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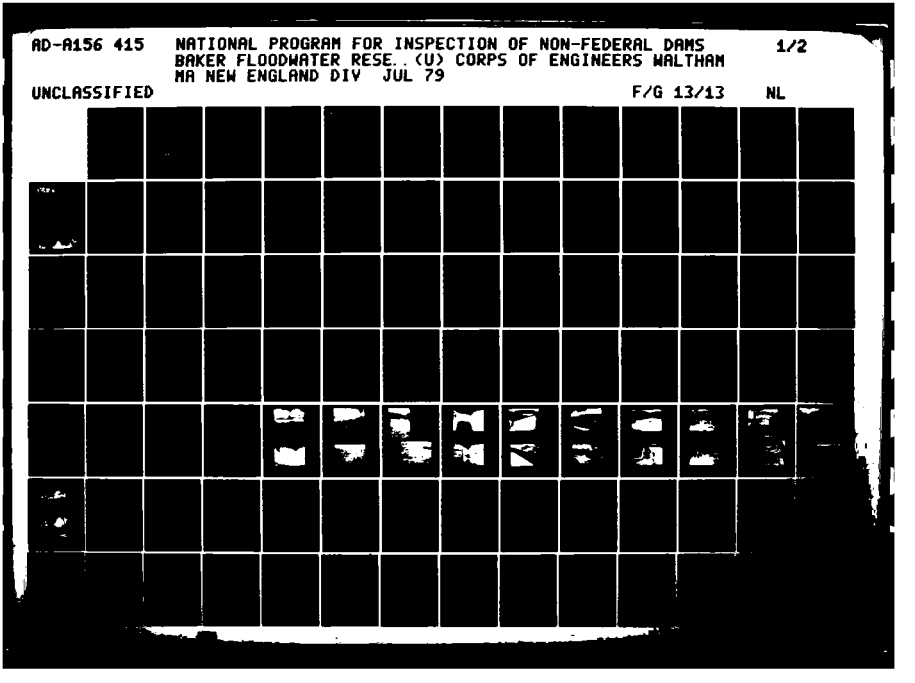
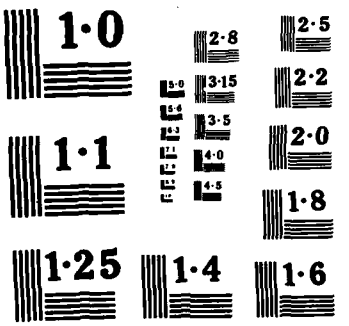




NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

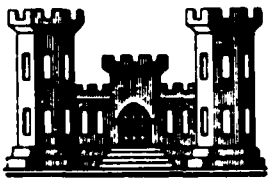
MERRIMACK RIVER BASIN

WENTWORTH, NEW HAMPSHIRE

BAKER FLOODWATER RESERVOIR
SITE 6
NH 00243

NHWRB NO. 24901

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM



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

JULY 1979

UNCLASSIFIED

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

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Merrimack River Basin
Wentworth New Hampshire
Pond Brook

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

The dam is an earthen structure consisting of homogeneous silty sand and earth fill on a bedrock foundation. The inspection revealed that the dam is in good condition. It is intermediate in size with a significant hazard classification. There are various remedial measures which should be implemented by the owner.

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DEPARTMENT OF THE ARMY
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REPLY TO
ATTENTION OF:
NEDED

FEB 14 1980

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

Dear Governor Gallen:

Inclosed is a copy of the Baker Floodwater Reservoir Site 6 Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Water Resources Board, the cooperating agency for the State of New Hampshire and the owner of the dam.

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

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

Sincerely,

MAX B. SCHEIDER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

BAKER FLOODWATER RESERVOIR SITE 6

NH 00243

NHWRB 249.01

MERRIMACK RIVER BASIN
WENTWORTH, NEW HAMPSHIRE

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM
PHASE I - INSPECTION REPORT
BRIEF ASSESSMENT

Identification No.:	00243
Name of Dam:	Baker Floodwater Reservoir Site 6
Town:	Wentworth
County and State:	Grafton, New Hampshire
Stream:	Pond Brook
Date of Inspection:	May 16, 1979

Baker Floodwater Reservoir Site 6 dam is an earthen structure consisting of homogeneous silty sand and earth fill on a bedrock foundation. Overall length of the dam is 203 feet. The height from the top of embankment to the streambed is 13 feet. Maximum structural height is 17 feet. Top width of the dam is 12 feet and the slope of the upstream and downstream embankments is 3 horizontal to 1 vertical. A concrete spillway discharges through the center of the dam. The spillway has two crests, a high stage and a low stage. In addition, there is a 3.0 foot by 3.1 foot slop log gate which is used as a pond drain. The dam construction was completed in June of 1973. Plans, design calculations and construction data were prepared by the Soil Conservation Service and are available for inspection.

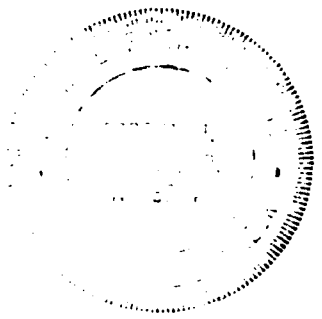
The visual inspection revealed that the dam is in good condition. The visual inspection revealed surface drainage from the right abutment, surface cracks and deterioration of the concrete walls of the spillway, and deficient riprap at the contact point of the inlet structure and the embankment.

Based on the intermediate size of the dam and its significant hazard classification and in accordance with Corps of Engineers Guidelines, the test flood inflow should be of a magnitude ranging from ½ the Probable Maximum Flood (PMF) to the full PMF. A test flood inflow equal to ½ the PMF or 12,700 cfs, was used. The routed test flood outflow of 8600 cfs overtops the dam by 3.2 feet. With the water surface at the top of dam the spillways will have a capacity of 4200 cfs (or 49 percent of the routed test flood outflow. The hydraulic design calculations indicate that the low level spillway crest was designed for up to a 100 year frequency flood. The hydraulic crest of the dam was designed using a total watershed runoff of 4.14 inches.

It is recommended that the owner engage a qualified, registered professional engineer to design a surface water diversion system to eliminate ponding of water on the right side of the spillway wall and to evaluate the condition of the backfill adjacent to the wall. Remedial measures include the development of a downstream warning system in the event of emergency conditions and replenishing of deficient rip-rap at the contact of the inlet structure and the embankment.

The recommendations and remedial measures are described in Section 7 and should be addressed within two (2) years, unless otherwise noted, after receipt of this report by the owner.

Gordon H. Slaney, Jr.



Gordon H. Slaney, Jr., P.E.
Project Engineer

Howard, Needles, Tammen & Bergendoff
Boston, Massachusetts

This Phase I Inspection Report on Baker Floodwater Reservoir Site 6 has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgement and practice, and is hereby submitted for approval.

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

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

JOSEPH A. MCELROY, CHAIRMAN
Chief, NED Materials Testing Lab.
Foundations & Materials 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.

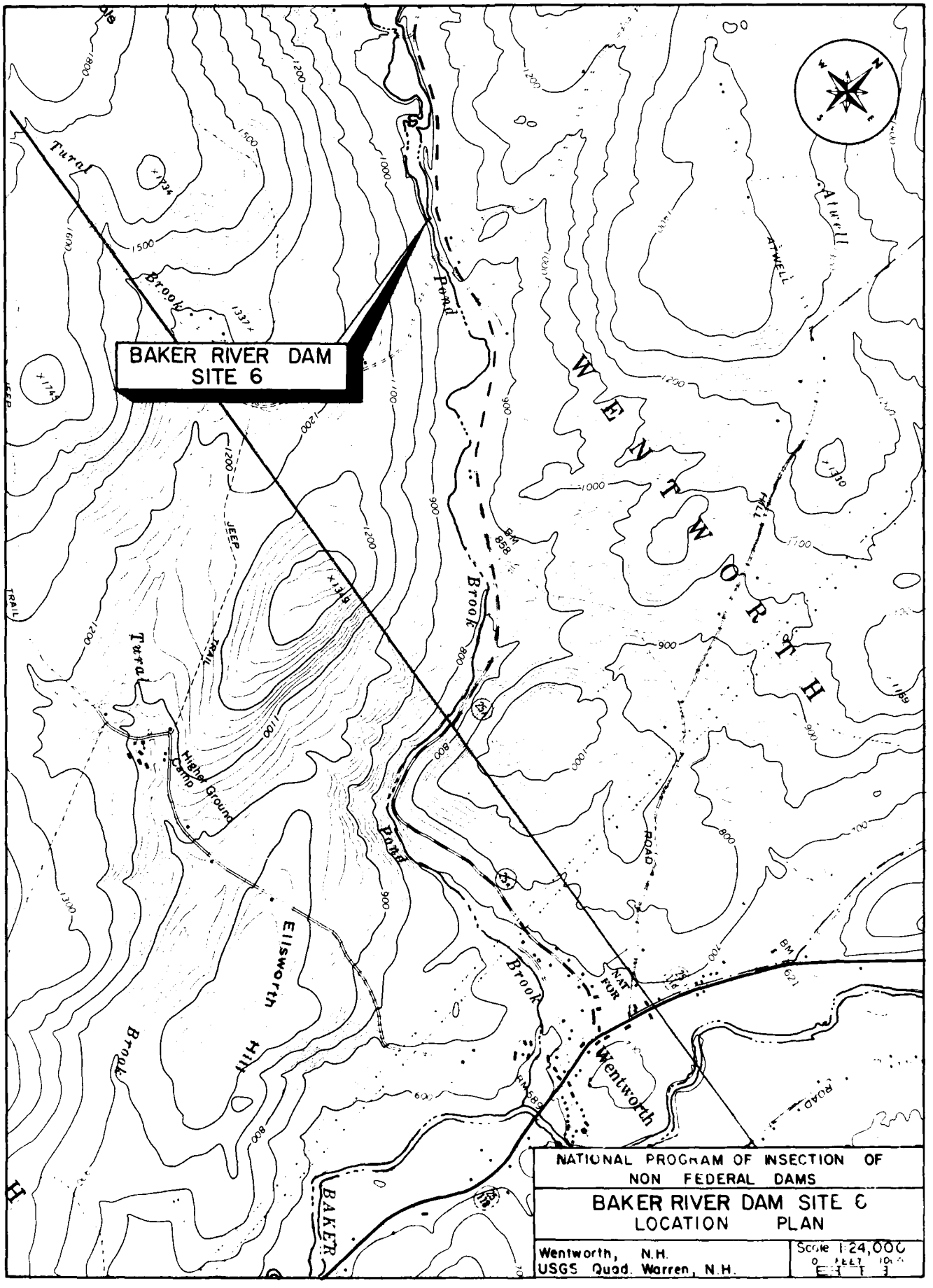
In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving 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 by 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

Baker River Dam - Site 6 - Overview looking upstream.



NATIONAL PROGRAM OF INSECTION OF NON FEDERAL DAMS

BAKER RIVER DAM SITE 6 LOCATION PLAN

Wentworth, N.H.
USGS Quad. Warren, N.H.

Scale 1:24,000
0 FEET 1000

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT
BAKER FLOODWATER RESERVOIR SITE 6

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. Howard, Needles, Tammen & Bergendoff has been retained by the New England Division to inspect and report on selected dams in the State of New Hampshire Authorization and notice to proceed were issued to Howard, Needles, Tammen & Bergendoff under a letter of March 30, 1979 from John P. Chandler, Colonel, Corps of Engineers. Contract No. DACW33-79-C-0060 has been assigned by the Corps of Engineers for this work.

b. Purpose

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

(2) To encourage and prepare the states to initiate 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

Baker Floodwater Reservoir Site 6, Baker Dam Site 6, is located on Pond Brook approximately 3 miles upstream of Route 25-118 in the Town of Wentworth, New Hamsphire. The location of the dam is shown on U.S.G.S. Quadrangle Wentworth, New Hampshire with approximate coordinates N43°53'15" W71°57'30", Grafton County, New Hampshire. The location of the dam is shown on the preceeding page.

b. Description of Dam and Appurtenances. Baker Dam Site 6 is an earthen structure consisting of homogeneous silty sand and earth fill on a bedrock foundation. A blanket drainage system is located under the downstream portion of the earth fill. Upstream and downstream faces of the embankment are on a 3 horizontal to 1 vertical slope. Top width of the dam is 12 feet. According to the existing plans the overall length is 203 feet, and the height from the top of embankment to the stream bed is 13 feet.

Appurtenant structures consist of a concrete box inlet drop spillway with high and low stage crests, a pond drain with a 3 foot by 3.1 foot stop log gate control. All inlets discharge through the concrete spillway located in the center of the dam.

Figures 1 and 2, located in Appendix B, show a plan of the dam and appurtenant structures. Photographs of each structure are shown in Appendix C.

c. Size Classification. Intermediate (hydraulic height-13 feet, storage-2240 acre-feet) classification based on storage being between 1000 and 50,000 acre-feet as given in Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification. The hazard posed by this dam is classified as significant. Failure of the dam with the pool at the top of dam would result in an average flood wave height of about 12 feet through a reach extending from the dam to a point three miles downstream. One dwelling located about 7 feet above the channel would be affected and a portion of Route 25A would be flooded.

e. Ownership. This dam is owned by the New Hampshire Water Resources Board, 37 Pleasant Street, Concord, New Hampshire.

f. Operator. This dam is maintained and operated by the New Hampshire Water Resources Board. Chairman of the Water Resources Board is Mr. George McGee, Sr.; Mr. Vernon Knowlton is Chief Engineer, Telephone No. 603/271-1110.

g. Purpose of Dam. This dam is used for floodwater control. The normal pool is maintained by the low stage spillway crest. The storage between the low stage spillway crest and the high stage spillway crest is used for flood-water control.

h. Design and Construction History. The construction of this dam was completed in June of 1973. Design and construction inspection of this dam were done by the Soil Conservation Service, Durham, New Hampshire. The construction contractor was Robie Construction Company, Inc.

i. Normal Operating Procedures. The normal pool elevation is maintained at the crest of the low stage spillway crest. Under flood conditions the storage between the low and high stage spillway crests is used to retard flood flows of up to a 100 year frequency flood. The high stage crest is utilized only for floods of greater than a 100 year frequency. The dam does not require any manual operation in order to function.

1.3 Pertinent Data

a. Drainage Area. The area tributary to Baker Dam Site 6 consists of 16.96 square miles of wooded mountainous terrain. There is some development in the watershed consisting mostly of summer camps. Approximately 60 percent of the watershed is tributary to Upper Baker Pond which is located upstream of Lower Baker Pond. Maximum elevation is at 2911 feet MSL, and the crest of the dam is at elevation 906.

The area around the reservoir is mostly wooded. There are some cottages located on the pond known as Lower Baker Pond. The reservoir between the dam and a roadway, located about 3000 feet upstream, is very narrow. The roadway bridge has an opening about 25 feet wide. The larger portion of the reservoir is located upstream of the roadway.

b. Discharge at Dam Site

(1) The outlet works for Baker Dam Site 6 consist of a stop log pond drain, and a box inlet type drop spillway with low and high stage inlets. The invert of the 3 foot by 3.1 foot stop log gate is 890.92 feet MSL. Maximum discharge of the opening when the water level is at the crest of the low stage spillway crest of 894.0 is approximately 54 cfs. The low stage spillway crest is at elevation 894.0 (normal pool). The crest length is 36 feet. Flow is controlled at the weir or by a 18 foot by 1 foot high orifice, which discharges to the main spillway. Capacity of the low stage spillway is 293 cfs when the water surface is at the high stage spillway crest of 900.0. The high stage spillway (emergency spillway) crest is set at elevation 900.0, with the water level at the top of dam (elevation 906.0) maximum capacity of the emergency spillway is 4200 cfs. Note that the maximum discharge of all inlets combined is 4200 cfs as they discharge through the same structure.

(2) There are no records available of maximum discharge at the site.

(3) The total spillway capacity with the water surface at the top of the dam is approximately 4200 cfs at elevation 906.0.

(4) Total spillway capacity with the water surface elevation at the test flood elevation of 908.8 is approximately 5500 cfs.

(5) The total project discharge at the test flood elevation of 908.8 is 8000 cfs.

c. Elevation (feet above MSL)

(1) Streambed at centerline of dam - 890.0

(2) Maximum tailwater - unknown

(3) Invert pond drain - 890.92

(4) Normal pool - 894.0

(5) Full flood control pool - 900.0

(6) Spillway crest (low stage) - 894.0
(high stage) - 900.0

(7) Design surcharge - 902.7

(8) Top dam - 906.0

(9) Test Flood Surcharge - 908.8

d. Reservoir (miles)

(1) Length of Maximum Pool - 1.80

(2) Length of Normal Pool - 1.25

(3) Length of Flood Control Pool - 1.65

e. Storage (gross acre-feet)

(1) Normal Pool - 210

(2) Surcharge Flood Control Pool - 1460

(3) High Stage Spillway Crest Pool - 921

(4) Top of Dam - 2240

f. Reservoir Surface (acres)

(1) Normal Pool - 121

(2) Surcharge Flood Control Pool - 215

(3) High Stage Spillway Crest - 183

(4) Test Flood Pool - 230

(5) Top Dam - 230

g. Dam

(1) Type - earth

(2) Length - 203 feet

(3) Height - 13 feet hydraulic
17 feet structural

(4) Top Width - 12 feet

(5) Side Slopes - upstream and downstream 3 horizontal to 1 vertical

(6) Zoning - 2 fill zones

(7) Impervious core - none

(8) Cutoff - zone 1 fill

(9) Grout Curtain - none

(10) Other - none

h. Diversion and Regulating Tunnel

See Section j

i. Principal Spillway

(1) Type - concrete box inlet drop spillway

(2) Length of Weir - Low Stage-36 feet
High Stage -154 feet

(3) Crest Elevation - Low Stage-894.0
High Stage-900.0

(4) Gates - Stop log gate in low stage spillway crest
3.0 feet by 3.1 feet invert 890.92

(5) U/S Channel - Approach channel for stop log gate 4 foot bottom width

(6) Downstream Channel - The spillway section through the dam is 26 feet wide and about 115 feet long with longitudal sills at the end. The channel downstream of the dam has a rock bottom with ledge outcroppings. The channel is fairly clear with only minor log debris. Some small trees overhang the channel.

j. Regulating Outlets. The normal pool is maintained by the low stage spillway crest at 894.0. There is a trash rack across the entire spillway section. The stop log pond drain gate (3.0 feet by 3.1 feet) is set into the low stage spillway at invert 890.92. The stop logs are normally in place to the crest of the spillway. There is a 4 foot bottom width approach channel to the stop log gate with an invert of 890.0 at the face of the dam.

SECTION 2
ENGINEERING DATA

2.1 Design

A complete set of design data including layout, hydraulic design, foundation and embankment design, geology and soils reports, structural design, quanities and specifications are available for Baker Dam Site 6. In addition, there are construction drawings available. Design of the dam was done by the Soil Conservation Service, Durham, New Hampshire.

2.2 Construction

The dam construction was completed in June of 1973. A complete record of construction documents were made available. These documents include; as-built plans, job diarys, surveying records, test drilling logs, compaction test results, concrete tests and certificate of completion. Construction was by Rodgers Construction Co., Inc., Brattleboro, Vermont, and was inspected by the Soil Conservation Services, Durham, New Hampshire.

2.3 Operation

Normally the pond drain line gate is closed. The normal level of 894.0 is maintained by the low stage spillway crest. The low stage spillway and reservoir storage is designed to retard runoff from up to a 100 year frequency storm without discharge occuring over the high stage spillway (crest 900.0).

2.4 Evaluation

a. Availability. Engineering data available for Baker Dam Site 6 consists of the information outlined in Sections 2.1 and 2.2. The plans, design data, and construction records are available at the offices of the Soil Conservation Service, Federal Building, Durham, New Hampshire, 03824.

b. Adequacy. A complete set of design and construction data did allow for a definative review within the confines of this Phase I - Inspection Report. Therefore, the adequacy of this dam is based on the design and construction data reviewed, visual inspection, past performance history and sound engineering judgement.

c. Validity. The field inspection indicated that the external features of Baker Dam Site 6 substantially agree with those shown on the available plans.

SECTION 3
VISUAL INSPECTION

3.1 Findings

a. General. The field inspection of Baker Dam Site 6 was made on May 16, 1979. The inspection team consisted of personnel from Howard, Needles, Tammen & Bergendoff and Geotechnical Engineers, Inc. A representative of the New Hampshire Water Resources Board was also present during the inspection. Inspection checklists, completed during the inspection, are included in Appendix A. At the time of inspection the water level was approximately 0.5 feet above the crest of the low stage spillway. The upstream face of the dam could only be inspected above this water level.

b. Dam. Visual inspection of the dam indicated the dam was in good condition.

The dam consists of a homogeneous earth embankment about 203 feet long with a maximum height of about 13 feet. A box-inlet drop spillway passing through the center of the dam discharges both the low stage spillway and the high stage spillway flows.

The embankment, constructed of silty sand, is founded on bedrock which in some areas is severely weathered. Upstream and downstream foundation drainage blankets were constructed to control possible foundation seepage through weathered or jointed rock.

Visual inspection indicated the dam is in good condition with the exception of the need to control surface drainage from the right abutment, which flows along the upstream toe of the dam. The surface water is ponding along the right training wall of the box-inlet structure. The ponding water is shown in Photo No. 18.

The high water table along the right training wall plus possible frost action due to the fines deposited in the backfill along the wall may have caused the deterioration of the upstream right training wall. Photos No. 9 & 11 show the right training wall and Photo No. 10 shows the upstream left training wall for comparison.

Crest

The crest of the dam is 12 feet wide and grass covered as shown in Photo No. 5. No misalignment of the crest was observed.

Downstream Slope

The downstream slope is 3 horizontal to 1 vertical and has a good grass cover. No signs of seepage or wet areas were observed, however, at the time of inspection, the pool elevation was approximately at the elevation of the downstream toe. In view of the possible foundation seepage beneath the dam, an inspection of the downstream toe area should be made when the pool is at a higher elevation.

Upstream Slope

The upstream slope is 3 horizontal to 1 vertical and has a good grass cover which at the time of inspection required mowing. Riprap placed at the contact between the inlet structure and the embankment is deficient in some areas as shown in Photo No. 17.

A small surface drainage brook exits from the right abutment and flows along the upstream toe to the box-inlet training wall. Photos No. 19 & 20 show this drainage brook along the toe of the embankment and Photo No. 18 shows the water ponding along the right training wall. This surface drainage has deposited soil fines along the training walls.

c. Appurtenant Structure. The visual inspection of the concrete box spillway with high and low stage inlets, pond drain with a stop log control and the discharge sluiceway channel did not reveal any evidence of stability problems. The concrete surface and vertical alignment of the spillway structure are in good condition except for numerous vertical cracks, staining and deposit of efflorescence around concrete cracks as shown in Photos No. 9 & 10.

The spillway structure, shown in Photos No. 7,8 & 12, consists of two elements, an overflow control (the low and high stage crests of the spillway) and an open sluiceway type discharge channel. The spillway structure is located in the center of the dam. Visual inspection revealed that the spillway structure appeared to be in good condition except the sluiceway walls which have experienced temperature cracks. Inspection of training walls shows concrete temperature cracks, water staining and evidence of efflorescence, a whitish crystalline deposit at the concrete cracks. A lack of construction joints in the training walls was noted.

The galvanized trash rack at the low stage spillway crest consists of structural steel shapes. The trach rack assembly is in good condition, no rust or peeling of the protective coating was noted, see Photos No. 13 and 14. Debris was noted on the trash rack.

The pond drain structure is located in the center of the spillway and is controlled by stop logs. The pond drain and control stop logs were under water at the time of inspection.

The foundation drainage system has 12-inch diameter outlet pipes on each side of the outlet channel just below the concrete training walls, see Photos No. 15 & 16. A slight outflow was observed from the right side drain pipe, and no flow was observed from the left side drain pipe.

d. Reservoir Area. The area around the reservoir is mostly wooded. There are some cottages on the pond known as Lower Baker Pond. The reservoir between the dam and a roadway bridge located at about 3000 feet upstream of the dam is very narrow. The roadway bridge has an waterway openning of about 25 feet as shown in Photo No. 21. The larger portion of the reservoir is located upstream of the bridge.

e. Downstream Channel. The channel downstream of the dam has a rock bottom with ledge outcroppings. The channel is fairly clear with only minor log debris. Some small trees overhang the channel as seen in Photo No. 22.

3.2 Evaluation

The visual inspection indicates that the dam is in good condition. The visual inspection revealed the following:

(a) Surface drainage from the right abutment, which causes ponding of water along the upstream spillway walls.

(b) Temperature cracks and deterioration of the concrete walls of the spillway.

(c) Rip-rap placed at the contact between the inlet structure and the embankment is deficient in some areas.

(d) Debris on the trash racks.

(e) The water level was 11.5 feet below the crest of the dam.

SECTION 4
OPERATIONAL PROCEDURES

4.1 Procedure

Baker Dam Site 6 is used for floodwater control. Under normal operating procedures the dam is left to function as designed. The normal pool level is maintained by the low stage spillway crest in the riser. Flood events up to a 100 year frequency are retarded by reservoir storage between the normal pool elevation and the crest of the high stage spillway. The high stage spillway is utilized only for flood events of greater than 100 year frequency.

4.2 Maintenance of Dam

The dam is inspected on an annual basis by the New Hampshire Water Resources Board and the Soil Conservation Service. Maintenance is undertaken as a result of the inspection on an as needed basis. The dam is visited on a monthly basis by personnel of the New Hampshire Water Resources Board.

4.3 Maintenance of Operating Facilities

Maintenance of the outlet works is performed as in Section 4.2.

4.4 Description of Warning Systems

There are no warning systems in effect for this facility.

4.5 Evaluation

The current operation and maintenance procedure for this facility appear to be adequate to insure that any problems encountered can be remedied within a reasonable period of time. However, the owner should establish a warning system to follow in the event of emergency conditions.

SECTION 5
HYDROLOGY AND HYDRAULIC ANALYSIS

5.1 Evaluation of Features

a. General. Baker Dam Site 6 is an earthen embankment dam 203 feet long with a hydraulic height of 13 feet. The dam is constructed with two fill zones and an earth fill core which extends to bedrock. Appurtenant works consist of a two stage box inlet spillway and a stop log gate that can be used to drain the reservoir.

The dam is used for floodwater control. The dam is classified as intermediate in size having a height of 13 feet and maximum storage of 2,240 acre-feet.

b. Design Data. According to the Soil Conservation Service design data this dam is constructed to retard flood flows of up to a 100 year frequency storm without utilizing the emergency spillway. The design flood control elevation is 900.0 feet or equal to the high stage spillway crest. Total runoff for this condition is 2.88 inches during a six hour Type IIB storm. The design freeboard of the dam was determined using an average watershed runoff of 4.14 inches to give an elevation of 902.7. The inflow hydrograph for Baker Site 6 was developed by combining the hydrograph of flow directly tributary to Lower Baker Pond with the routed hydrograph of flow tributary to Upper Baker Pond. The dam crest elevation of 906.0 was set to provide frost protection. The structure was classified as having a class "B" hazard which is defined as "being located in predominantly rural or agricultural area where failure may cause damage to isolated homes, main highways or major railroads, or cause interruption or use or service of relatively important public utilities.

c. Experience Data. There are no records available of maximum discharge at the dam site.

d. Visual Observations. No evidence of damage to any portion of the project from overtopping was visible at the time of inspection.

e. Test Flood Analysis. Detailed design data is available for this dam, and the basic conditions are noted above in Paragraph b. The hydrologic evaluation was preformed using information gathered by field investigation, watershed characteristics and Probable Maximum Flood (PMF) guide curves

prepared by the Corps of Engineers. In accordance with Corps of Engineers guidelines, the significant hazard classification and intermediate size of the dam warrant a test flood magnitude ranging from ½ the Probable Maximum Flood (PMF) to the full PMF. A test flood equal to ½ PMF was used as the available storage of 2,240 acre-feet is on the low end of the size classification range of 1,000 acre-feet to 50,000 acre-feet.

The test flood inflow of 11,700 cfs is based on design computations by the Soil Conservation Service (SCS), which include routing of a portion of the inflow through Upper Baker Pond. The SCS calculations yield an inflow to Lower Baker Pond of 5,120 cfs with an average watershed runoff of 4.15 inches. The test flood runoff of 9.5 inches was proportioned to the SCS inflow to obtain the test flood inflow.

The routed test flood outflow was determined in accordance with Corps of Engineers guidance for Estimating Effect of Surcharge Storage on Maximum Probable Discharge and the hydraulic characteristics of the dam. The stage discharge curve is based on SCS calculations and have been extended for elevations higher than those originally done by the SCS. It should be noted that flow control points in the spillway change from orifice to the high stage crest to the spillway throat width. This can be seen on Page 4 of Appendix "D", and in the SCS calculations at the end of Appendix "D".

The routed test flood outflow was determined to be approximately 8,000 cfs. As the maximum capacity of the spillway is 4,200 cfs (approximately 53 percent of the routed test flood outflow) the dam will be overtopped by 2.8 feet.

f. Dam Failure Analysis. The impact of failure of the dam was assessed using the "Rule of Thumb" Guidance for Estimating Downstream Dam Failure Hydrographs prepared by the Corps of Engineers. The breach discharge was estimated with the water surface at the crest of the dam and a breach width equal to 40 percent of the total length of the dam. The downstream hydrograph is a sum of the breach discharge and the maximum spillway capacity. Prior to the breach of dam the river stage about 1 mile downstream would be about 9.6 feet the spillway at a full capacity of 4,200 cfs. Breach of dam would result in an additional 4,890 cfs for a total of about 9,000 cfs. The reach used for the downstream hydrograph routing is smaller in cross section than the channel immediately downstream of the dam. Thus the flood

stages at the dam and for about 1,000 feet downstream of the dam will be lower than those noted in this report.

The river stage after breach of dam would be about 12.6 feet. This stage would not be reduced appreciably as there is little channel storage. In the reach of 15,000 feet only one dwelling located 7 feet above the channel and 3 miles downstream of the dam would be affected. A portion of Route 25A located 2,000 feet downstream of the dam would be flooded by about 6 feet for a distance of 300 feet along the roadway.

SECTION 6
STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observation. The visual inspection Baker Dam Site 6 did not disclose any immediate stability problems. The cracks in the spillway training wall do not present any immediate danger to the dam. The cracks may be due to temperature changes and a lack of construction joints. The ponding along the right training wall may aggrivate the situation due to hydrostatic pressure and frost heaving. The surface water should be diverted away from the training wall.

b. Design and Construction Data. Design drawings exist and indicate the dam is a homogeneous embankment of silty sand founded on bedrock. Construction drawings indicate the foundation was to be cleaned to sound rock.

The upstream and downstream slopes are 3 horizontal to 1 vertical.

Upstream and downstream drainage blankets were constructed to intercept seepage that might pass through areas of weathered rock.

The primary and emergency spillway consist of a concrete box-inlet which passes through the center of the embankment.

A review of the construction data available indicates that the dam and appurtenant structures were constructed according to the plans and specifications.

c. Operating Records. No operational records were made available.

d. Post Construction Changes. No post construction changes are apparent.

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

SECTION 7
ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition. The visual inspection of Baker Floodwater Reservior Site 6 indicated the dam is in good condition. The inspection revealed the following:

(1) Surface drainage from the right abutment, which causes ponding of water along the right upstream wall of the spillway.

(2) Temperature cracks and deterioration of the concrete walls of the spillway.

(3) Deficient riprap at the contact between the embankment and the inlet structure.

(4) The low level of the reservior prevented any meaningfull evaluation of seepage.

The hydraulic analysis reveals that the spillways cannot pass the routed test flood without overtopping the dam.

b. Adequacy of Information. A complete set of design and construction data did allow for a definitive review with the confines of this Phase I - Inspection Report. Therefore, the adequacy of this dam is based on the design and construction data review, visual inspection, past performance history and sound engineering judgement.

c. Urgency. This dam is in generally good condition. The recommendations and remedial measures described in Sections 7.2 and 7.3 should, unless otherwise noted, be accomplished within two years of the receipt of this Phase I - Inspection Report by the owner. The recommendation in Section 7.1.a should be accomplished within one year. The remedial measure in Section 7.3.a should be done as part of the regular maintenance.

d. Necessity of Additional Invesitgation. No additional investigation is needed to complete the Phase I Inspection.

7.2 Recommendations

(a) The owner should engage a qualified registered engineer to design a surface water diversion system that would eliminate ponding of water and erosion along the upstream right training wall of the box-inlet structure. The engineer should also evaluate the condition of the backfill adjacent to the wall to determine if it has become frost susceptible due to deposition of fines from the surface water ponding.

7.3 Remedial Measures

(a) The presently missing riprap adjacent to the inlet structure should be replaced.

(b) Devise a warning system to follow in the event of emergency conditions.

(c) The periodic inspection should be continued on not less than a biennial frequency. Special attention should be given for possible seepage in the area of the downstream toe of the dam, particularly of the reservoir level is high.

(d) Remove debris from trash racks on a regular basis.

(e) Repair all spalled concrete on the spillway and training walls.

7.4 Alternatives

There are no practical alternatives to the recommendations and remedial measures described in Sections 7.2 and 7.3.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT SITE 6, BAKER DAM

DATE May 16, 1979

TIME 10:00 AM

WEATHER Fair

W.S. ELEV. 894.5 U.S. - DN.S

PARTY:

1. G. Slaney - HNTB
2. S. Mazur - HNTB
3. D. LaGatta - GEI
4. C. Osgood - GEI
5.
6.
7.
8.
9.
10.

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Dam	D. LaGatta, C. Osgood	
2.	Spillway, Outlet Works	S. Mazur	
3.	and Downstream Channel	G. Slaney	
4.			
5.			
6.			
7.			
8.			
9.			
10.			

PERIODIC INSPECTION CHECK LIST

PROJECT BAKER SITE NO. 6 DAM DATE May 16, 1979

PROJECT FEATURE Earth Embankment NAME D. P. LaGatta

DISCIPLINE Geotechnical Engineer NAME C. E. Osgood

AREA EVALUATED	CONDITION
DAM EMBANKMENT	
Crest Elevation	906.0
Current Pool Elevation	894.5
Maximum Impoundment to Date	unknown
Surface Cracks	None observed
Pavement Condition	No pavement
Movement or Settlement of Crest	None observed
Lateral Movement	None observed
Vertical Alignment	No misalignment observed
Horizontal Alignment	No misalignment observed
Condition at Abutment and at Concrete Structures	Good except for collection of surface water at the right training wall and loss of riprap against wall.
Indications of Movement of Structural Items on Slopes	None
Trespassing on Slopes	No evidence of treaspassing was observed.
Sloughing or Erosion of Slopes or Abutments	None except for slight erosion of the upstream face of the embankment adjacent to the right training wall.
Rock Slope Protection - Riprap Failures	No failure. Some riprap missing adjacent to walls of box-inlet spillway.
Unusual Movement or Cracking at or near Toes	None
Unusual Embankment or Downstream Seepage	None observed
Piping or Boils	None observed
Foundation Drainage Features	Two blanket drains, exits are clear.
Toe Drains	None observed
Instrumentation System	None
Vegetation	Grass cover generally good

PERIODIC INSPECTION CHECK LIST

PROJECT SITE 6, BAKER DAM | DATE May 16, 1979

PROJECT FEATURE Intake Channel/Structure | NAME D. LaGatta, C. Osgood

DISCIPLINE Geotechnical/Structural Engs. | NAME S. Mazur

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	None
Slope Conditions	
Bottom Conditions	
Rock Slides or Falls	
Log Boom	None
Debris	Some at trash rack
Condition of Concrete Lining	
Drains or Weep Holes	
b. Intake Structure	
Condition of Concrete	Good
Stop Logs and Slots	Galvanized trash rack and concrete surface of intake structure are in good condition. Control stop logs at bottom release structure were under water.

PERIODIC INSPECTION CHECK LIST

PROJECT SITE 6, BAKER DAM DATE May 16, 1979

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER	
a. Concrete and Structural	This facility has no control tower.
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	

PERIODIC INSPECTION CHECK LIST

PROJECT SITE 6, BAKER DAM DATE May 16, 1979

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - TRANSITION AND CONDUIT	
General Condition of Concrete	None
Rust or Staining on Concrete	
Spalling	
Erosion or Cavitation	
Cracking	
Alignment of Monoliths	
Alignment of Joints	
Numbering of Monoliths	

PERIODIC INSPECTION CHECK LIST

PROJECT SITE 6, BAKER DAM — DATE May 16, 1979

PROJECT FEATURE Outlet Structure/Channel — NAME D. LaGatta, C. Osgood

DISCIPLINE Structural/Hydraulic/Geotechnical — NAME S. Mazur, G. Slaney

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	
General Condition of Concrete	Good
Rust or Staining	Water staining, spillway training walls.
Spalling	None
Erosion or Cavitation	None observed
Visible Reinforcing	None
Any Seepage or Efflorescence	Efflorescence at surface cracks.
Condition at Joints	Good
Drain Holes	Open and draining at both walls of box inlet
Channel	Channel open, free of obstruction
Loose Rock or Trees Overhanging Channel	None
Condition of Discharge Channel	Clear

PERIODIC INSPECTION CHECK LIST

PROJECT SITE 6, BAKER DAM — DATE May 16, 1979

PROJECT FEATURE Outlet Works - Spillway — NAME D. LaGatta, C. Osgood

DISCIPLINE Structural/Hydraulic/Geotechnical — NAME S. Mazur, G. Slaney

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	Outlet structure and spillway are one
General Condition	
Loose Rock Overhanding Channel	None observed
Trees Overhanging Channel	
Floor of Approach Channel	
b. Weir and Training Walls	
General Condition of Concrete	Spillway structure consists of two elements, an overflow with low and high stages of control and open sluiceway type discharge channel. The spillway structure appeared to be in good condition.
Rust or Staining	None
Spalling	None
Any Visible Reinforcing	
Any Seepage or Efflorescence	Efflorescence at spillway training wals.
Drain Holes	Clear and operating
c. Discharge Channel	
General Condition	Clear
Loose Rock Overhanging Channel	None
Trees Overhanging Channel	None-Downstream the channel enters woods
Floor of Channel	Rocky; riprap extends about 30 feet
Other Obstructions	None

PERIODIC INSPECTION CHECK LIST

PROJECT SITE 6, BAKER DAM DATE May 16, 1979

PROJECT FEATURE Service Bridge NAME

DISCIPLINE NAME

AREA EVALUATED	CONDITION
OUTLET WORKS - SERVICE BRIDGE	
a. Super Structure	This facility has no service bridge.
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

ENGINEERING DATA

1. LIST OF DESIGN, CONSTRUCTION AND MAINTENANCE RECORDS
2. PAST INSPECTION REPORTS
3. PLAN AND DETAILS

AVAILABLE ENGINEERING DATA

1. A set of drawings (20 sheets), dated June 1969, showing as built plans and details of the dam and appurtenant structures.

2. Design Data: including layout, hydraulic design, geology and soils reports, structural design, quanities and specifications.

3. Construction Data: including as-built plans, job diarys, surveying records, test drilling logs, compaction test results, concrete tests, and certificate of completion.

All of the above are on file with the U.S.D.A. Soil Conservation Service, Federal Building, Durham, N.H. 03824.

PAST INSPECTION REPORTS

F.le ...

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Federal Building, Durham, New Hampshire 03824

September 25, 1978

Mr. George M. McGee, Sr., Chairman
New Hampshire Water Resources Board
37 Pleasant Street
Concord, New Hampshire 03301

G.M.M.Sr.

Dear George:

In regard to the Baker River Watershed Site 6, we are concerned about the deterioration of the box concrete and the lack of drainage on the right abutment. We plan to investigate these conditions early next summer and will forward our recommendations then.

Sincerely,

Charles H. Dingle

Charles H. Dingle
Assistant State Conservationist (WR)

State of New Hampshire
WATER RESOURCES BOARD
37 Pleasant Street
Concord, N.H. 03301
Telephone 271-3406

September 18, 1978

Mr. Keith MacPherson
Soil Conservation Service
Federal Building
Durham, New Hampshire 03824

Dear Mr. MacPherson:

This letter is to inform you of the prevailing conditions at two of the Baker River System Flood Control Sites.

Site No. 6 249-1

1- Trash racks have been cleared of debris.

2- All bushes and tree sprouts on the dam have been pulled, cut or sprayed.

3- The concrete is still spalled in several areas of the channel wall and has broken away from the railing posts. The Board feels that it is your agency's responsibility for this repair.

4- To date we have not received your agency's recommendation of corrective action regarding the ponding against the right bank channel wall for our review. During this year's inspection this item was of some concern to Ray Winninger.

5- The traffic signs and riprap have been removed from the outlet channel.

Site No. 11-A 249-14

1- The bushes and tree sprouts on the dam and in the emergency spillway have been pulled, cut or sprayed.

2- The roadway guardrail repair is to be completed by the Town and not by us.

A more complete report will follow indicating all the work accomplished this year with respect to this year's O & M maintenance field inspection reports.

Very truly yours,

George McGee Sr.

GMM:GLK:paf

George M. McGee, Sr.,
Chairman

MAINTENANCE CHECKLIST FOR PL 566 FLOOD CONTROL STRUCTURES

This maintenance checklist is a guide for determining the maintenance required for Public Law 566 flood control structures in New Hampshire. It doesn't take the place of experience and judgment and is not inclusive. Items of a difficult nature to check, such as principal spillway conduit condition, are not included. Intensive checks of these items are necessary at proper intervals. Review of As Built drawings, the design folder, structure history, and previous maintenance reports should be part of the inspection. Prompt maintenance is a vital part of safe and effective operation.

Except where otherwise indicated, completion of this form may be facilitated by ranking maintenance items on a 1 to 4 basis where

1 = satisfactory
2 = satisfactory, but check carefully at next inspection
3 = requires maintenance this season
4 = requires immediate attention.

249.01

WATERSHED Baker SITE 6 DATE 6-13-78

INSPECTED BY Gary Kerr, Lyall Milligan (WRB); Mike Dannehy, Nick Luhtala, Ray Wenninger (SCS)

1. GENERAL ITEMS

Access Road.	N/A
Site Fencing.	1
Traffic Conditions.	1
Vandalism Control.	(3)
Trash Control.	

COMMENTS Traffic signs and riprap in box. These should be removed as they could affect flow distribution.

2. RESERVOIR

Timber stand at reservoir.	1
Debris and slash.	3 ✓
Sediment level in relation to low stage inlet	

COMMENTS A little debris at trash rack should be removed.

SOIL CONSERVATION SERVICE
U.S. DEPARTMENT OF AGRICULTURE

3. EMBANKMENT AND EXCAVATED SLOPES

(Report riprap and vegetation and erosion condition under Items 4 and 5.)

	Dam	Dike	Emergency Spillways left	Emergency Spillways right 1/	Other (____)	Other (____)
Sliding or sloughing	1					
Holes (rodent and other) (check especially at embankments)	1					
Excessive settlement (embankments)	1					
Cracks						
Traverse	1					
Longitudinal						
Seepage 2/	1					
Piping 2/	1					

COMMENTS

4. RIPRAP

	Displ. of Rock	Loss of Spalls	Loss of Bedding	Erosion of Found.	Break-down of Rock
Dam					
Upstream berm	4 ✓	4 ✓	1	4 ✓	1
Principal Spillway Outlet					
Embankment Gutters					
left					
right					
Emergency Spillway					
location					
location					
Waterways					
location					
location					
Outlet Channel					
Other					

COMMENTS Rock riprap should be replaced on each side of box as soon as possible as flow could erode impervious blanket below riprap if the riprap is not satisfactory. The correct size should be used for the total layer thickness, not just put back on top of the existing rock. Fines washed into the riprap on the right side could increase frost loading on the box sidewall.

1/ Looking downstream.

VEGETATION

	Dam	Emergency Spillways left	Emergency Spillways right 1/	Dike	Outlet Channel	Water way	Other (at right side of box)
Condition of stand (including need for lime and fertilizer)	1	—	—	—	—	—	—
Undesirable vegetation	1	—	—	—	—	—	—
Drainage (surface)	1	—	—	—	—	—	3
Erosion 2/	1	—	—	—	—	—	—
Sedimentation	1	—	—	—	—	—	—
Condition of planting	1	—	—	—	—	—	—
Pest control	1	—	—	—	—	—	—
Fire control	1	—	—	—	—	—	—

COMMENTS All vegetation o.k. Drainage from right side area of box should be diverted from box. This could increase frostloads on box and increase frost related cracking of concrete. An average of 4" of water ponded against box sidewall.

EMBANKMENT, STRUCTURAL, & OTHER DRAINS

		Dam left	Dam right 1/	Other (____)	Other (____)
Depth of Flow (in inches above invert)	With any obstruction	3/	3/	—	—
	Without any obstruction	—	—	—	—
Turbidity of Discharge (yes, no)	With any obstruction	—	—	—	—
	Without any obstruction	—	—	—	—
Condition of Protective Coating	Outside	—	—	—	—
	Inside	—	—	—	—
Obstruction in Flow (yes, no)		—	—	—	—
Animal Guard Condition		1	1	—	—
Outlet Condition		1	1	—	—

Retarding Pool Elevation (ft. msl)_____ or 6 in. (~~&&~~) above / below LS

Other_____

COMMENTS 3/ Submerged drains. Drain outlets into box appear o.k. Water over sill so close inspection not possible at this time. Recommend checking thoroughly drain outlet condition during low water.

RISER

N/A

Caution Be extremely careful when using ladders. Check condition before using. Ladders are sometimes broken, loose, corroded, and or slippery.
Use safety harness.

Ladders: inside and out	Condition of protective coating___; Corrosion___; Damaged parts___; Loose___; Other___.
Concrete: inside and out	Cracking___; Spalling___; Other deterioration ___; Excessive movement (check joint at riser and conduit)___; Other___.
Trashracks: low and high stage	Condition of protective coatings___; Corrosion ___; Damaged parts___; Condition of fastenings ___; Need of gratings due to beaver___; Safety condition (protruding fastenings, sharp edges, etc.)___; Other___.
Manhole:	Condition of protective coatings___; Corrosion ___; Damage___; Lock operable___; Other___.
Gate: including lifting device, stem, guides, disc	Condition of protective coating___; Corrosion ___; Damaged parts___; Condition of fastenings___; Stem alignment___; Lubrication___; Operation___; Other___.
Safety Items:	Condition of warning signs___; Condition of safety equipment___; Other___.

COMMENTS_____

IMPACT BASIN, SAF, BOX INLET, & MISCELLANEOUS CONCRETE STRUCTURES

(specify) BOX INLET

Concrete: inside and out	Cracking 3 ; Spalling 1 ; Other deterioration 3 ; Excessive movement (check joints) 1 ; Waterstops 1 ; Joint sealant 1 ; Other___.
Trashracks: low and high stage	Condition of protective coatings 1 ; Corrosion 1 ; Damaged parts 1 ; Condition of fastenings 1 ; Need of gratings due to beaverno ; Safety condition (protruding fastenings, sharp edges, etc.) 1 ; Other___.
Gates: including lifting device, stem, guides, disc, flap	Condition of protective coating___; Corrosion ___; Damaged parts___; Condition of fastenings___; Stem alignment___; Operation___; Lubrication___; Wood decay___; Other___.
Structure Drainage:	Report under "Embankment and Other Drains"
Structure, Railing, Grates, Barriers, etc.	Condition of protective coating 1 ; Corrosion 1 ; Damaged parts 3 ; Condition of Fastenings___; Wood decay___; Safety condition (protruding fastenings, sharp edges, etc.) ___; Other___.
Safety Items:	Condition of warning signs___; Condition of safety equipment___; Other___.

COMMENTS Need to put sealer in three or so fence sockets. Concrete box does not appear to be cracking anymore than before. However, a protective sealer such as silicone may retard water and freezing damage.

CHANNEL

Stream obstructions.	1
Debris in stream.	1
Sediment bars controlled.	1
Plunge pool stability.	1
Fish habitat appurtenances	--

Riprap -- Report under "Riprap" (item 4)

COMMENTS

MAINTENANCE CHECKLIST FOR PL 566 FLOOD CONTROL STRUCTURES

maintenance checklist is a guide for determining the maintenance required Public Law 566 flood control structures in New Hampshire. It doesn't take place of experience and judgment and is not inclusive. Items of a difficult re to check, such as principal spillway conduit condition, are not included. nsive checks of these items are necessary at proper intervals. Review of uilt drawings, the design folder, structure history, and previous maintenance rts should be part of the inspection. Prompt maintenance is a vital part of and effective operation.

pt where otherwise indicated, completion of this form may be facilitated anking maintenance items on a 1 to 4 basis where

1 = satisfactory
2 = satisfactory, but check carefully at next inspection
3 = requires maintenance this season
4 = requires immediate attention.

ERSHED BAKER RIVER SITE 6 DATE 5-20-77
ECTED BY KERR DANNEHY LUHTALA MILLIGAN KELSEY MACPHERSON

GENERAL ITEMS

Access Road.	1
Site Fencing.	2
Traffic Conditions.	1
Vandalism Control.	0
Trash Control.	0

COMMENTS MANY ROCKS FROM RIPRAP ALONG SIDES OF BOX HAVE BEEN THROWN INTO BOX INLET. CONSIDERATION MAY NEED TO BE GIVEN TO EITHER INCREASING THE SIZE OF THE RIPRAP OR GROUTING THE RIPRAP.
THERE IS A CONSIDERABLE AMOUNT OF GRASS CAUGHT IN THE TRASH RACK

RESERVOIR

Timber stand at reservoir.	1
Debris and slash.	1
Sediment level in relation to low stage inlet	

COMMENTS

7

SOIL CONSERVATION SERVICE
U.S. DEPARTMENT OF AGRICULTURE

3. EMBANKMENT AND EXCAVATED SLOPES

(Report riprap and vegetation and erosion condition under Items 4 and 5.)

	Dam	Dike	Emergency Spillways left	Emergency Spillways right 1/	Other (____)	Other (____)
Sliding or sloughing	/	—	—	—	—	—
Holes (rodent and other) (check especially at embankments)	/	—	—	—	—	—
Excessive settlement (embankments)	/	—	—	—	—	—
Cracks						
Traverse	/	—	—	—	—	—
Longitudinal	/	—	—	—	—	—
Seepage 2/	/	—	—	—	—	—
Piping 2/	/	—	—	—	—	—

COMMENTS _____

4. RIPRAP

	Displ. of Rock	Loss of Spalls	Loss of Bedding	Erosion of Found.	Breakdown of Rock
Dam					
Upstream berm	3	3	—	/	/
Principal Spillway Outlet	—	—	—	—	—
Embankment Gutters					
left	—	—	—	—	—
right	—	—	—	—	—
Emergency Spillway					
location _____	—	—	—	—	—
location _____	—	—	—	—	—
Waterways					
location _____	—	—	—	—	—
location _____	—	—	—	—	—
Outlet Channel	/	/	—	/	/
Other _____	—	—	—	—	—

COMMENTS MANY PIECES OF ROCK RIPRAP HAVE BEEN REMOVED FROM THE SIDE OF THE STRUCTURE & DROPPED INTO THE BOX. CONSIDERATION SHOULD BE GIVEN TO GROUTING THE ROCK OR REPLACING IT WITH LARGER ROCK TO PREVENT FURTHER REMOVAL.

1/Looking downstream.
2/Check especially at downstream face of embankments.

5. VEGETATION

	Dam	Emergency Spillways left	Emergency Spillways right 1/	Dike	Outlet Channel	Water way	Other (_____)
Condition of stand (including need for lime and fertilizer)	1	—	—	—	NA	—	—
Undesirable vegetation	3	—	—	—	1	—	—
Drainage (surface)	NA	—	—	—	NA	—	—
Erosion 2/	1	—	—	—	1	—	—
Sedimentation	1	—	—	—	1	—	—
Condition of planting	NA	—	—	—	NA	—	—
Pest control	—	—	—	—	—	—	—
Fire control	—	—	—	—	—	—	—

COMMENTS SOME BRUSH CONTROL NEEDED ON DAM.

TREFOIL - REED CANARY

6. EMBANKMENT, STRUCTURAL, & OTHER DRAINS

		Dam left	Dam right 1/	Other (_____)	Other (_____)
Depth of Flow (in inches above invert)	With any obstruction	*	*	—	—
	Without any obstruction	*	*	—	—
Turbidity of Discharge (yes, no)	With any obstruction	NO	NO	—	—
	Without any obstruction	NO	NO	—	—
Condition of Protective Coating	Outside	2	2	—	—
	Inside	2	2	—	—
Obstruction in Flow (yes, no)		NO	NO	—	—
Animal Guard Condition		1	1	—	—
Outlet Condition		1	1	—	—

Retarding Pool Elevation (ft. msl)_____ or_____(ft.) above / below _____

Other_____

COMMENTS * OUTLETS PARTIALLY SUBMERGED

1/Looking downstream.
2/Including wave, surface, stream, manmade, and livestock erosion.

RISER

Caution Be extremely careful when using ladders. Check condition before using. Ladders are sometimes broken, loose, corroded, and or slippery.
Use safety harness.

Ladders: inside and out — Condition of protective coating___; Corrosion___; Damaged parts___; Loose___; Other___.

Concrete: inside and out — Cracking___; Spalling___; Other deterioration ___; Excessive movement (check joint at riser and conduit)___; Other___.

Trashracks: low and high stage — Condition of protective coatings___; Corrosion ___; Damaged parts___; Condition of fastenings ___; Need of gratings due to beaver___; Safety condition (protruding fastenings, sharp edges, etc.)___; Other___.

Manhole: — Condition of protective coatings___; Corrosion ___; Damage___; Lock operable___; Other___.

Gate: including lifting device, stem, guides, disc — Condition of protective coating___; Corrosion ___; Damaged parts___; Condition of fastenings___; Stem alignment___; Lubrication___; Operation___; Other___.

Safety Items: — Condition of warning signs___; Condition of safety equipment___; Other___.

COMMENTS_____

IMPACT BASIN, SAF, BOX INLET, & MISCELLANEOUS CONCRETE STRUCTURES

(specify) BOX INLET

Concrete: inside and out	Cracking 2; Spalling 1; Other deterioration 1; Excessive movement (check joints) 1; Waterstops ___; Joint sealant ___; Other ___.
Trashracks: low and high stage	Condition of protective coatings 1; Corrosion 1; Damaged parts 1; Condition of fastenings 1; Need of gratings due to beaver 1; Safety condition (protruding fastenings, sharp edges, etc.) ___; Other ___.
Gates: including lifting device, stem, guides, disc, flap	Condition of protective coating 1; Corrosion 1; Damaged parts 3; Condition of fastenings 3; Stem alignment ___; Operation ___; Lubrication ___; Wood decay 1; Other ___.
Structure Drainage:	Report under "Embankment and Other Drains"
Structure, Railing, Grates, Barriers, etc.	Condition of protective coating ___; Corrosion ___; Damaged parts ___; Condition of Fastenings ___; Wood decay ___; Safety condition (protruding fastenings, sharp edges, etc.) ___; Other ___.
Safety Items:	Condition of warning signs ___; Condition of safety equipment ___; Other ___.

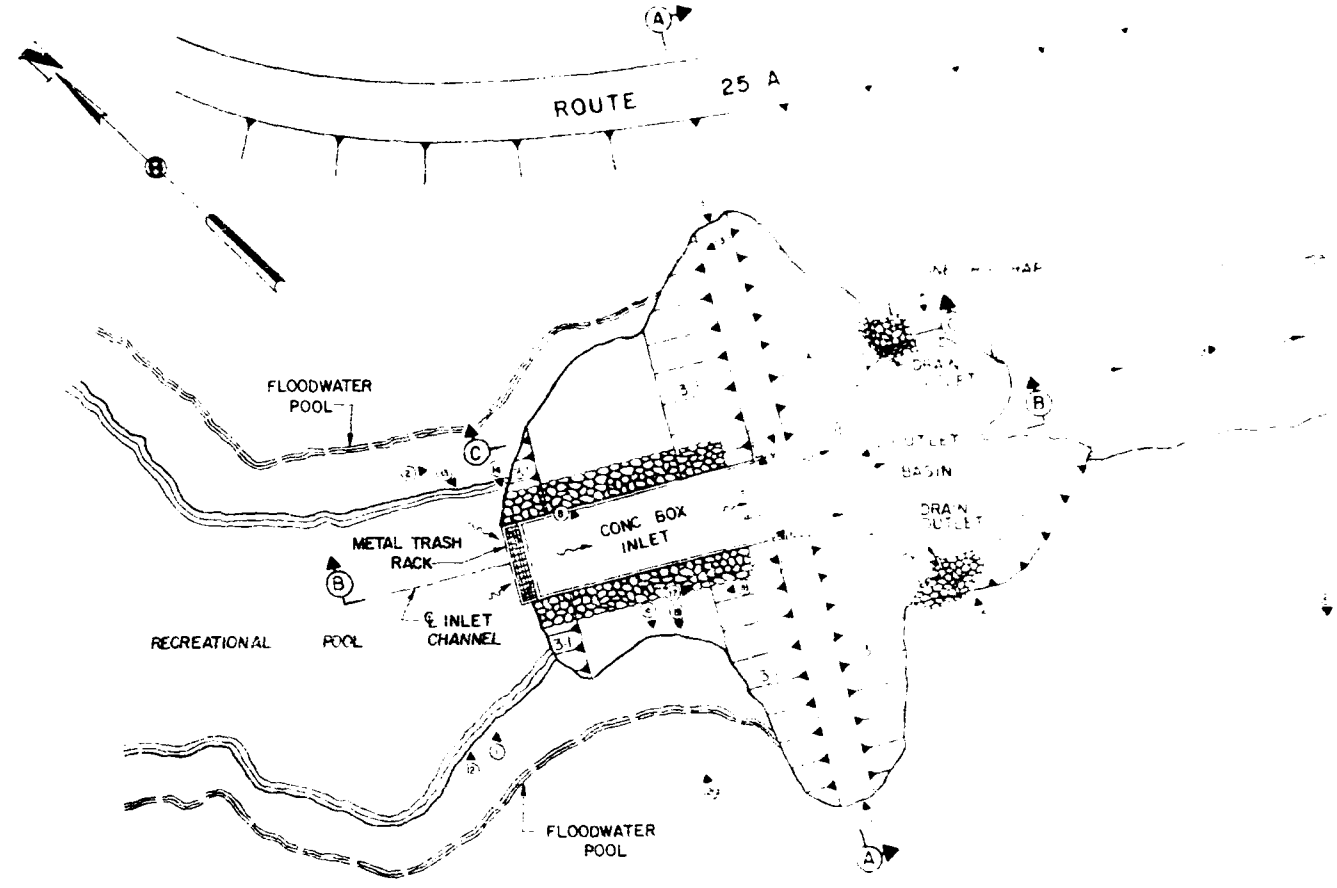
COMMENTS CHANNEL INSTALLED TO HOLD STOP LOGS IN PLACE IS LOOSE AT ONE END

CHANNEL

Stream obstructions.	1
Debris in stream.	1
Sediment bars controlled.	1
Plunge pool stability.	1
Fish habitat appurtenances	___

Riprap -- Report under "Riprap" (item 4)

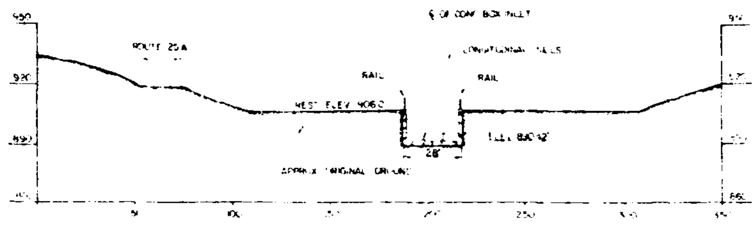
COMMENTS



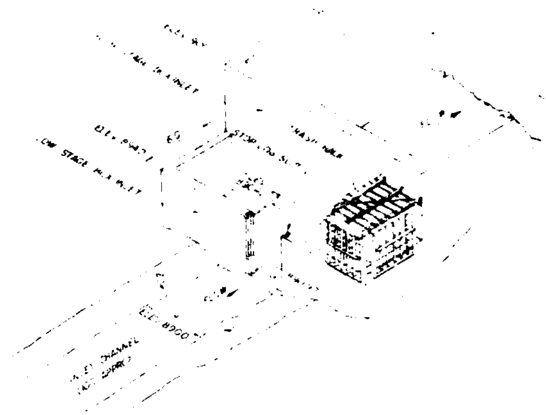
NOTE:
PHOTO 21 TAKEN 3000 FT UPSTREAM

PLAN

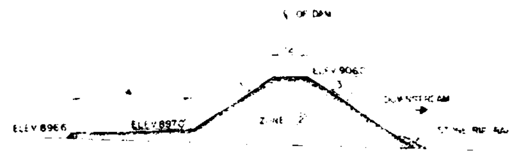
SITE NO 6
BAKER FLOODWATER
RESERVOIR



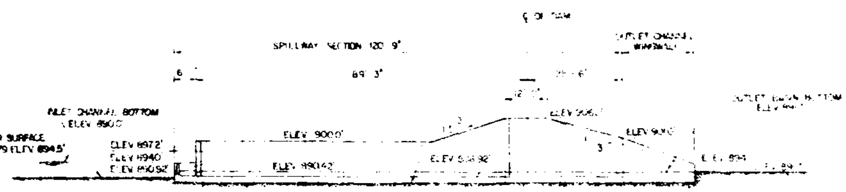
SECTION A-A



ISOMETRIC VIEW OF CONC BOX INLET



SECTION C-C



SECTION B-B

EARTH FILL REQUIREMENTS			
ZONE	MATERIAL	REQUIRED WATER CONTENT	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] BROADLY GRADED	[illegible]	[illegible] MAXIMUM [illegible]

1. [illegible] SHOWN ON THESE DRAWINGS BASED ON THE ORIGINAL CONSTRUCTION PLAN AND VISUAL OBSERVATIONS MADE DURING THE FIELD INSPECTION. DIMENSIONS OF [illegible] INDICATED IN THESE DRAWINGS WHICH WERE BELOW GRADE OR WATER DURING THE TIME OF INSPECTION WERE NOT VERIFIED.

2. THE ELEVATIONS SHOWN ARE 1929 [illegible] DATUM.

SITE NO. 6
BAKER FLOODWATER
RESERVOIR

Figure 2 of 2

APPENDIX C

PHOTOGRAPHS

FOR LOCATION OF PHOTOS, SEE FIGURE 1
LOCATED IN APPENDIX B

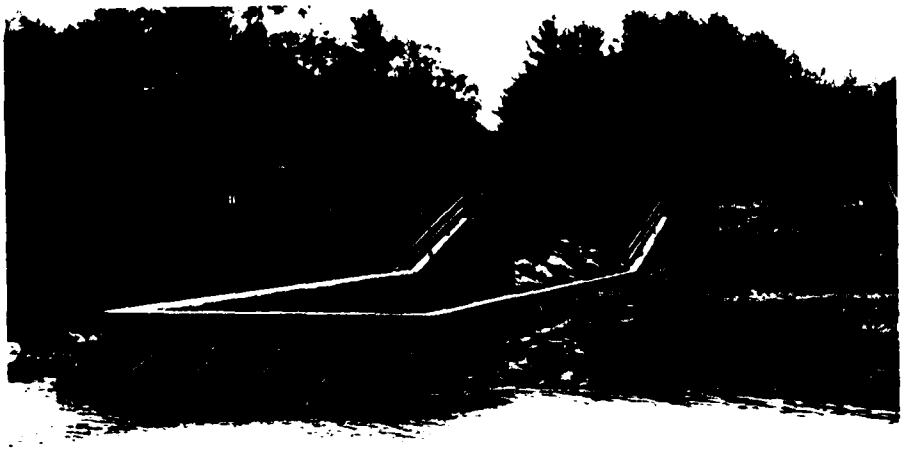


PHOTO NO. 1 - Dam and spillway as viewed from right bank of reservoir.

PHOTO NO. 2 - Upstream face of left dam embankment.

PHOTO NO. 3 - View of left abutment, reservoir is in background.

PHOTO NO. 4 - Upstream side of right embankment of the dam.

PHOTO NO. 5 - Crest of dam from left abutment.

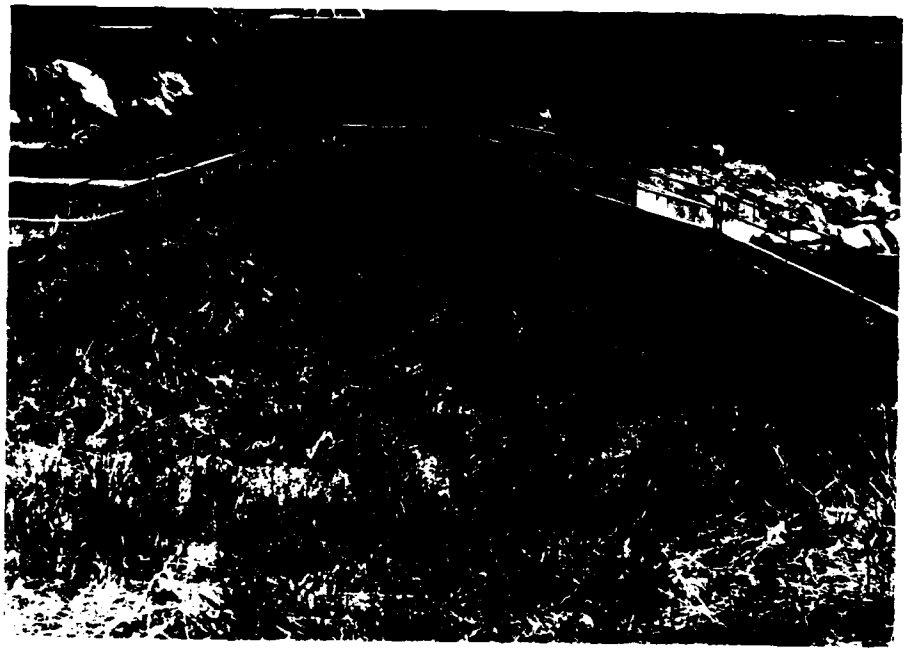


PHOTO NO. 6 - Crest of dam from right abutment.

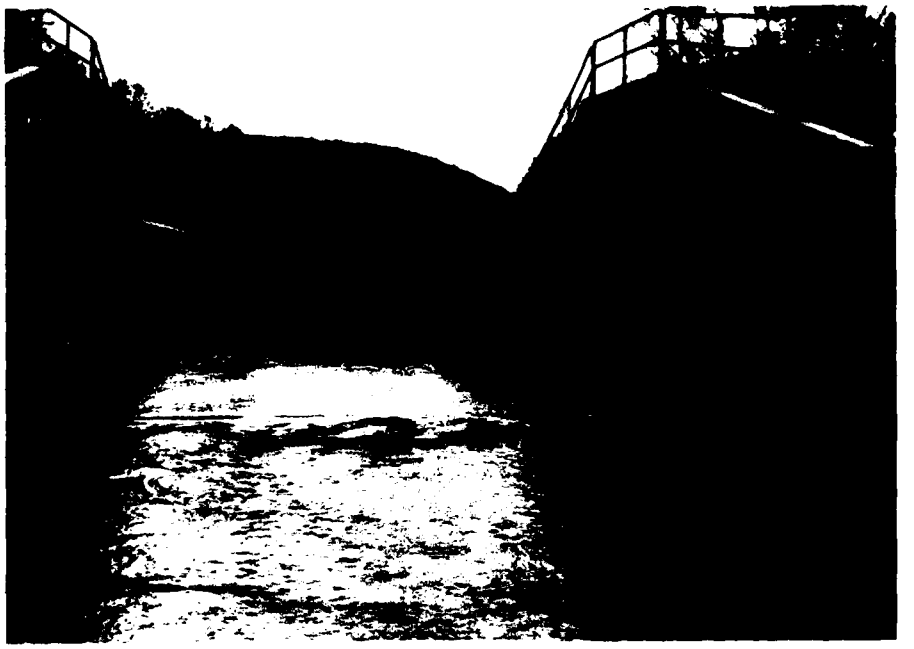


PHOTO NO. 7 - View of spillway section looking upstream.

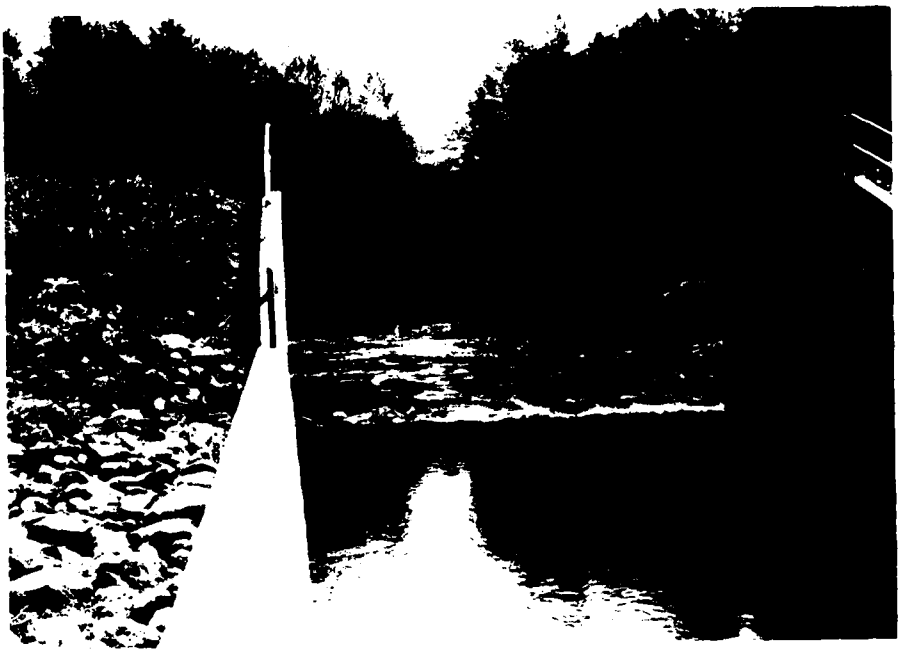


PHOTO NO. 8 - Spillway section through embankment.

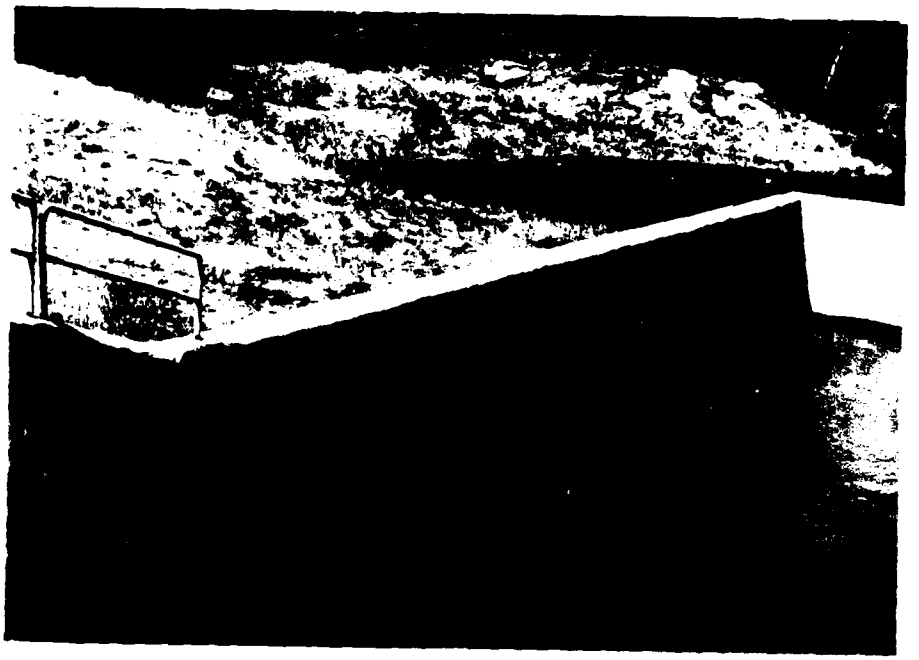


PHOTO NO. 9 - Right upstream wall of spillway.

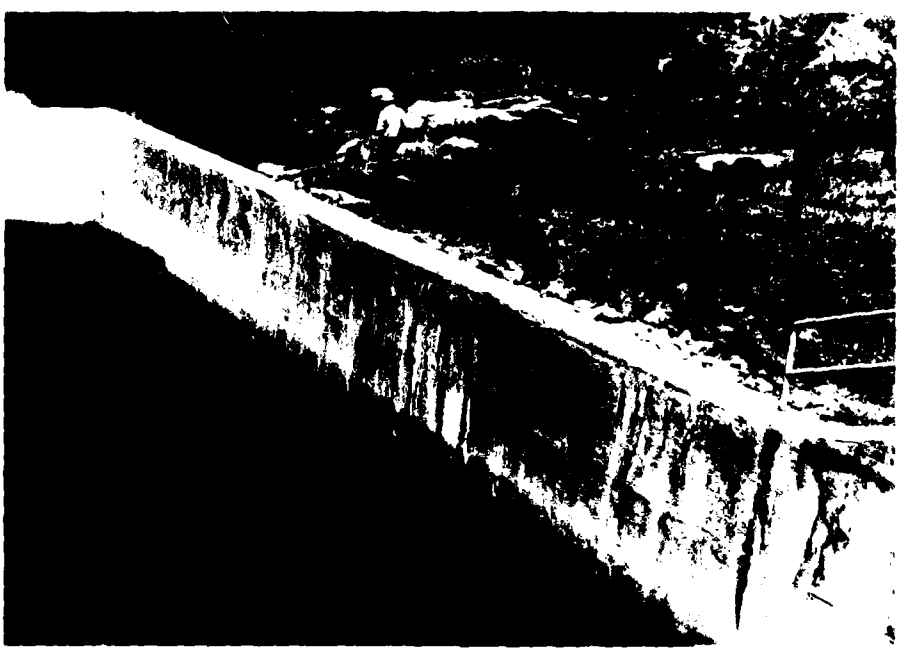


PHOTO NO. 10 - Left upstream wall of spillway.

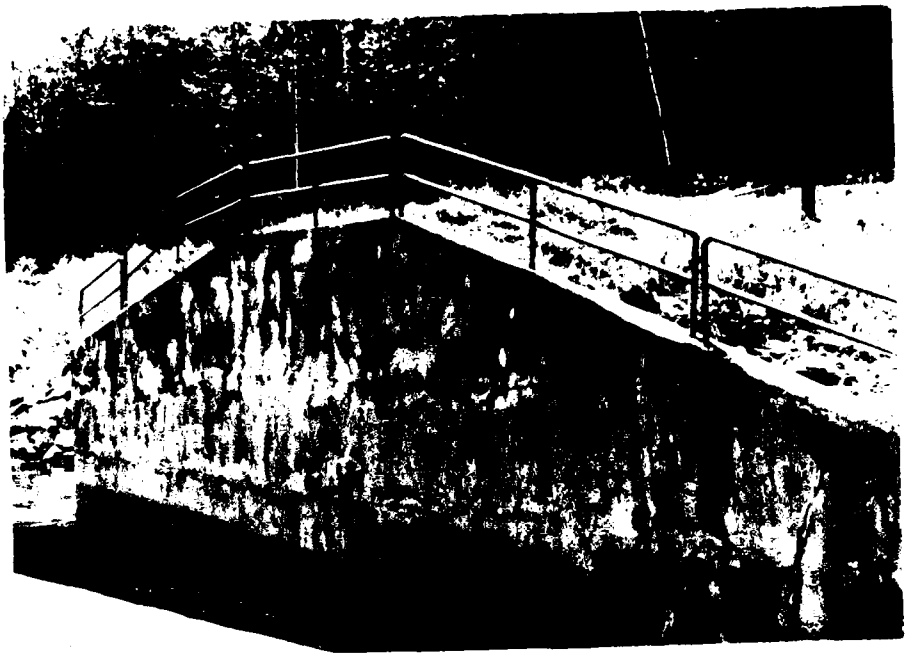


PHOTO NO. 11 - View of right wall of spillway at embankment.

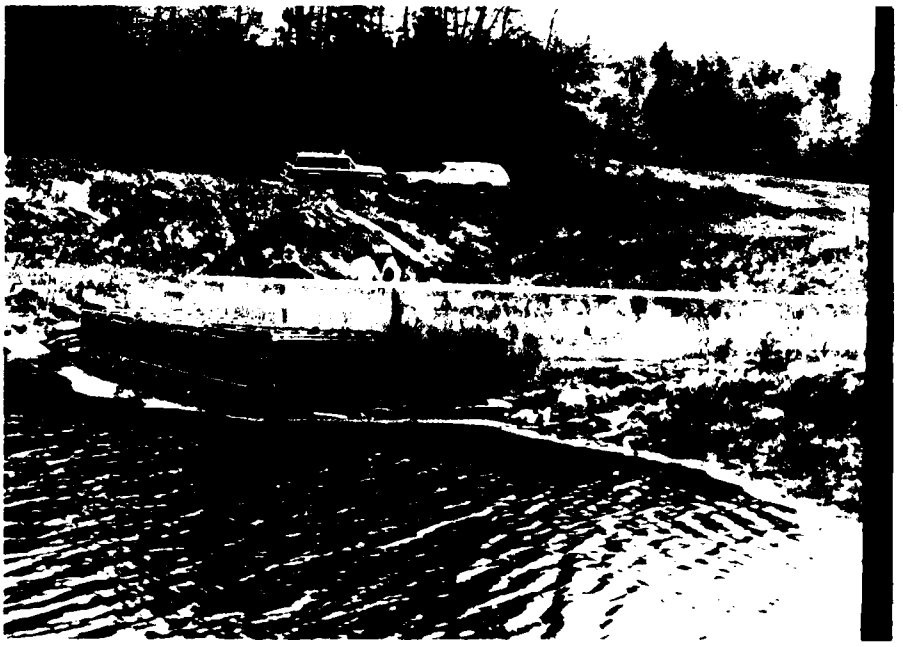


PHOTO NO. 12 - Upstream end of spillway from the right reservoir bank.

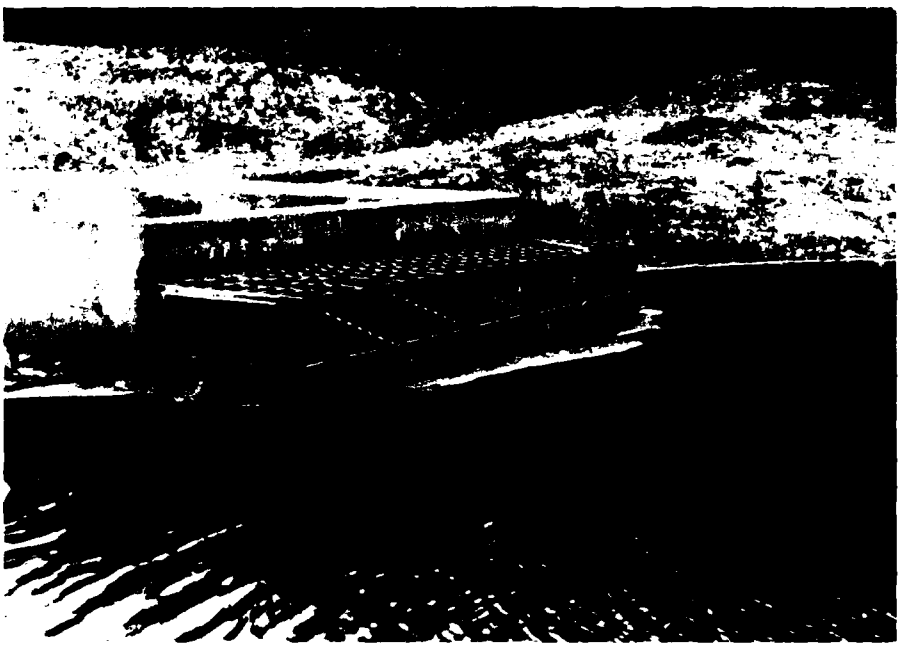


PHOTO NO. 13 - View of upstream end of spillway from the left reservoir bank.

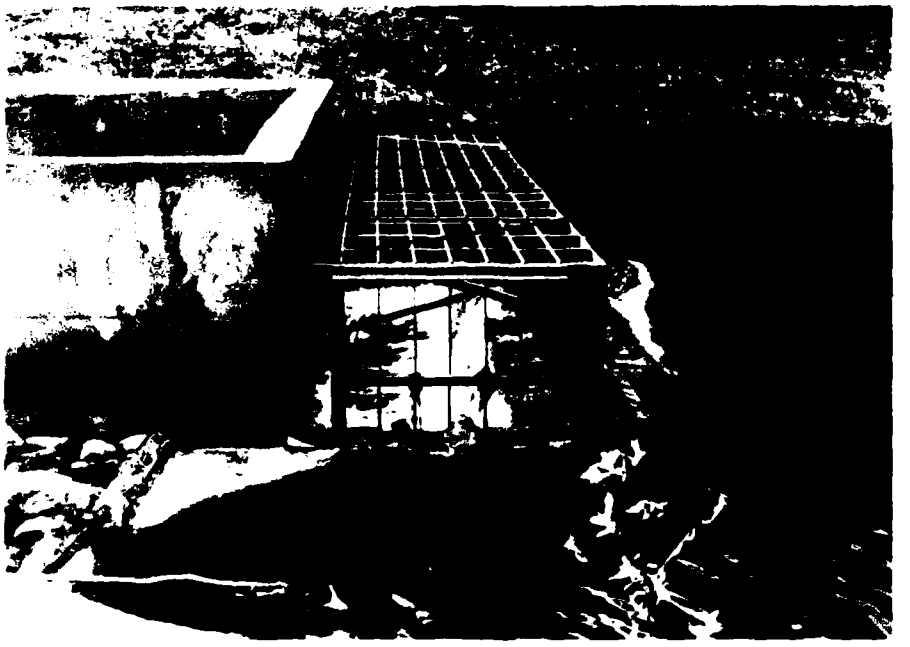


PHOTO NO. 14 - Detail of trash rack.

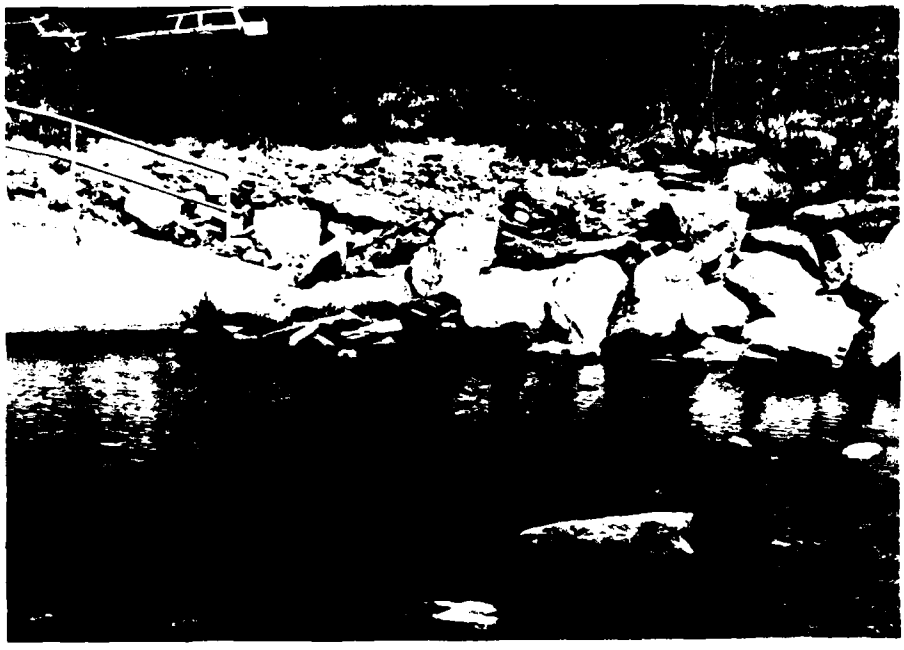


PHOTO NO. 15 - Left drain outlet pipe downstream of the spillway.

PHOTO NO. 16 - Right drain outlet pipe downstream of the spillway.

PHOTO NO. 17 - Erosion adjacent to the right side of the spillway.

PHOTO NO. 18 - Drainage on the right abutment adjacent to the spillway, looking upstream.

PHOTO NO. 19 - Close-up of drainage on right abutment.

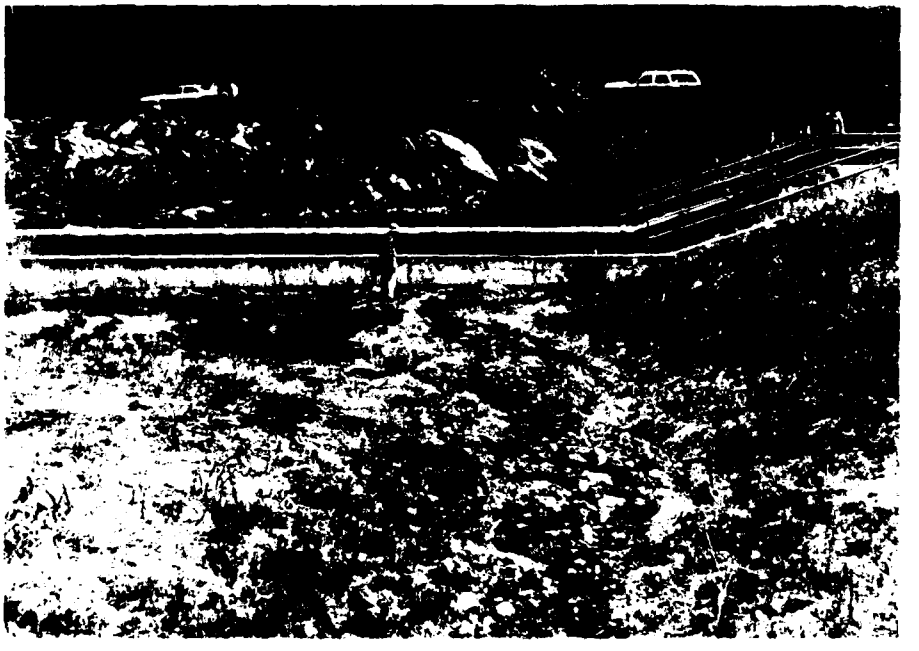


PHOTO NO. 20 - Drainage of right abutment.

PHOTO NO. 21 - Constriction in reservoir located 3000 feet upstream of the dam.

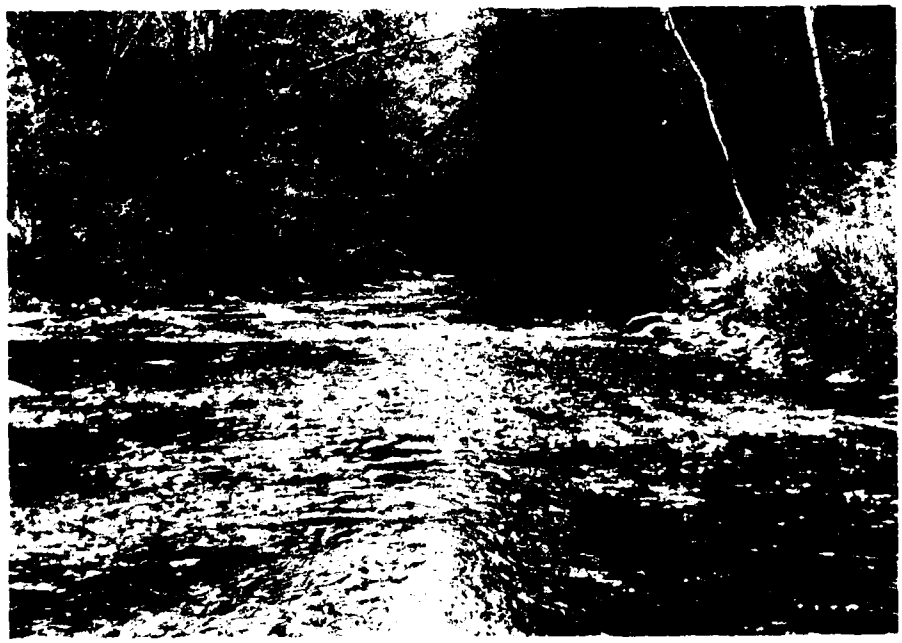


PHOTO NO. 22 - Channel downstream of the dam.

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

NTB OWARD NEEDLES TAMMEN & BERGENDOFF	Made by RY	Date 7/2/79	Job No 5965-11-03
	Checked by HM	Date 7/23/79	Sheet No 1
For Baker Dam Site #6			

HYDRAULICS & HYDROLOGY

Baker Dam Site 6 is Located across Pond Brook in the Town of Wentworth, N.H. in the Merrimack River Basin

Classification Size: Intermediate
Hazard: Significant

Basic Data Drainage Area = 16.96 Sq mi
Basin upstream storage in Upper Baker Pond
10.00 sq mi controlled
6.96 sq mi direct to Lower Baker
Surface area Upper Baker 43 acre
Ave stream bed slope 400± '/mi

Reservoir Area
Normal pool Elev. 894 ft MSL
Storage 210 acre ft
Max. (Top of Dam) Elev. 906 ft MSL
Storage 2240 acre ft
Crest Emer. Spillway elev 900.0
Storage 921 acre ft

Dam: Earth
Length 203 ft
Height 13 ft

Spillways
Low Level - crest elev 894.0
Length 36.0 ft.
High Level - crest elev 900.0
Length 154.0 ft.

See Appendix "B" for plan of Dam

HNTB JOWARD NEEDLES TAMMEN & BERGENDOFF	Made by RY	Date 3/2/79	Job No 5965-11-03
	Checked by TM	Date	Sheet No. 2
For Baker 6			

Step 1 Calculation of Test Flood Inflow

Classification Size: Intermediate
Hazard: Significant

Hydrologic Evaluation Guideline recommends
1/2 to full PMF for inflow

Use 1/2 PMF as size classification is on lower end of classification range of 1000 acre-ft to 50,000 acre-ft vs 2240 acre-ft

Runoff PMF = 19 in
1/2 PMF runoff equals 9.5 inches.

60% of the basin runoff passes through Upper Baker Pond with a surface area of 247 acres at elev. 910 and a corresponding storage of 1662 acre-ft.

Enough storage is provided to reduce the peak flows from the 10.0 sq mile area, and offset the peak from the 6.96 sq mi area peak.

SCS calculations indicate the peak flow from the 10 sq mile area to Upper Baker Pond to be 4607 cfs and the peak from the 6.96 square mile area directly tributary to Lower Baker Pond to be 4976 cfs. Routing thru Upper Baker Pond and adding the routed hydrograph from the 10.0 sq mi area to the hydrograph from the 6.96 sq mi area produces a peak inflow at Baker Site 6 of 5120 cfs

HNTB OWARD NEEDLES TAMMEN & BERGENDOFF	Made by RY	Date 1/3/79	Job No 5165-11-03
	Checked by HM	Date	Sheet No 3

For Site #6

This is a complex drainage basin the Test Flood inflow is calculated using the SCS computations adjusted by a factor to obtain a test flood equivalent to the 1/2 PMF.

SCS calcs Peak inflow to Site 6 5120 cfs
Runoff 4.27 in for 6.96 sq mi
4.06 in for 10.0 sq mi.

weighted ave $4.27 \times 6.96 = 29.72$
$4.06 \times 10.00 = 40.60$
$16.96 \quad 70.32$
$70.32/16.96 = 4.15$ in

Runoff equals 4.15 in

Test Flood Runoff = 7.5 in

Therefore Test Flood inflow

$\frac{7.5}{4.15} \times 5120 \text{ cfs} = 11720 \text{ cfs}$ say 11700 cfs

SCS Flood Hydrographs and Routed hydrographs are in appendix following this section.

NTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by RY	Date 7/2/79	Job No 5965-11-23
	Checked by HM	Date 7/23/79	Sheet No 4
For Baker #6			

Step 2 Calculation of Inflow Surcharge

Stage - Discharge Curve

Elev	ft above High Stage	A Low Stage Flow, orifice	B High Stage Flow	C Crest of Dam	Total
894.0	0	0			0
900.0	0	293 cfs			293 cfs
901.0	1	226	337 cfs		563
902.0	2	219	1076		1295
903.0	3	213	2136		2349
904.0	4	*	3384		3384
905.0	5		3785		3785
906.0	6		4200		4200
907.0	7		4629	541 cfs	5170
908.0	8		5071	1529	6600
909.0	9		5389	2210	7599
910.0	10		5996	4326	10322

* Spillway discharge channel width controls flow from both low and high stage crest.

A. From Baker River #3 Design Book, SCS, Durham, N.H. See copies of calcs. at the end of this section

B. Same as above Calculations extended above elev. 904.0

C Computed as flow over broad-crest weir

$$Q = CLH^{3/2}$$

$C = 3.09$

$L = 203$ ft overall $- 28$ ft spillway width $= 175'$

H = ft above dam crest

$$Q = 540.75 \times H^{3/2}$$

See Figure 2 for Plot.

HNTB Howard Needles Tammen & Bergendoff	Made by RY	Date 7/2/79	Job No 5965-11-03
	Checked by HM	Date 7/23/79	Sheet No 5
For Baker #6			

Step 3 Estimate of Surcharge - Storage Effect

$Q_{P_1} = 11{,}700$ cfs Runoff = 9.5 in

$$Q_{P_2} = Q_{P_1} \times \left(1 - \frac{Stor}{9.5''}\right)$$

Stor in acre-ft read from Figure 1 – 210 acre-ft

$$Stor(in) = \frac{Stor(acre\text{-}ft) \times 12\ in/ft}{16.96\ sq\ mi \times 640\ acre/mi^2} = (.00111)(Stor\ acre\text{-}ft)$$

Routing Curve

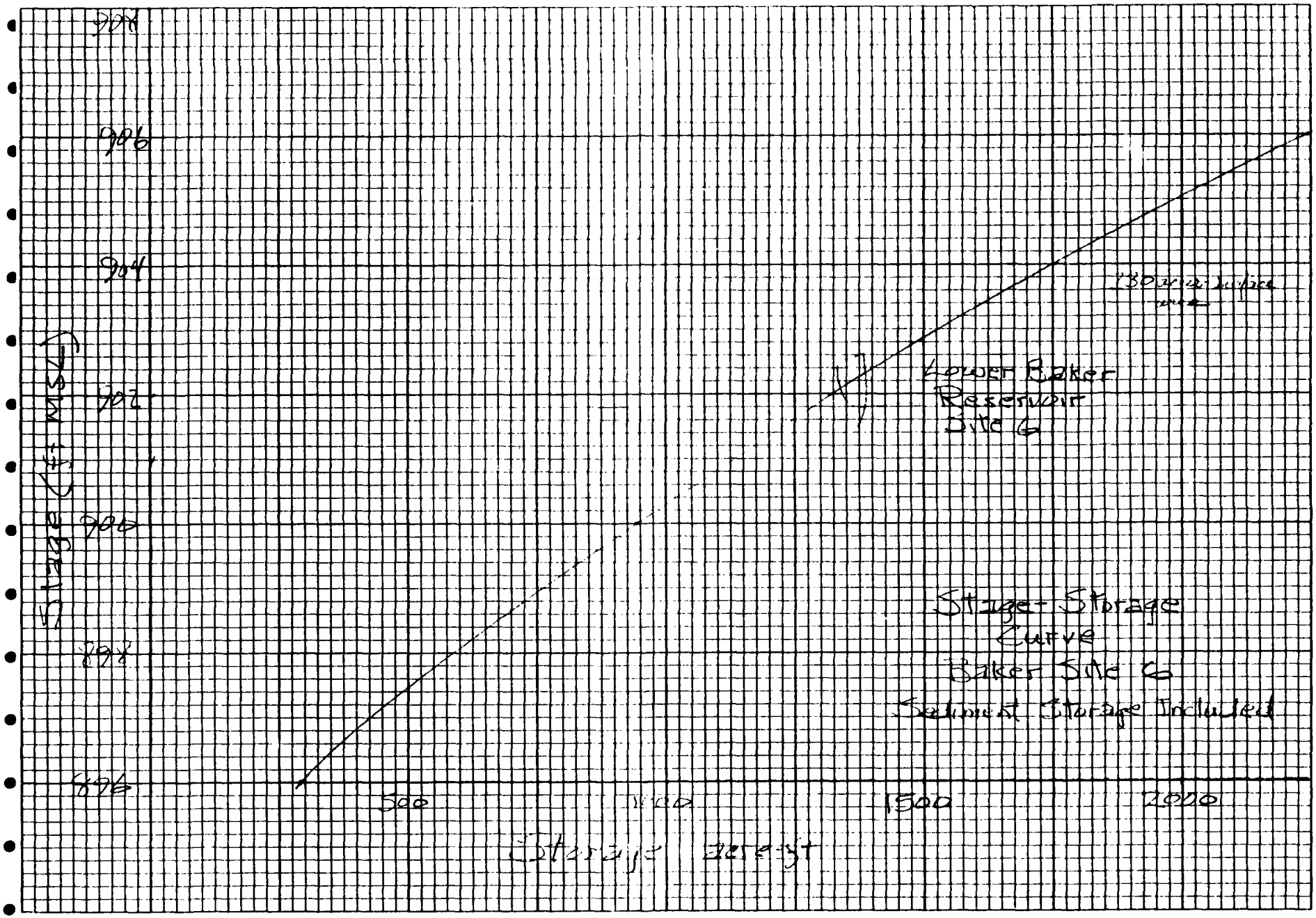
See fig 2 for Plot

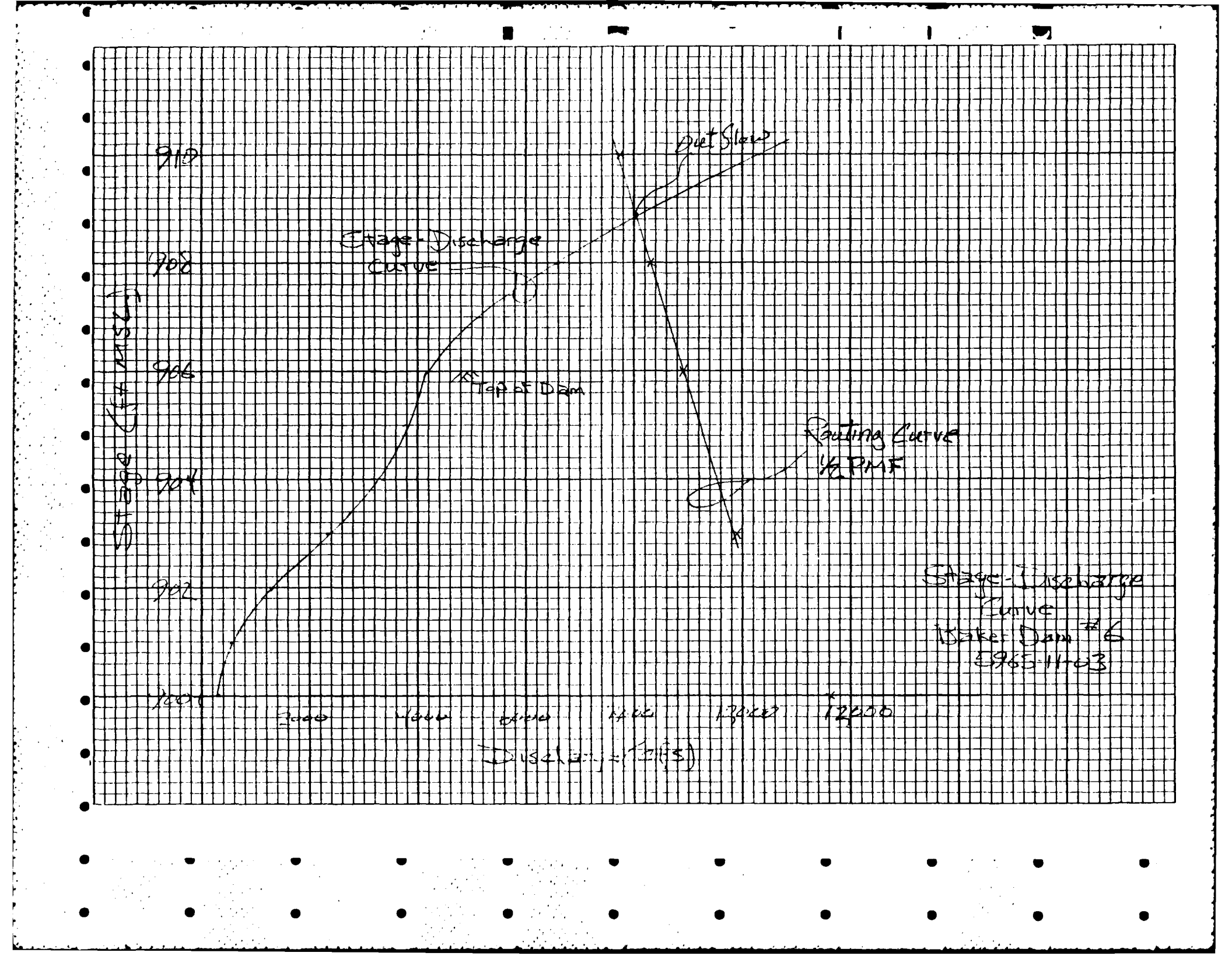
Elev	Stor acre-ft	Stor (in)	Q_{P_2}
900	711	.79	10700 cfs
903	1315	1.46	9900
906	2030	2.25	8900
908	2490	2.76	8300
910	2950	3.27	7670

From Figure 2 Outflow 8000 cfs

Stage = 908.8

or 2.8 ft over dam crest


Stage (ft)
904
902
900
898
896
500
1000
1500
2000
Storage (acre-ft)
Lower Baker Reservoir Site 6
Stage-Storage Curve
Baker Site 6
Sediment Storage Included


910
908
906
904
902
900
Stage - Discharge Curve
Top of Dam
Routing Curve 1/2 PMF
Stage - Discharge Curve Baker Dam #6 5965-11-03

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by RY	Date 5/23/79	Job No 5965-11-03
	Checked by	Date	Sheet No 6
For Baker # 6			

Downstream Damage Estimation

Step 1 Reservoir Storage

Top of dam 2240 acre-ft Lower Baker Pond only.
elev 906.00

Step 2 Peak Outflow

$$\text{Breach } Q = 8/27 \sqrt{g}\,(40\%)\, W_b \cdot Y_o^{3/2}$$

W_o = 40% of dam width = .40(175)
not including spillway section 28 ft wide

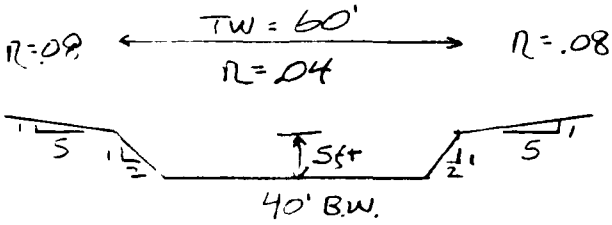
Y_o = Total height stream to pool elev. 12 ft

$$Q_B = 8/27\,(5.67)(.40)(175)\left(\tfrac{12}{3}\right)^{3/2} = 4190 \text{ cfs}$$

Spillway Discharge at top of dam 4200 cfs

Q_{P_1} = 9090 cfs
Say 9100 cfs

Step 3 Stage-Discharge



Reach = 16,000 ft
S = .0189'/'
$n_{channel}$ = .04
$n_{overbank}$ = .08

Stage-Discharge

5 ft	3260 cfs
6 ft	4660
7	6300
8	8180
9	10[illegible]

HNTB — HOWARD NEEDLES TAMMEN & BERGENDOFF

Made by	KY	Date	1/25/79	Job No	5965-11-03
Checked by	MH	Date	1/25/79	Sheet No	7

For Baker #6

Step 4 Reach Outflow

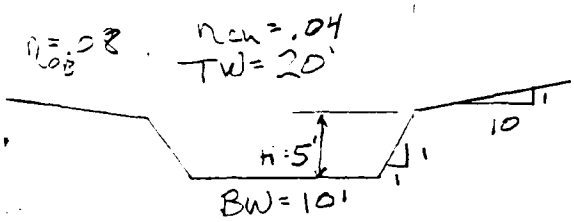
Reach 1 1000 ft long. S = 2240 cfs

Q_{P_1} = 9100 cfs Stage 1.45 ft A_{ch} = 516 sq ft

$$V_1 = \frac{516 \times 1000 \text{ ft}}{43560} = 12 \text{ acre ft}$$

no reduction in outflow due to small channel storage

Step 3 Reach 2 Stage Discharge



Reach = 15,000 ft
S = .0179'
n_{ch} = .04
n_{OB} = .08

Stage - Discharge

Stage	Q
5 ft	720 cfs
7	1740
9	3410
11	5970
13	9270

Step 4 Reach Outflow

Q_{P_1} = 9100 cfs Stage$_1$ = 12.7 ft A_{ch_1} = 822 ft^2

$$V_1 = \frac{822 \times 15000}{43560} = 283 \text{ acre ft} < \frac{2240}{2} \text{ linear}$$

$$Q_{2T} = 9100 \text{ cfs}\left(1 - \frac{283}{2240}\right) = 7950 \text{ cfs}$$

Stage$_2$ = 12.15 ft = A_{ch_2} = 729 ft^2

$$V_2 = \frac{729 \times 15000}{43560} = 251 \text{ acre ft}$$

HNTB	Made by RY	Date 6/25/79	Job No. 5965-11-03
HOWARD NEEDLES TAMMEN & BERGENDOFF	Checked by -11	Date 7/23/79	Sheet No. 8
For Baker #6			

$V_{ave} = 267$ acre ft

$Q_{P_2} = 9100 \text{ cfs}\left(1 - \frac{267}{2240}\right) = 8015 \text{ cfs}$

Stage $= 12.2$ ft

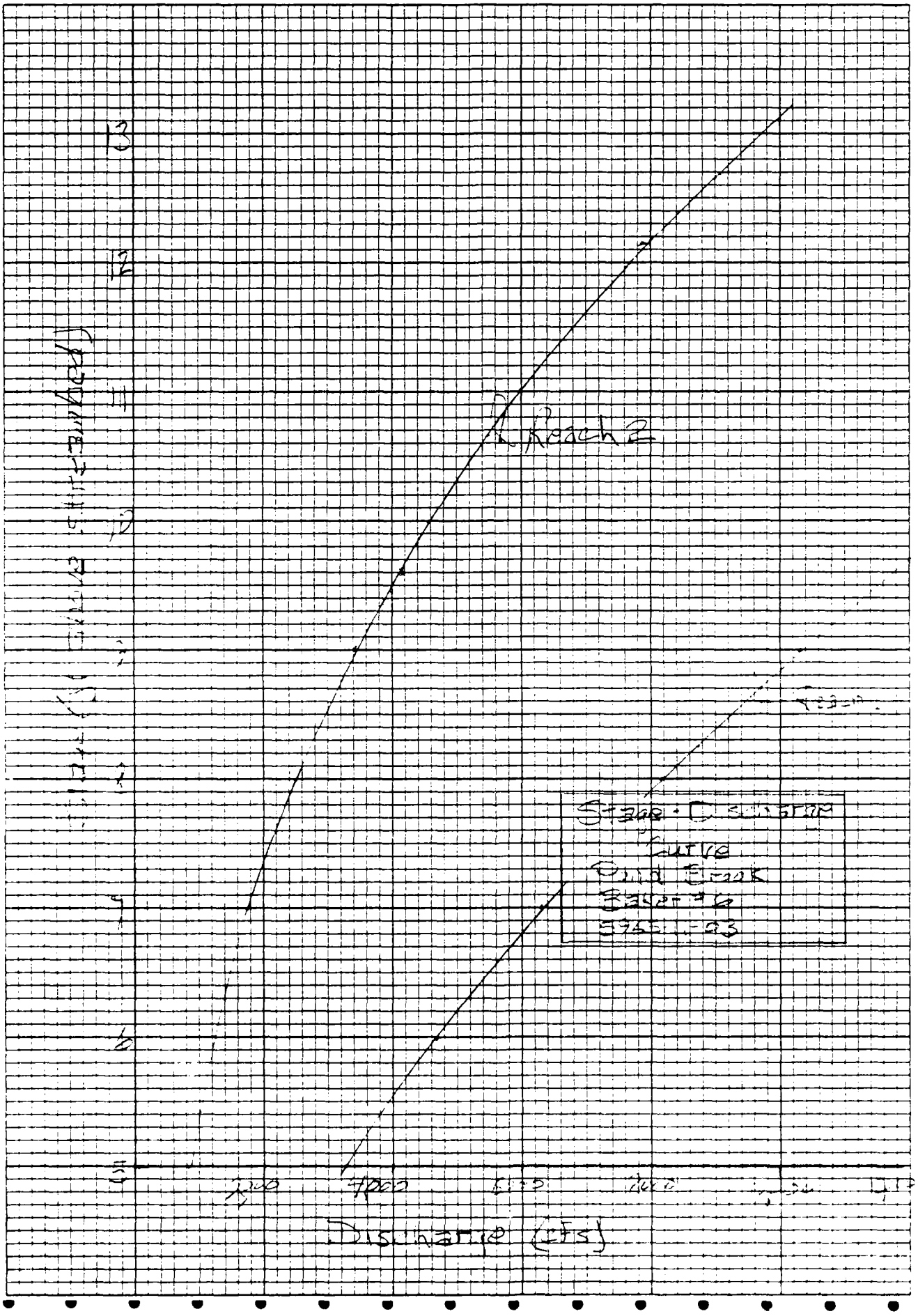
HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF

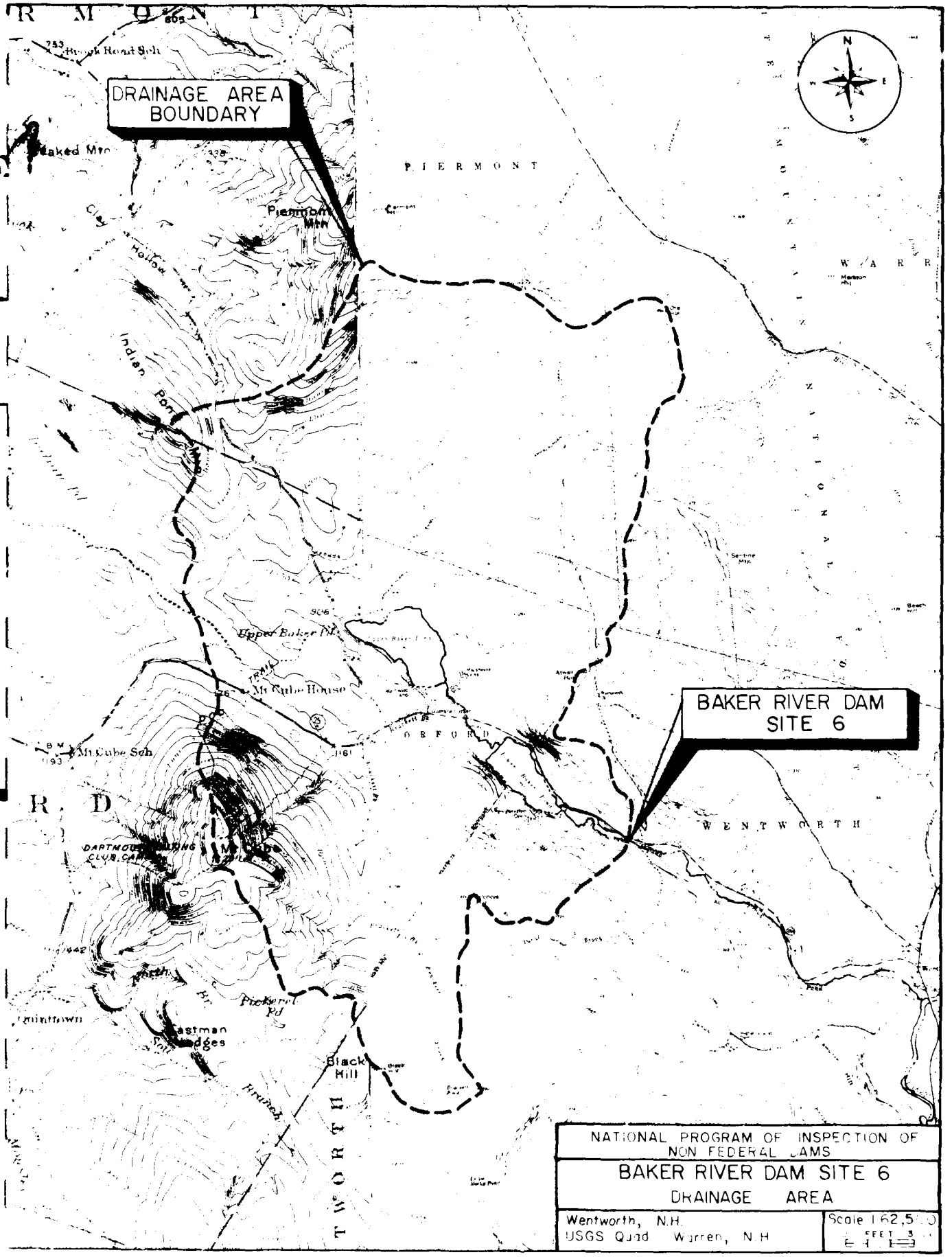
Made by	KV	Date	6/25/79	Job No	5965-11-03
Checked by		Date		Sheet No	9

For Baker #6

Summary

Downstream stage prior to breach of dam Reach 2	9.6ft
Subsequent to breach of Dam at dam	≈45ft
1000ft d.s. note: 18ft drop in channel thru reach	≈2.7ft
16,000ft d.s.	≈2ft


Reach 2
Discharge (cfs)



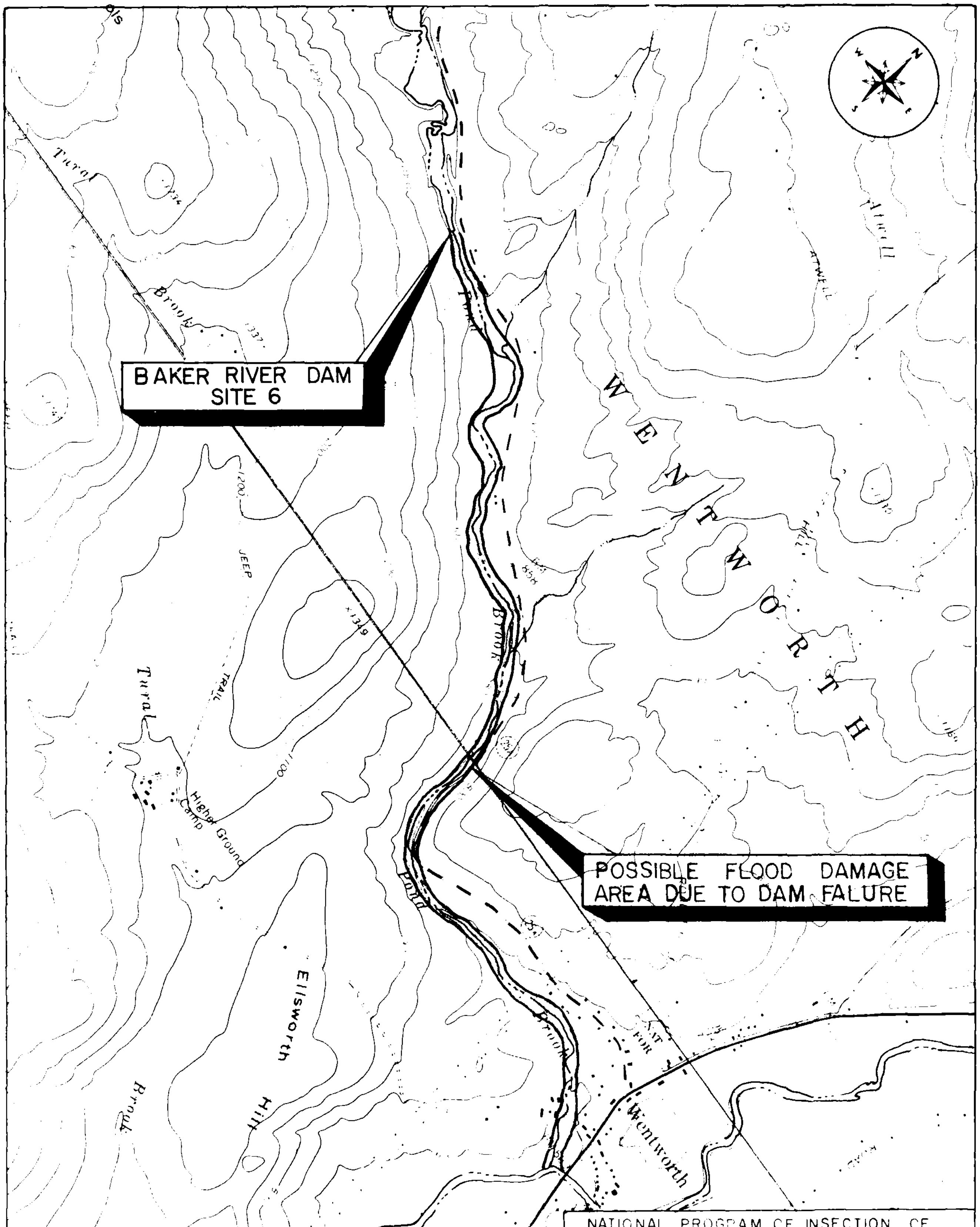
NATIONAL PROGRAM OF INSPECTION OF NON FEDERAL DAMS

BAKER RIVER DAM SITE 6

DRAINAGE AREA

Wentworth, N.H.
USGS Quad Warren, N.H.

Scale 1:62,500
FEET



NATIONAL PROGRAM OF INSECTION OF NON FEDERAL DAMS

BAKER RIVER DAM SITE 6
POSSIBLE FLOOD DAMAGE AREA

Wentworth, N.H.
USGS Quad. Warren, N.H.

Scale 1:24,000

State	NH	Project	BAKER RIVER SITE 6	
By	RVI	Date 2-69	Checked By	Date
Subject	WORK PLAN - DESIGN COMPARISON			Job No NH-681-H
				Sheet 1 of 42

ITEM	UNIT	WORK PLAN	DESIGN	COMMENTS
DRAINAGE AREA	SQ MI	16.96	16.96	
STORAGE CAPACITY				
SEDIMENT (INC AERATED)	AC FT	210	210	
BENEFICIAL	AC FT	0	0	
RETARDING	AC FT	1200	1194	
TOTAL	AC FT	1410	1404	
BETWEEN HIGH & LOW S	AC FT	925	921	
SURFACE AREA				
NORMAL POOL	ACRE	–	–	
RETARDING POOL	ACRE	183	183	INCLUDES PRESENT POND
DESIGN HIGH WATER	ACRE			
VOLUME OF FILL	CU. YD.	(CONC.)		
TOP OF DAM ELEV	FEET	900.0	906.0	CONC. DAM IN VIEW
MAX HEIGHT OF DAM	FEET	10	≈ 13	BOX INLET CLOSED IN DESIGN
EMERGENCY SPILLWAY				
CREST ELEVATION	FEET	900.0	902.0	
BOTTOM WIDTH	FEET	150	154	
TYPE	–	CONC. DAM	BOX INLET	
PERCENT CHANGE OF USE	–	10	10	
T-P CURVE NO. COND II	–	70	70	
FLOOD HYDROGRAPH				
STORM RAINFALL - 6 HR.	IN.	7.0	7.0	
STORM RUNOFF	IN.	2.88	2.88	
VELOCITY OF FLOW - V	FPS	–	–	
PEAK DISCHARGE RATE	CFS	865	390	
MAX. WATER SURFACE EL.	FEET	901.5	901.5	
FREEBOARD HYDROGRAPH				
STORM RAINFALL - 6 HR.	IN.	8.75	8.75	
STORM RUNOFF	IN.	4.14	4.14	
VELOCITY OF FLOW - V	FPS	–	–	
PEAK DISCHARGE RATE	CFS	2140	2000	
MAX. WATER SURFACE EL.	FEET	902.9	902.7	
PRINCIPAL SPILLWAY				
RISER SIZE	FT.	–	–	
MAX. LOW STAGE FLOW	CFS	293	293	
ORIFICE SIZE	FT.^{2}	18.0	18.33	
MAX. HIGH STAGE FLOW	CFS	0	0	
PIPE SIZE	DIA.	–	–	
CAPACITY EQUIVALENTS				
TOTAL SEDIMENT VOL.	IN	0.23	.23	
RETARDING STORAGE	IN	1.33	1.32	
EM. SPILLWAY STORAGE TO TOP OF DAM	IN.	.53	> .53 +	* TO TOP OF DAM
CLASS OF STRUCTURE	–	b	b	
CONSTRUCTION COSTS	–	#12,382		

State NH	Project BAKER RIVER		
By RW	Date 2-69	Checked By	Date
Subject STAGE - STORAGE DATA		Job No. NH-631-h	Sheet 4 of 42

TOPO MAP SCALE 1" = — FT.

LOWER POND

ELEV.	DIFFERENCE IN ELEV.	AREA FLOODED IN²	AREA FLOODED ACRES	AVERAGE AREA ACRES	INTERVAL STORAGE AC. FT.	TOTAL STORAGE AC. IN.	TOTAL STORAGE AC. FT.
893.8			118.57				
	0.2*			119.75*	24*		
894.0	(CREST)*		120.93*				0*
	2.0*			132.74	265		
896.0			144.54				265*
	4.0			163.95	656		
900.0			183.36				921*
	2.0			192.04	384		
902.0			200.73				1305*
	2.0			215.36	(431)		
904.0			(230) EST.				1736*

ALL DATA EXCEPT (*) TAKEN FROM "STAGE-STORAGE (LOWER POND)" SHEET IN WORK PLAN DATA BY J.HO 10-23-62

* [illegible]

OF - 2

Tabular Computations

BAKER RIVER S(& HEADWALL)

HYDRAULIC DES(ED TRAPEZOIDAL WEIR)

HEAD	0.5	0.75	1.0	3.75	4.0		
CONTROL AT INLET							
H/W	.0192	.0288	.0385	.144	.154		
Wc	167	167	167	169	169		
Wc/L	1.08	1.08	1.08	1.10	1.10		
CORR. FOR:							
HEAD	.76	.76	.76	.91	.91		
SHAPE	.95	.95	.95	.95	.95		
CHANNEL	.86	.86	.86	.87	.87		
DIKE	—	—	—	—	—		
CORRECTED COEF. x $\sqrt{2g}$	2.130	2.130	2.130	2.580	2.580		
$H^{3/2}$	.354	.650	1.000	7.262	8.000		
Q_{RECT}	116	213	328	2885	3179		
$H^{5/2}$	.177	.477	1.000	27.23	32.00		
Q_{TRAP}	2	4	9	245	288		
$Q_{WEIR\ TOT.}$	118	217	337	3130	3467		
CONTROL AT HEADWALL							
H_{02}	8.93	8.93	8.93	8.93	8.93		
$H+H_{02}$	9.43	9.68	9.93	12.68	12.93		
$(H+H_{02})^{3/2}$	28.96	30.12	31.29	45.15	46.49		
$Q_{HEADWALL}$	2108	2192	2278	3287	3384		
ELEV.	900.5	900.75	901.0	903.75	904.0		
$Q_{WEIR\ TOT}$ =	Q_{RECT} + Q_{TRAP}	(= 8/15 TAN θ/2 $\sqrt{2g}$ = 9)					
E/W	= 2.46						
$Q_{HEADWALL}$	= C_D W $\sqrt{2g}$ (						
D/W	= .3?	B					

BAKER RIVER SITE 6

HYDRAULIC DESIGN BOX INLET

HIGH STAGE ORIFICE FLOW

$Q = (.6)(18.33)(8.02)(H)^{1/2}$ (.6) COEF USED AS HEAD IS UNCERTAIN DUE TO FLOW IN BOX

(1) ELEV. LOWER POND	(2) $Q_{WAIR(HS)}$	(3) $Q_{ORIFICE}$ (ASSUMED)	(4) Q_{TOTAL} (ASSUMED)	(5) ELEV. WATER IN BOX (Q col 4)	(6) $H_{ORIFICE}$ COL (1) (5)	(7) $Q_{ORIFICE}$ FOR H IN col (6)		
900.5	118	225	343	893.95	6.55	226		
900.75	217	225	442	894.3	6.45	224		
901.0	337	223	560	894.5	6.50	225		
901.25	480	225	705	894.8	6.45	224		
901.5	658	225	883	895.1	6.40	223		
901.75	855	222	1077	895.5	6.25	221		
902.0	1076	220	1296	895.85	6.15	219		
902.25	1320	220	1540	896.2	6.05	217		
902.5	1590	215	1805	896.55	5.95	215		
902.75	1865	210	2075	896.85	5.90	214		
903.0	2136	210	2346	897.15	5.85	213		
903.25	2447	210	2657	897.45	5.90	212		
903.5	2778	210	2988	897.75	5.70	211		
903.75	3130	210	3340	898.05	5.70	211	WEIR &	LOSS AS
904.0	3384	210	3594	898.3	5.70	211	HEADWA	CONTROLS

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RW 2-69

BAKER RIVER SITE 6 NH-681-H

L = 36'

LOW STAGE WEIR FLOW SHT 24 OF 42

ELEV. W.S. UPST	H	H/W W=26'	H/W CORR.	CORRECTED $C_1\sqrt{2g}$	$H^{3/2}$	Q_{WEIR} FREE FLOW	$Q_{ORIFICE}$ (SUBMERGED)	Q_{WEIR} (L.C.) ACTUAL
894.0	(CREST)							
.2	.2	.007	.76		.0894	9	[illegible]	9
.4	.4		.76		.2530	24	[illegible]	24
.6	.6		.76		.4648	45	[illegible]	45
.8	.8		.76		.7155	69	[illegible]	69
895.0	1.0	.038	.76		1.000	97	152	97
.2	1.2	.046	.76		1.314	127	160	127
.4	1.4	.054	.76		1.656	164	157	150*
.6	1.6	.062	.80		2.024	206	173	164*
.8	1.8	.069	.82		2.415	252	180	173*
896.0	2.0	.077	.83		2.828	299	186	SAT ORIFICE FLOW
.5	2.5	.096	.87		3.953		202	
897.0	3.0	.115	.88		5.196		217	
.5	3.5							
898.0	4.0							
899.0	5.0							
900.0	6.0							
Q =	$C_1\sqrt{2g}$	$LH^{3/2}$		UNCORRECTED $C_1\sqrt{2g}$ =		3.43		
B/W =	5/26 =	.192	CORR = 1.03					
*	SUBMERGED FLOW — SEE CURVE							

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SCS-344 5-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

BAKER RIVER SITE 6 NH-681-H

HYDRAULIC DESIGN

STAGE DISCHARGE

ELEV. LOWER POND	LOW STAGE WEIR	ORIFICE	HIGH STAGE WEIR	TOTAL DISCHAGE				
894.0								
.2	9	120		9				
.4	24	128		24				
.6	45	137		45				
.8	69	144		69				
895.0	97	152		97				
.2	127	160		127				
.4	~~150~~	167		150				
.6	~~164~~	173		164				
.8	~~173~~	180		173				
896.0		186		186				
.5		202		202				
897.0		217		217				
.5		232		232				
898.0		246		246				
899.0		271		271				
900.0		293.	(CREST)	293.				
900.5		226	118	344				
900.75		224	217	441				
901.0		225	337	562				
901.25		224	480	704				
901.5		223	658	881				
901.75		221	855	1076				
902.0		219	1076	1295				
902.25		217	1320	1537				
902.50		215	1590	1805				
902.75		214	1865	2079				

ASSUME ORIFICE FLOW

Tabular Computations

SOIL CONSERVATION SERVICE

RW-77-52

BAKER RIVER SITE 6

NH: 6.21-11

HYDRAULIC DESIGN

STAGE DISCHARGE

SHT 2 OF 12

ELEV. LOWER POND		ORIFICE	HIGH STAGE WEIR	HEADWALL	TOTAL DISCHARGE			
903.0		213	2136		2349			
903.25		212	2447		2659			
903.5		211	2778	3192	2989			
903.75		211	3120	3387	3387			
904.0		211	3467	3384	3384			
904.5					3583	Top of Dam		by HNTB
905.0					3785	↓		
905.5					3990			✓
906.0					4200			✓
906.5					4412	+ 141	= 4553	✓
907.0					4629	+541	=5170	✓

HYDROGRAPH COMPUTATION

WATERSHED OR PROJECT [illegible] STATE [illegible]

STRUCTURE SITE OR SUBAREA [illegible] Upper Pond

DR. AREA 12.00 SQ. MI. T_c 5.0 HR. RUNOFF CONDITION NO. [illegible]

RUNOFF CURVE NO. [illegible] STORM DISTRIB. CURVE 3 . HYDROGRAPH FAMILY NO. [illegible]

STORM DURATION 6 HR. RAINFALL: POINT [illegible] IN. AREAL [illegible] IN.

Q 3.82 IN. COMPUTED T_p .7×5 3.5 HR. T_o 4.36 HR.

$(T_o + T_p)$: COMPUTED 1.25 : USED [illegible] . REVISED T_p 2.97 .

$q_p = \frac{484\ A}{REV,\ T_p} =$ 1663 CFS. Qq_p = 4690 CFS.

t(COLUMN) = (t/T_p) REV. T_p. q (COLUMN) = $(q_c/q_p)\ Qq_p$.

LINE NO.	t HOURS	q CFS	LINE NO.	t HOURS	q CFS	LINE NO.	t HOURS	q CFS
1	0	0	21	17.23	9	41		
2	0.85	129	22	18.09	5	42		
3	1.72	273	23	18.95	0	43		
4	2.58	2069.	24			44		
5	3.44	3016,	25	ΔT = 0.8613		45		
6	4.31	3374	26	Σq = 21,074		46		
7	5.17	2149	27			47		
8	[illegible]	[illegible]	28	Q = 0.8613 (21,074)		48		
9	[illegible]	2016	29	645 (10.00)		49		
10	[illegible]	[illegible]	30	= 2.814		50		
11	[illegible]	[illegible]	31			51		
12	[illegible]	[illegible]	32			52		
13	[illegible]	[illegible]	33			53		
14	[illegible]	[illegible]	34			54		
15	[illegible]	[illegible]	35			55		
16	[illegible]	[illegible]	36			56		
17	[illegible]	[illegible]	37			57		
18	[illegible]	[illegible]	38			58		
19	[illegible]	[illegible]	39			59		
20	[illegible]	[illegible]	40			60		

6-58

SOIL CONSERVATION SERVICE

SHT 32 OF 42

HYDROGRAPH COMPUTATION

WATERSHED OR PROJECT _____ STATE _____

STRUCTURE SITE OR SUBAREA _____

DR. AREA _____ SQ. MI. T_c _____ HR. RUNOFF CONDITION NO. _____

RUNOFF CURVE NO. _____ . STORM DISTRIB. CURVE _____ . HYDROGRAPH FAMILY NO. _____

STORM DURATION _____ HR. RAINFALL: POINT _____ IN. AREAL _____ IN.

Q _____ IN. COMPUTED T_p _____ HR. T_o _____ HR.

$(T_o + T_p)$: COMPUTED _____ ; USED _____ . REVISED T_p _____ .

$q_p = \frac{484\ A}{REV.\ T_p}$ = _____ CFS. Qq_p = _____ CFS.

t(COLUMN) = (t/T_p) REV. T_p . q(COLUMN) = (q_c/q_p) Qq_p

LINE NO.	t HOURS	q CFS	LINE NO.	t HOURS	q CFS	LINE NO.	t HOURS	q CFS
1	[illegible]	0	21	14.13	20	41		
2	[illegible]	27	22	[illegible]	13	42		
3	[illegible]	592	23	11.14	7	43		
4	1.52	1947	24	11.65	0	44		
5	2.03	3295	25	[illegible]		45		
6	2.53	3659	26	[illegible]		46		
7	[illegible]	3616	27			47		
8	[illegible]	3393	28	[illegible]		48		
9	[illegible]	3596	29	[illegible]		49		
10	[illegible]	3223	30	[illegible]		50		
11	[illegible]	1951	31	[illegible]		51		
12	[illegible]	1043	32		[illegible]	52		
13	[illegible]	[illegible]	33	=	1.72 [illegible]	53		
14	[illegible]	[illegible]	34			54		
15	[illegible]	[illegible]	35			55		
16	[illegible]	[illegible]	36			56		
17	[illegible]	[illegible]	37			57		
18	[illegible]	[illegible]	38			58		
19	[illegible]	[illegible]	39			59		
20	[illegible]	[illegible]	40			60		

HYDROGRAPH COMPUTATION

WATERSHED OR PROJECT _____ STATE _____

STRUCTURE SITE OR SUBAREA _____ #6

DR. AREA 6.96 SQ. MI. T_c 2.0 HR. RUNOFF CONDITION NO. II

RUNOFF CURVE NO. 70 . STORM DISTRIB. CURVE B . HYDROGRAPH FAMILY NO. III

STORM DURATION 6 HR. RAINFALL: POINT 8.75 (7x1.25) IN. AREAL 7.79 (8.75x.89) IN.

Q 4.27 IN. COMPUTED T_p 1.4 (.7t_c) HR. T_o 4.76 HR.

$(T_o + T_p)$: COMPUTED 3.36 : USED 3.0 . REVISED T_p 1.57 .

$q_p = \frac{484\ A}{REV.\ T_p}$ = 2146 CFS. Qq_p = 9 62 CFS.

t(COLUMN) = (t/T_p) REV. T_p. q(COLUMN) = $(q_c/q_p)\ Qq_p$

LINE NO.	t HOURS	q CFS	LINE NO.	t HOURS	q CFS	LINE NO.	t HOURS	q CFS
1	[illegible]	[illegible]	21	10.68	27	41		
2	[illegible]	[illegible]	22	11.21	[illegible]	42		
3	[illegible]	[illegible]	23	11.74	[illegible]	43		
4	[illegible]	2648	24	12.27	[illegible]	44		
5	[illegible]	4481	25	[illegible]		45		
6	2.67	4976	26	[illegible]		46		
7	3.20	4646	27	[illegible]		47		
8	[illegible]74	4078	28	[illegible]	36.568	48		
9	4.27	3528	29	645	6.96	49		
10	4.80	[illegible]	30	=935		50		
11	5.34	[illegible]	31			51		
12	5.87	2043	32			52		
13	6.41	1345	33			53		
14	6.94	880	34			54		
15	7.47	513	35			55		
16	8.01	307	36			56		
17	8.54	184	37			57		
18	9.07	119	38			58		
19	9.61	73	39			59		
20	10.14	37	40			60		

HYDROGRAPH COMPUTATION

WATERSHED OR PROJECT _____ STATE _____

STRUCTURE SITE OR SUBAREA _____

AREA _____ SQ. MI. T_c 5.0 HR. RUNOFF CONDITION NO. _____

RUNOFF CURVE NO. 70 . STORM DISTRIB. CURVE B . HYDROGRAPH FAMILY NO. _____

STORM DURATION _____ HR. RAINFALL: POINT 8.75 (7x1.25) IN. AREAL 7.53 (8.75x861) IN.

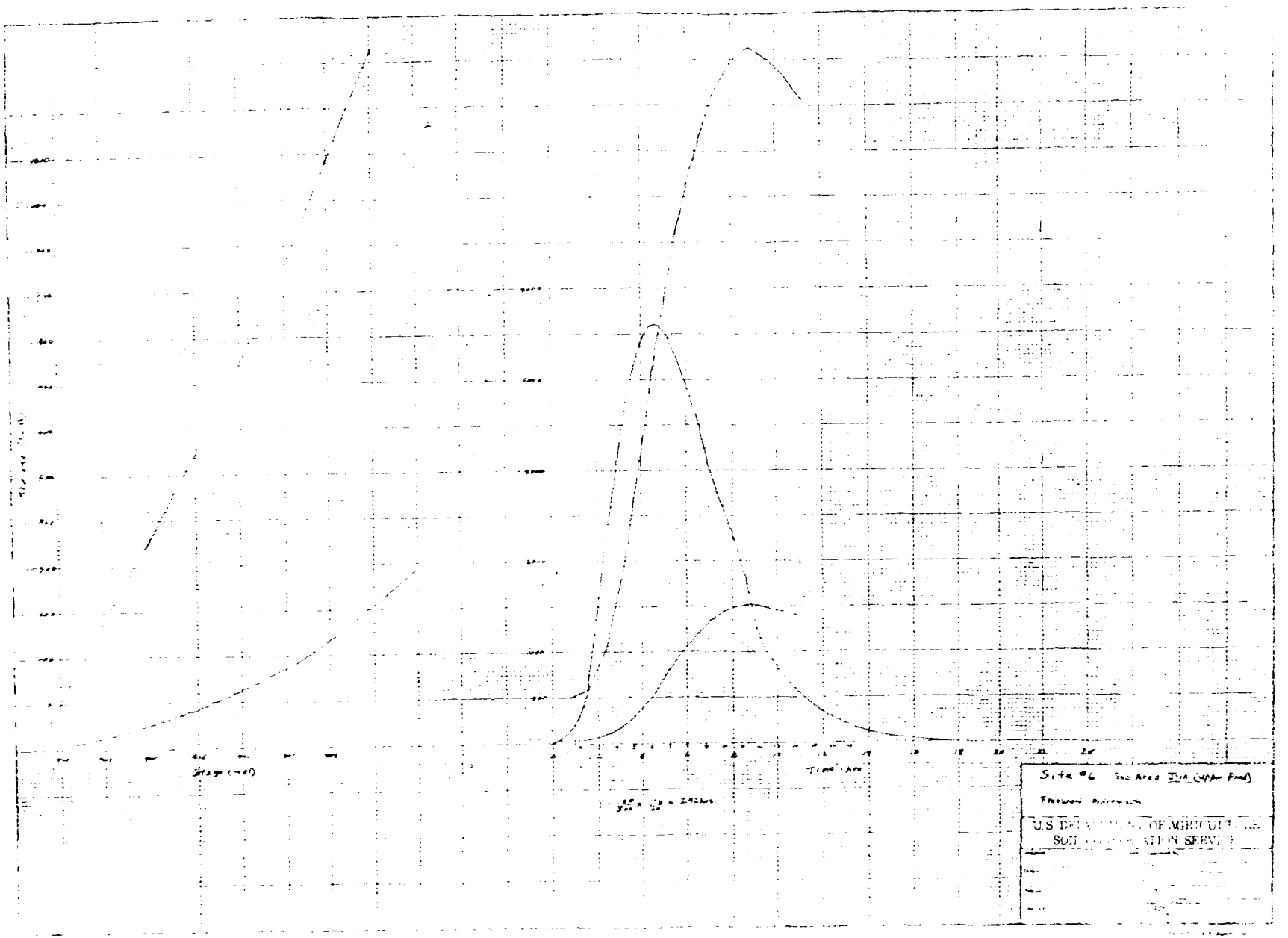
4.06 IN. .7 T_c COMPUTED T_p 3.5 HR. T_o 9.69 HR.

(T_o + T_p): COMPUTED 13.19 ; USED 13.5 . REVISED T_p 3.13 .

$q_p = \frac{484\ A}{REV.\ T_p}$ = 1546 CFS. Qq_p = 6277 CFS.

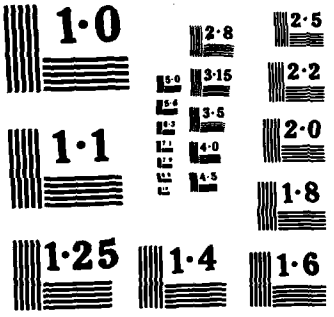
t (COLUMN) = (t/T_p) REV. T_p. q (COLUMN) = (q/q_p) Qq_p

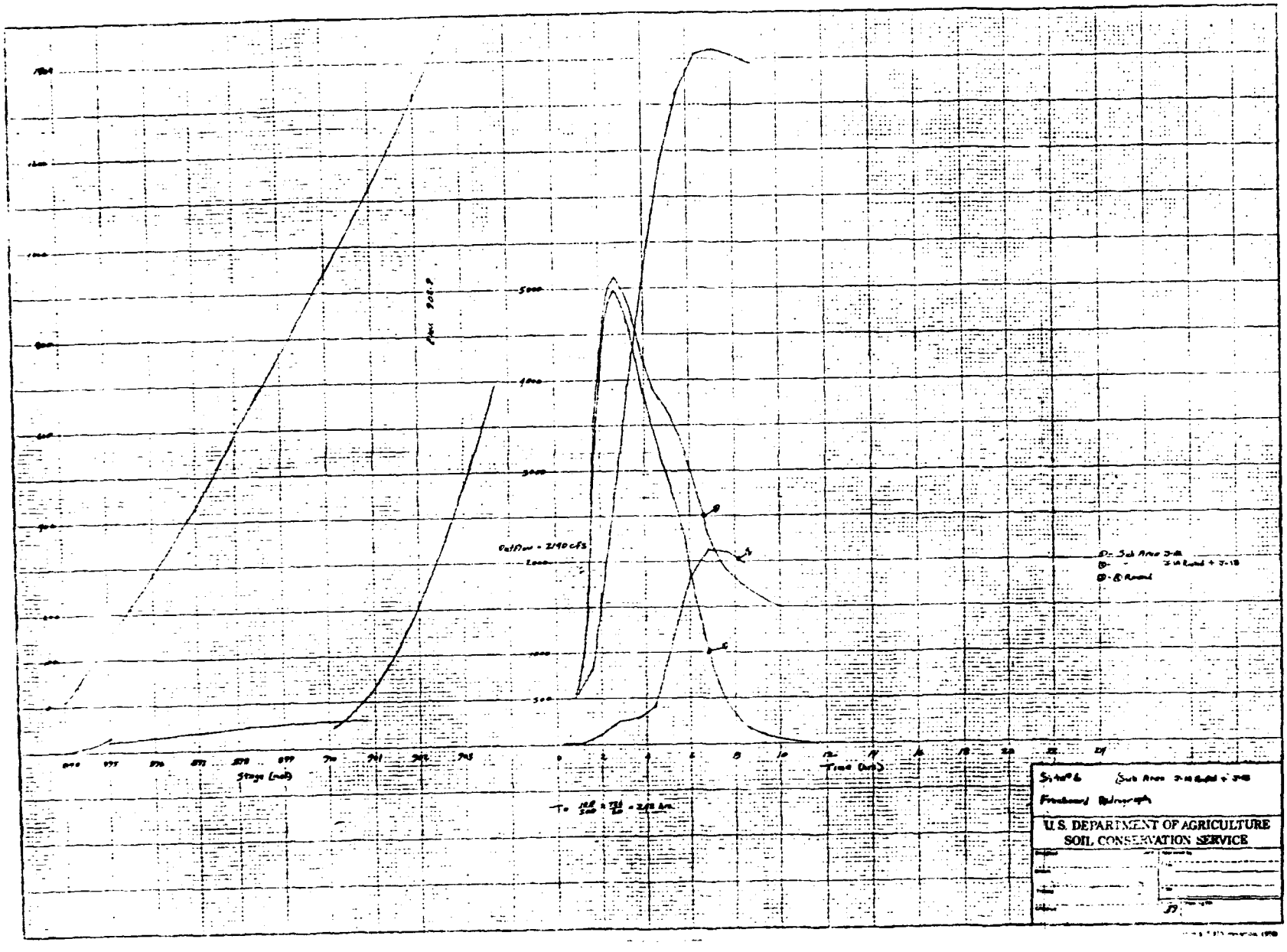
LINE NO.	t HOURS	q CFS	LINE NO.	t HOURS	q CFS	LINE NO.	t HOURS	q CFS
	0	0	21	8.15	13	41		
	0.76	76	22	19.06	6	42		
	1.52	1193	23	19.97	0	43		
	2.72	3825	24			44		
	3.03	4115	25			45		
	4.24	4607	26			46		
		4306	27			47		
8		3672	28			48		
	7.26	2793	29			49		
10	8.17	2197	30			50		
	7.08	1249	31			51		
12	9.98	829	32			52		
	10.89	559	33			53		
14	11.80	358	34			54		
	12.71	239	35			55		
16	13.62	157	36			56		
	14.52	94	37			57		
	15.43	50	38			58		
	16.34	31	39			59		
	17.25	10	40			60		

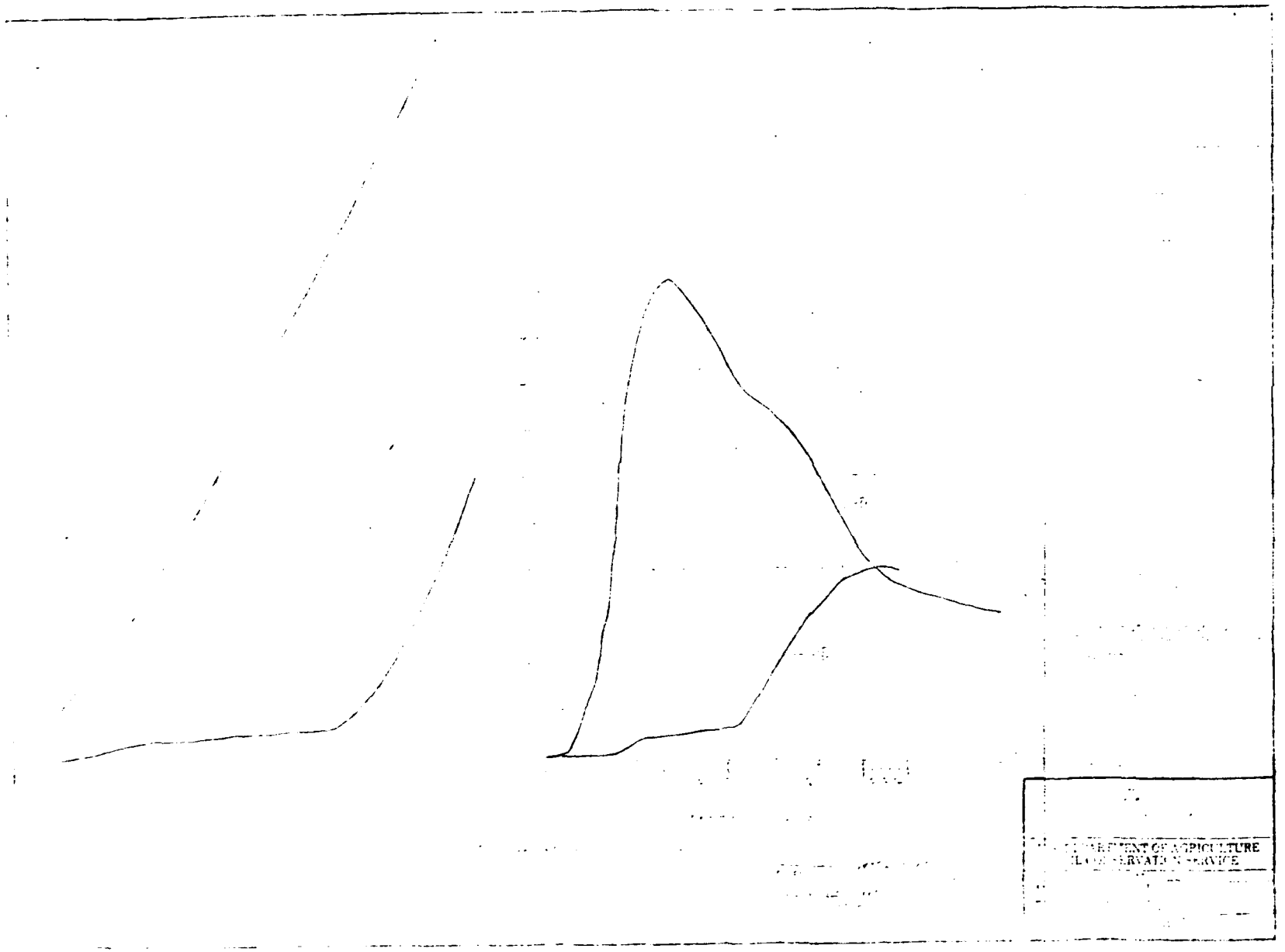

Site #6
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

AD-A156 415 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS 2/2
BAKER FLOODWATER RESE..(U) CORPS OF ENGINEERS WALTHAM
MA NEW ENGLAND DIV JUL 79

UNCLASSIFIED F/G 13/13 NL







APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

(1) STATE	(2) IDENTITY NUMBER	(3) DIVISION	(4) STATE	(5) COUNTY	(6) CONGR DIST.	(7) STATE	(8) COUNTY	(9) CONGR DIST.	(9) NAME	(10) LATITUDE (NORTH)	(11) LONGITUDE (WEST)	(12) REPORT DATE DAY | MO | YR
NH	243	NED	NH	009	02				BAKER FLOODWATER RESERVOIR SITE 6	4353.2	7157.5	24JUL79

(13) POPULAR NAME	(14) NAME OF IMPOUNDMENT
LOWER BAKER POND DAM	BAKER FLOODWATER RESERVOIR SITE 6

(15) REGION	(16) BASIN	(17) RIVER OR STREAM	(18) NEAREST DOWNSTREAM CITY–TOWN–VILLAGE	(19) DIST FROM DAM (MI.)	(20) POPULATION
01	05	POND BROOK	WENTWORTH	2	376

(21) TYPE OF DAM	(22) YEAR COMPLETED	(23) PURPOSES	(24) STRUCTURAL HEIGHT (FT.)	(25) HYDRAULIC HEIGHT (FT.)	(26) IMPOUNDING CAPACITIES MAXIMUM (ACRE-FT.)	(27) NORMAL (ACRE-FT.)	DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
REPG	1971	C	17	13	2240	210	NED	N	N	N	: B	

(28) REMARKS

(29) D/S HAS	(30) SPILLWAY CREST LENGTH	(31) TYPE	(32) WIDTH (FT.)	(33) MAXIMUM DISCHARGE (FT.)	(34) VOLUME OF DAM (CY)	(35) POWER CAPACITY INSTALLED (MW)	(36) PROPOSED (MW)	(37) NO.	(38) NAVIGATION LOCKS LENGTH (FT.)	WIDTH (FT.)	(40) LENGTH (FT.)	WIDTH (FT.)	(42) LENGTH (FT.)	WIDTH (FT.)	(44) LENGTH (FT.)	WIDTH (FT.)
2	203	U	154	4200	3743											

(45) OWNER	(46) ENGINEERING BY	(47) CONSTRUCTION BY
N H WATER RESOURCES BD	SOIL CONSERVATION SER	ROBIE CONSTRUCTION CO

(48) REGULATORY AGENCY			
DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	NONE

(49) INSPECTION BY	(50) INSPECTION DATE DAY | MO | YR	(51) AUTHORITY FOR INSPECTION
HOWARD NEEDLES TAMMEN BERGENDOFF	16MAY79	PL 92-367

(52) REMARKS

END

FILMED

8-85

DTIC