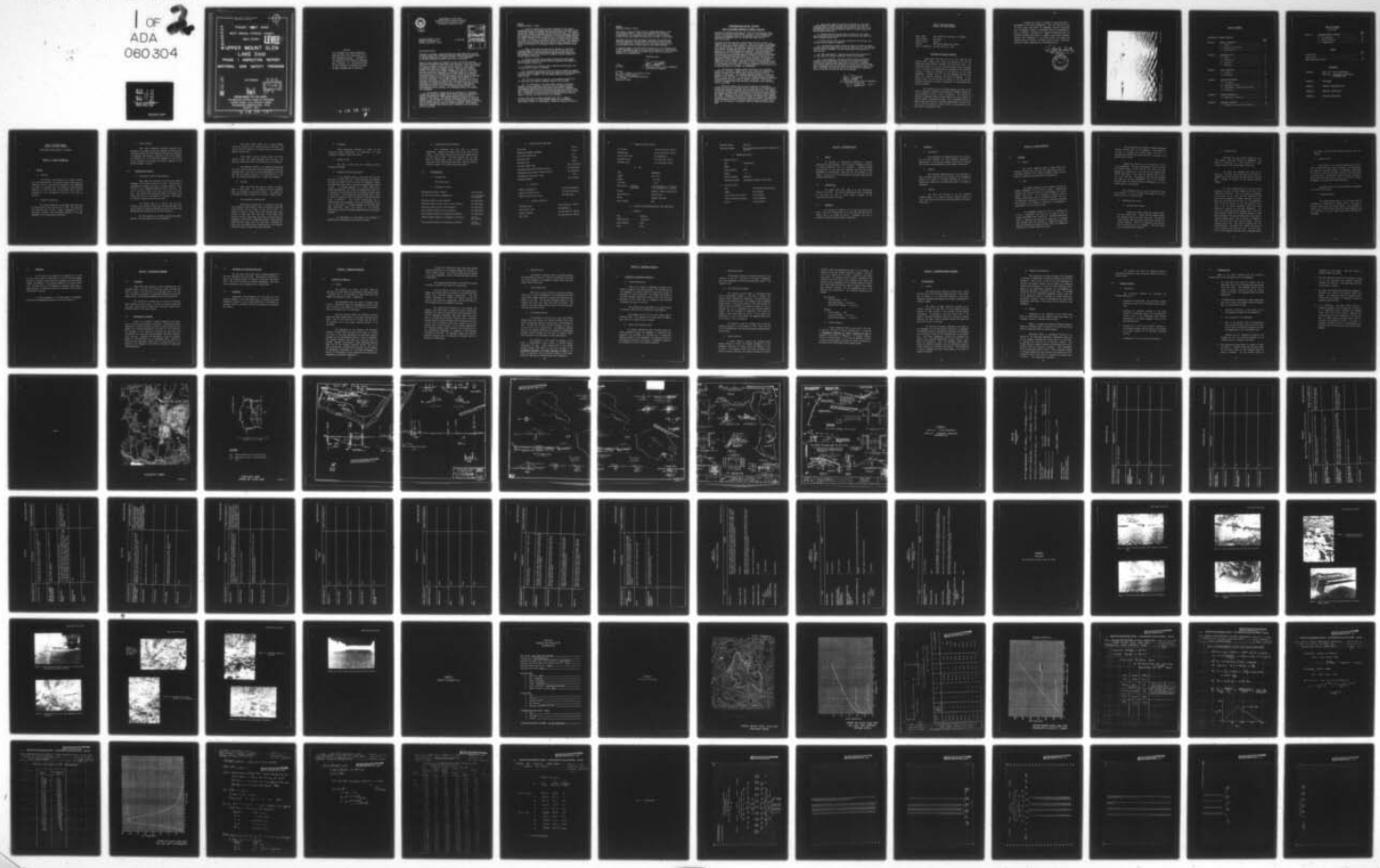
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NATIONAL DAM SAFETY PROGRAM. UPPER MOUNT GLEN LAKE DAM (NJ00202--ETC(U)
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PASSAIC RIVER BASIN

WEST BROOK, PASSAIC COUNTY

NEW JERSEY

LEVEL II

UPPER MOUNT GLEN LAKE DAM

PHASE I INSPECTION REPORT

NATIONAL DAM SAFETY PROGRAM

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NJ 00202

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DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
CUSTOM HOUSE - 2D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

AUGUST 1978

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Honorable Brendan T. Byrne
Governor of New Jersey
Trenton, New Jersey 08621

26 SEP 1978

AD A10 891

Dear Governor Byrne:

Inclosed is the Phase I Inspection Report for Upper Mount Glen Lake Dam in Passaic County, New Jersey which has been prepared under authorization of the Dam Inspection Act, Public Law 92-367. A brief assessment of the dam's condition is given in the front of the report.

Based on visual inspection, available records, calculations and past operational performance, Upper Mount Glen Lake Dam, a high hazard potential structure, is judged to be in fair overall condition. Also, the spillway is considered seriously inadequate since 8 percent of the Probable Maximum Flood (PMF) would overtop the dam. The seriously inadequate spillway is assessed as an UNSAFE, nonemergency condition, until more detailed studies prove otherwise or corrective measures are completed. The classification of UNSAFE applied to a dam because of a seriously inadequate spillway is not meant to indicate the same degree of emergency as would be associated with an UNSAFE classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard to loss of life downstream from the dam. To insure adequacy of the structure, the following actions, as a minimum, are recommended:

a. The spillway's adequacy should be determined by a qualified professional consultant, engaged by the owner, using more sophisticated methods, procedures and studies within six months from the date of approval of this report. Any remedial measures necessary to insure the adequacy of the spillway and to prevent overtopping should be initiated within calendar year 1979. In the interim, a detailed emergency operation plan and warning system, should be promptly developed. Also, during periods of unusually heavy precipitation, around-the-clock surveillance should be provided.

b. Within six months from the date of approval of this report, engineering studies and analyses should be performed to determine the dam and spillway foundation condition and structural stability. This should include test borings to determine material properties relative to stability and seepage and installation of piezometers to facilitate seepage studies. Any remedial measures found necessary should be initiated within calendar year 1979. In addition, the outlet pipe under the dam should be inspected to determine its condition and whether repairs are needed. The inspection should be completed within thirty days from the date of approval of this report and the repairs, if necessary, should be completed within ninety days.

c. Within thirty days from the date of approval of this report, a program should be started to remove all brush and trees from the downstream slope to avoid problems which may develop from their roots. The embankment should then be seeded to develop a growth of grass for surface erosion protection.

d. Within six months from the date of approval of this report, the existing dam plans and drawings should be annotated and updated to form a coherent as-built set.

e. Within one year from the date of approval of this report, the following actions should be completed.

(1) The downstream waterway should be cleared of timber and debris. A channel should be constructed from the low level outlet to the confluence with the natural streambed. The new channel should be protected by stone rip-rap.

(2) The crest should be restored to the elevation called for in the 1965 plans with properly compacted suitable fill material.

(3) O & M Procedures. The owner should initiate a formulated program of annual inspections of the dam, by an experienced party, utilizing the standard visual check list in this report. Headwater and tailwater gages should be installed in the dam, and read out during severe rainstorms and at routine operating and maintenance visits to the dam. A permanent log should be kept of all maintenance and operating events of the dam, the lake and the outlet passages.

A copy of the report is being furnished to Mr. Dirk C. Hofman, New Jersey Department of Environmental Protection, the designated State Office contact for this program. Within five days of the date of

this letter, a copy will also be sent to Congressman Robert A. Roe of the Eighth District. Under the provisions of the Freedom of Information Act, the inspection report will be subject to release by this office, upon request five days after the date of this letter.

Additional copies of this report may be obtained from the National Technical Information Services (NTIS), Springfield, Virginia, 22161 at a reasonable cost. Please allow four to six weeks from the date of this letter for NTIS to have copies of the report available.

An important aspect of the Dam Safety Program will be the implementation of the recommendations made as a result of the inspection. We accordingly request that we be advised of proposed actions taken by the State to implement our recommendations.

Sincerely yours,

JOEL T. CALLAHAN
Lieutenant Colonel, Corps of Engineers
Acting District Engineer

1 Incl
As stated

Cy furn:
Mr. Dirk C. Hofman, P.E., Deputy Director
Division of Water Resources
N. J. Dept. of Environmental Protection
P.O. Box 2809
Trenton, NJ 08625

UPPER MOUNT GLEN LAKE DAM (NJ00202)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 26 June and 7 July 1978 by Harris-ECI under contract to the State of New Jersey. The state, under agreement with the U.S. Army Engineer District, Philadelphia, had this inspection performed in accordance with the National Dam Inspection Act, Public Law 92-367.

The Upper Mount Glen Lake Dam, a high hazard potential structure, is judged to be in fair overall condition. Also, the spillway is considered seriously inadequate since 8 percent of the Probable Maximum Flood (PMF) would overtop the dam. The seriously inadequate spillway is assessed as an UNSAFE, non-emergency condition, until more detailed studies prove otherwise or corrective measures are completed. The classification of UNSAFE applied to a dam because of a seriously inadequate spillway is not meant to indicate the same degree of emergency as would be associated with an UNSAFE classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard to loss of life downstream from the dam. To insure adequacy of the structure, the following actions, as a minimum, are recommended:

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Joel Callahan

JOEL T. CALLAHAN
Lieutenant Colonel, Corps of Engineers
Acting District Engineer

26 September 1978

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Upper Mount Glen Lake Dam, I.D. NJ00202
State Located:	New Jersey
County Located:	Passaic
Stream:	West Brook, Wanaque River Basin
Date of Inspection:	June 26, and July 7, 1978

Assessment of General Condition

Upper Mount Glen Lake Dam is in fair condition with several small seepage areas along the downstream toe and the downstream slopes heavily overgrown with brush and trees. The downstream channel is a rocky creek bed through a heavily forested area. At present, the engineering data available is not sufficient to make a definitive statement on the stability of the earth embankment. Seepage sources in the left embankment section could affect the stability adversely and should be studied. On the positive side, the dam has been in service for 50 years, and has performed adequately, although modifications in the spillway were and are required.

The evaluation of the spillway adequacy was based on the Corps of Engineers Guidelines and additional guidance provided by the Philadelphia District, Corps of Engineers. The spillway is capable of passing a flood of approximately only seven percent of the PMF without overtopping the dam. Thus, the general safety of Upper Mount Glen Lake Dam is considered questionable in view of its lack of spillway capacity to pass the PMF, or even one-half of the PMF without overtopping the dam.

A program for control of growth of trees and brush is recommended to be started immediately. Also, the condition of the low level outlet pipe within the embankment should be determined and, if necessary, repairs or replacement should be accomplished as soon as possible. Acquisition of adequate engineering data for stability analysis and studies to augment the spillway discharge capacity are recommended to be started within six months and completed within 12 months. The owner should initiate a formalized program of annual inspections by an experienced party.

Robert Gershowitz

Robert Gershowitz, P.E.





UPPER MOUNT GLEN LAKE
Embankment, spillway and right abutment.

June 26, 1978

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APPENDIX D - HYDROLOGIC COMPUTATIONS

APPENDIX E - STABILITY CALCULATIONS

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

UPPER MOUNT GLEN LAKE DAM, ID. NJ00202

SECTION 1: PROJECT INFORMATION

1.1 General

a. Authority

The National Dam Inspection Act (Public Law 92-367, 1972) provides for the National Inventory and Inspection Program by the U.S. Army Corps of Engineers. This inspection was made in accordance wtih this authority under Contract C-FPM No. 35 with the State of New Jersey who in turn is contracted to the Philadelphia District of the Corps of Engineers.

b. Purpose of Inspection

The visual inspection of the Upper Mount Glen Lake and Dam was made on June 26, and July 7, 1978. The purpose of the inspection was to make a general assessment as to the structural integrity and operational adequacy of the dam embankment and its appurtenant structures.

c. Scope of Report

This report summarizes available pertinent data relating to the project; presents a summary of visual observations made during the Field Inspection; presents an evaluation of hydrologic and hydraulic conditions at the site; presents an evaluation as to the structural adequacy of the various project features; and assesses the general condition of the dam with respect to safety.

1.2 Description of Project

a. Description of Dam and Appurtenances

Upper Mount Glen Lake Dam is an earth and rockfill embankment with vertical concrete core wall. The dam has an approximately straight axis with an overall length of about 248 feet, and an embankment height of about 8-1/2 feet. The top of the dam is about 5 feet wide and is used as a foot path. The upstream and downstream slopes are irregular with slopes from 1-1/2 to 2 horizontal to 1 vertical. Both slopes are heavily overgrown with brush and vines.

The original dam was a rockfill and core wall structure with earthfill blanket over the upstream slope. The dam was raised in 1933 by extending the concrete core wall and adding additional earthfill over the entire section.

The dam apparently is founded on granite and gneiss bedrock. Rock outcrops occur in both abutments.

The outlet works consist of a 12-inch diameter steel pipe located in the central portion of the dam. The control valve is located in a concrete vault at the upstream edge of the dam crest.

Three small concrete overflow weirs and outlet channels control the normal discharge from the lake. All three are located well away from the dam and all are ungated.

The emergency spillway is an ungated broad-crested weir with vertical side walls and sloping approach apron and discharge chute. The weir is located approximately on the dam axis and the approach consists of the upstream face of the dam. The spillway discharges into a natural rocky channel.

b. Location

Upper Mount Glen Lake Dam is located in Passaic County of New Jersey. It is accessible by way of Otterhole Road, and Broadway and Roosevelt Streets. The damsite is surrounded by private property with no direct roadway access.

c. Size and Hazard Classification

Upper Mount Glen Lake Dam is classified in the dam size category as being "small", since its storage is less than 1,000 acre-feet and its height is less than 40 feet. At present, a failure of Upper Mount Glen Lake Dam could cause failure of Lower Mount Glen Lake Dam. Flood waters from failure of both of these dams could result in loss of life by flooding of a KOA trailer campground located a short distance downstream from Lower Mount Glen Lake Dam. Therefore, we concur with the "High" hazard classification in the National Inventory of Dams for Upper Mount Glen Lake Dam.

d. Ownership

Upper Mount Glen Lake Dam is owned by the Mount Glen Lakes Association, an association of local residents in Passaic County, New Jersey.

e. Purpose of Dam

The lake is used only for recreation, mostly boating and fishing.

f. Design and Construction History

It was reported orally by the owner that the dam was built in about 1927 for a land developer, Mr. Shipper. The dam was raised in 1933 as a part of a program to repair the Lower Mount Glen Lake Dam which had failed during a storm in 1932. A drawing prepared by L. Alfred Jenny & Co., Consulting Engineers, that shows the modifications that were to be made to the dam and spillway is available from the State of New Jersey. The spillway has been modified twice, first in 1933 in conjunction with the raising of the dam and then later in 1970-1971. The latter modification was a reconstruction and enlargement to meet the requirements of the State of New Jersey. A drawing prepared for the Mount Glen Lake Association shows the details of the spillway modification, along with proposed modifications on the dam and spillway.

No computations for the design of the original or modified dam and spillway are available for review.

g. Normal Operational Procedures

The discharge from the lake is normally unregulated. However, the water level in the lake is very stable. It was orally reported that the level normally varies not more than 6 inches. The owner reported that the water level is lowered about 2 feet in October to get the water level below boat docks during the winter. The water level is allowed to return to its normal level each spring.

1.3 Pertinent Data

a. Drainage Area

0.87 square miles

b. Discharge at Damsite

Maximum known flood at damsite	Not Available
Low level outlet pipe at maximum pool	9 cfs (estimate) (El. 926.52)
Warm water outlet at pool elevation	Not Applicable
Diversion tunnel low pool outlet at pool elevation	Not Applicable
Diversion tunnel outlet at pool elevation	Not Applicable
Gated spillway capacity at pool elevation	Not Applicable
Gated spillway capacity at maximum pool elevation	Not Applicable
Ungated spillway capacity at maximum pool elevation	170 cfs (El. 926.52)
Total spillway capacity at maximum pool elevation	170 cfs (El. 926.52)

c. Elevation (Feet above MSL)

Top of dam	926.52
Maximum pool-design surcharge	926.52
Full flood control pool	N.A.
Recreation pool	924.60
Spillway crest	924.6
Low level outlet pipe	918.7 (Estimate)
Upstream portal invert diversion tunnel	Not Applicable
Downstream portal invert diversion tunnel	Not Applicable
Streambed at centerline of dam	917.0
Maximum tailwater	Not Available

d. Reservoir

Length of maximum pool	0.23 mile (Estimate)
Length of recreation pool	0.21 mile (Estimate)
Length of flood control pool	Not Applicable

e. Storage (Acre-Feet)

Recreation pool	28 acre-feet (El. 924.6)
Flood control pool	Not Applicable
Design surcharge	50 acre-feet (El. 926.52)
Top of dam	50 acre-feet (El. 926.52)

f. Reservoir Surface (Acres)

Top of dam	12.22 ± acres (El. 926.52)
Maximum pool	12.22 ± acres (El. 926.52)
Flood control pool	Not Applicable
Recreation pool	10.7 acres (El. 924.6)
Spillway crest	10.7 acres (El. 924.6)

g. Dam

Type	Embankment
Length	247.5 feet
Height	8.2 feet
Top width	5 feet
Side slopes - Upstream	1-1/4 horizontal to 1 vertical
- Downstream	1-1/2 horizontal to 1 vertical
Zoning	Rockfill covered with earthfill
Impervious core	Concrete wall
Cutoff	Concrete core wall
Grout curtain	None

h. Diversion and Regulating Tunnel (Not Applicable)

i. Spillway

Type	Overflow
Length of weir	20.83 feet
Crest elevation	924.6
Gates	None

Upstream channel	Reservoir
Downstream channel	Narrow downstream channel with numerous rock outcrops.

j. Regulating Outlets

1. Channel Outlets

Type	Overflow wier
Number	2
Crest elevation	924.5
Length	2.0
Upstream channel	Reservoir
Downstream channel	Rectangular channel 2.0 feet wide

2. Low Level Outlet

Type	12" diameter steel pipeline
Length	Not available
Inlet centerline elevation	Not available
Outlet centerline elevation	918.7 (estimate)
Control	12" gate valve

SECTION 2: ENGINEERING DATA

2.1 Design

No drawings or computations pertaining to original construction could be found. No data from soil borings, soil tests or other geotechnical data is available. Drawings showing modifications to the dam were obtained from the New Jersey Department of Environmental Protection and are included in this report. Letters are on file pertaining to spillway capacities and required modifications.

2.2 Construction

No records have been found as to the construction history of the dam. The owner's representative has no knowledge of, and does not know of anyone having knowledge of the construction history of the dam.

2.3 Operation

No records of operation of the lake are kept by the owner. The only operating rule is to lower the lake each fall to protect boat docks during the winter. Otherwise, the lake is allowed to operate naturally without regulation.

2.4 Evaluation

a. Availability

The availability of engineering data is very poor. The only data available are three drawings pertaining to modification to the dam and spillway, which can be obtained from the New Jersey Department of Environmental Protection.

b. Adequacy

The available engineering data is not sufficient to draw a reliable conclusion on the stability of the embankment. Reduced size copies of available drawings and a list of engineering construction and maintenance data is included in Appendex A.

c. Validity

The plans and sections of the few available drawings appear to be valid at present. However, erosion of crest and slopes has altered the detailed shape of the dam in some places.

SECTION 3: VISUAL INSPECTION

3.1 Findings

a. General

The visual inspection made of Upper Mount Glen Lake Dam revealed that the dam and appurtenances were in serviceable condition, but a regular program of inspection and repair is required to maintain their serviceability.

b. Dam

The drawing prepared in 1933 indicates an earth and rockfill embankment with a concrete corewall. Observations indicate that the outer shells of the embankment are a well-graded silty sand. It is reasonable to assume, based on geologic observations, that the foundation extends to bedrock. No significant deviations in vertical or horizontal alignment were apparent. No evidence of cracking in the embankment or downstream of the toe could be found.

The embankment slopes are 1-1/4 to 1 upstream, and 1-1/2 to 1 downstream, and there are no signs of past or present downstream slope instability. Upstream slopes which could be inspected are protected by riprap and no problems were apparent above the waterline. Downstream slopes were heavily overgrown with brush and small trees. No evidence of holes dug by burrowing animals was found.

The dam apparently is founded on granite and gneiss bedrock. Outcrops occur at both abutments. Joint spacing in the rock is variable, but averages about 1-1/2 feet. A prominent set strikes N33°E nearly parallel to the axis of the dam and dips 45-55°SE.

Seepage was observed in four locations at the toe of the embankment. One seep, approximately 15 feet in width, was observed about 50 feet from the left end of the dam. Seepage was estimated at 2 to 3 gpm and was flowing clear. Another seep about 10 feet wide was observed about 25 feet left of the spillway. The seepage in this area was estimated at 2 gpm, was located immediately left of the spillway. Standing water was observed along the embankment toe in the section right of the spillway.

The prominent joint set nearly parallels the dam axis, therefore, it is very probable that seepage is not joint controlled, but is through the dam.

c. Appurtenant Structures

1. Spillway Chute Channel

Seepage was visible under the concrete spillway chute cutoff wall. A small leak was observed where the spillway contacts the left wing wall. The spillway crest concrete and the spillway chute floor concrete are in good condition. There is no cracking of the concrete and all construction is in alignment. The chute walls are in acceptable good condition.

2. Low Level Outlet

The dam's low level outlet consists of a 12-inch diameter steel pipe through the embankment. The outlet is controlled by a valve located in a small concrete vault at the upstream edge of the crest.

The inlet was submerged and could not be inspected. The last foot of the pipe at the outlet is exposed and is badly corroded with some holes in the pipe wall. Perhaps 50 percent of the original material remains.

The owner representative did not have the key available to unlock the valve chamber at the time of the inspection on June 26. Later, it still was not possible to gain access to the valve vault for inspection, even after several attempts to arrange a meeting, the last of which was cancelled the day prior to the inspection. Thus, it was not possible to test the operation of the valve. Mr. Sy Larkin, President, Mount Glen Lakes Association provided the following information. The valve is a 12-inch gate valve equipped with a 90^{o} level gear reduction drive and is operated manually by hand wheel attached to the gear reduction drive. The valve is normally operated once a year in October to November to lower the lake level below the boat docks. The last operation was in 1977. The valve is normally left in a closed position. According to Mr. Larkin, the valve is in good condition and functions well. The valve vault has a 3-inch diameter pipe drain that discharges beside

the outlet pipe and which keeps the valve vault unflooded.

d. Reservoir Area

The reservoir rim is gently sloped and no indications of instability were readily apparent. The slopes above the reservoir are heavily wooded. No buildings or dwellings are built on or near the shoreline, with only a few boat docks on the shoreline. The property around the lake is privately owned and it was reported that access to the lake is limited to members of the Mount Glen Lakes Association.

A geologic map of the lake and damsite is appended to the end of this report.

e. Downstream Channel

The downstream waterway is a very rocky natural streambed in a broad, gently sloping valley. The valley is heavily wooded with much timber debris. The streambed is stable, but a minor erosion channel has begun migrating from the confluence of the low level outlet works discharge and streambed.

3.2 Evaluation

At the time of the inspection the condition of the dam did not present cause for undue alarm. It is felt that the seepage observed in several places along the embankment toe does warrant further investigation. The spillway appears to be in good condition. The same is true of the abutments. Reservoir slopes show no apparent signs of instability and are not believed to be a potential hazard to the dam.

A further assessment of the dam appears in subsequent sections and recommendations appear at the end of Section 7.

SECTION 4: OPERATIONAL PROCEDURES

4.1 Procedures

Upper Mount Glen Lake Dam is used to impound water for recreation uses. The policy is to maintain a nearly constant lake level at close to the elevation of the spillway crest. The lake level is normally maintained by unregulated discharge through three small outlets. The spillway releases excess flow during storms.

The lake level is lowered late in each fall by releasing water through the outlet pipe. The lake is usually lowered and kept about 2 feet below the normal level during the winter and is allowed to refill in the early spring.

4.2 Maintenance of the Dam

There is no program of regular inspection and maintenance of the dam and appurtenant structures. The Mount Glen Lakes Association is severely limited in ability to obtain funds from its members for financing maintenance and repair of its facilities. The president of the Association reported that they have been unsuccessful in collecting from some members even after winning a court law suit. Operation and maintenance is done by volunteer members of the Association on an unscheduled basis. Records of operation and maintenance consist only of those reported in the minutes of the meetings of the board of directors of Mount Glen Lakes Association.

4.3 Maintenance of Operating Facilities

The low level outlet gate valve is opened annually for the fall lowering of the lake level. Maintenance of the valve is made on an infrequent basis, as required, to keep the valve operable. The outlet pipe has not received maintenance. The outlet end is exposed and can be inspected with a strong light.

4.4 Evaluation

Surveillance and maintenance is in the hands of a few volunteer members of the owner association. At present, the owner association appears to face severe difficulty in obtaining the necessary funds to establish an effective program for maintenance and repairs.

SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. Design

The drainage area above the Upper Mount Glen Lake Dam on the West Brook is approximately 0.87 square miles. A drainage map of the watershed of Upper Mount Glen Lake damsite is presented on Plate 1, Appendix D.

The topography within the basin is foothills type terrain. Elevations range from approximately 935 feet above mean sea level at the damsite to over 985 feet above mean sea level in the upper end of the watershed.

Land use patterns within the watershed are mostly urban with some forested lands in the upper elevations of the basin. Most of the urban areas are located near the rim of the reservoir and in the lower elevation portion of the watershed.

The evaulation of the hydraulic and hydrologic features of Upper Mount Glen Lake Dam was based on criteria set forth in the Corps Guidelines and additional guidance provided by the Philadelphia District, Corps of Engineers. The Probable Maximum Flood (PMF) was calculated from the Probable Maximum Precipitation using Hydrometeorological Report No. 33 with standard reduction factors. Due to the small drainage area of Upper Mount Glen Lake, the SCS triangular hydrograph, transformed to a curvilinear hydrograph, was adopted for developing the unit hydrograph. The derived unit hydrograph is presented in Appendix D.

Initial and infiltration loss rates were applied using SCS procedure to the Probable Maximum Storm rainfall to obtain rainfall excess. The rainfall excess was then applied to the unit hydrograph to obtain the PMF hydrograph utilizing program HEC-1.

The computed peak discharge of the PMF and one-half the PMF are 4,924 cfs and 2,462 cfs, respectively.

Both the PMF and one-half the PMF inflow hydrographs were routed through the reservoir by the Modified Puls Method, also utilizing computer program HEC-1. The peak outflow discharges for the PMF and one-half the PMF are 4,577 cfs and 2,229 cfs, respectively. Both the PMF and one-half the PMF result in overtopping of the dam.

The stage-outflow relation for the spillway was prepared from field notes, sketches and limited construction drawings. The reservoir stage-capacity data were based on the U.S.G.S. quadrangle topographic maps which agreed with data given in the National Dam Safety Inventory Table. Reservoir storage capacity include surcharge levels exceeding the top of the dam and the spillway rating curve assumed that the dam remains intact during routing. In the routing computations, the discharge through outlet facilities was excluded due to its insignificant magnitude as compared to the spillway discharge and the PMF. The spillway rating curve and the reservoir capacity curve are presented in Plates 2 and 3 of Appendix D, respectively.

b. Experience Data

No records of reservoir stage or spillway discharge are maintained for this site. However, according to interviews with local residents, the maximum reservoir level was never higher than the dam crest.

c. Visual Observations

There was no visual evidence of excessive sedimentation due to recent developments in the drainage basin which could cause a sudden increase in sediment load, which may pose danger to the dam. The spillway discharge channel is well defined with heavy rock riprap and some tree growth. The reservoir rim looks stable and the slope of the hills surrounding the reservoir are mild.

d. Overtopping Potential

As indicated in Section 5.1-a., both the Probable Maximum Flood and one-half the Probable Maximum Flood, when routed through Upper Mount Glen Lake result in overtopping the dam. The PMF and one-half the PMF overtopped the dam by 3.4 feet and 2.0 feet, respectively. The emergency spillway shown on the design drawing was not considered in determining spillway capacity because the area has an elevation higher than the crest of the dam based on visual observations.

The spillway is only capable of passing a flood equal to approximately seven percent of the PMF without overtopping the dam. Since one-half PMF is the minimum Spillway Design Flood (SDF) for this dam, according to the Recommended Guidelines for Safety Inspection of Dams by the Corps of Engineers, the the spillway capacity of the Upper Mount Glen Lake Dam is considered seriously "Inadequate".

SECTION 6: STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

There are no signs of embankment sloughing, local slides or slumps on the downstream side. The upstream side of the embankment was almost completely under water and was not available for visual inspection. The leakage and seepage in the right abutment, described in Section 3.1-b., have not been monitored by the owner and no information was uncovered concerning their age or flow rate.

The spillway chute slab exhibits no visual evidence of cracking, slide failure, undermining or misalignment.

The exposed end of the low level outlet pipe is severely eroded. The condition of the pipe under the embankment could not be observed and is unknown.

b. Design and Construction Data

No design computations were uncovered during the report preparation phase. No embankment or foundation soil parameters are available for carrying out a conventional stability analysis on the embankment. No construction data or specifications relating to the degree of embankment compaction are available for use in the stability analysis.

c. Operating Records

No operating records are available relating to the stability of the dam. According to the owner's representative, the embankment has served satisfactorily since it was raised in 1933.

d. Post-Construction Changes

The original section, based on information taken from a 1933 drawing, appears to have been a corewall with rockfill shells upstream and downstream. Clay was apparently placed on the upstream side of the corewall along the original ground surface. The dam was raised in 1933. The corewall was raised 2 feet and earthfill was placed on slopes of 1.25 to 1 upstream and 1.5 to 1 downstream over the existing rockfill slopes. The fill extended an additional 1 foot above the corewall. Total crest width is 5 feet. At the time of the inspection, the top of the corewall was exposed, indicating a loss of about 1 foot of freeboard.

The inspection team was informed that the dam was repaired according to a plan prepared in 1965. Since the time of this rehabilitation, the dam has obviously experienced some deterioration.

e. Static Stability

A static stability analysis was performed using Bishops Method of slices and assumed parameters for the embankment materials, to better assess the adequacy of the structure. The phreatic surface was taken at normal water surface elevation upstream, and assumed horizontal at ground

elevation from the downstream toe back to the corewall. No failure circles were passed through the corewall. The validity of the results are, of course, a function of the assumptions made. The results, which are given in Appendix E, did indicate that deep failure arcs appeared less likely than shallow surface sloughing, with an adequate margin of safety. The visual inspection did not reveal any signs of such sloughing, tending to indicate that the assumptions used in the analysis were conservative. The following parameters were assumed:

Fill Material

Friction Angle = 30°

Moist Unit Weight = 125 p.c.f.

Saturated Unit Weight = 130 p.c.f.

Rockfill

Friction Angle = 38°

Moist Unit Weight = 142 p.c.f.

Saturated Unit Weight = 145 p.c.f.

f. Seismic Stability

A fault, mapped by others, occurs about 1 mile east of the dam. The dam is located in Seismic Zone 1, as defined in Recommended Guidelines For Safety Inspection of Dams as prepared by the Corps of Engineers. In general, projects located in Seismic Zones 0, 1 and 2 may be assumed to present no hazard from earthquake, provided the seismic conditions are satisfactory and conventional safety margins exist.

SECTION 7: ASSESSMENT/REMEDIAL MEASURES

7.1 Dam Assessment

a. Safety

The dam has been inspected visually and a review has been made of the available engineering data. This assessment is subject to the limitations inherent in the visual inspection procedures stipulated by the Corps of Engineers for a Phase I report.

The safety of Upper Mount Glen Lake Dam is in question because the dam does not have adequate spillway capacity to pass the PMF or even one-half the PMF without overtopping. Overtopping of the dam carries with it the danger of possible progressive failure of the dam or concrete spillway. The dam's present spillway capacity can pass only about seven percent of the PMF.

No definitive statement pertaining to the safety of the embankment can be made without acquisition of embankment and foundation material engineering properties and determination of phreatic levels in the downstream part of the embankment. The present embankment, however, has performed adequately since the 1933 modification without failure or evidence of instability. While the embankment slopes appear steep, the stability analysis, with its limitations, does not reveal potential for serious slope failure. The possibility of minor sloughing may exist, particularly in the event of seismic excitation.

b. Adequacy of Information

The information and data uncovered is not adequate to perform a comprehensive, definitive evaluation of the dam's stability. Nevertheless, in view of the past performance of the dam, its present condition, and in light of the stability calculations performed, it is not felt that additional information on the engineering properties of the embankment and foundation materials is necessary at this time. The seepage at the toe of the downstream embankment, however, does call for an additional study to determine the actual location of the phreatic surface. Such an investigation will also yield information pertaining to the nature of the material in the embankment.

c. Urgency

Inspection of the condition of the outlet pipe under the dam should be done within 30 days and repairs, if necessary, should be completed within 90 days.

Studies to augment the spillway discharge capacity should be undertaken within six months, and a plan formulation should be completed within a 12-month period.

Observation wells or piezometers should be installed in the downstream embankment, immediately above the zone of seepage, approximately 25 feet left of the spillway, to determine the location of the phreatic surface. The borings should be logged according to the Unified Soil Classification system by qualified personnel. This information should be obtained within 6 months. This information should be evaluated immediately upon aquisition and compared with the assumptions used in this report to determine if further, more detailed stability analyses are necessary.

The existing dam plans and drawings should be annotated and updated to form a coherent as-built set within a 6 month period.

7.2 Remedial Measures

a. Alternatives

The alternative available for increasing the spillway capacity are:

1. Increasing the dam height, thus permitting a higher discharge to pass over the spillway without overtopping.

2. Providing for auxiliary spillway on the right abutment by "hardening" the top of the abutment and re-entry path to the downstream brook channel sufficiently to withstand emergency flows of one-half PMF magnitude.

3. Providing for a new service spillway, adjacent to the existing spillway, possibly gated, and utilizing the present spillway as an auxiliary discharge facility.

4. A combination of any of the above alternatives.

7.3 Recommendations

Based on the visual inspection and data evaluation presented herein, the following action is recommended.

1. All brush and trees should be removed from the downstream slope to avoid problems which may develop from their roots. The embankment should then be seeded to develop a growth of grass for surface erosion protection. This program should be started immediately.

2. A program should be undertaken to gather engineering data and to monitor the seepage through the embankment. The data should include:

   a. Subsurface information at the damsite, including engineering properties and parameters.

   b. Soil properties of the embankment.

   c. Data of the phreatic line, from observation wells, within the dam section at several cross-section lines including the maximum section and the seepage area in the left abutment area.

   Depending on the information provided by the program, the need for corrective measures can be considered and, if necessary, undertaken.

3. The downstream waterway should be cleared of timber and debris. A channel should be constructed from the low level outlet to the confluence with the natural streambed. The new channel should be

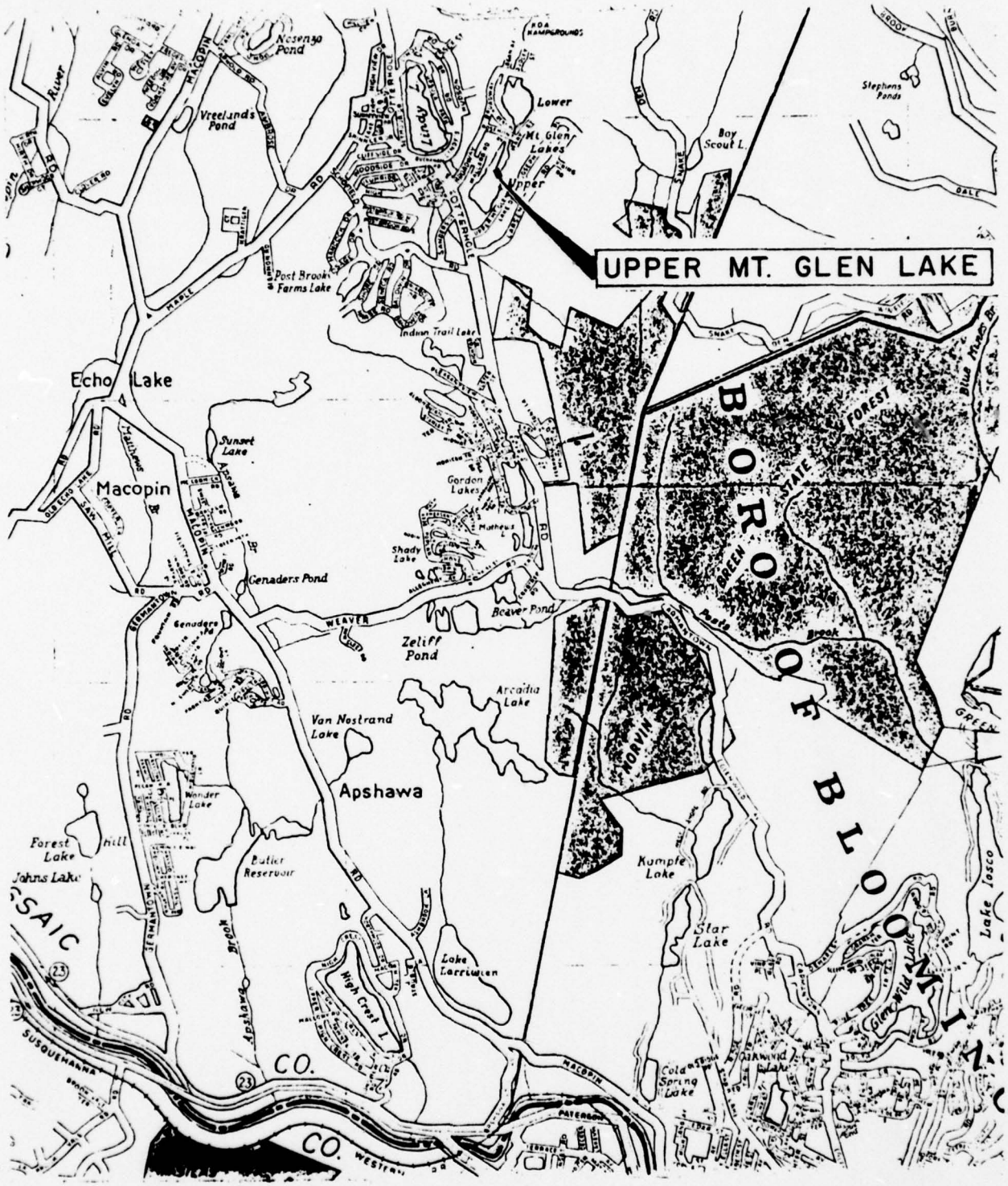
protected by rock riprap. This work should be completed within 12 months.

4. The crest should be restored to the elevation called for in the 1965 plans with properly compacted suitable fill material. This work should be completed within 12 months.

5. The outlet pipe under the dam should be inspected to determine its condition and whether repairs are needed. The inspection should be completed within 30 days and the repairs, if necessary, should be completed within 90 days.

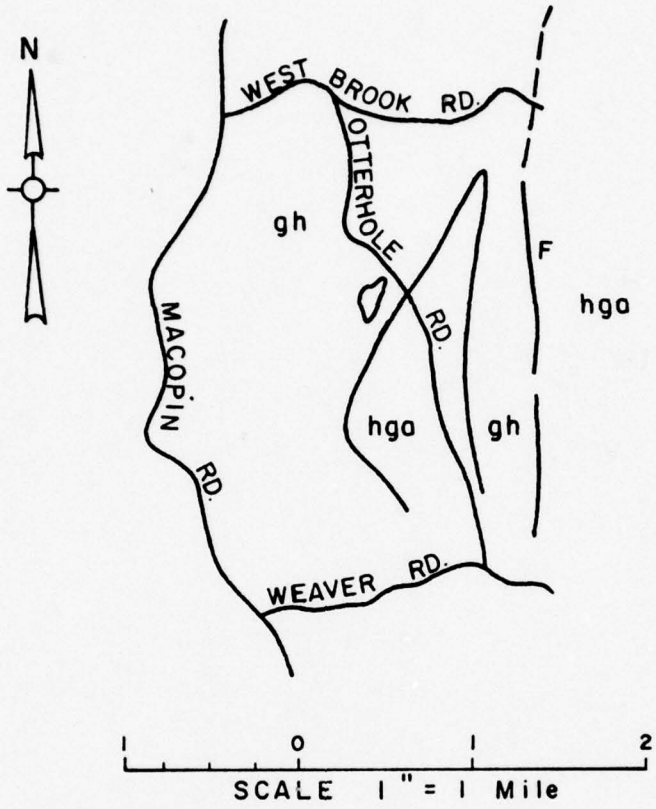
6. O & M Procedures. The owner should initiate a formulated program of annual inspections of the dam, by an experienced party, utilizing the standard visual check list in this report. Headwater and tailwater gages should be installed in the dam, and read out during severe rainstorms and at routine operating and maintenance visits to the dam. A permanent log should be kept of all maintenance and operating events of the dam, the lake and the outlet passages.

PLATES



VICINITY MAP

PLATE 1

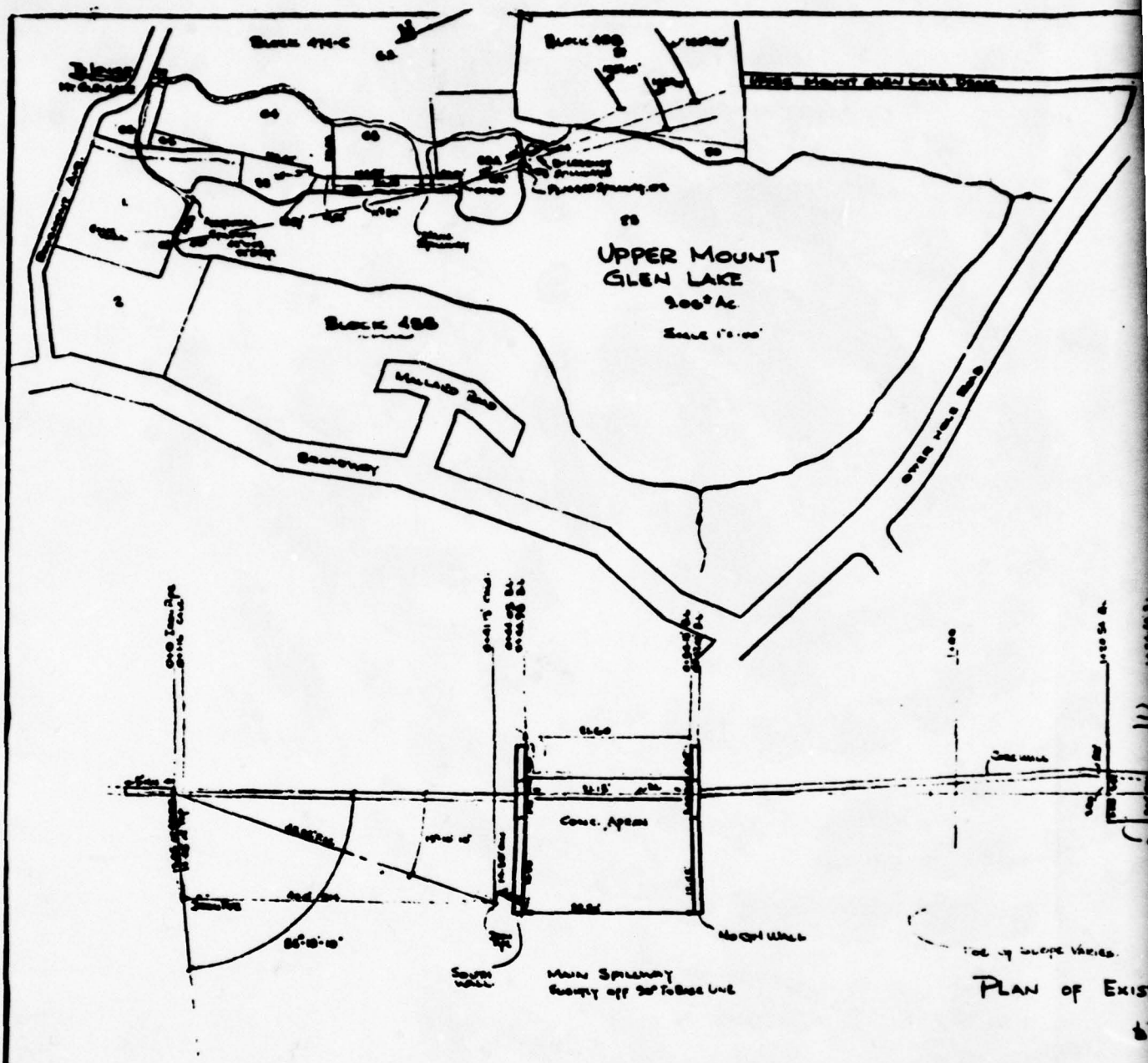


LEGEND

gh	Mostly hornblend Granite and Gneiss.
hga	Hypersthene - quartz - andesine Gneiss.
F	Fault

GEOLOGIC MAP
UPPER MT. GLEN DAM

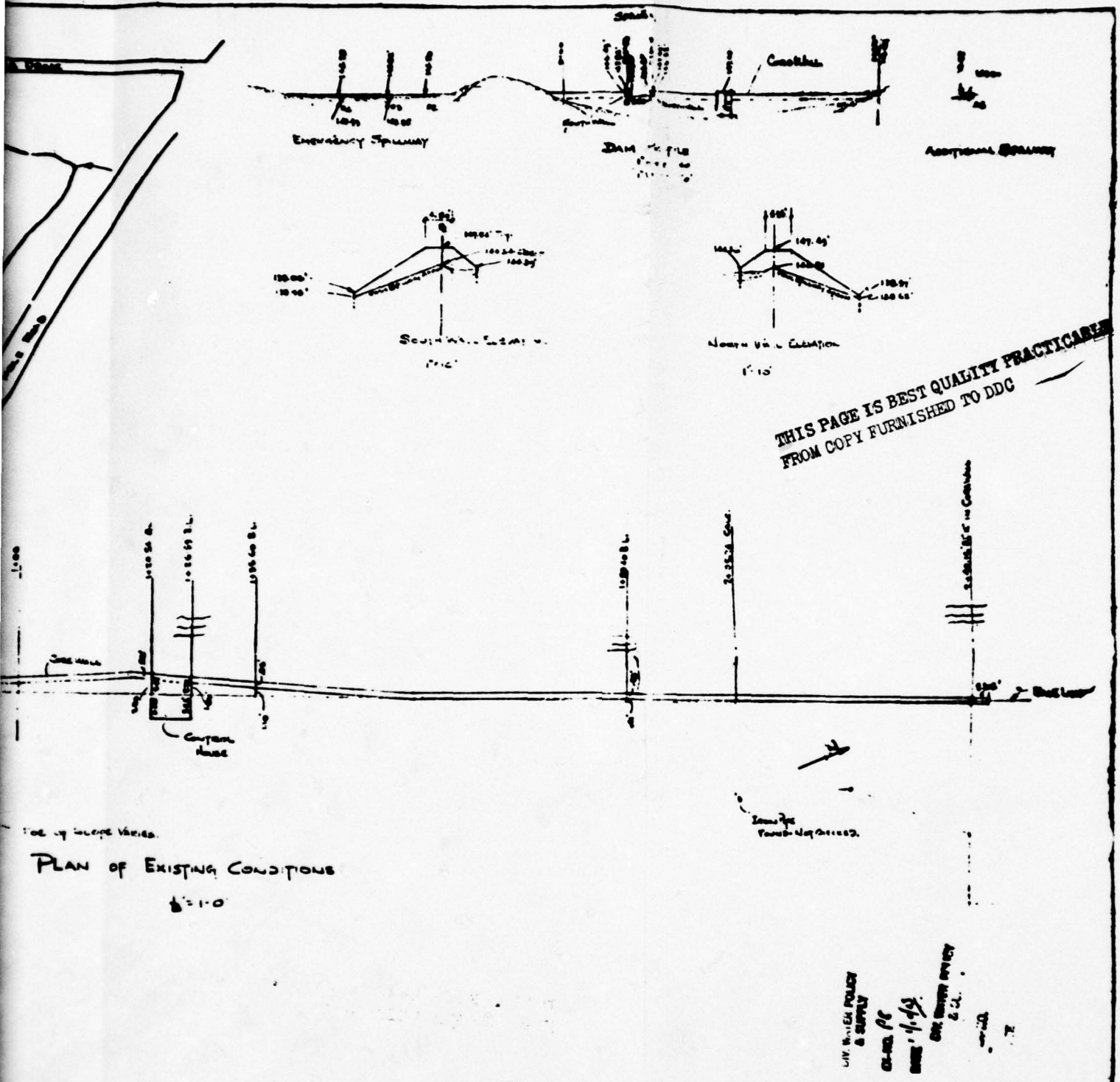
PLATE 2



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J FOLDER
SUPPLY
J. NO. P-5
DATE 1/4/71
7

FIELD DATA By HI County PE & RJ. Emmons L.S.



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Top of Slope Varies.

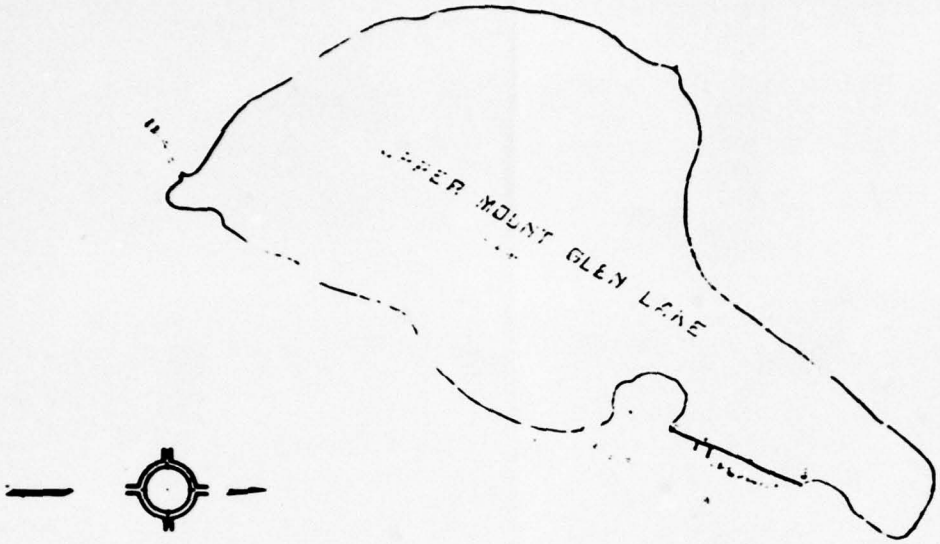
PLAN OF EXISTING CONDITIONS

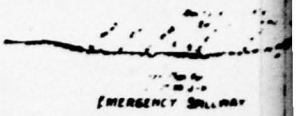
1" = 1'-0"

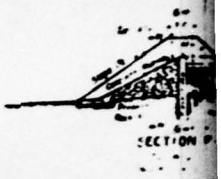
UPPER MOUNT GLEN LAKES DAM. AND PLAN OF EXISTING CONDITIONS FOR D. D. FRANKE - OTTERCLIFF ROAD MAP IN WEST MILFORD TWP HASSAIL COUNTY NEW JERSEY	W. Schmidt, P.E. Owosso Road Hewitt, N.J. 150/1

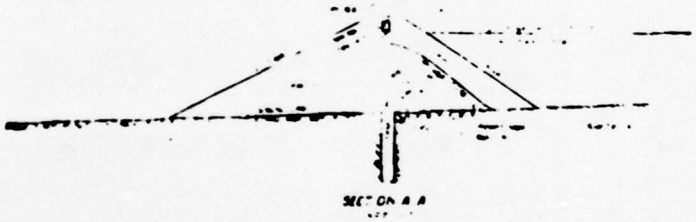
PLATE 3

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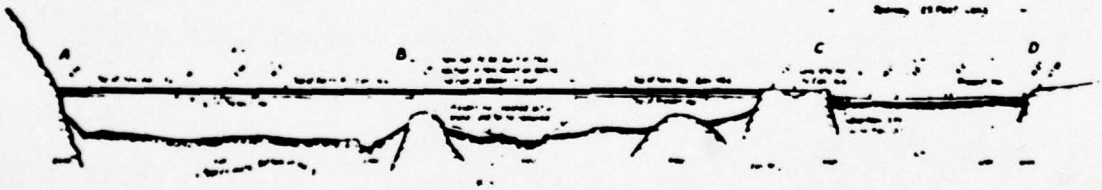






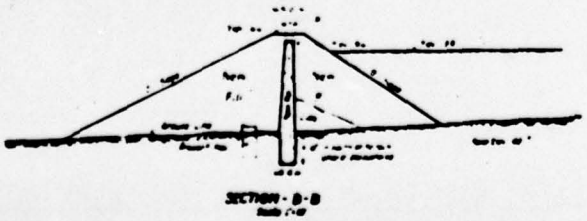


PLAN



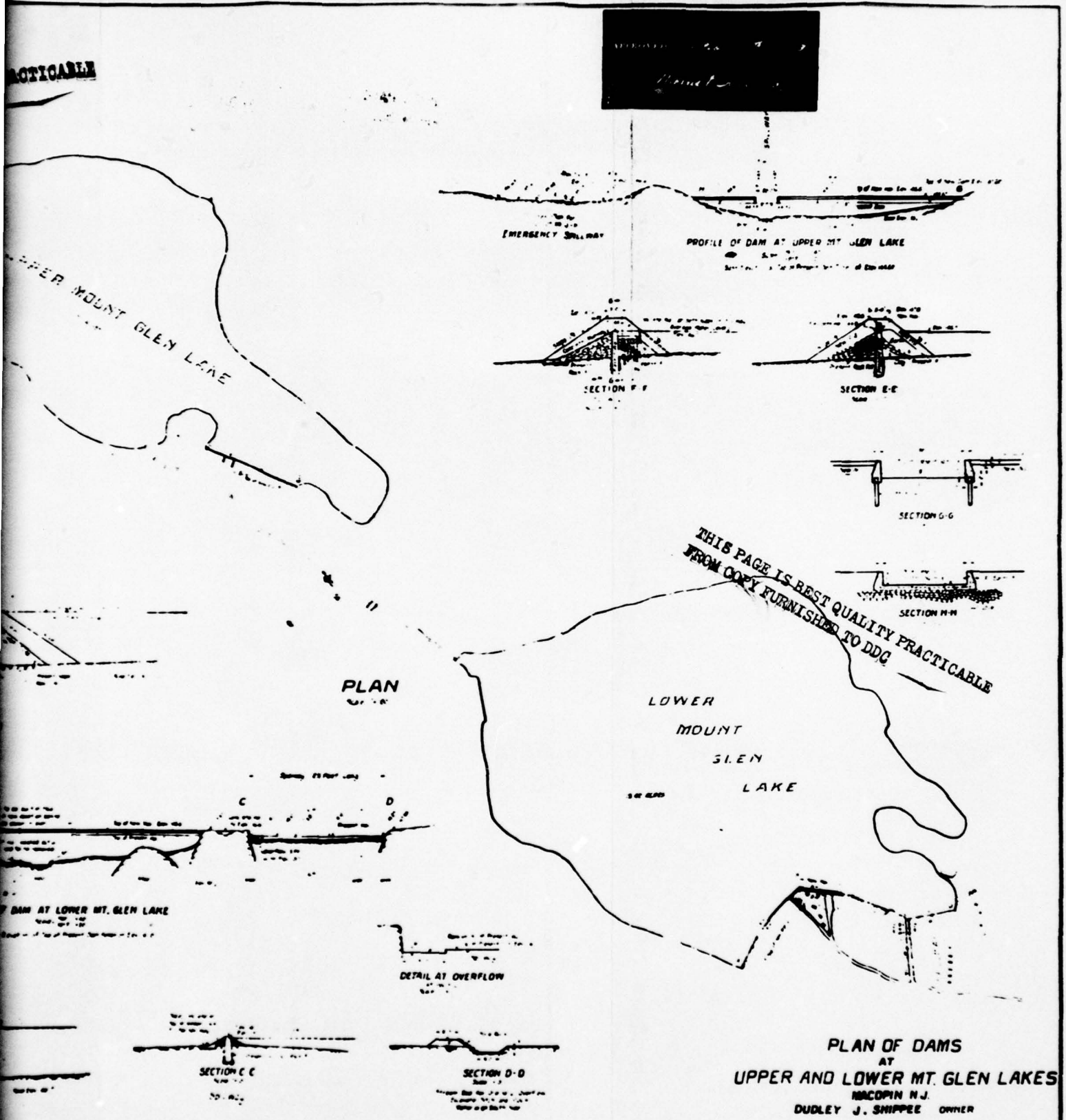
PROFILE OF DAM AT LOWER MT. GLEN LAKE











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PLAN OF DAMS
AT
UPPER AND LOWER MT. GLEN LAKES

MACOPIN N.J.

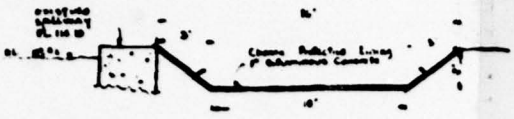
DUDLEY J. SNIPPEE OWNER

ALFRED JENNY & CO
Consulting Engineers
60 John Street, New York
January

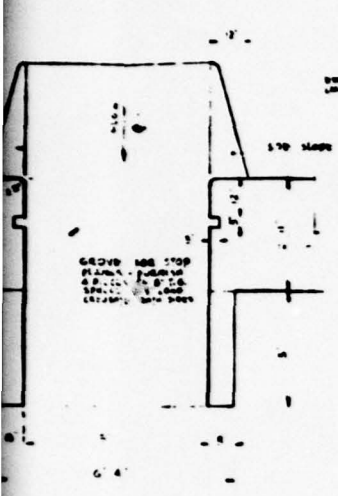
PLATE 4

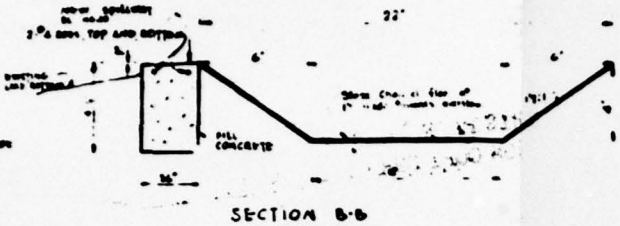
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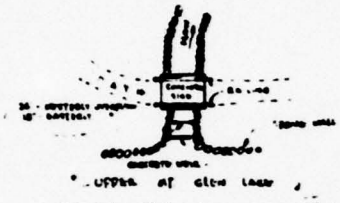


SECTION A-A





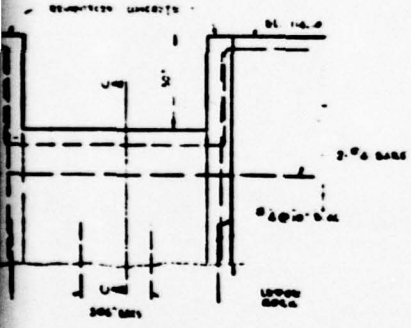
SECTION B-B



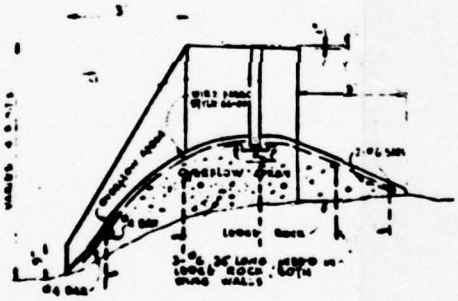
TYPICAL PLAN - WESTERLY AND EASTERLY OVERFLOWS



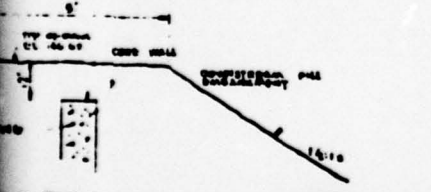
TYPICAL PROFILE
WESTERLY AND EASTERLY OVERFLOWS

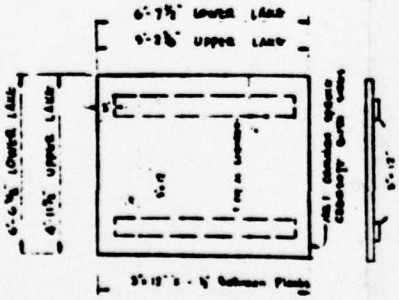


ELEVATION OF OVERFLOW LOWER LAKE

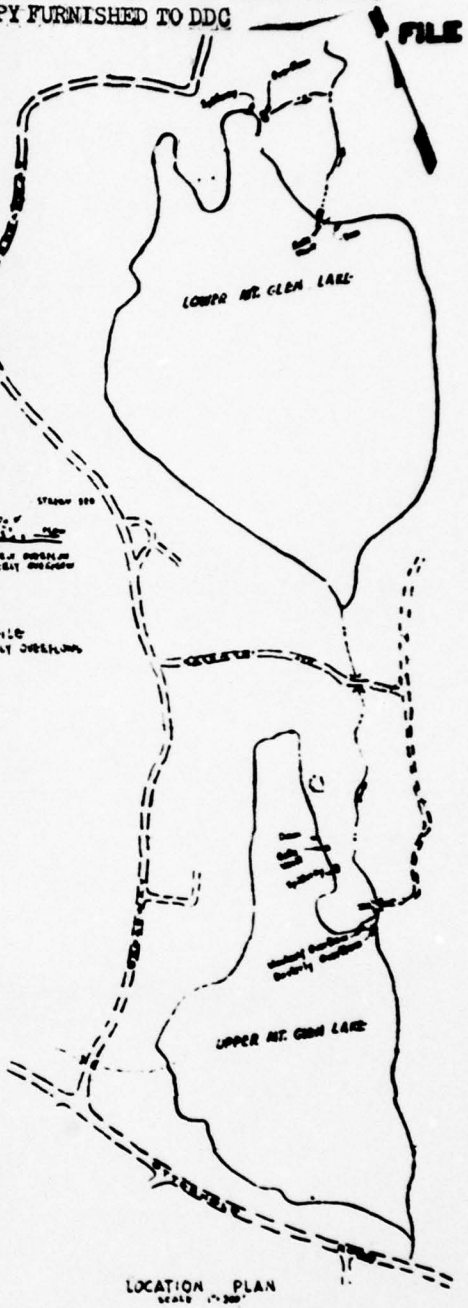


SECTION C-C

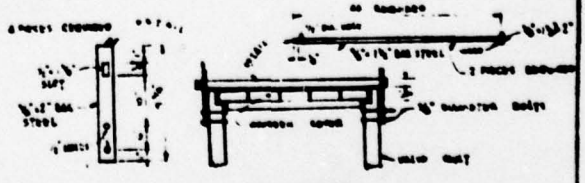




WOODEN COVERS FOR VALVE VAULTS



LOCATION PLAN



LOCKING BARS FOR VALVE VAULTS

FILE

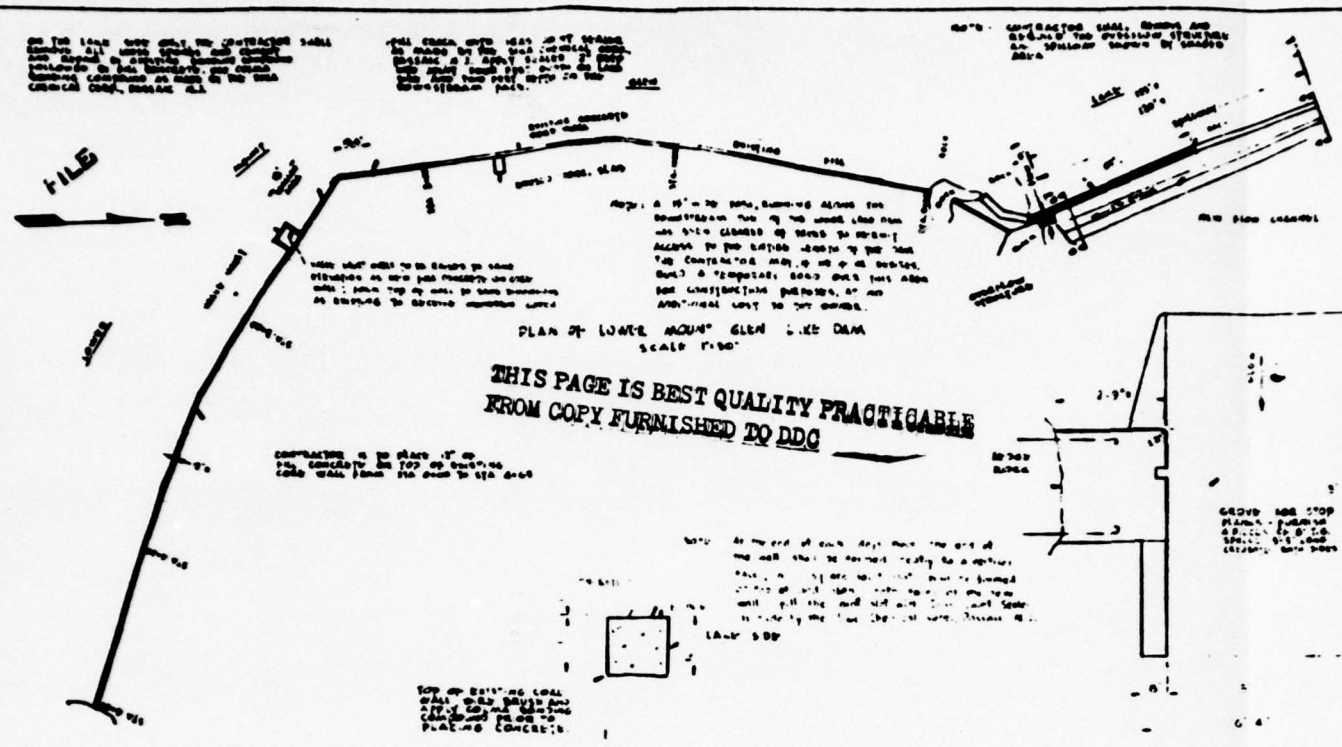
FILE

FILE

	SCALE AS SHOWN	RECONSTRUCTION AND REPAIRS TO DAMS UPPER AND LOWER LAKE MOUNT GLEN LAKE ASSOCIATION	PLAN NO. 69-42 MAY 1968	1 of 1

PLATE 5

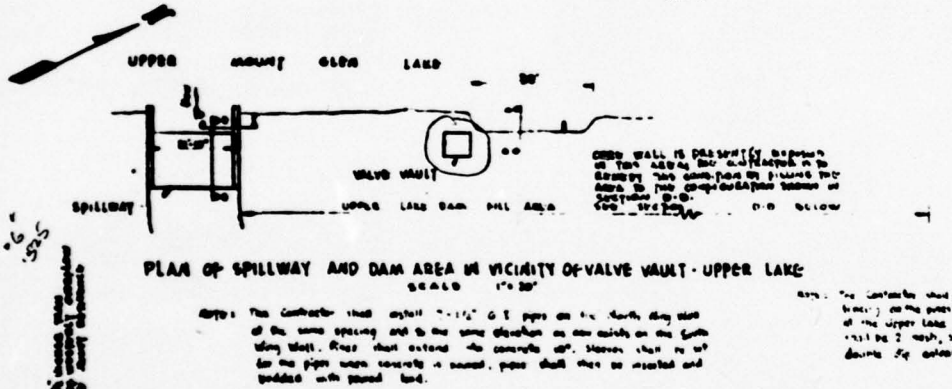
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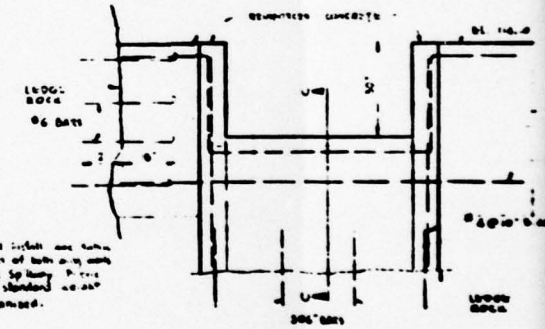
PLAN OF LOWER MOUNT GLEN LAKE DAM
SCALE 1"=50'

CROSS-SECTION OF FILL CONCRETE AND CORE WALL - LOWER LAKE - CORE WALL

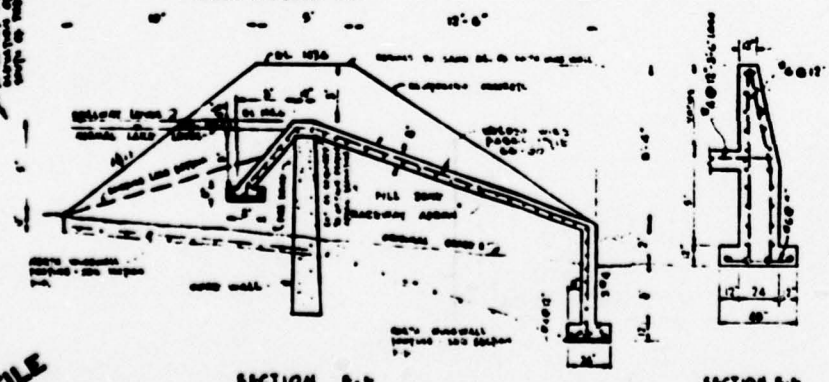
PLAN OF OVERFLOW - LOWER LAKE



PLAN OF SPILLWAY AND DAM AREA IN VICINITY OF VALVE VAULT - UPPER LAKE
SCALE 1"=20'

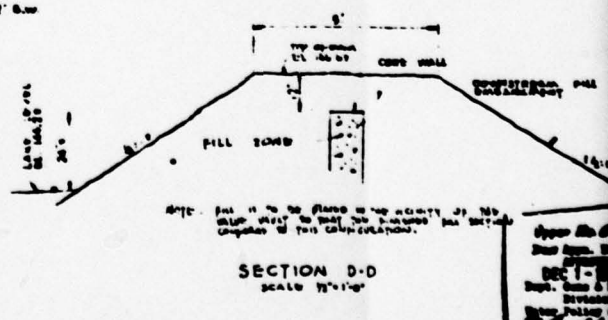


FRONT ELEVATION OF OVERFLOW LOWER LA
SCALE 1/4"=1'-0"



SECTION B-B
SCALE 1/4"=1'-0"

SECTION D-D
SCALE 1/4"=1'-0"



REVISIONS	NOTES	ANTHONY T. BUZZONI CONSULTING ENGINEER 9 DELAIR TR. WAYNE, NEW JERSEY	SCALE AS SHO
	1. Concrete pour for the Upper Lake Spillway and Lower Lake Spillway and Overflow shall be made in one continuous pour. 2. For the Upper Lake work the North Diking Weir is to be constructed first, removed by the apron.		

APPENDIX A

CHECK LIST - VISUAL OBSERVATIONS

CHECK LIST - ENGINEERING, CONSTRUCTION
MAINTENANCE DATA

CHECK LIST

Visual Inspection
Phase I

Name Dam Upper Mount. Glen Lake County Passaic State New Jersey Coordinators _____

Date(s) Inspection June 26, 1978 Weather Cool-Cloudy Temperature 70°F

Pool Elevation at Time of Inspection 144.5 M.S.L. Tailwater at Time of Inspection _____ M.S.L.

Inspection Personnel:

(June 26, 1978)	(July 7, 1978)	(July 7, 1978)
Joe Sirianni	Yin Au-Yeung	William Flynn
Henry King	Lynn Brown	
David Kerkes		

Robert B. Campbell Recorder

Owner Representative:

(June 26, 1978)

Simon Larkin, President
Mount Glen Lakes Association

CONCRETE/MASONRY DAMS

Upper Mount Glen Lake

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SEEPAGE OR LEAKAGE	N.A. (Not Applicable)	
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	N.A.	
DRAINS	N.A.	
WATER PASSAGES	N.A.	
FOUNDATION		

CONCRETE/MASONRY DAMS

Upper Mount Glen Lake

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

EMBANKMENT

Upper Mount Glen Lake

Type - Earth Embankment with Vertical Concrete Core Wall

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	Embankment heavily covered with brush and vines. No evidence of surface cracking can be found.	Remove brush and vines from slope and toe of embankment.
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	No surficial evidence of movement or cracking at or beyond toe.	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	Rock outcrops show on both abutments. Minor erosion of embankment at water line. Irregular downstream slopes. Maximum slope 2:1, maximum height approximately 8.2 feet.	Crest should be regraded and minor erosion areas refilled to original section.
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	No evidence of movement found.	
RIPRAP FAILURES	No riprap.	

EMBANKMENT

Upper Mount Glen Lake

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
Concrete Core Wall	Concrete core wall appears to tie into both abutments. Wall is 10 inches wide at top and has no apparent cracks.	
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	Right Abutment appears to be massive rock. Numerous rock outcrops at left abutment.	
ANY NOTICEABLE SEEPAGE	Several minor seepages were found as follows: 1. Toe midway between spillway and right abutment--No flow. 2. Toe max. section about 30 ft. left of spillway--Clear, 2 gpm. 3. At toe left side of spillway--Clear trickle less than 1 gpm. 4. General seepage under spillway--Total about 2 gpm. 5. Toe 40 ft. east of outlet pipe--Flowing clear, 2 gpm.	Channelize seepage and inspect monthly for indicated changes in quantity or clarity.
STAFF AND GAGE RECORDER	None.	
DRAINS	No embankment drains visible.	

OUTLET WORKS

Upper Mount Glen Lake

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	Outlet consists of 12 inch C.I. pipe 3 inch G.I. pipe through embankment. Both pipe projections badly eroded. Valve vault closed and could not be inspected on June 26, 1978.	Based on condition of pipes projecting from embankment, it appears that the outlet pipes should be replaced. Further examination of the condition of the pipes within the embankment is suggested.
INTAKE STRUCTURE	Submerged and not visible. Can not be inspected.	
OUTLET STRUCTURE	None - Free fall outlet.	
OUTLET CHANNEL	Naturally formed plunge pool and channel. Some erosion about 30 feet downstream from plunge pool. Flat slopes.	
EMERGENCY GATE	None.	

UNGATED SPILLWAY

Upper Mount Glen Lake

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	Trapezoidal shape overflow wier with rectangular cross-section. Floor surfaces slightly rough with aggregate exposed. Downstream cutoff wall appears to extend to rock. Caretaker confirmed.	Spillway reconstructed and dam rehabilitated in 1970-1971. Se drawing for details. Inspect along bottom of cutoff wall each month to detect erosion under wall.
APPROACH CHANNEL	None. Approach is from full reservoir.	
DISCHARGE CHANNEL	Discharge is into rocky natural creek bottom. Creek course is wooded and meandering alignment.	
BRIDGE AND PIERS	None.	

GATED SPILLWAY

(None)

Upper Mount Glen Lake

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

INSTRUMENTATION

Upper Mount Glen Lake

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

RESERVOIR

Upper Mount Glen Lake

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Shoreline protected by hand placed rock masonry. Upper slopes are gentle and stable.	
SEDIMENTATION	Reservoir not drawn down. Sedimentation rate not known but does not appear to be a problem. Caretaker states reservoir does get muddy during severe storm flooding.	
SHORELINE STRUCTURES	Shores are entirely owned by private home owners. All homes are well elevated above dam. Only structures near water level are docks and boat houses.	
USE	Sole use for recreation (boating, fishing, occassional swimming). Lake access is supposedly limited to home owners belonging to mount Glen Lakes Association.	
OPERATION	Water level is held very uniform through summer. Reservoir drawn down each fall with outlet works. Usually drawn down about 5 feet in October to protect docks.	

DOWNSTREAM CHANNEL

Upper Mount Glen Lake

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Rocky and heavily forested creek bed. Little debris evident. Bridge across creek several hundred feet downstream of dam. Lower Mount Glen Lake not much further downstream. See drawing.	
SLOPES	Rocky creek bottom and slopes. Slopes appear stable.	
APPROXIMATE NUMBER OF HOMES AND POPULATION	Only one dwelling near downstream channel, but located at least 10 feet above channel bottom.	

CHECK LIST
ENGINEERING DATA

DESIGN, CONSTRUCTION, OPERATION

Upper Mount Glen Lake

ITEM	REMARKS
PLAN OF DAM	Plan of Dams at Upper and Lower Mount Glen Lakes, dated January, 1933, is available. Plan of Existing Conditions at Upper Mount Glen Lake Dam, dated 1/10/63, is available. Plans and details for Reconstruction and Repair to Dams, Upper and Lower Lake, Mount Glen Lake Association is available.
REGIONAL VICINITY MAP	Available.
CONSTRUCTION HISTORY	Original construction history is not available. Post Construction history since owned by Mount Glen Lakes Association is available in the form of letters and minutes of meetings by the Board of Directors.
TYPICAL SECTIONS OF DAM	Available on plans listed above.
HYDROLOGIC/HYDRAULIC DATA	None available.
OUTLETS - PLAN	)
- DETAILS	) None Available.
- CONSTRAINTS	)
- DISCHARGE RATINGS	)
RAINFALL/RESERVOIR RECORDS	None Available.

CHECK LIST
ENGINEERING DATA

DESIGN, CONSTRUCTION, OPERATION
(Continued)

Upper Mount Glen Lake

ITEM	REMARKS
DESIGN REPORTS	None available.
GEOLOGY REPORTS	None available.
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	None available.
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	None available.
POST-CONSTRUCTION SURVEYS OF DAM	Upper Mount Glen Dam surveyed and drawing prepared showing existing condition in 1972.
BORROW SOURCES	Unknown. Appear to be from local sources.
SPILLWAY - PLAN - SECTIONS - DETAILS	Available.

CHECK LIST
ENGINEERING DATA

DESIGN, CONSTRUCTION, OPERATION
(Continued)

Upper Mount Glen Lake

ITEM	REMARKS
OPERATING EQUIPMENT PLANS AND DETAILS	) None available.)
MONITORING SYSTEMS	None.
MODIFICATIONS	Core wall and embankment raised in 1933. Spillway was reconstrcuted and enlarged during 1970-1971. Crest of dam was regraded and shaped at the same time.
HIGH POOL RECORDS	None available. Orally reported that the dam has never been overtopped.
POST-CONSTRUCTION ENGINEERING STUDIES AND REPORTS	Dam inspected and report prepared by State of New Jersey in 1961. Recommended that lake be dewatered pending enlargement of spillway.
PRIOR ACCIDENTS OR FAILURE OF DAM - DESCRIPTION - REPORTS	None uncovered.
MAINTENANCE, OPERATION RECORDS	None.

APPENDIX B

PHOTOGRAPHS

(All photos were taken on July 26, 1978.)

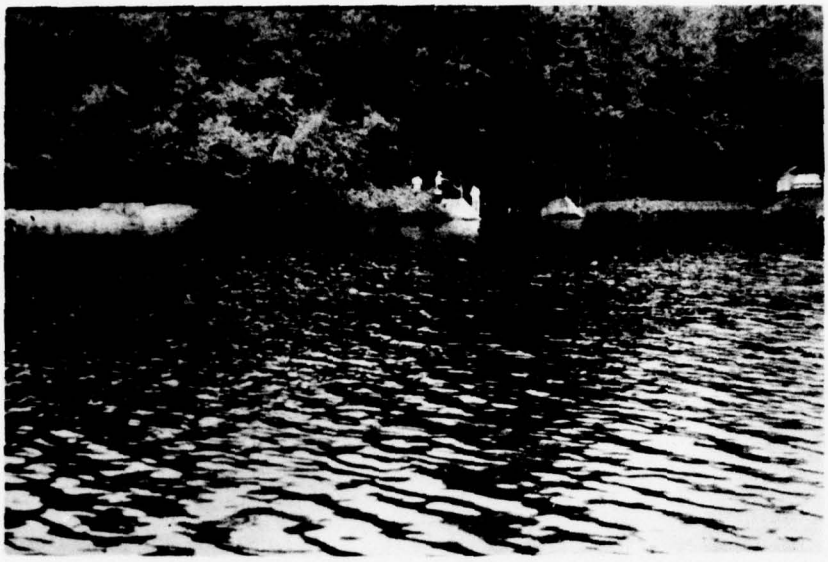


Photo 1 - View of dam and spillway from reservoir left shoreline.

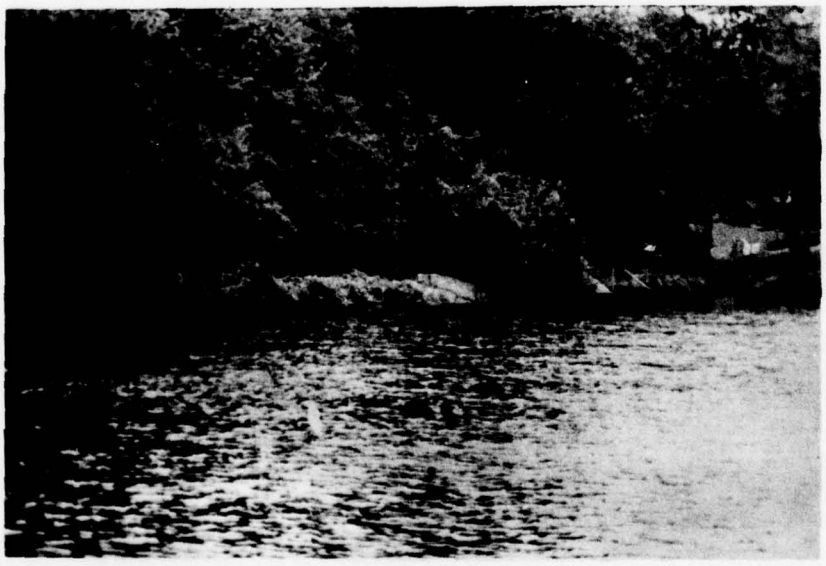


Photo 2 - View of dam from shoreline near left abutment.

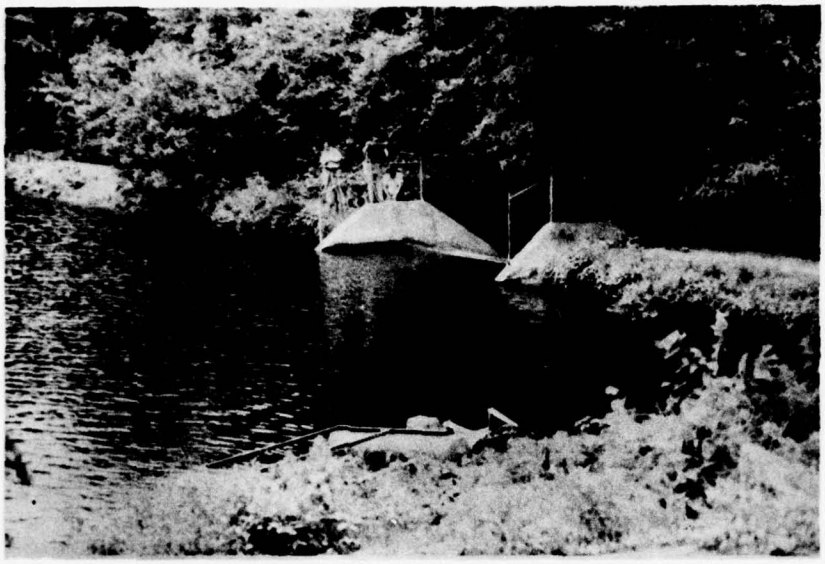


Photo 3 - View of dam and spillway from right abutment.



Photo 4 - View of spillway chute from downstream discharge channel.



Photo 5 - Discharge ends of low level outlet pipes.

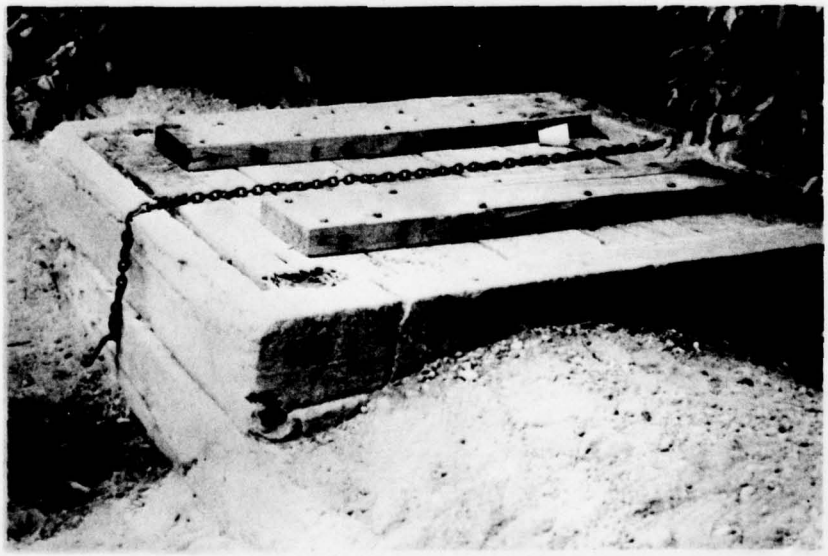


Photo 6 - View of top and cover on valve vault for low level outlet pipes.



Photo 7 - View of small discharge channels cut through right shoreline beyond right abutment.



Photo 8 - Flowing seep at toe of slope immediately left of spillway.



Photo 9 - Seepage area left of spillway along toe of slope.



Photo 10 - Seepage area located 50 feet left of spillway.

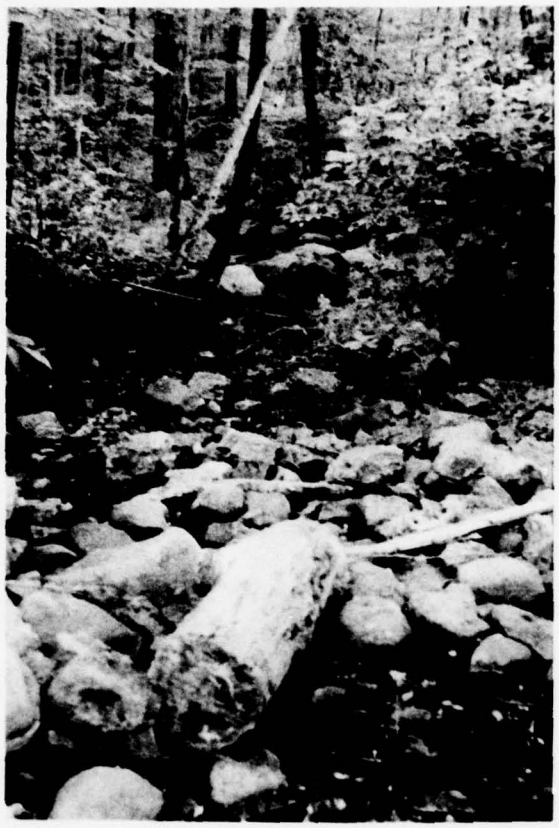


Photo 11 - Discharge channel at spillway.



Photo 12 - Discharge area downstream of spillway.

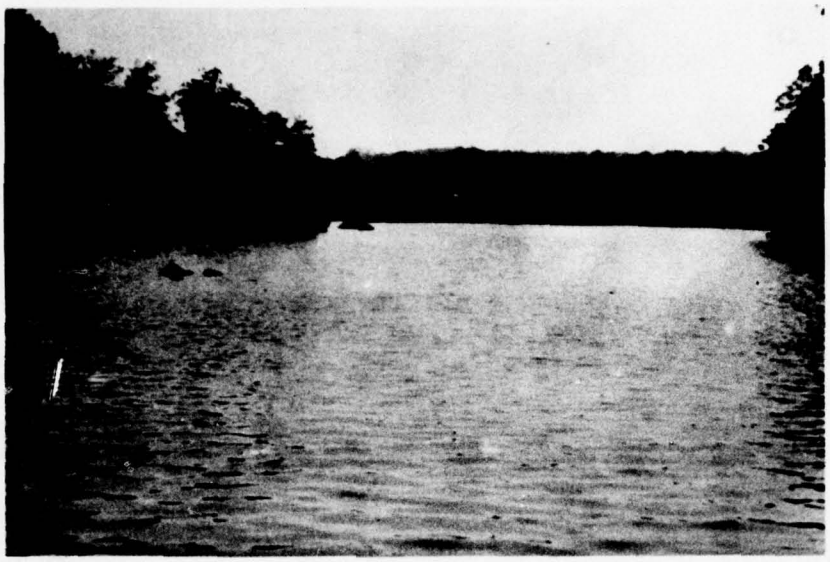


Photo 13 - View of lake with dam on left side of picture.

APPENDIX C

SUMMARY OF ENGINEERING DATA

CHECK LIST

HYDROLOGIC AND HYDRAULIC DATA

ENGINEERING DATA

Name of Dam: Upper Mount Glen Lake Dam

Drainage Area: 0.87 square miles

Elevation Top Normal Pool (Storage Capacity): 924.6 (28 AF)

Elevation Top Flood Control Pool (Storage Capacity): N.A.

Elevation Maximum Design Pool: 926.52

Elevation Top of Dam: 926.52

SPILLWAY CREST:

a. Elevation: 924.6

b. Type: Overflow

c. Width: 14 inches

d. Length: 20.83 feet

e. Location Spillover: Right side of the dam

f. Number and Type of Gates: None

OUTLET WORKS:

a. Type:

b. Location:

c. Entrance Inverts:

d. Exit Inverts:

e. Emergency Draindown Facilities:

HYDROMETEOROLOGICAL GAGES: (None)

a. Type:

b. Location:

c. Records:

MAXIMUM NON-DAMAGING DISCHARGE: 170 cfs (Estimated)

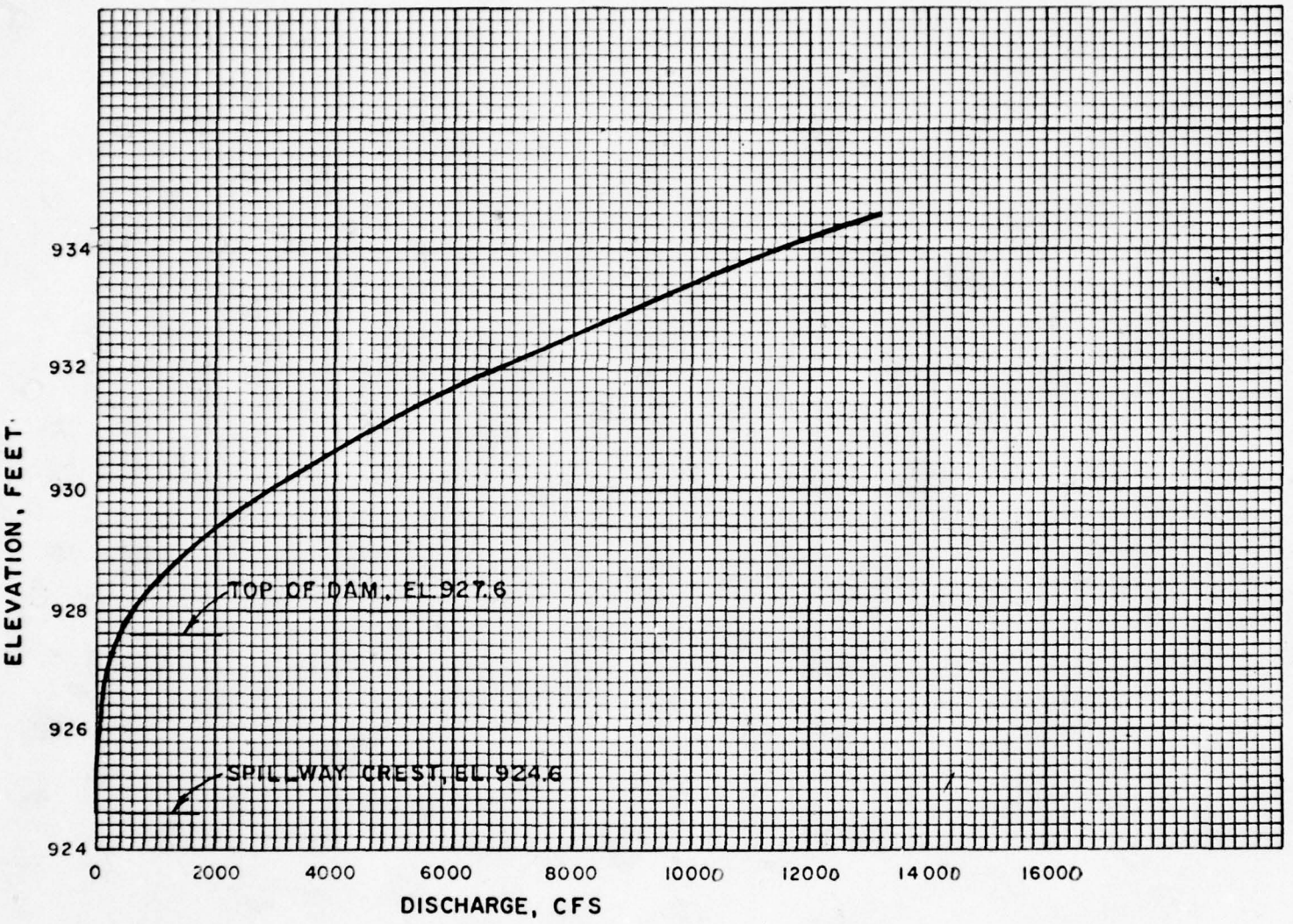
APPENDIX D

HYDROLOGIC COMPUTATIONS

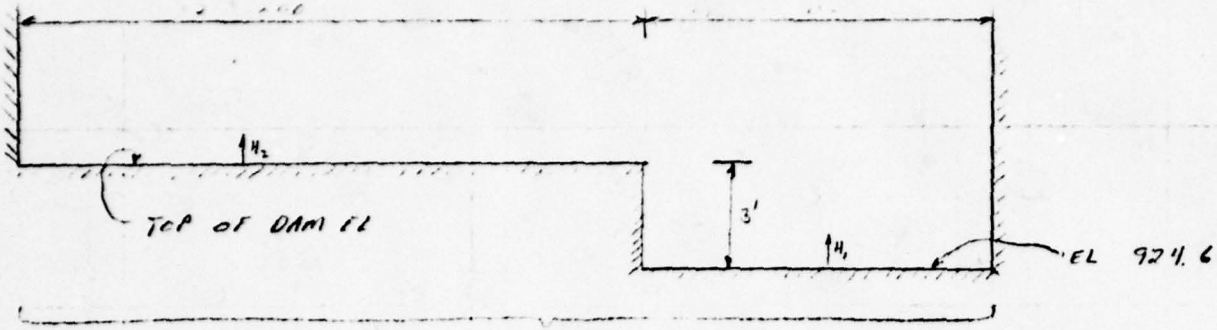
PLATE 1 APPENDIX D



UPPER MOUNT. GLEN LAKE DAM
DRAINAGE BASIN


UPPER MT. GLEN LAKE DAM
SPILLWAY AND OVERTOP
RATING CURVE
ELEVATION, FEET
934
932
930
928
926
924
TOP OF DAM., EL. 927.6
SPILLWAY CREST, EL. 924.6
0
2000
4000
6000
8000
10000
12000
14000
16000
DISCHARGE, CFS

NEW JERSEY (STATE) DAM SAFETY INSPECTION — SHEET NO. 1 OF
UPPER MT. GLENN LAKE DAM — JOB NO. 1212-001
SPILLWAY AND OVERTOP RATING CURVE — BY HLB DATE



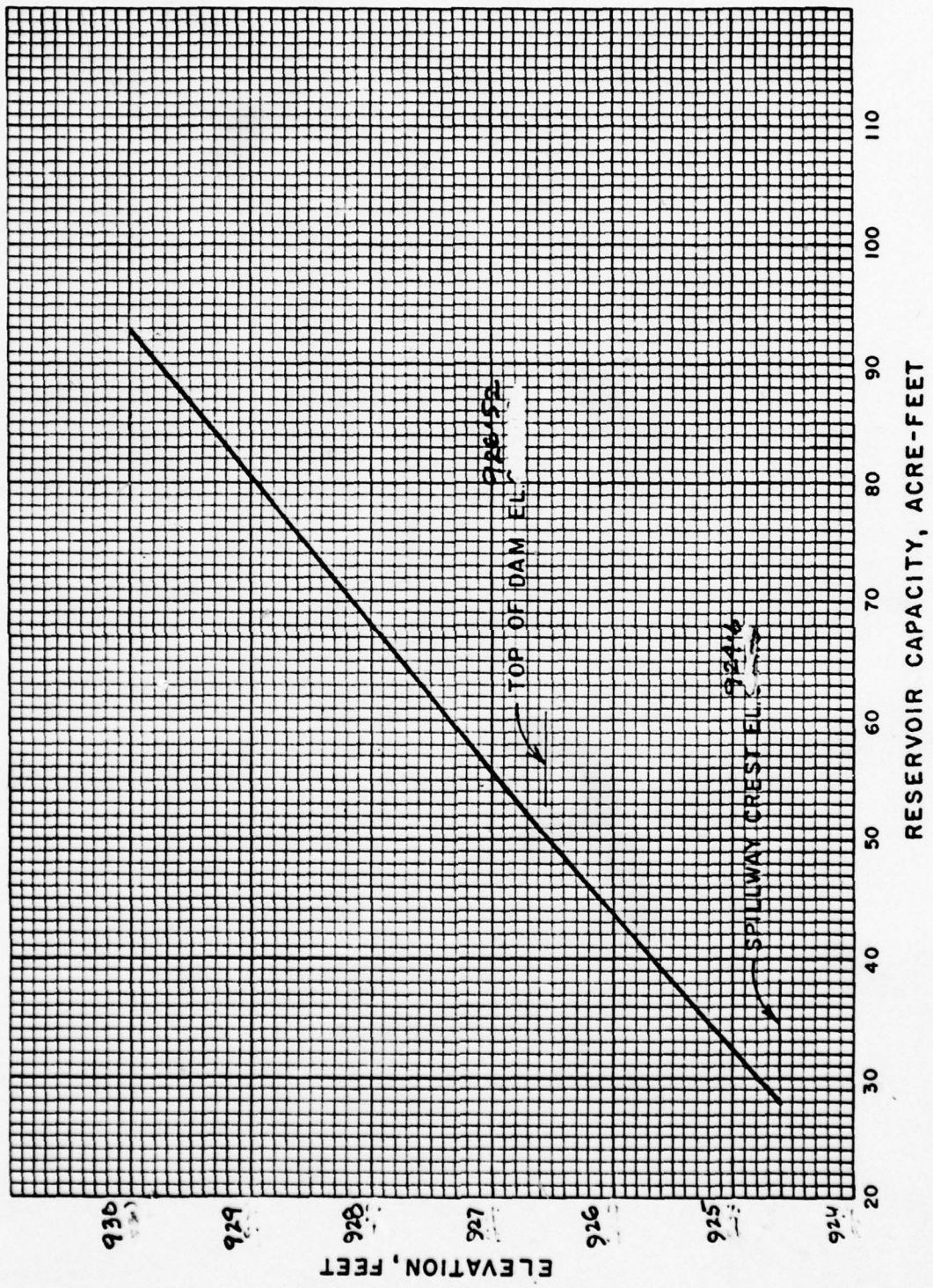
TREAT AS BROAD CRESTED WEIR $C = 3.03$

$$Q = C\,(L_1 H_1^{3/2} + L_2 H_2^{3/2})$$

ELEV. (FT)	HEAD ABOVE SPILLWAY CREST (FT)	H_1	H_2	L_1	L_2	C	$Q = C\,(L_1 H_1^{3/2} + L_2 H_2^{3/2})$
924.6	0	0	-	20.83	0	3.03	0
925.6	1	1	-	20.83	0	3.03	63.
926.6	2	2	-	20.83	0	3.03	179.
927.6	3	3	0	20.83	200'	3.03	328.
928.6	4	4	1	20.83	200'	3.03	1111
929.6	5	5	2	20.83	200'	3.03	2420
930.6	6	6	3	20.83	200'	3.03	4076
932.6	8	8	5	20.83	200'	3.03	8203
934.6	10	10	7	20.83	200'	3.03	13219

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PLATE 3 APPENDIX D



UPPER MOUNT GLEN LAKE DAM
RESERVOIR CAPACITY CURVE

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ENGINEERING CONSULTANTS, INC.

NEW JERSEY (STATE) DAM SAFETY INSPECTION — SHEET NO. 1 OF 2
UPPER MOUNT GLEN LAKE DAM — JOB NO. 1212-001
RESERVOIR AREA-CAPACITY DATA — BY MAS DATE 7-

Maximum Storage = 50 A-F

Normal Storage = 28 A-F

Reservoir Surface Area
= 9± Acres at an assumed
Elevation of 924.6 USGS

Elev. Feet	Area Acres	Volume AC-FT	
924.6	10.7 (from dwg.)	28	The area 10.7 acres is obtained from dwg. The normal volume 28A-F is assumed at 924.6
926.52	12.22±	50	The maximum volume of is assumed at top of Dam worked backward to obtain this area
928	12.22±	68	
930	12.22±	92.5	

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UNIT HYDROGRAPH - UPPER MT. GLEN LAKE DAM

a) Drainage Area = 0.87 Sq. mi (given)

b) $L = 1.75 \times \frac{24000}{12 \times 5280} = 0.663$ miles (see page 2)

c) $T_c = 0.36$ hrs (from page 2)

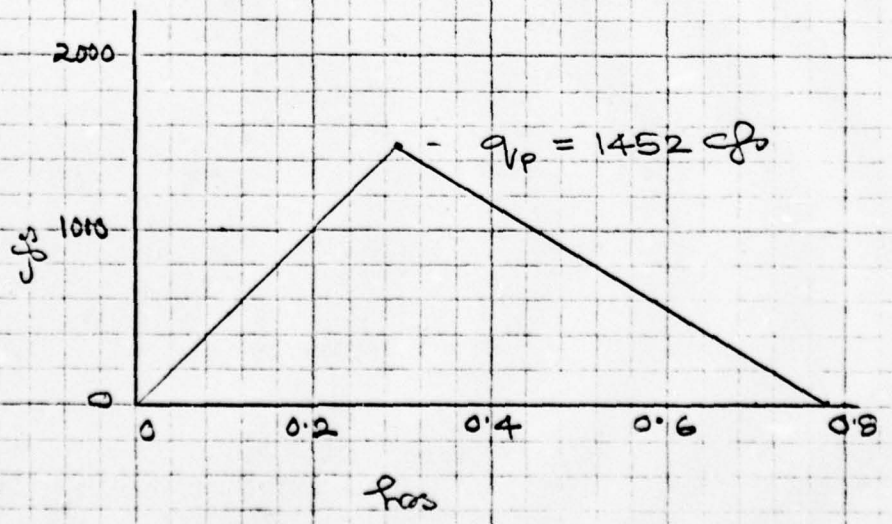
d) Assume $D = 0.15$ hrs $< \frac{T_c}{2}$

e) $T_p = \frac{D}{2} + 0.6 T_c = \frac{0.15}{2} + 0.6 \times 0.36$

$= 0.291$ hrs

f) $T_b = 2.67 T_p = 0.78$ hrs.

g) $q_{p(cfs)} = \frac{484A}{T_p} = \frac{484 \times 0.87}{0.29} = 1452$ cfs



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ENGINEERING CONSULTANTS, INC.

NEW JERSEY (STATE) DAM SAFETY INSPECTION — SHEET NO. 2 OF
UPPER MT GLENN LAKE DAM, #10 — JOB NO. 1212-001
DETERMINE BASIN PARAMETERS — BY KLB DATE

DETERMINE LENGTH OF STREAM

FROM USGS QUAD MAP

$$L = 1.75'' \times \frac{24000}{12 \times 5280} = 0.663 \text{ MILES} = 3500 \text{ FT}$$

DETERMINE BASIN SLOPE

$$\Delta H = 985 - 935 = 50'$$

DETERMINE TIME OF CONCENTRATION

$$T_C = \left(\frac{11.9 L^3}{\Delta H}\right)^{0.385} = \left(\frac{11.9 \times 0.663^3}{50}\right)^{0.385}$$

$$= 0.358 \text{ HR.}$$

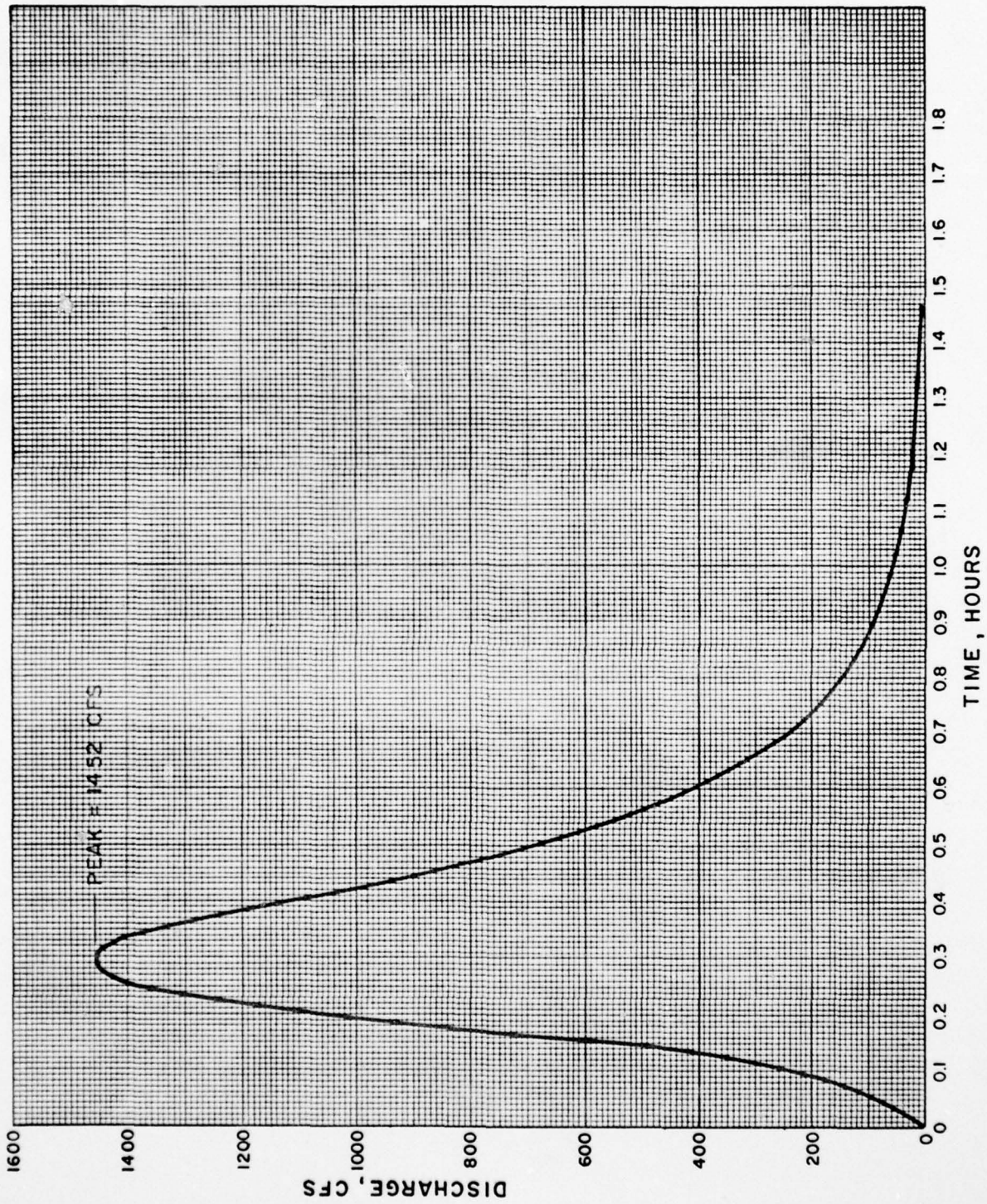
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ECI-4 **ENGINEERING CONSULTANTS, INC.**

NEW JERSEY (STATE) DAM SAFETY INSPECTION — SHEET NO. 3 OF 4
UPPER MT. GLEN LAKE DAM, #10 — JOB NO. 1212-001
UNIT HYDROGRAPH — BY MAB DATE 7-10-7

b) Curvilinear Unit Hydrograph.

Time, hrs	Discharge, Q cfs
0.0	0
0.029	22
0.058	109
0.087	232
0.12	407
0.15	624
0.17	871
0.20	1118
0.23	1292
0.26	1408
0.29	1452
0.32	1423
0.35	1336
0.38	1220
0.41	1089
0.44	958
0.47	813
0.52	610
0.58	465
0.64	348
0.70	261
0.76	189
0.81	142
0.87	109
1.02	52
1.16	26
1.31	13
1.46	6



UPPER MT. GLEN LAKE DAM
0.15 HR. UNIT HYDROGRAPH

NEW JERSEY DAM SAFETY INSPECTION
PMF DERIVATION Upper Mt Glen Lake Dam
Probable Maximum Precipitation

SHEET NO. ____ OF ____
JOB NO. 1212
BY JJN DATE July 78

PROBABLE MAXIMUM FLOOD CALCULATION (PMF)

DRAINAGE = 0.81 sq. mi

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From Hydrometeorological Report "33" Seasonal Variation of the Probable Maximum Precipitation East of the 105th Meridian for Areas from 10 to 1,000 Square Miles and Duration of 6, 12, 24 and 48 Hours. 1956

For D.A. = 10 sq. mi.
6 hour rainfall duration.
PMP = 24.5" for Zone 6 at this Basin.

Since D.A. < 10 sq mi. No area reduction to be applied.
PMP values for varies rain fall duration

Duration	PMP (inch)
6 Hr	1 × 24.5 = 24.5"
12 Hr	1.09 × 24.5 = 26.7
24 Hr	1.17 × 24.5 = 28.7
48 Hr.	1.26 × 24.5 = 30.9

PMP values are reduced by 20% to account for misalignment of Basin and Storm Isohyetal.

Duration	PMP
6 Hr	19.6
12 Hr	21.6
24 Hr	23.0
48 Hr	24.7

} Can be neglected.

NAPD Engineering DAM SAFETY INSPECTION (DSIP)
PMF DERIVATION - Upper Mt Glen Lake Dam
PROBABLE MAXIMUM PRECIPITATION

SHEET NO. ____ OF ____
JOB NO. 1212
BY YIN DATE ____

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PMP. PMF DERIVATION:

1) SOIL GROUP "C", & AMC = II.

2). CN = 85.

MIN LOSS RATE FOR ABOVE CONDITION IS 0.12"/hr

OR

.03

.02"/.15 hr

FOR CN = 85,

S = 1.76 in the

Eq. $Q = (P - 0.2S)^2 / P + 0.8S$.

OR $Q = (P - 0.352)^2 / P + 1.408$.

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NEW JERSEY DAM SAFETY INSPECTION - (DEP)
PMF DERIVATION - UPPER MT. GLEN LAKE DAM
DIRECT RUNOFF

SHEET NO. ___ OF ___
JOB NO. 1212
BY YIN DATE July '78

DIRECTION RUNOFF INCREMENTS FOR COMPUTING PMF
ACCORDING TO EC 1110-2-163

TIME ENDING (HR)	INCREMENTAL DESIGN RAINFALL (IN)	ACCUMULATIVE DESIGN RAINFALL (IN)	DIRECT RUNOFF ACCUMULATIVE	DIRECT RUNOFF Incremental	Incremental loss	Note
0.15	0.33	0.33	0.00	0.00	0.33	
0.30	0.33	0.65	0.09	0.09	0.24	
0.45	0.33	0.98	0.17	0.08	0.25	
0.60	0.33	1.31	0.34	0.17	0.16	
0.75	0.33	1.63	0.54	0.20	0.13	
0.90	0.33	1.96	0.77	0.23	0.10	
1.05	0.34	2.30	1.02	0.25	0.09	
1.20	0.34	2.63	1.29	0.27	0.07	
1.35	0.34	2.97	1.57	0.28	0.06	
1.50	0.34	3.30	1.85	0.28	0.06	
1.65	0.34	3.64	2.14	0.29	0.05	
1.80	0.34	3.97	2.43	0.29	0.05	
1.95	0.34	4.31	2.74	0.30	0.04	
2.10	0.42	4.73	3.12	0.38	0.04	
2.25	0.42	5.15	3.51	0.39	0.03	
2.40	0.42	5.57	3.90	0.39	0.03	*
2.55	0.42	5.99	4.30	0.40	0.02	
2.70	0.42	6.41	4.69	0.40	0.02	
2.85	0.42	6.83	5.09	0.40	0.02	
3.00	0.42	7.25	5.50	0.40	0.02	
3.15	0.42	8.13	6.34	0.86	0.02	
3.30	0.42	9.01	7.20	0.86	0.02	
3.45	0.42	9.90	8.06	0.86	0.02	
3.60	0.42	10.78	8.92	0.86	0.02	
3.75	2.16	12.94	11.04	2.14	0.02	
3.90	0.42	13.82	11.91	0.86	0.02	
4.05	0.88	14.70	12.78	0.86	0.02	
4.20	0.46	15.16	13.23	0.44	0.02	
4.35	0.46	15.61	13.68	0.44	0.02	
4.50	0.46	16.07	14.14	0.44	0.02	
4.65	0.46	16.53	14.59	0.44	0.02	
4.80	0.46	16.98	15.04	0.44	0.02	
4.95	0.46	17.44	15.49	0.44	0.02	
5.10	0.31	17.75	15.80	0.29	0.02	
5.25	0.31	18.06	16.11	0.29	0.02	
5.40	0.31	18.37	16.41	0.29	0.02	
5.55	0.31	18.67	16.71	0.29	0.02	
5.70	0.31	18.98	17.02	0.29	0.02	
5.85	0.31	19.29	17.33	0.29	0.02	
6.00	0.31	19.60	17.64	0.29	0.02	

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ECI-4 ENGINEERING CONSULTANTS, INC.

UPPER MT. GLENN LAKE DAM
INPUT TO HEC-1

SHEET NO. 1 OF
JOB NO. 1212-001
BY KLB DATE 7-24-7

INPUT TO HEC-1

	#	ELEV. (FT)	Y2 STORAGE (AC-FT)	Y3 DISCHARGE (CFS)
SPILLWAY CREST	1	924.60	28.0	0.
	2	925.30	35.7	10.
	3	926.00	43.7	100.
	4	926.50	49.7	150.
	5	927.00	55.7	200.
TOP OF DAM	6	927.60	62.0	328.
	7	928.00	68.0	600.
	8	928.50	74.3	1050.
	9	930.00	93.0	3000.
	10	934.00	143.0*	11600.

* EXTRAPOLATED

HEC-1 - COMPUTATIONS

****
HEC-1 VERSION DATED JAN 1973

****

DAM SAFETY INSPECTION - NEW JERSEY STATE
UPPER MT. GLENN LAKE DAM
PMF FLOOD ROUTING

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
120	0	9	0	0	0	0	0	0	0

JOPER NWT
5 0

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

SUB-AREA RUNOFF COMPUTATION

INPUT UNIT HYDROGRAPH DERIVED FROM SCS METHOD

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
10	0	0	0	0	0	1

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
0	-1	0.87	0.00	0.87	0.00	0.000	0	0	0

PRECIP DATA

NP	STORM	DAJ	DAK
40	0.00	0.00	0.00

PRECIP PATTERN

0.00	0.09	0.08	0.17	0.20	0.23	0.25	0.27	0.28	0.28
0.29	0.29	0.30	0.38	0.39	0.39	0.40	0.40	0.40	0.40
0.86	0.86	0.86	0.86	2.14	0.86	0.86	0.44	0.44	0.44
0.44	0.44	0.44	0.29	0.29	0.29	0.29	0.29	0.29	0.29

LOSS DATA

STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

GIVEN UNIT GRAPH, NUMGQ= 10

0.	503.	1452.	880.	410.	190.	90.	50.	25.	12.

UNIT GRAPH TOTALS 3612. CFS OR 0.96 INCHES OVER THE AREA

RECESSION DATA

STRTQ= 0.00 QRCSN= 0.00 RTIOR= 1.00

END-OF-PERIOD FLOW

TIME	RAIN	EXCS	COMP Q
1	0.00	0.00	0.
2	0.09	0.09	0.
3	0.08	0.08	45.
4	0.17	0.17	170.
5	0.20	0.20	280.
6	0.23	0.23	454.
7	0.25	0.25	605.

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8	0.27	0.27	728.
9	0.28	0.28	827.
10	0.28	0.28	906.
11	0.29	0.29	960.
12	0.29	0.29	992.
13	0.30	0.30	1020.
14	0.38	0.38	1040.
15	0.39	0.39	1101.
16	0.39	0.39	1234.
17	0.40	0.40	1525.
18	0.40	0.40	1374.
19	0.40	0.40	1409.
20	0.40	0.40	1427.
21	0.86	0.86	1437.
22	0.86	0.86	1673.
23	0.86	0.86	2343.
24	0.86	0.86	2748.
25	2.14	2.14	2937.
26	0.86	0.86	3668.
27	0.86	0.86	4024.
28	0.44	0.44	4215.
29	0.44	0.44	3414.
30	0.44	0.44	2528.
31	0.44	0.44	2030.
32	0.44	0.44	1807.
33	0.44	0.44	1695.
34	0.29	0.29	1641.
35	0.29	0.29	1529.
36	0.29	0.29	1301.
37	0.29	0.29	1164.
38	0.29	0.29	1102.
39	0.29	0.29	1074.
40	0.29	0.29	1060.
41	0.00	0.00	1053.
42	0.00	0.00	903.
43	0.00	0.00	480.
44	0.00	0.00	225.
45	0.00	0.00	106.
46	0.00	0.00	51.
47	0.00	0.00	25.
48	0.00	0.00	10.
49	0.00	0.00	3.
50	0.00	0.00	0.
51	0.00	0.00	0.
52	0.00	0.00	0.
53	0.00	0.00	0.
54	0.00	0.00	0.
55	0.00	0.00	0.
56	0.00	0.00	0.
57	0.00	0.00	0.
58	0.00	0.00	0.
59	0.00	0.00	0.
60	0.00	0.00	0.
61	0.00	0.00	0.
62	0.00	0.00	0.
63	0.00	0.00	0.
64	0.00	0.00	0.
65	0.00	0.00	0.
66	0.00	0.00	0.
67	0.00	0.00	0.
68	0.00	0.00	0.

FOR SOUTH NAVAL OCEAN LABORATORY

69	0.00	0.00	0.
70	0.00	0.00	0.
71	0.00	0.00	0.
72	0.00	0.00	0.
73	0.00	0.00	0.
74	0.00	0.00	0.
75	0.00	0.00	0.
76	0.00	0.00	0.
77	0.00	0.00	0.
78	0.00	0.00	0.
79	0.00	0.00	0.
80	0.00	0.00	0.
81	0.00	0.00	0.
82	0.00	0.00	0.
83	0.00	0.00	0.
84	0.00	0.00	0.
85	0.00	0.00	0.
86	0.00	0.00	0.
87	0.00	0.00	0.
88	0.00	0.00	0.
89	0.00	0.00	0.
90	0.00	0.00	0.
91	0.00	0.00	0.
92	0.00	0.00	0.
93	0.00	0.00	0.
94	0.00	0.00	0.
95	0.00	0.00	0.
96	0.00	0.00	0.
97	0.00	0.00	0.
98	0.00	0.00	0.
99	0.00	0.00	0.
100	0.00	0.00	0.
101	0.00	0.00	0.
102	0.00	0.00	0.
103	0.00	0.00	0.
104	0.00	0.00	0.
105	0.00	0.00	0.
106	0.00	0.00	0.
107	0.00	0.00	0.
108	0.00	0.00	0.
109	0.00	0.00	0.
110	0.00	0.00	0.
111	0.00	0.00	0.
112	0.00	0.00	0.
113	0.00	0.00	0.
114	0.00	0.00	0.
115	0.00	0.00	0.
116	0.00	0.00	0.
117	0.00	0.00	0.
118	0.00	0.00	0.
119	0.00	0.00	0.
120	0.00	0.00	0.
SUM	17.46	17.46	63064.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4924.	1566.	525.	525.	63065.
INCHES		16.74	16.85	16.85	16.85
AC-FT		777.	782.	782.	782.

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HYDROGRAPH ROUTING

ROUTE HYDROGRAPH THRU UPPER MT. GLENN LAKE DAM

ISTAQ	ICOMP	ICON	ITAPE	JPLT	JPRT	INAME
10	1	0	0	2	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.000	0.00	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
0	0	0	0.000	0.000	0.000	-1.

STORAGE=	28.	35.	43.	49.	55.	62.	68.	74.	93.	143.
OUTFLOW=	0.	10.	100.	150.	200.	328.	600.	1050.	8000.	11600.

TIME	EOP STOR	AVG IN	EOP OUT
1	28.	0.	0.
2	28.	0.	0.
3	28.	22.	0.
4	29.	108.	2.
5	32.	225.	5.
6	36.	367.	21.
7	42.	530.	88.
8	49.	667.	147.
9	56.	777.	222.
10	63.	866.	403.
11	68.	933.	650.
12	71.	976.	850.
13	72.	1006.	946.
14	73.	1030.	997.
15	74.	1070.	1042.
16	75.	1168.	1139.
17	76.	1280.	1249.
18	76.	1349.	1328.
19	77.	1391.	1378.
20	77.	1418.	1409.
21	77.	1432.	1427.
22	78.	1555.	1527.
23	82.	2008.	1904.
24	87.	2545.	2408.
25	90.	2842.	2749.
26	94.	3303.	3242.
27	100.	4296.	4330.
28	102.	4570.	4577.
29	97.	3815.	3790.
30	92.	2971.	2958.
31	87.	2279.	2425.
32	83.	1919.	2027.
33	81.	1751.	1810.
34	80.	1668.	1699.
35	79.	1585.	1609.
36	78.	1415.	1456.
37	76.	1232.	1280.
38	75.	1133.	1164.
39	74.	1088.	1104.
40	74.	1067.	1075.

1061 SOUTH MAGNOLIA DENVER COLORADO 80223

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41	74.	1059.	1060.	
42	73.	978.	1007.	
43	70.	691.	813.	
44	66.	552.	550.	
45	63.	165.	381.	
46	60.	70.	287.	
47	57.	38.	231.	
48	54.	17.	192.	
49	52.	7.	174.	
50	50.	1.	157.	
51	48.	0.	142.	
52	47.	0.	128.	
53	45.	0.	115.	
54	44.	0.	104.	
55	42.	0.	92.	
56	41.	0.	80.	
57	41.	0.	69.	
58	40.	0.	60.	
59	39.	0.	52.	
60	38.	0.	45.	
61	38.	0.	39.	
62	37.	0.	34.	
63	37.	0.	30.	
64	37.	0.	26.	
65	36.	0.	22.	
66	36.	0.	19.	
67	36.	0.	17.	
68	36.	0.	14.	
69	35.	0.	13.	
70	35.	0.	11.	
71	35.	0.	9.	
72	35.	0.	9.	
73	35.	0.	9.	
74	35.	0.	9.	
75	35.	0.	9.	
76	35.	0.	9.	
77	34.	0.	9.	
78	34.	0.	8.	
79	34.	0.	8.	
80	34.	0.	8.	
81	34.	0.	8.	
82	34.	0.	8.	
83	34.	0.	8.	
84	34.	0.	8.	
85	34.	0.	7.	
86	34.	0.	7.	
87	33.	0.	7.	
88	33.	0.	7.	
89	33.	0.	7.	
90	33.	0.	7.	
91	33.	0.	7.	
92	33.	0.	7.	
93	33.	0.	7.	
94	33.	0.	6.	
95	33.	0.	6.	
96	33.	0.	6.	
97	33.	0.	6.	
98	32.	0.	6.	
99	32.	0.	6.	
100	32.	0.	6.	
101	32.	0.	6.	

102	52.	0.	6.	
103	52.	0.	5.	
104	52.	0.	5.	
105	52.	0.	5.	
106	52.	0.	5.	
107	52.	0.	5.	
108	52.	0.	5.	
109	52.	0.	5.	
110	52.	0.	5.	
111	52.	0.	5.	
112	51.	0.	5.	
113	51.	0.	5.	
114	51.	0.	4.	
115	51.	0.	4.	
116	51.	0.	4.	
117	51.	0.	4.	
118	51.	0.	4.	
119	51.	0.	4.	
120	51.	0.	4.	
SUM			62785.	

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4577.	1518.	523.	523.	62785.
INCHES		16.23	16.78	16.78	16.78
AC-FT		753.	778.	778.	778.

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RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	10	4924.	1566.	525.	525.	0.87
ROUTED TO	10	4577.	1518.	523.	523.	0.87

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AD-A060 304 NEW JERSEY STATE DEPT OF ENVIRONMENTAL PROTECTION TRENTON F/G 13/2
NATIONAL DAM SAFETY PROGRAM. UPPER MOUNT GLEN LAKE DAM (NJ00202--ETC(U)
AUG 78 R GERSHOWITZ DACW61-78-C-0124

UNCLASSIFIED NL

2 OF 2
ADA
060304



END
DATE
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12-78
DDC

HEC-1 VERSION DATED JAN 1973

DAM SAFETY INSPECTION - NEW JERSEY STATE
UPPER MT. GLENN LAKE DAM
ONE HALF PMF FLOOD ROUTING

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
120	0	9	0	0	0	0	0	0	0

JOPER: 5
NWT: 0

SUB-AREA RUNOFF COMPUTATION

INPUT UNIT HYDROGRAPH DERIVED FROM SCS METHOD

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
10	0	0	0	0	0	1

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
0	-1	0.87	0.00	0.87	0.00	0.500	0	0	0

PRECIP DATA

NP	STORM	DAD	DAK
40	0.00	0.00	0.00

PRECIP PATTERN

0.00	0.09	0.08	0.17	0.20	0.23	0.25	0.27	0.28	0.28
0.29	0.29	0.30	0.38	0.39	0.39	0.40	0.40	0.40	0.40
0.86	0.86	0.86	0.86	2.14	0.86	0.86	0.44	0.44	0.44
0.44	0.44	0.44	0.29	0.29	0.29	0.29	0.29	0.29	0.29

LOSS DATA

STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

GIVEN UNIT GRAPH, NUMGQ= 10

0.	503.	1452.	880.	410.	190.	90.	50.	25.	12.

UNIT GRAPH TOTALS 3612. CFS OR 0.96 INCHES OVER THE AREA

RECESSION DATA

STRTQ= 0.00 QRCSN= 0.00 RTIOR= 1.00

END-OF-PERIOD FLOW

TIME	RAIN	EXCS	COMP Q
1	0.00	0.00	0.
2	0.09	0.09	0.
3	0.08	0.08	45.
4	0.17	0.17	170.
5	0.20	0.20	280.
6	0.23	0.23	454.
7	0.25	0.25	605.

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8	0.27	0.27	748.
9	0.28	0.28	827.
10	0.28	0.28	906.
11	0.29	0.29	960.
12	0.29	0.29	992.
13	0.30	0.30	1020.
14	0.36	0.36	1040.
15	0.39	0.39	1101.
16	0.39	0.39	1234.
17	0.40	0.40	1325.
18	0.40	0.40	1374.
19	0.40	0.40	1403.
20	0.40	0.40	1427.
21	0.86	0.86	1437.
22	0.86	0.86	1673.
23	0.86	0.86	2343.
24	0.86	0.86	2748.
25	2.14	2.14	2937.
26	0.86	0.86	3668.
27	0.86	0.86	4924.
28	0.44	0.44	4215.
29	0.44	0.44	3414.
30	0.44	0.44	2528.
31	0.44	0.44	2030.
32	0.44	0.44	1807.
33	0.44	0.44	1695.
34	0.29	0.29	1641.
35	0.29	0.29	1529.
36	0.29	0.29	1301.
37	0.29	0.29	1164.
38	0.29	0.29	1102.
39	0.29	0.29	1074.
40	0.29	0.29	1060.
41	0.00	0.00	1053.
42	0.00	0.00	963.
43	0.00	0.00	480.
44	0.00	0.00	225.
45	0.00	0.00	106.
46	0.00	0.00	51.
47	0.00	0.00	25.
48	0.00	0.00	10.
49	0.00	0.00	5.
50	0.00	0.00	0.
51	0.00	0.00	0.
52	0.00	0.00	0.
53	0.00	0.00	0.
54	0.00	0.00	0.
55	0.00	0.00	0.
56	0.00	0.00	0.
57	0.00	0.00	0.
58	0.00	0.00	0.
59	0.00	0.00	0.
60	0.00	0.00	0.
61	0.00	0.00	0.
62	0.00	0.00	0.
63	0.00	0.00	0.
64	0.00	0.00	0.
65	0.00	0.00	0.
66	0.00	0.00	0.
67	0.00	0.00	0.
68	0.00	0.00	0.

69	0.00	0.00	0.
70	0.00	0.00	0.
71	0.00	0.00	0.
72	0.00	0.00	0.
73	0.00	0.00	0.
74	0.00	0.00	0.
75	0.00	0.00	0.
76	0.00	0.00	0.
77	0.00	0.00	0.
78	0.00	0.00	0.
79	0.00	0.00	0.
80	0.00	0.00	0.
81	0.00	0.00	0.
82	0.00	0.00	0.
83	0.00	0.00	0.
84	0.00	0.00	0.
85	0.00	0.00	0.
86	0.00	0.00	0.
87	0.00	0.00	0.
88	0.00	0.00	0.
89	0.00	0.00	0.
90	0.00	0.00	0.
91	0.00	0.00	0.
92	0.00	0.00	0.
93	0.00	0.00	0.
94	0.00	0.00	0.
95	0.00	0.00	0.
96	0.00	0.00	0.
97	0.00	0.00	0.
98	0.00	0.00	0.
99	0.00	0.00	0.
100	0.00	0.00	0.
101	0.00	0.00	0.
102	0.00	0.00	0.
103	0.00	0.00	0.
104	0.00	0.00	0.
105	0.00	0.00	0.
106	0.00	0.00	0.
107	0.00	0.00	0.
108	0.00	0.00	0.
109	0.00	0.00	0.
110	0.00	0.00	0.
111	0.00	0.00	0.
112	0.00	0.00	0.
113	0.00	0.00	0.
114	0.00	0.00	0.
115	0.00	0.00	0.
116	0.00	0.00	0.
117	0.00	0.00	0.
118	0.00	0.00	0.
119	0.00	0.00	0.
120	0.00	0.00	0.
SUM	17.46	17.46	63064.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4924.	1566.	525.	525.	63065.
INCHES		16.74	16.85	16.85	16.85
AC-FT		777.	782.	782.	782.

RUNOFF MULTIPLIED BY 0.50

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0.	0.	22.	85.	140.	227.	302.	364.	413.	453.
480.	496.	510.	520.	550.	617.	662.	687.	704.	713.
718.	836.	1171.	1374.	1468.	1834.	2462.	2107.	1707.	1264.
1015.	903.	847.	820.	764.	650.	582.	551.	537.	530.
526.	451.	240.	112.	53.	25.	12.	5.	1.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2462.	783.	262.	262.	31532.
INCHES		8.37	8.42	8.42	8.42
AC-FT		388.	391.	391.	391.

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HYDROGRAPH ROUTING

ROUTE HYDROGRAPH THRU UPPER MT. GLENN LAKE DAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
10	1	0	0	0	0	1

ROUTING DATA

GLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.000	0.00	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
0	0	0	0.000	0.000	0.000	-1.

STORAGE=	28.	35.	43.	49.	55.	62.	68.	74.	95.	143.
OUTFLOW=	0.	10.	100.	150.	200.	328.	600.	1050.	3000.	11600.

TIME	EOP STOR	AVG IN	EOP OUT
1	28.	0.	0.
2	28.	0.	0.
3	28.	11.	0.
4	28.	54.	1.
5	30.	112.	2.
6	32.	185.	5.
7	35.	265.	9.
8	39.	333.	51.
9	43.	388.	95.
10	47.	433.	129.
11	51.	466.	162.
12	55.	488.	194.
13	58.	503.	256.
14	61.	515.	314.
15	63.	535.	398.
16	65.	584.	480.
17	66.	640.	550.
18	68.	674.	606.
19	68.	695.	661.
20	69.	709.	690.
21	69.	716.	706.

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22	70.	777.	750.
23	72.	1004.	905.
24	75.	1272.	1153.
25	77.	1421.	1363.
26	79.	1651.	1589.
27	83.	2148.	2028.
28	85.	2285.	2229.
29	83.	1907.	1976.
30	79.	1485.	1591.
31	76.	1139.	1236.
32	75.	959.	1025.
33	72.	875.	933.
34	71.	834.	872.
35	71.	792.	823.
36	70.	707.	752.
37	68.	616.	668.
38	68.	566.	606.
39	67.	544.	577.
40	67.	533.	559.
41	66.	526.	545.
42	66.	489.	520.
43	64.	345.	443.
44	61.	176.	327.
45	59.	82.	272.
46	56.	39.	220.
47	54.	19.	189.
48	52.	8.	171.
49	50.	3.	155.
50	48.	0.	139.
51	46.	0.	126.
52	45.	0.	113.
53	44.	0.	102.
54	42.	0.	90.
55	41.	0.	78.
56	40.	0.	68.
57	40.	0.	59.
58	39.	0.	51.
59	38.	0.	44.
60	38.	0.	38.
61	37.	0.	33.
62	37.	0.	29.
63	37.	0.	25.
64	36.	0.	22.
65	36.	0.	19.
66	36.	0.	16.
67	36.	0.	14.
68	35.	0.	12.
69	35.	0.	11.
70	35.	0.	9.
71	35.	0.	9.
72	35.	0.	9.
73	35.	0.	9.
74	35.	0.	9.
75	35.	0.	9.
76	34.	0.	9.
77	34.	0.	8.
78	34.	0.	8.
79	34.	0.	8.
80	34.	0.	8.
81	34.	0.	8.
82	34.	0.	8.

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83	54.	0.	8.	
84	54.	0.	7.	
85	54.	0.	7.	
86	53.	0.	7.	
87	53.	0.	7.	
88	53.	0.	7.	
89	53.	0.	7.	
90	53.	0.	7.	
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92	53.	0.	6.	
93	53.	0.	6.	
94	53.	0.	6.	
95	53.	0.	6.	
96	53.	0.	6.	
97	52.	0.	6.	
98	52.	0.	6.	
99	52.	0.	6.	
100	52.	0.	6.	
101	52.	0.	6.	
102	52.	0.	5.	
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110	52.	0.	5.	
111	51.	0.	5.	
112	51.	0.	5.	
113	51.	0.	4.	
114	51.	0.	4.	
115	51.	0.	4.	
116	51.	0.	4.	
117	51.	0.	4.	
118	51.	0.	4.	
119	51.	0.	4.	
120	51.	0.	4.	
SUM			31258.	

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2229.	741.	260.	260.	31258.
INCHES		7.92	8.35	8.35	8.35
AC-FT		367.	387.	387.	387.

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

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RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	10	2462.	785.	262.	262.	0.87
ROUTED TO	10	2229.	741.	260.	260.	0.87

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****
HEC-1 VERSION DATED JAN 1973
****

DAM SAFETY INSPECTION - NEW JERSEY STATE
UPPER MT. GLENN LAKE DAM
PERCENT OF PMF FLOOD ROUTING

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
120	0	9	0	0	0	0	0	0	0

JOPER: 3 NWT: 0

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

SUB-AREA RUNOFF COMPUTATION

INPUT UNIT HYDROGRAPH DERIVED FROM SCS METHOD

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
10	0	0	0	0	0	1

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
0	-1	0.87	0.00	0.87	0.00	0.115	0	0	0

PRECIP DATA

NP	STORM	DAJ	DAK
40	0.00	0.00	0.00

PRECIP PATTERN

0.00	0.09	0.08	0.17	0.20	0.23	0.25	0.27	0.28	0.28
0.29	0.29	0.30	0.38	0.39	0.39	0.40	0.40	0.40	0.40
0.86	0.86	0.86	0.86	2.14	0.86	0.86	0.44	0.44	0.44
0.44	0.44	0.44	0.29	0.29	0.29	0.29	0.29	0.29	0.29

LOSS DATA

STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

GIVEN UNIT GRAPH, NUMGQ= 10

0.	503.	1452.	880.	410.	190.	90.	50.	25.	12.

UNIT GRAPH TOTALS 3612. CFS OR 0.96 INCHES OVER THE AREA

RECESSION DATA

STRTQ= 0.00 QRCSN= 0.00 RTIOR= 1.00

END-OF-PERIOD FLOW

TIME	RAIN	EXCS	COMP Q
1	0.00	0.00	0.
2	0.09	0.09	0.
3	0.08	0.08	45.
4	0.17	0.17	170.
5	0.20	0.20	280.
6	0.23	0.23	454.
7	0.25	0.25	605.

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8	0.27	0.27	720.
9	0.28	0.26	827.
10	0.28	0.28	906.
11	0.29	0.29	960.
12	0.29	0.29	992.
13	0.30	0.30	1020.
14	0.38	0.38	1040.
15	0.39	0.39	1101.
16	0.39	0.39	1284.
17	0.40	0.40	1325.
18	0.40	0.40	1374.
19	0.40	0.40	1409.
20	0.40	0.40	1427.
21	0.86	0.86	1437.
22	0.86	0.86	1673.
23	0.86	0.86	2343.
24	0.86	0.86	2748.
25	2.14	2.14	2937.
26	0.86	0.86	3666.
27	0.86	0.86	4924.
28	0.44	0.44	4215.
29	0.44	0.44	3414.
30	0.44	0.44	2528.
31	0.44	0.44	2030.
32	0.44	0.44	1807.
33	0.44	0.44	1695.
34	0.29	0.29	1641.
35	0.29	0.29	1529.
36	0.29	0.29	1301.
37	0.29	0.29	1164.
38	0.29	0.29	1102.
39	0.29	0.29	1074.
40	0.29	0.29	1060.
41	0.00	0.00	1053.
42	0.00	0.00	903.
43	0.00	0.00	480.
44	0.00	0.00	225.
45	0.00	0.00	106.
46	0.00	0.00	51.
47	0.00	0.00	25.
48	0.00	0.00	10.
49	0.00	0.00	3.
50	0.00	0.00	0.
51	0.00	0.00	0.
52	0.00	0.00	0.
53	0.00	0.00	0.
54	0.00	0.00	0.
55	0.00	0.00	0.
56	0.00	0.00	0.
57	0.00	0.00	0.
58	0.00	0.00	0.
59	0.00	0.00	0.
60	0.00	0.00	0.
61	0.00	0.00	0.
62	0.00	0.00	0.
63	0.00	0.00	0.
64	0.00	0.00	0.
65	0.00	0.00	0.
66	0.00	0.00	0.
67	0.00	0.00	0.
68	0.00	0.00	0.

69	0.00	0.00	0.
70	0.00	0.00	0.
71	0.00	0.00	0.
72	0.00	0.00	0.
73	0.00	0.00	0.
74	0.00	0.00	0.
75	0.00	0.00	0.
76	0.00	0.00	0.
77	0.00	0.00	0.
78	0.00	0.00	0.
79	0.00	0.00	0.
80	0.00	0.00	0.
81	0.00	0.00	0.
82	0.00	0.00	0.
83	0.00	0.00	0.
84	0.00	0.00	0.
85	0.00	0.00	0.
86	0.00	0.00	0.
87	0.00	0.00	0.
88	0.00	0.00	0.
89	0.00	0.00	0.
90	0.00	0.00	0.
91	0.00	0.00	0.
92	0.00	0.00	0.
93	0.00	0.00	0.
94	0.00	0.00	0.
95	0.00	0.00	0.
96	0.00	0.00	0.
97	0.00	0.00	0.
98	0.00	0.00	0.
99	0.00	0.00	0.
100	0.00	0.00	0.
101	0.00	0.00	0.
102	0.00	0.00	0.
103	0.00	0.00	0.
104	0.00	0.00	0.
105	0.00	0.00	0.
106	0.00	0.00	0.
107	0.00	0.00	0.
108	0.00	0.00	0.
109	0.00	0.00	0.
110	0.00	0.00	0.
111	0.00	0.00	0.
112	0.00	0.00	0.
113	0.00	0.00	0.
114	0.00	0.00	0.
115	0.00	0.00	0.
116	0.00	0.00	0.
117	0.00	0.00	0.
118	0.00	0.00	0.
119	0.00	0.00	0.
120	0.00	0.00	0.
SUM	17.46	17.46	63064.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4924.	1566.	525.	525.	63063.
INCHES		16.74	16.85	16.85	16.85
AC-FT		777.	782.	782.	782.

RUNOFF MULTIPLIED BY 0.11

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0.	0.	5.	19.	32.	52.	69.	83.	95.	104.
110.	114.	117.	119.	126.	142.	152.	158.	162.	164.
169.	192.	269.	316.	337.	421.	566.	484.	392.	290.
233.	207.	194.	188.	175.	149.	133.	126.	123.	121.
121.	103.	55.	25.	12.	5.	2.	1.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	566.	180.	60.	60.	7252.
INCHES		1.92	1.93	1.93	1.93
AC-FT		89.	89.	89.	89.

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

HYDROGRAPH ROUTING

ROUTE HYDROGRAPH THRU UPPER MT. GLENN LAKE DAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
10	1	0	0	0	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.000	0.00	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
0	0	0	0.000	0.000	0.000	-1.

STORAGE=	28.	35.	43.	49.	55.	62.	68.	74.	93.	143.
OUTFLOW=	0.	10.	100.	150.	200.	328.	600.	1050.	3000.	11600.

TIME	EOP STOR	AVG IN	EOP OUT
1	28.	0.	0.
2	28.	0.	0.
3	28.	2.	0.
4	28.	12.	0.
5	28.	25.	0.
6	29.	42.	1.
7	29.	60.	2.
8	30.	76.	3.
9	31.	89.	4.
10	32.	99.	6.
11	34.	107.	7.
12	35.	112.	9.
13	36.	115.	20.
14	37.	118.	33.
15	38.	123.	45.
16	39.	134.	56.
17	40.	147.	68.
18	41.	155.	79.
19	42.	160.	90.
20	43.	163.	99.
21	44.	164.	106.

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22	45.	170.	113.
23	46.	230.	129.
24	48.	292.	141.
25	50.	326.	139.
26	53.	379.	181.
27	57.	494.	227.
28	60.	525.	294.
29	61.	458.	326.
30	62.	341.	331.
31	61.	202.	314.
32	60.	220.	293.
33	59.	201.	272.
34	58.	191.	254.
35	57.	182.	238.
36	56.	162.	221.
37	55.	141.	203.
38	55.	136.	194.
39	54.	125.	187.
40	53.	122.	181.
41	52.	121.	175.
42	50.	114.	169.
43	49.	79.	160.
44	48.	40.	148.
45	46.	19.	135.
46	45.	7.	123.
47	45.	4.	111.
48	43.	2.	100.
49	42.	0.	88.
50	41.	0.	76.
51	40.	0.	66.
52	39.	0.	58.
53	39.	0.	50.
54	38.	0.	43.
55	38.	0.	38.
56	37.	0.	33.
57	37.	0.	28.
58	37.	0.	25.
59	36.	0.	21.
60	36.	0.	18.
61	36.	0.	16.
62	36.	0.	14.
63	35.	0.	12.
64	35.	0.	10.
65	35.	0.	9.
66	35.	0.	9.
67	35.	0.	9.
68	35.	0.	9.
69	35.	0.	9.
70	35.	0.	9.
71	34.	0.	8.
72	34.	0.	8.
73	34.	0.	8.
74	34.	0.	8.
75	34.	0.	8.
76	34.	0.	8.
77	34.	0.	8.
78	34.	0.	8.
79	34.	0.	7.
80	34.	0.	7.
81	33.	0.	7.
82	33.	0.	7.

83	53.	0.	7.
84	53.	0.	7.
85	53.	0.	7.
86	53.	0.	7.
87	53.	0.	6.
88	53.	0.	6.
89	53.	0.	6.
90	53.	0.	6.
91	53.	0.	6.
92	52.	0.	6.
93	52.	0.	6.
94	52.	0.	6.
95	52.	0.	6.
96	52.	0.	6.
97	52.	0.	5.
98	52.	0.	5.
99	52.	0.	5.
100	52.	0.	5.
101	52.	0.	5.
102	52.	0.	5.
103	52.	0.	5.
104	52.	0.	5.
105	52.	0.	5.
106	51.	0.	5.
107	51.	0.	5.
108	51.	0.	4.
109	51.	0.	4.
110	51.	0.	4.
111	51.	0.	4.
112	51.	0.	4.
113	51.	0.	4.
114	51.	0.	4.
115	51.	0.	4.
116	51.	0.	4.
117	51.	0.	4.
118	51.	0.	4.
119	51.	0.	4.
120	51.	0.	4.
SUM			7000.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	331.	157.	58.	58.	7000.
INCHES		1.68	1.87	1.87	1.87
AC-FT		78.	86.	86.	86.

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RUNOFF SUMMARY: AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	10	566.	180.	60.	60.	0.87
ROUTED TO	10	531.	157.	58.	58.	0.87

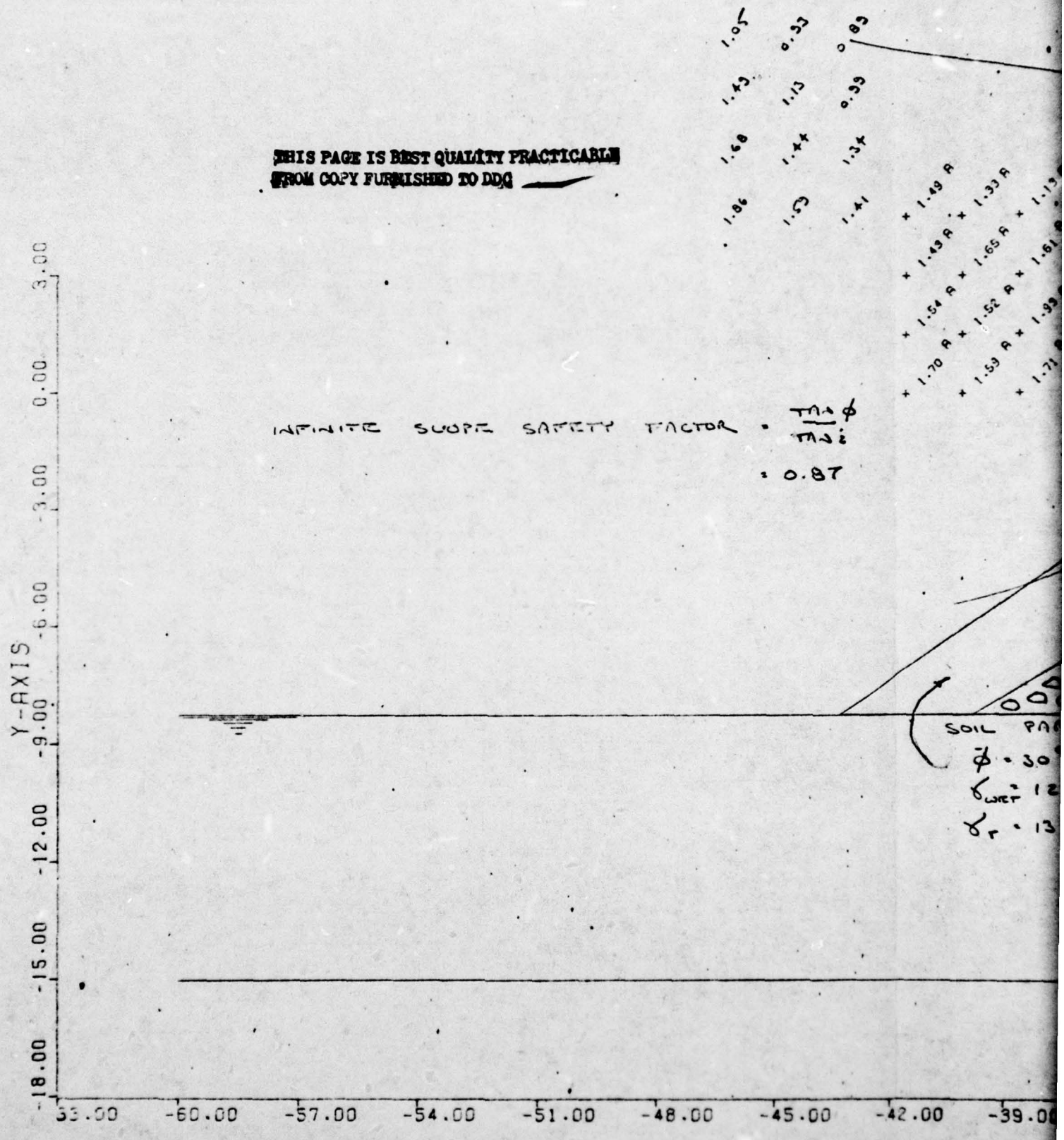
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EQL
1901 SOUTH NAVAJO, DENVER, COLORADO 80223

APPENDIX E

STABILITY CALCULATIONS

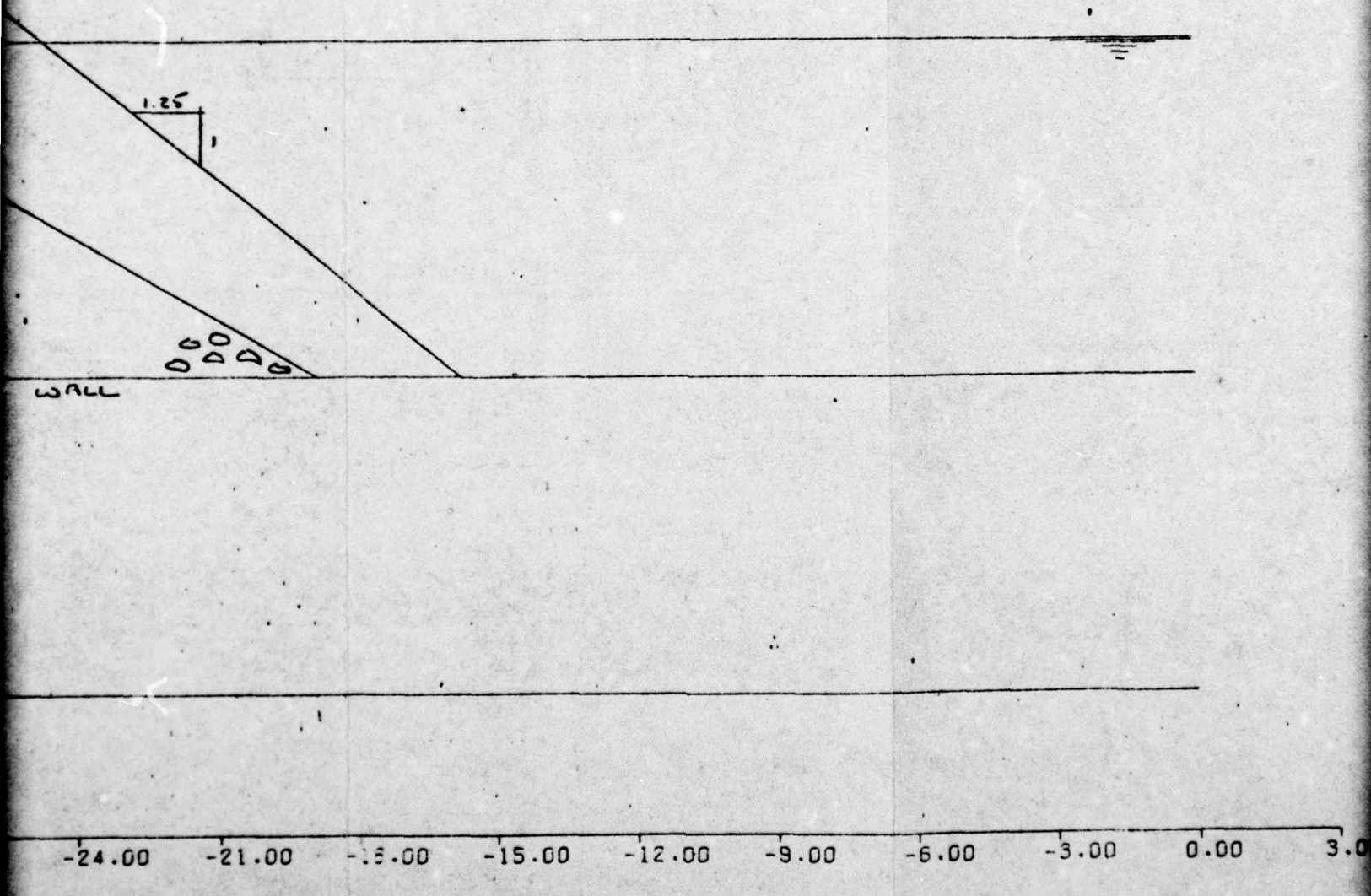
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UPPER MOUNT GLEN DAM SAFETY INSPECTION

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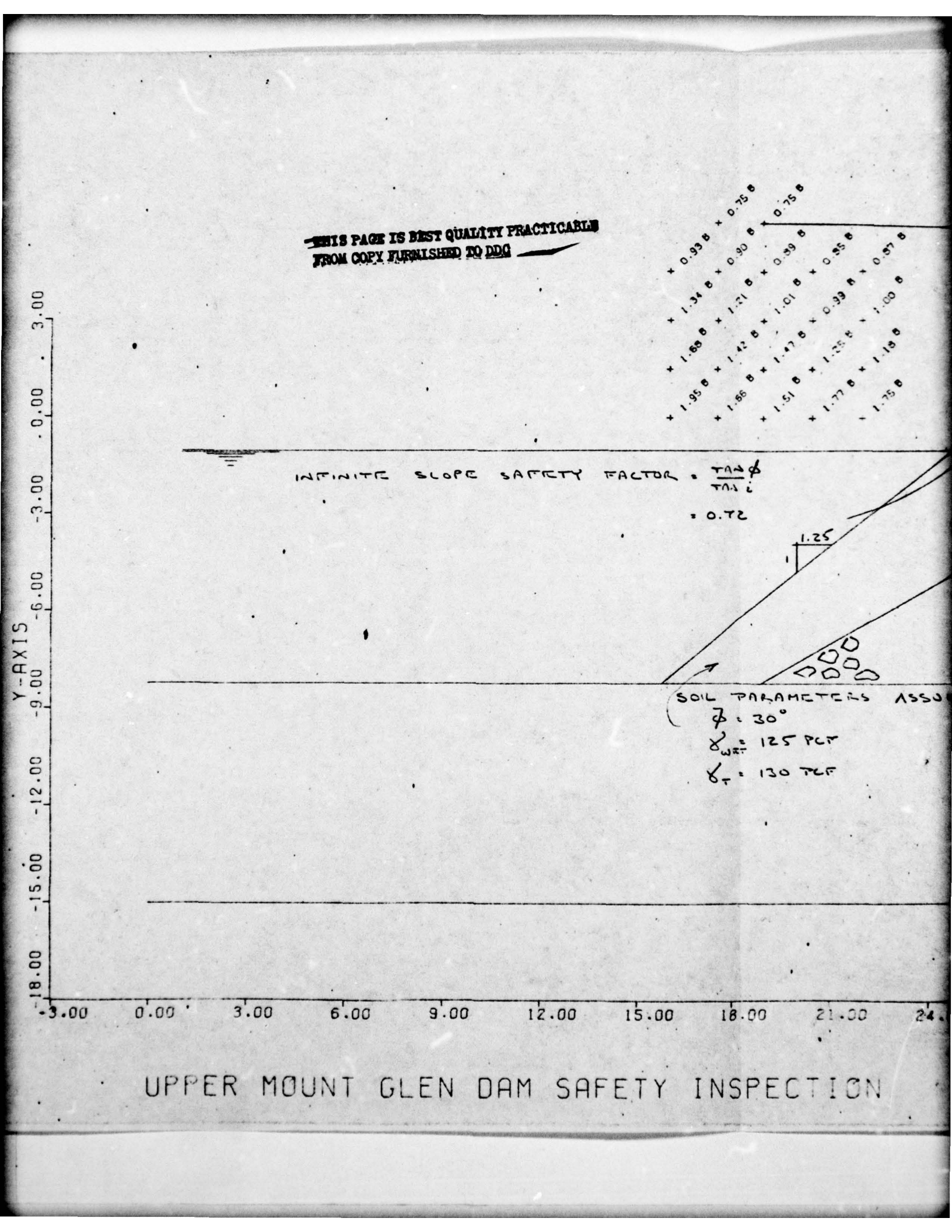
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UP 2 JULY 1978

SCALE 1" = 3'

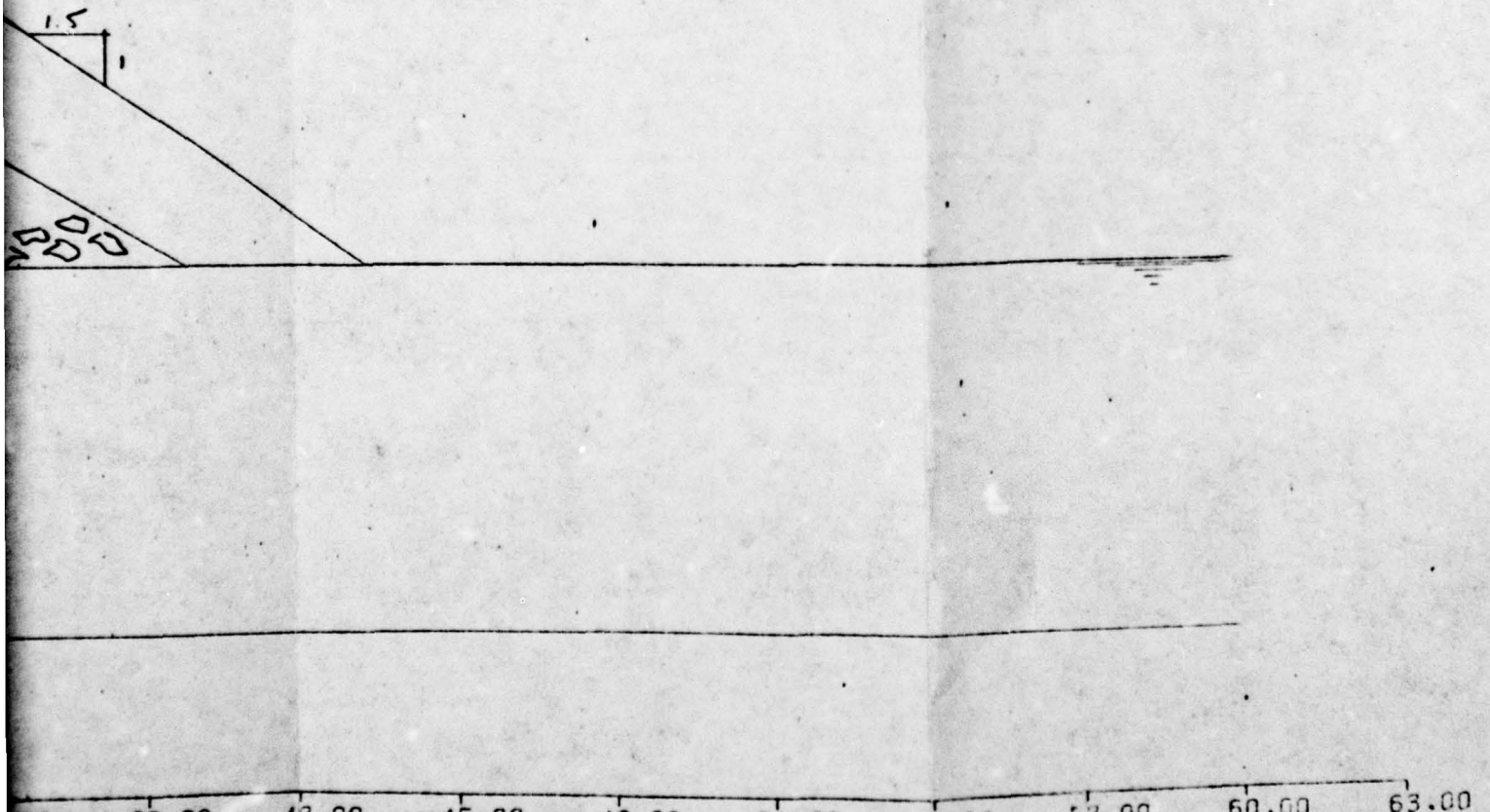
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UPPER MOUNT GLEN DAM SAFETY INSPECTION

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SCALE 1" = 3'

2 JULY 1978

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REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: NJ00202
2. GOVT ACCESSION NO.
3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle): Phase I Inspection Report
National Dam Safety Program
Upper Mount Glen Lake Dam
Passaic County, N.J.

5. TYPE OF REPORT & PERIOD COVERED: (9) FINAL report

6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s): Robert Gershowitz, P.E.

8. CONTRACT OR GRANT NUMBER(s): (15) DACW61-78-C-0124

9. PERFORMING ORGANIZATION NAME AND ADDRESS:
Harris-ECI Associates
453 Amboy Ave.
Woodbridge, N.J. 07095

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS

11. CONTROLLING OFFICE NAME AND ADDRESS:
U.S. Army Engineer District, Philadelphia
Custom House, 2d & Chestnut Streets
Philadelphia, Pennsylvania 19106

12. REPORT DATE: (11) August, 1978
13. NUMBER OF PAGES

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office): (10) Robert/Gershowitz

15. SECURITY CLASS. (of this report): Unclassified
15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

(12) 117 p.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

(6) National Dam Safety Program. Upper Mount Glen Lake Dam (NJ00202), Passaic River Basin, West Brook, Passaic County, New Jersey. Phase I Inspection Report.

18. SUPPLEMENTARY NOTES

Copies are obtainable from National Technical Information Service, Springfield, Virginia, 22151.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)
Dams--N.J.
National Dam Safety Program Phase I
Upper Mount Glen Lake Dam,N.J.
Dam Safety
Dam Inspection

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)
This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

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