LEVEL

OHIO RIVER BASIN

UNNAMED TRIBUTARY TO FOURMILE RUN, WESTMORELAND COUNTY
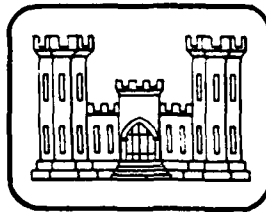
PENNSYLVANIA

BRESKIN POND DAM No. 1

NDI No. PA 01141
PennDER No. 65-141
Dam Owner: Joseph Breskin

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

prepared for

DEPARTMENT OF THE ARMY

Baltimore District, Corps of Engineers

Baltimore, Maryland 21203

prepared by

MICHAEL BAKER, JR., INC.

Consulting Engineers
4301 Dutch Ridge Road
Beaver, Pennsylvania 15009

April 1981

OHIO RIVER BASIN

BRESKIN POND DAM NO. 1
WESTMORELAND COUNTY, COMMONWEALTH OF PENNSYLVANIA
(NDI PA-01141
PennDER No. 65-141)

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Contract/ DACW 31-81-C-0011

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 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

Breskin Pond Dam No. 1, Westmoreland County, Pennsylvania
NDI No. PA 01141, PennDER No. 65-141
Unnamed Tributary to Fourmile Run
Inspected 5 December 1980

ASSESSMENT OF
GENERAL CONDITIONS

Breskin Pond Dam No. 1, owned by Joseph Breskin, is classi-
fied as a "Significant" hazard - "Small" size dam. The dam
was found to be in fair overall condition at the time of
inspection.

Hydraulic/hydrologic evaluations, performed in accordance
with procedures established by the Baltimore District, Corps
of Engineers, for Phase I Inspection Reports, revealed that
the spillway will pass approximately 30 percent of the
Probable Maximum Flood (PMF) before overtopping will occur.
A spillway design flood (SDF) in the range of the 100-year
flood to the 1/2 Probable Maximum Flood (1/2 PMF) is required
for Breskin Pond Dam No. 1. The 100-year flood was chosen
because the dam is on the low end of the "Small" size category
in terms of storage capacity. The total duration and maximum
depth of overtopping during the 100-year flood are 0.6 hours
and 0.34 foot, respectively. The spillway is therefore
assessed as being "Inadequate." It is recommended that the
owner, under the guidance of a professional engineer, develop
remedial measures to ensure that the dam will not be overtopped
by the 100-year flood.

The inspection and review of available information revealed
certain items of work which should be performed without
delay by the owner. Item 1 below should be completed under
the guidance of a qualified professional engineer experi-
enced in the design and construction of earth dams.

1)   Develop remedial measures to ensure that the dam
      will not be overtopped by the 100-year flood.

2)   Provide riprap or some means of protecting the
      emergency spillway channel from erosion during the
      SDF.

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3) Cut the brush and saplings on the downstream slope.

4) Fill the rodent hole on the downstream face of the embankment.

A formal emergency warning system has been prepared. It is recommended that formal emergency operation procedures for the dam be prepared. It is further recommended that formal inspection, maintenance, and operation procedures and records be developed and implemented. These should be included in a formal maintenance and operations manual for the dam.

Submitted by:

MICHAEL BAKER, JR., INC.

John A. Dziubek, P.E.
Engineering Manager-Geotechnical

Date: April 24, 1981

Approved by:

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS

JAMES W. PECK
Colonel, Corps of Engineers
District Engineer

Date: 11 MAY 81

BRESKIN POND DAM No. 1

Overall View of Dam from Right Abutment

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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 of Inspection - The purpose of the inspec-
     tion is to determine if the dam constitutes a
     hazard to human life or property.

1.2 DESCRIPTION OF PROJECT

a.   Description of Dam and Appurtenances - Breskin
     Pond Dam No. 1 is an earthfill embankment with a
     height of 29 feet and a length of 338 feet. The
     embankment has a minimum crest elevation of 1491.8
     feet Mean Sea Level (ft. M.S.L.), a crest width of
     24 feet and side slopes of 2.25H:1V (Horizontal to
     Vertical) upstream and 2H:1V downstream.

     The principal spillway of the dam consists of a
     30-inch diameter bituminous coated corrugated
     metal pipe (BCCMP) which acts as a fixed crest
     riser. It is connected to a 24-inch BCCMP that
     extends through the embankment and exits near the
     toe. According to the owner, there are four
     corrugated metal anti-seep collars (6 ft. by
     6 ft.) on this pipe. The crest of the principal
     spillway is at elevation 1488.5 ft. M.S.L. and is
     protected with a trash rack.

     The emergency spillway, located on the right
     abutment, is an unvegetated (at time of inspection)
     earth trapezoidal channel. The spillway has a
     bottom width of 6 feet (perpendicular to flow) and
     side slopes of 5H:1V. The spillway crest elevation
     of 1489.9 ft. M.S.L. is about 2 feet lower than
     the minimum top of dam. The spillway empties into
     a grass-lined trapezoidal discharge channel.

There is an 8-inch BCCMP running through the bottom of the embankment that can be used to dewater the reservoir. This pipe is controlled by an Armco slide gate which is operated from the upstream crest of the embankment. According to the owner, there are four corrugated metal anti-seep collars (5 ft. by 5 ft.) on this pipe. There is also a leaf gate located at the outlet end of the pipe.

b. Location - Breskin Pond Dam No. 1 is located on an unnamed tributary of Fourmile Run, approximately 3.8 miles north of Mansville, Pennsylvania. The structure is located in Ligonier Township, Westmore-land County, Pennsylvania. The coordinates of the dam are N 40° 13.9' and W 79° 19.3'. The dam and reservoir are shown on USGS 7.5 minute topographic quadrangle, Stahlstown, Pennsylvania.

c. Size Classification - The height of the dam is 29 feet. The reservoir volume to the top of dam, elevation 1491.8 ft. M.S.L., is 36 acre-feet. Therefore, the dam is in the "Small" size category.

d. Hazard Classification - There are a low number of habitable structures which might be affected by a failure of Breskin Pond No. 1. There is one residential structure located immediately downstream from the dam in which there is likely to be economic damage and loss of life if the dam were to fail. This house is approximately 5 to 10 feet above the streambed.

Breskin Pond No. 2 (NDI No. PA 00485, PennDER No. 65134) is located approximately 1700 feet downstream from Breskin Pond No. 1. Breskin Pond Dam No. 2 has been classified as a "High" hazard dam. One house and one summer cottage are located 2000 feet downstream of Breskin Pond No. 2. Economic damage to these structures, as well as to a secondary road and driveways, is likely to occur. However, failure of Breskin Pond No. 1 is not likely to cause loss of life in the damage center downstream from Breskin Pond No. 2. Breskin Pond No. 1 is therefore classified as a "Significant" hazard dam.

e. Ownership - The dam is owned by Joseph Breskin, 506 MaGee Building, 336 Fourth Avenue, Pittsburgh, PA 15222.

f. <u>Purpose of Dam</u> - The reservoir created by the dam is used for recreation.

g. <u>Design and Construction History</u> - Breskin Pond Dam No. 1 was constructed in 1971 by Latimer Construction Company of New Alexandria, Pennsylvania. J. Fred Triggs, P.E., of Pittsburgh, Pennsylvania, and Ronald E. Kelley, P.E., of Greensburg, Pennsylvania, conducted separate engineering studies and made recommendations for modifications of the dam in 1972. Modifications of the dam in accordance with the plans and specifications prepared by Ronald E. Kelley were completed in 1973.

h. <u>Normal Operating Procedures</u> - The normal depth of the reservoir is approximately 4 feet (elevation 1472.6 ft. M.S.L.). The owner indicates that the impoundment has a leaky reservoir which cannot maintain a full pool; therefore, he cannot raise the reservoir level to the crest of the principal spillway.

1.3 PERTINENT DATA

a. <u>Drainage Area (square miles)</u> -   0.2

b. <u>Discharge at Dam Site (c.f.s.)</u> -

Maximum Flood   Unknown
Spillway Capacity at Maximum Pool
  (El. 1491.8 ft. M.S.L.) -   154

c. <u>Elevation* (feet above Mean Sea Level [ft. M.S.L.])</u> -

Design Top of Dam -   Unknown
Minimum Top of Dam -   1491.8
Maximum Design Pool -   Unknown
Principal Spillway Crest -   1488.5
Streambed at Toe of Dam -   1463.0
Maximum Tailwater of Record -   Unknown

d. <u>Reservoir (feet)</u> -

Length of Maximum Pool
  (El. 1491.8 ft. M.S.L.) -   600
Length of Normal Pool
  (El. 1488.5 ft. M.S.L.) -   400

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*All elevations are referenced to assumed elevation for the centerline of the adjacent roadway, El. 1500.0 ft. M.S.L., as assumed from the USGS 7.5 minute topographic quadrangle, Stahlstown, Pennsylvania.

e.   Storage (acre-feet) -

    Top of Dam (El. 1491.8 ft. M.S.L.) -   36
    Normal Pool (El. 1488.5 ft. M.S.L.) -   29

f.   Reservoir Surface (acres) -

    Top of Dam (El. 1491.8 ft. M.S.L.) -   2.37
    Normal Pool (El. 1488.5 ft. M.S.L.) -   1.84

g.   Dam -

    Type - Earthfill
    Total Length Without Spillway (feet) -   338
    Height (feet) - Design -   Unknown
                    Field -   29
    Top Width (feet) -   24
    Side Slopes - Upstream -   2.25H:1V
                  Downstream -   2H:1V
    Zoning -   None
    Impervious Core -   None
    Cut-off -   None
    Drains -   None

h.   Diversion and Regulating Tunnels -   None

i.   Principal Spillway -

    Type - 30-inch BCCMP riser pipe connected to a
      24-inch BCCMP outlet conduit.
    Location - Right-center of embankment.
    Crest Elevation (ft. M.S.L.) -   1488.5
    Gates -   None
    Downstream Channel - Spillway discharges near
                         downstream toe of dam and
                         flows to the original stream
                         channel.

j.   Emergency Spillway -

    Type - Trapezoidal earth channel
    Location - Right abutment
    Bottom Width of Channel Perpendicular
      to Flow (feet) -   6
    Side Slopes   5H:1V
    Crest Elevation (ft. M.S.L.) -   1489.9
    Gates -   None
    Downstream Channel - Spillway discharges past
                         embankment and into the
                         original stream channel.

k.   Outlet Works - 8-inch BCCMP controlled by Armco
                     slide gate, operated from crest of
                     embankment.

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SECTION 2 - ENGINEERING DATA

2.1 DESIGN

The information reviewed consisted of File 65-141 of the Pennsylvania Department of Environmental Resources (PennDER). This file contained the following information:

1) The contract between Joseph and Kathleen Breskin and Latimer Construction Company of New Alexandria, Pennsylvania for the construction of two dams, dated 10 September 1971.

2) Various correspondence between Joseph Breskin and the Department of Forest and Waters and the Department of Environmental Resources regarding the design and safety of the dam.

3) An engineering report on the condition of Breskin Pond Dam No. 1 by J. Fred Triggs, P.E., dated 27 February 1972.

4) Test results and boring logs on the soils at the dam site by Pittsburgh Testing Laboratory, dated 10 June 1972.

5) Design plans for a spillway by J. Fred Triggs, P.E., dated 10 June 1972.

6) Design plans for an emergency spillway plan and an engineering report on the dam by Ronald E. Kelley, P.E., dated 24 June 1972.

7) Final report on completion of modifications to the Breskin Dams by Ronald E. Kelley, P.E., dated 20 July 1973.

8) An inspection report on Breskin Pond Dam No. 2, conducted on 26 May 1978, stating that Breskin Pond Dam No. 1 was found to be dewatered and water was flowing through the 8-inch diameter outlet pipe.

2.2 CONSTRUCTION

Breskin Pond Dam No. 1 was constructed in 1971 by Latimer Construction Company of New Alexandria,

Pennsylvania. The spillway of the dam was modified in accordance with plans and specifications prepared by Ronald E. Kelley, P.E., of Greensburg, Pennsylvania. This work was completed in July of 1973.

2.3 OPERATION

Mr. Joseph Breskin, the owner, and his caretaker, Elmer Lenhart, are responsible for the maintenance and operation of the dam. Mr. Breskin visits the dam daily. Maintenance procedures and a general inspection of the dam are performed monthly. However, there is no operation and maintenance manual.

2.4 EVALUATION

a. Availability - PennDER File No. 65-141 contains the design drawings, correspondence and memorandums for Breskin Pond Dam No. 1.

b. Adequacy - The information available is generally adequate for a Phase I Inspection.

c. Validity - Observations and measurements performed during the visual inspection indicated a few deviations from the design drawings of the emergency spillway of the dam. These are:

1) There is no thin layer of concrete over the embankment at the emergency spillway.

2) There is no riprap on the right downstream embankment below the discharge channel of the emergency spillway.

3) The emergency spillway discharge channel is not lined with riprap.

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SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. <u>General</u> - The dam was found to be in fair overall condition at the time of inspection on 5 December 1980. No unusual weather conditions were experienced during the inspection. The pool level was approximately 16 feet below riser crest (normal pool) level. Noteworthy deficiencies observed during the visual inspection are described briefly in the following paragraphs. The complete visual inspection checklist, field sketch, top of dam profile, and typical cross-section are given in Appendix A.

b. <u>Dam</u> - The downstream slope is covered with brush and small saplings. A rodent hole was observed at Station 3+25, approximately 7 feet below the crest. The owner reports that the reservoir will not hold water. He reports that a rise of 3 to 4 inches occurs in his springhouse downstream from the dam when the lake is full. No outlet for seepage from the reservoir was observed in the immediate area of the dam during the inspection.

c. <u>Appurtenant Structures</u> - An 8-inch Armco slide gate, which can be operated from near the crest on the upstream slope, serves as closure for the outlet pipe. The crank rods for this slide gate are bent; however, the owner reports the slide gate is operational. The discharge end of the principal spillway is located 6.5 feet above the downstream toe of the embankment. Because of the present configuration of the outlet end of the principal spillway, there is potential for scour and erosion of a portion of the embankment. At the time of the inspection, this area was not eroded; however, it should be examined in future inspections. The emergency spillway is located at the right abutment of the dam. Approximately half of the control section is excavated to bedrock; the other half consists of erodible soils without vegetation (i.e., grass) cover.

d. <u>Reservoir Area</u> - The reservoir slopes are moderate with no signs of instability. Sedimentation is not a problem for this impoundment. The owner

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indicates that this impoundment has a leaky reservoir which cannot maintain a full pool.

e. <u>Downstream Channel</u> - There is a two-story wooden frame residence approximately 200 feet downstream of the dam to the left of the downstream channel. Breskin Pond Dam No. 2 (NDI No. PA 00485, PennDER No. 65-134) is located approximately 1700 feet downstream of Breskin Pond Dam No. 1. Ackenheil and Associates has prepared a Phase I Inspection Report for Breskin Pond Dam No. 2, dated 21 August 1980. One house and one summer cottage are located 2000 feet downstream of Breskin Pond Dam No. 2. These may suffer economic damage if Breskin Pond Dam No. 1 were to fail.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

There is a formal warning and evacuation plan in effect for Breskin Pond Dam No. 1. The plan was written in October 1980 and includes a plan to alert downstream occupants and local authorities of the procedures that should be followed in the event of a severe flood or imminent failure of the dam.

4.2 MAINTENANCE OF DAM

There are no formal records of maintenance or formal procedures for evaluating the necessity of maintenance for the structure. It is recommended that formal inspection procedures be developed.

4.3 MAINTENANCE OF OPERATING FACILITIES

The only operating facility at Breskin Pond Dam No. 1 is an 8-inch gate valve on the bottom of the upstream embankment. This gate valve is operated by a control at the upstream crest of the embankment. According to the owner, this valve and operating equipment is oiled and checked regularly by his caretaker. This valve is used to draw down the reservoir during the winter months.

4.4 DESCRIPTION OF ANY WARNING SYSTEM

There is a formal warning and evacuation plan in effect for Breskin Pond Dam No. 1. The plan was written in October 1980 and includes a plan to alert downstream occupants and local authorities of the procedures that should be followed in the event of a severe flood or imminent failure of the dam.

4.5 EVALUATION OF OPERATIONAL ADEQUACY

The current operational features are adequate for the purpose they serve. However, it is recommended that a formal maintenance and operations manual be prepared for this dam.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 EVALUATION OF FEATURES

a. **Design Data** - No hydrologic or hydraulic design calculations are available for Breskin Pond Dam No. 1.

b. **Experience Data** - There is no information available on the maximum reservoir level or discharge.

c. **Visual Observations** - There is one low spot on the crest of the dam, located near the center of the embankment at Station 2+50. This spot is approximately 1.9 feet above the spillway crest.

The velocity in the emergency spillway during the 1/2 PMF is approximately 7 f.p.s. which will cause erosion of the unprotected channel. The spillway channel should have riprap or some other type of erosion protection.

No other problems were observed during the inspection which would indicate that the dam and appurtenant structures could not perform satisfactorily during a flood event.

d. **Overtopping Potential** - Breskin Pond Dam No. 1 is a "Small" size - "Significant" hazard dam requiring evaluation for a spillway design flood (SDF) in the range of the 100-year flood to the 1/2 Probable Maximum Flood (1/2 PMF). Because of the small size of the impoundment, the 100-year flood was selected as the SDF.

The hydraulic capacity of the dam, reservoir and spillway was assessed by using the U.S. Army Corps of Engineers' Flood Hydrograph Package, HEC-1 DB. The hydrologic characteristics of the drainage basin, specifically the Snyder's unit hydrograph parameters, were obtained from a regionalized analysis conducted by the Baltimore District of the U.S. Army Corps of Engineers.

Analysis of the dam and spillway shows that the dam would be overtopped by the 100-year flood for a total duration of 0.60 hour by a maximum depth of 0.34 foot.

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e. <u>Spillway Adequacy</u> - As outlined in the above
    analyses, the spillway will not pass the SDF
    without overtopping the dam; therefore, the spillway
    is considered "Inadequate."

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations - There were no structural inadequacies noted during the visual inspection that cause concern for the structural stability of the dam.

b. Design and Construction Data - A boring was performed by Pittsburgh Testing Laboratories on 3 January 1972. This boring went through the embankment and into the underlying foundation. A shelby tube sample was extracted from a depth of 5.0 ft. to 6.5 ft. A sample from this shelby tube was sheared in a direct shear apparatus with the following results:

    Cohesion (c) =   0.26 TSF
    Angle of Internal Friction (ϕ) = 34.4°

    A 27 February 1972 Engineering Report by J. Fred Triggs, P.E., contained the following information concerning the stability analysis:

    "Stability analyses have been made in accordance with recommended procedures in 'Engineering for Dams,' by Justin, Hinds and Craeger, John Wiley and Sons, Inc., June 1957. These analyses show a Factor of Safety in Resistance to Sliding of 73914/24,500 or 3.02; a Factor of Safety of Stability against Headwater Pressure of 51.53/14.84 or 3.47; and a Factor of Stability in the case of Instant Drawdown of 42,058/20980 or 2.004."

    Since no sign of distress was observed in the field and the slopes have had a history of satisfactory performance, further assessments of the structural stability are not considered necessary. However, should future inspections observe signs of distress or seepage which would affect the structural stability of the dam, additional evaluations and corrective measures may become necessary.

c. Operating Records - No operating records are available. Nothing in the procedures described by the owner indicates concern for the structural stability of the dam.

d. <u>Post-Construction Changes</u> - No changes adversely affecting the structural stability of the dam have been performed.

e. <u>Seismic Stability</u> - The dam is located in Seismic Zone 1 of the "Seismic Zone Map of the Contiguous United States," Figure 1, page D-30, "Recommended Guidelines for Safety Inspection of Dams." This is a zone of minor seismic activity; therefore, further consideration of the seismic stability is not warranted.

SECTION 7 - ASSESSMENT, RECOMMENDATIONS, REMEDIAL MEASURES

7.1 DAM ASSESSMENT

a. Safety - Breskin Pond Dam No. 1 was found to be in fair overall condition at the time of inspection. The dam is a "Significant" hazard - "Small" size dam requiring a spillway capacity in the range of the 100-year flood to the 1/2 PMF. The 100-year flood was chosen as the SDF because the dam is on the low end of the "Small" size category in terms of storage capacity. As presented in Section 5, the spillway and reservoir are not capable of passing the 100-year flood without overtopping of the dam. During the 100-year flood, the depth and duration of overtopping are 0.34 foot and 0.60 hours, respectively. Therefore, spillway is considered to be "Inadequate".

b. Adequacy of Information - The information available and the observations made during the visual inspection are considered sufficient for this Phase I Inspection Report.

c. Urgency - The owner should immediately initiate the further investigation discussed in paragraph 7.1.d.

d. Necessity for Additional Data/Evaluation - The hydraulic/hydrologic analysis performed in connection with this Phase I Inspection Report has indicated the need for additional spillway capacity. It is recommended that the owner of Breskin Pond Dam No. 1, under the guidance of a professional engineer, develop remedial measures to ensure that the dam will not be overtopped by the 100-year flood.

7.2 RECOMMENDATIONS/REMEDIAL MEASURES

The inspection and review of information revealed certain items of work which should be performed without delay by the owner. Item 1 below should be completed under the direction of a qualified professional engineer experienced in the design and construction of earth dams.

1) Develop remedial measures to ensure that the dam will not be overtopped by the 100-year flood.

2) Provide riprap or some means of protecting the emergency spillway channel from erosion during the SDF.

3) Cut the brush and saplings on the downstream slope.

4) Fill the rodent hole on the downstream face of the embankment.

A formal emergency warning system has been prepared. It is recommended that formal emergency operation procedures for the dam be prepared. It is further recommended that formal inspection, maintenance, and operation procedures and records be developed and implemented. These should be included in a formal maintenance and operations manual for the dam.

APPENDIX A

VISUAL INSPECTION CHECK LIST, FIELD SKETCH,
TOP OF DAM PROFILE, AND TYPICAL CROSS-SECTION

Check List
Visual Inspection
Phase 1

Name of Dam Breskin Pond Dam No. 1   County Westmoreland   State PA   Coordinates Lat. N40° 13.9'

NDI # PA 01141   Long. W79° 19.3'
PennDER # 65-141

Date of Inspection 5 December 1980   Weather Cloudy   Temperature 35° F.

                                    1472.57   1463.19
Pool Elevation at Time of Inspection _____ ft. M.S.L.* Tailwater at Time of Inspection _____ ft. M.S.L.

*All elevations referenced to assumed elevation for the centerline of the adjacent roadway,
El. 1500.0 ft. M.S.L. as assumed from USGS 7.5 minute topographic quadrangle, Stahlstown,
Pennsylvania.

Inspection Personnel: Michael Baker, Jr., Inc.:   Owner's Representatives:

                        James G. Ulinski   Joseph Breskin
                        Jeffrey S. Maze
                        Gary W. Todd

                                    James G. Ulinski   Recorder

CONCRETE/MASONRY DAMS - Not Applicable

Name of Dam: BRESKIN POND DAM NO. 1

NDI # PA 01141

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
LEAKAGE		
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS		
DRAINS		
WATER PASSAGES		
FOUNDATION		

CONCRETE/MASONRY DAMS - Not Applicable

Name of Dam: BRESKIN POND DAM NO. 1

NDI # PA 01141

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

EMBANKMENT

Name of Dam BRESKIN POND DAM NO. 1

NDI # PA 01141

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
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	

EMBANKMENT

Name of Dam BRESKIN POND DAM NO. 1

NDI # PA 01141

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	No problem observed	
RIPRAP FAILURES	None observed	
VEGETATION	The downstream slope is covered with brush and small saplings.	Cut the brush and saplings.
ANIMAL/RODENT HOLES	A rodent hole was observed at approximate station 3+25, approximately 7 ft. below the crest.	Fill the rodent hole.

EMBANKMENT

Name of Dam BRESKIN POND DAM NO. 1

NDI # PA 01141

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	No problems observed	
ANY NOTICEABLE SEEPAGE	None observed. The owner reports that the reservoir will not hold water. He reported that a rise of 3 to 4 in. occurs in his springhouse downstream when the lake is full. No outlet for seepage from the reservoir was observed in the immediate area of the dam during the inspection.	
STAFF GAGE AND RECORDER	None	
DRAINS	None	

OUTLET WORKS

Name of Dam: BRESKIN POND DAM NO. 1

NDI # PA 01141

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	The outlet conduit is an 8-in. BCCMP.	
INTAKE STRUCTURE	Submerged - not observable	
OUTLET STRUCTURE	No problem observed	
OUTLET CHANNEL	No problem observed	
EMERGENCY GATE	An 8-in. Armco slide gate which can be operated from the upstream slope serves as upstream closure. The crank rods along the upstream slope are bent and distorted; however, the owner reports the slide gate is operational.	

PRINCIPAL SPILLWAY

Name of Dam: BRESKIN POND DAM NO. 1

NDI # PA 01141

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	The riser unit is a 30-in. BCCMP. No problem was observed.	
APPROACH CHANNEL	The crest of the riser is protected with a trash rack.	
DISCHARGE CHANNEL	A 24-in. BCCMP serves as an outlet for the principal spillway. The discharge invert of the pipe is 6.5 ft. above the toe of the dam. Some minor erosion has occurred, but nothing requiring remedial work at this time.	Future inspections should examine the discharge area of the principal spillway for necessity of repair.
BRIDGE AND PIERS	None	

EMERGENCY SPILLWAY

Name of Dam: BRESKIN POND DAM NO. 1

NDI # PA 01141

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONTROL SECTION	The emergency spillway is approximately half founded on resistant rock at the right abutment. The other half is erodible soils.	
APPROACH CHANNEL	The approach channel is formed by a bench along the right abutment. No problem was observed.	
DISCHARGE CHANNEL	The discharge channel is a grass-lined channel running along the right downstream abutment.	
BRIDGE AND PIERS	None	

INSTRUMENTATION

Name of Dam: BRESKIN POND DAM NO. 1

NDI # PA 01141

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	None	
OBSERVATION WELLS	None	
WEIRS	None	
PIEZOMETERS	None	
OTHER		

RESERVOIR

Name of Dam: BRESKIN POND DAM NO. 1

NDI # PA 01141

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	The reservoir slopes are moderate (5°-15°) and forested.	
SEDIMENTATION	Sedimentation is not a problem for this impoundment.	

DOWNSTREAM CHANNEL

Name of Dam: BRESKIN POND DAM NO. 1

NDI # PA 01141

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	The downstream channel flows into the reservoir for Breskin Pond Dam No. 2.	
SLOPES	The downstream channel slope is approximately 2% to the downstream pond.	
APPROXIMATE NO. OF HOMES AND POPULATION	There is a two story wooden frame residence, 5 to 10 ft. above the stream approximately 200 ft. downstream from the dam. Breskin Pond Dam No. 2 (NDI No. PA 00485, PennDER No. 65-134) is located approximately 1700 ft. downstream of Breskin Pond Dam No. 1. Ackenheil and Associates has prepared a Phase I Inspection Report for Breskin Pond Dam No. 2, dated 21 August 1980. There is 1 house and 1 summer cottage located 2000 ft. downstream of Breskin Pond Dam No. 2 which may suffer damage.	
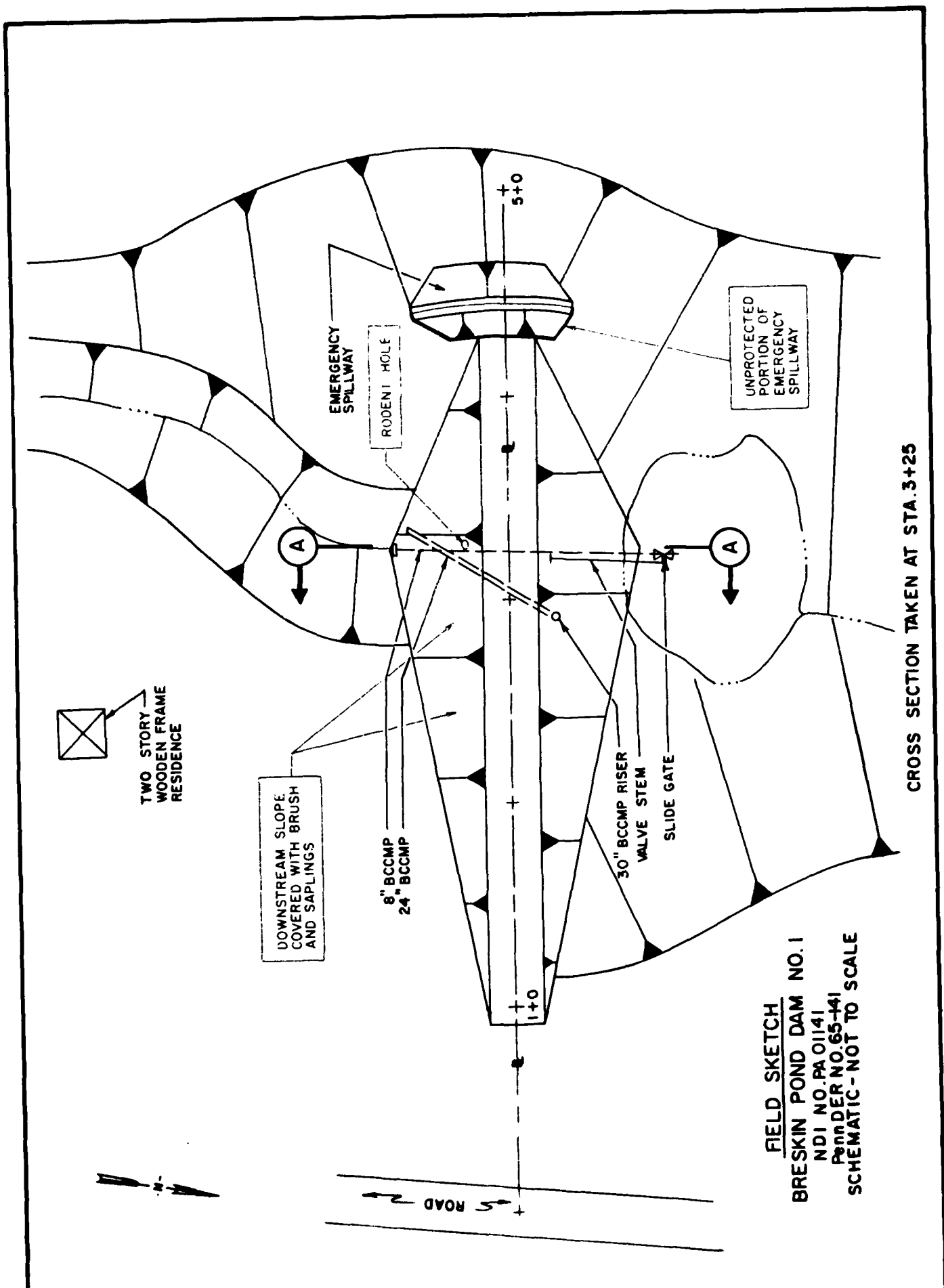
FIELD SKETCH
BRESKIN POND DAM NO. 1
NDI NO. PA 01141
Penn DER NO. 65-141
SCHEMATIC- NOT TO SCALE

CROSS SECTION TAKEN AT STA. 3+25

EMERGENCY SPILLWAY

RODENT HOLE

UNPROTECTED PORTION OF EMERGENCY SPILLWAY

TWO STORY WOODEN FRAME RESIDENCE
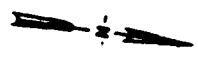
DOWNSTREAM SLOPE COVERED WITH BRUSH AND SAPLINGS

8" BCCMP
24" BCCMP

30" BCCMP RISER
VALVE STEM
SLIDE GATE

ROAD

5+0

1+0

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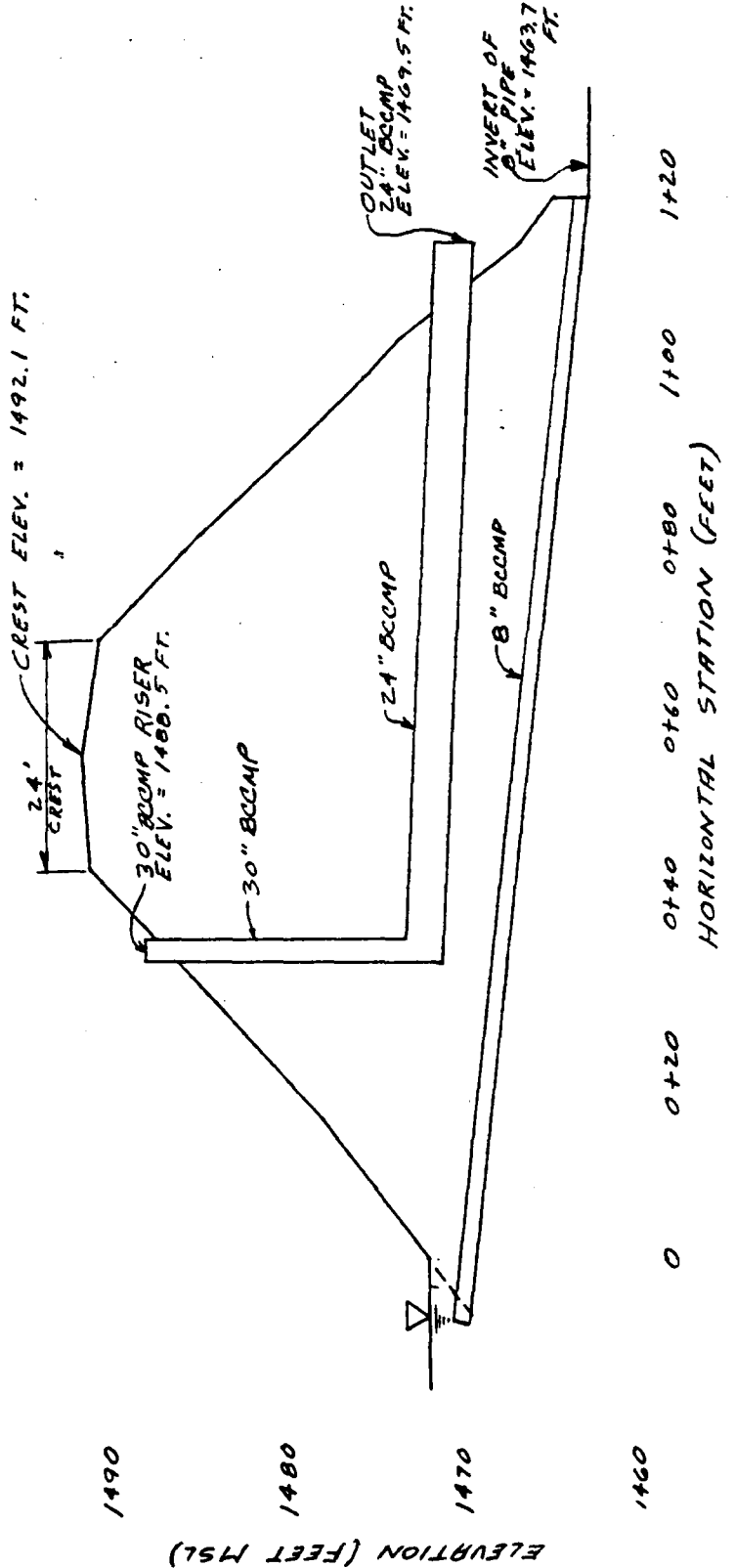
Box 280
Beaver, Pa. 15009

BRESKIN POND DAM NO. 1

TOP OF DAM PROFILE
TYPICAL CROSS-SECTION

DATE OF INSPECTION: 5 December 1980

TOP OF DAM PROFILE (LOOKING DOWNSTREAM)
LENGTH OF DAM = 338 FEET

EMERGENCY SPILLWAY ELEV. = 1489.9 FT.

338' LENGTH OF DAM

MINIMUM CREST ELEV. = 1491.8 FT.

HORIZONTAL STATION (FEET)

ELEVATION (FEET MSL)

TYPICAL CROSS SECTION AT STA. 3+25

CREST ELEV. = 1492.1 FT.

2.4' CREST

30" BCCMP RISER ELEV. = 1480.5 FT.

30" BCCMP

24" BCCMP

8" BCCMP

OUTLET 24" BCCMP ELEV. = 1469.5 FT.

INVERT OF 8" PIPE ELEV. = 1463.7 FT.

HORIZONTAL STATION (FEET)

ELEVATION (FEET MSL)
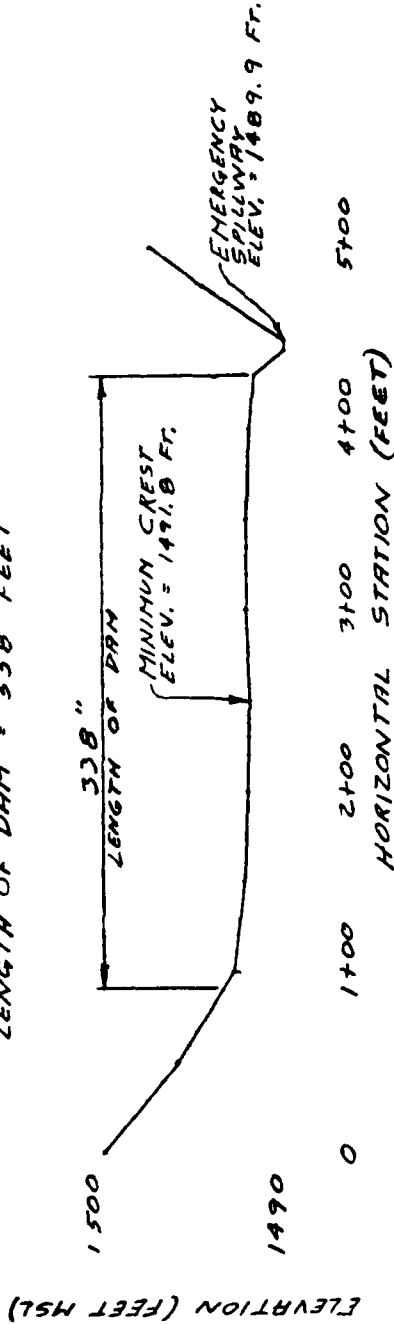
APPENDIX B

ENGINEERING DATA CHECK LIST

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION

Name of Dam: BRESKIN POND DAM NO. 1
NDI # PA 01141

ITEM	REMARKS
PLAN OF DAM	See Plate 3 of this report.
REGIONAL VICINITY MAP	A USGS 7.5 minute topographic quadrangle, Stahlstown, Pennsylvania, was used to prepare the vicinity map which is enclosed in this report as the Location Plan (Plate 1).
CONSTRUCTION HISTORY	Breskin Pond Dam No. 1 was constructed by Latimer Construction Company of New Alexandria, Pennsylvania in 1971. Modifications of the dam in accordance with the plans and specifications prepared by Ronald E. Kelley were completed in 1973.
TYPICAL SECTIONS OF DAM	See Plate 4 of this report.
HYDROLOGIC/HYDRAULIC DATA	No information available
OUTLETS – PLAN	None available
– DETAILS	None available
– CONSTRAINTS	None
– DISCHARGE RATINGS	None
RAINFALL/RESERVOIR RECORDS	No records are kept.

Name of Dam: BRESKIN POND DAM NO. 1

NDI # PA 01141

B-2

ITEM	REMARKS
DESIGN REPORTS	None available
GEOLOGY REPORTS	No geology reports are available for the dam. See Appendix F for the Regional Geology.
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	A stability analysis and seepage determination was computed by J. Fred Triggs, P.E. A copy of the calculations, dated 27 February 1972, is available in the PennDER file.
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	A core boring was made at the center of the dam near the original stream-bed location to a depth of 43.8 ft. This core boring was made by Pittsburgh Testing Laboratory on 3 January 1972 and the results are available in the PennDER file. One direct shear test was performed on material from a shelby tube sample (5.0 ft. to 6.5 ft. depth). The results were cohesion = 0.26 TSF and $\phi = 34.4°$.
POST-CONSTRUCTION SURVEYS OF DAM	No information available
BORROW SOURCES	The borrow source was obtained from the reservoir area and high on the right abutment.

Name of Dam: BRESKIN POND DAM NO. 1

NDI # PA 01141

ITEM	REMARKS
MONITORING SYSTEMS	None
MODIFICATIONS	The emergency spillway was reportedly modified in 1972 by paving it with a thin layer of concrete. However, there was no evidence of the pavement at the time of inspection.
HIGH POOL RECORDS	No records are kept.
POST-CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None available
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None reported in the available information.
MAINTENANCE OPERATION RECORDS	No records are kept.

Name of Dam: BRESKIN POND DAM NO. 1

NDI # PA 01141

B-4

ITEM	REMARKS
SPILLWAY PLAN,	
SECTIONS, and DETAILS	See Plates 3 and 4 of this report.
OPERATING EQUIPMENT PLANS & DETAILS	None available

CHECK LIST
HYDROLOGIC AND HYDRAULIC DATA
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: 0.2 sq. mi., moderate to steep

slopes, heavily wooded

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): 1488.5 ft. M.S.L.

(29 ac.-ft.)

ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): 1491.8 ft. M.S.L.

(36 ac.-ft.)

ELEVATION MAXIMUM DESIGN POOL: Unknown

ELEVATION TOP DAM: 1491.8 ft. M.S.L. (minimum top of dam elevation)

EMERGENCY SPILLWAY: _____

    a.   Crest Elevation 1489.9 ft. M.S.L.
    b.   Type Trapezoidal earth channel
    c.   Width of Crest Parallel to Flow 80 ft. (along centerline)
    d.   Length of Crest Perpendicular to Flow 6.0 ft. at bottom
    e.   Location Spillover Right abutment
    f.   Number and Type of Gates None

OUTLET WORKS: _____

    a.   Type 30" BCCMP riser pipe with 24" BCCMP outlet pipe
    b.   Location 125 ft. left of emergency spillway
    c.   Entrance Inverts 1488.5 ft.
    d.   Exit Inverts 1469.5 ft.
    e.   Emergency Drawdown Facilities 8" BCCMP blow-off pipe

HYDROMETEOROLOGICAL GAGES: None

    a.   Type
    b.   Location
    c.   Records

MAXIMUM NON-DAMAGING DISCHARGE Unknown

APPENDIX C

PHOTOGRAPH LOCATION PLAN AND PHOTOGRAPHS

DETAILED PHOTOGRAPH DESCRIPTIONS

Overall View - Overall View of Dam From Right Abutment

Photograph Location Plan

Photo 1 - View of Upstream Slope From Right Abutment

Photo 2 - View of Crest and Downstream Slope From Right
          Abutment

Photo 3 - View of Crest From Left Abutment

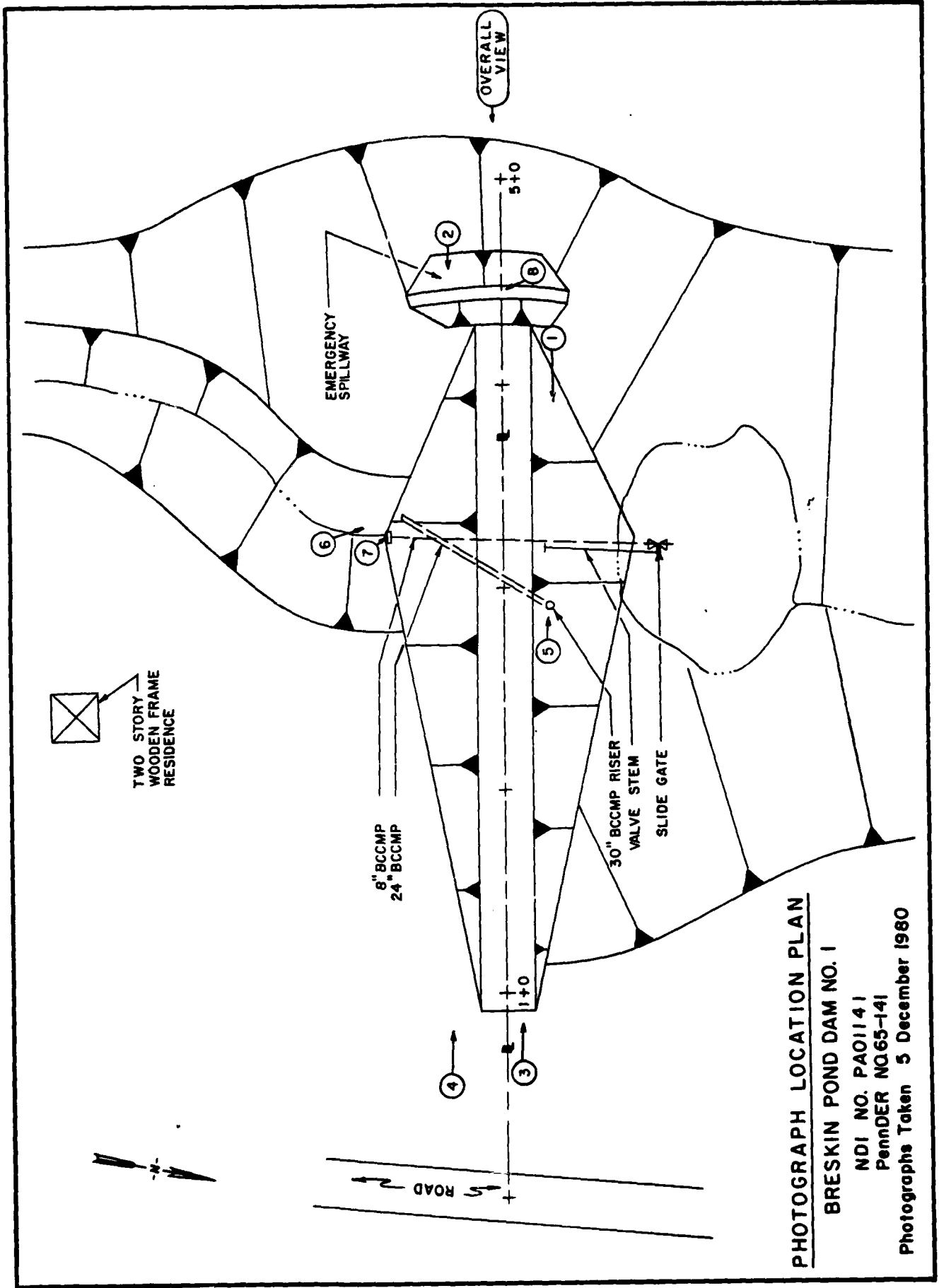Photo 4 - View of Downstream Slope From Left Abutment

Photo 5 - View of Principal Spillway Riser Crest

Photo 6 - View of Downstream End of Principal Spillway and
          Outlet Works

Photo 7 - Close-up View of Downstream Outlet Works Headwall
          Structure

Photo 8 - View of Emergency Spillway Channel at Crest of Dam
          (Looking Downstream)

Note: Photographs were taken on 5 December 1980.
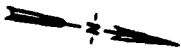
PHOTOGRAPH LOCATION PLAN

BRESKIN POND DAM NO. 1

NDI NO. PA01141
PennDER NQ65-141
Photographs Taken 5 December 1980

BRESKIN POND DAM No. 1

PHOTO 1. View of Upstream Slope from Right Abutment

PHOTO 2. View of Crest and Downstream Slope from Right Abutment
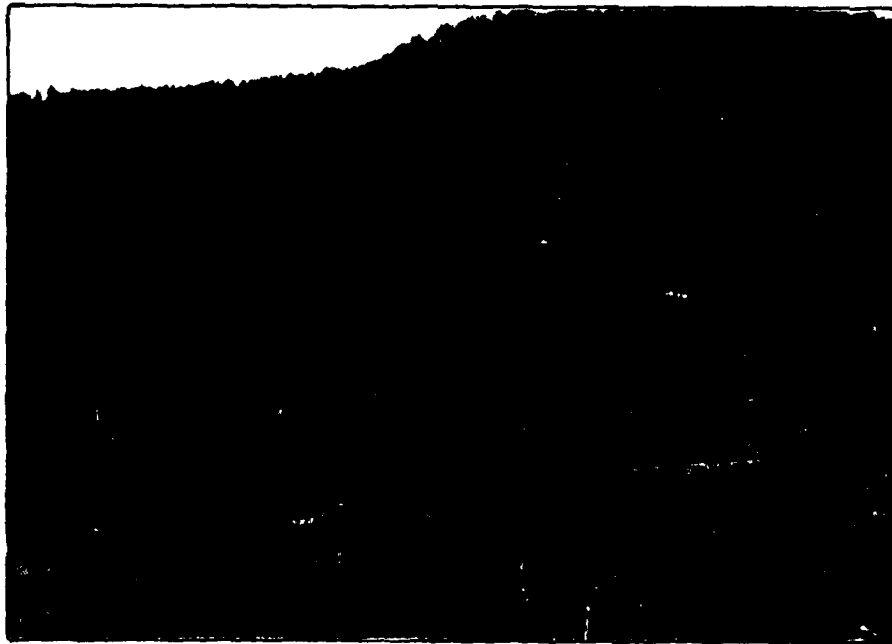
PHOTO 3. View of Crest from Left Abutment

PHOTO 4. View of Downstream Slope from Left Abutment

PHOTO 5. View of Principal Spillway Riser Crest

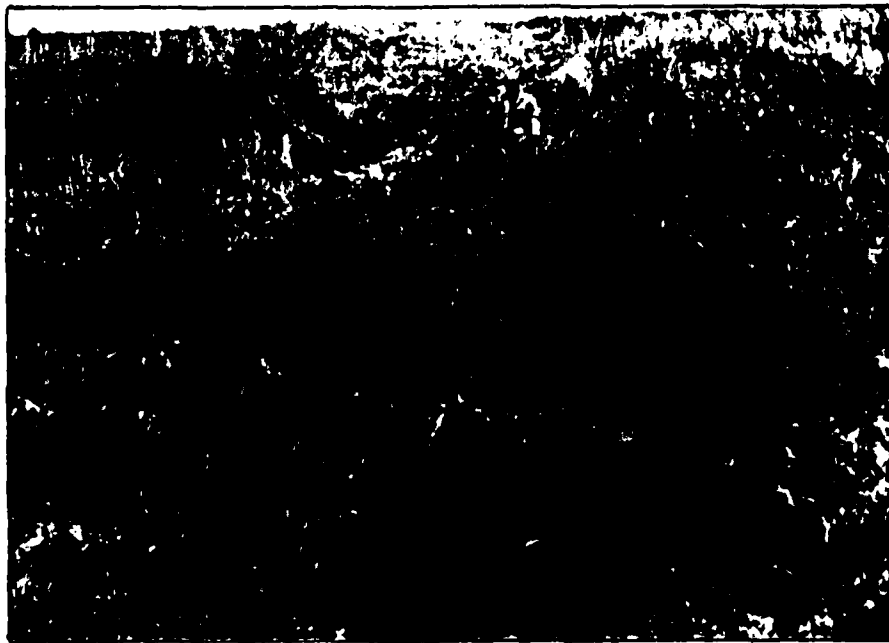**PHOTO 6. View of Downstream End of Principal Spillway and Outlet Works**

PHOTO 7. Close-up View of Downstream Outlet Works Headwall Structure

**PHOTO 8. View of Emergency Spillway Channel at Crest of Dam
(Looking Downstream)**

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

Subject _Breskin Pond Dam No. 1_ S.O. No. _____

Appendix D - Hydrologic and Sheet No. _____ of _____

Hydraulic Calculations Drawing No. _____

Computed by _____ Checked by _____ Date _____

TABLE OF CONTENTS

PREFACE

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

The hydrologic determinations presented in this Phase I
Inspection Report are based on the use of a Snyder's unit
hydrograph developed by the U.S. Army Corps of Engineers.
Due to the limited number of gaging stations available in
this hydrologic region and the wide variations of watershed
slopes, the Snyder's coefficients may yield results of
limited accuracy for this watershed. As directed however, a
further refinement of these coefficients is beyond the scope
of this Phase I Investigation.

In addition, the conclusions presented pertain to present
conditions, and the effect of future development on the
hydrology has not been considered.

NAME OF DAM: __BRESKIN POND DAM NO. 1__

100- YEAR STORM = 5.5 INCHES/24 HOURS[1]

STATION	1	2	3	4	5
Station Description	BRESKIN POND DAM No. 1				
Drainage Area (square miles)	0.2				
Cumulative Drainage Area (square miles)	0.2				
Adjustment of PMF for Drainage Area (%)[1] 6 Hours 12 Hours 24 Hours 48 Hours 72 Hours	100-YEAR STORM DISTRIBUTION ON SHEET 12				
SCS Dimensionless Unit Hydrograph Parameters T_c = .94 Hr. Lag Time = 0.56 Hr.					
Spillway Data Crest Length (ft) Freeboard (ft) Discharge Coefficient Exponent					

[1]Technical Paper No. 40 Cooperative Studies Section, U.S. Weather Bureau, Washington, D.C., 1961.

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Subject __BRESKIN DAM No 1__ S.O. No. _____

__HYDRAULIC DATA__ Sheet No. _2_ of _19_

Drawing No. _____

Computed by __APK__ Checked by __WDC__ Date _1-5-81_

STORAGE CALCULATIONS

AREA VS. ELEVATION (MEASURED FROM QUADS)

ELEVATION (FT)	SURFACE AREA (ACRES)
1488.5	1.84
1500.0	3.67
1520.0	5.51

NORMAL POOL STORAGE

$$\text{STORAGE VOLUME} = V_{NP} = \frac{h}{3}\left(A_1 + A_2 + \sqrt{A_1 A_2}\right)$$

h = ESTIMATED AVERAGE DEPTH = 20.0 FT

A_1 = SURFACE AREA OF NORMAL POOL = 1.84 acre

A_2 = SURFACE AREA OF RESERVOIR BOTTOM = 1.10 acre
(ESTIMATED FROM AVERAGE DEPTH
AND RESERVOIR SIDE SLOPES)

$$\text{NORMAL POOL STORAGE} = V_{NP} = \frac{20}{3}\left(1.84 + 1.10 + \sqrt{(1.84)(1.10)}\right)$$

$$V_{NP} = 29.1 \text{ acre-ft.}$$

TOP OF DAM STORAGE

36 acre-ft (FROM HEC-1 ANALYSIS)

SNYDERS UNIT HYDROGRAPH PARAMETERS
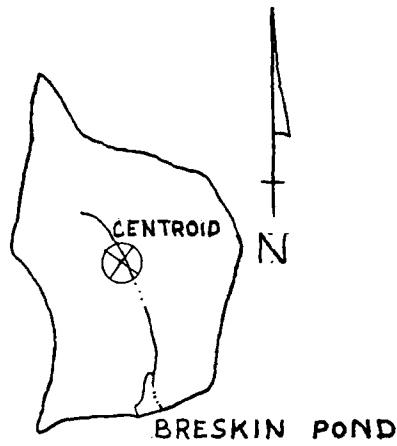
$L = 0.83$ mi $\quad L_{CA} = 0.30$ mi

WATERSHED IS IN ZONE 24

$C_T = 1.60$ $\quad C_p = 0.45$

$$T_p = C_T\left(L \times L_{CA}\right)^{0.3} = 1.6\left(0.83 \times 0.30\right)^{0.3} = 1.06$$

DRAINAGE AREA = 0.2 SQUARE MILES

QUAD:
STAHLSTOWN

CENTROID

N

BRESKIN POND

BRESKIN POND DAM:
DRAINAGE AREA AND
CENTROID MAP

| 0 | 2000 | 4000 | 6000 |

SCALE: 1" = 2000'

TOP OF DAM PROFILE (LOOKING DOWNSTREAM)
LENGTH OF DAM = 338 FEET

EMERGENCY SPILLWAY ELEV. = 1489.9 FT.

MINIMUM CREST ELEV. = 1491.8 FT.

33.8" LENGTH OF DAM

ELEVATION (FEET MSL)

HORIZONTAL STATION (FEET)

TYPICAL CROSS SECTION AT STA. 3+25

CREST ELEV. = 1492.1 FT.

OUTLET 24" BCCMP ELEV. = 1469.5 FT.

INVERT OF 8" PIPE ELEV. = 1463.7 FT.

2.4' CREST

30" BCCMP RISER ELEV. = 1480.5 FT.

30" BCCMP

24" BCCMP

8" BCCMP

ELEVATION (FEET MSL)

HORIZONTAL STATION (FEET)
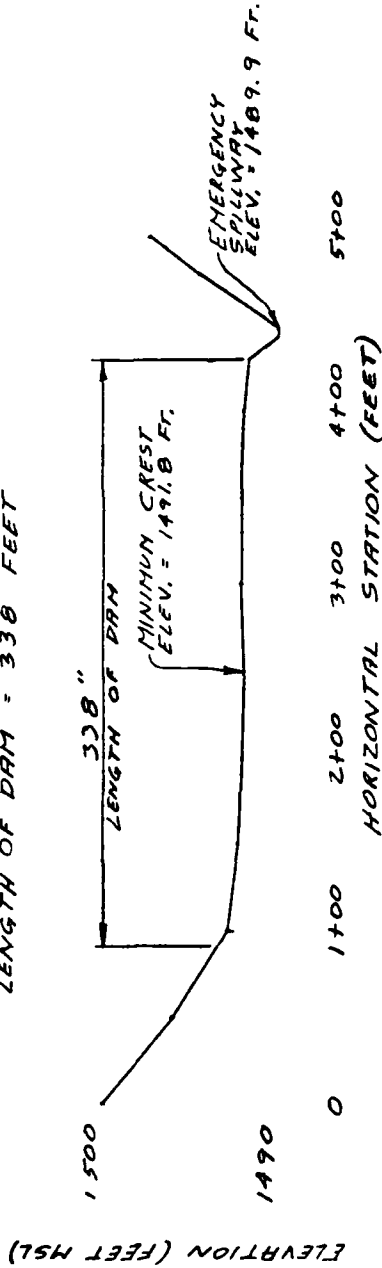
MICHAEL BAKER, JR., INC.
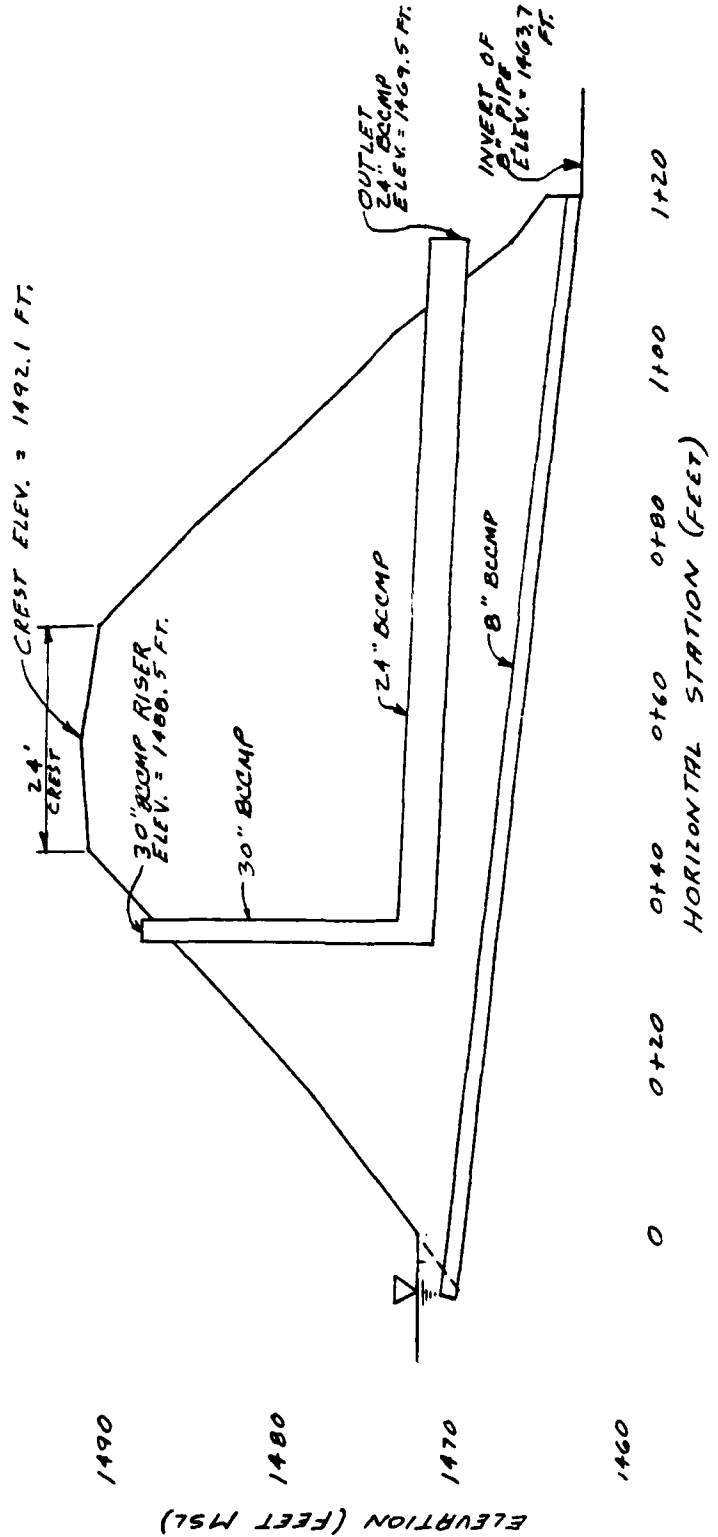
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Subject BRESKIN POND DAM No. 1

OUTLET PIPE RATING

Computed by G.W.T.   Checked by WDL

S.O. No. _____

Sheet No. 5 of 19

Drawing No. _____

Date 12/31/80

PIPE = 24" DIA. BCCMP

LENGTH = 86 FEET

TAILWATER = ELEV. 1463.7 FT.

RESERVOIR = ELEV. 1472.6 FT.

TOP OF RISER = ELEV. 1488.5 FT.

RISER TOP = 30" DIA. BCCMP

INLET FOR 24" DIA. PIPE = ELEV. 1471.5 FT.

OUTLET FOR 24" DIA. PIPE = ELEV. 1469.5 FT.

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Subject BRESKIN POND DAM No. 1 S.O. No. _____
OUTLET PIPE RATING Sheet No. 6 of 19

Drawing No. _____

Computed by GWT Checked by WDL Date 12-31-60

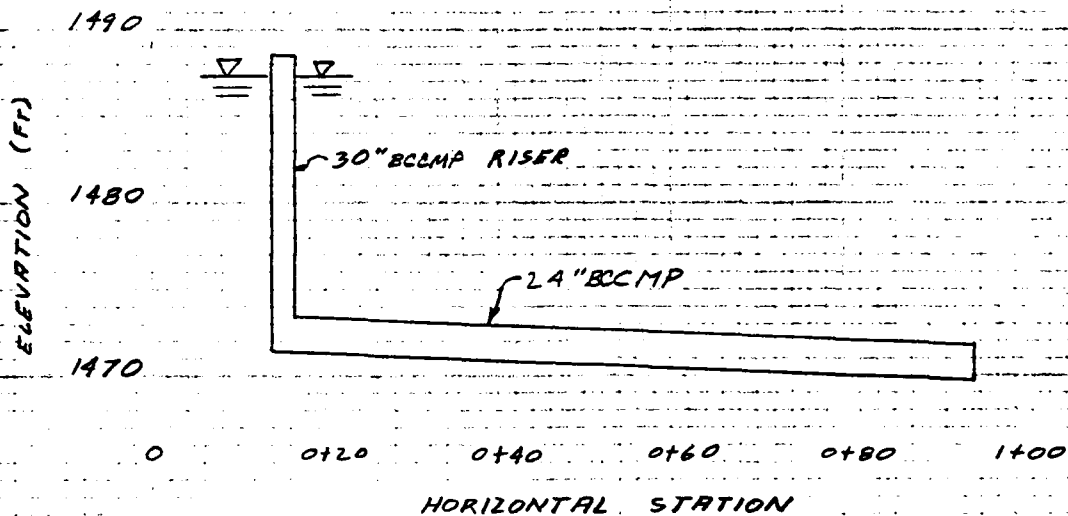## WEIR FLOW - 30" DIA. INLET TOWER

$Q = CLH^{3/2}$

$Q = 29.8 \, H^{3/2}$

$L = C = 2\pi R$ R = 1.25 FT.

$= 7.85$ FT.

H VARIES FROM 0 TO 6 FT.

C = 3.8 Pg. 5-11 BRATER & KING

ELEVATION, (FT)	C	L (FT)	H (FT)	Q, (CFS)
1488.5	3.8	7.85	0	0
1489.0	3.8	7.85	0.5	10.5
1489.5	3.8	7.85	1.0	29.8
1490.0	3.8	7.85	1.5	54.7
1490.5	3.8	7.85	2.0	84.3
1491.0	3.8	7.85	2.5	117.8
1491.5	3.8	7.85	3.0	154.8

ORIFICE FLOW - 30" DIA. INLET TOWER

$Q = CA(2gH)^{0.5}$

$= 0.6(4.91)(2gH)^{0.5}$

$= 23.64 \, (H)^{.5}$

DIA. = 30" = 2.5 FT.

$A = \pi R^2 = 4.91$

$g = 32.2$ FT/SEC^2

C = 0.6 Pg. 4-31 BRATER & KING.

H VARIES FROM 0 TO 6 FT.

ELEVATION, (FT)	H, (FT)	Q, (CFS)
1488.5	0	0
1489.0	0.5	16.7
1489.5	1.0	23.6
1490.0	1.5	28.9
1490.5	2.0	33.4
1491.0	2.5	37.4
1491.5	3.0	40.9
1492.0	3.5	44.2
1493.0	4.5	50.1
1494.0	5.5	55.4

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Subject __BRESKIN POND DAM No. 1__   S.O. No. _____

__OUTLET PIPE RATING__   Sheet No. __7__ of __19__

Drawing No. _____

Computed by __GWT__   Checked by __WDL__   Date __12/31/80__

ORIFICE FLOW — 24" DIA. OUTLET PIPE

$$Q = CA (2gH)^{0.5}$$
$$Q = 0.6 (3.14)(64.4 H)^{0.5}$$
$$= 15.12 (H)^{0.5}$$

DIA = 24" = 2.0 FT

$A = \pi R^2 = 3.14$ SQ. FT.

$g = 32.2$ FT/SEC^2

$C = 0.6$ Pg 4-31 + 4-32 BRATER + KING

H VARIES FROM 16.0 FT. TO 22.0 FT.
AND IS MEASURED FROM THE CENTER
OF THE PIPE ELEV. 1472.5 FT.

ELEVATION, (FT)	H_i (FT)	Q_i (CFS)
1488.5	0	0
1489.0	16.5	61.4
1489.5	17.0	62.3
1490.0	17.5	63.2
1490.5	18.0	64.1
1491.0	18.5	65.0
1492.0	19.5	66.8
1493.0	20.5	68.4
1494.0	21.5	70.1

PIPE FLOW — 24" DIA. OUTLET PIPE

$$q = \frac{A (2gH)^{1/2}}{[1 + K_e + K_b + K_c(L)]^{1/2}}$$
$$= \frac{3.14 (64.4 H)^{1/2}}{[1 + .78 + 0 + .0423(86)]^{1/2}}$$
$$q = 10.82 H^{1/2}$$

$A = 3.14$ SQ. FT.

$g = 32.2$ FT/SEC^2

$L = 86$ FT.

$K_e \{K_e\} = 0.78$ Pg 5.5-6 SCS NEH 5

$K_b \{K_s\} = 0$ Pg 5.5-10 SCS NEH 5

$K_c \{K_r\} = 0.0423$ Pg 5.5-4 SCS NEH 5

$n = 0.024$

H VARIES FROM 17 FT TO 23
FT. AND IS MEASURED FROM THE
TOP OF PIPE ELEV. AT THE
OUTLET = ELEV 1471.5 FT.

ELEVATION, (FT)	H_i (FT)	Q_i (CFS)
1488.5	0	0
1489.0	17.5	45.3
1489.5	18.0	45.9
1490.0	18.5	46.5
1490.5	19.0	47.2
1491.0	19.5	47.8
1492.0	20.5	48.9
1493.0	21.5	50.2
1494.0	22.5	51.3

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Subject _BRESKIN POND DAM No. 1_ S.O. No. _____
OUTLET PIPE RATING CURVE Sheet No. _8_ of _19_

Drawing No. _____
Computed by _GWT_ Checked by _WDL_ Date _1-2-81_
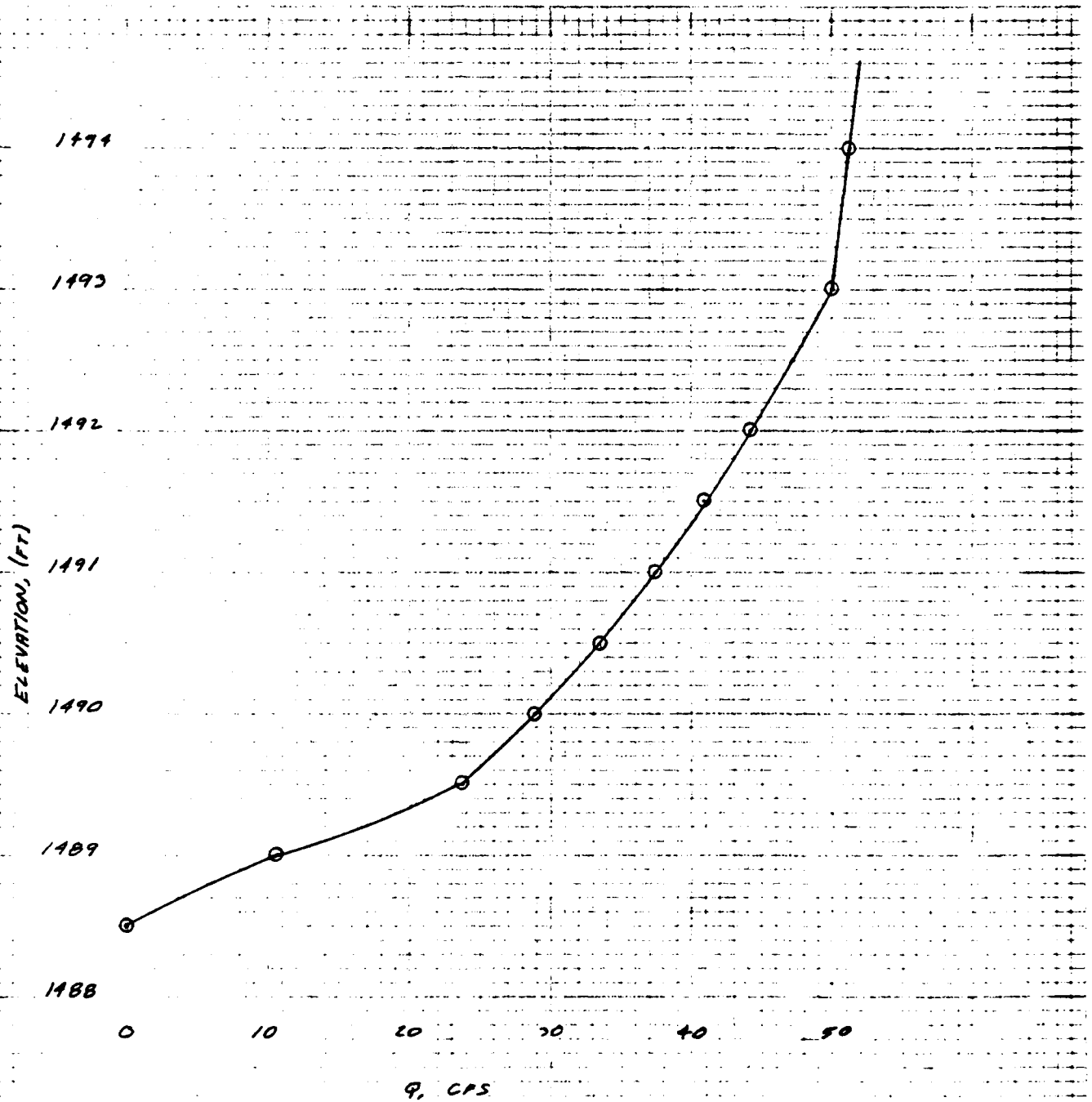
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Subject _BRESKIN POND DAM No. 1_ S.O. No. _____

EMERGENCY SPILLWAY RATING Sheet No. _9_ of _19_

Drawing No. _____

Computed by _GWT_ Checked by _WDL_ Date _1-2-81_

SPILLWAY SECTION
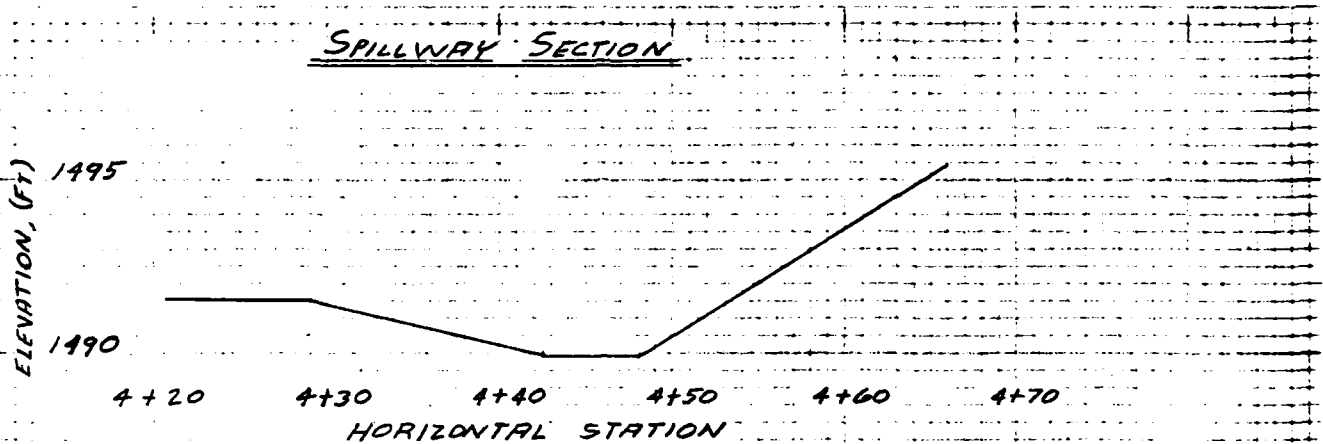
DEVELOPE RATING CURVE BASED UPON CRITICAL FLOW OVER SPILLWAY:

$$V = \sqrt{gD} \qquad \text{(CHOW, OPEN CHANNEL HYDRAULICS, p. 43)}$$

$$g = 32.2 \ \text{FT/SEC}^2$$

$$D = \text{MEAN HYDRAULIC DEPTH} = \frac{\text{FLOW AREA}}{\text{FREE SURFACE TOP WIDTH}} = \frac{A}{T}$$

$$Q = VA \qquad V = \text{MEAN FLOW VELOCITY}$$

ELEVATION (FT)	FLOW DEPTH (FT)	AREA (FT²)	TOP WIDTH (FT)	A/T	V (FT/SEC)	Q (CFS)	$V^2/2g$	RESERVOIR ELEVATION (FT)
1489.9	0	0	5.5	0	0	0	0	1489.9
1490.0	0.1	0.6	6.5	0.09	1.70	1.02	0.04	1490.0
1490.5	0.6	5.4	12.5	0.43	3.72	20.09	0.21	1490.7
1491.0	1.1	13.2	18.5	0.71	4.78	63.10	0.35	1491.3
1491.5	1.6	23.6	24.0	0.98	5.62	132.63	0.49	1492.0
1492.0	2.1	36.1	26.0	1.39	6.69	241.51	0.69	1492.7
1492.5	2.6	49.3	27.5	1.79	7.59	374.19	0.89	1493.4
1493.0	3.1	63.3	29.0	2.18	8.38	530.45	1.09	1494.1
1493.5	3.6	78.1	30.5	2.56	9.08	709.15	1.28	1494.8
1494.0	4.1	93.6	32.0	2.93	9.71	908.86	1.46	1495.5

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Subject _BRESKIN POND DAM No. 1_   S.O. No. _____
EMERGENCY SPILLWAY RATING   Sheet No. _10_ of _19_
CURVE   Drawing No. _____
Computed by _GWT_ ___ Checked by _____ Date _1-2-81_
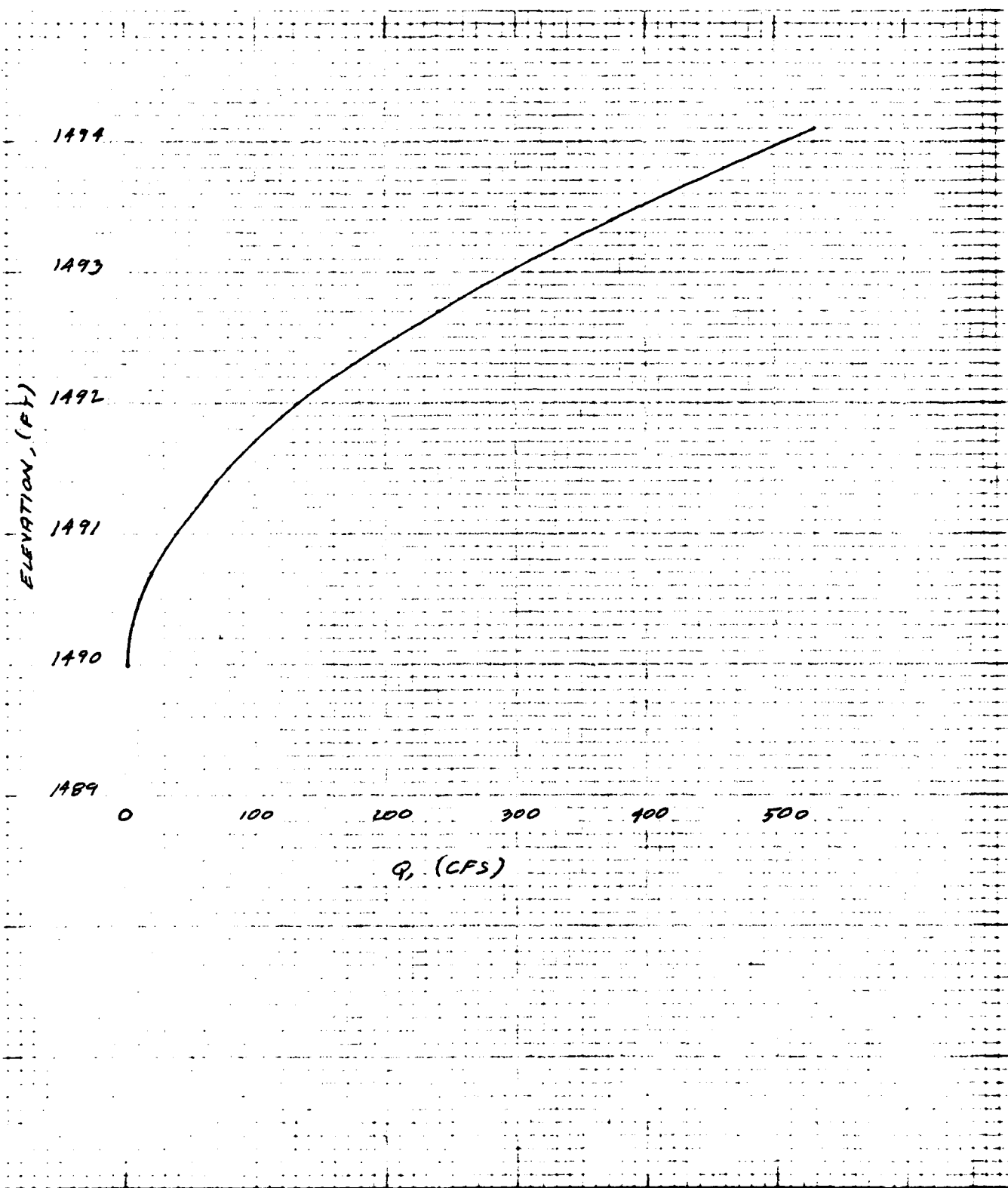
MICHAEL BAKER, JR., INC.
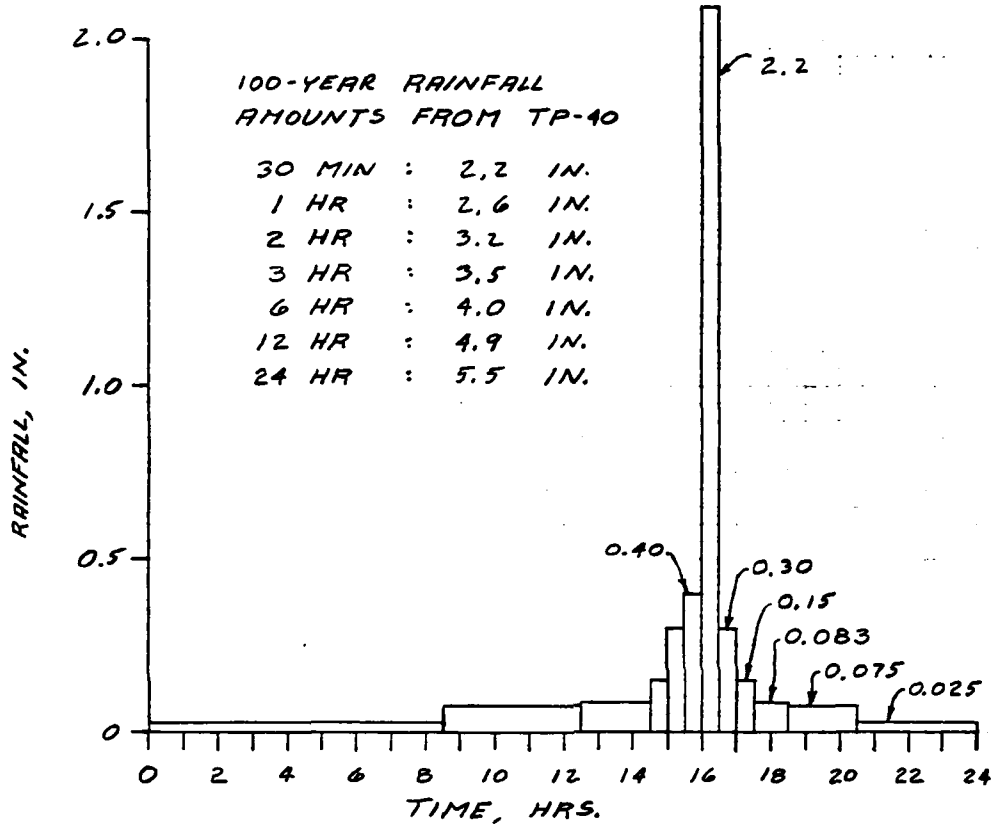
THE BAKER ENGINEERS

Box 280
Beaver, Pa. 15009

Subject _BRESKIN POND DAM No. 1_ S.O. No. _____

SPILLWAY AND PIPE SUMMARY Sheet No. _11_ of _19_

Drawing No. _____

Computed by _GWT_ Checked by _____ Date _1-2-81_

ELEVATION (FT)	OUTLET PIPE, Q. (cfs)	SPILLWAY, Q. (cfs)	TOTAL Q. (cfs)
1488.5	0	0	0
1489.0	10.5	0	10.5
1489.5	23.6	0	23.6
1490.0	28.9	1.0	29.9
1490.5	33.4	11.0	44.4
1491.0	37.4	40.0	77.4
1491.5	40.9	80.0	120.9
1492.0	44.2	132.6	176.8
1492.5	47.2	209.0	256.2
1493.0	50.1	295.0	345.1
1493.5	50.6	395.0	445.6
1494.0	51.3	530.0	581.3

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Subject _BRESKIN POND DAM No. 1_ S.O. No._____
100-YEAR STORM DISTRIBUTION Sheet No. _12_ of _19_

Drawing No. _____
Computed by _GWT_ Checked by _WDL_ Date _4/15/81_

100-YEAR RAINFALL
AMOUNTS FROM TP-40

30 MIN	:	2.2	IN.
1 HR	:	2.6	IN.
2 HR	:	3.2	IN.
3 HR	:	3.5	IN.
6 HR	:	4.0	IN.
12 HR	:	4.9	IN.
24 HR	:	5.5	IN.

RAINFALL DISTRIBUTION
(30 MINUTE INTERVAL)

INTERVAL NUMBERS	% TOTAL RF OCCURING IN EACH INTERVAL
1 - 17	0.5
18 - 25	1.3
26 - 29	1.5
30	2.7
31	5.4
32	7.2
33	40.0
34	5.4
35	2.7
36 - 37	1.5
38 - 41	1.3
42 - 48	0.5

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Subject _BRESKIN POND DAM No. 1_ S.O. No. _____

100-YEAR FLOOD CALCULATION Sheet No. _13_ of _19_

FROM OHIO RIVER REGRESSION EQUATION Drawing No. _____

Computed by _GWT_ Checked by _WDY_ Date _4/15/81_

CALCULATION OF 100-YEAR FLOW

FROM ANALYSIS PERFORMED BY THE
PITTSBURGH DISTRICT, CORPS OF ENGINEERS

$$Q_{100} = 120.38 \ (D.A. \times S^{1/2})^{0.744099}$$

$$D.A. = DRAINAGE \ AREA = 0.20 \ SQ. \ MI.$$

$S = CHANNEL \ SLOPE \ IN \ THE \ LOWER \ 0.7 \ OF$
$THE \ WATERSHED = Fr/Mi.$

$$S = \frac{1700 - 1488.5}{0.83} = 254.8$$

$$Q_{100} = 120.38 \left[(0.20)(254.8)^{1/2}\right]^{0.744099}$$

$$Q_{100} = 284 \ CFS$$

USING ZERO LOSS RATES, A PEAK FLOW OF 193 C.F.S.
WAS OBTAINED IN THE HEC-1 ANALYSIS IF THE SNYDERS'
UNIT HYDROGRAPH PARAMETERS ORIGINALLY DERIVED FOR
THIS BASIN WERE USED.

THE 100-YEAR FLOOD HYDROGRAPH IS THEREFORE COMPUTED
USING THE SCS DIMENSIONLESS UNIT HYDROGRAPH APPROACH.
TIME OF CONCENTRATION AND LAG TIME ARE COMPUTED AS
FOLLOWS:

T_c = TIME OF CONCENTRATION = OVERLAND FLOW TIME +
CHANNEL FLOW TIME

OVERLAND FLOW TIME

DISTANCE = 1850

$$SLOPE = \frac{1745 - 1625}{1850} = 6.5\%$$

AVERAGE FLOW VELOCITY = 0.60 FT/SEC
(FROM FIG. 3.1, T.R. No.55 _URBAN HYDROLOGY_
FOR SMALL WATERSHEDS, SCS.)

TRAVEL TIME = 3,083 SEC.

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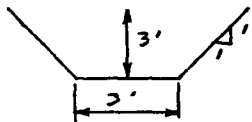Subject _BRESKIN POND DAM No. 1_ S.O. No. _____

100-YEAR FLOOD CALCULATION Sheet No. _14_ of _19_

(CONTINUED Drawing No. _____

Computed by _GWT_ Checked by _WX_ Date _4/15/81_

CHANNEL FLOW TIME

DISTANCE = 2300 FT.

$$SLOPE = \frac{1625 - 1488.5}{2300} = 5.9\%$$

ASSUME AVERAGE CHANNEL SIZE IS:

$n = 0.045$

AVERAGE FLOW VELOCITY = $V = \frac{1.49}{n} R^{2/3} S^{1/2}$

$$V = \frac{1.49}{0.45}\left(\frac{(3+3)3}{3+6\sqrt{10}}\right)^{2/3}(.059)^{1/2}$$

$$V = 7.04$$

TRAVEL TIME = 326 SEC.

TOTAL TRAVEL TIME = T_c = 3083 + 326 = 3409 SEC.

= 0.94 HR.

LAG TIME = 0.6 T_c = .56 HR.

WITH THE SCS PROCEDURE, A CURVE NUMBER OF 69 PRODUCED A PEAK FLOW OF 286 C.F.S. THIS VALUE IS WITHIN 1 % OF THE PREVIOUSLY COMPUTED PEAK FLOW OF 284 CFS AND IS WITHIN THE 10 % LIMIT SUGGESTED BY THE CORPS GUIDELINES.

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*************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION    JULY 1978
LAST MODIFICATION   26 FEB 79
MBJ UPDATE    04 JUN 79
*************************

 1   A1      NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS
 2   A2      HYDROLOGIC AND HYDRAULIC ANALYSIS OF BRESKIN POND DAM  No.1
 3   A3      UNIT HYDROGRAPH BY SCS METHOD
 4   B     300      0       0       0       0       0       0      -4       0
 5   B1      5
 6
 7   J       1
 8   J1      1
 9   K       1               1
10   K1      RUNOFF HYDROGRAPH TO DAM
11   M       0       2     0.20
12   Q      68     5.5
13   QI    .035    .005    .005    .005    .005    .005    .005    .005    .005
14   QI    .005    .005    .005    .013    .013    .013    .013    .013    .013
15   QI    .013    .013    .013    .015    .015    .015    .015    .015    .015
16   QI    .054    .072    .400    .027    .015    .013    .013    .013    .013
17   QI    .013    .005    .005    .005    .005    .005    .005    .005    .005
18   T                                                      -69
19   W2      0.05
20   >      -1.5   -0.05    2.0
21   K       1               2
22   K1      ROUTING FOR BRESKIN POND DAM NO. 1
23   Y       1
24   YL   1488.5  1489.0  1489.5  1490.0  1490.5  1491.0  1491.5  1492.0  1492.5  1493.0
25   Y4   1493.5  1494.0
26   Y5     10.5    23.6    29.9    44.4    77.4   123.9   176.8   256.2   345.1
27   V5    445.6   581.3
28   SA      1.1    1.84    7.67    5.51
29   SE   1468.5  1488.5  1500.0  1520.0
30   SS   1488.5
31   SD   1491.8    2.03    1.5     288     342     350
32   SL      0      153     310     335
33   SV   1491.8  1492.0  1492.5  1493.0  1493.5  1494.0
34   K      93
```

```
**************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION    JULY 1973
    LAST MODIFICATION  26 FEB 79
    MBJ UPDATE         04 JUN 79
**************************

RUN  DATE 04/16/81
     TIME 16:10


        NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS
        HYDROLOGIC AND HYDRAULIC ANALYSIS OF BRESKIN POND DAM
        UNIT HYDROGRAPH BY SCS METHOD


                    JOB SPECIFICATION
     NO   NFR   NMIN  IDAY  IHR  IMIN  NEIRC  IPLT  IPRT  NSTAN
     300   0     6     0     0    0      0     0    -4     0
                    JOPER  NWT  LRDPT  TRACE
                      5     0     0      0

            MULTI-PLAN ANALYSES TO BE PERFORMED
                NPLAN= 1 NRTIO= 1 LRTIO= 1
     RTIOS= 1.00

     **********          **********          **********


                    SUB-AREA RUNOFF COMPUTATION

     RUNOFF HYDROGRAPH TO DAM

            ISTAQ ICOMP IECON ITAPE JPLT JPRT INAVE ISTAGE IAUTO
              1     0     0     0     0    0    1     0      0

                         HYDROGRAPH DATA
     IHYDG IJHG TAREA SNAP TRSDA TRSPC RATIO ISNOW ISAME LOCAL
       0    2   0.20  0.0  0.20  0.0   0.0    0     0     0

                         LOSS DATA
     LROPT STRKR DLTKR RTIOL ERAIN STRKS RTIOK SFRTL CNSTL ALSMX RTIMP
       0    0.3  1.00  1.00  0.0   0.0   1.00 -1.00 -69.00 0.0   0.0

     CURVE NO = -69.00 WETNESS = -1.00 EFFECT CN = 69.00

                    UNIT HYDROGRAPH DATA
                  IC= 0.0  LAG= 0.56

                    RECESSION DATA
     STRTQ= -1.50  QRCSN= -0.05  RTIOR= 2.00

                    END-OF-PERIOD FLOW
     MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q   MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q
       0

                                    SUM   5.53  2.33  3.17  3155.
                                        (140.)( 59.)( 81.)( 89.)(34)
```

****

HYDROGRAPH ROUTING

ROUTING FOR BRESKIN POND DAM NO. 1

	ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAVE	ISTAGE	IAUTO
	2	1	0	0	0	0	1	0	0

ROUTING DATA

	IRES	ISAME	IOPT	IPMP	LSTR
QLOSS	0.0				
0.0	1	1	0	0	0

CLOSS	AVG						
0.0	0.0						

VSTPS	NSTDL	LAG	AMSKK	TSK	STORA	ISPRAT
1	0	0.0	0.0	0.0	-1489.	-1

STAGE	1488.50	1489.50	1490.00	1490.50	1491.00	1491.50	1492.00	1492.50	1493.00
	1493.50	1482.00							
		1494.00							

FLOW	0.0	10.50	23.60	29.90	44.40	77.40	120.90	176.80	256.20	345.10
	445.60	981.30								

SURFACE AREA=	1.	2.	4.	6.
CAPACITY=	0.	29.	60.	151.
ELEVATION=	1469.	1489.	1500.	1520.

	REL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
	1488.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1491.8	2.8	1.5	288.

CREST LENGTH	0.	153.	310.	335.	342.	350.
AT OR BELOW ELEVATION	1491.8	1492.0	1492.5	1493.0	1493.5	1494.0

PEAK OUTFLOW IS 255. AT TIME 4.00 HOURS

****

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	RATIOS APPLIED TO FLOWS RATIO 1 1.00
HYDROGRAPH AT	1	0.20 (0.52)	1	286. (8.091)
ROUTED TO	2	0.20 (0.52)	1	255. (7.211)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1488.50	1488.50	1491.80
STORAGE	29.	29.	36.
OUTFLOW	0.	0.	154.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	1492.14	0.34	37.	255.	0.60	4.00	0.0

100-YEAR FLOOD ROUTING

BRESLIN POND DAM NO. 1

APPENDIX E

PLATES

CONTENTS

BRESKIN POND DAM NO.1

PA.

N

BRESKIN
POND
DAM
NO.1

BRESKIN
POND
DAM
NO 2

DOWNSTREAM
HAZARDS

SCALE 1:24000

1 MILE

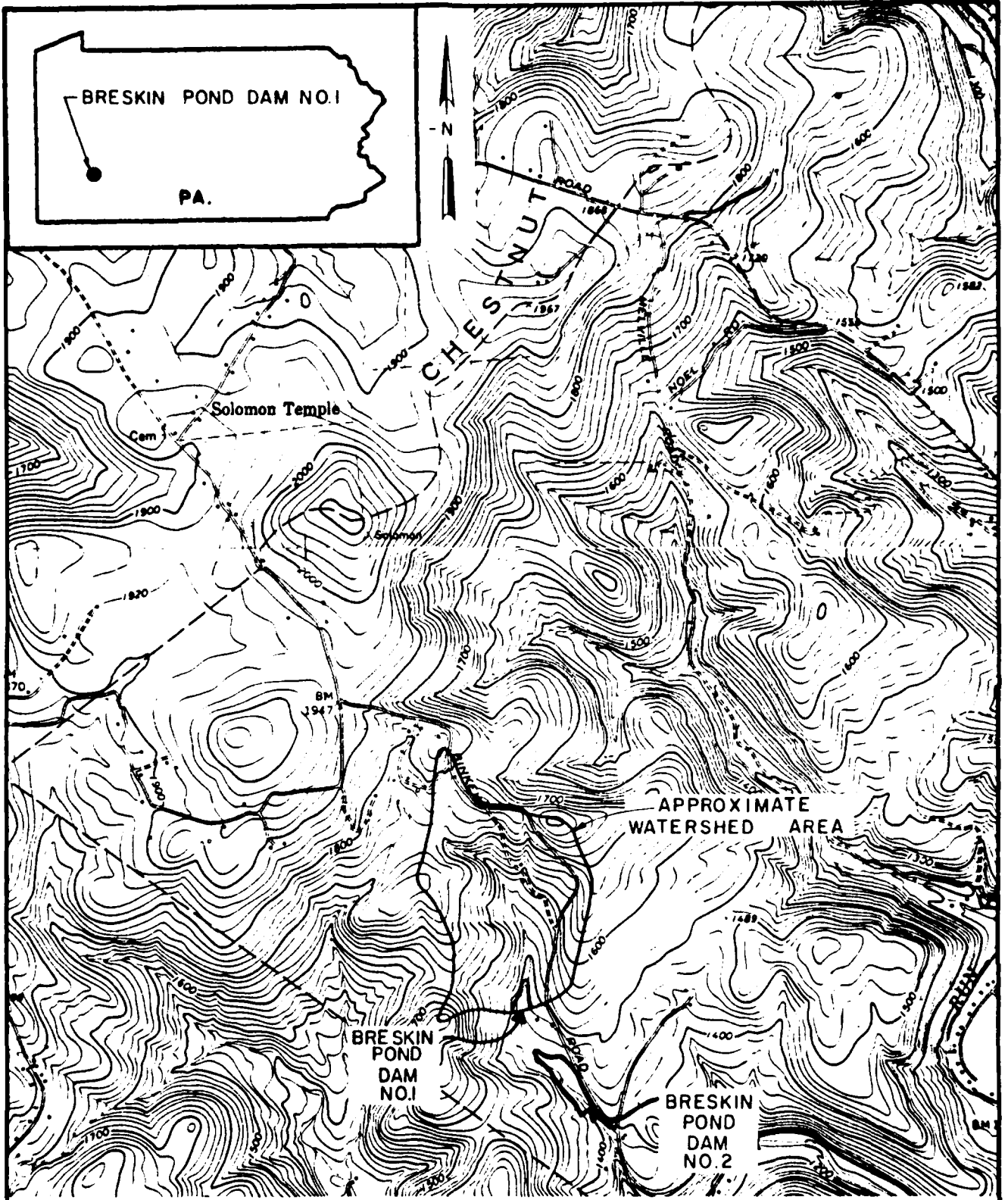1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
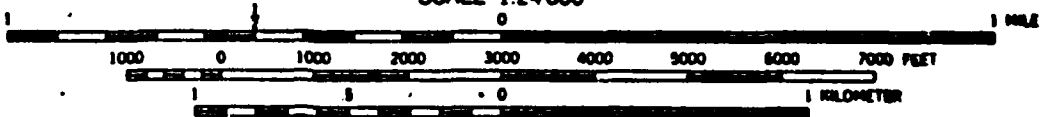
1 KILOMETER

REFERENCES:
1. U.S.G.S. 7.5' DERRY, PA.
   QUADRANGLE. PHOTOREVISED 1973
2. U.S.G.S. 7.5' STAHLSTOWN, PA.
   QUADRANGLE. PHOTOREVISED 1973

PLATE 1 LOCATION PLAN
BRESKIN POND DAM NO.1

BRESKIN POND DAM NO.1

PA.

N

C H E S T N U T

Solomon Temple

Cem

Solomon

BM
1947

APPROXIMATE
WATERSHED AREA

BRESKIN
POND
DAM
NO.1

BRESKIN
POND
DAM
NO.2

SCALE 1:24000

1000   0   1000   2000   3000   4000   5000   6000   7000 FEET

1   .5   0   1 KILOMETER
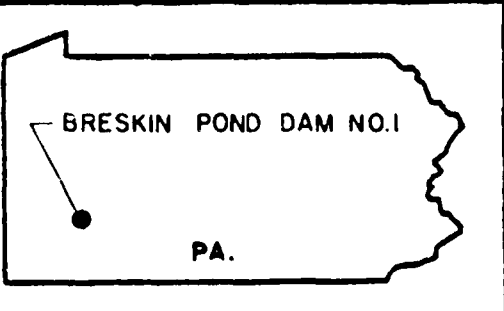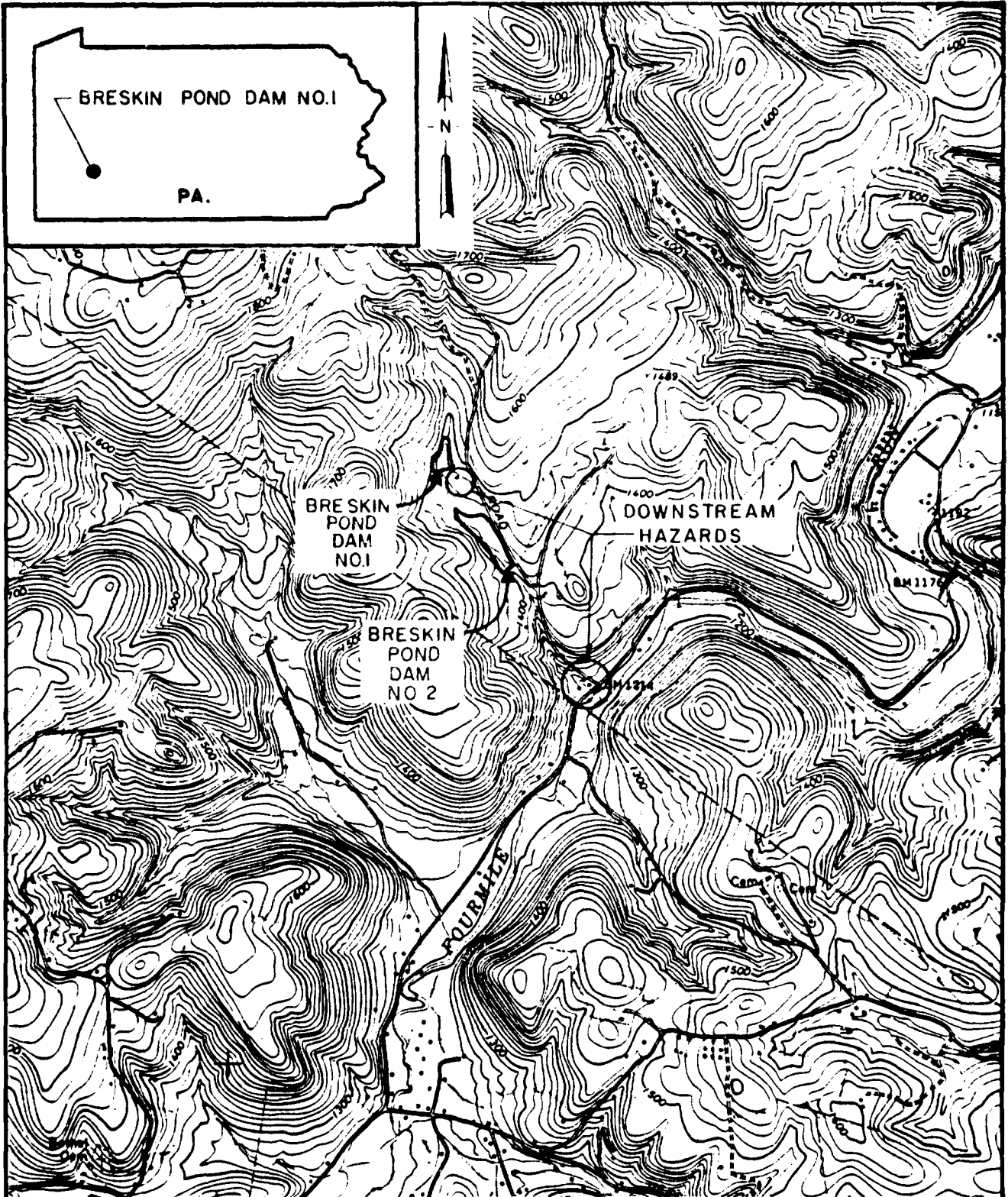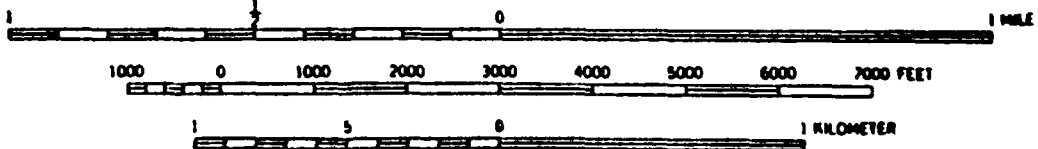
REFERENCES:
1. U.S.G.S. 7.5' DERRY, PA.
   QUADRANGLE. PHOTOREVISED 1973
2. U.S.G.S. 7.5' STAHLSTOWN, PA.
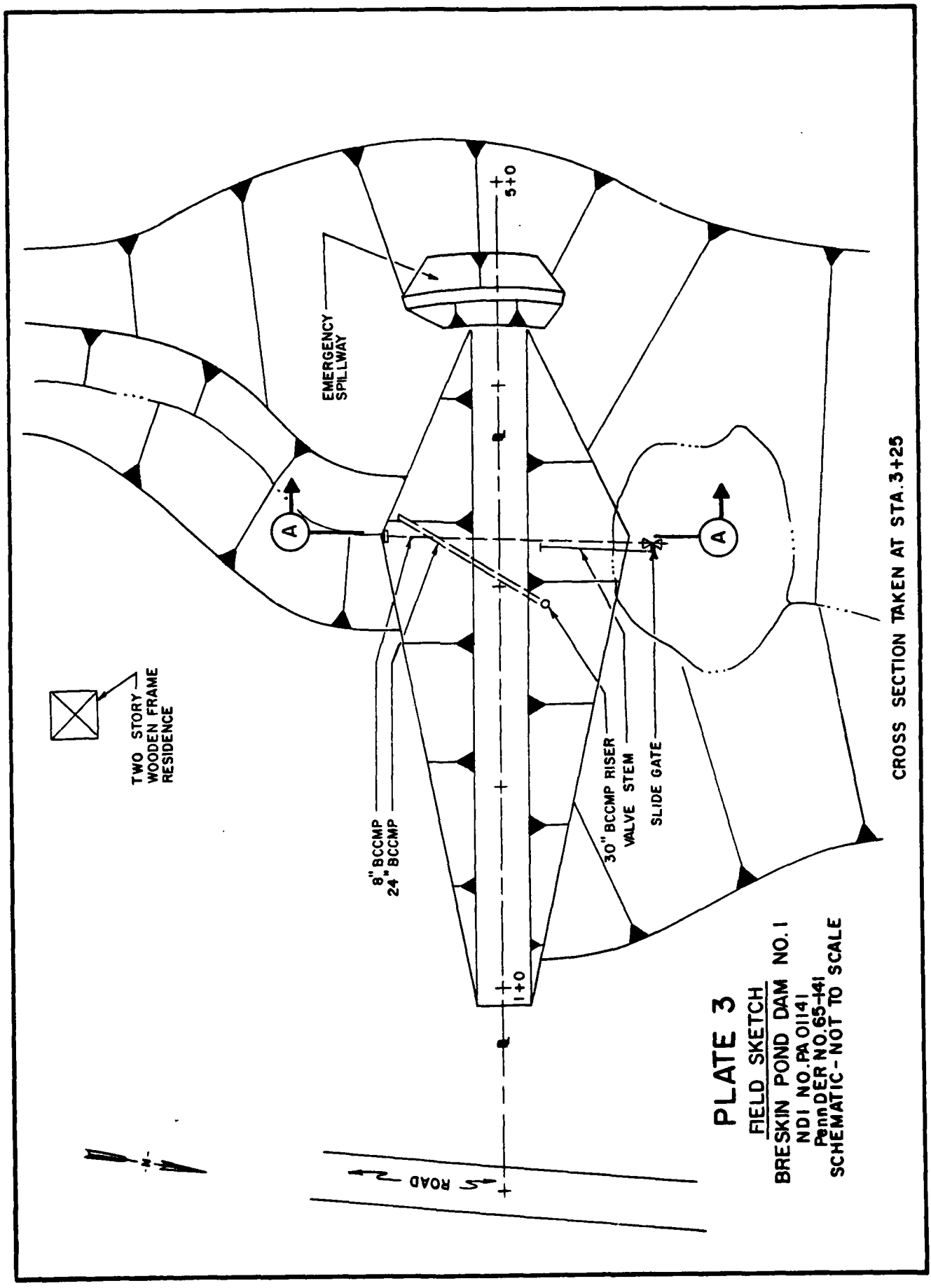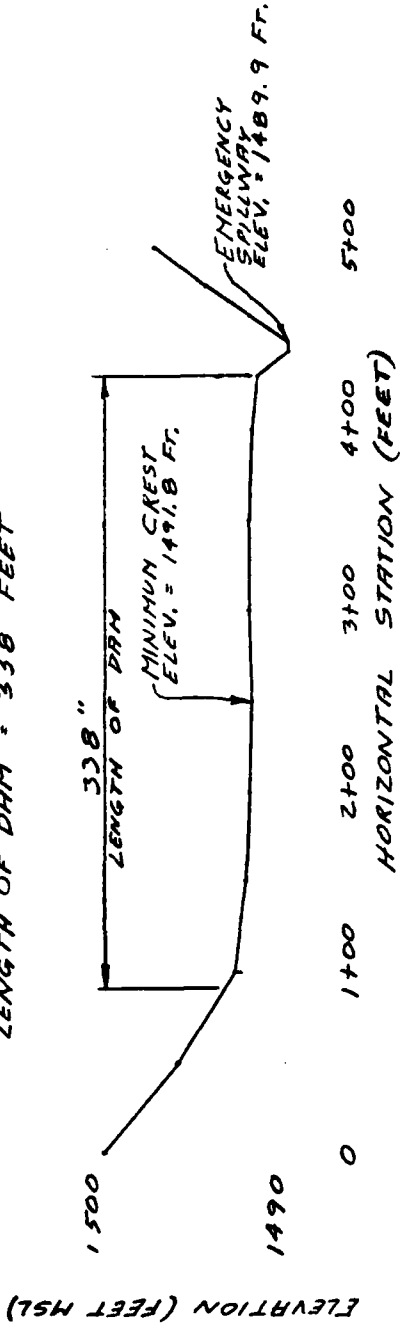   QUADRANGLE. PHOTOREVISED 1973

PLATE 2 WATERSHED MAP

BRESKIN POND DAM NO.1

PLATE 3

FIELD SKETCH
BRESKIN POND DAM NO.1
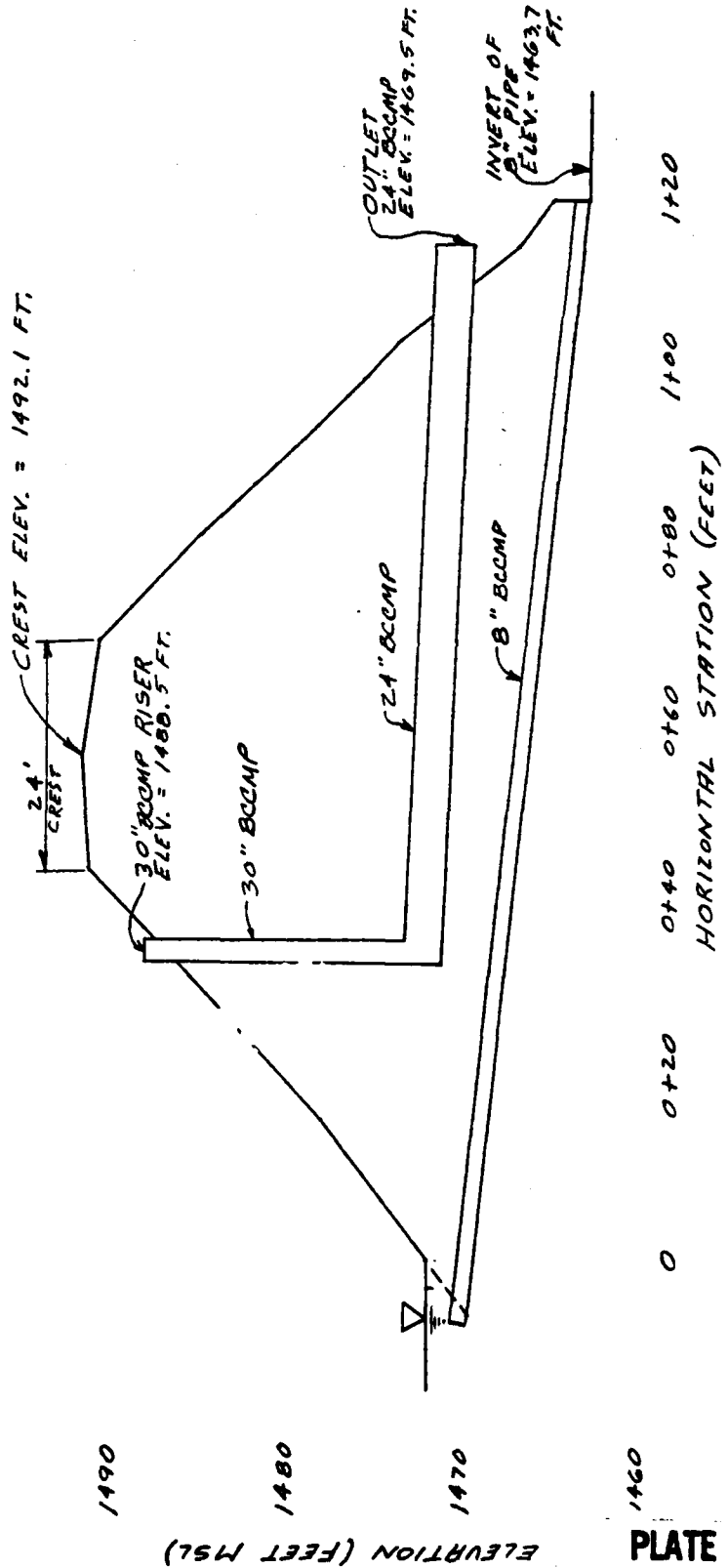NDI NO. PA 01141
PennDER NO.65-141
SCHEMATIC- NOT TO SCALE

CROSS SECTION TAKEN AT STA.3+25

TWO STORY
WOODEN FRAME
RESIDENCE

EMERGENCY
SPILLWAY

8" BCCMP
24" BCCMP

30" BCCMP RISER
VALVE STEM
SLIDE GATE

ROAD

N

A

A

5+0

1+0

TOP OF DAM PROFILE (LOOKING DOWNSTREAM)

LENGTH OF DAM = 338 FEET

EMERGENCY SPILLWAY ELEV. = 1489.9 FT.

338" LENGTH OF DAM

MINIMUM CREST ELEV. = 1491.8 FT.

HORIZONTAL STATION (FEET)

ELEVATION (FEET MSL)

1500

1490

0   1+00   2+00   3+00   4+00   5+00

TYPICAL CROSS SECTION AT STA. 3+25

CREST ELEV. = 1492.1 FT.

24' CREST

30" BCCMP RISER ELEV. = 1480.5 FT.

30" BCCMP

24" BCCMP

8" BCCMP

OUTLET 24" BCCMP ELEV. = 1469.5 FT.

INVERT OF 8" PIPE ELEV. = 1463.7 FT.

HORIZONTAL STATION (FEET)

ELEVATION (FEET MSL)

1490

1480

1470

1460

0   0+20   0+40   0+60   0+80   1+00   1+20

PLATE 4

APPENDIX F

REGIONAL GEOLOGY

REGIONAL GEOLOGY

Breskin Pond Dam is located in the Allegheny Mountains
section of the Appalachian Plateaus physiographic province
on the eastern flank of Chestnut Ridge. The dam is situated
in a small valley with 10%-20% slopes in an area that shows
a maximum relief of approximately 400 feet. This valley
drains southwest to Fourmile Run and then north to Loyalhanna
Creek.

According to the Soil Conservation Service's Soil Survey for
Westmoreland County, the soil in the vicinity of the dam
consists primarily of silt loams that have a Unified Soil
Classification of ML-CL. These soils are colluvium derived
from shales of the Freeport Formation and range from 2 to 20
feet thick. The soils may contain minor amounts of sand
where underlain by sandstone members and may contain up to
25% parent material fragments in localized areas and at
greater depths in the soil profile. A test boring for
Joseph Breskin (boring #5) indicates 15 feet of silty sand
below the center of the dam.

Geologic references indicate that bedrock in the vicinity of
the dam consists of members of the Freeport Formation in the
Allegheny Group. This Pennsylvanian Age Formation lies
stratigraphically below the Upper Freeport Coal and is
composed primarily of shale with some mineable coals and
non-persistent sandstones. The coals generally have clays
and limestones associated with them but have not been mined,
except for localized stripping for private use. The test
boring indicates that bedrock below the center of the dam is
gray shale, probably of the Freeport Formation. Due to the
extremely erratic occurrence of sandstone members in the
formation, it could not be determined if the impoundment is
founded on the Butler sandstone, a clean, permeable, sandstone
found in a stratigraphically equivalent location further to
the southwest. However, the possibility of infiltration
problems in the impoundment area does exist. The dam is
situated on the eastern flank of the Chestnut Ridge Anticline
which plunges about 3° to the northeast in the vicinity of
the dam. Thus, the strata beneath the dam is dipping approxi-
mately 10° to the southeast. In view of this regional dip,
artesian conditions could exist beneath the dam if a suitable,
confined aquifer were present.

GEOLOGIC MAP
Breskin Pond Dam No. 1
NDI No. PA 01141, Westmoreland County

Reproduced from
Greater Pittsburgh Region Geologic Map,
Compiled by W. R. Wagner and others, 1975

Scale: One Inch Equals Approximately Two Miles
See Legend, Next Page

GEOLOGY MAP LEGEND

GROUP	FORMATION		DESCRIPTION
	Alluvium	Qt	Sand, gravel, clay.
	Terrace deposits		Sand, clay, gravel on terraces above present rivers, includes Carmichaels Formation.
DUNKARD	Greene		Cyclic sequences of sandstone, shale, red beds, thin limestones and coals.
DUNKARD	Washington	Pw	Cyclic sequences of sandstone, shale, limestone, and coal; contains Washington coal bed at base.
DUNKARD	Waynesburg		Cyclic sequences of sandstone, shale, limestone and coal; contains Waynesburg coal bed at base.
MONONGAHELA		Pm	Cyclic sequences of shale, limestone, sandstone and coal; contains Pittsburgh coal bed at base.
CONEMAUGH	Casselman	Pcc	Cyclic sequence of sandstone, shale, red beds and thin limestone and coal.
CONEMAUGH	Ames		
CONEMAUGH	Glenshaw	Pcg	Cyclic sequences of sandstone, shale, red beds and thin limestone and coal, several fossiliferous limestone; Ames limestone bed at top.
ALLEGHENY	Vanport	Pa	Cyclic sequences of shale, sandstone, limestone, and coal, contains Brookville coal at base and Upper Freeport coal at top; within group are the commercial Vanport limestone and Kittanning and Clarion coals.
ALLEGHENY	Vanport	Pa	
POTTSVILLE		Pp	Sandstone and shale, contains some conglomerate and locally mineable coal.
	Mauch Chunk		Red and green shale with some sandstone; contains Wymps Gap and Loyalhanna limestones.
	Pocono		Sandstone and shale with Burgoon sandstone at top.

P

DATE
ILME