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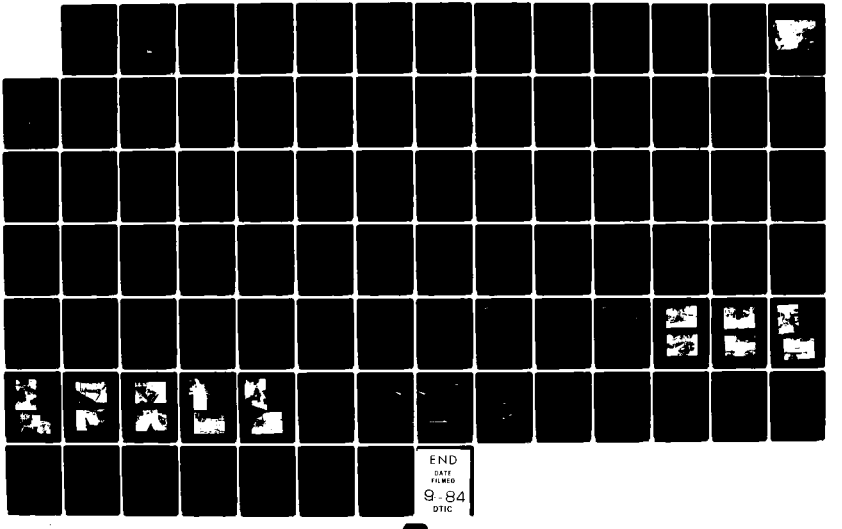

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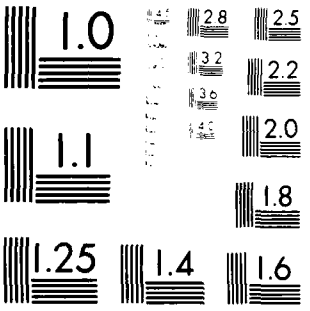

THAMES RIVER BASIN
VOLUNTOWN, CONNECTICUT

SAWMILL POND DAM
CT. 00627

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.

JANUARY, 1981

UNCLASSIFIED

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Thames River Basin
Voluntown, Connecticut

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

Sawmill Pond Dam is a 180 foot long earth embankment including a 51.5 foot long spillway and 15.5 foot wide intake structure. The dam has a maximum height of 20 feet. The dam is classified as SMALL in size and a HIGH hazard structure. Based on the size and hazard classification, the adopted test flood for this structure is equal to ½ the PMF.

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SAWMILL POND DAM

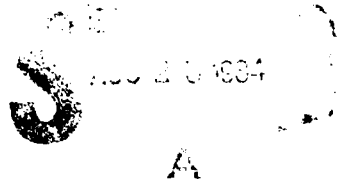
CT 00627

THAMES RIVER BASIN

VOLUNTOWN, CONNECTICUT

PHASE 1 INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM



A1

NATIONAL DAM INSPECTION REPORT

PHASE 1 INSPECTION REPORT

IDENTIFICATION NO:	CT 00627
NAME OF DAM:	Sawmill Pond Dam
COUNTY AND STATE:	New London County, Connecticut
STREAM:	Pachaug River
DATE OF INSPECTION:	25 November 1980

Brief Assessment

Sawmill Pond dam is a 180 foot long earth embankment including a 51.5 foot long spillway and 15.5 foot wide intake structure. The dam has a maximum height of 20 feet and an impoundment capacity of 40 acre-feet at the spillway elevation of 235.0 NGVD. The downstream face of the earth embankment is a vertical stone masonry wall and the upstream face has a slope of 2:1. The crest width is approximately 10 feet. The dam appears to be founded on bedrock.

A 15.5 foot wide headrace extends from the intake structure at the left abutment to about 100 feet downstream. A gate house spans the headrace on the upstream end and contains the control works for the headrace intake gates. The right side of the headrace channel presently functions as a dike and contains a 20.5 foot side discharge spillway on the upstream end. A drawdown outlet gate and an outlet gate to a 12 foot diameter water wheel are also located on the right side of the headrace. An 18 foot long embankment dike damming the original headrace has been constructed in the downstream end.

The dam is classified as SMALL in size and a HIGH hazard structure in accordance with recommended guidelines established by the Corps of Engineers. Based on the size and hazard classifications, the adopted test flood for this structure is equal to one-half the Probable Maximum Flood (PMF) which is estimated to be 470 CSM, or 12,380 CFS, from the 26.2 square mile drainage basin. This test flood has a routed outflow discharge equal to 12,315 CFS and would overtop the dam by 5.7 feet. The maximum spillway capacity is equal to 1,120 CFS which represents only 9% of the test flood outflow, therefore, the spillway capacity is considered inadequate.

Based on a visual inspection at the site, the dam is considered to be in FAIR condition. However, there are several areas of concern which must be corrected to assure the long-term performance of this dam. It is recommended that the owner engage the services of a registered engineer experienced in the design of dams to accomplish the following:

1. Perform detailed hydrologic and hydraulic studies to assess further the potential for overtopping the dam and the need for and means to increase the project discharge capacity.

2. Inspect the downstream face of the principal spillway with no water flowing over it.

3. Evaluate the seepage from the right embankment and the left side of the principal spillway.

4. Evalute the need for, and design as required, a low level outlet to control the pond level.

5. Recommend and supervise the placement of riprap on the upstream face and abutments.

6. Remove trees and their root systems from the dam to a distance of 15 feet downstream and backfill the holes with appropriate compacted soil.

These and other recommendations and remedial measures as described in Section 7 should be implemented by the owner within one year after receipt of this Phase 1 Inspection Report.

NEW ENGLAND ENGINEERING, INC.

BY: David A. Sluter
David A. Sluter, P. E.
President

This Phase 1 Inspection Report on Sawmill Pond Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgement and practice, and are hereby submitted for approval.

ARAMAST MAHTESIAN, MEMBER
Geotechnical Engineering Branch
Engineering Division

CARNEY M. TERZIAN, CHAIRMAN
Design Branch
Engineering Division

JOE FINEGAN, MEMBER
Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYAR, Chief,
Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase 1 Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, DC 20314. The purpose of a Phase 1 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 1 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 the data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase 1 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 reasonable possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid 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.

The Phase 1 Investigation does <u>not</u> include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

TABLE OF CONTENTS

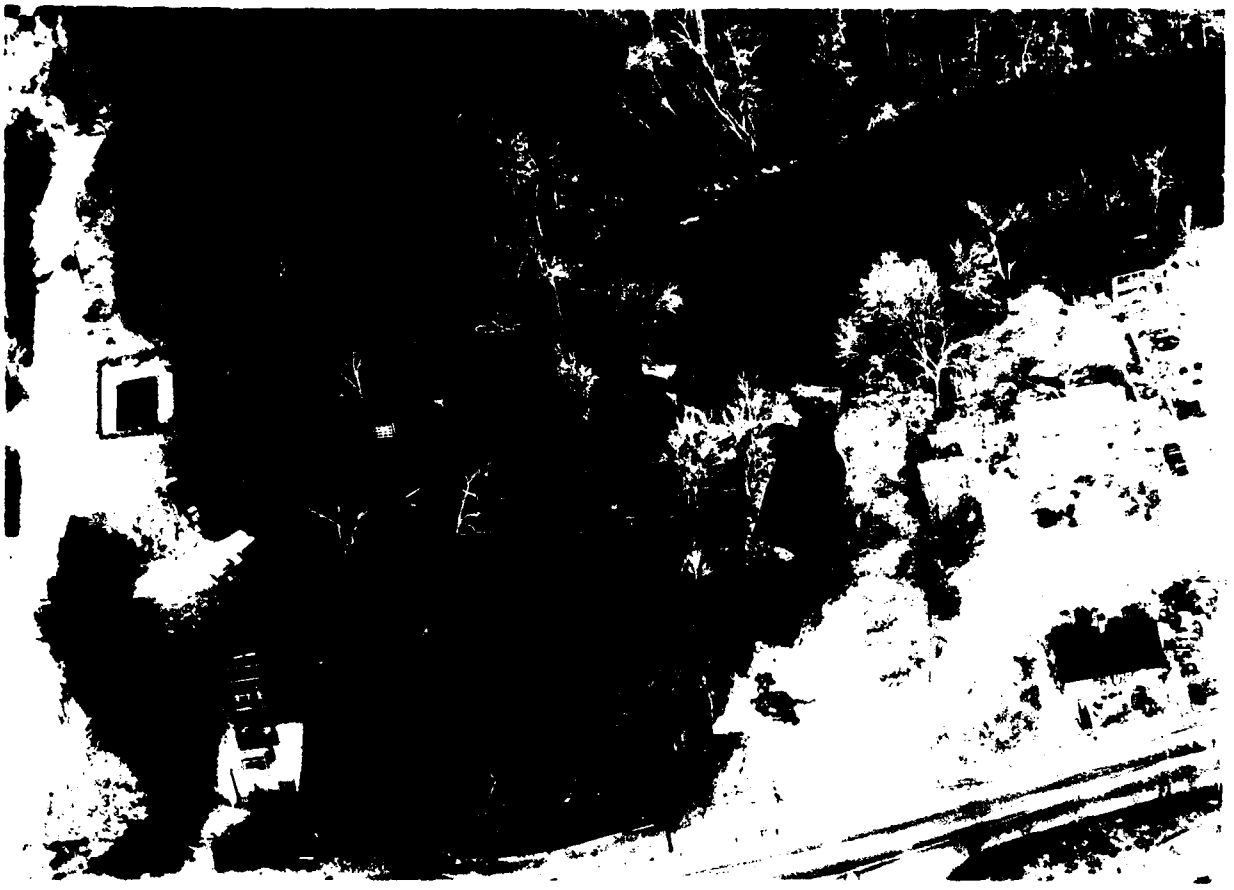
Section			Page
LETTER OF TRANSMITTAL			
BRIEF ASSESSMENT			
REVIEW BOARD PAGE			
PREFACE			i
TABLE OF CONTENTS			ii
OVERVIEW PHOTO			
LOCATION MAP			
	REPORT		
1.	PROJECT INFORMATION		1-1
	1.1	General	1-1
		a. Authority	1-1
		b. Purpose of Inspection	1-1
	1.2	Description of Project	1-1
		a. Location	1-1
		b. Description of the Dam & Appurtenances	1-2
		c. Size Classification	1-2
		d. Hazard Classification	1-2
		e. Ownership	1-2
		f. Operator	1-2
		g. Purpose of the Dam	1-2
		h. Design and Construction History	1-3
		i. Normal Operational Procedures	1-3
	1.3	Pertinent Data	1-3
		a. Drainage Area	1-3
		b. Discharge at Damsite	1-3
		c. Elevations	1-4
		d. Reservoir Lengths	1-5
		e. Storage	1-5
		f. Reservoir Surface Area	1-5
		g. Dam	1-5
		h. Diversion and Regulating Tunnels	1-6
		i. Spillway	1-6
		j. Regulating Outlets	1-6

Section		Page
2.	ENGINEERING DATA	2-1
	2.1 Design Data	2-1
	2.2 Construction Data	2-1
	2.3 Operation Data	2-1
	2.4 Evaluation of Data	2-1
	a. Availability	2-1
	b. Adequacy	2-1
	c. Validity	2-1
3.	VISUAL INSPECTION	3-1
	3.1 Findings	3-1
	a. General	3-1
	b. Dam	3-1
	c. Appurtenant Structures	3-2
	d. Reservoir Area	3-4
	e. Downstream Channel	3-4
	3.2 Evaluation	3-4
4.	OPERATIONAL PROCEDURES	4-1
	4.1 Operational Procedures	4-1
	a. General	4-1
	b. Description of any Warning System in Effect	4-1
	4.2 Maintenance Procedures	4-1
	a. General	4-1
	b. Operating Facilities	4-1
	4.3 Evaluation	4-1
5.	EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES	5-1
	5.1 General	5-1
	5.2 Design Data	5-1
	5.3 Experience Data	5-1
	5.4 Test Flood Analysis	5-2
	5.5 Dam Failure Analysis	5-2

Section		Page
6.	EVALUATION OF STRUCTURAL STABILITY	6-1
	6.1 Visual Observations	6-1
	6.2 Design & Construction Data	6-1
	6.3 Post-Construction Changes	6-1
	6.4 Seismic Stability	6-1
7.	ASSESSMENT RECOMMENDATION & REMEDIAL MEASURES	7-1
	7.1 Dam Assessment	7-1
	a. Condition	7-1
	b. Adequacy of Information	7-1
	c. Urgency	7-1
	7.2 Recommendations	7-1
	7.3 Remedial Measures	7-2
	a. Operation & Maintenance Procedures	7-2
	7.4 Alternatives	7-2

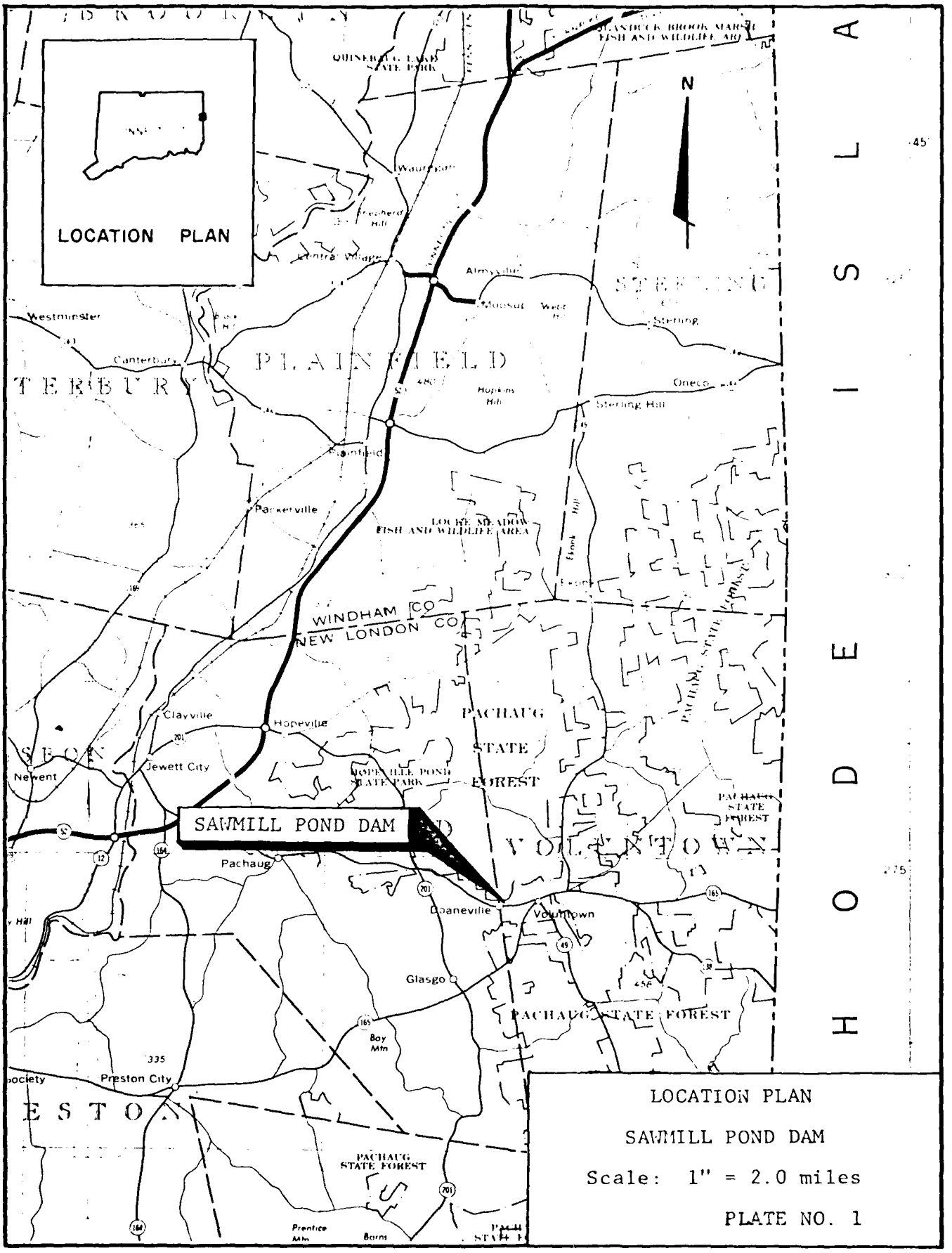
APPENDICES

APPENDIX A	INSPECTION CHECKLIST
APPENDIX B	ENGINEERING DATA
APPENDIX C	PHOTOGRAPHS
APPENDIX D	HYDROLOGIC & HYDRAULIC COMPUTATIONS
APPENDIX E	INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS



OVERVIEW PHOTO - Sawmill Pond Dam

December 12, 1980



LOCATION PLAN

SAWMILL POND DAM

Scale: 1" = 2.0 miles

PLATE NO. 1

NATIONAL DAM INSPECTION PROGRAM

PHASE 1 - INSPECTION PROGRAM

SAWMILL POND DAM

SECTION 1

PROJECT INFORMATION

1.1 General

a. Authority. Public Law 92-367, August 8, 1972, authorized the Secretary of the Army through the Corps of Engineers to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. New England Engineering, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed was issued to New England Engineering, Inc. under a letter from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-81-C-0007 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection.

1. Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

2. Encourage and assist the State to initiate quickly effective dam safety programs for non-Federal dams.

3. To update, verify, and complete the National Inventory of Dams.

1.2 Description of the Project

a. Location. Sawmill Pond Dam is located in Voluntown, New London County, Connecticut on the Pachaug River approximately 450 feet north of the Route 138 bridge. Coordinates of the dam are approximately 41 degrees, 34.4' North Latitude, and 71 degrees, 52.4' West Longitude as shown on the Voluntown, CT USGS Quadrangle Sheet. The dam impounds water from the Pachaug River which drains a 26.2 square mile watershed of rolling, wooded terrain. The axis of the pond is oriented in a Northeast-Southwest direction with the dam at the southern extremity of the pond.

b. Description of the Dam and Appurtenances. Sawmill Pond Dam is an earth embankment with a downstream stone masonry face. The main dam is approximately 180 feet long spanning a small gorge cut by the Pachaug River. The maximum height of the dam is 20 feet and the main spillway length is 51.5 feet. At the left side of the dam is the old headrace with a partially collapsed wooden gate house spanning the headrace intake channel. The headrace intake gates are not functional. The downstream end of the headrace is blocked by an earth dike. Contained in and along the right headrace wall are a 20.5 foot side discharge spillway at the same elevation as the main spillway, a 3 foot diameter drawdown gate and a sluiceway and gate to provide water to a 12 foot water wheel located on the downstream slope.

c. Size Classification. The dam at Sawmill Pond has an impoundment capacity at the top of the dam (elevation 238.0 NGVD) equal to 64 Ac-Ft and a height of 20.0 feet. In accordance with guidelines established by the Corps of Engineers, this dam is classified as a SMALL size structure based on its impoundment capacity. Corps of Engineers guidelines specify that dams with impoundment capacities less than 1,000 Ac-Ft and greater than or equal to 50 Ac-Ft or a height of less than 40 feet and greater than or equal to 25 feet be classified as SMALL in size.

d. Hazard Classification. This dam is classified a HIGH hazard potential because its failure could result in a loss of more than a few lives and inundation of four to five homes and the overtopping of two dams downstream of the dam. It is estimated that a dam failure would result in a failure discharge of 4,830 CFS and flooding to a depth of 2-4 feet in the homes located within the prime dam failure impact area. The pre-failure discharge of 1,120 CFS woul produce flooding to a depth of 1-2 feet in the affected homes. The dam failure discharge was computed assuming the water level in the reservoir to be equal to the top of dam elevation of 238.0 NGVD at the time of failure.

e. Ownership. The dam is presently owned by Mr. Paul E. McGuire, Route 138, Voluntown, Connecticut 06384. Phone (203) 376-4877.

f. Operator. Operation is at the direction of the owner.

g. Purpose of Dam. The dam was formerly used to supply water power for various commercial activities including a sawmill and later a grain mill. Currently the dam is used for limited recreational activity only.

h. Design and Construction History. The dam was reportedly built around 1870. No construction history or record of subsequent modifications is available.

i. Normal Operating Procedure. The reservoir is normally unregulated and all downstream flows result from flow over the uncontrolled spillways.

1.3 Pertinent Data

a. Drainage Area. The Sawmill Pond drainage basin is fan-shaped with an average length of approximately 5 miles, a width of 8 miles and a total drainage area of 26.2 square miles (See Appendix D for the basin map). Approximately 30 percent of the basin is man-made or natural storage. The topography consists of rolling terrain with elevations ranging from a high of 570 feet to 235 feet at the spillway crest. Basin slopes are considered moderate.

b. Discharge at Damsite. There are no discharge records available for this dam. Calculated discharge data for the dam is listed below.

1. Outlet Works

a. Conduit & size

Right Outlet	4.2 x 3.1 foot concrete box culvert with stop logs. Invert = 235.0 feet.
Drawdown Outlet	3.0 foot diameter steel pipe. Invert - 228.6.
Sluiceway Outlet	2.5 x 2.0 foot concrete sluiceway. Invert = 233.3.

b. Discharge Capacity with pond at spillway crest elevation = 235.0.

Right Outlet	0 CFS
Drawdown Outlet	75 CFS
Sluiceway Outlet	20 CFS

c. Discharge Capacity with pond at top of dam elevation = 238.0

Right Outlet	77 CFS
Drawdown Outlet	99 CFS
Sluiceway Outlet	46 CFS

d. Discharge capacity at test flood elevation = 243.7

Right Outlet	168 CFS
Drawdown Outlet	125 CFS
Sluiceway Outlet	74 CFS

2.	Maximum known flood at damsite	Unknown
3.	Ungated spillway capacity at top of dam	
	a. Main spillway	800 CFS
	b. Headrace spillway	320 CFS
4.	Ungated spillway capacity at test flood elevation	
	a. Main spillway	3,965 CFS
	b. Headrace spillway	1,580 CFS
5.	Ungated spillway capacity at normal pool elevation	N/A
6.	Gated spillway capacity at test flood elevation	N/A
7.	Total spillway capacity at test flood elevation	5,540 CFS
8.	Total project discharge at top of dam	1,340 CFS
9.	Total project discharge at test flood elevation	12,315 CFS

c. Elevations (Datum assumed at 235.0 for spillway crest)

1.	Streambed at toe of dam	218.0
2.	Bottom of cutoff	Unknown
3.	Maximum tailwater	Unknown
4.	Recreation pool	235.0
5.	Full flood control pool	N/A
6.	Spillway crest	235.0

7.	Design surcharge (Original Design)	Unknown
8.	Top of dam	238.0
9.	Test flood	243.7

d. Reservoir Lengths (in feet)

1.	Normal pool	2,300
2.	Flood control pool	N/A
3.	Spillway crest pool	2,300
4.	Top of dam	2,300
5.	Test flood pool	2,300

e. Storage (acre-feet)

1.	Normal pool	40
2.	Flood control pool	N/A
3.	Spillway crest pool	40
4.	Top of dam	64
5.	Test flood pool	110

f. Reservoir Surface Area (Acres)

1.	Normal pool	8
2.	Flood control pool	N/A
3.	Spillway crest	8
4.	Top of dam	8
5.	Test flood pool	8

g. Dam

1.	Type	Earth embankment
2.	Length	180 feet
3.	Height	20 feet maximum
4.	Top width	10 feet on embankment.

5.	Side slopes	2:1 U/S, Vertical D/S on embankment.
6.	Zoning	Dry stone masonry wall on downstream face.
7.	Impervious Core	Unknown
8.	Cutoff	Unknown
9.	Grout Curtain	Unknown
10.	Other	No comment

h. Diversion and Regulating Tunnel — N/A

i. Spillways

1.	Type	Broad-crested with free overflow vertical fall
2.	Length of weir	
	a. Main	51.5 feet
	b. Headrace	20.5 feet
3.	Crest elevation	235.0 feet
4.	Gates	None
5.	U/S Channels	Natural bed of reservoir and headrace
6.	D/S Channel	Natural stone bed of Pachaug River
7.	General	D/S Channel passes under a roadway bridge 450 feet downstream. Opening = 20' high by 50' wide.

j. Regulating Outlets

Right Outlet

1.	Invert	235.0 feet
2.	Size	4.2 w. x 3.1 h. rectangular opening
3.	Description	Concrete box culvert
4.	Control Mechanism	Wooden stop logs on upstream end
5.	Other	No comment.

Drawdown Outlet

1.	Invert	228.6 feet
2.	Size	3.0 foot diameter
3.	Description	Riveted steel pipe
4.	Control mechanism	Iron and bronze control valve on face of headrace wall

Sluiceway Outlet

1.	Invert	231.3 feet
2.	Size	2.3 x 2.0 feet
3.	Description	Concrete sluiceway
4.	Control mechanism	Steel sluice gate with vertical lift rack
5.	Other	Feeds water to large water wheel on left downstream side of dam

SECTION 2

ENGINEERING DATA

2.1 Design

There is no available documentation regarding the design of this facility.

2.2 Construction

No formal records of construction or subsequent repairs are available for this dam. However, certain repairs were done to the dam as referred by the State of Connecticut dam inspection reports from the 1940's included in Appendix B.

2.3 Operation

No operational records are maintained. The level of the pond is not generally controlled.

2.4 Evaluation

a. Availability. There is no information available.

b. Adequacy. The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance and sound engineering judgement.

c. Validity. There is no information available.

SECTION 3

VISUAL INSPECTION

3.1 Findings

a. General. The Phase 1 visual inspection of the Sawmill Pond Dam was conducted on November 25, 1980 by representatives of New England Engineering, Inc. and Geotechnical Engineers, Inc. A visual checklist and photographic record of that inspection have been included in Appendix A and C, respectively, of this report. At the time of the inspection, the water level was 0.2 feet over the spillway crest.

Based on the visual inspection, the dam at Sawmill Pond is judged to be in FAIR condition.

b. Dam. Sawmill Pond Dam is an earth embankment with a downstream dry stone masonry face. The main spillway is just left of center at the highest part of the dam. At the left side of the dam is a long headrace feeding several outlet works. The right wall and downstream end of the headrace are both earth dike embankments and are described under appurtenances.

1. Upstream Face. The upstream face of the dam (Photo C-1) is an earth slope covered with grass and trees. There is no riprap protection on the slope or abutments and a 20" erosion scarp has developed from water and ice action. Foot traffic has also led to erosion of the upstream slope behind the right spillway training wall.

2. Crest. The crest of the dam (Photos C-2 & C-9) is approximately 10 feet wide, flat, and grass-covered with numerous trees and stumps to 12" diameter along the upstream edge. Traffic has worn a footpath along the crest. A small depression was observed over the right outlet structure which is probably post-construction settlement. No lateral movement or misalignment was observed.

3. Downstream Face and Toe. The downstream face of the dam (Photo C-2) is stone masonry, approximately 4 feet high from the right abutment to near the main spillway. The wall appears in good condition. The soil is wet at the toe in the area from 50 to 85 feet left of the right abutment. This wet area is approximately 0.5 feet below the pond level and is possibly a result of seepage along the bedrock-embankment interface.

c. Appurtenant Structures. See the General Plan in Appendix B for the locations of appurtenant structures on the dam.

1. Main Spillway. The main spillway of the dam (Photos C-3 & C-5). spans 51.5 feet across a gorge cut into bedrock by the Pachaug River. The spillway is a broad crested weir of stone masonry with a wood deck covering. Water was flowing over the weir at the time of the inspection preventing a full examination.

   The dry stone masonry training walls of the spillway showed no cracks or misalignment. However, a large void was observed in the left training wall downstream from the crest, where a stone apparently was dislodged (Photo C-10). Minor seepage flowing clear at 1-2 gpm emerged from the face of the left training wall about 3 feet downstream and 1 to 2 feet below the crest of the spillway.

2. Right Outlet. The right outlet structure is a 4.3' wide x 3.1' high box culvert through the dam embankment and is located about 50 feet from the right abutment (Photo C-4). The outlet is in good condition and is controlled by 4 foot long wooden stop logs on the upstream side which were observed to leak beneath the bottom log at 30 to 50 gpm. The invert of the culvert matches the spillway invert so head is limited to the surcharge in the reservoir. The downstream channel is small, overgrown and full of debris and leads to a pair of abandoned water wheels and then the Pachaug River.

3. Headrace Intake & Gate House. The 16 foot wide headrace intake channel and gate house are located at the left abutment of the dam. Intake of water to the headrace is controlled by four 4 foot wide wooden gates with control mechanisms for the gates enclosed above in a gate house spanning the headrace (Photo C-8). The headrace formerly supplied water to a mill that was located approximately 100 feet downstream of the dam. The last 20 feet of the headrace are now abandoned and blocked by an earthfill dike.

   The approach channel to the gates was submerged and unobservable. The upstream training walls are of mortared stone masonry construction, and mortar has spalled from between the stones leaving voids at the bottom of the wall. The gatehouse is in very poor condition (Photo C-8). Differential settlements exceeding 1 foot were observed, and much of the floor spanning the intake channel has rotted and collapsed (Photo C-11). The intake gates appear to be in poor condition. The top 8 inches of boards

are missing from all the gates and, according to the Owner, only the third gate from the left has an operable control mechanism. It is possible that the intake gates would fail if they were subjected to the differential water pressure that would result from draining the headrace.

4. Dike - Right Headrace Wall. Because existing conditions at the dam constantly maintain impounded water within the headrace, the right wall of the headrace functions as a dike. The dike consists of an upstream, mortared stone masonry face with earth on the downstream side (Photo C-7). It could not be determined from visual inspection if earth on the downstream side of the wall was placed fill, natural ground, or both. Mortar was observed to have spalled between stones on the upstream face, but no voids or cracks were observable above the water level in the headrace. The downstream side of the dike is forested, and trees up to 8 inch diameter were observed growing directly behind the upstream wall (Photo C-8). The dike also contains the side discharge spillway on its right abutment, a drawdown outlet structure about 41 feet left of the spillway, and a sluiceway outlet structure for the 12 foot diameter water wheel on the downstream end. The visual inspections of these features are described in subsequent sections and their locations in the dike are shown schematically in the general plan in Appendix B.

5. Dike - Earth Dike in Headrace. An earth fill dike (Photo C-8) has been constructed across the headrace to dam the original outlet channel. Continuous seepage was observed to emerge from the downstream toe and downstream slope up to 2 feet above the toe. This seepage was flowing clear at approximately 2 gpm. The crest, downstream slope and downstream toe of the earth dike is overgrown with brush and trees up to 5 inch diameter.

6. Headrace Spillway. Located just downstream of the gate house is a 20.5 foot wide side channel spillway of stone masonry construction (Photo C-6). At the time of inspection, the downstream face of the spillway was unobservable due to water overflowing the spillway crest. Some mortar was observed to have spalled from the stone masonry training walls (Photo C-10), and a 1 foot diameter void under the main spillway was observed in the right training wall downstream from the spillway crest.

7. Drawdown Outlet In Headrace. Thd drawdown outlet, located on the right wall of the headrace about 41 feet left from the left end of the side discharge spillway (Photo C-12) consists of a gated 3.0 foot diameter steel pipe with an iron and bronze control valve. The control mechanism and concrete on the gate structure (Photo C-8) appeared to be in fair condition. At the time of inspection the gate was closed. The gate on the upstream end of the conduit was submerged and could not be observed. Water was leaking from the bottom of the gate at an estimated rate of 50 gpm (Photo C-12). Seepage was also observed to flow clear at a rate of about 1 gpm from the contact of the stone masonry headrace wall with the conduit between the crown and the left springline. Spalling of mortar between stones in the small retaining walls left and right of the conduit outlet was observed, and a large stone at the bottom of the left retaining wall apparently has moved outward slightly into the channel.

8. Sluiceway Outlet for Water Wheel. The outlet structure for the large water wheel consists of a concrete sluice through the side of the headrace with a steel sluice gate on the downstream end (Photos C-13, C-14). The concrete sluice appears to be underlain by a dry stone masonry foundation. Clear seepage was observed to flow from beneath the stone foundation at an estimated rate of 5 to 10 gpm (Photo C-16).

d. Reservoir Area. No specific detrimental features in the reservoir area were observed during the visual inspection.

e. Downstream Channel. The downstream channel (Photo C-15) consists of the natural streambed in bedrock. Many trees overhang the channel, and approximately 450 feet downstream the channel is constricted by the State Route 138 bridge crossing.

3.2 Evaluation

Based on the visual inspection, the following features could adversely affect the future performance of the dam and should be investigated;

a. The condition of the downstream faces of the principal spillway and headrace side discharge spillway, when the reservoir level is below the crests of the spillways.

b. The poor condition of the gate house, the inoperability of the gates, and the probable inability of the gates to withstand the differential water pressure that would result from draining the headrace.

c. Seepage exiting from beneath the outlet structure for the large water wheel on the dike comprising the right wall of the headrace, which could lead to piping of earth behind the upstream stone masonry wall and possible failure of the dike.

d. Seepage exiting from the downstream face and toe of the earth dike on the downstream end of the headrace.

e. Leakage through the drawdown outlet gate on the headrace.

f. The absence of a low level outlet to dewater the pond below the level of the headrace drawdown outlet.

g. Growth of trees adjacent to the dike forming the right wall of the headrace, which could displace stones and otherwise damage the walls, and growth of trees and brush on the earth dike on the downstream end of the headrace, which could provide paths of seepage through the dike along root systems.

h. Lack of riprap on the upstream slope right of the dam embankment and the left and right abutments.

i. Tree growth on the upstream slope of the dam right of the spillway.

j. The source of the wet area at the toe of the downstream face of the dam from 50 to 85 feet left of the right abutment.

SECTION 4

OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 Operational Procedures

a. General. Sawmill Pond is used by the owner as a recreational facility. Operational control is the responsibility also of the Owner. The drawdown outlet gate is reportedly opened only in preparation of forecasted flooding. Normally, the outlet structures remain closed and the water level is maintained at the spillway height.

b. Warning System. There is no warning system in effect at Sawmill Pond Dam. There is no formalized emergency action plan for the dam.

4.2 Maintenance Procedures

a. General. The dam and appurtenances are not maintained.

b. Operating Facilities. The four outlet works at Sawmill Pond are in various states of repair as follows:

1. Right outlet-weir boards and guide slots are of the newest construction and are in good condition.

2. Headrace gate house. Structure is partially collapsed and only one of four gates is operable according to the owner.

3. Drawdown outlet is operable according to owner. Gate leaks along bottom. Operating hardware is exposed and in poor condition.

4. Sluiceway outlet. Sluicegate could not be readily operated. Control hardware is exposed and in very poor condition.

4.3 Evaluation

a. The facility is not regularly maintained, monitored or regulated by the Owner. The outlet works are mostly inoperable due to decay of equipment and structures.

b. Trees and brush are present over the embankment and headrace dikes. The stone masonry on the spillway and gatehouse training walls is in deteriorating condition.

c. There is no regularly scheduled maintenance for this dam. There are numerous maintenance deficiencies as described above. A systematic inspection and rehabilitation program should be developed and implemented. The outlet structures should be rehabilitated so that the pond and headrace may be regulated, if required.

d. An emergency action plan should also be developed and implemented that includes reservoir dewatering procedures, locations of emergency equipment, materials or manpower to reduce or minimize dam failure damage, authorities to be contacted in emergency situations and a program of surveillance during unusual storm events.

SECTION 5

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 General

The dam at Sawmill Pond was reportedly constructed around 1870 as a source of power for the adjacent mill. The dam is located on the Pachaug River in the Thames River Basin. The watershed for the reservoir is 26.2 square miles with approximately 30% of this basin man-made or natural storage.

The dam has a main spillway length of 51.5 feet and a maximum height of 20 feet. There is also a 20.5 foot side discharge spillway on the headrace channel at the same elevation. The total length of the dam is 250 feet including the headrace dike. The reservoir has a storage capacity at the spillway crest of 40 Ac-Ft. Each foot of depth above the spillway level can accommodate 8 Ac-Ft of water equivalent to 0.005 inches of runoff.

It will take 1 hour to lower the reservoir 1 foot based on a surface area of 8 acres and an outflow of 99 cfs. For the 40 Ac-Ft of storage below the spillway it is estimated that it would take 8 hours to drain the reservoir.

5.2 Design Data

Little specific data is available for this watershed or structure. In lieu of existing complete design information, U.S.G.S topographic maps (scale 1" = 2,000 ft.) were utilized to develop hydrologic parameters such as: drainage area, reservoir surface areas, basin slopes, time of concentration and other runoff characteristics. Elevation-storage relationships for the reservoir were approximated. Some of the pertinent hydraulic data was obtained and/or confirmed by actual field measurements at the time of the visual inspection. Test flood inflows and outflows and dam failure flows were determined in accordance with the Corps of Engineers guidelines.

5.3 Experience Data

No historical data for recorded discharges is available for this dam.

5.4. Test Flood Analysis

Recommended guidelines for the Safety Inspection of Dams by the Corps of Engineers were used for selection of the Test Flood. This dam is classified under those guidelines as a HIGH hazard and SMALL in size. Guidelines indicate that a storm event equal to 100 year to one-half the PMF be used as a range of test floods for such a classification. One-half PMF was selected as the test flood because of the potential downstream damage. The watershed has a total drainage area equal to 26.2 square miles of which approximately 30% is manmade or natural storage. This drainage area is moderately populated, fairly wooded, with rolling topography.

A test flood value was selected from the Corps of Engineers PMF curve for a watershed with flat to rolling topography and reduced by 30% for storage within the watershed. A test flood equal to one-half the PMF was calculated to be 470 CSM, equal to 12,380 CFS and was adopted for this analysis. The routed outflow discharge for the test flood inflow was 12,315 CFS. The spillway and outlet rating curves are illustrated in Appendix D. Flood routing was performed assuming a full reservoir at the spillway crest.

The analysis indicated that the capacity of the spillways is hydraulically inadequate to pass the test flood outflow and this outflow would overtop the dam by approximately 5.7 feet assuming the overflow length of dam to be 250 feet. The maximum outflow capacity of the spillway to the top of dam elevation 238.0 is 1,120 cfs or 9% of the test flood.

5.5 Dam Failure Analysis

For this analysis a full-depth, partial-width breach was assumed to have occurred in this dam. The adopted breach width of 30.0 feet was based on 40% of the dam length at mid-height. A dam failure discharge of 4,830 CFS was calculated assuming the reservoir level to be at the top of dam elevation 238.0. It is estimated that failure could result in an inundation of 4-5 homes located downstream of the dam to a depth of 2-4 feet and the loss of more than a few lives. In addition, two dams located downstream would be overtopped. The prefailure discharge of 1,120 CFS would result in flooding of 1-2 feet in the affected homes. The prime impact area that would be subject to damage if the dam were to fail has been delineated on the Dam Failure Impact Area Map in Appendix D. As a result of the failure analysis, the dam has been classified as a HIGH hazard structure.

SECTION 6

EVALUATION OF STRUCTURAL STABILITY

6.1 Visual Observations

Visual examination of the geotechnical and structural aspects of the dam do not indicate any immediate stability problems. However, the following features could affect the long-term stability of the headrace dike and the right wall of the headrace.

a. Seepage through the downstream slope and toe of the earth dike on the downstream end of the headrace, which could cause piping and possible failure of the dike.

b. Seepage from beneath the sluiceway outlet structure for the large water wheel, which could cause piping of the earth downstream from the stone wall acting as a dike on the right side of the headrace.

6.2 Design and Construction Data

No design or construction drawings or records for the dam or headrace are available.

6.3 Post-Construction Changes

The headrace dike is the only obvious post-construction change to the dam. No records are available as to when this was built, blocking off the original headrace which continued downstream. This dike has already been referenced in 6.1a as a potential problem area due to seepage.

6.4 Seismic Stability

The dam is located in Seismic Zone 1 and, in accordance with recommended Phase 1 guidelines, does not warrant seismic stability analysis.

SECTION 7

ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition. Based on the visual inspection, this dam appears to be in FAIR condition. Features which could adversely affect the condition of the dam in the future are:

1. Seepage at the downstream face and toe of the earth dike on the downstream end of the headrace and beneath the sluiceway outlet to the water wheel.

2. Leakage through the drawdown outlet gate on the headrace.

3. Trees on the crest and downstream slope of the earth dike, and adjacent to the upstream stone masonry wall on the dike comprising the right wall of the headrace.

b. Adequacy of Information. The available information is such that the assessment of the condition of the dam must be based on visual observation.

c. Urgency. The recommendations and remedial measures described below should be implemented by the owner within one year after receipt of the Phase 1 report.

7.2 Recommendations

The following items should be carried out under the direction of a qualified registered engineer and recommendations resulting should be implemented by the owner.

a. Perform detailed hydrologic and hydraulic studies to assess further the potential for overtopping the dam and the need for and the means to increase the discharge capacity of the dam.

b. Inspect the downstream faces and toes of the principal spillway and headrace spillway in the absence of overflowing water.

c. Evaluate the seepage downstream of the right embankment and on the left end of the main spillway.

d. Remove the trees and their root systems from the crest and abutments of the dam and backfill root depressions with appropriate compacted soil.

e. Evaluate the need for, and design a low level outlet to control the reservoir level.

f. Design riprap as needed for the upstream slope of the dam.

g. Drawdown the reservoir to inspect the condition of the intake gates to the headrace and make necessary design recommendations for repair of the gate.

h. Analyze the influence of seepage beneath the sluiceway outlet structure to the water wheel on the stability of the dike comprising the right wall of the headrace and make recommendations for repair if necessary.

i. Investigate the cause of seepage through the earth dike on the downstream end of the headrace and make recommendations for control of this seepage if necessary.

j. Investigate the drawdown outlet gate on the headrace for operability and the cause of present leakage.

7.3 Remedial Measures

a. Operation and Maintenance Procedures.

1. Develop an "Emergency Action Plan" that will include an effective preplanned downstream warning system, locations of emergency equipment, materials and manpower, authorities to contact and potential areas that require evacuation.

2. Institute a program of annual technical inspection by a qualified registered engineer.

3. Develop a system for the recording of data with regard to items such as: water levels, discharges, time and drawdown to assist those responsible for monitoring of the structure.

4. Implement a regular maintenance program for the facility.

5. Provide surveillance during and immediately after high intensity rainfall.

7.4 Alternatives

There are no practical alternatives to the remedial measures discussed above.

APPENDIX A

INSPECTION CHECKLIST

1

VISUAL INSPECTION CHECKLIST
PARTY ORGANIZATION

PROJECT SAWMILL POND DAM - CT 00627

DATE Nov. 25, 1980

TIME 1:30 p.m.

WEATHER Overcast, 50 degrees

W.S. ELEV. 235.2 U.S. 219.0 DN.S.

PARTY:

1. David Sluter - New England Engineering
2. Stephen Fodor - New England Engineering
3. Steve J. Poulos - GEI
4. Robert E. Stetkar - GEI
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Hydrology & Hydraulics	D. Sluter	
2.	Civil	S. Fodor	
3.	Geotechnical	S. Poulos, R. Stetkar	
4.			
5.			
6.			
7.			
8.			
9.			
10.			

2

PERIODIC INSPECTION CHECKLIST

PROJECT SAWMILL POND DAM, CT DATE Nov. 25, 1980

PROJECT FEATURE Dam Embankment NAME Poulos/Stetkar

DISCIPLINE Geotechnical/Civil NAME Sluter/Fodor

AREA EVALUATED	CONDITION
DAM EMBANKMENT	
Crest Elevation	238.0
Current Pool Elevation	235.2
Maximum Impoundment to Date	Unknown
Surface Cracks	None observed.
Pavement Condition	N/A.
Movement or Settlement of Crest	Small transverse depression 18 in. wide and 4 in. deep in crest behind gate 50 feet left of right abutment.
Lateral Movement	None observed.
Vertical Alignment	No misalignment observed.
Horizontal Alignment	No misalignment observed.
Condition at Abutment and at Concrete Structures	Satisfactory.
Indications of Movement of Structural Items on Slopes	N/A.
Trespassing on Slopes	Free access. Footpath on crest 18-24 in. wide and 1-2 in. deep.
Sloughing or Erosion of Slopes or Abutments	Scarp to ∞ 20 in. above present water level on upstream slope. Minor erosion into upstream slope at left abutment and at spillway right abutment.
Rock Slope Protection - Riprap Failures	No riprap on upstream slope.
Unusual Movement or Cracking at or Near Toe	Slight bulge in stone masonry downstream face at outlet 50 ft left of right abutment, possibly constructed that way.
Unusual Embankment or Downstream Seepage	Wet area downstream from masonry face from 50 to 85 ft left of right abutment. No flowing seepage observed.
Piping or Boils	None observed.
Foundation Drainage Features	None.
Toe Drains	None.
Instrumentation System	None.
Vegetation	Trees & brush on upstream slope to 12 in diameter. Brush & small trees in masonry training walls of spillway & outlet structure

3

PERIODIC INSPECTION CHECKLIST

PROJECT SAWMILL POND DAM — DATE Nov. 25, 1980

PROJECT FEATURE Dike - Rt. Wall of Headrace — NAME Poulos/Stetkar

DISCIPLINE Geotechnical/Civil — NAME Sluter/Fodor

AREA EVALUATED	CONDITION
DIKE - RIGHT WALL OF HEADRACE	
Crest Elevation	Dike contains upstream mortared stone masonry face. Earth downstream from upstream face may be fill or natural ground. Headrace spillway, drawdown outlet and outlet structure to water wheel located on dike.
Current Pool Elevation	
Maximum Impoundment to Date	
Upstream Face	Some mortar spalled from upstream face.
Pavement Condition	N/A.
Movement or Settlement of Crest	None observed.
Lateral Movement	None observed.
Vertical Alignment	Satisfactory.
Horizontal Alignment	Satisfactory.
Condition at Abutment and at Concrete Structures	Satisfactory.
Indications of Movement of Structural Items on Slopes	Minor movement of left downstream training wall of drawdown outlet. See page 10.
Trespassing on Slopes	Free access to downstream slope.
Sloughing or Erosion of Slopes or Abutments	No significant erosion or sloughing observed.
Rock Slope Protection - Riprap Failures	N/A.
Unusual Movement or Cracking at or Near Toes	None observed.
Unusual Embankment or Downstream Seepage	Seepage beneath concrete sluice outlet ≈5-10 gpm. Seepage adjacent to drawdown outlet conduit approximately 1 gpm.
Piping or Boils	None observed.
Foundation Drainage Features	None.
Toe Drains	None.
Instrumentation System	None.
Vegetation	Extensive growth of trees on entire slope. Trees to 8 in diameter grow adjacent to upstream masonry face.

PERIODIC INSPECTION CHECKLIST

PROJECT SAWMILL POND DAM DATE Nov. 25, 1980

PROJECT FEATURE Earth Dike in Headrace NAME Poulos/Stetkar

DISCIPLINE Geotechnical/Civil NAME Sluter/Fodor

AREA EVALUATED	CONDITION
EARTH DIKE EMBANKMENT	Note: Earth dike embankment is located on downstream end of headrace.
Crest Elevation	
Current Pool Elevation	
Maximum Impoundment to Date	
Surface Cracks	None observed.
Pavement Condition	N/A.
Movement or Settlement of Crest	No significant movement or settlement observed. Crest surface irregular.
Lateral Movement	None observed.
Vertical Alignment	No misalignment observed.
Horizontal Alignment	No misalignment observed.
Condition at Abutment and at Concrete Structures	Satisfactory.
Indications of Movement of Structural Items on Slopes	
Trespassing on Slopes	No significant effects from trespassing observed.
Sloughing or Erosion of Slopes or Abutments	Minor erosion at water level on upstream slope.
Rock Slope Protection - Riprap Failures	No rock slope protection.
Unusual Movement or Cracking at or Near Toes	None observed.
Unusual Embankment or Downstream Seepage	Continuous seepage through entire downstream toe of dike and through downstream slope up to 2 ft above downstream toe; total flow 1-2 gpm flowing clear.
Piping or Boils	None observed.
Foundation Drainage Features	None.
Toe Drains	None.
Instrumentation System	None.
Vegetation	Extensive brush and tree gorwth on crest, upstream and downstream slopes; trees up to 5 in diameter.

5

PERIODIC INSPECTION CHECKLIST

PROJECT SAWMILL POND DAM — DATE Nov. 25, 1980

PROJECT FEATURE Right Outlet — NAME Sluter/Fodor

DISCIPLINE Hydraulic/Civil/Geotechnical — NAME Poulos/Stetkar

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	Right outlet works serves small water wheel now abandoned.
a. Approach Channel	
Slope Conditions	Under water and not observable at time of inspection.
Bottom Conditions	Under water - natural pond bed covered with leaves. Weeds observed adjacent to intake structure.
Rock Slides or Falls	None.
Log Boom	None.
Debris	Minor - leaves and pine needles.
Condition of Concrete Lining	N/A.
Drains or Weep Holes	N/A.
b. Intake Structure	
Condition of Concrete	Satisfactory.
Stop Logs and Slots	Five 2 in x 8 in stop logs in steel slots; leakage under bottom stop log 30-50 gpm.

6

PERIODIC INSPECTION CHECKLIST

PROJECT SAWMILL POND DAM DATE Nov. 25, 1980

PROJECT FEATURE Right Outlet NAME Sluter/Fodor

DISCIPLINE Structural NAME Poulos/Stetkar

AREA EVALUATED	CONDITION
OUTLET WORKS - TRANSITION AND CONDUIT	51 in wide by 37 in deep concrete box conduit.
General Condition of Concrete	Good.
Rust or Staining on Concrete	None observed.
Spalling	None observed.
Erosion or Cavitation	None observed.
Cracking	Hairline crack between top deck and right wall on downstream end.
Alignment of Monoliths	N/A.
Alignment of Joints	Good.
Numbering of Monoliths	N/A.

7

PERIODIC INSPECTION CHECKLIST

PROJECT SAWMILL POND DAM DATE Nov. 25, 1980

PROJECT FEATURE Right Outlet NAME Poulos/Stetkar

DISCIPLINE Geotechnical/Hydraulic/Civil NAME Sluter/Fodor

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	No outlet structure at the right outlet works.
General Condition of Concrete	
Rust or Staining	
Spalling	
Erosion or Cavitation	
Visible Reinforcing	
Any Seepage or Efflorescence	
Condition at Joints	
Drain holes	
Channel	Small 3 ft wide by 6 in deep ditch in natural soil over bedrock - no longer in use.
Loose Rock or Trees Overhanging Channel	Trees overhanging channel.
Condition of Discharge Channel	Poor. Channel obstructed with leaves and vegetation. Inadequate to route other than small flow.

8

PERIODIC INSPECTION CHECKLIST

PROJECT SAWMILL POND DAM DATE Nov. 25, 1980

PROJECT FEATURE Headrace Intake NAME Sluter/Fodor

DISCIPLINE Hydraulic/Civil/Geotechnical NAME Poulos/Stetkar

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	This channel leads to headrace.
a. Approach Channel	
Slope Conditions	Under water and not observable at time of inspection.
Bottom Conditions	Not observable.
Rock Slides or Falls	None.
Log Boom	None.
Debris	Minor.
Condition of Concrete Lining	None observable.
Drains or Weep Holes	N/A.
b. Intake Structure	
Condition of Masonry	Fair. Mortar spalling from between stones at right and left training walls. Small brush and tree stumps in right training wall.
Stop Logs and Slots	None.

PERIODIC INSPECTION CHECKLIST

PROJECT SAWMILL POND DAM DATE Nov. 25, 1980

PROJECT FEATURE Headrace Gate House NAME Sluter/Fodor

DISCIPLINE Structural NAME Poulos/Stetkar

AREA EVALUATED	CONDITION
OUTLET WORKS - GATE HOUSE	Gate house contains intake controls for headrace. Structure spans headrace intake.
a. Structural	
General Condition	Poor.
Condition of Superstructure	Wooden superstructure partly collapsed; floor boards rotting and roof partly collapsed.
Spalling	N/A.
Visible Reinforcing	N/A.
Rusting or Staining of Concrete	N/A.
Any Seepage or Efflorescence	None observed.
Joint Alignment	Structure exhibits differential movements up to ≈ 12 in.
Unusual Seepage or Leaks in Gate Chamber	None observed.
Cracks	Boards missing in roof; several floor boards cracked.
Rusting or Corrosion of Steel	Wooden structure.
b. Mechanical and Electrical	
Air Vents	N/A.
Float Wells	N/A.
Crane Hoist	N/A.
Elevator	N/A.
Hydraulic System	N/A.
Service Gates	Four intake gates in generally poor condition. Top 8 in of boards missing from all gates. Third gate from left is only gate operable, according to owner.
Emergency Gates	
Lightning Protection System	N/A.
Emergency Power System	N/A.
Wiring and Lighting System	None.

10

PERIODIC INSPECTION CHECKLIST

PROJECT SAWMILL POND DAM DATE Nov. 25, 1980

PROJECT FEATURE Drawdown Outlet NAME Sluter/Fodor

DISCIPLINE Civil/Geotechnical NAME Poulos/Stetkar

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL FOR DRAW-DOWN GATE	Drawdown outlet located on right wall of headrace.
General Condition of Concrete	Control valve anchor is the only concrete visible.
Rust or Staining	None observed.
Spalling	None observed.
Erosion or Cavitation	Minor erosion behind left downstream training wall.
Visible Reinforcing	N/A.
Any Seepage or Efflorescence	Leakage from bottom of gate ≤ 50 gpm through outlet conduit. Seepage at contact between outlet conduit and masonry portion of outlet structure on downstream face flowing clear at ≤ 1 gpm.
Condition at Joints	Joint between outlet conduit and masonry structure not properly sealed.
Drain Holes	N/A.
Channel	Drawdown outlet onto bedrock slope leading to outlet channel for spillway.
Loose Rock or Trees Overhanging Channel	Several trees overhang channel.
Condition of Discharge Channel	Satisfactory.

11

PERIODIC INSPECTION CHECKLIST

PROJECT SAWMILL POND DAM DATE Nov. 25, 198

PROJECT FEATURE Sluiceway Outlet NAME Poulos/Stetkar

DISCIPLINE Civil/Geotechnical/Hydraulic NAME Sluter/Fodor

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL FOR WATER WHEEL	Outlet structure for sluiceway to water wheel located on right wall of headrace.
General Condition of Concrete	Good.
Rust or Staining	Minor rusting of sluice gate controls.
Spalling	None observed.
Erosion or Cavitation	None observed.
Visible Reinforcing	None.
Any Seepage or Efflorescence	Continuous seepage from beneath concrete outlet structure. Seepage flows clear at a combined volume of 5-10 gpm.
Condition at Joints	Satisfactory.
Drain Holes	N/A.
Channel	Outlet channel is steel chute to water wheel, presently not in use.
Loose Rock or Trees Overhanging Channel	Several trees overhang chute.
Condition of Discharge Channel	Fair to poor.

12

PERIODIC INSPECTION CHECKLIST

PROJECT SAWMILL POND DAM DATE Nov. 25, 1980

PROJECT FEATURE Main Spillway NAME Poulos/Stetkar

DISCIPLINE Civil/Hydraulic/Geotechnical NAME Sluter/Fodor

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	MAIN SPILLWAY.
a. Approach Channel	Sawmill Pond.
General Condition	Satisfactory.
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	None.
Floor of Approach Channel	Under water - sand and gravel visible immediately upstream from weir.
b. Weir and Training Walls	Weir crest composed of timber and concrete in satisfactory condition.
General Condition of Masonry	Masonry training walls in fair condition. Downstream face not observable.
Rust or Staining	None observed.
Spalling	N/A.
Any Visible Reinforcing	N/A.
Any Seepage or Efflorescence	Seepage through left training wall 3 ft downstream and 1 to 2 ft below crest of spillway weir. Seepage flows clear at 1-2 gpm.
Drain Holes	N/A.
c. Discharge Channel	
General Condition	Good.
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	Many trees overhanging channel.
Floor of Channel	Bedrock.
Other Obstructions	Road bridge over channel 400 to 500 ft downstream from weir.
Other Comments	Masonry downstream face of spillway could not be inspected due to overflow.

13

PERIODIC INSPECTION CHECKLIST

PROJECT SAWMILL POND DAM DATE Nov. 25, 1980

PROJECT FEATURE Headrace Spillway NAME Sluter/Fodor

DISCIPLINE Civil/Hydraulic/Geotechnical NAME Poulos/Stetkar

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	HEADRACE SPILLWAY.
a. Approach Channel	Approach channel is headrace to water wheel.
General Condition	Satisfactory.
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	Trees overhang headrace channel.
Floor of Approach Channel	Under water - not observable.
b. Weir and Training Walls	Weir crest of stone.
General Condition of Masonry	Fair. Stone missing in right training wall. Small brush growing from downstream left training wall. Downstream face not observable.
Rust or Staining	None observed.
Spalling	Spalling of mortar from masonry training walls.
Any Visible Reinforcing	N/A.
Any Seepage or Efflorescence	None observable - downstream face of spillway unable to be inspected due to overflow
Drain Holes	N/A.
c. Discharge Channel	Discharge channel for this spillway enters discharge channel for main spillway 50 ft downstream from dam.
General Condition	Good.
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	One tree overhangs left side of channel.
Floor of Channel	Bedrock.
Other Obstructions	None.
Other Comments	Downstream face of spillway not observable due to overflow.

14

PERIODIC INSPECTION CHECKLIST

PROJEC SAWMILL POND DAM DATE Nov. 25, 1980

PROJECT FEATURE _____ NAME Sluter/Fodor

DISCIPLINE Structural NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SERVICE BRIDGE	None.
a. Super Structure	
Bearings	
Anchor Bolts	
Bridge Seat	
Longitudinal Members	
Underside of Deck	
Secondary Bracing	
Deck	
Drainage System	
Railings	
Expansion Joints	
Paint	
b. Abutment & Piers	
General Condition of Concrete	
Alignment of Abutment	
Approach to Bridge	
Condition of Seat & Backwall	

APPENDIX B

ENGINEERING DATA

APPENDIX B-1

SELECTED COPIES OF PAST INSPECTION REPORTS

10

No. _____

Inventoried By _____

Date _____

WATER RESOURCES COMMISSION
SUPERVISION OF DAMS
INVENTORY DATA

C162

2

Name of Dam or Pond Sawmill Pond Dam

Code No. 14.7 533 266 PG 118

Nearest Street Location RT 138

Town Voluntown

U.S.G.S. Quad. Voluntown

Name of Stream Pachaug River

Owner PAUL E. MCGUIRE

Address RT 138

VOLUNTOWN

Long 71-52.4

Lat 41-32.4

DA=28.8

Pond Used For REC.

Dimensions of Pond: Width _____ Length _____ Area 13.5

1870?

Total Length of Dam 120' Length of Spillway 45'

Location of Spillway c. SOUTH END

Height of Pond Above Stream Bed 16'

Height of Embankment Above Spillway 3'

Type of Spillway Construction [illegible]

Type of Dike Construction EARTH FILL WITH STONE MASONRY FACING

Downstream Conditions [illegible]

Summary of File Data _____

Remarks _____

Would Failure Cause Damage? [illegible] Class B

STATE OF CONNECTICUT

799

RECEIVED
NOV 20 1945
STATE WATER COMMISSION

STATE BOARD OF SUPERVISION OF DAMS

ROOM 317, STATE OFFICE BUILDING, HARTFORD

Created by Chapter 290 of the Public Acts of 1939 to supervise dams, dikes, reservoirs and other similar structures. "All such structures, with their appurtenances, without exception and without further definition or enumeration herein, which, by breaking away or otherwise, might endanger life or property, shall be subject to the jurisdiction conferred by this act."

PLEASE REPLY TO

November 14, 1945

General Sanford H. Wadhams, Chairman
State Board of Supervision of Dams
Room 317, State Office Building
Hartford, Connecticut

Dear General Wadhams:

Under date of January 13, 1944, you wrote me concerning two dams owned by the Glasgo Finishing Company, which were repaired by them without any reference to the board and asked that I investigate the matter. Subsequently, I proceeded to do this, inspected the sites, and held a conference with Mr. Revell, superintendent of the Glasgo Finishing Company.

My investigation revealed that there were not only two dams they had repaired, but also others that they had reconstructed, one of which, located at Collins Pond, had been entirely rebuilt, In tracing down the dams controlled by the Glasgo Finishing Company, I discovered other dams on the Pachaug River which had been repaired by owners other than the Glasgo Company, the character of which would bring them under our jurisdiction. In order to properly study the Glasgo dams, it would be necessary to take these other dams into consideration. After consultation with another member of the Board, Clarence Blair, who was familiar with the territory, and has since passed away, we decided that the best method of approach would be to make a complete analysis of the Pachaug River watershed, examining all dams on the Pachaug River together with the one at Collins Pond on Denison Brook. I consequently made such recommendation to you and with your approval, have proceeded with same.

The Pachaug River rises at Beach Pond, located in the towns of Voluntown, Conn. and Exeter, R.I., and flows thence in a Westerly direction through Voluntown and Griswold, Conn. until its confluence with the Quinebaug River just below Jewett

City and a slight distance downstream from the large Concrete highway bridge on Route 12 across the Quinebaug River.

The situation along the valley of the Pachaug, with its numerous crossing highways, farms, and villages, and the danger to life and limb, and public and private property, should one of the larger of these dams go out, or the danger of progressive failure should one of the larger upstream impounding dams go out, is such as to bring all dams on this stream under the jurisdiction of the board.

You will find enclosed a report divided into several parts as follows:

1. Geological survey maps on which is shown the Pachaug River and tributary streams and on which I have indicated the location of dams by Key number and an outline of the Watershed of each specific contributing area.

2. Hydrologic discussion of the Pachaug River Watershed in general.

3. Key to dams.

4. Descriptive data, discussion, and conclusions concerning individual dams by key.

5. Recommendations.

6. Summation.

Notes, detailed analyses, and calculations are on file in my office and are available for reference when desired by your office or by members of the Board of Supervision of Dams.

As of this writing--detailed data and plans covering the construction of new gates at Glasgo Dam have not been received from F.V. Steutemann, Chief Engineer of the Glasgo Co. Same has been promised and I am again writing to Mr. Steutemann to remind him that we are still waiting for this information.

I am sending this report on to you, however, without a full report on this one dam, but as soon as final plans are received, I will correlate and forward them to you so that your file will be complete.

Two dams on the Pachaug River, located lowest downstream and nearest the mouth of the river, have not been inspected or treated in this report.

S.H.W./3/Nov. 14, 1945

The first of these, Ashland Dam, lies next in line downstream from Hopeville Dam and is in the center of the borough of Jewett City. I understand that some work was done around this structure a while back. The second of these, Slater Dam, lies just above the highway bridge on Route 138 over the Pachaug at the lower end of the borough. I understand that its condition is good. The Highway Department has just let a contract for the construction of a new 100' span bridge to replace the old at this site. Both Ashland and Slater are large dams and though inspection of them is not urgent nor not perhaps as necessary as in the case of the other Pachaug Dams, it is suggested that they be looked over a little later when construction of the new bridge at Slater Dam is started to ascertain whether in any way the dam will be disturbed or affected.

Very truly yours,

Linwood G. Mort

Linwood G. Mort
Member, State Board of Supervision
of Dams.

LGM:JS
Lnc.

HYDROLOGIC DISCUSSION

The Pachaug River rises on the Eastern Connecticut, Rhode Island border at Beach Pond in heavily wooded, hilly country. Characteristic of the rugged topography is an average slope pitch around the headwaters of 50' in a thousand. Even with this heavy wooded growth, run-off is comparitively rapid and a coefficient of .20 has been assumed. The elevation of Beach Pond is 296, Geologic survey datum and is source of the Pachaug.

The elevation at the mouth, confluence with the Quinebaug at Jewett City, is 100, Geologic Survey datum. Thus through its meandering course of 14 miles, it shows a drop of almost 200'.

Geologic strata is mostly granite and gneiss overlaid with glacial moraines of gravel and boulders with some interweaving clay deposits.

From Colonial and Revolutionary days, dams have been built at various points along the river to provide power for grist and sawmills, for a foundry, and for various textile manufacturing processes. The present Glasgo dam is built on the foundations of an original dam constructed by a negro by the name of Glasgo (for whom the village is named) and iron was smelted from Bog Ore for the manufacture of Harpoons which were famous throughout the old Whaling industry.

In the past century, several severe floods have caused considerable damage mainly through the breaking of one or more of the upper dams. Since 1860 there have been two disastrous floods caused by the breaking of dams. One, in 1868, when several of the upper dams went out causing what was then called the Jewett City dam to go out and cause considerable property damage. The other took place in the spring freshet of 1888 when Slater Dam went out with attendant damage. For the past fifty years and since the construction of Pachaug Dam, a series of storage ponds and reservoirs assist in breaking peak flows and averaging them out. If it were not for this storage factor, the spillway capacity of several of the dams would be much too small to take flash floods.

On only two occasions since reliable rain-gauge recordings were made in this watershed has the rainfall exceeded 4". Computations after thorough check of records and stream flow have been based on a 5" rainfall.

The greatest flow on record occurred on September 21, 1938, at the time of the Hurricane.

HYDROLOGIC DISCUSSION

(2)

The U.S. Geological Survey gauged the flow over Slater dam,(last dam before confluence with Quinebaug) at 2240 sec. ft.. The watershed area above this dam is 59 square miles which corresponds to a flow of 38 sec.ft./sq.mi. at that time. This record flow took place at a time when all ponds were full and spillways taking near maximum capacity because of the several days heavy rain which preceded the flood and hurricane.

The safety of this chain of 13 dams is particularly interdependent. The failure of almost any one could possibly lead to the overtopping and failure of all lying below it on the stream. It is, therefore, imperative that they all be kept in excellent repair.

LOCATION REFERENCE & KEY TABLE

1. BEACH POND DAM
2. LYBLOCKS DAM
3. FORGE POND DAM
3A. COLLINS POND DAM
4. BEACHDALE DAM
5. YELLOW MILL DAM
6. SAWMILL POND DAM
7. SHELDON'S POND DAM
8. STONE MILL DAM
9. GLASCO DAM
10. PACHAUG DAM
11. HOPEVILLE DAM
12. ASHLAND DAM
13. SLATER DAM

T14.753.3&6.6 PG11.8

STATE BOARD OF SUPERVISION OF DAMS
CONNECTICUT

1. Name: Saw Mill Dam--Built Before 1900
2. Owner: B. Stanton, Voluntown, Conn.
3. Town: Voluntown
4. Stream: Pachaug River
5. Pond: Saw Mill Pond
6. Location: North of Route 138, Jewett City Voluntown Highway
7. Watershed and Drainage Area: 26.2 S.M.
8. Size of Pond: 8 Acres
9. Type of Construction: Wet rubble masonry dam, with stone masonry spillways, stone canal, wooden gates, and Steel blow-off pipe.
10. Freeboard: 3'
11. Overall Length: (Height above Stream)142'
12. Length of Spillway: 51'6" main dam, 20'6" on canal below gate house
13. Height of Spillway: (Elev. Toe of Dam to Spillway Crest) 17'
14. Height of Non-Overflow Section: 20'
15. Depth of Spillway: (Top of Spillway Abutments to Crest of Spillway) 3'
16. Type of Gate: Wooden creosote plank and timber, Manually operated gear control.
17. Size of Gate: 15'X6'
18. Draw off Pipe: 3' Diameter--Steel Pipe, Iron and Bronze Valve Control
19. Flashboards: None
20. Max. Discharge sec. ft.: 1441
21. Spillway Capacity C.F.S.: 1247.4
22. Gate Capacity sec. ft.: 402.8
23. Draw off Pipe Capacity, sec. ft.: 100
24. Max. Discharge C.F.S./sq. mi.: 55

SAW MILL DAM

This dam was built previous to 1900. The name of the original builder and owner is not readily ascertainable though we do know that it passed through the hands of the defunct Briggs Manufacturing Company to the present owner, Benjamin Stanton, who operates a grain mill on the site and utilizes power from a water wheel. The flowage and riparian rights were purchased by and are now vested in the Glasgo Finishing Company.

Saw Mill Pond, on which the dam is located is small, approximately 8 acres in size and its storage capacity fair as the pond is rather deep. The dam proper is well constructed of wet rubble stone masonry, is of stable gravity section and is well anchored between two high stone ledges, the river at this point having eroded a small gorge through solid ledge rock. The main spillway of 51'6" is in the stone gravity section of the dam proper and is stone capped.

A canal leading to the water wheels enters through the main gate, is 15'6' wide, and 6' deep. When I first inspected this dam, the gates were in poor shape and required repairs. After conference with the Glasgo Finishing Co. officials, of which B. Stanton, owner of the dam, is treasurer, they agreed to replace the gates. This has been completed in entirely with new creosoted plank and timber gates installed, the gate house and raising and lowering mechanism repaired, and a new bridge constructed across the canal to my satisfaction.

A concrete spillway 20'6" in length is constructed on the downstream river side of the canal to relieve the canal during peak flows, as is a 3' steel blow off pipe. This is necessary inasmuch as the main spillway has insufficient capacity for maximum discharge, and the mill penstock and wheel cannot take the necessary discharge from the canal gates, which gates must be allowed full capacity to provide an adequate safety margin.

I have observed this dam under head and find no leaks to cause concern. Since necessary repairs were made, I believe this structure and its appurtenances to be in sound condition.

RECOMMENDATION

This dam is in good condition and is adjudged safe.

STATE BOARD OF SUPERVISION OF DAMS
CONNECTICUT

SUMMATION

From the data and information in this report and reference to the keyed Geological Survey map, one obtains a picture of typical New England use of water for power and processing. For almost a century prior to 1900, this river was dotted with small dams to give water power for small home owned industries. As the general industrial trend toward centralization of manufacturing facilities developed in the first three decades of this century, many of these small plants were abandoned and their dams and appurtenances allowed to fall into disrepair. Some were swept away never to be rebuilt again. Others were weakened by the ravages of time and maintenance allowed to lapse.

With the advent of modern truck transportation in the 1920's, manufacturers reversed their previous trend and began to decentralize some of their plants as the trucks made economical hauling of finished goods possible.

Such was the case of the Glasgo Finishing Company who came into the Pachaug River area and bought up a number of old dams and mills because of the clean available water. They have expanded constantly, have spread employment, and are endeavoring to place their dams in first class condition.

It is unfortunate that the Glasgo Company did not employ an engineer well versed in dam construction instead of endeavoring to design themselves. If they had done so, much needless expense to them would have been saved and their work would have been better suited to conditions.

The same thing appears to be true of other owners such as Sundholm, Gordon Brothers, Ace Woolen Company, and the Ashland Corporation.

We assume that these owners to a large extent proceeded in ignorance of the State Law governing construction of dams.

The Board, in the case of much of the work done on the Pachaug River, is faced with a fait accompli; and therefore I have, under the circumstances, not felt that we should issue certificates for these dams when we are not familiar with all details of construction. The single exception to this is the Glasgo Dam, with which we are quite familiar. I shall issue the necessary certificate for this when the plans of the completed work are received.

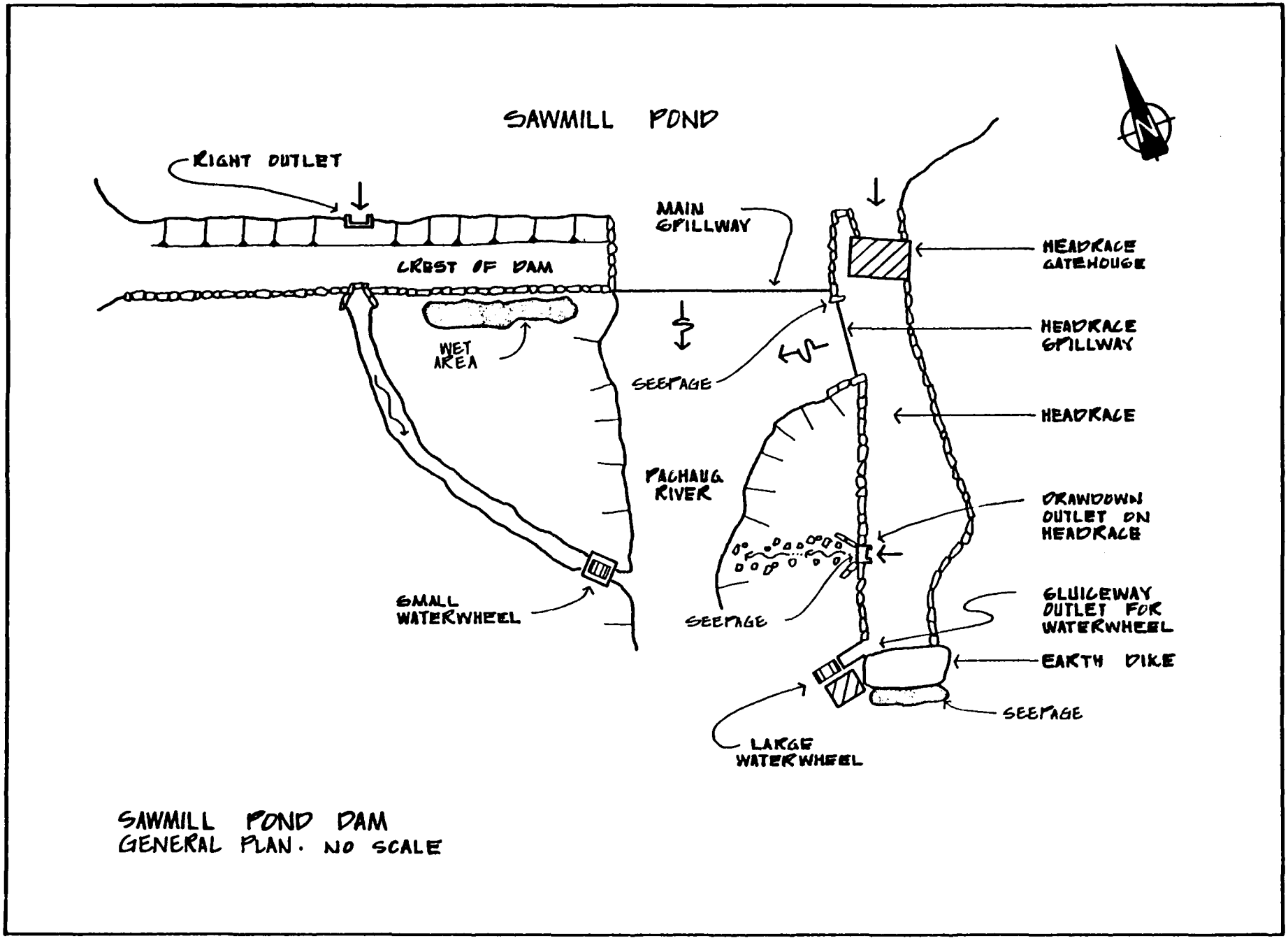
STATE BOARD OF SUPERVISION OF DAMS
CONNECTICUT

SUMMATION
(2)

I believe that when all steps as recommended in each individual dam case have been taken, we may adjudge the situation on the Pachaug River as under control and in safe condition.

APPENDIX B-2

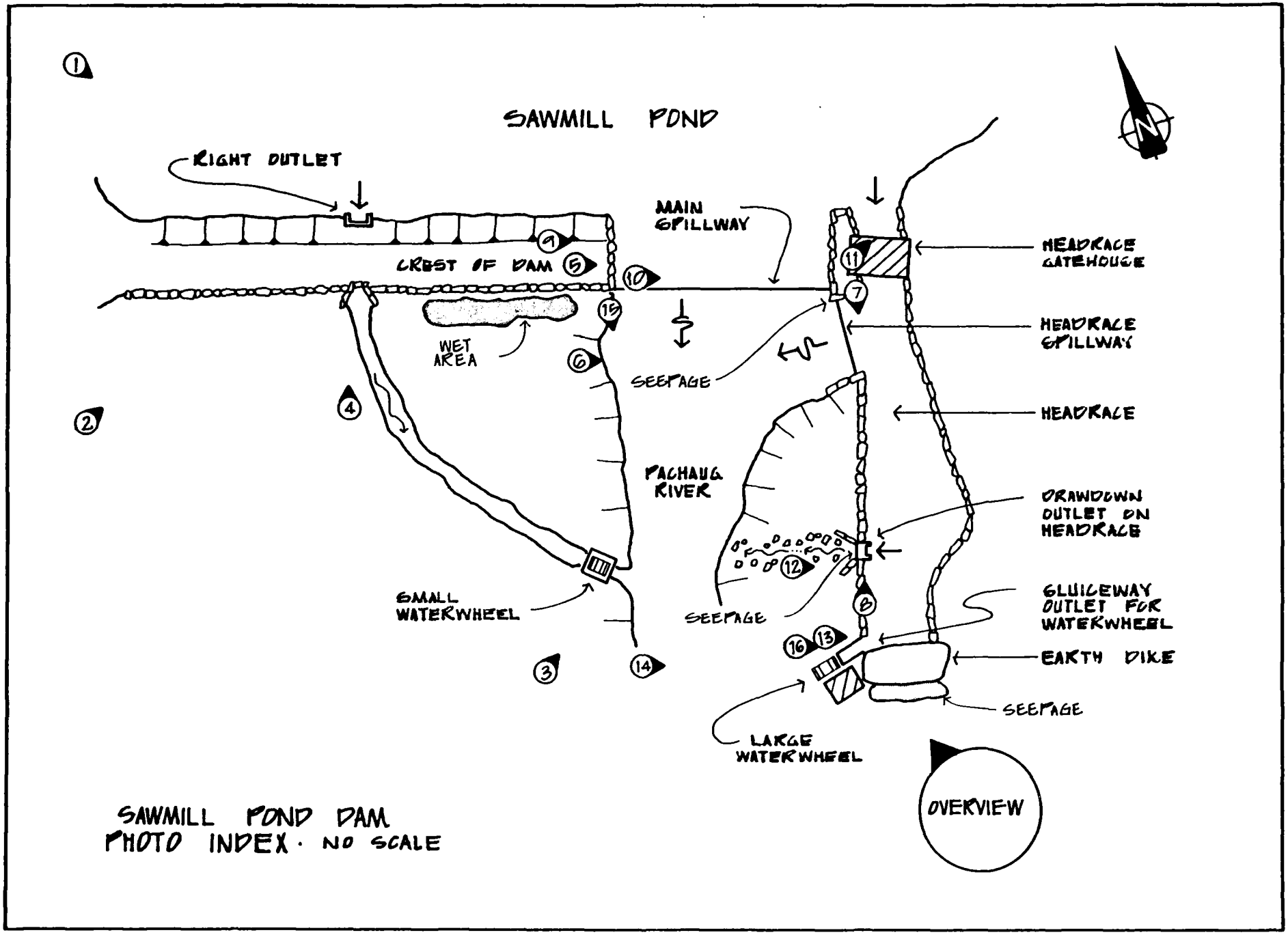
PLANS, SECTIONS AND DETAILS



SAWMILL POND DAM
GENERAL PLAN. NO SCALE

APPENDIX C

PHOTOGRAPHS



SAWMILL POND DAM
PHOTO INDEX · NO SCALE

PHOTO C-1: Upstream face of dam from right side.

PHOTO C-2: Downstream face of dam from right side.

PHOTO C-3: Downstream view of both spillways. Water wheels in foreground fed from right outlet structure.

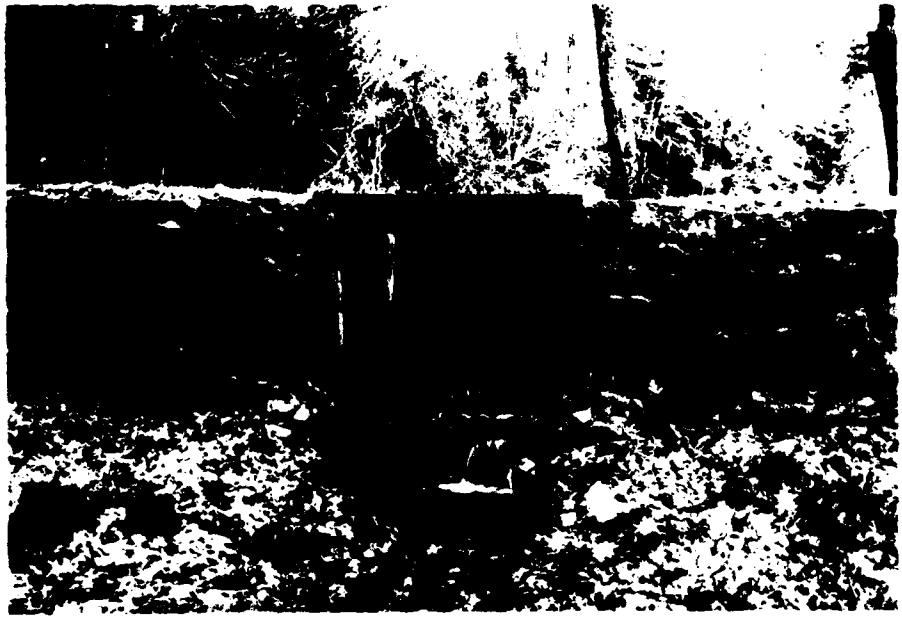


PHOTO C-4: Right outlet structure. Note stop logs on upstream end.

PHOTO C-5: Main spillway from right side.

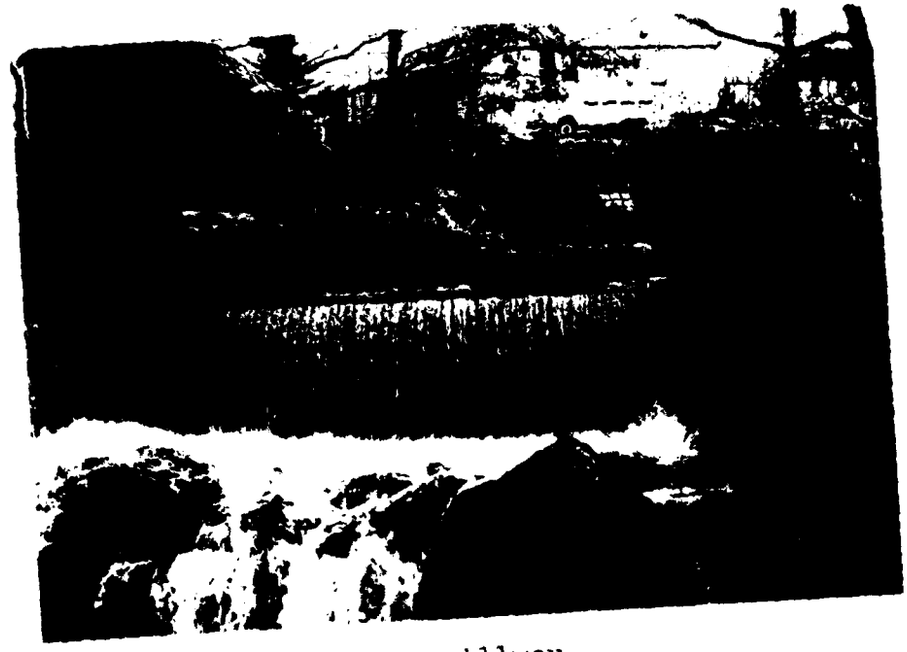


PHOTO C-6: Headrace spillway.

PHOTO C-7: Headrace from upstream. Note dike across end of channel.

PHOTO C-8: Headrace from downstream. Note collapsing gate house in background and the drawdown outlet control in foregroung.

PHOTO C-9: Crest of dam.

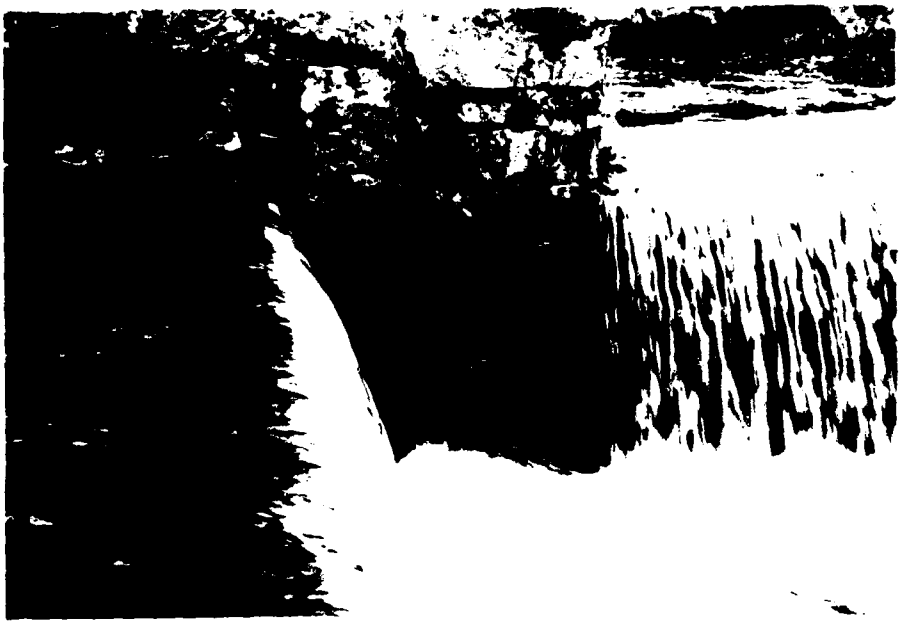


PHOTO C-10: Seepage and displaced stone in masonry between spillways.

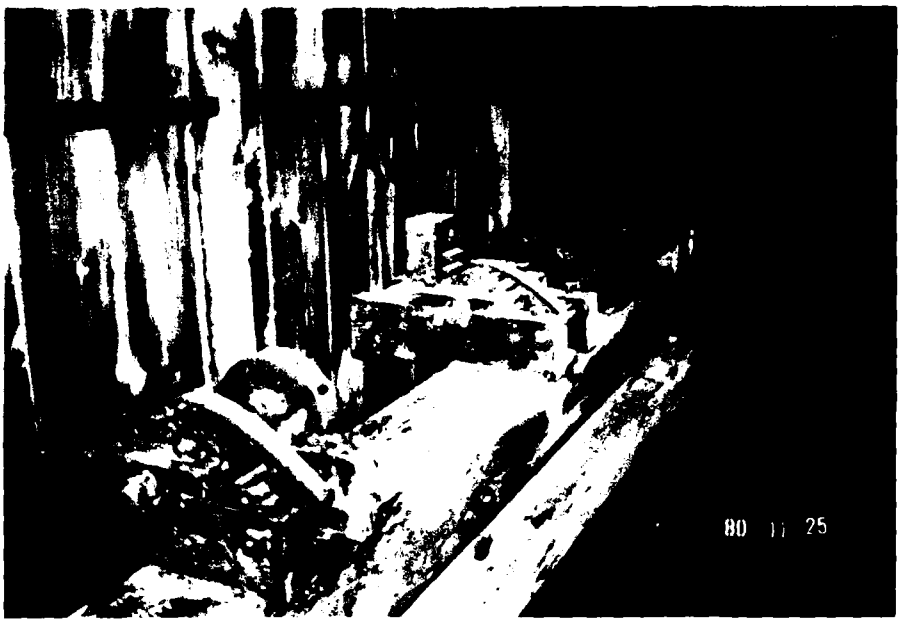


PHOTO C-11: Control mechanisms inside gate house.

PHOTO C-12: Drawdown outlet showing leakage from gate and seepage through wall at top right corner.

PHOTO C-13: Control mechanism and gate for sluiceway outlet.

PHOTO C-14: Water wheel served by sluiceway shown in background.

PHOTO C-15: Downstream channel from dam.

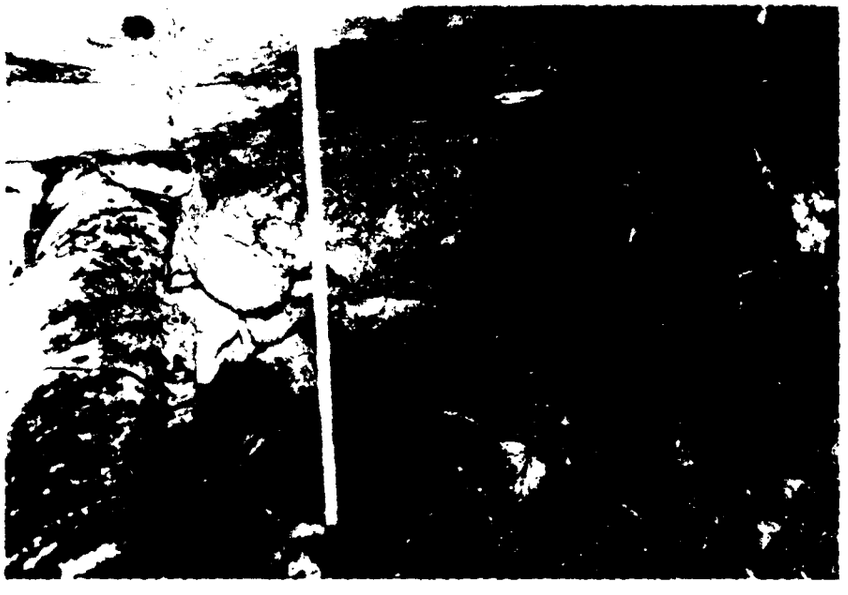
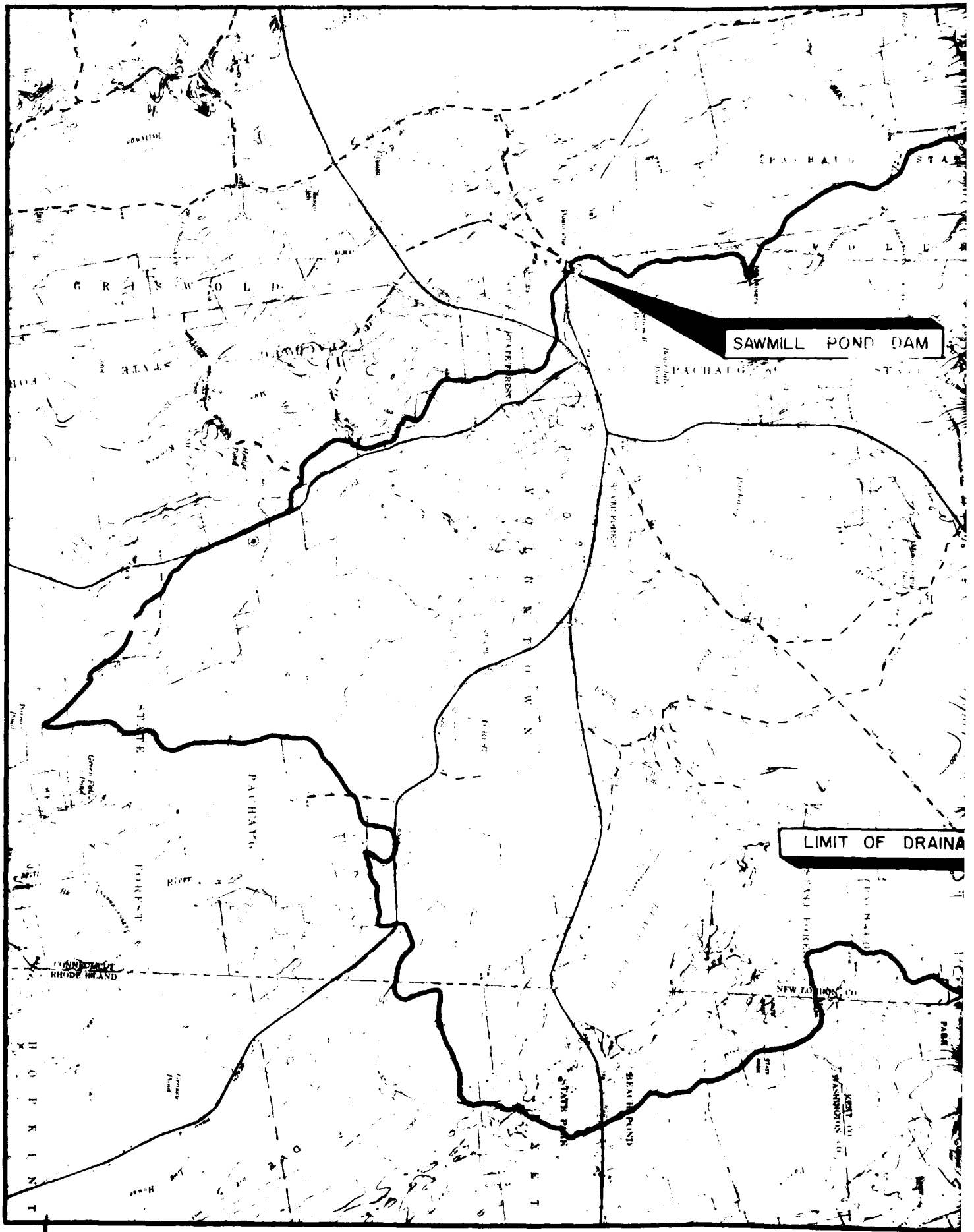
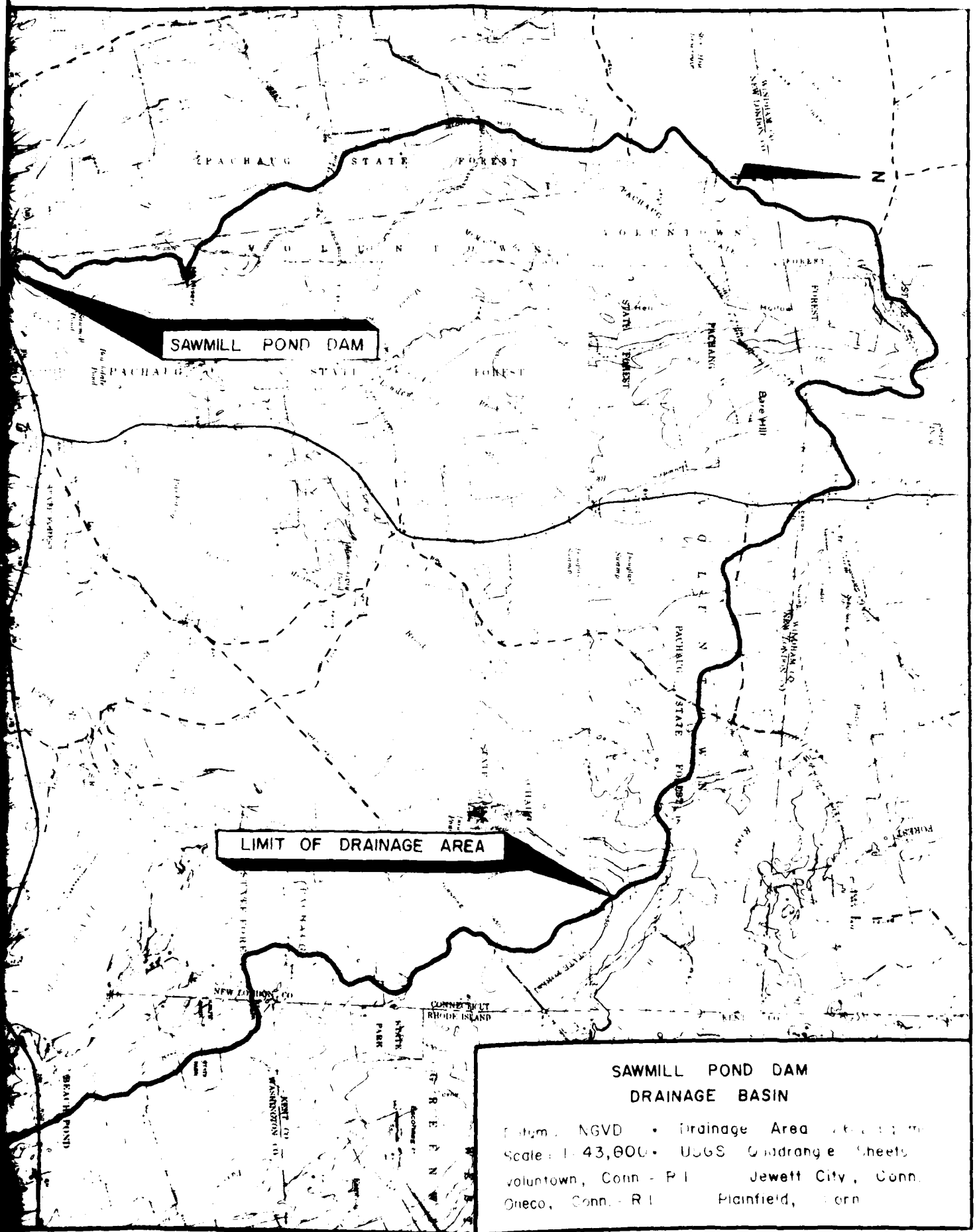


PHOTO C-16: Seepage through wall beneath sluiceway outlet.

APPENDIX D

HYDROLOGIC & HYDRAULIC COMPUTATIONS

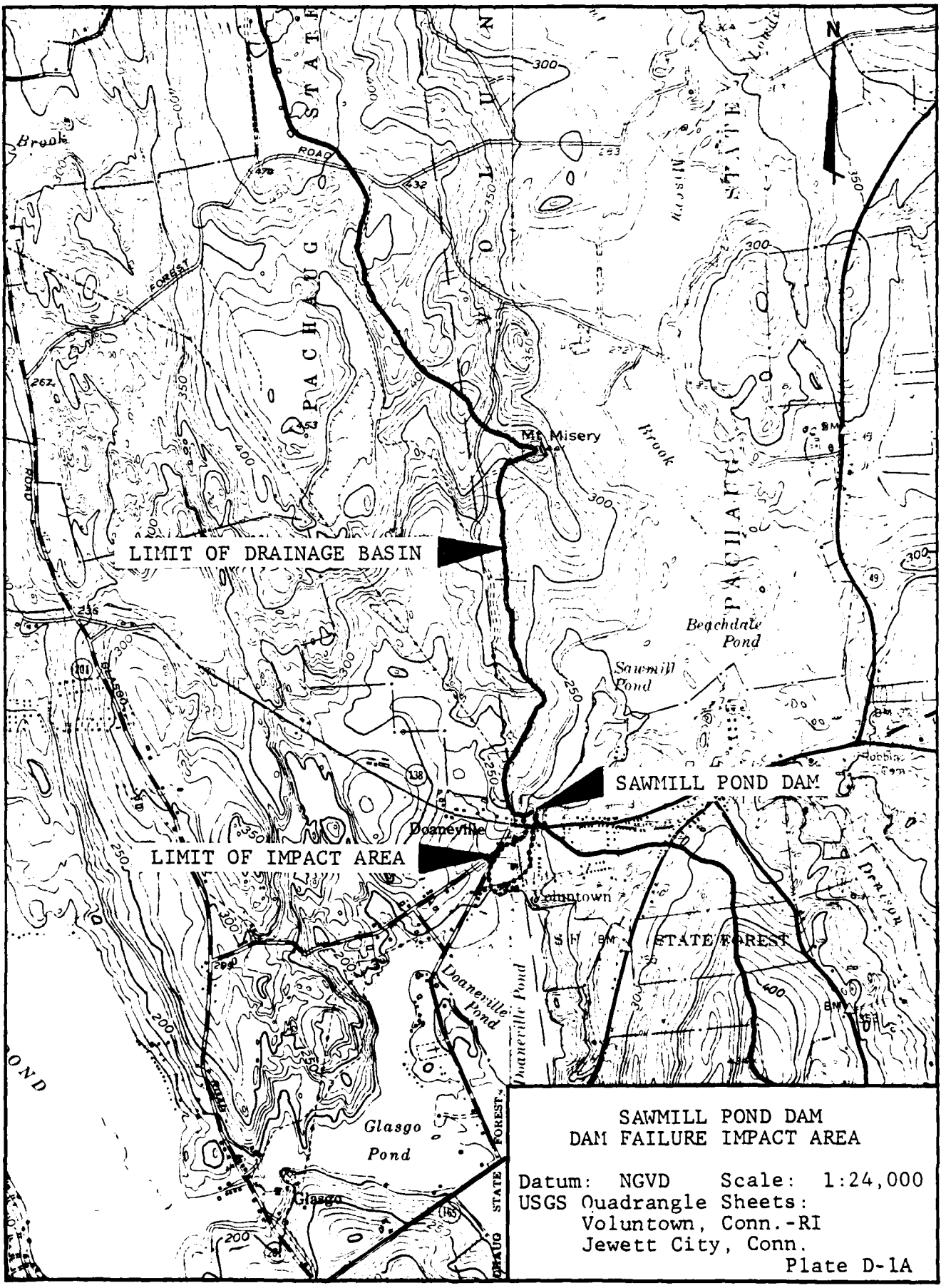

SAWMILL POND DAM
LIMIT OF DRAINA
GREENWOOD
PACHAUG
HOPKINTON
RHODE ISLAND
STATE FOREST
BEACH POND
STATE PARK



SAWMILL POND DAM
DRAINAGE BASIN

Datum: NGVD • Drainage Area [illegible]
Scale: 1" = 43,800' • USGS Quadrangle Sheets
Voluntown, Conn. - R.I. Jewett City, Conn.
Oneco, Conn. - R.I. Plainfield, Conn.

2



SAWMILL POND DAM
DAM FAILURE IMPACT AREA

Datum: NGVD Scale: 1:24,000
USGS Quadrangle Sheets:
Voluntown, Conn.-RI
Jewett City, Conn.

Plate D-1A

SAWMILL POND DAM

BASIC DATA

DRAINAGE AREA = 26.2 SQ MI
NORMAL POOL ELEV. = 235.0 (ESTMATED FROM USGS)
MAX POOL ELEV. = 238.0

RESEEVOIR :
@ NORMAL POOL - AREA = 8 ACRES
STORAGE = 40 AC-FT
@ MAX POOL - AREA = 8 ACRES
STORAGE = 64 AC-FT

DAM : EARTHFILL W/ STONE MASONRY FACES
MAX HEIGHT = 20 FT
LENGTH = 250 FT (INC HEADRACE DIKE)

SPILLWAYS :

MAIN - STONE MASONRY W/ WOODEN DECK
ELEVATION : 238.0 NGVD
LENGTH : 51.5 FT

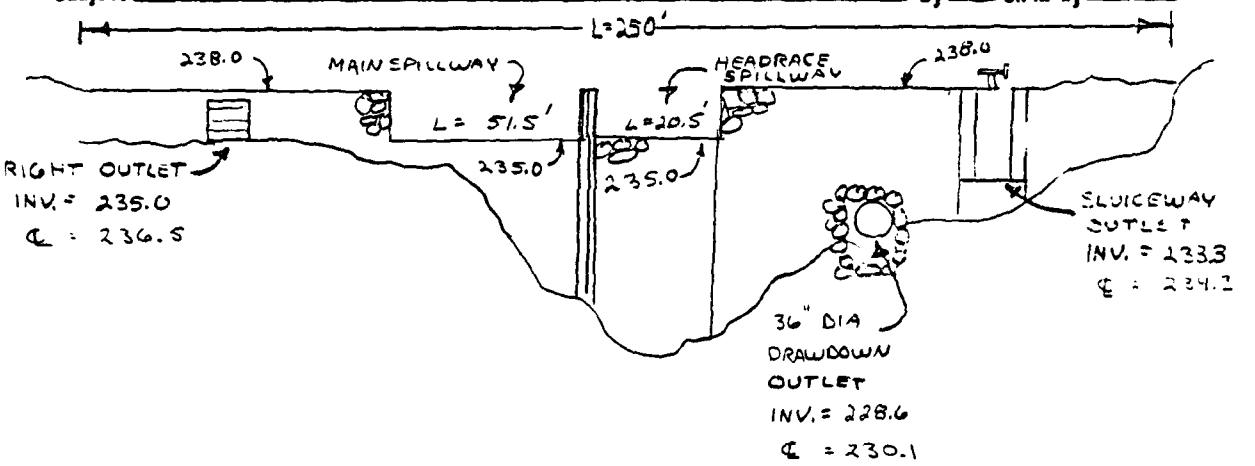
HEADRACE - STONE MASONRY
SPILLWAY ELEVATION : 235.0
LENGTH : 20.5 FT

OUTLETS

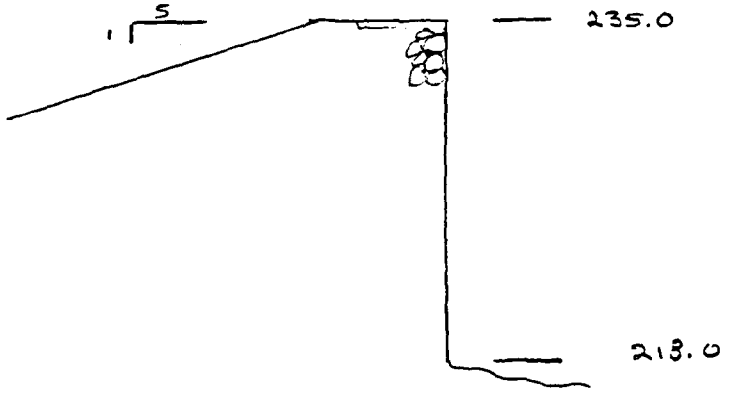
EMERGENCY BLOWOFF : 3 FT DIA STEEL PIPE
INVERT = 228.6

SLUICEWAY OUTLET : 2.5' W BY 2.0' H RECT. OUTLET
INVERT = 231.3

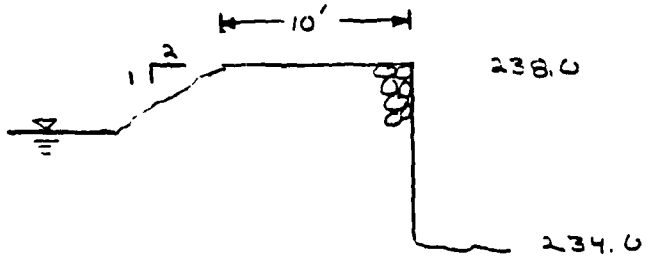
RIGHT OUTLET : 4.2' W X 3.1' H RECT. OPENING W/ STOPLOGS
INVERT = 235.0



LONGITUDINAL SECTION ALONG DAM - LOOKING UPSTREAM



MAIN SPILLWAY SECTION



RIGHT EMBANKMENT SECTION

New England Engineering, Inc. *PROVIDENCE, R.I. 02903*

Job No. 80105 Sheet 3 of 10
Project SAWMILL BRVD DAM Date
Subject By DS Ch'k. by LRE

CALCULATE TEST FLOOD

CLASSIFICATION : SMALL
HAZZARD : SIGNIFICANT ∴ USE 100 YR TO ½ PMF
USE : ½ PMF

FOR DA = 26.2 SQ MI.

PMF = 1350 CSM (FROM COE PMF CURVE)

REDUCE BY 30% FOR STORAGE AREAS WITHIN BASIN

PMF = .7 × 1350 CSM = 945 CSM

½ PMF = $\frac{945 \times 26.2}{2}$

= 12,380 CFS

CALCULATE DAM RATING CURVE

SPILLWAY & DAM DISCHARGE : $Q = CLH^{3/2}$

SPILLWAY (2) C = 3.0 COMBINED LENGTH = 20.5 + 51.5 = 72.0
DAM C = 2.6 L = 250 − 72.0 = 178.0

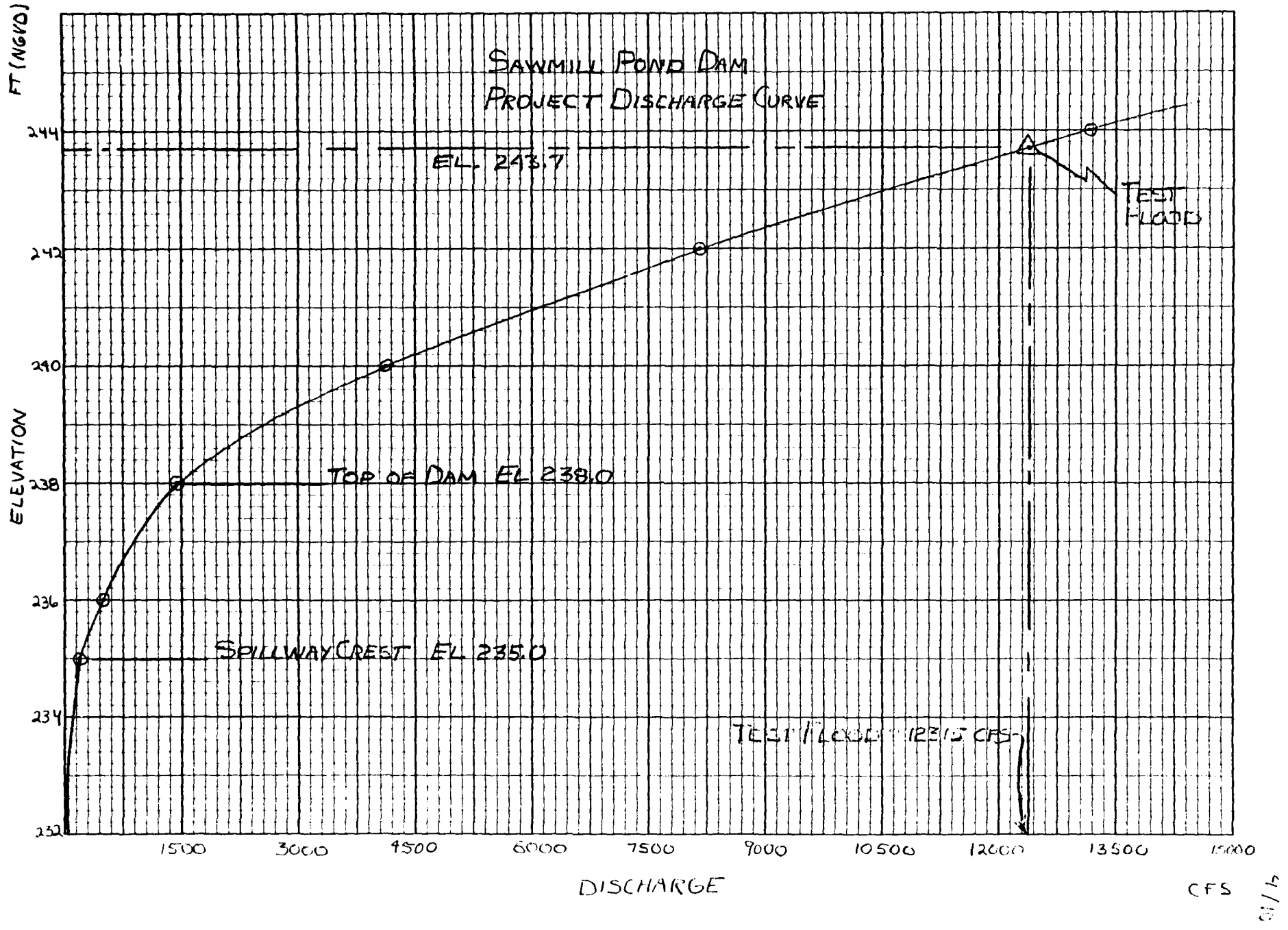
OUTLET DISCHARGE = $CA\sqrt{2gh}$

RIGHT OUTLET C = 0.60 AREA = 13 SQ FT
DRAWDOWN OUTLET C = 0.62 AREA = 7 SQ FT.
SLUICEWAY OUTLET C = 0.60 AREA = 5 SQ FT

ELEV.	H SPILL	Q SPILL	H DAM	Q DAM	H R.OUT.	Q R.OUT	H DRAW. OUT	Q DRAW OUT	H SLUICE. OUT.	Q SLUICE. OUT.	ΣQ
235.0	–	–	–	–	–	–	4.9	75	0.7	20	95
236.0	1.0	216	–	–	0.5	14	5.9	82	1.7	31	343
238.0	3.0	1122	–	–	1.5	77	7.9	95	3.7	46	1340
240.0	5.0	2415	2	1309	3.5	117	9.9	106	5.7	57	4004
242.0	7.0	4000	4	3702	5.5	147	11.9	116	7.7	67	8032
244.0	9.0	5832	6	6802	7.5	171	13.9	126	9.7	75	13006

@ TOP OF DAM :

MAIN SPILLWAY CAP. = 802 CFS
HEADRACE SPILL. CAP. = 320 CFS
RIGHT OUTLET CAP = 77 CFS
DRAWDOWN OUT. CAP. = 95 CFS
SLUICEWAY OUT. CAP. = 46 CFS
1340


SAWMILL POND DAM
PROJECT DISCHARGE CURVE
FT (NGVD)
ELEVATION
244
242
240
238
236
234
232
EL. 243.7
TEST FLOOD
TOP OF DAM EL 238.0
SPILLWAY CREST EL 235.0
TEST FLOOD = 12315 CFS
1500
3000
4500
6000
7500
9000
10500
12000
13500
15000
DISCHARGE
CFS

CALCULATE EFFECT OF SURCHARGE STORAGE

PEAK INFLOW = 13,560 CFS, SURCHARGE = 8.7 FT

SURCHAGE VOLUME = 8 AC x 8.7 FT = 69.6 AC-FT

$$V_1 = \frac{69.6 \text{ AC-FT} \times 12 \text{ IN}}{26.2 \text{ SQ. MI.} \times 640 \text{ AC/SQ MI.}} = .05 \text{ IN}$$

$$Q_{P1} = 12{,}380\left(1 - \frac{.05}{9.5}\right) = \underline{12{,}315}$$

NO FURTHER ITERATIONS ARE NECESSARY

$\therefore$

1. STORAGE WILL REDUCE THE TEST FLOOD DISCHARGE BY 65 CFS OR 0.5%
2. THE SPILLWAYS CAN PASS 1122 CFS OR 9% OF THE TEST FLOOD.
3. AT THE TEST FLOOD DISCHARGE OF 12,315 CFS, THE DAM WILL BE OVERTOPPED BY 5.7 FT.

DAM FAILURE ANALYSIS

DAM FAILURE DISCHARGE = $8/27\ W_B \sqrt{g}\ Y_o^{3/2}$

Y_o = BREACH HEIGHT = 20 FT.

W_B = BREACH WIDTH → 40% OF DAM LENGTH @ MID-HEIGHT
= .4 x 75 = 30 FT. (AT MAIN SPILLWAY)

$$Q_{FAIL.} = 8/27\,(30)\sqrt{32.2}\,(20)^{3/2}$$

= 4510 CFS + 320 (HEAD. SPILL Q.) = 4830 CFS

MAX DEPTH OF FLOW = $\frac{4}{9} Y_o$ = 8.9 FT

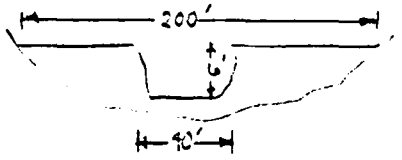
— THERE ARE TWO DAMS LOCATED 800 FT. & 1300 FT DOWN STREAM. THE FIRST DAM IS PARTIALLY BREACHED. THE BREACH IS APPROXIMATEY 6 FT. HIGH BY 40 FT WIDE

ESTIMATE DOWNSTREAM IMPACT

REACH 1

WILL BE CONTROLLED BY THE BREACHED DAM

APPROX. DIMENSIONS SHOWN BELOW



ESTABLISH RATING FOR DAM ; $Q = CLH^{3/2}$ $C = 2.8$

STAGE	H_{BREACH}	Q	H_{DAM}	Q	ΣQ
4	4	896	-	-	896
6	6	1646	-	-	1646
7	7	2075	1	560	2635
8	8	2535	2	1585	4120
9	9	3025	3	2910	5935

STAGE @ DAM DISCHARGE (1340 CFS) = 5.4 FT
STAGE @ FAILURE DISCHARGE (4830 CFS) = 8.4 FT
3.0 FT

ESTIMATE OUTFLOW FROM REACH 2

THE POND UPSTREAM FROM HAS AN AVERAGE WIDTH OF 200 FT, L = 400'

$V_1 = \frac{200\,FT \times 3.0\,FT}{43560} \times 400\,Ft$ (NEGLIGIBE STORAGE FROM DAM TO RT 138)

$= 5.5$ AC-FT

$Q_{P2} = \left(1 - \frac{16.5}{64}\right) 4830 = 4415$ CFS

@ 4415 CFS, STAGE = 8.2, $V = \frac{2.9 \times 200 \times 400}{43560}$ 5.1 AC-FT

$V_{AVG} = \frac{5.1 + 5.5}{2} = 5.3$

$Q_{P2} = \left(1 - \frac{5.3}{64}\right) 4830 = \underline{4430\ CFS}$, STAGE = 8.2

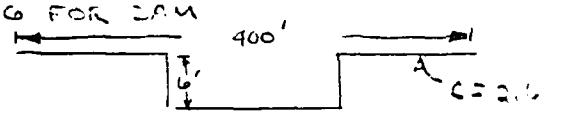
@ Q = 1340 (DAM Q), STAGE = 5.4 FT.

REACH 2 -

REACH 2 IS CONTROLLED BY A 2ND DAM DOWNSTREAM OF SAWMILL POND DAM - ESTIMATED WIDTH = 100'

ESTABLISH DISCHARGE RATING FOR DAM

$Q = CLH^{3/2}$, $C = 3.0$



STAGE	H_{SPILL}	Q	H_{ROAD}	Q	ΣQ
2	2	425	-	-	425
4	4	1200	-	-	1200
6	6	2445	-	-	2445
8	8	3394	2	2942	6336

@ Q_{FAIL} = 4430, STAGE = 7.3 FT, POND WIDTH = 200', L = 300'
@ $Q_{PREFAIL}$ = 1340, STAGE = 4.3 Δ = 3.0

$$V_1 = \frac{3.0 \times 200 \times 300}{43560} = 4.1 \text{ AC-FT}$$

$$Q_{P2} = \left(1 - \frac{4.1}{64}\right) 4430 = 4145 \text{ CFS}, \text{ STAGE} = 7.2'$$

$$V = \frac{2.9 \times 200 \times 300}{43560} = 4.0 \text{ AC-FT} \quad V_{AVG} = \frac{4.0 + 4.1}{2} = 4.05 \text{ AC-FT}$$

$$Q_{P2} = \left(1 - \frac{4.05}{64}\right) 4430 = \underline{4150 \text{ CFS}}, \text{ STAGE} = 7.1 \text{ FT}$$

∴ DAM COULD BE OVERTOPPED BY APPROX. 1.1 FT

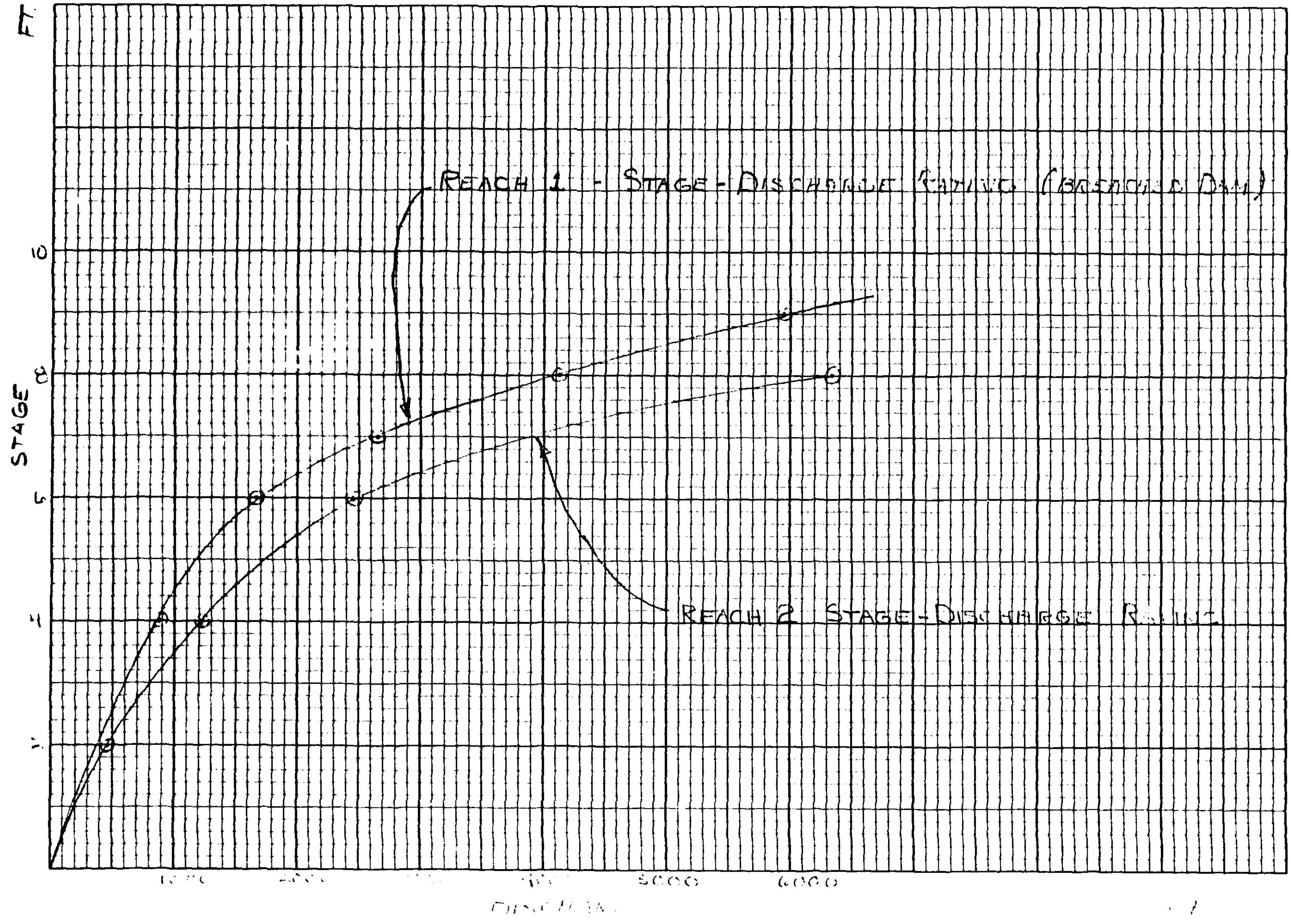
DOWNSTREAM OF THIS REACH, GLASGO & DOANEVILLE PONDS (SAME ELEVATION) HAVE A SURFACE AREA OF 170 ACRES

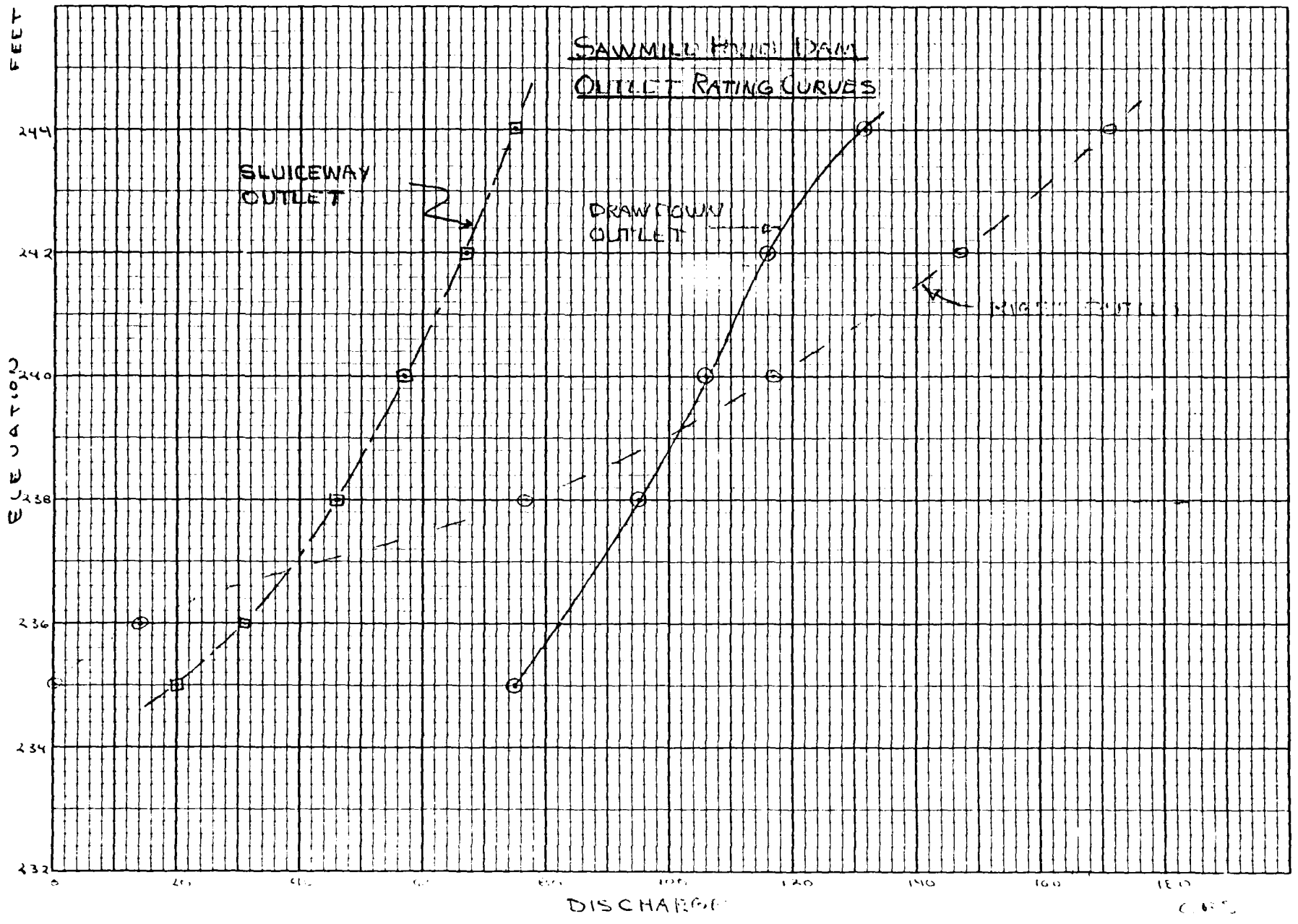
∴ ONE FOOT OF SURCHARGE CAN MORE THAN ACCOMODATE THE REMAINING ESTIMATED DAM FAILURE VOLUME OF SAWMILL POND (< 64 AC-FT) AND DOWNSTREAM IMPACT WOULD BE INSIGNIFICANT (DOWNSTREAM OF THESE PONDS)

ESTIMATE OF DAMAGE

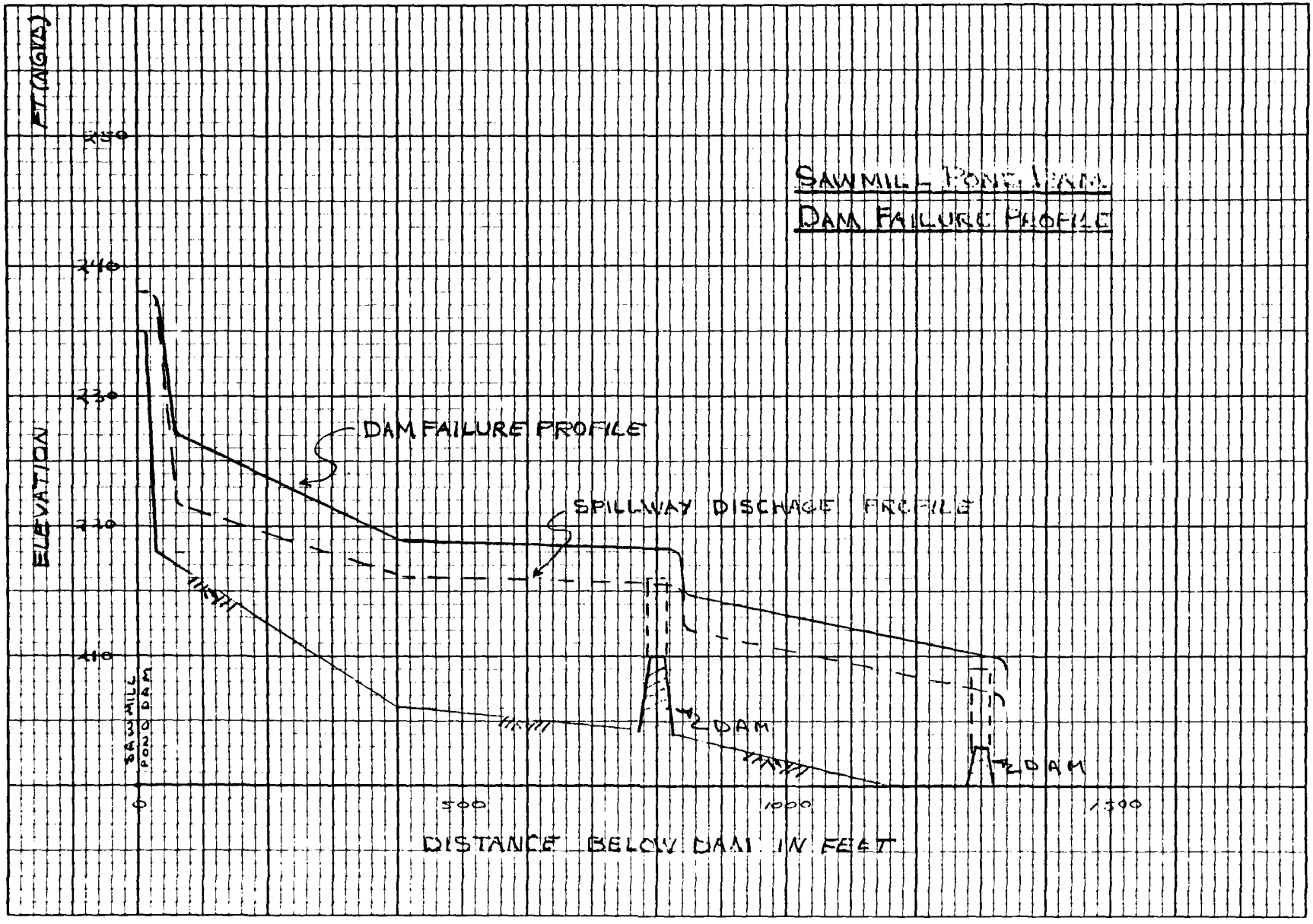
REACH 1 - @ $Q_{PREFAIL}$, STAGE = 1.2 FT @ Q_{FAIL}, STAGE = 2.4 FT
- 1-2 HOMES LOCATED IN THE IMPACT AREA & POTENTIAL FAILURE OF DOWNSTREAM DAM

REACH 2 - @ $Q_{PREFAIL}$, STAGE = 1.2 FT, @ Q_{FAIL}, STAGE = 2.4 FT
SEVERAL RESIDENTIAL STRUCTURES LOCATED IMMEDIATELY DOWNSTREAM OF 2ND DAM SUBJECT TO 1-2 FT OF FLOODING FROM OVERTOPPING.


REACH 1 - STAGE-
REACH 2 STAGE-
STAGE
FT
10
8
6
4
5000
6000

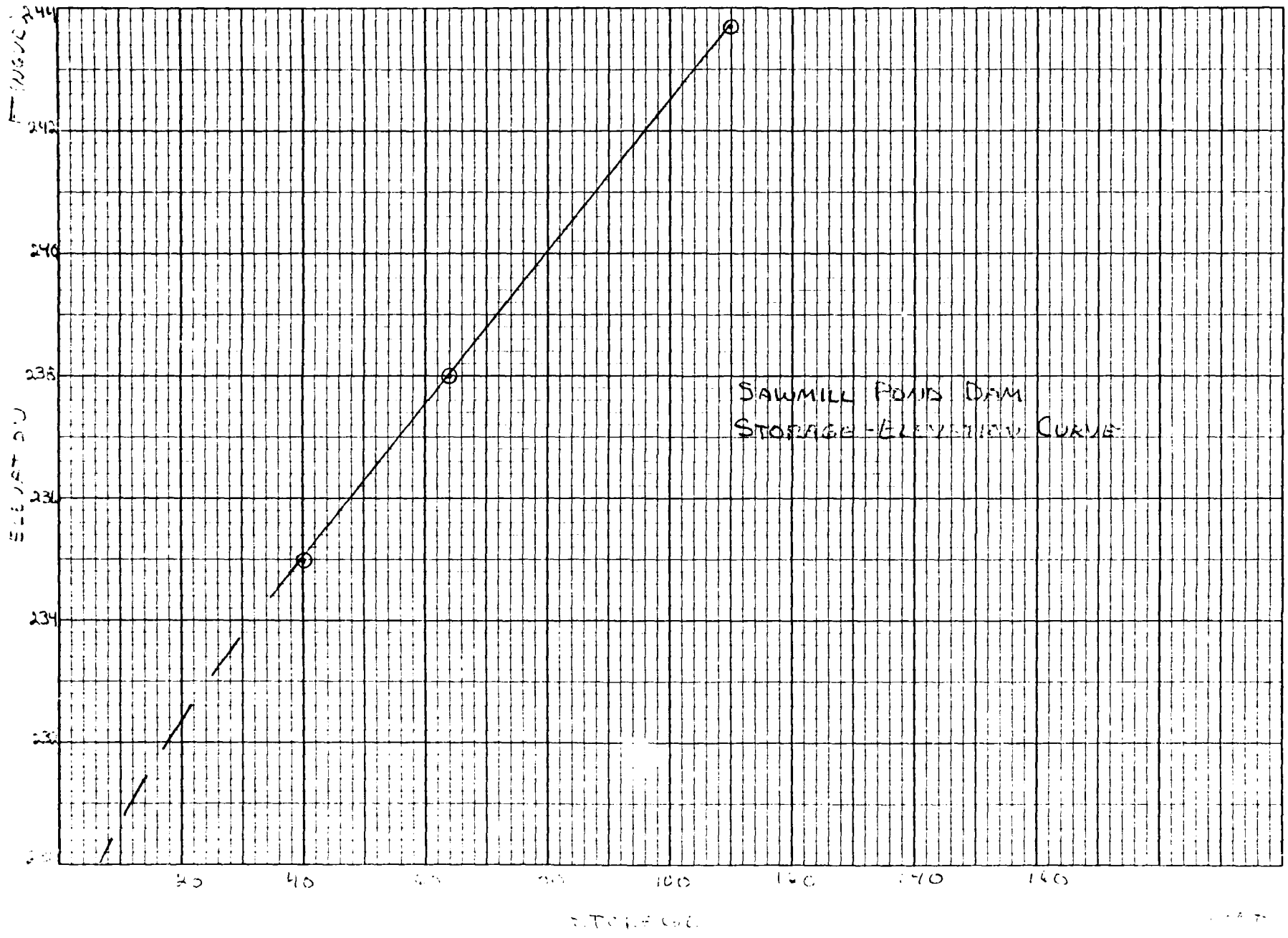

SAWMILL [illegible] DAM
OUTLET RATING CURVES
SLUICEWAY OUTLET
DRAWDOWN OUTLET
[illegible] OUTLET
ELEVATION FEET
244
242
240
238
236
234
232
0
20
40
60
80
100
120
140
160
180
DISCHARGE
CFS

9116



SAWMILL POND DAM
DAM FAILURE PROFILE

01/01


SAWMILL PONDS DAM
STORAGE-ELEVATION CURVE
244
242
240
238
236
234
232
40

APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS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ME