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NATIONAL DAM INSPECTION PROGRAM. COOKS POND DAM (NDI I.D. PA-00--ETC(U)
1981 DACW31-81-C-0019
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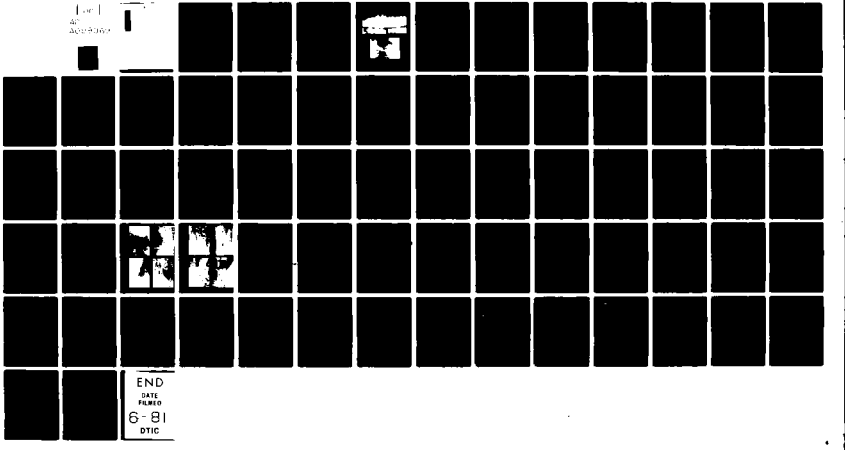

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PREFACE

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 Department of the Army, 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 visual observations and review of available data. Detailed investigations and analyses involving topographic mapping, subsurface investigations, material testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the inspection is intended to identify any need for such studies which should be performed by the owner.

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 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 the dam depends on numerous and constantly changing internal and external factors which are 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.

The assessment of the conditions and recommendations was made by the consulting engineer in accordance with generally and currently accepted engineering principles and practices.

PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM

NAME OF DAM: Cooks Pond Dam
STATE LOCATED: Pennsylvania
COUNTY LOCATED: Bradford
STREAM: North Branch of Beaver Creek
SIZE CLASSIFICATION: Small
HAZARD CLASSIFICATION: High
OWNER: Mr. E. W. Manchester
DATE OF INSPECTION: November 15, 1980 and February 4, 1981

ASSESSMENT: Based on the evaluation of the existing conditions, the condition of Cooks Pond Dam is considered to be unsafe/nonemergency due to the seriously inadequate spillway capacity and structural deficiencies. The condition of the embankment is considered to be poor.

The dam is old and in a general state of disrepair. The crest of the dam is irregular and the center of the dam appears to have settled. The stone wall along the downstream toe is irregular and bulging. The toe of the wall is swampy, caused by a general underseepage. In view of these observations, the overall stability of the dam is considered to be questionable, requiring further investigation and implementation of measures to improve the stability of the dam.

The spillway capacity was evaluated according to the recommended procedure and was found to pass less than 10 percent of the Probable Maximum Flood (PMF) without overtopping the embankment. This capacity is less than the required spillway capacity of one-half PMF relative to the size and hazard classification of the dam. Because the spillway capacity is less than 50 percent of the PMF and it is estimated that failure of the dam due to overtopping would significantly increase the downstream hazard of loss of life compared to that which would exist just before failure, the spillway is considered to be seriously inadequate, and consequently the condition of the dam is considered to be unsafe/nonemergency.

The following recommendations should be implemented immediately or on a continuing basis:

1. The owner should immediately retain a professional engineer experienced in the design and construction of dams either for orderly removal of the dam or to prepare and execute plans for:

   a. Evaluating the structural integrity of the dam in view of the observed conditions;

b. Initiating additional detailed hydrologic and hydraulic studies to more accurately ascertain the spillway capacity and to determine the nature and extent of improvements required to provide adequate spillway capacity; and

c. Providing low level outlet facilities with an upstream closure or prepare plans for draining the reservoir in the event of an emergency.

2. Around-the-clock surveillance should be provided during unusually heavy runoff and a formal warning system developed to alert the downstream residents in the event of emergencies.

3. The dam and appurtenant structures should be inspected regularly and a formal maintenance manual should be developed for future maintenance of the dam.

Lawrence D. Andersen, P.E.
Vice President

March 19, 1981
Date

Approved by:

JAMES W. PECK
Colonel, Corps of Engineers
District Engineer

Date 22 APR 81

COOKS POND DAM
NDI I.D. PA-0041
DER I.D. 008-035
NOVEMBER 15, 1980

Looking Downstream

Looking Upstream

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(Continued)

PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM
COOKS POND DAM
NDI I.D. PA-0041
DER I.D. 008-035

SECTION 1
PROJECT INFORMATION

1.1 General

a. Authority. The inspection was performed pursuant to the authority granted by The National Dam Inspection Act, Public Law 92-367, to the Secretary of the Army, through the Corps of Engineers, to conduct inspections of dams throughout the United States.

b. Purpose. The purpose of this inspection is to determine if the dam constitutes a hazard to human life or property.

1.2 Description of Project

a. Dam and Appurtenances. Cooks Pond Dam consists of an earth embankment approximately 280 feet long with a maximum height of 10 feet above the downstream toe. The dam is approximately L-shaped in plan view. A stone wall along the main section, extending to the crest level of the dam, forms the downstream face of the dam. The crest width is 10 feet. In the remaining portions of the dam, the downstream face has a slope of approximately 2 horizontal to 1 vertical and is covered with well-established grass.

Flood discharge facilities for the reservoir consist of primary and emergency spillways. The primary spillway is a dry masonry overflow section located near the left abutment. The emergency spillway consists of an earth channel at the right abutment with the control section located approximately 10 feet downstream from the axis of the dam. The emergency spillway discharge channel is an unprotected earth channel. The primary spillway discharge channel is a riprap-lined earth channel which flows downstream for about 150 feet to the confluence with the emergency spillway channel, then further downstream.

No low level outlet facilities could be located during the field inspection.

b. Location. Cooks Pond Dam is located (N41° 53.6', W76° 14.3') on the northwest branch of Beaver Creek, approximately one mile north of the town of Potterville in Orwell Township, Bradford County, Pennsylvania. Plate 1 illustrates the location of the dam.

c. Size Classification. Small (based on 10-foot height and 288 acre-feet storage capacity).

d. Hazard Classification. The dam is classified to be in the high hazard category. Discharge from the dam site flows through the northwest branch of Beaver Creek for one mile to the town of Potterville where the stream joins the main branch of Beaver Creek. In the floodplain of the northwest branch are a house, 3,000 feet downstream from the dam, and two houses and a trailer about 4,000 feet downstream. One mile downstream is the small town (approximately 35 homes) of Potterville in which many of the houses are located in the floodplain of Beaver Creek. These areas are estimated to be the main impact region in the event of a flood due to a dam failure. It is further estimated that failure of Cooks Pond Dam would cause loss of more than a few lives and extensive economic loss in the potential damage areas described.

e. Ownership. Mr. E. W. Manchester, R.D. #1, Box 266, Rome, Pennsylvania 18837.

f. Purpose of Dam. Recreation.

g. Design and Construction History. The design and construction history of the dam is unknown. The dam was first inspected by the Commonwealth of Pennsylvania in 1919.

h. Normal Operating Procedure. The reservoir is normally maintained at the crest level of the uncontrolled primary spillway. The inflow occurring when the lake is at or above the spillway crest level is discharged through the primary and emergency spillways.

1.3 Pertinent Data. Elevations referred to in this and subsequent sections of the report were calculated based on field measurements assuming the spillway crest at Elevation 1443 (USGS Datum), which is shown to be the normal pool elevation on the USGS 7.5-minute Little Meadows quadrangle.

a. Drainage Area — 0.59 square mile[1]

b. Discharge at Dam Site (cfs)

Maximum known flood at dam site	Unknown
Outlet conduit at maximum pool	No outlet facilities
Gated spillway capacity at maximum pool	Not applicable
Ungated spillway capacity at maximum pool	70
Total spillway capacity at maximum pool	70

[1] Planimetered from USGS topographic map. State records indicate the drainage area to be 0.5 square mile.

c. Elevation (USGS Datum) (feet)

Top of dam	1444.4 (low spot on dam crest)
Maximum pool	1444.4
Normal pool	1443.0
Maximum tailwater	Unknown
Toe of dam	1434.8

d. Reservoir Length (feet)

Normal pool level	2100
Maximum pool level	2116±

e. Storage (acre-feet)

Normal pool level	170
Maximum pool level	220

f. Reservoir Surface (acres)

Normal pool level	34.0
Maximum pool level	37.3

g. Dam

Type	Earth embankment with downstream dry masonry wall
Length	280± feet
Height	10 feet
Top width	10 feet
Side slopes	Downstream: Vertical (stone wall) Upstream: Varies, 2.H:1V to 4H:1V
Zoning	Unknown
Impervious core	Unknown
Cutoff	Unknown
Grout curtain	Unknown

h. Regulating Outlet

Type	Dam has no regulating outlet

i. Spillway (Primary and Emergency)

Type	Primary: Dry masonry overflow Emergency: Earth channel

Length	Primary: 12 feet Emergency: 33 feet (both measured perpendicular to flow)
Crest elevation	Primary: 1443.0; Emergency: 1443.5
Upstream channel	Lake
Downstream channel	Primary: Riprap-lined earth channel; Emergency: Earth channel

SECTION 2
DESIGN DATA

2.1 Design

a. Data Available. The available data consist of files provided by the Commonwealth of Pennsylvania, Department of Environmental Resources (PennDER), which contain correspondence and inspection reports.

(1) Hydrology and Hydraulics. No design information is available.

(2) Embankment. Available information consists of past inspection reports and correspondence.

(3) Appurtenant Structures. No information is available.

b. Design Features

(1) Embankment. No information is available on the design of the embankment. The dam consists of an earth embankment 280 feet long and about 10 feet high above the downstream toe. The crest width is 10 feet. The downstream side of the main embankment is a dry masonry wall. The upstream face of the dam is covered with grass and has a slope varying from 2 horizontal on 1 vertical to 4 horizontal on 1 vertical.

(2) Appurtenant Structures. The appurtenant structures consist of the primary and emergency spillways as described in Section 1.2 a.

c. Design Data

(1) Hydrology and Hydraulics. No design data are available.

(2) Embankment. No engineering data are available on the design of the embankment.

(3) Appurtenant Structures. No design information is available on the appurtenant structures.

2.2 Construction. No information is available on construction of the dam. Information in state files indicates that postconstruction changes to the dam include adding the riprap to the primary spillway discharge channel and constructing the earth channel comprising the emergency spillway.

2.3 Operation. There are no formal operating records maintained for the dam.

2.4 Other Investigations. None reported.

2.5 Evaluation

a. Availability. The available information was provided by PennDER.

b. Adequacy. No design and construction information is available to assess the adequacy of the design of the embankment or spillway facilities.

SECTION 3
VISUAL INSPECTION

3.1 Findings

a. General. The onsite inspection of Cooks Pond Dam consisted of:

1. Visual inspection of the embankment, abutments, and embankment toe.

2. Visual examination of the primary and emergency spillways.

3. Evaluation of the downstream area hazard potential.

The specific observations are illustrated in Plate 2 and in the photographs in Appendix C.

b. Embankment. The general inspection of the embankment consisted of searching for indications of structural distress, such as cracks, subsidence, bulging, wet areas, seeps and boils, and observing general maintenance conditions, vegetative cover, erosion, and other surficial features.

In general, the condition of the dam is considered to be poor. The stone wall forming the downstream side of the main embankment has an irregular horizontal alignment due to bulging of the wall near the middle of the dam. Seepage was observed in a wet area near the toe, with an unmeasurable flow discharging from the toe of the stone wall. The upstream face of the dam is covered with grass and weeds and lacks erosion protection.

The crest of the dam was surveyed relative to the spillway crest elevation and was found to have vertical irregularities. The crest slopes downward to the center of the embankment to approximately one foot below the crest level near the left and right abutments. The dam crest profile is illustrated in Plate 3.

c. Appurtenant Structures. The spillway structures were examined for deterioration or other signs of distress that would limit flow. In general, the primary spillway structures, which consist of an unlined earth channel and a dry masonry overflow section, were found to be in fair condition except for some loose rock along the right edge of the section and no erosion protection other than grass cover on the sides of the overflow section. The primary spillway channel downstream from the dam is riprap lined and in good condition. The emergency spillway channel lacks any form of erosion protection and is considered to present a breach potential since large flows through the spillway could erode the embankment near the right abutment.

d. Reservoir Area. A map review indicates that the watershed is predominantly covered by woodlands. A review of the regional geology (Appendix F) indicates that the reservoir slopes are not likely to be subject to landslides which may affect the storage capacity of the reservoir.

e. Downstream Channel. One mile downstream from the dam, the northwest branch of Beaver Creek flows through the town of Potterville and to the confluence with the main branch of Beaver Creek. A further description of the downstream conditions is included in Section 1.2 d.

3.2 Evaluation. The condition of the dam is considered to be poor. The middle of the embankment appears to have settled up to one foot below the levels near the left and right abutments. The dry masonry wall near the center of the dam is bulging downstream. The toe of the wall is swampy, which may further affect its stability. The emergency spillway lacks any erosion protection. In view of these conditions, repair and restoration of the dam is required.

Further, it appears that the dam has no outlet facilities. It is also recommended that the owner provide outlet facilities or prepare plans for draining the lake in the event of an emergency.

SECTION 4
OPERATIONAL FEATURES

4.1 Procedure. There are no formal operating procedures for the dam. The reservoir is normally maintained at the uncontrolled primary spillway crest level with excess inflow discharging over the primary spillway and through the emergency spillway channel.

4.2 Maintenance of the Dam. The maintenance of the dam is considered to be poor. It appears that the dam has been essentially abandoned other than some recent attempts to fill the crest of the dam and to cut some trees. Some of the trees along the downstream toe of the embankment have recently been cut.

4.3 Maintenance of Operating Facilities. The dam appears to have no operating facilities.

4.4 Warning System. No formal warning system exists for the dam. Telephone communication facilities are available via residences approximately one mile downstream in the town of Potterville.

4.5 Evaluation. The maintenance of the dam is considered to be poor. As previously mentioned, the dam is in need of general repair and restoration. In conjunction with this work, installation of low level outlet facilities or development of a plan to lower the lake in the event of emergencies should be considered.

SECTION 5
HYDRAULICS AND HYDROLOGY

5.1 Evaluation of Features

a. Design Data. Cooks Pond Dam has a watershed area of 0.59 square mile and impounds a reservoir with a surface area of 34.0 acres at normal pool level. The flood discharge facilities for the dam consist of the primary spillway at the left abutment and emergency spillway channel at the right abutment. The combined emergency and primary spillway capacity was determined to be 70 cfs, based on 1.4 feet of available freeboard relative to the low spot on the dam crest.

b. Experience Data. As previously stated, Cooks Pond Dam is classified as a small dam in the high hazard category. Under the recommended criteria for evaluating emergency spillway discharge capacity, such impoundments are required to pass one-half to full PMF. In view of the height and storage capacity of the dam which correspond to the lower limit of the small size classification, the one-half PMF is selected as the spillway design flood.

The PMF inflow hydrograph for the reservoir was determined utilizing the Dam Safety Version of the HEC-1 computer program developed by the Hydrologic Engineering Center of the U.S. Army, Corps of Engineers. Data used for the computer input are presented in Appendix D. The PMF inflow hydrograph was found to have a peak flow of 1803 cfs, while the one-half PMF hydrograph has a peak flow of 902 cfs. The computer input and the summary of the computer output are also included in Appendix D.

c. Visual Observations. On the date of inspection, no conditions were observed that would indicate that the capacity of the spillways would be significantly reduced in the event of a flood.

d. Overtopping Potential. Various percentages of PMF inflow hydrograph were routed through the reservoir to determine the percent of PMF inflow that the dam can pass without significantly overtopping the embankment. The computer analyses indicate that the spillway can pass 10 percent PMF without overtopping. For 30 percent PMF, the dam would be overtopped for a duration of 6.5 hours with a maximum depth of 0.8 foot. It is estimated that overtopping of the dam by six inches could initiate breaching of the dam.

e. Spillway Adequacy. Since the spillway cannot pass the recommended design flood of one-half PMF without overtopping, the spillway is classified to be inadequate. A breach analysis was conducted to determine if the spillway is seriously inadequate; that is, if dam failure resulting from overtopping would significantly increase the loss

of life or damage downstream from the dam over that which would exist just before overtopping failure. For the breach analysis, the duration to failure was taken as 0.75 hour and it was assumed that the breaching would initiate when the dam is overtopped by six inches, and the entire embankment would be removed within the failure duration.

Review of the flood stages in the potential damage area (stations 4 through 7) before and after failure indicates that flood stages would rise four or five feet due to dam failure, which is considered to significantly increase the loss of life or damage potential. Therefore, the spillway is classified to be seriuosly inadequate.

SECTION 6
STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

(1) Embankment. As discussed in Section 3, the stone wall downstream of the embankment is irregular due to bulging of the wall near the center of the dam. Further, an area around the toe of the wall is swampy, which may affect the stability of the wall. Considering the bulge in the stone wall and the swampy conditions along the toe, the stability of the dam is considered to be questionable, requiring further investigation.

(2) Appurtenant Structures. The only condition noted relative to the structural features of the spillway was the lack of erosion protection in the emergency spillway channel, which is considered to present a breach potential since large flows through the spillway could erode the embankment.

b. Design and Construction Data. No quantitative design and construction data are available for this dam.

c. Operating Records. The structural stability of the dam is not considered to be affected by the operational features.

d. Postconstruction Changes. The only structural modification reported is the construction of the emergency spillway at the right abutment.

e. Seismic Stability. The dam is located in Seismic Zone 1 and based on visual observations, the static stability of the dam is considered to be questionable, requiring further investigation. Therefore, the seismic stability of the dam is also questionable and should be investigated in conjunction with the static stability of the dam.

SECTION 7
ASSESSMENT AND RECOMMENDATIONS/PROPOSED REMEDIAL MEASURES

7.1 Dam Assessment

a. Assessment. The visual observations indicate that Cooks Pond Dam is in poor condition and, further, because of the seriously inadequate spillway capacity, the condition is considered to be unsafe/nonemergency. The dam is old and in a general state of disrepair. The crest of the dam is irregular and the center of the dam appears to have settled. The stone wall along the downstream toe is irregular and bulging. The toe of the wall is swampy, caused by general underseepage. In view of these observations, the overall stability of the dam is considered to be questionable, requiring further investigation and implementation of measures to improve the stability of the dam or remove the dam.

The dam has no outlet facilities. Therefore, it is recommended that the owner provide such facilities or prepare plans for draining the lake in case of emergency.

Spillway capacity was evaluated according to the recommended procedure and was found to pass 10 percent of the PMF without overtopping the embankment. This capacity is less than the recommended spillway capacity of 50 percent of the PMF according to the size and hazard classification for this dam. Results of the breach analysis indicate that downstream damage would be significantly increased due to a dam failure and, as a result, the spillway is classified as seriously inadequate.

b. Adequacy of Information. The available information, in conjunction with the visual observations, is considered to be sufficient to make a Phase I evaluation.

c. Urgency. The following recommendations should be implemented immediately or on a continuing basis.

d. Necessity for Additional Investigations. In view of the inadequate spillway capacity, the owner should immediately initiate additional studies to more accurately ascertain the spillway capacity and the extent of improvements required to provide adequate spillway capacity. The structural condition of the dam should also be evaluated and necessary repairs made.

7.2 Recommendations/Remedial Measures. It is recommended that:

1. The owner should immediately retain a professional engineer experienced in the design and construction of dams either for orderly removal of the dam or to prepare and execute plans for:

a. Evaluating the structural integrity of the dam in view of the observed conditions;

b. Initiating additional detailed hydrologic and hydraulic studies to more accurately ascertain the spillway capacity and to determine the nature and extent of improvements required to provide adequate spillway capacity; and

c. Providing low level outlet facilities with an upstream closure or prepare plans for draining the reservoir in the event of an emergency.

2. Around-the-clock surveillance should be provided during unusually heavy runoff and a formal warning system developed to alert the downstream residents in the event of emergencies.

3. The dam and appurtenant structures should be inspected regularly and a formal maintenance manual should be developed for future maintenance of the dam.

APPENDIX A

CHECKLIST
VISUAL INSPECTION
PHASE I

APPENDIX A

CHECKLIST
VISUAL INSPECTION
PHASE I

NAME OF DAM Cooks Pond COUNTY Bradford STATE Pennsylvania ID# NDI: PA-0041 DER: 008-035

TYPE OF DAM Earth embankment with dry masonry wall downstream HAZARD CATEGORY High

DATE(S) INSPECTION November 15, 1980 WEATHER Cloudy TEMPERATURE 30's

POOL ELEVATION AT TIME OF INSPECTION 1442.5 M.S.L. TAILWATER AT TIME OF INSPECTION No tail-water M.S.L.

INSPECTION PERSONNEL:	REVIEW INSPECTION PERSONNEL: (February 4, 1981)
Douglas Cosler	Lawrence D. Andersen
Arthur Smith	James H. Poellot
Bilgin Erel	Bilgin Erel

Owner's Representative: Bilgin Erel RECORDER

E. W. Manchester (owner)

VISUAL INSPECTION
PHASE I
EMBANKMENT

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.	
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	Irregular crest profile (See Plate 3). Bulges were also observed toward the center of the downstream wall.	
RIPRAP FAILURES	Upstream slope of embankment has no riprap protection.	Owner should provide erosion protection along the upstream slope of the dam.

VISUAL INSPECTION
PHASE I
EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	No problems observed.	
ANY NOTICEABLE SEEPAGE	Some seepage under the dam was observed at the center of the embankment.	Seepage should be monitored. Necessary remedial work should be performed if more serious seepage conditions develop.
STAFF GAGE AND RECORDER	None	
DRAINS	None	

VISUAL INSPECTION
PHASE I
CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
ANY NOTICEABLE SEEPAGE	Seepage noticed near the toe of the dam.	See comments on Page 3.
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	No visual signs of distress except for bulging of wall near center of embankment.	
DRAINS	None found.	
WATER PASSAGES	None	
FOUNDATION	No perceivable sign of distress.	

VISUAL INSPECTION
PHASE I
CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	Dry masonry dam, N/A.	
STRUCTURAL CRACKING	Dry masonry dam, N/A.	
VERTICAL AND HORIZONTAL ALIGNMENT	See comments on Page 2.	
MONOLITH JOINTS	Dry masonry dam, N/A.	
CONSTRUCTION JOINTS	(No construction joints.)	
STAFF GAGE OF RECORDER:	None found.	

VISUAL INSPECTION
PHASE I
OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	Dam has no outlet facilities.	Owner should provide outlet facilities or prepare plans for draining the lake in case of emergency.
INTAKE STRUCTURE	N/A	
OUTLET STRUCTURE	N/A	
OUTLET CHANNEL	N/A	
EMERGENCY GATE	None	See above comments.

VISUAL INSPECTION
PHASE I
UNGATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	Primary spillway is a trapezoidal weir with stone walls and concrete base. Some of the stones have become loose. Emergency spillway is an earth channel along the right edge of the dam. This channel has no erosion protection.	Erosion protection should be provided for the emergency spillway channel.
APPROACH CHANNEL	Lake. No obstructions were noted in either of the approach channels.	
DISCHARGE CHANNEL	See above comments.	
BRIDGE AND PIERS	None	

VISUAL INSPECTION
PHASE I
GATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SILL	Dam has no gated spillway.	
APPROACH CHANNEL	N/A	
DISCHARGE CHANNEL	N/A	
BRIDGE PIERS	N/A	
GATES AND OPERATION EQUIPMENT	N/A	

VISUAL INSPECTION
PHASE I
INSTRUMENTATION

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

VISUAL INSPECTION
PHASE I
RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	No problems observed.	
SEDIMENTATION	Owner said that much of the lake had become silted over the years.	
UPSTREAM RESERVOIRS	None	

VISUAL INSPECTION
PHASE I
DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	No problems observed.	
SLOPES	No problems observed.	
APPROXIMATE NUMBER OF HOMES AND POPULATION	One mile downstream from the dam is the small town of Potterville which has about 35 homes (approximate population is 120).	

APPENDIX B

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
AND HYDROLOGIC AND HYDRAULIC
PHASE I

APPENDIX B

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

NAME OF DAM Cooks Pond

ID# NDI: PA-0041
DER: 008-035

ITEM	REMARKS
AS-BUILT DRAWINGS	None available.
REGIONAL VICINITY MAP	See Plate 1.
CONSTRUCTION HISTORY	Unknown
TYPICAL SECTIONS OF DAM	See Plate 2 (sections defined according to field measurements).
OUTLETS - PLAN - DETAILS - CONSTRAINTS - DISCHARGE RATINGS	Dam has no outlet facilities.

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

ITEM	REMARKS
RAINFALL/RESERVOIR RECORDS	None available.
DESIGN REPORTS	None available.
GEOLOGY REPORTS	No geology information reported.
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	None reported.
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	None available.

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

ITEM	REMARKS
POST CONSTRUCTION SURVEYS OF DAM	None reported.
BORROW SOURCES	Unknown
MONITORING SYSTEMS	No existing monitoring systems.
MODIFICATIONS	None reported.
HIGH POOL RECORDS	None available.

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

ITEM	REMARKS
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None available.
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None reported.
MAINTENANCE OPERATION RECORDS	None available.
SPILLWAY PLAN SECTIONS DETAILS	See Plates 2 and 3 (sections defined according to field measurements).
OPERATING EQUIPMENT PLANS AND DETAILS	Dam has no operating equipment.

CHECKLIST
ENGINEERING DATA
HYDROLOGIC AND HYDRAULIC

DRAINAGE AREA CHARACTERISTICS: 0.59 square mile (wooded)

ELEVATION, TOP OF NORMAL POOL AND STORAGE CAPACITY: 1443.0 (170 acre-feet)

ELEVATION, TOP OF FLOOD CONTROL POOL AND STORAGE CAPACITY: 1444.4 (288 acre-feet)

ELEVATION, MAXIMUM DESIGN POOL: 1444.4 (maximum design pool unknown)

ELEVATION, TOP OF DAM: 1444.4 (low spot on crest)

SPILLWAY: (Primary):

a. Elevation 1443.0

b. Type Trapezoidal weir with stone wall and concrete floor

c. Width 7 feet at base and 12 feet at top (perpendicular to flow)

d. Length 5 feet

e. Location Spillover None observed

f. Number and Type of Gates None

SPILLWAY: (Emergency):

a. Elevation 1443.5

b. Type Earth channel

c. Width 7 feet at base and 4.5H:1V side slopes (perpendicular to flow)

d. Length N/A

e. Location Spillover None observed

f. Number and Type of Gates None

OUTLET WORKS:

a. Type Dam has no outlet facilities

b. Location N/A

c. Entrance Inverts N/A

d. Exit Inverts N/A

e. Emergency Drawdown Facilities None

HYDROMETEOROLOGICAL GAGES:

a. Type None

b. Location N/A

c. Records N/A

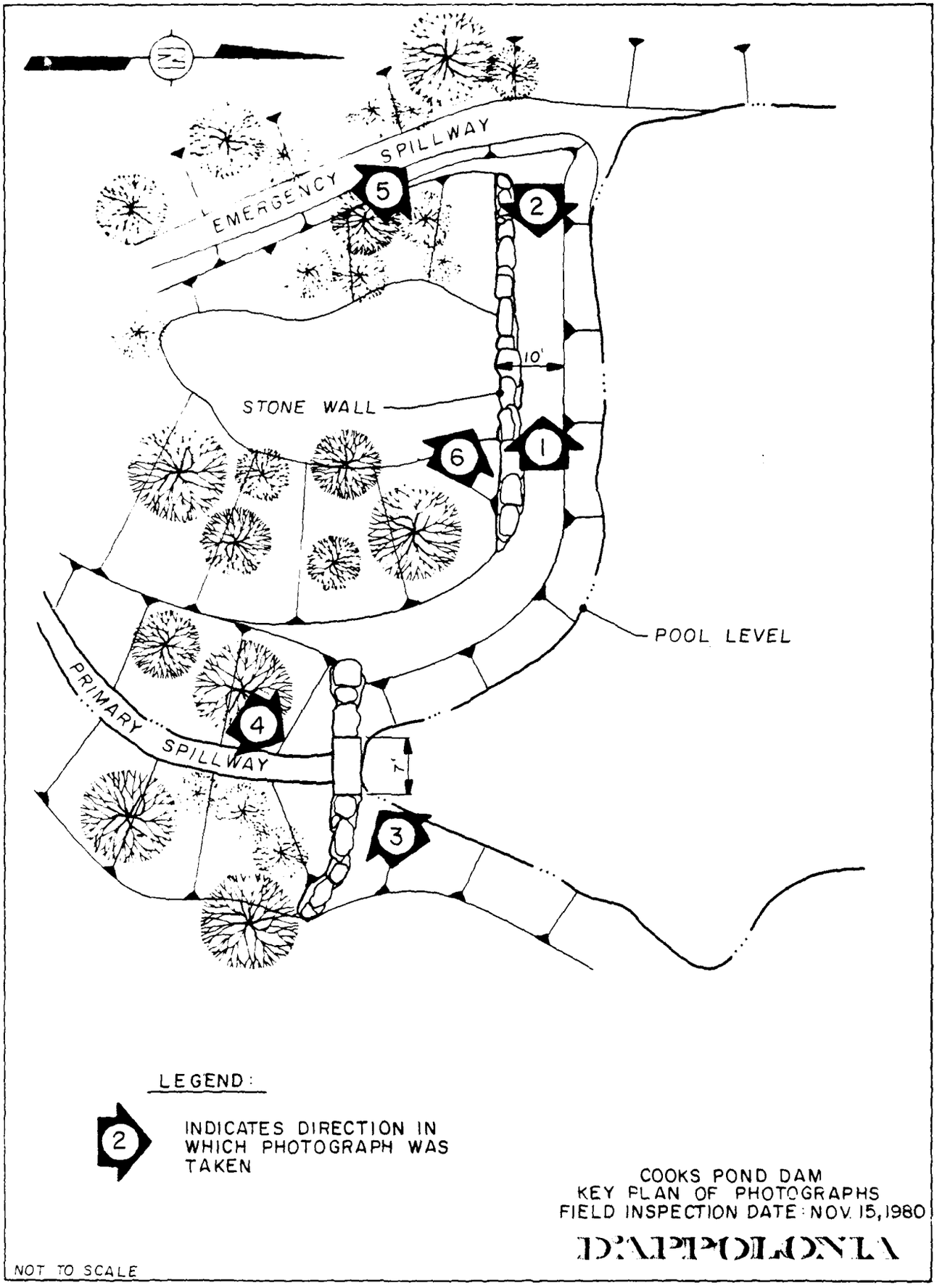
MAXIMUM NONDAMAGING DISCHARGE: Combined spillway capacity (70 cfs)

APPENDIX C

PHOTOGRAPHS

LIST OF PHOTOGRAPHS
COOKS POND DAM
NDI I.D. NO. PA-0041
NOVEMBER 15, 1980

PHOTOGRAPH NO.	DESCRIPTION
1	Crest (looking west).
2	Crest (looking east).
3	Primary spillway (looking west).
4	Primary spillway (looking upstream).
5	Emergency spillway (looking upstream).
6	Downstream face of dam.
7	House - Potterville (mile 1.0).
8	Trailer - Potterville (mile 0.8).

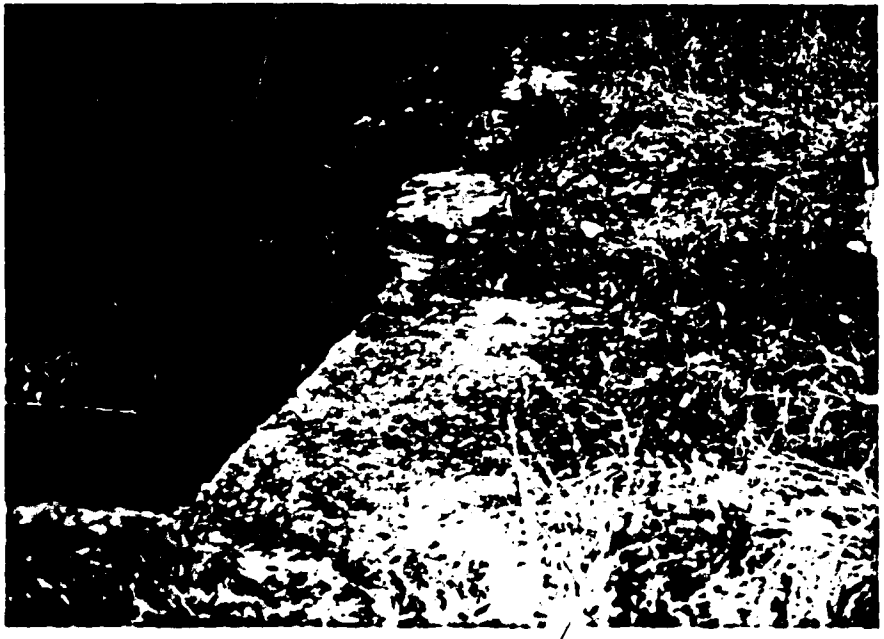


COOKS POND DAM
KEY PLAN OF PHOTOGRAPHS
FIELD INSPECTION DATE: NOV. 15, 1980

DAPPOLONIA

PHOTOGRAPH NO 1

PHOTOGRAPH NO 2



PHOTOGRAPH NO 3

PHOTOGRAPH NO 4

PHOTOGRAPH NO 5

PHOTOGRAPH NO. 6

APPENDIX D

HYDROLOGY AND HYDRAULICS ANALYSES

HYDROLOGY AND HYDRAULIC ANALYSIS
DATA BASE

NAME OF DAM: Cooks Pond Dam

PROBABLE MAXIMUM PRECIPITATION (PMP) = 22.2 INCHES/24 HOURS

STATION	1	2	3	4	5
Station Description	Cooks Pond Reservoir	Cooks Pond Dam	Beaver Creek		
Drainage Area (square miles)	0.59	-	-		
Cumulative Drainage Area (square miles)	0.59	0.59	0.59		
Adjustment of PMF for Drainage Area (%)[1]	95%				
6 Hours	117	-	-		
12 Hours	127	-	-		
24 Hours	136	-	-		
48 Hours	145	-	-		
72 Hours	-	-	-		
Snyder Hydrograph Parameters					
Zone[2]	11	-	-		
C_p/C_t[3]	0.62/1.5	-	-		
L (miles)[4]	1.04	-	-		
L_{ca} (miles)[4]	0.38	-	-		
$t_p = C_t(L \cdot L_{ca})^{0.3}$ (hours)	1.14	-	-		
Spillway Data		Primary:	Emergency:		
Crest Length (ft)	-	9.5	7' Trapezoidal with 4.5:1 side slope		
Freeboard (ft)	-	1.4	0.9		
Discharge Coefficient	-	2.67	Varies		
Exponent	-	1.5	1.5		

(1) Hydrometeorological Report 40, U.S. Weather Bureau, 1965.
(2) Hydrological zone defined by Corps of Engineers, Baltimore District, for determining Snyder's Coefficients (C_p and C_t).
(3) Snyder's Coefficients.
(4) L = Length of longest water course from outlet to basin divide.
L_{ca} = Length of water course from outlet to point opposite the centroid of drainage area.

STORAGE VS. ELEVATION

ELEVATION	ΔH, FEET	AREA (acres)[1]	ΔVOLUME (acre-feet)[2]	STORAGE (acre-feet)
1460		74.4		1069.3
	17		899.3	
1443 (Normal pool elevation)		34.0		170.0
	-		170.0[3]	
Reservoir Bottom				0

(1) Planimetered from USGS maps.
(2) ΔVolume = $\Delta H/3\ (A_1 + A_2 + \sqrt{A_1 A_2})$.
(3) From PennDER files.

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  01 APR 80
**********
    1                A1       SNYDER UNIT HYDROGRAPH, DAM BREACH AND DOWN STREAM ROUTING
    2                A2       COOK'S POND,(DER 08-35),BRADFORD COUNTY,  PROJECT NO.80-556-15
    3                A3       FOR 10%,20%,30%,40%,50%,AND 100% PROBABLE MAXIMUM FLOOD (PMF)
    4                B     300        0       15        0        0        0        0        0       -4        0
    5                B1      5
    6                J       2        6        1
    7                J1   0.10     0.20     0.30     0.40     0.50     1.00
    8                K       0        1                                          1
    9                K1       CALCULATION OF SNYDER INFLOW HYDROGRAPH TO COOK'S POND,(DER 08-35)
   10                M       1        1     0.59              0.59                                      1
   11                P               21.1      117      127      136      145
   12                T                                                            1.0      0.5           0.0901
   13                J    1.14     0.62
   14                K    -1.5    -0.05      2.0
   15                K       1        2                                          1
   16                K1       ROUTING FLOW THROUGH COOK'S POND,(DER 08-35)
   17                Y                                         1        1
   18                Y1      1                                                -1443.0       -1
   19                Y1443.0  1443.5   1444.0   1444.5   1445.0   1445.5   1446.0   1446.5   1447.0   1447.5
   20                Y1448.0  1448.5   1449.0   1449.5
   21                Y5    0.0      8.0     32.8     75.7    136.1    217.1    318.1    440.9    586.8    757.0
   22                Y5 952.6   1174.7   1424.4   1702.5
   23                SA    9.9     34.0     74.4    107.4
   24                SE1434.8   1443.0   1460.0   1480.0
   25                SL1443.0
   26                SD1444.4      2.0      1.5    287.0
   27                SL   50.0     75.0    125.0    160.0    229.0    262.0    287.0
   28                SV1444.4   1444.6   1444.8   1445.0   1445.4   1445.6   1448.1
   29                SQ  282.0      0.5   1434.8     0.75   1443.0   1480.0
   30                SR  282.0      0.5   1434.8     0.75   1443.0   1444.9
   31                K       1        3                                          1
   32                K1       CHANNEL ROUTING USING MODIFIED PULS: REACH 1, MILE 0.0 TO 0.30
   33                Y                                         1        1
   34                Y1      1
   35                Y5 0.045    0.040    0.045   1370.0   1389.0   1600.0   0.0405
   36                Y7    0.0   1400.0    100.0   1390.0    120.0   1374.0    125.0   1370.0    135.0   1370.0
   37                Y7 140.0   1374.0    200.0   1380.0    250.0   1400.0
   38                K       1        4                                          1
   39                K1       CHANNEL ROUTING USING MODIFIED PULS: REACH 2, MILE 0.30 TO 0.59
   40                Y                                         1        1
   41                Y1      1
   42                Y5 0.040    0.040    0.045   1310.0   1329.0   1500.0   0.0400
   43                Y7    0.0   1340.0    900.0   1320.0   1050.0   1320.0   1110.0   1318.0   1150.0   1310.0
   44                Y7110.0   1310.0   1260.0   1320.0   1330.0   1340.0
   45                K       1        5                                          1
   46                K1       CHANNEL ROUTING USING MODIFIED PULS: REACH 3, MILE 0.59 TO 0.74
   47                Y                                         1        1
   48                Y1      1
   49                Y5 0.040    0.040    0.040   1280.0   1299.0    800.0   0.0375
   50                Y7    0.0   1310.0    225.0   1295.0    300.0   1295.0    305.0   1280.0    315.0   1280.0
```

```
51          YY 5..0   1285.0   570.0   1265.0   450.0   1300.0
52          K      1        0                                    1
53          K1        CHANNEL ROUTING USING MODIFIED PULS: REACH 4, MILE 0.74 TO 0.83
54          Y                                      1       1
55          Y1     1
56          Y4 0.040   0.030   0.040   1260.0   1279.0   500.0   0.0400
57          YY   0.0   1280.0    25.0   1278.0    100.0   1278.0   200.0   1260.0   210.0   1260.0
58          YY 215.0   1265.0   415.0   1265.0    815.0   1280.0
59          K      1        7                                    1
60          K1        CHANNEL ROUTING USING MODIFIED PULS: REACH 5, MILE 0.83 TO 0.96
61          Y                                      1       1
62          Y1     1
63          Y4 0.040   0.030   0.040   1250.0   1269.0   650.0   0.0154
64          YY   0.0   1280.0   100.0   1260.0    500.0   1255.0   505.0   1250.0   515.0   1250.0
65          YY 520.0   1255.0   870.0   1250.0   1370.0   1280.0
66          K     99
```

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 .10	RATIO 2 .20	RATIO 3 .30	RATIO 4 .40	RATIO 5 .50	RATIO 6 1.00
HYDROGRAPH AT	1	.59	1	180.	361.	541.	721.	902.	1805.
	(	1.53)	(	5.11)(	10.21)(	15.32)(	20.43)(	25.53)(	51.07)(
			2	180.	361.	541.	721.	902.	1805.
			(	5.11)(	10.21)(	15.32)(	20.43)(	25.55)(	51.07)(
ROUTED TO	2	.59	1	47.	185.	379.	580.	782.	1695.
	(	1.53)	(	1.32)(	5.25)(	10.73)(	16.45)(	22.15)(	47.99)(
			2	47.	185.	5877.	6170.	6385.	6225.
			(	1.32)(	5.25)(	166.43)(	174.72)(	180.79)(	176.21)(
ROUTED TO	3	.59	1	47.	185.	379.	580.	782.	1691.
	(	1.53)	(	1.32)(	5.24)(	10.74)(	16.41)(	22.14)(	47.88)(
			2	47.	185.	5528.	5798.	6095.	6024.
			(	1.32)(	5.24)(	156.53)(	164.17)(	172.60)(	170.58)(
ROUTED TO	4	.59	1	47.	185.	377.	582.	781.	1687.
	(	1.53)	(	1.32)(	5.23)(	10.69)(	16.48)(	22.13)(	47.78)(
			2	47.	185.	5668.	6046.	6364.	6275.
			(	1.32)(	5.23)(	160.49)(	171.19)(	180.20)(	177.69)(
ROUTED TO	5	.59	1	47.	185.	378.	582.	779.	1698.
	(	1.53)	(	1.32)(	5.22)(	10.71)(	16.48)(	22.06)(	47.79)(
			2	47.	185.	5915.	6208.	6509.	6514.
			(	1.32)(	5.22)(	167.50)(	178.35)(	187.14)(	184.52)(
ROUTED TO	6	.59	1	47.	185.	379.	582.	780.	1689.
	(	1.53)	(	1.32)(	5.24)(	10.72)(	16.49)(	22.08)(	47.92)(
			2	47.	185.	5985.	6379.	6699.	6579.
			(	1.32)(	5.24)(	169.41)(	180.63)(	189.70)(	186.47)(
ROUTED TO	7	.59	1	47.	185.	378.	581.	779.	1695.
	(	1.53)	(	1.32)(	5.23)(	10.70)(	16.44)(	22.06)(	47.99)(
			2	47.	185.	6108.	6481.	6782.	6649.
			(	1.32)(	5.23)(	172.85)(	183.52)(	192.05)(	188.30)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1443.00	1443.00	1444.[illegible]
STORAGE	170.	170.	220.
OUTFLOW	0.	0.	67.

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
.10	1444.16	0.00	211.	47.	0.00	43.50	0.00
.20	1444.84	.44	236.	185.	5.00	42.50	0.00
.30	1445.17	.77	249.	379.	6.50	41.75	0.00
.40	1445.41	1.01	258.	580.	7.25	41.50	0.00
.50	1445.60	1.20	265.	782.	8.25	41.25	0.00
1.00	1446.24	1.84	291.	1955.	13.75	41.00	0.00

PLAN 2 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1443.00	1443.00	1444.[illegible]
STORAGE	170.	170.	220.
OUTFLOW	0.	0.	67.

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
.10	1444.16	0.00	211.	47.	0.00	43.50	0.00
.20	1444.84	.44	236.	185.	5.00	42.50	0.00
.30	1445.03	.63	243.	6327.	1.32	41.59	41.00
.40	1445.08	.68	245.	6434.	1.09	41.09	40.50
.50	1445.15	.75	248.	6552.	1.35	40.85	40.25
1.00	1445.[illegible]8	.68	245.	6799.	1.09	39.60	39.00

PLAN 1 STATION 3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	47.	1370.6	43.50
.20	185.	1371.6	42.50
.30	379.	1372.3	41.75
.40	580.	1373.2	41.50
.50	782.	1373.8	41.25
1.00	1691.	1375.4	41.00

PLAN 2 STATION 3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	47.	1371.6	43.50
.20	185.	1371.6	42.50
.30	552.	1376.5	41.50
.40	579.	1378.7	41.00
.50	6095.	1378.8	41.00
1.00	6024.	1378.8	39.75

PLAN 1 STATION 4

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	47.	1310.5	43.50
.20	185.	1311.3	42.50
.30	377.	1311.9	42.00
.40	582.	1312.5	41.50
.50	781.	1313.0	41.25
1.00	1682.	1315.7	41.00

PLAN 2 STATION 4

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	47.	1311.5	43.50
.20	185.	1311.3	42.50
.30	560.	1316.2	41.75
.40	6046.	1316.4	41.25
.50	6364.	1316.5	41.00
1.00	6275.	1316.5	39.75

PLAN 1 STATION 5

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	47.	1281.5	43.50
.20	145.	1281.4	42.50
.30	326.	1282.2	42.00
.40	5[illegible].	1282.9	41.50
.50	77[illegible].	1283.4	41.25
1.00	1688.	1285.1	41.25

PLAN [illegible] STATION 5

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	47.	1[illegible].5	43.50
.20	145.	1281.4	42.50
.30	[illegible]	1[illegible].9	41.75
.40	62[illegible].	1[illegible].0	41.25
.50	[illegible]	1[illegible].1	41.[illegible]
1.00	[illegible]	1[illegible].1	39.75

PLAN 1 STATION 6

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	47.	1260.4	43.50
.20	145.	1261.2	42.75
.30	5[illegible].	1261.9	42.00
.40	[illegible]	1262.4	41.50
.50	[illegible]	1262.7	41.25
1.00	1689.	1264.0	41.25

PLAN 2 STATION 6

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	47.	1260.4	43.50
.20	145.	1261.2	42.75
.30	5985.	1260.1	41.75
.40	5579.	1260.2	41.25
.50	6699.	1260.2	41.00
1.00	6591.	1260.2	39.75

DOWNSTREAM FLOOD ROUTING SUMMARY
(Continued)
PAGE D7 OF 16

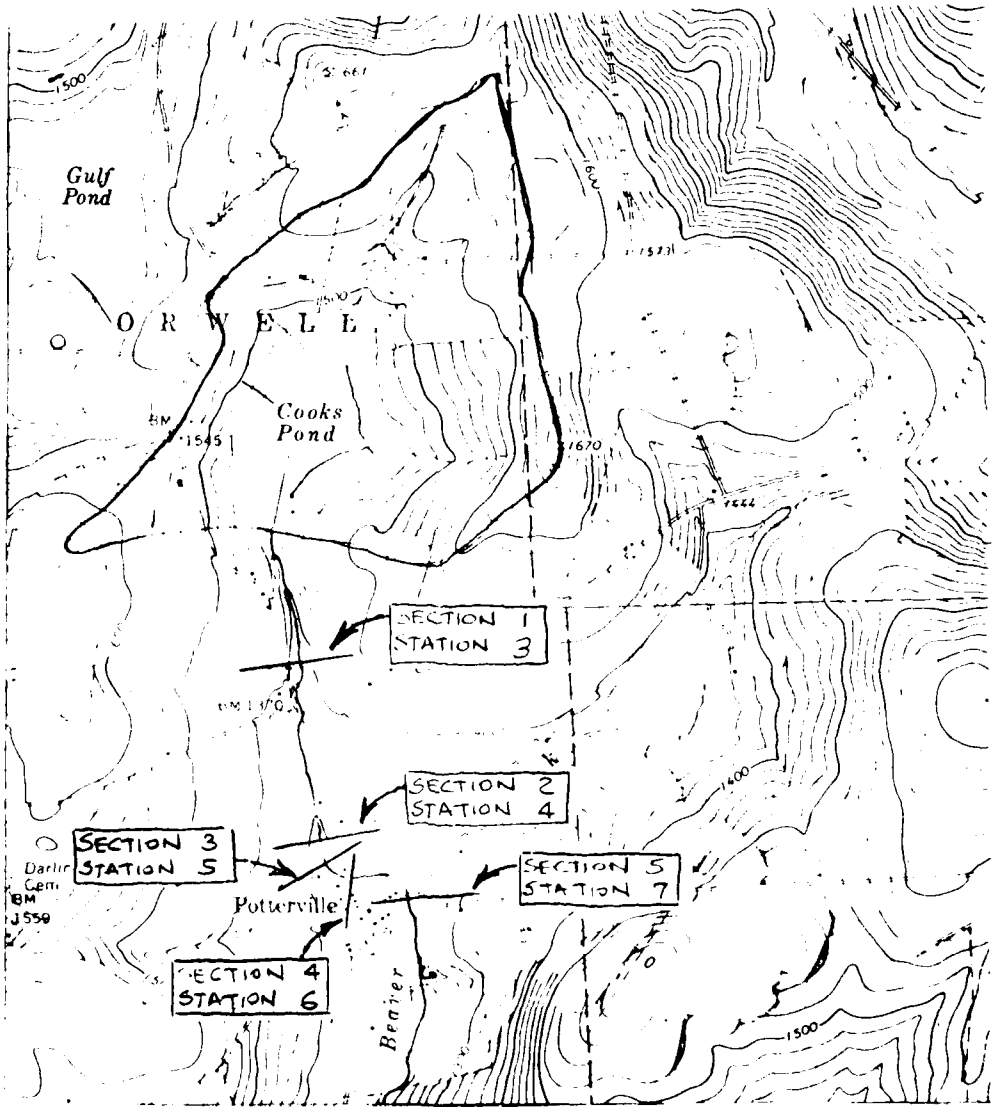
PLAN 1 STATION 7

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	47.	1250.8	43.75
.20	185.	1251.9	42.75
.30	378.	1252.9	42.00
.40	581.	1253.7	41.50
.50	779.	1254.4	41.25
1.00	1699.	1256.3	41.25

PLAN 2 STATION 7

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	47.	1250.8	43.75
.20	185.	1251.9	42.75
.30	6103.	1257.8	41.75
.40	6481.	1257.9	41.25
.50	6782.	1258.0	41.00
1.00	6669.	1258.0	39.75

LOCATION OF DOWNSTREAM SECTIONS



SCALE 1"= 2000'

DOWNSTREAM PROFILE (1)

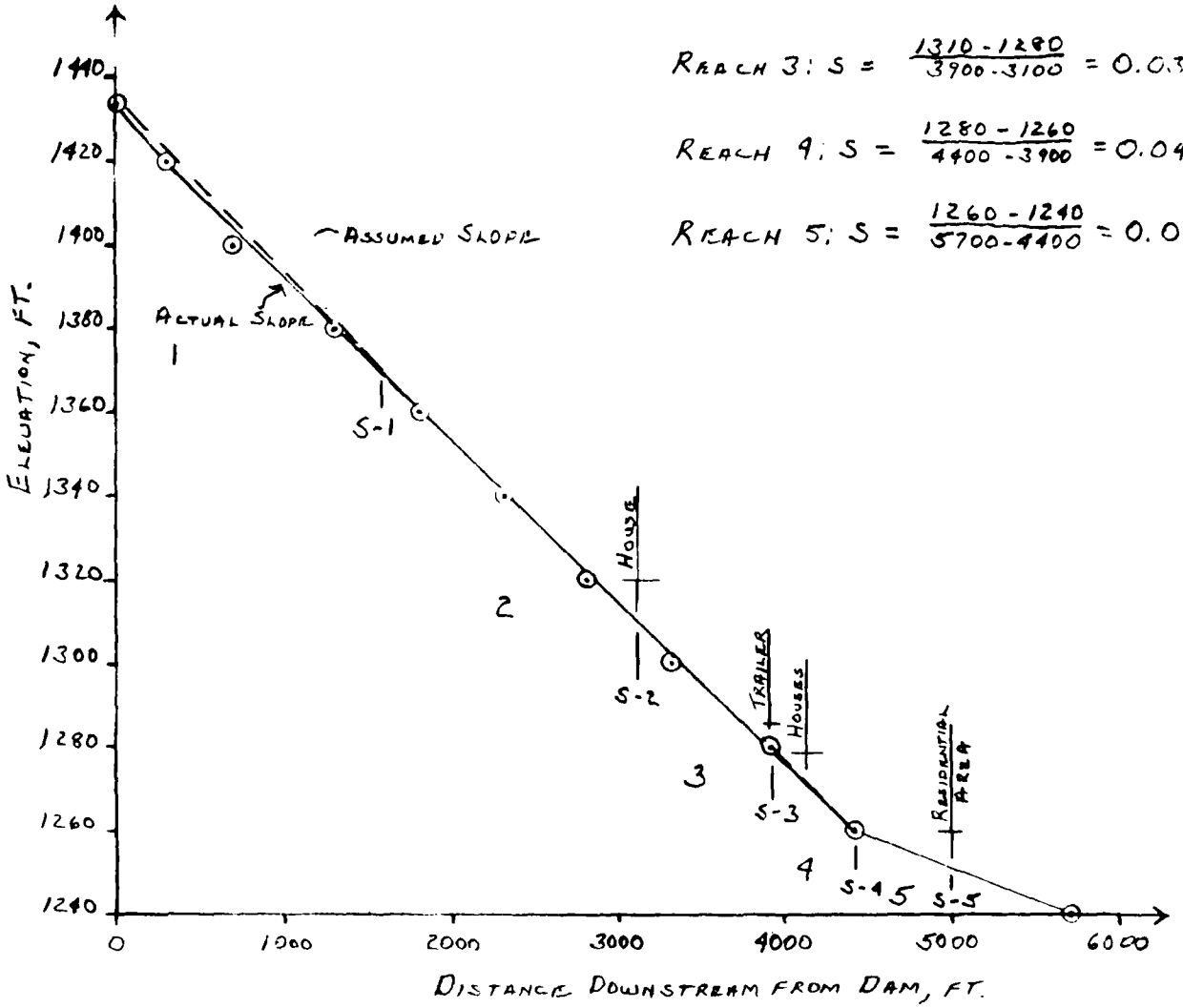
REACH 1: $S = \frac{1430-1370}{1600} = 0.0405$

REACH 2: $S = \frac{1370-1310}{3100-1600} = 0.0400$

REACH 3: $S = \frac{1310-1280}{3900-3100} = 0.0375$

REACH 4: $S = \frac{1280-1260}{4400-3900} = 0.0400$

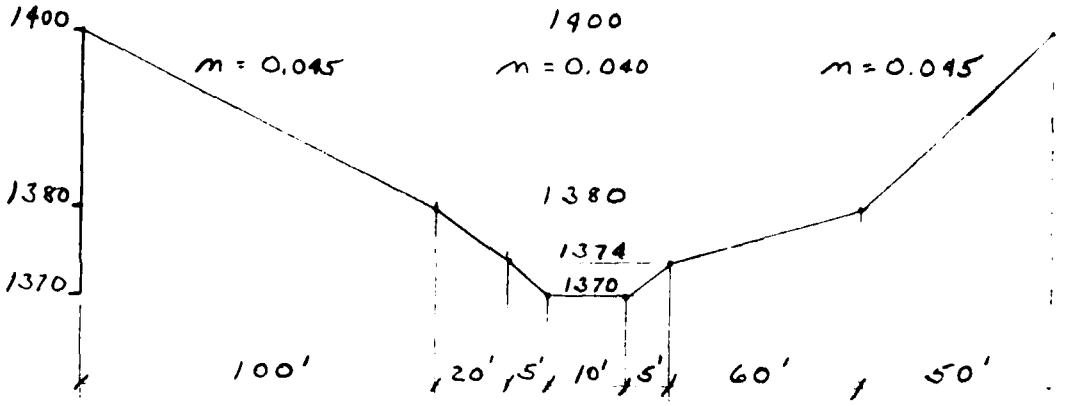
REACH 5: $S = \frac{1260-1240}{5700-4400} = 0.0154$



(1) REFERENCE: USGS MAP, 7.5 MINUTE SERIES, 1" = 2000', LITTLE MEADOWS, PA - N.Y. QUADRANGLE, 1967 PHOTOREVISED - 1978

Downstream Sections

Section 1
Reach #1, 0.0 to 1600', Mile 0.0 to 0.30



Distance	Elevation
0.0	1400.
100.0	1380.
120.0	1374.
125.0	1370.
135.0	1370.
140.0	1374.
200.0	1380.
250.0	1400.

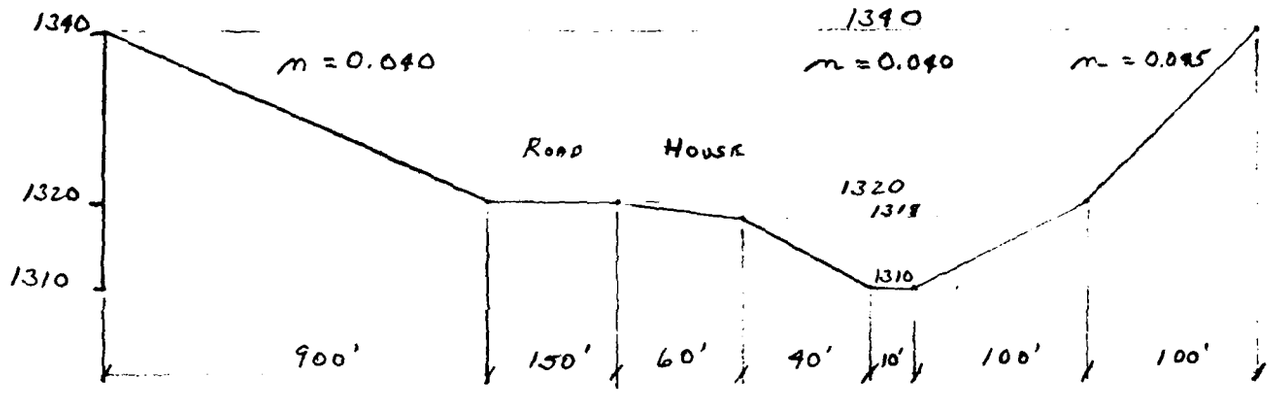
Reach Length = 1600'
S = 0.0405

D'APPOLONIA
CONSULTING ENGINEERS, INC.

(4)

By MB Date 1/20/81 Subject COOKS POND Sheet No. 4 of 7
Chkd. By DJC Date 3/17/81 DOWNSTREAM ROUTING Proj. No. 80-556-15

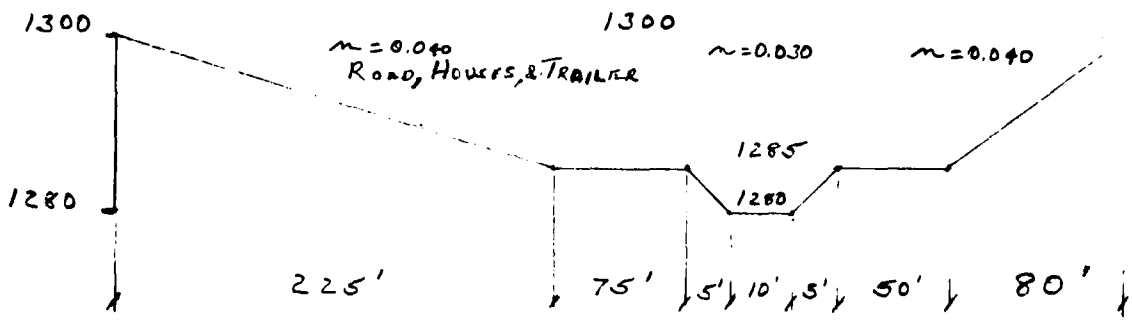
SECTION 2
REACH #2 - 1600' TO 3100', MILE 0.30 TO 0.59



DISTANCE	ELEVATION
0.0	1340.0
900.0	1320.0
1050.0	1320.0
1110.0	1318.0
1150.0	1310.0
1160.0	1310.0
1260.0	1320.0
1360.0	1340.0

REACH LENGTH = 1500'
S = 0.0400

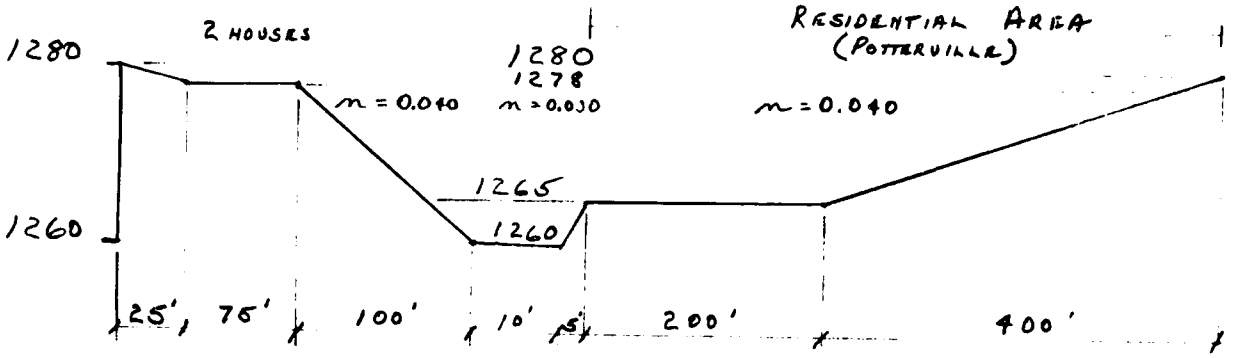
SECTION 3
REACH # 3 - 3100' TO 3900', MILE 0.59 TO 0.74



DISTANCE	ELEVATION
0.0	1300.
225.0	1285.
300.0	1285.
305.0	1280.
315.0	1280.
320.0	1285.
370.0	1285.
450.0	1300.

REACH LENGTH = 800'
S = 0.0375

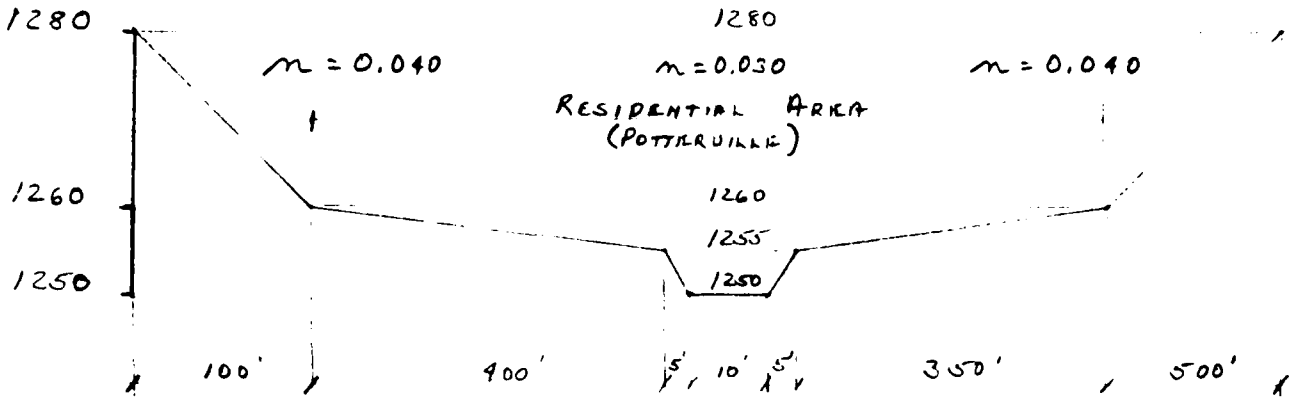
SECTION 4
REACH #4 - 3900' TO 4400', MILE 0.74 TO 0.83



DISTANCE	ELEVATION
0.0	1280.
25.0	1278.
100.0	1278.
200.0	1260.
210.0	1260.
215.0	1265.
415.0	1265.
815.0	1280.

REACH LENGTH = 500'
S = 0.0400

SECTION 5
REACH #5 - 4400' TO 5050', MILE 0.83 TO 0.96



DISTANCE	ELEVATION
0.0	1280.0
100.0	1260.0
500.0	1255.0
505.0	1250.0
515.0	1250.0
520.0	1255.0
870.0	1260.0
1370.0	1280.0

REACH LENGHT = 650'
S = 0.0154

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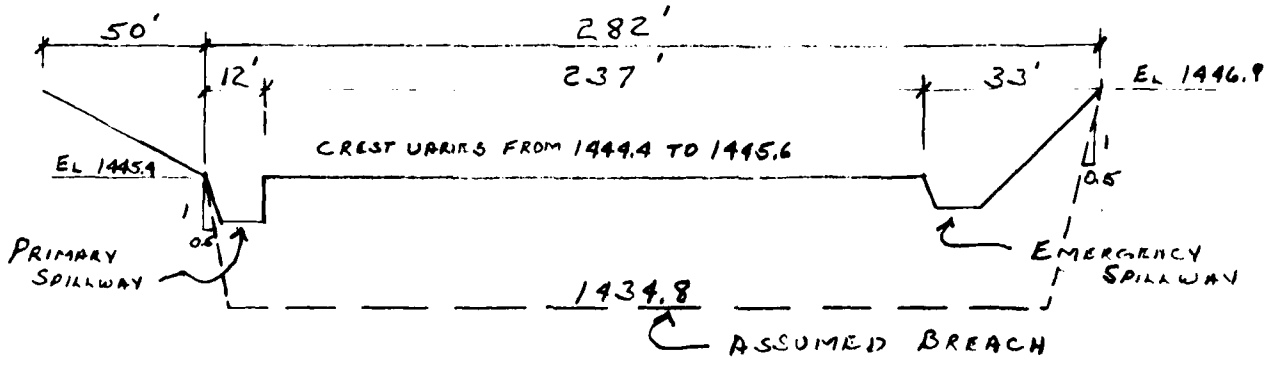
(B)

By MB Date 1/20/81 Subject COOKS LAKE Sheet No. 1 of 1
Chkd. By DV Date 3/17/81 DAM BREACH ANALYSIS Proj. No. 80-556-15

THE DAM BREACH ASSUMED IS:



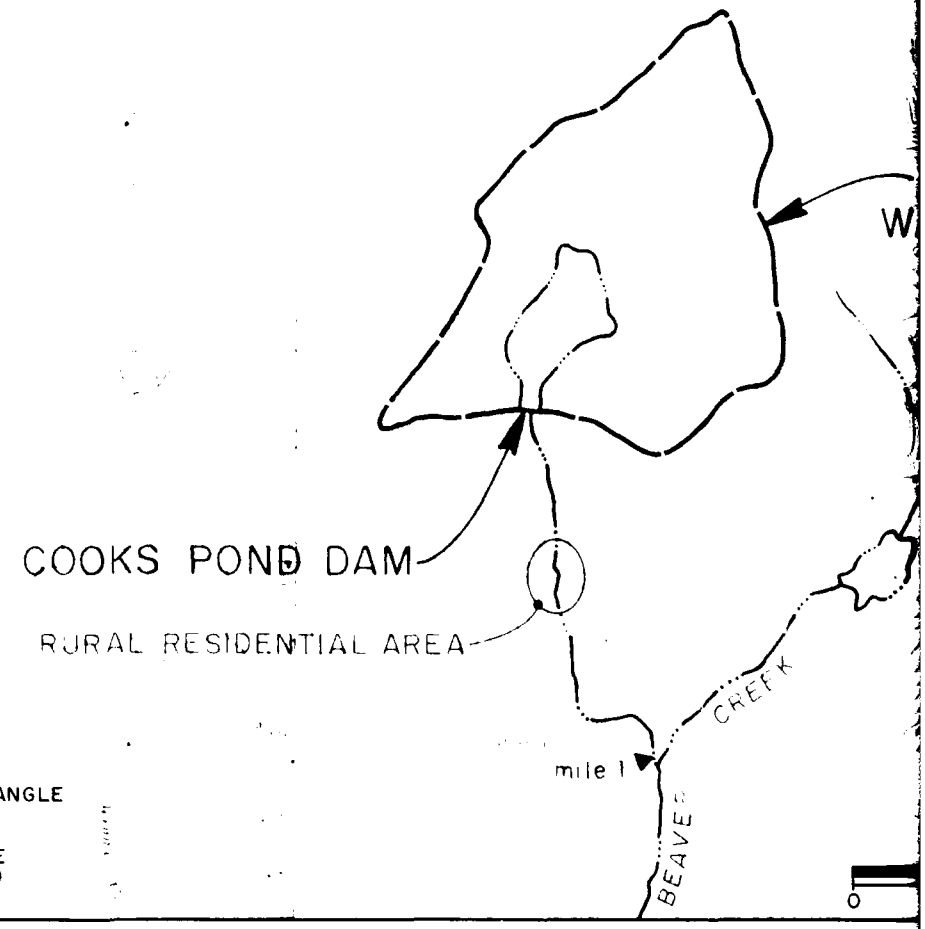
BREACH DATA: LENGTH - 282'
DEPTH - 1434.8
SIDE SLOPES - 0.5 : 1.0 (H:V) (MASONARY)
TIME - 0.75 HOURS

BREACH WILL BE ASSUMED TO OCCUR AT AN OVERTOPPING DEPTH OF 0.5 FEET

APPENDIX E

PLATES

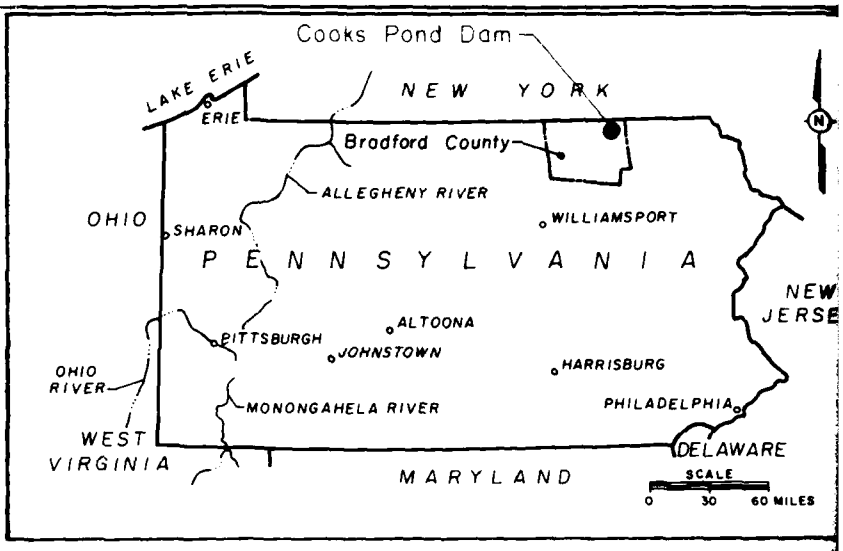
DRAWN BY	ACS	CHECKED BY	BC	2-22-81	DRAWING NUMBER 80-556-B2
	12-1-80	APPROVED BY	JHP	2-17-81	



REFERENCES

1 USGS LITTLE MEADOWS, PA-NY QUADRANGLE PHOTOREVISED 1978, SCALE 1 24000

2 USGS WINDHAM, PA-NY QUADRANGLE PHOTOREVISED 1978, SCALE 1 24000



KEY PLAN

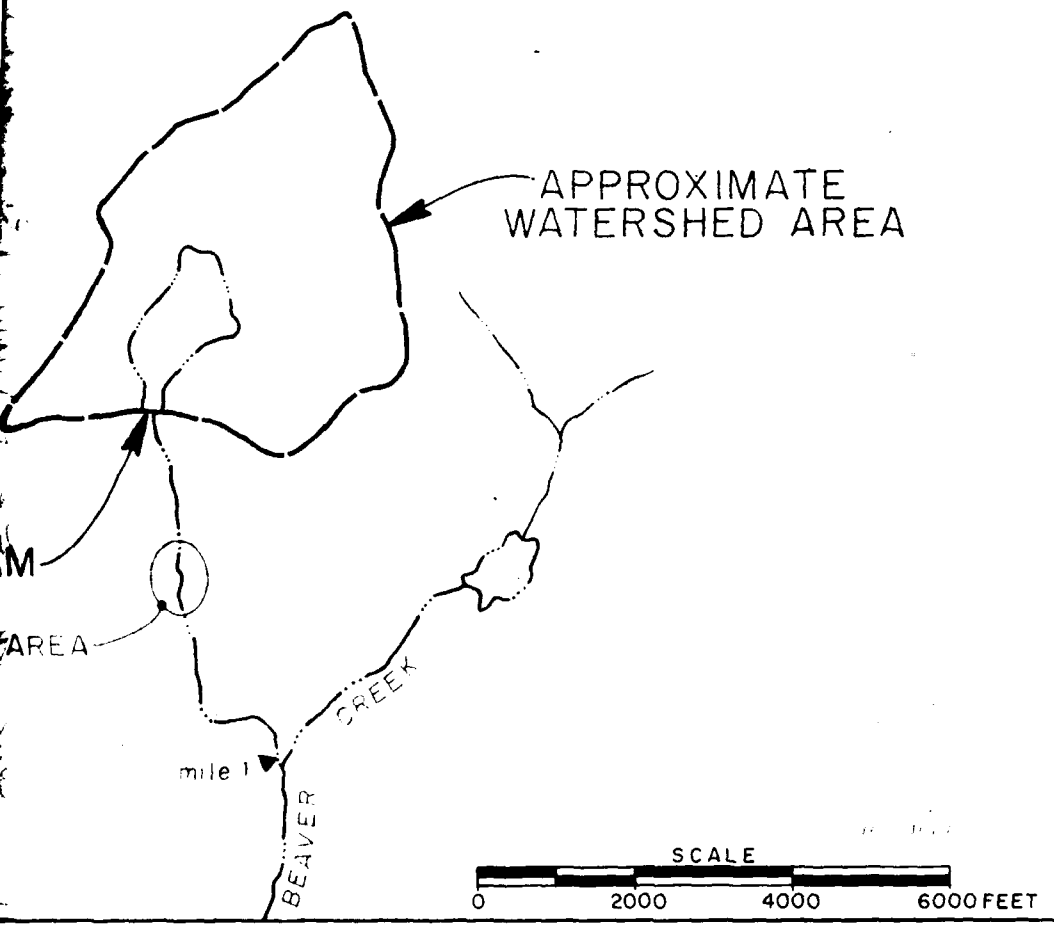


PLATE I

COOKS POND DAM
VICINITY, FLOOD PLAIN & WATERSHE

D'APPOLONI

2

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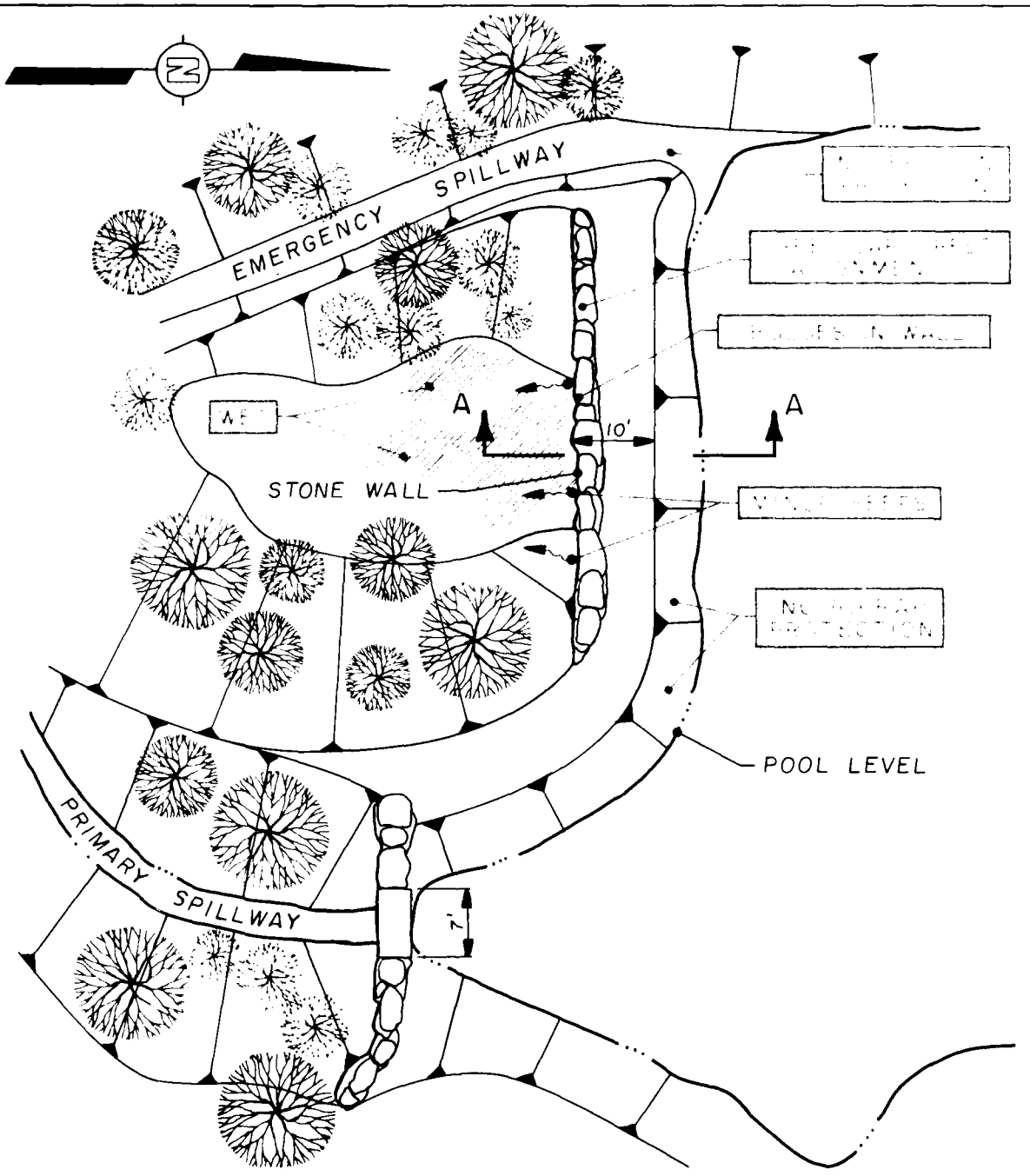
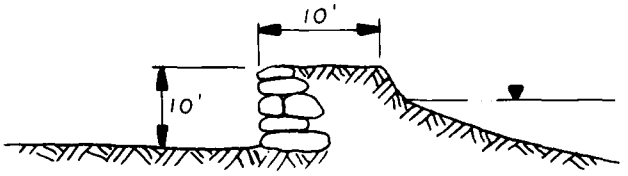
1-5-81	APPROVED BY	2-17-81	



NOTE:
POOL LEVEL AT DATE OF INSPECTION:
6" BELOW SPILLWAY CREST



SECTION A-A

NOT TO SCALE

PLATE 2

COOKS POND DAM
GENERAL PLAN
FIELD INSPECTION NOTES
FIELD INSPECTION DATE NOV 15, 1980

DAPPOLONIA

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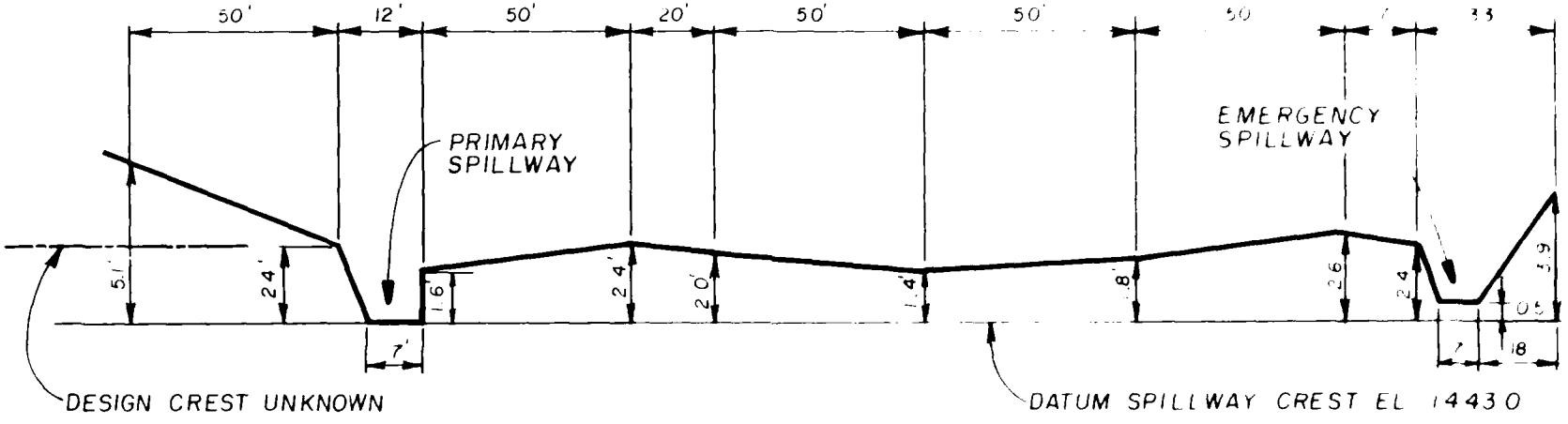
	12/ 24/80	APPROVED BY			



DAM CREST PROFILE
(LOOKING DOWNSTREAM)

NOTES

1 DAM CREST WAS SURVEYED RELATIVE TO SPILLWAY CREST LEVEL

2 DATUM ELEVATION PER USGS MAPS

PLATE 3

COOKS POND DAM
DAM CREST SURVEY
FIELD INSPECTION DATE NOV. 26, 1980

DELAWARE

APPENDIX F

REGIONAL GEOLOGY

REGIONAL GEOLOGY
COOKS POND DAM

The Cooks Pond Dam is located in the glaciated low plateaus section of the Appalachian Plateau physiographic province, characterized as a mature glaciated plateau of moderate relief.

The geologic structure consists of a series of northeast trending folds (approximately N70°E) which plunge gently to the southwest. The dip of the limbs of the folds in the vicinity of the Cooks Pond Dam is less than two degrees, with the southeast limb steeper than the northwest limb. The dam is located north of the Rome Anticline. In general, the discontinuity trends are northeast and northwest.

The stratigraphy consists of glacial till which will range in thickness from very thin to approximately 200 feet. The glacial till is underlain by the Devonian Chemung Formation, which is approximately 380 feet thick in this area. The Chemung Formation is marine in origin, consisting of interbedded green-gray sandstone, sandy shale and shale. The shale strata tend to weather rapidly when exposed.

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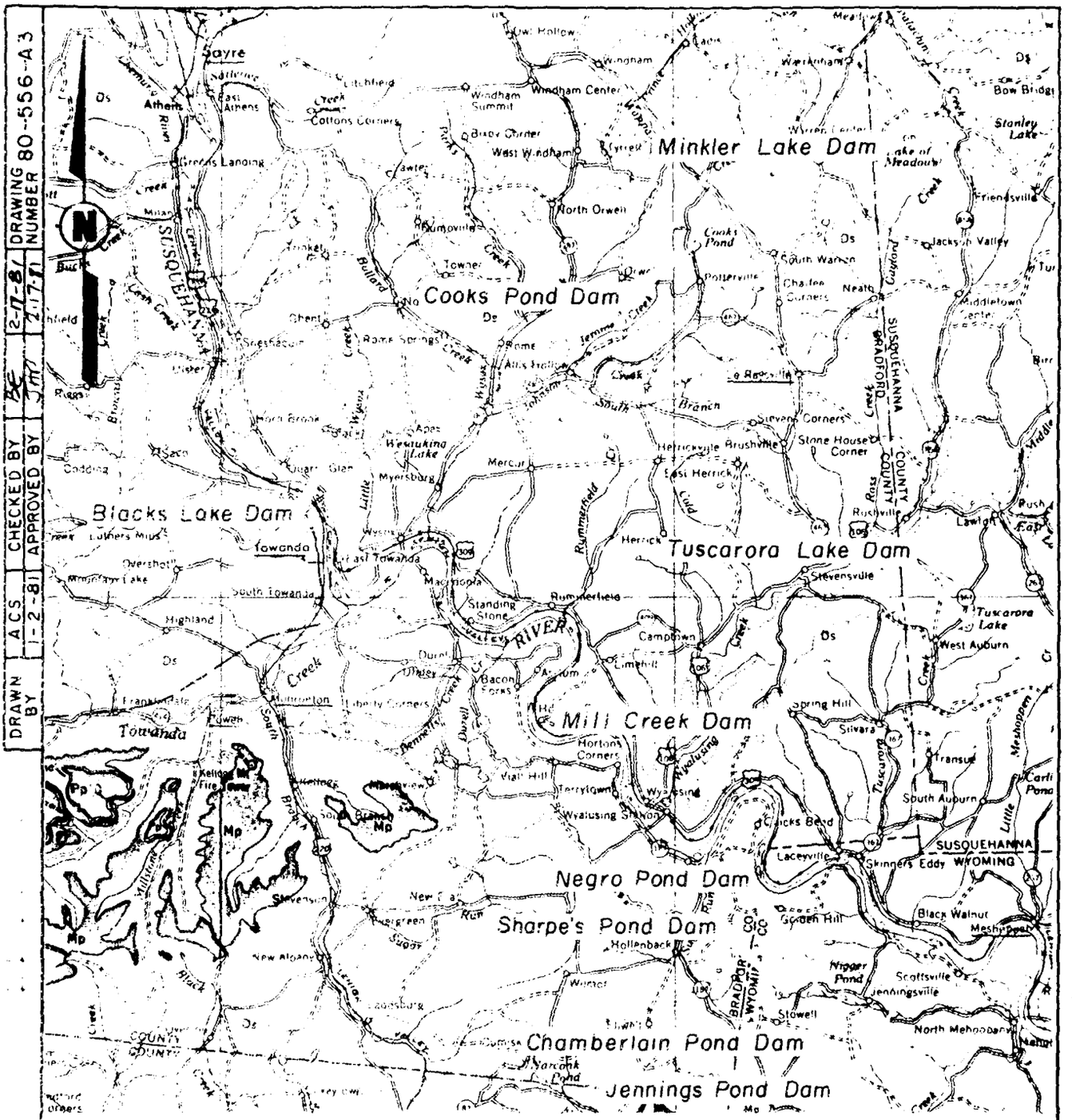
DRAWING NUMBER	80-556-A3	2-17-81



GEOLOGY MAP

REFERENCE

GEOLOGIC MAP OF PENNSYLVANIA PREPARED BY COMMONWEALTH OF PENNA, DEPARTMENT OF ENVIRONMENTAL RESOURCES DATED 1960 SCALE 250,000

D'APPOLONIA

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	1-2-81	APPROVED BY	2-17-81	80-556-A4

PENNSYLVANIAN

APPALACHIAN PLATEAU

Ps — Sewickley Group

Pp — Pottsville Group

ANTHRACITE REGION

Pp — Pottsville Group

MISSISSIPPIAN

Mmc — Mauch Chunk Formation

Mp — Pocono Group

DEVONIAN

UPPER

CENTRAL AND EASTERN PENNSYLVANIA

Dos — Oswayo Formation

Dck — Catskill Formation

Ds — Susquehanna Group

GEOLOGY MAP LEGEND

REFERENCE

GEOLOGIC MAP OF PENNSYLVANIA PREPARED BY COMMONWEALTH OF PENNA., DEPARTMENT OF ENVIRONMENTAL RESOURCES, DATED 1960
SCALE : 250,000

D'APPOLONIA

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