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NATIONAL DAM SAFETY PROGRAM. LONG BOTTOM BRANCH DAM, INVENTORY --ETC(U)
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(11) SEP [redacted] 1979

Name Of Dam: LONG BOTTOM BRANCH DAM

Location: BUCHANAN COUNTY, VIRGINIA

Inventory Number: VA. NO. 02702

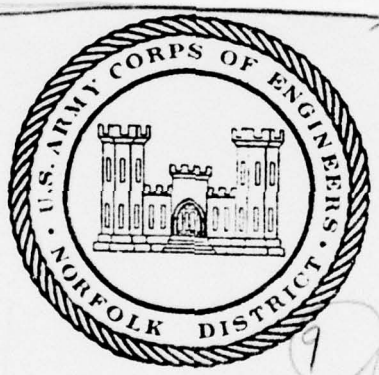
LEVEL II

(12) 42

PHASE I INSPECTION REPORT

NATIONAL DAM SAFETY PROGRAM

(6) Long Bottom Branch Dam, Inventory Number VA-02702. Buchanan County, Virginia. Phase I Inspection Report.



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(15) DACW65-79-D-0004

PREPARED FOR

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

BY

SCHNABEL ENGINEERING ASSOCIATES, P.C./
J. K. TIMMONS AND ASSOCIATES, INC.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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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 investigation is to identify 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 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.

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 and appurtenances, all existing engineering data, operational procedures, hydraulic/hydrologic data of the watershed, dam stability, visual inspection report and an assessment including required remedial measures.

(1)

NAME OF DAM: LONG BOTTOM BRANCH DAM
LOCATION: BUCHANAN COUNTY, VIRGINIA
INVENTORY NUMBER: VA. NO. 02702

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

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

BY

SCHNABEL ENGINEERING ASSOCIATES, P.C./
J. K. TIMMONS AND ASSOCIATES, INC.

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 Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

TABLE OF CONTENTS

Name: Long Bottom Branch Dam Va. No. 02702
State: Virginia
County: Buchanan
USGS Quad Sheet: Panther
Coordinates: Lat 37°-24' Long 81°-57.7'
Stream: Long Bottom Branch of Knox Creek
Date of Inspection: June 13, 1979

BRIEF ASSESSMENT OF DAM

Long Bottom Branch Dam is a heterogeneous earthfill structure about 100 ft long and 26.5 ft high. This impoundment is a cross-valley type structure which is located on the Long Bottom Branch of Knox Creek, approximately 2.8 miles northeast of Blackey, Virginia. The roadway, which impounds water, was used as an access road for coal mining operations for the Eastern Coal Company. There is a 15" diameter corrugated metal pipe (CMP) used for the principal spillway.

The dam is a "small" size structure and is designated a significant hazard classification. Based on criteria established by the Department of the Army, Office of the Chief of Engineers (OCE), the appropriate spillway design flood (SDF) is the ½ Probable Maximum Flood (½ PMF). The dam will pass less that 10% of the PMF prior to being overtopped. During the SDF the dam will be overtopped by 4.2 ft for 6 hours at a critical velocity of 8.1 fps, and the spillway is considered inadequate.

The visual inspection revealed no serious problems. An accurate check on stability could not be made since design and construction data are not available for this structure. The embankment slopes are much steeper than the slopes

recommended by the U. S. Bureau of Reclamation for small homogeneous earthfill dams on stable foundations. Erosion observed on the downstream slope does not appear to be serious but should be corrected before further erosion occurs. The seepage observed is of concern since it could result in deterioration of the dam's stability.

Overall, the dam appeared to be in fair condition at the time of the inspection, however, the following remedial measures are recommended:

(1) The Owner, at his own expense, should have a qualified professional engineer perform a study in order to evaluate the safety of the dam. The study should include a detailed determination of the dam's stability, the Spillway Design Flood (SDF) appropriate to the dam, and necessary modifications to the dam, spillway, floodplain, and/or any other methods of eliminating danger imposed by the impoundment.

(2) A staff gage should be installed to monitor water levels.

The following routine maintenance and observation functions should be initiated immediately:

Seepage present along the downstream toe should be monitored quarterly to detect any increase in flow rates which may cause piping within the embankment. Vegetation should be routinely controlled. The slopes and crest of the structure should be mowed twice per year and all existing small trees or saplings removed.

Eroded areas and excavations created by removal of trees should be backfilled with compacted fill. The embankment should be reseeded and all surface drainage should be diverted to prevent further erosion.

Since the use of the dam has been discontinued, the owner can alternatively drain the pond and breach the dam.

Prepared by:

SCHNABEL ENGINEERING ASSOCIATES, P.C./
J. K. TIMMONS AND ASSOCIATES, INC.

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Commonwealth of Virginia

Submitted by:

Original signed by
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for Douglas L. Haller
Colonel, Corps of Engineers
District Engineer

Recommended by:

Original signed by:
Carl S. Anderson, Jr.

for Jack G. Starr, P.E., R.A.
Chief, Engineering Division

Date: SEP 27 1979

OVERVIEW PHOTO

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
LONG BOTTOM BRANCH DAM
VA. NO. 02702

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 inspections 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 (See Reference 1, Appendix IV). The main responsibility is to expeditiously identify those dams which may be a potential threat to human life or property.

1.2 Project Description:

1.2.1 Dam and Appurtenances: Long Bottom Branch Dam is a heterogeneous cross-valley earthfill structure approximately 100 ft long and 26.5 ft high.* The top of the dam is 21 ft wide and varies from elevation 1594 to 1600± msl. Side slopes are approximately 1 horizontal to 1 vertical on the upstream slope and 1.5:1 on the downstream slope (See Plate Nos. 2 and 3, Appendix I).

* Height is based on the difference in elevation from the downstream toe of the dam to the low point in the dam crest.

The spillway consists of a 15 inch corrugated metal pipe (CMP) which passes under the roadway at the left abutment 9 ft below the crest of the dam. There is an approach channel to the spillway approximately 25 ft long, which is trapezoidal in shape with a bottom width varying from 1 ft to 4 ft.

1.2.2 Location: Long Bottom Branch Dam is located on the Long Bottom Branch of Knox Creek, 2.8 miles northeast of Blackey, Virginia (See Plate 1, Appendix I).

1.2.3 Size Classification: The dam is classified as a "small" dam.

1.2.4 Hazard Classification: The dam is located in a rural area; however, based upon the presence of five homes within approximately 6,000 ft downstream, the dam is assigned a "significant" hazard classification. The hazard classification used to categorize dam is a function of location only and has nothing to do with its stability or probability of failure.

1.2.5 Ownership: The dam is owned by the Eastern Coal Company.

1.2.6 Purpose: The dam was constructed as an access road across the valley for mining operations. Mining operations above the dam are no longer active.

1.2.7 Design and Construction History: The dam was constructed under the supervision of the Eastern Coal Company. No design drawings or data were available for

the original design.

1.2.8 Normal Operational Procedures: The spillway is ungated; therefore, water is automatically discharged downstream.

1.3 Pertinent Data:

1.3.1 Drainage Areas: The drainage area is 0.15 square miles.

1.3.2 Discharge at Dam Site:

Spillway Discharge:

Pool Elevation at Crest of Dam (El 1594 msl)	15 CFS

1.3.3 Dam and Reservoir Data: See Table 1.1 below.

TABLE 1.1 DAM AND RESERVOIR DATA

		Reservoir			
Item	Elevation Feet msl	Area Acres	Acre Feet	Watershed Inches	Length Miles
Crest of Dam	1594*	.6	4.0	.5	.06
Spillway Invert	1591	.5	2.5	.3	.05
Streambed at Toe of Dam	1567.5	-	-	-	-

* Low point in dam.

SECTION 2 - ENGINEERING DATA

2.1 Design: There is no design data available for the dam.

2.2 Construction: Construction records were not available. The dam was reportedly constructed around 1955 by the Eastern Coal Company.

2.3 Operation: There are no operation and instrumentation records.

2.4 Evaluation: Original engineering calculations and drawings are not available. There are no records available for dam performance.

SECTION 3 - VISUAL INSPECTION

3.1 Findings: The dam was generally in fair condition at the time of inspection. Field observations are outlined in Appendix III.

3.1.1 General: An inspection was made 13 June 1979, and the weather was fair with the temperature 75°F. The pool elevation at the time of inspection was 1591 msl and no tailwater was observed since the spillway discharges below the toe of the dam. This corresponds to normal flow conditions. Ground conditions were dry at the time of inspection.

3.1.2 Dam and Spillway: The spillway has an approach channel which is trapezoidal in shape with a minimum 1 ft bottom width and a grade of 4 percent. The channel side slopes vary from 1:1 to 2:1. The spillway is a 15" corrugated metal pipe (CMP) and is in good condition. Both the approach channel and the discharge channel have a thick grass cover. The spillway discharges directly onto the left abutment without any method of dissipating velocity. There was minor erosion on the abutment at the point of discharge of the spillway. No method to drain the impoundment below the 15" CMP invert was observed. The downstream slope of the embankment was overgrown with tall grass (3 to 4 ft±), weeds, and trees (up to 12 inches ± diameter), making visual inspection difficult. The central portion of the downstream slope appeared to include a blanket of dumped fill. Two eroded areas or washes were

encountered on the downstream slope along the left abutment and to the right of the dam center where the dam curves into the right abutment. These eroded areas were up to 3 ft wide, 1 to 2 ft deep, and extended from about halfway down the slope to the toe. Three seeps, each flowing at 2 gpm± were encountered. Two occur along the toe of the eroded channels or washes and the third was approximately 10 ft right of the right erosion channel along the toe of the slope. Heavy iron staining was associated with the three seeps. Erosion and seepage features are illustrated on Plate 2, Appendix I.

Bedrock is exposed at numerous locations along the access trail to the dam. The bedrock consists of gray to brown interbedded sandstones and shales with a few thin coal seams. The bedrock appears to be essentially flat-lying and scattered rectangular joint sets were visible. No faults were noted in the field during this inspection and geologic maps of the area do not show the presence of faults in the immediate vicinity.

Surficial exposures indicate the dam was constructed with soil and rock debris from adjacent side hill cuts. The surficial rock fill has a matrix which was visually classified sandy silt or clayey silt (ML) to silty sand (SM), according to the Unified Soil Classification System.

3.1.3 Reservoir Area: The reservoir slopes were wooded and free of debris. The side slopes were 2:1. Some sedimentation was observed at the upstream end of the pond.

3.1.4 Downstream Area: The downstream area includes thick brush and heavy woods. The side slopes were 2:1 with a bottom width of approximately 20 ft at the toe of the dam. Five homes were observed within 1 mile downstream in the floodplain. The floodplain changes from narrow and with steep slopes to broad and with mild slopes where the dwellings begin.

3.2 Evaluation:

3.2.1 Dam and Spillway: The spillway is in good condition. Overall, the embankment was in fair condition at the time of inspection. Trees on the embankment should be cut and stumps and roots should be removed. All excavations should be backfilled with compacted fill. The grass and weeds should also be mowed twice per year, preferably in the spring and fall. Seepage at the toe of the dam should also be monitored on a quarterly basis to detect any changes in the flow rate.

As an alternative to these measures, the dam could be drained and breached to relieve the hazard potential.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 Procedures: There are no operation procedures except for the automatic discharge of water through the spillway when the pool elevation rises above the invert of the spillway.

4.2 Maintenance of Dam and Appurtenances: Maintenance is the responsibility of the Eastern Coal Company. There are no operating appurtenances that require regular maintenance. There has not been any maintenance performed on the dam for a substantial period.

4.3 Warning System: No system exists at this time.

4.4 Evaluation: There is inadequate maintenance of the structure. If this impoundment is to remain in place, a routine maintenance program should be established.

SECTION 5 - HYDRAULICS/HYDROLOGIC DATA

5.1 Design: Long Bottom Branch Dam was built as a cross valley access road.

5.2 Hydrologic Records: There are no hydrologic records available for this drainage area.

5.3 Flood Experience: There are no flood experience records for this structure.

5.4 Flood Potential: In accordance with the established guidelines, the spillway design flood is based on the estimated "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. The Probable Maximum Flood (PMF), ½ PMF and 100-Year Flood hydrographs were as outlined in the SCS method (Reference 4, Appendix IV). Precipitation amounts for the flood hydrographs of the PMF, ½ PMF, and 100-Year Flood are taken from U.S. Weather Bureau Information (References 5 and 6, Appendix IV). Appropriate adjustments for basin size and shape were accounted for and hydrograph determination procedures as outlined in Reference 4, Appendix IV were used for the flood hydrographs. These hydrographs were routed through the reservoir to determine maximum pool elevations.

5.5 Reservoir Regulation: For routing purposes, the pool at the beginning of the flood was assumed to be at elevation 1591 msl. Reservoir stage-storage data and stage-discharge data were determined from field measurements and USGS quadrangle sheets. The spillway was not utilized in flood routing.

5.6 Overtopping Potential: The predicted rise of the reservoir pool and other pertinent data were determined by routing the flood hydrographs through the reservoir as previously described. The results for the flood conditions (PMF, ½ PMF, and 100-Year Flood) are shown in the following Table 5.1.

TABLE 5.1 RESERVOIR PERFORMANCE

		Hydrograph		
	Normal Flow	100 Year	½PMF	PMF
Peak Flow (CFS)				
Inflow	-	377	1231	2462
Outflow	-	377	1231	2462
Maximum Pool Elev. (Ft., msl)		1595.9	1598.2	1601.1
Non-overflow Section (El 1594)				
Depth of Flow (ft)		1.9	4.2	7.1
Duration (hrs)		4.0	6.0	6.5
Velocity (fps)		5.7	8.8	11.4
Tailwater at Downstream Toe at Centerline of Dam	1567.5	1568.9	1570.5	1572.5

5.7 Reservoir Emptying Potential: There is no method of draining the reservoir below the spillway.

5.8 Evaluation: Department of the Army, COE, guidelines indicate the appropriate spillway design flood (SDF) for a small size significant hazard dam is the 100-Year Flood to ½ PMF. Due to the risk involved, the ½ PMF has been selected as the SDF. The spillway will pass less than 10 percent of the PMF. The SDF will overtop the dam by a maximum of 4.2 ft, remain above the dam for 6 hrs with a critical velocity of 8.1 fps. The spillway is inadequate.

Hydrologic data used in the evaluation pertain to present day conditions with no consideration given to future development.

SECTION 6 - DAM STABILITY

6.1 Foundation and Abutments: The dam site is located within the eastern edge of the Appalachian Plateau Physiographic Province of Virginia. The Appalachian Plateau is a stream dissected plateau which is underlain by sedimentary rocks up to lower Pennsylvanian in age (Reference 3, Appendix IV).

The dam site is underlain by flat-lying rocks of the Norton Formation or Gladeville Sandstone of lower Pennsylvanian age. The Norton ranges from 800 to 1300 ft in thickness and consists of repetitious sequences of gray to brown sandstone, siltstone and shale with thin interbeds of coal. The overlying Gladeville Sandstone is 50 to 100 ft thick and consists of brownish-red micaceous sandstone.

6.2 Embankment: The upstream slope is 1 horizontal to 1 vertical with crest at elevation 1594 msl (low point). The crest of the dam is approximately 21 ft wide. Normal pool level is elevation 1591 msl. The downstream slope is 1.5 horizontal to 1 vertical. The embankment appears to be constructed of silt, sand and rock excavated from adjacent side hill cuts.

6.3 Evaluation:

6.3.1 Foundation and Abutments: Dam foundations must be evaluated on the basis of potential settlement, sliding and seepage. Excessive settlement of the dam is not believed to be a problem assuming the structure rests upon fairly competent bedrock and firm to compact alluvial, colluvial, and/or residual soils. The underlying soils probably had essentially fully consolidated under the applied load at the end of the construction period.

Sliding within the foundation bedrock would not normally appear to be a problem based upon the nature of the Norton Formation. A review of the geologic data indicates that there are probably no adversely oriented weak planes within the foundation rock that would act as a potential sliding plane.

The potential for seepage exists within the foundation since the dam is believed to be founded, at least in part, on alluvial, colluvial and/or residual soils possessing various rates of permeability. The thickness of overburden soils is not known; however, based upon past experience in the plateau area, overburden thicknesses of more than 10 ft do not often occur along the upper reaches of stream channels. The permeability of underlying bedrock may also vary considerably, based upon composition, degree of fracturing and weathering. Although the condition of the underlying bedrock is not known, some seepage should be expected in the upper portion of the

bedrock. It is not known whether a cutoff trench was provided during construction.

6.3.2 Embankment: The embankment slopes do not meet the requirement recommended by the U.S. Bureau of Reclamation for small homogeneous earthfill dams on stable foundation.

An accurate check on the stability of this structure cannot be made since there is no design and construction data. Embankment slopes are steep and it is possible that a plane of weakness may exist beneath the dam. Seepage observed at three locations along the downstream toe is believed to represent water passing through the embankment. An engineering study will be required to evaluate in detail the actual stability condition of the dam and to make recommendations for the required remedial measures.

SECTION 7 - ASSESSMENT/REMEDIAL MEASURES

7. Dam Assessment: Long Bottom Branch Dam at the time of inspection appeared in fair condition. The spillway will pass less than 10% of the PMF without overtopping the dam. The appropriate SDF is the ½ PMF. During the SDF the dam will be overtopped by 4.2 ft maximum, for a period of 6 hours, and at a critical velocity of 8.1 fps. The spillway is considered inadequate.

The embankment is not constructed according to any conventional standards and no construction records are available. Without design data and construction records, the stability of the structure cannot be assessed. Furthermore, the embankment slopes are much steeper than the slopes recommended by the U. S. Bureau of Reclamation, Reference 2, Appendix IV, for small homogeneous earthfill dams on stable foundations.

The erosion observed on the downstream slope does not appear to be serious at this time; however, continued use of the impoundment will require corrective measures in order to maintain the safe performance of the dam. The seepage observed is of concern, since it could cause piping within the embankment.

7.2.1 Investigation by Owner: It is recommended that the owner have a qualified professional engineer evaluate the stability conditions of the dam and to make specific recommendations for the required remedial measures. This analysis should assess the factors of safety of the dam with respect to the loading conditions contained in Reference 1, Appendix IV. The owner

should also provide for design work and the construction of the remedial work outlined below within one year of the date of this report.

7.2 Remedial Measures:

7.2.2 A detailed study of the downstream flood plain and of the Spillway Design Flood appropriate to this dam should be made. Remedial measures to be considered include modification to the dam, spillway, flood plain, and/or any other method of eliminating the danger imposed by the impoundment

7.2.3 A staff gage should be installed to monitor high water levels.

7.3 Required Maintenance:

7.3.1 Seepage observed along the downstream toe of the embankment should be monitored quarterly to detect any increase in flow rates which may cause piping within the embankment.

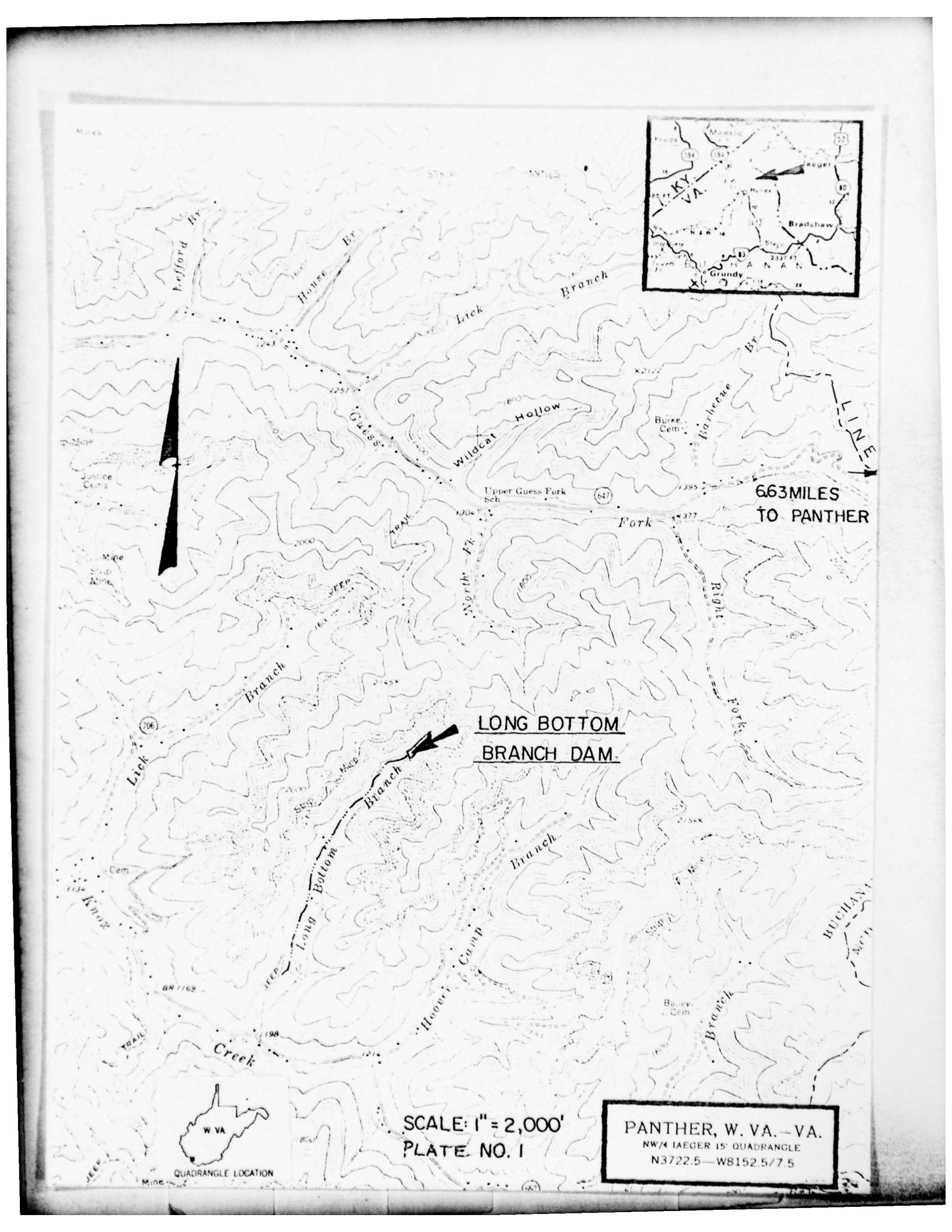
7.3.2 The embankment should be mowed twice per year, preferably in the spring and fall.

7.3.3 All trees on the embankment should be removed and excavations backfilled with compacted fill. Eroded areas should also be backfilled and the embankment reseeded. Surface drainage should be diverted to prevent future erosion.

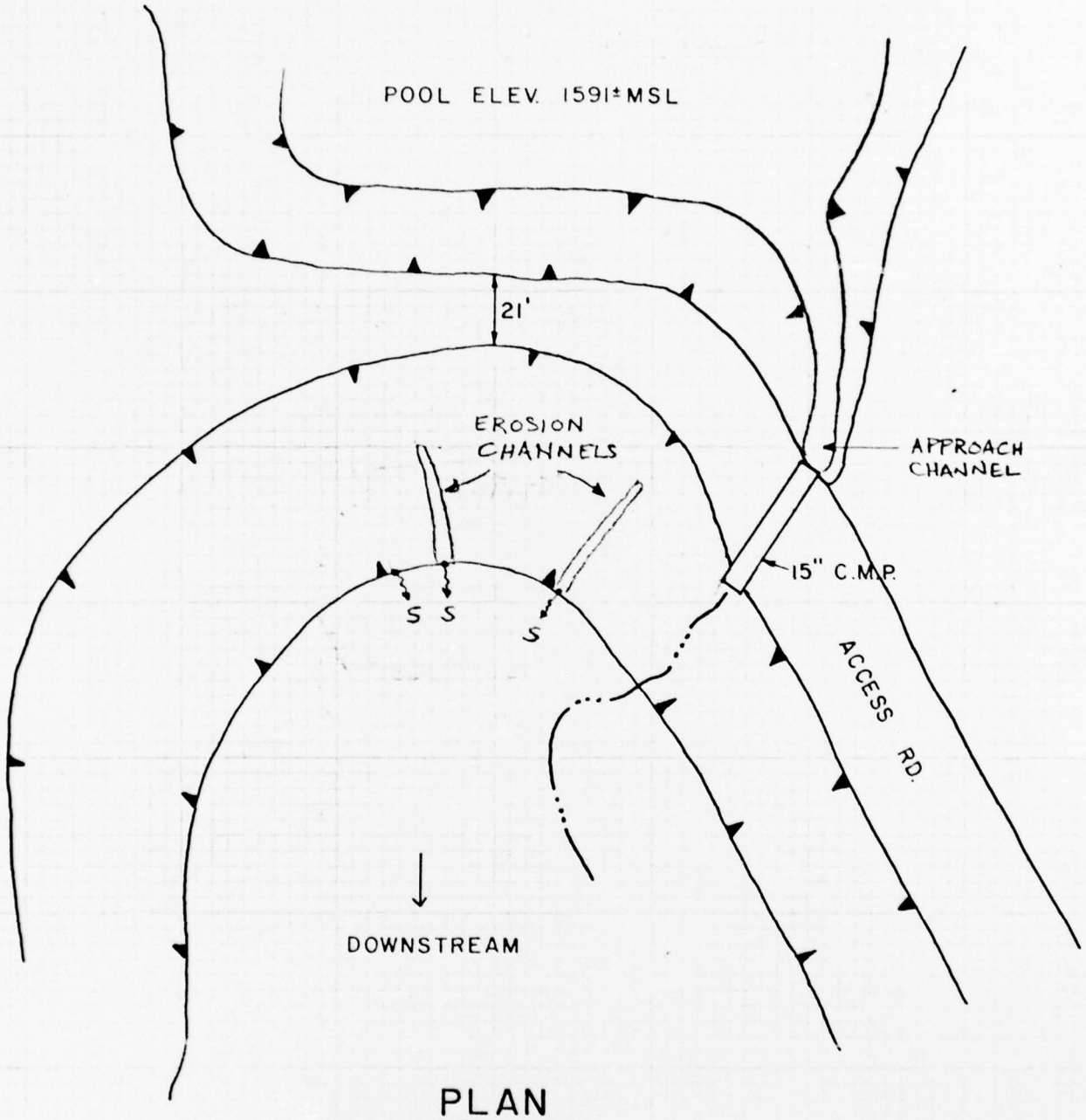
7.4 Alternative remedial measures - Since the use of the dam has been discontinued, the owner can alternatively drain the pond and breach the dam.

APPENDIX I

MAPS AND DRAWINGS


LONG BOTTOM
BRANCH DAM
.663 MILES
TO PANTHER
LINE
SCALE: 1" = 2,000'
PLATE NO. 1
PANTHER, W. VA. – VA.
NW/4 IAEGER 15' QUADRANGLE
N3722.5—W8152.5/7.5
W VA
QUADRANGLE LOCATION
KY
VA
Bradshaw
Grundy
Jaeger
Majestic
Upper Guess Fork Sch
Burke Cem
Justice Cem
Wildcat Hollow
Long Bottom Branch
Hoover Camp
Creek
Fork
Right
North Fk
Lick
Branch

LONG BOTTOM BRANCH DAM



PLAN
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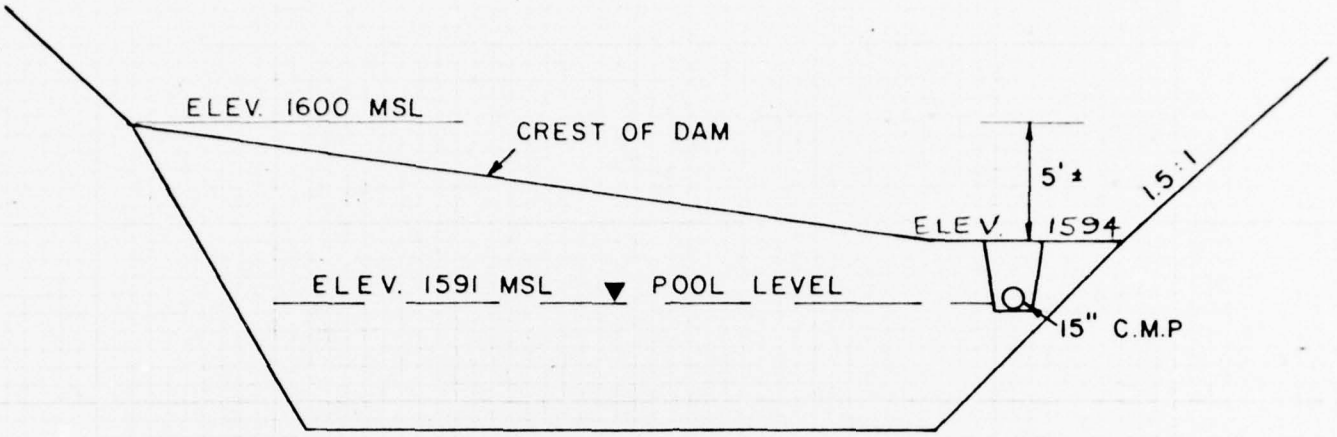
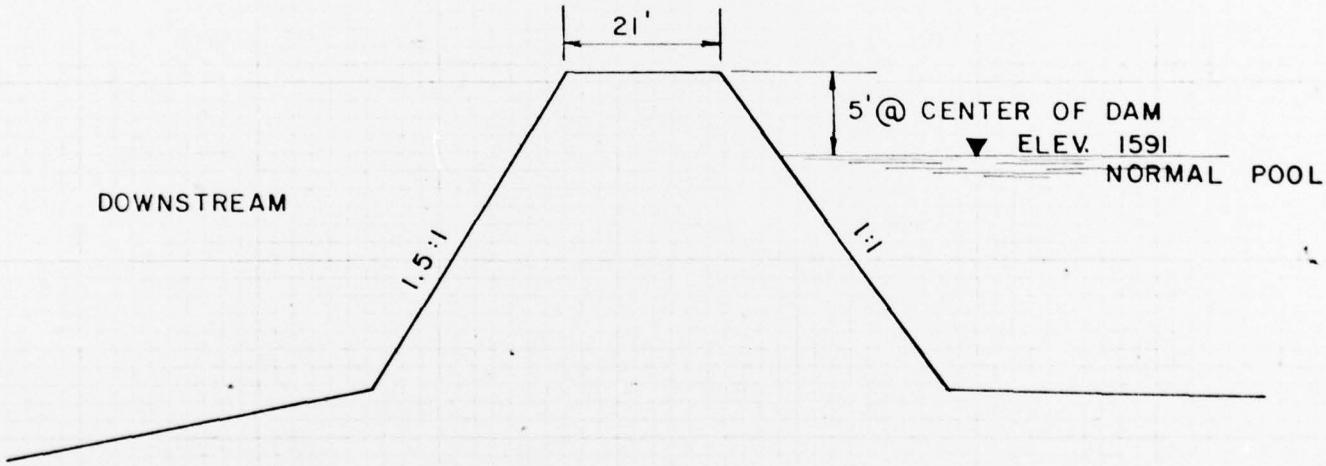
PLATE NO. 2

LONG BOTTOM BRANCH DAM



ELEVATION

LOOKING UPSTREAM



SECTION

(NO SCALE)

PLATE NO. 3

APPENDIX II

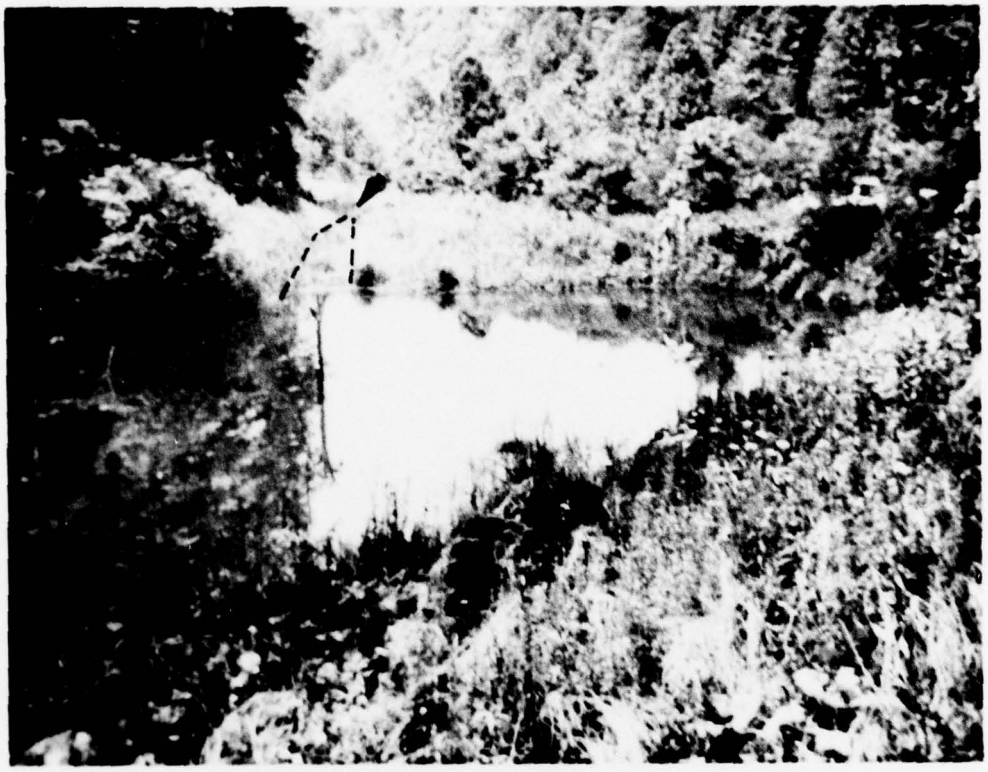
PHOTOGRAPHS

HOUSE LOCATED DOWNSTREAM IN FLOODPLAIN. THE SLOPE IN BACKGROUND IS TYPICAL OF SIDE SLOPES BETWEEN IMPOUNDMENT AND THIS HOME.

VIEW SHOWING WOODEN ACCESS BRIDGE APPROXIMATELY 2½ MILES DOWNSTREAM AND THE FIRST HOUSE IN FLOODPLAIN DOWNSTREAM

VIEW SHOWING HAUL ROAD ACROSS CREST OF DAM

VIEW LOOKING UPSTREAM FROM IMPOUNDMENT. NOTE: GRASS SPILLWAY IN FOREGROUND AND TYPICAL SIDE SLOPES IN BACKGROUND.



VIEW OF UPSTREAM FACE OF EMBANKMENT. NOTE: DASH LINES INDICATE LOCATION OF GRASS SPILLWAY AND ARROW INDICATES CM PIPE SPILLWAY.

APPENDIX III

FIELD OBSERVATIONS

FIELD OBSERVATIONS

Name of Dam: Long Bottom Branch

County: Buchanan

State: Virginia

Coordinates: Lat 37°-24' Long 81°-57.7'

Date of Inspection: June 13, 1979

Weather: Fair, temperature 75°F

Pool Elevation at Time of Inspection: 1591 msl

Tailwater at Time of Inspection: 1567.5

Inspection Personnel:

Schnabel Engineering Associates, P.C.
Ray E. Martin, P.E.
Stephen G. Werner (recorder)

J. K. Timmons and Associates, Inc.
Robert G. Roop, P.E.
William A. Johns (recorder)

State Water Control Board
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1 Embankment:

1.1 Surface Cracks: The slopes, crest, emergency spillway, and abutment contacts were inspected and no cracks were noted. The downstream slope of the embankment was highly vegetated with tall grass, weeds (3 to 4 ft±) and trees. Visual inspection was difficult. The central portion of the downstream slopes appears to include a dumped blanket of fill probably younger than the primary embankment fill.

1.2 Unusual Movement: No unusual movements were noted on thedam or downstream beyond the embankment toe.

1.3 Sloughing or Erosion: Two erosion channels or washes were observed on the downstream slope along the left abutment and along the right edge of slope where the dam curves. The eroded areas were up to 3 ft wide and 1 to 2 ft deep. They extend from about half way down the slope to the toe. Erosion also exists at the spillway outlet.

1.4 Alignment: The embankment appears to be curved on both the downstream and upstream slopes. A relatively straight haul road extends across the crest of the dam. The alignment appears to be satisfactory. Based upon alignment, this structure does not appear to be a designed dam.

1.5 Riprap: No riprap was encountered.

1.6 Junctions: Junctions could not be closely inspected because of abundant vegetation. The embankment fill appears to tie into the steep natural slopes which bound the structure. No bedrock was observed. Loose blocks of rock observed represent fill or colluvial material.

1.7 Seepage: Three seeps were encountered during the inspection. Two were located along the toe of the two eroded channels or washes and the third was approximately 20 ft right of the right erosion channel along the toe of slope. Seepage from all three areas was estimated as 2 gpm$^{\pm}$. Heavy iron staining was generally present along seepage paths.

1.8 Staff Gage: None found.

1.9 Drains: None.

2 Outlet Works:

2.1 Intake Structure: 15" corrugated metal pipe. Erosion observed adjacent to the pipe.

2.2 Outlet Structure: 15" corrugated metal pipe. No riprap present below the outlet.

2.3 Outlet Channel: Water discharges down the face of a 1:1 berm slope.

2.4 Emergency Gate: None. There is no emergency spillway.

3 Ungated Spillway:

3.1 Concrete Weir: None.

3.2 Approach Channel: A trapezoidal shaped channel with 2:1 slope on one side and 1:1 slope on the other. The bottom is 1 ft wide with a slope of 4 percent.

3.3 Discharge Channel: None.

4 Reservoir:

4.1 Slopes: Steep to very steep, highly vegetated slopes bound the left side. The haul road extends up the right abutment-reservoir slope. Rock debris with blocks up to vehicle size rest on the slope at angle of repose. Entire right side consists of rock and soil fill which has been graded.

4.2 Sedimentation: None.

5 Downstream Channel:

5.1 Condition: Thick brush and wooded area observed for several miles. Includes a very marshy area with abundant marsh grass directly below the dam.

5.2 Slopes: Steep to very steep wooded slopes bound the channel.

5.3 Population and Facilities: Five homes were observed directly in the floodplain some 1½ miles downstream.

6 Instrumentation:

6.1 Monumentation: None.

6.2 Observation Wells and Piezometers: No observation wells or piezometers were noted in the field.

APPENDIX IV - REFERENCES

1. Recommended Guidelines for Safety Inspection of Dams, Department of Army, Office of the Chief of Engineers, 46 pp.
2. Design of Small Dams, U. S. Department of Interior, Bureau of Reclamation, 1974, 816 pp.
3. Geology and Coal Resources of Buchanan County, Virginia, Henry Hinds, Virginia Division of Mineral Resources Bulletin 18, 1918, 278 pp.
4. HEC-1 Flood Hydrograph Package, (Hydrologic Engineering Center, U. S. Army Corps of Engineers), July 1978.
5. Hydrometerological Report No. 33, U. S. Department of Commerce, Weather Bureau, U. S. Department of Army, Corps of Engineers, Washington, D.C., April 1956.
6. Technical Paper No. 40, U. S. Department of Commerce Weather Bureau, Washington, D. C. May 1961.