

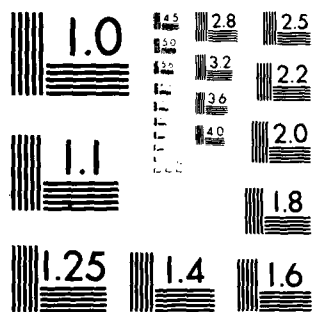
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7 LOWER HUDSON RIVER BASIN

1 LAKE CASSE DAM

2 PUTNAM COUNTY, NEW YORK

3 INVENTORY NO. N.Y. 1156

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. The examination of documents and the visual inspection of Lake Casse Dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the		

dam has some deficiencies which require further investigation and remedial action.

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that with the existing steel box cover in place the dam would be overtopped for all storms exceeding approximately 28 percent of the PMF. The overtopping of the dam could cause the erosion of both abutments and the downstream face of the dam resulting in dam failure, thus significantly increasing the hazard to the loss of life downstream. The spillway is therefore adjudged as "seriously inadequate" and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a "seriously inadequate" spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in spillway capacity with the steel box cover in place and that if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to loss of life downstream of the dam.

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LOWER HUDSON RIVER BASIN

LAKE CASSE DAM

**PUTNAM COUNTY, NEW YORK
INVENTORY NO. N.Y. 1156**

**PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM**



NEW YORK DISTRICT CORPS OF ENGINEERS

SEPTEMBER 1981

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D. C., 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations, and analyses involving topographic mapping, sub-surface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

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

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

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

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
LAKE CASSE DAM
I.D. NO. N.Y. 1156
D.E.C. NO. 1797
LOWER HUDSON RIVER BASIN
PUTNAM COUNTY, N.Y.

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

NAME OF DAM	Lake Casse Dam
STATE LOCATED	New York
COUNTY LOCATED	Putnam
STREAM	TR Croton Falls Reservoir
BASIN	Lower Hudson River
DATE OF INSPECTION	May 6, 1981

ASSESSMENT

The examination of documents and the visual inspection of Lake Casse Dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action.

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that with the existing steel box cover in place the dam would be overtopped for all storms exceeding approximately 28 percent of the PMF. The overtopping of the dam could cause the erosion of both abutments and the downstream face of the dam resulting in dam failure, thus significantly increasing the hazard to the loss of life downstream. The spillway is therefore adjudged as "seriously inadequate" and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a "seriously inadequate" spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in spillway capacity with the steel box cover in place and that if a severe storm were

to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to loss of life downstream of the dam.

It is therefore recommended that within 3 months of notification to the owner, detailed hydrologic/hydraulic investigations of the structure should be undertaken to more accurately determine the site specific characteristics of the watershed and their affect upon the overtopping potential of the dam. The results of these investigations will determine the appropriate remedial measures which will be required to achieve a spillway capacity adequate to discharge the outflow from at least the one-half PMF. Within 12 months of the date of notification to the owner, modifications to the structure, deemed necessary as a result of studies, should have been completed. In the interim, the cover should be modified or replaced to allow full outlet capacity; a detailed emergency action plan must be developed and implemented during periods of unusually heavy precipitation. Also, around-the-clock surveillance of the structure must be provided during these periods.

In addition, the dam has a number of problem areas which, if left uncorrected, have the potential for the development of hazardous conditions and must be corrected within one year. These are:

1. The downstream discharge area of the low level outlet should be cleared of all brush, debris, and growth and the channel be cleaned out to a depth which will allow free flow from the discharge pipe. Following this clearing and channel cleaning, the seepage and flow conditions in the area of the discharge pipe and toe should be examined and the condition of the outlet pipe up to the drop inlet structure should be investigated. Appropriate repairs, if required, should be determined and carried out.

2. The brush, saplings and debris should be removed from the downstream slope. All coniferous trees should be removed while larger hardwood trees should not be removed, but should be inventoried and their condition monitored. If a tree dies, the area around the tree should then be monitored for possible seepage. A program of periodic mowing and cutting should be provided.

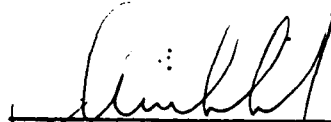
3. All trees and brush on the upstream face should be removed and periodic mowing and cutting provided.

4. Provide a program of periodic inspection and maintenance of the dam and appurtenances including yearly operation and lubrication of the reservoir drain system. The results of the inspection and test operation should be documented for future reference. The aforementioned emergency action plan should be maintained and updated periodically during the life of the structure.



Eugene O'Brien, P.E.
New York No. 29823

Approved by:



Col. W.M. Smith, Jr.
New York District Engineer

Date:

14 Aug 81



1. OVERVIEW

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
LAKE CASSE DAM
I.D. NO. N.Y. 1156
D.E.C. NO. 1797
LOWER HUDSON RIVER BASIN
PUTNAM COUNTY, N.Y.

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers by Contract No. DACW 51-81-C-0008 dated 14 December 1980 in fulfillment of the requirements of the National Dam Inspection Act, Public Law 92-367, 8 August 1972.

b. Purpose of Inspection

The inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life or property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF THE PROJECT

a. Description of the Dam and Appurtenant Structures

The Lake Casse Dam is composed of an approximately 690 foot long earth embankment with a crest width of 36 feet. The maximum height of the dam is 14 feet. The upstream and downstream slopes of the dam are 1V to 3H.

An outlet box located 33.5 feet upstream of the centerline of the dam and about 250 feet from the left abutment serves as a drop inlet spillway. The upstream face of the spillway has a 24-inch sluice gate which serves as a reservoir drain. The discharge from the outlet box enters a 48-inch reinforced concrete pipeline which is located under the dam. The pipeline exits through a headwall structure at the downstream toe of the dam. The top of the outlet box is 3 feet

below the crest of the dam and has a 5 foot by 5 foot opening. The opening is covered by a steel box which contains 3 side openings. Two of the openings are 2.5 feet wide by 7 inches high and the other is 4 feet wide by 7 inches high.

b. Location

Lake Casse Dam is located on a tributary of the Croton Falls Reservoir about one mile northeast of the Village of Mahopac. Lake Road passes over the crest of the dam.

c. Size Classification

The dam is 14 feet high and has a maximum storage capacity of 182 acre-feet and therefore is classified as a small dam.

d. Hazard Classification

The dam is in the "high" hazard potential category because of its location directly upstream and in close proximity to a number of homes.

e. Ownership

Lake Casse Dam is owned by the Lake Casse Property Owners Association, P.O. Box 245, Mahopac, New York, 10541. The officer of the Association contacted was Mr. Thomas Mulligan at Tel. (914) 628-6244.

f. Purpose of Dam

The dam impounds water to provide a recreational lake for a housing subdivision.

g. Design and Construction History

The dam was designed and constructed in 1953. The designer was Roy Burgess, Consulting Engineer, Main Street, Carmel, New York. The name of the contractor is unknown.

h. Normal Operating Procedures

There is no normal operating procedure nor records of past operating procedures. Reservoir level is changed on an as-needed basis by the Association members.

1.3 PERTINENT DATA

a.	<u>Drainage Area</u> , Square Miles	0.38
b.	<u>Discharge at Damsite</u> , cfs	
	5' Drop Inlet-Without Steel Cover	240
	5' Drop Inlet-With Steel Cover and Side Openings	41
	24-inch Sluice Gate	
	48-inch Reinforced Concrete Pipe	240
	Maximum Total Discharge Capacity (Reinforced Concrete Pipe)	240
c.	<u>Elevation</u> , Feet Above MSL,	
	USGS Datum	
	Top of Dam	610
	Maximum Design Pool	Unknown
	Spillway Crest	607
	Low Level Outlet	597.5
d.	<u>Reservoir</u>	
	Length of Maximum Pool (Miles)	0.46
	Surface Area of Maximum Pool (acres)	37.2
	Surface Area of Normal Pool (acres)	30.3
e.	<u>Storage</u> , Acre-feet	
	Reservoir at Spillway Crest	80
	Reservoir at Maximum Pool	182
f.	<u>Dam</u>	
	Type	Earth Embankment
	Length (feet)	690
	Upstream Slope	1V:3H
	Downstream Slope	1V:3H
	Crest Elevation (MSL)	610
	Crest Width (feet)	36'
	Grout Curtain	Unknown
	Cutoff Trench	3.0' deep puddled clay
g.	<u>Spillway</u>	
	Type	Uncontrolled Concrete Drop Inlet-Discharge through 48-inch RCP

Size	
Drop Inlet (without cover)	5 ft Square
Side Openings in Steel	2 @ 2'-6" by 7" high
Cover at Drop Inlet	1 @ 4'-0" by 7" high
Crest Elevation	607.0
Upstream Channel	None
Downstream Channel	48-inch Diameter
	Pipe Discharges
	Through Headwall
	Structure into Open
	Channel
Auxiliary Spillway	None
h. <u>Reservoir Drain and Pipeline</u>	
Reservoir Drain	24-inch Sluice Gate
	Discharges into Bottom
	of Drop Inlet at
	Elevation 597.5
Pipeline	Pipe in Common with
	Spillway

SECTION 2 - ENGINEERING DATA

2.1 GEOLOGY

The records of the owner contain no data on site geology. However, there is data available in the literature on the general geology of the area. Lake Casse Dam is located in the Hudson Highlands section of the New England Uplands Physiographic Province. The province is characterized by a low, but rugged mountain range consisting primarily of igneous and metamorphic rock. The rock underlying the Lake Casse site is Precambrian biotite granitic gneiss.

2.2 SUBSURFACE INVESTIGATIONS

There are no records of subsurface investigations carried out at the site. The "Application for the Construction" of the dam indicates the soil in the foundation and abutments to be "hardpan".

2.3 DAM AND APPURTENANT STRUCTURES

There is a drawing showing the "General Plan" and several details of the dam; this is included in Appendix A. Additionally, of the original construction application is available and included in Appendix F.

2.4 CONSTRUCTION RECORDS

No information has been located in relation to the construction of the project. The name(s) of the contractor(s) is (are) unknown.

2.5 OPERATION RECORDS

There are no operation records kept for the dam. No systematic monitoring of the performance of the dam is in effect.

2.6 EVALUATION OF DAM

There is sufficient data available to support a Phase I evaluation of the dam.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

The visual inspection of the Lake Casse Dam was made on 6 May 1981. The weather was overcast and the temperature was in the mid 60's. At the time of the inspection, the lake level was just above the spillway crest level.

b. Dam

The horizontal and vertical alignment of the crest of the dam show no signs of stress, deformation, or cracking. The upstream and downstream slopes of the earth embankment are heavily overgrown with trees and shrubs. The upstream slope of the dam suffers from local erosion at a level near the current water level.

The downstream slope of the dam appears to be somewhat irregular due to fill which has been placed to widen the crest subsequent to the construction of the dam. A complete view of the downstream slope and toe area was obscured by the dense brush and tree growth (See Photo No. 3).

There is no emergency action plan for the project.

c. Spillway

The drop inlet spillway, which was originally an open box culvert with 5 foot square opening, has been covered with a steel plate box with three small side openings. The steel plate box significantly reduces the discharge capacity of the inlet. The concrete sills of the spillway appear to be in good condition. Discharge was flowing through the side openings at the time of the inspection (See Photo No. 6).

The drop inlet spillway discharges through the 48-inch pipeline which is discussed in paragraph 3.1d.

d. Outlets and Pipelines

The 24-inch reservoir drain, which is located in the drop inlet tower at a depth below crest level of 12.75 feet, was unobservable. The sluice gate is however, reportedly operable and is used whenever required to lower the reservoir.

The sluice gate and drop inlet spillway discharge through a 48-inch reinforced concrete pipeline. The downstream exit of the pipeline is clogged for about 3/4 of its depth by silting and debris. This severely restricts the flow capacity of the pipeline. At the time of the inspection, the water entering the spillway could not be seen discharging at the silted-up pipe exit, but the discharge could have been observed in the channel about 50 feet downstream of the pipeline exit (See Photos No. 8 and 9).

e. Abutments

The abutment/dam contacts and abutments are in good condition. There does not appear to be any low point or erosion in these areas.

f. Reservoir Area

The reservoir is located in a hilly lightly developed residential area. No slides, rock falls, or sloughing were observed around the reservoir. There is no visible sediment accumulation in the reservoir.

3.2 EVALUATION OF OBSERVATIONS

Although deficiencies were observed, there is no indication that the dam is in imminent danger. A number of the deficiencies observed in the previous paragraphs are minor and can be corrected by increased maintenance. Other conditions described above, however, represent conditions which may have potential for further deterioration and for this reason these conditions need to be investigated or corrected.

The most significant feature requiring correction and further investigation is the condition of the discharge area of the 48-inch low level outlet pipe. Previous reports in 1969 (see Appendix F) have stated that although water was entering the drop inlet structure, none was exiting from the 48-inch outlet pipe downstream of the dam. Therefore, it was concluded that the pipe was broken within the dam allowing the water to exit through some crevice in the foundation and in due time could lead to failure of the dam. It also reported that the downstream slope and toe area of the dam were unobservable due to excessive brush growth.

As reported in Section 3.1c and 3.1d, these conditions still exist. However, at the time of the inspection, water was flowing in the discharge channel about 50 feet downstream of the dam at about the same rate as water was entering the drop inlet. In view of the existence of the condition for 10 years and the fact that there is no evidence of cracking, sloughing or slides on the dam the previously reached conclusions regarding the broken pipe may not be correct. However, it is still not possible to clearly identify the discharge conditions which exist at the pipeline.

It is recommended, therefore, that the downstream discharge area be cleared of all brush, debris and growth and the channel be cleaned out to a depth which will allow free flow from the discharge pipe. Following this clearing and channel cleaning of the debris, the seepage and flow conditions in the area of the discharge pipe and the toe should be examined and the condition of the outlet pipe through its entire length, should be investigated. Solutions appropriate to the problems identified, if any, should be determined and carried out.

Other significant deficiencies observed, which require immediate corrective action to insure the safety of the dam are listed below. The following is a summary of the problem areas encountered with the appropriate recommended action.

1. The steel box cover which has been placed over the drop inlet has significantly reduced the spillway capacity. This cover should be removed and be replaced by an appropriate trash rack structure which will provide maximum spillway capacity.

2. All brush, saplings and debris should be removed from the upstream and downstream slopes. All coniferous trees should be removed while larger hardwood trees should not be removed but should be inventoried and their condition monitored. If a tree dies, the area around the tree should then be monitored for possible seepage. A program of periodic cutting and mowing should be provided.

3. The local erosion on the upstream face should be repaired by regrading the area. Slope protection should then be provided to prevent a reoccurrence of the erosion.

4. A program of periodic inspection and maintenance of the dam and appurtenances including yearly test operation and lubrication of the gates should be provided. The results of the inspection and test operation should be documented for future reference. An emergency action plan described in Section 7.1d should be established, maintained and periodically updated during the life of the structure.

SECTION 4 - OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

No written operation and maintenance procedures exist for the project. There is no scheduled operation of the project.

4.2 MAINTENANCE OF THE DAM

There is no regular maintenance schedule for the dam and no regular maintenance is performed on the dam or appurtenances.

4.3 WARNING SYSTEM IN EFFECT

No warning system is in effect or in preparation.

4.4 EVALUATION

The overall maintenance of Lake Casse Dam is considered inadequate in the following areas:

1. The area of the low level outlet discharge is clogged with brush, silt and debris.
2. The upstream and downstream slopes are not kept clear of brush, trees and debris. The upstream slope is subject to erosion.
3. No formal operation and maintenance manual exists for the project.

SECTION 5 - HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The Lake Casse Dam is located at the southern end of Lake Casse in Carmel Township, Putnam County, New York (Hydrologic Unit Code 02030101). The area of the drainage basin is 0.38 square miles, with a maximum (east-west) width of 0.6 miles and a maximum (north-south) length of 0.8 miles. The area is moderately developed, with low rolling hills, and wide valleys. Land cover ranges from lawns to woodlands, and rises from a lake elevation of 607 feet (MSL) to just over 750 feet in the northwestern corner of the basin.

5.2 ANALYSIS CRITERIA

The analysis of the adequacy of the spillway was performed by developing a design flood, using the unit hydrograph method, the Probable Maximum Precipitation (PMP) and the HEC-1DB computer program. The all season 200 square mile 24 hour PMP for the Lake Casse area of 22 inches was obtained from Hydrometeorological Report No. 33. The unit hydrographs were computed using Snyder's method and coefficients of 2 and 0.5 for C_t and C_p , respectively. Rainfall loss parameters of 1.0 inch initial loss and 0.1 inch per hour constant loss were assumed.

In accordance with the Recommended Guidelines for Safety Inspection of Dams (Ref. 1), the adequacy of the spillway was analyzed using the Probable Maximum Flood (PMF). Two multi-plan analysis were performed using 0.25, 0.50, 0.75 and full PMF for the spillway with, then without the steel cover.

5.3 SPILLWAY CAPACITY

An outlet box located 33.5 feet upstream of the centerline of the dam 250 feet from the left abutment serves as a drop inlet type spillway. The sill level for the spillway is 3 feet below the crest of the dam at El 607. Total sill length as designed and built is 20 feet. The spillway discharges through a 48-inch concrete pipe under the dam. There is currently a steel box cover with 3 small side openings over the top of the drop inlet significantly reducing the spillway capacity.

The computed maximum discharges of the spillway with and without steel cover are 41 cfs and 240 cfs respectively when lake surface is at El 610 (top of dam).

5.4 RESERVOIR CAPACITY

The normal capacity of the reservoir is listed as 80 acre-feet. The computed surcharge storage between spillway crest elevation 607 feet and top of dam El 610 is 102 acre-feet, which is equivalent to about 5 inches of runoff over the entire basin.

5.5 FLOODS OF RECORD

There are no records of floods or maximum reservoir elevations at the dam.

5.6 OVERTOPPING POTENTIAL

The potential of the dam being overtopped was investigated on the basis of the spillway discharge capacity and the available surcharge storage to meet the selected design flood inflows.

The analysis was performed assuming that the water surface in the reservoir was at the spillway crest elevation at the start of the flood event. The results of the multi-plan analysis are shown below.

WITH COVER

<u>Ratio of PMF</u>	<u>Inflow Peak (cfs)</u>	<u>Outflow Peak (cfs)</u>	<u>Overtopping (ft)</u>
1.00	911	898	0.54
0.75	683	667	0.44
0.50	455	367	0.28
0.25	228	35	0.00

Spillway passes 27.5% PMF without overtopping

WITHOUT COVER

1.00	911	888	0.45
0.75	683	545	0.27
0.50	455	233	0.00
0.25	228	202	0.00

Spillway passes 53.6% PMF without overtopping

5.7 EVALUATION

With the steel box cover in place, the Lake Casse Dam spillway is unable to pass either the PMF or one-half (1/2) PMF without the dam being overtopped. The overtopping of the dam could cause the failure of the dam, thus significantly increasing the hazard for the loss of life downstream. The spillway is therefore assessed as being "seriously inadequate" and the dam is assessed as unsafe, non-emergency.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Visual observations did not indicate any structural problems with the embankment or appurtenant structures with the reservoir at its present level. There are no adverse conditions which would affect the stability of the dam at its present level. As detailed in Section 3, however, an important question exists with regard to the path of the discharge from the 48-inch low level outlet and the hydraulic capacity of the drop inlet spillway structure with its cover in place. During flood conditions these situations increase the potential for overtopping and erosion of the downstream face of the dam.

b. Design and Construction Data

A design drawing has been located for the project. A review of this drawing does not reveal any potential structural stability problems.

c. Operating Records

There are no operating records presently kept or available. There are no records or reports of any operational problems which would effect the stability of the dam.

d. Post-Construction Changes

There are no reported post-construction changes to the dam or appurtenant structures. There was however the addition of a metal box structure over the drop inlet spillway as described in Section 3. The addition of this metal box structure significantly reduces the spillway capacity and thus during flood conditions increases the potential for overtopping and failure of the dam.

e. Seismic Stability

In accordance with recommended Phase I guidelines, the dam is located in Seismic Risk Zone No. 1. However, based on past local seismic experience, the New York State Geological Survey recommended that the damsite is to be considered in Zone 2.

SECTION 7 - ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

Examination of the available documents and visual inspections of the Lake Casse Dam and appurtenant structures did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action.

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that with the steel box cover in place that the dam would be overtopped for all storms exceeding approximately 28 percent of the PMF. The overtopping of the dam could cause the erosion of the abutments and the downstream face of the dam resulting in dam failure, thus significantly increasing the hazard for loss of life downstream. The spillway is therefore adjudged as "seriously inadequate" and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a "seriously inadequate" spillway is not meant to connote 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, that with the steel box cover in place, 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.

b. Adequacy of Information

The report and its conclusions are based on a visual inspection, interview data, contract drawings, and office hydrologic and hydraulic studies. This information and data are adequate for a Phase I inspection.

c. Need for Additional Investigations

Since the spillway is considered to be "seriously inadequate" with the metal box cover in place, additional hydrologic/

hydraulic investigations are required to more accurately determine the site specific characteristics of the watershed. After the in-depth hydrologic/hydraulic investigations have been completed, remedial measures must be initiated to provide spillway capacity sufficient to discharge the outflow from the one-half (1/2) PMF event.

In addition, as described in Section 3.2, an investigation should be carried out to study the low level outlet discharge conditions and to carry out the appropriate remedial measures.

d. Urgency

The additional hydrologic/hydraulic investigations which are required must be initiated within 3 months from the date of notification. Within 12 months of notification, remedial measures as a result of these investigations must be initiated, with completion of these measures during the following year. In the interim, develop an emergency action plan for the notification of downstream residents and proper governmental authorities in the event of overtopping, and provide around-the-clock surveillance of the dam during periods of extreme runoff. The other problem areas listed below must be corrected within one year from notification.

7.2 RECOMMENDED MEASURES

Recommended measures are as follows:

1. The steel box cover which has been placed over the drop inlet should be removed and replaced by an appropriate trash rack structure which will provide maximum spillway capacity.
2. All brush, saplings and debris should be removed from the downstream slope. All coniferous trees should be removed, while larger hardwood trees should not be removed but should be inventoried and their condition monitored. If a tree dies, the area around the tree should then be monitored for possible seepage. A program of periodic mowing and cutting should be provided.

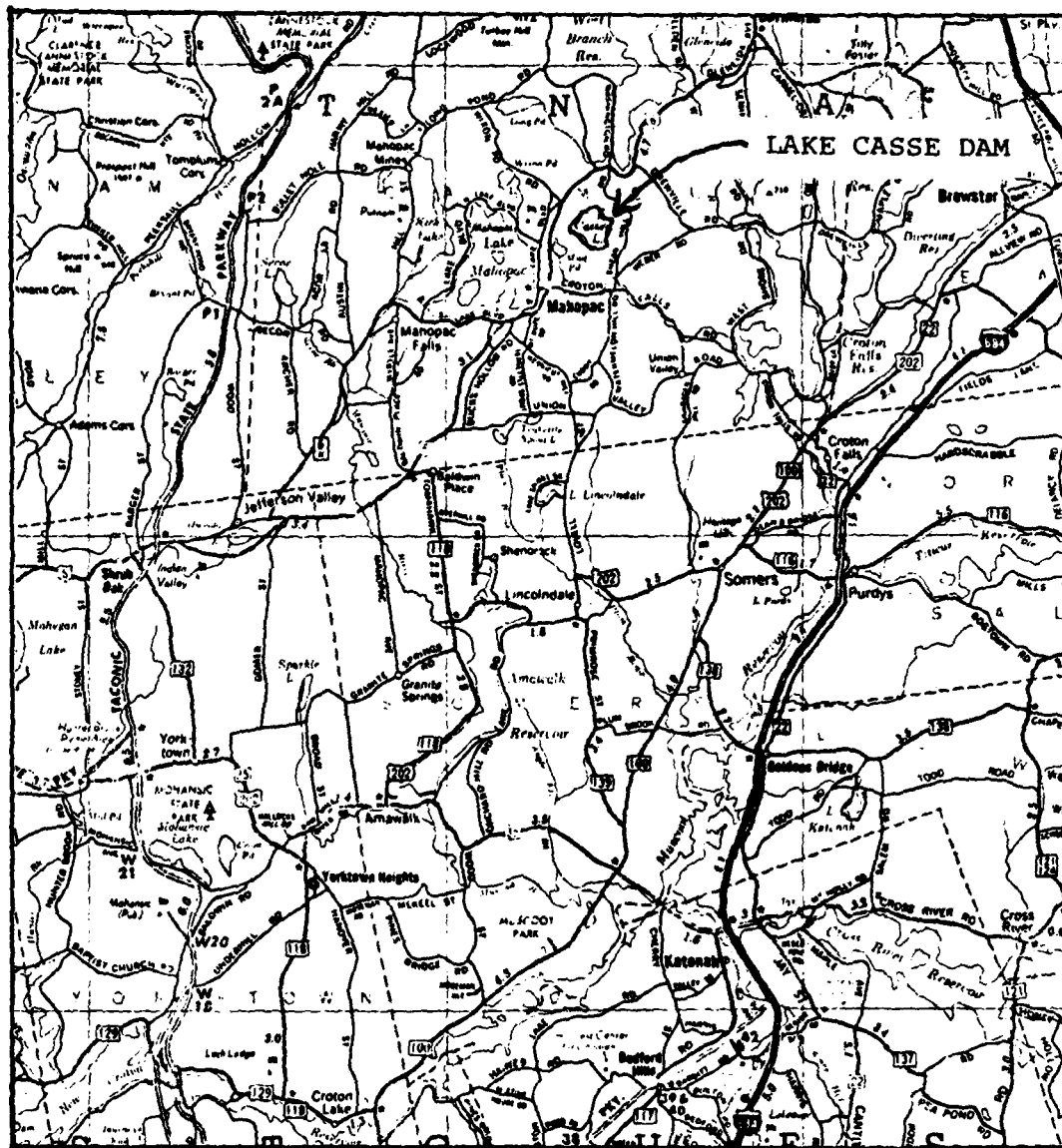
3. The local erosion on the upstream face should be repaired by regrading the area. Slope protection should then be provided to prevent a reoccurrence of the erosion.

4. A program of periodic inspection and maintenance of the dam and appurtenances including yearly test operation and lubrication of the reservoir outlet system should be provided. The results of the inspection and test operation should be documented for future reference. The emergency action plan described in Section 7.1d should be maintained and updated periodically during the life of the structure.

DRAWINGS

- a. Vicinity Map
- b. Topographic Map
- c. Plan Sections and Details

APPENDIX A



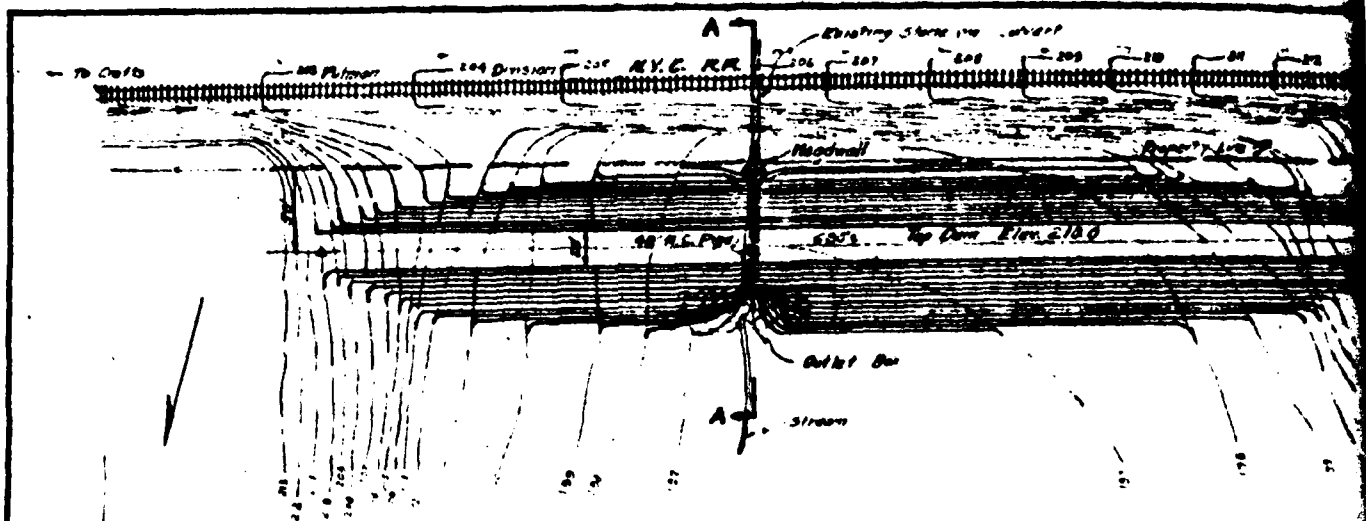
Scale: 1"=2.2 Miles

LAKE CASSE DAM
VICINITY MAP

1



TOPOGRAPHIC MAP
LAKE CASSE DAM



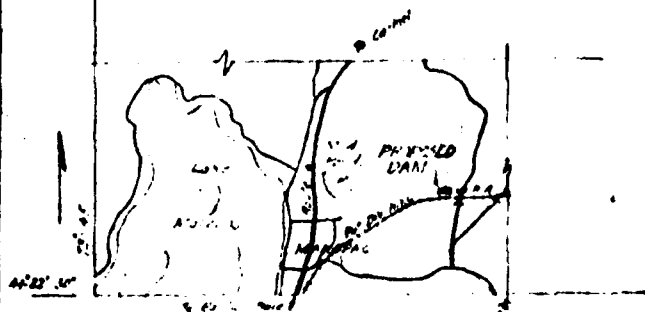
GENERAL PLAN
Scale 1"=50'

LEGEND

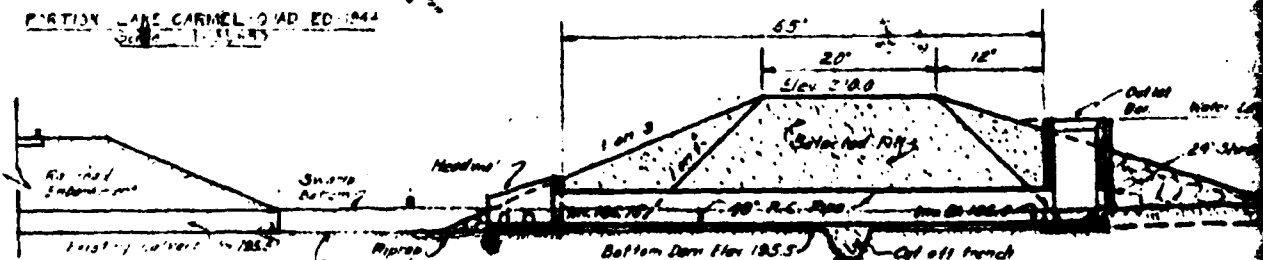
Existing Structure
Proposed Structure

Notes

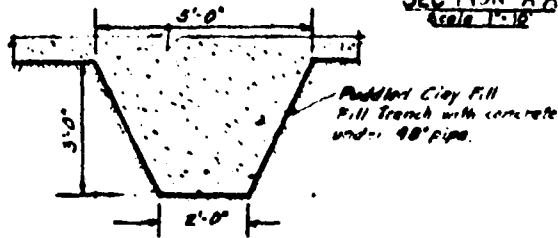
1. Entire dam site to be cleared.
2. Selected fill to be a mixture of 20% of which are particles 1/4" or less and 80% of which are particles 1/4" or more.
3. R.C.P. to be reinforced with 4" x 6" bars.
4. Outlet gate to be well maintained for 20' working pressure.
5. R.C.P. to be full marks or less.
6. Cut off trench to extend east.



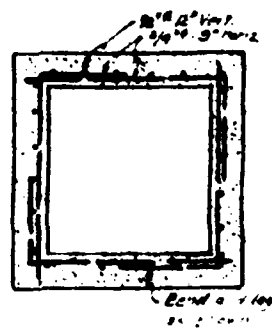
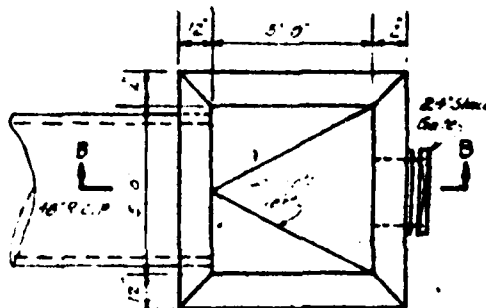
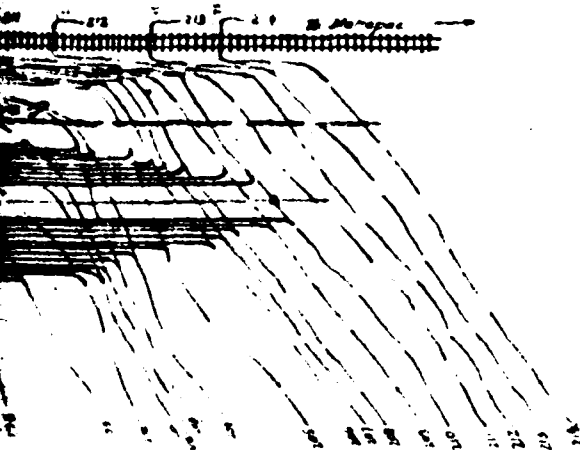
PARTIAL MAP OF CARMEL QUAD ED 144
Scale 1"=1/2 MI



SECTION AA
Scale 1"=10'

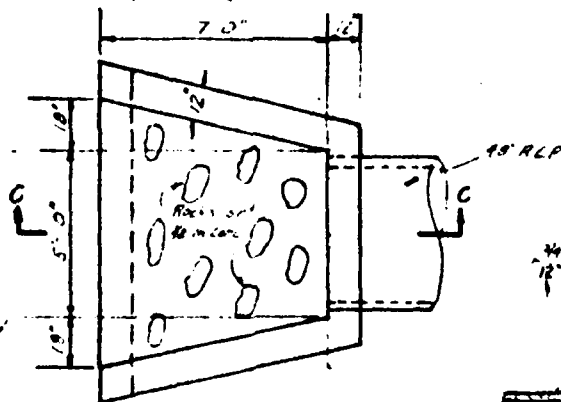


CUTOFF TRENCH
Scale 1"=1'-0"

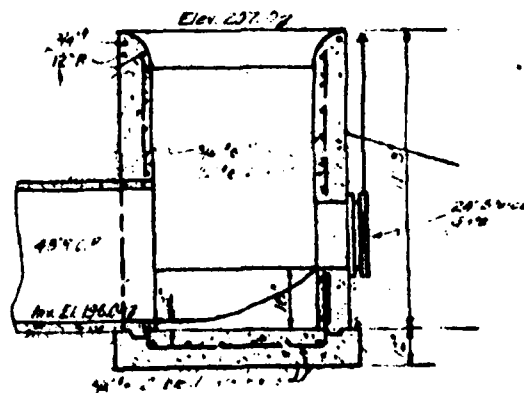


PLAN

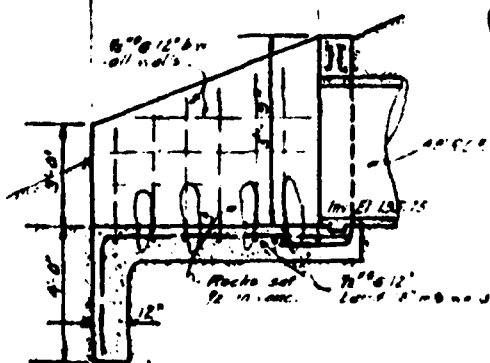
SECTIONAL PLAN



PLAN



SECTION B-B
OUTLET BOX
Scale 1/4" = 1'-0"



SECTION C-C
HEADWALL
Scale 1/4" = 1'-0"

DAM ON PROPERTY OF
LOUIS CASAGRANDE -
MANHATTAN TOWN OF CARMEL
PUTMAN CO. N.Y.
Scale As Noted May 1939

PHOTOGRAPHS

APPENDIX B



2. VIEW ALONG CREST OF DAM FROM
RIGHT ABUTMENT



3. VIEW OF DOWNSTREAM FACE OF DAM



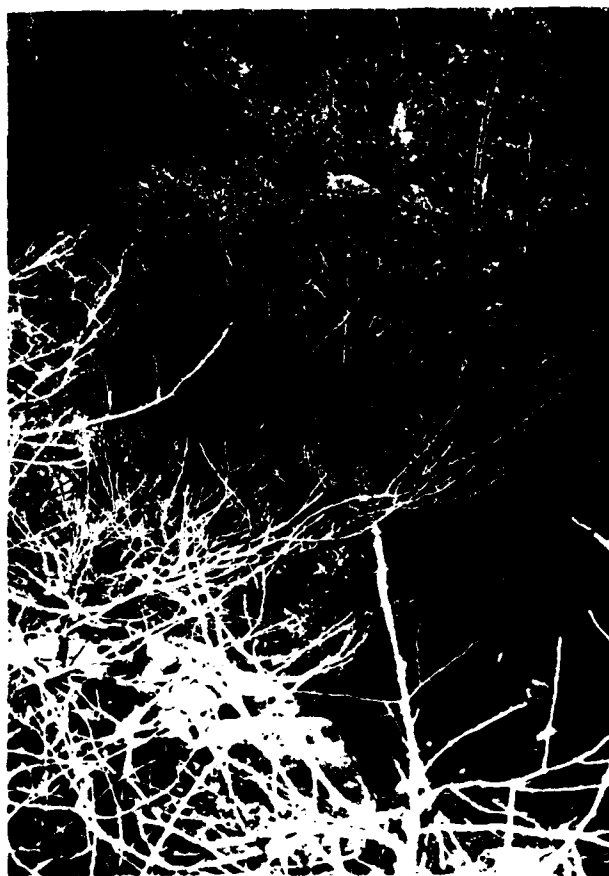
4. VIEW OF UPSTREAM FACE OF DAM



5. CLOSEUP OF UPSTREAM FACE OF DAM



6. DROP INLET SPILLWAY/OUTLET STRUCTURE



7. CONCRETE
OUTLET
PIPE



8. CLOSEUP OF OUTLET PIPE



9. DISCHARGE
CHANNEL
50 FEET DOWN-
STREAM OF OUT-
LET PIPE

VISUAL INSPECTION CHECKLIST

APPENDIX C

VISUAL INSPECTION CHECKLIST

Basic Data

a. General

Name of Dam Long Pond Dam No. 3
 Fed. I.D. # NY00115 DEC Dam No. 1
 River Basin Mianus River
 Location: Town NORTH CASTLE County Westchester
 Stream Name UNNAMED DRAINAGE
 Tributary of MIANUS RIVER
 Latitude (N) 41-08.5 Longitude (W) 073-40.4
 Type of Dam EARTH AND ROCK FILL
 Hazard Category HIGH (1)
 Date(s) of Inspection 9 June 1981
 Weather Conditions OVERCAST & INTERMITTENT SHOWERS
 Reservoir Level at Time of Inspection 470.5' (ESTIMATED BASED ON USGS MAP)

b. Inspection Personnel HARVEY FELDMAN - Principal Geotechnical Eng.
John F. Wallace - Geotechnical Engineer

c. Persons Contacted (Including Address & Phone No.) MR. K. KARL MUELLER
Long Pond Ct., Windmill Farms, Armonk, N.Y. 10504
(914)-273-8074

d. History:

Date Constructed UNKNOWN (CIRCA 1935) Date(s) Reconstructed —
 Designer ELWYNE E. SEELEY & CO., CONSULTING ENGINEERS, N.Y., N.Y.
 Constructed By UNKNOWN
 Owner MR. K. KARL MUELLER, Long Pond Ct. Armonk, N.Y.

2) Embankment

a. Characteristics

(1) Embankment Material EARTH AND ROCK FILL

(2) Cutoff Type NONE KNOWN TO EXIST

(3) Impervious Core NONE KNOWN TO EXIST

(4) Internal Drainage System NONE KNOWN TO EXIST

(5) Miscellaneous _____

b. Crest

(1) Vertical Alignment GOOD

(2) Horizontal Alignment GOOD

(3) Surface Cracks NONE

(4) Miscellaneous _____

c. Upstream Slope

(1) Slope (Estimate) (V:H) 1V:5H to 1V:6H

(2) Undesirable Growth or Debris, Animal Burrows NUMEROUS BURLS
OCCASIONAL SMALL (smaller than 8" diam) deciduous trees

(3) Sloughing, Subsidence or Depressions NONE observed

(4) Slope Protection NONE

(5) Surface Cracks or Movement at Toe NONE observed

d. Downstream Slope

(1) Slope (Estimate - V:H) BROKEN SLOPE 1V:1.5H to 1V:2.0H w/ 20' bench 20' below crest
NEAR NORTH ABUTMENT SPILLWAY CHANNEL APPROX 10' W

(2) Undesirable Growth or Debris, Animal Burrows NUMEROUS MIDDLE

AGE (8" to 18" diameter) deciduous trees - bushes & herbs AT CREST

(3) Sloughing, Subsidence or Depressions NONE observed

(4) Surface Cracks or Movement at Toe NONE

(5) Seepage SEEPAGE AT MID SLOPE OF SOUTH ABUTMENT - SEEPAGE
FLOW ESTIMATED to be 5 to 7 gpm. NO SOIL EROSION

(6) External Drainage System (Ditches, Trenches; Blanket) Spillway
CHANNEL LOCATED ON DOWNSTREAM SLOPE NEAR EAST ABUTMENT

(7) Condition Around Outlet Structure SCORE UNDER CRISTING OF SPILLWAY
SLAB

(8) Seepage Beyond Toe NONE observed

e. Abutments - Embankment Contact

SEEPAGE AT CONTACT OF SOUTH ABUTMENT NEAR MIDPOINT of slope

(1) Erosion at Contact NONE

(2) Seepage Along Contact AT MIDPOINT OF WEST ABUTMENT -

QUANTITY EST BE BE 5 & 7 gpm

3) Drainage System

a. Description of System NONE

b. Condition of System N/A

c. Discharge from Drainage System N/A

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.) NONE OBSERVED

Reservoir

- a. Slopes Appear to be generally stable - no signs of
sloughing or instability in vicinity of Dam or South shoreline
- b. Sedimentation NONE
- c. Unusual Conditions Which Affect Dam LOCATION of NORTH Lake Dam
IMMEDIATELY DOWNSTREAM

6. Area Downstream of Dam

- a. Downstream Hazard (No. of Homes, Highways, etc.) SEVERAL RESIDENTIAL
HOME -
- b. Seepage, Unusual Growth NONE
- c. Evidence of Movement Beyond Toe of Dam NONE
- d. Condition of Downstream Channel NATURAL SWAIL WITH FEW TREES
OTHERWISE GOOD

7. Spillway(s) (Including Discharge Conveyance Channel)

- a. General RECTANGULAR REINFORCED BOX CULVERT LOCATED
AT NORTH END OF DAM - 4' high by 6' wide SECTION 54' in
length including approach AND discharge SLABS - Walls are
1 ft thick with
- b. Condition of Service Spillway SOME SPALLING OF TENING WALLS AND
APPROACH EDGES - BOTTOM SLAB ON DOWNSTREAM END IS
CRACKED AND PARTIALLY SEPARATED APPROXIMATELY 3-5 FEET
FROM END. SOME UNDER CUTTING AT SLAB SUPPORT
HAS RESULTED

c. Condition of Auxiliary Spillway Roadway Embankment located on
South end of lake may have crest elevation not two feet
lower than the embankment crest and therefore could function
as a secondary spillway under part flood (PIF) conditions
Present Condition is good - good supports in high water and no

d. Condition of Discharge Conveyance Channel Channel Section on
Downstream Dam Face. Heavily covered with durable massive
boulders - no significant erosion - Section beyond toe
in natural channel - relatively clear except for occasional
deciduous trees - good condition

8) Reservoir Drain/Outlet

Type: Pipe UNKNOWN Conduit Other

Material: Concrete UNKNOWN Metal Other

Size: UNKNOWN Length UNKNOWN

Invert Elevations: Entrance UNKNOWN Exit UNKNOWN

Physical Condition (Describe): Unobservable X

Material: UNKNOWN

Joints: Alignment

Structural Integrity: UNKNOWN

Hydraulic Capability: UNKNOWN

Means of Control: Gate ? Valve ? Uncontrolled

Operation: Operable Inoperable Other UNKNOWN

Present Condition (Describe): Outlet downstream of dam is presumably
buried under several large boulders - gate house is situated in Roseauire
and was inaccessible

9) Structural

a. Concrete Surfaces

SEE ITEM 7 Spillway

b. Structural Cracking

SEE ITEM 7b

c. Movement - Horizontal & Vertical Alignment (Settlement)

SEE ITEM 7b

d. Junctions with Abutments or Embankments

Spillway junctions with

DAM ARE GOOD WITH THE EXCEPTION OF THE DOWNSTREAM TO
THE BOTTOM SLAB - UNDERSTANDING FOR GRADE MODERATE
EROSION TO OCCUR

e. Drains - Foundation, Joint, Face

NONE OBSERVED

f. Water Passages, Conduits, Sluices

SEE ITEM 7

g. Seepage or Leakage

Leakage below downstream spillway

channel slab through cut and separation located

4 to 6 feet upstream of downstream seal

h. Joints - Construction, etc. None observed

i. Foundation

j. Abutments

k. Control Gates NONE

l. Approach & Outlet Channels see IPI 7B

m. Energy Dissipators (Plunge Pool, etc.) NONE

n. Intake Structures NOT OBSERVED

o. Stability GOOD

p. Miscellaneous

10) Appurtenant Structures (Powerhouse, Lock, Gatehouse, Other)

a. Description and Condition

see item 7 Spillway

NO OTHER APPURTENANT STRUCTURES
WERE OBSERVED

HYDROLOGIC DATA AND COMPUTATIONS

APPENDIX D

LONG POND DAM #3.

CHECK LIST FOR DAMS HYDROLOGIC AND HYDRAULIC ENGINEERING DATA

1

AREA-CAPACITY DATA:

	<u>Elevation *</u> (ft.)	<u>Surface Area</u> (acres)	<u>Storage Capacity</u> (acre-ft.)
1) Top of Dam	<u>476</u>	<u>11.28</u>	<u>173.6</u>
2) Design High Water (Max. Design Pool)	<u>Unknown</u>	<u> </u>	<u> </u>
3) Auxiliary Spillway Crest	<u>475*</u> <u>Low highway embankment</u>	<u> </u>	<u> </u>
4) Pool Level with Flashboards	<u> </u>	<u> </u>	<u> </u>
5) Service Spillway Crest	<u>470</u>	<u>8.26</u>	<u>715</u>

DISCHARGES

	<u>Volume</u> (cfs)
1) Average Daily	<u>UNKNOWN</u>
2) Spillway @ Maximum High Water	<u>222</u>
3) Spillway @ Design High Water	<u>UNKNOWN</u>
4) Spillway @ Auxiliary Spillway Crest Elevation	<u>UNKNOWN</u>
5) Low Level Outlet	<u>UNKNOWN</u>
6) Total (of all facilities) @ Maximum High Water	<u>222±</u>
7) Maximum Known Flood	<u>UNKNOWN</u>
8) At Time of Inspection	<u>UNKNOWN</u>

* All ELEVATIONS ARE BASED ON POND LEVEL DATUM
RELATIVE TO AN ELEVATION INTERPOLATED FROM THE 1955 HOUSTON LAKE, NY.
QUAD SHEET.

Embarkment
CREST:

ELEVATION: 476

Type: Embankment Road Sill

Width: 34' Length: 365'

Spillover NONE

Location

SPILLWAY:

SERVICE

AUXILIARY

470'

INVERT

Elevation

4'0" H X 6'0" W box culvert

Type

Approx 54.0' in length

Width

Type of Control

☒ Uncontrolled

Controlled:

Type

(Flashboards; gate)

Number

Size/Length

Invert Material

Anticipated Length
of operating service

Chute Length

Height Between Spillway Crest
& Approach Channel Invert
(Weir Flow)

HYDROMETEOROLOGICAL GAGES:

NONE USED

Type : _____

Location: _____

Records:

Date - _____

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: _____

NONE

Method of Controlled Releases (mechanisms):

gate valve on Reservoir Drain

DRAINAGE AREA: _____

0.52 SQ MI

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: WOODS - SMALL FARMSTerrain - Relief: HillySurface - Soil: GLACIAL TILLRunoff Potential (existing or planned extensive alterations to existing
(surface or subsurface conditions)None observed

Potential Sedimentation problem areas (natural or man-made; present or future)

NonePotential Backwater problem areas for levels at maximum storage capacity
including surcharge storage:NoneDikes - Floodwalls (overflow & non-overflow) - Low reaches along the
Reservoir perimeter:

Location: _____

Elevation: _____

Reservoir:

Length @ Maximum Pool 0.096 (NORMAL) to Dam ALIQUOT (Miles)Length of Shoreline (@ Spillway Crest) 0.74 mi (Miles)

TAMS

Job No. 1579-10 Sheet 1 of 85
 Project LONG POND DAM No 3 Date JUNE 18, 81
 Subject HYDROLOGIC/HYDRAULIC COMPUTATIONS By LKC
HYDROLOGIC UNIT CODE No 01100006 Ch'k. by _____

ASSUME:

1. BASIN UPSTREAM OF WINDMILL LAKE IS COMPLETELY CONTROLLED & WILL NOT CONTRIBUTE TO LONG POND INFLOW
 2. FOR ANALYSIS BASIN IS DIVIDED INTO 3 SUB-AREAS
 - (1) North Lake sub-area
 - (2) Sub-area - 1 downstream of North Lake.
 - (3) Sub-area - 2 West of Long Pond extending to Windmill Lake
- TOTAL AREA = 0.46 SQ MILES.

SUB-AREA 1 (59.2 ac = 0.09 mi²)

$$L = 1400' = 0.36 \text{ miles}$$

$$L_{CA} = 400' = 0.076 \text{ miles}$$

$$\text{USE } C_T = 2 \text{ \& } 640 C_p = 400 \quad C_p = 0.625$$

$$t_p = 2 (.36 \times 0.076)^{.75} = 0.68 \text{ hrs}$$

$$t_n = 0.68 / 5.5 = 0.12 \text{ hrs}$$

$$\text{FOR } t_R = 0.33 \text{ hrs}$$

$$t_{PR} = t_p + 0.75(0.33 - 0.12) = 0.73 \text{ hours}$$

$$\% \text{ impervious } 413/59.2 = 0.07$$

SUB-AREA 2 (67.5 acres = 0.11 mi²)

$$L = 1600' = 0.3 \text{ mile}$$

$$L_{CA} = 600' = 0.11 \text{ mile}$$

$$\text{USE } C_T = 2 \text{ \& } 640 C_p = 400$$

$$t_p = 2 (0.3 \times 0.11)^{.75} = 0.72 \text{ hrs}$$

$$t_n = 0.72 / 5.5 = 0.13 \text{ hrs}$$

TAMS

Job No. 1579-10

Sheet 2 of 55

Project LONG POND DAM #3

Date 7-11-51

Subject HYDROLOGIC/HYDRAULIC COMPUTATIONS

By DLC

Ch'k. by _____

SUB AREA 2 CONT

% impervious $\frac{4.13}{67.5} = 0.06$

$$t_{PR} = t_p + 0.25(t_R - t_n)$$

For $t_R = 0.33$ hrs

$$t_{PR} = 0.72 + 0.25(0.33 - 0.13) = 0.77 \text{ hours}$$

NORTH LAKE Sub-basin. (from North Lake DAM #3)
(PHASE 1 REPORT)

$$t_{PR} = 0.98 \text{ hrs}$$

$$t_R = 0.33 \text{ hrs}$$

TAMS

Job No. 1579-10

Sheet 3 of 85

Project LONG POINT DAM No 3

Date June 18, 81

Subject HYDROLOGIC / HYDRAULIC Computations

By D.L.C.

Ch'k. by J.M.D.

SPILLWAY RATING INVERT EL. 410.

USE MANNING FORMULA for depth (d) = 1, 2, 3.5

	$Q = \frac{1.49}{n} AR^{2/3} S^{1/2}$					$S = 0.0025$
d	$\frac{1.49}{n}$	A	P	$R^{2/3}$	$S^{1/2}$	h = 0.015
1	99.3	6	8	.75	.05	24.6
2		12	10	1.2	.083	67.3
3.5		21	13	1.6	.085	142.6

H/d	H	Q/b	Q ₁	(See attached chart, Open-Channel Hydraulics - Chow)
0.3	1.2	4	24	471.2
0.5	2.0	8.8	53	472
1.0	4	25	150	474
1.25	5	30	180	475
1.375	5.5	33.5	201	475.5
1.5	6	37	222	476
2.0	8	45	270	478
2.5	10	53	318	480

498

RAPIDLY VARIED FLOW

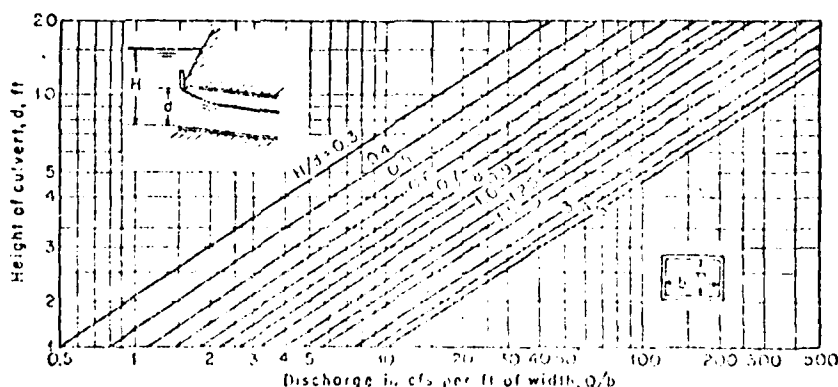


FIG. 17-29. Chart for estimating headwater on box culverts with square-edged entrances, flowing partly full. (Based on data of U.S. Bureau of Public Roads [20].)

TAMS

Job No. 1579-10

Sheet 4 of 35

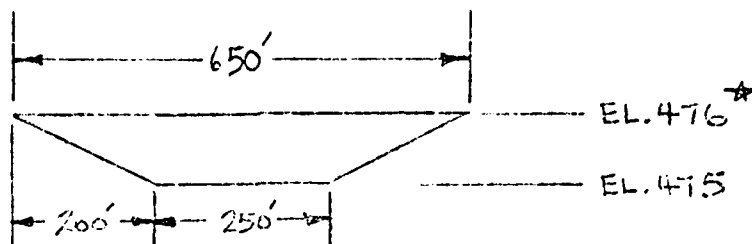
Project Lower Pond Dam No. 3

Date 6/25/21

Subject LOW SPOT IN RETENTION WHICH ACTS AS
SECONDARY SPILLWAY - DISCHARGE VS. ELEVATION

By JHC & DLC

Ch'k. by _____



ASSUME: $n=0.025$ (LAWN & ROADWAY SURFACES)
 $S=0.001 \Rightarrow S^{1/2} = 0.032$

ELEV. (ft.)	A (ft ²)	P (ft)	R (ft)	$R^{2/3}$ (ft ^{2/3})	$Q = \frac{1.49}{n} A R^{2/3} S^{1/2} = 1.9072 A R^{2/3}$ (cfs)
475					0
475.5	175	450	0.39	0.53	177
476	450	650	0.69	0.78	669
478	1750	654	2.68	1.93	6433

* ABOVE EL. 476, THE SPILLWAY WIDTH WILL REMAIN AT 650 FT.

NORTH LAKE (ID # 113) - STORAGE:

ELEVATION	ΔH	AREA AC.	MEAN AREA AC.	Δ VOL AC-FT	STORAGE AC-FT
572		21.6			210
574	2	21.9	22.25	44.5	254.5
575	1	23.6	23.25	23.25	277.75
577	2	25.0	24.3	48.6	326.35
580	3	27.1	26.05	75.15	401.5

TAMS

Job No. 1579-10

Sheet 5 of ES

Project Longhorn Lake No. 3

Date 7-1-54

Subject Hydrologic, Flood Control

By DLS

Ch'k. by _____

LONG POND - SPILLWAY

Discharge Q_{100}

(PRIMARY SPILLWAY)

(SE Corner of Lake)
Flow over Low Spot

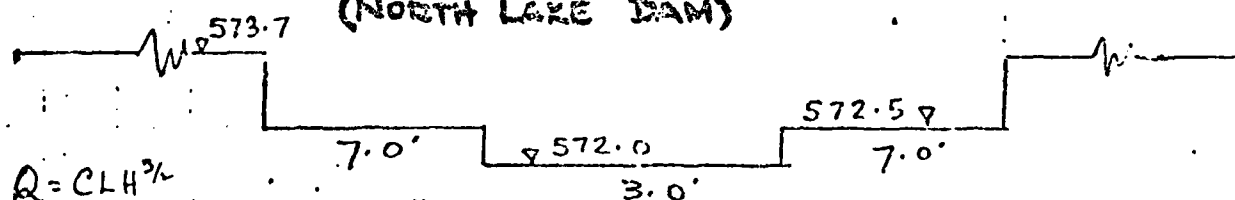
Q_2

TOTAL

Q_T

470	0	0	0
471.2	24	0	24
472.	53	0	53
474.	150	0	150
475	180	0	180
475.5	201	177	378
476	222	669	891
478	270	6433	6703
4 Y4			4 Y5

SPILLWAY DISCHARGE CAPACITY (NORTH LAKE DAM) BREADTH $\approx 60'$



EL.	L	H	C	Q_1 (CFS)	L	H	C	Q_2	Q_T
572	3	0	0		0		0		0
573	3	1	2.68	8	14	0.5	2.6	12.9	20.9
573.75	3	1.75	2.65	18.4	14	1.25	2.66	52.0	70.4
575	3	3	2.66	41.5	14	2.5	2.67	147.8	189.3

TAMS

Job No. 1579-10

Project LONG POND DAM No 3

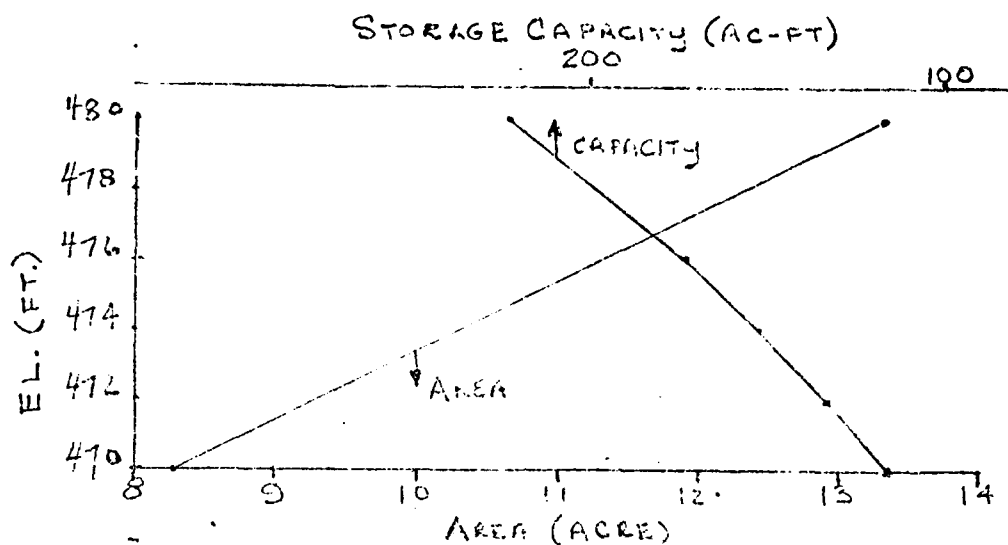
Subject HYDROLOGIC / HYDRAULIC COMPUTATION

Sheet 6 of 85

Date JUNE 19

By D-C

Ch'k. by

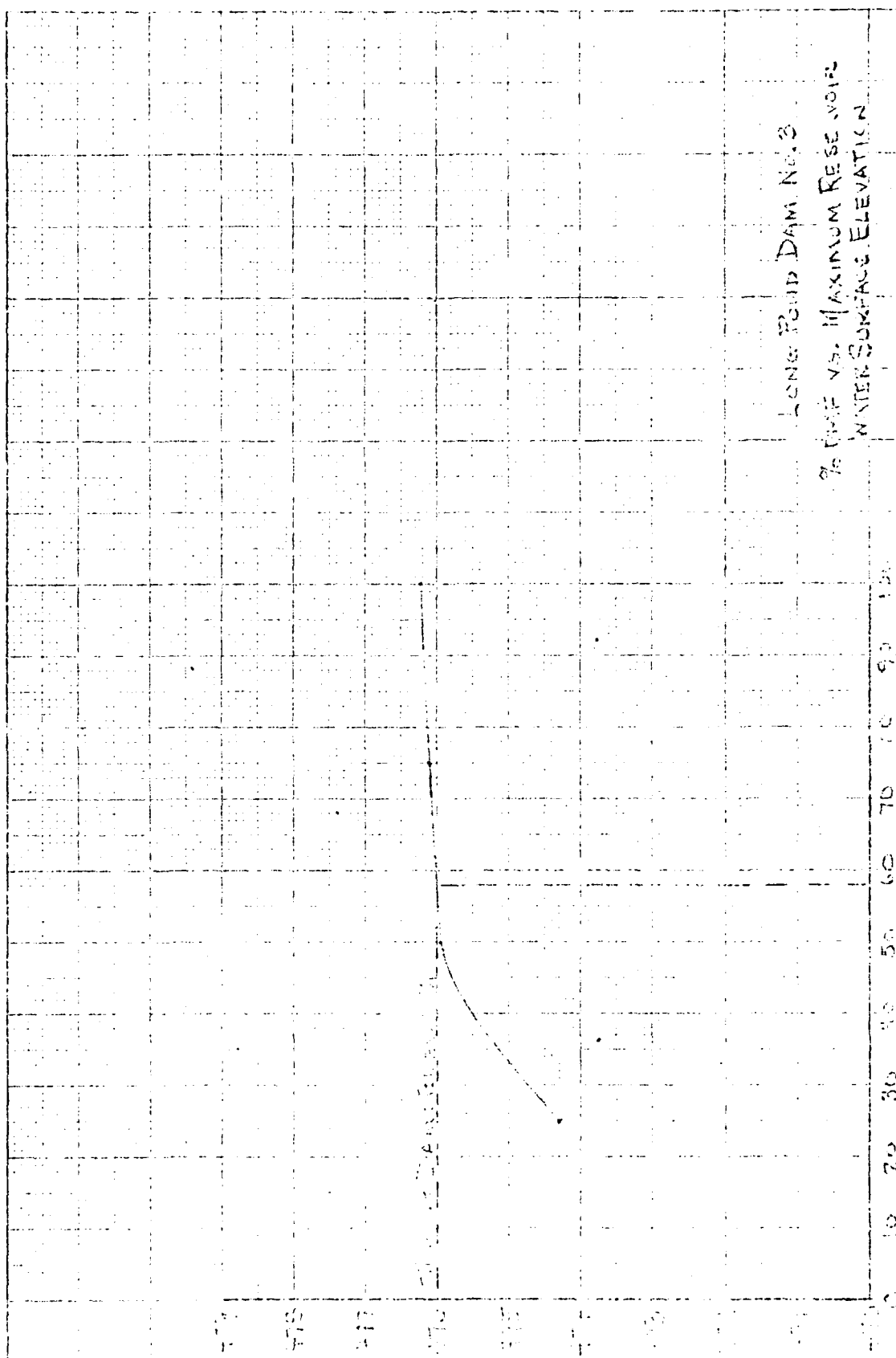


EL	ΔH	AREA	MEAN AREA	Δ VOL	STORAGE
470		8.26			115*
472	2	9.27	8.765	17.53	132.5
474	2	10.28	9.775	19.55	152.1
476	2	11.28	10.78	21.56	173.6
480	4	13.3	12.29	49.16	222.8

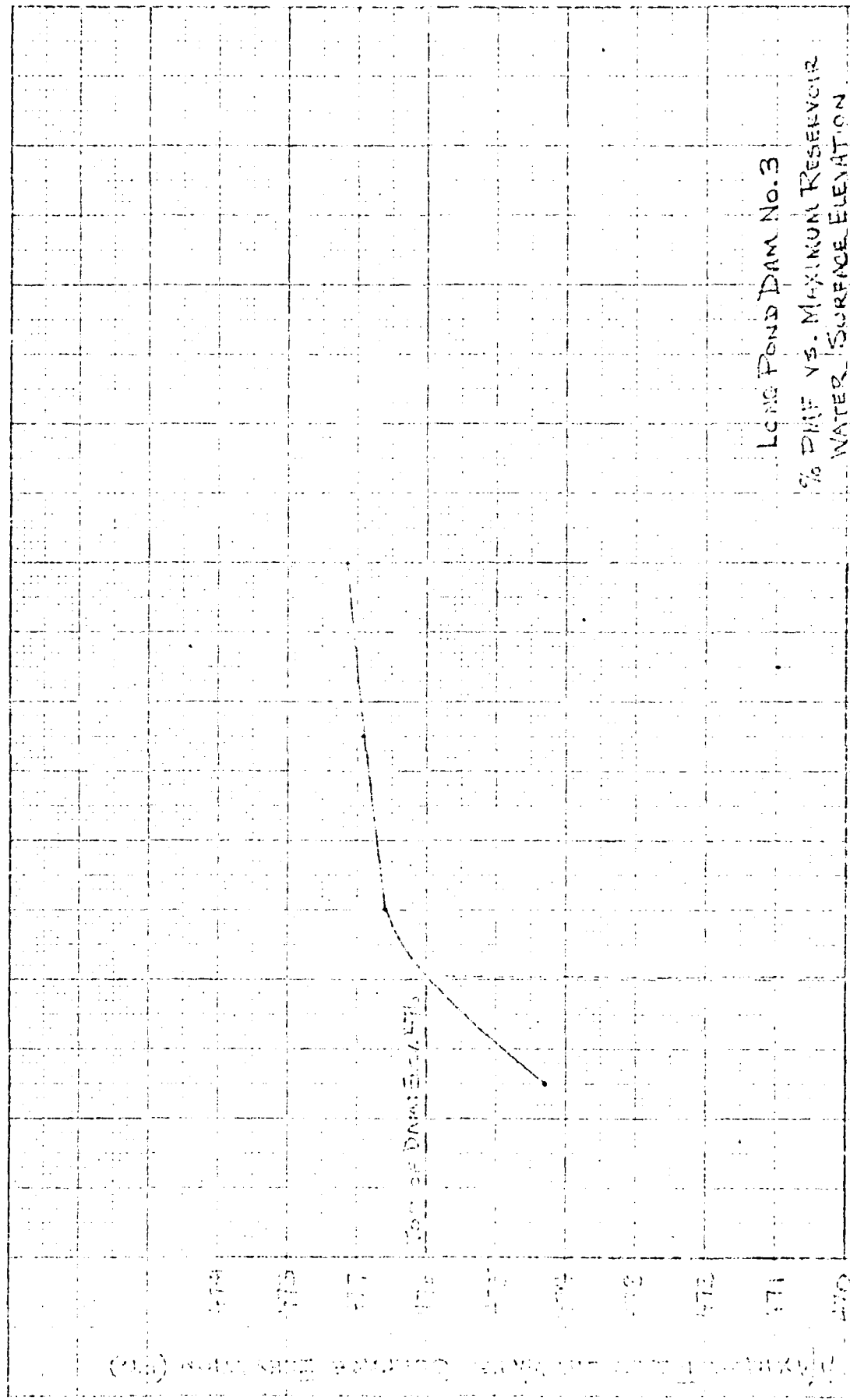
LONG FORD DAM NO. 3

% PMF VS. MAXIMUM RESE VOIR
WATER SURFACE ELEVATION

(NOTE: NATURAL DEPRESSION INCLUDED
IN DISCHARGE CALCULATIONS)



(11) DISCHARGE AT 75% PMF VS. WATER SURFACE ELEVATION



% PMF

(NOTE: NATURAL DEPRESSION NOT INCLUDED)

AS-1

FLOOD HYDROGRAPH PACKAGE (HEC-1)
 SAN JUAN COUNTY VERMONT JULY 1978
 LAR JEFFREY

LONG POND DAM NO 2									
PHASE 1 SAFETY INSPECTION									
HEC 1 DB PNF ANALYSIS									
	A1	A2	B	C	D	E	F	G	H
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Sheet 1 of 1

10. ROUTE THROUGH LONG POND

ST	KT	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20	Y21	Y22	Y23	Y24	Y25	Y26	Y27	Y28	Y29	Y30	Y31	Y32	Y33	Y34	Y35	Y36	Y37	Y38	Y39	Y40	Y41	Y42	Y43	Y44	Y45	Y46	Y47	Y48	Y49	Y50	Y51	Y52	Y53	Y54	Y55	Y56	Y57	Y58	Y59	Y60	Y61	Y62	Y63	Y64	Y65	Y66	Y67	Y68	Y69	Y70	Y71	Y72	Y73	Y74	Y75	Y76	Y77	Y78	Y79	Y80	Y81	Y82	Y83	Y84	Y85	Y86	Y87	Y88	Y89	Y90	Y91	Y92	Y93	Y94	Y95	Y96	Y97	Y98	Y99	Y100	Y101	Y102	Y103	Y104	Y105	Y106	Y107	Y108	Y109	Y110	Y111	Y112	Y113	Y114	Y115	Y116	Y117	Y118	Y119	Y120	Y121	Y122	Y123	Y124	Y125	Y126	Y127	Y128	Y129	Y130	Y131	Y132	Y133	Y134	Y135	Y136	Y137	Y138	Y139	Y140	Y141	Y142	Y143	Y144	Y145	Y146	Y147	Y148	Y149	Y150	Y151	Y152	Y153	Y154	Y155	Y156	Y157	Y158	Y159	Y160	Y161	Y162	Y163	Y164	Y165	Y166	Y167	Y168	Y169	Y170	Y171	Y172	Y173	Y174	Y175	Y176	Y177	Y178	Y179	Y180	Y181	Y182	Y183	Y184	Y185	Y186	Y187	Y188	Y189	Y190	Y191	Y192	Y193	Y194	Y195	Y196	Y197	Y198	Y199	Y200	Y201	Y202	Y203	Y204	Y205	Y206	Y207	Y208	Y209	Y210	Y211	Y212	Y213	Y214	Y215	Y216	Y217	Y218	Y219	Y220	Y221	Y222	Y223	Y224	Y225	Y226	Y227	Y228	Y229	Y230	Y231	Y232	Y233	Y234	Y235	Y236	Y237	Y238	Y239	Y240	Y241	Y242	Y243	Y244	Y245	Y246	Y247	Y248	Y249	Y250	Y251	Y252	Y253	Y254	Y255	Y256	Y257	Y258	Y259	Y260	Y261	Y262	Y263	Y264	Y265	Y266	Y267	Y268	Y269	Y270	Y271	Y272	Y273	Y274	Y275	Y276	Y277	Y278	Y279	Y280	Y281	Y282	Y283	Y284	Y285	Y286	Y287	Y288	Y289	Y290	Y291	Y292	Y293	Y294	Y295	Y296	Y297	Y298	Y299	Y300	Y301	Y302	Y303	Y304	Y305	Y306	Y307	Y308	Y309	Y310	Y311	Y312	Y313	Y314	Y315	Y316	Y317	Y318	Y319	Y320	Y321	Y322	Y323	Y324	Y325	Y326	Y327	Y328	Y329	Y330	Y331	Y332	Y333	Y334	Y335	Y336	Y337	Y338	Y339	Y340	Y341	Y342	Y343	Y344	Y345	Y346	Y347	Y348	Y349	Y350	Y351	Y352	Y353	Y354	Y355	Y356	Y357	Y358	Y359	Y360	Y361	Y362	Y363	Y364	Y365	Y366	Y367	Y368	Y369	Y370	Y371	Y372	Y373	Y374	Y375	Y376	Y377	Y378	Y379	Y380	Y381	Y382	Y383	Y384	Y385	Y386	Y387	Y388	Y389	Y390	Y391	Y392	Y393	Y394	Y395	Y396	Y397	Y398	Y399	Y400	Y401	Y402	Y403	Y404	Y405	Y406	Y407	Y408	Y409	Y410	Y411	Y412	Y413	Y414	Y415	Y416	Y417	Y418	Y419	Y420	Y421	Y422	Y423	Y424	Y425	Y426	Y427	Y428	Y429	Y430	Y431	Y432	Y433	Y434	Y435	Y436	Y437	Y438	Y439	Y440	Y441	Y442	Y443	Y444	Y445	Y446	Y447	Y448	Y449	Y450	Y451	Y452	Y453	Y454	Y455	Y456	Y457	Y458	Y459	Y460	Y461	Y462	Y463	Y464	Y465	Y466	Y467	Y468	Y469	Y470	Y471	Y472	Y473	Y474	Y475	Y476	Y477	Y478	Y479	Y480	Y481	Y482	Y483	Y484	Y485	Y486	Y487	Y488	Y489	Y490	Y491	Y492	Y493	Y494	Y495	Y496	Y497	Y498	Y499	Y500	Y501	Y502	Y503	Y504	Y505	Y506	Y507	Y508	Y509	Y510	Y511	Y512	Y513	Y514	Y515	Y516	Y517	Y518	Y519	Y520	Y521	Y522	Y523	Y524	Y525	Y526	Y527	Y528	Y529	Y530	Y531	Y532	Y533	Y534	Y535	Y536	Y537	Y538	Y539	Y540	Y541	Y542	Y543	Y544	Y545	Y546	Y547	Y548	Y549	Y550	Y551	Y552	Y553	Y554	Y555	Y556	Y557	Y558	Y559	Y560	Y561	Y562	Y563	Y564	Y565	Y566	Y567	Y568	Y569	Y570	Y571	Y572	Y573	Y574	Y575	Y576	Y577	Y578	Y579	Y580	Y581	Y582	Y583	Y584	Y585	Y586	Y587	Y588	Y589	Y590	Y591	Y592	Y593	Y594	Y595	Y596	Y597	Y598	Y599	Y600	Y601	Y602	Y603	Y604	Y605	Y606	Y607	Y608	Y609	Y610	Y611	Y612	Y613	Y614	Y615	Y616	Y617	Y618	Y619	Y620	Y621	Y622	Y623	Y624	Y625	Y626	Y627	Y628	Y629	Y630	Y631	Y632	Y633	Y634	Y635	Y636	Y637	Y638	Y639	Y640	Y641	Y642	Y643	Y644	Y645	Y646	Y647	Y648	Y649	Y650	Y651	Y652	Y653	Y654	Y655	Y656	Y657	Y658	Y659	Y660	Y661	Y662	Y663	Y664	Y665	Y666	Y667	Y668	Y669	Y670	Y671	Y672	Y673	Y674	Y675	Y676	Y677	Y678	Y679	Y680	Y681	Y682	Y683	Y684	Y685	Y686	Y687	Y688	Y689	Y690	Y691	Y692	Y693	Y694	Y695	Y696	Y697	Y698	Y699	Y700	Y701	Y702	Y703	Y704	Y705	Y706	Y707	Y708	Y709	Y710	Y711	Y712	Y713	Y714	Y715	Y716	Y717	Y718	Y719	Y720	Y721	Y722	Y723	Y724	Y725	Y726	Y727	Y728	Y729	Y730	Y731	Y732	Y733	Y734	Y735	Y736	Y737	Y738	Y739	Y740	Y741	Y742	Y743	Y744	Y745	Y746	Y747	Y748	Y749	Y750	Y751	Y752	Y753	Y754	Y755	Y756	Y757	Y758	Y759	Y760	Y761	Y762	Y763	Y764	Y765	Y766	Y767	Y768	Y769	Y770	Y771	Y772	Y773	Y774	Y775	Y776	Y777	Y778	Y779	Y780	Y781	Y782	Y783	Y784	Y785	Y786	Y787	Y788	Y789	Y790	Y791	Y792	Y793	Y794	Y795	Y796	Y797	Y798	Y799	Y800	Y801	Y802	Y803	Y804	Y805	Y806	Y807	Y808	Y809	Y810	Y811	Y812	Y813	Y814	Y815	Y816	Y817	Y818	Y819	Y820	Y821	Y822	Y823	Y824	Y825	Y826	Y827	Y828	Y829	Y830	Y831	Y832	Y833	Y834	Y835	Y836	Y837	Y838	Y839	Y840	Y841	Y842	Y843	Y844	Y845	Y846	Y847	Y848	Y849	Y850	Y851	Y852	Y853	Y854	Y855	Y856	Y857	Y858	Y859	Y860	Y861	Y862	Y863	Y864	Y865	Y866	Y867	Y868	Y869	Y870	Y871	Y872	Y873	Y874	Y875	Y876	Y877	Y878	Y879	Y880	Y881	Y882	Y883	Y884	Y885	Y886	Y887	Y888	Y889	Y890	Y891	Y892	Y893	Y894	Y895	Y896	Y897	Y898	Y899	Y900	Y901	Y902	Y903	Y904	Y905	Y906	Y907	Y908	Y909	Y910	Y911	Y912	Y913	Y914	Y915	Y916	Y917	Y918	Y919	Y920	Y921	Y922	Y923	Y924	Y925	Y926	Y927	Y928	Y929	Y930	Y931	Y932	Y933	Y934	Y935	Y936	Y937	Y938	Y939	Y940	Y941	Y942	Y943	Y944	Y945	Y946	Y947	Y948	Y949	Y950	Y951	Y952	Y953	Y954	Y955	Y956	Y957	Y958	Y959	Y960	Y961	Y962	Y963	Y964	Y965	Y966	Y967	Y968	Y969	Y970	Y971	Y972	Y973	Y974	Y975	Y976	Y977	Y978	Y979	Y980	Y981	Y982	Y983	Y984	Y985	Y986	Y987	Y988	Y989	Y990	Y991	Y992	Y993	Y994	Y995	Y996	Y997	Y998	Y999	Y1000	Y1001	Y1002	Y1003	Y1004	Y1005	Y1006	Y1007	Y1008	Y1009	Y1010	Y1011	Y1012	Y1013	Y1014	Y1015	Y1016	Y1017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PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	2
ROUTE HYDROGRAPH TO	3
RUNOFF HYDROGRAPH AT	2
COMBINE 2 HYDROGRAPHS AT	2
RUNOFF HYDROGRAPH AT	3
COMBINE 2 HYDROGRAPHS AT	3
ROUTE HYDROGRAPH TO	10
E.O. OF NETWORK	

.....
 FLOOD HYDROGRAPH PACKAGE (F-H-P)
 DAY SAFETY VERSION JULY 1975
 LAST MODIFICATION 03 APR 76

501 (471) 17/00/18
 11/11/124

 FLOOD HYDROGRAPH PACKAGE (HRC-1)
 SAN SAFETY VERSION JULY 1976
 LAST MODIFICATION 01 APR 80

PON DATE: 01/06/80
 TIME: 11:30:26

LONG POND DAM NO 3
 PHASE 1 SAFETY INSPECTION
 HEC 1 DP PMF ANALYSIS

JOB SPECIFICATION
 VC HRR NMIN IDAY IHR IMIN METRC IPLY IPRT NSTAN
 150 0 20 0 0 0 0 0 0 0
 JOPEL NWT LROPT TRACE
 5 0 0 0

MULTI-PLAN ANALYSIS TO BE PERFORMED
 NPLAN= 1 NRTIO= 4 LRTIO= 1

RTIOS= 1.00 .75 .50 .25

SU"-AREA RUNOFF COMPUTATION

1 NORTH LEFT BASIN RUN-OFF

ISTAG ICCMP IECON IIAPE JPLY JPRT INAME ISTAGE IAUO
 1 0 0 0 0 0 1 0 0

HYDROGRAPH DATA
 IMYIC IUNG TAPFA CMAP TRSDA TOSPC PATIO ISNOW ISAME LOCAL
 1 1 .26 0.00 0.00 .46 0.00 0.000 0 1 0

PRECIP DATA
 SPTF PMS R6 R12 P24 R48 R72 R96
 22.00 112.00 123.00 133.00 141.00 0.00 0.00

IASPC COMPUTED BY THE PROGRAM IS .870

LOSS DATA
 LROPT STPM OLTR RTIO LRAIN STEPS RTIO STOTL CNSTL ALSMX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 1.00 .10 0.00 .13

UNIT HYDROGRAPH DATA
 TPE .98 CPE .63 NTA= 0

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CF AND TP ARE: TCF= 3.63 AND R= 2.36 INTERVALS
 STETC= -1.00 DRESH= -1.10 RTIOCR= 1.50

UNIT HYDROGRAPH 15 END-OF-PERIOD ORDINATES, LAC= .97 HOURS, CPE= .62 VOL= 1.00
 12. 62. 101. 76. 50. 32. 21. 14. 9.
 6. 4. 2. 1.

Chart 12 of 25

NO. DA	PM-MX	PERIOD	RAIN	EXCS	LOSS	COMP Q	END-OF-PERIOD FLOW	NO. DA	HR-MN	PERIOD	PAIN	EXCS	LOSS	COMP Q
1.01	.20	1	.00	.00	.00	0.	1.02	1.20	76	.04	.01	.03	.03	3.
1.01	.40	2	.00	.00	.00	0.	1.22	1.40	77	.04	.01	.03	.03	4.
1.01	1.00	3	.00	.00	.00	0.	1.02	2.00	72	.04	.01	.03	.03	4.
1.01	1.40	4	.00	.00	.00	0.	1.02	2.20	70	.04	.01	.03	.03	5.
1.01	1.40	5	.00	.00	.00	0.	1.02	2.40	68	.04	.01	.03	.03	5.
1.01	1.40	6	.00	.00	.00	0.	1.02	2.60	67	.04	.01	.03	.03	5.
1.01	1.40	7	.00	.00	.00	0.	1.02	2.80	67	.04	.01	.03	.03	5.
1.01	1.40	8	.00	.00	.00	0.	1.02	3.00	67	.04	.01	.03	.03	5.

END-OF-PERIOD FLOW

NO.04	MS.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	YO-DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	1.20	1	.00	.00	.00	0	1.02	1.20	76	.04	.01	.03	3.
1.01	1.40	2	.00	.00	.00	0	1.02	1.40	77	.04	.01	.03	4.
1.01	1.00	3	.00	.00	.00	0	1.02	2.00	78	.04	.01	.03	4.
1.01	1.20	4	.00	.00	.00	0	1.02	2.20	79	.04	.01	.03	5.
1.01	1.40	5	.00	.00	.00	0	1.02	2.40	80	.04	.01	.03	5.
1.01	2.00	6	.00	.00	.00	0	1.02	3.00	81	.04	.01	.03	5.
1.01	2.20	7	.00	.00	.00	0	1.02	3.20	82	.04	.01	.03	5.
1.01	2.40	8	.00	.00	.00	0	1.02	3.40	83	.04	.01	.03	5.
1.01	3.00	9	.00	.00	.00	0	1.02	4.00	84	.04	.01	.03	5.
1.01	3.20	10	.00	.00	.00	0	1.02	4.20	85	.04	.01	.03	5.
1.01	3.40	11	.00	.00	.00	0	1.02	4.40	86	.04	.01	.03	5.
1.01	4.00	12	.00	.00	.00	0	1.02	5.00	87	.04	.01	.03	5.
1.01	4.20	13	.00	.00	.00	0	1.02	5.20	88	.04	.01	.03	5.
1.01	4.40	14	.00	.00	.00	0	1.02	5.40	89	.04	.01	.03	5.
1.01	5.00	15	.00	.00	.00	0	1.02	6.00	90	.04	.01	.03	5.
1.01	5.20	16	.00	.00	.00	0	1.02	6.20	91	.04	.01	.03	6.
1.01	5.40	17	.00	.00	.00	0	1.02	6.40	92	.04	.01	.03	11.
1.01	6.00	18	.00	.00	.00	0	1.02	7.00	93	.04	.01	.03	18.
1.01	6.20	19	.00	.00	.00	0	1.02	7.20	94	.04	.01	.03	25.
1.01	6.40	20	.00	.00	.00	0	1.02	7.40	95	.04	.01	.03	30.
1.01	7.00	21	.00	.00	.00	0	1.02	8.00	96	.04	.01	.03	33.
1.01	7.20	22	.00	.00	.00	0	1.02	8.20	97	.04	.01	.03	37.
1.01	7.40	23	.00	.00	.00	0	1.02	8.40	98	.04	.01	.03	37.
1.01	8.00	24	.00	.00	.00	0	1.02	9.00	99	.04	.01	.03	39.
1.01	8.20	25	.00	.00	.00	0	1.02	9.20	100	.04	.01	.03	39.
1.01	8.40	26	.00	.00	.00	0	1.02	9.40	101	.04	.01	.03	39.
1.01	9.00	27	.00	.00	.00	0	1.02	10.00	102	.04	.01	.03	39.
1.01	9.20	28	.00	.00	.00	0	1.02	10.20	103	.04	.01	.03	39.
1.01	9.40	29	.00	.00	.00	0	1.02	10.40	104	.04	.01	.03	39.
1.01	10.00	30	.00	.00	.00	0	1.02	11.00	105	.04	.01	.03	39.
1.01	10.20	31	.00	.00	.00	0	1.02	11.20	106	.04	.01	.03	39.
1.01	10.40	32	.00	.00	.00	0	1.02	11.40	107	.04	.01	.03	39.
1.01	11.00	33	.00	.00	.00	0	1.02	12.00	108	.04	.01	.03	39.
1.01	11.20	34	.00	.00	.00	0	1.02	12.20	109	.04	.01	.03	40.
1.01	11.40	35	.00	.00	.00	0	1.02	12.40	110	.04	.01	.03	43.
1.01	12.00	36	.00	.00	.00	0	1.02	13.00	111	.04	.01	.03	43.
1.01	12.20	37	.00	.00	.00	0	1.02	13.20	112	.04	.01	.03	43.
1.01	12.40	38	.00	.00	.00	0	1.02	13.40	113	.04	.01	.03	43.
1.01	13.00	39	.00	.00	.00	0	1.02	14.00	114	.04	.01	.03	43.
1.01	13.20	40	.00	.00	.00	0	1.02	14.20	115	.04	.01	.03	43.
1.01	13.40	41	.00	.00	.00	0	1.02	14.40	116	.04	.01	.03	43.
1.01	14.00	42	.00	.00	.00	0	1.02	15.00	117	.04	.01	.03	43.
1.01	14.20	43	.00	.00	.00	0	1.02	15.20	118	.04	.01	.03	43.
1.01	14.40	44	.00	.00	.00	0	1.02	15.40	119	.04	.01	.03	43.
1.01	15.00	45	.00	.00	.00	0	1.02	16.00	120	.04	.01	.03	43.
1.01	15.20	46	.00	.00	.00	0	1.02	16.20	121	.04	.01	.03	43.
1.01	15.40	47	.00	.00	.00	0	1.02	16.40	122	.04	.01	.03	43.
1.01	16.00	48	.00	.00	.00	0	1.02	17.00	123	.04	.01	.03	43.
1.01	16.20	49	.00	.00	.00	0	1.02	17.20	124	.04	.01	.03	43.
1.01	16.40	50	.00	.00	.00	0	1.02	17.40	125	.04	.01	.03	43.
1.01	17.00	51	.00	.00	.00	0	1.02	18.00	126	.04	.01	.03	43.
1.01	17.20	52	.00	.00	.00	0	1.02	18.20	127	.04	.01	.03	43.
1.01	17.40	53	.00	.00	.00	0	1.02	18.40	128	.04	.01	.03	43.
1.01	18.00	54	.00	.00	.00	0	1.02	19.00	129	.04	.01	.03	43.
1.01	18.20	55	.00	.00	.00	0	1.02	19.20	130	.04	.01	.03	43.
1.01	18.40	56	.00	.00	.00	0	1.02	19.40	131	.04	.01	.03	43.

That Bdf 35

1.01	19.00	57	.00	.00	.00	0	1.02	20.00	132	.04	.01	.03	92.
1.01	19.20	58	.00	.00	.00	0	1.02	20.20	133	.04	.01	.03	98.
1.01	19.40	59	.00	.00	.00	0	1.02	20.40	134	.04	.01	.03	85.
1.01	20.00	60	.00	.00	.00	0	1.02	21.00	135	.04	.01	.03	81.
1.01	20.20	61	.00	.00	.00	0	1.02	21.20	136	.04	.01	.03	78.
1.01	20.40	62	.00	.00	.00	0	1.02	21.40	137	.04	.01	.03	75.
1.01	21.00	63	.00	.00	.00	0	1.02	22.00	138	.04	.01	.03	72.
1.01	21.20	64	.00	.00	.00	0	1.02	22.20	139	.04	.01	.03	69.
1.01	21.40	65	.00	.00	.00	0	1.02	22.40	140	.04	.01	.03	66.

[illegible]

PLANK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
1	100	100	100	300
2	100	100	100	300
3	100	100	100	300
4	100	100	100	300
5	100	100	100	300
6	100	100	100	300
7	100	100	100	300
8	100	100	100	300
9	100	100	100	300
10	100	100	100	300
11	100	100	100	300
12	100	100	100	300
13	100	100	100	300
14	100	100	100	300
15	100	100	100	300
16	100	100	100	300
17	100	100	100	300
18	100	100	100	300
19	100	100	100	300
20	100	100	100	300
21	100	100	100	300
22	100	100	100	300
23	100	100	100	300
24	100	100	100	300
25	100	100	100	300
26	100	100	100	300
27	100	100	100	300
28	100	100	100	300
29	100	100	100	300
30	100	100	100	300
31	100	100	100	300
32	100	100	100	300
33	100	100	100	300
34	100	100	100	300
35	100	100	100	300
36	100	100	100	300
37	100	100	100	300
38	100	100	100	300
39	100	100	100	300
40	100	100	100	300
41	100	100	100	300
42	100	100	100	300
43	100	100	100	300
44	100	100	100	300
45	100	100	100	300
46	100	100	100	300
47	100	100	100	300
48	100	100	100	300
49	100	100	100	300
50	100	100	100	300
51	100	100	100	300
52	100	100	100	300
53	100	100	100	300
54	100	100	100	300
55	100	100	100	300
56	100	100	100	300
57	100	100	100	300
58	100	100	100	300
59	100	100	100	300
60	100	100	100	300
61	100	100	100	300
62	100	100	100	300
63	100	100	100	300
64	100	100	100	300
65	100	100	100	300
66	100	100	100	300
67	100	100	100	300
68	100	100	100	300
69	100	100	100	300
70	100	100	100	300
71	100	100	100	300
72	100	100	100	300
73	100	100	100	300
74	100	100	100	300
75	100	100	100	300
76	100	100	100	300
77	100	100	100	300
78	100	100	100	300
79	100	100	100	300
80				

CPS
CPS
INCHES
AC-FT
TIGUS CUM

MAXIMUM STORAGE = 30Y8015

MAXIMUM STAGE IS 477.0

CU?-AREA DIFF? COMPUTATION

2 SUB-AREA 1 RUN-OFF

INNOG	INUM	TARZ	STAP	TRSC	TRSC	RATIO	ISNO	ISME	LOCAL
1	1	1.0	0.00	46	0.00	0.000	0	1	0

RECEIVED DATA

TRSPC COMPUTED BY THE PROGRAM	22.00	YES
-----	3.00	YES

600

LOSS DATA									
LOSS	STUCK	CLIP	RIOT	FRAN	STICK	STILL	END	ALSY	RTIM
0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00

UNIT HYDROGRAPHIC DATA

10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100-101-102-103-104-105-106-107-108-109-110-111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000-1001-1002-1003-1004-1005-1006-1007-1008-1009-1010-1011-1012-1013-1014-1015-1016-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-1034-1035-1036-1037-1038-1039-1040-1041-1042-1043-1044

LOSS DATA
 LAFT STKR DLTK RTIDU ERIN STNKS RTICK STRIC CASTL ALSNV RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 1.00 0.00 .07

UNIT HYDROGRAPH DATA
 TDE .73 CPE .67 RTAE 0

RECESSION DATA
 STAGE -1.00 GRESNE -1.10 RTIME 1.50
 APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE 1C= 2.67 AND 6= 1.86 INTERVALS

UNIT HYDROGRAPH 12 END-OF-PERIOD ORIGINATES LAGE .73 HOURS, CPE .63, VOLE 1.00
 12 33. 19. 11. 6. 1.

WATER	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	END-OF-PERIOD FLOW	NO.DA	HR.MN	PERIOD	PAIN	EXCS	LOSS	COMP Q
1.00	1.00	1	1.00	.00	.03	0	1.02	1.02	1.00	76	.04	.01	.03	1
1.00	1.40	2	1.00	.00	.03	0	1.02	1.40	1.40	77	.04	.01	.03	1
1.00	1.80	3	1.00	.00	.03	0	1.02	1.80	1.80	78	.04	.01	.03	1
1.00	2.20	4	1.00	.00	.03	0	1.02	2.20	2.20	79	.04	.01	.03	1
1.00	2.60	5	1.00	.00	.03	0	1.02	2.60	2.60	80	.04	.01	.03	1
1.00	3.00	6	1.00	.00	.03	0	1.02	3.00	3.00	81	.04	.01	.03	1
1.00	3.40	7	1.00	.00	.03	0	1.02	3.40	3.40	82	.04	.01	.03	1
1.00	3.80	8	1.00	.00	.03	0	1.02	3.80	3.80	83	.04	.01	.03	1
1.00	4.20	9	1.00	.00	.03	0	1.02	4.20	4.20	84	.04	.01	.03	1
1.00	4.60	10	1.00	.00	.03	0	1.02	4.60	4.60	85	.04	.01	.03	1
1.00	5.00	11	1.00	.00	.03	0	1.02	5.00	5.00	86	.04	.01	.03	1
1.00	5.40	12	1.00	.00	.03	0	1.02	5.40	5.40	87	.04	.01	.03	1
1.00	5.80	13	1.00	.00	.03	0	1.02	5.80	5.80	88	.04	.01	.03	1
1.00	6.20	14	1.00	.00	.03	0	1.02	6.20	6.20	89	.04	.01	.03	1
1.00	6.60	15	1.00	.00	.03	0	1.02	6.60	6.60	90	.04	.01	.03	1
1.00	7.00	16	1.00	.00	.03	0	1.02	7.00	7.00	91	.04	.01	.03	1
1.00	7.40	17	1.00	.00	.03	0	1.02	7.40	7.40	92	.04	.01	.03	1
1.00	7.80	18	1.00	.00	.03	0	1.02	7.80	7.80	93	.04	.01	.03	1
1.00	8.20	19	1.00	.00	.03	0	1.02	8.20	8.20	94	.04	.01	.03	1
1.00	8.60	20	1.00	.00	.03	0	1.02	8.60	8.60	95	.04	.01	.03	1
1.00	9.00	21	1.00	.00	.03	0	1.02	9.00	9.00	96	.04	.01	.03	1
1.00	9.40	22	1.00	.00	.03	0	1.02	9.40	9.40	97	.04	.01	.03	1
1.00	9.80	23	1.00	.00	.03	0	1.02	9.80	9.80	98	.04	.01	.03	1
1.00	10.20	24	1.00	.00	.03	0	1.02	10.20	10.20	99	.04	.01	.03	1
1.00	10.60	25	1.00	.00	.03	0	1.02	10.60	10.60	100	.04	.01	.03	1
1.00	11.00	26	1.00	.00	.03	0	1.02	11.00	11.00	101	.04	.01	.03	1
1.00	11.40	27	1.00	.00	.03	0	1.02	11.40	11.40	102	.04	.01	.03	1
1.00	11.80	28	1.00	.00	.03	0	1.02	11.80	11.80	103	.04	.01	.03	1
1.00	12.20	29	1.00	.00	.03	0	1.02	12.20	12.20	104	.04	.01	.03	1
1.00	12.60	30	1.00	.00	.03	0	1.02	12.60	12.60	105	.04	.01	.03	1
1.00	13.00	31	1.00	.00	.03	0	1.02	13.00	13.00	106	.04	.01	.03	1
1.00	13.40	32	1.00	.00	.03	0	1.02	13.40	13.40	107	.04	.01	.03	1
1.00	13.80	33	1.00	.00	.03	0	1.02	13.80	13.80	108	.04	.01	.03	1
1.00	14.20	34	1.00	.00	.03	0	1.02	14.20	14.20	109	.04	.01	.03	1
1.00	14.60	35	1.00	.00	.03	0	1.02	14.60	14.60	110	.04	.01	.03	1
1.00	15.00	36	1.00	.00	.03	0	1.02	15.00	15.00	111	.04	.01	.03	1
1.00	15.40	37	1.00	.00	.03	0	1.02	15.40	15.40	112	.04	.01	.03	1
1.00	15.80	38	1.00	.00	.03	0	1.02	15.80	15.80	113	.04	.01	.03	1
1.00	16.20	39	1.00	.00	.03	0	1.02	16.20	16.20	114	.04	.01	.03	1
1.00	16.60	40	1.00	.00	.03	0	1.02	16.60	16.60	115	.04	.01	.03	1
1.00	17.00	41	1.00	.00	.03	0	1.02	17.00	17.00	116	.04	.01	.03	1
1.00	17.40	42	1.00	.00	.03	0	1.02	17.40	17.40	117	.04	.01	.03	1
1.00	17.80	43	1.00	.00	.03	0	1.02	17.80	17.80	118	.04	.01	.03	1
1.00	18.20	44	1.00	.00	.03	0	1.02	18.20	18.20	119	.04	.01	.03	1
1.00	18.60	45	1.00	.00	.03	0	1.02	18.60	18.60	120	.04	.01	.03	1
1.00	19.00	46	1.00	.00	.03	0	1.02	19.00	19.00	121	.04	.01	.03	1
1.00	19.40	47	1.00	.00	.03	0	1.02	19.40	19.40	122	.04	.01	.03	1
1.00	19.80	48	1.00	.00	.03	0	1.02	19.80	19.80	123	.04	.01	.03	1
1.00	20.20	49	1.00	.00	.03	0	1.02	20.20	20.20	124	.04	.01	.03	1
1.00	20.60	50	1.00	.00	.03	0	1.02	20.60	20.60	125	.04	.01	.03	1

5. 10. 15. 20. 25. 30. 35. 40. 45. 50. 55. 60. 65. 70. 75. 80. 85. 90. 95. 100. 105. 110. 115. 120. 125. 130. 135. 140. 145. 150. 155. 160. 165. 170. 175. 180. 185. 190. 195. 200.

| DATE | TIME | WIND | WAVE | SEA | 6-HOUR | 24-HOUR | 72-HOUR | TOTAL VOLUME |
|------|------|------|------|-----|--------|---------|---------|--------------|
| 430 | 270 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 420 | 260 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 410 | 250 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 400 | 240 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 390 | 230 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 380 | 220 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 370 | 210 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 360 | 200 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 350 | 190 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 340 | 180 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 330 | 170 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 320 | 160 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 310 | 150 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 300 | 140 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 290 | 130 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 280 | 120 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 270 | 110 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 260 | 100 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 250 | 90 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 240 | 80 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 230 | 70 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 220 | 60 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 210 | 50 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 200 | 40 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 190 | 30 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 180 | 20 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 170 | 10 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 160 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 150 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 140 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 130 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 120 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 110 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 100 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 90 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 80 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 70 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 60 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 50 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 40 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 30 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 20 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 10 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |
| 0 | 0 | 10 | 20 | 100 | 200 | 300 | 400 | 500 |

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[illegible]

PEAK OUTFLOW IS 1214. AT TIME 40.67 HOURS

| YEAR | 1-FOUR | 24-FOUR | 72-FOUR | TOTAL | VOLUME |
|------|--------|---------|---------|-------|--------|
| 1944 | 563 | 123 | 5 | 3 | 1324 |
| 1945 | 34 | 3 | 3 | 3 | 355 |
| 1946 | 1134 | 16 | 14 | 14 | 1248 |
| 1947 | 105 | 1679 | 1408 | 1408 | 3748 |
| 1948 | 28316 | 37934 | 37806 | 37806 | 37906 |
| 1949 | 279 | 363 | 365 | 365 | 365 |
| 1950 | 344 | 447 | 450 | 450 | 450 |

STATION 10, PL N 1, P. 10, 3
END-OF-PRICE HYDROGRAPH OPERATES

50731NO

[illegible]

五、

2941

[illegible]

AD-A107 405

TIPPETS-ABBETT-MCCARTHY-STRATTON NEW YORK
NATIONAL DAM SAFETY PROGRAM. LAKE CASSE DAM (INVENTORY NUMBER N--ETC(U)
AUG 81 E O'BRIEN
DACW51-81-C-0008

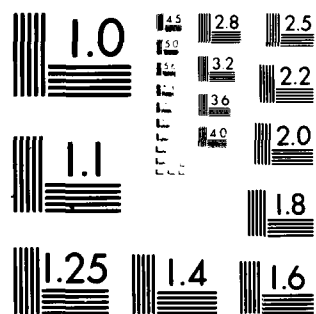
F/O 13/13

UNCLASSIFIED

NL

2 of 2
AD-A107 405

END
DATE
FILMED
1981-01-11
DTIC



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

| |
|-------|
| 1970 | 174. | 175. | 176. | 177. | 178. | 179. | 180. | 181. | 182. | 183. | 184. | 185. | 186. | 187. | 188. | 189. | 190. | 191. | 192. | 193. | 194. | 195. | 196. | 197. | 198. | 199. | 200. | 201. | 202. | 203. | 204. | 205. | 206. | 207. | 208. | 209. | 210. | 211. | 212. | 213. | 214. | 215. | 216. | 217. | 218. | 219. | 220. | 221. | 222. | 223. | 224. | 225. | 226. | 227. | 228. | 229. | 230. | 231. | 232. | 233. | 234. | 235. | 236. | 237. | 238. | 239. | 240. | 241. | 242. | 243. | 244. | 245. | 246. | 247. | 248. | 249. | 250. | 251. | 252. | 253. | 254. | 255. | 256. | 257. | 258. | 259. | 260. | 261. | 262. | 263. | 264. | 265. | 266. | 267. | 268. | 269. | 270. | 271. | 272. | 273. | 274. | 275. | 276. | 277. | 278. | 279. | 280. | 281. | 282. | 283. | 284. | 285. | 286. | 287. | 288. | 289. | 290. | 291. | 292. | 293. | 294. | 295. | 296. | 297. | 298. | 299. | 300. | 301. | 302. | 303. | 304. | 305. | 306. | 307. | 308. | 309. | 310. | 311. | 312. | 313. | 314. | 315. | 316. | 317. | 318. | 319. | 320. | 321. | 322. | 323. | 324. | 325. | 326. | 327. | 328. | 329. | 330. | 331. | 332. | 333. | 334. | 335. | 336. | 337. | 338. | 339. | 340. | 341. | 342. | 343. | 344. | 345. | 346. | 347. | 348. | 349. | 350. | 351. | 352. | 353. | 354. | 355. | 356. | 357. | 358. | 359. | 360. | 361. | 362. | 363. | 364. | 365. | 366. | 367. | 368. | 369. | 370. | 371. | 372. | 373. | 374. | 375. | 376. | 377. | 378. | 379. | 380. | 381. | 382. | 383. | 384. | 385. | 386. | 387. | 388. | 389. | 390. | 391. | 392. | 393. | 394. | 395. | 396. | 397. | 398. | 399. | 400. | 401. | 402. | 403. | 404. | 405. | 406. | 407. | 408. | 409. | 410. | 411. | 412. | 413. | 414. | 415. | 416. | 417. | 418. | 419. | 420. | 421. | 422. | 423. | 424. | 425. | 426. | 427. | 428. | 429. | 430. | 431. | 432. | 433. | 434. | 435. | 436. | 437. | 438. | 439. | 440. | 441. | 442. | 443. | 444. | 445. | 446. | 447. | 448. | 449. | 450. | 451. | 452. | 453. | 454. | 455. | 456. | 457. | 458. | 459. | 460. | 461. | 462. | 463. | 464. | 465. | 466. | 467. | 468. | 469. | 470. | 471. | 472. | 473. | 474. | 475. | 476. | 477. | 478. | 479. | 480. | 481. | 482. | 483. | 484. | 485. | 486. | 487. | 488. | 489. | 490. | 491. | 492. | 493. | 494. | 495. | 496. | 497. | 498. | 499. | 500. | 501. | 502. | 503. | 504. | 505. | 506. | 507. | 508. | 509. | 510. | 511. | 512. | 513. | 514. | 515. | 516. | 517. | 518. | 519. | 520. | 521. | 522. | 523. | 524. | 525. | 526. | 527. | 528. | 529. | 530. | 531. | 532. | 533. | 534. | 535. | 536. | 537. | 538. | 539. | 540. | 541. | 542. | 543. | 544. | 545. | 546. | 547. | 548. | 549. | 550. | 551. | 552. | 553. | 554. | 555. | 556. | 557. | 558. | 559. | 560. | 561. | 562. | 563. | 564. | 565. | 566. | 567. | 568. | 569. | 570. | 571. | 572. | 573. | 574. | 575. | 576. | 577. | 578. | 579. | 580. | 581. | 582. | 583. | 584. | 585. | 586. | 587. | 588. | 589. | 590. | 591. | 592. | 593. | 594. | 595. | 596. | 597. | 598. | 599. | 600. | 601. | 602. | 603. | 604. | 605. | 606. | 607. | 608. | 609. | 610. | 611. | 612. | 613. | 614. | 615. | 616. | 617. | 618. | 619. | 620. | 621. | 622. | 623. | 624. | 625. | 626. | 627. | 628. | 629. | 630. | 631. | 632. | 633. | 634. | 635. | 636. | 637. | 638. | 639. | 640. | 641. | 642. | 643. | 644. | 645. | 646. | 647. | 648. | 649. | 650. | 651. | 652. | 653. | 654. | 655. | 656. | 657. | 658. | 659. | 660. | 661. | 662. | 663. | 664. | 665. | 666. | 667. | 668. | 669. | 670. | 671. | 672. | 673. | 674. | 675. | 676. | 677. | 678. | 679. | 680. | 681. | 682. | 683. | 684. | 685. | 686. | 687. | 688. | 689. | 690. | 691. | 692. | 693. | 694. | 695. | 696. | 697. | 698. | 699. | 700. | 701. | 702. | 703. | 704. | 705. | 706. | 707. | 708. | 709. | 710. | 711. | 712. | 713. | 714. | 715. | 716. | 717. | 718. | 719. | 720. | 721. | 722. | 723. | 724. | 725. | 726. | 727. | 728. | 729. | 730. | 731. | 732. | 733. | 734. | 735. | 736. | 737. | 738. | 739. | 740. | 741. | 742. | 743. | 744. | 745. | 746. | 747. | 748. | 749. | 750. | 751. | 752. | 753. | 754. | 755. | 756. | 757. | 758. | 759. | 760. | 761. | 762. | 763. | 764. | 765. | 766. | 767. | 768. | 769. | 770. | 771. | 772. | 773. | 774. | 775. | 776. | 777. | 778. | 779. | 780. | 781. | 782. | 783. | 784. | 785. | 786. | 787. | 788. | 789. | 790. | 791. | 792. | 793. | 794. | 795. | 796. | 797. | 798. | 799. | 800. | 801. | 802. | 803. | 804. | 805. | 806. | 807. | 808. | 809. | 810. | 811. | 812. | 813. | 814. | 815. | 816. | 817. | 818. | 819. | 820. | 821. | 822. | 823. | 824. | 825. | 826. | 827. | 828. | 829. | 830. | 831. | 832. | 833. | 834. | 835. | 836. | 837. | 838. | 839. | 840. | 841. | 842. | 843. | 844. | 845. | 846. | 847. | 848. | 849. | 850. | 851. | 852. | 853. | 854. | 855. | 856. | 857. | 858. | 859. | 860. | 861. | 862. | 863. | 864. | 865. | 866. | 867. | 868. | 869. | 870. | 871. | 872. | 873. | 874. | 875. | 876. | 877. | 878. | 879. | 880. | 881. | 882. | 883. | 884. | 885. | 886. | 887. | 888. | 889. | 890. | 891. | 892. | 893. | 894. | 895. | 896. | 897. | 898. | 899. | 900. | 901. | 902. | 903. | 904. | 905. | 906. | 907. | 908. | 909. | 910. | 911. | 912. | 913. | 914. | 915. | 916. | 917. | 918. | 919. | 920. | 921. | 922. | 923. | 924. | 925. | 926. | 927. | 928. | 929. | 930. | 931. | 932. | 933. | 934. | 935. | 936. | 937. | 938. | 939. | 940. | 941. | 942. | 943. | 944. | 945. | 946. | 947. | 948. | 949. | 950. | 951. | 952. | 953. | 954. | 955. | 956. | 957. | 958. | 959. | 960. | 961. | 962. | 963. | 964. | 965. | 966. | 967. | 968. | 969. | 970. | 971. | 972. | 973. | 974. | 975. | 976. | 977. | 978. | 979. | 980. | 981. | 982. | 983. | 984. | 985. | 986. | 987. | 988. | 989. | 990. | 991. | 992. | 993. | 994. | 995. | 996. | 997. | 998. | 999. | 1000. |
|-------|

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 172. | 170. | 167. | 165. | 162. | 160. | 158. | 156. | 154. | 152. |
| 150. | 149. | 147. | 146. | 145. | 144. | 142. | 141. | 140. | 140. |

[illegible]

PEAK OUTFLOW IS 761. AT TIME 41.60 HOURS

| | PEAK | 6-HOUR | 24-HOUR | 72-HOUR | TOTAL VOLUME |
|-------------|--------|--------|---------|---------|--------------|
| CFS | 761. | 337. | 116. | 35. | 834. |
| CFS | 22. | 10. | 5. | 2. | 28. |
| INCHES | 6.81 | 9.38 | 9.44 | 9.44 | |
| IN | 173.06 | 238.15 | 239.83 | 239.83 | |
| CU-FT | 167. | 230. | 232. | 232. | |
| THOUS CU FT | 206. | 284. | 284. | 284. | |

STATION 10, PLAN 1, RATIO 4
END-OF-PERIOD HYDROGRAPH ORIGINATES

[illegible][illegible]

| | | | | | | |
|------|------|------|------|------|------|------|
| 115. | 115. | 115. | 115. | 115. | 115. | 115. |
| 115. | 115. | 115. | 115. | 115. | 115. | 115. |
| 115. | 115. | 115. | 115. | 115. | 115. | 115. |
| 115. | 115. | 115. | 115. | 115. | 115. | 115. |
| 116. | 116. | 116. | 116. | 116. | 116. | 117. |
| 117. | 117. | 117. | 118. | 118. | 118. | 118. |
| 119. | 119. | 119. | 120. | 120. | 120. | 120. |
| 120. | 120. | 120. | 121. | 121. | 121. | 121. |

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
 AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION STATION AREA PLAN RATIO 1 RATIO 2 RATIO 3 RATIO 4
 1.00 .75 .50 .25

HYDROGRAPH AT 1 26 1 922 692 461 231
 (26.12) (19.59) (13.66) (6.53)

ROUTED TO 2 26 1 923 690 456 143
 (26.13) (19.53) (12.91) (4.06)

ROUTED TO 3 26 1 921 691 457 144
 (26.08) (19.55) (12.77) (4.09)

HYDROGRAPH AT 2 363 273 182 91
 (10.29) (7.72) (5.15) (2.57)

2 COMBINED 2 35 1 1224 918 601 187
 (34.66) (25.90) (17.02) (5.30)

HYDROGRAPH AT 3 433 324 216 108
 (12.25) (9.19) (6.13) (3.06)

2 COMBINED 3 46 1 1647 1224 804 242
 (1.19) (46.66) (22.53) (6.45)

ROUTED TO 10 46 1 1630 1214 761 159
 (1.19) (46.15) (21.55) (4.50)

Sheet 44 of 85

NORTH LAKE DAM
 SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 ELEVATION STORAGE INITIAL VALUE SPILLWAY CREST TOP OF DAM
 572.00 210 572.00 573.75
 0 0 249

NORTH LAKE DAM

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

| | | | |
|-----------|---------------|----------------|------------|
| ELEVATION | INITIAL VALUE | SPILLWAY CREST | TOP OF DAM |
| STORAGE | 572.00 | 572.00 | 573.75 |
| OUTFLOW | 210. | 210. | 249. |
| | 0. | 0. | 70. |

| RATIO OF PWF | MAXIMUM DEPTH OVER DAM | MAXIMUM STORAGE AC-FT | MAXIMUM OUTFLOW CFS | DURATION OVER TOP HOURS | TIME OF MAX OUTFLOW HOURS | TIME OF FAILURE HOURS |
|--------------|------------------------|-----------------------|---------------------|-------------------------|---------------------------|-----------------------|
| 1.00 | .62 | 263. | 923. | 8.67 | 40.67 | 0.00 |
| .75 | .50 | 260. | 690. | 6.33 | 40.67 | 0.00 |
| .50 | .36 | 257. | 456. | 4.67 | 40.67 | 0.00 |
| .25 | .11 | 251. | 143. | 2.33 | 41.67 | 0.00 |

PLAN 1 STATION 3

| RATIO | MAXIMUM FLOW CFS | MAXIMUM STAGE-FT | TIME HOURS |
|-------|------------------|------------------|------------|
| 1.00 | 921. | 478.7 | 40.67 |
| .75 | 691. | 478.3 | 40.67 |
| .50 | 450. | 477.8 | 40.67 |
| .25 | 144. | 477.0 | 41.67 |

Sheet 45 of 85

LONG POINT DAM w/o Auxiliary Spillway

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

| | | | |
|-----------|---------------|----------------|------------|
| ELEVATION | INITIAL VALUE | SPILLWAY CREST | TOP OF DAM |
| STORAGE | 470.00 | 470.00 | 476.00 |
| OUTFLOW | 115. | 115. | 174. |
| | 0. | 0. | 222. |

Long Pond Dam w/o Auxiliary Spillway
SUMMARY OF DAM SAFETY ANALYSIS

| PLAN 1 | | INITIAL VALUE | | SPILLWAY CREST | | TOP OF DAM | |
|--------------------|----------------------------------|------------------------------|-----------------------------|---------------------------|-------------------------------|------------|---------|
| ELEVATION | | 470.00 | | 470.00 | | 476.00 | |
| STORAGE | | 115. | | 115. | | 174. | |
| OUTFLOW | | 0. | | 0. | | 222. | |
| RATIO
OF
PMF | MAXIMUM
RESERVOIR
W.S.ELEV | MAXIMUM
DEPTH
OVER DAM | MAXIMUM
STORAGE
AC-FT | MAXIMUM
OUTFLOW
CFS | DURATION
OVER TOP
HOURS | TIME OF | |
| | | | | | | MAX | FAILURE |
| | | | | | | HOURS | HOURS |
| 1.00 | 477.16 | 1.14 | 182. | 1630. | 5.00 | 40.67 | 0.00 |
| .75 | 476.90 | .90 | 185. | 1214. | 4.00 | 40.87 | 0.00 |
| .50 | 476.60 | .60 | 181. | 731. | 3.00 | 41.00 | 0.00 |
| .25 | 474.30 | 0.00 | 155. | 159. | 0.00 | 42.67 | 0.00 |

Sheet 46 of 85

| ST | K1 | 10 ROUTE THROUGH LONG POND (INCLUDING FLOW OVER DEPRESSION) | 1 | 115 | -1 |
|----|----|---|-------|-------|------|
| 51 | Y1 | 470 | 472 | 475 | 476 |
| 52 | Y4 | 471.2 | 474 | 475.5 | 478 |
| 53 | Y5 | 24 | 53 | 378 | 891 |
| 54 | Y5 | 115 | 150 | 180 | 6433 |
| 55 | Y5 | 132.5 | 152.1 | 173.6 | |
| 56 | SE | 470 | 472 | 476 | 480 |
| 57 | SE | 270 | 474 | 476 | |
| 58 | SE | 476 | 1.5 | 365 | |
| 59 | K | 99 | | | |
| 60 | | | | | |

Sheet 48 of 85

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

| | |
|--------------------------|----|
| RUNOFF HYDROGRAPH AT | 1 |
| ROUTE HYDROGRAPH TO | 2 |
| ROUTE HYDROGRAPH TO | 3 |
| RUNOFF HYDROGRAPH AT | 2 |
| COMBINE 2 HYDROGRAPHS AT | 3 |
| RUNOFF HYDROGRAPH AT | 3 |
| COMBINE 2 HYDROGRAPHS AT | 3 |
| ROUTE HYDROGRAPH TO | 10 |
| END OF NETWORK | |

Sheet 49 of 85

 FLOOD HYDROGRAPH PACKAGE (REC-1)
 DAM SAFETY VERSION JULY 1978
 LAST MODIFICATION 01 APR 80

RUN DATE: 8/7/6720
 TIME: 12.49.20.

LONG POND DAM NO 3
 PHASE 1 SAFETY INSPECTION
 REC 1 DB PMF ANALYSIS

| JOB SPECIFICATION | | | | | | | | | |
|-------------------|-----|------|-------|-----|-------|-------|------|------|-------|
| HQ | NHR | NMIN | 1DAY | 1HR | 1MIN | METRC | IPLT | IPRT | NSTAN |
| 150 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | JOPER | NWT | LROPT | TRACE | | | |
| | | | 5 | 0 | 0 | 0 | | | |

MULTI-PLAN ANALYSES TO BE PERFORMED
 NPLAN= 1 NRTIO= 4 LRTIO= 1

RTIOS= 1.00 .75 .50 .25

***** SUB-AREA RUNOFF COMPUTATION *****

1 NORTH LAKE BASIN RUN-OFF

| ISTAQ | ICOMP | IECON | ITAPE | JPLT | JPRY | INAME | ISTAGE | IAUTO |
|-------|-------|-------|-------|------|------|-------|--------|-------|
| 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

HYDROGRAPH DATA

| INYDG | 1UNG | TAREA | SNAP | TPSDA | TRSPC | RATIO | ISNOW | ISANE | LOCAL |
|-------|------|-------|------|-------|-------|-------|-------|-------|-------|
| 1 | 1 | .26 | 0.00 | .46 | 0.00 | 0.000 | 0 | 1 | 0 |

PRECIP DATA

| SPFE | PMS | R6 | R12 | R24 | R4P | R72 | R96 |
|------|-------|--------|--------|--------|--------|------|------|
| 0.00 | 22.00 | 112.00 | 123.00 | 133.00 | 141.00 | 0.00 | 0.00 |

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

| LROPT | SINKR | DLTRP | RTIOL | FRAIN | STKRS | RTICK | STRTL | CNSTL | ALSMY | RTIMP |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.0 | 0.00 | .13 |

UNIT HYDROGRAPH DATA

TP= .98 CP= .63 NTA= 0

RECESSION DATA

STRATQ= -1.00 CRCSN= -.10 RTIOR= 1.50
 APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 3.63 AND R= 2.36 INTERVALS

UNIT HYDROGRAPH IS END-OF-PERIOD ORDINATES, LAG= .97 HOURS, CP= .62 VOL= 1.00

| 18. | 62. | 101. | 103. | 74. | 50. | 32. | 21. | 14. | 9. |
|-----|-----|------|------|-----|-----|-----|-----|-----|----|
| 6. | 4. | 2. | 1. | | | | | | |

ST -1
 RECESS DATA
 OR
 ON 61... HYDRO... AND TC... 0.03 PND n= 2.36 INTERVALS
 RT 1.50
 UNIT HYDROGRAPH 15 END-OF-PERIOD ORIGINATES, LAG= .97 HOURS, CP= .62 VOL= 1.00
 18. 82. 101. 103. 76. 50. 32. 21. 14. 9.
 6. 2. 1.

| MO. DA | | HR. MN | | PERIOD | | RAIN | | EXCS | | LOSS | | COMP Q | | END-OF-PERIOD FLOW | | MO. DA | | HR. MN | | PERIOD | | RAIN | | EXCS | | LOSS | | COMP Q | |
|--------|--------|--------|------|--------|------|--------|--------------------|--------|--------|--------|------|--------|------|--------------------|--|--------|--|--------|--|--------|--|------|--|------|--|------|--|--------|--|
| MO. DA | HR. MN | PERIOD | RAIN | EXCS | LOSS | COMP Q | END-OF-PERIOD FLOW | MO. DA | HR. MN | PERIOD | RAIN | EXCS | LOSS | COMP Q | | | | | | | | | | | | | | | |
| 1.01 | 2.20 | 1 | .00 | .00 | .00 | 0 | 1.02 | 1.20 | 76 | .04 | .01 | .03 | 3 | | | | | | | | | | | | | | | | |
| 1.01 | 3.40 | 2 | .00 | .00 | .00 | 0 | 1.02 | 1.40 | 77 | .04 | .01 | .03 | 4 | | | | | | | | | | | | | | | | |
| 1.01 | 4.00 | 3 | .00 | .00 | .00 | 0 | 1.02 | 2.00 | 78 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 1.20 | 4 | .00 | .00 | .00 | 0 | 1.02 | 2.20 | 79 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 1.40 | 5 | .00 | .00 | .00 | 0 | 1.02 | 2.40 | 80 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 2.00 | 6 | .00 | .00 | .00 | 0 | 1.02 | 3.00 | 81 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 2.20 | 7 | .00 | .00 | .00 | 0 | 1.02 | 3.20 | 82 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 2.40 | 8 | .00 | .00 | .00 | 0 | 1.02 | 3.40 | 83 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 3.00 | 9 | .00 | .00 | .00 | 0 | 1.02 | 4.00 | 84 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 3.20 | 10 | .00 | .00 | .00 | 0 | 1.02 | 4.20 | 85 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 3.40 | 11 | .00 | .00 | .00 | 0 | 1.02 | 4.40 | 86 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 4.00 | 12 | .00 | .00 | .00 | 0 | 1.02 | 5.00 | 87 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 4.20 | 13 | .00 | .00 | .00 | 0 | 1.02 | 5.20 | 88 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 4.40 | 14 | .00 | .00 | .00 | 0 | 1.02 | 5.40 | 89 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 5.00 | 15 | .00 | .00 | .00 | 0 | 1.02 | 6.00 | 90 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 5.20 | 16 | .00 | .00 | .00 | 0 | 1.02 | 6.20 | 91 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 5.40 | 17 | .00 | .00 | .00 | 0 | 1.02 | 6.40 | 92 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 6.00 | 18 | .00 | .00 | .00 | 0 | 1.02 | 7.00 | 93 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 6.20 | 19 | .01 | .00 | .01 | 0 | 1.02 | 7.20 | 94 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 6.40 | 20 | .01 | .00 | .01 | 0 | 1.02 | 7.40 | 95 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 7.00 | 21 | .01 | .00 | .01 | 0 | 1.02 | 8.00 | 96 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 7.20 | 22 | .01 | .00 | .01 | 0 | 1.02 | 8.20 | 97 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 7.40 | 23 | .01 | .00 | .01 | 0 | 1.02 | 8.40 | 98 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 8.00 | 24 | .01 | .00 | .01 | 0 | 1.02 | 9.00 | 99 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 8.20 | 25 | .01 | .00 | .01 | 0 | 1.02 | 9.20 | 100 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 8.40 | 26 | .01 | .00 | .01 | 0 | 1.02 | 9.40 | 101 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 9.00 | 27 | .01 | .00 | .01 | 0 | 1.02 | 10.00 | 102 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 9.20 | 28 | .01 | .00 | .01 | 0 | 1.02 | 10.20 | 103 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 9.40 | 29 | .01 | .00 | .01 | 0 | 1.02 | 10.40 | 104 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 10.00 | 30 | .01 | .00 | .01 | 0 | 1.02 | 11.00 | 105 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 10.20 | 31 | .01 | .00 | .01 | 0 | 1.02 | 11.20 | 106 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 10.40 | 32 | .01 | .00 | .01 | 0 | 1.02 | 11.40 | 107 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 11.00 | 33 | .01 | .00 | .01 | 0 | 1.02 | 12.00 | 108 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 11.20 | 34 | .01 | .00 | .01 | 0 | 1.02 | 12.20 | 109 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 11.40 | 35 | .01 | .00 | .01 | 0 | 1.02 | 12.40 | 110 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 12.00 | 36 | .01 | .00 | .01 | 0 | 1.02 | 13.00 | 111 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 12.20 | 37 | .04 | .01 | .03 | 1 | 1.02 | 13.20 | 112 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 12.40 | 38 | .04 | .01 | .03 | 1 | 1.02 | 13.40 | 113 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 13.00 | 39 | .04 | .01 | .03 | 1 | 1.02 | 14.00 | 114 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 13.20 | 40 | .05 | .01 | .04 | 2 | 1.02 | 14.20 | 115 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 13.40 | 41 | .05 | .01 | .04 | 2 | 1.02 | 14.40 | 116 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 14.00 | 42 | .05 | .01 | .04 | 2 | 1.02 | 15.00 | 117 | .04 | .01 | .03 | 5 | | | | | | | | | | | | | | | | |
| 1.01 | 14.20 | 43 | .04 | .01 | .03 | 3 | 1.02 | 15.20 | 118 | 1.72 | 1.69 | .03 | 392. | | | | | | | | | | | | | | | | |
| 1.01 | 14.40 | 44 | .04 | .01 | .03 | 3 | 1.02 | 15.40 | 119 | 4.72 | 4.69 | .03 | 555. | | | | | | | | | | | | | | | | |
| 1.01 | 15.00 | 45 | .04 | .01 | .03 | 3 | 1.02 | 16.00 | 120 | 1.05 | 1.02 | .03 | 784. | | | | | | | | | | | | | | | | |
| 1.01 | 15.20 | 46 | .10 | .01 | .09 | 4 | 1.02 | 16.20 | 121 | .92 | .89 | .03 | 922. | | | | | | | | | | | | | | | | |
| 1.01 | 15.40 | 47 | .28 | .04 | .25 | 4 | 1.02 | 16.40 | 122 | .92 | .89 | .03 | 914. | | | | | | | | | | | | | | | | |
| 1.01 | 16.00 | 48 | .04 | .01 | .03 | 6 | 1.02 | 17.00 | 123 | .92 | .89 | .03 | 700. | | | | | | | | | | | | | | | | |
| 1.01 | 16.20 | 49 | .06 | .03 | .03 | 9 | 1.02 | 17.20 | 124 | .72 | .69 | .03 | 688. | | | | | | | | | | | | | | | | |
| 1.01 | 16.40 | 50 | .04 | .03 | .03 | 11 | 1.02 | 17.40 | 125 | .72 | .69 | .03 | 517. | | | | | | | | | | | | | | | | |
| 1.01 | 17.00 | 51 | .04 | .03 | .03 | 12 | 1.02 | 18.00 | 126 | .72 | .69 | .03 | 506. | | | | | | | | | | | | | | | | |
| 1.01 | 17.20 | 52 | .04 | .01 | .03 | 12 | 1.02 | 18.20 | 127 | .06 | .06 | .03 | 440. | | | | | | | | | | | | | | | | |
| 1.01 | 17.40 | 53 | .14 | .01 | .13 | 12 | 1.02 | 18.40 | 128 | .06 | .06 | .03 | 362. | | | | | | | | | | | | | | | | |
| 1.01 | 18.00 | 54 | .04 | .01 | .03 | 1 | 1.02 | 19.00 | 129 | .06 | .06 | .03 | 271. | | | | | | | | | | | | | | | | |
| 1.01 | 18.20 | 55 | .00 | .00 | .00 | 9 | 1.02 | 19.20 | 130 | .06 | .06 | .03 | 167. | | | | | | | | | | | | | | | | |
| 1.01 | 18.40 | 56 | .00 | .00 | .00 | 8 | 1.02 | 19.40 | 131 | .06 | .06 | .03 | 126. | | | | | | | | | | | | | | | | |

Sheet 51485

| | | | | | | | | | | | |
|------------|-----|-----|-----|-----|----|------------|-----|-----|-------|-----|------|
| 1.01 17.00 | 51 | -06 | -03 | -03 | 12 | 1.02 18.00 | 122 | -14 | -68 | -03 | 577. |
| 1.01 17.20 | 52 | -04 | -01 | -07 | 12 | 1.02 18.20 | 126 | -07 | -03 | -03 | 576. |
| 1.01 17.40 | 53 | -04 | -01 | -07 | 11 | 1.02 18.40 | 129 | -06 | -03 | -03 | 575. |
| 1.01 17.60 | 54 | -04 | -01 | -07 | 11 | 1.02 19.00 | 130 | -06 | -03 | -03 | 574. |
| 1.01 17.80 | 55 | -00 | -00 | -00 | 9 | 1.02 19.20 | 131 | -06 | -03 | -03 | 573. |
| 1.01 18.00 | 56 | -00 | -00 | -00 | 8 | 1.02 19.40 | 131 | -06 | -03 | -03 | 572. |
| 1.01 18.20 | 57 | -00 | -00 | -00 | 6 | 1.02 20.00 | 132 | -06 | -03 | -03 | 571. |
| 1.01 18.40 | 58 | -00 | -00 | -00 | 6 | 1.02 20.20 | 133 | -06 | -03 | -03 | 570. |
| 1.01 18.60 | 59 | -00 | -00 | -00 | 3 | 1.02 20.40 | 134 | -06 | -03 | -03 | 569. |
| 1.01 18.80 | 60 | -00 | -00 | -00 | 2 | 1.02 20.60 | 135 | -06 | -03 | -03 | 568. |
| 1.01 19.00 | 61 | -00 | -00 | -00 | 1 | 1.02 20.80 | 136 | -06 | -03 | -03 | 567. |
| 1.01 19.20 | 62 | -00 | -00 | -00 | 1 | 1.02 21.00 | 137 | -06 | -03 | -03 | 566. |
| 1.01 19.40 | 63 | -00 | -00 | -00 | 1 | 1.02 21.20 | 138 | -06 | -03 | -03 | 565. |
| 1.01 19.60 | 64 | -00 | -00 | -00 | 1 | 1.02 21.40 | 139 | -06 | -03 | -03 | 564. |
| 1.01 19.80 | 65 | -00 | -00 | -00 | 1 | 1.02 21.60 | 140 | -06 | -03 | -03 | 563. |
| 1.01 20.00 | 66 | -00 | -00 | -00 | 1 | 1.02 21.80 | 141 | -06 | -03 | -03 | 562. |
| 1.01 20.20 | 67 | -00 | -00 | -00 | 1 | 1.02 22.00 | 142 | -06 | -03 | -03 | 561. |
| 1.01 20.40 | 68 | -00 | -00 | -00 | 1 | 1.02 22.20 | 143 | -06 | -03 | -03 | 560. |
| 1.01 20.60 | 69 | -00 | -00 | -00 | 1 | 1.02 22.40 | 144 | -06 | -03 | -03 | 559. |
| 1.01 20.80 | 70 | -00 | -00 | -00 | 1 | 1.02 22.60 | 145 | -06 | -03 | -03 | 558. |
| 1.01 21.00 | 71 | -00 | -00 | -00 | 1 | 1.02 22.80 | 146 | -06 | -03 | -03 | 557. |
| 1.01 21.20 | 72 | -00 | -00 | -00 | 1 | 1.02 23.00 | 147 | -06 | -03 | -03 | 556. |
| 1.01 21.40 | 73 | -00 | -00 | -00 | 1 | 1.02 23.20 | 148 | -06 | -03 | -03 | 555. |
| 1.01 21.60 | 74 | -00 | -00 | -00 | 1 | 1.02 23.40 | 149 | -06 | -03 | -03 | 554. |
| 1.01 21.80 | 75 | -00 | -00 | -00 | 1 | 1.02 23.60 | 150 | -06 | -03 | -03 | 553. |
| 1.01 22.00 | 76 | -00 | -00 | -00 | 1 | 1.02 23.80 | 151 | -06 | -03 | -03 | 552. |
| 1.01 22.20 | 77 | -00 | -00 | -00 | 1 | 1.02 24.00 | 152 | -06 | -03 | -03 | 551. |
| 1.01 22.40 | 78 | -00 | -00 | -00 | 1 | 1.02 24.20 | 153 | -06 | -03 | -03 | 550. |
| 1.01 22.60 | 79 | -00 | -00 | -00 | 1 | 1.02 24.40 | 154 | -06 | -03 | -03 | 549. |
| 1.01 22.80 | 80 | -00 | -00 | -00 | 1 | 1.02 24.60 | 155 | -06 | -03 | -03 | 548. |
| 1.01 23.00 | 81 | -00 | -00 | -00 | 1 | 1.02 24.80 | 156 | -06 | -03 | -03 | 547. |
| 1.01 23.20 | 82 | -00 | -00 | -00 | 1 | 1.02 25.00 | 157 | -06 | -03 | -03 | 546. |
| 1.01 23.40 | 83 | -00 | -00 | -00 | 1 | 1.02 25.20 | 158 | -06 | -03 | -03 | 545. |
| 1.01 23.60 | 84 | -00 | -00 | -00 | 1 | 1.02 25.40 | 159 | -06 | -03 | -03 | 544. |
| 1.01 23.80 | 85 | -00 | -00 | -00 | 1 | 1.02 25.60 | 160 | -06 | -03 | -03 | 543. |
| 1.01 24.00 | 86 | -00 | -00 | -00 | 1 | 1.02 25.80 | 161 | -06 | -03 | -03 | 542. |
| 1.01 24.20 | 87 | -00 | -00 | -00 | 1 | 1.02 26.00 | 162 | -06 | -03 | -03 | 541. |
| 1.01 24.40 | 88 | -00 | -00 | -00 | 1 | 1.02 26.20 | 163 | -06 | -03 | -03 | 540. |
| 1.01 24.60 | 89 | -00 | -00 | -00 | 1 | 1.02 26.40 | 164 | -06 | -03 | -03 | 539. |
| 1.01 24.80 | 90 | -00 | -00 | -00 | 1 | 1.02 26.60 | 165 | -06 | -03 | -03 | 538. |
| 1.01 25.00 | 91 | -00 | -00 | -00 | 1 | 1.02 26.80 | 166 | -06 | -03 | -03 | 537. |
| 1.01 25.20 | 92 | -00 | -00 | -00 | 1 | 1.02 27.00 | 167 | -06 | -03 | -03 | 536. |
| 1.01 25.40 | 93 | -00 | -00 | -00 | 1 | 1.02 27.20 | 168 | -06 | -03 | -03 | 535. |
| 1.01 25.60 | 94 | -00 | -00 | -00 | 1 | 1.02 27.40 | 169 | -06 | -03 | -03 | 534. |
| 1.01 25.80 | 95 | -00 | -00 | -00 | 1 | 1.02 27.60 | 170 | -06 | -03 | -03 | 533. |
| 1.01 26.00 | 96 | -00 | -00 | -00 | 1 | 1.02 27.80 | 171 | -06 | -03 | -03 | 532. |
| 1.01 26.20 | 97 | -00 | -00 | -00 | 1 | 1.02 28.00 | 172 | -06 | -03 | -03 | 531. |
| 1.01 26.40 | 98 | -00 | -00 | -00 | 1 | 1.02 28.20 | 173 | -06 | -03 | -03 | 530. |
| 1.01 26.60 | 99 | -00 | -00 | -00 | 1 | 1.02 28.40 | 174 | -06 | -03 | -03 | 529. |
| 1.01 26.80 | 100 | -00 | -00 | -00 | 1 | 1.02 28.60 | 175 | -06 | -03 | -03 | 528. |
| 1.01 27.00 | 101 | -00 | -00 | -00 | 1 | 1.02 28.80 | 176 | -06 | -03 | -03 | 527. |
| 1.01 27.20 | 102 | -00 | -00 | -00 | 1 | 1.02 29.00 | 177 | -06 | -03 | -03 | 526. |
| 1.01 27.40 | 103 | -00 | -00 | -00 | 1 | 1.02 29.20 | 178 | -06 | -03 | -03 | 525. |
| 1.01 27.60 | 104 | -00 | -00 | -00 | 1 | 1.02 29.40 | 179 | -06 | -03 | -03 | 524. |
| 1.01 27.80 | 105 | -00 | -00 | -00 | 1 | 1.02 29.60 | 180 | -06 | -03 | -03 | 523. |
| 1.01 28.00 | 106 | -00 | -00 | -00 | 1 | 1.02 29.80 | 181 | -06 | -03 | -03 | 522. |
| 1.01 28.20 | 107 | -00 | -00 | -00 | 1 | 1.02 30.00 | 182 | -06 | -03 | -03 | 521. |
| 1.01 28.40 | 108 | -00 | -00 | -00 | 1 | 1.02 30.20 | 183 | -06 | -03 | -03 | 520. |
| 1.01 28.60 | 109 | -00 | -00 | -00 | 1 | 1.02 30.40 | 184 | -06 | -03 | -03 | 519. |
| 1.01 28.80 | 110 | -00 | -00 | -00 | 1 | 1.02 30.60 | 185 | -06 | -03 | -03 | 518. |
| 1.01 29.00 | 111 | -00 | -00 | -00 | 1 | 1.02 30.80 | 186 | -06 | -03 | -03 | 517. |
| 1.01 29.20 | 112 | -00 | -00 | -00 | 1 | 1.02 31.00 | 187 | -06 | -03 | -03 | 516. |
| 1.01 29.40 | 113 | -00 | -00 | -00 | 1 | 1.02 31.20 | 188 | -06 | -03 | -03 | 515. |
| 1.01 29.60 | 114 | -00 | -00 | -00 | 1 | 1.02 31.40 | 189 | -06 | -03 | -03 | 514. |
| 1.01 29.80 | 115 | -00 | -00 | -00 | 1 | 1.02 31.60 | 190 | -06 | -03 | -03 | 513. |
| 1.01 30.00 | 116 | -00 | -00 | -00 | 1 | 1.02 31.80 | 191 | -06 | -03 | -03 | 512. |
| 1.01 30.20 | 117 | -00 | -00 | -00 | 1 | 1.02 32.00 | 192 | -06 | -03 | -03 | 511. |
| 1.01 30.40 | 118 | -00 | -00 | -00 | 1 | 1.02 32.20 | 193 | -06 | -03 | -03 | 510. |
| 1.01 30.60 | 119 | -00 | -00 | -00 | 1 | 1.02 32.40 | 194 | -06 | -03 | -03 | 509. |
| 1.01 30.80 | 120 | -00 | -00 | -00 | 1 | 1.02 32.60 | 195 | -06 | -03 | -03 | 508. |
| 1.01 31.00 | 121 | -00 | -00 | -00 | 1 | 1.02 32.80 | 196 | -06 | -03 | -03 | 507. |
| 1.01 31.20 | 122 | -00 | -00 | -00 | 1 | 1.02 33.00 | 197 | -06 | -03 | -03 | 506. |
| 1.01 31.40 | 123 | -00 | -00 | -00 | 1 | 1.02 33.20 | 198 | -06 | -03 | -03 | 505. |
| 1.01 31.60 | 124 | -00 | -00 | -00 | 1 | 1.02 33.40 | 199 | -06 | -03 | -03 | 504. |
| 1.01 31.80 | 125 | -00 | -00 | -00 | 1 | 1.02 33.60 | 200 | -06 | -03 | -03 | 503. |
| 1.01 32.00 | 126 | -00 | -00 | -00 | 1 | 1.02 33.80 | 201 | -06 | -03 | -03 | 502. |
| 1.01 32.20 | 127 | -00 | -00 | -00 | 1 | 1.02 34.00 | 202 | -06 | -03 | -03 | 501. |
| 1.01 32.40 | 128 | -00 | -00 | -00 | 1 | 1.02 34.20 | 203 | -06 | -03 | -03 | 500. |
| 1.01 32.60 | 129 | -00 | -00 | -00 | 1 | 1.02 34.40 | 204 | -06 | -03 | -03 | 499. |
| 1.01 32.80 | 130 | -00 | -00 | -00 | 1 | 1.02 34.60 | 205 | -06 | -03 | -03 | 498. |
| 1.01 33.00 | 131 | -00 | -00 | -00 | 1 | 1.02 34.80 | 206 | -06 | -03 | -03 | 497. |
| 1.01 33.20 | 132 | -00 | -00 | -00 | 1 | 1.02 35.00 | 207 | -06 | -03 | -03 | 496. |
| 1.01 33.40 | 133 | -00 | -00 | -00 | 1 | 1.02 35.20 | 208 | -06 | -03 | -03 | 495. |
| 1.01 33.60 | 134 | -00 | -00 | -00 | 1 | 1.02 35.40 | 209 | -06 | -03 | -03 | 494. |
| 1.01 33.80 | 135 | -00 | -00 | -00 | 1 | 1.02 35.60 | 210 | -06 | -03 | -03 | 493. |
| 1.01 34.00 | 136 | -00 | -00 | -00 | 1 | 1.02 35.80 | 211 | -06 | -03 | -03 | 492. |
| 1.01 34.20 | 137 | -00 | -00 | -00 | 1 | 1.02 36.00 | 212 | -06 | -03 | -03 | 491. |
| 1.01 34.40 | 138 | -00 | -00 | -00 | 1 | 1.02 36.20 | 213 | -06 | -03 | -03 | 490. |
| 1.01 34.60 | 139 | -00 | -00 | -00 | 1 | 1.02 36.40 | 214 | -06 | -03 | -03 | 489. |
| 1.01 34.80 | 140 | -00 | -00 | -00 | 1 | 1.02 36.60 | 215 | -06 | -03 | -03 | 488. |
| 1.01 35.00 | 141 | -00 | -00 | -00 | 1 | 1.02 36.80 | 216 | -06 | -03 | -03 | 487. |
| 1.01 35.20 | 142 | -00 | -00 | -00 | 1 | 1.02 37.00 | 217 | -06 | -03 | -03 | 486. |
| 1.01 35.40 | 143 | -00 | -00 | -00 | 1 | 1.02 37.20 | 218 | -06 | -03 | -03 | 485. |
| 1.01 35.60 | 144 | -00 | -00 | -00 | 1 | 1.02 37.40 | 219 | -06 | -03 | -03 | 484. |
| 1.01 35.80 | 145 | -00 | -00 | -00 | 1 | 1.02 37.60 | 220 | -06 | -03 | -03 | 483. |
| 1.01 36.00 | 146 | -00 | -00 | -00 | 1 | 1.02 37.80 | 221 | -06 | -03 | -03 | 482. |
| 1.01 36.20 | 147 | -00 | -00 | -00 | 1 | 1.02 38.00 | 222 | -06 | -03 | -03 | 481. |
| 1.01 36.40 | 148 | -00 | -00 | -00 | 1 | 1.02 38.20 | 223 | -06 | -03 | -03 | 480. |
| 1.01 36.60 | 149 | -00 | -00 | -00 | 1 | 1.02 38.40 | 224 | -06 | -03 | -03 | 479. |
| 1.01 36.80 | 150 | -00 | -00 | -00 | 1 | 1.02 38.60 | 225 | -06 | -03 | -03 | 478. |
| 1.01 37.00 | 151 | -00 | -00 | -00 | 1 | 1.02 38.80 | 226 | -06 | -03 | -03 | 477. |
| 1.01 37.20 | 152 | -00 | -00 | -00 | 1 | 1.02 39.00 | 227 | -06 | -03 | -03 | 476. |
| 1.01 37.40 | 153 | -00 | -00 | -00 | 1 | 1.02 39.20 | 228 | -06 | -03 | -03 | 475. |
| 1.01 37.60 | 154 | -00 | -00 | -00 | 1 | 1.02 39.40 | 229 | -06 | -03 | -03 | 474. |
| 1.01 37.80 | 155 | -00 | -00 | -00 | 1 | 1.02 39.60 | 230 | -06 | -03 | -03 | 473. |
| 1.01 38.00 | 156 | -00 | -00 | -00 | 1 | 1.02 39.80 | 231 | -06 | -03 | -03 | 472. |
| 1.01 38.20 | 157 | -00 | -00 | -00 | 1 | 1.02 40.00 | 232 | -06 | -03 | -03 | 471. |
| 1.01 38.40 | 158 | -00 | -00 | -00 | 1 | 1.02 40.20 | 233 | -06 | -03 | -03 | 470. |
| 1.01 38.60 | 159 | -00 | -00 | -00 | 1 | 1.02 40.40 | 234 | -06 | -03 | -03 | 469. |
| 1.01 38.80 | 160 | -00 | -00 | -00 | 1 | 1.02 40.60 | 235 | -06 | -03 | -03 | 468. |
| 1.01 39.00 | 161 | -00 | -00 | -00 | 1 | 1.02 40.80 | 236 | -06 | -03 | -03 | 467. |
| 1.01 39.20 | 162 | -00 | -00 | -00 | 1 | 1.02 41.00 | 237 | -06 | -03 | -03 | 466. |
| 1.01 39.40 | 163 | -00 | -00 | -00 | 1 | 1.02 41.20 | 238 | -06 | -03 | -03 | 465. |
| 1.01 39.60 | 164 | -00 | -00 | -00 | 1 | 1.02 41.40 | 239 | -06 | -03 | -03 | 464. |
| 1.01 39.80 | 165 | -00 | -00 | -00 | 1 | 1.02 41.60 | 240 | -06 | -03</ | | |

| DATE | TIME | PEAK | 6-HOUR | 24-HOUR | 72-HOUR | TOTAL VOLUME |
|--------|-------|-------|--------|---------|---------|--------------|
| 5/23/6 | 690. | 573.6 | 573.6 | 573.6 | 573.5 | 573.5 |
| 5/23/6 | 710. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 730. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 750. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 770. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 790. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 810. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 830. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 850. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 870. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 890. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 910. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 930. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 950. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 970. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 990. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1010. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1030. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1050. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1070. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1090. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1110. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1130. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1150. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1170. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1190. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1210. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1230. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1250. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1270. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1290. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1310. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1330. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1350. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1370. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1390. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1410. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1430. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1450. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1470. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1490. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1510. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1530. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1550. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1570. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1590. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1610. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |
| 5/23/6 | 1630. | 573.6 | 573.6 | 573.5 | 573.5 | 573.5 |

| | | | | | | | |
|---------|--------|-------|-------|-------|-------|-------|-------|
| STORAGE | 0.00 | 2.26 | 3.25 | 4.36 | 5.60 | 6.96 | 8.46 |
| 100.0 | 10.03 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 | 32.88 |
| 100.0 | 11.84 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 13.75 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 15.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 17.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 19.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 21.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 23.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 25.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 27.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 29.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 31.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 33.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 35.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 37.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 39.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 41.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 43.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 45.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 47.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 49.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 51.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 53.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 55.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 57.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 59.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 61.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 63.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 65.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 67.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 69.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 71.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 73.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 75.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 77.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 79.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 81.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 83.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 85.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 87.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 89.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 91.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 93.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 95.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 97.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 99.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 101.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 103.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 105.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 107.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 109.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 111.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 113.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 115.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 117.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 119.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 121.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 123.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 125.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 127.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 129.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 131.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 133.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 135.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 137.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 139.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 141.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 143.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 145.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 147.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 149.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 151.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 153.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 155.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 157.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 159.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 161.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 163.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 165.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 167.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 169.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 171.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 173.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 175.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 177.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 179.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 181.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 183.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 185.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 187.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 189.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 191.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 193.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 195.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 197.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 199.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 201.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 203.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 205.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 207.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 209.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 211.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 213.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 215.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 217.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 219.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 221.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 223.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 225.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 227.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 229.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 231.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 233.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 235.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 237.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 239.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 241.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 243.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 245.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 247.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 249.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 251.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 253.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 255.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 257.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 259.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 261.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 263.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 265.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 267.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 269.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 271.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 273.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 275.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 277.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 279.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 281.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 283.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 285.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 287.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 289.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 291.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 293.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 295.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 297.76 | 15.87 | 18.19 | 20.72 | 23.45 | 26.39 | 29.53 |
| 100.0 | 299.76 | 15.8 | | | | | |

| | 0.00 | 191.07 | 776.04 | 1871.51 | 3892.90 | 6684.99 | 10228.09 | 15560.86 | 19722.81 | 25753.83 |
|---------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|
| OUTFLOW | 32695.81 | 40582.41 | 49209.75 | 59032.24 | 70126.11 | 82581.95 | 96446.30 | 111796.25 | 128708.21 | 147245.45 |
| STAGE | 478.03 | 477.26 | 478.53 | 479.79 | 481.05 | 482.32 | 483.58 | 484.84 | 486.11 | 487.37 |
| | 488.63 | 489.89 | 491.16 | 492.42 | 493.68 | 494.95 | 496.21 | 497.47 | 498.74 | 500.00 |
| FLOW | 0.00 | 191.07 | 776.04 | 1871.51 | 3892.90 | 6684.99 | 10228.09 | 15560.86 | 19722.81 | 25753.83 |
| | 32695.81 | 40582.41 | 49209.75 | 59032.24 | 70126.11 | 82581.95 | 96446.30 | 111796.25 | 128708.21 | 147245.45 |

[illegible][illegible][illegible]

DATE PPS HQ R12 R24 R48 R72 R96
 0.00 22.00 112.00 123.00 135.00 141.00 0.00 0.00
 TRSFC COMPUTED BY THE PROGRAM IS .000

LOSS DATA
 LROPT STRKA DLTR RTIOL ERAIN STRKS RTICK STRTL CNSTL ALSMX RTIMP
 0 0.00 0.00 1.00 0.00 0.00 1.00 1.00 .10 0.00 .07

UNIT HYDROGRAPH DATA
 TP= .73 CP= .63 HTA= 0

RECESION DATA
 STRIG= -1.00 GRCSH= -.10 RTIOR= 1.50
 APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 2.67 AND R= 1.86 INTERVALS

UNIT HYDROGRAPH 12 END-OF-PERIOD ORIGINATES LAG= .73 HOURS CP= .63 VOL= 1.00
 12. 37. 46. 11. 6. 2. 1.

| END-OF-PERIOD FLOW | | | | | | | | | |
|--------------------|-------|--------|------|------|------|--------|-------|-------|--------|
| MO.DA | HR.MN | PERIOD | RAIN | EXCS | LOSS | COMP Q | WO.DA | HR.MN | PERIOD |
| 1.01 | 1.20 | 1 | .00 | .00 | .00 | 0. | 1.02 | 1.20 | 76 |
| 1.01 | 1.40 | 2 | .00 | .00 | .00 | 0. | 1.02 | 1.40 | 77 |
| 1.01 | 1.50 | 3 | .00 | .00 | .00 | 0. | 1.02 | 2.00 | 78 |
| 1.01 | 1.23 | 4 | .00 | .00 | .00 | 0. | 1.02 | 2.20 | 79 |
| 1.01 | 1.40 | 5 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 80 |
| 1.01 | 1.40 | 6 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 81 |
| 1.01 | 2.20 | 7 | .00 | .00 | .00 | 0. | 1.02 | 2.20 | 82 |
| 1.01 | 2.40 | 8 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 83 |
| 1.01 | 3.00 | 9 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 84 |
| 1.01 | 3.20 | 10 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 85 |
| 1.01 | 3.40 | 11 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 86 |
| 1.01 | 4.00 | 12 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 87 |
| 1.01 | 4.20 | 13 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 88 |
| 1.01 | 4.40 | 14 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 89 |
| 1.01 | 5.20 | 15 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 90 |
| 1.01 | 5.20 | 16 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 91 |
| 1.01 | 5.40 | 17 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 92 |
| 1.01 | 6.00 | 18 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 93 |
| 1.01 | 6.20 | 19 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 94 |
| 1.01 | 6.40 | 20 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 95 |
| 1.01 | 7.00 | 21 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 96 |
| 1.01 | 7.20 | 22 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 97 |
| 1.01 | 7.40 | 23 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 98 |
| 1.01 | 8.00 | 24 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 99 |
| 1.01 | 8.20 | 25 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 100 |
| 1.01 | 8.40 | 26 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 101 |
| 1.01 | 9.00 | 27 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 102 |
| 1.01 | 9.20 | 28 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 103 |
| 1.01 | 9.40 | 29 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 104 |
| 1.01 | 10.00 | 30 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 105 |
| 1.01 | 10.20 | 31 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 106 |
| 1.01 | 10.40 | 32 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 107 |
| 1.01 | 11.00 | 33 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 108 |
| 1.01 | 11.20 | 34 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 109 |
| 1.01 | 11.40 | 35 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 110 |
| 1.01 | 12.00 | 36 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 111 |
| 1.01 | 12.20 | 37 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 112 |
| 1.01 | 12.40 | 38 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 113 |
| 1.01 | 13.00 | 39 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 114 |
| 1.01 | 13.20 | 40 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 115 |
| 1.01 | 13.40 | 41 | .00 | .00 | .00 | 0. | 1.02 | 2.40 | 116 |

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| | | | | | | | | | |
|------|-------|----|-----|-----|-----|----|------|-------|-----|
| 1.01 | 14.00 | 42 | .00 | .00 | .00 | 1. | 1.02 | 15.00 | 117 |
| 1.01 | 14.20 | 43 | .00 | .00 | .00 | 1. | 1.02 | 15.20 | 118 |
| 1.01 | 14.40 | 44 | .00 | .00 | .00 | 1. | 1.02 | 15.40 | 119 |

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
 AREA IN SQUARE MILES (SQUARE KILOMETERS)

| OPERATION | STATION | AREA | PLAN | RATIOS APPLIED TO FLOWS | | | |
|---------------|---------|----------------|------|-------------------------|-------------------|------------------|-----------------|
| | | | | RATIO 1 | RATIO 2 | RATIO 3 | RATIO 4 |
| | | | | 1.00 | .75 | .50 | .25 |
| HYDROGRAPH AT | 1 | .26
(.67) | 1 | 922.
(26.12) | 692.
(19.59) | 461.
(13.06) | 231.
(6.53) |
| ROUTED TO | 2 | .26
(.67) | 1 | 923.
(26.13) | 690.
(19.53) | 456.
(12.91) | 143.
(4.06) |
| ROUTED TO | 3 | .26
(.67) | 1 | 921.
(26.09) | 691.
(19.55) | 450.
(12.73) | 144.
(4.08) |
| HYDROGRAPH AT | 2 | .09
(.23) | 1 | 363.
(10.29) | 273.
(7.72) | 182.
(5.15) | 91.
(2.57) |
| 2 COMBINED | 2 | .35
(.91) | 1 | 1224.
(34.66) | 918.
(25.99) | 601.
(17.02) | 187.
(5.30) |
| HYDROGRAPH AT | 3 | .11
(.28) | 1 | 433.
(12.25) | 324.
(9.19) | 216.
(6.13) | 108.
(3.06) |
| 2 COMBINED | 3 | .46
(1.19) | 1 | 1647.
(46.66) | 1224.
(34.66) | 806.
(22.83) | 242.
(6.85) |
| ROUTED TO | 1C | .46
(1.19) | 1 | 1628.
(45.40) | 1222.
(34.62) | 847.
(23.99) | 159.
(4.50) |

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NORTH LAKE DAM

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 INITIAL VALUE SPILLWAY CREST TOP OF DAM
 ELEVATION 572.00 572.00 573.75
 STORAGE 210. 210. 249.
 OUTFLOW 0. 0. 70.

| RATIO OF PHF | MAXIMUM DEPTH OVER DAM | MAXIMUM STORAGE AC-FT | MAXIMUM OUTFLOW CFS | DURATION OVER TOP HOURS | TIME OF MAX OUTFLOW HOURS | TIME OF FAILURE HOURS |
|--------------|------------------------|-----------------------|---------------------|-------------------------|---------------------------|-----------------------|
| 1.00 | .62 | 263. | 923. | 8.67 | 40.67 | 0.00 |
| .75 | .50 | 240. | 690. | 6.23 | 40.67 | 0.00 |
| .50 | .36 | 257. | 456. | 4.67 | 40.67 | 0.00 |
| .25 | .11 | 251. | 143. | 2.33 | 41.67 | 0.00 |

PLAN 1 STATION 3

| RATIO | MAXIMUM FLOW-CFS | MAXIMUM STAGE-FT | TIME HOURS |
|-------|------------------|------------------|------------|
| 1.00 | 921. | 478.7 | 40.67 |
| .75 | 691. | 478.3 | 40.67 |
| .50 | 450. | 477.8 | 40.67 |
| .25 | 144. | 477.0 | 41.67 |

Sheet 83 of 85

LONG POINT DAM SUMMARY OF DAM SAFETY ANALYSIS

| PLAN 1 | | INITIAL VALUE | | SPILLWAY CREST | | TOP OF DAM | |
|--------------------|----------------------------------|------------------------------|-----------------------------|---------------------------|-------------------------------|---------------------------------|------|
| | | ELEVATION | | | | | |
| | | STORAGE | | 470.00 | | 476.00 | |
| | | OUTFLOW | | 115. | | 174. | |
| | | | | 0. | | 891. | |
| RATIO
OF
PMF | MAXIMUM
RESERVOIR
W.S.ELEV | MAXIMUM
DEPTH
OVER DAM | MAXIMUM
STORAGE
AC-FT | MAXIMUM
OUTFLOW
CFS | DURATION
OVER TOP
HOURS | TIME OF
MAX OUTFLOW
HOURS | |
| | | | | | | FAILURE
HOURS | |
| 1.00 | 476.22 | .22 | 176. | 1628. | 2.67 | 40.67 | 0.00 |
| .75 | 476.11 | .11 | 175. | 1222. | 1.67 | 40.33 | 0.00 |
| .50 | 475.06 | 0.00 | 173. | 847. | 0.00 | 40.57 | 0.00 |
| .25 | 474.30 | 0.00 | 155. | 159. | 0.00 | 42.67 | 0.00 |

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.....
FLOOD HYDROGRAPH PACKAGE (REC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION C1 APR 80
.....

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REFERENCES

APPENDIX E

REFERENCES

1. "Flood Hydrograph Package (HEC-1) Users Manual for Dam Safety Investigations", U. S. Army Corps of Engineers, Hydrologic Engineering Center, September 1979.
2. "Seasonal Variation of the Probable Maximum Precipitation, East of the 105th Meridian for Areas from 10 to 1,000 Square Miles, and Durations of 6, 12, 24 and 48 Hours", Hydrometeorological Report No. 33. Weather Bureau, U.S. Department of Commerce, April 1956.
3. "Recommended Guidelines for Safety Inspection of Dams", Department of the Army, Office of the Chief of Engineers, Appendix D.
4. The University of the State of New York, The State Education Department State Museum and Science Service Geological Survey - MAP and Chart Series No. 5, Geologic MAP of New York 1961, Lower Hudson Sheet.

