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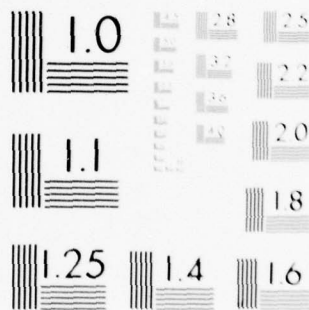
O'BRIEN AND GERE ENGINEERS INC PHILADELPHIA PA JUSTIN--ETC F/G 13/2
NATIONAL DAM SAFETY PROGRAM. SCOTT'S RUN DAM (NDI-PA 00725, PA --ETC(U)
JUL 79 DACW31-79-C-0010

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DELAWARE RIVER BASIN
SCOTT'S RUN, BERKS COUNTY

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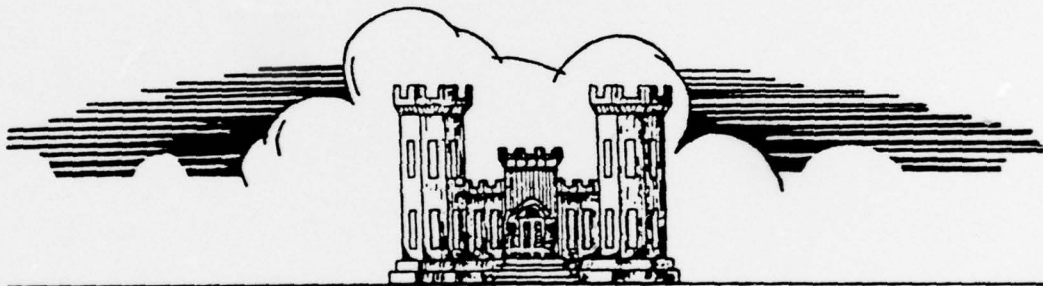
PENNSYLVANIA

SCOTT'S RUN LAKE DAM

NDI - PA 00725
PA DER 6-435

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PHASE I INSPECTION REPORT NATIONAL DAM INSPECTION PROGRAM



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Prepared By
O'BRIEN & GERE

Justin & Courtney Division
PHILADELPHIA, PENNSYLVANIA
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FOR

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT CORPS OF ENGINEERS
BALTIMORE, MARYLAND

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JULY 1979

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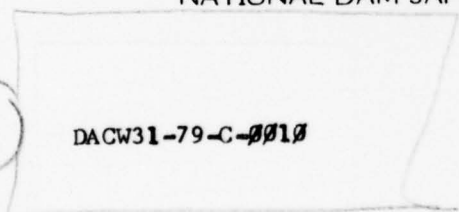
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DELAWARE RIVER BASIN

Name of Dam: Scott's Run Dam
County & State: Berks County, Pennsylvania
Inventory Number: PA00725

(6) National Dam Safety Program, Scott's Run Dam (NDI-PA 00725, PA DER 6-435), Delaware River Basin, Scott's Run, Berks County, Pennsylvania, Phase I Inspection Report.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

(15) 

DACW31-79-C-0010

Prepared by:

O'BRIEN & GERE ENGINEERS, INC
JUSTIN & COURTNEY DIVISION

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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations, 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 frequent inspections can unsafe conditions be detected, and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The spillway design flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM

Name of Dam:	Scott's Run Dam ID #PA00725
State Located:	Pennsylvania
County Located:	Berks County
Stream:	Scott's Run
Coordinates:	Latitude 40° 12.5', Longitude 75° 47.7'
Date of Inspection:	May 2, 1979

ASSESSMENT

Scott's Run Dam is an earth embankment with a 40-foot masonry spillway. The embankment is approximately 625 feet long with a maximum height of 34 feet and impounds a reservoir with a normal pool storage capacity of 200 acre-feet. The Dam is located on Scott's Run in French Creek State Park, about 12 miles Southeast of Reading, Pennsylvania.

The Spillway Design Flood (SDF) chosen for this "Small" size "High" hazard dam is one-half of the Probable Maximum Flood (PMF). The spillway is capable of discharging 87 percent of the PMF without overtopping of the embankment. Therefore, the spillway is considered "Adequate".

Based on the visual observations and review of the information obtained from the Pennsylvania Department of Environmental Resources, Division of Dam Safety, Scott's Run Dam is considered to be in good condition.

Recommendations and Remedial Measures are as follows:

a. Facilities

1. The design drawings indicate that two drainage ditches were to have been provided parallel to the outlet channel (one on either side) to direct toe drain discharge downstream. These ditches were not apparent on the date of the inspection. A drainage system should be installed which would direct the toe drain discharge downstream.
2. The crest of the masonry spillway should be repaired and restored to design elevation where necessary.
3. Blocks of riprap that have been removed from the upstream face should be replaced in their original location.

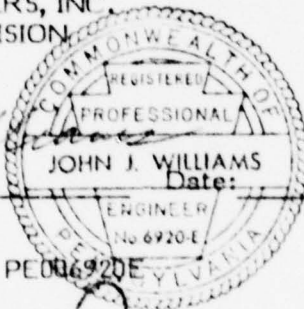
b. Operation and Maintenance Procedures

1. The "Operation and Maintenance Manual for Scott's Run Dam" describes the required inspection, operation, and maintenance procedures for all features of the dam. Compliance with this manual will constitute a satisfactory maintenance program.
2. A downstream warning system should be developed. During periods of heavy rainfall, the dam should be monitored and downstream residents should be alerted in the event of an impending failure.

O'BRIEN & GERE ENGINEERS, INC.
JUSTIN & COURTNEY DIVISION

John J. Williams
John J. Williams, P.E.
Vice President

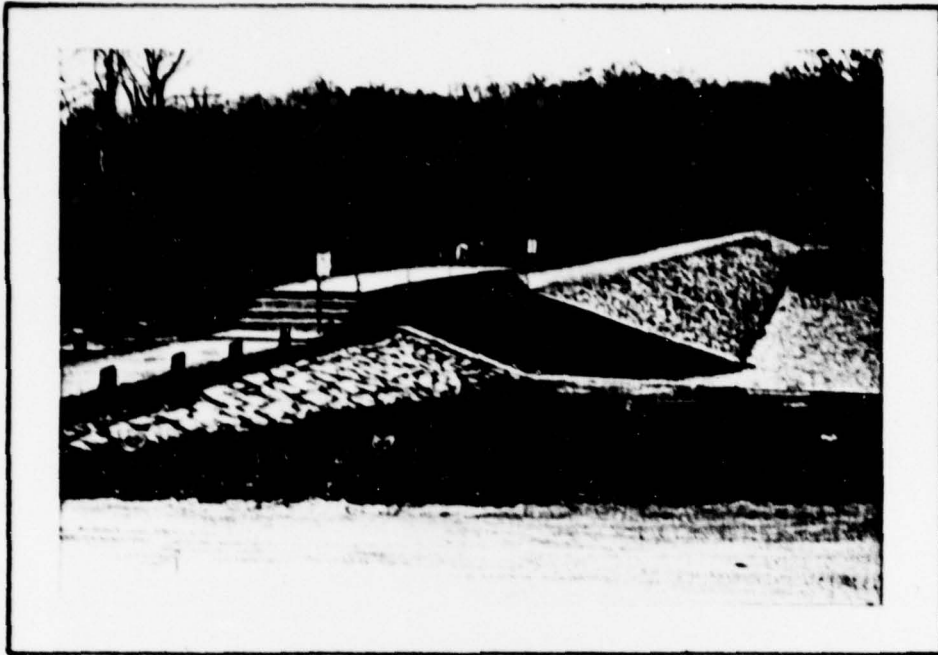
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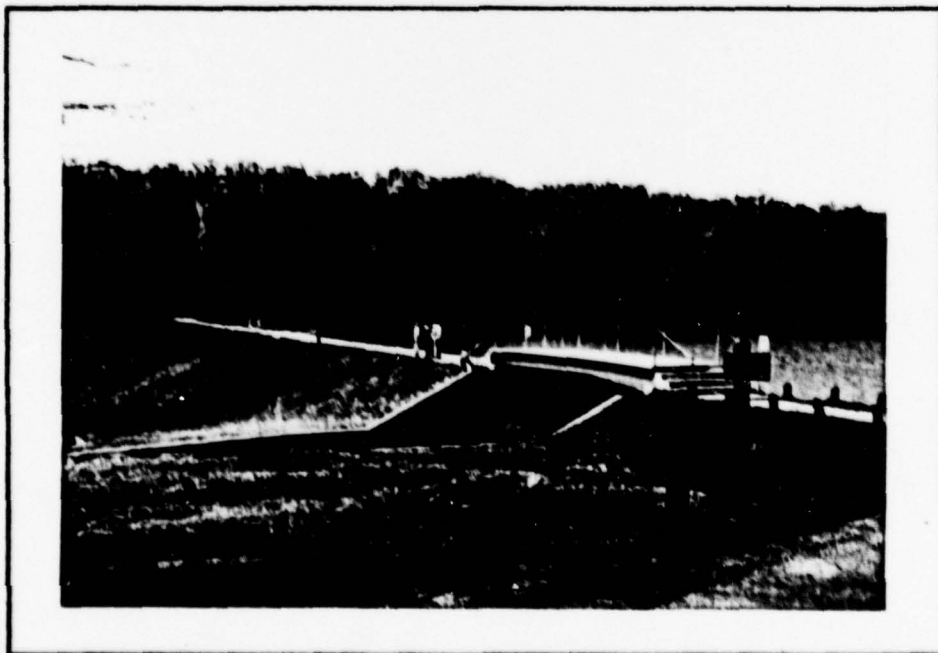
20 July '79

Approved by: *James W. Sed*

Date: *1 Aug 79*



*UPSTREAM FACE OF THE DAM AS
VIEWED FROM THE LEFT ABUTMENT*



*DOWNSTREAM FACE OF THE DAM AS
VIEWED FROM THE LEFT ABUTMENT*

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PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM
SCOTT'S RUN DAM NDI ID #PA00725

SECTION 1

PROJECT INFORMATION

1.1 General

a. Authority. The Dam Inspection Act, Public Law 92-367, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a program of inspection of dams throughout the United States.

b. Purpose. The purpose of this inspection is to determine if Scott's Run Dam constitutes a hazard to human life or property.

1.2 Description of Project (Supplemented by information obtained from the Pennsylvania Department of Environmental Resources (DER), Division of Dam Safety, Harrisburg, Pennsylvania) *ABSTRACT*

a. Dam and Appurtenances. Scott's Run Dam is a zoned earth embankment, approximately 625 feet in length with a maximum height of 34 feet. The dam was constructed for recreational purposes and impounds a reservoir with a surface area of 21.9 acres and a storage capacity of 200 acre-feet at normal pool. The top of the dam is 14 feet wide and the side slopes are 3H:1V upstream and 2H:1V downstream. A cofferdam is incorporated into the upstream face of the embankment, forming a 28-foot wide berm from Elevation 582.0 to 584.0. The upstream slope is 2.5H:1V below the berm elevation. According to the information obtained from DER, the embankment is constructed in 3 zones. A central core section with 0.6H:1V side slopes is composed of selected impervious material (class "A" material). A cutoff trench with 1H:1V side slopes and a 16-foot bottom width is excavated into impervious foundation material below the central core and is also composed of Class "A" material. The upstream shell of the embankment consists of less impervious material (class "B" material) and the downstream shell is composed of pervious material consisting of sand and some stones (class "C" material). According to available information, a concrete cutoff wall extends through the cutoff trench and into the foundation material below the cutoff along the axis of the dam. Seepage control is provided by a downstream toe drain composed of gravel and small stone and an upstream impervious blanket (class "A" material) which extends approximately 500 feet beyond the upstream toe. Upstream slope protection is provided by large (3-foot) dumped stone at the toe, grouted 8-inch concrete block on 6 inches of crushed stone to Elevation 589.0, and 18-inch hand placed riprap on a 6-inch crushed stone base from Elevation 589.0 to the top of the dam. *ABSTRACT*

The spillway (axis) is located on the embankment approximately 80 feet from the left abutment (looking downstream) and is constructed of stone masonry. The crest is at Elevation 592.0, has a 40-foot width, and a height of 4 feet. A 5-foot wide normal discharge notch is provided at the center of the spillway with an invert elevation of 591.5. Masonry side walls flank the channel for 65 feet downstream, 46 feet upstream on the left side, and 28 feet upstream on the right side. The approach channel floor is protected by hand placed riprap for a distance of 16 feet upstream at Elevation 589.0. An 18-inch thick concrete cutoff wall extends from the base of the Ogee section into the underlying impervious material. The discharge channel is paved with grouted riprap for 58 feet downstream, then lined with hand placed riprap for the remaining 410 feet to the original streambed. The channel drops on a 2% grade (from Elevation 588.0) for the first 60 feet downstream of the weir, then on a 4% grade for a distance of 168 feet, and on an 8% grade for the final 240 feet.

The outlet structure for drawdown purposes consists of a 24-inch diameter cast iron pipe encased in 6 inches of concrete. The pipe passes beneath the embankment near the maximum section. A sluice gate located 15 feet upstream of the embankment axis provides control of the outflow. The gate is operated from the top of a reinforced concrete tower at Elevation 599.0. An outlet channel lined with grouted stone riprap directs the outflow from the discharge point of the conduit to the original streambed about 50 feet downstream.

b. Location. Scott's Run Dam is located on Scott's Run in French Creek State Park, Pennsylvania. The dam is approximately 0.75 miles upstream of Hopewell Lake and 12 miles Southeast of Reading, and lies within Union Township in Berks County. The dam site is shown on the USGS quadrangle entitled, "Elverson, Pennsylvania" at coordinates N 40° 12.5', W 75° 47.7'. A regional location plan of Scott's Run Dam is enclosed as Plate 1, Appendix E.

c. Size Classification. The dam has a maximum height of 34 feet and a maximum pool storage capacity of 425 acre-feet. This places it in the "Small" size category.

d. Hazard Classification. Failure of Scott's Run Dam would cause potential failure of Hopewell Dam located 0.75 miles downstream. Hopewell Village National Historic Site, which consists of approximately 10 buildings, is located 0.25 miles downstream of Hopewell Dam and would be subject to extensive property damage and there would be the possibility of loss of life in the event of a failure of Hopewell Dam. Therefore, Scott's Run Dam is categorized as "High" hazard. The Spillway Design Flood (SDF) chosen for this structure is one-half of the Probable Maximum Flood (PMF).

e. Ownership. Scott's Run Dam is owned by the Pennsylvania Department of Environmental Resources, P.O. Box 2063, Harrisburg, PA 17120.

f. Purpose of Dam. The dam was constructed to create a lake for recreational purposes.

g. Design and Construction History. Scott's Run Dam was originally designed by the Birkinbine Engineering Offices for the General State Authority of the Commonwealth of Pennsylvania under the direction of O. Weimer Birkinbine, P.E.

Construction was begun on February 3, 1950 by the contractor, Floyd Rhodes. Mr. Birkinbine died in August of 1950 and construction continued under the assumed direction of the General State Authority. The Lycoming Construction Company replaced Floyd Rhodes as the contractor in September of 1950. Construction was suspended for the winter on December 15, 1950 and did not resume until June of 1952, due to disputes between the contractor and the General State Authority (GSA). Albright and Friel, Inc., Consulting Engineers, was hired by GSA in 1951. The design was revised and construction was resumed under the supervision of Francis S. Friel, P.E. The project was completed on May 25, 1953. Extensive repair work was carried out by Albright and Friel, Inc., in 1954. This repair work included rebuilding settled areas to design elevation, repairing an intake tower leak, and refilling voids in the riprap.

h. Normal Operating Procedures. The only operating device is the sluice gate which is used to control the outlet works. The sluice gate control and tower were inspected visually on an annual basis until 1976. No inspection reports were available from DER for post - 1976 inspections.

1.3 Pertinent Data

a. Drainage Area

Square Miles	1.0
--------------	-----

b. Discharge at Dam Site (cfs).

Normal discharge notch (reservoir at normal pool, Elev. 592.0)	6
Maximum Spillway Discharge (reservoir at crest of dam, Elev. 599.0)	2,593

c. Elevation (feet above MSL)

Spillway Crest (normal pool)	592.0
Top of Dam (design)	599.0
Top of Dam (Low Point)	598.9
Floor of Spillway Approach Section	589.0
Floor of Spillway Discharge Channel (at crest)	588.0
Streambed at Downstream Toe	565.0

d. Reservoir (Miles)

Length of normal pool	0.38
Length of maximum pool	0.45

e. Storage (acre-feet)

Normal Pool, Elev. 592	200
Top of Dam, Elev. 599	425

f. Reservoir Surface Area (acres)

Normal Pool, Elev. 592	21.9
------------------------	------

Top of Dam, Elev. 599.0

43.0

g. Dam Data

Type	Earth
Length	625 feet
Height	34 feet (maximum)
Crest Width	14 feet
Side Slopes	3H:1V (upstream); 2H:1V (downstream)
Zoning	3 zones
Impervious Core	Central Core Zone
Cutoff	Cutoff trench and concrete cutoff wall
Grout Curtain	Unknown

h. Spillway

Type	Stone masonry weir
Width	40 feet
Crest Elevation	592.0
Gates	None
Upstream Channel	Hand placed riprap channel for 16-foot distance upstream at Elev. 589.0.
Downstream Channel	Grouted riprap channel for 58-foot distance downstream, hand placed riprap channel for remaining 410 feet.

i. Outlet Works

Type	24-inch cast iron pipe encased in 6 inches of concrete.
Length	360 feet
Closure	Sluice gate 15 feet upstream of the centerline.
Access	Tower which houses the gate system is accessible from the top of the dam.
Regulating Facilities	Hand operated gate.

SECTION 2

ENGINEERING DATA

2.1 Design

a. Data Available. The information available for review of Scott's Run Dam includes the following obtained from DER:

1. "Application", "Report Upon the Application", and "Permit" to construct Scott's Run Dam, DER, 1950.
2. Original design drawings by Birkinbine Engineers.
3. Revised design drawings by Albright and Friel, Inc.
4. Construction progress reports and photographs.
5. Annual inspection reports and photographs.
6. Construction Specifications.
7. Specifications for repair work performed in 1954.
8. Soils and geology reports.
9. Detailed correspondence, memoranda, and general reports.

b. Design Features. The design features are described in Section 1.2.a and shown on the Plates in Appendix E.

2.2 Construction

Based on the field investigation and the information available in the construction reports, the dam appears to have been constructed in general conformance with the revised design drawings.

2.3 Operation

Operational procedures are limited to the control of the sluice gate for the reservoir drain system.

2.4 Evaluation

a. Availability. The information utilized in this report and listed in Section 2.1.a. was provided by the DER.

b. Adequacy. The material listed in Section 2.1.a. and provided by DER is extensive except for limited design calculations. The available information combined with the field inspection is considered adequate for a Phase I investigation.

c. Validity. There is no reason to question the validity of the data obtained from DER.

SECTION 3

VISUAL INSPECTION

3.1 Findings

a. General. The field inspection of Scott's Run Dam took place on May 2, 1979. At the time of the inspection, the water surface was approximately level with the spillway crest. Flow was occurring over the normal discharge notch in the center of the spillway. The observations and comments of the field inspection team are in the checklist which is Appendix B of this report. The appearance of the facility indicates that the dam and its appurtenances are well maintained.

b. Dam. The visible portion of the riprap on the upstream slope of the embankment is composed of precisely cut large stones which form an 18-inch thick smooth facing. Several of these stones have rolled into the reservoir, leaving gaps in the riprap cover.

The downstream face of the embankment had a thick grass cover on the date of the inspection. Undulations of approximately six inches were apparent along the longitudinal axis of the downstream slope.

The top of the dam is covered by a gravel path and a concrete foot bridge spans the spillway. The bottom steel chord of the bridge is above the top of dam elevation and does not constrict the spillway flow in any manner.

On the date of inspection considerable seepage was observed downstream of the embankment in the vicinity of the outlet works channel. Approximately 2 cfs of clear water was flowing toward the outlet channel near the right abutment and about 1 cfs was flowing to the left of the outlet channel. Soft, wet ground was apparent for several hundred feet downstream of the embankment. The seepage appeared to be from the toe drain since the embankment was not saturated in any location.

c. Appurtenant Structures. The crest of the masonry spillway is slightly deteriorated in that some of the stone has been cracked or chipped away. During the inspection, small quantities of water were flowing over sections of the spillway other than the normal discharge notch, even though the reservoir surface was approximately level with the spillway crest. The masonry training walls appear to be undamaged.

The exposed portion of the reinforced concrete tower which houses the outlet works sluice gate appears to be in good condition. The outlet conduit and outlet structure appear to be unobstructed and operable.

d. Reservoir. Area reconnaissance of the reservoir disclosed no evidence of excessive siltation, slope instability, or other features that would significantly affect the storage capacity of the reservoir. The slopes along the perimeter of the reservoir are heavily wooded and on gradients of less than ten percent.

e. Downstream Channel. The spillway discharge channel is reduced in width from 40 feet to 10 feet within a 60-foot distance downstream of the spillway. The narrowed channel section does not appear to reduce the spillway discharge capacity due to the steep gradient of the channel and the available overflow area to the right of the channel. Spillway discharge in excess of that which the channel is capable of passing would flow over the right training wall of the channel and continue across the downstream area toward the natural stream channel.

Several of the blocks of riprap further downstream have become displaced. The channel ends in a stilling basin which discharges flow into the natural channel downstream.

The outlet works outlet channel joins the natural streambed 50 feet downstream of the dam. This channel discharges reservoir releases through two 24-inch diameter metal pipes under a dirt trail located about 150 feet downstream of the dam.

Approximately 0.75 miles downstream of Scott's Run Dam, Scott's Run flows into Hopewell Lake. About 0.25 miles downstream of Hopewell Lake, Scott's Run flows through Hopewell Village National Historic Site.

SECTION 4

OPERATIONAL PROCEDURES

4.1 Procedures

The Department of Environmental Resources has provided the French Creek State Park authorities with a written Operation and Maintenance Manual (published in February, 1979). According to the manual, "Scott's Run Dam is designed to control flows automatically. Weekly inspections should be accomplished to be certain that the spillway weir is free of floating debris." In addition, "During periods of low flow,...., it may be necessary to operate the 24-inch sluice gate in order to pass sufficient flows to support fish life in the stream below the dam." Drawdown procedures and rates are also described.

4.2 Maintenance of Dam

Inspection and maintenance procedures are described in detail in the manual for the embankment, spillway, drawdown structure and conduit, sluice gate and operating stand, outlet channel, concrete, rock riprap and seeding.

4.3 Maintenance of Operating Facilities

The maintenance manual describes the following procedures for the sluice gate and operating stand:

"The tower chamber, sluice gate and gate stem should be thoroughly cleaned and inspected for cracks, deterioration, cavitation, rusting of the metal parts or any other signs of failure. Any damage notes should be immediately reported to the Bureau of Operations in Harrisburg, Pennsylvania.

The stem should be lubricated with a light film of high grade lubrication.

The gate control is supplied with high pressure grease fittings in the operating case and spur grease case. The gate control should be lubricated with a high grade pressure grease, impervious to water, such as Mobile Grease #4 or an approved equal. Lubrication should be performed at intervals which do not exceed six (6) months. The sluice gate should require no maintenance other than adjustment to stop leakage through the gate."

4.4 Warning Systems in Effect

According to Mr. Cliff Romig, DER representative, no formal warning system currently exists, but DER is in the process of developing one.

4.5 Evaluation of Operational Adequacy

The "Operation and Maintenance Manual for Scott's Run Dam" outlines an adequate program for inspection and maintenance of the dam.

SECTION 5

HYDRAULICS AND HYDROLOGY

5.1 Evaluation of Features

a. Design Data. Scott's Run Dam has a drainage area of 1.0 square miles and impounds a reservoir with a normal pool storage capacity of 200 acre-feet. The spillway is a 40-foot wide masonry section with a maximum discharge capacity of approximately 2,593 cfs.

b. Experience Data. There are no rainfall or reservoir level records kept for this dam.

c. Visual Observations. The reduced discharge channel section downstream of the spillway does not appear to constrict the spillway flow due to the steep gradient of the channel and the available overflow area to the right of the channel. No other spillway discharge obstructions were observed on the date of the inspection (See Appendix C for computations).

d. Overtopping Potential. The Spillway Design Flood (SDF) for this site is given as a range from 50 percent of the PMF to the full PMF. Based on the small storage capacity of Scott's Run Dam relative to Hopewell Dam and the fact that Hopewell Village (the damage center) is not an inhabited town, the SDF selected for use is 50 percent of the PMF.

The peak inflow and outflow rates for the SDF were determined to be 1,823 cfs. and 1,493 cfs., respectively. Based on the hydrologic and hydraulic analyses, the spillway is capable of discharging approximately 87 percent of the PMF without overtopping of the embankment (See Appendix C for computations). The capacity of the narrowed section of the discharge channel was also calculated and is capable of passing only 33% of the PMF (See Appendix C). However, higher stage discharges would flow over the right training wall of the channel and continue downstream and would not constrict the spillway flow.

e. Spillway Adequacy. The Scott's Run Dam spillway is classified as "Adequate" because it is capable of discharging the SDF.

SECTION 6

STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations. The undulations along the downstream face of the embankment are relatively minor and should present no structural problem. These undulations could be the result of poor compaction during construction.

Considerable seepage of clear water was observed immediately downstream of the embankment and the natural ground downstream was predominantly saturated and spongy. This condition could potentially weaken the embankment. Therefore, provision should be made for directing the seepage into the outlet channel.

Several blocks of riprap on the upstream face have been displaced into the reservoir. These should be replaced to provide complete protection against wave erosion.

On the date of the inspection, the masonry spillway and training walls appeared to be in good structural condition and showed no signs of instability. The cracked portions of the spillway crest could lead to deterioration of the spillway structure if they are not repaired.

b. Design and Construction Data. Design drawings and extensive construction progress reports were obtained from DER. The dam appears to have been constructed in general conformance with the revised design drawings.

c. Operating Records. There is no evidence that operating records are maintained for this structure.

d. Post-Construction Changes. Major repair work was performed under the direction of Albright and Friel, Inc. in 1954. There is no record of any modifications to the structural features of the dam.

e. Seismic Stability. Scott's Run Dam is located in Seismic Zone 1 of the "Seismic Zone Map of Contiguous States". A dam located in Seismic Zone 1 is generally considered to be safe under any expected earthquake loading, if it is stable under static loading conditions.

SECTION 7

ASSESSMENT, RECOMMENDATIONS, AND PROPOSED REMEDIAL MEASURES

7.1 Dam Assessment

a. Safety. Based on the visual observations and review of the available information, Scott's Run Dam is considered to be in good condition. However, several deficiencies were noted during the inspection. Outlets are not provided for the embankment toe drain and as a consequence there are extensive soft, saturated areas in the region immediately downstream of the dam. The masonry on the spillway crest is in need of repair in several locations. Several blocks of riprap require replacement in the upstream face of the embankment.

The SDF selected for Scott's Run Dam is 50 percent of the PMF. The spillway is capable of discharging 87 percent of the PMF without overtopping of the embankment. Therefore, the spillway is classified as "Adequate".

b. Adequacy of Information. The information obtained from DER is considered adequate for a Phase I investigation.

c. Urgency. The remedial measures recommended in Section 7.2 should be effected immediately.

d. Necessity for Further Investigation. Further investigations are not considered necessary for Scott's Run Dam at this time.

7.2 Recommendations and Remedial Measures

a. Facilities

1. The design drawings indicate that two drainage ditches were to have been provided parallel to the outlet channel (one on either side) to direct toe drain discharge downstream. These ditches were not apparent on the date of the inspection. A drainage system should be installed which would direct the toe drain discharge downstream.
2. The crest of the masonry spillway should be repaired and restored to design elevation where necessary.
3. Blocks of riprap that have been removed from the upstream face should be replaced in their original location.

b. Operation and Maintenance Procedures

1. The "Operation and Maintenance Manual for Scott's Run Dam" describes the required inspection, operation, and maintenance procedures for all features of the dam. Compliance with this manual will constitute a satisfactory maintenance program.
2. A downstream warning system should be developed. During periods of heavy rainfall, the dam should be monitored and downstream residents should be alerted in the event of an impending failure.

APPENDIX

A

Check List Engineering Data
Design, Construction, Operation
Phase I

NAME OF DAM SCOTT'S RUN DAM
 ID # PA 00725

Sheet 1 of 4

CHECK LIST
 ENGINEERING DATA
 DESIGN, CONSTRUCTION, OPERATION
 PHASE I

REMARKS

AS-BUILT DRAWINGS

NONE AVAILABLE

REGIONAL VICINITY MAP

REFER TO PLATE 1 APPENDIX E

CONSTRUCTION HISTORY

CONSTRUCTION PHASES
 PHASES AND PROGRESS WERE OBTAINED
 FROM DATA

TYPICAL SECTIONS OF DAM

REFER TO PLATES 10 APPENDIX E

OUTLETS - PLAN

DETAILS

CONSTRAINTS

DISCHARGE RATINGS

RAINFALL/RESERVOIR RECORDS

REFER TO PLATES IN APPENDIX E

NONE AVAILABLE

NONE AVAILABLE

ITEM	REMARKS
DESIGN REPORTS	DESIGN DRAWINGS BY PICKERING ENGINEERS AND BY ACHER & PRICE, INC. WAS UPON THE PLAN PREP BY THE DESIGN PERSONNEL. THESE WERE AVAILABLE
GEOLOGY REPORTS	A GEOLOGY REPORT WAS OBTAINED FROM THE
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	LIMITED DESIGN CALCULATIONS WERE AVAILABLE
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	A SOIL PROFILE WAS OBTAINED FROM THE FIELD
POST-CONSTRUCTION SURVEYS OF DAM	NONE AVAILABLE
BORROW SOURCES	PLANS SHOWING BORROW AREAS WERE NOT PROVIDED IN THE DESIGN INFORMATION

ITEM REMARKS

MONITORING SYSTEMS

None

MODIFICATIONS

DESIGN MODIFICATIONS WERE MADE BY E. E. KELLEY & SONS, INC. IN 1949. DESIGN MODIFICATIONS ARE APPROPRIATE.

HIGH POOL RECORDS

None Available

POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS

SECTION 100 AND 101 REPORTS CONCERNING CONCRETE PILE WORK COMPLETED IN 1954 ARE AVAILABLE FOR USE.

PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS

None

MAINTENANCE OPERATION RECORDS

INSPECTION AND REPAIRS MAINTENANCE RECORDS WERE OBTAINED FROM VET.

ITEM	REMARKS
SHEET 4 OF 4	
SPILLWAY PLAN	
SECTIONS	
DETAILS	
OPERATING EQUIPMENT PLANS & DETAILS	
MISCELLANEOUS	

APPENDIX

B

Check List

Visual Inspection

Phase I

CHECK LIST
VISUAL INSPECTION
PHASE I

Sheet 1 of 11

Name Dam SCOTT'S RUN DAM County BECKS State PENNA. National ID # PA 00925
Type of Dam EARTH Hazard Category HIGH
Date(s) Inspection 5/2/79 Weather FAIR Temperature 65° F.

Pool Elevation at Time of Inspection 592.1 M.S.L. Tailwater at Time of Inspection 565 M.S.L.

Inspection Personnel:

LEE H. DRUCKER LEONARD R. BECK ROBERT R. LOWKES

LEE H. DRUCKER Recorder

Remarks:

Mr. Cliff Komic and Mr. Gary Emmanuel, representatives from DFR, were
present during the inspection.

CONCRETE/MASONRY DAMS

Sheet 2 of 11

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
ANY NOTICEABLE SEEPAGE	N/A	
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	N/A	
DRAINS	N/A	
WATER PASSAGES	N/A	
FOUNDATION	N/A	

CONCRETE/MASONRY DAMS

Sheet 3 of 11

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	N/A	
STRUCTURAL CRACKING	N/A	
VERTICAL AND HORIZONTAL ALIGNMENT	N/A	
MONOLITH JOINTS	N/A	
CONSTRUCTION JOINTS	N/A	

EMBANKMENT

Sheet 4 of 11

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
SURFACE CRACKS	NONE OBSERVED	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	NONE OBSERVED	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	NONE OBSERVED	
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	THE SURVEY OF THE CREST REVEALED SOME SLIGHT UNDULATION, BUT THE MAXIMUM VARIATION IS LESS THAN SIX INCHES	
RIPRAP FAILURES	SEVERAL RIPRAP BLOCKS HAVE BEEN DISPLACED FROM THE UPSTREAM SLOPE AND ROLLED INTO THE REEFLOOR.	REPLACEMENT OF THESE BLOCKS IS RECOMMENDED

EMBANKMENT

Sheet 5 of 11

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
DRAINS	CLEAR WATER WAS DISCHARGING FREELY FROM THE TOE DRAIN INTO THE NATURAL GROUND DOWNSTREAM OF THE EMBANKMENT.	DRAINAGE SHOULD BE PROVIDED TO DIRECT THE TOE DRAIN FLOW INTO THE OUTLET CHANNEL DOWNSTREAM
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	NO PROBLEMS OBSERVED.	
ANY NOTICEABLE SEEPAGE	SUBSTANTIAL SEEPAGE TOWARD THE OUTLET CHANNEL IS NOTICEABLE ALONG THE NATURAL GROUND DOWNSTREAM. THIS SEEPAGE APPARENTLY COMES DIRECTLY THROUGH THE TOE DRAIN.	DRAINAGE SHOULD BE PROVIDED AS DESCRIBED ABOVE
STAFF GAGE AND RECORDER		

NONE

OUTLET WORKS

Sheet 6 of 11

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	NONE OBSERVED	
INTAKE STRUCTURE	THE INTAKE STRUCTURE IS SUBMERGED	
OUTLET STRUCTURE	APPEARS TO BE IN GOOD CONDITION	
OUTLET CHANNEL	OUTLET CHANNEL JOINS THE NATURAL STREAM CHANNEL ABOUT 50 FEET DOWNSTREAM OF THE DAM	
EMERGENCY GATE	THE EMERGENCY GATE WAS NOT OPERATED OR INSPECTED DURING THE INSPECTION	

UNGATED SPILLWAY

Sheet 7 of 11

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	THE MASONRY ALONG THE CREST IS SLIGHTLY DEGRADED.	REPAIRS TO MASONRY ARE RECOMMENDED TO RESTORE CREST TO DESIGN ELEVATION.
APPROACH CHANNEL	MASONRY TRIMMING WALLS EXPOSED A SHEAR DISTRESS DUE TO TAIL AN APPROACH CHANNEL	
DISCHARGE CHANNEL	THE SPILLWAY DISCHARGE CHANNEL IS LINED WITH GRAVEL RIPPED FOR ABOUT 60 FEET. THESE WALLS HAVE BEEN RIPPED THE REMAINING DISTANCE TO THE STILLING BASIN.	
BRIDGE AND PIERS		NONE

GATED SPILLWAY

Sheet 8 of 11

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
CONCRETE SILL	N/A	
APPROACH CHANNEL	N/A	
DISCHARGE CHANNEL	N/A	
BRIDGE AND PIERS	N/A	
GATES AND OPERATION EQUIPMENT	N/A	

UNITED STATES OF AMERICA
NATIONAL MONUMENTS

DESCRIPTION

OBSERVATIONS

FIELD CONTINUATION

MONUMENT/STUDY SURVEY

DESCRIPTION

NOTE

REMARKS

OTHER

RESERVOIR

VISUAL EXAMINATION OF SLOPES OBSERVATIONS REMARKS OR RECOMMENDATIONS

Sheet 10 of 11

RESERVOIR SLOPES ARE ABOUT

10% AND ARE COVERED WITH

ROCK

SEDIMENTATION

THE SEDIMENTATION LEVEL COULD
NOT BE DETERMINED BUT NO
PROBLEMS WERE APPARENT

DOWNSTREAM CHANNEL

Sheet 11 of 11

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	NO OBSTRUCTIONS WERE OBSERVED	
SLOPES	THE CHANNEL SLOPE BETWEEN SCOTT'S RUN DAM AND HOPWELL LAKE IS APPROXIMATELY 1.5 %	
APPROXIMATE NO. OF HOMES AND POPULATION	THE NATURAL HISTORIC SITE OF HOPWELL VILLAGE IS LOCATED IMMEDIATELY DOWNSTREAM OF HOPWELL DAM. APPROXIMATELY 5 BUILDINGS WOULD BE SUBJECT TO DAMAGE IN THE VILLAGE. THE NUMBER OF PEOPLE IN THE VILLAGE WILL VARY ACCORDING TO THE SEASON, BUT AS MANY AS 100 PEOPLE COULD BE EXPECTED ON A SUMMER WEEKEND.	

APPENDIX

C

Hydrologic & Hydraulic Data

TABLE OF CONTENTS - APPENDIX C

HYDROLOGIC & HYDRAULIC DATA

PMP CALCULATIONS

SHEET 1

SNYDER COEFFICIENTS

SHEET 1

DISCHARGE CHANNEL CAPACITY CALCULATIONS

SHEETS 1A-1B

HEC - 1 DAM SAFETY VERSION COMPUTER OUTPUT

SHEETS 2-6



O'BRIEN & GERE

SUBJECT	SHEET	BY	DATE	JOB NO.
SCOTT'S RUN DAM	1	RRB	3/13/79	

HYDROLOGY CALCS.

DRAINAGE AREA (PLANIMETERED ON USGS QUAD SHEET): 1.0 mi.²

PMP CALCULATIONS (HMS REPORT 33)

AREA IS IN ZONE 6

24 HR., 200 SQ. MI. RAINFALL = 23.5"

<u>HR.</u>	<u>%</u>	<u>RAINFALL</u>	<u>ΔRF</u>
6	113	26.6"	26.6"
12	123	28.9"	2.3"
24	132	31.0"	2.1"
48	142	33.4"	2.4"

SNYDER COEFFICIENTS

FROM INFO. PROVIDED BY COE FOR THE
DELAWARE RIVER BASIN, ZONE 7 (SCHUYLKILL RIVER
SUB-BASIN):

$$C_p = 0.65$$

AND $C_t = 1.35$

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

$$L = 1.2 \text{ miles}$$

$$L_{ca} = 0.4 \text{ miles}$$

$$t_p = 1.35 (1.2 \cdot 0.4)^{0.3} = 1.1 \text{ HR.}$$



O'BRIEN & GERE

SUBJECT

Scott's Run

SHEET

1A

BY

REL

DATE

JOB NO

CALCULATION OF NARROWED CHANNEL CONSTRICTION OF FLOW

$$\text{ENERGY GRADE LINE EQUATION} \rightarrow \frac{V_1^2}{2g} + d_1 + S_0 l = \frac{V_2^2}{2g} + d_2 + h_f$$

SECTION 1 IS AT THE SPILLWAY CREST,

SECTION 2 IS AT THE CHANNEL CONSTRICTION (~ 70 FT. DOWNSTREAM)

 d_1 = SPILLWAY CREST HEIGHT PLUS DEPTH OF WATER OVER SPILLWAY CREST d_2 = DEPTH OF WATER AT CHANNEL CONSTRICTION S_0 = SLOPE OF CHANNEL l = LENGTH OF CHANNEL h_f = FRICTION HEAD

THE DESIRED SOLUTION IS FOR $d_2 = 4$ FT. OR THE CAPACITY OF THE NARROWED CHANNEL. SOLUTION WAS DETERMINED BY TRIAL AND ERROR.

V AND h_f WERE CALCULATED AS FOLLOWS:

$$V = Q/A$$

$$h_f = \frac{kn^2 V^2}{2.2082 r^{4/3}}$$

WHERE n = ROUGHNESS COEFFICIENT

(.025 IN THIS CASE)

AND r = HYDRAULIC RADIUSHEAD OF WATER
OVER SPILLWAY
CREST (FT)

	Q (CFS)	A_1 (FT ²)	V_1 (FPS)	d_1 (FT)	$S_0 l$ (FT)	A_2 (FT ²)	V_2 (FPS)	h_f (FT)
4	1120	160	7.0	8	1.4	58	19.3	2.0

$$\frac{V_1^2}{2g} + d_1 + S_0 l = 10.2 \text{ FT.} \rightarrow \frac{V_2^2}{2g} + d_2 + h_f = 11.8 \text{ FT.}$$

3	725	120	6.0	7	1.4	58	12.5	0.8
---	-----	-----	-----	---	-----	----	------	-----

$$\frac{V_1^2}{2g} + d_1 + S_0 l = 9.0 \text{ FT.} \rightarrow \frac{V_2^2}{2g} + d_2 + h_f = 7.2 \text{ FT.}$$

(NEXT PAGE - CONT.)



O'BRIEN & GERE

SUBJECT

Scott's Run

SHEET

18

BY

RRE

DATE

JOB NO

HEAD OF WATER OVER SPILLWAY CREST (FT)	Q (CFS)	A ₁ (FT ²)	V ₁ (CFS)	d ₁ (FT)	S ₀ L (FT)	A ₂ (FT ²)	V ₂ (CFS)	h _f (FT)
3.5	920	140	6.6	7.5	1.4	58	15.9	1.3
$\frac{V_1^2}{2g} + d_1 + S_0L = 9.6 \text{ FT.} \rightarrow \frac{V_2^2}{2g} + d_2 + h_f = 9.2 \text{ FT.}$								
3.7	1000	148	6.8	7.7	1.4	58	17.2	1.6
$\frac{V_1^2}{2g} + d_1 + S_0L = 9.8 \text{ FT.} \rightarrow \frac{V_2^2}{2g} + d_2 + h_f = 10.2 \text{ FT.}$								
3.6	960	144	6.7	7.6	1.4	58	16.6	1.5
$\frac{V_1^2}{2g} + d_1 + S_0L = 9.7 \text{ FT.} \rightarrow \frac{V_2^2}{2g} + d_2 + h_f = 9.8 \text{ FT.}$								

THEREFORE, THE CHANNEL IS CAPABLE OF PASSING THE DISCHARGE OF 3.6 FEET OF HEAD OVER THE SPILLWAY CREST. THIS CORRESPONDS TO A DISCHARGE OF 960 CFS AND A STORM OF ONLY ABOUT 33% OF THE PMF. HOWEVER, ANY ADDITIONAL DISCHARGE OVER THE SPILLWAY WOULD FLOW OVER THE RIGHT TRAINING WALL OF THE CHANNEL AND WOULD NOT CONSTRICT SPILLWAY FLOW.

EQUATIONS USED ABOVE WERE OBTAINED FROM THE SCS HYDRAULICS ENGINEERING HANDBOOK (SECTION 5), PP. 5.4-16 AND 5.4-17.

.....
 FLOOD HYDROGRAPH PACKAGE (REC-1)
 DAM SAFETY VERSION JULY 1978
 LAST MODIFICATION 25 SEP 78

SHEET 2

1	A1	150	0	30	0	0	0	-4	0
2	A2	5	9	1	0	0	0	0	0
3	A3	1	.3	.4	.5	.6	.7	.8	.9
4	B	0	0	0	0	0	0	0	0
5	C	0	0	0	0	0	0	0	0
6	D	0	0	0	0	0	0	0	0
7	E	0	0	0	0	0	0	0	0
8	F	0	0	0	0	0	0	0	0
9	G	0	0	0	0	0	0	0	0
10	H	0	0	0	0	0	0	0	0
11	I	0	0	0	0	0	0	0	0
12	J	0	0	0	0	0	0	0	0
13	K	0	0	0	0	0	0	0	0
14	L	0	0	0	0	0	0	0	0
15	M	0	0	0	0	0	0	0	0
16	N	0	0	0	0	0	0	0	0
17	O	0	0	0	0	0	0	0	0
18	P	0	0	0	0	0	0	0	0
19	Q	0	0	0	0	0	0	0	0
20	R	0	0	0	0	0	0	0	0
21	S	0	0	0	0	0	0	0	0
22	T	0	0	0	0	0	0	0	0
23	U	0	0	0	0	0	0	0	0

NATIONAL DAM INSPECTION PROGRAM
 SCOTTS RUN DAM
 PMF HYDROGRAPH

0 0 0 0 0 0 0 0 0 0
 1 1 1 1 1 1 1 1 1 1
 .4 .5 .6 .7 .8 .9 1.0 1.1
 RUNOFF TO SCOTTS RUN LAKE
 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7
 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5
 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3
 3.4 3.5 3.6 3.7 3.8 3.9 4.0 4.1
 4.2 4.3 4.4 4.5 4.6 4.7 4.8 4.9
 5.0 5.1 5.2 5.3 5.4 5.5 5.6 5.7
 5.8 5.9 6.0 6.1 6.2 6.3 6.4 6.5
 6.6 6.7 6.8 6.9 7.0 7.1 7.2 7.3
 7.4 7.5 7.6 7.7 7.8 7.9 8.0 8.1
 8.2 8.3 8.4 8.5 8.6 8.7 8.8 8.9
 9.0 9.1 9.2 9.3 9.4 9.5 9.6 9.7
 9.8 9.9 10.0 10.1 10.2 10.3 10.4 10.5
 10.6 10.7 10.8 10.9 11.0 11.1 11.2 11.3
 11.4 11.5 11.6 11.7 11.8 11.9 12.0 12.1
 12.2 12.3 12.4 12.5 12.6 12.7 12.8 12.9
 13.0 13.1 13.2 13.3 13.4 13.5 13.6 13.7
 13.8 13.9 14.0 14.1 14.2 14.3 14.4 14.5
 14.6 14.7 14.8 14.9 15.0 15.1 15.2 15.3
 15.4 15.5 15.6 15.7 15.8 15.9 16.0 16.1
 16.2 16.3 16.4 16.5 16.6 16.7 16.8 16.9
 17.0 17.1 17.2 17.3 17.4 17.5 17.6 17.7
 17.8 17.9 18.0 18.1 18.2 18.3 18.4 18.5
 18.6 18.7 18.8 18.9 19.0 19.1 19.2 19.3
 19.4 19.5 19.6 19.7 19.8 19.9 20.0 20.1
 20.2 20.3 20.4 20.5 20.6 20.7 20.8 20.9
 21.0 21.1 21.2 21.3 21.4 21.5 21.6 21.7
 21.8 21.9 22.0 22.1 22.2 22.3 22.4 22.5
 22.6 22.7 22.8 22.9 23.0 23.1 23.2 23.3
 23.4 23.5 23.6 23.7 23.8 23.9 24.0 24.1
 24.2 24.3 24.4 24.5 24.6 24.7 24.8 24.9
 25.0 25.1 25.2 25.3 25.4 25.5 25.6 25.7
 25.8 25.9 26.0 26.1 26.2 26.3 26.4 26.5
 26.6 26.7 26.8 26.9 27.0 27.1 27.2 27.3
 27.4 27.5 27.6 27.7 27.8 27.9 28.0 28.1
 28.2 28.3 28.4 28.5 28.6 28.7 28.8 28.9
 29.0 29.1 29.2 29.3 29.4 29.5 29.6 29.7
 29.8 29.9 30.0 30.1 30.2 30.3 30.4 30.5
 30.6 30.7 30.8 30.9 31.0 31.1 31.2 31.3
 31.4 31.5 31.6 31.7 31.8 31.9 32.0 32.1
 32.2 32.3 32.4 32.5 32.6 32.7 32.8 32.9
 33.0 33.1 33.2 33.3 33.4 33.5 33.6 33.7
 33.8 33.9 34.0 34.1 34.2 34.3 34.4 34.5
 34.6 34.7 34.8 34.9 35.0 35.1 35.2 35.3
 35.4 35.5 35.6 35.7 35.8 35.9 36.0 36.1
 36.2 36.3 36.4 36.5 36.6 36.7 36.8 36.9
 37.0 37.1 37.2 37.3 37.4 37.5 37.6 37.7
 37.8 37.9 38.0 38.1 38.2 38.3 38.4 38.5
 38.6 38.7 38.8 38.9 39.0 39.1 39.2 39.3
 39.4 39.5 39.6 39.7 39.8 39.9 40.0 40.1
 40.2 40.3 40.4 40.5 40.6 40.7 40.8 40.9
 41.0 41.1 41.2 41.3 41.4 41.5 41.6 41.7
 41.8 41.9 42.0 42.1 42.2 42.3 42.4 42.5
 42.6 42.7 42.8 42.9 43.0 43.1 43.2 43.3
 43.4 43.5 43.6 43.7 43.8 43.9 44.0 44.1
 44.2 44.3 44.4 44.5 44.6 44.7 44.8 44.9
 45.0 45.1 45.2 45.3 45.4 45.5 45.6 45.7
 45.8 45.9 46.0 46.1 46.2 46.3 46.4 46.5
 46.6 46.7 46.8 46.9 47.0 47.1 47.2 47.3
 47.4 47.5 47.6 47.7 47.8 47.9 48.0 48.1
 48.2 48.3 48.4 48.5 48.6 48.7 48.8 48.9
 49.0 49.1 49.2 49.3 49.4 49.5 49.6 49.7
 49.8 49.9 50.0 50.1 50.2 50.3 50.4 50.5
 50.6 50.7 50.8 50.9 51.0 51.1 51.2 51.3
 51.4 51.5 51.6 51.7 51.8 51.9 52.0 52.1
 52.2 52.3 52.4 52.5 52.6 52.7 52.8 52.9
 53.0 53.1 53.2 53.3 53.4 53.5 53.6 53.7
 53.8 53.9 54.0 54.1 54.2 54.3 54.4 54.5
 54.6 54.7 54.8 54.9 55.0 55.1 55.2 55.3
 55.4 55.5 55.6 55.7 55.8 55.9 56.0 56.1
 56.2 56.3 56.4 56.5 56.6 56.7 56.8 56.9
 57.0 57.1 57.2 57.3 57.4 57.5 57.6 57.7
 57.8 57.9 58.0 58.1 58.2 58.3 58.4 58.5
 58.6 58.7 58.8 58.9 59.0 59.1 59.2 59.3
 59.4 59.5 59.6 59.7 59.8 59.9 60.0 60.1
 60.2 60.3 60.4 60.5 60.6 60.7 60.8 60.9
 61.0 61.1 61.2 61.3 61.4 61.5 61.6 61.7
 61.8 61.9 62.0 62.1 62.2 62.3 62.4 62.5
 62.6 62.7 62.8 62.9 63.0 63.1 63.2 63.3
 63.4 63.5 63.6 63.7 63.8 63.9 64.0 64.1
 64.2 64.3 64.4 64.5 64.6 64.7 64.8 64.9
 65.0 65.1 65.2 65.3 65.4 65.5 65.6 65.7
 65.8 65.9 66.0 66.1 66.2 66.3 66.4 66.5
 66.6 66.7 66.8 66.9 67.0 67.1 67.2 67.3
 67.4 67.5 67.6 67.7 67.8 67.9 68.0 68.1
 68.2 68.3 68.4 68.5 68.6 68.7 68.8 68.9
 69.0 69.1 69.2 69.3 69.4 69.5 69.6 69.7
 69.8 69.9 70.0 70.1 70.2 70.3 70.4 70.5
 70.6 70.7 70.8 70.9 71.0 71.1 71.2 71.3
 71.4 71.5 71.6 71.7 71.8 71.9 72.0 72.1
 72.2 72.3 72.4 72.5 72.6 72.7 72.8 72.9
 73.0 73.1 73.2 73.3 73.4 73.5 73.6 73.7
 73.8 73.9 74.0 74.1 74.2 74.3 74.4 74.5
 74.6 74.7 74.8 74.9 75.0 75.1 75.2 75.3
 75.4 75.5 75.6 75.7 75.8 75.9 76.0 76.1
 76.2 76.3 76.4 76.5 76.6 76.7 76.8 76.9
 77.0 77.1 77.2 77.3 77.4 77.5 77.6 77.7
 77.8 77.9 78.0 78.1 78.2 78.3 78.4 78.5
 78.6 78.7 78.8 78.9 79.0 79.1 79.2 79.3
 79.4 79.5 79.6 79.7 79.8 79.9 80.0 80.1
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 81.0 81.1 81.2 81.3 81.4 81.5 81.6 81.7
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 83.4 83.5 83.6 83.7 83.8 83.9 84.0 84.1
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 85.0 85.1 85.2 85.3 85.4 85.5 85.6 85.7
 85.8 85.9 86.0 86.1 86.2 86.3 86.4 86.5
 86.6 86.7 86.8 86.9 87.0 87.1 87.2 87.3
 87.4 87.5 87.6 87.7 87.8 87.9 88.0 88.1
 88.2 88.3 88.4 88.5 88.6 88.7 88.8 88.9
 89.0 89.1 89.2 89.3 89.4 89.5 89.6 89.7
 89.8 89.9 90.0 90.1 90.2 90.3 90.4 90.5
 90.6 90.7 90.8 90.9 91.0 91.1 91.2 91.3
 91.4 91.5 91.6 91.7 91.8 91.9 92.0 92.1
 92.2 92.3 92.4 92.5 92.6 92.7 92.8 92.9
 93.0 93.1 93.2 93.3 93.4 93.5 93.6 93.7
 93.8 93.9 94.0 94.1 94.2 94.3 94.4 94.5
 94.6 94.7 94.8 94.9 95.0 95.1 95.2 95.3
 95.4 95.5 95.6 95.7 95.8 95.9 96.0 96.1
 96.2 96.3 96.4 96.5 96.6 96.7 96.8 96.9
 97.0 97.1 97.2 97.3 97.4 97.5 97.6 97.7
 97.8 97.9 98.0 98.1 98.2 98.3 98.4 98.5
 98.6 98.7 98.8 98.9 99.0 99.1 99.2 99.3
 99.4 99.5 99.6 99.7 99.8 99.9 100.0 100.1
 100.2 100.3 100.4 100.5 100.6 100.7 100.8 100.9
 101.0 101.1 101.2 101.3 101.4 101.5 101.6 101.7
 101.8 101.9 102.0 102.1 102.2 102.3 102.4 102.5
 102.6 102.7 102.8 102.9 103.0 103.1 103.2 103.3
 103.4 103.5 103.6 103.7 103.8 103.9 104.0 104.1
 104.2 104.3 104.4 104.5 104.6 104.7 104.8 104.9
 105.0 105.1 105.2 105.3 105.4 105.5 105.6 105.7
 105.8 105.9 106.0 106.1 106.2 106.3 106.4 106.5
 106.6 106.7 106.8 106.9 107.0 107.1 107.2 107.3
 107.4 107.5 107.6 107.7 107.8 107.9 108.0 108.1
 108.2 108.3 108.4 108.5 108.6 108.7 108.8 108.9
 109.0 109.1 109.2 109.3 109.4 109.5 109.6 109.7
 109.8 109.9 110.0 110.1 110.2 110.3 110.4 110.5
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 177.8 177.9 178.0 178.1 178.2 178.3 178.4 178.5
 178.6 178.7 178.8 178.9 179.0 179.1 179.2 179.3
 179.

NATIONAL DAM INSPECTION PROGRAM
SCOTTS RUN DAM
PMF HYDROGRAPH

NO	NH#	NMIN	IDAY	JOB SPECIFICATION				IPRT	NSTAN
150	0	30	0	IN#	ININ	METRC	0	-4	0
			JOB#	NMT	LEOPT	TRACE	0		
			5	0	0	0	0		

MULTI-PLAN ANALYSES TO BE PERFORMED

```
RTIOS= .20 .30 .40 .50 .60 .70 .80 .90 1.00
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.....

.....

SUB-AREA RUNOFF COMPUTATION

RUNOFF TO SCOTTS RUN LAKE

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRY	INAME	ISTAGE	IAUTO
INFLOW	0	0	0	0	0	1	0	0

IMVGG	1	IMUG	1	TAREA	1.00	SNAP	0.00	HYDROGRAPH DATA				RATIO	ISNOW	ISAME	LOCAL
								TRSLA	1.00	TRSPC	0.00	0.000	0	1	0

```

TRSPC COMPUTED BY THE PROGRAM IS .800
SPFE      PMS      R6      PRECIP DATA
0.00      23.50    113.00    R12      H24
                                123.00    132.00

```

LOSS DATA										
LRPT	STPR	DLTR	RTOL	EPAIN	SPKX	RTIOK	STRTL	CHSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA
TP= 1.10 CQ= .65 NTA= 0

```
STRTO= -1.50 RECESSION DATA RTIOR= 2.00
GRCSN= -.05
```

UNIT HYDROGRAPH 11 END-OF-PERIOD ORIGINATES, LAG= 1.10 HOURS, CP= .65 VOL= 1.00
 97. 284. 356. 253. 138. 76. 41. 23. 12.
 .05 UNCSME RTTOR= 2.00

[illegible]

SHEET 4

SUN 24.42 22.97 1.45 31.74.
(635.11 563.11 47.11 484.24)

HYDROGRAPH ROUTING

ROUTING THROUGH SCOTTS RUN LAKE

ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
OUTFLO	1	0	0	0	0	1	0	0
ROUTING DATA								
AVG		IPRES	ISAME	IOPT	IPMP		LSTR	
0.00	0.00	1	1	0	0		0	
NSTPS								
1	0	LAG	AMSK	X	TSK	STORA	ISPRAT	
		0	0.000	0.000	0.000	-592.	0	

SURFACE AREA= 0. 22. 46.

CAPACITY= 0. 198. 444.

ELEVATION= 565. 592. 600.

CREL	SPWID	COOW	EXPW	ELEV	COOL	CAREA	EXPL
592.0	40.0	3.5	1.5	0.0	0.0	0.0	0.0

DAM DATA			
TOREL	COQU	EXPD	DAMWID
599.0	3.1	1.5	580.

PEAK OUTFLOW IS 574. AT TIME 17.50 HOURS

PEAK OUTFLOW IS 801. AT TIME 17.50 HOURS

PEAK OUTFLOW IS 1187. AT TIME 17.50 HOURS

PEAK OUTFLOW IS 1493. AT TIME 17.50 HOURS

PEAK OUTFLOW IS 1799. AT TIME 17.50 HOURS

PEAK OUTFLOW IS 2103. AT TIME 17.50 HOURS

PEAK OUTFLOW IS 2406. AT TIME 17.50 HOURS

PEAK OUTFLOW IS 2798. AT TIME 17.50 HOURS

PEAK OUTFLOW IS 3365. AT TIME 17.50 HOURS

SHEET 5

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

OPERATION	STATION	AREA	PLAN	RATIO 1	RATIOS APPLIED TO FLOWS									
					RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6	RATIO 7	RATIO 8	RATIO 9		
					.20	.30	.40	.50	.60	.70	.80	.90	1.00	
HYDROGRAPH AT INFLOW	(	1.00	1	729.	1094.	1459.	1823.	2188.	2552.	2917.	3282.	3646.		
		2.59)	(	20.65)	30.98)	41.30)	51.63)	61.95)	72.28)	82.60)	92.93)	103.25)		
ROUTED TO OUTFLOW	(	1.00	1	574.	861.	1187.	1493.	1799.	2103.	2406.	2709.	3012.		
		2.59)	(	16.27)	24.94)	33.62)	42.29)	50.93)	59.54)	68.12)	76.74)	85.28)		

SHEET 6

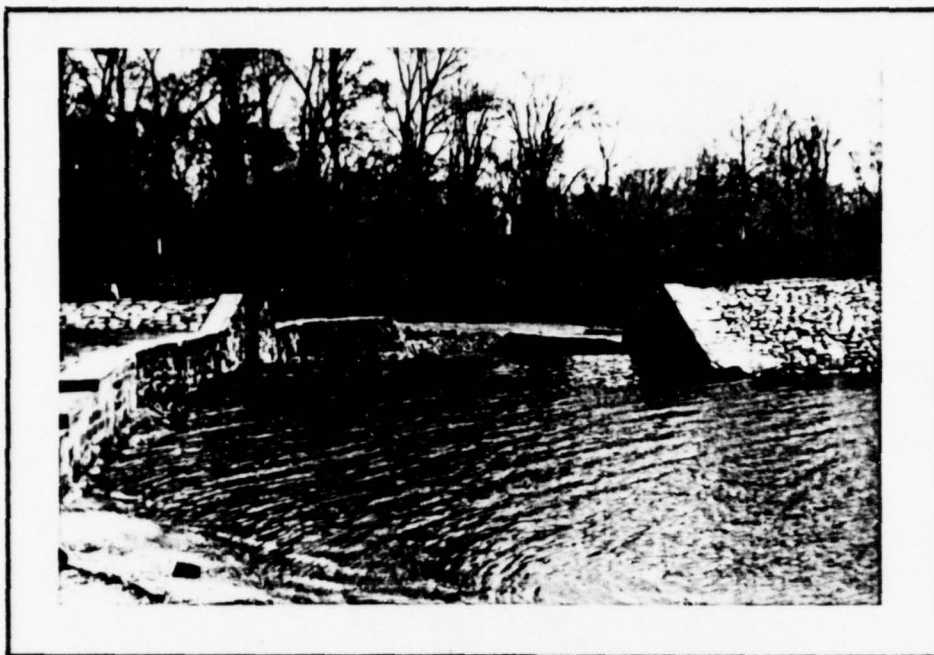
SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1	ELEVATION STORAGE OUTFLOW	INITIAL VALUE 592.00 198. 0.	SPILLWAY CREST 592.00 198. 0.	TOP OF DAM 599.00 420. 2593.	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
RATIO OF PHF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	
.20	594.56	0.00	263.	574.	0.00	0.00
.30	595.41	0.00	288.	881.	0.00	0.00
.40	596.16	0.00	312.	1181.	0.00	0.00
.50	596.85	0.00	336.	1493.	0.00	0.00
.60	597.49	0.00	359.	1799.	0.00	0.00
.70	598.09	0.00	383.	2103.	0.00	0.00
.80	598.66	0.00	406.	2406.	0.00	0.00
.90	599.16	.16	427.	2798.	.50	0.00
1.00	599.44	.44	439.	3365.	1.50	0.00

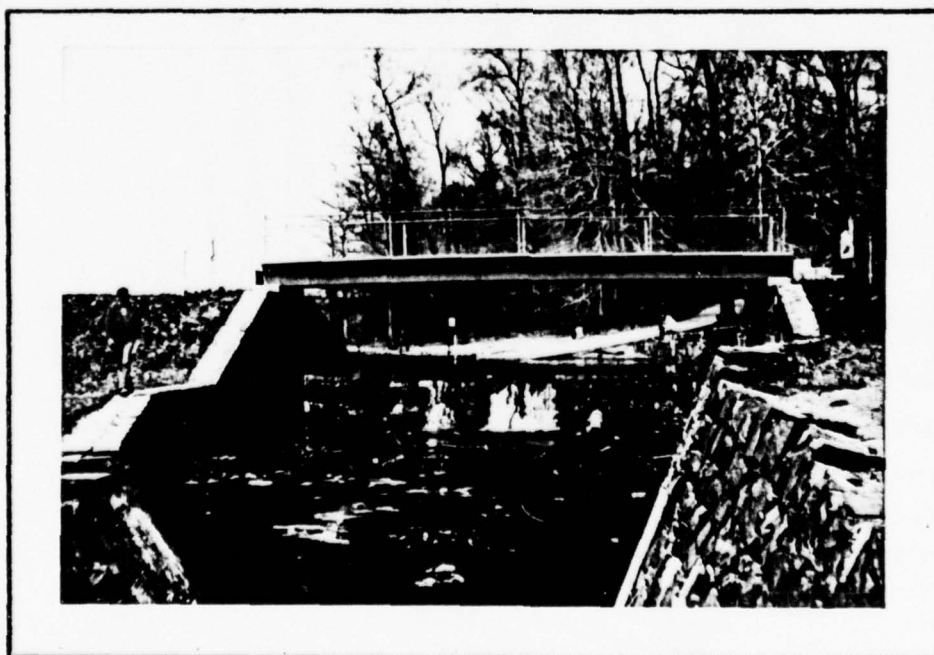
APPENDIX

D

Photographs



*SPILLWAY SECTION AND FOOT BRIDGE
LOOKING DOWNSTREAM*



*SPILLWAY SECTION LOOKING UPSTREAM SHOWING
WATER FLOWING OVER THE LOW FLOW DISCHARGE
NOTCH AND LOWERED SECTIONS IN THE SPILLWAY CREST*



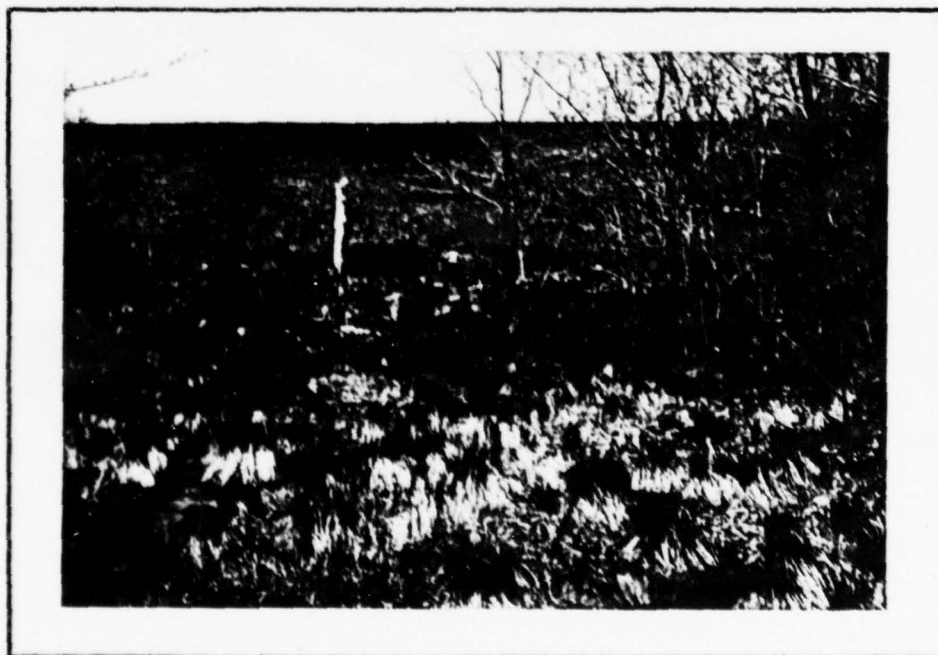
*SPILLWAY DISCHARGE CHANNEL LOOKING DOWNSTREAM
FROM THE FOOT BRIDGE OVER THE SPILLWAY*



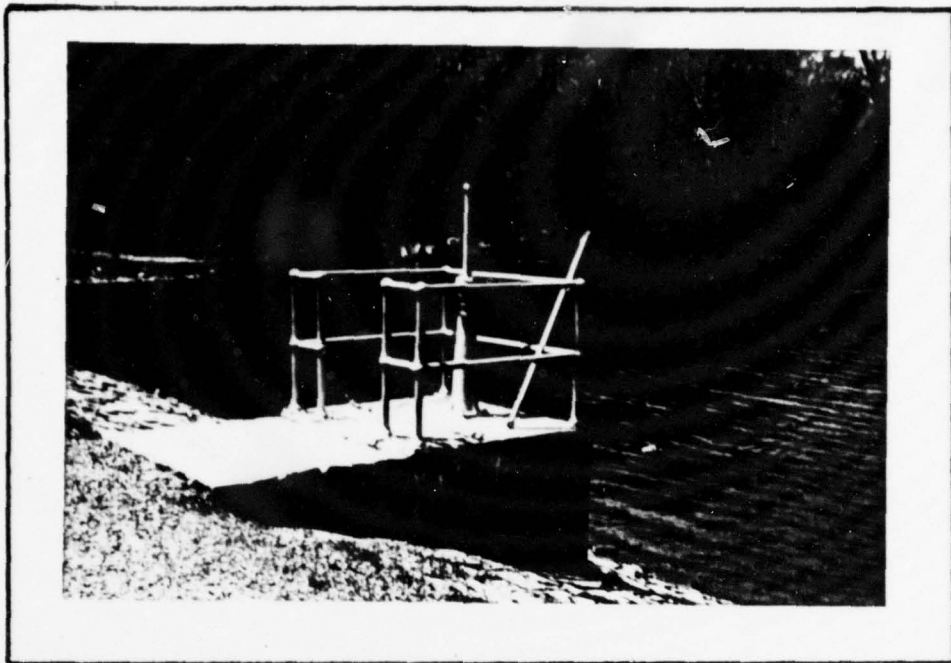
*STILLING BASIN AT THE DOWNSTREAM END
OF THE SPILLWAY DISCHARGE CHANNEL*



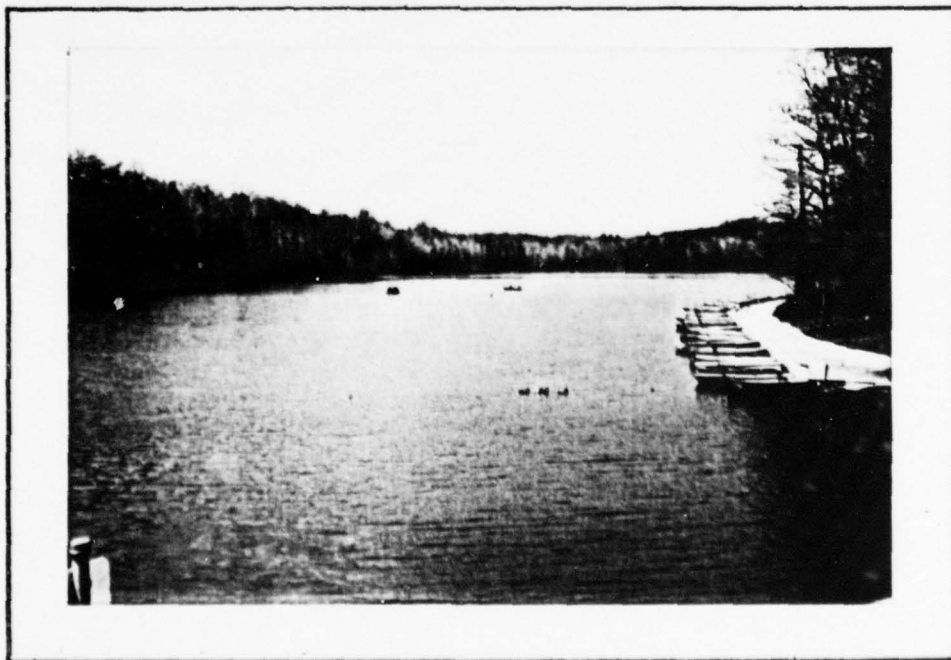
*WET AREA AT THE DOWNSTREAM TOE OF THE DAM SHOWING
SEEPAGE INTO THE RESERVOIR DRAIN OUTLET CHANNEL*



*SATURATED AREA DOWNSTREAM OF THE DAM ALONG
WITH FLOW IN THE RESERVOIR DRAIN OUTLET CHANNEL*



*GATE HOIST ON THE UPSTREAM FACE OF THE DAM FOR
THE RESERVOIR DRAIN OUTLET WORKS SLUICE GATE*



VIEW OF THE RESERVOIR FROM THE DAM

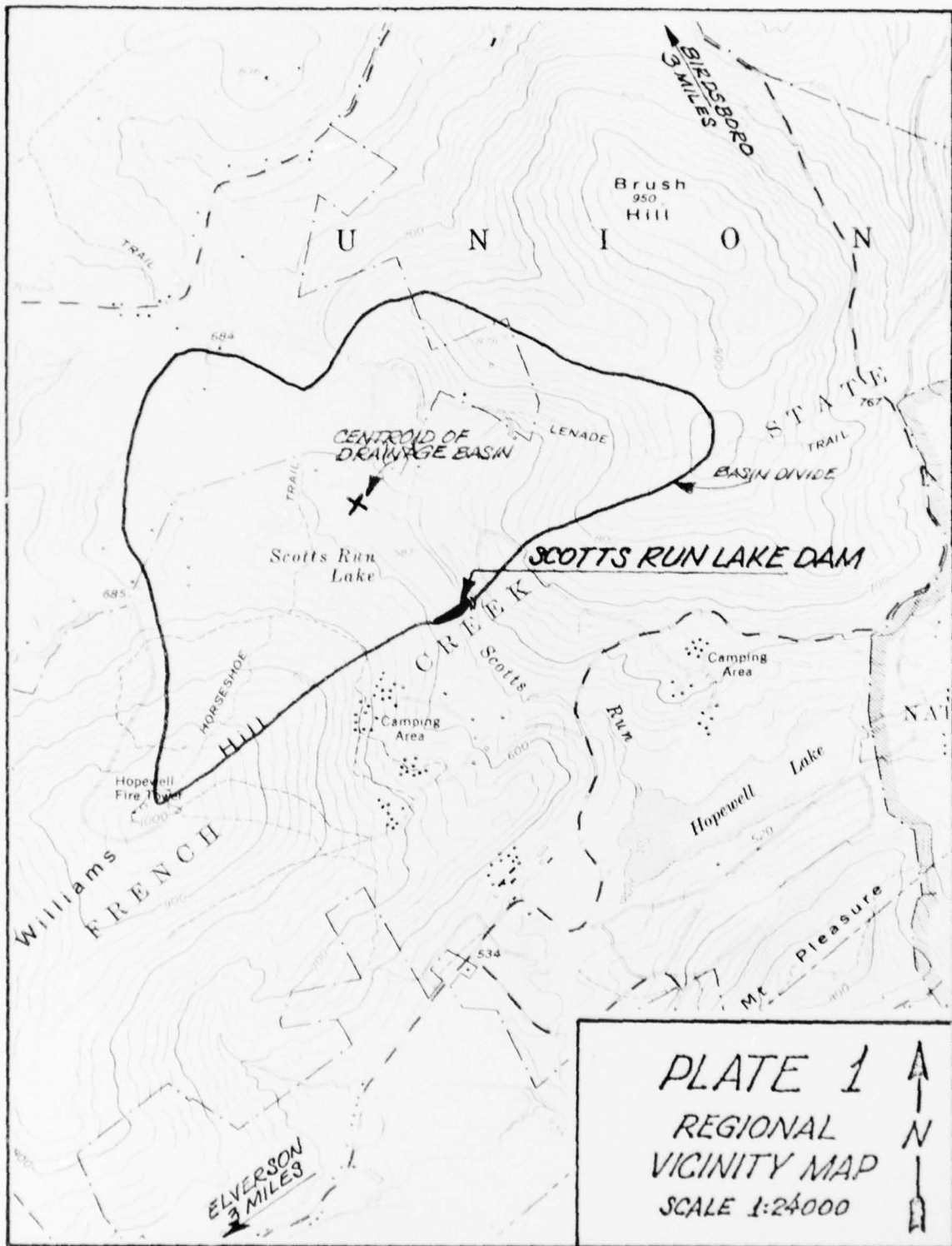
APPENDIX

E

Drawings

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REGIONAL VICINITY MAP	PLATE 1
GENERAL LAYOUT	PLATE 2
PLAN AND LONGITUDINAL SECTION	PLATE 3
CROSS SECTION	PLATE 4
SPILLWAY PLAN, ELEVATION, AND SECTIONS	PLATE 5
GENERAL PLAN DRAWING SHOWING PROBLEM AREAS	PLATE 6
PROFILE OF TOP OF DAM @ TIME OF INSPECTION	PLATE 7





PLAT

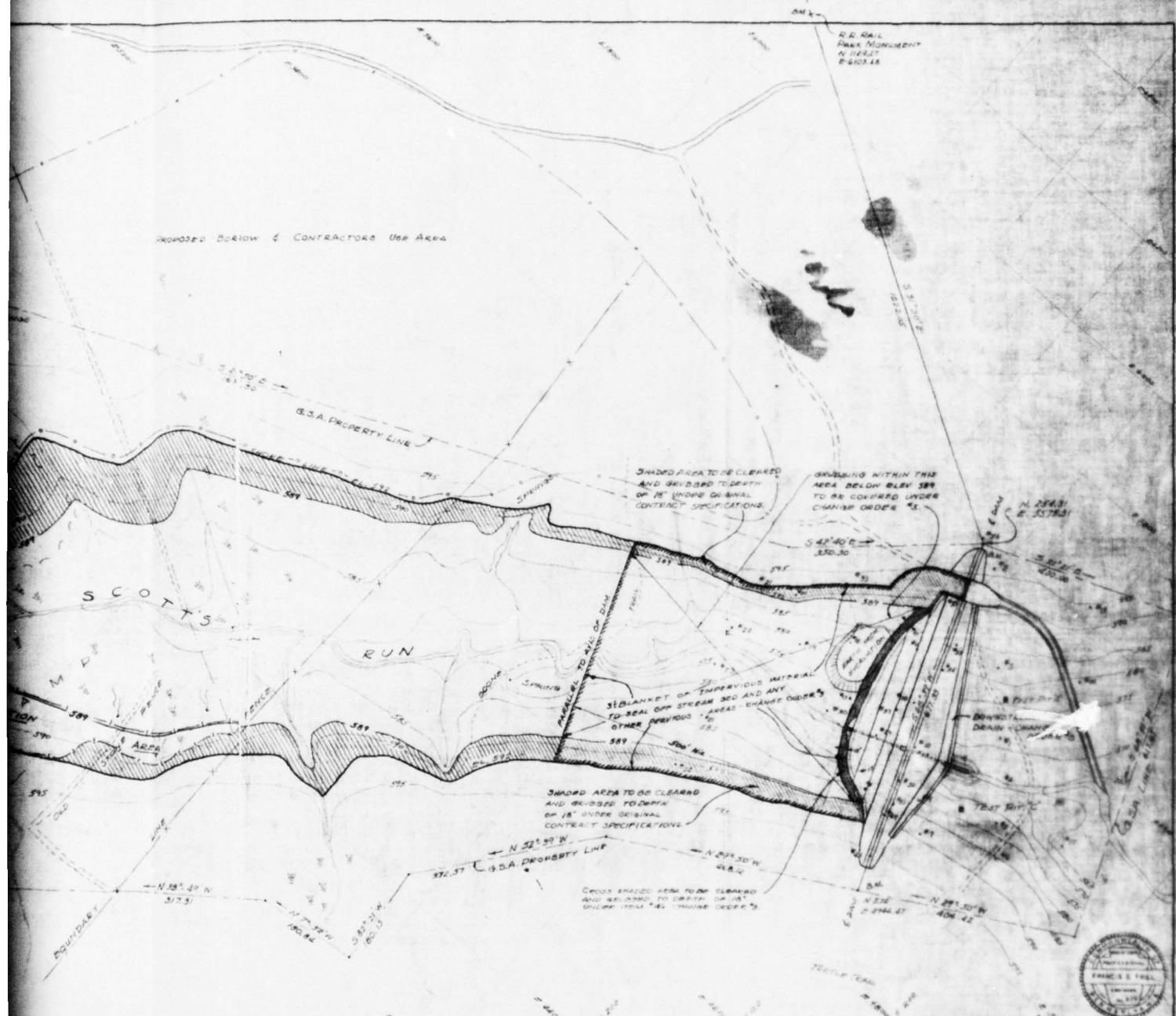


PLATE 2

REVISED		THE GENERAL STATE AUTHORITY		PROJECT NO. G.S.A. III-1			
		APPROVED	EXECUTION DIRECTOR	SCOTT'S RUN DAM			
		APPROVED	DIRECTOR	FRENCH CREEK STATE PARK RECREATIONAL AREA			
		SUBMITTED	<i>Francis S. Friel</i>	GENERAL LAYOUT			
		APPROVED	SECRETARY, DEPT. OF FORESTS & WATERS	ALBRIGHT & FRIEL, INC.			
		APPROVED	CHIEF, DEPT. OF FORESTS & WATERS	CONSULTING ENGINEERS PHILADELPHIA, PA.			
		APPROVED	DEPT. OF PROPERTY & SUPPLIES	1949 THE GENERAL STATE AUTHORITY SHEET NO.			
		ACCEPTED	CONTRACTOR	DATE JOHN & FINE PRESIDENT			
		ACCEPTED	CONTRACTOR	7-8-51 OSCAR N. LINDAH, EXEC. DIRECTOR			
		ACCEPTED	CONTRACTOR	SCALE HARRISBURG, PA.			
				CHECKED FOR P.S.A.			
				SUR ARCH ARCH BYBURY MECH. ELECT.			



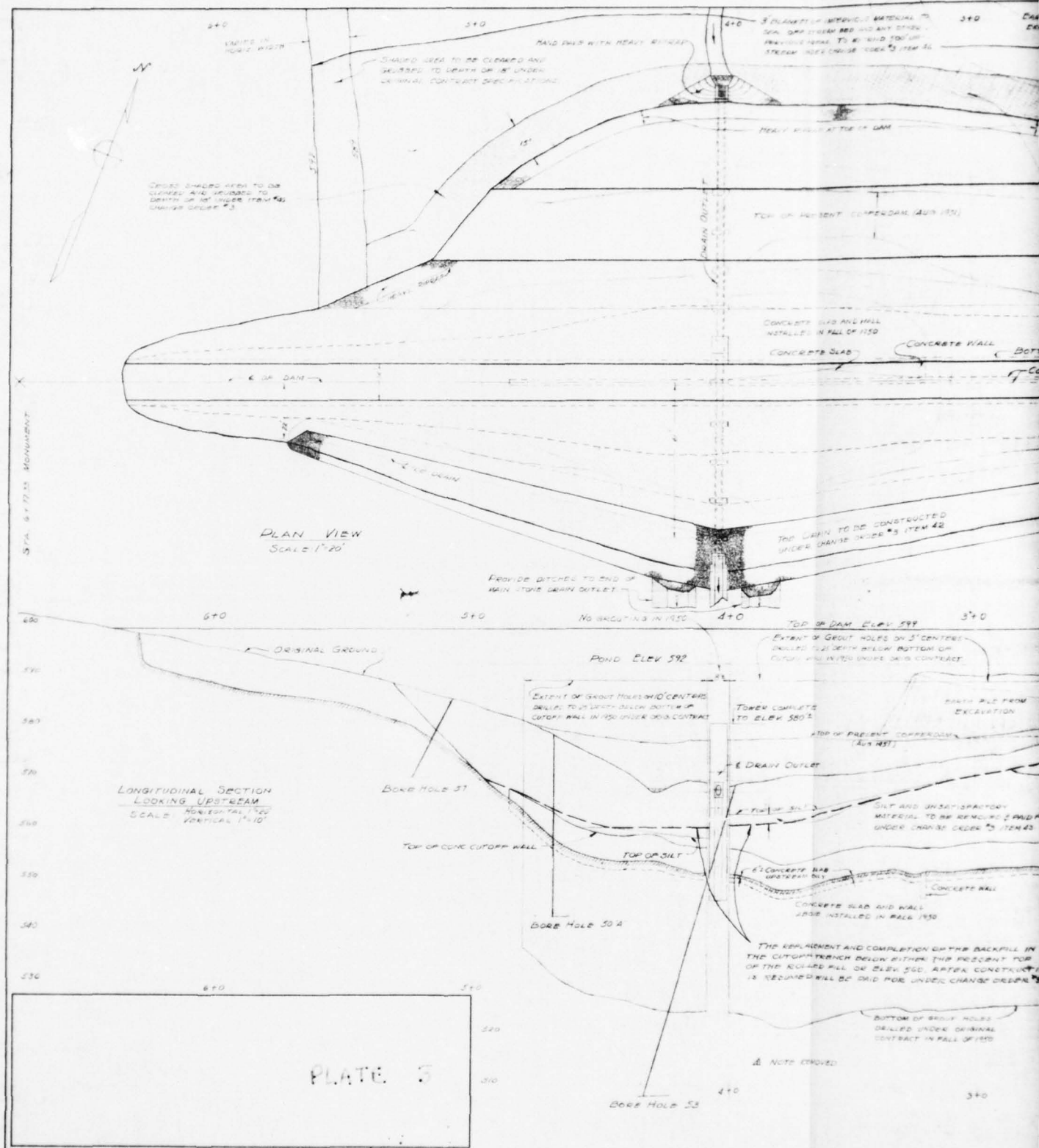


PLATE 5

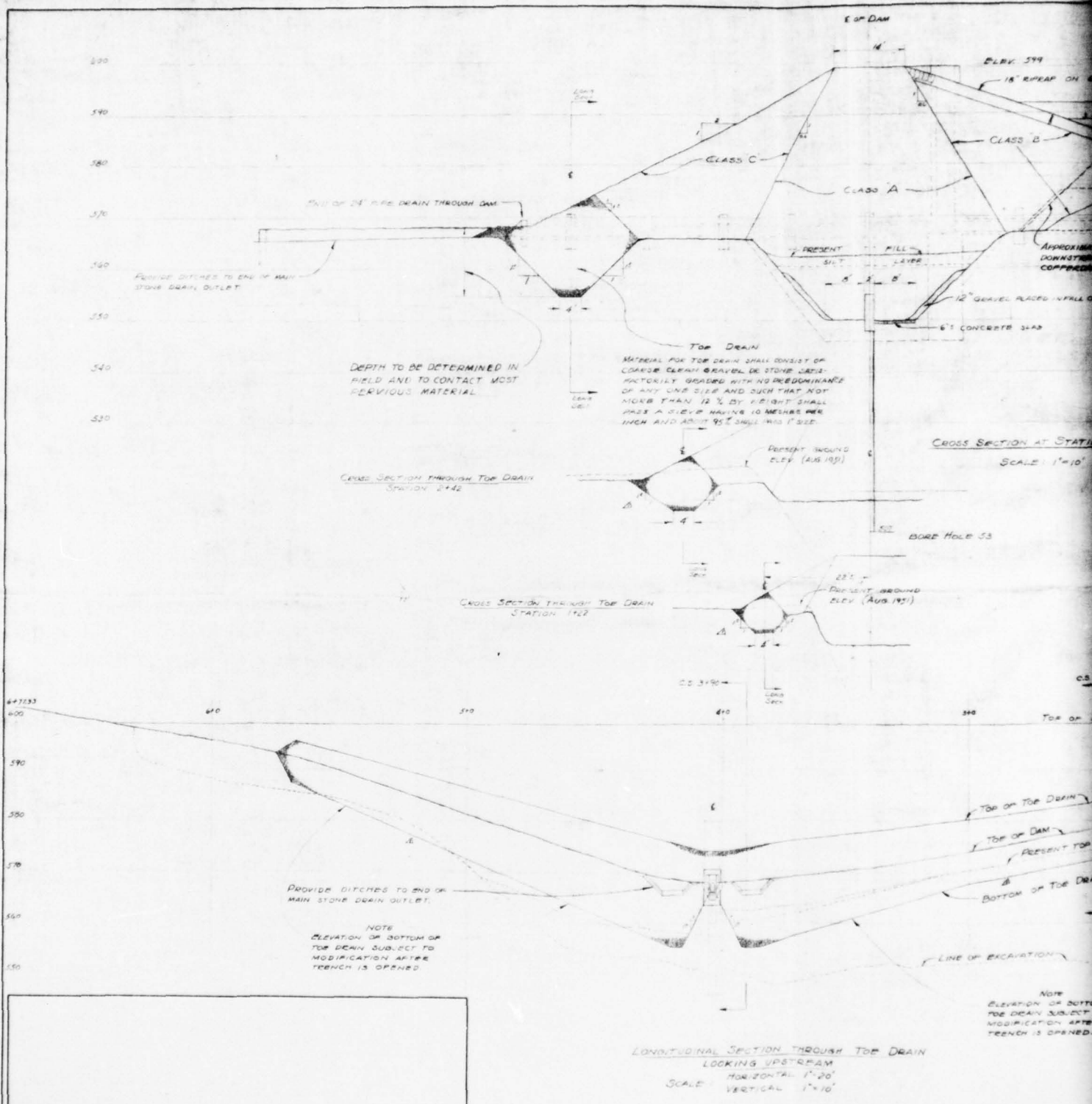
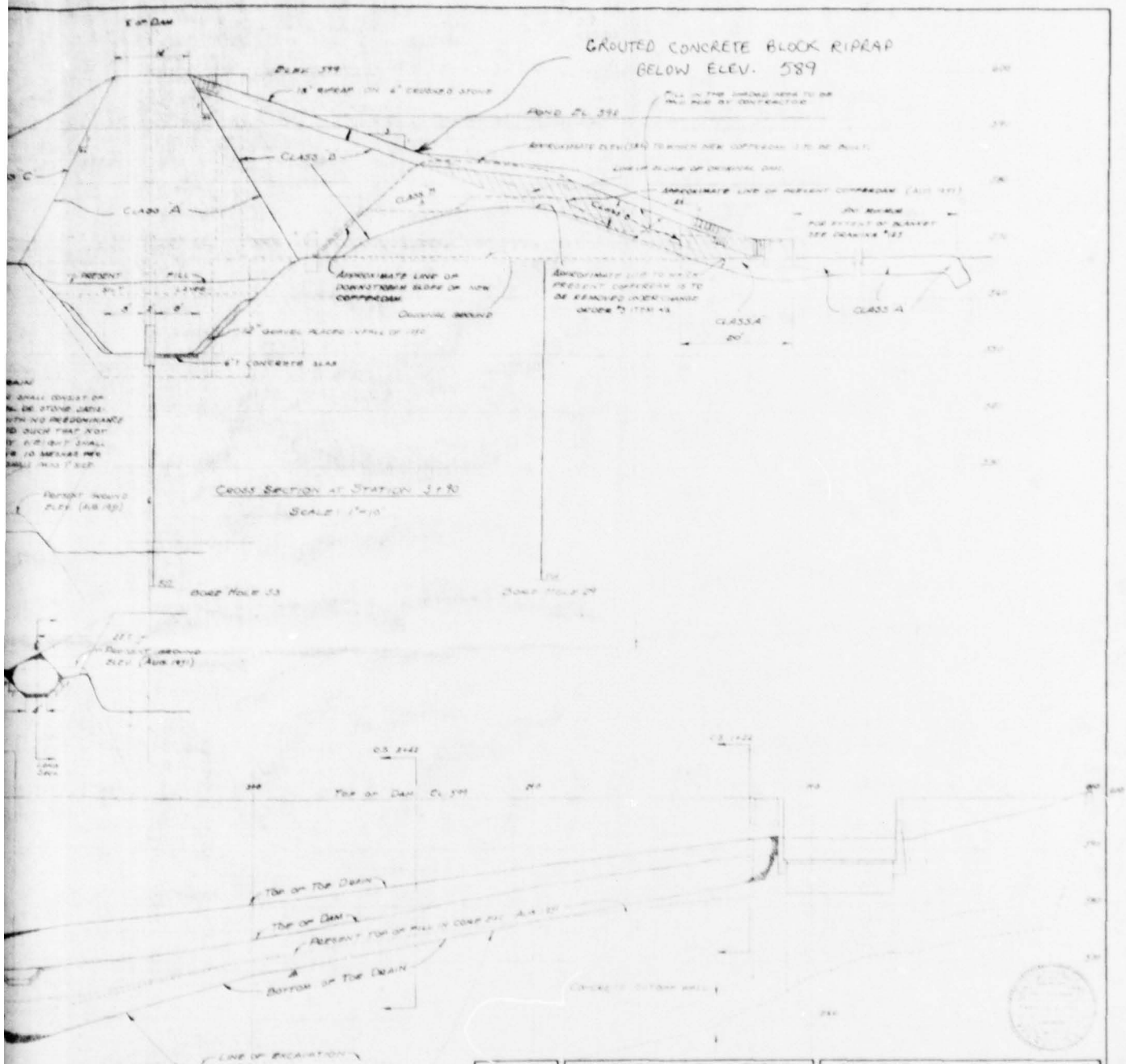
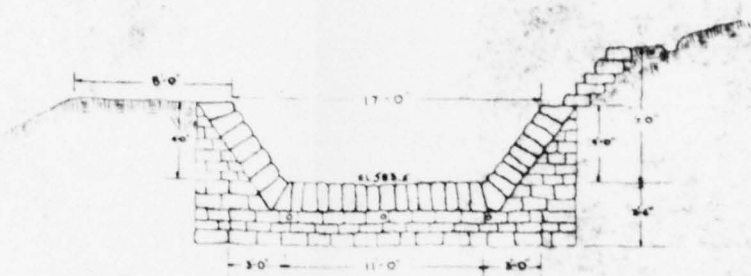
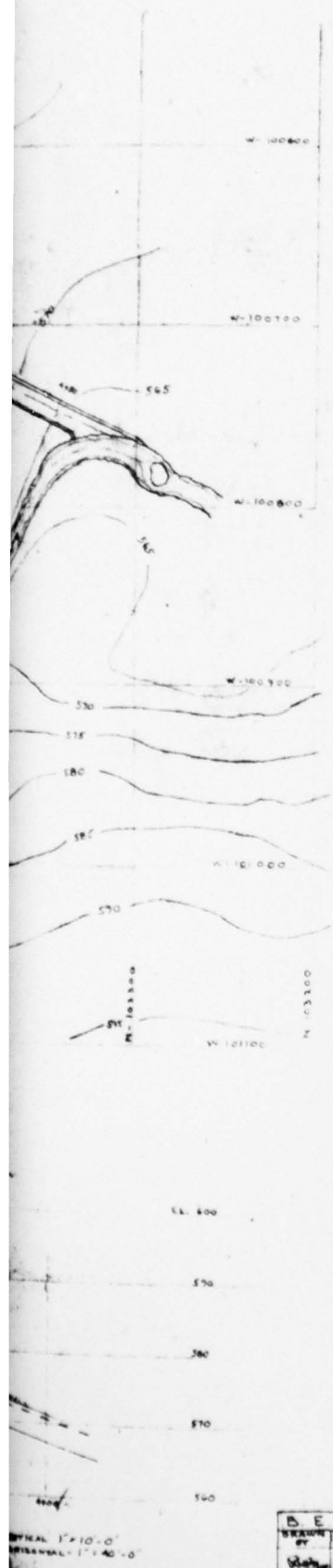


PLATE 4

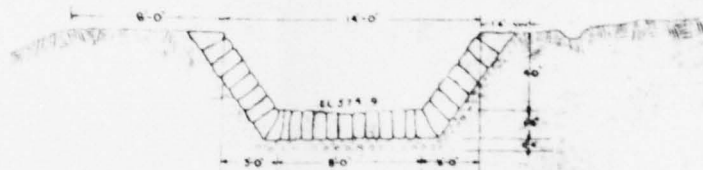


REVISED 1 2 3 4 5 6 7 8 9 10 11 12		THE GENERAL STATE AUTHORITY APPROVED BY <i>[Signature]</i> DIRECTOR APPROVED BY <i>[Signature]</i> ENGINEER SUBMITTED BY <i>[Signature]</i> SECRETARY, DEPT. OF FORESTS & WATERS APPROVED BY <i>[Signature]</i> CHIEF, DEPT. OF FORESTS & WATERS APPROVED BY <i>[Signature]</i> DEPT. OF PROPERTY & SUPPLIES ACCEPTED BY CONTRACTOR ACCEPTED BY CONTRACTOR ACCEPTED BY CONTRACTOR		PROJECT NO. G.S.A. III-1 SCOTT'S RUN DAM FRENCH CREEK STATE PARK RECREATIONAL AREA CROSS SECTION ALBRIGHT & FRIEL, INC. CONSULTING ENGINEERS PHILADELPHIA, PA. 1949 PROGRAM DATE 7-3-51 SCALE AS NOTED CHECKED FOR ARCH. BY ARCH. BY MECH. BY ELECT.			
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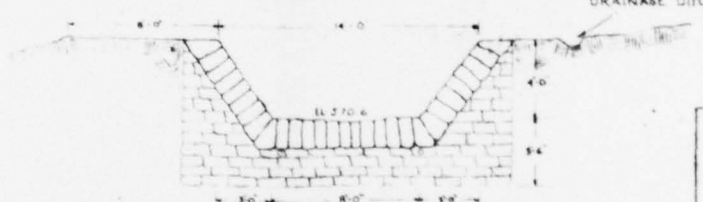
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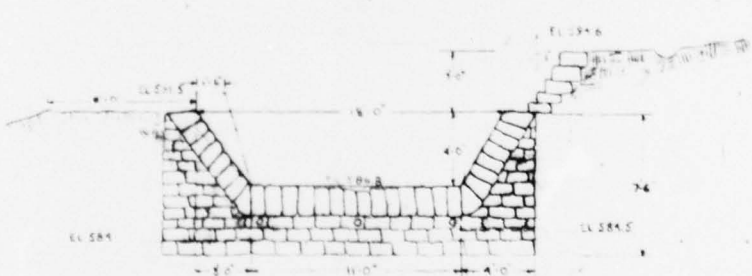
CROSS-SECTION - STATION 1+30
VIEW UPSTREAM - SCALE 1"=40'



CROSS-SECTION - STATION 3+00
VIEW UPSTREAM - SCALE 1"=40'



CROSS-SECTION - STATION 5+50
VIEW UPSTREAM - SCALE 1"=40'



CROSS-SECTION - STATION 0+65
VIEW UPSTREAM - SCALE 1"=40'

PRELIMINARY DRAWING

PLATE 5

REVISED <table border="1"> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </table>							THE GENERAL STATE AUTHORITY APPROVED: EXECUTIVE DIRECTOR APPROVED: DEPT. OF ENGINEER SUBMITTED: ENGINEERING OFFICES HCB-RE APPROVED: DEPARTMENT OF FOREST & WILDERNESS APPROVED: DEPT. OF PROPERTY & SUPPLIES APPROVED: DEPT. OF HEALTH ACCEPTED: CONTRACTOR BY ACCEPTED: CONTRACTOR BY ACCEPTED: CONTRACTOR BY		PROJECT NO GSA-146 SCOTT'S RUN DAM FRENCH CREEK STATE PARK RECREATIONAL AREA — SPILLWAY — PLAN, ELEVATION SECTIONS DATE: 9-12-49 SCALE: AS SHOWN THE GENERAL STATE AUTHORITY JAMES H. RUFF, PRESIDENT OSCAR MILLER, DEPT. DIRECTOR HARRISBURG, PA. SHEET NO. 22 CHECKED BY: STROUT MECH. FILED	

B.E.O. 2319-60
 DRAWN BY: [Signature]
 CHECKED BY: [Signature]
 DESIGNED BY: [Signature]
 APPROVED BY: [Signature]

SUBJECT	SCOTT'S RUN DAM	SHEET	BY	DATE	JOB NO.
			RRB		

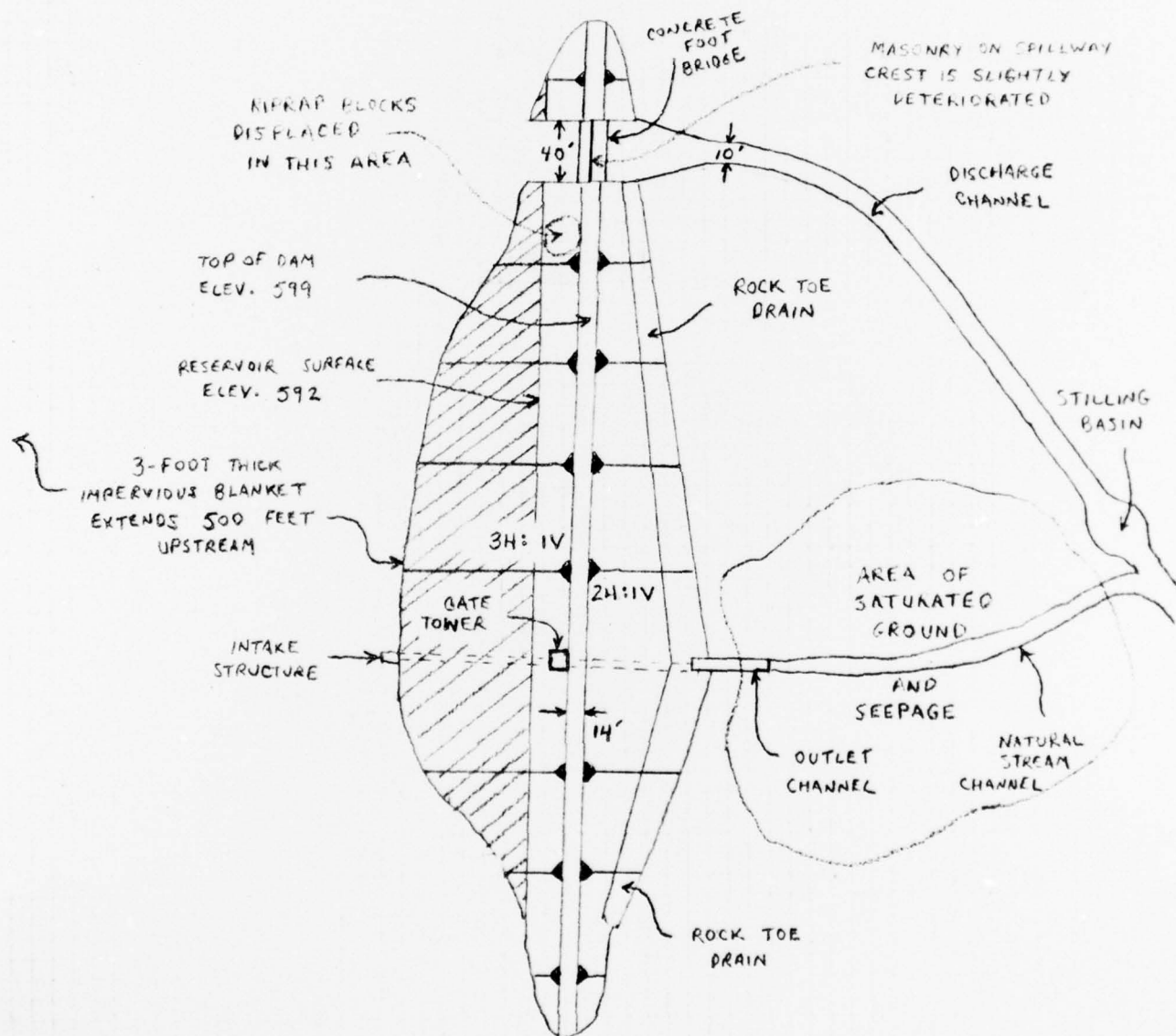
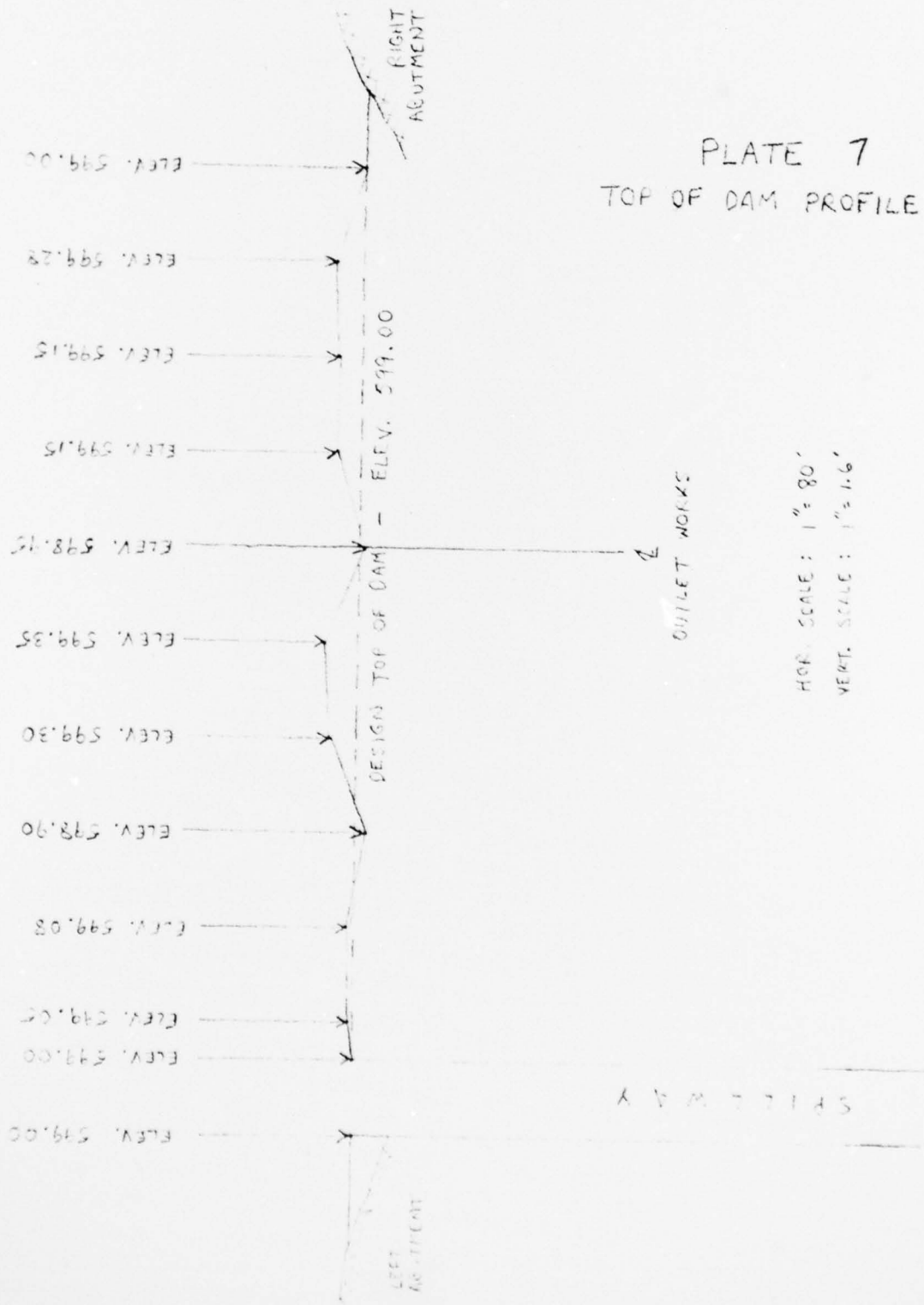


PLATE 6
PLAN VIEW
SHOWING PROBLEM AREAS

SUBJECT SCOTT'S RUN DAM	SHEET	BY H.R.G.	DATE	JOB NO.
----------------------------	-------	--------------	------	---------



APPENDIX

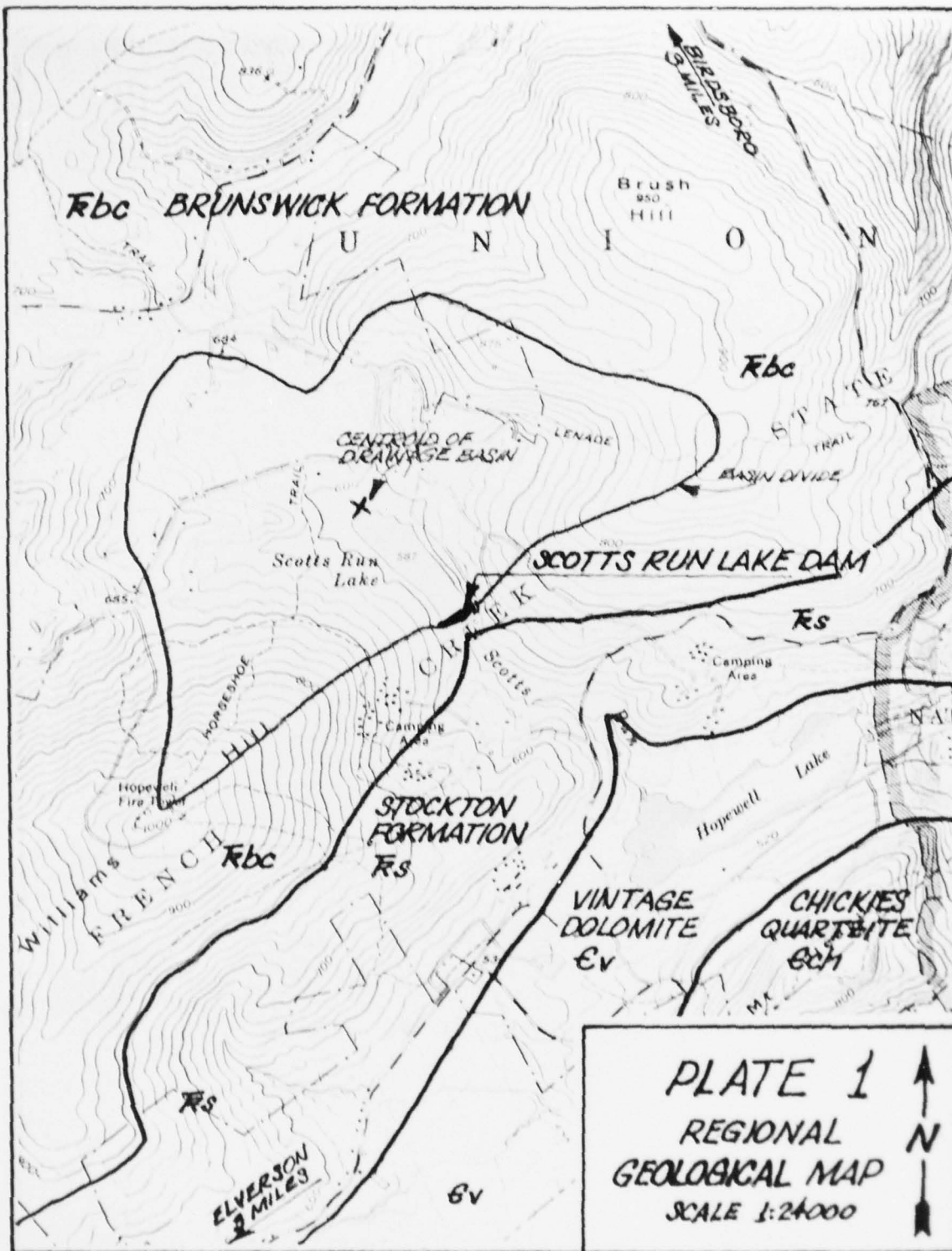
F

Site Geology

SITE GEOLOGY

SCOTT'S RUN DAM

Scott's Run is located in the Triassic Lowlands section of the Piedmont physiographic province. The dam is founded upon residual soils derived from the underlying red shale and conglomeratic units of the Brunswick formation. According to the stratigraphic sections resulting from subsurface exploration of the dam site, and from the geological report prepared for the dam design a dropped block of conglomerate and shale exists in the valley foundation. The exact limits of this block were postulated in the original report but verification was not recorded. If such structure exists it does not appear to have adverse effect on the stability of the dam. No major faults are noted in the vicinity of the dam or reservoir.



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