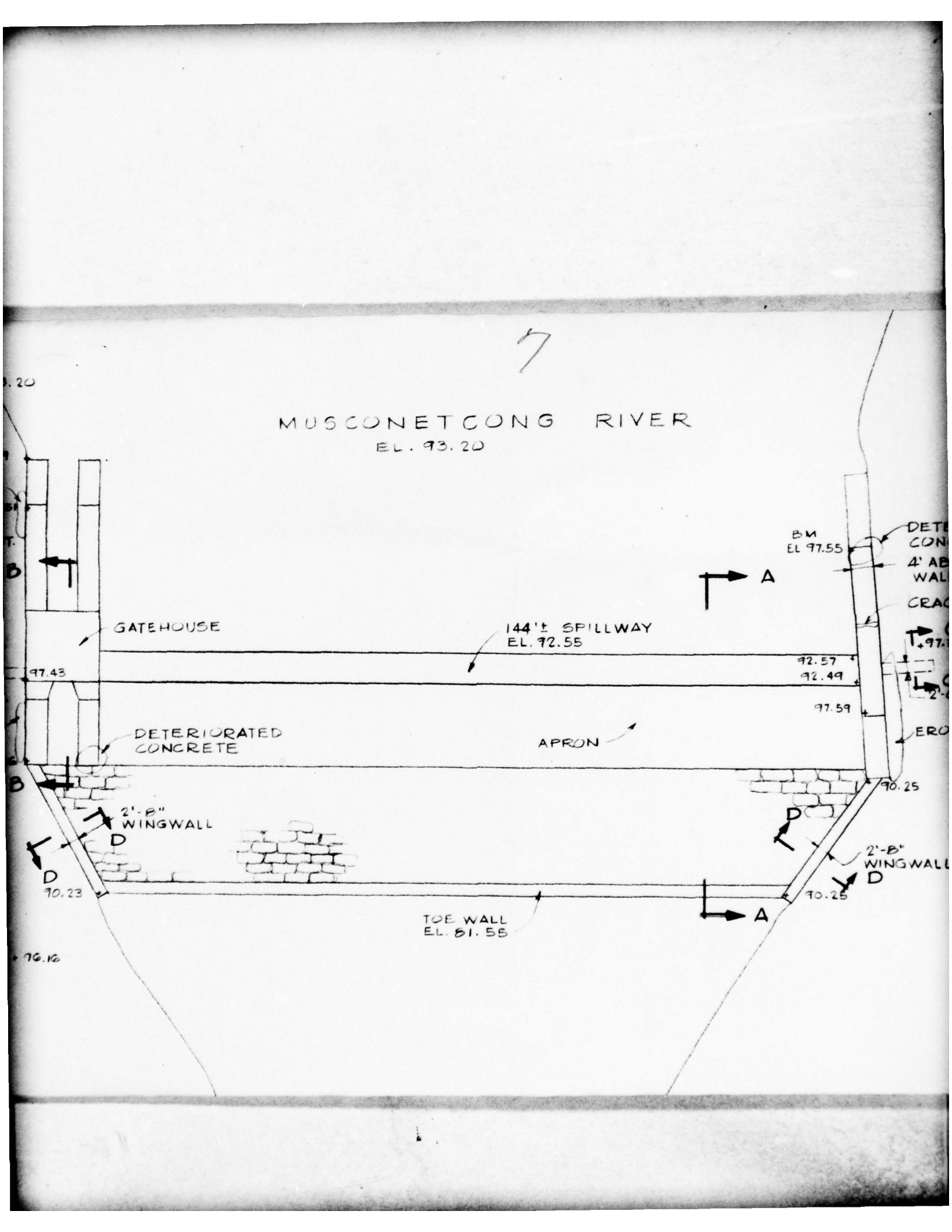


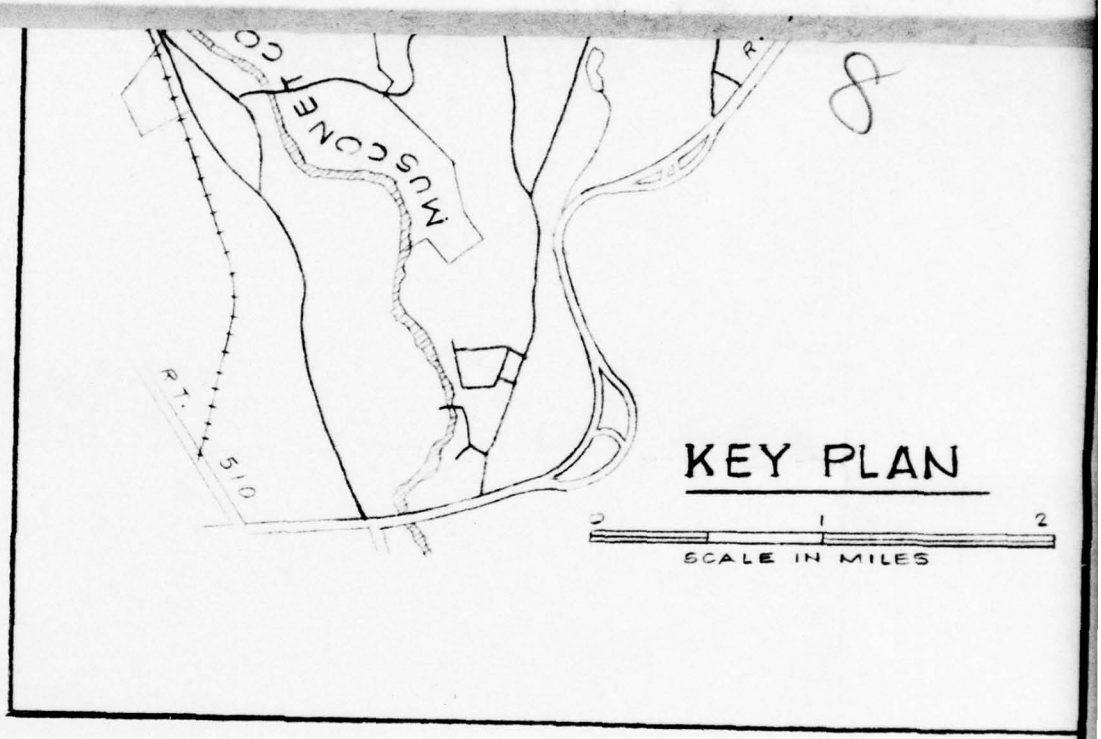
SECTION C-C

SCALE : 1" = 4'




6
93.10
93.19
+100.55
+97.70
97.78
EROSION
97.51
+97.83
START OF EXIST. LOCK FILLED
+106.84
B
2' CUT-OFF WALL
C
C
EROSION
96.39 +
91.36
B
PAVED ROAD
16" CIP (124'±)
TOP OF WINGWALL
EL. 90.25
4'-4"
3'
FOUNTAIN


MUSCONETCONG RIVER
EL. 93.20
BM
EL 97.55
A
GATEHOUSE
144'± SPILLWAY
EL. 92.55
97.43
92.57
92.49
97.59
DETERIORATED
CONCRETE
APRON
B
2'-8"
WINGWALL
D
90.23
90.25
2'-8"
WINGWALL
TOE WALL
EL. 81.55



DELAWARE LACKAWANNA & WESTERN R.R.

RIORATED
RETE
ITMENT

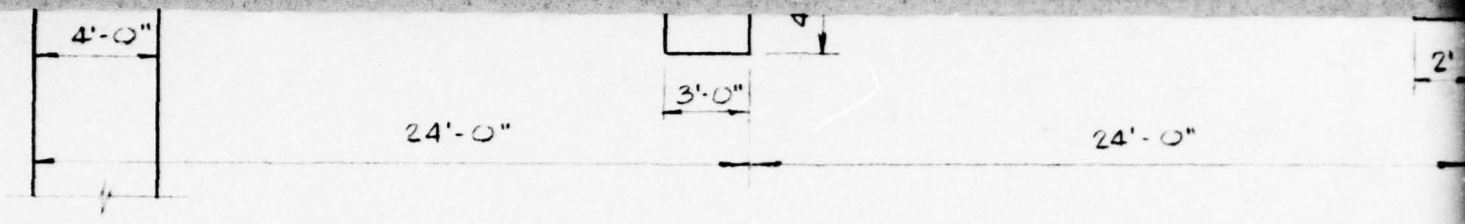
+101.57

T-OFF WALL

ION

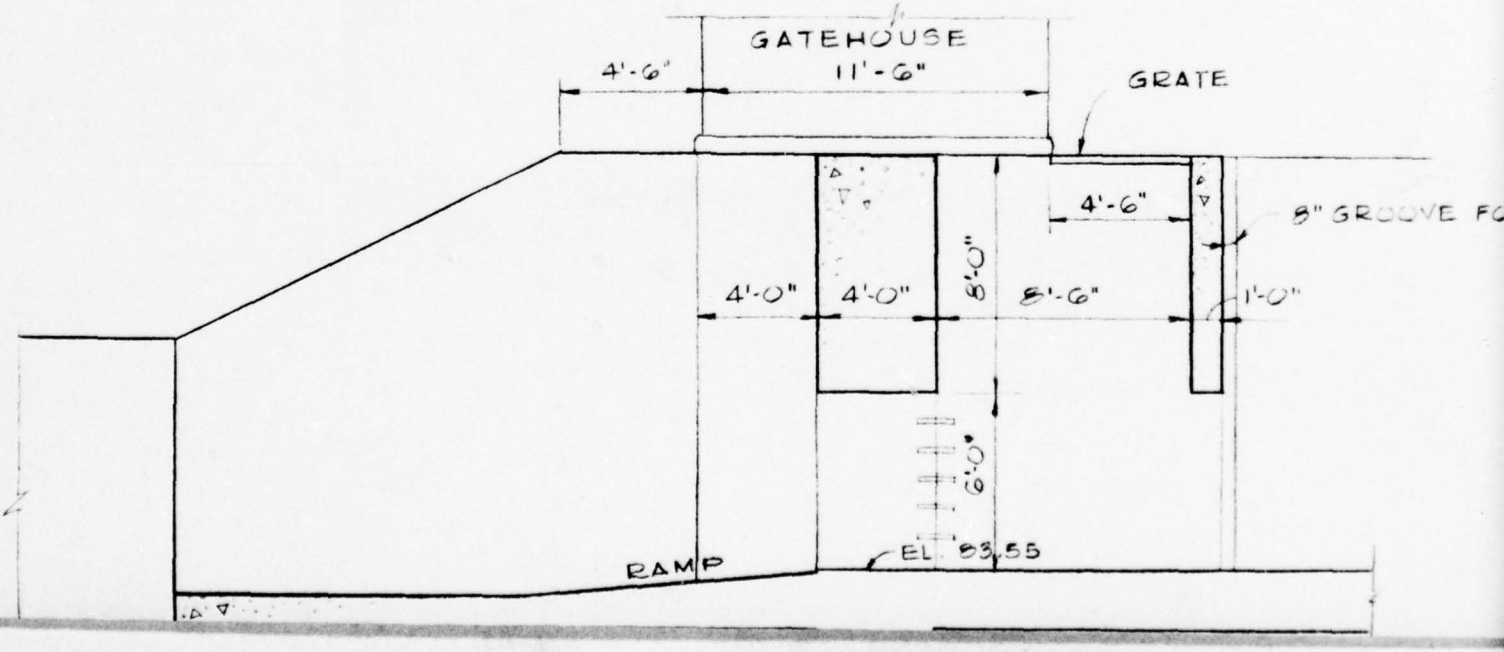
+100.57

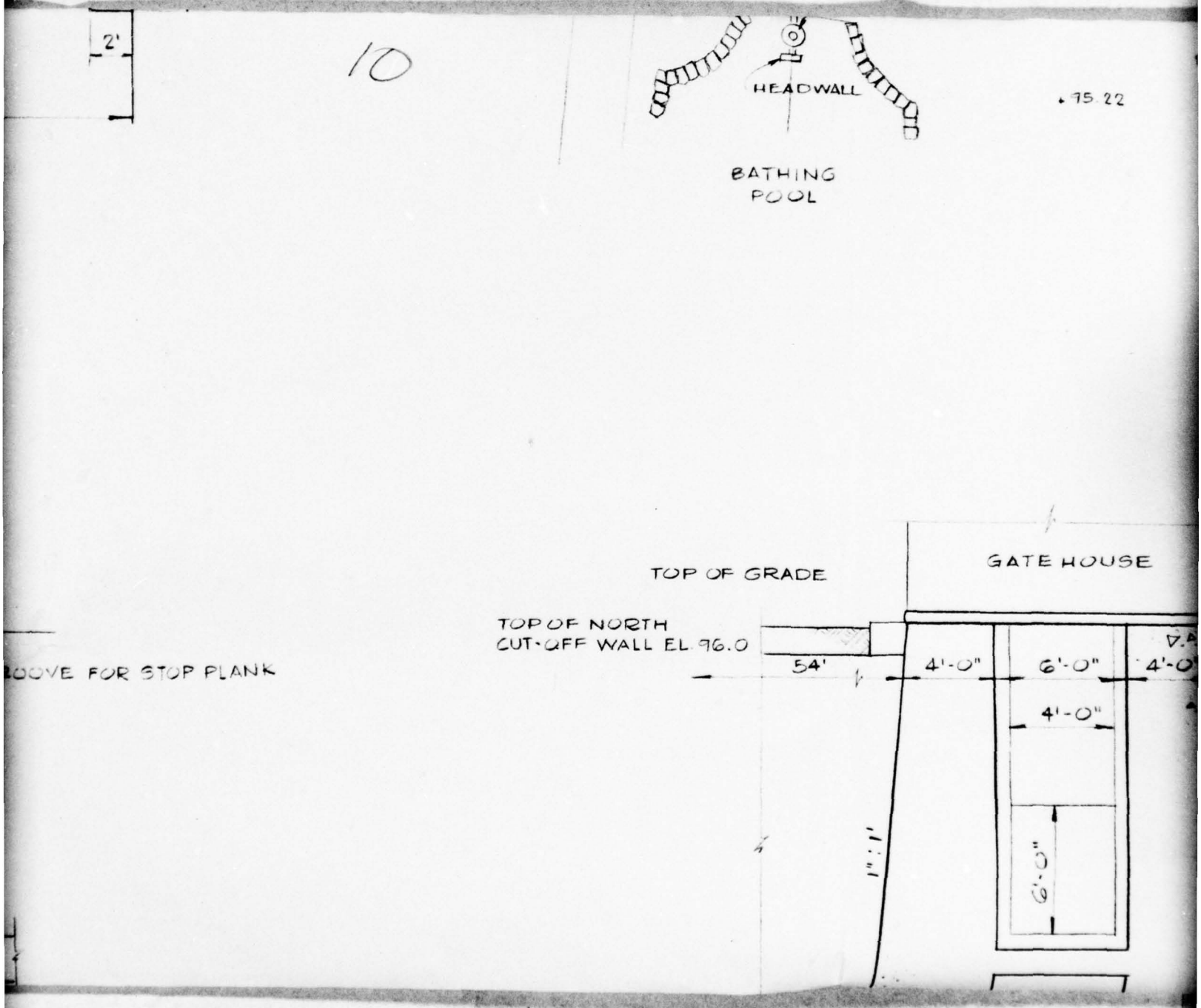
9



SECTION A-A

SCALE: 1"=6'



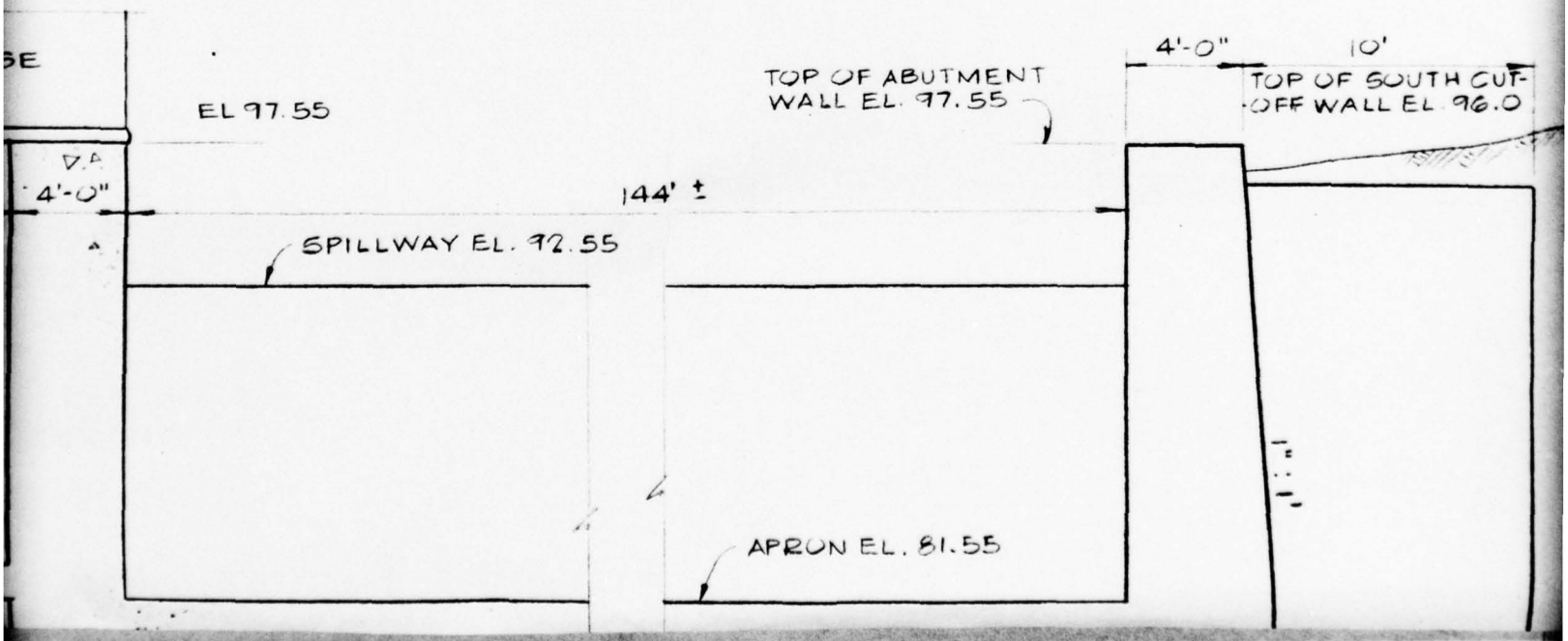

2'
10
HEADWALL
75.22
BATHING
POOL
TOP OF GRADE
GATE HOUSE
TOP OF NORTH
CUT-OFF WALL EL 96.0
OOVE FOR STOP PLANK
54'
4'-0"
6'-0"
4'-0"
4'-0"
6'-0"

87.69 +

80.77 + 87.39

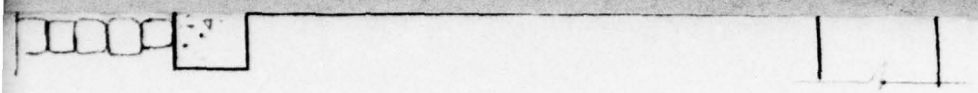
PLAN

SCALE: 1"=20'



12

DATE	DESCRIPTION	NO.
REVISIONS		

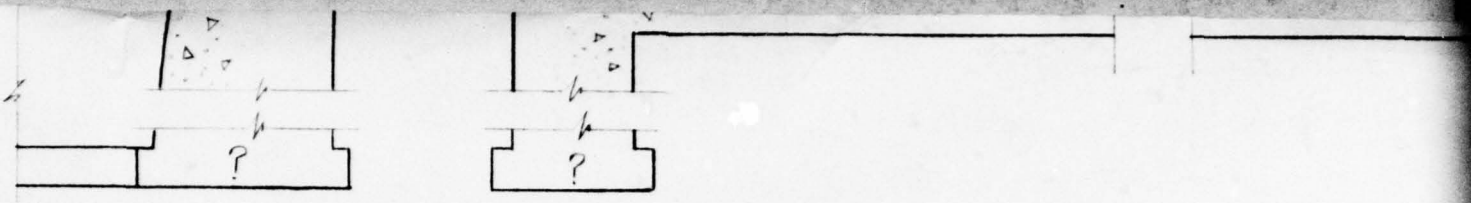


13

SECTION B-B

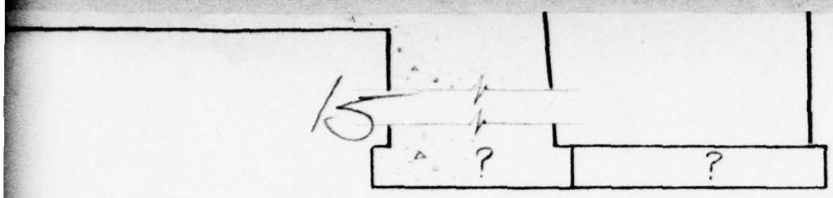
SCALE: 1"-6'

14



ELEVATION

SCALE: 1" = 6'



16

NOTE:

THE ELEVATIONS SHOWN WERE OBTAINED USI
TRANSIT AND LEVEL AND DRAWINGS OF THE MORR
BANKING CO. DOVER, N.J. OFFICE NOV. 20, 1926. EL
APPROXIMATE. THE BENCHMARK ELEVATION OF 97.5
ABUTMENT WALL WAS USED AS SHOWN ON SAID D
SHOWN BELOW GROUND SURFACE AND WATER LEV
ON THE BASIS OF THE ABOVE MENTIONED DWGS.

6

ED USING A SURVEYOR'S
E MORRIS CANAL &
926. ELEVATIONS ARE
OF 97.55 ON THE SOUTH
SAID DWGS. INFORMATION
ER LEVEL ARE INFERRED
DWGS.

LANGAN ENGINEERING ASSOCIATES, INC.

990 Clifton Avenue, Clifton, New Jersey 07013
(201) 472-9366

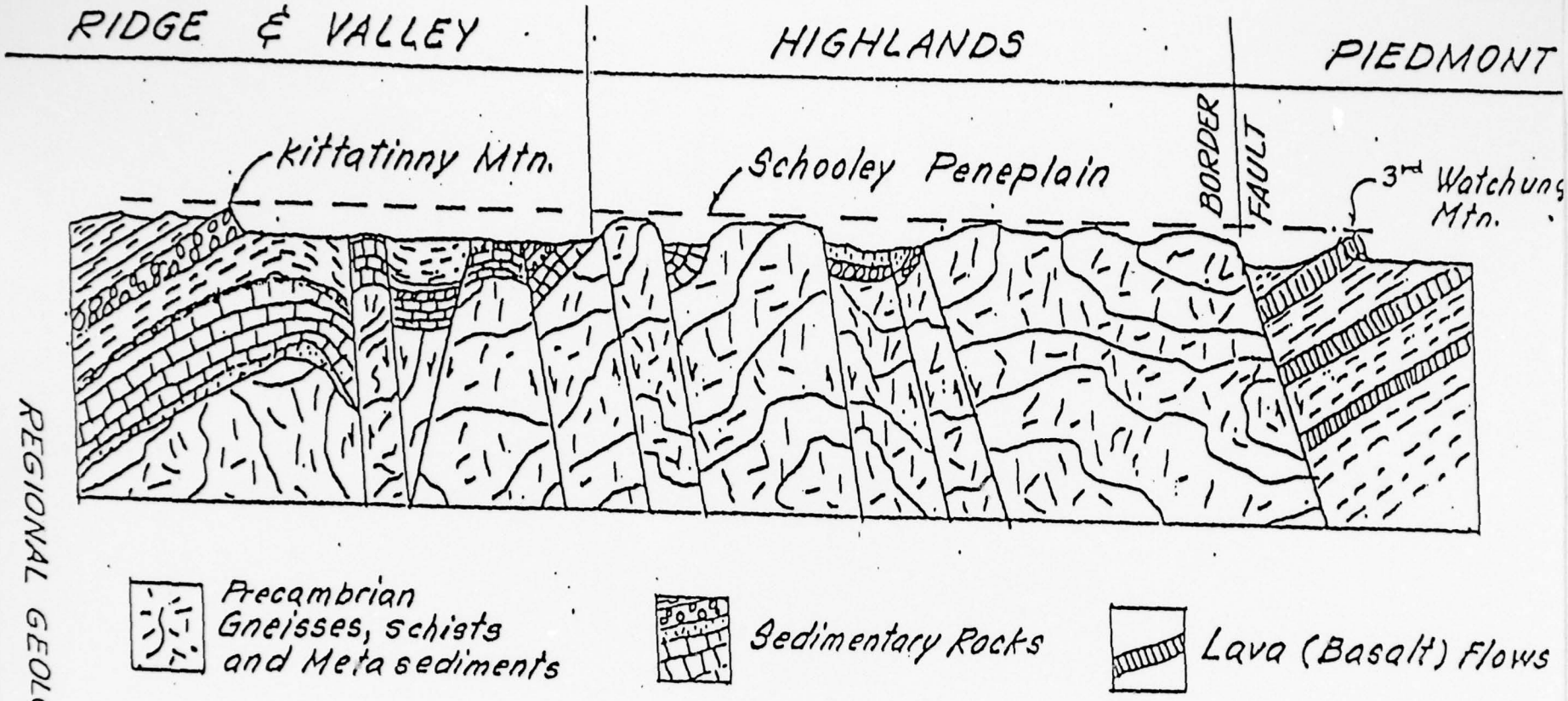
PROJECT

PHASE I
INSPECTION & EVALUATION OF NEW JERSEY DAMS

DRAWING TITLE

SAXTON FALLS DAM
JANUARY 1979
FED. I.D. NO. NJ00277

JOB NO. J-783B	DRAWING NO. FIG. 2
DATE 25 FEB 1979	
SCALE AS NOTED	
DRN. BY J.R.	
CHKD. BY D.J.L.	



Schematic Cross-section New Jersey Highlands Physiographic Province (After Wolfe; 1977)

REGIONAL GEOLOGIC FEATURES

Fig. 3

APPENDIX I

CHECK LIST

VISUAL INSPECTION

SAXTON FALLS DAM

CHECK LIST
VISUAL INSPECTION

Phase I

NAME DAM Saxton Falls Dam COUNTY Morris STATE New Jersey COORDINATORS N.J. DEP

DATE(s) INSPECTION See below WEATHER Clear TEMPERATURE 40° F

POOL ELEVATION AT TIME OF INSPECTION 93.20 TAILWATER AT TIME OF INSPECTION 85.0+

*Elevations are referenced to a BM elevation of 97.55 at top of south abutment wall (see Fig. 2)

INSPECTION PERSONNEL:

D. Leary (12/6/78)	P. Yu (12/14/78)	
J.Richards (12/6/78)	C. Campbell (12/14/78)	
J. Rizzo (12/14/78)		

James L. Richards RECORDER

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Dead trees and rubber tires in channel.	Trees and tires should be removed.
SLOPES	Erosion about 5 to 10 ft. along right downstream slope approximately 200 ft. below dam.	Eroded areas should be repaired.
APPROXIMATE NO. OF HOMES AND POPULATION	5 homes located immediately downstream. Greater than 25 people estimated. Homes located 5 to 10 ft. below spillway crest.	

EARTH EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SEE PAGE ON LEAKAGE		
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	Erosion two to three inches deep at downstream right abutment/structure junction. Erosion at downstream of left abutment/structure junction.	Eroded areas should be repaired.
DRAINS	Appears satisfactory.	
WATER PASSAGES	Spotted areas of debris.	Debris should be removed.
FOUNDATION (Direction: looking d/s)	Not observable.	

CONCRETE/MASONRY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	Concrete on both abutments has cracks on three sides.	Cracks should be repaired.
STRUCTURAL CRACKING	Crack above and below downstream gatehouse wall. Steel beam rusted.	
VERTICAL AND HORIZONTAL ALIGNMENT	Appears satisfactory.	
MONOLITH JOINTS	Not observed.	
CONSTRUCTION JOINTS		

N/A

OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	Appears satisfactory.	
INTAKE STRUCTURE	Cracks along top and sides.	Concrete cracks should be repaired.
OUTLET STRUCTURE	Top of concrete outlet walls spalled on downstream side.	Spalled concrete should be repaired.
OUTLET CHANNEL	Leaves, bottles, pieces of spalled concrete from walls, and paper in channel.	Debris should be removed.
EMERGENCY GATE	None observed.	

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARK OR RECOMMENDATIONS
SLOPES	Sides have eroded in several locations.	
SEDIMENTATION	Appears satisfactory.	

UNGATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	Dead logs and leaves have accumulated.	Debris should be removed.
APPROACH CHANNEL	Dead trees and stumps in channel. Sediment behind spillway wall to height of spillway.	Debris and sediment should be removed.
DISCHARGE CHANNEL	A dilapidated boat, dead trees, brush and wood in channel.	Boat and debris should be removed.
BRIDGE AND PIERS		

INSTRUMENTATION

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	None observed.	
OBSERVATION WELLS	None observed.	
WEIRS		
PIEZOMETERS		
OTHER	Water depth gage attached to inlet wall has algae growth below 1.40.	

GATE HOUSE

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SILL	Two areas of approximately 2 ft square have spalled concrete. Several cracks across top, and down sides.	Spalled areas should be repaired. Cracked concrete should be further investigated.
APPROACH CHANNEL	Bottle, leaves and dead trees in channel.	Debris should be removed.
DISCHARGE CHANNEL	Concrete spalled and several surface cracks.	Spalled concrete areas should be repaired.
BRIDGE AND PIERS		
GATES AND OPERATION EQUIPMENT	Crank type operator located in center of gatehouse, rusted. However, it appears to be functional.	

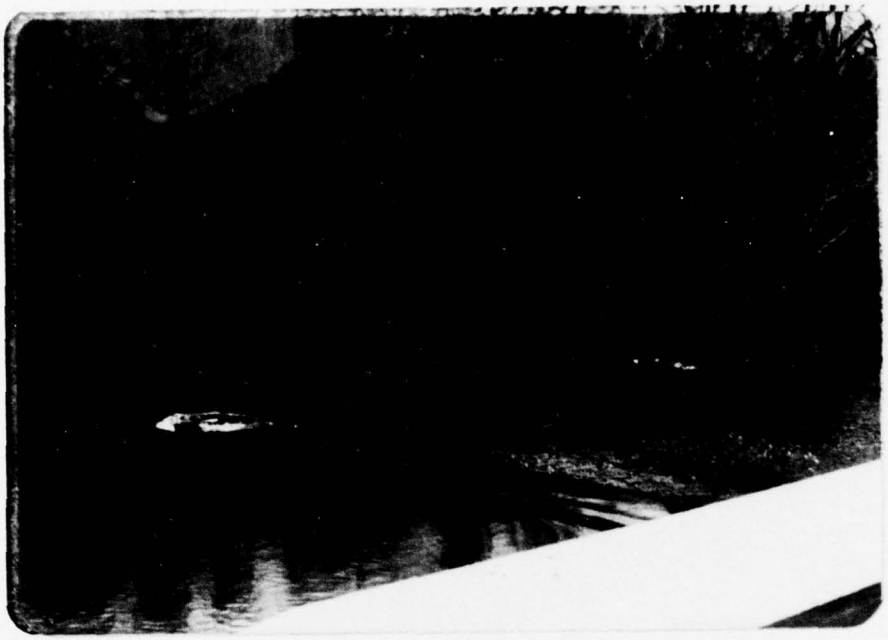
APPENDIX 2

PHOTOGRAPHS

SAXTON FALLS DAM

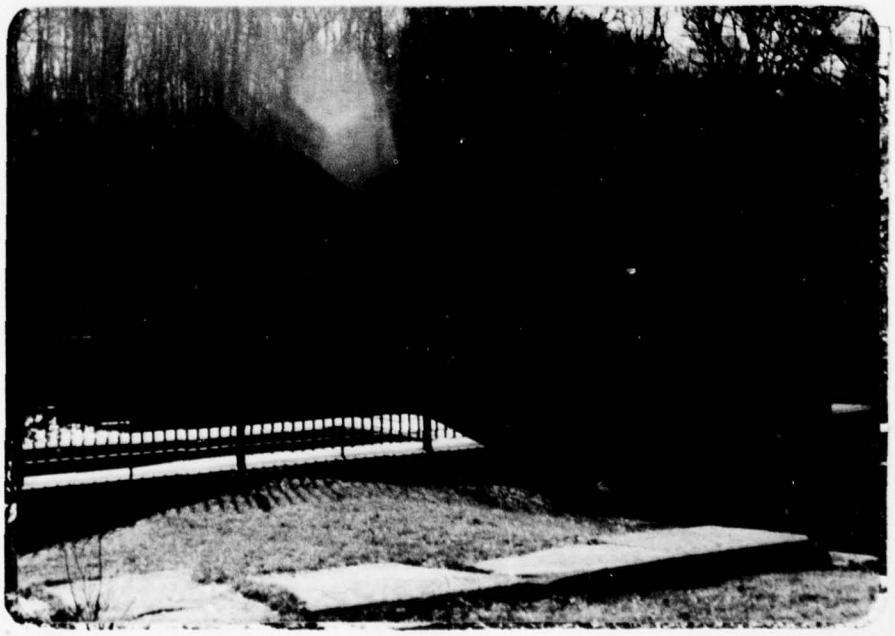
Spillway and Discharge Channel. Looking Upstream. 6 December 1978

Spillway. Looking south. 6 December 1978



Top of spillway and riprapped.
Left bank of discharge channel.

6 December 1978

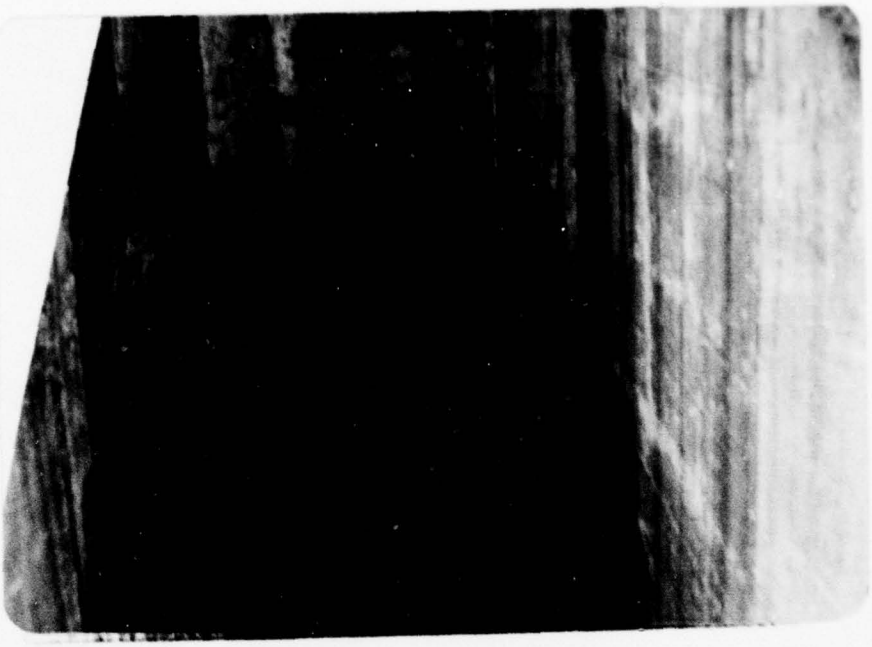


Gatehouse at right side of spillway.

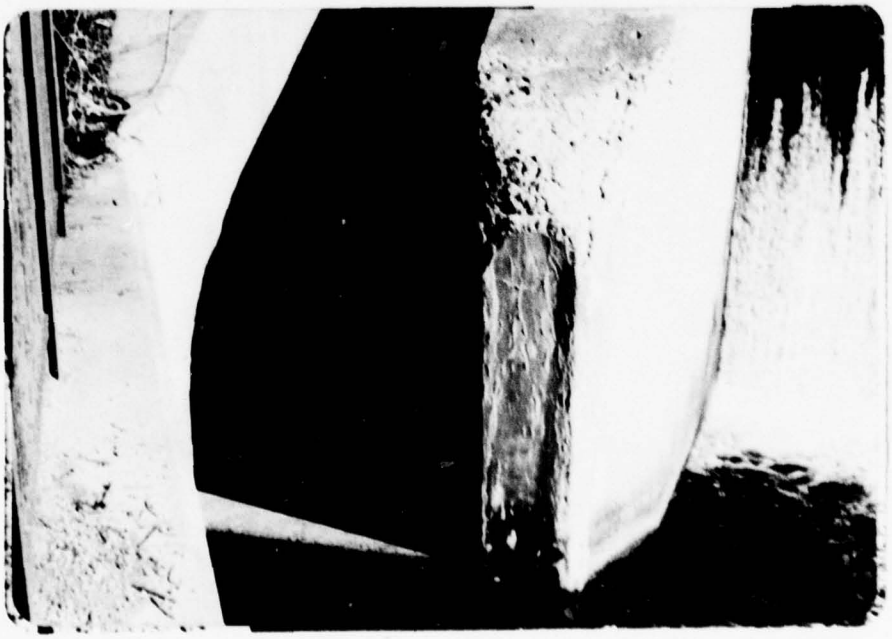
6 December 1978

Gatehouse and spillway. Looking upstream. 6 December 1978

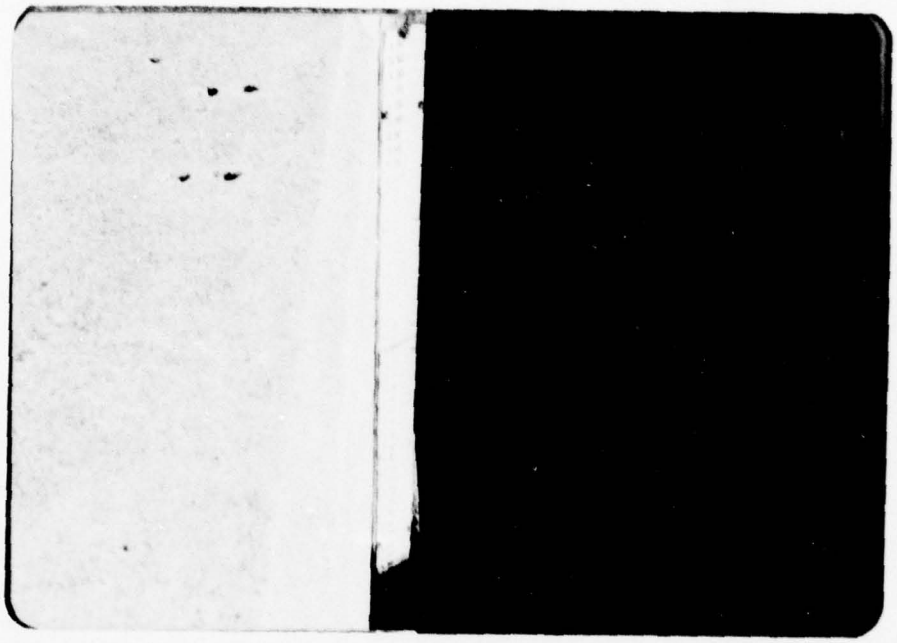
Erosion at right abutment immediately north of gate house. 6 December 1978



Discharge opening of downstream side of gate house. 6 December 1978



Spalled concrete on south wall of gate house discharge channel. 6 December 1978



Water level gage at gate house. 6 December 1978

Former lock and valve chamber used to release water into lake for swimming. 6 December 1978

Left sidewall of spillway. 6 December 1978

Spalling of concrete at left side wall of spillway. 6 December 1978

Recently repaired crack in left sidewall of spillway.

6 December 1978

Erosion at abutment of left sidewall of spillway.

6 December 1978

APPENDIX 3

HYDROLOGIC COMPUTATIONS

SAXTON FALLS DAM

LANGAN ENGINEERING ASSOCIATES, INC.

HYDROLOGIC COMPUTATIONS

SAXTON FALLS DAM

Location : Morris - Warren County, N.J.

Drainage Area : 68 sq. mi – [25.4 sq. mi to Lake Hopatcong
4.9 sq. mi to Lake Musconetcong proper
37.7 sq. mi to Saxton Falls proper]

Lake Area : 63.5 Ac.

Classification : size – small
hazard – high

Spillway Design Flood

Based on available information, it is understood that the spillway has been designed on the basis of the flood data obtained on Feb. 6, 1896.
In accordance with the evaluation criteria, ½PMF to PMF should be used and PMF is chosen.

COMPUTE PMF

1. Dam located in Zone 6
   PMP = 22.4 inches (200 sq. mi in 24 hrs)
2. PMF must be adjusted for basin size

Duration - hr.	% Factor (for 58 sq. mi)	Reduction Factor*
0-6	100	
0-12	109	
0-24	119	0.835
0-48	131	

* P.48 'D.S.D.'

BY PJ DATE 2-2-79 Saxton Falls Dam JOB NO. E7832
CKD JED DATE 5-28-79 SHEET NO. 1 OF 13

3. Methodology

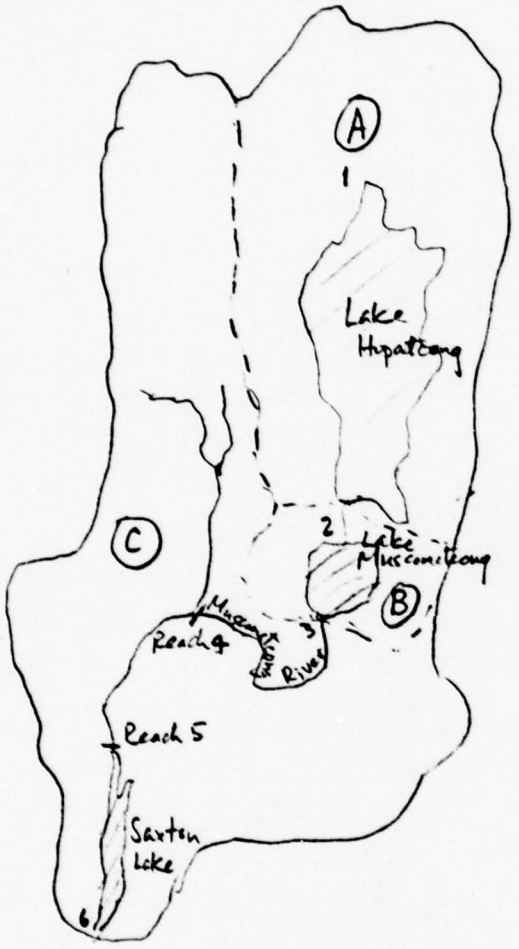
a) PMF be calculated using HEC-1 with Snyder Coefficients $C_t = 3.70$ and $C_p = 0.58$ recommended by the Army Corp of Engineers.

b) Within Saxton Falls drainage basin lie Lakes Hopatcong and Musconetcong. The outflow hydrograph of Lake Hopatcong is combined with the local inflow of Lake Musconetcong and routed to obtain the outflow hydrograph of Lake Musconetcong. This outflow hydrograph of Lake Musconetcong is routed through 2 reaches to upstream end of Saxton Lake. Such routed hydrograph is added to the local inflow of Saxton Lake which in turn yields the inflow hydrograph for Saxton Falls Dam. The procedure is illustrated on a schematic network shown on sheet No. 3

c) Considering the valley topography of the Musconetcong River between Lake Musconetcong and Saxton Lake, a generalized channel section is used at each reach for the channel routing. The generalized channel sections are shown on sheet No. 4

LANGAN ENGINEERING ASSOCIATES, INC.

Catchment Basin



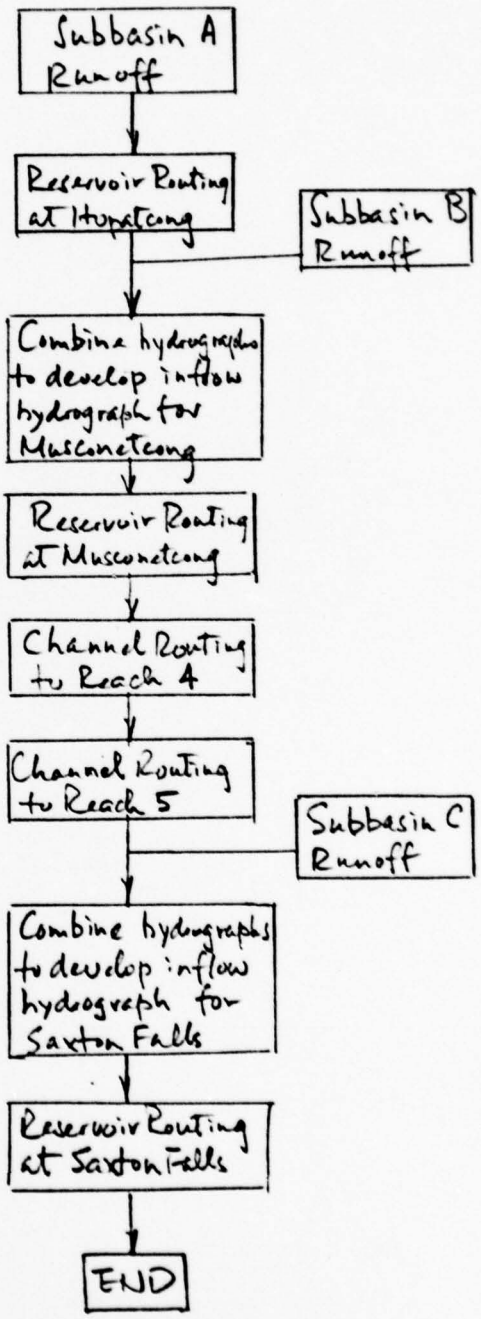
Ⓐ - Hopatcong Subbasin

Ⓑ - Musconetcong Subbasin

Ⓒ - Saxton Subbasin

1 to 6 - Reach numbers

Schematic Network



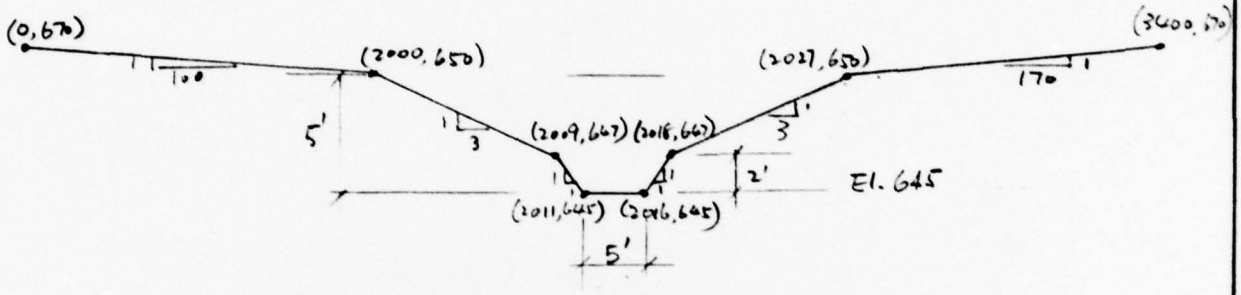
BY Dry DATE 2-5-79 Saxton Falls Dam JOB NO. 5-763 B

CKD TSD DATE 3 28 79 SHEET NO. 3 OF 13

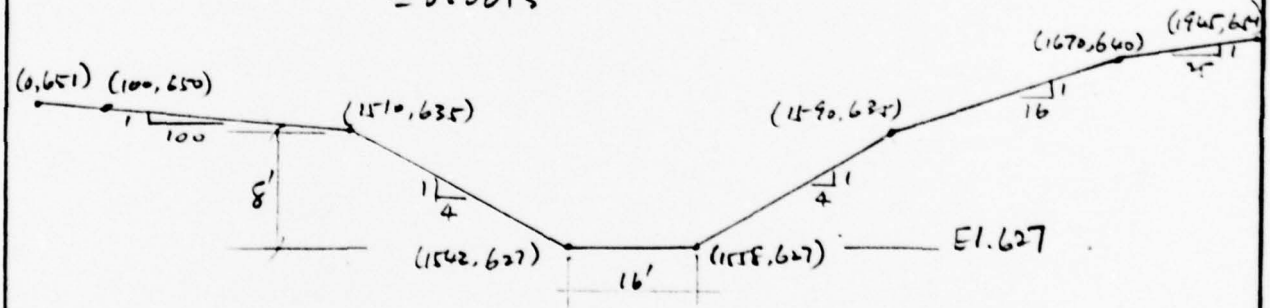
LANGAN ENGINEERING ASSOCIATES, INC.

GENERALIZED CHANNEL SECTION

Reach 4: Left & right overbank Manning's $n = 0.06$
Channel Manning's $n = 0.04$
Channel slope (from Lake Muscometcong to reach 4)
$\doteq 0.0146$



Reach 5: Left & right overbank Manning's $n = 0.06$
Channel Manning's $n = 0.04$
Channel slope (reach 4 to reach 5)
$= 0.0013$



Note: Channel section generated by assumption for main channel dimensions and information from U.S.G.S. Topographic maps.
Numbers in brackets are coordinates used for defining the sections.

BY Dy DATE 2-6-79 Rev 3-21-79 Canton Falls Dam JOB NO. F-7858
CKD GED DATE 3-28-79 SHEET NO. 4 OF 13

UNIT HYDROGRAPH

Corp of Engineers has indicated that Snyder Method be used to develop local inflow for Saxton Falls' intermediate drainage area.

$C_t = 3.7$, $C_p = 0.58$

Snyder Lag time:

$t_p = C_t (L \cdot L_{ca})^{0.3}$

from drainage area

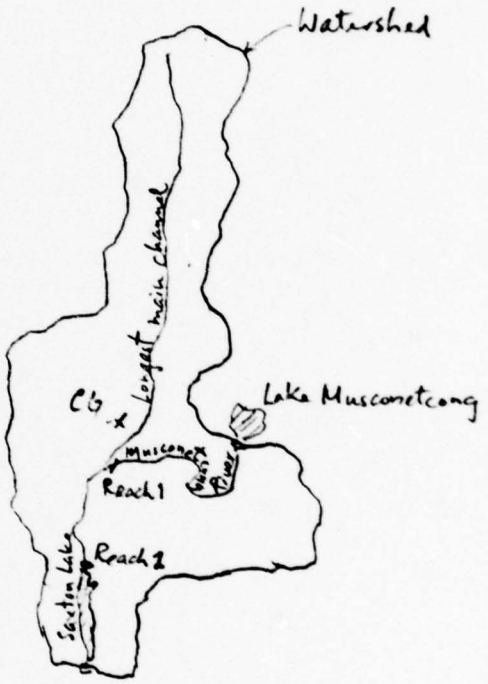
$L = 80000\,ft = 15.2\,mi$

$L_{ca} = 28000\,ft = 5.3\,mi$

$\therefore t_p = 3.7(15.2 \times 5.3)^{0.3}$

$= 13.8\,hrs$

$C_p = 0.58$

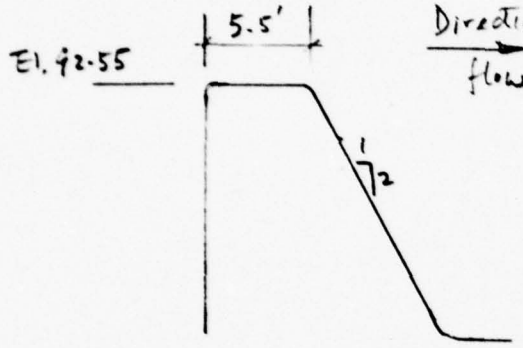


Saxton Lake Subbasin

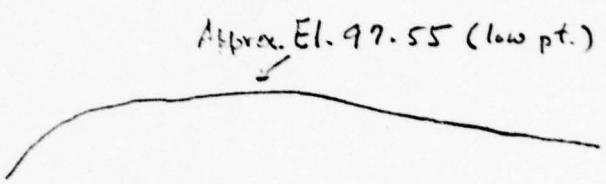
LANGAN ENGINEERING ASSOCIATES, INC.

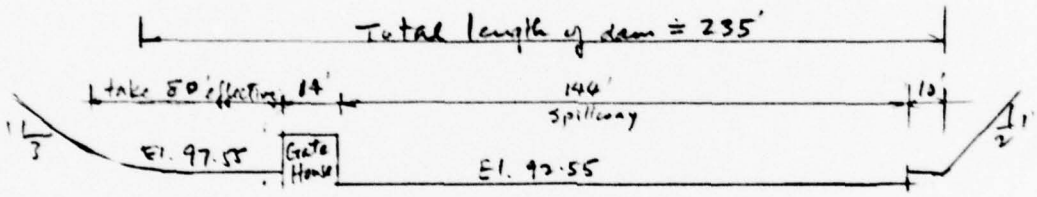
SPILLWAY CAPACITY

Spillway Section:



End Abutment Section (generalized):





$Q = CLH^{3/2}$

Spillway section resembles trapezoidal cross-section with vertical upstream face, inclined downstream face and rounded corners. Choose $C_{avg.} = 3.4$ (Ref. Table 5-9 of 'Handbook of Hydraulics' by King & Brater)

$L = 144'$

End abutments are of irregular shape.

Take effective length of 90 feet (both ends)

$C_{avg} = 2.7$

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Elev. (ft)	Spillway		End Abutments		Q_T (cfs) $= Q_S + Q_E$	
	H(ft)	Q_S(cfs)	H(ft)	Q_E(cfs)		
92.55	0				0	
93.55	1	490			490	
94.55	2	1385			1385	
95.55	3	2544			2544	
96.55	4	3917			3917	
97.55	5	5474	0		5474	← Top of dam
98.55	6	7196	1	243	7439	
99.55	7	9068	2	687	9755	
100.55	8	11078	3	1263	12341	
101.55	9	13219	4	1944	15163	
102.55	10	15483	5	2717	18200	
103.55	11	17862	6	3571	21433	
104.55	12	20352	7	4500	24852	
105.55	13	22949	8	5498	28447	

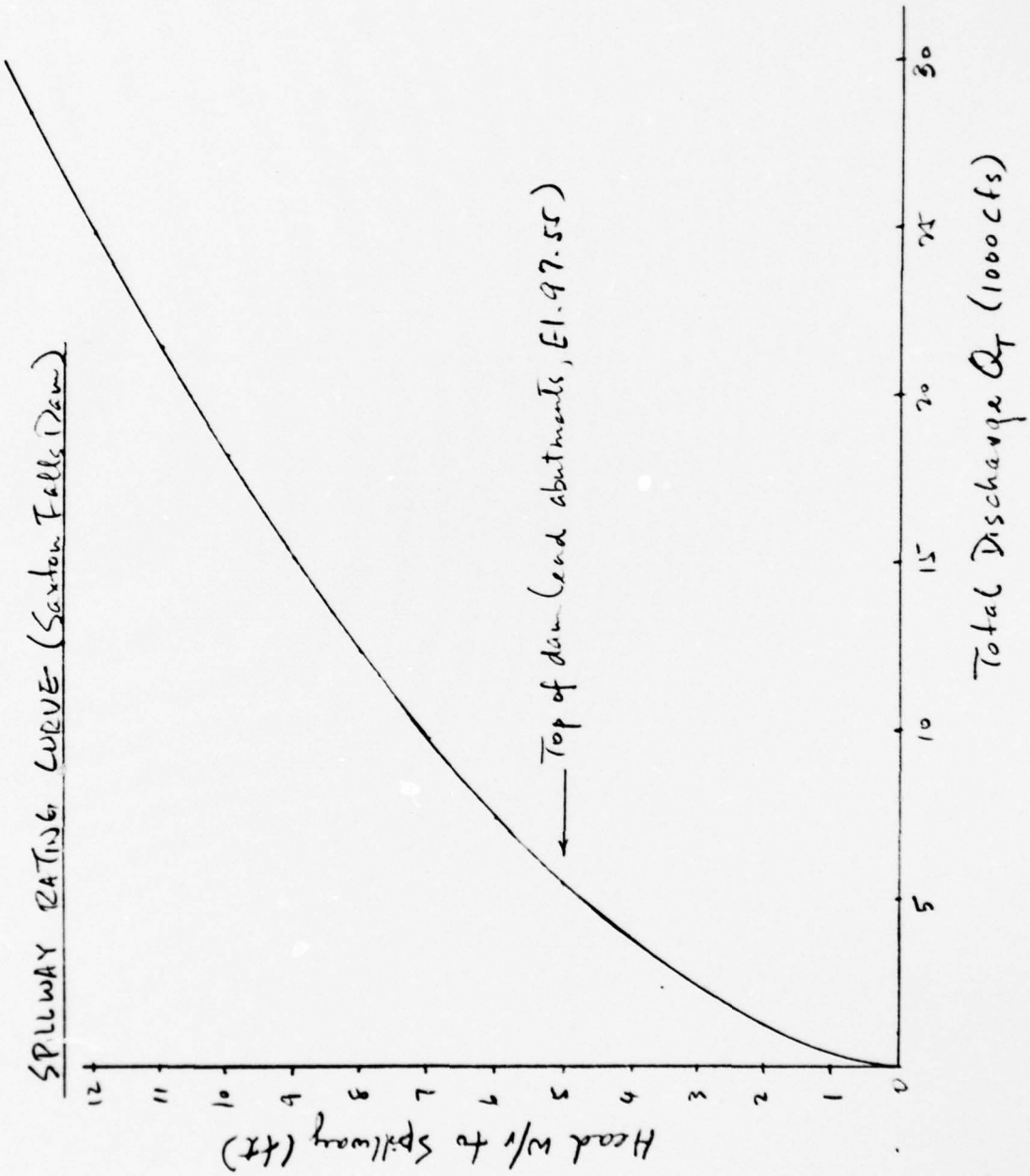
$Q_S = 489.6\, H^{3/2}$

$Q_E = 243\, H^{1/2}$

BY RJ DATE 2-3-79 Sexton Falls Dam JOB NO. J-783B

CKD GED DATE 3-28-79 SHEET NO. 7 OF 13

LANGAN ENGINEERING ASSOCIATES, INC.



BY RJ DATE 2-3-79 Saxton Falls Dam JOB NO. J-7635

CKD GED DATE 3-28-79 SHEET NO. 8 OF 13

Reservoir Storage Capacity

Assume a linear distribution for the area of the lake with elevation. Start at a zero storage at the crest of the spillway.

Area of Lake = 63.5 Acres

Perimeter of Lake ≈ 32500 ft (measured from U.S.G.S. map)

Since perimeter is estimated from U.S.G.S. map, ∴ for estimated analysis purpose, it is assumed to be constant within the working elevation range.

Take average side slope = 1V : 6H.

∴ for every foot of water above the crest of spillway, the area of lake increases by $\frac{6(32500)}{43560} \doteq 4.5$ Ac.

Elev. (ft)	(ft)	Increase in Lake area (Acres)	Area of Lake (Acres)
92.5	0		63.5
93.5	1	4.5	68.0
94.5	2	9.0	72.5
95.5	3	13.5	77.0
96.5	4	18.0	81.5
97.5	5	22.5	86.0
98.5	6	27.0	90.5
99.5	7	31.5	95.0
100.5	8	36.0	99.5
101.5	9	40.5	104.0
102.5	10	45.0	108.5
103.5	11	49.5	113.0
104.5	12	54.0	117.5
105.5	13	58.5	122.0

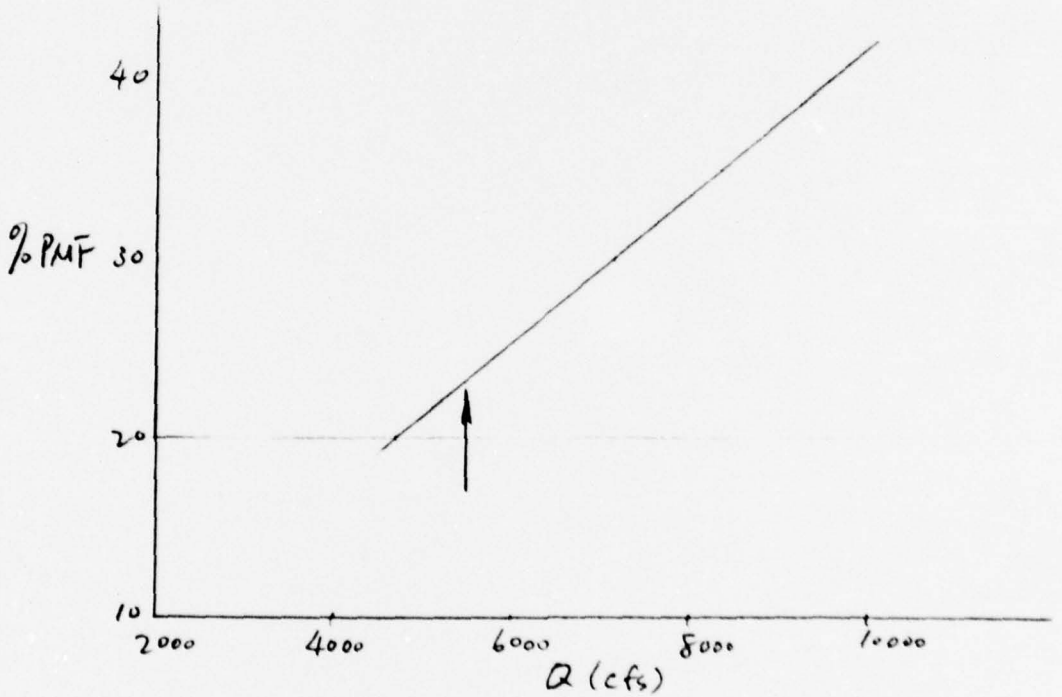
LANGAN ENGINEERING ASSOCIATES, INC.

SUMMARY OF HYDROGRAPH AND FLOOD ROUTING

1. Hydrograph and routing calculated using HEC-1
2. PMF for Saxton Lake is 24141 cfs (routed to 24135 cfs)
3. Routing indicates the dam (and abutments) overtops by approx. 6.8 ft for PMF

OVERTOPPING POTENTIAL

1. Various % of PMF have been routed using HEC-1
2. Plot peak outflow vs % PMF



3. Dam overtops at approx. El. 97.55 with Q = 5474 cfs.
   i.e. dam can pass approx. 23% of PMF

BY PY DATE 2-7-79 (REV 3-21-79) Saxton Falls Dam JOB NO. 1-7838
CKD GED DATE 3-28-79 SHEET NO. 10 OF 17

DRAWDOWN ANALYSIS

1. Outlet structures

   1 - 4' x 6' sluicegate

   (outlet for 16"ϕ pipe appeared blocked, ∴ not considered)

2. Outlet Capacity

   Sill of gate at El. 83.55

   top of gate at El. 89.55

When pool elevation is above El. 89.55, gate discharge is governed by orifice flow. As pool elevation is lowered below El. 89.55, gate discharge is governed by weir flow. Use $C = 3.0$ for weir flow and $C = 0.62$ for orifice flow

	Elev. (ft)	Head (ft)	Q (cfs)	$Q_{out\ avg.}$ (cfs)
orifice flow	92.55	6	292	280
	91.55	5	267	253
	90.55	4	239	208
weir flow	89.55	6	176	155
	88.55	5	134	115
	87.55	4	96	79
	86.55	3	62	48
	85.55	2	34	23
	84.55	1	12	6
	83.55	0	0	

LANGAN ENGINEERING ASSOCIATES, INC.

3. Storage Capacity

a. Estimated storage above lowest elevation of the gate is 350 ac-ft

b. Assume area varies linearly with height.
Area of lake at bottom of gate ≈ 14.3

Elev. (ft)	Area (Ac)	ΔStorage (Ac-ft)	Total Storage (Ac-ft)
92.55	63.5		350
		60.75	
91.55	58.0		
		55.3	
90.55	52.6		
		49.85	
89.55	47.1		
		44.35	
88.55	41.6		
		38.9	
87.55	36.2		
		33.45	
86.55	30.7		
		27.95	
85.55	25.2		
		22.5	
84.55	19.8		
		17.05	
83.55	14.3		

BY Dy DATE 2-5-79 Saxton Falls Dam JOB NO. J-7838

CKD GED DATE 3-28-79 SHEET NO. 17 OF 13

LANGAN ENGINEERING ASSOCIATES, INC.

4. Assume inflow to be 2 cfs/sq.mi

$Q_{in} = 2 \times 68 = 136$ cfs.

Elev. (ft)	$Q_{out\ avg.}$ (cfs)	Q_{net}* (cfs)	Δ Storage (Ac-ft)	Δt (hr.)	$\Sigma \Delta t$ (h)	
92.5	280	144	60.75	5.1		
91.5	253	117	55.3	5.7		
90.5	208	72	49.85	8.4	19.2	
89.5	155	19	44.35	28.2	47.4	(1.98 days)
88.5	115	-**	38.9			
87.5	79	-	33.45			
86.5	48	-	27.95			
85.5	23	-	22.5			
84.5	6	-	17.05			
83.5						

* $Q_{net} = Q_{out\ avg} - Q_{in} = Q_{out\ avg} - 136$

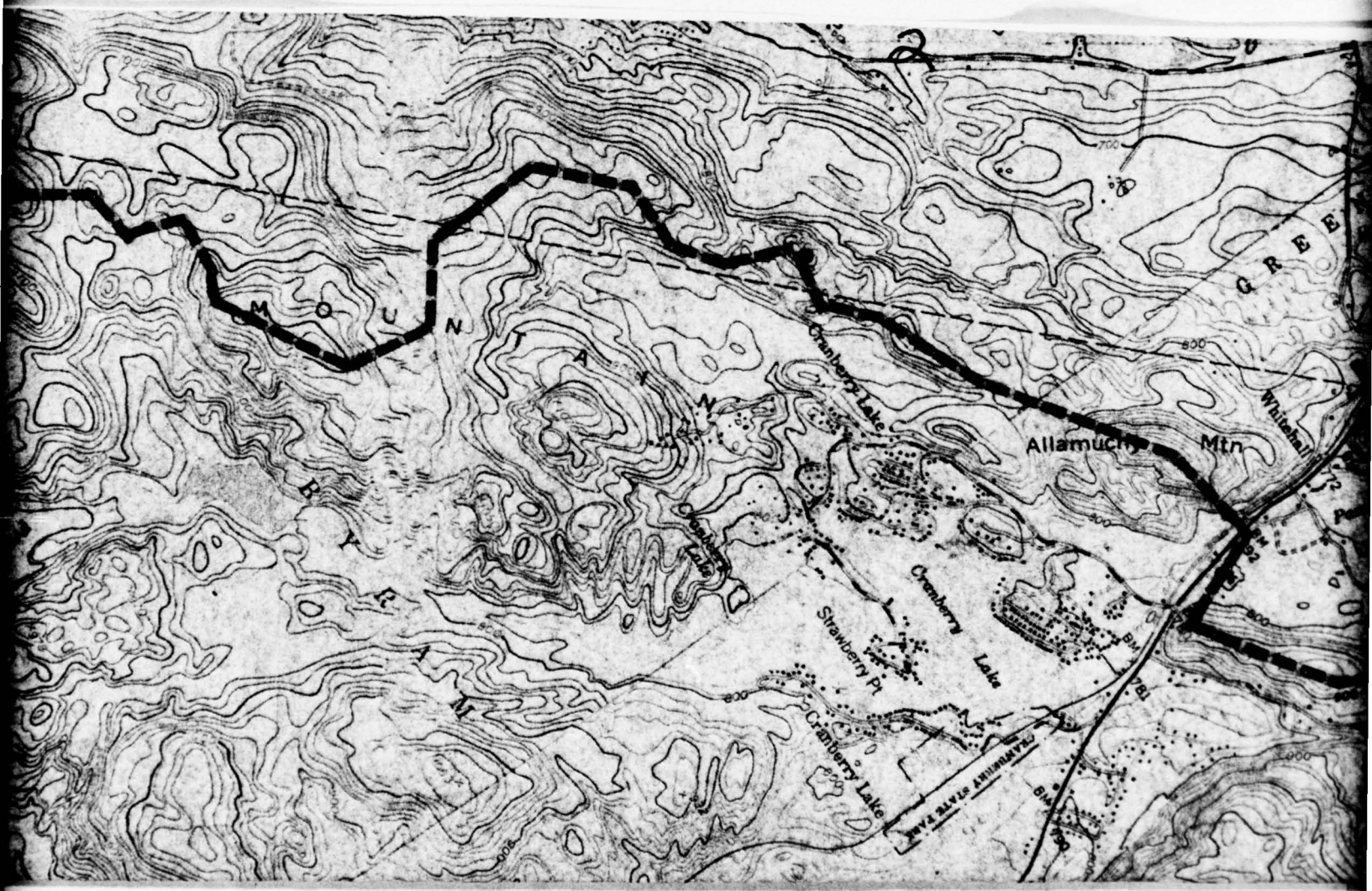
** $Q_{in} > Q_{out}$ not considered

First 3 feet of lake can be lowered in about 19 hrs.
Lake can be lowered 4 feet in approximately 2 days.
We estimate the gate is not capable of lowering the lake more than 4 feet.

BY [illegible] DATE 2-5-79 Saxton Falls Dam JOB NO. J-753B

CKD GED DATE 3-22-79 SHEET NO. 13 OF 13

Villa Madonna
M U C H Y
Deer Park Pond
MUSCONETCONG
DELAWARE
ABANDONED
RIVER
MORRIS CO.
SUSSEX CO.
WARREN CO.
Penwiles Pond


MOUNTAIN
BRYAN
GREE
Cranberry Lake
Allamuchy Mtn
Whitehall
Strawberry Pt
Cranberry Lake
Cranberry Lake
Cranberry Lake
CRANBERRY STATE PARK
800
700
600
BM

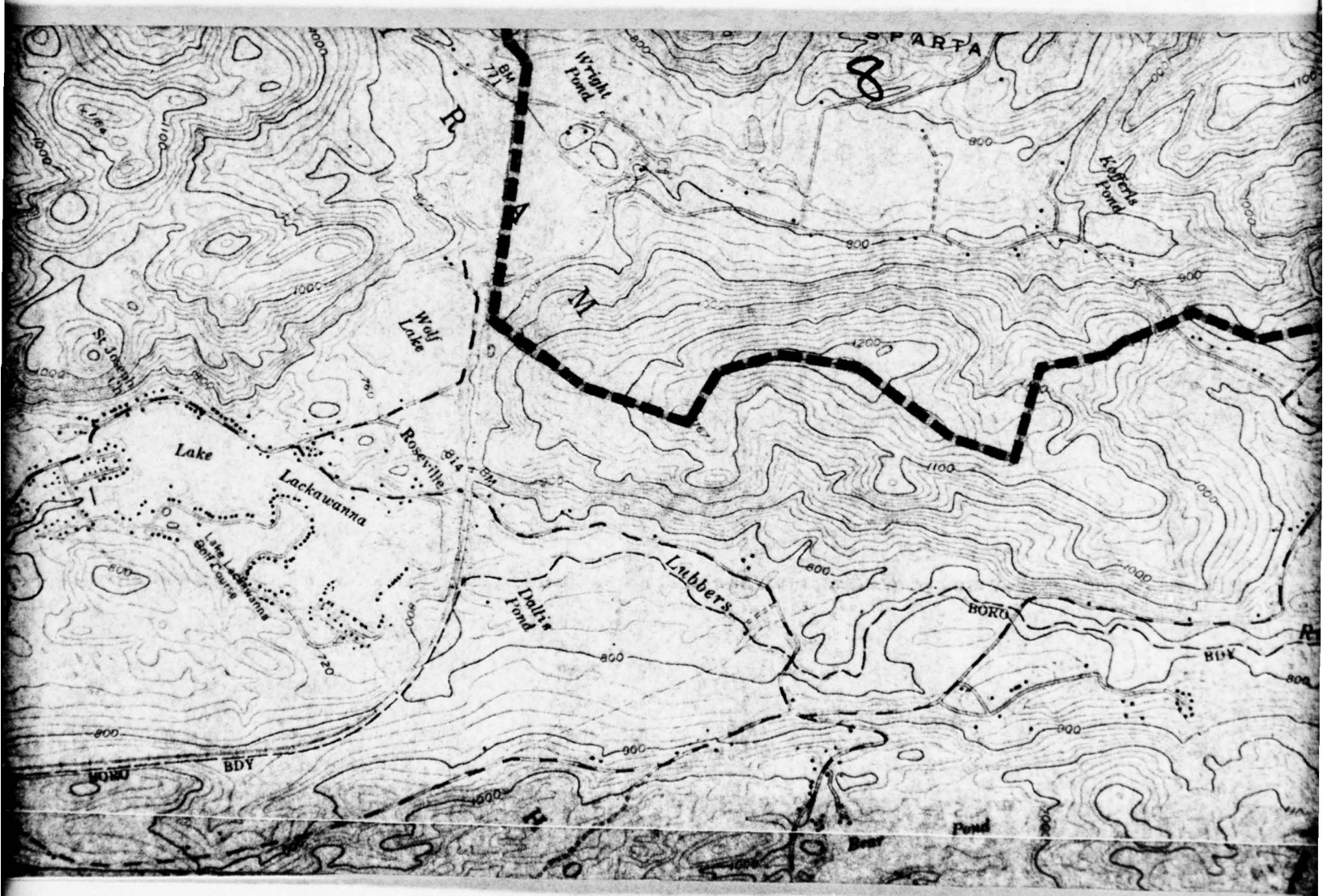
Andover Ponds
Rocky Pond
Panther Lake
Forrest Lake
Johnson Lake
BDY
BORO
PRIVATE
ERIE
LACKAWANNA
BM
700
800
900
1000

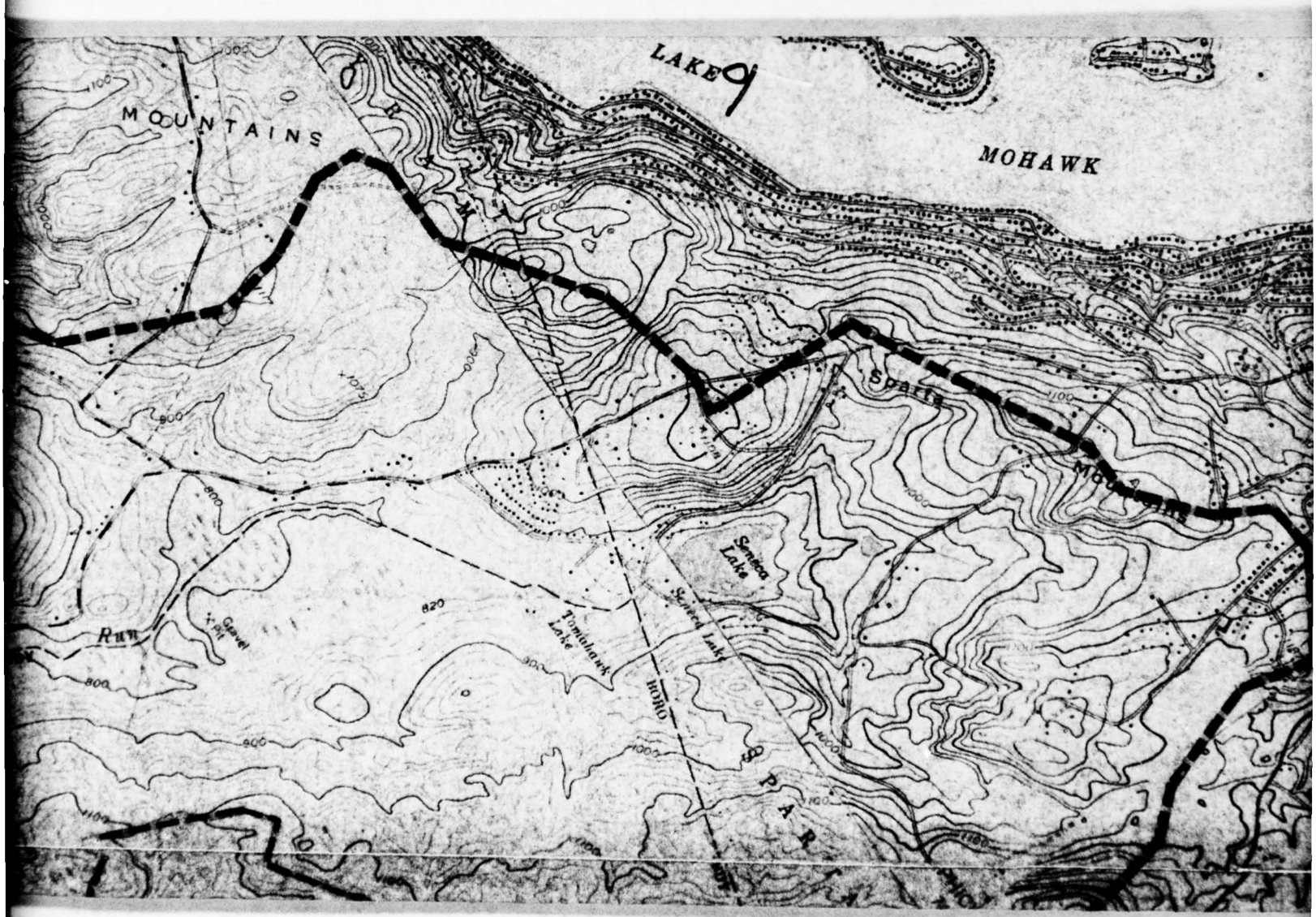
Upper Mohawk Lake
Upper Mohawk
Singdare Pond
Forona Lake
Valentine Pond
Hughs Pond

AND
SUSQUEHANNA
Upper Mohawk Lake

6
Lake
Waterloo
Whitney Point Reservoir
ERIE
1069

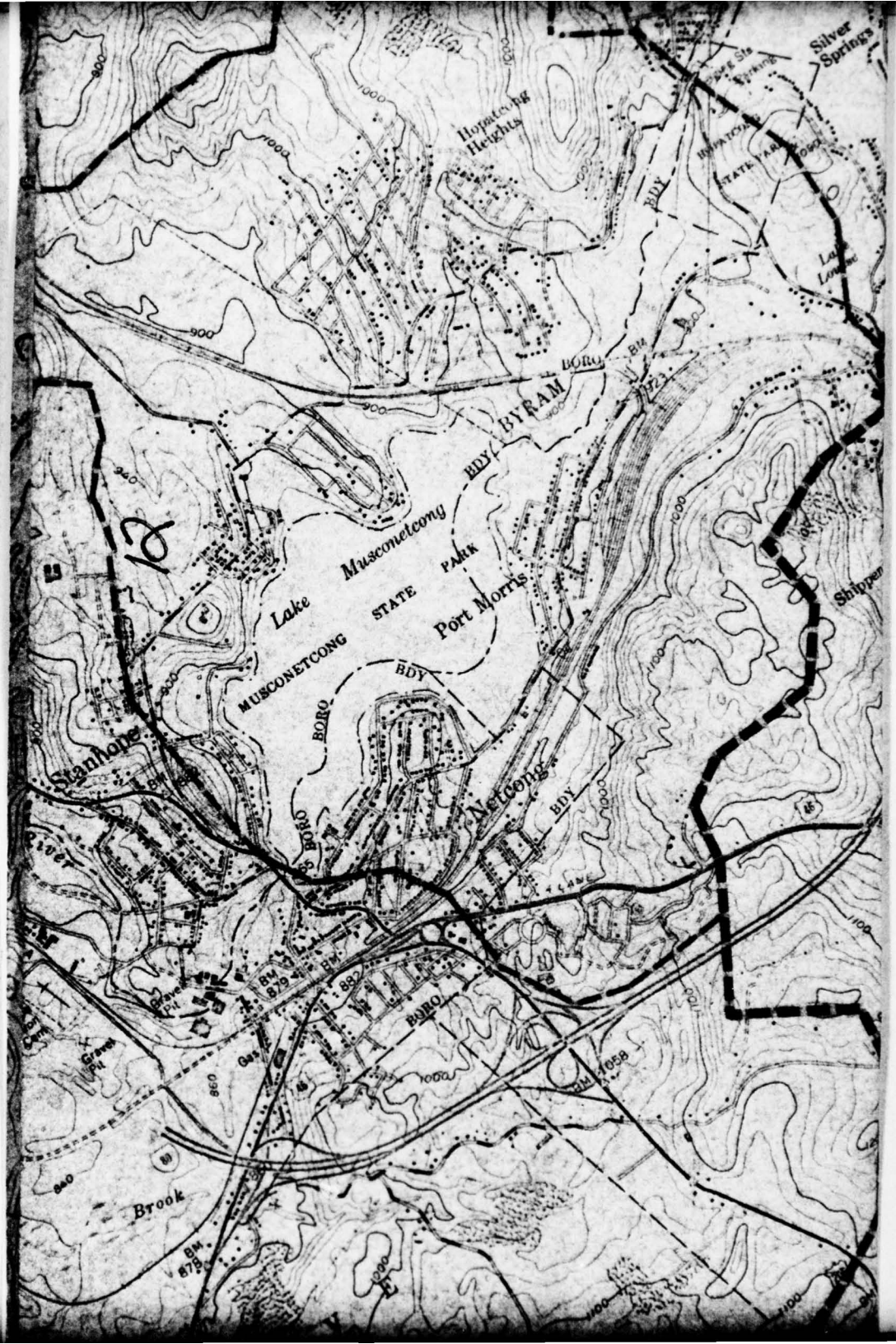
Consolidated Sch
Lakeside
Lackawanna
BM 1682
BM 1707
BM 1732
BORO
BDY
Jefferson Lake
Cage Hill
Lackwood
Munsonetcong
RUSSEL MORRIS
CO
CO
ROAD
Sand Pit
ERIE
Sand Pit
UNDER CONS
Waterloo Lakes
MORRIS
CANAL
LACKAWANNA
Waterloo
Waterloo Lakes
ERIE

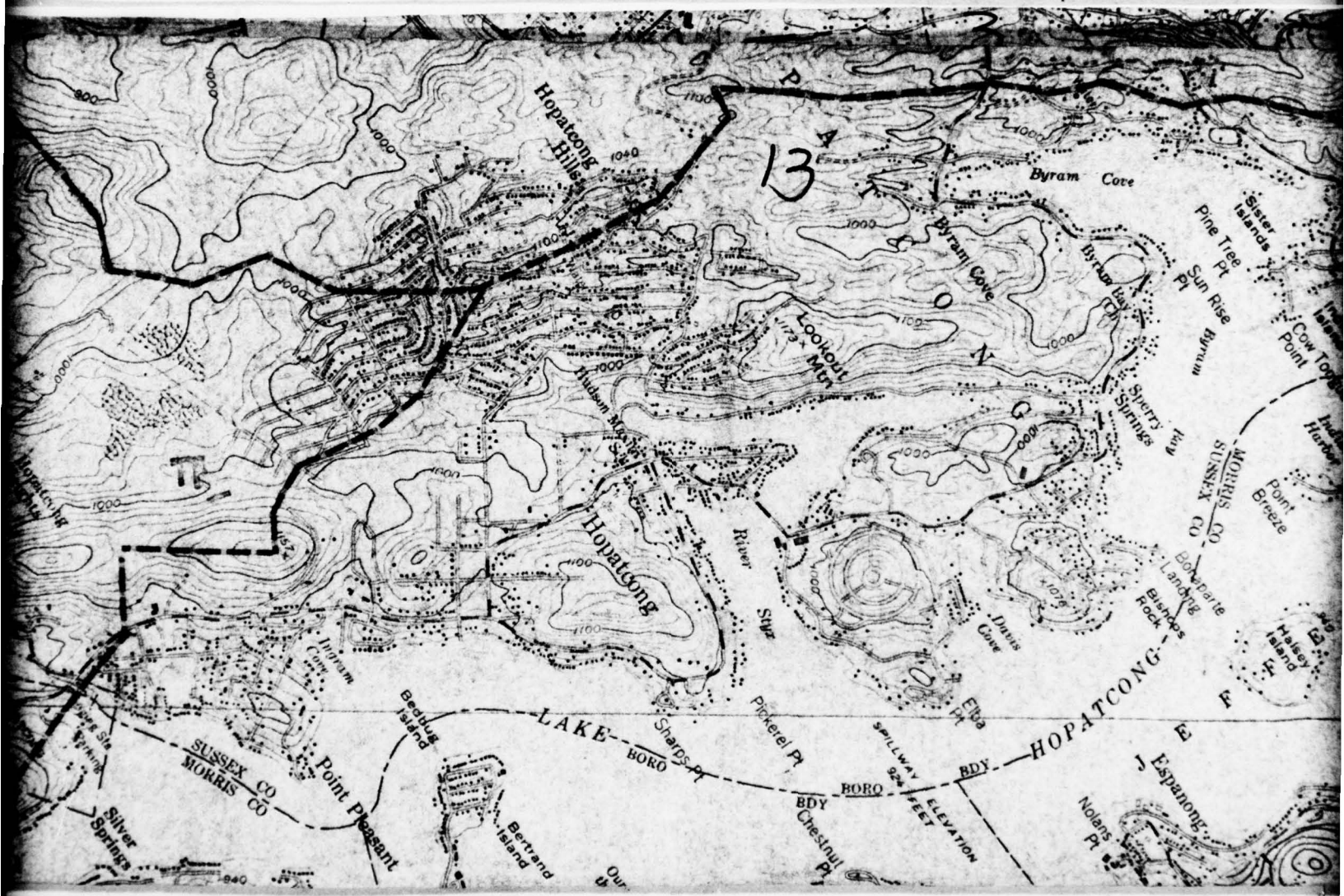

SPARTA
Wright Pond
Wolf Lake
Roseville
Lake Lackawanna
Lake Lackawanna Golf Course
Dalrie Pond
Lubbers
Pond
BORO
BDY

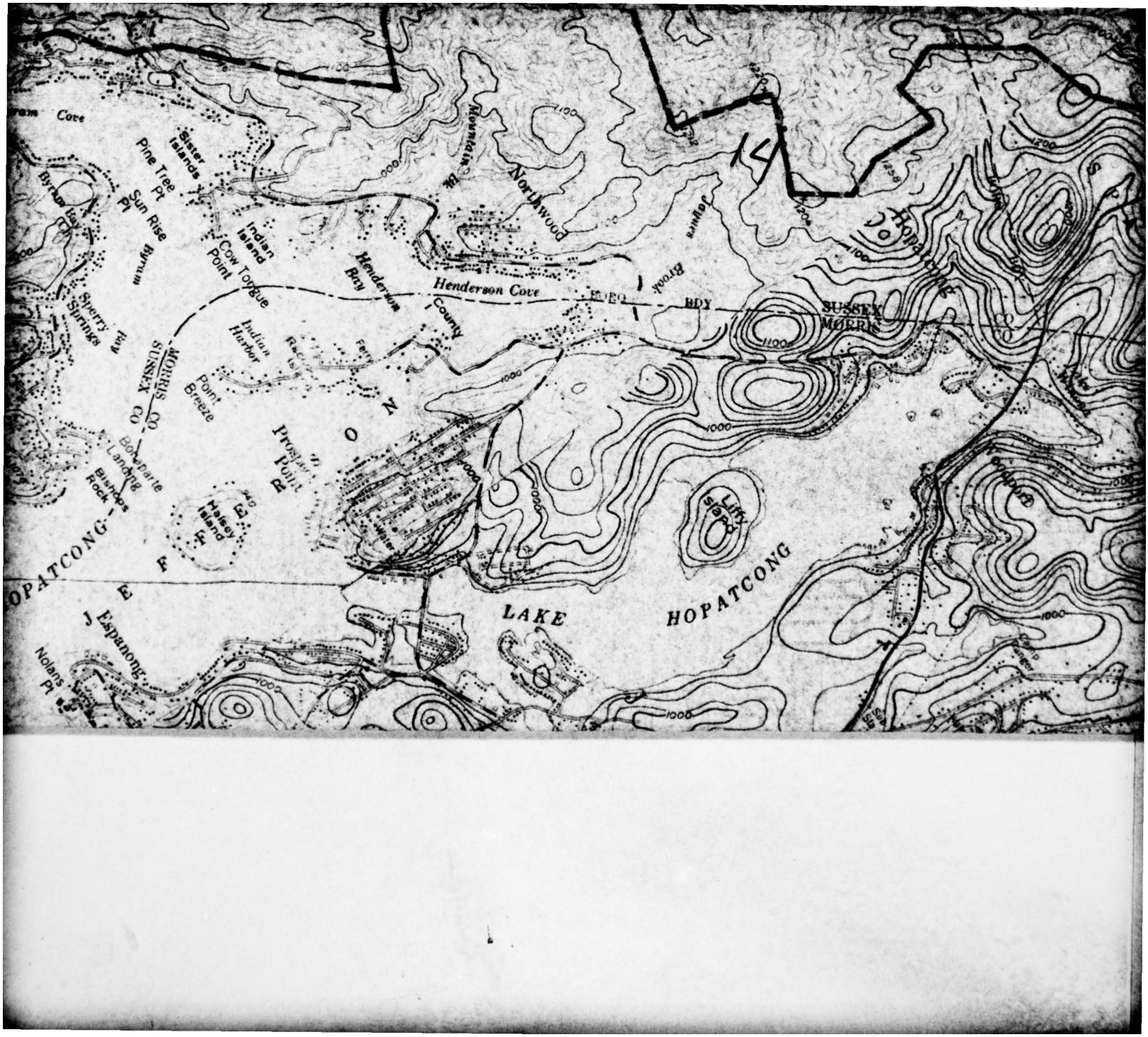

LAKE 9
MOUNTAINS
MOHAWK
Sparta
Seneca Lake
Tomtidawk Lake
Seneca Lake
Run
Gravel Pit
820
BORO
PAR

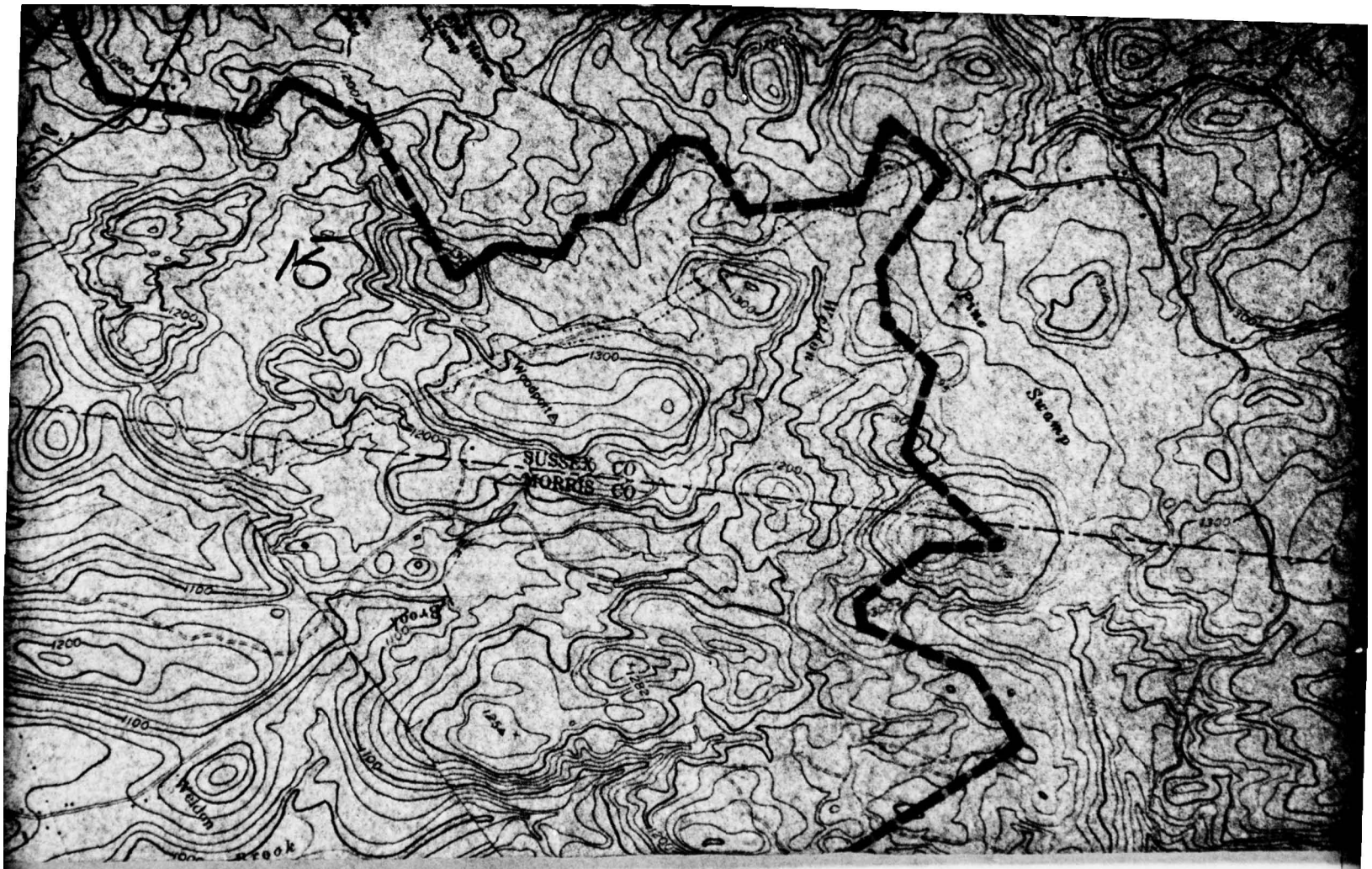
10
Sparta
Newton Reservoir
Morris Lake
Glen Lake

Budd
Lake
BUDD LAKE
Budd Lake
Budd Lake
Brook
Parker
Brook
Mount Olive
1000
1100
1080
1090
960
940
920
900
880
BM
Quarry
Budd Lake
Church


Silver Springs
Horseshoe Heights
BYRAM
BORO
BDY
Lake Musconetcong STATE PARK
MUSCONETCONG
Port Morris
Stanhope
Netcong
Grace Pl
Brook
BM 879
BM 882
BM 1058
Gas
Shippen


13
Hopatcong Hills
Byram Cove
Pine Tree Pt
Sun Rise Pt
Sister Islands
Cow Point
Lookout Mtn
Hudson Mtn
Sperry Springs
Point Breeze
Hopatcong
River Styx
Davis Cove
Bonparle Landing
Bishops Rock
Halsey Island
Indian Cove
Bedbug Island
Sharps Pt
Pickerel Pt
Elba Pt
LAKE HOPATCONG
BORO
BDY
SPILLWAY 924 FEET ELEVATION
Point Pleasant
SUSSEX CO
MORRIS CO
Silver Springs
Bertrand Island
Chestnut Pt
Nolans Pt
J Espanong
940

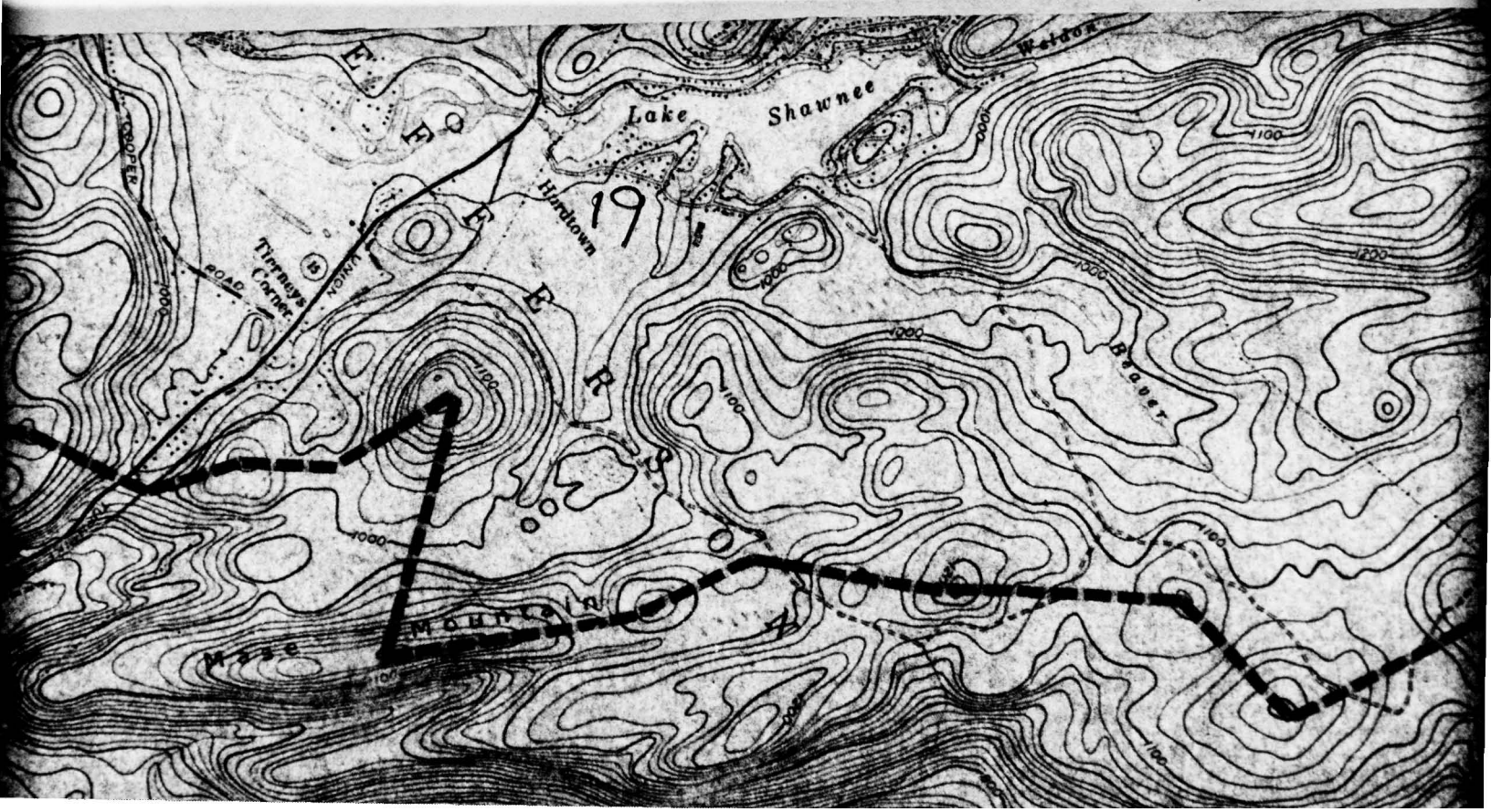

Cove
Sister Islands
Pine Tree Pt
Sun Rise Pt
Byram
Indian Island
Cow Tongue Point
Henderson Bay
Henderson Cove
Mountain Dr
Northwood
Brook
Jaynes
Hopatcong
BDY
SUSSEX
MORRIS
County
Sherry Springs
Indian Harbor
Point Breeze
Prospect Point
Bonaparte Landing
Bishops Rock
Halsey Island
Lily Pad
Water
HOPATCONG
LAKE
Espanong
Nolans Pt
19


15
SUSSEX CO
MORRIS CO
Pine
Swamp
Weldon
Brook

16
DOLKLING ROAD
1054
Conkling Pond
1000
900
1100
1120
1140
1110
700
600
500
650
550
600
Flanders
678
NEW JERSEY
679
Drakes
Brook
Sand Pit
720
780
800
740
DOWN HOLLOW
RR
BT
R
O
X

BDY
Shore Hills
BORO
Floating Island
Landing
Lake Rogerine
Mountain Pond
Dimlar Pond
ERIE
LACKAWANNA
BORO
BDY
BDY
ERIE
R
O
U
T
E
B
A
Ladywood Pond
Ladywood
CANAL
CANAL
1000
900
1100

Great Cove
Lake Hopatcong
Espanong
Mount Arlington
Mt Arlington
Rockaway


Lake Shawnee
Weldon
Hardtown
Tinsleys Corner
Union
Trooper
Mose Mountain
Beaver
1000
1100
1200

Beaver
Brook
Bk
1100
1200
1300
MAP SOURCE: U.S.G.S.
DOVER, FRANKLIN, NEWTON EAST, STANHOPE, TRANQUILITY
SCALE 1" = 2000'
DRAINAGE BASIN
LANGAN ENGINEERING ASSOCIATES, INC.

HEC-1 OUTPUT

SAXTON FALLS DAM

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION   11 JAN 79
**********
     1                A
     2                A                              SAXTON FALLS DAM
     3                A                              INFLOW HYDROGRAPH AND ROUTING
     4                A                              N.J. DAM INSPECTION
     5                B     200       1         0         0         0         0         0         0         0         0
     6                B1      3
     7                K                 1                                                   1
     8                K1    COMPUTE HYDROGRAPH - HOPATCONG LOCAL
     9                M         1         1      25.4                          0.82
    10                P                   22.4       104       113       123       135
    11                T                                                                1       .15
    12                W     12.0      0.58
    13                X       -2                1
    14                K         1         2                                            1
    15                K1    ROUTING COMPUTATIONS - HOPATCONG
    16                Y                                   1
    17                Y1        1                                                                -1
    18                Y4  923.3     924.3     925.3     926.3     927.7     928.7     929.7     930.7     931.7
    19                Y5        0       333       942      1730      3073      4497      6291      8355     10651
    20                $A   2474      2491      2508      2525      2542      2559      2576      2593      2610      2627
    21                $A   2644      2661
    22                $E  923.3     924.3     925.3     926.3     927.3     928.3     929.3     930.3     931.3     932.3
    23                $E  933.3     934.3
    24                $$  923.3
    25                $D  927.7
    26                K                 2                                                   1
    27                K1    COMPUTE HYDROGRAPH - MUSCONETCONG LOCAL
    28                M         1         1       4.9                          .80
    29                P                   22.4       112       123       132       142
    30                T                                                                1       .15
    31                W         6       .58
    32                X       -2                1
    33                K         2         2                                            1
    34                K1    COMBINE OUTFLOW OF HOPATCONG WITH LOCAL INFLOW OF MUSCONETCONG
    35                K         1         3                                            1
    36                K1    ROUTING COMPUTATIONS - MUSCONETCONG
    37                Y                                   1
    38                Y1        1                                                                -1
    39                Y4859.75  860.75    861.75    862.75    863.50    864.00    865.00    866.00    867.00    868.00
    40                Y5        0       605      1895      3400      3460      3697      5148      7535     10383     13806
    41                $A    307       310       313       316       319       322       325       328       331       334
    42                $E859.75  860.75    861.75    862.75    863.75    864.75    865.75    866.75    867.75    868.75
    43                $$859.75
    44                $D863.50
    45                K         1         4                                            1
    46                K1    CHANNEL ROUTING TO REACH 4
    47                Y                                       1
    48                Y1        1
    49                Y6      .06       .04       .06       645       665     14000     .0146
    50                Y7        0       670      2000       650      2009       647      2011       645      2016       645
    51                Y7   2018       647      2027       650      3400       670
```

```
K       1       5                                                       1
K1  CHANNEL ROUTING FROM REACH 4 TO SAXTON LAKE
Y                                       1
Y1      1
Y5    .06      .04      .06      627      650    14000    .0013
Y7     0       651      100      650     1510      635     1542      627      1558      627
Y7  1590       635     1670      640     1945      651
K                       5                                               1
K1  COMPUTE HYDROGRAPH - SAXTON LAKE LOCAL
H       1       1     37.7                      .835
P                    22.4      100      109      119      131
T                                                       1      .15
W    13.8      .58
X      -2               1
K       2       5                                               1
K1  COMBINE ROUTED OUTFLOW OF MUSCONETCONG WITH LOCAL INFLOW OF SAXTON
K       1       6
K1  ROUTING COMPUTATIONS - SAXTON FALLS (INDEPENDANT ELEVATIONS USED)
Y                                       1
Y1      1                                                              -1
Y4  92.55    93.55    94.55    95.55    96.55    97.55    98.55    99.55    100.55    101.55
Y4 102.55   103.55   104.55   105.55
Y5       0      490     1385     2544     3917     5474     7439     9755     12341     15163
Y5  18200    21433    24852    28447
$A   63.5     68.0     72.5     77.0     81.5     86.0     90.5     95.0     99.5      104.0
$A  108.5    113.0    117.5    122.0
$E  92.55    93.55    94.55    95.55    96.55    97.55    98.55    99.55    100.55    101.55
$E 102.55   103.55   104.55   105.55
$$  92.55
$D  97.55
K      99
```

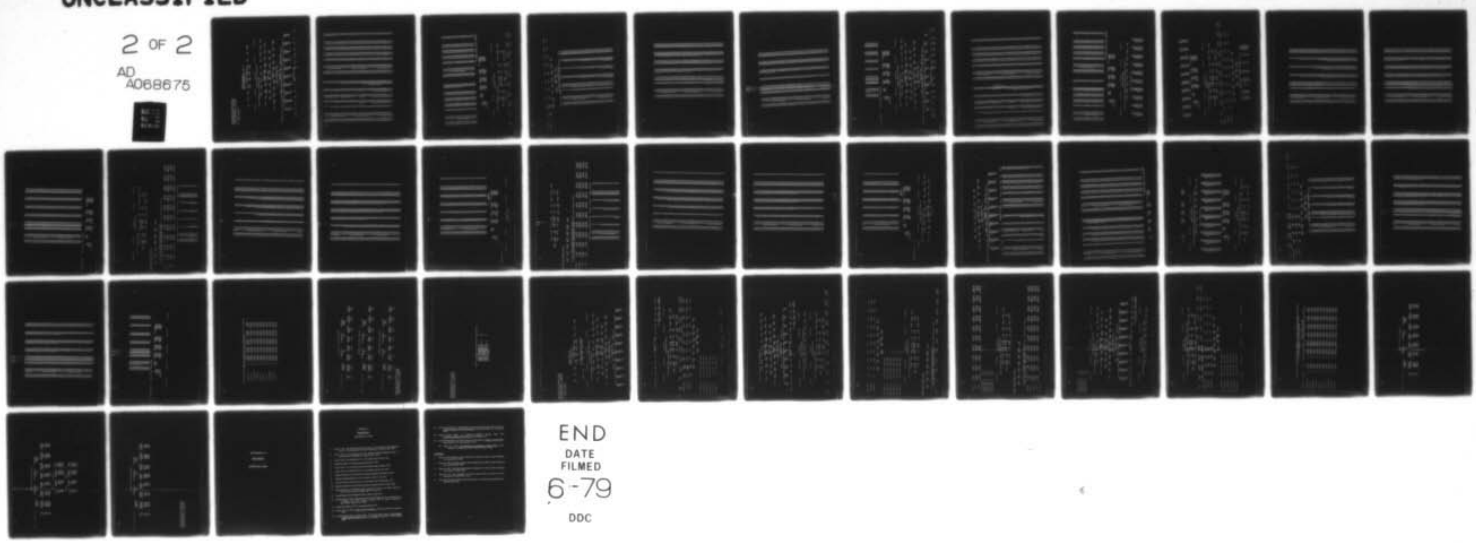
PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	2
RUNOFF HYDROGRAPH AT	2
COMBINE 2 HYDROGRAPHS AT	2
ROUTE HYDROGRAPH TO	3
ROUTE HYDROGRAPH TO	4
ROUTE HYDROGRAPH TO	5
RUNOFF HYDROGRAPH AT	5
COMBINE 2 HYDROGRAPHS AT	5
ROUTE HYDROGRAPH TO	6
END OF NETWORK	

AD-A068 675 NEW JERSEY STATE DEPT OF ENVIRONMENTAL PROTECTION TRENTON F/G 13/2
NATIONAL DAM SAFETY PROGRAM. SAXTON FALLS DAM (NJ 00277), DELAW--ETC(U)
MAR 79 D J LEARY DACW61-78-C-0124

UNCLASSIFIED NL

2 OF 2
AD
A068675



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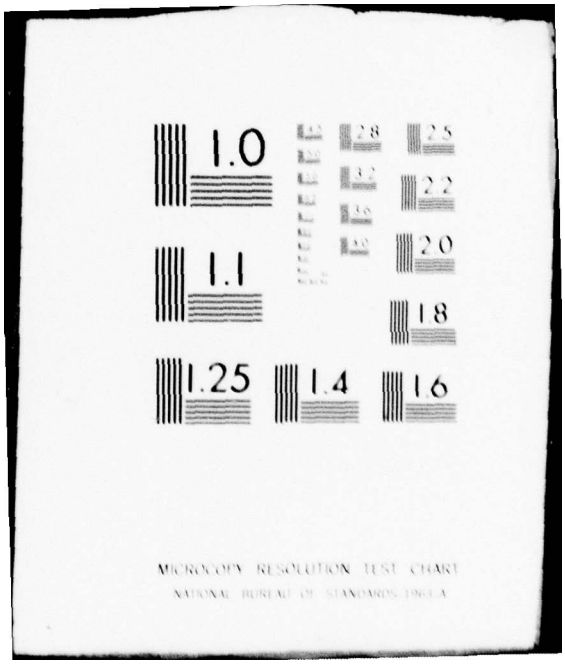
DATE
FILMED
6-79
DDC


1.0
1.1
1.25
1.4
1.6
2.8
2.5
3.2
2.2
3.6
2.0
4.0
1.8
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

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**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION   11 JAN 79
**********

VOL  DATE# 79/03/20.
     TIME# 11.27.15.
```

SAXTON FALLS DAM
INFLOW HYDROGRAPH AND ROUTING
N.J. DAM INSPECTION

JOB SPECIFICATION

NO	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
200	1	0	0	0	0	0	0	0	0

	JOPER	NMT	LROPT	TRACE
	3	0	0	0

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

SUB-AREA RUNOFF COMPUTATION

COMPUTE HYDROGRAPH - HOPATCONG LOCAL

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

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	25.40	0.00	25.40	.82	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.40	104.00	113.00	123.00	135.00	0.00	0.00

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
1	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.15	0.00	0.00

UNIT HYDROGRAPH DATA
TP= 12.00 CP= .58 NTA= 0

RECESSION DATA
STRTQ= -2.00 QRCSN= 0.00 RTIOR= 1.00

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC=12.98 AND R=12.76 INTERVALS

UNIT HYDROGRAPH 75 END-OF-PERIOD ORDINATES, LAG= 12.03 HOURS, CP= .58 VOL= 1.00

19.	70.	143.	229.	323.	424.	528.	624.	701.	760.
799.	817.	807.	764.	707.	653.	604.	559.	517.	478.
442.	408.	378.	349.	323.	298.	276.	255.	236.	218.
202.	186.	172.	159.	147.	136.	126.	117.	108.	100.
92.	85.	79.	73.	67.	62.	56.	53.	49.	45.
42.	39.	36.	33.	31.	28.	26.	24.	22.	21.
19.	18.	16.	15.	14.	13.	12.	11.	10.	9.
9.	8.	7.	7.	6.					

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.	1.	1	.01	.00	.01	51.	1.05	5.00	101	0.00	0.00	[illegible]	402.

1.03	22.00	70	0.00	0.00	0.00	3828.	1.08	2.00	170	0.00	0.00	0.00		51.
1.03	23.00	71	0.00	0.00	0.00	3543.	1.08	3.00	171	0.00	0.00	0.00		51.
1.04	0.00	72	0.00	0.00	0.00	3280.	1.08	4.00	172	0.00	0.00	0.00		51.
1.04	1.00	73	0.00	0.00	0.00	3036.	1.08	5.00	173	0.00	0.00	0.00		51.
1.04	2.00	74	0.00	0.00	0.00	2811.	1.08	6.00	174	0.00	0.00	0.00		51.
1.04	3.00	75	0.00	0.00	0.00	2603.	1.08	7.00	175	0.00	0.00	0.00		51.
1.04	4.00	76	0.00	0.00	0.00	2411.	1.08	8.00	176	0.00	0.00	0.00		51.
1.04	5.00	77	0.00	0.00	0.00	2233.	1.08	9.00	177	0.00	0.00	0.00		51.
1.04	6.00	78	0.00	0.00	0.00	2068.	1.08	10.00	178	0.00	0.00	0.00		51.
1.04	7.00	79	0.00	0.00	0.00	1916.	1.08	11.00	179	0.00	0.00	0.00		51.
1.04	8.00	80	0.00	0.00	0.00	1776.	1.08	12.00	180	0.00	0.00	0.00		51.
1.04	9.00	81	0.00	0.00	0.00	1646.	1.08	13.00	181	0.00	0.00	0.00		51.
1.04	10.00	82	0.00	0.00	0.00	1525.	1.08	14.00	182	0.00	0.00	0.00		51.
1.04	11.00	83	0.00	0.00	0.00	1414.	1.08	15.00	183	0.00	0.00	0.00		51.
1.04	12.00	84	0.00	0.00	0.00	1311.	1.08	16.00	184	0.00	0.00	0.00		51.
1.04	13.00	85	0.00	0.00	0.00	1216.	1.08	17.00	185	0.00	0.00	0.00		51.
1.04	14.00	86	0.00	0.00	0.00	1129.	1.08	18.00	186	0.00	0.00	0.00		51.
1.04	15.00	87	0.00	0.00	0.00	1047.	1.08	19.00	187	0.00	0.00	0.00		51.
1.04	16.00	88	0.00	0.00	0.00	972.	1.08	20.00	188	0.00	0.00	0.00		51.
1.04	17.00	89	0.00	0.00	0.00	903.	1.08	21.00	189	0.00	0.00	0.00		51.
1.04	18.00	90	0.00	0.00	0.00	838.	1.08	22.00	190	0.00	0.00	0.00		51.
1.04	19.00	91	0.00	0.00	0.00	776.	1.08	23.00	191	0.00	0.00	0.00		51.
1.04	20.00	92	0.00	0.00	0.00	721.	1.09	0.00	192	0.00	0.00	0.00		51.
1.04	21.00	93	0.00	0.00	0.00	670.	1.09	1.00	193	0.00	0.00	0.00		51.
1.04	22.00	94	0.00	0.00	0.00	623.	1.09	2.00	194	0.00	0.00	0.00		51.
1.04	23.00	95	0.00	0.00	0.00	580.	1.09	3.00	195	0.00	0.00	0.00		51.
1.05	0.00	96	0.00	0.00	0.00	540.	1.09	4.00	196	0.00	0.00	0.00		51.
1.05	1.00	97	0.00	0.00	0.00	503.	1.09	5.00	197	0.00	0.00	0.00		51.
1.05	2.00	98	0.00	0.00	0.00	469.	1.09	6.00	198	0.00	0.00	0.00		51.
1.05	3.00	99	0.00	0.00	0.00	438.	1.09	7.00	199	0.00	0.00	0.00		51.
1.05	4.00	100	0.00	0.00	0.00	409.	1.09	8.00	200	0.00	0.00	0.00		51.
									SUM	24.80	19.82	4.98		333350.
										(630.)	(503.)	(126.)		(9439.42)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	15026.	14418.	10167.	4450.	333278.
CMS	425.	408.	288.	126.	9437.
INCHES		5.28	14.89	19.56	20.34
MM		134.12	378.29	496.79	516.71
AC-FT		7149.	20165.	26482.	27544.
THOUS CU M		8819.	24873.	32665.	33975.

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HYDROGRAPH ROUTING

ROUTING COMPUTATIONS - HOPATCONG

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

ROUTING DATA

GLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	-1

STAGE	923.30	924.30	925.30	926.30	927.70	928.70	929.70	930.70	931.70
FLOW	0.00	337.00	942.00	1730.00	3073.00	4497.00	6291.00	8355.00	10651.00
				[illegible]	[illegible]	2559.	2576.	2593.	2610.	2627.

CAPACITY=	0. 25500.	2442. 28242.	4982.	7498.	10052.	12582.	15150.	17734.	20336.	22954.
ELEVATION=	923. 933.	924. 934.	925.	926.	927.	928.	929.	930.	931.	932.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
923.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
927.7	0.0	0.0	0.

END-OF-PERIOD HYDROGRAPH ORDINATES

MO.DA	HR.MN	PERIOD	HOURS	INFLOW	OUTFLOW	STORAGE	STAGE
1.01	1.00	1	1.00	51.	1.	4.	923.3
1.01	2.00	2	2.00	51.	1.	8.	923.3
1.01	3.00	3	3.00	51.	2.	12.	923.3
1.01	4.00	4	4.00	51.	2.	16.	923.3
1.01	5.00	5	5.00	51.	3.	20.	923.3
1.01	6.00	6	6.00	51.	3.	24.	923.3
1.01	7.00	7	7.00	51.	4.	28.	923.3
1.01	8.00	8	8.00	51.	4.	32.	923.3
1.01	9.00	9	9.00	51.	5.	36.	923.3
1.01	10.00	10	10.00	51.	5.	40.	923.3
1.01	11.00	11	11.00	51.	6.	43.	923.3
1.01	12.00	12	12.00	51.	6.	47.	923.3
1.01	13.00	13	13.00	51.	7.	51.	923.3
1.01	14.00	14	14.00	51.	7.	54.	923.3
1.01	15.00	15	15.00	51.	8.	58.	923.3
1.01	16.00	16	16.00	60.	8.	62.	923.3
1.01	17.00	17	17.00	88.	9.	67.	923.3
1.01	18.00	18	18.00	131.	10.	76.	923.3
1.01	19.00	19	19.00	184.	12.	88.	923.3
1.01	20.00	20	20.00	245.	14.	104.	923.3
1.01	21.00	21	21.00	310.	17.	126.	923.4
1.01	22.00	22	22.00	378.	21.	153.	923.4
1.01	23.00	23	23.00	443.	25.	185.	923.4
1.02	0.00	24	24.00	498.	30.	221.	923.4
1.02	1.00	25	25.00	541.	35.	262.	923.4
1.02	2.00	26	26.00	571.	41.	305.	923.4
1.02	3.00	27	27.00	587.	47.	349.	923.4
1.02	4.00	28	28.00	587.	53.	393.	923.5
1.02	5.00	29	29.00	565.	59.	436.	923.5
1.02	6.00	30	30.00	531.	64.	476.	923.5
1.02	7.00	31	31.00	498.	69.	513.	923.5
1.02	8.00	32	32.00	474.	74.	548.	923.5
1.02	9.00	33	33.00	461.	78.	580.	923.5
1.02	10.00	34	34.00	461.	82.	611.	923.5
1.02	11.00	35	35.00	475.	86.	643.	923.6
1.02	12.00	36	36.00	503.	91.	676.	923.6
1.02	13.00	37	37.00	578.	96.	713.	923.6
1.02	14.00	38	38.00	757.	102.	760.	923.6
1.02	15.00	39	39.00	1097.	111.	828.	923.6
1.02	16.00	40	40.00	1725.	126.	935.	923.7
1.02	17.00	41	41.00	2730.	149.	1107.	923.7
1.02	18.00	42	42.00	4062.	185.	1374.	923.9
1.02	19.00	43	43.00	5633.	236.	1758.	924.0
1.02	20.00	44	44.00	7335.	305.	2271.	924.2
1.02	21.00	45	45.00	9074.	440.	2918.	924.5
1.02	22.00	46	46.00	10763.	629.	3694.	924.8
1.02	23.00	47	47.00	12283.	846.	4585.	925.1
1.03	0.00	48	48.00	13526.	1127.	5570.	925.5
1.03	1.00	49	49.00	14425.	1455.	6619.	926.0
1.03	2.00	50	50.00	14988.	1805.	7697.	926.4
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2212.	8769.	926.8

1.03	4.00	52	52.00	14722.	2601.	9799.	927.2
1.03	5.00	53	53.00	14058.	2963.	10758.	927.6
1.03	6.00	54	54.00	13170.	3392.	11621.	927.9
1.03	7.00	55	55.00	12236.	3811.	12373.	928.2
1.03	8.00	56	56.00	11334.	4169.	13017.	928.5
1.03	9.00	57	57.00	10495.	4472.	13562.	928.7
1.03	10.00	58	58.00	9716.	4782.	14015.	928.9
1.03	11.00	59	59.00	8992.	5038.	14382.	929.0
1.03	12.00	60	60.00	8321.	5241.	14673.	929.1
1.03	13.00	61	61.00	7698.	5396.	14895.	929.2
1.03	14.00	62	62.00	7121.	5509.	15057.	929.3
1.03	15.00	63	63.00	6588.	5584.	15165.	929.3
1.03	16.00	64	64.00	6095.	5626.	15226.	929.3
1.03	17.00	65	65.00	5640.	5640.	15245.	929.3
1.03	18.00	66	66.00	5218.	5628.	15228.	929.3
1.03	19.00	67	67.00	4829.	5594.	15180.	929.3
1.03	20.00	68	68.00	4469.	5541.	15104.	929.3
1.03	21.00	69	69.00	4136.	5472.	15004.	929.2
1.03	22.00	70	70.00	3828.	5385.	14885.	929.2
1.03	23.00	71	71.00	3543.	5293.	14748.	929.1
1.04	0.00	72	72.00	3280.	5188.	14597.	929.1
1.04	1.00	73	73.00	3036.	5074.	14434.	929.0
1.04	2.00	74	74.00	2811.	4954.	14261.	929.0
1.04	3.00	75	75.00	2603.	4828.	14080.	928.9
1.04	4.00	76	76.00	2411.	4697.	13894.	928.8
1.04	5.00	77	77.00	2233.	4564.	13703.	928.7
1.04	6.00	78	78.00	2068.	4442.	13509.	928.7
1.04	7.00	79	79.00	1916.	4332.	13311.	928.6
1.04	8.00	80	80.00	1776.	4221.	13110.	928.5
1.04	9.00	81	81.00	1646.	4108.	12907.	928.4
1.04	10.00	82	82.00	1525.	3995.	12703.	928.3
1.04	11.00	83	83.00	1414.	3881.	12500.	928.3
1.04	12.00	84	84.00	1311.	3768.	12296.	928.2
1.04	13.00	85	85.00	1216.	3655.	12094.	928.1
1.04	14.00	86	86.00	1129.	3544.	11893.	928.0
1.04	15.00	87	87.00	1047.	3433.	11695.	928.0
1.04	16.00	88	88.00	972.	3324.	11499.	927.9
1.04	17.00	89	89.00	903.	3216.	11306.	927.8
1.04	18.00	90	90.00	838.	3110.	11117.	927.7
1.04	19.00	91	91.00	776.	3028.	10930.	927.7
1.04	20.00	92	92.00	721.	2958.	10744.	927.6
1.04	21.00	93	93.00	670.	2889.	10560.	927.5
1.04	22.00	94	94.00	623.	2820.	10378.	927.4
1.04	23.00	95	95.00	580.	2752.	10197.	927.4
1.05	0.00	96	96.00	540.	2684.	10019.	927.3
1.05	1.00	97	97.00	503.	2618.	9843.	927.2
1.05	2.00	98	98.00	469.	2553.	9670.	927.2
1.05	3.00	99	99.00	438.	2488.	9499.	927.1
1.05	4.00	100	100.00	409.	2424.	9331.	927.0
1.05	5.00	101	101.00	382.	2362.	9166.	927.0
1.05	6.00	102	102.00	357.	2301.	9004.	926.9
1.05	7.00	103	103.00	334.	2240.	8844.	926.8
1.05	8.00	104	104.00	312.	2181.	8688.	926.8
1.05	9.00	105	105.00	293.	2123.	8536.	926.7
1.05	10.00	106	106.00	274.	2067.	8386.	926.7
1.05	11.00	107	107.00	256.	2011.	8239.	926.6
1.05	12.00	108	108.00	240.	1957.	8096.	926.5
1.05	13.00	109	109.00	225.	1903.	7955.	926.5
1.05	14.00	110	110.00	211.	1851.	7818.	926.4
1.05	15.00	111	111.00	198.	1801.	7684.	926.4
1.05	16.00	112	112.00	177.	1751.	7553.	926.3
1.05	17.00	113	113.00	154.	1707.	7424.	926.3
1.05	18.00	114	114.00	131.	1667.	7296.	926.2
1.05	19.00	115	115.00	82.	1627.	7169.	926.2
1.05	20.00	116	116.00	65.	1587.	7042.	926.1
1.05	21.00	117	117.00	52.	1549.	6917.	926.1
1.05	22.00	118	118.00	52.	1510.	6795.	926.0

1.08	20.00	188	188.00	51.	370.	2634.	924.4
1.08	21.00	189	189.00	51.	364.	2608.	924.4
1.08	22.00	190	190.00	51.	357.	2583.	924.3
1.08	23.00	191	191.00	51.	351.	2557.	924.3
1.09	0.00	192	192.00	51.	345.	2533.	924.3
1.09	1.00	193	193.00	51.	339.	2509.	924.3
1.09	2.00	194	194.00	51.	334.	2485.	924.3
1.09	3.00	195	195.00	51.	330.	2462.	924.3
1.09	4.00	196	196.00	51.	327.	2439.	924.3
1.09	5.00	197	197.00	51.	324.	2416.	924.3
1.09	6.00	198	198.00	51.	321.	2394.	924.3
1.09	7.00	199	199.00	51.	318.	2372.	924.3
1.09	8.00	200	200.00	51.	315.	2350.	924.2

PEAK OUTFLOW IS 5640. AT TIME 65.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5640.	5600.	5103.	3406.	304901.
CMS	160.	159.	145.	96.	8634.
INCHES		2.05	7.48	14.97	18.61
MM		52.09	189.89	380.21	472.71
AC-FT		2777.	10122.	20268.	25198.
THOUS CU M		3425.	12486.	25000.	31082.

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SUB-AREA RUNOFF COMPUTATION

COMPUTE HYDROGRAPH - MUSCONFTCONG LOCAL

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

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	4.90	0.00	4.90	.80	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.40	112.00	123.00	132.00	142.00	0.00	0.00

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.15	0.00	0.00

UNIT HYDROGRAPH DATA

TP= 6.00 CP= .58 NTA= 0

RECESSION DATA

STRTQ= -2.00 QRCSN= 0.00 RTIOR= 1.00

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 6.77 AND R= 6.15 INTERVALS

UNIT HYDROGRAPH 37 END-OF-PERIOD ORDINATES, LAG= 4.00 HOURS, CP= .58 VOL= 1.00

15.	70.	140.	214.	276.	309.	308.	274.	233.	198.
168.	143.	122.	103.	88.	75.	63.	54.	46.	39.
33.	28.	24.	20.	17.	15.	12.	11.	9.	8.
6.	5.	5.	4.	3.	3.	2.			

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	1.00	1	.01	.00	.01	10.	1.05	5.00	101	0.00	0.00	0.00	10.
		2	.01	.00	.01	10.	1.05	6.00	102	0.00	0.00	0.00	10.

1.03	23.00	71	0.00	0.00	0.00	114.	1.08	3.00	171	0.00	0.00	0.00	10.
1.04	0.00	72	0.00	0.00	0.00	98.	1.08	4.00	172	0.00	0.00	0.00	10.
1.04	1.00	73	0.00	0.00	0.00	85.	1.08	5.00	173	0.00	0.00	0.00	10.
1.04	2.00	74	0.00	0.00	0.00	69.	1.08	6.00	174	0.00	0.00	0.00	10.
1.04	3.00	75	0.00	0.00	0.00	56.	1.08	7.00	175	0.00	0.00	0.00	10.
1.04	4.00	76	0.00	0.00	0.00	43.	1.08	8.00	176	0.00	0.00	0.00	10.
1.04	5.00	77	0.00	0.00	0.00	23.	1.08	9.00	177	0.00	0.00	0.00	10.
1.04	6.00	78	0.00	0.00	0.00	15.	1.08	10.00	178	0.00	0.00	0.00	10.
1.04	7.00	79	0.00	0.00	0.00	10.	1.08	11.00	179	0.00	0.00	0.00	10.
1.04	8.00	80	0.00	0.00	0.00	10.	1.08	12.00	180	0.00	0.00	0.00	10.
1.04	9.00	81	0.00	0.00	0.00	10.	1.08	13.00	181	0.00	0.00	0.00	10.
1.04	10.00	82	0.00	0.00	0.00	10.	1.08	14.00	182	0.00	0.00	0.00	10.
1.04	11.00	83	0.00	0.00	0.00	10.	1.08	15.00	183	0.00	0.00	0.00	10.
1.04	12.00	84	0.00	0.00	0.00	10.	1.08	16.00	184	0.00	0.00	0.00	10.
1.04	13.00	85	0.00	0.00	0.00	10.	1.08	17.00	185	0.00	0.00	0.00	10.
1.04	14.00	86	0.00	0.00	0.00	10.	1.08	18.00	186	0.00	0.00	0.00	10.
1.04	15.00	87	0.00	0.00	0.00	10.	1.08	19.00	187	0.00	0.00	0.00	10.
1.04	16.00	88	0.00	0.00	0.00	10.	1.08	20.00	188	0.00	0.00	0.00	10.
1.04	17.00	89	0.00	0.00	0.00	10.	1.08	21.00	189	0.00	0.00	0.00	10.
1.04	18.00	90	0.00	0.00	0.00	10.	1.08	22.00	190	0.00	0.00	0.00	10.
1.04	19.00	91	0.00	0.00	0.00	10.	1.08	23.00	191	0.00	0.00	0.00	10.
1.04	20.00	92	0.00	0.00	0.00	10.	1.09	0.00	192	0.00	0.00	0.00	10.
1.04	21.00	93	0.00	0.00	0.00	10.	1.09	1.00	193	0.00	0.00	0.00	10.
1.04	22.00	94	0.00	0.00	0.00	10.	1.09	2.00	194	0.00	0.00	0.00	10.
1.04	23.00	95	0.00	0.00	0.00	10.	1.09	3.00	195	0.00	0.00	0.00	10.
1.05	0.00	96	0.00	0.00	0.00	10.	1.09	4.00	196	0.00	0.00	0.00	10.
1.05	1.00	97	0.00	0.00	0.00	10.	1.09	5.00	197	0.00	0.00	0.00	10.
1.05	2.00	98	0.00	0.00	0.00	10.	1.09	6.00	198	0.00	0.00	0.00	10.
1.05	3.00	99	0.00	0.00	0.00	10.	1.09	7.00	199	0.00	0.00	0.00	10.
1.05	4.00	100	0.00	0.00	0.00	10.	1.09	8.00	200	0.00	0.00	0.00	10.
									SUM	25.45	20.64	4.81	66938.
										(646.)	(524.)	(122.)	(1895.47)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5580.	4978.	2530.	912.	66899.
CMS	158.	141.	72.	26.	1894.
INCHES		9.45	19.21	20.77	21.17
MM		240.05	487.90	527.65	537.65
AC-FT		2468.	5017.	5426.	5529.
THOUS CU M		3045.	6189.	6693.	6820.

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COMBINE HYDROGRAPHS

COMBINE OUTFLOW OF HOPATCONG WITH LOCAL INFLOW OF MUSCONETCONG

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

SUM OF 2 HYDROGRAPHS AT 2

10.	11.	11.	12.	13.	13.	14.	14.	15.	15.
16.	16.	17.	17.	18.	23.	38.	60.	85.	109.
145.	132.	128.	121.	114.	109.	107.	105.	104.	104.
108.	121.	147.	187.	238.	296.	386.	565.	988.	1483.
2599.	5513.	4628.	5497.	6019.	6140.	5904.	5558.	5254.	5039.
4964.	4944.	4956.	5087.	5253.	5396.	5516.	5670.	5794.	5885.
5945.	5976.	5983.	5967.	5930.	5876.	5807.	5723.	5627.	5522.
5407.	5286.	5159.	5023.	4883.	4740.	4587.	4457.	4342.	4231.
4118.	4005.	3891.	3778.	3665.	3553.	3443.	3333.	3226.	3120.
3038.	2968.	2898.	2830.	2762.	2694.	2628.	2562.	2498.	2434.
2372.	2310.	2250.	2191.	2133.	2077.	2021.	1967.	1913.	1861.

1816.	1761.	1716.	1677.	1637.	1597.	1558.	1520.	1483.	1447.
1411.	1377.	1343.	1310.	1278.	1247.	1217.	1187.	1159.	1130.
1103.	1076.	1050.	1025.	1000.	976.	953.	935.	917.	900.
884.	867.	851.	836.	820.	805.	790.	776.	761.	748.
734.	720.	707.	694.	682.	669.	657.	645.	634.	622.
611.	600.	589.	579.	568.	558.	548.	539.	529.	520.
511.	502.	493.	484.	476.	467.	459.	451.	444.	436.
428.	421.	414.	407.	400.	393.	386.	380.	374.	367.
361.	355.	349.	343.	340.	337.	334.	331.	328.	325.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6140.	5947.	5603.	4137.	371800.
CMS	174.	168.	159.	117.	10528.
INCHES		1.83	6.88	15.24	19.02
MM		46.37	174.77	387.12	483.22
AC-FT		2949.	11113.	24616.	30727.
THOUS CU M		3637.	13708.	30364.	37902.

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HYDROGRAPH ROUTING

ROUTING COMPUTATIONS - KUSCONETCONG

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
3	1	0	0	0	0	1	0	0

ROUTING DATA

GLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	-1

STAGE	859.75	860.75	861.75	862.75	863.50	864.00	865.00	866.00	867.00	868.00
FLOW	0.00	605.00	1895.00	3400.00	3460.00	3697.00	5148.00	7535.00	10383.00	13806.00
SURFACE AREA=	307.	310.	313.	316.	319.	322.	325.	328.	331.	334.
CAPACITY=	0.	308.	620.	934.	1252.	1572.	1896.	2222.	2552.	2884.
ELEVATION=	860.	861.	862.	863.	864.	865.	866.	867.	868.	869.

CREL	SPWID	COOW	EXPW	ELEVL	COQL	CAREA	EXPL
859.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
863.5	0.0	0.0	0.

END-OF-PERIOD HYDROGRAPH ORDINATES

MO.DA	HR.MN	PERIOD	HOURS	INFLOW	OUTFLOW	STORAGE	STAGE
1.01	1.00	1	1.00	10.	2.	1.	859.8
1.01	2.00	2	2.00	11.	3.	1.	859.8
1.01	3.00	3	3.00	11.	4.	2.	859.8
1.01	4.00	4	4.00	12.	5.	3.	859.8
1.01	5.00	5	5.00	13.	6.	3.	859.8
1.01	6.00	6	6.00	13.	7.	4.	859.8
1.01	7.00	7	7.00	14.	8.	4.	859.8
			8.00	14.	9.	5.	859.8

1.01	9.00	9	9.00	15.	10.	5.	859.8
1.01	10.00	10	10.00	15.	11.	5.	859.8
1.01	11.00	11	11.00	16.	11.	6.	859.8
1.01	12.00	12	12.00	16.	12.	6.	859.8
1.01	13.00	13	13.00	17.	13.	6.	859.8
1.01	14.00	14	14.00	17.	13.	7.	859.8
1.01	15.00	15	15.00	18.	14.	7.	859.8
1.01	16.00	16	16.00	23.	15.	8.	859.8
1.01	17.00	17	17.00	38.	17.	9.	859.8
1.01	18.00	18	18.00	60.	22.	11.	859.8
1.01	19.00	19	19.00	85.	30.	15.	859.8
1.01	20.00	20	20.00	109.	40.	20.	859.8
1.01	21.00	21	21.00	125.	51.	26.	859.8
1.01	22.00	22	22.00	132.	63.	32.	859.9
1.01	23.00	23	23.00	128.	73.	37.	859.9
1.02	0.00	24	24.00	121.	81.	41.	859.9
1.02	1.00	25	25.00	114.	86.	44.	859.9
1.02	2.00	26	26.00	109.	90.	46.	859.9
1.02	3.00	27	27.00	107.	93.	47.	859.9
1.02	4.00	28	28.00	105.	95.	48.	859.9
1.02	5.00	29	29.00	104.	96.	49.	859.9
1.02	6.00	30	30.00	104.	97.	49.	859.9
1.02	7.00	31	31.00	108.	99.	50.	859.9
1.02	8.00	32	32.00	121.	101.	51.	859.9
1.02	9.00	33	33.00	147.	106.	54.	859.9
1.02	10.00	34	34.00	187.	115.	59.	859.9
1.02	11.00	35	35.00	238.	130.	66.	860.0
1.02	12.00	36	36.00	296.	151.	76.	860.0
1.02	13.00	37	37.00	386.	179.	91.	860.0
1.02	14.00	38	38.00	565.	224.	114.	860.1
1.02	15.00	39	39.00	888.	299.	152.	860.2
1.02	16.00	40	40.00	1483.	432.	220.	860.5
1.02	17.00	41	41.00	2399.	708.	333.	860.8
1.02	18.00	42	42.00	3513.	1366.	492.	861.3
1.02	19.00	43	43.00	4628.	2190.	681.	861.9
1.02	20.00	44	44.00	5497.	3138.	880.	862.6
1.02	21.00	45	45.00	6019.	3438.	1084.	863.2
1.02	22.00	46	46.00	6140.	3640.	1294.	863.9
1.02	23.00	47	47.00	5904.	4293.	1464.	864.4
1.03	0.00	48	48.00	5558.	4746.	1564.	864.7
1.03	1.00	49	49.00	5254.	4953.	1610.	864.9
1.03	2.00	50	50.00	5039.	5015.	1623.	864.9
1.03	3.00	51	51.00	4964.	5009.	1622.	864.9
1.03	4.00	52	52.00	4944.	4992.	1618.	864.9
1.03	5.00	53	53.00	4956.	4979.	1616.	864.9
1.03	6.00	54	54.00	5047.	4992.	1618.	864.9
1.03	7.00	55	55.00	5253.	5047.	1631.	864.9
1.03	8.00	56	56.00	5396.	5134.	1650.	865.0
1.03	9.00	57	57.00	5516.	5277.	1671.	865.1
1.03	10.00	58	58.00	5670.	5425.	1691.	865.1
1.03	11.00	59	59.00	5794.	5569.	1710.	865.2
1.03	12.00	60	60.00	5885.	5695.	1727.	865.2
1.03	13.00	61	61.00	5945.	5798.	1741.	865.3
1.03	14.00	62	62.00	5976.	5874.	1751.	865.3
1.03	15.00	63	63.00	5983.	5923.	1758.	865.3
1.03	16.00	64	64.00	5967.	5947.	1761.	865.3
1.03	17.00	65	65.00	5930.	5948.	1761.	865.3
1.03	18.00	66	66.00	5876.	5927.	1759.	865.3
1.03	19.00	67	67.00	5807.	5887.	1757.	865.3
1.03	20.00	68	68.00	5723.	5830.	1745.	865.3
1.03	21.00	69	69.00	5627.	5758.	1736.	865.3
1.03	22.00	70	70.00	5522.	5672.	1724.	865.2
1.03	23.00	71	71.00	5407.	5575.	1711.	865.2
1.04	0.00	72	72.00	5286.	5468.	1696.	865.1
1.04	1.00	73	73.00	5159.	5353.	1681.	865.1
1.04	2.00	74	74.00	5027.	5230.	1664.	865.0
1.04	3.00	75	75.00	4893.	5117.	1646.	865.0

1.04	5.00	77	77.00	4587.	4909.	1600.	864.8
1.04	6.00	78	78.00	4457.	4787.	1573.	864.8
1.04	7.00	79	79.00	4342.	4666.	1546.	864.7
1.04	8.00	80	80.00	4231.	4547.	1520.	864.6
1.04	9.00	81	81.00	4118.	4430.	1494.	864.5
1.04	10.00	82	82.00	4005.	4314.	1468.	864.4
1.04	11.00	83	83.00	3891.	4199.	1443.	864.3
1.04	12.00	84	84.00	3778.	4084.	1417.	864.3
1.04	13.00	85	85.00	3665.	3970.	1392.	864.2
1.04	14.00	86	86.00	3553.	3856.	1367.	864.1
1.04	15.00	87	87.00	3443.	3743.	1342.	864.0
1.04	16.00	88	88.00	3333.	3673.	1316.	863.9
1.04	17.00	89	89.00	3226.	3627.	1285.	863.9
1.04	18.00	90	90.00	3120.	3575.	1250.	863.7
1.04	19.00	91	91.00	3038.	3517.	1211.	863.6
1.04	20.00	92	92.00	2968.	3460.	1171.	863.5
1.04	21.00	93	93.00	2898.	3449.	1128.	863.4
1.04	22.00	94	94.00	2830.	3437.	1080.	863.2
1.04	23.00	95	95.00	2762.	3424.	1027.	863.[illegible]
1.05	0.00	96	96.00	2694.	3409.	971.	862.9
1.05	1.00	97	97.00	2628.	3299.	913.	862.7
1.05	2.00	98	98.00	2562.	3067.	865.	862.5
1.05	3.00	99	99.00	2498.	2890.	828.	862.4
1.05	4.00	100	100.00	2434.	2750.	798.	862.3
1.05	5.00	101	101.00	2372.	2636.	774.	862.2
1.05	6.00	102	102.00	2310.	2538.	754.	862.2
1.05	7.00	103	103.00	2250.	2453.	736.	862.1
1.05	8.00	104	104.00	2191.	2377.	720.	862.1
1.05	9.00	105	105.00	2133.	2306.	706.	862.0
1.05	10.00	106	106.00	2077.	2240.	692.	862.0
1.05	11.00	107	107.00	2021.	2176.	679.	861.9
1.05	12.00	108	108.00	1967.	2116.	666.	861.9
1.05	13.00	109	109.00	1913.	2058.	654.	861.9
1.05	14.00	110	110.00	1861.	001.	642.	861.8
1.05	15.00	111	111.00	1810.	1946.	631.	861.8
1.05	16.00	112	112.00	1761.	1893.	620.	861.7
1.05	17.00	113	113.00	1716.	1848.	609.	861.7
1.05	18.00	114	114.00	1677.	1804.	598.	861.7
1.05	19.00	115	115.00	1637.	1761.	588.	861.6
1.05	20.00	116	116.00	1597.	1719.	577.	861.6
1.05	21.00	117	117.00	1558.	1678.	567.	861.6
1.05	22.00	118	118.00	1520.	1638.	558.	861.6
1.05	23.00	119	119.00	1483.	1598.	548.	861.5
1.06	0.00	120	120.00	1447.	1559.	539.	861.5
1.06	1.00	121	121.00	1411.	1521.	529.	861.5
1.06	2.00	122	122.00	1377.	1484.	520.	861.4
1.06	3.00	123	123.00	1343.	1448.	512.	861.4
1.06	4.00	124	124.00	1310.	1413.	503.	861.4
1.06	5.00	125	125.00	1278.	1378.	495.	861.3
1.06	6.00	126	126.00	1247.	1344.	487.	861.3
1.06	7.00	127	127.00	1217.	1312.	479.	861.3
1.06	8.00	128	128.00	1187.	1280.	471.	861.3
1.06	9.00	129	129.00	1159.	1249.	464.	861.2
1.06	10.00	130	130.00	1130.	1218.	456.	861.2
1.06	11.00	131	131.00	1103.	1189.	449.	861.2
1.06	12.00	132	132.00	1076.	1160.	442.	861.2
1.06	13.00	133	133.00	1050.	1132.	435.	861.2
1.06	14.00	134	134.00	1025.	1104.	429.	861.1
1.06	15.00	135	135.00	1000.	1077.	422.	861.1
1.06	16.00	136	136.00	976.	1051.	416.	861.1
1.06	17.00	137	137.00	953.	1026.	410.	861.1
1.06	18.00	138	138.00	935.	1002.	404.	861.1
1.06	19.00	139	139.00	917.	980.	399.	861.0
1.06	20.00	140	140.00	900.	959.	394.	861.0
1.06	21.00	141	141.00	884.	939.	389.	861.0
1.06	22.00	142	142.00	867.	921.	384.	861.0
1.06	23.00	143	143.00	851.	903.	380.	861.[illegible]
1.[illegible]	[illegible]	144	144.00	[illegible]	[illegible]	[illegible]	[illegible]

1.07	1.00	145	145.00	820.	869.	372.	861.0
1.07	2.00	146	146.00	805.	852.	368.	860.9
1.07	3.00	147	147.00	790.	836.	364.	860.9
1.07	4.00	148	148.00	776.	821.	360.	860.9
1.07	5.00	149	149.00	761.	805.	357.	860.9
1.07	6.00	150	150.00	748.	790.	353.	860.9
1.07	7.00	151	151.00	734.	776.	350.	860.9
1.07	8.00	152	152.00	720.	762.	346.	860.9
1.07	9.00	153	153.00	707.	748.	343.	860.9
1.07	10.00	154	154.00	694.	734.	339.	860.8
1.07	11.00	155	155.00	682.	720.	336.	860.8
1.07	12.00	156	156.00	669.	707.	333.	860.8
1.07	13.00	157	157.00	657.	694.	330.	860.8
1.07	14.00	158	158.00	645.	682.	327.	860.8
1.07	15.00	159	159.00	634.	669.	324.	860.8
1.07	16.00	160	160.00	622.	657.	321.	860.8
1.07	17.00	161	161.00	611.	645.	318.	860.8
1.07	18.00	162	162.00	600.	634.	315.	860.8
1.07	19.00	163	163.00	589.	622.	313.	860.8
1.07	20.00	164	164.00	579.	611.	310.	860.8
1.07	21.00	165	165.00	568.	603.	307.	860.7
1.07	22.00	166	166.00	558.	597.	304.	860.7
1.07	23.00	167	167.00	548.	590.	301.	860.7
1.08	0.00	168	168.00	539.	583.	297.	860.7
1.08	1.00	169	169.00	529.	576.	294.	860.7
1.08	2.00	170	170.00	520.	568.	290.	860.7
1.08	3.00	171	171.00	511.	560.	286.	860.7
1.08	4.00	172	172.00	502.	552.	282.	860.7
1.08	5.00	173	173.00	493.	544.	277.	860.6
1.08	6.00	174	174.00	484.	536.	273.	860.6
1.08	7.00	175	175.00	476.	528.	269.	860.6
1.08	8.00	176	176.00	467.	519.	265.	860.6
1.08	9.00	177	177.00	459.	511.	260.	860.6
1.08	10.00	178	178.00	451.	503.	256.	860.6
1.08	11.00	179	179.00	444.	494.	252.	860.6
1.08	12.00	180	180.00	436.	486.	248.	860.6
1.08	13.00	181	181.00	428.	478.	244.	860.5
1.08	14.00	182	182.00	421.	470.	240.	860.5
1.08	15.00	183	183.00	414.	462.	236.	860.5
1.08	16.00	184	184.00	407.	455.	232.	860.5
1.08	17.00	185	185.00	400.	447.	228.	860.5
1.08	18.00	186	186.00	393.	439.	224.	860.5
1.08	19.00	187	187.00	386.	432.	220.	860.5
1.08	20.00	188	188.00	380.	425.	216.	860.5
1.08	21.00	189	189.00	374.	418.	213.	860.4
1.08	22.00	190	190.00	367.	411.	209.	860.4
1.08	23.00	191	191.00	361.	404.	205.	860.4
1.09	0.00	192	192.00	355.	397.	202.	860.4
1.09	1.00	193	193.00	349.	390.	199.	860.4
1.09	2.00	194	194.00	343.	384.	195.	860.4
1.09	3.00	195	195.00	340.	377.	192.	860.4
1.09	4.00	196	196.00	337.	372.	189.	860.4
1.09	5.00	197	197.00	334.	366.	186.	860.4
1.09	6.00	198	198.00	331.	361.	184.	860.3
1.09	7.00	199	199.00	328.	356.	181.	860.3
1.09	8.00	200	200.00	325.	352.	179.	860.3

PEAK OUTFLOW IS 5948. AT TIME 65.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5948.	5914.	5518.	4099.	369654.
CMS	168.	167.	156.	116.	10467.
INCHES		1.82	6.78	15.10	18.91
MM		46.12	172.12	383.56	480.43
AC-FT		2933.	10945.	24390.	30550.
THOUS CU M		3617.	13500.	30085.	37683.

HYDROGRAPH ROUTING

CHANNEL ROUTING TO REACH 4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
4	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.0600	.0400	.0600	645.0	685.0	14000.	.01460

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

0.00 670.00 2000.00 650.00 2009.00 647.00 2011.00 645.00 2016.00 645.00
2018.00 647.00 2027.00 650.00 3400.00 670.00

STORAGE	0.00	2.05	4.81	9.14	15.61	26.02	80.19	194.43	364.73	601.09
	897.30	1251.98	1666.51	2141.10	2675.75	3270.47	3925.24	4640.07	5414.95	6249.90
OUTFLOW	0.00	24.69	89.31	199.15	375.34	577.61	1207.43	2846.98	5936.13	10859.69
	17964.46	27570.88	39979.68	55475.98	74332.16	96809.86	123161.53	153631.57	188457.32	227869.75
STAGE	645.00	646.65	647.11	648.16	649.21	650.26	651.32	652.37	653.42	654.47
	655.53	656.58	657.63	658.68	659.74	660.79	661.84	662.89	663.95	665.00
FLOW	0.00	24.69	89.31	199.15	375.34	577.61	1207.43	2846.98	5936.13	10859.69
	17964.46	27570.88	39979.68	55475.98	74332.16	96809.86	123161.53	153631.57	188457.32	227869.75

MO.DA	HR.MN	PERIOD	EOP STOR	AVG IN	EOP OUT	STAGE	AVG PUMP
1.01	1.00	1	0.	2.	1.	645.0	0.
1.01	2.00	2	0.	2.	2.	645.1	0.
1.01	3.00	3	0.	4.	3.	645.1	0.
1.01	4.00	4	0.	5.	4.	645.2	0.
1.01	5.00	5	0.	6.	5.	645.2	0.
1.01	6.00	6	1.	7.	6.	645.3	0.
1.01	7.00	7	1.	8.	7.	645.3	0.
1.01	8.00	8	1.	9.	8.	645.3	0.
1.01	9.00	9	1.	9.	9.	645.4	0.
1.01	10.00	10	1.	10.	10.	645.4	0.
1.01	11.00	11	1.	11.	11.	645.5	0.
1.01	12.00	12	1.	12.	11.	645.5	0.
1.01	13.00	13	1.	12.	12.	645.5	0.
1.01	14.00	14	1.	13.	13.	645.5	0.
1.01	15.00	15	1.	14.	13.	645.6	0.
1.01	16.00	16	1.	14.	14.	645.6	0.
1.01	17.00	17	1.	16.	15.	645.7	0.
1.01	18.00	18	2.	20.	18.	645.8	0.
1.01	19.00	19	2.	26.	23.	646.0	0.

1.04	16.00	88	244.	3708.	3725.	652.7	0.
1.04	17.00	89	240.	3650.	3662.	652.6	0.
1.04	18.00	90	238.	3601.	3611.	652.6	0.
1.04	19.00	91	234.	3546.	3556.	652.6	0.
1.04	20.00	92	231.	3489.	3499.	652.6	0.
1.04	21.00	93	229.	3454.	3461.	652.6	0.
1.04	22.00	94	228.	3443.	3446.	652.6	0.
1.04	23.00	95	227.	3430.	3433.	652.6	0.
1.05	0.00	96	227.	3416.	3419.	652.6	0.
1.05	1.00	97	224.	3354.	3364.	652.5	0.
1.05	2.00	98	215.	3183.	3211.	652.5	0.
1.05	3.00	99	204.	2979.	3015.	652.4	0.
1.05	4.00	100	195.	2820.	2850.	652.4	0.
1.05	5.00	101	186.	2693.	2733.	652.3	0.
1.05	6.00	102	179.	2587.	2624.	652.2	0.
1.05	7.00	103	172.	2496.	2529.	652.2	0.
1.05	8.00	104	166.	2415.	2444.	652.1	0.
1.05	9.00	105	161.	2341.	2368.	652.1	0.
1.05	10.00	106	156.	2273.	2297.	652.0	0.
1.05	11.00	107	151.	2208.	2231.	652.0	0.
1.05	12.00	108	147.	2146.	2168.	651.9	0.
1.05	13.00	109	143.	2087.	2108.	651.9	0.
1.05	14.00	110	139.	2029.	2049.	651.9	0.
1.05	15.00	111	135.	1974.	1993.	651.8	0.
1.05	16.00	112	131.	1920.	1939.	651.8	0.
1.05	17.00	113	128.	1871.	1888.	651.8	0.
1.05	18.00	114	124.	1826.	1842.	651.7	0.
1.05	19.00	115	121.	1783.	1798.	651.7	0.
1.05	20.00	116	118.	1740.	1755.	651.7	0.
1.05	21.00	117	115.	1699.	1713.	651.6	0.
1.05	22.00	118	113.	1658.	1672.	651.6	0.
1.05	23.00	119	110.	1618.	1632.	651.6	0.
1.06	0.00	120	107.	1579.	1592.	651.6	0.
1.06	1.00	121	104.	1540.	1553.	651.5	0.
1.06	2.00	122	102.	1503.	1516.	651.5	0.
1.06	3.00	123	99.	1466.	1479.	651.5	0.
1.06	4.00	124	97.	1430.	1443.	651.5	0.
1.06	5.00	125	94.	1395.	1407.	651.4	0.
1.06	6.00	126	92.	1361.	1373.	651.4	0.
1.06	7.00	127	89.	1328.	1340.	651.4	0.
1.06	8.00	128	87.	1296.	1307.	651.4	0.
1.06	9.00	129	85.	1264.	1275.	651.4	0.
1.06	10.00	130	83.	1233.	1244.	651.3	0.
1.06	11.00	131	81.	1203.	1214.	651.3	0.
1.06	12.00	132	78.	1174.	1187.	651.3	0.
1.06	13.00	133	76.	1146.	1160.	651.2	0.
1.06	14.00	134	74.	1118.	1133.	651.2	0.
1.06	15.00	135	71.	1091.	1105.	651.1	0.
1.06	16.00	136	69.	1064.	1079.	651.1	0.
1.06	17.00	137	67.	1039.	1053.	651.1	0.
1.06	18.00	138	65.	1014.	1028.	651.0	0.
1.06	19.00	139	63.	991.	1004.	651.0	0.
1.06	20.00	140	61.	969.	981.	650.9	0.
1.06	21.00	141	59.	949.	960.	650.9	0.
1.06	22.00	142	57.	930.	941.	650.9	0.
1.06	23.00	143	56.	912.	922.	650.8	0.
1.07	0.00	144	54.	894.	904.	650.8	0.
1.07	1.00	145	53.	877.	886.	650.8	0.
1.07	2.00	146	51.	860.	869.	650.8	0.
1.07	3.00	147	50.	844.	853.	650.7	0.
1.07	4.00	148	48.	828.	837.	650.7	0.
1.07	5.00	149	47.	813.	821.	650.7	0.
1.07	6.00	150	46.	798.	806.	650.6	0.
1.07	7.00	151	44.	783.	791.	650.6	0.
1.07	8.00	152	43.	769.	777.	650.6	0.
1.07	9.00	153	42.	755.	762.	650.6	0.
1.07	10.00	154	41.	741.	748.	650.5	0.
1.07	11.00	155	40.	727.	735.	[illegible]	0.

1.07	12.00	156	38.	714.	721.	650.5	0.
1.07	13.00	157	37.	701.	708.	650.5	0.
1.07	14.00	158	36.	688.	695.	650.5	0.
1.07	15.00	159	35.	676.	682.	650.4	0.
1.07	16.00	160	34.	663.	670.	650.4	0.
1.07	17.00	161	33.	651.	658.	650.4	0.
1.07	18.00	162	32.	640.	646.	650.4	0.
1.07	19.00	163	31.	628.	634.	650.4	0.
1.07	20.00	164	30.	617.	623.	650.3	0.
1.07	21.00	165	29.	607.	612.	650.3	0.
1.07	22.00	166	28.	600.	604.	650.3	0.
1.07	23.00	167	28.	593.	597.	650.3	0.
1.08	0.00	168	27.	587.	590.	650.3	0.
1.08	1.00	169	27.	580.	583.	650.3	0.
1.08	2.00	170	26.	572.	576.	650.3	0.
1.08	3.00	171	25.	564.	566.	650.2	0.
1.08	4.00	172	25.	556.	557.	650.2	0.
1.08	5.00	173	25.	548.	549.	650.1	0.
1.08	6.00	174	24.	540.	541.	650.1	0.
1.08	7.00	175	24.	532.	533.	650.0	0.
1.08	8.00	176	23.	523.	524.	650.0	0.
1.08	9.00	177	23.	515.	516.	649.9	0.
1.08	10.00	178	22.	507.	508.	649.9	0.
1.08	11.00	179	22.	499.	500.	649.9	0.
1.08	12.00	180	22.	490.	491.	649.8	0.
1.08	13.00	181	21.	482.	483.	649.8	0.
1.08	14.00	182	21.	474.	475.	649.7	0.
1.08	15.00	183	20.	466.	467.	649.7	0.
1.08	16.00	184	20.	459.	459.	649.6	0.
1.08	17.00	185	20.	451.	452.	649.6	0.
1.08	18.00	186	19.	443.	444.	649.6	0.
1.08	19.00	187	19.	436.	437.	649.5	0.
1.08	20.00	188	18.	428.	429.	649.5	0.
1.08	21.00	189	18.	421.	422.	649.5	0.
1.08	22.00	190	18.	414.	415.	649.4	0.
1.08	23.00	191	17.	407.	408.	649.4	0.
1.09	0.00	192	17.	400.	401.	649.3	0.
1.09	1.00	193	17.	394.	394.	649.3	0.
1.09	2.00	194	16.	387.	388.	649.3	0.
1.09	3.00	195	16.	381.	381.	649.2	0.
1.09	4.00	196	16.	374.	375.	649.2	0.
1.09	5.00	197	15.	369.	368.	649.2	0.
1.09	6.00	198	15.	364.	363.	649.1	0.
1.09	7.00	199	15.	359.	358.	649.1	0.
1.09	8.00	200	15.	354.	354.	649.1	0.
				SUM	369653.		
					(10467.41)		

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5945.	5909.	5517.	4095.	369475.
CMS	168.	167.	156.	116.	10462.
INCHES		1.81	6.78	15.09	18.91
MM		46.08	172.09	383.23	480.19
AC-FT		2930.	10943.	24369.	29535.
THOUS CU M		3614.	13498.	30059.	37665.

MAXIMUM STAGE IS 653.4

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HYDROGRAPH ROUTING

CHANNEL ROUTING FROM REACH A TO SAKI'S LAKE

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
5	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.0600	.0400	.0600	627.0	650.0	14000.	.00130

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

0.00 651.00 100.00 650.00 1510.00 635.00 1542.00 627.00 1558.00 627.00
1590.00 635.00 1670.00 640.00 1945.00 651.00

STORAGE	0.00	8.11	19.99	35.63	55.04	78.22	105.17	139.56	216.86	345.97
	526.88	759.74	1047.49	1391.28	1791.12	2247.01	2758.94	3326.91	3950.93	4630.99
OUTFLOW	0.00	33.23	120.31	267.84	485.02	780.90	1164.23	1693.38	2508.18	3698.45
	5384.92	7664.42	10631.60	14407.46	19082.28	24742.22	31469.72	39344.03	48441.64	58836.60
STAGE	627.00	628.21	629.42	630.63	631.84	633.05	634.26	635.47	636.68	637.89
	639.11	640.32	641.53	642.74	643.95	645.16	646.37	647.58	648.79	650.00
FLOW	0.00	33.23	120.31	267.84	485.02	780.90	1164.23	1693.38	2508.18	3698.45
	5384.92	7664.42	10631.60	14407.46	19082.28	24742.22	31469.72	39344.03	48441.64	58836.60

0

MO.DA	HR.MN	PERIOD	EOP STOR	AVG IN	EOP OUT	STAGE	AVG PUMP
1.01	1.00	1	0.	1.	0.	627.0	0.
1.01	2.00	2	0.	1.	1.	627.0	0.
1.01	3.00	3	0.	2.	1.	627.0	0.
1.01	4.00	4	0.	4.	2.	627.1	0.
1.01	5.00	5	1.	5.	3.	627.1	0.
1.01	6.00	6	1.	6.	4.	627.1	0.
1.01	7.00	7	1.	7.	5.	627.2	0.
1.01	8.00	8	1.	8.	5.	627.2	0.
1.01	9.00	9	2.	9.	6.	627.2	0.
1.01	10.00	10	2.	9.	7.	627.3	0.
1.01	11.00	11	2.	10.	8.	627.3	0.
1.01	12.00	12	2.	11.	9.	627.3	0.
1.01	13.00	13	2.	12.	10.	627.4	0.
1.01	14.00	14	3.	12.	10.	627.4	0.
1.01	15.00	15	3.	13.	11.	627.4	0.
1.01	16.00	16	3.	14.	12.	627.4	0.
1.01	17.00	17	3.	15.	13.	627.5	0.
1.01	18.00	18	3.	17.	14.	627.5	0.
1.01	19.00	19	4.	21.	16.	627.6	0.
1.01	20.00	20	5.	28.	19.	627.7	0.
1.01	21.00	21	6.	39.	25.	627.9	0.
1.01	22.00	22	8.	51.	33.	628.2	0.
1.01	23.00	23	10.	62.	46.	628.4	0.
1.02	0.00	24	11.	72.	58.	628.6	0.
1.02	1.00	25	13.	80.	68.	628.7	0.
1.02	2.00	26	14.	86.	76.	628.8	0.
1.02	3.00	27	15.	90.	82.	628.9	0.
1.02	4.00	28	15.	91.	87.	629.0	0.

1.05	1.00	97	315.	3391.	3414.	637.6	0.
1.05	2.00	98	308.	3288.	3344.	637.5	0.
1.05	3.00	99	294.	3113.	3216.	637.4	0.
1.05	4.00	100	277.	2932.	3060.	637.2	0.
1.05	5.00	101	261.	2791.	2912.	637.1	0.
1.05	6.00	102	247.	2678.	2783.	637.0	0.
1.05	7.00	103	234.	2576.	2669.	636.8	0.
1.05	8.00	104	223.	2486.	2568.	636.7	0.
1.05	9.00	105	214.	2406.	2476.	636.6	0.
1.05	10.00	106	206.	2332.	2389.	636.5	0.
1.05	11.00	107	198.	2264.	2313.	636.4	0.
1.05	12.00	108	192.	2199.	2244.	636.3	0.
1.05	13.00	109	186.	2138.	2179.	636.2	0.
1.05	14.00	110	180.	2078.	2118.	636.1	0.
1.05	15.00	111	174.	2021.	2059.	636.0	0.
1.05	16.00	112	169.	1966.	2003.	635.9	0.
1.05	17.00	113	164.	1913.	1948.	635.9	0.
1.05	18.00	114	159.	1865.	1898.	635.8	0.
1.05	19.00	115	154.	1820.	1851.	635.7	0.
1.05	20.00	116	150.	1776.	1806.	635.6	0.
1.05	21.00	117	146.	1734.	1762.	635.6	0.
1.05	22.00	118	142.	1692.	1720.	635.5	0.
1.05	23.00	119	138.	1652.	1674.	635.4	0.
1.06	0.00	120	135.	1612.	1626.	635.3	0.
1.06	1.00	121	132.	1573.	1585.	635.2	0.
1.06	2.00	122	130.	1535.	1546.	635.1	0.
1.06	3.00	123	128.	1497.	1508.	635.0	0.
1.06	4.00	124	125.	1461.	1471.	635.0	0.
1.06	5.00	125	123.	1425.	1435.	634.9	0.
1.06	6.00	126	121.	1390.	1400.	634.8	0.
1.06	7.00	127	118.	1356.	1366.	634.7	0.
1.06	8.00	128	116.	1323.	1333.	634.6	0.
1.06	9.00	129	114.	1291.	1300.	634.6	0.
1.06	10.00	130	112.	1260.	1269.	634.5	0.
1.06	11.00	131	110.	1229.	1238.	634.4	0.
1.06	12.00	132	108.	1200.	1209.	634.4	0.
1.06	13.00	133	106.	1170.	1181.	634.3	0.
1.06	14.00	134	104.	1146.	1155.	634.2	0.
1.06	15.00	135	103.	1119.	1128.	634.1	0.
1.06	16.00	136	101.	1092.	1101.	634.1	0.
1.06	17.00	137	99.	1066.	1075.	634.0	0.
1.06	18.00	138	97.	1040.	1049.	633.9	0.
1.06	19.00	139	95.	1016.	1024.	633.8	0.
1.06	20.00	140	94.	993.	1001.	633.7	0.
1.06	21.00	141	92.	971.	979.	633.7	0.
1.06	22.00	142	91.	951.	958.	633.6	0.
1.06	23.00	143	89.	931.	938.	633.5	0.
1.07	0.00	144	88.	913.	919.	633.5	0.
1.07	1.00	145	87.	895.	901.	633.4	0.
1.07	2.00	146	85.	878.	884.	633.4	0.
1.07	3.00	147	84.	861.	867.	633.3	0.
1.07	4.00	148	83.	845.	851.	633.3	0.
1.07	5.00	149	82.	829.	835.	633.2	0.
1.07	6.00	150	81.	814.	819.	633.2	0.
1.07	7.00	151	80.	799.	804.	633.1	0.
1.07	8.00	152	79.	784.	789.	633.1	0.
1.07	9.00	153	78.	769.	775.	633.0	0.
1.07	10.00	154	77.	755.	761.	633.0	0.
1.07	11.00	155	76.	741.	748.	632.9	0.
1.07	12.00	156	75.	728.	734.	632.9	0.
1.07	13.00	157	73.	715.	721.	632.8	0.
1.07	14.00	158	72.	702.	707.	632.8	0.
1.07	15.00	159	71.	689.	695.	632.7	0.
1.07	16.00	160	70.	676.	682.	632.6	0.
1.07	17.00	161	69.	664.	669.	632.6	0.
1.07	18.00	162	69.	652.	657.	632.5	0.
1.07	19.00	163	68.	640.	645.	632.5	0.
1.07	20.00	164	67.	629.	634.	632.5	0.

1.07	21.00	165	65.	612.	615.	632.4	0.
1.07	22.00	166	65.	608.	612.	632.4	0.
1.07	23.00	167	64.	601.	604.	632.3	0.
1.08	0.00	168	64.	594.	597.	632.3	0.
1.08	1.00	169	63.	587.	590.	632.3	0.
1.08	2.00	170	63.	580.	583.	632.2	0.
1.08	3.00	171	62.	571.	574.	632.2	0.
1.08	4.00	172	61.	562.	565.	632.2	0.
1.08	5.00	173	61.	553.	557.	632.1	0.
1.08	6.00	174	60.	545.	549.	632.1	0.
1.08	7.00	175	59.	537.	541.	632.1	0.
1.08	8.00	176	59.	529.	532.	632.0	0.
1.08	9.00	177	58.	520.	524.	632.0	0.
1.08	10.00	178	57.	512.	516.	632.0	0.
1.08	11.00	179	57.	504.	507.	631.9	0.
1.08	12.00	180	56.	495.	499.	631.9	0.
1.08	13.00	181	56.	487.	491.	631.9	0.
1.08	14.00	182	55.	479.	483.	631.8	0.
1.08	15.00	183	54.	471.	476.	631.8	0.
1.08	16.00	184	54.	463.	468.	631.7	0.
1.08	17.00	185	53.	456.	460.	631.7	0.
1.08	18.00	186	52.	448.	452.	631.7	0.
1.08	19.00	187	51.	440.	445.	631.6	0.
1.08	20.00	188	51.	433.	437.	631.6	0.
1.08	21.00	189	50.	426.	430.	631.5	0.
1.08	22.00	190	49.	418.	423.	631.5	0.
1.08	23.00	191	49.	411.	416.	631.5	0.
1.09	0.00	192	48.	405.	409.	631.4	0.
1.09	1.00	193	48.	398.	402.	631.4	0.
1.09	2.00	194	47.	391.	395.	631.3	0.
1.09	3.00	195	46.	385.	388.	631.3	0.
1.09	4.00	196	46.	378.	382.	631.3	0.
1.09	5.00	197	45.	372.	376.	631.2	0.
1.09	6.00	198	45.	366.	369.	631.2	0.
1.09	7.00	199	44.	361.	364.	631.2	0.
1.09	8.00	200	44.	356.	359.	631.1	0.

SUM 363126.
(10452.49)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5925.	5892.	5513.	4092.	368947.
CMS	168.	167.	156.	116.	10447.
INCHES		1.81	6.77	15.07	18.88
MM		45.94	171.95	382.89	479.51
AC-FT		2922.	10934.	24348.	30491.
THOUS CU M		3604.	13487.	30033.	37611.

MAXIMUM STAGE IS 639.4

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SUB-AREA RUNOFF COMPUTATION

COMPUTE HYDROGRAPH - SAXTON LAKE LOCAL

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
5	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	37.70	0.00	37.70	.84	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.40	107.00	109.00	119.00	131.00	0.00	0.00

LOSS DATA

LKOPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.15	0.00	0.00

UNIT HYDROGRAPH DATA
TP= 13.80 CP= .58 NTA= 0

RECESSION DATA
STRTQ= -2.00 QRCSN= 0.00 RTIOR= 1.00

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC=15.03 AND R=14.71 INTERVALS

UNIT HYDROGRAPH 86 END-OF-PERIOD ORDINATES, LAG= 13.91 HOURS, CP= .58 VOL= 1.00

19.	73.	150.	240.	340.	448.	561.	676.	785.	876.
949.	1003.	1038.	1052.	1038.	990.	925.	865.	808.	755.
705.	659.	615.	575.	537.	502.	469.	438.	409.	382.
357.	334.	312.	291.	272.	254.	238.	222.	207.	194.
181.	169.	158.	148.	138.	129.	120.	112.	105.	98.
92.	86.	80.	75.	70.	66.	61.	57.	53.	50.
46.	43.	41.	38.	35.	33.	31.	29.	27.	25.
24.	22.	21.	19.	18.	17.	16.	15.	14.	13.
12.	11.	10.	10.	9.	8.				

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	1.00	1	.01	0.00	.01	75.	1.05	5.00	101	0.00	0.00	0.00	877.
1.01	2.00	2	.01	0.00	.01	75.	1.05	6.00	102	0.00	0.00	0.00	820.
1.01	3.00	3	.01	0.00	.01	75.	1.05	7.00	103	0.00	0.00	0.00	770.
1.01	4.00	4	.01	0.00	.01	75.	1.05	8.00	104	0.00	0.00	0.00	724.
1.01	5.00	5	.01	0.00	.01	75.	1.05	9.00	105	0.00	0.00	0.00	681.
1.01	6.00	6	.01	0.00	.01	75.	1.05	10.00	106	0.00	0.00	0.00	642.
1.01	7.00	7	.03	0.00	.03	75.	1.05	11.00	107	0.00	0.00	0.00	604.
1.01	8.00	8	.03	0.00	.03	75.	1.05	12.00	108	0.00	0.00	0.00	570.
1.01	9.00	9	.03	0.00	.03	75.	1.05	13.00	109	0.00	0.00	0.00	537.
1.01	10.00	10	.03	0.00	.03	75.	1.05	14.00	110	0.00	0.00	0.00	507.
1.01	11.00	11	.03	0.00	.03	75.	1.05	15.00	111	0.00	0.00	0.00	478.
1.01	12.00	12	.03	0.00	.03	75.	1.05	16.00	112	0.00	0.00	0.00	452.
1.01	13.00	13	.19	0.00	.19	75.	1.05	17.00	113	0.00	0.00	0.00	427.
1.01	14.00	14	.23	0.00	.23	75.	1.05	18.00	114	0.00	0.00	0.00	404.
1.01	15.00	15	.28	0.00	.28	75.	1.05	19.00	115	0.00	0.00	0.00	382.
1.01	16.00	16	.72	.52	.20	86.	1.05	20.00	116	0.00	0.00	0.00	362.
1.01	17.00	17	.26	.11	.15	116.	1.05	21.00	117	0.00	0.00	0.00	342.
1.01	18.00	18	.21	.06	.15	163.	1.05	22.00	118	0.00	0.00	0.00	324.
1.01	19.00	19	.02	0.00	.02	222.	1.05	23.00	119	0.00	0.00	0.00	306.
1.01	20.00	20	.02	0.00	.02	289.	1.06	0.00	120	0.00	0.00	0.00	290.
1.01	21.00	21	.02	0.00	.02	362.	1.06	1.00	121	0.00	0.00	0.00	275.
1.01	22.00	22	.02	0.00	.02	439.	1.06	2.00	122	0.00	0.00	0.00	261.
1.01	23.00	23	.02	0.00	.02	518.	1.06	3.00	123	0.00	0.00	0.00	235.
1.02	0.00	24	.02	0.00	.02	594.	1.06	4.00	124	0.00	0.00	0.00	208.
1.02	1.00	25	.12	0.00	.12	661.	1.06	5.00	125	0.00	0.00	0.00	178.
1.02	2.00	26	.12	0.00	.12	715.	1.06	6.00	126	0.00	0.00	0.00	116.
1.02	3.00	27	.12	0.00	.12	757.	1.06	7.00	127	0.00	0.00	0.00	94.
1.02	4.00	28	.12	0.00	.12	786.	1.06	8.00	128	0.00	0.00	0.00	78.
1.02	5.00	29	.12	0.00	.12	800.	1.06	9.00	129	0.00	0.00	0.00	77.
1.02	6.00	30	.12	0.00	.12	797.	1.06	10.00	130	0.00	0.00	0.00	77.
1.02	7.00	31	.28	.13	.15	774.	1.06	11.00	131	0.00	0.00	0.00	78.
1.02	8.00	32	.28	.13	.15	743.	1.06	12.00	132	0.00	0.00	0.00	76.
1.02	9.00	33	.28	.13	.15	721.	1.06	13.00	133	0.00	0.00	0.00	76.
1.02	10.00	34	.28	.13	.15	712.	1.06	14.00	134	0.00	0.00	0.00	75.
1.02	11.00	35	.28	.13	.15	718.	1.06	15.00	135	0.00	0.00	0.00	75.
1.02	12.00	36	.28	.13	.15	742.	1.06	16.00	136	0.00	0.00	0.00	75.
1.02	13.00	37	1.87	1.72	.15	813.	1.06	17.00	137	0.00	0.00	0.00	75.
1.02	14.00	38	2.24	2.09	.15	994.	1.06	18.00	138	0.00	0.00	0.00	75.
1.02	15.00	39	2.81	2.66	.15	1343.	1.06	19.00	139	0.00	0.00	0.00	75.
1.02	16.00	40	7.11	6.96	.15	1993.	1.06	20.00	140	0.00	0.00	0.00	75.

1.02	17.00	41	2.62	2.47	.15	3035.	1.06	21.00	141	0.00	0.00	0.00	0.00	75.
1.02	18.00	42	2.06	1.91	.15	4420.	1.06	22.00	142	0.00	0.00	0.00	0.00	75.
1.02	19.00	43	.19	.04	.15	6067.	1.06	23.00	143	0.00	0.00	0.00	0.00	75.
1.02	20.00	44	.19	.04	.15	7887.	1.07	0.00	144	0.00	0.00	0.00	0.00	75.
1.02	21.00	45	.19	.04	.15	9803.	1.07	1.00	145	0.00	0.00	0.00	0.00	75.
1.02	22.00	46	.19	.04	.15	11742.	1.07	2.00	146	0.00	0.00	0.00	0.00	75.
1.02	23.00	47	.19	.04	.15	13628.	1.07	3.00	147	0.00	0.00	0.00	0.00	75.
1.03	0.00	48	.19	.04	.15	15353.	1.07	4.00	148	0.00	0.00	0.00	0.00	75.
1.03	1.00	49	0.00	0.00	0.00	16817.	1.07	5.00	149	0.00	0.00	0.00	0.00	75.
1.03	2.00	50	0.00	0.00	0.00	17965.	1.07	6.00	150	0.00	0.00	0.00	0.00	75.
1.03	3.00	51	0.00	0.00	0.00	18762.	1.07	7.00	151	0.00	0.00	0.00	0.00	75.
1.03	4.00	52	0.00	0.00	0.00	19173.	1.07	8.00	152	0.00	0.00	0.00	0.00	75.
1.03	5.00	53	0.00	0.00	0.00	19182.	1.07	9.00	153	0.00	0.00	0.00	0.00	75.
1.03	6.00	54	0.00	0.00	0.00	18796.	1.07	10.00	154	0.00	0.00	0.00	0.00	75.
1.03	7.00	55	0.00	0.00	0.00	18031.	1.07	11.00	155	0.00	0.00	0.00	0.00	75.
1.03	8.00	56	0.00	0.00	0.00	17036.	1.07	12.00	156	0.00	0.00	0.00	0.00	75.
1.03	9.00	57	0.00	0.00	0.00	15983.	1.07	13.00	157	0.00	0.00	0.00	0.00	75.
1.03	10.00	58	0.00	0.00	0.00	14956.	1.07	14.00	158	0.00	0.00	0.00	0.00	75.
1.03	11.00	59	0.00	0.00	0.00	13992.	1.07	15.00	159	0.00	0.00	0.00	0.00	75.
1.03	12.00	60	0.00	0.00	0.00	13087.	1.07	16.00	160	0.00	0.00	0.00	0.00	75.
1.03	13.00	61	0.00	0.00	0.00	12237.	1.07	17.00	161	0.00	0.00	0.00	0.00	75.
1.03	14.00	62	0.00	0.00	0.00	11441.	1.07	18.00	162	0.00	0.00	0.00	0.00	75.
1.03	15.00	63	0.00	0.00	0.00	10694.	1.07	19.00	163	0.00	0.00	0.00	0.00	75.
1.03	16.00	64	0.00	0.00	0.00	9996.	1.07	20.00	164	0.00	0.00	0.00	0.00	75.
1.03	17.00	65	0.00	0.00	0.00	9344.	1.07	21.00	165	0.00	0.00	0.00	0.00	75.
1.03	18.00	66	0.00	0.00	0.00	8735.	1.07	22.00	166	0.00	0.00	0.00	0.00	75.
1.03	19.00	67	0.00	0.00	0.00	8166.	1.07	23.00	167	0.00	0.00	0.00	0.00	75.
1.03	20.00	68	0.00	0.00	0.00	7634.	1.08	0.00	168	0.00	0.00	0.00	0.00	75.
1.03	21.00	69	0.00	0.00	0.00	7137.	1.08	1.00	169	0.00	0.00	0.00	0.00	75.
1.03	22.00	70	0.00	0.00	0.00	6673.	1.08	2.00	170	0.00	0.00	0.00	0.00	75.
1.03	23.00	71	0.00	0.00	0.00	6239.	1.08	3.00	171	0.00	0.00	0.00	0.00	75.
1.04	0.00	72	0.00	0.00	0.00	5834.	1.08	4.00	172	0.00	0.00	0.00	0.00	75.
1.04	1.00	73	0.00	0.00	0.00	5455.	1.08	5.00	173	0.00	0.00	0.00	0.00	75.
1.04	2.00	74	0.00	0.00	0.00	5102.	1.08	6.00	174	0.00	0.00	0.00	0.00	75.
1.04	3.00	75	0.00	0.00	0.00	4771.	1.08	7.00	175	0.00	0.00	0.00	0.00	75.
1.04	4.00	76	0.00	0.00	0.00	4463.	1.08	8.00	176	0.00	0.00	0.00	0.00	75.
1.04	5.00	77	0.00	0.00	0.00	4174.	1.08	9.00	177	0.00	0.00	0.00	0.00	75.
1.04	6.00	78	0.00	0.00	0.00	3905.	1.08	10.00	178	0.00	0.00	0.00	0.00	75.
1.04	7.00	79	0.00	0.00	0.00	3653.	1.08	11.00	179	0.00	0.00	0.00	0.00	75.
1.04	8.00	80	0.00	0.00	0.00	3418.	1.08	12.00	180	0.00	0.00	0.00	0.00	75.
1.04	9.00	81	0.00	0.00	0.00	3198.	1.08	13.00	181	0.00	0.00	0.00	0.00	75.
1.04	10.00	82	0.00	0.00	0.00	2993.	1.08	14.00	182	0.00	0.00	0.00	0.00	75.
1.04	11.00	83	0.00	0.00	0.00	2801.	1.08	15.00	183	0.00	0.00	0.00	0.00	75.
1.04	12.00	84	0.00	0.00	0.00	2622.	1.08	16.00	184	0.00	0.00	0.00	0.00	75.
1.04	13.00	85	0.00	0.00	0.00	2454.	1.08	17.00	185	0.00	0.00	0.00	0.00	75.
1.04	14.00	86	0.00	0.00	0.00	2298.	1.08	18.00	186	0.00	0.00	0.00	0.00	75.
1.04	15.00	87	0.00	0.00	0.00	2152.	1.08	19.00	187	0.00	0.00	0.00	0.00	75.
1.04	16.00	88	0.00	0.00	0.00	2015.	1.08	20.00	188	0.00	0.00	0.00	0.00	75.
1.04	17.00	89	0.00	0.00	0.00	1888.	1.08	21.00	189	0.00	0.00	0.00	0.00	75.
1.04	18.00	90	0.00	0.00	0.00	1769.	1.08	22.00	190	0.00	0.00	0.00	0.00	75.
1.04	19.00	91	0.00	0.00	0.00	1657.	1.08	23.00	191	0.00	0.00	0.00	0.00	75.
1.04	20.00	92	0.00	0.00	0.00	1553.	1.09	0.00	192	0.00	0.00	0.00	0.00	75.
1.04	21.00	93	0.00	0.00	0.00	1456.	1.09	1.00	193	0.00	0.00	0.00	0.00	75.
1.04	22.00	94	0.00	0.00	0.00	1366.	1.09	2.00	194	0.00	0.00	0.00	0.00	75.
1.04	23.00	95	0.00	0.00	0.00	1281.	1.09	3.00	195	0.00	0.00	0.00	0.00	75.
1.05	0.00	96	0.00	0.00	0.00	1201.	1.09	4.00	196	0.00	0.00	0.00	0.00	75.
1.05	1.00	97	0.00	0.00	0.00	1127.	1.09	5.00	197	0.00	0.00	0.00	0.00	75.
1.05	2.00	98	0.00	0.00	0.00	1058.	1.09	6.00	198	0.00	0.00	0.00	0.00	75.
1.05	3.00	99	0.00	0.00	0.00	994.	1.09	7.00	199	0.00	0.00	0.00	0.00	75.
1.05	4.00	100	0.00	0.00	0.00	933.	1.09	8.00	200	0.00	0.00	0.00	0.00	75.
									SUM	24.50	19.50	5.00	486934.	
										(622.)(495.)(127.)(13788.44)				

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	19182.	18574.	13862.	6428.	486893.
CMS	543.	526.	393.	182.	13787.
INCHES		4.08	12.68	19.03	20.02

MM		116.41	347.50	483.47	508.59
AC-FT		9210.	27494.	38252.	40239.
THOUS CU M		11361.	33914.	47183.	49634.

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COMBINE HYDROGRAPHS

COMBINE ROUTED OUTFLOW OF MUSCONETCONG WITH LOCAL INFLOW OF SAXTON

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
5	2	0	0	0	0	1	0	0

SUM OF 2 HYDROGRAPHS AT 5

76.	76.	77.	77.	78.	79.	80.	81.	82.	83.
84.	84.	85.	86.	87.	97.	128.	177.	238.	308.
387.	471.	564.	652.	729.	792.	840.	873.	891.	890.
869.	840.	820.	815.	828.	862.	952.	1158.	1547.	2261.
3423.	5022.	7089.	9603.	12130.	14609.	16942.	19132.	21054.	22553.
23566.	24086.	24141.	23771.	23020.	22057.	21066.	20135.	19293.	18522.
17805.	17126.	16476.	15850.	15245.	14659.	14090.	13538.	13002.	12481.
11976.	11486.	11012.	10552.	10110.	9692.	9296.	8918.	8553.	8200.
7862.	7539.	7230.	6935.	6652.	6381.	6120.	5875.	5655.	5463.
5291.	5128.	4979.	4850.	4740.	4642.	4541.	4402.	4210.	3993.
3789.	3603.	3439.	3292.	3157.	3030.	2917.	2814.	2717.	2625.
2538.	2455.	2376.	2302.	2233.	2168.	2105.	2044.	1981.	1916.
1860.	1807.	1743.	1679.	1613.	1517.	1460.	1410.	1377.	1345.
1314.	1285.	1257.	1230.	1204.	1177.	1150.	1125.	1100.	1076.
1054.	1033.	1014.	995.	977.	959.	943.	926.	910.	895.
879.	865.	850.	837.	823.	809.	796.	783.	770.	757.
745.	733.	721.	709.	698.	688.	680.	673.	665.	658.
650.	641.	633.	624.	616.	608.	599.	591.	583.	575.
566.	558.	551.	543.	536.	528.	520.	513.	505.	498.
491.	484.	477.	470.	464.	457.	451.	445.	439.	434.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	24141.	23482.	18804.	10417.	855839.
CMS	684.	665.	532.	295.	24235.
INCHES		3.21	10.29	17.10	19.51
MM		81.59	261.36	434.36	495.63
AC-FT		11644.	37298.	61987.	70731.
THOUS CU M		14362.	46006.	76460.	87245.

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HYDROGRAPH ROUTING

ROUTING COMPUTATIONS - SAXTON FALLS (INDEPENDANT ELEVATIONS USED)

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
6	1	0	0	0	0	0	0	0

ROUTING DATA

WLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	-1

	102.55	103.55	104.55	105.55						
FLOW	0.00 18200.00	430.00 21433.00	1585.00 24852.00	2544.00 28447.00	3917.00	5474.00	7439.00	9755.00	12341.00	15163.00
SURFACE AREA=	64. 109.	68. 113.	73. 118.	77. 122.	82.	86.	91.	95.	100.	104.
CAPACITY=	0. 860.	66. 971.	136. 1086.	211. 1206.	290.	374.	462.	555.	652.	754.
ELEVATION=	93. 103.	94. 104.	95. 105.	96. 106.	97.	98.	99.	100.	101.	102.

CREL	SPWID	COOW	EXPW	ELEVL	COOL	CAREA	EXPL
92.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COOD	EXPD	DAMWID
97.6	0.0	0.0	0.

END-OF-PERIOD HYDROGRAPH ORDINATES

MO.DA	HR.MN	PERIOD	HOURS	INFLOW	OUTFLOW	STORAGE	STAGE
1.01	1.00	1	1.00	76.	37.	5.	92.6
1.01	2.00	2	2.00	76.	56.	7.	92.7
1.01	3.00	3	3.00	77.	65.	9.	92.7
1.01	4.00	4	4.00	77.	71.	9.	92.7
1.01	5.00	5	5.00	78.	74.	10.	92.7
1.01	6.00	6	6.00	79.	76.	10.	92.7
1.01	7.00	7	7.00	80.	78.	10.	92.7
1.01	8.00	8	8.00	81.	79.	10.	92.7
1.01	9.00	9	9.00	82.	80.	10.	92.7
1.01	10.00	10	10.00	83.	81.	11.	92.7
1.01	11.00	11	11.00	84.	82.	11.	92.7
1.01	12.00	12	12.00	84.	83.	11.	92.7
1.01	13.00	13	13.00	85.	84.	11.	92.7
1.01	14.00	14	14.00	86.	85.	11.	92.7
1.01	15.00	15	15.00	87.	85.	11.	92.7
1.01	16.00	16	16.00	97.	89.	12.	92.7
1.01	17.00	17	17.00	128.	100.	13.	92.8
1.01	18.00	18	18.00	177.	125.	16.	92.8
1.01	19.00	19	19.00	238.	164.	22.	92.9
1.01	20.00	20	20.00	308.	216.	28.	93.0
1.01	21.00	21	21.00	387.	278.	37.	93.1
1.01	22.00	22	22.00	471.	349.	46.	93.3
1.01	23.00	23	23.00	564.	427.	57.	93.4
1.02	0.00	24	24.00	652.	521.	68.	93.6
1.02	1.00	25	25.00	729.	640.	77.	93.7
1.02	2.00	26	26.00	792.	724.	84.	93.8
1.02	3.00	27	27.00	840.	788.	89.	93.9
1.02	4.00	28	28.00	873.	835.	92.	93.9
1.02	5.00	29	29.00	891.	867.	95.	94.0
1.02	6.00	30	30.00	890.	883.	96.	94.0
1.02	7.00	31	31.00	869.	881.	96.	94.0
1.02	8.00	32	32.00	840.	863.	94.	94.0
1.02	9.00	33	33.00	820.	849.	93.	93.9
1.02	10.00	34	34.00	815.	824.	91.	93.9
1.02	11.00	35	35.00	828.	822.	91.	93.9
1.02	12.00	36	36.00	862.	838.	93.	93.9
1.02	13.00	37	37.00	952.	885.	96.	94.0
1.02	14.00	38	38.00	1158.	1002.	105.	94.1
1.02	15.00	39	39.00	1547.	1242.	124.	94.4
1.02	16.00	40	40.00	2261.	1741.	158.	94.9
1.02	17.00	41	41.00	3423.	2601.	214.	95.6
1.02	18.00	42	42.00	5022.	3955.	292.	96.6
1.02	19.00	43	43.00	7089.	5815.	389.	97.7
[illegible]	[illegible]	44	44.00	[illegible]	8261.	496.	[illegible]

1.02	21.00	45	45.00	12130.	10943.	599.	100.0
1.02	22.00	46	46.00	14609.	13506.	693.	101.0
1.02	23.00	47	47.00	16942.	15939.	780.	101.8
1.03	0.00	48	48.00	19132.	18206.	860.	102.6
1.03	1.00	49	49.00	21054.	20277.	931.	103.2
1.03	2.00	50	50.00	22553.	21947.	988.	103.7
1.03	3.00	51	51.00	23566.	23176.	1029.	104.1
1.03	4.00	52	52.00	24086.	23891.	1053.	104.3
1.03	5.00	53	53.00	24141.	24135.	1061.	104.3
1.03	6.00	54	54.00	23771.	23939.	1055.	104.3
1.03	7.00	55	55.00	23020.	23342.	1034.	104.1
1.03	8.00	56	56.00	22057.	22456.	1005.	103.8
1.03	9.00	57	57.00	21066.	21465.	972.	103.6
1.03	10.00	58	58.00	20135.	20525.	939.	103.3
1.03	11.00	59	59.00	19293.	19639.	909.	103.0
1.03	12.00	60	60.00	18522.	18836.	881.	102.7
1.03	13.00	61	61.00	17805.	18098.	856.	102.5
1.03	14.00	62	62.00	17126.	17418.	832.	102.3
1.03	15.00	63	63.00	16476.	16751.	809.	102.1
1.03	16.00	64	64.00	15850.	16113.	786.	101.9
1.03	17.00	65	65.00	15245.	15498.	765.	101.7
1.03	18.00	66	66.00	14659.	14910.	744.	101.5
1.03	19.00	67	67.00	14090.	14342.	724.	101.3
1.03	20.00	68	68.00	13538.	13780.	703.	101.1
1.03	21.00	69	69.00	13002.	13234.	684.	100.9
1.03	22.00	70	70.00	12481.	12705.	665.	100.7
1.03	23.00	71	71.00	11976.	12197.	646.	100.5
1.04	0.00	72	72.00	11486.	11713.	628.	100.3
1.04	1.00	73	73.00	11012.	11229.	610.	100.1
1.04	2.00	74	74.00	10552.	10760.	592.	99.9
1.04	3.00	75	75.00	10110.	10309.	575.	99.8
1.04	4.00	76	76.00	9692.	9879.	559.	99.6
1.04	5.00	77	77.00	9296.	9486.	544.	99.4
1.04	6.00	78	78.00	8918.	9104.	528.	99.3
1.04	7.00	79	79.00	8553.	8731.	513.	99.1
1.04	8.00	80	80.00	8200.	8371.	499.	99.0
1.04	9.00	81	81.00	7862.	8024.	485.	98.8
1.04	10.00	82	82.00	7539.	7693.	472.	98.7
1.04	11.00	83	83.00	7230.	7382.	459.	98.5
1.04	12.00	84	84.00	6935.	7098.	446.	98.4
1.04	13.00	85	85.00	6652.	6808.	433.	98.2
1.04	14.00	86	86.00	6381.	6529.	421.	98.1
1.04	15.00	87	87.00	6120.	6262.	409.	98.0
1.04	16.00	88	88.00	5875.	6008.	397.	97.8
1.04	17.00	89	89.00	5655.	5774.	387.	97.7
1.04	18.00	90	90.00	5463.	5566.	378.	97.6
1.04	19.00	91	91.00	5291.	5393.	369.	97.5
1.04	20.00	92	92.00	5128.	5235.	361.	97.4
1.04	21.00	93	93.00	4979.	5079.	352.	97.3
1.04	22.00	94	94.00	4850.	4937.	344.	97.2
1.04	23.00	95	95.00	4740.	4814.	338.	97.1
1.05	0.00	96	96.00	4642.	4708.	332.	97.1
1.05	1.00	97	97.00	4541.	4607.	327.	97.0
1.05	2.00	98	98.00	4402.	4490.	320.	96.9
1.05	3.00	99	99.00	4210.	4329.	312.	96.8
1.05	4.00	100	100.00	3993.	4130.	301.	96.7
1.05	5.00	101	101.00	3789.	3920.	290.	96.6
1.05	6.00	102	102.00	3603.	3735.	279.	96.4
1.05	7.00	103	103.00	3439.	3558.	269.	96.3
1.05	8.00	104	104.00	3292.	3399.	260.	96.2
1.05	9.00	105	105.00	3157.	3254.	251.	96.1
1.05	10.00	106	106.00	3030.	3120.	243.	96.0
1.05	11.00	107	107.00	2917.	2998.	236.	95.9
1.05	12.00	108	108.00	2814.	2887.	230.	95.8
1.05	13.00	109	109.00	2717.	2784.	224.	95.7
1.05	14.00	110	110.00	2625.	2688.	219.	95.7
1.05	15.00	111	111.00	2538.	2598.	214.	95.6
[illegible]	[illegible]	[illegible]	112.00	[illegible]	[illegible]	[illegible]	[illegible]

1.05	17.00	113	113.00	2376.	2439.	204.	95.5
1.05	18.00	114	114.00	2302.	2362.	199.	95.4
1.05	19.00	115	115.00	2233.	2289.	194.	95.3
1.05	20.00	116	116.00	2168.	2221.	189.	95.3
1.05	21.00	117	117.00	2105.	2155.	185.	95.2
1.05	22.00	118	118.00	2044.	2092.	181.	95.2
1.05	23.00	119	119.00	1981.	2030.	177.	95.1
1.05	0.00	120	120.00	1916.	1967.	173.	95.1
1.06	1.00	121	121.00	1860.	1905.	169.	95.0
1.06	2.00	122	122.00	1807.	1849.	165.	95.0
1.05	3.00	123	123.00	1743.	1791.	162.	94.9
1.06	4.00	124	124.00	1679.	1728.	158.	94.8
1.06	5.00	125	125.00	1613.	1664.	154.	94.8
1.06	6.00	126	126.00	1517.	1586.	149.	94.7
1.06	7.00	127	127.00	1460.	1509.	144.	94.7
1.06	8.00	128	128.00	1410.	1450.	140.	94.6
1.06	9.00	129	129.00	1377.	1406.	137.	94.6
1.06	10.00	130	130.00	1345.	1373.	135.	94.5
1.06	11.00	131	131.00	1314.	1344.	133.	94.5
1.06	12.00	132	132.00	1285.	1314.	130.	94.5
1.05	13.00	133	133.00	1257.	1285.	128.	94.4
1.06	14.00	134	134.00	1230.	1257.	126.	94.4
1.06	15.00	135	135.00	1204.	1230.	123.	94.4
1.05	16.00	136	136.00	1177.	1203.	121.	94.3
1.06	17.00	137	137.00	1150.	1176.	119.	94.3
1.06	18.00	138	138.00	1125.	1150.	117.	94.3
1.05	19.00	139	139.00	1100.	1124.	115.	94.3
1.06	20.00	140	140.00	1076.	1100.	113.	94.2
1.06	21.00	141	141.00	1054.	1076.	111.	94.2
1.06	22.00	142	142.00	1033.	1054.	109.	94.2
1.06	23.00	143	143.00	1014.	1033.	108.	94.2
1.07	0.00	144	144.00	995.	1013.	106.	94.1
1.07	1.00	145	145.00	977.	995.	105.	94.1
1.07	2.00	146	146.00	959.	976.	103.	94.1
1.07	3.00	147	147.00	943.	959.	102.	94.1
1.07	4.00	148	148.00	926.	942.	101.	94.1
1.07	5.00	149	149.00	910.	926.	99.	94.0
1.07	6.00	150	150.00	895.	910.	98.	94.0
1.07	7.00	151	151.00	879.	894.	97.	94.0
1.07	8.00	152	152.00	865.	879.	96.	94.0
1.07	9.00	153	153.00	850.	864.	95.	94.0
1.07	10.00	154	154.00	837.	850.	93.	94.0
1.07	11.00	155	155.00	823.	836.	92.	93.9
1.07	12.00	156	156.00	809.	822.	91.	93.9
1.07	13.00	157	157.00	796.	809.	90.	93.9
1.07	14.00	158	158.00	783.	795.	89.	93.9
1.07	15.00	159	159.00	770.	782.	88.	93.9
1.07	16.00	160	160.00	757.	769.	87.	93.9
1.07	17.00	161	161.00	745.	757.	86.	93.8
1.07	18.00	162	162.00	733.	744.	85.	93.8
1.07	19.00	163	163.00	721.	732.	84.	93.8
1.07	20.00	164	164.00	709.	720.	83.	93.8
1.07	21.00	165	165.00	698.	709.	82.	93.8
1.07	22.00	166	166.00	688.	698.	82.	93.8
1.07	23.00	167	167.00	680.	688.	81.	93.8
1.08	0.00	168	168.00	673.	680.	80.	93.8
1.08	1.00	169	169.00	665.	672.	80.	93.8
1.08	2.00	170	170.00	658.	665.	79.	93.7
1.08	3.00	171	171.00	650.	657.	79.	93.7
1.08	4.00	172	172.00	641.	649.	78.	93.7
1.08	5.00	173	173.00	633.	640.	77.	93.7
1.08	6.00	174	174.00	624.	632.	77.	93.7
1.08	7.00	175	175.00	616.	624.	76.	93.7
1.08	8.00	176	176.00	608.	615.	75.	93.7
1.08	9.00	177	177.00	599.	607.	75.	93.7
1.08	10.00	178	178.00	591.	599.	74.	93.7
1.08	11.00	179	179.00	583.	591.	73.	93.7

1.08	13.00	181	181.00	566.	574.	72.	93.6
1.08	14.00	182	182.00	558.	566.	72.	93.6
1.08	15.00	183	183.00	551.	558.	71.	93.6
1.08	16.00	184	184.00	543.	550.	70.	93.6
1.08	17.00	185	185.00	536.	543.	70.	93.6
1.08	18.00	186	186.00	528.	535.	69.	93.6
1.08	19.00	187	187.00	520.	527.	69.	93.6
1.08	20.00	188	188.00	513.	520.	68.	93.6
1.08	21.00	189	189.00	505.	512.	67.	93.6
1.08	22.00	190	190.00	498.	505.	67.	93.6
1.08	23.00	191	191.00	491.	498.	66.	93.6
1.09	0.00	192	192.00	484.	490.	66.	93.6
1.09	1.00	193	193.00	477.	486.	65.	93.5
1.09	2.00	194	194.00	470.	480.	64.	93.5
1.09	3.00	195	195.00	464.	474.	64.	93.5
1.09	4.00	196	196.00	457.	468.	63.	93.5
1.09	5.00	197	197.00	451.	462.	62.	93.5
1.09	6.00	198	198.00	445.	456.	61.	93.5
1.09	7.00	199	199.00	439.	450.	60.	93.5
1.09	8.00	200	200.00	434.	444.	59.	93.5

PEAK OUTFLOW IS 24135. AT TIME 53.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	24135.	23447.	18793.	10413.	855197.
CMS	683.	664.	532.	295.	24216.
INCHES		3.21	10.28	17.09	19.50
MM		81.47	261.19	434.19	495.26
AC-FT		11627.	37275.	61963.	70677.
THOUS CU M		14341.	45978.	76430.	87179.

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RUNOFF SUMMARY, AVERAGE FLOW IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES(SQUARE KILOMETERS)

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	1	15026.	14418.	10167.	4450.	25.40
		(425.48)	(408.27)	(287.88)	(126.02)	(65.79)
ROUTED TO	2	5640.	5600.	5103.	3406.	25.40
		(159.70)	(158.56)	(144.51)	(96.45)	(65.79)
HYDROGRAPH AT	2	5580.	4978.	2530.	912.	4.90
		(158.01)	(140.97)	(71.63)	(25.82)	(12.69)
2-COMBINED	2	6140.	5947.	5603.	4137.	30.30
		(173.86)	(168.40)	(158.66)	(117.14)	(78.48)
ROUTED TO	3	5948.	5914.	5518.	4099.	30.30
		(168.42)	(167.47)	(156.25)	(116.07)	(78.48)
ROUTED TO	4	5945.	5909.	5517.	4095.	30.30
		(168.35)	(167.31)	(156.23)	(115.97)	(78.48)
ROUTED TO	5	5925.	5892.	5513.	4092.	30.30
		(167.77)	(166.84)	(156.10)	(115.87)	(78.48)
HYDROGRAPH AT	5	19182.	18574.	13862.	6428.	37.70
		(543.18)	(525.96)	(392.52)	(182.03)	(97.64)
2-COMBINED	5	24141.	23482.	18804.	10417.	68.00
		(683.60)	(664.92)	(532.48)	(294.99)	(176.12)
ROUTED TO	6	24135.	23447.	18793.	10413.	68.00
		(683.43)	(663.95)	(532.15)	(294.87)	(176.12)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	923.30	923.30	927.70
STORAGE	0.	0.	11050.
OUTFLOW	0.	0.	3073.

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
0.00	929.34	1.64	15245.	5640.	37.00	65.00	0.00

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	859.75	859.75	863.50
STORAGE	0.	0.	1172.
OUTFLOW	0.	0.	3460.

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
0.00	865.34	1.84	1761.	5948.	46.00	65.00	0.00

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	92.55	92.55	97.55
STORAGE	0.	0.	374.
OUTFLOW	0.	0.	5474.

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
0.00	104.54	6.79	1061.	24135.	48.00	53.00	0.00

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FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 11 JAN 79
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FLOOD HYDROGRAPH PACKAGE (HEC-1)
JAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  11 JAN 79
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PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	2
RUNOFF HYDROGRAPH AT	3
COMBINE 2 HYDROGRAPHS AT	3
ROUTE HYDROGRAPH TO	4
ROUTE HYDROGRAPH TO	5
ROUTE HYDROGRAPH TO	6
RUNOFF HYDROGRAPH AT	6
COMBINE 2 HYDROGRAPHS AT	6
ROUTE HYDROGRAPH TO	6

END OF NETWORK

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**********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION     JULY 1978
  LAST MODIFICATION   11 JAN 79
**********************************

RUN  DATE= 79/03/26.
     TIME= 11.32.50.
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SAXTON FALLS DAM
% PMF
N.J. DAM INSPECTION

JOB SPECIFICATION

NO	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
200	1	0	0	0	0	0	0	4	0

	JOPER	NWT	LROPT	TRACE
	5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 6 LRTIO= 1

RTIOS=	1.00	.50	.40	.30	.20	.10

SUB-AREA RUNOFF COMPUTATION

COMPUTE HYDROGRAPH - HOPATCONG LOCAL

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

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	25.40	0.00	25.40	.82	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.40	104.00	113.00	123.00	135.00	0.00	0.00

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.15	3.00	0.00

UNIT HYDROGRAPH DATA
TP= 12.00 CP= .58 NTA= 0

RECESSION DATA
STRTQ= -2.00 QRCSN= 0.00 RTIOR= 1.00

UNIT HYDROGRAPH 75 END-OF-PERIOD ORDINATES, LAG= 12.03 HOURS, CP= .58 VOL= 1.00

13.	70.	143.	229.	323.	424.	528.	624.	701.	760.
799.	817.	807.	764.	707.	653.	604.	559.	517.	478.
442.	408.	378.	349.	323.	298.	276.	255.	236.	218.
202.	186.	172.	159.	147.	136.	126.	117.	108.	100.
92.	85.	79.	73.	67.	62.	58.	53.	49.	45.
42.	39.	36.	33.	31.	28.	26.	24.	22.	21.
19.	18.	16.	15.	14.	13.	12.	11.	10.	9.
9.	8.	7.	7.	6.					

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	END-OF-PERIOD FLOW COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	24.80 (630.)	19.82 (503.)	4.98 (126.)	333350. (9439.42)

HYDROGRAPH ROUTING

ROUTING COMPUTATIONS - HOPATCONG

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

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	-1

STAGE	923.30	924.30	925.30	926.30	927.70	928.70	929.70	930.70	931.70
FLOW	0.00	333.00	942.00	1730.00	3073.00	4497.00	6291.00	8355.00	10651.00
SURFACE AREA=	2474. 2644.	2491. 2661.	2508.	2525.	2542.	2559.	2576.	2593.	2610.	2627.
CAPACITY=	0. 25590.	2482. 28242.	4982.	7498.	10032.	12582.	15150.	17734.	20336.	22954.
ELEVATION=	923. 933.	924. 934.	925.	926.	927.	928.	929.	930.	931.	932.

CREL	SPWID	COQW	EXPW	ELEVL	COOL	CAREA	EXPL
923.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
927.7	0.0	0.0	0.

PEAK OUTFLOW IS 5640. AT TIME 65.00 HOURS

PEAK OUTFLOW IS 2120. AT TIME 69.00 HOURS

PEAK OUTFLOW IS 1574. AT TIME 70.00 HOURS

PEAK OUTFLOW IS 1378. AT TIME 71.00 HOURS

PEAK OUTFLOW IS 841. AT TIME 72.00 HOURS

PEAK OUTFLOW IS 471. AT TIME 75.00 HOURS

SUB-AREA RUNOFF COMPUTATION

COMPUTE HYDROGRAPH - MUSCONETCONG LOCAL

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

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	4.90	0.00	4.90	.80	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.40	112.00	123.00	132.00	142.00	0.00	0.00

LOSS DATA

LKOPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.15	0.00	0.00

UNIT HYDROGRAPH DATA

TP= 6.00 CP= .58 NTA= 0

RECESSION DATA

STRTQ= -2.00 QRCSN= 0.00 RTIOR= 1.00

UNIT HYDROGRAPH 37 END-OF-PERIOD ORDINATES, LAG= 6.00 HOURS, CP= .58 VOL= 1.00

19.	70.	140.	214.	276.	309.	308.	274.	233.	198.
168.	143.	122.	103.	88.	75.	63.	54.	46.	39.
33.	28.	24.	20.	17.	15.	12.	11.	9.	8.
6.	5.	5.	4.	3.	3.	2.			

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	25.45	20.64	4.81	66938.
										(646.)(524.)(122.)(1895.47)			

COMBINE HYDROGRAPHS

COMBINE OUTFLOW OF HOPATCONG WITH LOCAL INFLOW OF MUSCONETCONG

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

HYDROGRAPH ROUTING

ROUTING COMPUTATIONS - MUSCONETCONG

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
3	1	0	0	0	0	1	0	0

ROUTING DATA

GLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	-1

STAGE	859.75	860.75	861.75	862.75	863.50	864.00	865.00	866.00	867.00	868.00
FLOW	0.0	535.00	1845.00	3406.00	3460.00	3697.00	5148.00	7535.00	10383.00	13806.00

SURFACE AREA=	307.	310.	313.	316.	319.	322.	325.	328.	331.	334.
CAPACITY=	0.	308.	620.	934.	1252.	1572.	1896.	2222.	2552.	2884.
ELEVATION=	860.	861.	862.	863.	864.	865.	866.	867.	868.	869.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
859.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
863.5	0.0	0.0	0.

PEAK OUTFLOW IS 5948. AT TIME 65.00 HOURS

PEAK OUTFLOW IS 2527. AT TIME 49.00 HOURS

PEAK OUTFLOW IS 1970. AT TIME 49.00 HOURS

PEAK OUTFLOW IS 1445. AT TIME 49.00 HOURS

PEAK OUTFLOW IS 907. AT TIME 49.00 HOURS

PEAK OUTFLOW IS 405. AT TIME 51.00 HOURS

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HYDROGRAPH ROUTING

CHANNEL ROUTING TO REACH 4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
4	1	0	0	0	0	1	0	0

ROUTING DATA

WLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.0600	.0450	.0600	645.0	665.0	14000.	.01460

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

0.00 670.00 2009.00 650.00 2009.00 647.00 2011.00 645.00 2016.00 645.00
2018.00 647.00 2027.00 650.00 3400.00 670.00

STORAGE	0.00	2.05	4.81	9.14	15.61	26.02	80.19	194.43	364.73	603.09
	[illegible]	[illegible]	[illegible]	2141.10	2670.75	3270.47	3925.24	4642.07	5414.95	6249.90

OUTFLOW	0.00	24.69	84.31	199.15	375.34	577.61	1207.43	2846.98	5936.13	10859.69
	17964.46	27570.88	39979.68	55475.98	74332.16	96809.86	123161.53	153631.57	188457.32	227869.75
STAGE	645.00	646.05	647.11	648.16	649.21	650.26	651.32	652.37	653.42	654.47
	655.53	656.58	657.63	658.68	659.74	660.79	661.84	662.89	663.95	665.00
FLOW	0.00	24.69	84.31	199.15	375.34	577.61	1207.43	2846.98	5936.13	10859.69
	17964.46	27570.88	39979.68	55475.98	74332.16	96809.86	123161.53	153631.57	188457.32	227869.75

MAXIMUM STAGE IS 653.4

MAXIMUM STAGE IS 652.1

MAXIMUM STAGE IS 651.8

MAXIMUM STAGE IS 651.5

MAXIMUM STAGE IS 650.8

MAXIMUM STAGE IS 649.4

34

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HYDROGRAPH ROUTING

CHANNEL ROUTING FROM REACH 4 TO SAXTON LAKE

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
5	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.0600	.0400	.0600	627.0	650.0	14000.	.00130

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

0.00 651.00 100.00 650.00 1510.00 635.00 1542.00 627.00 1558.00 627.00
1590.00 635.00 1670.00 640.00 1945.00 651.00

STORAGE	0.00	8.11	19.99	35.63	55.04	78.22	105.17	139.56	216.86	345.97
	528.86	759.74	1047.49	1391.28	1791.12	2247.01	2758.94	3326.91	3950.93	4630.99
OUTFLOW	0.00	33.23	120.31	267.84	485.02	780.90	1164.23	1693.36	2508.18	3698.45
	5384.92	7664.42	10631.60	14407.46	19082.28	24742.22	31469.72	39344.03	48441.64	58836.60
STAGE	627.00	628.21	629.42	630.63	631.84	633.05	634.26	635.47	636.68	637.89
	639.11	640.32	641.53	642.74	643.95	645.16	646.37	647.58	648.79	650.00
FLOW	0.00	33.23	120.31	267.84	485.02	780.90	1164.23	1693.36	2508.18	3698.45
	5384.92	7664.42	10631.60	14407.46	19082.28	24742.22	31469.72	39344.03	48441.64	58836.60

MAXIMUM STAGE IS 639.4

MAXIMUM STAGE IS 636.6

MAXIMUM STAGE IS 635.6

MAXIMUM STAGE IS 634.8

MAXIMUM STAGE IS 633.4

MAXIMUM STAGE IS 631.4

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SUB-AREA RUNOFF COMPUTATION

COMPUTE HYDROGRAPH - SAXTON LAKE LOCAL

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
5	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	37.70	0.00	37.70	.84	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.40	100.00	109.00	119.00	131.00	0.00	0.00

LOSS DATA

LKOPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.15	0.00	0.00

UNIT HYDROGRAPH DATA

TP= 13.80 CP= .58 NTA= 0

RECESSION DATA

STRTQ= -2.00 QRCSN= 0.00 RTIOR= 1.00

UNIT HYDROGRAPH 86 END-OF-PERIOD ORDINATES, LAG= 13.91 HOURS, CP= .58 VOL= 1.00

19.	73.	150.	240.	340.	448.	561.	676.	785.	876.
949.	1003.	1038.	1052.	1038.	990.	925.	865.	808.	755.
705.	659.	615.	575.	537.	502.	469.	438.	409.	382.
357.	334.	312.	291.	272.	254.	238.	222.	207.	194.
181.	169.	158.	148.	138.	129.	120.	112.	105.	98.
92.	86.	80.	75.	70.	65.	61.	57.	53.	50.
46.	43.	41.	38.	35.	33.	31.	29.	27.	25.
24.	22.	21.	19.	18.	17.	16.	15.	14.	13.
12.	11.	10.	10.	9.	8.				

END-OF-PERIOD FLOW

0 MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
							SUM			24.50	13.50	5.00	486934.
										(622.)	(495.)	(127.)	(13788.44)

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COMBINE HYDROGRAPHS

COMBINE ROUTED OUTFLOW OF MUSCONETCONG WITH LOCAL INFLOW OF SAXTON

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
5	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

ROUTING COMPUTATIONS - SAXTON FALLS (INDEPENDANT ELEVATIONS USED)

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
6	1	0	0	0	0	0	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	-1

STAGE	92.55	93.55	94.55	95.55	96.55	97.55	98.55	99.55	100.55	101.55
	102.55	103.55	104.55	105.55						
FLOW	0.00	490.00	1385.00	2544.00	3917.00	5474.00	7439.00	9755.00	12341.00	15163.00
	18200.00	21433.00	24852.00	28447.00						
SURFACE AREA=	64.	68.	73.	77.	82.	86.	91.	95.	100.	104.
	109.	113.	118.	122.						
CAPACITY=	0.	66.	136.	211.	290.	374.	462.	555.	652.	754.
	860.	971.	1086.	1206.						
ELEVATION=	93.	94.	95.	96.	97.	98.	99.	100.	101.	102.
	103.	104.	105.	106.						

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
92.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
97.6	0.0	0.0	0.

PEAK OUTFLOW IS 24135. AT TIME 53.00 HOURS

PEAK OUTFLOW IS 11997. AT TIME 53.00 HOURS

PEAK OUTFLOW IS 9548. AT TIME 53.00 HOURS

PEAK OUTFLOW IS 7116. AT TIME 53.00 HOURS

PEAK OUTFLOW IS 4699. AT TIME 53.00 HOURS

PEAK OUTFLOW IS 2306. AT TIME 53.00 HOURS

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

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 1.00	RATIO 2 .50	RATIO 3 .40	RATIO 4 .30	RATIO 5 .20	RATIO 6 .10
HYDROGRAPH AT	1	25.40	1	15026.	7513.	6010.	4508.	3005.	1503.
		(65.79)		(425.48)(	212.74)(	170.19)(	127.64)(	85.10)(	42.55)(
ROUTED TO	2	25.40	1	5640.	2120.	1574.	1079.	641.	261.
		(65.79)		(159.70)(	60.02)(	44.57)(	30.55)(	18.14)(	7.40)(
HYDROGRAPH AT	2	4.90	1	5580.	2790.	2232.	1674.	1116.	558.
		(12.69)		(158.01)(	79.00)(	63.20)(	47.40)(	31.60)(	15.80)(
2 COMBINED	2	30.30	1	6140.	3004.	2403.	1803.	1202.	601.
		(78.48)		(173.86)(	85.07)(	68.06)(	51.04)(	34.03)(	17.02)(
ROUTED TO	3	30.30	1	5948.	2527.	1970.	1445.	907.	405.
		(78.48)		(168.42)(	71.57)(	55.79)(	40.92)(	25.67)(	11.46)(
ROUTED TO	4	30.30	1	5945.	2499.	1946.	1425.	890.	404.
		(78.48)		(168.35)(	70.77)(	55.10)(	40.34)(	25.20)(	11.43)(
ROUTED TO	5	30.30	1	5925.	2456.	1913.	1408.	880.	401.
		(78.48)		(167.77)(	69.53)(	54.18)(	39.88)(	24.91)(	11.34)(
HYDROGRAPH AT	5	37.70	1	19182.	9591.	7673.	5755.	3836.	1918.
		(97.64)		(543.18)(	271.59)(	217.27)(	162.95)(	108.64)(	54.32)(
2 COMBINED	5	68.00	1	24141.	12015.	9565.	7137.	4714.	2319.
		(176.12)		(683.60)(	340.34)(	270.86)(	202.09)(	133.49)(	65.66)(
ROUTED TO	6	68.00	1	24135.	11997.	9548.	7116.	4699.	2306.
		(176.12)		(683.43)(	339.72)(	270.36)(	201.49)(	133.07)(	65.31)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	923.30	923.30	927.70
STORAGE	0.	0.	11050.
OUTFLOW	0.	0.	3073.

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
1.00	929.34	1.64	15245.	5640.	37.00	65.00	0.00
.50	926.71	0.00	8525.	2120.	0.00	69.00	0.00
.40	926.16	0.00	6999.	1574.	0.00	70.00	0.00
.30	925.47	0.00	5418.	1079.	0.00	71.00	0.00
.20	924.80	0.00	3742.	641.	0.00	72.00	0.00
.10	924.08	0.00	1946.	261.	0.00	75.00	0.00

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	859.75	859.75	863.50
STORAGE	0.	0.	1172.
OUTFLOW	0.	0.	3460.

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
1.00	865.34	1.84	1761.	5948.	46.00	65.00	0.00
.50	862.17	0.00	752.	2527.	0.00	49.00	0.00
.40	861.80	0.00	636.	1970.	0.00	49.00	0.00
.30	861.40	0.00	511.	1445.	0.00	49.00	0.00
.20	860.98	0.00	381.	907.	0.00	49.00	0.00
.10	860.42	0.00	206.	405.	0.00	51.00	0.00

PLAN 1 STATION 4

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
1.00	5945.	653.4	65.00
.50	2499.	652.1	50.00
.40	1946.	651.8	50.00
.30	1425.	651.5	50.00
.20	890.	650.8	51.00
.10	404.	649.4	51.00

PLAN 1 STATION 5

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
1.00	5925.	639.4	67.00
.50	2456.	636.6	51.00
.40	1913.	635.8	51.00
.30	1408.	634.8	51.00
.20	880.	633.4	52.00
.10	401.	631.4	53.00

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	92.55	92.55	97.55
STORAGE	0.	0.	374.
OUTFLOW	0.	0.	5474.

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
1.00	104.34	6.79	1061.	24135.	48.00	53.00	0.00
.50	100.42	2.87	639.	11997.	25.00	53.00	0.00
.40	99.46	1.91	546.	9548.	19.00	53.00	0.00
.30	98.39	.84	447.	7116.	11.00	53.00	0.00
.20	97.05	0.00	331.	4699.	0.00	53.00	0.00
.10	95.34	0.00	195.	2306.	0.00	53.00	0.00

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FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 11 JAN 79
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APPENDIX 4

REFERENCES

SAXTON FALLS DAM

APPENDIX 4

REFERENCES

SAXTON FALLS DAM

1. Letter to Dr. H.B. Kummel, Director, Dept. of Conservation & Development, from C.C. Vermeule, Morris Canal & Banking Co., dated 11 Feb. 1927.

2. Letter to Mr. C.C. Vermeule from J.N. Brooks, Hydraulic Engineer, Dept. of Conservation & Development, dated 18 Feb. 1927.

3. Letter to Mr. J.N. Brooks from C.C. Vermeule, dated 7 March 1927.

4. Inspection Report by J.N. Brooks, dated 8 March 1927.

5. Letter to Mr. C.C. Vermeule from J.N. Brooks, dated 10 March 1927.

6. Letter to Mr. J.N. Brooks from C.C. Vermeule, dated 14 July 1927.

7. Inspection Report by J.N. Brooks, Hydraulic Engineer, dated23 July 1927.

8. Monthly Progress Report by C.C. Vermuele, dated 31 July 1927.

9. Letter to Mr. J.N. Brooks from C.C. Vermeule, dated 7 November 1927.

10. Inspection Report by J.N. Brooks, Hydraulic Engineer, dated 11 May 1928.

11. Memorandum to C.P. Wilbur, State Forester, from H.T. Critchlow, Director, Div. of Water Policy & Supply, dated 14 July 1953.

12. Annual Report by M. Berkowitz, P.E., dated 5 June 1968.

13. Memorandum to G.R. Shanklin, Director & Chief Engineer, Div. of Water Policy & Supply, from J.J. Truncer, Director, Div. of Parks, Forestry & Recreation, dated 26 June 1968.

14. Inspection Report by S.A. Aziz, dated 28 May 1971.

15. Chow, Ven Te, Ph.D, Open Channel Hydraulics, McGraw-Hill Book Company, 1959.

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DRAWINGS

1. Dwg. No 522, Profile & Sections-Old Dam & MC52, by Morris Canal & Banking Co., dated 6 April 1926.

2. Dwg. No 523, Cross Sections Near Saxton Falls Dam, by Morris Canal & Banking Co., dated 26 Sept. 1926.

3. Dwg. No 524, Cross Sections Elevation-Gatehouse, by Morris Canal & Banking Co., dated 1 October 1926.

4. Dwg. No 525, Plan Elevation & Sections-Saxton Dam, by Morris Canal & Banking Co., dated 20 Nov. 1926.

5. Dwg. No 521, General Plan Saxton Falls Dam, by Morris Canal & Banking Co., dated 9 April 1926.