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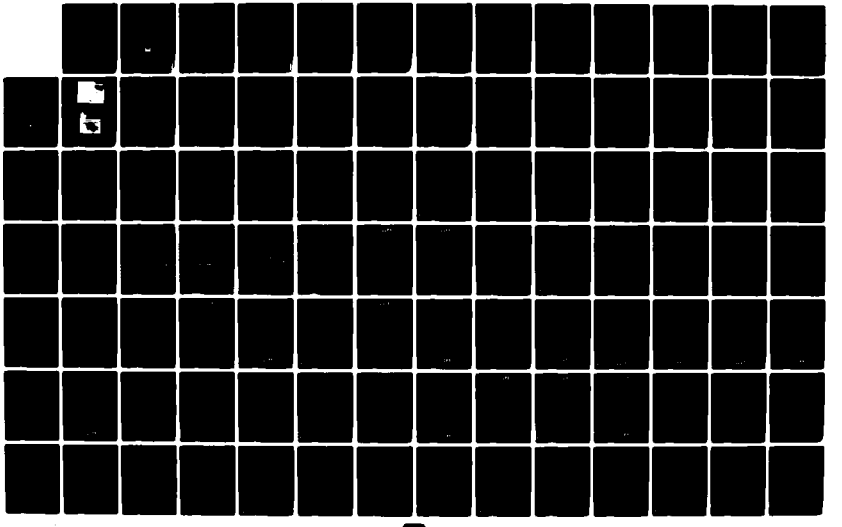

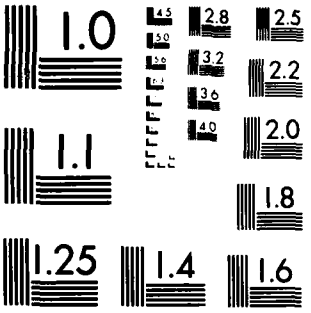

CHARLES RIVER BASIN

WRENTHAM, MASSACHUSETTS

RED DAM

MA. 00170

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

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

SEPTEMBER 1978

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

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18. SUPPLEMENTARY NOTES

Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.

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

DAMS, INSPECTION, DAM SAFETY,
Charles River Basin
Wrentham, Mass.

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

Red Dam has an overall length of approximately 270 feet and consist of about 210 feet of earth embankment, 1 45 foot long, 6 foot wide broad-crested spillway and a masonry-concrete sluiceway structure, about 16 feet wide. The height of the dam above the downstream toe is about 6.5 feet. The dam is in poor condition. The cursory Phase I analysis indicates that the spillway and sluiceway have a combined capacity of about 900 cfs, equal to about 15% of the estimated "PMF".

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RED DAM

MA 00170

CHARLES RIVER BASIN
WRENTHAM, MASSACHUSETTS

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

BRIEF ASSESSMENT
NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

Identification No.:	MA 00170
Name of Dam:	Red Dam
Town:	Wrentham
County and State:	Norfolk County, Massachusetts
Stream:	Eagle Brook
Date of Inspection:	January 13 and June 22, 1978

Red Dam confines the waters of Lake Pearl. The dam has an overall length of approximately 270 feet and consists of about 210 feet of earth embankment, a 45-foot long, 6-foot wide broad-crested spillway, and a masonry-concrete sluiceway structure, about 16 feet wide. The height of dam above the downstream toe is about 6.5 feet.

The dam is in poor condition. Visual inspection reveals large trees growing in the earthen embankment and a sluiceway structure with a concrete facing and a broad-crested spillway section of questionable permanency. Past correspondence and photographs indicate the dam was breached in the past. The cursory Phase I analysis indicates that the spillway and sluiceway have a combined capacity of about 900 cfs, equal to about 15 percent of the estimated "probable maximum flood" (PMF) or about 30 percent of half the PMF and thus is considered inadequate.

The "probable maximum flood" would likely overtop the dam by as much as five feet. An analysis of backwater conditions at the dam during major flood flows should be made a part of more detailed studies.

In the event of a sudden failure of Red Dam with the pool at the top of dam, it was estimated that the main impact area would extend about two miles downstream, with a flood wave of about three feet in depth,

possibly effecting a bridge for Route 140, several residences, regulating facilities for a pond at a sportsmen's club and a cranberry bog.

The owner, the Town of Wrentham, should engage the services of a qualified consultant within two years for further analysis and possibly a design study for rebuilding or providing for extensive repairs to the dam. The recommendation should be implemented if the owner wishes to maintain a recreation pool and a pool which provides recharge of an aquifer that is drawn upon by two town wells, and a structure that will pass major flooding events.

Round-the-clock surveillance should be provided during periods of high precipitation. The owner should develop a formal warning system. An operational procedure to follow in the event of an emergency should also be adopted.

Recommendations and remedial measures described in Section 7 should be implemented by the owner within two years and one year respectively, after receipt of this Phase I inspection report.

GREGORY T. BUTEAU, P.E.
Massachusetts Registration #27567

This Phase I Inspection Report on Red 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.

CHARLES G. TIERSCH, Chairman
Chief, Foundation and Materials Branch
Engineering Division

FRED J. RAVENS, JR., Member
Chief, Design Branch
Engineering Division

SAUL COOPER, Member
Chief, 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 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.

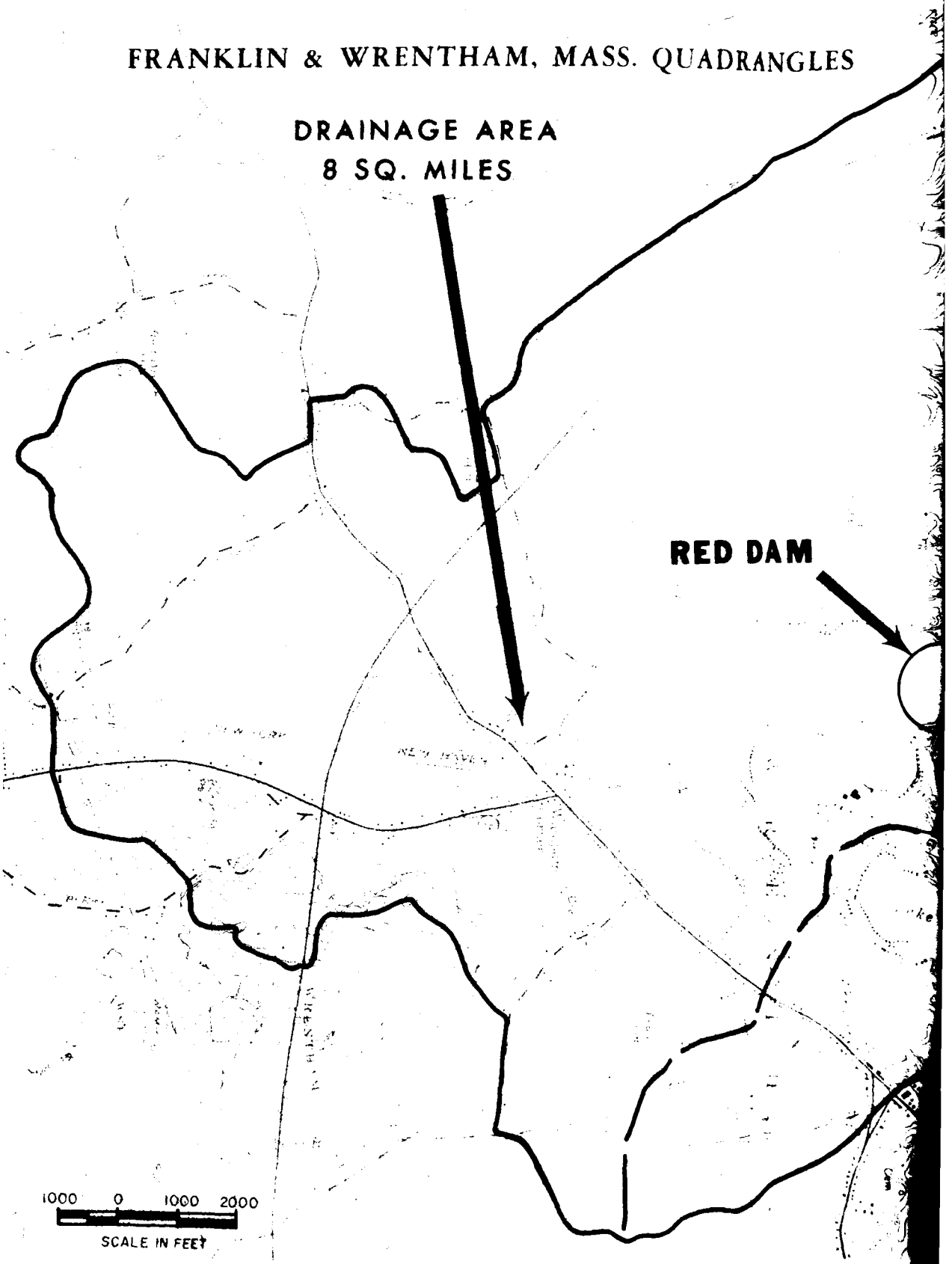
It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the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

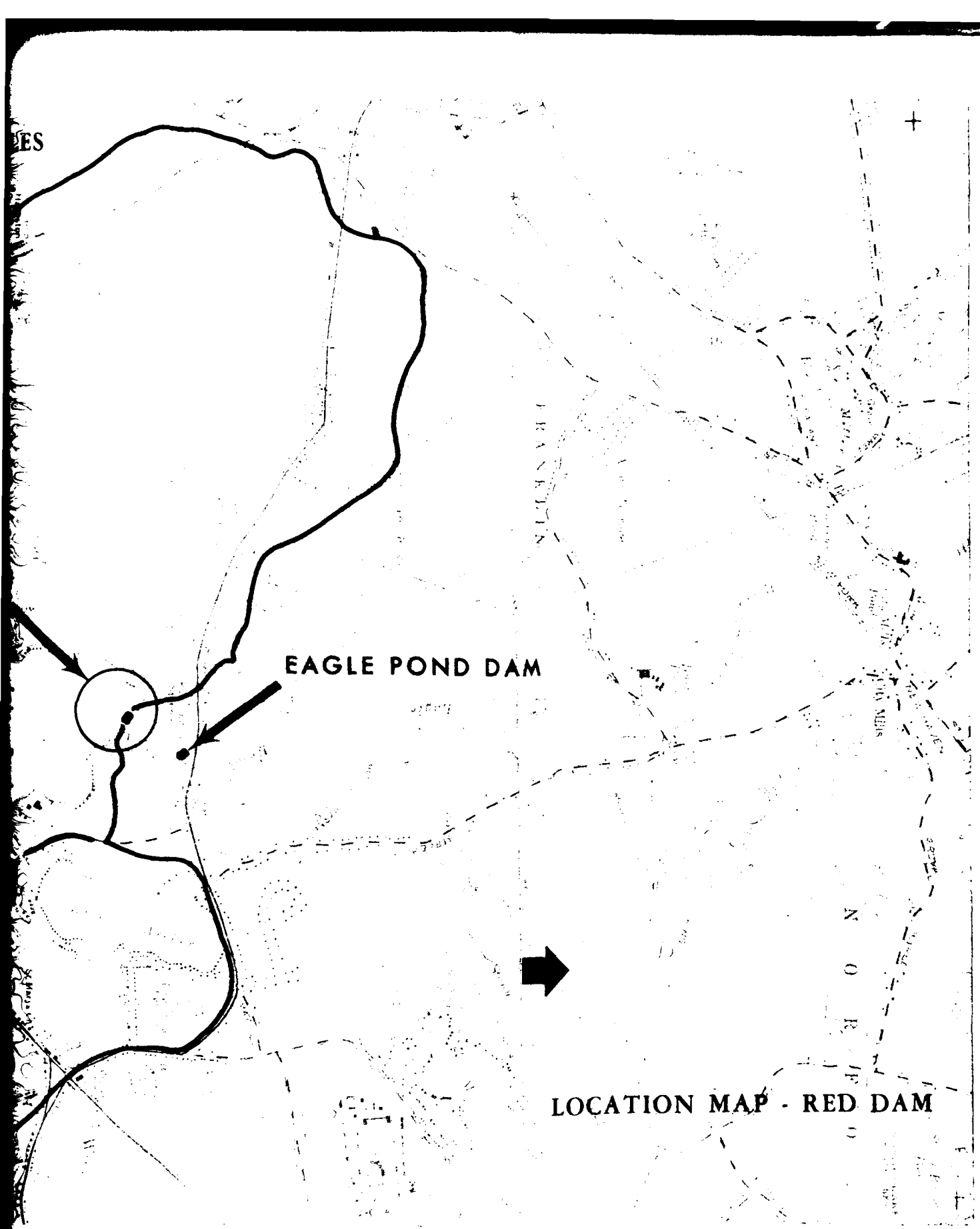
Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because 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 aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

TABLE OF CONTENTS

APPENDICES

FRANKLIN & WRENTHAM, MASS. QUADRANGLES





LOCATION MAP - RED DAM

Photograph #1

Downstream View of 45-foot Spillway
from Left Abutment

Photograph #2

Downstream View of Red Dam,
Spillway & Sluiceway

PHASE I INSPECTION REPORT
RED DAM AT LAKE PEARL
MA 00170

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.

This dam was inspected and the resulting report prepared by the technical staff within the New England Division of the Corps of Engineers.

b. Purpose.

(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 states 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 Project.

a. Location. Lake Pearl, which is impounded by Red Dam, is located approximately one and a half miles west of the Town of Wrentham in the Charles River (Mill River) Basin. Red Dam is shown on U.S.G.S. Quadrangle, Wrentham, Mass., with coordinates N 42°-04'-10", E 71°-21'-10" and is located in Norfolk County.

b. Description of Dam and Appurtenances. Red Dam, located on the northern side of Lake Pearl, has an overall length of approximately 270 feet. The dam consists of approximately 210 feet of earth embankment, a

45-foot long, 6-foot wide broad-crested spillway, and a masonry-concrete faced sluice structure about 16 feet wide. The sluiceway opening for the structure is 2'-9" wide and about 6 feet deep. The top width for the earth dam varies from 10-12 feet, with variable side slopes from 1 on 1 to 1 on 2. The height of dam above the downstream toe is about 6.5 feet.

Approximately 1200 feet downstream of Red Dam exists the remains of Eagle Dam which failed on July 1, 1968.

c. Size Classification. With a dam height of about 6.5 feet, and with storage at spillway crest of about 1,400 acre-feet, and top of dam of 2260 acre-feet, the category classification is INTERMEDIATE.

d. Hazard Classification. Very few residential structures are located near the path of Eagle Brook, which is downstream of Eagle Dam. From Red and Eagle Brook Dams, the brook flows under Route 140, then through an extensive swamp area, two small ponds, a sportsmen's club, a cranberry bog area and then through two mill ponds. At one mill pond, Bush Pond, a pile fabric manufacturer, presently owned by Buckley & Mann, Inc. abuts the pond. The described flow path was measured to be about 2.3 miles in length. In the flow path, there is also a buried water main which parallels Route 140 and is located downstream of Eagle Dam. This main leads from two of the town wells which account for approximately two-thirds of the town's water supply system.

Based upon the above potential loss of life and economic loss, the dam is in a SIGNIFICANT HAZARD classification.

e. Ownership. The present owner of Red Dam is the Town of Wrentham. Previously, the dam had been privately owned by Lapdam, Inc. Other owners of record in chronological order are City Mills Realty Corp. and the American Felt Co.

f. Operator. Mr. Everett Skinner, Jr., Supt. of Wrentham DPW, is responsible for the raising and lowering of the water level for Lake Pearl. He may be contacted at (617) 384-2951.

g. Purpose. The primary purpose for Lake Pearl, which is impounded by Red Dam, is recreation. Lake Pearl also provides water for recharge by means of induced infiltration to an aquifer that is drawn upon by the Town of Wrentham's Wells #2 and #3. These two wells account for approximately two-thirds of the town's water supply and are located downstream of Eagle Dam.

h. Design and Construction History. Design data and as-built drawings are not available. An old inventory sheet lists date of construction as approximately 1920. However, this date cannot be verified.

Some superficial repairs have been made to dam consisting of a facing of the concrete sluiceway and the adding of gravel to the dam.

i. Normal Operational Procedures. In the past, Lake Pearl was maintained at a pool elevation of 199 feet msl, by a 45-foot long and 6-foot wide broad-crested, concrete, timber and gravel spillway. At present, due to disrepair at the spillway and poor condition of the dam, State officials have instructed the owner to lower the lake by removing all stop logs from the sluice to its invert elevation of 196 feet msl. Now, the lake elevation is controlled by the 2'-9" wide concrete capped masonry sluice.

However, during the second inspection visit to the site on June 22, 1978, approximately 2-1/2 inches of water was observed passing over the 45-foot spillway, as a result of the 2'-9" sluiceway slot being blocked by a piece of plywood. This difference in sluiceway operation is shown by comparing Photographs #10 and #14 in Appendix C.

1.3 Pertinent Data.

a. Drainage Area. The drainage area of the dam consists of mostly rolling to flat topography and measures about 8 square miles. For this 8-mile drainage area, 1 square mile of it drains into Lake Archer. A 36-inch diameter conduit controls the flow from Lake Archer to Lake Pearl. Normally, a 12-foot elevation differential is maintained between the water surface of Lake Archer to that of Lake Pearl.

b. Discharge at Dam Site. There are no discharge records available for the project. The largest known flood occurred in this area in March 1968. Review of U.S. Geological Survey records of streams in the general area indicate that Lake Pearl probably experienced an inflow of about 75 cubic feet per second per square mile drainage area. Excess flows are now passed through the 2'-9" sluice from elevations 196 to 199 feet msl (3 feet) then the 45-foot long spillway augments the outflow to elevation 202 feet msl (top of dam). A sluice and spillway rating curve are shown in Appendix D. With a pool at top of dam elevation 202 feet msl, the total sluice and spillway capacity is about 900 cfs.

c. Elevation (ft. above MSL)

(1)	Top Dam	202±
(2)	Test Flood	207±
(3)	Maximum pool-design surcharge	unknown
(4)	Full flood control pool	none
(5)	Recreation pool	196±
(6)	Spillway crest (gated)	none
(7)	Upstream portal invert diversion tunnel	none
(8)	Streambed at centerline of dam	195±
(9)	Maximum tailwater	N.A.

d. Reservoir

(1) Length of maximum pool (spillway crest)	0.9± mile
(2) Length of recreation pool	0.9± mile
(3) Length of flood control pool	none

e. Storage (acre-feet, gross)

(1) Spillway crest (El. 199)	1,400 approx.
(2) Flood control pool	none
(3) Design surcharge	unknown
(4) Top of dam (El. 202)	2,260 approx.
(5) Sluice invert (El. 196)	750 approx.

f. Reservoir Surface (acres)

(1) Top dam (El. 202)	320 approx.
(2) Maximum pool	320 approx.
(3) Flood-control pool	N.A.
(4) Sluice invert (El. 196)	160 approx.
(5) Spillway crest (El. 199)	260 approx.

g. Dam

(1) Type	Earth fill
(2) Length	210 feet
(3) Height (above streambed at downstream toe)	7± feet
(4) Top Width	12-15 feet
(5) Side Slopes	varies 1 on 1 and 1 on 2
(6) Zoning	unknown
(7) Impervious Core	unknown
(8) Cutoff	unknown
(9) Grout curtain	unknown

h. Spillway. The spillway section consists of a 45-foot long by 6-foot wide broad-crested weir at elevation 199 feet msl. The broad crest consists of wood on concrete, gravel filler, concrete and rock and gravel area, see detail of spillway in Appendix C, Photograph Index Map. Adjacent to the spillway is a 3-foot wide, 6-foot deep and approximately 8-foot long concrete-capped masonry sluiceway with invert at elevation 196 feet msl. Slots are provided in the concrete walls of the sluice for the placement of stop logs to elevation 202 feet msl.

There is no upstream approach channel and as the reservoir rises behind Red Dam, it meets the spillway crest directly. The downstream channel is formed by backwater created by the breached Eagle Pond dam located about 1,200 feet downstream of Red Dam. The spillway section of Eagle Pond Dam failed in July 1968 and as yet has not been repaired. The water surface elevation differential of Lake Pearl and the downstream channel was observed to be about 3 feet on June 22, 1978.

SECTION 2: ENGINEERING DATA

2.1 Design and Construction. Neither engineering design data nor construction records are available for Red Dam. There are no cross sections of the original dam to show material zoning or type of materials used. There is no data available on seepage and stability analysis or adopted design values for the foundations or embankments.

The only source of information is the copies of past inspection reports and a topographic plan of the dam area dated August 16-20, 1968, inclosed in Appendix B.

Superficial repairs have been made to the dam consisting of a concrete facing to the masonry sluiceway and the adding of gravel to the earthen portion of the dam.

2.2 Evaluation.

a. Availability. There is not sufficient data available for stability or seepage analyses. For a rational analysis, boring information is required for the embankment and foundations soils in order to assign realistic values of shear strength, unit weights, void ratios, and permeability of the embankment and foundation soils.

b. Adequacy. There is no foundation boring or embankment materials data available.

The lack of indepth 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 history and sound engineering judgement.

SECTION 3: VISUAL INSPECTION

3.1 Findings.

a. General. The overall project has been poorly maintained and is in various degrees of disrepair.

b. Dam. A recent cap of gravel fill has been placed on top of the dam with spillage over the side slopes. Observation of the top of dam and side slopes reflect much foot traffic. Large trees and brush grow on both the upstream and downstream slopes for the 210 feet of earth abutments. See Appendix C for photographs #5, #7 and #8 which show this extensive tree growth.

On the west abutment, at the downstream toe of the dam, standing water 8-10 inches deep forms a pool, with a stream 6 inches by 1-inch deep flowing from the pool into the downstream channel at about 0.5 fps. Through embankment seepage emerges on the downstream slope about 6 inches above the toe of slope. The head differential observed on June 22, 1978 was about 3 feet. No boils or piping of material was noted.

There is no rock protection or riprap on the side slopes. No cracks or sluffing was noted on the slopes, however the recent gravel fill would mask any cracks on the top of dam. There is no evidence of foundation drainage facilities or toe drains.

c. Appurtenant Structures.

(1) Spillway. The 45-foot spillway, which is approximately 6 feet wide, consists of a 1'-9" concrete weir on the upstream end, followed by 3 feet of sand and gravel, and finally wood timbers on the downstream end. The spillway, at elevation 199' msl is 3 feet below top of dam, elevation 202' msl. The rock fill downstream of the timbers in the

spillway is very irregular and approximates an exit slope of 1 on 4. The 6-foot broad-crested section, although recently repaired with gravel and rock fill, will require this type of maintenance periodically. A more permanent section should be considered if a pool is to be maintained at spillway elevation.

The inspection on January 13, 1978 showed no flow over the spillway with discharge occurring through the 2'-9" sluiceway. No stop logs or obstructions were noted in the sluiceway on the January 13 inspection.

During the first inspection, the team was informed that State officials had advised the owner to discharge outflow thru the sluiceway and in turn not obstruct the sluice opening, in order to minimize the possibility of spillway flow.

On the June 22, 1978 inspection, 2-1/2 inches of water was flowing over the 45-foot spillway. The sluiceway was blocked by stop logs and a piece of plywood. Subsequent efforts were made by town officials to remove the above blockage.

A review of past inspection reports as contained in Appendix D indicate that "blockage" of the sluiceway has occurred several times. In particular, Lapdam, Inc., a past owner, had been requested by Mass. DPW in a letter dated September 28, 1972 to remove a similar blockage in the sluiceway.

Review of past correspondence also indicates in a letter dated August 1970 the lake abutters requested "raising the water to a reasonable level" since the drop in water level has caused excessive weed growth, debris and stagnation, and affected swimming. By maintaining a lower pool elevation for Lake Pearl, recreational benefits decrease.

The two referenced letters above indicate conflicting regulation purposes. The September 1972 letter attempts to minimize the water level because of the condition of the dam, whereas the August 1970 letter requests increasing the level of water for recreational purposes.

Lastly, photographs in Appendix C dated 1953, show a breach in the spillway area which is noted in a letter dated April 30, 1953 from the County Engineer to City Mills Corp. — "The dam at Lake Pearl has recently been found in very poor condition, particularly on the southerly side of the spillway. The whole bank has been washed out for at least ten feet and the remainder for a distance of fifty feet is rapidly becoming in the same condition."

(2) Sluiceway. The sluiceway was originally built of stone masonry. Recent repair work consists of a concrete cap and facing 6 to 10 inches thick over the original deteriorated masonry. This cap masks any structural weakness in the underlying construction. Past erosion near the foundation of the sluice sections had been corrected by placing gravel fill in the voids.

d. Reservoir Area. The beach area, located on the northwesterly side of the lake near the Uncas Brook inlet, was inspected and no problems were observed. The outlet channel, from Lake Archer to the drop structure at the intake of the 36-inch diameter concrete pipe, was in poor condition, overgrown with brush and trees. Because of the limited capacity of the 36-inch pipe from Lake Archer to Lake Pearl, plus the resulting surcharge storage, it was assumed that Lake Archer is able to control flood runoff from its small one square mile of watershed.

e. Downstream Channel. The channel downstream of Lake Pearl outlet consists of backwater created by Eagle Pond Dam located about 1,200 feet downstream. At present the backwater surface at Red Dam is about 3 feet lower than normal due to the spillway breach at Eagle Pond Dam. Failure of the spillway section occurred in July 1968. From this lower dam, the flow is then conveyed in an open channel for about 200 feet downstream of the dam to a 2.5-foot high by 19-foot wide concrete bridge under Route 140 (Franklin Street). The brook's path then continues through a relatively undeveloped area consisting of swamps, natural ponds, a cranberry bog, and two other ponds for a distance of about 2.3 miles to a mill building. If Red Dam or its spillway breached, there would be shallow inundation throughout this area because of the relative flat existing gradient, however, flood prone development in the reach is minimal.

3.2 Evaluation. The overall project appears to be in poor condition. Maintenance appears to be minimal as indicated by the significant tree growth and the superficial type of repairs to the dam.

Inducing spillway flow by blocking the sluice opening for an extended period will erode the spillway area and undermine the sluice abutments to an elevation lower than the existing sluice invert. As a result of the above, control of the lake level is lost. To maintain a lake level that is beneficial to all objectives, a coordinated effort should be made by the owner to eliminate blockage of the sluice opening one and one-half feet below spillway crest elevation.

SECTION 4: OPERATIONAL PROCEDURES

4.1 Procedures. Lake Pearl, impounded by Red Dam, is used primarily as a recreational project. Additional benefits are derived in the control of ground water level by the lake. This helps to recharge water supply wells which provide water for about two-thirds of the local needs. Normal flows, at present, are passed by the sluiceway and excessive flows are passed by the sluiceway and spillway. The State has advised the owner not to block the sluiceway opening by stoplogs or other means, in order to minimize the possibility of flows over the spillway.

4.2 Maintenance of Dam and Appurtenance. There is no periodic maintenance performed at this project. However, due to the concern of local people, and the efforts of State officials, the dam and spillway area have received some superficial improvements in recent years.

4.3 Maintenance of Operating Facilities. Some blockage of the sluiceway opening occurs as noted in the inspection visit on June 22, 1978 despite past advice to keep the referenced opening clear.

4.4 Warning System. There is no formal warning system other than residents of the lake.

4.5 Evaluation. Since the spillway construction is not considered adequate to pass flows, coordinated efforts should be made by the owner to eliminate blockage of the sluiceway opening that would result in spillway flows.

SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features.

a. Design Data. There is no known design data available.

b. Experienced Data. There is no specific historical data available. General data that is available consists of time and peak of events experienced in the region. The flood of record in this area occurred in March 1968.

c. Visual Observation. At the time of the inspection on January 13, 1978, a one-foot depth of flow was observed in the sluice. The water surface of Lake Pearl was estimated to be at about elevation 197 feet msl.

During the inspection on June 22, 1978, a flow of 2-1/2 inches over the spillway was observed with a corresponding lake elevation of 199 msl.

d. Overtopping Potential. In accordance with 1977 guidelines, with a size classification of INTERMEDIATE and hazard potential of SIGNIFICANT, the test flood should be half Probable Maximum Flood (PMF) to full PMF. A full PMF was therefore adopted. Based on a New England Regional Guide Curve, the estimated Probable Maximum Flood would have a peak of 1,250 cfs/square mile or 8,800 cfs for the net 7.0 square mile basin assuming a minimum contribution from Lake Archer. It was further estimated that, based on size of pool area relative to the size of the watershed, the reduction in inflow to outflow by surcharge storage would be about 2,000 cfs. The resulting peak outflow would then be 6,800 cfs and the resulting water surface of the reservoir would be about 206.7 feet msl, or about 4.7 feet over the top of the dam. A standard project flood, estimated at about half the PMF or 4400 cfs, was also tested for overtopping potential.

The outflow, as reduced by surcharge storage, was about 2800 cfs and resulted in a surcharge water surface of 204.0 feet msl, or about 2.0 feet over the top of dam.

e. Dam Failure Analysis. A cursory dam failure analysis was made for Red Dam assuming the reservoir filled to top of dam, a 40 percent dam breach width, and a breach depth equal to height of dam above streambed. It was further assumed that downstream road bridges would fail and not significantly modify or magnify the resulting dam failure peak discharge.

The peak dam failure outflow was estimated at about 2600 cfs conceivably producing about a 3-foot flood wave just downstream. The resulting discharge would possibly affect a bridge for Route 140, several residences, regulating facilities for a pond at a sportsmen's club, and a cranberry bog.

SECTION 6: STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability.

a. Visual Observations. From visual inspections, the dam appeared in poor condition. Seepage was noted at the downstream toe on the left abutment with a head differential of approximately 3 feet on the June 22, 1978 inspection. Also, large trees and brush have been growing for some time on both the upstream and downstream slopes. As noted previously, some superficial repairs in the form of a concrete cap have been made to the masonry sluiceway, as well as the addition of gravel to the earthen portion of the dam. A more permanent section for the spillway, other than the existing 6-foot wide, broad-crested section consisting of a concrete weir, sand and gravel, and timbers, should be considered.

b. Design and Construction Data. No information is available regarding the design and construction of this dam.

c. Operating Records. A letter dated April 30, 1953 from the County Engineer to City Mills Realty Company (past owner), found in Appendix B, indicates that the dam had been breached. A photograph from the Mass. DPW records, as found in Appendix C, verifies this washout.

Another photograph from the Mass. DPW records, in Appendix C, also indicates another breach in the dam occuring on March 30, 1961. No written documentation on the above event was found.

Correspondence found in Appendix B shows that unauthorized blockages of the sluiceway have occurred several times. The correspondence also indicates that the dam has been in disrepair for some time, although recently some superficial improvements have been made.

d. Post Construction Changes. Other than the concrete cap for the sluiceway and the adding of gravel to the dam, no records on major repairs could be found.

e. Seismic Stability. This dam is located in seismic probability Zone 2, and in accordance with recommended Phase I guidelines does not warrant seismic analysis.

SECTION 7: ASSESSMENT, RECOMMENDATIONS, & REMEDIAL MEASURES

7.1 Dam Assessment.

a. Condition. Based upon visual inspections and the Phase I hydrologic analysis, Red Dam is in poor condition.

From the Phase I analysis of Red Dam at Lake Pearl, it was determined that the existing spillway and sluiceway have a combined capacity of about 900 cfs, equal to 30 percent of the estimated "Standard Project Flood" discharge or about 15 percent of the "maximum probable flood." In the event of a maximum probable flood, it is calculated that the dam could be subjected to overtopping by as much as five feet. However, based upon past experience, it does not appear that this project will be able to withstand such overtopping.

In the event of a sudden failure of Red Dam with the pool initially filled to the top of dam, it was estimated that the main impact area would extend about 3 miles downstream, with an initial flood wave in the order of about three feet, possibly effecting a bridge for Route 140, several residences, regulating facilities for a sportsmen's club and a cranberry bog.

b. Adequacy of Information. The lack of indepth 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 history and sound engineering judgement.

c. Urgency. The recommendations and operating and maintenance procedures in Sections 7.2 and 7.3 below, should be implemented within two years and one year respectively, after receipt of this Phase I report by the owner.

7.2 Recommendations. It is recommended that the owner should engage the services of a qualified consultant for further analysis and possibly a design study to rebuild or provide for extensive repairs to Red Dam if the dam is expected to withstand major flooding events, retain a recreation pool, and a pool which provides water for recharge to an aquifer that is drawn upon by two town wells accounting for two-thirds of the Town's water supply.

The spillway discharge capacity is considered inadequate. Further hydrologic studies by competent consulting engineers are necessary to determine what alternative measures are necessary to significantly increase the discharge capabilities at the dam.

7.3 Remedial Measures.

a. Alternatives. Breaching of the dam is a possibility, however the resulting decrease in lake level would affect the recreational resources provided by the lake.

b. Operation and Maintenance Procedures. Because of the limited spillway capacity and the poor condition of the structure, remedial repair procedures to improve the dam are not considered practical.

However, a formal operational procedure should be developed in the event of an emergency, which should include a warning system and evacuation plan. This procedure should include a plan of surveillance, particularly during periods of heavy rains. This procedure should be implemented within one year.

Also, weekly visits to check for unauthorized blockage of the sluiceway, seepage monitoring and annual periodic technical inspections should be implemented.

APPENDIX A

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT Red Dam, Pearl Lake
Wrentham, Mass.

DATE 1/13/78 & 6/22/78

TIME Approx. 9:30 A.M.-3:00 P.M.

WEATHER 1/13/78-Cole, Snowing, 3" of snow on ground, approx. 30° F.
6/22/78-Cloudy, Approx. 70-80°F.

PARTY:

1. J. Aiken - NED, F&M Br. ***
2. G. Buteau- NED, Civil Eng. **
3. M. Michielutti-NED, WCB *
4. A. MacCallum--Mass. DEQE *
5. A. Lounsbury--Mass. DPW, Dist #6 *
6. K. Kohut, Selectwoman-Town of Wrentham**
7. A. Tedesko, Acting. Supt. of Wrentham, DPW, Town of Wrentham **
8.
9.
10.

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Dam, Spillway and Sluiceway	Michielutti & Buteau	
2.	Dam, Wpillway & Sluiceway	Aiken & Buteau	
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

* Attended inspection on 1/13/78
** Attended inspections on both 1/13/78 and 6/22/78
*** Attended inspection on 6/22/78

PROJECT Red Dam DATE 1/13/78 & 6/22/78

PROJECT FEATURE Dam Embankment NAME Inspection Team

DISCIPLINE NAME

AREA EVALUATED	CONDITIONS
DAM EMBANKMENT	
Crest Elevation	202 ±
Current Pool Elevation	199 ± (6/22/78) & 197 ± (1/13/78)
Maximum Impoundment to Date	Unknown
Surface Cracks	None observed
Pavement Condition	No pavement
Movement or Settlement of Crest	Surface recently capped with gravel fill
Lateral Movement	None observed
Vertical Alignment	Fair
Horizontal Alignment	Fair
Condition at Abutment and at Concrete Structures	Surface erosion at sluiceway abutment
Indications of Movement of Structural Items on Slopes	Recent concrete cap on sluiceway and spillway abutments
Trespassing on Slopes	Large trees & brush on both slopes
Sloughing or Erosion of Slopes or Abutments	Erosion of gravel fill on both slopes
Rock Slope Protection - Riprap Failures	No rock slope protection
Unusual Movement or Cracking at or near Toes	None observed
Unusual Embankment or Downstream Seepage	Stagnant pool 8-10 inches deep downstream of west embankment. Seepage emerges on downstream slope 6 inches above pool.
Piping or Boils	None observed
Foundation Drainage Features	Unknown
Toe Drains	None observed
Instrumentation System	None.

PROJECT Red Dam, Pearl Lake DATE 1/13/78 & 6/22/78

PROJECT FEATURE NAME Inspection Team

DISCIPLINE NAME

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	Intake Channel is Lake Pearl
a. Approach Channel	
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	

PROJECT Red Dam, Pearl Lake DATE 1/13/78 & 6/22/78

PROJECT FEATURE _____ NAME Inspection Team

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER	
a. Concrete and Structural	Not applicable
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	
Crane Hoist	
Elevator	
Hydraulic System	
Service Gates	
Emergency Gates	
Lightning Protection System	
Emergency Power System	
Wiring and Lighting System in [illegible]	

PROJECT Red Dam, Pearl Lake

DATE 1/13/78 & 6/22/78

PROJECT FEATURE

NAME Inspection Team

DISCIPLINE

NAME

AREA EVALUATED	CONDITION
OUTLET WORKS - TRANSITION AND CONDUIT	Not applicable
General Condition of Concrete	
Rust or Staining on Concrete	
Spalling	
Erosion or Cavitation	
Cracking	
Alignment of Monoliths	
Alignment of Joints	
Numbering of Monoliths	

PERIODIC INSPECTION CHECK LIST

PROJECT Red Dam, Pearl Lake DATE 6/22/78

PROJECT FEATURE Sluiceway NAME Inspection Team

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	
General Condition of Concrete	*
Rust or Staining	None observed
Spalling	None observed
Erosion or Cavitation	None observed
Visible Reinforcing	None observed
Any Seepage or Efflorescence	None observed
Condition at Joints	Not applicable
Drain holes	None observed
Channel	
Loose Rock or Trees Overhanging Channel	None observed
Condition of Discharge Channel	Discharges directly into streambed

* Outlet works consists of a sluiceway 2'-9" wide, 14'-5"long, and 6'-3" deep, with stop log controls. Recent concrete cap, approximately 6-10 inches thick placed over masonry and/or concrete walls and top, masks any defects to structure.

PERIODIC INSPECTION CHECK LIST

PROJECT Red Dam, Pearl Lake DATE 6/22/78

PROJECT FEATURE Spillway NAME Inspection Team

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS *	
a. Approach Channel	No approach channel.
General Condition	
Loose Rock Overhanging Channel	
Trees Overhanging Channel	
Floor of Approach Channel	
b. Weir and Training Walls	
General Condition of Concrete	Right abutment consists of mortored masonr (joints are deteriorating). Left abutment - stone masonry with recent 6-10 inch concrete cap.
Rust or Staining	Staining on weir
Spalling	None observed
Any Visible Reinforcing	None observed
Any Seepage or Efflorescence	None observed
Drain Holes	None observed
c. Discharge Channel	
General Condition	
Loose Rock Overhanging Channel	None observed
Trees Overhanging Channel	" "
Floor of Channel	Channel floor is dumped rock with size up to 500 pounds. Very irregular surface. Exit slope of rock is about 1 on 4.
Other Obstructions	None observed

* On 6/22/78 approximately 2 1/2 inches of water was flowing over spillway crest, as a result of stop logs in sluiceway. The Town removed part of obstruction in sluiceway on the 6/22/78 inspection date to lower water level. On 1/13/78 inspection, no flow was observed over spillway since no stoplogs were in sluiceway. On the 1/13/78 inspection date, we were told that owner had been advised to maintain water level below spillway crest.

PERIODIC INSPECTION CHECK LIST

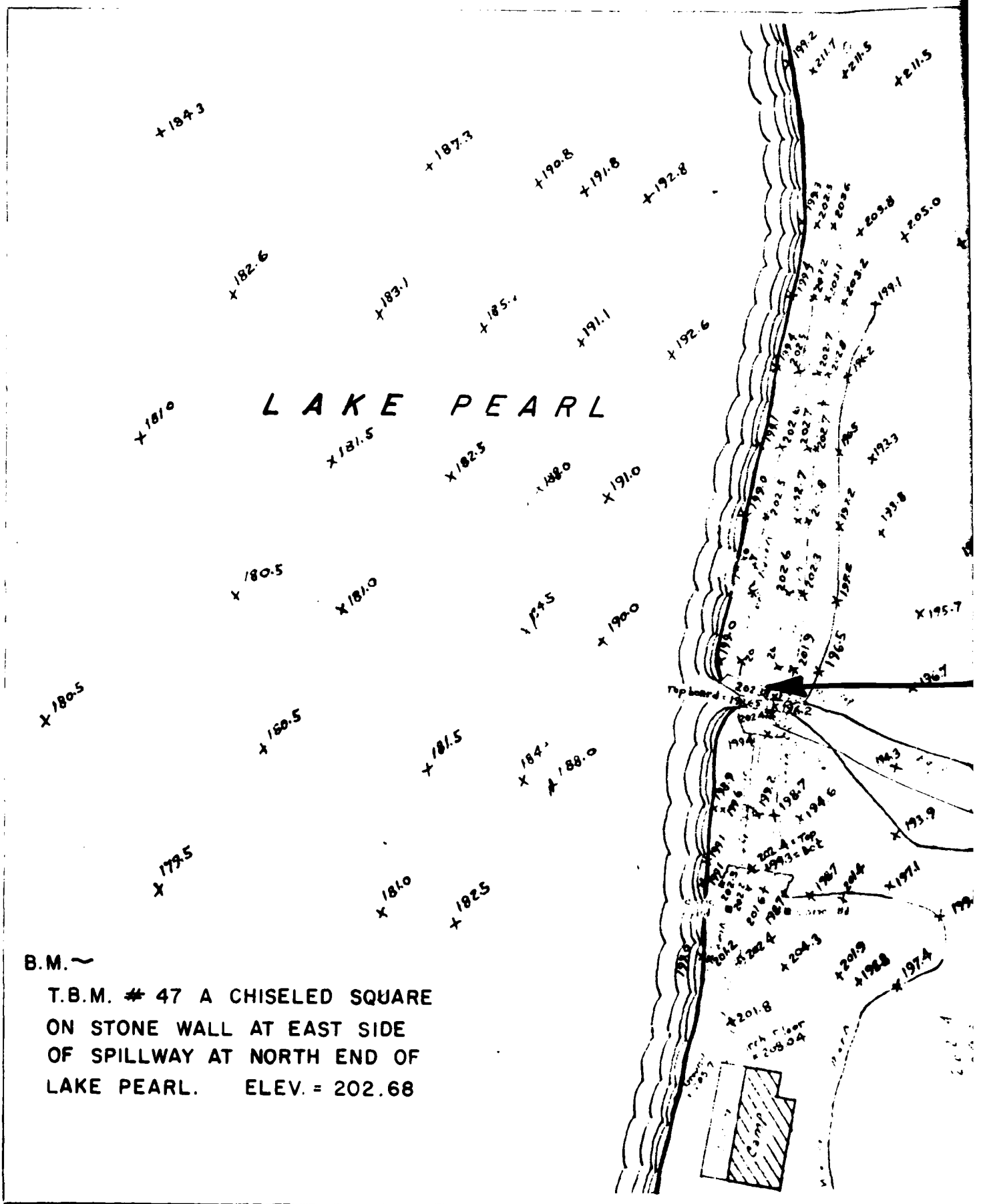
PROJECT Red Dam, Lake Pearl — DATE 1/13/78 & 6/22/78

PROJECT FEATURE _____ — NAME Inspection Team

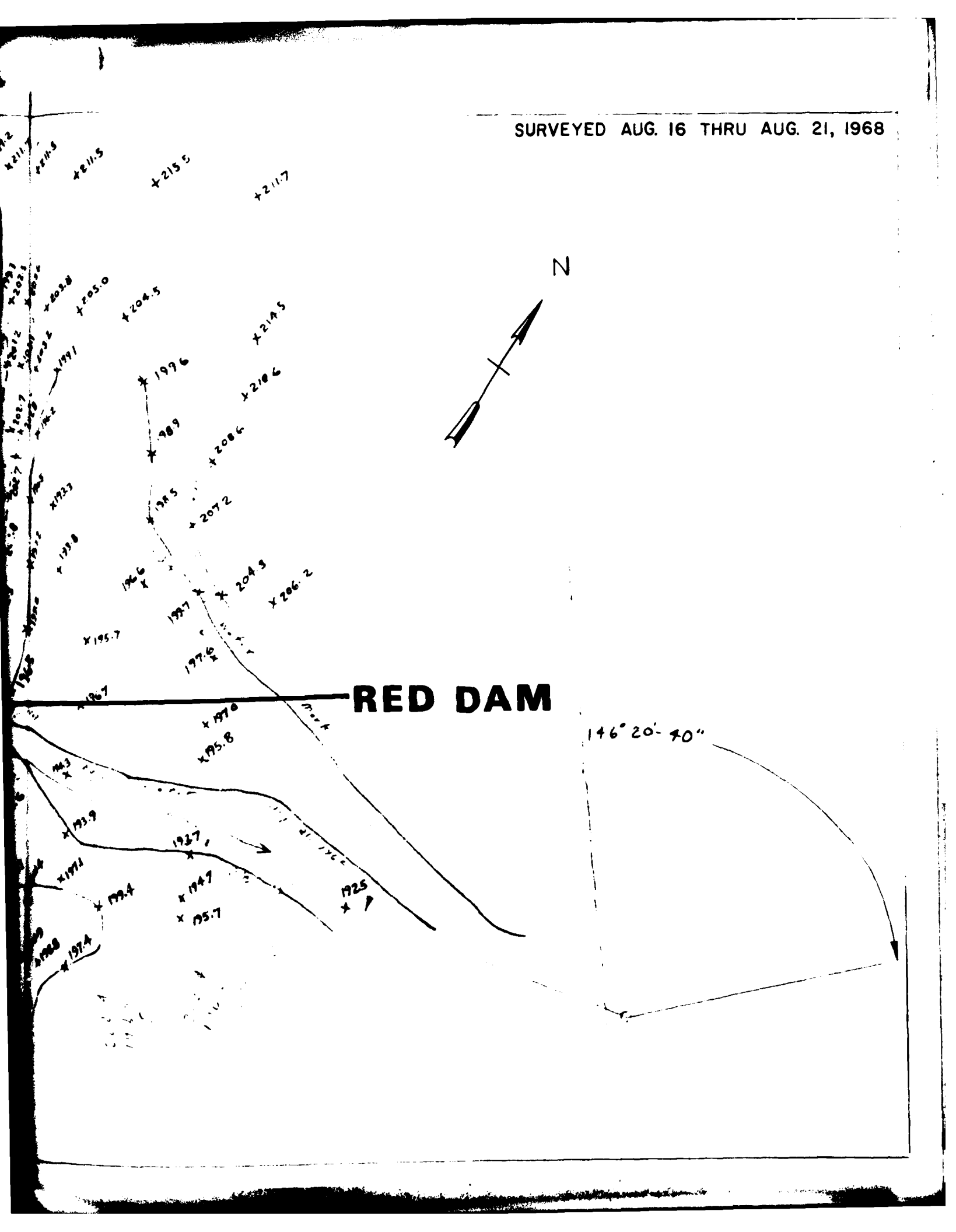
DISCIPLINE _____ — NAME _____

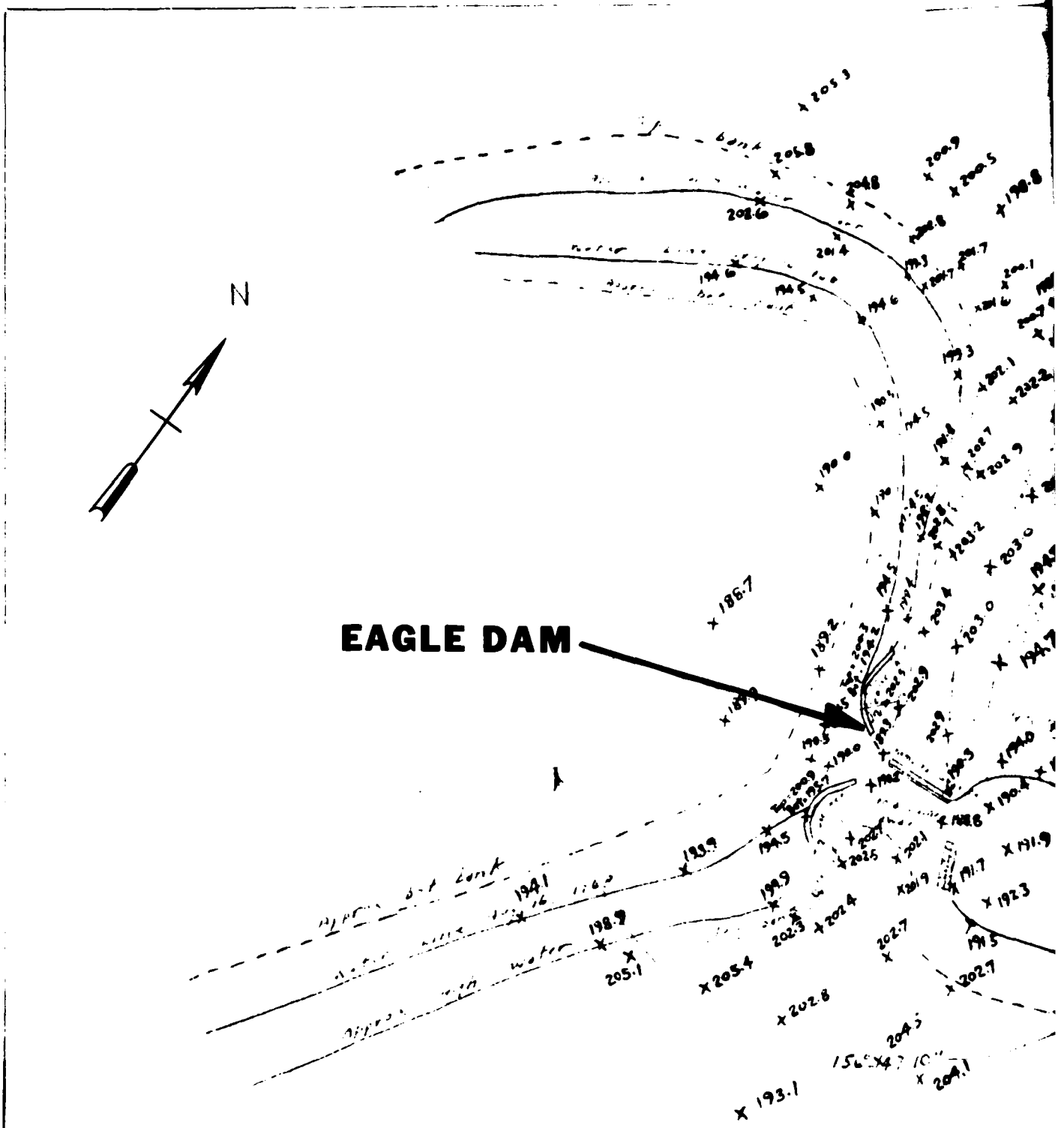
AREA EVALUATED	CONDITION
OUTLET WORKS - SERVICE BRIDGE	Not applicable
a. Super Structure	
Bearings	
Anchor Bolts	
Bridge Seat	
Longitudinal Members	
Under Side of Deck	
Secondary Bracing	
Deck	
Drainage System	
Railings	
Expansion Joints	
Paint	
b. Abutment & Piers	
General Condition of Concrete	
Alignment of Abutment	
Approach to Bridge	
Condition of Seat & Backwall	

APPENDIX B


LAKE PEARL
B.M.~
T.B.M. # 47 A CHISELED SQUARE ON STONE WALL AT EAST SIDE OF SPILLWAY AT NORTH END OF LAKE PEARL. ELEV. = 202.68

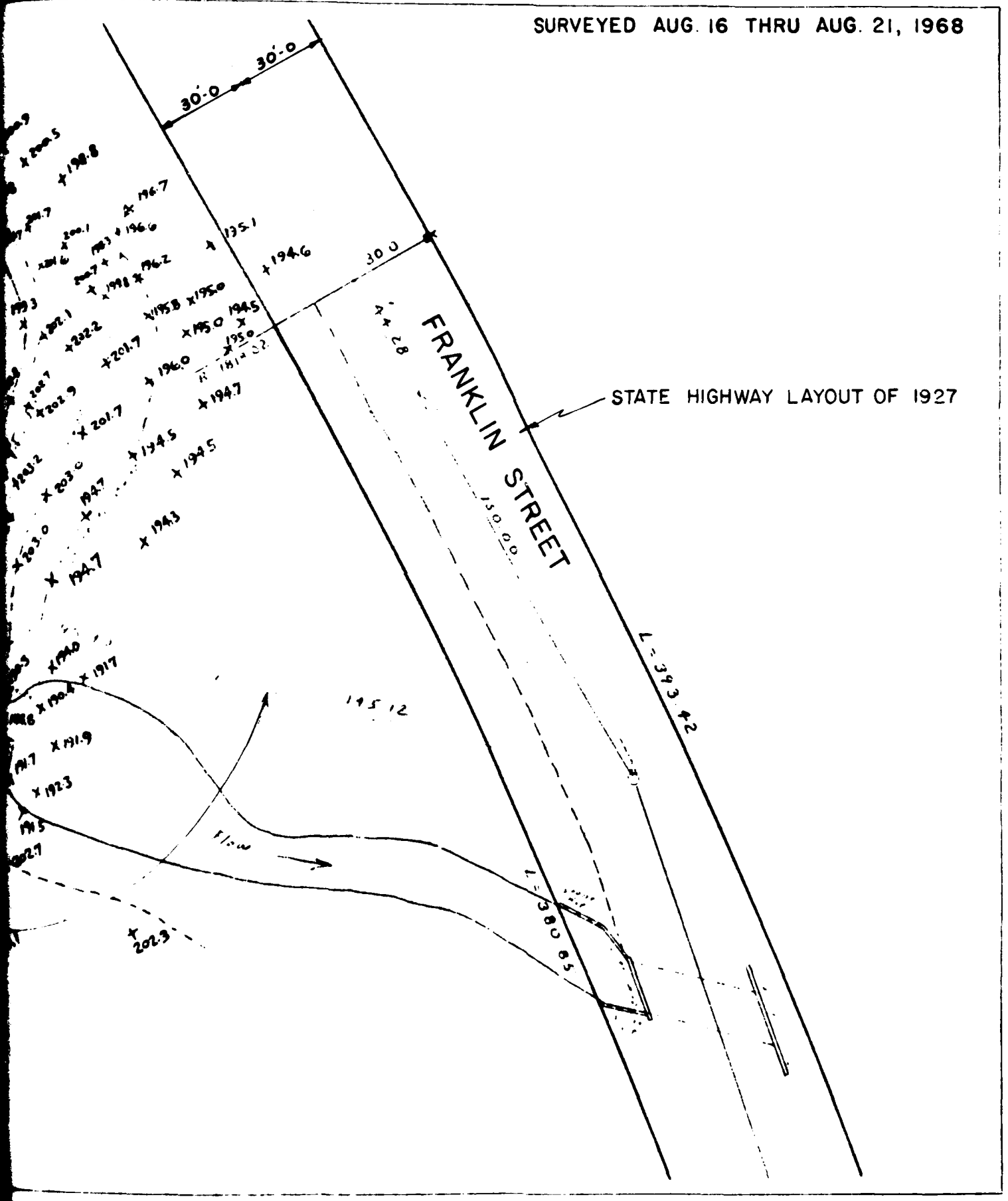
SURVEYED AUG. 16 THRU AUG. 21, 1968





B.M.~

T.B.M. # 45 A CHISELED SQUARE
ON STONE WALL AT SOUTHEAST
END OF BRIDGE OVER EAGLE BROOK.
ELEV. = 193.14


SURVEYED AUG. 16 THRU AUG. 21, 1968
30'-0
30'-0
30.0
FRANKLIN STREET
STATE HIGHWAY LAYOUT OF 1927
L = 393.42
L = 380.65
150.00
19512
Flow

SWAINE/552/pac

NEDPL-P

17 January 1978

Honorable Margaret M. Heckler
House of Representatives
Washington DC 20515

Dear Mrs. Heckler:

This is in further response to your letter of 6 December 1977 concerning safety aspects of the Red Dam and Eagle Dam in Wrentham, Massachusetts and reports our evaluation of flood and erosion control problems along Eagle Brook. Specific assistance under the Section 205 and Section 14 authorities was also requested by the Wrentham Board of Selectmen by letter dated 14 November 1977.

My interim letter of 19 December 1977 advised you of our findings and recommendations concerning possible repairs or restoration of the two aforementioned dams and in summary stated that the Corps of Engineers could not provide Federal funds for the repair, restoration, improvement or maintenance of either dam under existing programs.

Engineers of my staff met with local officials on 29 December 1977, to discuss and inspect flood prone and erosion areas along Eagle Brook. Initially, they inspected a reported erosion problem at the Route 140 highway bridge. The bridge is located on Eagle Brook immediately downstream from the Eagle Dam. This investigation revealed that there was no active erosion taking place at the bridge and that the structure and roadway were not currently

NEDPL-P
Honorable Margaret M. Heckler

endangered. It was reported by local officials that the Massachusetts DPW is currently planning to relocate a portion of the roadway and construct a larger bridge at this location.

During the meeting with the Board of Selectmen, they indicated that they were still primarily concerned with obtaining funds to repair the two dams. This became apparent when it was reported that there has not been a significant history of flood damages along Eagle Brook. Local officials feel that if the Red Dam should fail, the surge of water would cause damages to the town's water supply well field, a State school building, 23 houses and 2 mill buildings. It was explained that under the Section 205 authority, the possibility of future damages could not be equated to estimated project costs to determine project justification unless recurring damages had been sustained by those properties.

Although this office could not assist the Town of Wrentham in repair of the two dams, it was suggested that two other possibilities were available. These include (1) application to HUD for a block grant to repair the dams and (2) application to the Massachusetts Department of Environmental Quality Engineering Division of Waterways for inclusion in Phase I of the Dam Safety Inspection Program. The Board of Selectmen indicated that they would follow up on these ideas.

I regret that no further action can be undertaken by this office for flood and erosion control improvements along Eagle Brook at this time. A final report of these findings will be forwarded to the Wrentham Board of Selectmen.

Sincerely yours,

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

cf:
Honorable Margaret M. Heckler
One Washington Street
Wellesley Hills, MA 02181

DAEN-CWZ-D
P. Gould - Engineering Div.
Major Hando
Mr. Ciriello
Plan Div. Files

NEDPL-P

Eagle Brook, Wrentham, Mass.

Division Engineer	W. Swaine	5 January 1978
(THRU: Channels)	205 Project Unit	Swaine/532/pac

1. Duration of Trip: One day - 29 December 1977

2. Sponsored by: Wrentham Bd. of Selectmen

3. Principal Participants:

Oscar L. Mayer, Chairman, Bd. of Selectmen
Karen Kohut, Bd. of Selectmen
George Smith, Bd. of Selectmen
Frank Belitsky, Mass. Civil Defense
Douglas Forbes, Mass. Civil Defense
William Swaine, NED
Michael Minior, NED

4. Report:

At the request of the Wrentham Bd. of Selectmen we inspected a reported river erosion problem at the Route 140 highway bridge. The bridge is located on Eagle Brook immediately downstream from two dams (Red Dam and Eagle Dam) which were recently inspected by Major Hando and Mr. Gould. A detailed description of the area and the dams in particular is contained in Major Hando's letter of 13 December 1977 to the Mass Director of Civil Defense (copy attached).

Inspection of the bridge site indicated no active erosion taking place. The subsequent meeting with the Bd. of Selectmen indicated that they were still primarily concerned with obtaining funds to repair the two dams. We explained the intent and requirements of the Section 14 and Section 205 authorities and requested information relative to past flood damages. Ms. Kohut explained that, while there has not been a significant history of past flood damages, she feels that if the dam should fail, the surge of water would cause damages to the towns water supply well field, a state school building, 23 houses and two mill buildings, all located downstream from the dams.

SUBJECT: Trip Report - Field Inspection 5 January 1978
Eagle Brook, Wrentham, Mass.

Local officials realized that their needs to have the dams repaired could not be solved under the special continuing authorities programs. It was explained that two other avenues of approach could be utilized to assist in determining the stability of the structures. Those included (1) application for a HUD block grant to repair the dams and (2) application to Mass. Civil Defense and Div. of Waterways for inclusion in Phase I of the Dam Safety Inspection Program. The Bd. of Selectmen were satisfied that, although they could not be assisted under Section 205 or 14, they were going to receive aid from those other areas.

A report of our findings will be forwarded to Congresswoman Heckler.

Incl: as

W. Swaine

cf:
Maj. Hando
Eng. Div. (Gould)
Ciriello
Div Files

Major Hando/mrr/270

NEDDX

19 December 1977

Honorable Margaret M. Heckler
House of Representatives
Washington, D.C. 20515

Dear Mrs. Heckler:

This is in reply to your letter of December 6, 1977 with regard to federal support for improvement of Red Dam and Eagle Dam in Wrentham, Massachusetts.

At the request of Mr. Cunningham, the Director of Civil Defense for Massachusetts, a member of my staff attended a joint inspec- of these dams on November 17, 1977 with town officials, and members of the Commonwealth's engineering staff. The results of that visit were forwarded to Mr. Cunningham on December 13, 1977 and are summarized below. Subsequent to that, we received a request from the Board of Selectmen, Wrentham, to evaluate conditions there for possible application of our special continuing authorities, specifically, the Emergency Bank Protection program. Members of my staff will visit Wrentham again on December 29, 1977. Our area of primary concern will be that section of Eagle Brook downstream of Eagle Dam and in the vicinity of the bridge for Route 140. I will advise you of the results of that visit.

Lake Pearl is a natural storage and detention area with a water surface area of approximately 240 acres servicing a drainage area of about eight square miles. The purpose of Red Dam is to minimize lake level fluctuation. Red Dam is an earth and concrete structure approximately 200 feet in length and eight feet in height. The remains of Eagle Dam are approximately 1200 feet downstream of Red Dam. The highway bridge for Route 140 is approximately 200 feet downstream of Eagle Dam. In response to requests from Congressman Harrington (October 1975) and Senator Brooke (November 1975) it was determined that the gradient of Eagle Brook downstream of Lake Pearl is extremely flat and that

Major Hando/mrr/270

NEDDX
Honorable Margaret M. Heckler

19 December 1977

the brook's backwater would produce some flood detention storage in Lake Pearl even if there were no dam at the lake. The potential for additional flood regulation through modification, improvement, or reregulation at the dams would be minimal. Further, the possibility of modifying Red Dam so that it could be used to control runoff and reduce potential flood damages was investigated. It was determined that this was not feasible due to the recreational uses of the lake and the proximity of surrounding properties to the lake.

It is obvious that Red Dam has suffered from vandalism and a lack of proper maintenance and Eagle Dam is in such dis-repair that it is no longer functional. However, it was noted during the November 17, 1977 site visit that, during the two years between Corps visits to this site, some improvements had been made and that, in outward appearance, Red Dam is in better condition today than it was in November of 1975. Still, the Town of Wrentham should develop a long term plan for maintenance and rehabilitation of Red Dam. In our letter to Mr. Cunningham, we provided some specific suggestions of what that maintenance should include.

We concluded that neither Red Dam nor Eagle Dam qualifies for federal assistance, emergency repairs, under the authority of Public Law 84-99. Further, there are no existing programs within the purview of the Corps of Engineers that could provide federal funds for the repair, restoration, improvement, or maintenance of either dam. However, the option does remain for the Commonwealth to include these dams in the recently funded Dam Safety Inspection Program (Phase I).

I hope that this information is useful to you and I will inform you of the results of the meeting to be held on December 29, 1977.

Sincerely,

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

cc: Mr. Gould
Mr. Swaine
EOC File

NEDDX 13 December 1977

Mr. Robert Cunningham
Director of Civil Defense
Office of Emergency Preparedness
400 Worcester Road
Framingham, Massachusetts 01701

Dear Bob:

This is to confirm our recent telephone conversation with regard to the visit of Mr. Gould to Lake Pearl, Wrentham, MA, on November 17, 1977.

Red Dam is an earth and concrete structure (approximately 200 ft in length and approximately 8 ft in height) that serves as the outlet for Lake Pearl in Wrentham, MA. The lake has a water surface area of approximately 240 acres and services a drainage area of about eight square miles. Lake Pearl is a natural storage and detention area. The purpose of Red Dam is to minimize lake level fluctuation. The dam consists of an earth embankment section, on the left abutment, which is approximately 135 ft in length with a top width of 12 to 15 ft. Abutting this is a concrete sluiceway which is 2 ft 8 inches wide between abutments. The total width of those abutments and sluiceway is approximately eighteen feet. Between the sluiceway abutment and the extreme right abutment of the dam is an emergency spillway which is approximately 45 ft long. There is a 2 ft 9 inch freeboard between the crest of the spillway and the high ground that serves as the right abutment of the dam. The difference in elevation between the sluiceway and the spillway is approximately one foot.

In response to a request of Congressman Harrington (October of 1975) it was determined that the gradient of Eagle Brook downstream of the lake is extremely flat and that the brook's backwater would produce some flood detention storage in Lake Pearl even if there was no dam at the lake. The potential for additional flood regulation through modification, improvement, or reregulation at the dam would be minimal. Further, in reply to Senator Brooke (November 1975),

the possibility of modifying the dam so that it could be used to control runoff and reduce flood damages was investigated. It was determined that this was not feasible due to the recreational uses of the lake and the proximity of surrounding properties to the lake.

It is obvious that Red Dam has suffered from vandalism and a lack of proper maintenance. However, it was noted during the November 17, 1977 site visit that, during the two years between Corps visits to this site, some improvements have been made and that, in outward appearance, Red Dam is in better condition today than it was in November of 1975. Still, the Town of Wrentham should develop a long term plan for maintenance and rehabilitation of the dam. This plan should include, but certainly not be limited to:

a. removal of trees on the earth section (stump removal should be accomplished with caution so that the compacted soil is not disturbed to the extent that a breach of the dam is created);

b. rip-rap should be placed on both sides of the spillway;

c. stone protection should be applied to the washed out section on the downstream side of the outlet works;

d. the capacity of the emergency spillway should be computed to determine it's adequacy;

e. Eagle Dam, immediately downstream of Red Dam, should be either repaired or removed, and all debris should be removed from the channel between Red Dam and Route 140; and

f. extensive repairs, or a finite determination of the condition of the dam, would require a thorough engineering study to include tasks such as core borings to determine foundation conditions. This thorough engineering study is the only sure means of determining adequacy, safety, and proper long term rehabilitation and maintenance of Red Dam.

This facility does not qualify for federal assistance under the authority of PL 84-99. Further, there are no existing programs within the purview of the Corps of Engineers that could provide federal funds for the repair, restoration, improvement, or maintenance of Red Dam.

NEDDX 13 December 1977
Mr. Robert Cunningham

Perhaps you, in conjunction with the community, should consider this facility for inclusion in Phase I of the Dam Safety Inspection Program (re: your meeting with Mr. Gould on December 5, 1977).

I hope that this information will be of use to your Agency and the community. If we may be of further assistance on this matter, or if any points require further clarification, please feel free to contact me.

Sincerely,

ROBERT J. HANDO
Major, Corps of Engineers
Assistant Division Engineer

EXECUTIVE DEPARTMENT

CIVIL DEFENSE AGENCY AND OFFICE OF EMERGENCY PREPAREDNESS

400 WORCESTER ROAD

FRAMINGHAM, MASS. 01701

MICHAEL S. DUKAKIS
GOVERNOR

ROBERT H. CUNNINGHAM
DIRECTOR

10

December 19, 1977

Board of Selectmen
Town Hall
Wrentham, Massachusetts 02093

Attention: Mrs. K. E. Kohut

Gentlemen:

Per your request, on November 17, 1977, representatives of the Massachusetts Civil Defense Agency, Environmental Quality Engineering and the U. S. Army Corps of Engineers, made an on-site inspection of the Red Dam in Wrentham. Attached is a copy of the Corps of Engineers' report on this visit. I hope that this report, along with Mr. John Hannon's letter to you, will be of some assistance.

As pointed out in paragraph (f) on page 2 of Major Hando's letter,

> "... thorough engineering study is the only sure means of determining adequacy, safety and proper long-term rehabilitation and maintenance of Red Dam."

One possible means of obtaining this type of study could be through the recently initiated Dam Safety Inspection Program which is being conducted by the Corps of Engineers. If you would like this Agency to request that Red Dam be included in this program please notify me as soon as possible through your local Civil Defense Director.

Regardless of the above, if your local Civil Defense Director and public works personnel feel that this dam could endanger lives this Agency will, upon request, provide a professional planner to the community to assist the local officials in developing an evacuation plan for the portion of Wrentham that could be affected.

If this Agency can be of any further assistance to you, please contact the Area III Director Mr. Harold Rossi at our Westboro Headquarters.

Sincerely,

Robert H. Cunningham
Director

RHC/mm

Attachment

cc: Major Robert J. Hando, C/E's
John J. Hannon, P.E.,
Division of Waterways
Harold F. Rossi, Director - Area III
Alfred F. Hooper, C.D. Director

NEDED-E 28 October 1975

Honorable Michael J. Harrington
Salem Post Office Building
Salem, Massachusetts 01970

Dear Mr. Harrington:

Reference is made to your letter of 16 October 1975 to Mr. Raymond F. Muise, Chief, Resident Engineering Support Group, Federal Regional Center, Maynard, Massachusetts, requesting assistance in the repair or replacement of Lake Pearl Dam (Red Dam) in Wrentham, Massachusetts. The dam in question, Lake Pearl Dam, is a small earth and concrete structure which is quite old and in need of extensive maintenance or rebuilding, and is privately owned by Lapdam, Inc. of Boston, Massachusetts.

Lake Pearl has a water surface area of about 240 acres and a watershed area of about 8 square miles. An examination of the USGS Quadrangle map indicates that the lake is in a natural storage detention area and the existing low dam at the outlet serves only to minimize lake level fluctuation. The gradient of Eagle Brook downstream of the lake is extremely flat and the brook's backwater would produce flood detetion storage in Lake Pearl even if there was no dam at the lake; therefore, the potential for additional flood regulation, through modification, improvement, or reregulation at the dam, would be minimal.

In the Commonwealth of Massachusetts the owner of a private dam is responsible for the maintenance and operation of the structure under the direction of the Commissioner of the Department of Public Works. The Waterways Division of the Massachusetts Department of Public Works is aware of the fact that the dam needs extensive maintenance or repairs, and have advised the owner that such repairs should be made. Currently there is a bill pending in the Massachusetts General Court directing the Waterways Division of the Massachusetts Department of Public Works to repair the Lake Pearl Dam.

COPY

NEDED-E 28 October 1975

Honorable Michael J. Harrington

Although the Corps can make safety inspections of dams in times of emergency, under current laws and regulations we do not have funding or authority to make routine inspections of privately owned dams. Also, the Corps of Engineers cannot assist in the repair or rehabilitation of privately owned dams, as the maintenance and repair of these dams and associated structures is considered an area of private responsibility. In addition, the Corps does not have a grant or cost-sharing program whereby we could assist the owners of the local community in the reconstruction of this dam.

Sincerely yours,

RALPH T. GARVER
Colonel, Corps of Engineers
Acting Division Engineer

CF:
Hon. M.J. Harrington
House of Representatives
Washington, D.C. 20515

HQDA (DAEN-CWE-B)
Mrs. Quill
Proj. Mgt. Br.
Reading Files
Eng. Div. Files

COPY 2

[illegible]
[illegible], Massachusetts

COMMITTEE ON
INTERNATIONAL RELATIONS

COMMITTEE ON
GOVERNMENT OPERATIONS

CONGRESS OF THE UNITED STATES
HOUSE OF REPRESENTATIVES
WASHINGTON, D.C. 20515
Salem Post Office Building
Salem, Massachusetts 01970

(202) 225-3626
[illegible]
Post Office Building
Salem, Massachusetts 01970
(617) 745-5800

Post Office Building
Lynn, Massachusetts 01901
(617) 599-7105

October 16, 1975

Raymond F. Muise
Chief of Resident Engineering Support Group
Federal Regional Center
Maynard, MA 01754

Dear Mr. Muise:

We have received a communication concerning an eroding dam in Wrentham, Massachusetts. The dam in question, Red Dam, holds back a lake of some size, Lake Pearl, and is located on a tributary of the Charles River.

It appears that the dam needs repair and there is some concern over its safety. I would appreciate your looking into this matter and determining whether in the interest of flood control the Army Corps of Engineers might be able to take some action to repair or replace the dam.

Please inform me of your determination in this matter.

Yours sincerely,

Michael J. Harrington

MJH/rfm

COPY

November 3, 1975

George N. Bergin, Jr., Secretary
Lakeside Improvement Association, Inc.
3 Harvard Street
Plainville, Mass. 02702

RE: Dam #6-11-350-1
Wrentham
Lake Pearl Dam

Dear Sir:

Reference is made to your letter dated, September 11, 1975, in behalf of the Lakeside Improvement Association, Inc. in Wrentham to Senator Edward M. Kennedy a copy of which was sent to Governor Dukakis who in turn referred this matter to the Executive Office of environmental affairs.

Concern has been expresed by the Association over the lack of any definitive action plan to reconstruct or repair the Lake Pearl Dam. Much correspondence and some meetings relating to this matter have been initiated by the Massachusetts Department of Public Works through the Division of Waterways who administers the so-called Dam Safety Program for the Commissioner of the Massachusetts Department of Public Works as provided by Chapter 595 of the Acts of 1970. At this meeting several alternatives were presented which included the following:

1. Direct the owner to repair, reconstruct or breach the dam. (Breaching is not advocated as Lake Pearl is a popular recreational area whose periphery is dotted with summer homes).

2. That the Town of Wrentham purchase the dam and then petition the Division of Waterways through Chapter 91 to repair or reconstruct the dam.

   Explore the possibility of the availability of Federal assistance to repair or reconstruct the dam.

COPY

4. Encourage owners along the lake to form an Association (such as yours) to purchase the dam and make the repairs or reconstruct as necesary.

Most recently, as you are aware, State Representative Filosa filed a Bill (House #855) hereby D.P.W. Commissioner Carroll responded in a letter dated May 2, 1975 (copy enclosed) which conditionally opposed the Bill in the form as presented. It appears that since that time several alternatives have been pursued by interested parties, all of whih have been fruitless. It also appears that the cost estimate of $365,000.00 is a figure which is prohibitive at a time when economic conditions are adverse. Please be advised that the estimate was prepared and reflects the extreme condition which may exist. An in-depth preliminary engineering investigation may result in alternatives which could reduce that figure considerably.

At this point it appears that the ownership or the maintenance of the dam should be acquired by the Town of Wrentham, the Conservation Commission, or your Association, each of which has an interest in the project. At that time a meaningful program may be developed.

Very truly yours,

DAVID STANDLEY
Commissioner

jmp

LAKESIDE IMPROVEMENT ASSOSIATION, Inc.

WRENTHAM, MASSACHUSETTS

September 11, 1975

Honorable Edward M. Kennedy
Senate Office Building
Washington, D. C. 20510

Dear Mr. Kennedy:

Since 1968 when the Red Dam eroded and gave way, Lake Pearl (a state pond) in Wrentham, Massachusetts has been wasting away because of inactivity by both state and local officials. At a recent meeting with the selectmen, we heard the same excuses, stories and theories that we heard back in 1969. We, and the rest of the residents, feel our efforts to have the situation solved by either of these parties has been kicked around long enough for us to seek "higher-up" help.

The stalemate exists between the present owner of the land and water rights, Lapdam Corp. (a paper corporation) and the town. The Town of Wrentham has money ($7500) in escrow to purchase the land, but now the present owner wants $12,300. The town is reluctant to purchase, or take by eminent domain, this land because of the assumption of liability to make the repairs (approximately $350,000) if the state should mandate.

State Representative Philip Filosa has a bill (#855) which would require the State Department of Public Works to repair the dam along with the reconstruction of the bridge on Route 140. We've been told that the state will not vote money to work on privately owned property. Representative Filosa revealed the possibility that the lake could be breeched if the responsible parties did not make the repairs at the time the state mandated it be done. This is another reason why our concern has mounted to a panic point to prevent any such possibility.

We seek your help and advice and would like to explore the possibility of you interceding with Corp. of Engineers in Massachusetts to examine the situation and possibly seizing the property and rebuilding the dam. Whereas, the water situation affects all the residents of the lake along with a cranberry business and a rod and gun club downstream in Norfolk; it also has a bearing on the Charles River which dissects Boston. We feel that these dangers and factors should warrant such action by the Corp. of Engineers.

COPY

Perhaps you could inform the undersigned what can be done to assist you in seeking this help and you can be assured of our full cooperation. If there is any other information you might need, I will be happy to obtain it and forward.

Thank you for your assistance.

Very truly yours,

LAKESIDE IMPROVEMENT ASSN., INC.

George N. Bargh, Jr.
Secretary
3 Harvard Street
Plainville, MA 02762

GNB jr:p

COPY

COPY

May 2, 1975

D. Joseph Burke, Secretary and Counsel
House Ways and Means Committee
State House
Boston, Massachsuetts 02133

Re: House Bill No. 855

Dear Sir:

Reference is made to House Bill No. 855 (copy attached) which is an Act directing the Department of Public Works to repair Red Dam and Eagle Brook Dam in the Town of Wrentham.

In a prior memo to Malcolm Graf, Associate Commissioner from Norman L. Diegoli, acting Deputy Chief Engineer, it was stated that the Division of Waterways is opposed to this Legislative Act in its present form. Our investigation indicates that the property on which these dams are located is privately owned. While these projects appear necesary it is recommended that a benefit-cost analysis be conducted which shall include, but not necessarily be limited to, the alternatives of repair, reconstruction or breaching. Upon completion of the feasibility study the Town may elect to acquire the property, including flowage rights and petition the Division of Waterways to undertake these projects through Chapter 91. The costs would be shared equally by the Town and the Commonwealth. In the event that this legislative bill is approved it is suggested that some cost sharing formula be incorporated.

Without a sub-surface investigation or cost analysis, a cost estimate was prepared which includes the complete removal of both dams and the construction of one dam (Red Dam). That estimate amounts to $365,000.00.

Very truly yours,

JOHN J. CARROLL
COMMISSIONER

LRA:jmp
cc: Commission on A. & F.
Senate Ways & Means Committee
Gerard Conway, Admin, Asst.

COPY

COPY

March 19, 1973

Mr. Theodore S. Kaiser
Executive Secretary
Board of Selectmen
Wrentham, Massachuetts 02093

Dear Mr. Kaiser:

Reference is made to your letter dated December 29, 1972, wherein you inquire on the status of the Lake Pearl Dam with regard to the intentions of the owner, Lapedam, Inc.

As of this writing no repairs or improvements have been made to the dam or spillway. Mr. John Piaseany of my staff has recently contacted Mr. Henry A. Malkasian, attorney for Lapedam, Inc. to discuss the matter. Based upon information received from the letter it appears that we cannot hope to satisfactorily resolve the problem of the deteriorated condition of the dam until a meeting is held to openly discuss the matter.

It is our understanding that Lapedam, Inc. is a "paper-company" with no finances or other assets. Mr. Malkasian indicated that the Company has no particular interest in the dam and would be willing to negotiate a transfer of ownership to the Town.

According to Section 47 of Chapter 595 of the Acts of 1970, if the owner refuses or neglects to make such alterations or repairs as the Commissioner may order the latter may cause the reservoir or dam to be altered and repaired, or any part thereof removed or the water drawn off, whichever he considers necessary for the safety of life, property, roads, bridges, and public utilities on the stream below.

COPY

COPY

March 19, 1973

In veiw of the apparent inability of Lapedam, Inc. to make the necessary repairs to the dam, and the expressed concern of the Board of Selectmen in the matter, it is suggested that a meeting be conducted at this office in the near future to hopefully resolve the problem.

I realize that arrangements for this meeting may be difficult because of work schedules, therefore may I suggest the following date for consideration: Monday, (April 2) Thursday (April 5), Friday (April 6). My schedule is such that the April 5 date is preferable.

Invitation to this meeting is hereby extended to you and the Board of Selectmen, as well as Attorney Henry Malkasian for Lapedam, Inc.

Kindly advise this office of your intentions and preferred meeting date and time by contacting Mr. John Piaseany, telephone 727-4793. Hopefully we can all meet together to discuss and resolve this situation.

Very truly yours,

MALCOLM E. GRAF
ASSOCIATE COMMISSIONER

JNP/scs
c.c. Joseph T. Cronin, D.H.H. #6
Al Lounsbury, Dist. #6
Lapedam, Inc.
c/o Henry A. Malkasian, ESQ.

COPY

COPY

September 28, 1972

Board of Selectmen
Town Hall
Wrentham, Massachusetts

RE: Inspection of Dam #6-11-350-1
Wrentham
Lake Pearl Dam

Gentlemen:

Reference is made to your letter dated February 16, 1972, to Acting Deputy Chief Engineer William E. Donahue, pertaining to, what the Board has described as, an "unauthorized blockage" of the sluiceway at the Eagle Pond Dam. Your letter requested that an inspection of this unauthorized work be made by the Department and that appropriate action be taken in the matter.

It is noted that the iam that you refer to as the Eagle Pond Dam is actually the Lake Pearl Dam, where the reported blockage exists.

Since that time, the Department has inspected the dam and spillway on March 29, 1972, and more recently on September 15.

A copy of our letter to Lapedam, Inc., owner of this dam, and the next dam downtream; i.e., the Eagle Pond Dam, is attached for your information.

Please feel free to contact us if we can be of further assistance.

Very truly yours,

MALCOLM E. GRAF
ASSOCIATE COMMISSIONER

JHP:hlb
ENCLOSURE
CC: J.T. Cronin
A. Lounsbury
Rep. George L. Woods, Jr.

COPY

COPY

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

September 28, 1972

Lapedam, Inc.
c/o Mr. Henry A. Malkasian, Esq.
19 Congress Street
Boston, Massachusetts

RE: Inspection of Dam #6-11-350-1
Wrentham
Lake Pearl Dam

Dear Mr. Malkasian:

On March 29 of this year, and more recently on September 15, engineers from this Department have inspected the Lake Pearl Dam, of which Lapedam, Inc. is the owner.

It had been previously reported by the Board of Selectmen of the Town of Wrentham that a certain "unauthorized blockage" of the sluiceway was observed, which raised the question as to it having a detrimental effect on the dam.

The purpose of these latest inspections was to check on the reported blockage and to determine if it consituted a hazard to the safety of the dam. The blockage consisted of a trapezoidal-shaped concrete block across the base of the sluiceway, approximately 2-1/2 feet high, in front of which was placed a neatly shaped steel plate over which the water flowed. The top of the steel plate was set at about the same elevation as the spillway, and thereby maintained the level of Lake Pearl.

The most recent inspection of this dam on September 15, 1972, revealed that the steel plate is no longer in place. It is not known when the concrete block and plate were originally placed, or by whom, but it was obviously a measure taken to maintain the level of the Lake which could have otherwise dropped between 2-1/2 to 3 feet. The blockage itself, whether authorized or not by Lapedam, Inc. is

COPY

not the primary concern of this Department because the resultant water level of the Lake did not appear excessive. The same effect might have been accomplished by the placement of flashboards at the sluiceway, except for the fact that the masonry and concrete-capped structure is so badly deteriorated that this arrangement was impossible.

The latest inspection of this dam reveals that major repair work and maintenance is required to render the structure safe. The inspection was made in accordance with the provisions of Chapter 253 of the Massachusetts General Laws, as most recently amended by Chapter 595 of the Acts of 1970.

Lapedam, Inc., as the recorded owner of the Lake Pearl Dam, is hereby directed to undertake immediately the following corrective work:

1. Complete reconstruction of the sluiceway, to include both abutments, with provisions for stop-logs, or consideration of a gate control structure. Widening of the sluiceway from its present 3-foot width for greater capacity should also be investigated.

2. Placement of suitable coarse gravel backfill along the upstream slope of the earthen dam. Erosion and backwash of the existing slope is evident. In addition to the placement and grading of this material, a protective blanket of rip-rap or dumped stone along the dam is recommended to maintain the stability of the slope.

Your cooperation in this matter is expected. Failure to comply with this directive may make it necessary to breach the structure, in accordance with the provisions of Chapter 595 (Acts of 1970).

You are reminded that it is the responsibility of the owner of a dam to maintain the structure in good condition so that it is "sufficiently strong to resist the action of the water under any circumstances which may reasonably be expected to occur," as provided by Section 46 of Chapter 595.

COPY

Your prompt reply in this matter is anticipated. The position and intentions of Lapedam, Inc. should be clearly defined therein so that action may be taken to render the structure safe.

Very truly yours,

MALCOLM E. GRAF
ASSOCIATE COMMISSIONER

JHP:hlb
cc: J.T. Cronin
A. Lounsbury
Rep. gEorge L. Woods, Jr.
Board of Selectmen, Wrentham

COPY

Department of Public Works
... County Street, Taunton ...

April 24, 1972

SUBJECT: Wrentham-Lake Pearl Dam
No. 6-11-350-1

Mr. D. S. Horgan, P. E.
Chief Engineer

Dear Sir:

Reference is made to your letter of March 9, 1972, relative to correspondence from the Board of Selectmen of the Town of Wrentham.

The correspondence indicated work on Eagle Pond Dam, but referred to a blockage of flow from Lake Pearl into Eagle Pond.

Eagle Pond Dam (6-11-350-2) failed in 1968 and is still in a breached condition.

On March 29, 1972, Lake Pearl Dam was visited by A. H. Lounsbury, of this office. Present from the Town of Wrentham were Mr. Louis H. Roby, Superintendent of Streets, and Mr. Edward J. Duffy, Water Department Superintendent.

The alteration indicated by Mr. Roby is shown on the enclosed sketch, and consists of a metal plate and adjoining concrete block placed within the sluiceway at the upstream opening.

The concrete dam wall across the spillway is three feet below the top of the concrete cap wall of the sluiceway, which is approximately the same elevation as the plate and block.

It is not known who placed the plate and block, but it appears to be an attempt to maintain the elevation of Lake Pearl at the height of the spillway.

This block contributes to the infiltration of water through the pier, which is in need of repairs.

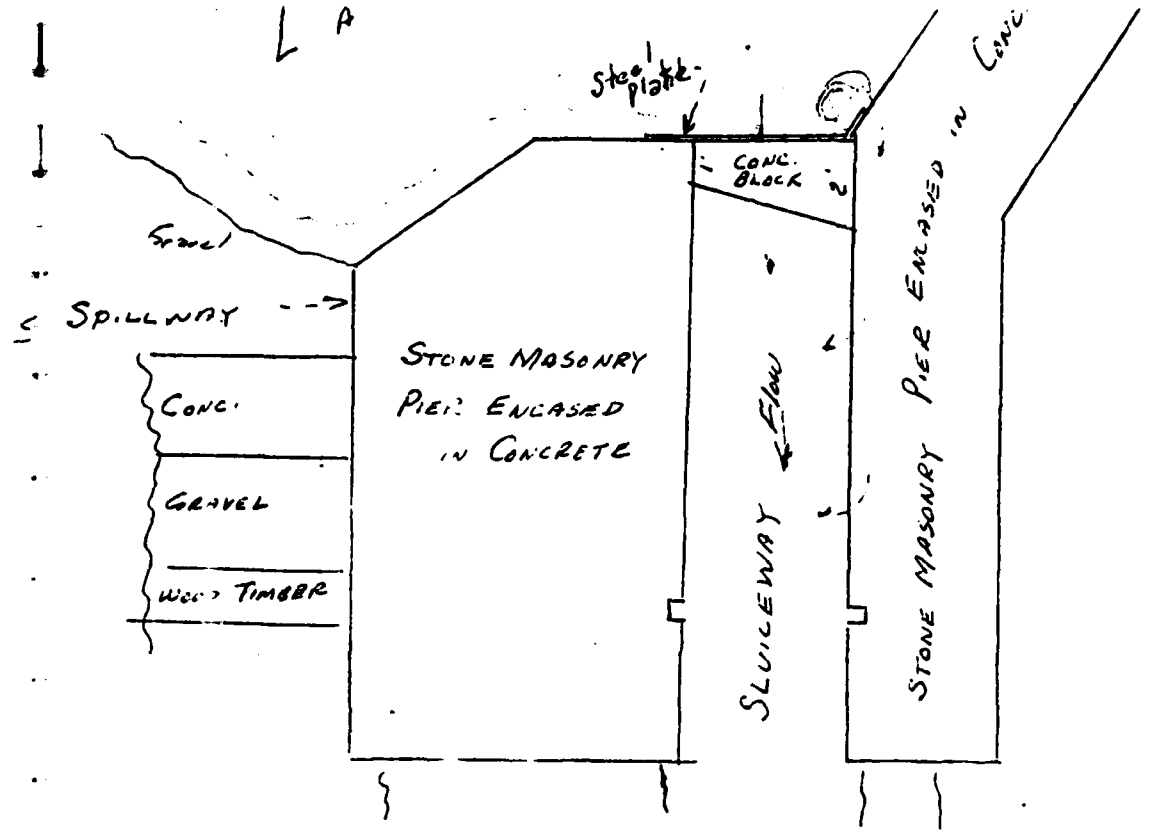
The dam structure is still in need of repairs and with the exception of a few concrete patches, little has been done to conform to the letter from Commissioner Campbell, dated October 13, 1971.

I recommend that the condition of this dam be brought, again, to the attention of Lapedum, Inc.

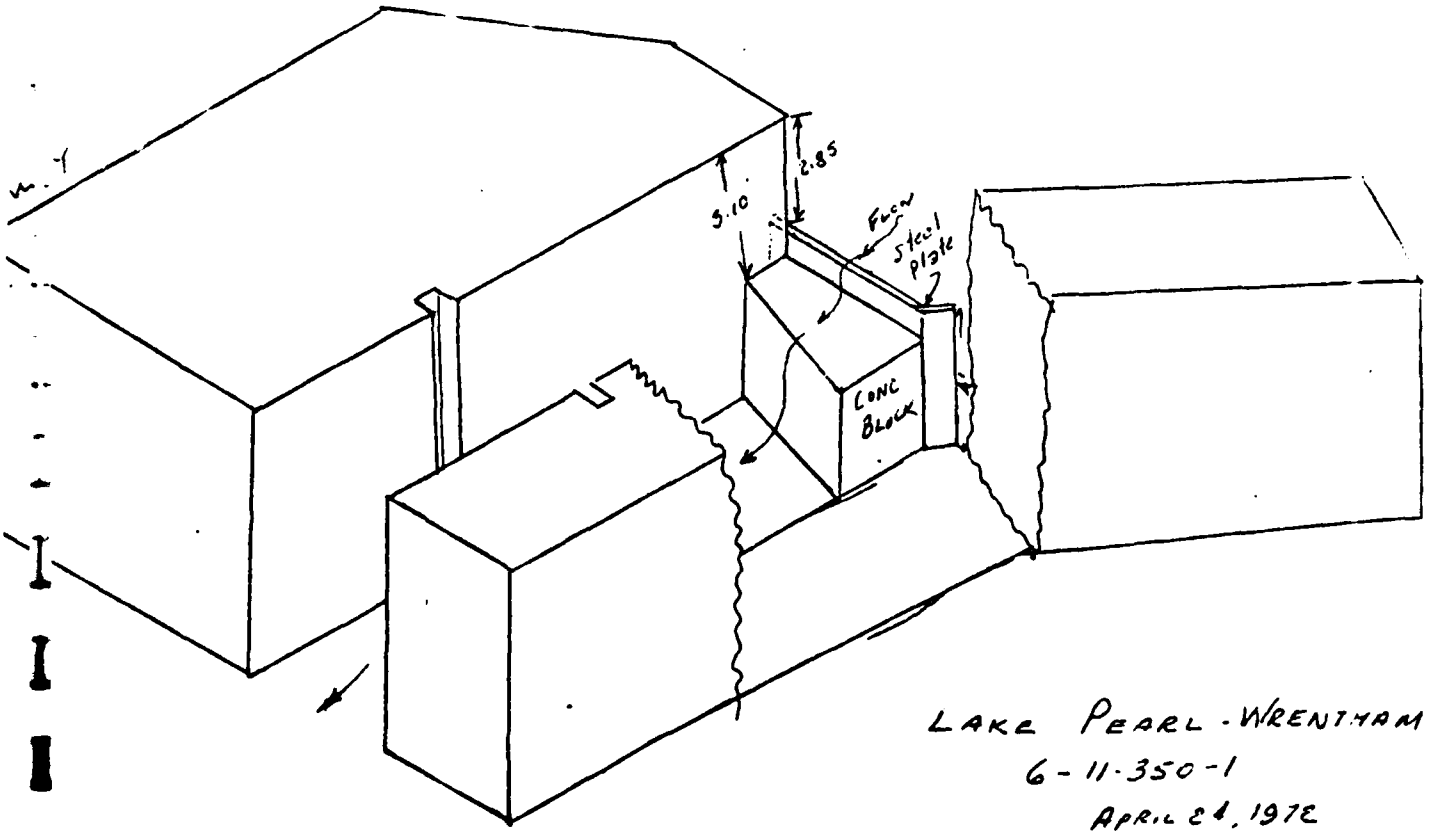
Very truly yours,

J. T. Cronin, P. E.
District Highway Engineer

AHL:hcm
cc: File
Enclosure (2)



D-2



LAKE PEARL - WRENTHAM
6-11-350-1
APRIL 24, 1978

BOARD OF SELECTMEN

TOWN OF WRENTHAM

NORFOLK COUNTY

MASSACHUSETTS

February 16, 1972

Lapedam, Inc.
c/o Mr. Henry A. Malkasian
19 Congress Street
Boston, Massachusetts 02109

Dear Mr. Malkasian:

This is a follow-up of our telephone conversation of February 14, 1972 concerning Eagle Pond Dam. We are hereby notifying you that certain unauthorized alterations has been completed on Eagle Pond Dam by unknown persons. This alteration consists of poured concrete into a form, blocking the normal flow from Lake Pearl into Eagle Pond and thence into Eagle Brook.

Lapedam, Inc. being the owners of record are responsible for the dam referred to as Eagle Dam, therefore it is incumbent upon Lapedam, Inc. to correct the situation immediately.

Very truly yours,

Francis R. L'Herault

Francis R. L'Herault

George L. Dusty

George L. Dusty

Albert J. Fuller

Albert J. Fuller

FRL/hsp

DEPARTMENT OF PUBLIC WORKS
DEPUTY CHIEF ENGINEER
WATERWAYS

RECEIVED FEB 22 1972

Referred To-----
Report back to -----
File -----

COPY

September 30, 1971

Representative George L. Woods, Jr.
14th Norfolk District
House of Representatives
State House
Boston, Massachusetts

RE: Eagle Pond Dam - Wrentham

Dear Representative Woods:

This is in reply to your telephone call to Mr. Edward Chase, on September 20, 1971, regarding Eagle Pond Dam repairs.

On September 22, 1971 an inspection of the above dam was conducted and indicated no change in conditions since the dam failure of July 1, 1968. Section 46 of Chapter 595 of the Acts of 1970, authorizes the Commissioner of the Department of Public Works to order such repairs as are necessary to make the structure permanent and secure. The existing condition of the dam poses no threat to life and property downtream, and thus this Department does not have the jurisdiction to order the owner to rebuild the dam.

A similar inspection was made at the Lake Pearl Dam and the report indicates repairs are necesary. A notice is being sent ordering such repairs. Both dams are owned by Lapedam, Inc.

If this office can be of further assistance to you please do not hesitate to contact us.

Very truly yours,

WILLIAM E. DONAHUE, P.E.
Acting Deputy Chief Engineer

LNH:hlb
cc: Mr. Chase

COPY

COPY

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

October 13, 1971

Lapedam, Inc.
c/o Mr. Harry A. Malkasian
19 Congress Street
Boston, Massachusetts

Dear Mr. Malkasian:

Re: Wrentham - Lake Pearl Dam.

On September 22, 1971, an engineer from the Department made an inspection of Lake Pearl Dam in the Town of Wrentham, of which Lapedam, Inc., is the supposed owner.

This inspection was madenin accordance with Chapter 253 of the Massachusetts General Laws, as most recently amended by Chapter 595 of the Acts of 1970, a copy of which is enclosed.

The inspection of September 22, 1971 confirmed the results of an inspection made in July 1968 by a Norfolk County Engineer.

The following conditions require corrective measures and you are hereby directed to initiate positive action within thirty days:

1) Correct erosion and remove trees, northerly and southerly of the spillway.
2) Make safe the earthen dam northerly of spillway which is low and quite narrow.
3) Replace spillway - deteriorating in all areas.
4) Repair or replace the northerly stone wall that is deteriorating.
5) Stabilize the concrete dam wall across the spillway which is broken in two places and has been displaced in a downstream direction.
6) Repair wall at the northerly end of the spillway which is deteriorating.
7) Repair or replace the sluiceway at the northerly end of the spillway that is in very poor condition.
8) Repair or replace the northerly wall of sluiceway which is cracked and deteriorated.

COPY

Lapedam, Inc. October 13, 1971

Please contact Fred C Schwelm, Deputy Chief Engineer for the Waterways Division, if any further assistance is desired.

Very truly yours,

BRUCE CAMPBELL
Commissioner

LPE/ed
cc: J. T. Cronin

Enclosure

COPY

C-63323

March 15, 1971

Representative George L. Woods, Jr.
14th Norfolk District
House of Representatives
State House,
Boston, Massachusetts

Dear Representative Woods:

Your letter dated February 25, 1971 regarding Eagle Dam in the Town of Wrentham, addressed to Commissioner Ribbs, has been referred to us for reply.

The estimated cost including engineering and contingencies, for replacing Eagle Dam is $25,000.00. Chapter 595 of the Acts of 1970, transferring supervison of dams to this Department, contained no funds for implementation.

This project will have to be funded by a Special Act or under the provisions of Chapter 91 which calls for a 50 percent contribution from local interests. No matter what method of funding is selected I would advise the town to file a petition for this work with the Department. The town was notified by letter dated February 26, 1971, that the Annual Rivers and Harbors Hearing will be held on April 1, 1971, and that petitions should be filed not later than March 26, 1971.

Very truly yours,

EC/mrm

FRED C. SCHWELM
Acting Deputy Chief Engineer

cc: Board of Selectmen-Wrentham

COPY

Typed notes shown below are copies of handwritten field notes dated July 2, 1968

LAKE PEARL DAM - WRENTHAM

1.

Overall condition of this dam is poor, particularly at the spillway.

The earth dam both sly and nly of the spillway has areas of erosion and trees, etc. that should be removed. Also, the earth dam sly of the spillway is too low in some areas and is quite narrow.

The spillway is deteriorating in all areas. The sly stone wall has much erosion behind it and is gradually falling apart. The concrete dam wall across the spillway is broken in two places and has been displaced in a downstream direction. The wall at the nly is deteriorating and needs repair.

2.

The sluiceway at the nly end of the spillway is in very poor condition. The nly wall of the sluiceway at the pond end has a crack opening at the waterline and a large void at the waterline at the angle of it (see photograph). The nly wall of the of the sluiceway at the splash boards is also deteriorating and allowing water to penetrate it. Also, the downstream end of the nly sluiceway wall has broken-up and is allowing water to wash over it thereby washing over part of the downstream side of the earth dam.

NOTE - Area downstream of dam not flooded today because of lowering of Eagle Pond due to failure at spillway.

A. DOWNS

METCALF & EDDY INC.
STATLER BUILDING · BOSTON · MASSACHUSETTS 0211
ENGINEERS
CABLE ADDRESS - METEDD - BOSTON
TWX 710-321-6364
(617) 423-5660

March 5, 1970

3-9701

Mr Charles C. Cain
Norfolk County Engineer
Court House
Dedham, Massachusetts 02026

Dear Mr. Cain:

This is with reference to the inspection of the dam at the northerly end of Lake Pearl in Wrentham, Massachusetts, made by the writer accompanied by you on February 13, 1970. In accordance with your oral request at the time of the inspection, we submit this letter concerning the condition of the dam.

The dam consists of a concrete spillway and sluiceway flanked by earth embankments. The spillway is a broad crest type, approximately 45 feet long and 2 feet wide. The height is estimated from elevations furnished by the County to be from 4 to 5 feet. The sluiceway, located on the westerly end of the spillway, is approximately 3 feet wide and 6 feet deep. Each embankment is about 160 feet long with an average top width of about 12 feet on the west and 70 feet on the east embankment.

The spillway, together with its abutment walls and the sluiceway, show signs of deterioration. The concrete spillway has cracked in two places and has shifted slightly downstream. The crest has been deeply scoured in one place. The spillway has apparently been stabilized by the construction of a stone-fill about 3 feet wide on the downstream side. The stone fill is contained by a narrow wall of concrete or mortared stone, capped with a timber, built parallel to the spillway. Some of the stone fill on the westerly end is missing.

The westerly concrete abutment wall is badly cracked and is eroded near the bottom. The walls of the sluiceway are cracked, broken and eroded. The easterly abutment wall of mortared stone is eroded at the base.

The embankments are in fair condition. All trees on the embankments should, however, be removed together with their stumps and large roots. The holes should be backfilled with compacted earth.

The discharge capacity of the spillway appears to be adequate to handle a flood of a magnitude that might reasonably be expected to occur. We do not, however, have sufficient information on the design and construction of the dam to check its stability. On the other hand, it is apparent that the structure is being weakened by constant deterioration. A collapse of any of the abutment walls of the spillway or sluiceway could cause a breach in the dam. With the lake level only at the spillway crest, there would be the possibility of a relatively rapid release from the lake of as much as 42 to 52 million cubic feet of water. As a result, Franklin Street (State Route 140) located about 1450 feet downstream from the dam could be flooded and possibly damaged.

The dam cannot be considered to be safe and in good condition. We therefore, recommend that all structural members of the dam be satisfactorily repaired or reconstructed and that all trees, stumps, and large roots be removed from the embankments. Designs and specifications for corrective action should be approved by the Norfolk County Commissioners prior to construction.

Very truly yours,

METCALF & EDDY, INC.

Gordon E. Thomas

Gordon E. Thomas
Project Engineer

GET:ayg

Hon.Board of Selectmen, Town of W.

August, 1970

TO THE State of Massachusetts
County Commissioners
Norfolk County

We, the property owners and tenants of Lake Pearl, Norfolk County, Wrentham, Massachusetts, are concerned with the existing conditions at Lake Pearl.

Due to one of the dams collapsing, the water level has dropped approximately two feet, causing excessive weed growth, debris and stagnation, making unsanitary conditions along the shore. It has affected the swimming in many areas.

Since under Chapter 253, Sections 44-50, jurisdiction over the above properties is vested in the County Commissioners, we respectfully request that some temporary measures be taken by the use of sheet steel or planking on the existing dam, to at least raise the water to a reasonable level.

PROPERTY OWNERS	TENANTS
Florence M. Carolla	Edward A. Hindle
Margaret H. Nielsen	Arnold K. Nielsen
[illegible] T. Stewart	Marguerite M. Stewart
Michael A. [illegible]	Louise Lorusso
[illegible] R. [illegible]	Geraldine A. Hindle
Daniel W. O'Donahue	Carolyn M. Cofsky
Louise M. Cofsky	George J. Carter
Addie B. Pontifex	Mrs Fred Falvey
[illegible] Brecher	Barbara M. Reynolds
[illegible]	R. John Reynolds
[illegible]	
[illegible]	

PROPERTY OWNERS	TENANTS
Mary [illegible]	Jean MacDonald
Frederick E. Cotton	Francis E. MacDonald
Marion A. Sheffield	Ralph D. Toscano
William B. Sheffield	Joanne L. Toscano
Claire K. Ford	Marie A. Lenzi
Elaine W. Rowler	
Anne Gaulet	
Joseph Gaulet	
Elsie D. Wood	
George N. Bugle Jr.	
[illegible] Carlton	

See now what!

THE COMMONWEALTH OF MASSACHUSETTS

INTER OFFICE CORRESPONDENCE — DEPARTMENT OF PUBLIC WORKS

From Mr. Donald Kavanagh

Attention of Mr. John T. Hannon, Deputy Chief Engineer — September 15, 1969

Subject WRENTHAM: Lake Pearl - Dam Investigation

As requested by Mr. Chase, on September 5, I visited the outlet of Lake Pearl in the Town of Wrentham, where Eagle Brook passes under State Highway Rte. 140, also known as Franklin Street at the north end of the lake. Just south of this highway Eagle Brook Dam (so called) consisting of a substantial earth dike with a concrete control structure exists. This control structure which controlled the overflow from Lake Pearl collapsed on July 1, 1968. The structure was constructed of stone masonry which had been repaired and reinforced with a concrete shell apparently in 1953. Large sections of this structure still exist in a highly unstable manner, creating a dangerous situation. Also, there are signs of erosion of the earth dike.

There is a second dam about a quarter of a mile south of the highway, at the outlet of Lake Pearl into Eagle Pond. Red Dam (so called) consists of an earth dike and a concrete structure with a spillway and a smaller control section with stop planks. This structure is deteriorated to a degree that it should be either repaired or replaced. The water level of Lake Pearl was approximately one foot below the spillway, normally the water level is approximately one to two feet above the spillway.

The water level of Eagle Brook Pond was down approximately five feet with a small stream passing through the breached section of Eagle Brook Dam.

The breaching of this dam affects the abutters along Eagle Brook and Eagle Brook Pond in regard to recreation, fishing, and cranberry bogs in the area. In addition, the removal of the impounded waters of Lake Pearl may affect the town water supply wells nearby.

It appears at this date that ownership of these two dams plus water rights was conveyed by Buckley & Mann Inc. to Lapedan Inc. on July 10, 1968 recorded with Norfolk Registry of Deeds, book 4525, page 743.

From this preliminary investigation the estimated cost to replace both of these structures is approximately $20,000,00.

Respectfully submitted,

Donald Kavanagh

DONALD KAVANAGH
Asst. Civil Engineer

'69 In called Mrs. Jane Sievert
Tel. call Sen. Quinlan's office
785-0555

FORM NO. WD-4. 10-67-946152

THE COMMONWEALTH OF MASSACHUSETTS

INTER OFFICE CORRESPONDENCE

DEPARTMENT OF PUBLIC WORKS

From Donald Kavanagh

DIVISION OF WATERWAYS

Attention of J. T. Hannon, Deputy Ch. Engr. Sept. 23, 19 69

Subject WRENTHAM - LAKE PEARL
Dam Investigation

Supplementing my memo of September 15, 1969 on the investigation made at Lake Pearl in Wrentham, the following is submitted:

Jurisdiction: The County Engineers have to approve all dams if they meet the following requirements:

1. Over ten (10) feet in height.

2. Retain more than one (1) million gallons. (3 A/F)

3. Drainage area is over one (1) square mile.

The only control the Division of Waterways has on this Lake is the natural lake level which has been established at elevation 195'. We have no control over elevations higher than this level.

Respectfully submitted,

Donald R Kavanagh

Donald R. Kavanagh
Asst. Civil Engr.

460 Main St. • Walpole, Mass. 02081

January 2, 1969

Mr. Charles Cain
County Engineer
Registry of Deeds Building
Dedham, Massachusetts 02026

Dear Mr. Cain:

Enclosed is a copy of Report on Preliminary Investigation on Eagle Pond Dam (Mill Pond) Wrentham, Massachusetts, compiled by Richard L. Pratt, Engineering Specialist for eastern half of Massachusetts and approved by Robert N. Morehouse, Soil Conservationist, Soil Conservation Service. Also attached is a perspective view of box inlet drop spillway.

Very truly yours,

THE NORFOLK CONSERVATION DISTRICT

William C Sweet (m)
William C. Sweet
Chairman

encl.

WCS:mfm

PRELIMINARY INVESTIGATION
EAGLE POND DAM (MILL POND)
WRENTHAM, MASSACHUSETTS
NORFOLK COUNTY

INTRODUCTION

The Town of Wrentham, Massachusetts, and Norfolk Conservation District have requested the Soil Conservation Service to prepare a preliminary investigation relative to replacing the masonry dam at the outlet of Eagle Pond which failed during the early summer in 1968.

The failure of the dam was not associated with any storm. It appears to have been caused by the disintegration of the structure caused by tree roots. These roots cracked the concrete and created channels through the fill adjacent to the structure. Water, under pressure, enlarged these channels by carrying out earth material which eventually undermined the concrete causing the structure to collapse under its own weight.

The water impounded by this structure was released suddenly and created minor flooding over the highway just downstream. This did little or no damage downstream of the highway since there is little development and a broad flood plain.

This dam failure had little or no effect on an upstream body of water called Lake Pearl since an existing dam at the outlet of this lake held the water.

The upstream dam at Lake Pearl is an earth fill with a small concrete control structure which is in poor condition. There is a 45 foot overflow weir section constructed of earth fill and reinforced with a concrete wall approximately 12 inches thick running longitudinally through this spillway.

This dam is probably adequate for the present water level at Lake Pearl. However, its stability would be questionable should a severe storm occur.

This proposal of this preliminary investigation is to replace the structure and dam on Eagle Pond at location where the old dam washed out and to eliminate the need for the upstream dam at Lake Pearl when the new structure has been completed.

REFERENCES

The Wrentham, Mass., USGS Quadrangle on Scale of 1' = 2000' was used to determine contributing drainage area and volumes of flood storage.

The Norfolk County Engineering Department supplied a topographical map of the Eagle Pond dam site and Upper Lake Pearl dam site. From this map critical elevations and volumes of earth fill required were determined.

The State Geologist, Soil Conservation Service, made a geological reconnaissance investigation of the site and submitted a report as part of the supporting data for this project.

Standard SCS procedures were used to compute peak runoff volumes and routings to proportion a new structure.

Cost estimates are based on SCS 1968 costs used for the Massachusetts Water Resource Inventory studies.

Preliminary Investigation - Eagle Pond Dam Cont'd.

FINDINGS

It is recommended that the existing earth dam and stone and concrete structure be removed and that a new earth dam with a reinforced concrete principle spillway be installed. No emergency spillway would be required for this structure as it will have adequate capacity to safely pass runoff from major storms.

A proposed structure replacement is the box-inlet drop structure type requiring approximately 175 cubic yards of reinforced concrete. (See Example A). Provisions for draining the pond could be included in the plans for this structure but are not considered in the estimated costs.

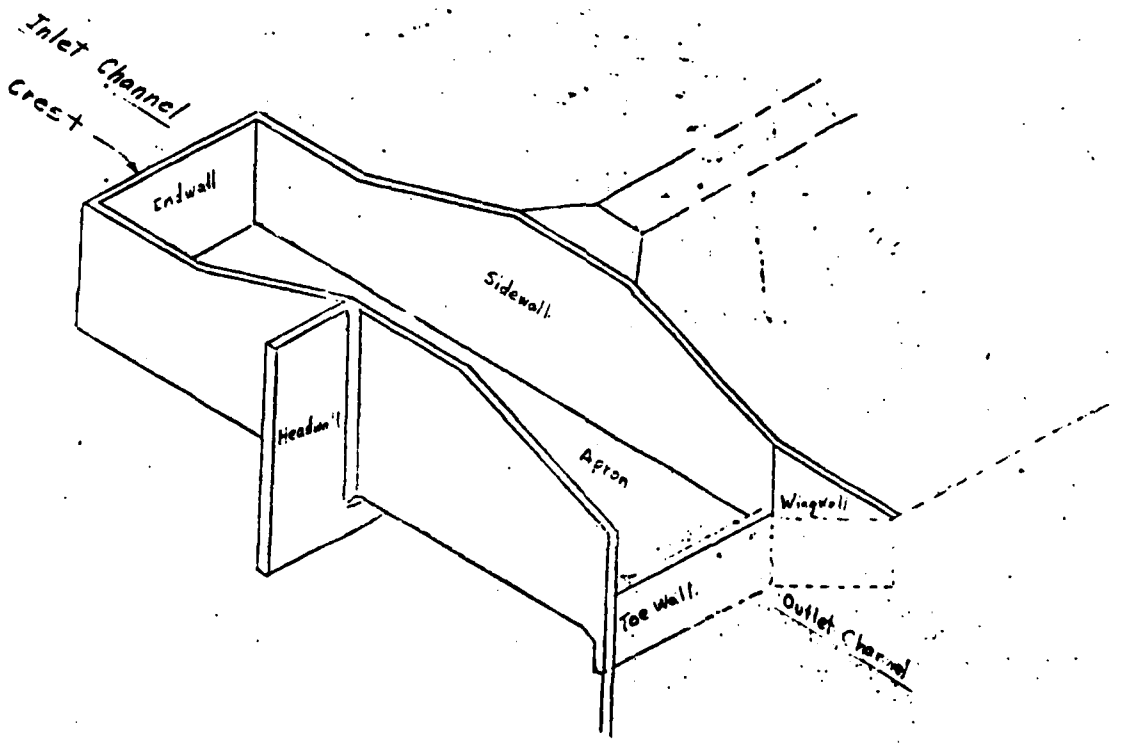
The existing earth fill would be removed. However, most of the material could be salvaged and used in the new dam. Additional earth fill may be needed for the construction of the proposed dam. (See Example A). The estimated cost for the new structure and dam is $66,000.00. This includes allowances for the following:

Materials and Labor	$40,500.00
Installation Costs	17,300.00
Contingencies	8,200.00
Total	$66,000.00

This report is based on a preliminary investigation. Estimated quantities and costs are not to be considered necessarily exact or final. Detailed surveys, geological borings, and designs will be required prior to construction. All plans and specifications must be approved by the County Commissioners prior to the start of any construction.

PERSPECTIVE VIEW

BOX INLET DROP SPILLWAY



Preliminary Investigation - Eagle Pond Dam Cont'd.

The information compiled by the Soil Conservation Service pertaining to this project will be available for inspection as authorized by the Town and Conservation District.

Compiled by: Richard T. Pratt

Approved by : Robert W Markham

-4-

June 13, 1969

Board of Selectmen
Town of Wrentham
Wrentham, Massachusetts

Re: Buckley & Mann
Lapedam Inc.
Town of Wrentham

Gentlemen:

At a previous conference with the Selectmen and officials of Buckley & Mann I may have made a statement concerning the ownership of land at Red Dam and I wish to submit this memorandum in writing.

In 1899 Norfolk Deeds Book 836, Page 141 the American Felt Company of New Jersey acquired 7 pardels of land from the City Mills Company and in particular parcels No. 5, 6, and 7 therein. Parcels 5, 6, and 7 were conveyed by American Felt Company of New Jersey to the American Felt Company of Massachusetts in 1911, Norfolk Deeds Book 1179, Page 543. In 1944 the American Felt Company conveyed to the Town of Wrentham these 3 parcels of land excepting therefrom the land conveyed to City Mills Realty Corp. by deed dated December 10, 1941, Norfolk Deeds Book 2373, Page 227. Subsequently City Mills Realty Corp. conveyed to Buckley & Mann, and Buckley & Mann conveyed to Lapedam Inc. the premises described in Book 2373, Page 227.

In my opinion the Town of Wrentham owns approximately 15 acres of land on both sides of Franklin Street including the Mill Pond, so-called, and the Meadow, both of Plan of American Felt Company Land, Wrentham, Mass., Eagle Mill, recorded with Norfolk Deeds, Plan Book 60, Plan 2063 and Lapedam and its predecessor Buckley & Mann and City Mills Realty Corp., owned only the 2 dam sites, mill privileges, water rights and the small areas of land described in detail in said deeds.

Very truly yours,

Howard C. Abbott

Howard C. Abbott
Town Counsel
Town of Wrentham

Lake

July 11, 1968

Norfolk County Commissioners
Court House
Dedham, Mass. 02026

Gentlemen:

I herewith submit a report on the dam located at Lake Pearl in Wrentham owned by Buckley & Mann, Inc., Norfolk, Mass. which has been visited and examined in accordance with G.L.Chapter 253, as amended.

This is an earth dam located southerly of Franklin Street, Wrentham at the northerly end of Lake Pearl.

The dam was visited by a man from the Norfolk County Engineering Department on September 27, 1967 and was visited and examined by men from the Engineering Department on July 2, 1968.

It is my opinion that the overall condition of the dam is poor, particularly at the spillway, and, therefore, it cannot be considered to be safe and in good condition.

The earth dam has eroded such that it is now both too low and too narrow in several areas. Also, large trees and brush growing over the entire dam should be removed and the dam repaired where the stumps are removed.

The spillway has deteriorated and, in general, is in poor condition. The concrete wall across the spillway has broken in two places and moved in a downstream direction and the stone walls at both ends of the spillway, particularly on the downstream ends, have collapsed or are in some stage of collapsing. This deterioration is also present in the walls of the sluice at the northerly end of the spillway. These damaged areas should be restored to their original condition as soon as possible since further deterioration will probably take place at an increased rate.

Respectfully submitted,

Charles C. Cain
County Engineer

April 30, 1953

City Mills Realty Company
Norfolk,
Massachusetts

Gentlemen:-

The dam at Lake Pearl has recently been inspected and has been found in very poor condition, particularly on the southerly side of the spillway. The whole bank has been washed out for at least ten feet and the remainder for a distance of fifty feet is rapidly becoming in the same condition.

I am enclosing a copy of the law pertaining to the safety of dams and if you wish will discuss this matter with you or your representative as this requires immediate attention.

Very truly yours,

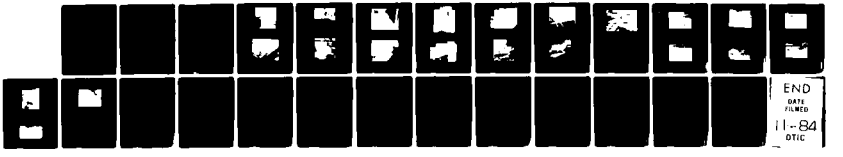
County Engineer

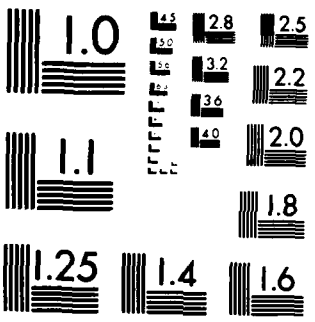
Copy
Post

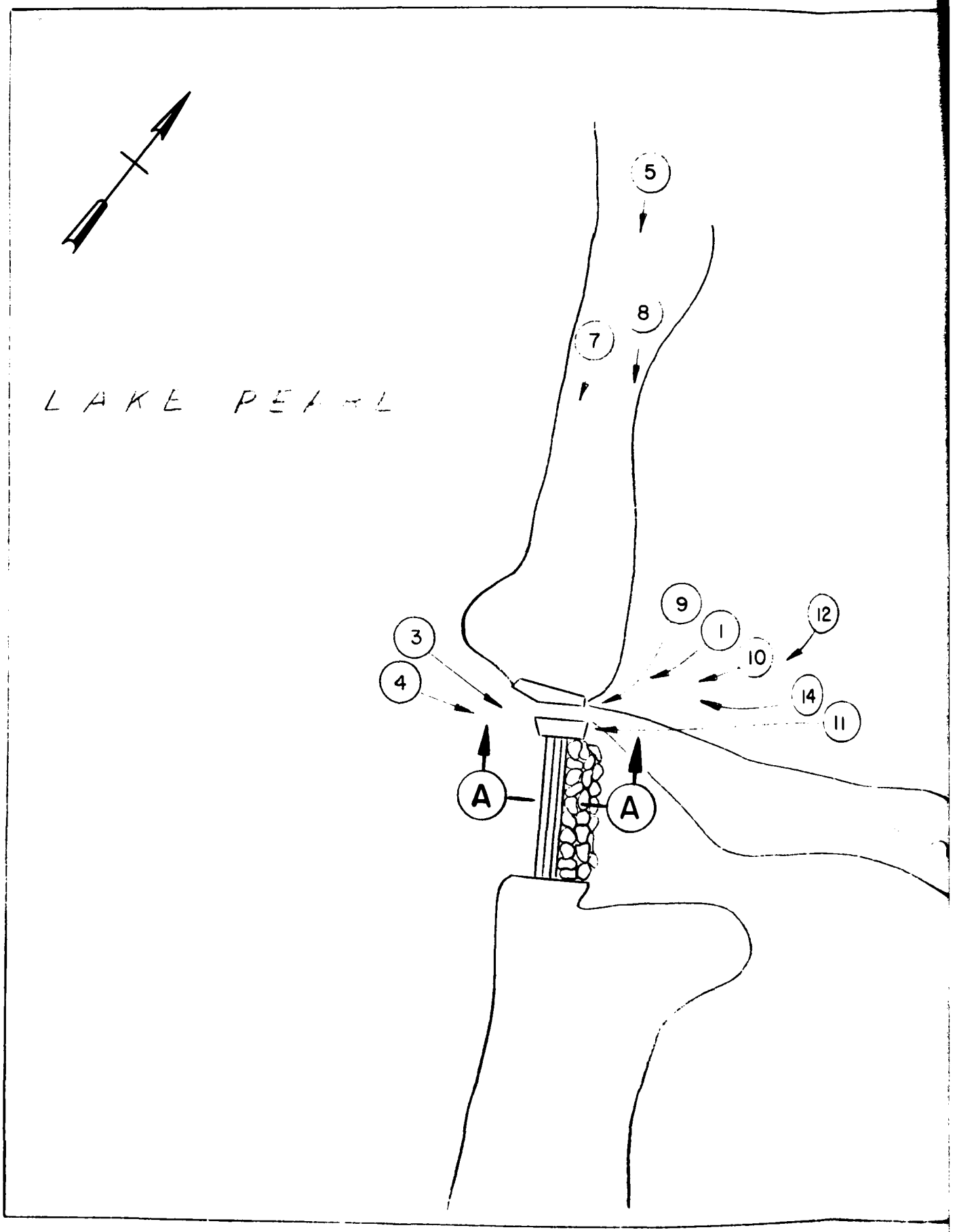
APPENDIX C

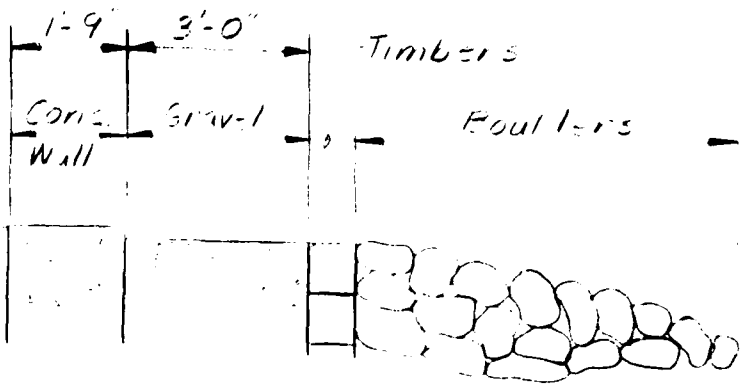
AD-A146 889 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS RED DAM (MA 00170) CH..(U) CORPS OF ENGINEERS WALTHAM MA NEW ENGLAND DIV SEP 78 2/2

UNCLASSIFIED F/G 13/13 NL






LAKE PEARL
5
8
7
9
1
12
10
3
14
4
11
A
A



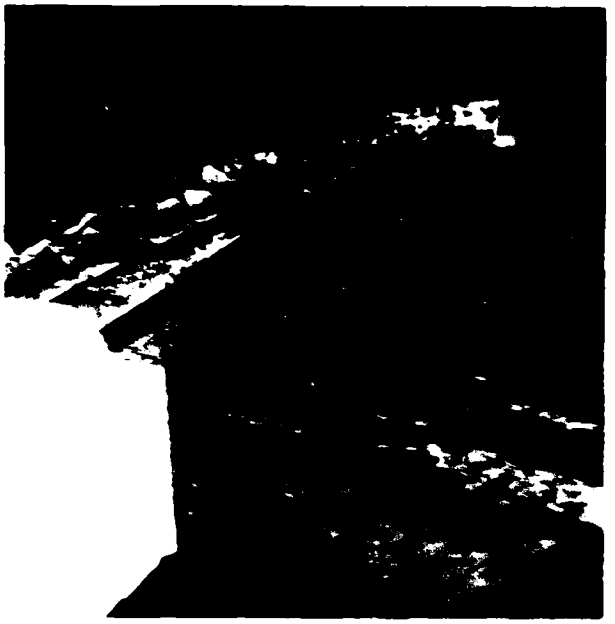
SECTION A-A

NOTE

PHOTOGRAPHS #6, #13, #15 & OLD PHOTOGRAPHS FROM MASS. D.P.W. RECORDS ARE NOT SHOWN.

2)

RED DAM
WRENTHAM, MASS.
PHOTOGRAPH INDEX
MAP



Photograph #3

Upstream View of Spillway - Left Abutment,
Broad Crest Weir Consists of 1'-9" Concrete Weir,
3' Sand & Gravel, Timbers and Rock Riprap
June 22, 1978

Photograph #4

Upstream View of Spillway - Right Abutment
No Flow Over Spillway Observed on
January 13, 1978

Photograph #5

Left Abutment - Top of Dam View

Photograph #6

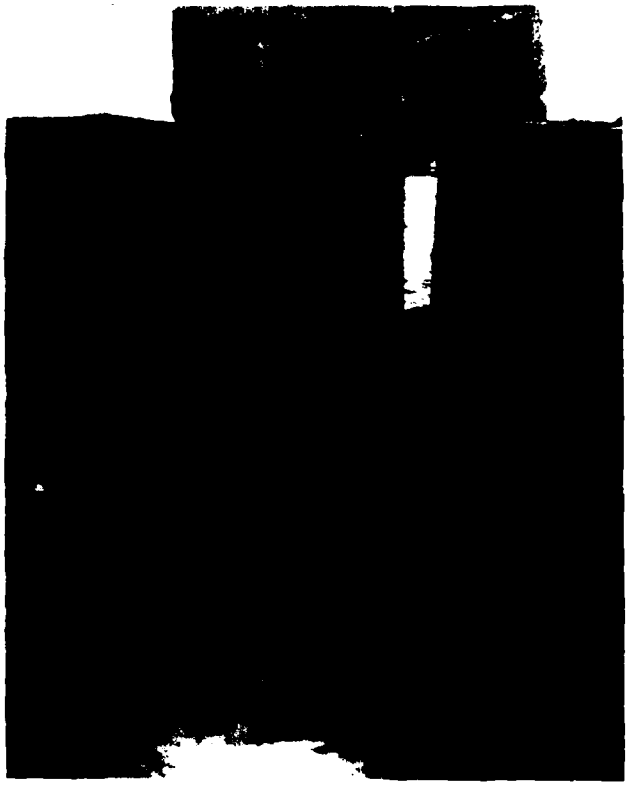
Trash Rock for 36-inch Pipe from
Lake Archer to Lake Pearl on
North Side of Creek Street

Photograph #7

Upstream View of Left Abutment

Photograph #8

Downstream View of Left Abutment

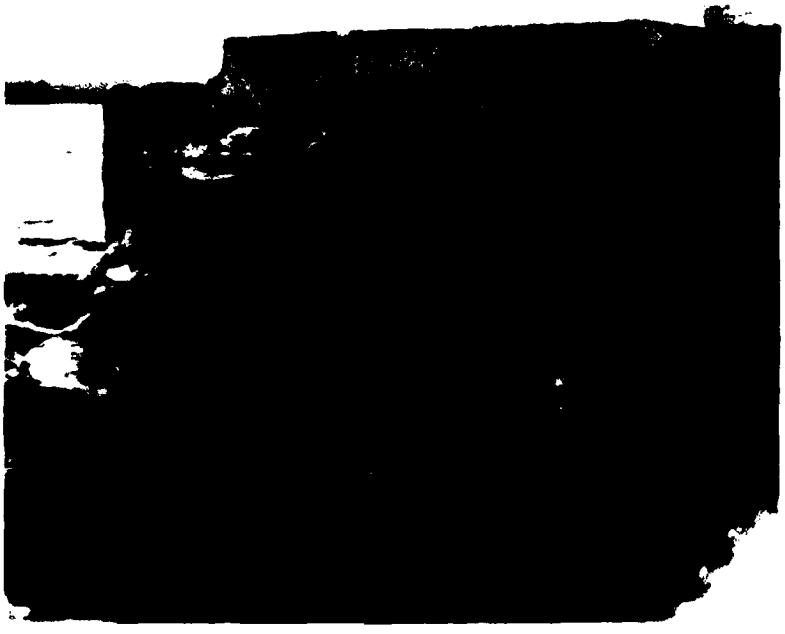


Photograph #9

Downstream View of Sluiceway Observed on June 22, 1978. Stop logs have been placed in Sluiceway Slots. Concrete Block positioned above the Slot Openings.

Photograph #10

Downstream View of Sluiceway and Spillway - 2 1/2 inches of Flow over Spillway observed on June 22, 1978



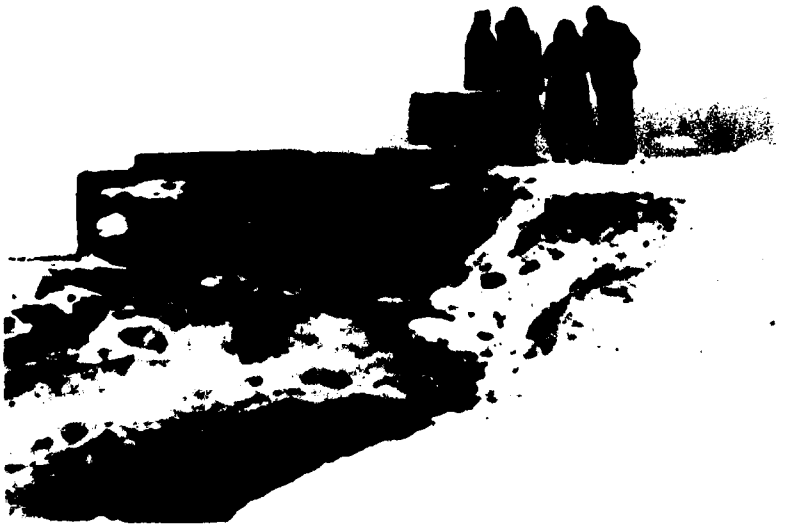
Photograph #11

Right Abutment of Sluiceway - Downstream View
Showing Masonry Structure Capped with Concrete

Photograph #12

Downstream View of Left Abutment
Red Dam, Spillway and Sluiceway

Photograph #13
Breached Section of Eagle Dam



Photograph #14

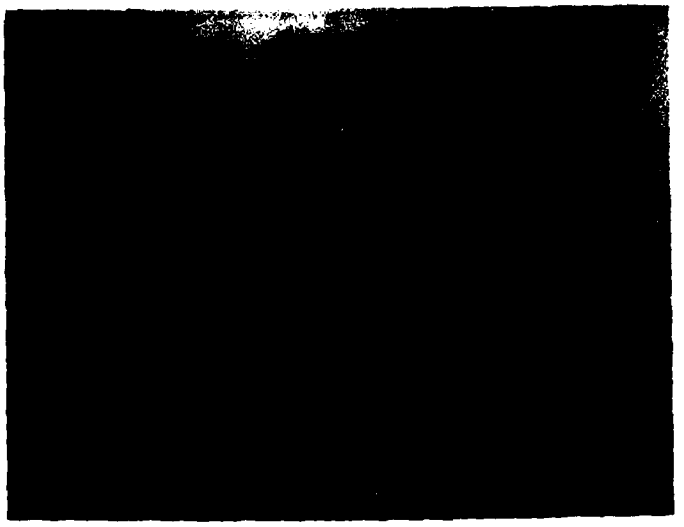
Flow thru Sluiceway at Red Dam
Observed on Jan. 13, 1978. Concrete Block
is not above stop log slots.
No stop logs are in place.

Photograph #15

Control Works located at Pond for
Sportsmen's Club - Downstream from
Red Dam about 1 mile

Downstream View of Spillway
August 22, 1969

Downstream View of Spillway
August 22, 1969



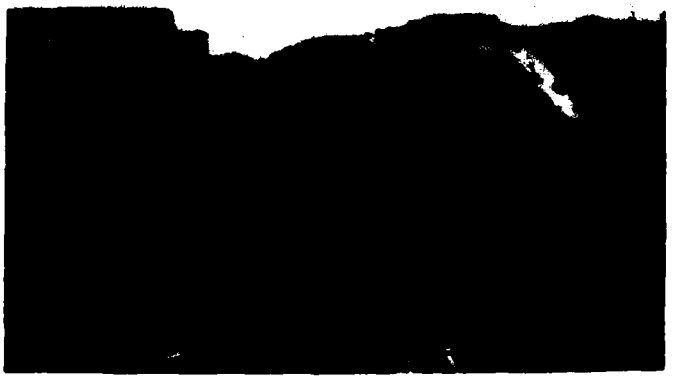
Breach in Red Dam - 1953

Breach in Red Dam - March 30, 1961

Downstream View of Spillway
Showing Timbers for Broad-Crested Weir
March 12, 1970

Downstream View of Spillway
March 12, 1970

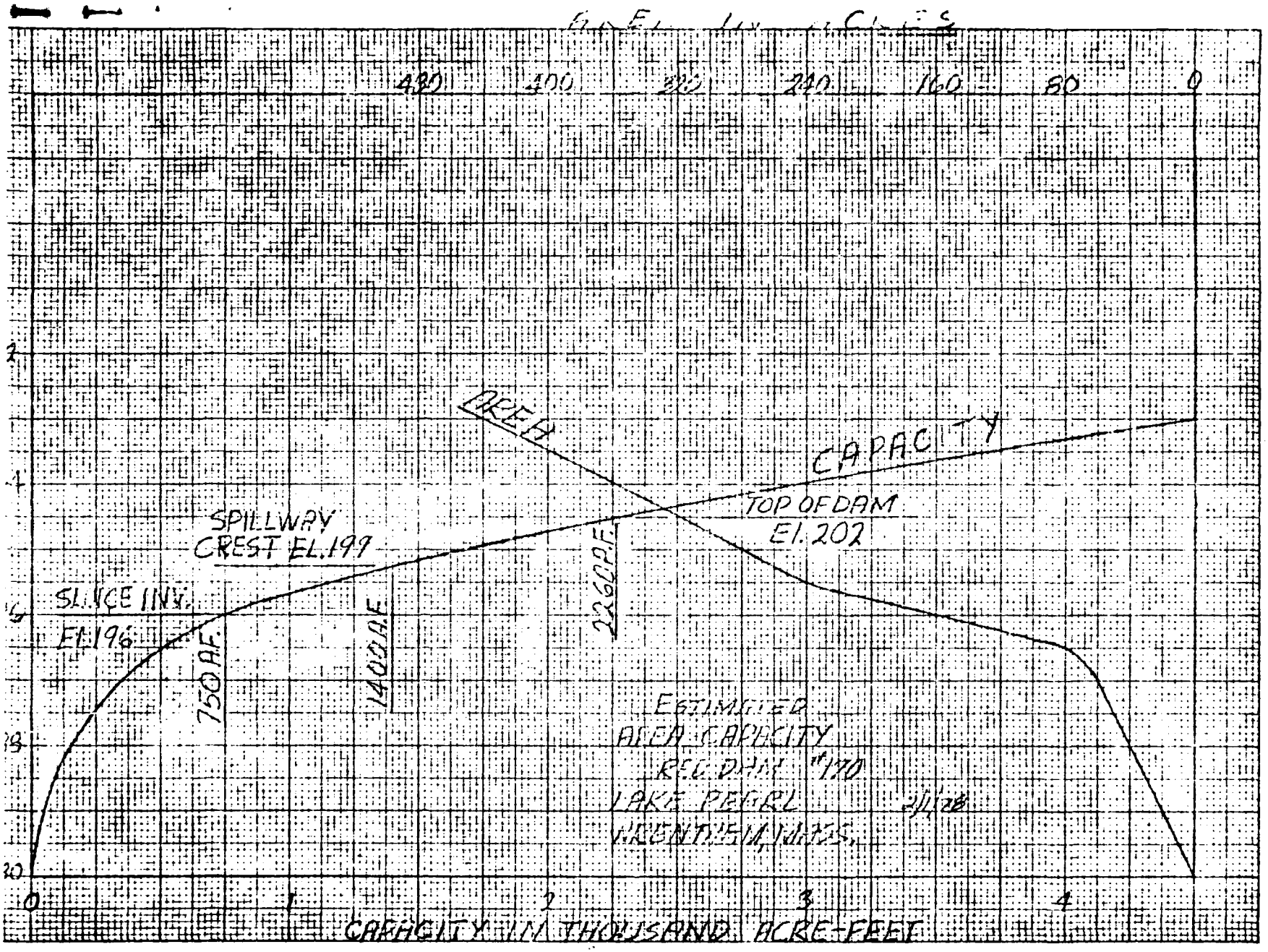
Downstream View of
Masonry Sluiceway Structure
August 9, 1968



Downstream View of
Masonry Sluiceway Structure
March 12, 1970

New Gravel Fill on Left
Abutment of Dam
August 9, 1968

APPENDIX D

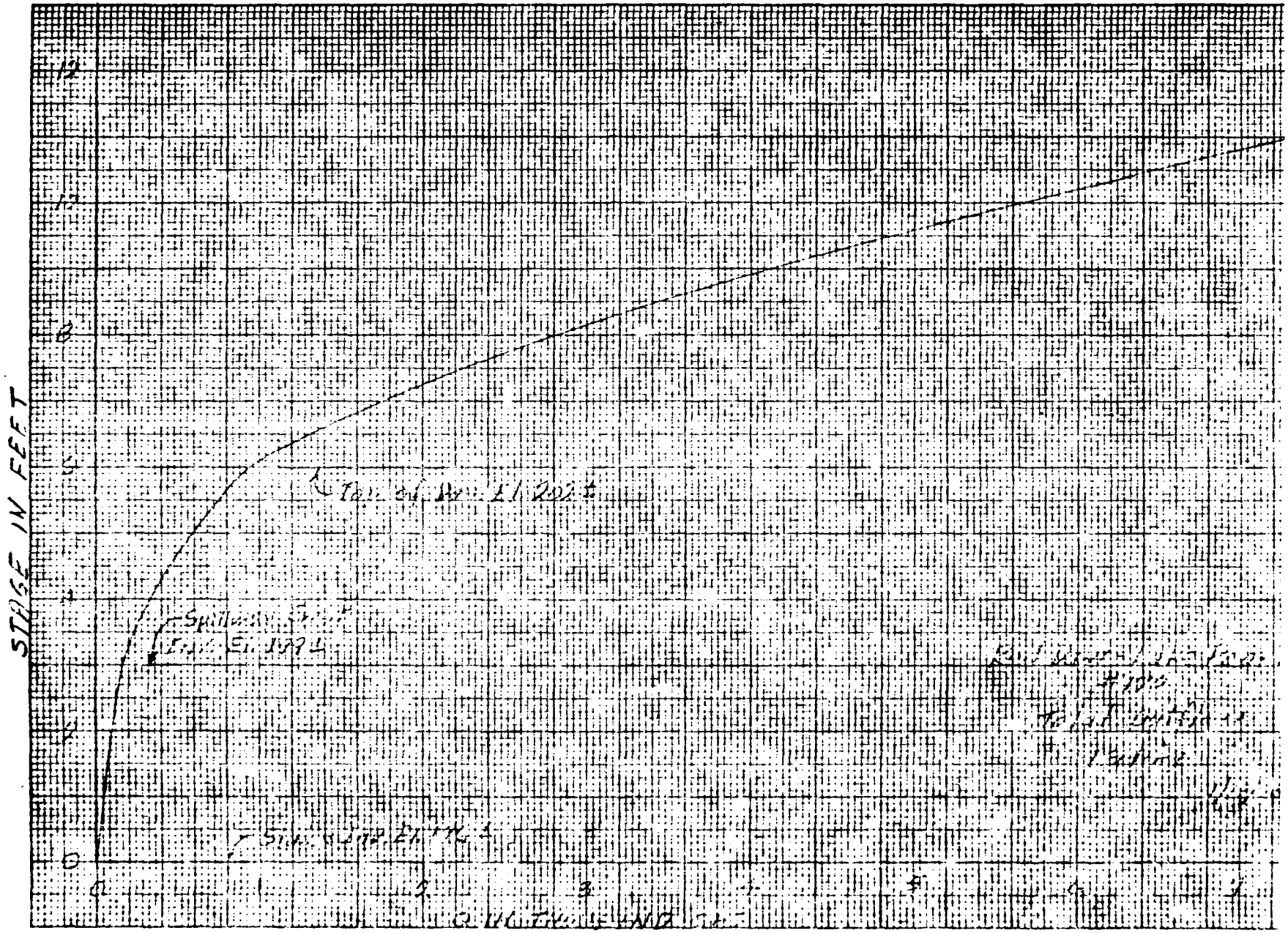

480
400
320
240
160
80
0
AREA
CAPACITY
TOP OF DAM
El. 202
SPILLWAY
CREST EL. 199
SLUICE INV.
El. 196
750 A.F.
1400 A.F.
2260 A.F.
ESTIMATED
AREA-CAPACITY
RELATIONSHIP
LAKE PEARL
0
1
2
3
4
CAPACITY IN THOUSAND ACRE-FEET

SUBJECT: Lake Pearl - Red Dam Wrentham, Mass. [illegible]

COMPUTATION: Estimated Area-Capacity based on Survey of 8/21/1958

COMPUTED BY: ______ CHECKED BY: ______ DATE: 1/31/78

	El.	Area Acres	Ave Area	depth	Δ Ac.Ft.	Σ Ac.Ft.
	180	0				0
			5	2	10	
	82	10				10
			15	"	30	
	84	20				40
			25	"	50	
	86	30				90
			35	"	70	
	88	40				160
			45	"	90	
	190	50				250
			55	"	110	
	92	60				360
			70	"	140	
	94	80				500
			120	"	240	
	96	160				740
			200	"	400	
Spillway 199 →	98	240 ✓				1140
			260	"	520	
	200	280 -				1660
			300	"	600	
Top Dam	02	320				2260
			340	"	680	
	04	360				2940
			380	"	760	
	06	400				3700
			420	"	840	
	08	440				4540
			460	"	920	
	10	480				5460
			500	"	1000	
	12	520				6460


STAGE IN FEET
12
10
8
6
4
2
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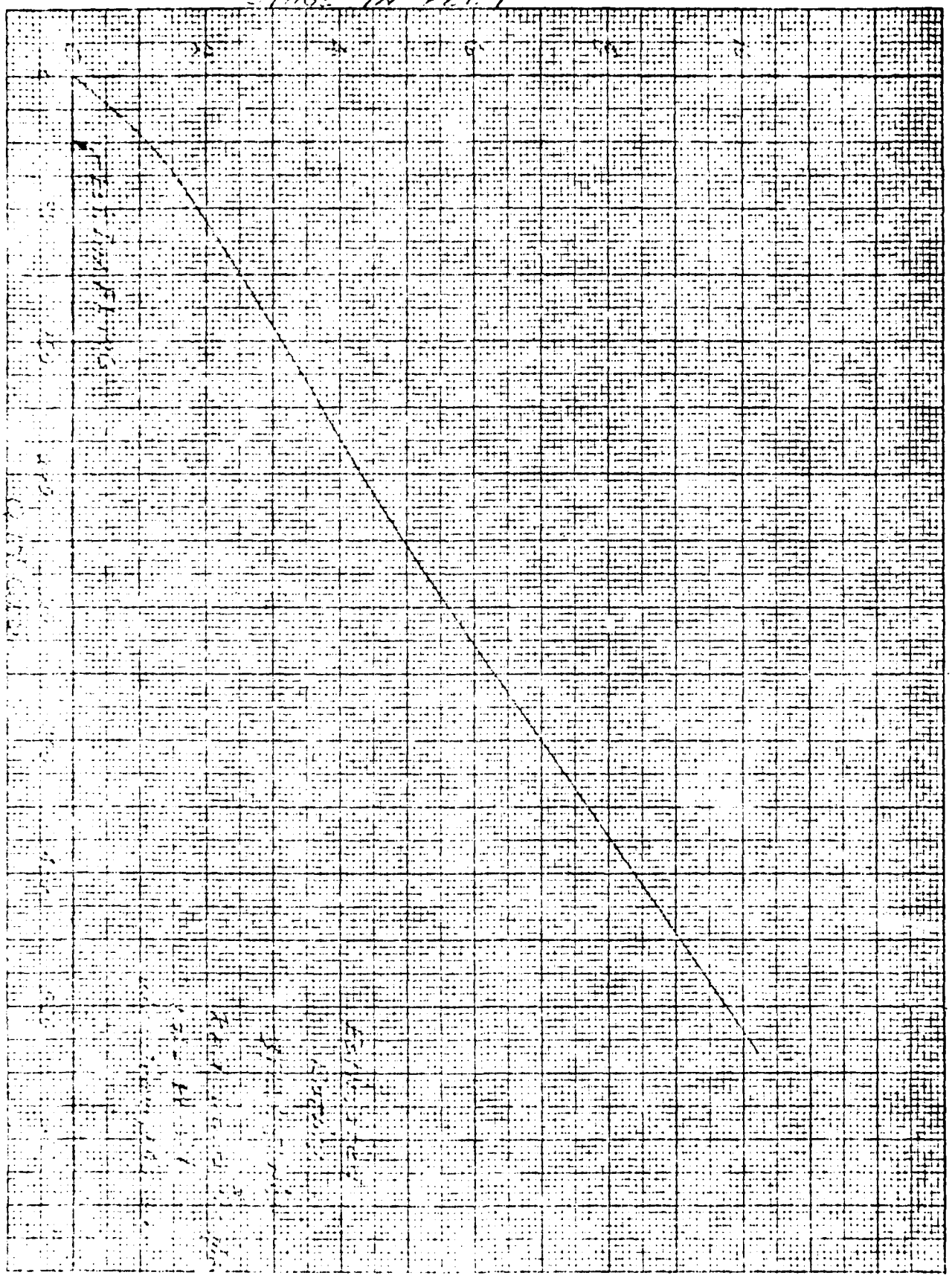
6
7

STAGE IN FEET

STAGE IN FEET



NED FORM 225
22 SEPT 49

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U. S. ARMY

PAGE ......

SUBJECT: Rel Dam - Lake Pearl Wrentham Mass #170

COMPUTATION: 3 ft. Sluice - Rating

COMPUTED BY .... CHECKED BY .... DATE 1/18/79

Sluice 3' wide, Conc. impact Conditions n=0.025, S=0.08

El.	H	Area	WP	r	V	Q	Spillway Rating	Dam overflow Rating	Total All
196	0	—	—	—	—	0			0
197	1	3	5	.60	11.96	36			36
198	2	6	7	.86	15.65	94			94
199	3	9	9	1.0	16.81	151	0		151
200	4	12	11	1.1	17.90	215	112		327
201	5	15	13	1.2	18.99	285	318		603
202	6	18	15	1.2	18.99	342	585	0	927
203	7	21	17	1.2	18.99	399	900	375	1674
204	8	24	19	1.3	19.12	460	1260	1060	2780
205	9	27	21	1.3	19.12	516	1650	1950	[illegible]
206	10	30	23	1.3	19.12	574	2080	3000	5654
207	11	33				600	2540	4200	7340
208	12	36				600	3040	5500	9140
209	13	39				600	3540	6950	11100

21 Sept 49 CORPS OF ENGINEERS, U.S. ARMY PAGE

SUBJECT Red Dam - Lake Pearl Wrentham, Mass. #170

COMPUTATION Spillway Rating

COMPUTED BY _____ CHECKED BY _____ DATE 1/10/78

est. C = 2.5, L = 45'

El.	H.	$H^{3/2}$	CL	Q
199	0	-	112.5	0
200	1	1.0	"	112
201	2	2.828	"	318
202	3	5.196	"	585
203	4	8.00	"	900
204	5	11.18	"	1260
205	6	14.70	"	1650
206	7	18.52	"	2080
207	8	22.63	"	2540
208	9	27.00	"	3040
209	10	31.62	"	3540

27 Sept 49 CORPS OF ENGINEERS, U.S. ARMY PAGE

SUBJECT Red Dam - Lake Pearl - Wrentham, Mass. #170

COMPUTATION Est. Rating of Dam overflow area

COMPUTED BY _____ CHECKED BY _____ DATE 1/18/78

Est. net overflow $L = 150' \pm$, est. $C = 2.5$

El.	H	$H^{3/2}$	CL	Q
202	0	-	375	0
203	1	1	"	375
204	2	2.828	"	1060
205	3	5.196	"	1950
206	4	8.00	"	3000
207	5	11.18	"	4200
208	6	14.70	"	5500
209	7	18.52	"	6950

21 Sept 49

CORPS OF ENGINEERS, U.S. ARMY

PAGE

SUBJECT

COMPUTATION

COMPUTED BY CHECKED BY DATE

Swamp Area ds.
Little Pond basin

4742	4343	4946	
4639	4742	4843	
1.03	1.01	1.03	= 1.02 x .14348 = .146 sq mi

x 640

95 acres

Rel Dam
Max. El. basin

460
198
262 ft.

Longest water course = 14000 ft. = 2.7 mile

Est $S = 0.019$ ft/ft.

21 Sept 49

CORPS OF ENGINEERS, U.S. ARMY

PAGE ...

SUBJECT ...

COMPUTATION ...

COMPUTED BY ... CHECKED BY ... DATE 1/16/53

1:24,000 1" = 0.14348 Sq mi

Lake Hubbard WS Area

@ El. 210

8343	8428	8516
8250	8343	8428
.93	.85	.88

2.66 ÷ 3 = .9 □"

= 0.14 Sq mi

831 Acres

d.a. to Lk Hubbard

2018	2673	3337
1359	2018	2673
6.59	6.55	6.64

19.78 ÷ 3 = 6.6 □"

= .95 Sq mi

606 Acres

Lake Pearl WS Area

@ El. 198

4689	4949	5218
4437	4689	4941
2.52	2.60	2.69

7.81 ÷ 3 = 2.60 □"

= .4 Sq mi

234 Acres

d.a. to Lk Pearl

6346	11398	6464
1284	6346	1348
50,62	50,52	50.66

151.8 ÷ 3 = 50.6 □"

7.3 Sq mi