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NEW ENGLAND DIV MAR 79

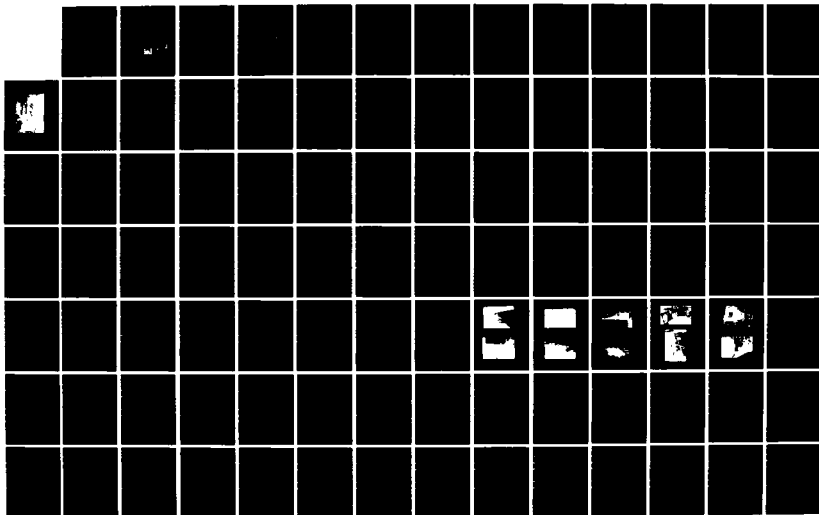
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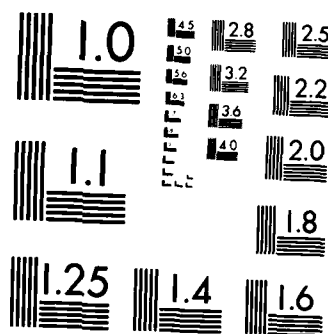
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AD-A155 999

PISCATAQUA RIVER BASIN
SOMERSWORTH, NEW HAMPSHIRE

NEW DAM
NH-00126

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The dam is a stone masonry gravity structure. The dam is about 35 ft. high and 270 ft. long. The dam is assessed to be in fair condition. The dam is small in size with a significant hazard potential. The test flood is $\frac{1}{2}$ of the PMF. There are various remedial measures that should be implemented by the owner.		

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:
NEDED

JUN 13 1970

Honorable Hugh J. Gallen
Governor of the State of New Hampshire
State House
Concord, New Hampshire 03301

Dear Governor Gallen:

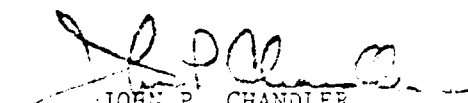
I am forwarding to you a copy of the New Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Water Resources Board, the cooperating agency for the State of New Hampshire. In addition, a copy of the report has also been furnished the owner, City of Somersworth, City Hall, Somersworth, New Hampshire, ATTN: Mr. Norman G. Leclerc, City Engineer.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Water Resources Board for your cooperation in carrying out this program.

Sincerely yours,


JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

PISCATAQUA RIVER BASIN
SOMERSWORTH, NEW HAMPSHIRE

NEW DAM

NH-00126

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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NATIONAL DAM INSPECTION PROGRAM

PHASE I INSPECTION REPORT

NH-00126

NEW DAM

SOMERSWORTH, NEW HAMPSHIRE

STRAFFORD COUNTY, NEW HAMPSHIRE

SALMON FALLS RIVER

November 15, 1978

BRIEF ASSESSMENT

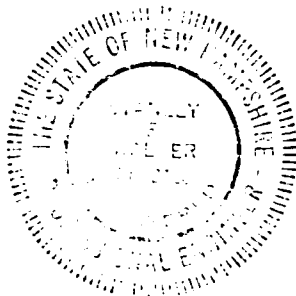
The New Dam is a stone masonry gravity structure. The dam is approximately 35 feet high, and about 270 feet long. The dam has a 178-foot long uncontrolled free overfall spillway.

Based on the visual inspection the New Dam is assessed to be in fair condition. Major concerns regarding the safety of the dam include: leakage through the dam, bulging of downstream face lack of operable outlet works, and lack of adequate closure of abandoned gateworks at both ends of dam.

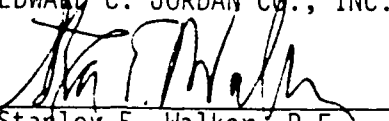
Based on the Corps of Engineers guidelines, the dam is classified as a small dam having a significant hazard potential. In accordance with Corps of Engineers' guidelines for the determination of spillway adequacy, the test flood is one-half the probable maximum flood (PMF). The spillway will pass 11,260 cfs or about 17 percent of the test flood. During the test flood, water would overtop the dam by about 10 feet at the north abutment.

The recommendations and items of remedial maintenance and operation presented in Section 7 should be implemented within 1 year of receipt of this report by the Owner. A qualified engineer should be retained to design the following: 1) provisions to curtail leakage through dam; 2) sealing or rehabilitation of the existing outlet works; 3) a facility to drain the impoundment in the event of an emergency or for maintenance; and 4) a means of curtailing deflection of the masonry in the downstream face of the dam. Such modifications and rehabilitations should be implemented within a time frame to be recommended by the Engineer. Remedial maintenance includes: 1) repair spalled concrete spillway crest;

2) repair spalled and cracked surfaces of concrete training walls; 3) develop a formal warning system; 4) provide around-the-clock surveillance during heavy runoff periods; and 5) institute a program of annual periodic technical inspection.



EDWARD C. JORDAN CO., INC.


Stanley E. Walker, P.E.
Project Officer

This Phase I Inspection Report on New 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 judgment and practice, and is hereby
submitted for approval.

Joseph W. Finegan
JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division

Carney M. Terzian
CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

Joseph A. McElroy
JOSEPH A. MCELROY, CHAIRMAN
Chief, NED Materials Testing Lab.
Foundations & Materials Branch
Engineering Division

APPROVAL RECOMMENDED:

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

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

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

TABLE OF CONTENTS

	<u>Page</u>
LETTER OF TRANSMITTAL	
BRIEF ASSESSMENT	i
REVIEW BOARD SIGNATURE SHEET	iii
PREFACE.	iv
TABLE OF CONTENTS.	v
OVERVIEW PHOTOGRAPH.	vii
LOCATION MAP	viii

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL	1-1
1.2 DESCRIPTION OF PROJECT.	1-1
1.3 PERTINENT DATA.	1-3

SECTION 2 - ENGINEERING DATA

2.1 DESIGN.	2-1
2.2 CONSTRUCTION.	2-1
2.3 OPERATION	2-1
2.4 EVALUATION.	2-1

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS.	3-1
3.2 EVALUATION.	3-3

SECTION 4 - OPERATING PROCEDURES

4.1 PROCEDURES.	4-1
4.2 MAINTENANCE OF DAM.	4-1
4.3 MAINTENANCE OF OPERATING FACILITIES	4-1
4.4 DESCRIPTION OF ANY WARNING SYSTEM IN EFFECT	4-1
4.5 EVALUATION.	4-1

TABLE OF CONTENTS (Continued)

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 EVALUATION OF FEATURES	5-1
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SECTION 6 - STRUCTURAL STABILITY

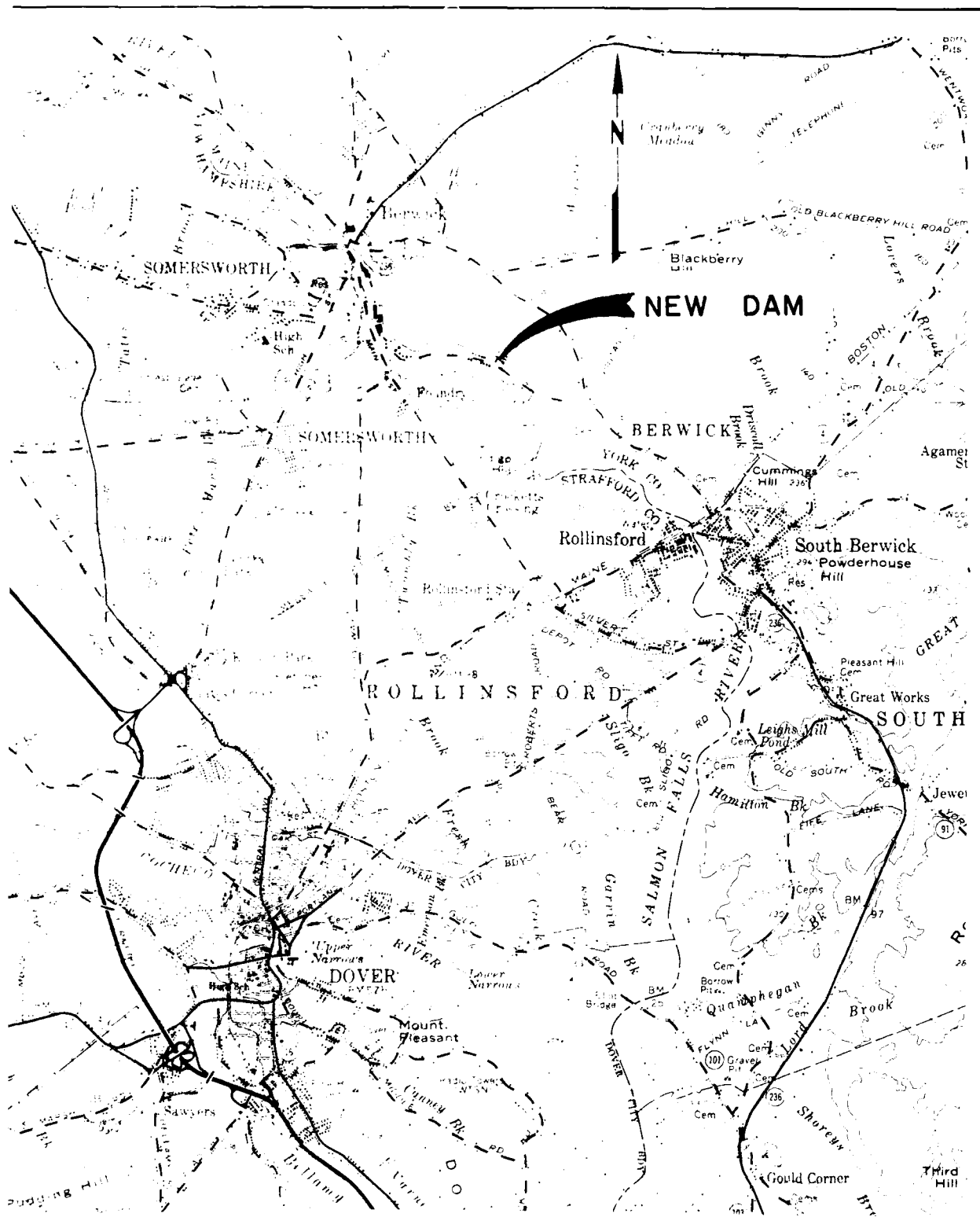
6.1 EVALUATION OF STRUCTURAL STABILITY	6-1
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SECTION 7 - ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 DAM ASSESSMENT	7-1
7.2 RECOMMENDATIONS.	7-1
7.3 REMEDIAL MEASURES.	7-2
7.4 ALTERNATIVES	7-2

APPENDICES

A FIELD INSPECTION NOTES	
B ENGINEERING DATA	
C PHOTOGRAPHS	
D HYDROLOGIC AND HYDRAULIC COMPUTATIONS	
E INVENTORY FORMS	



U S GEOLOGICAL SURVEY MAP

BERWICK, ME. - N.H. QUADRANGLE
DOVER, N.H. - ME. QUADRANGLE

2 3 MILES

NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS	
NEW DAM	
LOCATION MAP	
SALMON FALLS RIVER ME. - N.H.	
20799101	AS SHOWN MARCH 1972

- f. Dam Failure Analysis. To determine the hazard classification for the New Dam, the potential impact of failure of the dam at maximum pool was assessed. The failure analysis relied upon the "rule of thumb" guidelines outlined in an attachment to ETL 1100-2-234. The hazard potential was determined by calculating downstream dam failure hydrographs which might result from a breach of the spillway section of the dam.

Flow at the dam, with water at top of the dam, would be about 11,000 cfs, which is considered to represent a significant flood discharge. At a distance of 4300 feet below the dam, peak flood flow would be reduced to 8700 cfs, corresponding to a flood stage of 4 to 5 feet. The flood peak at the dam from failure was computed to be 31,560 cfs. It would take the reservoir approximately 35 to 40 minutes to empty. At a distance of 4,300 feet below the dam, the peak flow from failure would be reduced to about 13,000 cfs resulting in flood stage of about 8 feet. Inflow to the reservoir located downstream of the New Dam would be approximately 10,600 cfs under the failure conditions assumed. This downstream dam is situated between the towns of South Berwick, Maine and Rollinsford, New Hampshire. The flow from failure of the New Dam was routed through this downstream dam. The routed peak outflow was calculated to be 6,500 cfs.

Failure of the New Dam would result in potential loss of life and considerable property damage at the apartments located immediately below the dam on the south bank. Some flooding to a depth of 1 to 2 feet could also be expected in Rollinsford and South Berwick. Approximately 5 industrial buildings would be affected in these towns.

Due to its stone masonry construction, the New Dam would be expected to be fairly stable during overtopping conditions.

SECTION 5

HYDROLOGIC AND HYDRAULIC ANALYSIS

5.1 EVALUATION OF FEATURES

- a. General. The New Dam is a stone masonry gravity structure. The dam is about 35 feet high, 270 feet long. It has a spillway crest width of about 2 feet and a spillway length of about 178 feet. Originally the dam was constructed for power production and process water storage. It is now used for process water storage and recreational purposes.
- b. Design Data. No original hydrologic or hydraulic design data were available.
- c. Experience Data. No information regarding past overtopping or other notable hydrologic events was available. According to U.S.G.S. Water Supply Paper 798, the flood of March 1936 produced a peak discharge of approximately 8,600 cfs at Somersworth, N.H. and overtopped the New Dam by about 7 feet.
- d. Visual Observations. The pond level is controlled only by the free-overfall spillway. During the inspection, the following observations of the hydraulic characteristics of the dam were made: 1) considerable leakage was occurring at the toe of the south abutment; 2) some erosion of the concrete spillway crest has occurred; and 3) the approach and outlet channels are clear and unobstructed. There was no evidence of damage caused by overtopping.
- e. Test Flood Analysis. The New Dam is a small dam having a significant hazard potential. Based on the Corps of Engineers "Recommended Guidelines for Safety Inspection of Dams," a test flood equal to one-half of the probable maximum flood (PMF) was used in evaluating the dam's spillway capacity. There is no design flood control pool provided by the dam. The 219 square mile drainage area is characterized as flat and coastal. As shown in Appendix D, the surcharge storage has no measurable effect on the peak of the test flood. The test flood produces a peak flow of 32,900 cfs. The spillway is capable of discharging 11,260 cfs with water level at top of dam (elev. 119.7 MSL). During the test flood event, water would overtop the dam to a height of 5.4 feet at the north abutment and 2.6 feet at the south abutment.

SECTION 4
OPERATING PROCEDURES

4.1 PROCEDURES

Since there are no operational gateworks at the dam, the only provision for discharge from the reservoir is over the uncontrolled free-overfall spillway.

4.2 MAINTENANCE OF DAM

Reportedly, maintenance is performed on an as-needed basis. It appears that maintenance of the structure in recent years has consisted of the application of concrete patches on the downstream face and north abutment.

4.3 MAINTENANCE OF OPERATING FACILITIES

Not applicable.

4.4 DESCRIPTION OF ANY WARNING SYSTEM IN EFFECT

No warning system is known to be in effect.

4.5 EVALUATION

Current maintenance and operating procedures are inadequate. The dam lacks a pond drain which could be used in emergencies or to facilitate repairs. No established surveillance or flood warning system is in effect.

gates appear to be operational, however, the penstock into which the outlet discharges has apparently been blocked and abandoned. Holes in the ground in the area of the old penstock noted in previous inspection reports were not observed on November 15, 1979. At the northerly end of the dam is another abandoned headworks. The penstock from this headworks has been partially filled and abandoned. Although they are abandoned, neither of these headworks has been permanently sealed.

- d. Reservoir Area. The reservoir's northerly shoreline is primarily forested. The southerly shore contains many residences. Slopes above high waterline are gentle to moderate. No evidence of recent landslides was observed during the inspection.
- e. Downstream Channel. The downstream channel, just below the dam, is straight, of regular cross-section, unconstricted, steep and rocky. Within about 500 feet below the dam the slope is reduced to about 8 feet per mile. The overbank areas are sparsely to moderately wooded with a moderate growth of underbrush. There is a dam located approximately 2.4 miles below the New Dam between the towns of Rollinsford, New Hampshire and South Berwick, Maine just upstream of the Boston and Maine Railroad crossing of the Salmon Falls River.

3.2 EVALUATION

Based on the visual inspection findings, the New Dam appears to be in fair condition. Substantial leakage is occurring through and beneath the dam. The downstream face has slightly bulged in some areas. The only provision for discharge from the reservoir is over the spillway. The appurtenant gateworks have been abandoned but not permanently sealed. As outlined in Section 7, rehabilitative construction and maintenance are necessary.

bulges (less than 6 inches). A concrete sill of varying heights placed at the toe appears to have been a corrective measure for the displacement.

- (d) Substantial seepage is occurring through the dam and discharging primarily near the downstream toe. In some areas the seepage is outletting at a point about $\frac{2}{3}$ the height of the dam. Heavy flow is also occurring through the drain pipes in the concrete sill along the toe of the dam.
- (e) The surface of the concrete spillway crest and training walls is deteriorating. The spalling and eroding of the spillway crest has exposed reinforcing steel in many areas. The training walls, particularly the southerly wall, are cracked and badly spalled.

- (2) Hydraulics - during the initial inspection visit (November 15, 1978), water was flowing over the spillway crest at a depth of about 0.15 feet (20 to 40 cfs). During the review visit (December 1, 1978) the crest was dry and the entire river flow was leaking through the dam. Hydraulic control of the water surface is provided by the capacity of the spillway since there are no operable gated outlet works at the dam. The dam cannot be drained for repairs or emergency situations without breaching it. Although not observed at the time of inspection, the Somersworth Director of Public Works, Norman Leclerc, reported that there were several eroded depressions at the upstream face. This suggests that piping may be taking place through the dam. No significant scour or undermining of the dam foundation was observed at the time of inspection. A detailed inspection of the downstream toe was not possible due to tailwater conditions.

c. Appurtenant Structures. Appurtenant to the dam are two sets of headworks. At the south end of the dam are two vertical lift gates with hoists. These

SECTION 3
VISUAL INSPECTION

3.1 FINDINGS

a. General. The New Dam, located in a broad steep sided valley along the Salmon Falls River, is classified as a small dam. The dam appears to be founded on bedrock and shows no signs of distress related to foundation support. No operational outlet works exist at the dam. An uncontrolled, free-overfall spillway extends across almost the entire length of the dam.

b. Dam

(1) Structural - the dam is constructed of dry-laid stone masonry with a concrete capped spillway crest. The north abutment is mortar-laid stone masonry with a concrete cap. The south abutment is mortar-laid stone masonry and concrete. See plan, profile and cross-sections in Appendix B. In general, the New Dam appears to be in fair condition (see Appendix A for detail inspection findings). The inspection resulted in the following major findings:

- (a) The abutments and training walls consist of mortar-laid stone masonry and concrete and appear to be founded on bedrock. The abutments appear to be in generally good condition and true to line and grade. No leakage was observed through or around the north abutment; however, heavy leakage was occurring at the toe of the south abutment.
- (b) The spillway crest appears true to line and grade with no sags or lateral displacement. The crest was constructed of concrete formed to overlie the stone masonry.
- (c) The bottom of the downstream face has several relatively small downstream

SECTION 2
ENGINEERING DATA

2.1 DESIGN

No design data were available for the New Dam.

2.2 CONSTRUCTION

No engineering data were available regarding construction of the New Dam.

2.3 OPERATION

No engineering operational data were available.

2.4 EVALUATION

- a. Availability. There are essentially no engineering data or plans available that would be useful in evaluating the integrity of New Dam.
- b. Adequacy. The lack of 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 and engineering judgment.
- c. Validity. Not applicable.

Upstream Channel - The approach channel to the spillway is clear and unobstructed.

Downstream Channel - The downstream channel, just below the dam, is straight, of regular cross-section, unconstricted, steep and rocky. Within 500 feet below the dam the slope is reduced to about 8 feet per mile. There are remnants of an old tailrace and training wall for former turbine discharge on a north bank. The overbank areas are sparsely to moderately wooded with a moderate growth of underbrush. There is a dam located approximately 2.4 miles below the New Dam between the towns of Rollinsford, New Hampshire and South Berwick, Maine.

- j. Regulating Outlets. None visible. According to information received from the New Hampshire Water Resources Board there is a deep gate near the north abutment. However, no information pertaining to such a gate is available.

f. Reservoir Surface Area.

<u>Item</u>	<u>Acres</u>
Normal water surface	33
Top of dam (elev. 119.7)	62
PMF pool	117
1/2 PMF pool	90

g. Dam

- (1) Type - stone masonry gravity structure with a mortar-laid stone masonry and concrete abutments.
- (2) Length - the length between abutments is approximately 270 feet.
- (3) Height - 35 feet from top of dam to stream bed
- (4) Top Width - approximately 2 feet at spillway crest
- (5) Side slopes - See Plan and cross-sections in Appendix B-1.
- (6) Zoning - Unknown
- (7) Impervious Core - Not available
- (8) Cutoff - stone masonry apparently placed on bedrock
- (9) Grout Curtain - none

h. Diversion and Regulating Tunnel. Not applicable.

i. Spillway

Type - Uncontrolled broad crested weir, free over-fall type.

Length - Approximately 178 feet.

Crest Elevation - Approximately 113.1 feet (MSL).

Gates - None.

- (4) Total project discharge at 1/2 PMF - 32,850 cfs at elevation 125.1 feet.

c. Elevation. During the field inspection, no physical reference of the dam elevation to mean sea level was readily available. An approximate elevation based on mean sea level was calculated by noting the dam's location on a U.S.G.S. topographic map. The following elevations above mean sea level are approximate only.

Item	Elevation Above MSL
Top of dam - north abutment	119.7
south abutment	122.5
PMF pool	129.8
1/2 PMF pool	125.1
Spillway crest	113.1
Full flood control pool	Not Applicable
Streambed at centerline of dam	84.6
Maximum tailwater	Unknown
Normal water surface (spillway crest)	113.1

d. Reservoir Reach.

Item	Length (Feet)
Normal water surface pool	4,400
Top of Dam (elev. 119.7)	6,600

e. Reservoir Storage Capacity.

Item	Acre-Feet
Normal water surface pool	476
Top of dam (elev. 119.7)	800
PMF pool	1571
1/2 PMF pool	1146

Previous: Great Falls Manufacturing Co.
unknown to 1929

Public Service Co. of New Hampshire
1929 to 1963

f. Operator.

None.

Responsible Contact: Norman G. Leclerc, City Engineer
Tel. 603-692-3421

g. Purpose of Dam. The dam was originally constructed to provide process water and water for hydromechanical power generation to the Great Falls Manufacturing Co. Mills. Several companies currently obtain water for their respective needs from the impoundment.

h. Design and Construction History. Very little design and construction data pertinent to this dam was available. According to the current owner of the adjacent buildings, Mark Phillips, the dam was built at this site in 1825.

i. Normal Operating Procedures. The New Dam has no operable controlled outlet works. No flashboards are in use at the free overfall spillway. The water surface elevation is governed by the flow of the river.

1.3 PERTINENT DATA

a. Drainage Area. The drainage area above the New Dam is about 220 square miles. The watershed is primarily forested with some urbanized areas and a significant amount of low-lying swampy terrain.

b. Discharge at Dam Site. Discharge can only be made at the spillway. The following discharges were estimated assuming water surface at top of the north abutment unless otherwise noted:

- (1) Spillway capacity - 11,260 cfs
- (2) Maximum historical flood discharge at dam site is unknown.
- (3) Total project discharge at PMF - 65,700 cfs at elevation 129.8 feet.

spillway and mortar-laid stone masonry and concrete abutments.

Information received from the New Hampshire Water Resources Board, indicates that a deep gate is located near the east abutment. However, no information pertaining to such a gate is available.

Appurtenant to the dam are two sets of headworks gates. At the south end of the dam are two timber vertical lift gates with hoists. These gates appear to be operational, however, the penstock into which the outlet discharges has an abandoned headworks at the north end of the dam. The canal leading from the headworks to the penstocks has been abandoned and filled.

- c. Size Classification. The New Dam has a storage capacity of about 800 acre-feet and a height of 35 feet assuming water surface at the top of the north abutment. According to the Corps of Engineers "Recommended Guidelines for Safety Inspection of Dams," a dam with storage capacity less than 1000 acre-feet and a height of less than 40 feet is classified as a small dam.
- d. Hazard Classification. The New Dam has a significant hazard potential. Failure of the dam could cause damage to the apartment building located immediately downstream. There is a potential for loss of life if the bottom floor of the apartment building were occupied at the time of failure. Flooding to a depth of 1 to 2 feet would occur in a few buildings, primarily industrial, in the towns of Rollinsford, N.H. and South Berwick, Maine, located approximately 2.4 miles downstream of the dam.
- e. Ownership.

Current: City of Somersworth
 City Hall
 Somersworth, New Hampshire
 Tel: 603-692-3421

According to the Owner, the remnants of the appurtenant structures in the north abutment, i.e. deep gate section, canal, and power house area, have been purchased by a private Maine party.

PHASE I INSPECTION REPORT

NEW 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. Edward C. Jordan Co., Inc. has been retained by the New England Division to inspect and report on selected dams in the states of Maine and New Hampshire. Authorization and notice to proceed were issued to Edward C. Jordan Co., Inc. under a letter of December 1, 1978 from Max B. Scheider, Colonel, Corps of Engineers. Contract No. DACW33-79-C-0017 has been assigned by the Corps of Engineers for this work.

b. Purpose

- (1) To 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) To encourage and prepare the states to initiate effective dam safety programs for non-Federal dams.
- (3) To update, verify and complete the National Inventory of Dams.

1.2 DESCRIPTION OF PROJECT

a. Location. The New Dam is located on the Salmon Falls River in the City of Somersworth, New Hampshire. N 43°-15.6', W 70°-51.6'.

b. Description of Dam and Appurtenances. New Dam is a stone-masonry gravity structure. It is approximately 35 feet high and is about 270 feet long. The dam has a 178-foot long uncontrolled free overfall



OVERVIEW

SECTION 6

STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

- a. Visual Observations. Based on the visual observations made during the field inspection, the New Dam appears to be in fair condition. The downstream masonry face has deflected slightly downstream in some areas. A concrete sill and short retaining walls have been constructed along the toe of the dam as a corrective measure. These repairs appear to have been effective.

Heavy leakage is occurring through the masonry of the dam indicating the absence of an effective impervious zone. This leakage has resulted in the piping of soil from the upstream face as reported in previous inspections. Continued erosion of this surface could cause increased volume and velocity of flow and disruption of the stone masonry. During freezing weather this seepage may cause displacement of the stone masonry due to freezing of water within the joints. Such frost action most likely causes the bulging of the downstream face, as reportedly progressive deflection occurs annually.

- b. Design and Construction Data. No data concerning original design or construction were available.
- c. Operating Records. No operating records were available.
- d. Post-Construction Changes. Major repair and new construction was performed on the dam in 1931. This work reportedly included re-surfacing the spillway crest, repair to the gateworks at the south end of the dam, repair to the upstream face of the dam, and the construction of a canal around the north end of the dam to a new powerhouse. Since 1931, the canal has been filled and repairs along the toe of the downstream face of the dam have been made. Some time following the 1969 inspection, the north abutment was partially secured with a sizable concrete patch.

- e. Seismic Stability. The dam is located in Seismic Zone No. 2 and in accordance with recommended Phase I guidelines, does not warrant seismic analysis.

SECTION 7

ASSESSMENT, RECOMMENDATIONS, AND REMEDIAL MEASURES

7.1 DAM ASSESSMENT

- a. Condition. Based on the visual inspection, the New Dam is assessed to be in fair condition. The inspection identified the following areas of major concern:
- (1) Leakage through the dam.
 - (2) Bulging of the downstream face.
 - (3) Lack of operable outlet works, no provision for drainage during emergency situations or repair of dam.
 - (4) Lack of adequate closure of abandoned gate-works at both ends of dam.
- b. Adequacy of Information. The information available is such that the assessment of the condition of the dam must be based primarily on the visual inspection and engineering judgment.
- c. Urgency. The recommendations and remedial measures outlined in 7.2 and 7.3 below should be implemented within 1 year after receipt of this report by the owner.
- d. Need for Additional Investigation. Additional investigation is not considered necessary for the current assessment.

7.2 RECOMMENDATIONS

The need and appropriate construction details for the following should be evaluated and developed by a qualified engineer and implemented as found necessary:

- a. Provisions to curtail the leakage through the dam.
- b. Rehabilitation or sealing the existing gateworks.

- c. Facility to drain the impoundment in the event of an emergency or for maintenance.
- d. A means of curtailing deflection of the masonry in the downstream face of the dam.
- e. Increased spillway capacity.

7.3 REMEDIAL MEASURES

- a. Operating and Maintenance Procedures. A program of regular inspection and maintenance of the dam should be implemented and recorded. It should include the following specific maintenance and operating procedures:
 - (1) Repair the spalled surface of the concrete spillway crest.
 - (2) Repair the spalled and cracked surfaces of the concrete training walls.
 - (3) Provide around-the-clock surveillance during periods of heavy runoff.
 - (4) Develop a formal warning system and implement its use in the event of an emergency.
 - (5) Institute a program of annual periodic technical inspections.

7.4 ALTERNATIVES

An alternative to rehabilitation to the dam would be the removal of the structure. If the structure is to be removed, such removal should be under the supervision of a qualified engineer with consideration given to potential release of accumulated sediments or other possible environmental impacts of lowering the level of the reservoir.

APPENDIX A

VISUAL INSPECTION CHECK LIST
AND
SUPPLEMENTARY INSPECTION NOTES

VISUAL INSPECTION CHECKLIST PARTY ORGANIZATION

PROJECT New Dam

DATE 11-15-78

TIME A.M.

WEATHER Sunny, cool

W.S. ELEV. 113.2 U.S. DN.S.

PARTY:

- | | |
|---------------------------|-----------------------|
| 1. <u>Stephen W. Cole</u> | 6. <u>John Kimble</u> |
| 2. <u>Brian Bisson</u> | 7. <u> </u> |
| 3. <u>John Devine</u> | 8. <u> </u> |
| 4. <u>Scott Decker</u> | 9. <u> </u> |
| 5. <u>Tim Noonan</u> | 10. <u> </u> |

PROJECT FEATURE	INSPECTED BY	REMARKS
1. <u>Geotechnical</u>	<u>Cole</u>	
2. <u>Structural</u>	<u>Cole, Decker, Devine</u>	
3. <u>Hydraulics/Hydrology</u>	<u>Bisson, Devine</u>	
4. <u>Civil</u>	<u>Decker</u>	
5. <u>Photography</u>	<u>Decker, Bisson</u>	
6. <u>Survey</u>	<u>Noonan, Kimble</u>	

Review Inspection S. Walker, C. Horstmann

12/1/78 NOTE: Pond level about 0.6 feet below spillway crest; no overflow, downstream face was visible.

NOTE: See Supplementary Inspection Notes Following Checklist

INSPECTION CHECKLIST

PROJECT New Dam DATE 11-15-78
 PROJECT FEATURE Dam Embankment NAME Cole
 DISCIPLINE Geotechnical NAME _____

AREA EVALUATED	CONDITIONS
<u>DAM EMBANKMENT</u>	Embankment consists only of back-fill at abutments and refill of a canal around the east abutment which has been backfilled.
Crest Elevation	119.7
Current Pool Elevation	113.2
Maximum Impoundment to Date	
Surface Cracks	None
Pavement Condition	Turf
Movement or Settlement of Crest	None
Lateral Movement	None
Vertical Alignment	Good
Horizontal Alignment	Good
Condition at Abutment and at Concrete Structures	Good
Indications of Movement of Structural Items on Slopes	None
Trespassing on Slopes	None apparent
Sloughing or Erosion of Slopes or Abutments	None
Vegetation	Turf

AREA EVALUATED	CONDITIONS
----------------	------------

DAM EMBANKMENT (cont.)

Rock Slope Protection - Riprap Failures	None
Unusual Embankment or Downstream Seepage	None
Piping or Boils	None
Foundation Drainage Features	None
Toe Drains	None
Instrumentation System	None

INSPECTION CHECKLIST

PROJECT New Dam DATE 11-15-78
 PROJECT FEATURE Intake Channel/Structure NAME Cole
 DISCIPLINE Structural, Geotechnical NAME Decker, Bisson
Hydraulics/Hydrology

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE</u>	
a. Approach Channel	No operational gated outlet works were observed. Abandoned, closed gateworks exist at both the north and south ends of the dam. These outlet works have not been sealed closed by bulk-heads and the gates are intact. The outlets have apparently been blocked.
Slope Conditions	
Bottom Conditions	
Rock Slides or Falls	
Log Boom	
Debris	
Condition of Concrete Lining	
Drains or Weep Holes	
b. Intake Structure	
Condition of Concrete	
Stop Logs and Slots	
Debris Screen	

INSPECTION CHECKLIST

PROJECT New Dam

DATE 11-15-78

PROJECT FEATURE Control Tower

NAME Cole

DISCIPLINE Structural

NAME Decker

AREA EVALUATED	CONDITION
----------------	-----------

OUTLET WORKS - CONTROL TOWER

None

a. Masonry and Structural

General Condition

Condition of Joints

Spalling

Visible Reinforcing

Rusting or Staining of Concrete

Any Seepage or Efflorescence

Joint Alignment

Unusual Seepage or Leaks in Gate Chamber

Cracks

Rusting or Corrosion of Steel

b. Mechanical and Electrical

Air Vents

Float Wells

Gate Hoist

Elevator

NOT APPLICABLE

AREA EVALUATED	CONDITIONS
<u>OUTLET WORKS - CONTROL TOWER (cont.)</u>	
Hydraulic System	
Service Gates	
Emergency Gates	
Lightning Protection System	
Emergency Power System	
Wiring and Lighting System	

INSPECTION CHECKLIST

PROJECT New Dam

DATE 11-15-78

PROJECT FEATURE Transition and Conduit

NAME Cole

DISCIPLINE Structural

NAME Decker

AREA EVALUATED	CONDITION
----------------	-----------

OUTLET WORKS - TRANSITION AND CONDUIT

No operational outlet works

General Condition of Stone Masonry

Rust or Staining on Stone Masonry

Spalling

Erosion or Cavitation

Cracking

Alignment of Monoliths

Alignment of Joints

Numbering of Monoliths

NOT APPLICABLE

PERIODIC INSPECTION CHECKLIST

PROJECT New Dam DATE 11-15-78
 PROJECT FEATURE Outlet Structure/Channel NAME Cole
 DISCIPLINE Structural, Geotechnical NAME Decker, Bisson
Hydraulics/Hydrology

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL</u>	No operable outlet works
General Condition of Stone Masonry	/
Rust or Staining	
Spalling	
Erosion or Cavitation	
Visible Reinforcing	
Any Seepage or Efflorescence	
Condition at Joints	Not Applicable
Drain holes	/
Channel	
Loose Rock or Trees Overhanging Channel	Trees on downstream banks
Condition of Discharge Channel	Clear, unobstructed

INSPECTION CHECKLIST

PROJECT <u>New Dam</u>	DATE <u>11-15-78</u>
PROJECT FEATURE <u>Spillway</u>	NAME <u>Cole, Bisson</u>
DISCIPLINE <u>Geotechnical, Structural</u> <u>Hydraulics/Hydrology</u>	NAME <u>Decker, Devine</u>

AREA EVALUATED

CONDITION

OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS

- | | |
|---|--|
| a. Approach Channel | Clear, unobstructed |
| General Condition | Good |
| Loose Rock Overhanging Channel | None |
| Trees Overhanging Channel | None, trees on banks |
| Floor of Approach Channel | Appears clear |
| b. Weir and Training Walls | |
| General Condition of Concrete and Masonry | Fair |
| Rust or Staining | None |
| Spalling | South training wall badly spalled, spillway crest - some spall |
| Any Visible Reinforcing | Downstream edge, spillway crest |
| Any Seepage or Efflorescence | Substantial seepage and leakage through lower portion of masonry |
| Drain Holes | None |
| c. Discharge Channel | |
| General Condition | Good |
| Loose Rock Overhanging Channel | None |
| Trees Overhanging Channel | None - trees on banks |
| Floor of Channel | Bedrock and boulders |
| Other Obstructions | None |

Dam No. 218.01, Salmon Falls River

Items of Maintenance

- 1- At several locations of the toe of the dam leaks were found. It looks like direct piping action from upstream of the dam to the toe has been established.
- 2- The dam is in general in good condition but there are sizable joints in east abutment masonry allowing considerable leakage.
- 3- Just east of the Baxter Mills penstocks and about five feet to ten feet downstream of the gates, there are two holes in the ground denoting settlement from some sub-surface cause.
- 4- The Town should get a budget in for 1979 and try to repair the discrepancies mentioned above.

COPY

WATER RESOURCES BOARD

37 Pleasant Street
Concord, N.H. 03301

TELEPHONE 271-3405

October 3, 1978

City of Somersworth
Municipal Building
Somersworth, New Hampshire 03878

COPY

Dear Sir:

Under the provisions of RSA Chapter 482, Sections 8 through 15, copy enclosed, on August 16, '78, an engineer of the Water Resources Board inspected your dam in Somersworth. This Dam, No. 218.01, is classified in the files of this Office as a menace structure and as such must be maintained in a manner not to endanger public safety nor become a dam in disrepair.

As a result of this inspection it was noted that an item of maintenance was in need of attention:

Please see attached sheet.

Because this dam is classified as a menace structure, we require that you send us a proposed schedule of repairs. The actual work does not have to begin until the weather is better, but we need this schedule within thirty (30) days.

If you have any questions, please contact us at your convenience.

Sincerely,

George McGee Sr.
George B. McGee, Sr.,
Chairman

GME:paf
Enc.

B-2.2

New Dam

APPENDIX B-2

PAST INSPECTION REPORTS

Attached are copies of inspection reports pertaining to the New Dam on file with the New Hampshire Water Resources Board in Concord, New Hampshire.

B-2.1

New Dam

ELEV, FT.
(MSL)

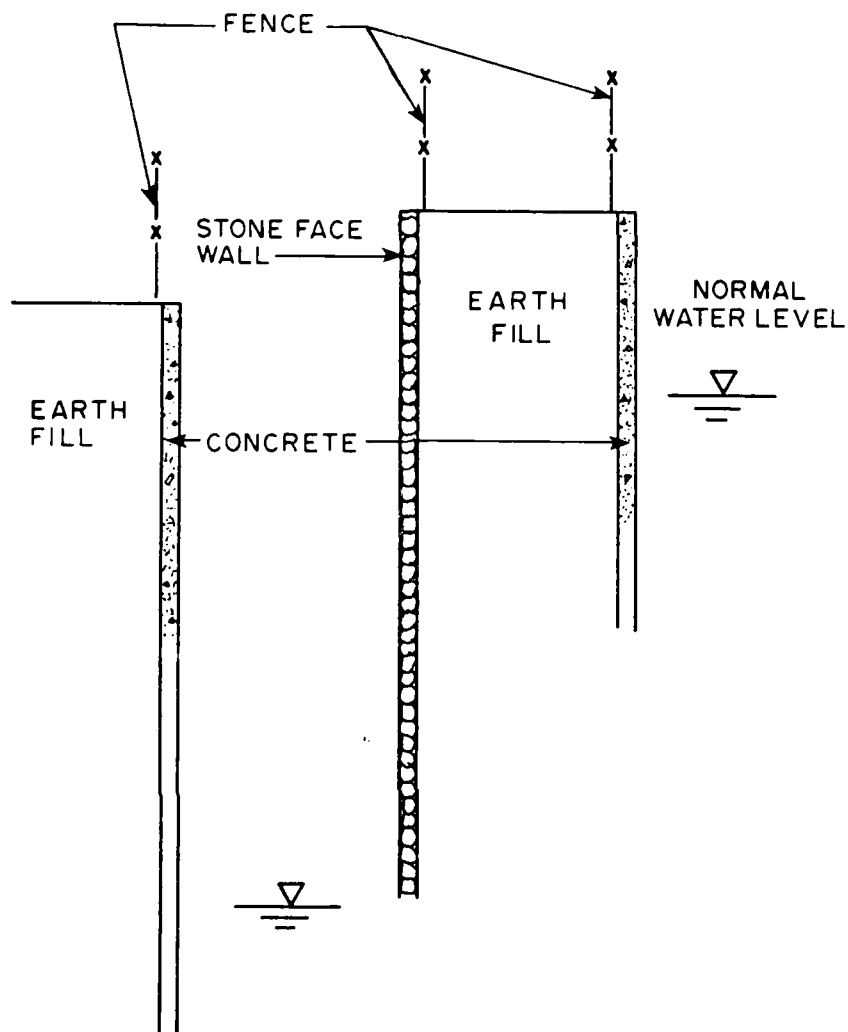
120

110

100

90

80



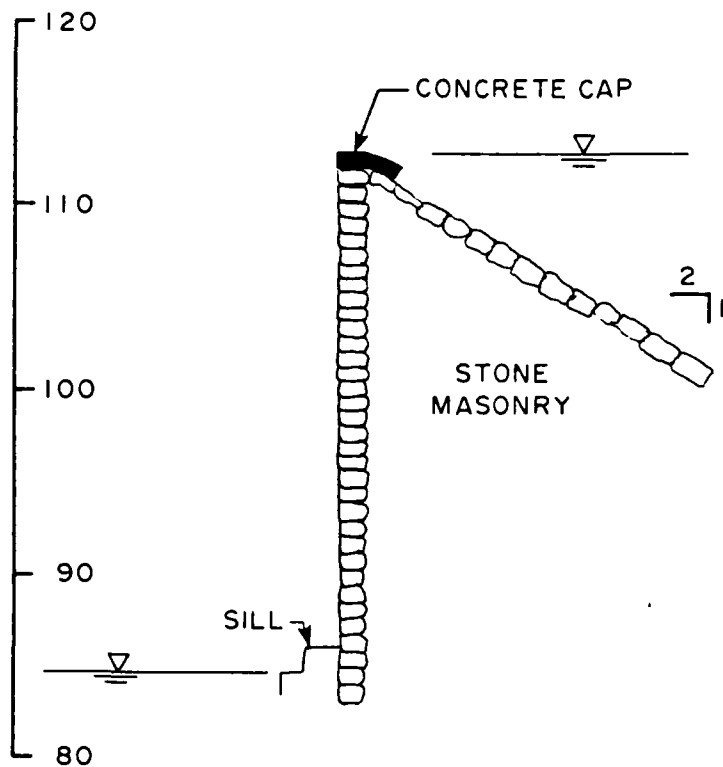
SECTION C

2079901

R-1.5

EDWARD C. JORDAN CO., INC. PORTLAND, ORE.	U.S. ARMY ENGINEER 1951-5-41 5544 CORP. 1951-5-41 5544
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS	
NEW DAM	
X-SECTION SKETCH	
SALMON FALLS RIVER	N.H.
SCALE	DATE

ELEV., FT.
(MSL)



SECTION B

2079901

B-1.4

EDWARD C. JORDAN CO., INC. PORTLAND, OREGON	U.S. ARMY ENGINEER REGIMENT PORTLAND, OREGON
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS	
NEW DAM	
X-SECTION SKETCH	
SALMON FALLS RIVER	N. H.
DATE	DATE

ELEV. FT.
(MSL)

120

110

100

90

80

WATER
LEVEL



MORTAR-LAID
STONE MASONRY

EARTH FILL

CONCRETE
CAP

NORMAL
WATER
LEVEL



MORTAR LAID
STONE
MASONRY

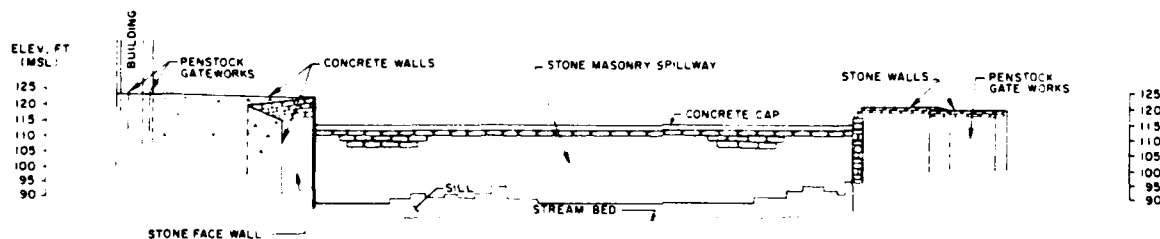
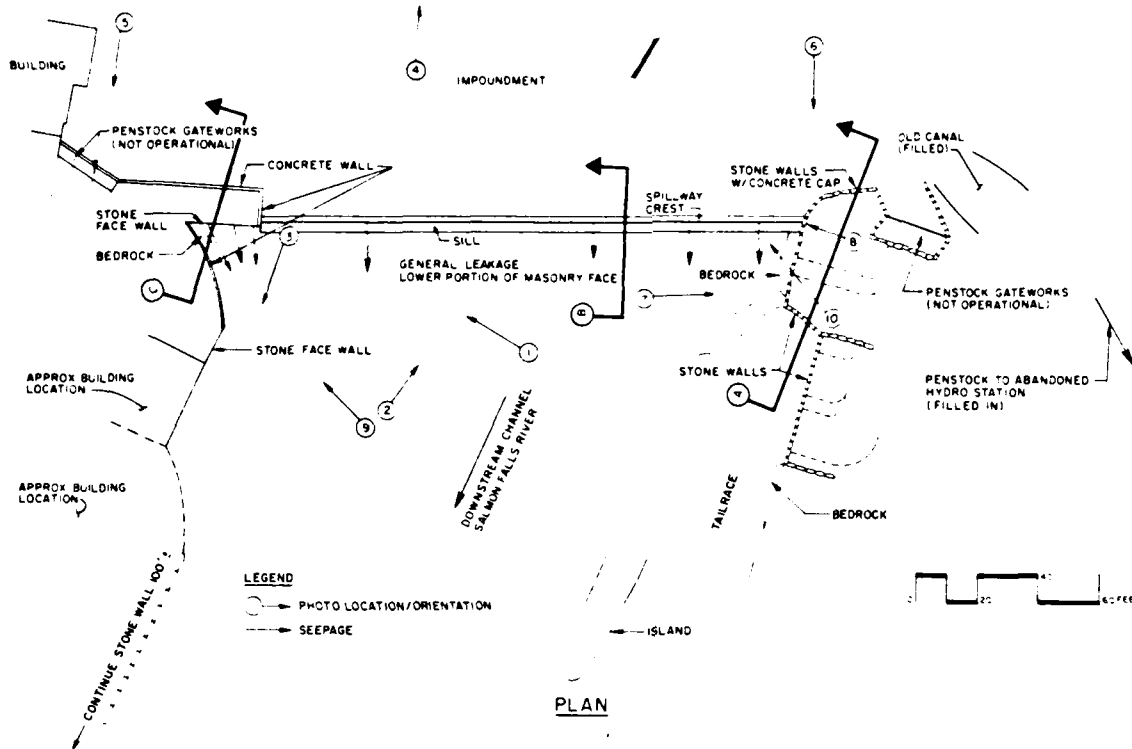


SECTION A

EDWARD C. JORDAN CO., INC. PORTLAND, ME 04102	U.S. ARMY ENGINEER DISTRICT OFFICE PORTLAND, ME 04102
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS	
NEW DAM	
X-SECTION SKETCH	
SALMON FALLS RIVER N.H.	
DATE	DATE

2079901

B-1 3



B-1.2

2079901

FORWARD: JORDAN CO. ME	U.S. ARMY ENGINEER DISTRICT: NEW HAVEN, CT
PROJECT: 100-100	DATE: 10/1/55
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS	
NEW DAM	
PLAN & PROFILE	
PISCATAQUA RIVER	ME., N.H.
SCALE	DATE

APPENDIX B-1

GENERAL PROJECT DATA

- I. The following material is available at the office of the New Hampshire Water Resources Board, 37 Pleasant Street, Concord, New Hampshire:
 - A. Periodic inspection reports, copies of which are attached as Appendix B-2 of this report.
 - B. Photographs taken of dam at various times.
 - C. Miscellaneous correspondence and survey data.
- II. The following plan, profile and cross-sections of the dam were developed from a limited stadia survey performed during the visual inspection, field notes taken by inspection team members, and photographs taken during the visual inspection. U.S.G.S. (mean sea level) elevations were obtained from U.S.G.S. maps by noting the reservoir location on the maps.

APPENDIX B
ENGINEERING DATA

This appendix lists the engineering data collected either from project records or other sources of data developed as a result of the visual inspection. The contents of this appendix are listed below.

<u>Appendix</u>	<u>Description</u>
B-1	General Project Data
B-2	Past Inspection Reports

B-1

New Dam

ford, New Hampshire and South Berwick, Maine just upstream of a Boston and Maine Railroad crossing of the Salmon Falls River.

8. OPERATING AND MAINTENANCE FEATURES

- a. Reservoir Regulation Plan. No formal plan was disclosed.

tailed inspection of the stilling basin was not possible due to the level of tailwater. However, it appears that erosion below the dam has been minimal.

4. OUTLET WORKS

There are gated headworks at both ends of the dam. These gate works are no longer operational, and the penstocks and the gated outlet sluiceways have apparently been filled. There are no operational drawdown facilities.

5. SAFETY AND PERFORMANCE INSTRUMENTATION

None.

6. RESERVOIR

- a. Shore Line. No recent earth movements along the shoreline were observed.
- b. Sedimentation. The extent of sedimentation in the reservoir is not known and could not be observed during the visual inspection. However, the sediment accumulation does not impede flow to the spillway.
- c. Potential Upstream Hazards. No significant hazard potential was observed upstream with the exception of one renovated mill building at the south abutment.
- d. Watershed Runoff Potential. Due to the gentle to moderate ground slopes, shallow average streambed slopes predominance of a forest cover, and presence of many swampy areas, the watershed runoff potential was judged to be low.

7. DOWNSTREAM CHANNEL

The downstream channel just below the dam is steep, rocky, straight, of regular cross-section, and unconfined. Within about 500 feet below the dam the slope is reduced to about 8 feet per mile. The overbank areas are sparsely to moderately wooded with a moderate growth of underbrush. There is a dam located approximately 2.4 miles below the New Dam between the towns of Rollins-

face of the dam below the spillway. The volume of seepage in this area could not be determined due to water overflowing the top of the spillway during the initial inspection. At the toe of the westerly abutment seepage flow was estimated to be in excess of 500 gallons per minute (gpm). During the review inspection, the entire flow of the river was leaking through the dam. Seepage and leakage at the toe of the dam was estimated to be several thousand gpm.

h. Monolith Joints. Not applicable.

i. Foundations. The dam appears to be founded on bedrock along its entire length with bedrock outcrops at both ends. The dam shows no signs of vertical movement or settlement indicating foundation distress. Due to the water levels at the time of inspection, the amount of erosion or undermining downstream of the dam could not be determined.

j. Abutments. The dam abutments consist of mortar-laid, stone masonry on bedrock. The training wall face of the north abutment has been patched with concrete. Both abutments appear to be backed by earth-fill, although they are founded on bedrock. Neither abutment showed signs of excessive wear or instability.

2. EMBANKMENT STRUCTURES

The dam has no separate embankment sections.

3. SPILLWAY STRUCTURES

The spillway is constructed of masonry with a concrete crest. There are no spillway gates in the dam.

a. Control Gates and Operating Machinery. Not applicable.

b. Unlined Saddle Spillways. None.

c. Approach and Outlet Channels. The approach and outlet channels appear to be clear and unobstructed.

d. Stilling Basin. The stilling basin below the spillway consists of the downstream channel. De-

SUPPLEMENTARY INSPECTION NOTES

1. CONCRETE AND STONE MASONRY STRUCTURES

- a. Concrete Surfaces. The spillway crest, top of stone abutments, and the sill along the toe of the dam below the spillway, are constructed of concrete. The surfaces of concrete on the spillway crest and the sill appear to be in fair condition. However, the concrete in the south abutment and training wall and lower portion of the north abutment is spalled and cracked. The downstream face of the dam, constructed of dry-laid irregular shaped stone masonry, appears tight but some bulging is apparent.
- b. Structural Cracking. There appeared to be no structural cracking of concrete at the north abutment or spillway portion of the dam. Structural cracks were present, however, in the training wall downstream of the south abutment.
- c. Movement, Horizontal and Vertical Alignment. The spillway crest appears true to line and grade. The lower portion of the downstream face bows outward (downstream) in some areas.
- d. Junctions. The junctions between the north abutment and the spillway section of the dam appears to be in good condition. No movement of this junction or leakage through the junction was observed. The junction between the spillway and the south abutment shows signs of leakage particularly near the bottom of the dam.
- e. Drains. Several drains are located in the concrete sill. Substantial flow was coming over the sill and through the drains.
- f. Water Passages. The only water passage from the dam is the free overfall spillway. The gate works on both the north and south ends of the dam are not operational and have apparently been filled.
- g. Seepage or Leakage. Some very minor seepage was observed to be coming through the north abutment. Substantial seepage was coming through the downstream

INSPECTION CHECKLIST

PROJECT New Dam DATE 11-15-78
 PROJECT FEATURE Service Bridge NAME Cole
 DISCIPLINE Structural NAME _____

AREA EVALUATED	CONDITION
----------------	-----------

OUTLET WORKS - SERVICE BRIDGE

- | | |
|-------------------------------|----------------|
| a. Superstructure | None |
| Bearings | |
| Anchor Bolts | |
| Bridge Seat | |
| Longitudinal Members | |
| Under Side of Deck | |
| Secondary Bracing | NOT APPLICABLE |
| Deck | |
| Drainage System | |
| Railings | |
| Expansion Joints | |
| Paint | |
| b. Abutment & Piers | |
| General Condition of Concrete | |
| Alignment of Abutment | |
| Approach to Bridge | |
| Condition of Seat & Backwall | |

COPY

October 1, 1969

Mr. Norman C. Leclerk, Director
Somersworth Department of Public Works
Municipal Building
157 Main Street
Somersworth, New Hampshire 03873

Dear Mr. Leclerk:

In reply to your request as to the condition of "new" dam on Salmon Falls River in Somersworth, I had my staff engineer on August 15, 1969 inspect and report on its condition.

I urge you to obtain the water rights and dam appurtenances located in the State of Maine (Carrick) for use during future repairs to the dam. The report shows the dam to be generally in good condition.

I am submitting a copy of the report made by Board personnel.

Very truly yours,

George M. McGee, Sr.
Chairman

gmcg/fcm:c
enc.

B-2.4

New Dam

Report of Inspection of "New" Dam on Salmon Falls River, Somersworth

T. H. H. H. H.

At the request of Norman G. Leclerk, Director of Somersworth Department of Public Works, "New" dam, owned by the municipality, was inspected on August 15, 1969 in company with personnel from his department. Donald Rapoza accompanied me on this inspection. Beside making a routine dam inspection, close watch was made to determine the needed repairs in the next few years to maintain the dam in safe condition.

This masonry dam is in good condition generally. Downstream of the New Hampshire abutment to the spillway there is considerable leakage between the spillway and the masonry retaining wall parallel with the stream. Due to width between upstream and downstream abutment walls, the stability of this dam is in no danger.

Also, there are two holes in the ground just downstream of the Baxter Mill penstock gates. This condition could be easily corrected by compacting some earth in these holes.

The east abutment (Maine) to the spillway has sizeable holes in the joints between masonry blocks as seen in the photo taken during this inspection. This could be partially corrected by carefully pointing up these joints to prevent water seepage and damage.

At some time within the next twenty years it might be advisable to place a concrete face over this abutment to thoroughly seal the openings.

The gates to Baxter Mill seem to be inoperative due to badly rotted gate stems. If some provision could be made to pass flow through these penstocks, the gates should be made operative. However, these penstocks do not appear to be as low as those on the Maine side.

The City should acquire the water rights on the Maine side and place the gate hoisting equipment in operable condition. This would be needed to drain the pond for repairs and reduce flood levels during serious flood flows.

A Capital Reserve Fund of \$1,000. to \$1,500 annually should provide ample funds to maintain this dam for many years to come (at present prices).

FCM
FCM/jb

COPY

MEMORANDUM

COPY

March 15, 1966

TO: Mr. McGee

RE: Report on the inspection of the Somersworth City Dam - File #218.01

On March 3, 1966, the Mayor of the City of Somersworth, Roland N. Hebert, informed the Board that they intended to introduce a bill in the 1967 Legislature to transfer the former Baxter Woolen Company "New Dam" to the State of New Hampshire. They requested that the Board advise the City of any requirements for an appropriation that should be included as part of this proposed bill. On March 10, 1966, an inspection of this dam was made to determine its condition and inquiries were made to determine what conditions the City may have in this proposed transfer.

The following is a summary of the inspection of the dam:

New Hampshire Abutment: - This abutment consists of a stone embankment faced with concrete. A penstock leads from this abutment to the former Great Falls Woolen Company factory on this river bank. This penstock has been blocked off except for a 16 - 18" pipe that supplied process water to these buildings when they were in operation. No immediate repairs are indicated on this abutment.

Spillway:- This spillway consists of a stone and concrete gravity section. Due to the high flow over this dam, no inspection of its condition was made. However, the City Engineer informed me that there are minor leaks through the section. No flashboards on dam at time of inspection.

Maine Abutment and Power Station: - This abutment consists of a stone and earth embankment which appears to be in sound condition. A gate section on this abutment was not inspected as the gate house was locked. However, the City Engineer stated that the gates and machinery appeared to be in sound condition. No leakage was noticed downstream of the gate section.

The head gates on the canal leading to the power house are in sound condition. However, the canal downstream has been filled in to prevent the operation of these gates. Some of the concrete at this section is deteriorated. The power house appears to be in sound condition. However, all the hydro machinery has been removed and the penstocks upstream of the power house have been cut open to make them unusable.

After inspecting the dam, I met with Mayor Habert and the City Engineer, Norman Leclerc. They informed me that all the holdings on the Maine side of the river were sold by the City to a party in Maine. This includes the deep gate section, canal, and power house areas. A R.O.W. to the Maine abutment was retained. The land along the New Hampshire side of the river is still owned by the City except for six house lots which have been sold along Buffumville Road. The area between these house lots and the river will be utilized in the future as a recreation area.

The City is presently being taxed for that portion of the dam that lies in the State of Maine. The intention of the City is to relieve itself of this tax burden and the cost of maintaining this structure in the future. However, they wish to have the dam retained to provide this pond for recreation after the pollution is removed from the stream.

In this discussion, I stated that in a possible transfer of this dam, we would require the City to buy back the rights on the deep gate section and possibly the canal and power house areas.

The acquisition of this property by the State would not protect any existing recreation facilities nor would this site appear to have any potential as a public recreational area. The Fish and Game Department would be interested in having this dam removed to provide for the migration of salmon up the river in the future. In my opinion, the City should retain this dam to insure its serving the purpose they intend it should. The cost of maintaining this structure doesn't appear to be prohibitive. However, no detail study of this cost has been made.

COPY

Vernon A. Knowlton
Civil Engineer

COPY

January 7, 1963

Mr. John F. Beamis
Attorney at Law
Somersworth, New Hampshire

Dear Mr. Beamis:

This will confirm my comments with respect to Great Falls Lower Dam made at the time of inspection on December 27, 1962.

It is my opinion, based on this inspection, that the dam is in a reasonably safe condition and that normal maintenance will keep the dam in this condition.

The dam could be removed from the stream at some future time. However, if this is done, consideration should be given to sediments stored behind the dam and their disposition.

The dam could be lowered a few feet to provide additional safety. I have had one of my engineers check flood capacity of existing spillway. The results indicate that the existing dam will easily pass a "100 year flood" but will not pass a "500 year flood" without additional protective measures.

Our records show that there is a deep gate in this dam. This gate and its operating mechanism should be maintained in operable condition.

I hope this information is satisfactory for your purposes and I will be glad to discuss this matter with you at any time.

Very truly yours,

Leonard R. Frost
Water Resources Engineer

lrf:c

B-2.8

New Dam

NEW HAMPSHIRE WATER CONTROL COMMISSION

REPORT ON DAM INSPECTION

TOWN Somersworth DAM NO. 21821 STREAM Shannon Falls River
 OWNER Public Service Co. of N.H. ADDRESS Somersworth, N.H.

In accordance with Section 20 of Chapter 133, Laws of 1937, the above dam was inspected by me on 7/20/50 accompanied by _____

NOTES ON PHYSICAL CONDITION

Abutments Good

Spillway Good

Gates Operable

Other _____

COPY

CHANGES SINCE LAST INSPECTION

FUTURE INSPECTIONS

Yes

This dam (is) (~~is not~~) a menace because of broken fence and property down stream

REMARKS

Spilling about 20000 cfs
Dam about 150' long, 25' high permanent spillway
+ 2' of flood banks / about 10' high
Not shown in plan

Copy to Owner	Date

Frederic C. Allen
 INSPECTOR

B-2.9

New Dam

(Additional Notes Over)

NEW HAMPSHIRE WATER CONTROL COMMISSION

REPORT ON DAM INSPECTION

TOWN SOMERSWORTH DAM NO. 218.01 STREAM Salmon Falls River
OWNER Public Service Co. of N.H. ADDRESS Somersworth, N. H.

In accordance with Section 20 of Chapter 133, Laws of 1937, the above dam was inspected by me on July 18, 1940 accompanied by Mr. [illegible]

NOTES ON PHYSICAL CONDITION

Abutments EX. 100 ft. high

Spillway Overflowing at inspection

Gates 20 ft. high

Other

COPY

CHANGES SINCE LAST INSPECTION

FUTURE INSPECTIONS

This dam (is) ~~(is not)~~ a menace because it is in a state of repair

REMARKS

Pool level 100 ft. high = 100 ft. draw
670 cfs 100 ft. draw = 100 ft. draw
670 cfs 100 ft. draw = 100 ft. draw

Copy to Owner	Date

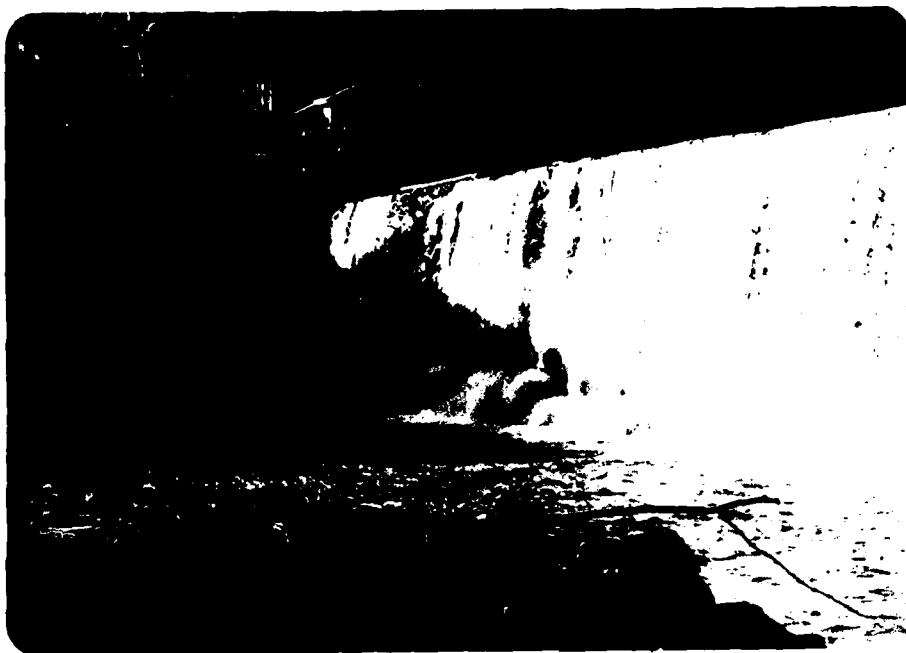
B-2.10

C.D. [illegible]
INSPECTOR

APPENDIX C

PHOTOGRAPHS

The following are photographs referenced in this report. See Sheet B-1 for photograph locations and orientations.



1 DOWNSTREAM FACE



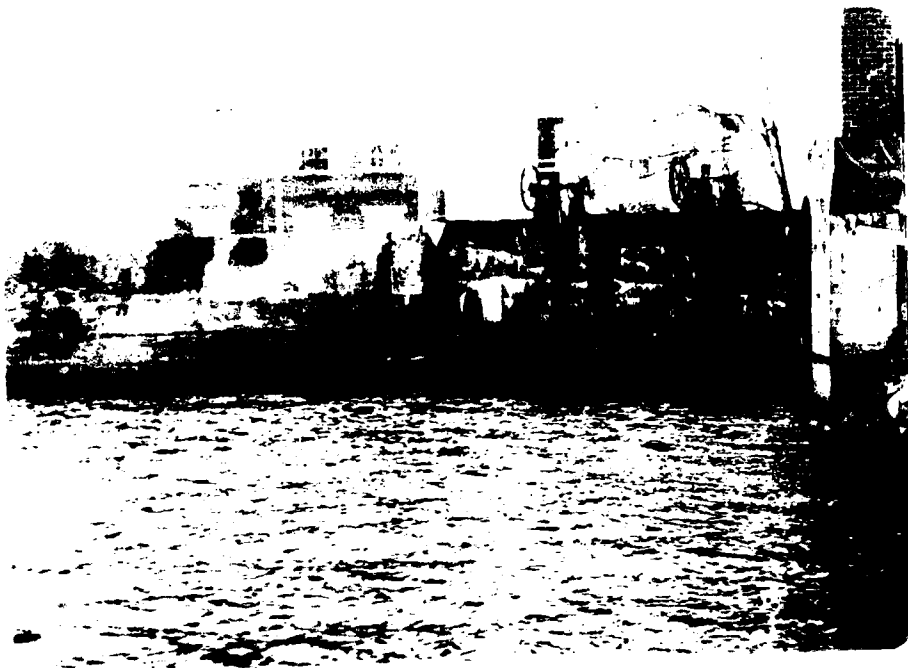
2 DOWNSTREAM FACE



3 DOWNSTREAM CHANNEL



4 UPSTREAM CHANNEL



5 HEADWORKS GATES - SOUTH



6 HEADWORKS GATES - NORTH



7 NORTH ABUTMENT



8 SPILLWAY CREST



9 VIEW FROM DOWNSTREAM



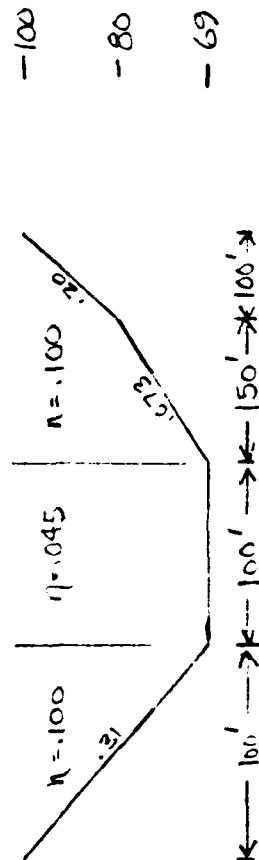
10 TOE OF SPILLWAY

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

Hydrologic computations pertinent to this investigation are attached. The following figure shows the Salmon Falls River watershed at the New Dam.

CROSS SECTION
(LOCATED 1.3 MILES BELOW NEW DAM NEAR HEAD WATERS
OF RESERVOIR WITH DAM JUST ABOVE RR CROSSING
OF SALMON FALLS RIVER BETWEEN ROLLINGFORD,
N.H. AND SOUTH BERNARD, N.E.)



← 100' → 100' → 150' → 100' →

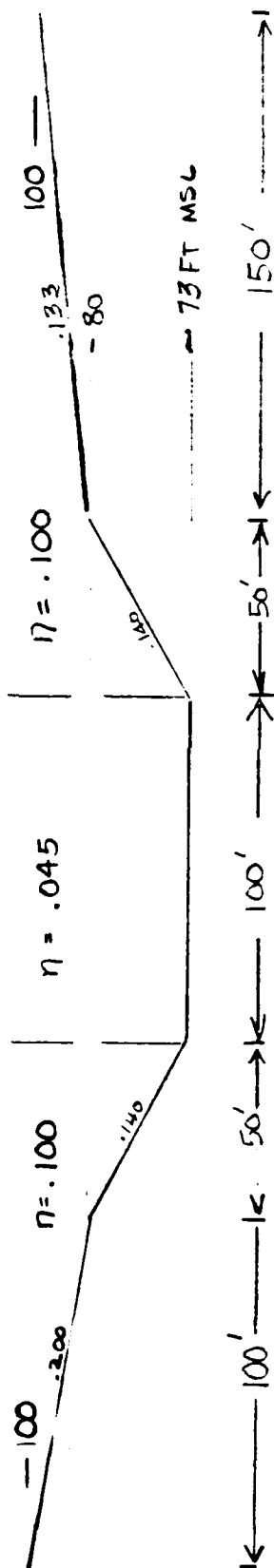
ELEV	1.486		A		P		R		Q	Q+
	IS	OS	IS	OS	IS	OS	IS	OS		
71	33.0	14.9	200	33.8	100	34.2	2.00	0.99	416	436
75	"	"	600	305	100	103	5.00	2.96	2,598	2,470
80	"	"	1,100	1,024	100	188	11.00	5.45	7,125	8,481
85	"	"	1,600	2,087	100	230	16.00	7.07	13,302	18,600
90									5,247	

D-14

New Dam

PROJECT	COMP BY	JOB NO.
	CHK BY	DATE

CROSS-SECTION #2
(LOCATED APPROX. 4300 FT DOWNSTREAM)
ELEVATIONS ESTIMATED FROM USGS GAUGE



" η " VALUES FROM "DESIGN OF SMALL DAMS", BUREAU OF RECLAMATION, PG 577
 $S = 20/12,700 = .0016$, $S^{1/2} = .0397$

ELEV	$\frac{1.486}{\eta}$	A	P	R	$R^{2/3}$	S	$S^{1/2}$	Q_{OB}	Q_{IN}	Q_T
75	14.9	29	29	1.00	1.00	.0016	.0397	17	416	433
80	"	1350	101	3.47	2.29	"	"	474	3,353	3,827
90	"	11,975	226	8.74	4.18	"	"	4,885	14,732	19,344
95	"	8,260	288	11.3	4.96	"	"	7,566	22,183	31,747

1/ Q_{OB} = OVERTANK FLOW, COMPUTED IN TABLE
 2/ Q_{IN} = INSIDE FLOW, COMPUTATION NOT SHOWN
 3/ Q_T = TOTAL FLOW IN SECTION

D-13

New Dam

PROJECT

COMP BY

JSC

JOB NO.

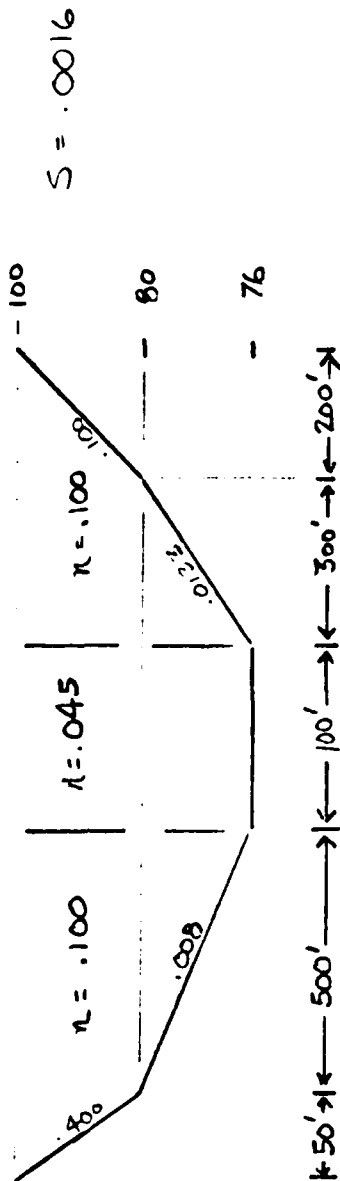
20709-01

CHK BY

DATE

1-25-79

CROSS - SECTION #1
 REPRESENTATIVE OF STREAM FOR 3,000 FT BELOW DAM
 (cross-section actually drawn at station 2,400 feet below dam)



K = 50' → 500' → 100' → 300' → 200' →

ELEV	1.486 n		A		P		R		SLOPE		Q		QT
	IS	OB	IS	OB	IS	OB	IS	OB			IS	OB	
78	33.0	14.9	200	400	100	400	2.00	1.00	.0016		416	237	653
80	"	"	400	1,600	100	800	4.00	2.00	"		1,320	1,501	2,821
85	"	"	900	4,156	100	864	9.00	4.81	"		5,097	6,998	12,095
90	"	"	1,400	10,225	100	928	14.00	11.02	"		10,660	29,900	40,560
95	"	"	1,900		100		19.00		"		17,700		
100	"	"							"				
	KEL 0 REL 1								KEL 2				

IS = INSTREAM
 OB = OVERBANK

PROJECT	COMP BY	JOB NO.
	CHK BY	DATE
	JJD	20799-0
		-25-75

CROSS - SECTION # 3 (6900 FT BELOW DAM)

$$q_2 = 13,000 \text{ cfs} \quad \text{TRIAL STAGE} = 13.1 \text{ FT}$$

$$V_1 = \left(\frac{2340 + 2480}{2} \right) \times \frac{2600}{43560} = 159 \text{ A-F}$$

$$q_3 = 13,000 \left(1 - \frac{159}{800} \right) = 10,416$$

$$V_2 = \left(\frac{2357 + 2380}{2} \right) \times \frac{2600}{43560} = 132 \text{ A-F}$$

$$V_{AVE} = 146 \text{ A-F}$$

$$Q_3 = 13,000 \left(1 - \frac{146}{800} \right) = 10,630 \text{ cfs}$$

STAGE = 11.9 FT AFTER FAILURE, 9.0 FT PRIOR TO FAILURE
USING A ROUTED PRE-FAILURE $Q = 6,630 \text{ cfs}$

∴ 10,630 cfs IS PEAK INFLOW TO PISCERIOR NEAR
TOWNS OF SOUTH BERNICK AND ROLLINSFORD

PROJECT NEW DAM DAM FAILURE ANALYSIS	COMP BY CJD	JOB NO. 20799-0
	CHK BY	DATE 1-25-77

CROSS-SECTION #1

$$S = 800 \text{ AC-FT}$$

$$q_D = 31,560 \quad (\text{TRIAL STAGE} = 12.4 \text{ FT})$$

LET $V_1 = 400 \text{ AC-FT}$, FIND DISTANCE REQUIRED TO
REDUCE PEAK BY 50% (ASSUME 11,260 CFS FLOW PRIOR TO
FAILURE IS NOT A STEADY-STATE FLOW, BUT A FLOOD DISCHARGE)

$$400 = \frac{9,520 \times D_{50}}{43,560} \quad D_{50} = 1,830 \text{ FT}$$

AT A DISTANCE OF APPROX. 1,830 FT, THE PEAK FLOW
FROM FAILURE WOULD BE REDUCED TO 15,730 CFS FOR FIRST
PHASE OF TRIAL

$$\therefore V_2 = \frac{5900 \times 1830}{43,560} = 249 \text{ AC-FT}$$

$$V_{AVE} = 324 \text{ AC-FT}$$

$$Q_1 = 31,560 \left(1 - \frac{324}{800}\right) = 18,780 \text{ CFS}$$

STAGE = 10.2 FT AFTER FAILURE, 7.1 FT PRIOR TO
FAILURE USING A ROUTED PRE-FAILURE FLOW = 8,720 cfs

CROSS-SECTION #2 (4300 FT BELOW DAM)

$$S = 800 \text{ A-F}$$

$$q_1 = 18,780 \text{ cfs}$$

$$V_1 = \left(\frac{3300 + 4600}{2}\right) \times \frac{2470}{43,560} = 281 \text{ A-F}$$

$$q_2 = 18,780 \left(1 - \frac{281}{800}\right) = 12,183 \text{ CFS}$$

$$V_2 = \left(\frac{5100 + 2340}{2}\right) \times \frac{2470}{43,560} = 211 \text{ A-F}$$

$$V_{AVE} = 246$$

$$Q_2 = 18,780 \left(1 - \frac{246}{800}\right) = 13,000 \text{ CFS}$$

STAGE = 12.9 FT AFTER FAILURE, 9.4 FT PRIOR TO
FAILURE USING A ROUTED PRE-FAILURE Q = 7620 cfs

PROJECT NEW DAM DAM FAILURE ANALYSIS	COMP BY JSD	JOB NO. 20799-01
	CHK BY E. J. J.	DATE 1-25-70

DAM FAILURE ANALYSIS

(1) STORAGE AT TIME OF FAILURE (WITH WATER AT TOP OF NORTH ABUTMENT) = 800 AC.-FT.

(2) PEAK FAILURE OUTFLOW, Q_{pi}

$$Q_{pi} = \frac{8}{27} W_b \sqrt{G} Y_0^{3/2}$$

$$W_b = .4 \times 178 = 71.2 \text{ FT.}$$

$$Y_0 = 35 \text{ FT}$$

$$Q_{pi} = 24,800 \text{ CFS}$$

WITH WATER AT TOP OF NORTH ABUTMENT, Q PRIOR TO FAILURE = 11,260 cfs. Q AFTER FAILURE = $24,800 + .6(11,260)$
= 31,560 cfs

PEAK FLOW FROM FAILURE = 31,560 CFS

(3) TIME FOR RESERVOIR TO EMPTY, T

$$T = \frac{12.1 S}{\frac{1}{2} Q_p} = \frac{12.1 (800)}{\frac{1}{2} (31,560)} = 0.61 \text{ HOURS} \approx 37 \text{ min}$$

PROJECT EFFECT OF SURCHARGE STORAGE	COMP BY JTD	JOB NO. 20792-0
	CHK BY JTD	DATE 1-24-70

PMF INFLOW = 65,700 cfs

SURCHARGE HEIGHT TO PASS PMF = 129.8 - 119.7 = 10.1 FT

VOLUME OF SURCHARGE :

$$1,095 \text{ AC-FT} \times \frac{1}{219 \text{ MI}^2} \times \frac{1 \text{ MI}^2}{640 \text{ AC}} \times \frac{12 \text{ in}}{\text{ft}} = .094 \text{ inches}$$

$$\frac{.094}{19} = .005 \approx 0$$

NO EFFECT TO PMF OR $\frac{1}{2}$ PMF INFLOW DUE TO SURCHARGE STORAGE

THEREFORE :

PMF IS 65,700 CFS WITH ELEVATION OF 129.8 FT
- OVERTOPS NORTH ABUTMENT BY 10.1 FT AND
SOUTH ABUTMENT BY 7.3 FT.

(TEST FLOOD) $\frac{1}{2}$ PMF IS 32,850 CFS WITH ELEVATION OF 125.1 FT
- OVERTOPS NORTH ABUTMENT BY 5.4 FT AND
SOUTH ABUTMENT BY 2.6 FT.

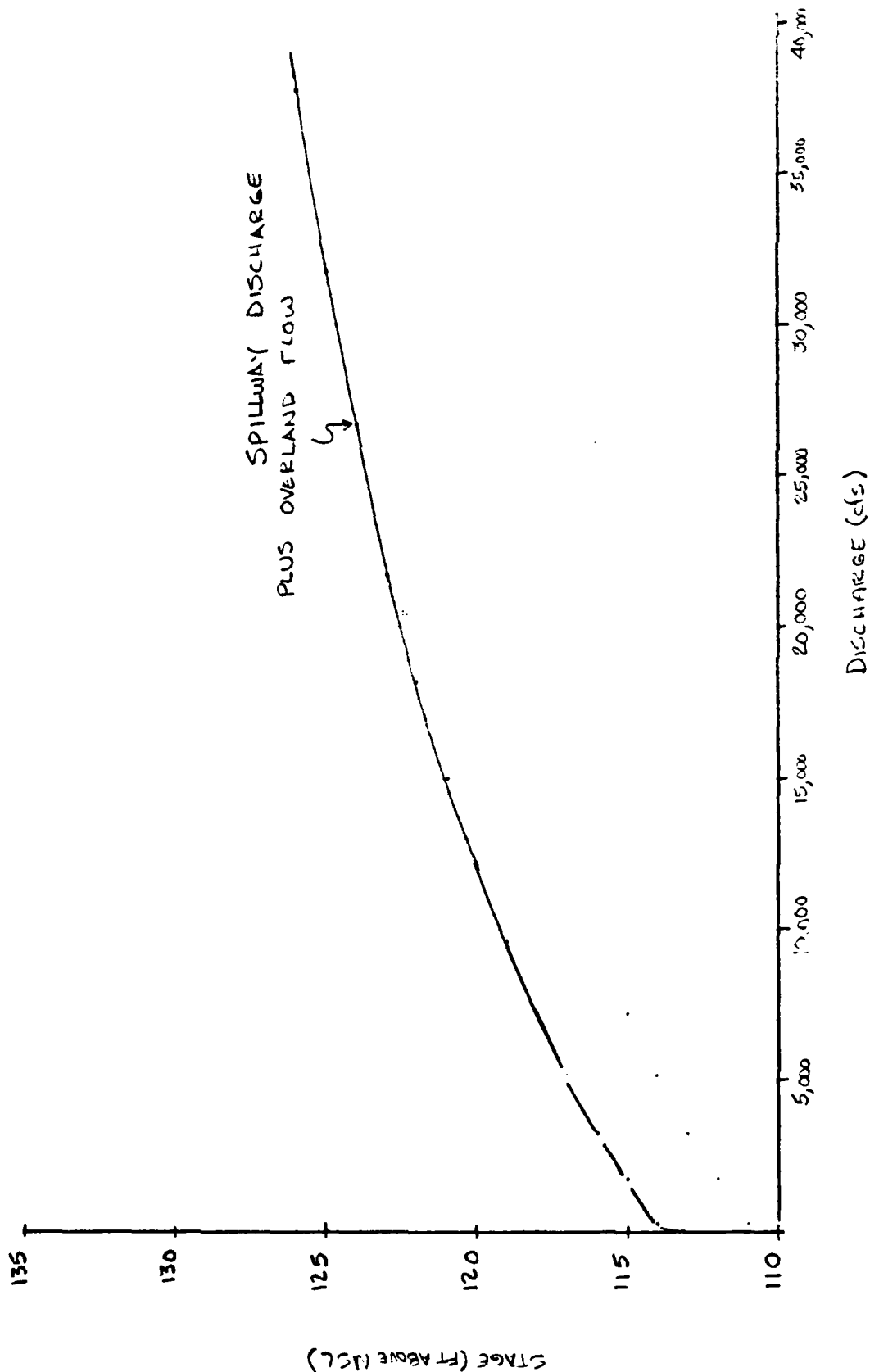
SPILLWAY IS INADEQUATE TO PASS $\frac{1}{2}$ PMF. SPILLWAY
CAN PASS 34% OF $\frac{1}{2}$ PMF AND 17% OF PMF

PROJECT
NEW DAM
HYDRAULICS

COMP. BY
JTD
CHK. BY

JOB NO.
3-700-01
DATE
3-28-79

STAGE - DISCHARGE RATING CURVE
NEW DAM (AT DAM)



PROJECT	COMP BY	JOS NO.
	CHK BY	DATE
	JSD	20799-01
		-23-79

OVERLAND FLOW CALCS

RIGHT OVERBANK :

(120 FT)
ELEV: 107 FT (SURVEY DATUM) $n = .07$, $S = .040$ (FROM USGC MAP GROUND SLOPES)

$$A = 13.6, P = 41.1, R = .33; \therefore Q = 28 \text{ CFS}$$

(121) FT
ELEV: 108 FT
 $A = 55, P = 45, R = 1.22, \therefore Q = 267 \text{ CFS}$

ELEV: 110 FT (123 FT.)
 $A = 141, P = 82, R = 1.72, \therefore Q = 859 \text{ CFS}$

ELEV: 112 FT (125 FT)
 $A = 141 + 162 + 4 = 307, P = 82 + 4.5 = 87, R = 3.53$
 $Q = 3,018$

ELEV: 114 (127 FT.)
 $A = 307 + 4 + 170 = 481, P = 82 + 9 = 91, R = 5.29$
 $Q = 6,131$

ELEV: 117 (130 FT)
 $A = 481 + 273 + 9 = 763, P = 91 + 6.7 = 98, R = 7.79$
 $Q = 12,550$

LEFT OVERBANK : $n = .07, S = .040$

- OVERLAND FLOW

ELEV: 110 FT (123 FT)
 $A = 33 \text{ FT}^2, P = 67, R = .49, Q = 87 \text{ CFS}$

ELEV: 112 (125 FT)
 $A = 33 + 131 + 2 = 166, P = 67 + 6 + 2.8 = 76, R = 2.18$
 $Q = 1,186$

ELEV: 114 (127 FT)
 $A = 166 + 135 + 2 = 303, P = 76 + 6 + 2.8 = 85, R = 3.56$
 $Q = 3,000 \text{ CFS}$

ELEV: 117 (130 FT)
 $A = 303 + 212 + 4.5 = 519, P = 98, R = 5.30$
 $Q = 6,620$

- WEIR FLOW (BROAD-CRESTED W/ BREADTH = 15 FT)

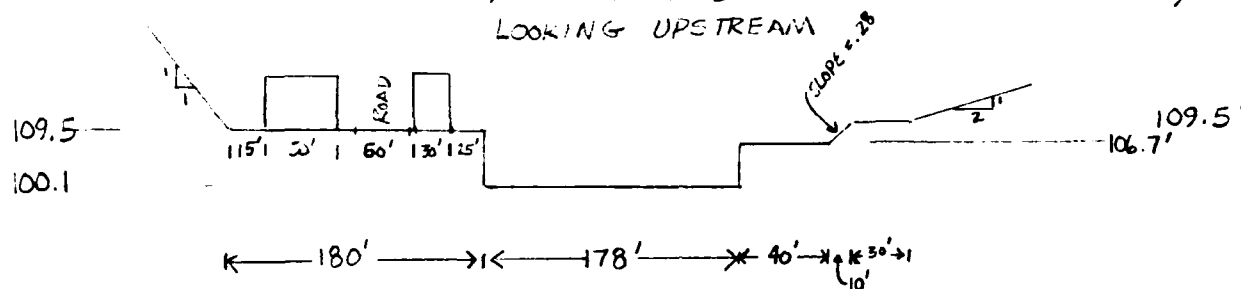
ELEV	H	C	Q	ELEV	H	C	Q
110	0.5	2.70	24	115	5.5	2.63	848
112	2.5	2.63	260	116	6.5	2.63	1,090
114	4.5	2.63	628	117	7.5	2.63	1,350

PROJECT	COMP BY	JOB NO.
NEW DAM	15	20799-01
DAM RATING CURVE	CHK BY	DATE
	15	1-23-79

OVERLAND FLOW

X-SECT. AT DAM
LOOKING UPSTREAM

(USING SURVEY
DATUM ELEV.)

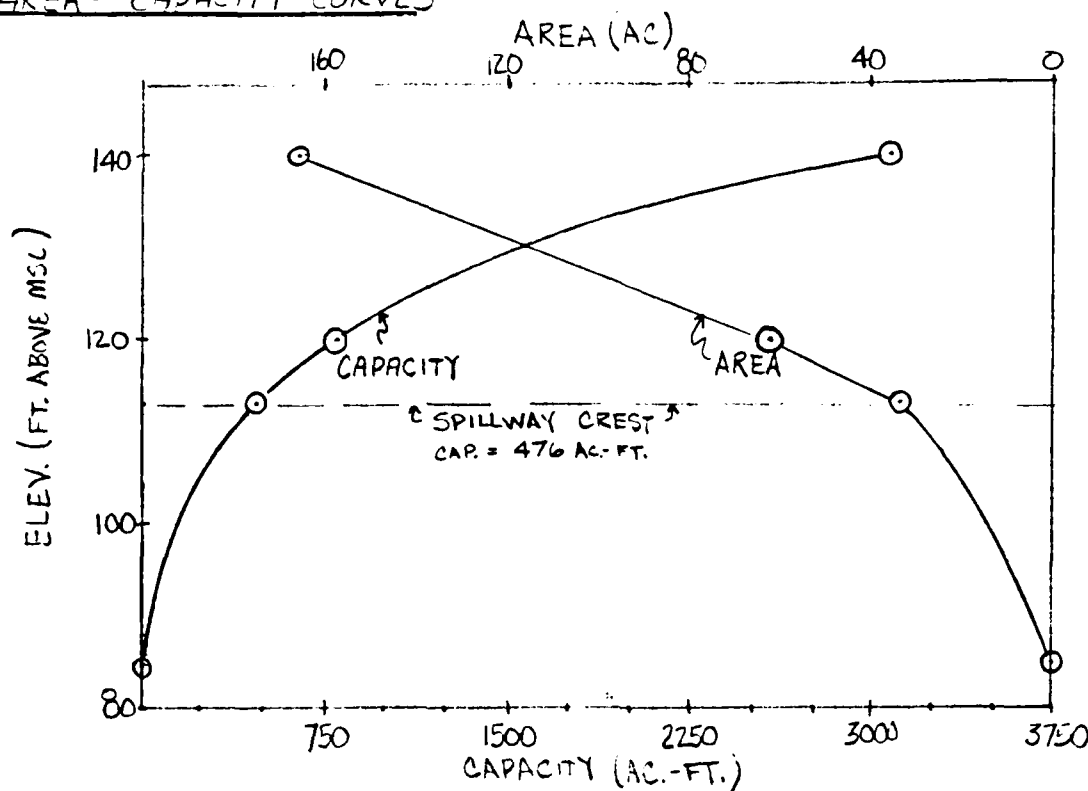


X-SECT. AT DAM PRIMARILY FROM FIELD INSPECTION.
25 FT. SECTION NEAR LEFT ABUTMENT CAN BE CONSIDERED AS A
BROAD-CRESTED WEIR

USGS ELEV	SURVEY ELEV (FT)	LEFT OVERBANK OVERLAND FLOW (CFS)	WEIR FLOW (CFS)	RIGHT OVERBANK OVERLAND FLOW (CFS)	TOTAL Q (CFS)
119.0	106.0	0	0	0	0
	107.0	0	0	28	28
121.0	108.0	0	0	267	267
	109.0	0	0	563	563
123.0	110.0	87	24	859	970
	111.0	637	121	1,937	2,697
125.0	112.0	1,186	260	3,018	4,464
	113.0	2,093	430	4,574	7,097
127.0	114.0	3,000	628	6,131	9,759
	115.0	4,195	848	8,249	13,292
129.0	116.0	5,389	1,090	10,368	16,847
130.0	117.0	6,620	1,350	12,550	20,520

PROJECT	COMP BY	JOB NO.
	CHK BY	DATE

AREA - CAPACITY CURVES



USGS ELEV (FT)	SPIILLWAY DISCHARGE (CFS)	SURCHARGE STORAGE (AC.-FT.)
113.0	0	0
114.0	518	41
115.0	1,702	83
116.0	3,270	124
117.0	5,114	176
118.0	7,202	227
119.0	9,515	279
119.7	11,258	330
120.0	12,034	391
121.0	14,742	452
122.0	17,628	574
124.0	23,893	749
126.0	30,762	924
128.0	38,186	1,114
130.0	46,127	1,304
132.0	54,553	

D-4

New Dam

PROJECT New Dam Hydraulics	COMP BY JJD	JOB NO. 20779-01
	CHK BY JJD	DATE 1-23-77

A. Spillway Capacity

NO. 1
5

FREE OVERFALL SPILLWAY WITH VERTICAL DOWNSTREAM FACE AND 2:1
UPSTREAM FACE, BREADTH WIDTH = 2 FEET, LENGTH = 178 FEET

SURVEY DATUM ELEV (FT)	USGS ELEV (FT)	H	C	L	Q	
100.1	113.1	0			0	SPILLWAY CREST
		0.4	3.41	178	153	
101.0	114.0	0.9	3.41	178	518	
		1.4	3.57	"	1,053	
102.0	115.0	1.9	3.65	"	1,702	
		2.4	3.70	"	2,449	
103.0	116.0	2.9	3.72	"	3,270	
		3.4	3.73	"	4,162	
104.0	117.0	3.9	"	"	5,114	
		4.4	"	"	6,128	
105.0	118.0	4.9	"	"	7,202	
		5.4	"	"	8,331	
106.0	119.0	5.9	"	"	9,515	
106.7	119.7	6.6	"	"	11,258	TOP OF NORTH ABUT
107.0	120.0	6.9	"	"	12,034	
		7.4	"	"	13,365	
108.0	121.0	7.9	"	"	14,742	
		8.4	"	"	16,164	
109.0	122.0	8.9	"	"	17,628	
109.5	122.5	9.4	"	"	19,135	TOP OF SOUTH ABUT
110.0	123.0	9.9	"	"	20,682	
		10.9	"	"	23,893	
112.0	125.0	11.9	"	"	27,255	
		12.9	"	"	30,762	
114.0	127.0	13.9	"	"	34,407	
		14.9	"	"	38,186	
116.0	129.0	15.9	"	"	42,094	
		16.9	"	"	46,127	
118.0	131.0	17.9	"	"	50,281	
		18.9	"	"	54,553	
120.0	133.0	19.9	"	"	58,940	

PROJECT New Dam TEST FLOOD DEVELOPMENT	COMP BY JFC	JOB NO. 2-111-01
	CHK BY JFC	DATE 1-23-79

TEST FLOOD ANALYSIS

DRAINAGE AREA - 219 SQUARE MILES (FROM N.H. WATER RESOURCES BOARD DATA)

DESCRIPTION - FLAT AND COASTAL

FROM C.O.E. GUIDE CURVES :

PMF PEAK FLOW RATE = 300 CFS/SQ. MI.

$\therefore$ PMF = 65,700 CFS

$\frac{1}{2}$ PMF = 32,850 CFS

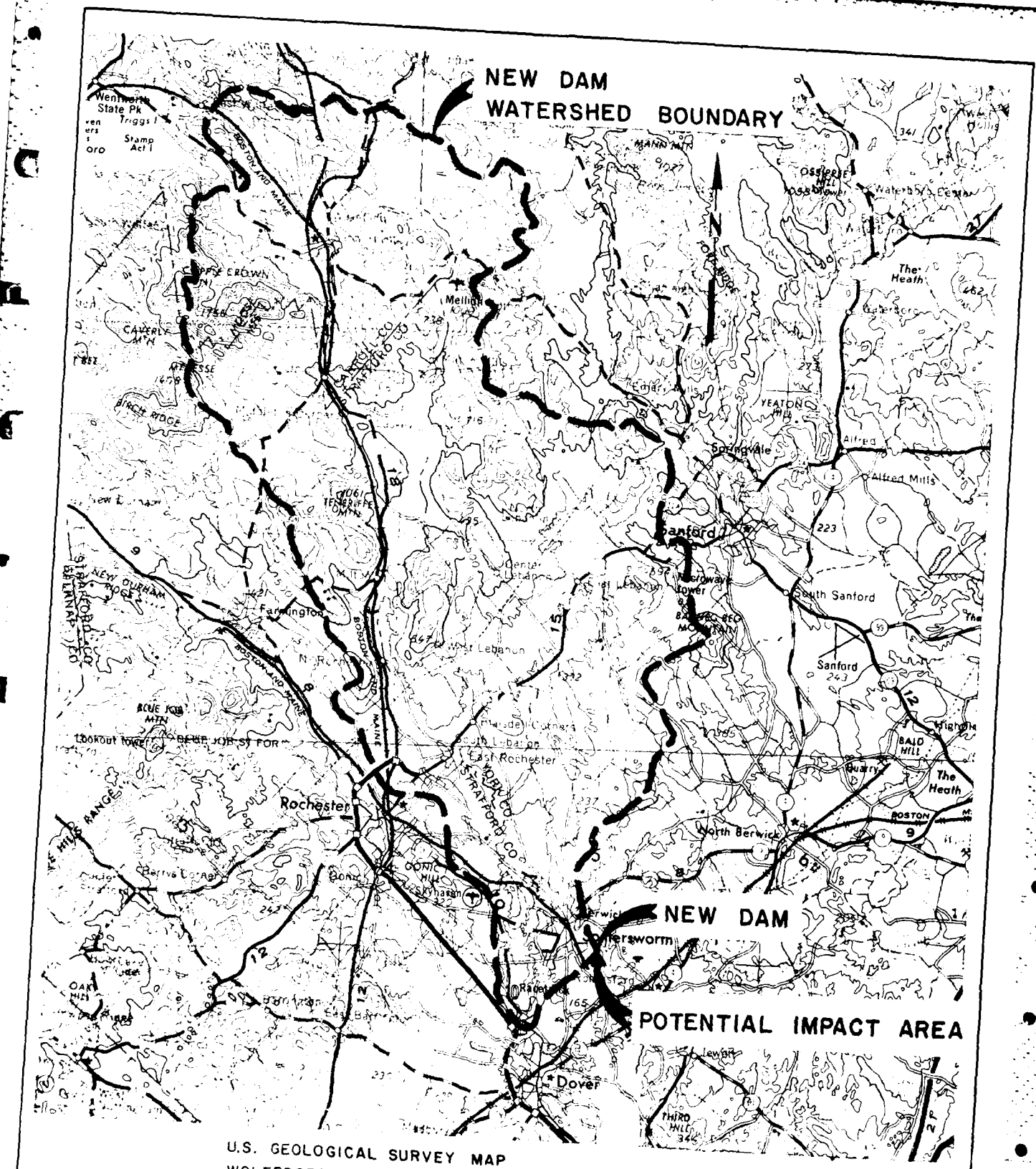
BECAUSE ITS A SMALL DAM AND A REGULATED DRAINAGE TO A CERTAIN EXTENT, TEST FLOOD = $\frac{1}{2}$ PMF

AREA - CAPACITY DATA :

TIE INTO USGS ELEVATION - SPILLWAY CREST = 113.1 FT ABOVE MSL
(ESTIMATED FROM USGS QUADS) (SURVEY DATUM - 100.1 FT.)

HEIGHT OF DAM FROM SPILLWAY CREST TO TAILWATER
STREAMBED = 28.5 FT.

ELEV (FT. ABOVE MSL)	AREA (AC)	AVG AREA (AC)	DEPTH (FT.)	Δ VOL (AC.-FT.)	VOL (AC.-FT.)
84.6	0				0
		16.7	28.5	476	
113.1	33.3				476
		47.8	6.9	330	
120.0	62.3				806
		114	20	2,280	
140.0	165				3,086



U.S. GEOLOGICAL SURVEY MAP
 WOLFEBORO, N.H. QUADRANGLE
 NEWFIELD, N.H. QUADRANGLE
 BERWICK, ME. - N.H. QUADRANGLE
 ALTON, N.H. QUADRANGLE
 DOVER, N.H. - ME. QUADRANGLE

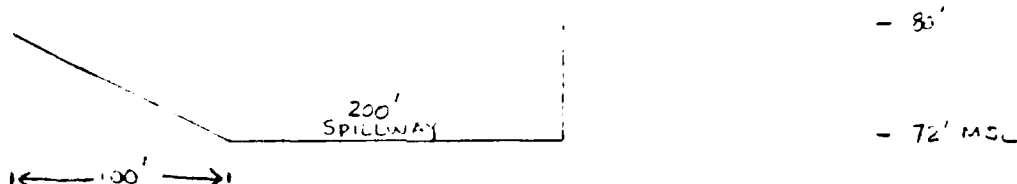


NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS	
NEW DAM DRAINAGE AREA MAP	
SALMON FALLS RIVER ME. - N.H.	
2079301	AS SHOWN MARCH 1979

PROJECT	COMP BY	JOB NO.
	CHK BY	DATE

CROSS-SECTION #4
 (AT DAM LOCATED ABOUT 2.3 MILES DOWNSTREAM
 OF NEW DAM) (ALL DATA FROM USGS QUADS 1" = 1 MILE
 AND TOWN OF ROLLINGFORD, PENNSYLVANIA)

FREE OVERLAND SPILLWAY, LENGTH = 200 FT, ACCUM C = 3.32



HYDRAULICS:

A) SPILLWAY (OVERLAND FLOW IS INSIGNIFICANT)

ELEV (MSL)	H	C	L	Q (CFS)
74	2	3.32	200'	1,878
75	3	"	"	3,430
76	4	"	"	5,312
77	5	"	"	7,424
78	6	"	"	9,759
79	7	"	"	12,297

AREA - CAPACITY DATA

ELEV	AREA	AVG. AREA	DEPTH	AVG	VOL
61	0				0
		35	11	385	
72	70				385
		125	8	1000	
80	180				1,385
		265	20	5300	
100	350				6,635

EFFECT OF COUNTERCHARGE STORAGE

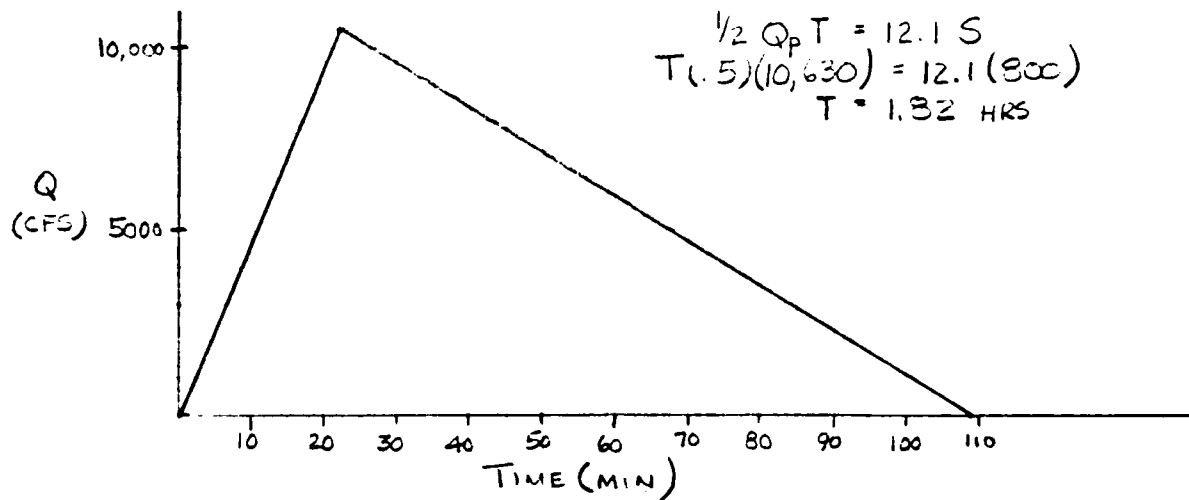
ROUTING BY HEC-1.

D-15

New Dam

PROJECT NEW DAM ROUTING OF DAM FAILURE FLOW THRU DAM	COMP BY JL	JOB NO. 2072-0
	CHK BY	DATE 1-25-79

INFLOW HYDROGRAPH



TIME TO PEAK ESTIMATE :

AVG. PEAK Q = 21,100 CFS

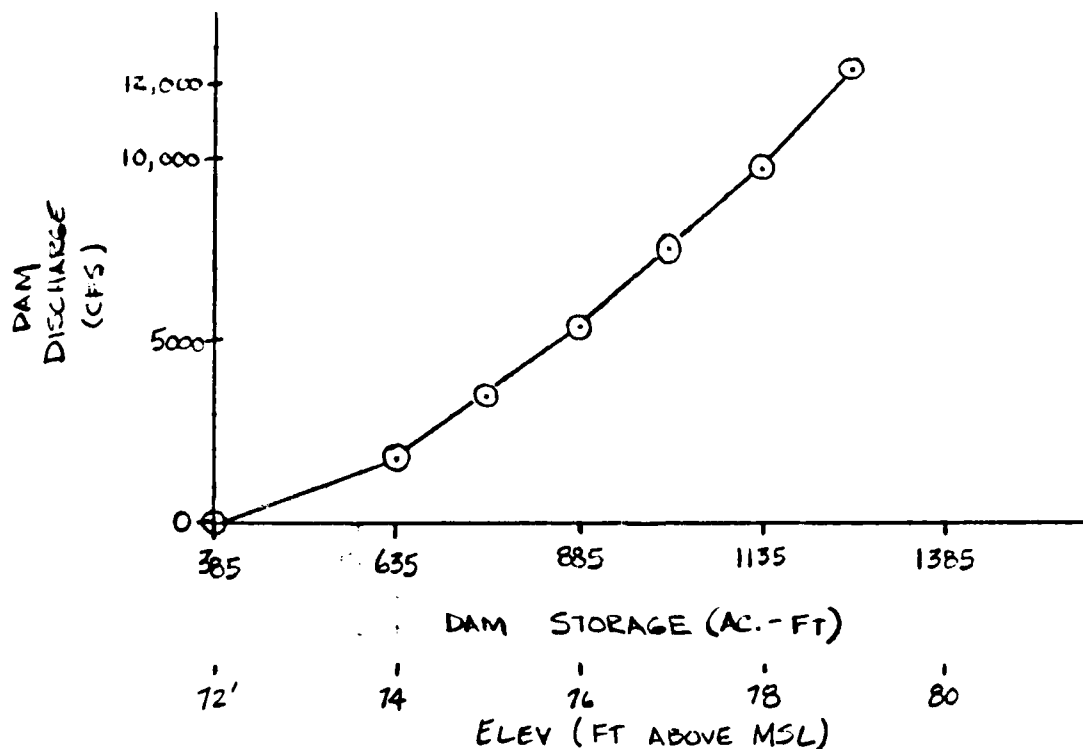
AVG A $\approx$ 4,000 FT²

$\therefore$ AVG V = 5.3 FPS

DISTANCE = 6,900 FT

TIME TO PEAK $\approx$ 22 MIN

DISCHARGE-STORAGE CURVE



 REC-1 VERSION DATED JAN 1973
 LATEST AUG 74
 DRAWING NO. 01

CUF DAM INSPECTION
 NEW DAM
 DAM FAILURE FLOW ROUTING

JOB SPECIFICATION
 NO NMW NMIN ICAY IMQ IMIN METRC IPLT IPMT NSTAN
 20 0 20 0 0 0 0 2 0 0
 JOPER 3 NMT 0
 3 0

SUB-AREA RUNOFF COMPUTATION

DAM FAILURE FLOW ROUTING

ISTAO ICOMP IECON ITAPE JPLT JPMT INAME
 1 0 0 0 0 0 1

HYDROGRAPH DATA

IMYOG IUNG TAPFA SNAP TMSDA TMSPC RATIO ISNUP ISAME LOCAL
 -1 0 219.00 0.00 0.00 0.00 0.00 0 0 0

INPUT HYDROGRAPH

0. 4830. 9660. 9650. 8300. 7100. 5900. 4700. 3600. 2200.
 1000. 0. 0. 0. 0. 0. 0. 0. 0. 0.

PEAK 4-HOUR 24-HOUR 72-HOUR TOTAL VOLUME
 9660. 3152. 2837. 56740.
 CFS .13 .13 .13
 INCHES 1564. 1564. 1564.
 AC-FT

•UVP•

STATION 1

	0.	1000.	2000.	3000.	4000.	5000.	6000.	7000.	8000.	9000.	10000.	0.	0.
1	I	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	I	.	.	.	.	I	.	.
3	.	.	.	.	.	.	.	.	.	.	I	.	.
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D-18

New Dam

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HYDROGRAPH ROUTING

DAM FAILURE FLOW ROUTING

ISTAQ 1
ICOMP 1
IFCON 0
ITAPE 0
JPLT 0
JPHI 0
INAME 1

ROUTING DATA
CLOSS 0.0
AVG 0.00
IFES 1
ISAME 0

ULOSS 0.0
NSTPS 0
NSTCL 0
LAG 0
AMSKK 0.000
X 0.000
TSK 0.000
STOWA 0.

STOWAGF= 0. 250. 375. 500. 750. 875. 0. 0. 0. 0.
OUTFLOW= 0. 1878. 3450. 5300. 7424. 9759. 12297. 0. 0. 0. 0.

TIME EOP STOP AVG IN EOP OUT

1	0.	0.	0.	0.
2	60.	2415.	453.	0.
3	230.	7245.	1727.	0.
4	416.	9455.	4059.	0.
5	528.	8975.	5775.	0.
6	471.	7700.	6505.	0.
7	571.	6502.	6503.	0.
8	544.	5300.	6047.	0.
9	499.	4056.	5290.	0.
10	442.	2800.	4447.	0.
11	377.	1600.	3483.	0.
12	307.	500.	2544.	0.
13	246.	0.	1848.	0.
14	200.	0.	1501.	0.
15	162.	0.	1220.	0.
16	132.	0.	991.	0.
17	107.	0.	805.	0.
18	87.	0.	654.	0.
19	71.	0.	532.	0.
20	57.	0.	432.	0.

SUM 54469.
PEAK 6505.
CFS 3024.
INCHES .13
AC-FT 1500.
72-HOUR 2743.
TOTAL VOLUME 54469.
1512.

STATION 1

	INFLW(I):	OUTFLOW(O)	AND OBSERVED FLOW(*)
	4000.	6000.	10000.
0.	0.	0.	0.
1	1	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0

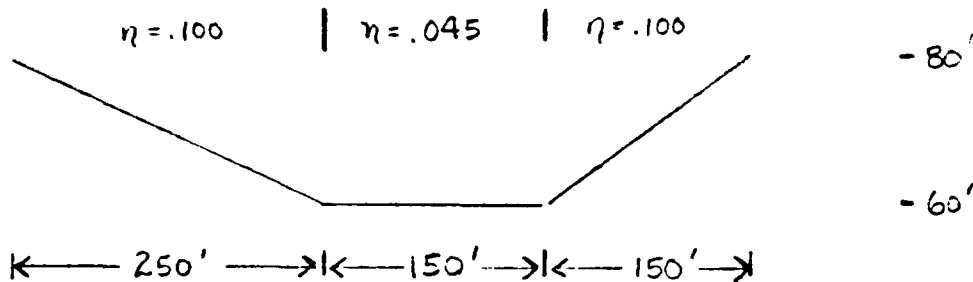
D-20

New Dam

		WINGOFF SUMMARY, AVERAGE FLOW				
HYDROGRAPH AT ROUTED TO		PIER	6-MCUH	24-MCUH	72-MCUH	AREA
	1	4440.	3152.	2437.	2437.	219.00
	1	4504.	3026.	2743.	2743.	219.00

PROJECT	COMP BY	JOB NO.
	CHK BY	DATE
	JSD	2-7-77
		1-25-77

CROSS-SECTION #5
(LOCATED ABOUT 350 FT. BELOW DAM OF X-SECT #4)



$$S = 20 / 300 = .067$$

INSTREAM :

W.S. ELEV	$\frac{1.436}{n}$	A	P	R	S	Q
65	33.0	750	150	5.00	.067	18,700
63	33.0	450	150	3.00	.067	7,937

∴ NO DAMAGE TO RESIDENTIAL AREAS IN SOUTH BERWICK, N.E.
OR ROLLINSFORD, N.H. PROBABLY SOME DAMAGE TO MILLS
IN ROLLINSFORD, N.H.

APPENDIX E

Information as Contained in the National
Inventory of Dams

E-1

New Dam

INVENTORY OF DAMS IN THE UNITED STATES

STATE	DIVISION	CONGR. DIST.	COUNTY	CITY	NAME	REPORT DATE
NM	12	17	01	ME	031	01
NM	12	17	01	ME	031	01
NM	12	17	01	ME	031	01

POPULAR NAME	NAME OF IMPOUNDMENT
Great Falls Luner Dam	
REGION/DASH	RIVER OR STREAM
01	SALMON FALLS RIVER
	MOLLINSFORD
	NEAREST DOWNSTREAM CITY - TOWN - VILLAGE
	POPULATION
	1

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUCT. HEIGHT (FT.)	HYDRAU. HEIGHT (FT.)	IMPOUNDING CAPACITIES (ACRE-FT.)
1	1925	S	35	35	000

REMARKS
1- 21801 21-STONE MASONRY 22-PIKUL 10

D/S HAS	SPILLWAY	MAXIMUM DISCHARGE (FT.)	VOLUME OF DAM (CY)	POWER CAPACITY (KW)	INSTALLED	PROPOSED	NOTES	LENGTH (FT.)	WIDTH (FT.)	HEIGHT (FT.)	DEPTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	HEIGHT (FT.)	DEPTH (FT.)
2	270	U	174	11200											

OWNER	ENGINEERING BY	CONSTRUCTION BY
CITY OF SURE-SMITH		

DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NM WATER RES BD	NM WATER RES BD	NM WATER RES BD	NM WATER RES BD

INSPECTION BY	INSPECTION DATE DAY MO YR	AUTHORITY FOR INSPECTION
EDWARD C JORDAN CU INC	15NOV78	PUBLIC LAW 92-367 AUG1972

REMARKS

1ST UNN FED R PHY/PEU SCS A VER/DATE
N N N 15NOV78

REPRODUCED AT GOVERNMENT EXPENSE

NOMENCLATURE		DATA	FORM 4474 ITEM	NOMENCLATURE
1	STATE	NEC0126	28	(SEE BELOW)
2	COUNTY	NEC	29	D/S HAZARD
3	CONGR. DIST.	30	30	CREST LENGTH
4	2ND STATE	017 (STRAFFORD)	31	SPILLWAY TYPE
5	2ND COUNTY	01	32	SPILLWAY WID
6	2ND CONGR	ME	33	MAX DISCHARGE
7	OFF. DAM NAME	021	34	VOLUME
8	LATITUDE	01	35	POWER INSTALL
9	LONGITUDE	NEW DAM	36	POWER PROPOS
10	REPORT DATE	43-15.6	37	NO. OF LOCKS
11	POPULAR NAME	070-51.6	38-45	LOCK LENGTH
12	IMPOUND. NAME	21/01/05.	46	OWNER NAME
13	REGION	GREAT FALLS LOWER DAM	47	ENGINEERING
14	REGION	01	48	CONSTRUCTION
15	REGION	01	49	REG. DESIGN
16	REGION	01	50	REG. CONST
17	REGION	01	51	REG. OPER.
18	REGION	01	52	REG. MAINT.
19	REGION	01	53	INSPECTOR
20	REGION	01	54	INSP. DATE
21	REGION	01	55	INSP. AUTH.
22	REGION	01	56	(SEE BELOW)
23	REGION	01	57	INSP. INIT.
24	REGION	01	58	UNSAFE
25	REGION	01	59	URGENCY
26	REGION	01	60	INSP. COMPL
27	REGION	01	61	RPT. APPR.
28	REGION	01	62	GOV. NOTIF.
29	REGION	01	63	INSPECTOR
30	REGION	01	64	GOV. RPT.
31	REGION	01	65	DEFICIENCY
32	REGION	01		
33	REGION	01		
34	REGION	01		
35	REGION	01		
36	REGION	01		
37	REGION	01		
38	REGION	01		
39	REGION	01		
40	REGION	01		
41	REGION	01		
42	REGION	01		
43	REGION	01		
44	REGION	01		
45	REGION	01		
46	REGION	01		
47	REGION	01		
48	REGION	01		
49	REGION	01		
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58	REGION	01		
59	REGION	01		
60	REGION	01		
61	REGION	01		
62	REGION	01		
63	REGION	01		
64	REGION	01		
65	REGION	01		

REMARK 1-NH21001 21-STONE MASONRY 22-PRIOR TO
REMARK 20-1A=219 1M 30-SA=30 AC

REMARK

NOTIFICATION	DATA
(SEE BELOW)	
D/S HAZARD	2
CHEST LENGTH	00270
SPILLWAY TYPE	U
SPILLWAY WIDTH	0178
MAX DISCHARGE	0011260
VOLUME	
POWER INSTALLED	000020
POWER PROPOSED	
NO. OF LOCKS	0
45 LOCK LEN/WID	
OWNER NAME	CITY OF SOMERSWORTH
ENGINEERING	UNKNOWN
CONSTRUCTION	UNKNOWN
REG. DESIGN	NONE
REG. CONST	NONE
REG. OPER.	NH WRB
REG. MAINT.	NH WRB
INSPECTOR	EDWARD C JORDAN INC
INSP. DATE	78/11/15.
INSP. AUTH.	PL 92-367
(SEE BELOW)	
INSP. INIT.	78/11/15.
UNSAFE	
URGENCY	
INSP. COMPL.	79/05/01.
RPT. APPR.	79/05/21.
GOV. NOTIF.	
INSPECTOR	DC
GOV. RPT.	79/06/18.
DEFICIENCY	

REPRODUCED AT GOVERNMENT EXPENSE

INVENTORY OF DAMS

NOMENCLATURE		DATA	FORM 4474 ITEM	NOMENCLATURE
1	DIVISION	NEC017	28	(SEE BELOW)
2	STATE	NEB	29	D/S HAZARD
3	COUNTY	30	30	CREST LENGTH
4	CONGR. DIST.	017 (STRAFFORD)	31	SPILLWAY TYPE
5	2ND STATE	01	32	SPILLWAY WIDTH
6	2ND COUNTY	ME	33	MAX DISCHARGE
7	2ND CONGR.	031	34	VOLUME
8	OFF. DAM NAME	01	35	POWER INSTALLATION
9	LOCATION	GREAT FALLS UPPER DAM	36	POWER PROPOSED
10	LONGITUDE	43-10.8	37	NO. OF LOCKS
11	COORDINATE	070-11.8	38-45	LOCK LENGTH
12	POPULAR NAME	41/01/00	46	OWNER NAME
13	GROUND. NAME	GREAT FALLS UPPER DAM	47	ENGINEERING
14	REGION	SALMON FALLS RIVER	48	CONSTRUCTION
15	IN.	01	49	REG. DESIGN
16	CONSTR. YEAR	00	50	REG. CONST.
17	DESIGNER	00	51	REG. OPER.
18	CONSTRUCTION	00	52	REG. MAINT.
19	MAINT.	00	53	INSPECTOR
20	REPAIRS	00	54	INSP. DATE
21	TYPE OF DAM	00	55	INSP. AUTH.
22	YEAR COMPLETED	1901	56	(SEE BELOW)
23	PURPOSE	00	57	INSP. INIT.
24	HT. HEIGHT	0017	58	UNSAFE
25	CRY. HEIGHT	0017	59	URGENCY
26	MAX CAPACITY	0000000	60	INSP. COME
27	NORMAL CAP.	0000000	61	RPT. APPR.
28	SPILL. DIST.	NEB	62	CCV. NOTIF.
29	WATER GATE	N	63	INSPECTOR
30	LED. REGULATED	N	64	CCV. RPT.
31	RVT. IN. FEET	N	65	DEFICIENCY
32	POSS. AIR	N		
33	REMARKS	CC 0972		
34	REMARKS	HEED FEED		
35	REMARKS	SM 30-54-50		

81/07/24. PAGE 2778

6784

6474

ITEM NOMINCLATURE DATA

28	(SEE BELOW)	
29	D/S HAZARD	3
30	CREST LENGTH	00400
31	SPILLWAY TYPE	U
32	SPILLWAY WIDTH	0327
33	MAX DISCHARGE	0009500
34	VOLUME	
35	POWER INSTALLED	000026
36	POWER PROPOSED	
37	NO. OF LOCKS	0
38-45	LOCK LEN/WID	
46	OWNER NAME	PUBLIC SERVICE CO.
47	ENGINEERING	UNKNOWN
48	CONSTRUCTION	UNKNOWN
49	REG. DESIGN	NH PSC
50	REG. CONST	NH PSC
51	REG. OPER.	NH WRB
52	REG. MAINT.	NH WRB
53	INSPECTOR	NH WATER RESOURCES BOARD
54	INSP. DATE	80/07/27.
55	INSP. AUTH.	RSA CHAPTER 482 NH LAWS 1965
56	(SEE BELOW)	
57	INSP. INIT.	
58	UNSAFE	
59	URGENCY	
60	INSP. COMPL.	
61	RPT. APPR.	
62	CCV. NOTIF.	
63	INSPECTOR	
64	CCV. RPT.	
65	EFFICIENCY	

AD-A155 999

NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS NEW 2/2
DAM NH - 00126 PI (U) CORPS OF ENGINEERS WALTHAM MA
NEW ENGLAND DIV MAR 79

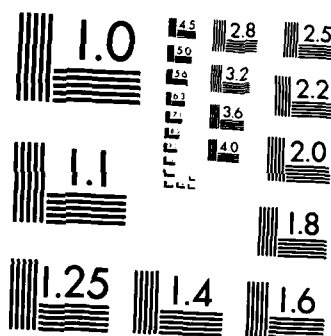
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

REPRODUCED AT GOVERNMENT EXPENSE

NOMENCLATURE		DATA	FORM 4474 ITEM	NOMENCLATURE
1	SECTION	N000121	28	(SEE RECD
2	STATE	NED	29	O/S HAZAR
3	COUNTY	30	30	CREST LEN
4	CORNER, DIST.	017 (STRAITFORD	31	SPILLWAY
5	2ND STATE	01	32	SPILLWAY
6	2ND COUNTY	MI	33	MAX DISCH
7	2ND CONC	031	34	VOLUME
8	OFF. DAM NAME	01	35	POWER INS
9	LATITUDE	MAST POINT DAM	36	POWER PRO
10	LONGITUDE	43-17.2	37	NO. OF LO
11	REPORT DATE	070-93.9	38-45	LOCK LF
12	POPULAR NAME	41/01/05.	46	OWNER NAM
13	IMPOUND. NAME		47	ENGINEER
14	REGION	SALMON FALLS RIVER	48	CONSTRUCT
15	BASIN.	01	49	REG. DESI
16	UPSTREAM	06	50	REG. CONS
17	CITY-IND	SALMON FALLS RIVER	51	REG. OPER
18	ESTABL.	SOMEWHERE	52	REG. MAIN
19	RELATIVE		53	INSPECTOR
20	DATE OF		54	INSP. DAT
21	YEAR COMPLETED	0001	55	INSP. AUT
22	PERMITS	1931	56	(SEE RECD
23	1. HEIGHT	0013	57	INSP. INT
24	2. HEIGHT	0013	58	UNSAFE
25	MAX CAPACITY	000007.0	59	URGENCY
26	TOTAL CAP.	00000400	60	INSP. COM
27A	CORPS DIST.	NED	61	RPT. APPR
27B	OWNER CODE	N	62	GOV. NOTI
27C	REG. REGULATED	N	63	INSPECTOR
27D	RVT. ON FED.	N	64	GOV. RPT.
27E	SCS AID	N	65	DEFICIENC
27F	VERIFY DATE	80/09/29.		

REMARK 21-TYPE A FRAME 28-INDUSTRIAL USE
REMARK 22-INCLUDES 4-184 FT WASTE GATES

1000. 00134

11/2

REPRODUCED AT GOVERNMENT EXPENSE

ITEM	NOMENCLATURE	DATA
28	(SEE BELOW)	
29	D/S HAZARD	3
30	CREST LENGTH	00170
31	SPILLWAY TYPE	U
32	SPILLWAY WIDTH	0140
33	MAX DISCHARGE	0005800
34	VOLUME	
35	POWER INSTALLED	
36	POWER PROPOSED	
37	NO. OF LOCKS	0
38-45	LOCK LEN/WID	
46	OWNER NAME	GENERAL ELECTRIC CO.
47	ENGINEERING	UNKNOWN
48	CONSTRUCTION	UNKNOWN
49	REG. DESIGN	NH PSC
50	REG. CONST	NH PSC
51	REG. OPER.	NH WRB
52	REG. MAINT.	NH WRB
53	INSPECTOR	NH WATER RESOURCES BOARD
54	INSP. DATE	50/07/26.
55	INSP. AUTH.	RSA CHAPTER 482 NH LAWS 1965
56	(SEE BELOW)	
57	INSP. INIT.	
58	UNSAFE	
59	URGENCY	
60	INSP. COMPL.	
61	RPT. APPR.	
62	GOV. NOTIF.	
63	INSPECTOR	
64	GOV. RPT.	
65	DEFICIENCY	

272

END

FILMED

8-85

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