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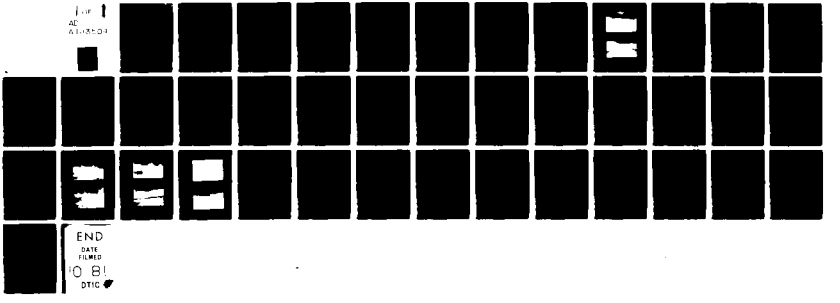

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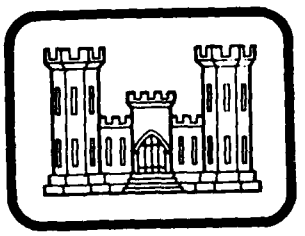
ROANOKE RIVER BASIN

LEVEL II

Name Of Dam: POWELL
Location: CITY OF SOUTH BOSTON
Inventory Number: VA 08336

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM



PREPARED BY
NORFOLK DISTRICT CORPS OF ENGINEERS
803 FRONT STREET
NORFOLK, VIRGINIA 23510

IN CONJUNCTION WITH

COMMONWEALTH OF VIRGINIA
STATE WATER CONTROL BOARD

DECEMBER 1980

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20. Abstract

Pursuant to Public Law 92-367, Phase I Inspection Reports are prepared under guidance contained in the recommended guidelines for safety inspection of dams, published by the Office of Chief of Engineers, Washington, D. C. 20314. The purpose of a Phase I Inspection is to indentify expeditiously those dams which may pose hazards to human life or property. The assessment of the general conditions of the dam is based upon available data and visual inspection. 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.

Based upon the field conditions at the time of the field inspection and all available engineering data, the Phase I report addresses the hydraulic, hydrologic, geologic, geotechnic, and structural aspects of the dam. The engineering techniques employed give a reasonably accurate assessment of the conditions of the dam. It should be realized that certain engineering aspects cannot be fully analyzed during a Phase I inspection. Assessment and remedial measures in the report include the requirements of additional indepth study when necessary.

Phase I reports include project information of the dam appurtenenances, all existing engineering data, operational procedures, hydraulic/hydrologic data of the watershed, dam stability, visual inspection report and an assessment including required remedial measures.

ROANOKE RIVER BASIN

NAME OF DAM: POWELL
LOCATION: CITY OF SOUTH BOSTON
INVENTORY NUMBER: VA 08336

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

PREPARED BY
NORFOLK DISTRICT CORPS OF ENGINEERS
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IN CONJUNCTION WITH
COMMONWEALTH OF VIRGINIA
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2111 N. HAMILTON STREET
RICHMOND, VIRGINIA 23230

DECEMBER 1980

TABLE OF CONTENTS

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 the Chief of Engineers, Washington, D. C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

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

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the spillway design flood is based on the estimate "Probable Maximum Flood" for the region (flood discharges that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the design flood should not be interpreted as necessarily posing a highly inadequate condition. The design flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

BRIEF ASSESSMENT OF DAM

Name of Dam:	Powell Dam
State:	Virginia
Location:	City of South Boston
USGS Quad Sheet:	South Boston
Stream:	Tributary of Reedy Creek
Date of Inspection:	4 December 1980

The Powell Dam is an earthen embankment about 400 feet long and 25.3 feet high. The dam is owned and maintained by Mr. Fred Powell. The dam is classified as a small dam with a high hazard classification (on the basis of location). The spillway is an earthen channel located at the left abutment. The reservoir is used to irrigate surrounding cropland.

Based on criteria established by the Department of the Army, Office of the Chief of Engineers (OCE), the Spillway Design Flood (SDF) is the 1/2 PMF. The emergency spillway will pass 37 percent of the PMF and 80 percent of the SDF without overtopping the lowest point on the dam crest. The SDF will overtop the lowest point on the dam crest by 0.2 feet with an average critical velocity of 2.1 feet per second and flow over the dam for 0.5 hours. Therefore, the spillway is adjudged as inadequate but not seriously inadequate.

The visual inspection revealed no apparent problems or remedial measures in need of immediate attention. There is no formal regular maintenance operation program or warning system, and it is recommended that a formal maintenance program and warning system be established. The maintenance items listed in Section 7.2 should be accomplished as a part of the regular maintenance program within the next 12 months.

Submitted By:

ORIGINAL SIGNED BY
JOHN H. SACKETT

JAMES A. WALSH, P. E.
Chief, Design Branch

Recommended By

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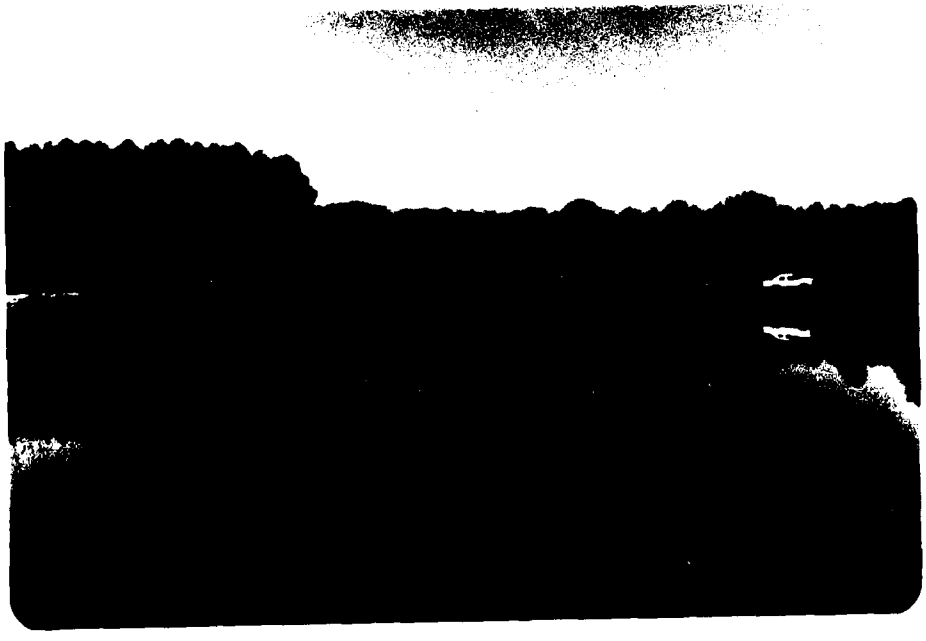
Original signed by:
Douglas L. Haller

DOUGLAS L. HALLER
Colonel Corps of Engineers
District Engineer

Date: MAR 11 1961

CREST



UPSTREAM FACE/RESERVOIR AREA

OVERALL VIEWS OF POWELL DAM

4 DECEMBER 1980

SECTION 1

PROJECT INFORMATION

1.1 GENERAL:

1.1.1 Authority: Public Law 92-367, 8 August 1972, authorized the Secretary of the Army, through the Corps of Engineers to initiate a national program of safety inspection of dams throughout the United States. The Norfolk District has been assigned the responsibility of supervising the inspection of dams in the Commonwealth of Virginia.

1.1.2 Purpose of Inspection: The purpose is to conduct a Phase I inspection according to the Recommended Guidelines for Safety Inspection of Dams (Reference 1, Appendix IV). The main responsibility is to expeditiously identify those dams which may be a potential hazard to human life and property.

1.2 Project Description:

1.2.1 Dam and Appurtenances: Powell Dam is an earthen embankment dam about 400 feet long and 25.3 feet high.# The crest of the dam is 15 feet wide with minimum crest elevations of 103.7 TBM* at the left abutment and 103.9 TMB at the right abutment. The dam crest elevation rises uniformly from each abutment to a maximum elevation of 106.4 TBM at the center of the dam. The upstream and downstream slopes are 2.5 horizontal to 1.0 vertical (2.5H:1.0V). A dirt and gravel road traverse the crest of the dam.

It is unknown whether the dam has a clay core, cut off trench, or foundation drainage system. There are no foundation drain outlets.

The principal spillway intake consists of two separate pipes. These are a 12-inch corrugated metal pipe (CMP) located near the water's edge (inv. el. 100.0 TBM) and a CMP approximately 8-inches in diameter and 1.0 feet higher located farther out in the water. The principal spillway outlet is a 12-inch CMP (inv. el. 83.0 TMB) that discharges into a small stilling basin at the toe of the dam.

The emergency spillway consists of an earthen side channel located in the left abutment with an average bottom width of 25 feet and an average control section elevation of 102.0 TBM.

Dam height based on the difference in elevation between the streambed at the toe of the dam and the maximum height on the crest.

* TBM (temporary bench mark) - the top of the 12-inch CMP riser pipe is elevation 100.0 feet.

1.2.2 Location: Powell Dam is located within the City of South Boston, on its northeast side.

1.2.3 Size Classification: The dam is classified as a small size structure on the basis of its height.

1.2.4 Hazard Classification: There is a subdivision in the area immediately downstream from the dam, such that its failure could endanger lives and cause economic losses. Therefore, a high hazard classification is given to this structure according to guidelines contained in Section 2.1.2 of Reference 1, Appendix IV. The hazard classification used to categorize this dam is a function of location only and has nothing to do with its stability or probability of failure.

1.2.5 Ownership: Powell Dam is owned by Mr. Fred Powell.

1.2.6 Purpose: The dam is used for irrigation.

1.2.7 Design and Construction History: The dam was designed with assistance from the Soil Conservation Service. Construction of the dam was completed in 1956 by the Allen Albert Construction Company of Gretna, Virginia.

1.2.8 Normal Operational Procedures: Water passes automatically through the principal and emergency spillways as the reservoir rises above the two intake risers and the emergency spillway crest.

1.3 Pertinent Data:

1.3.1 Drainage Area: The dam controls a drainage area of 0.07 square miles.

1.3.2 Discharge at Dam Site: Maximum flood - unknown.

Pool level at lowest point on dam crest (elevation 103.7):

Principal Spillway . . . . . 17 cfs
Emergency Spillway . . . . . 300 cfs

1.3.3 Dam and Reservoir Data: Pertinent data on the dam and reservoir are shown in the following table:

TABLE 1.1 DAM AND RESERVOIR DATA

Item	Elevation feet TBM	Reservoir Capacity Area, acres	Acre, feet	Watershed, inches	Length (miles)
Top of Dam					
Highest Point	106.4	7.0	57.0	15.0	0.14
Lowest Point	103.7	4.1	47.0	12.6	0.12
Emergency Spillway Crest	102.0	5.3	41.0	11.0	0.11
Principal Spillway Crest	100.0	4.6	34.0	9.1	0.10
Stream at Downstream Toe of Dam	80.6	--	--	--	--

SECTION 2

ENGINEERING DATA

2.1 Design: There is no known design information, other than the fact that design assistance was provided by the Soil Conservation Service.

2.2 Construction: There are no known construction records.

2.3 Evaluation: There is insufficient information to evaluate foundation conditions and embankment stability.

SECTION 3

VISUAL INSPECTION

3.1 Findings:

3.1.1 General: The results of the inspection on December 4, 1980, are recorded in Appendix III. At the time of the inspection, the weather was sunny and clear, with a temperature of 45°F. Ground conditions were moist due to a heavy frost that morning. The pool elevation was approximately 98.8 TBM. The principal spillway consists of a conduit through the embankment, with two risers 8 and 12 inches in diameter serving as the intake and a 12-inch CMP (corrugated metal pipe) as the outlet. The emergency spillway is an earthen channel located at the left abutment. No flow was passing through either the principal or emergency spillways at the time of the inspection. The tailwater elevation was approximately 81.0 TBM. There are no known prior inspection reports.

3.1.2 Embankment: The embankment is in good condition. A dirt and gravel roadway traverse the crest of the dam. A sketch showing a plan view and crest profile is provided on Plate II, Appendix I. A cross section is given on Plate III, Appendix I. Overall views of the dam are provided at the beginning of the report.

There are no signs of surface cracks, unusual movement, sloughing, or misalignment. Wave erosion on the upstream face is minor. No seepage was observed. The dam has a good grass cover. There are some trees with diameters up to 8 to 10 inches scattered over the embankment, primarily cedars and pines, especially on the downstream face, where some underbrush was noted also. No foundation drains were observed.

3.1.3 Principal Spillway: The principal spillway intake consists of two separate pipes. These are a 12-inch CMP located near the water's edge and a CMP approximately 8-inches in diameter and 1.0 feet higher located farther out in the water. These are connected to a 12-inch CMP passing through the embankment at a low level and discharging into the stilling basin at the toe of the dam. The intake risers are effectively screened to prevent clogging of the intakes by debris.

3.1.4 Emergency Spillway: The emergency spillway is an earthen channel located at the left abutment. The crest road traverses the emergency spillway at its control section (smallest cross-sectional area). The approach channel is unobstructed and clear of debris. The discharge channel is clear for the first 100 feet, with a cover of tall grass. Beyond this distance an erosion gully has formed, which is several feet in depth and extend down toward the stream bed.

3.1.5 Instrumentation: There is no instrumentation on this dam.

3.1.6 Reservoir Area: The slopes of the watershed are mild, variously covered with woods and cropland. There are no signs of reservoir slope failure. There is minor shoreline erosion. Sedimentation in the reservoir was not observed.

3.1.7 Downstream Channel: The channel immediately below the dam is overgrown with trees and underbrush. Beyond this obstructed area the channel is a natural streambed through terrain characterized by mild slopes. A subdivision is located in the downstream area immediately below the dam.

3.1.8 Stilling Basin: The stilling basin was small with very steep side slopes. These side slopes were not protected by riprap.

3.2 Evaluation: Overall, the dam appears to be in good condition. However, the inspection revealed certain preventive maintenance items which should be scheduled as part of an annual maintenance program. These are:

a. Check the embankment for animal burrows during periodic maintenance inspections, and fill with well compacted soil when found. These areas should also be seeded.

b. Maintain the roadway with adequate gravel to prevent rutting, with particular attention given to the section crossing the emergency spillway.

c. Cut trees on the dam down to the ground, and keep the embankment mowed to maintain grass cover and prevent the encroachment of underbrush. All trees with diameters greater than three inches should have the root ball and root structure removed also. All subsequent holes should be filled with well compacted soil and these areas should be seeded or sodded.

d. Clear the trees and underbrush from the outlet area and from the channel below it so that the flow of water is not obstructed.

e. Dress up the gully at the lower end of the emergency spillway discharge channel to prevent the progressive erosion of the channel and hillside. Consideration should be given to placing erosive material in this area to arrest erosion.

f. Install a staff gage, which is a staff, rod, or post with elevations indicated on it permanently mounted in a lake to show the depth of the water. It should be of sufficient height to indicate the depth of flow through the emergency spillway.

g. Enlarge the stilling basin and place riprap on its banks to protect them from erosion.

SECTION 4

OPERATIONAL PROCEDURES

4.1 Procedures: The normal storage pool elevation is about 100.0 feet TBM, which is the elevation of the crest of the 12" riser intake for the principal spillway. Water passes automatically over the crests of the intake risers as the water level in the reservoir rises above them. Ultimately water will pass through the emergency spillway when the lake level rises above the elevation of its crest.

4.2 Maintenance: General maintenance work is performed at the dam as the need arises.

4.3 Warning System: At this time, there is no warning system or evacuation plan for Powell Dam.

4.4 Evaluation: The dam does not require an elaborate operation and maintenance program. However, a program should be initiated to help detect and correct any problems that might occur. An emergency operation and warning plan should be developed, to include:

a. How to operate the dam during an emergency.

b. Who to notify, including public officials, in case evacuation from the downstream area becomes necessary.

The local Emergency Services Coordinator of the state office of Energy and Emergency Services can assist in the preparation of an Emergency Warning Plan.

SECTION 5

HYDRAULIC/HYDROLOGIC DATA

5.1 Design: No design data were available.

5.2 Hydrologic Records: None were available.

5.3 Flood Experience: Unknown.

5.4 Flood Potential: The 1/2 PMF and PMF were developed and routed by use of the HEC-1DB computer program (Reference 2, Appendix IV). Clark's Tc and R coefficients for the local drainage area were estimated from basin characteristics. The appropriate rainfalls applied to the developed unit hydrograph were obtained from U. S. National Weather Service publications (Reference 3, Appendix IV).

5.5 Reservoir Regulation: Pertinent dam and reservoir data are shown in Table 1.1.

Water passes automatically through the principal and emergency spillways as water rises above their crests.

The storage curve was developed based on areas obtained from a U. S. Geological Survey Quadrangle Map. Rating curves were developed for the spillway. In routing hydrographs through the reservoir, it was assumed that the initial pool elevation was at 100.0 TBM.

5.6 Overtopping Potential: The probable rise in the reservoir and other pertinent information on reservoir performance is shown in the following table:

Table 5.1 RESERVOIR PERFORMANCE

Item	Normal Flow	Hydrograph 1/2 PMF	Hydrograph PMF 1/
Peak flow c.f.s.			
Inflow	.5	411	822
Outflow	.5	374	804
Maximum elevation ft. TBM	100.0	103.9	104.4
Non-overflow Section (el 103.7 2/)			
Depth of flow, ft	----	0.2	0.7
Duration, hours	----	0.5	1.3
Velocity, fps 3/	----	2.1	3.9
Tailwater elevation ft., TBM	81.0±	---	---

1/ The PMF is an estimate of flood discharges that may be expected from the most severe combinations of critical meteorologic and hydrologic conditions that are reasonably possible in the region.

2/ Lowest point on dam crest.

3/ Critical Velocity

5.7 Reservoir Emptying Potential: There is no low level outlet or other means for emptying this impoundment.

5.8 Evaluation: Based on the size (small) and hazard classification classification (high) the recommended Spillway Design Flood is 1/2 PMF to PMF. Because of the risk involved in this project, the 1/2 PMF has been selected as the SDF. The emergency spillway will pass 37 percent of the PMF or 80 percent of the SDF without overtopping the dam. The SDF will overtop the lowest point of the dam crest at the left abutment by 0.2 feet, reach an average critical velocity of 2.1 feet per second and flow over the dam for 0.5 hours.

Conclusions pertain to present day conditions. The effect of future development on the hydrology has not been considered.

SECTION 6

DAM STABILITY

6.1 Foundation and Abutments: There is no information available on the foundation conditions, except what can be inferred from geologic studies of the area, which lies within the Piedmont geologic province. Briefly, the area is underlain by granite and hornblende gneiss, referred to as "mixed gneisses" in the text of Bulletin 75: Geology and Ground-Water Resources of Pittsylvania and Halifax Counties, published by the Virginia Division of Mineral Resources. The geologic map in this publication indicates that the dam site itself is underlain by granite gneiss, which can be observed in a very weathered condition in exposures along the shoreline of the impoundment and in the erosion gully in the lower reaches of the emergency spillway channel. Residual soils derived from this material can be highly variable, but typically are yellow or brownish-yellow light friable sandy clays or brownish-yellow or brown heavy plastic clays. These soils may exhibit a considerable potential for shrinking and swelling with changes in moisture content. The weathered parent rock may be found at depths of only a few feet below the surface in places. Soil samples examined during the inspection appear to be yellow or brownish-yellow sandy clay or clay.

The site should afford a good foundation for the dam, assuming that proper care was taken during construction to guard against the problems inherent in areas of expansive soils. The clayey nature of the area soils would make the foundation relatively impermeable. There is no evidence of undue settlement of the dam which would have resulted from a clay foundation being compressed under the weight of the embankment. It is likely that the embankment may rest to a large degree on the weathered rock noted at relatively shallow depths on the site. It is not known whether a cutoff trench or other means was used to directly key the dam into the foundation. There is no evidece that the dam has a foundation drainage system, but seepage does not appear to be a problem.

6.2 Embankment:

6.2.1 Material: There is no information recorded on the nature of the embankment materials, but it is likely that the source of borrow for the dam was located in the vicinity of the impoundment, with a considerable portion probably coming from within the area presently covered by the reservoir. As noted, the area soils appear to be clays and sandy clays of medium to high plasticity.

6.2.2 Stability: There are no available stability calculations. The dam is 25.3 feet high and 15 feet wide at the crest. A dirt and gravel road traverses the crest of the dam. The upstream slope is 2.5H:1V and the downstream slope is also 2.5H:1V. The dam is not subjected to a sudden drawdown because there is no low level drain. The existing pool is approximately 3.0 feet below maximum control storage pool, which is at the crest of the emergency spillway. In other words, there is presently 3.0 feet of freeboard. There is no record of the dam experiencing the maximum control storage pool, but in view of its age, it is likely that it may have, at least for a brief period of time. If so, no side affects are apparent, except for the erosion of the lower end of the emergency spillway channel, which may have resulted from hillside runoff rather than flow through the emergency spillway.

According to the guidelines presented in Design of Small Dam, U. S. Department of the Interior, Bureau of Reclamation, the slopes recommended for a homogeneous small dam of similar material not subjected to a rapid drawdown are 3H:1V upstream and 2.5H:1V downstream. The recommended crest width is 15 feet. Based on these guidelines, the Powell Dam has an adequate downstream slope and crest width, and an inadequate upstream slope.

6.2.3 Seismic Stability: The dam is located in Seismic Zone 2. Therefore, according to the Recommended Guidelines for Safety Inspection of Dams, the dam is considered to have no hazard from earthquakes provided static stability conditions are satisfactory and conventional safety margins exist.

6.3 Evaluation: There is insufficient information to adequately evaluate the stability of the dam. However, the visual inspection revealed no apparent instability. Based on the visual inspection, the foundation is considered sound. Based on the Bureau of Reclamation guidelines, the downstream slope and crest width are adequate and the upstream slope is slightly inadequate. The embankment is considered stable during both normal pool and maximum storage pool operations. In addition, overtopping is not a problem because flows are of less than one foot in depth, are of relatively brief duration, and the velocity is less than 6 fps, the effective eroding velocity for a vegetated earth embankment. A stability check is not required.

SECTION 7

ASSESSMENT/REMEDIAL MEASURES

7.1 Dam Assessment: Engineering data was not available to adequately assess the condition of the dam. The visual inspection revealed no findings that proved the dam to be unsound. There is no regular maintenance operations program formalized and no emergency operation and warning plan. Overall, the dam is in good condition and there is no immediate need for remedial measures. Corps guidelines indicate the appropriate Spillway Design Flood (SDF) for this dam (small size and high hazard) is the 1/2 PMF. The spillway will pass 37 percent of the PMF and 80 percent of the SDF without overtopping the dam and therefore the spillway is adjudged as inadequate but not seriously inadequate.

A stability check of the dam is not required.

7.2 Recommended Remedial Measures: It is recommended that a regular maintenance operations program be formalized for future reference. A formal emergency procedure should be prepared and furnished to those responsible for maintaining the dam in a safe condition. This should include how to operate the dam during an emergency, and who to notify, including public officials, in case evacuation from the downstream area is necessary. The local Emergency Services Coordinator of the State office of Energy and Emergency Services can assist in the preparation of an Emergency Warning Plan. Also, the inspection revealed the following maintenance items that should be scheduled by the owner during a regular maintenance period withing the next 12 months:

a. All trees and saplings on the upstream and downstream faces of the dam should be cut even with the ground to prevent the eventual deterioration of the dam by root systems. All trees with diameters greater than three inches should have the root ball and root structure removed. The subsequent holes should be filled with well compacted soil and then seeded or sodded.

b. Clear the underbrush from the outlet area and from the channel below it so that the flow of water is not obstructed.

c. Maintain roadway across the crest of the dam with adequate gravel to prevent rutting, with particular attention given to the section crossing the emergency spillway.

d. Check embankment for animal burrows during maintenance inspections, and fill with well compacted soil when found.

e. Continue mowing the dam area to maintain the grass cover and prevent the encroachment of underbrush.

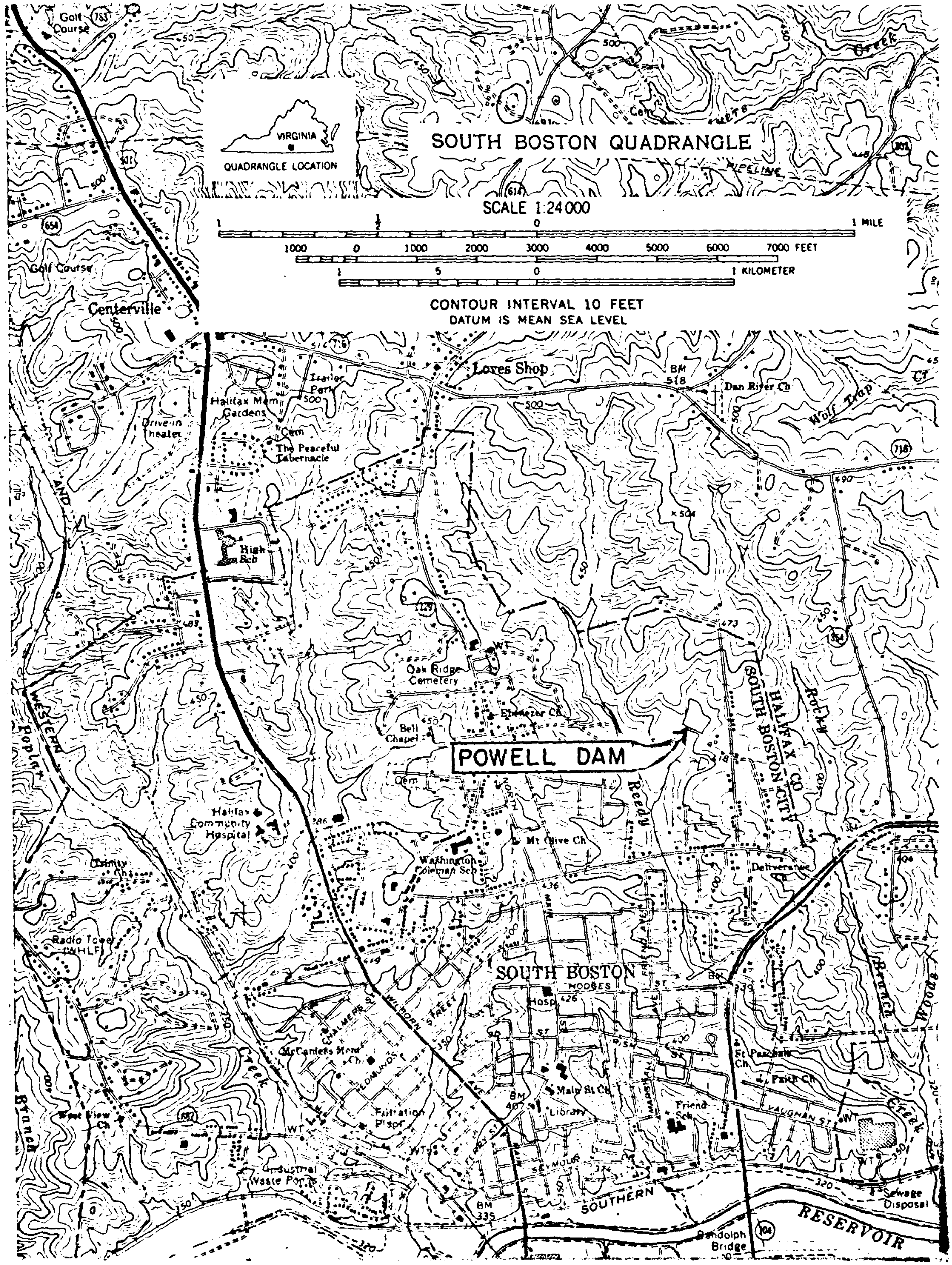
f. Dress up the gully in the lower reaches of the emergency spillway channel to prevent progressive erosion of the discharge channel and hillside. Consideration should be given to placing erosion protection material in this area to arrest the problem.

g. Install a staff gage, which is a staff, rod, or post with elevations indicated on it permanently mounted in a lake to show the depth of the water. It should be of sufficient height to indicate the depth of flow through the emergency spillway.

h. Enlarge the stilling basin and place riprap on its banks to protect them from erosion.

APPENDIX I

MAPS AND DRAWINGS


VIRGINIA
QUADRANGLE LOCATION
SOUTH BOSTON QUADRANGLE
SCALE 1:24 000
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL
Golf Course
Centerville
Loves Shop
Dan River Ch
Trailer Park
Halifax Mem Gardens
Drive-in Theater
The Peaceful Tabernacle
High Sch
Oak Ridge Cemetery
Ebenezer Ch
Bell Chapel
POWELL DAM
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Halifax Community Hospital
Mt Olive Ch
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Trinity Ch
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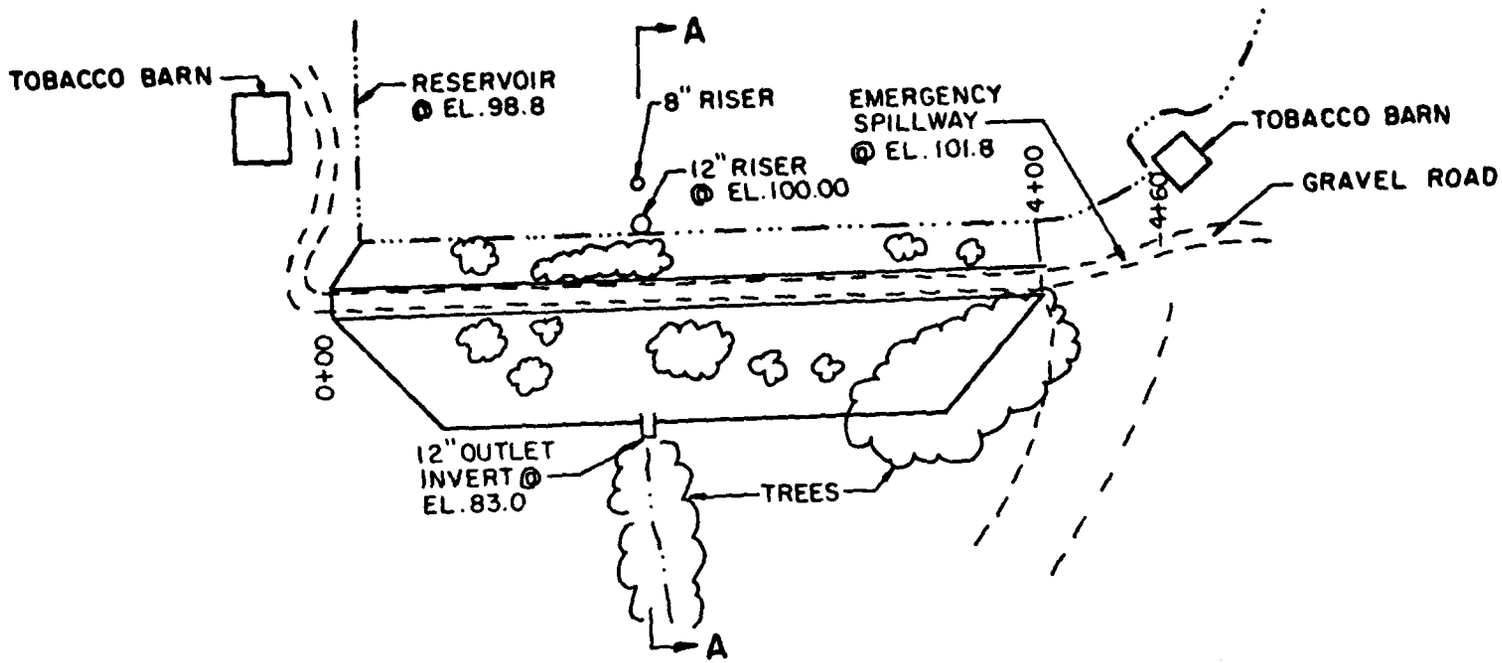
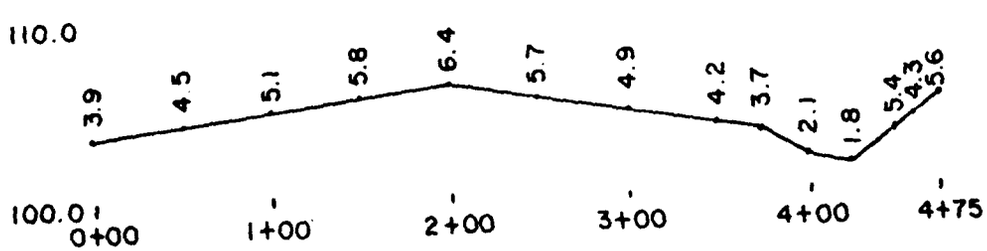


PLAN VIEW
NTS

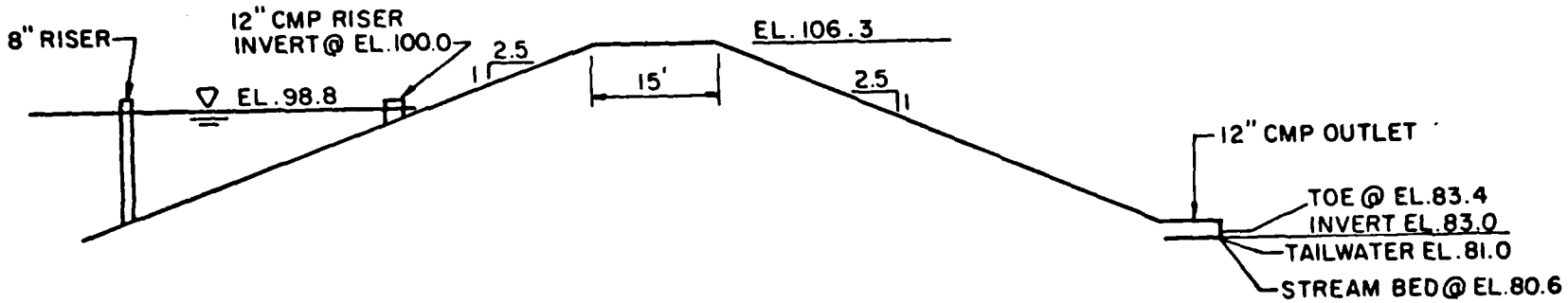


CREST PROFILE
SCALE: H; 1" = 100'
V; 1" = 10'

NOTE: ELEVATIONS BASED ON TBM WHERE TOP OF 12" RISER PIPE IS EQUAL TO 100.0

PLATE II

POWELL DAM
SO. BOSTON, VA.
4 DEC. 1980



CROSS SECTION A-A
NTS

POWELL DAM
SO. BOSTON, VA.
4 DEC. 1980

PLATE III

APPENDIX II

PHOTOGRAPHS

PHOTO #1 CREST

PHOTO #2 DOWNSTREAM FACE

PHOTO #3 UPSTREAM FACE

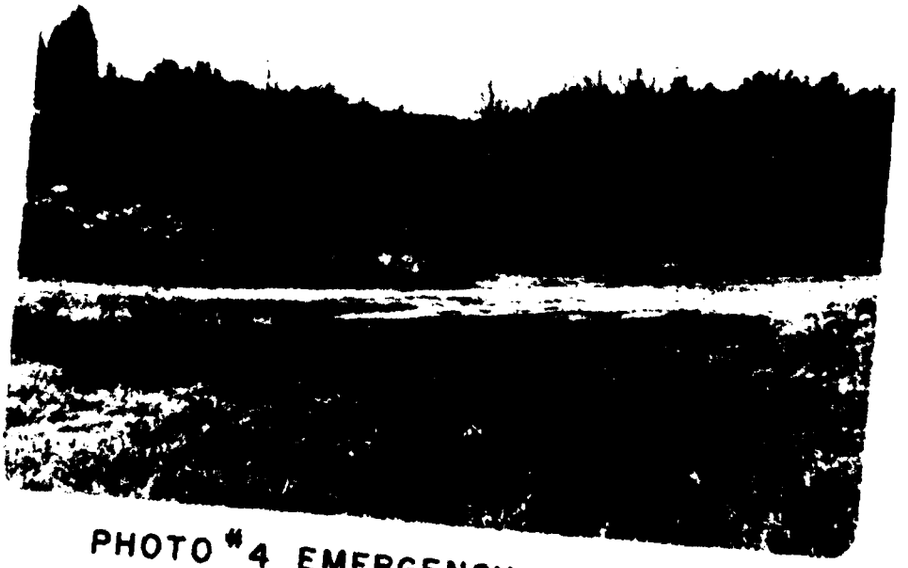


PHOTO #4 EMERGENCY SPILLWAY
AT LEFT ABUTMENT

PHOTO #5 APPROACH CHANNEL
TO EMERGENCY SPILLWAY

PHOTO #6 DOWNSTREAM AREA

APPENDIX III

FIELD OBSERVATIONS

Check list
Visual Inspection
Phase I

Name Dam: Powell Dam City: South Boston State: Virginia Coordinates: Lat. 36° - 43.0'
Long. 78° - 53.5'

Date(s) Inspection: 4 Dec 1980 Weather: Clear, sunny Temperature: 45° F

Pool Elevation at Time of Inspection: 98.8TBM* Tailwater at Time of Inspection: 81.0TBM

Inspection Personnel:

B. Taran, COE	L. Jones, COE	H. Gildea, SWCB
D. Pezza, COE	D. Bushman, SWCB	Fred Powell, Owner
J. Robinson, COE	L. Musselwhite, SWCB	

D. Bushman & H. Gildea Recorders

*TBM - temporary benchmark - the top of the 12" riser pipe is assigned an elevation of 100.0'

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	None observed.	None.
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	None observed.	None.
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	Does not appear to be a problem. One old animal burrow noted on the downstream face at station 2 plus 60. The upstream face of the embankment has experienced erosion from wave action.	Check embankment for animal burrows during maintenance inspections, and fill with well compacted soil. These areas should also be seeded or sodded. Provide riprap or other protection on the upstream face should wave erosion become a serious problem.
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	There is no appreciable settlement or horizontal movement of the crest, which is crowned in the center. A dirt and gravel roadway traverses the crest of the dam.	Maintain roadway across the crest with adequate gravel to prevent rutting.
RIPRAP FAILURES	There is no riprap on the embankment at the waterline, where some wave erosion has occurred.	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
FOUNDATION	There is no evidence to suggest that the foundation is unstable.	None.
ANY NOTICEABLE SEEPAGE	No seepage was observed.	None.
DRAINS	No drains were observed.	None.
MATERIALS	Unknown. Local soils appear to be clays and sandy clays.	None.
VEGETATION	The dam has a good grass cover. There are some trees with diameters up to eight to ten inches scattered over the embankment, primarily cedars and pines, especially on the downstream face, where some underbrush was noted also.	Cut trees down to the ground, and keep embankment mowed to maintain grass cover and prevent the encroachment of underbrush. Trees with diameters greater than three inches should have their root ball and root structures removed. The subsequent holes should be filled with well compacted soil and then seeded or sodded.

PRINCIPAL SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONTROL SECTIONS	None.	None.
INTAKE	The intake consists of 8" and 12" risers, with the latter closer to the embankment. The intake risers are effectively screened to prevent clogging of the spillway by debris.	None.
OUTLET	The outlet is a 12" CMP (corrugated metal pipe). It discharges into a small stilling basin with steep banks, which is heavily overgrown.	Clear the underbrush from the outlet area and from the channel below it so that the flow of water is not obstructed.
BRIDGE AND PIERS	None	
EMERGENCY GATE	None	
GATES AND OPERATION EQUIPMENT	None	

EMERGENCY SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONTROL SECTIONS	The crest road traverses the emergency spillway at its control section.	Additional gravel should be placed on the roadway to maintain it so as to prevent rutting.
APPROACH CHANNEL	Clear of debris with no obstructions.	
DISCHARGE CHANNEL	The discharge channel is clear for the first 100 feet, with a cover of tall grass. Beyond this distance there is an erosion gully several feet deep which extends down toward the stream bed.	Desirable to restore this gully by placing erosion resistant material to prevent progressive erosion of the discharge channel and hillside.
BRIDGE AND PIERS	None.	
MISCELLANEOUS	None.	

INSTRUMENTATION

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATION
MONUMENTATION/SURVEYS	None	
OBSERVATION WELLS	None	
WEIRS	None	
PIEZOMETERS	None	
STAFFGAGES	None	Install a staff gage, which is a staff, rod, or post with elevations indicated on it permanently mounted in a lake to show the depth of the water. It should be of sufficient height to indicate the depth of flow through the emergency spillway.
OTHER		

RESERVOIR

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	The slopes of the watershed are mild and well vegetated with woods and cropland. Minor shoreline erosion does not present any special problems.	None.
SEDIMENTATION	Sedimentation was not measured.	None.

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	The channel immediately below the dam is overgrown with trees and underbrush. There was a pool of water in the ill defined plunge pool. There was no erosion protection in the plunge pool area.	The trees and brush should be removed so that flow from the outlet pipe will not be obstructed. If erosion from reservoir, discharges occurs means of erosion protection should be provided.
SLOPES	The slopes surrounding the downstream channel are mild.	None
APPROXIMATE NO. OF HOMES AND POPULATION	Several homes are located in the floodplain below the dam.	Develop an emergency warning plan to safeguard the lives and property of those living below the dam.

APPENDIX IV

REFERENCES

APPENDIX IV

REFERENCES

1. Recommended Guidelines for Safety Inspection of Dams, Office of the Chief of Engineers, Department of the Army, Washington, D. C.

2. HEC-1 Flood Hydrograph Package, (Hydrologic Engineering Center, U. S. Army Corps of Engineers, January 1973.)

3. "Probable Maximum Precipitation Estimates, United States East of the 105th Meridian," Hydrometeorological Report No. 51, (National Weather Service, June 1978).

4. "Rainfall Frequency Atlas of the Unites States", Technical Paper No. 40, (National Weather Service, May 1961).

5. Bulletin 75: Geology and Ground-Water Resources of Pittsylvania and Halifax Counties, Harry E. Legrand, (Virginia Division of Mineral Resources, 1960).

6. Soil Survey of Halifax County, Virginia, (U.S. Department of Agriculture, 1938).