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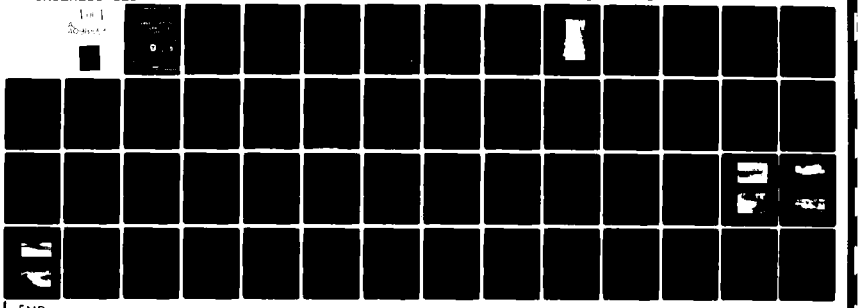

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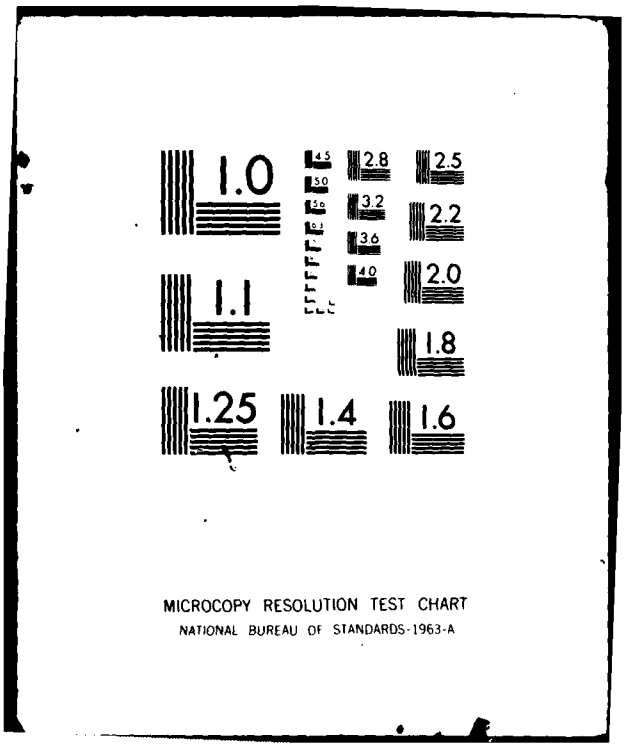
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3 RARITAN RIVER BASIN,
COLD BROOK, HUNTERDON COUNTY,
NEW JERSEY.

2 J. SEWARD JOHNSON DAM

LEVEL II

NJ 00770

1 PHASE 1 INSPECTION REPORT
6 NATIONAL DAM SAFETY PROGRAM.
J. Seward Johnson Dam (NJ00770). Raritan River Basin, Cold Brook, Hunterdon County, New Jersey. Phase I Inspection Report.

9 Final rept.,

15 DACW61-79-C-0011

10 A Abraham Perea

DEPARTMENT OF THE ARMY
Philadelphia District
Corps of Engineers
Philadelphia Pennsylvania

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Dams
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Visual Inspection
Structural Analysis
National Dam Safety Program
J. Seward Johnson Dam, N.J.
Erosion
Spillway

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

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

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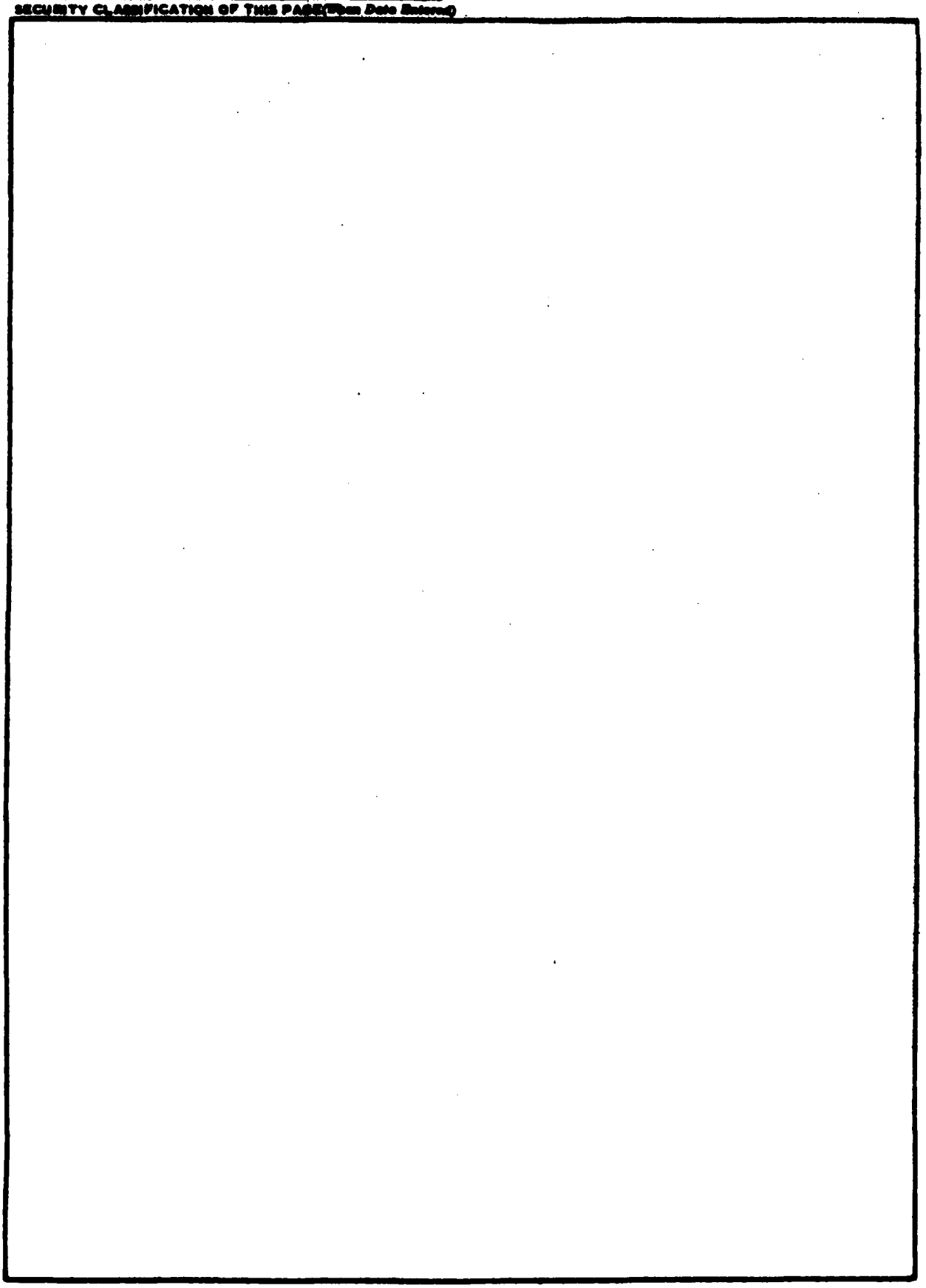

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
CUSTOM HOUSE—2 D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

IN REPLY REFER TO
NAPEN-N

27 APR 1981

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

Dear Governor Byrne:

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

Based on visual inspection, available records, calculations and past operational performance, J. Seward Johnson Dam, initially listed as a high hazard potential structure but reduced to a significant hazard potential structure as a result of this inspection, is judged to be in good overall condition and the spillway is considered adequate. To ensure the adequacy of the structure the following remedial actions are recommended:

a. The following actions should be completed within one year from the date of approval of this report:

(1) Clear the heavy brush from the embankment, upstream face of the dam, and the entrance to the auxiliary spillway approach channel, insuring that a durable grass cover is established in its place.

(2) Fill, grade, and reseed the eroded areas on the upstream face of the dam.

(3) Fill rodent burrows on the downstream slope of the embankment.

(4) The owner should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam.

(5) An emergency action plan should be developed which outlines actions to be taken by the owner to minimize the downstream effects of an emergency at the dam.

b. It is further recommended that employees continue to operate the blow-off valve periodically to ensure its workability and to keep the intake area free of excessive siltation and release additional water through the blow-off in anticipation of, or during, severe storms.

NAPEN-N
Honorable Brendan T. Byrne

A copy of the report is being furnished to Mr. Dirk C. Hofman, New Jersey Department of Environmental Protection, the designated State Office contact for this program. Within five days of the date of this letter, a copy will also be sent to Congressman Courter of the Thirteenth District. Under the provision of the Freedom of Information Act, the inspection report will be subject to release by this office, upon request, five days after the date of this letter.

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

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

Sincerely,

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

1 Incl
As stated

Copies furnished:
Mr. Dirk C. Hofman, P.E., Deputy Director
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

Mr. John O'Dowd, Acting Chief
Bureau of Flood Plain Regulation
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

J. SEWARD JOHNSON DAM (NJ00770)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 28 August 1980 by Louis Berger and Associates, Inc. under contract to the State of New Jersey. The State, under agreement with the U.S. Army Engineer District, Philadelphia, had this inspection performed in accordance with the National Dam Inspection Act, Public Law 92-367.

J. Seward Johnson Dam, initially listed as a high hazard potential structure but reduced to a significant hazard potential structure as a result of this inspection, is judged to be in good overall condition and the spillway is considered adequate. To ensure the adequacy of the structure the following remedial actions are recommended:

a. The following actions should be completed within one year from the date of approval of this report:

(1) Clear the heavy brush from the embankment, upstream face of the dam, and the entrance to the auxiliary spillway approach channel, insuring that a durable grass cover is established in its place.

(2) Fill, grade, and reseed the eroded areas on the upstream face of the dam.

(3) Fill rodent burrows on the downstream slope of the embankment.

(4) The owner should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam.

(5) An emergency action plan should be developed which outlines actions to be taken by the owner to minimize the downstream effects of an emergency at the dam.

b. It is further recommended that employees continue to operate the blow-off valve periodically to ensure its workability and to keep the intake area free of excessive siltation and release additional water through the blow-off in anticipation of, or during, severe storms.

APPROVED: James G. Ton

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

DATE: 5 April 1981

PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM

Name of Dam J. Seward Johnson Dam Fed ID# NJ 00770
NJ ID# 577

State Located	New Jersey
County Located	Hunterdon
Coordinates	Lat. 4041.3 - Long. 7445.8
Stream	Cold Brook
Date of Inspection	August 28, 1980

ASSESSMENT OF GENERAL CONDITIONS

J. Seward Johnson Dam is in a good overall condition and has an adequate spillway capacity to accommodate the 100-year design flood. It is recommended that its hazard classification be downgraded to significant because its overtopping or collapse could damage farm property immediately downstream. No detrimental findings were uncovered to merit further study. Recommended remedial actions to be taken in the future include repair and seeding of the eroded areas and rodent burrows on the embankment, and the removal of excessive vegetation. It is further recommended that the owner develop written operating procedures, a periodic maintenance plan, and an emergency action and alert plan.

A. Perera

Abraham Perera P.E.
Project Manager

OVERVIEW OF J. SEWARD JOHNSON DAM
AUGUST, 1980

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PREFACE

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

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
NAME OF DAM: J. SEWARD JOHNSON DAM FED #NJ 00770
AND NJ ID # 577

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

This report is authorized by the Dam Inspection Act, Public Law 92-367, and has been prepared in accordance with Contract FPM-36 between Louis Berger & Associates, Inc. and the State of New Jersey and its Department of Environmental Protection, Division of Water Resources. The State, in turn, is under agreement with the U.S. Army Engineer District, Philadelphia to have this inspection performed.

b. Purpose of Inspection

The purpose of this inspection is to evaluate the structural and hydraulic condition of the J. Seward Johnson Dam and appurtenant structures, and to determine if the dam constitutes a hazard to human life or property.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

J. Seward Johnson Dam is an 1,150-foot-long crescent-shaped, earthen structure with a 2-foot-thick impervious soil blanket upstream. The embankment has a maximum height of 24 feet, a crest width of 15 feet and 3H:1V/4H:1V slopes upstream and downstream, respectively. The principal discharge outlet consists of a drop inlet structure containing a two-stage concrete riser with an anti-vortex slab, a low-level gate-controlled 15-inch-diameter inlet, and a 66-inch diameter CMP outlet. A 30-foot-wide trapezoidal-shaped auxiliary spillway with a negatively sloped approach channel is located at the right abutment. In addition, an 8-inch-diameter, asphalt-cement irrigation pipe extends from the bottom of the pond through the dam to a cluster of barns where it connects with the existing irrigation system. A 3-inch-diameter sustained flow pipe extends from the upstream side of the

pond to the intake for the principal outlet. All pipes that pass through the dam have anti-seep collars and a stone drain is located beneath the downstream toe of the dam.

b. Location

The dam is located on Cold Brook in Tewksbury Township, Hunterdon County and is approximately one mile north of Oldwick. It is approximately 400 feet northeast of County Rte. 517.

c. Size Classification

The dam at Johnson Pond has a maximum height of 24 feet and a maximum storage capacity of 75 acre-feet. Accordingly, this dam is in the small size category as defined by the criteria in the Recommended Guidelines for Safety Inspection of Dams (storage less than 1,000 acre-feet and height less than 40 feet).

d. Hazard Classification

This dam is located in a gently rolling agricultural region of the county. The area immediately below the dam is very broad and flat with no clearly defined channel valley. The only downstream hazard is a farm house and three barns located 400-500 feet below the dam. All of these structures could receive substantial damage in the event of a dam failure; accordingly, it is recommended that this dam be downgraded to a significant hazard category.

e. Ownership

This dam is owned by Mr. James Johnson, Vliettown Road, Oldwick, New Jersey 08858, (201) 439-3130.

f. Purpose of Dam

The purpose of the dam is irrigation.

g. Design and Construction History

The dam was designed in 1965 by the SCS. Construction was completed in 1966, but leakage through the joints of the CMP outlet required

grouting, which was performed by Prepakt Concrete Company in 1967.

h. Normal Operating Procedures

The dam is maintained by personnel employed at the Johnson Farm. Water is drawn off as required for irrigation or other agricultural purposes.

1.3 PERTINENT DATA

a. Drainage Area

J. Seward Johnson Dam has a drainage area of 0.64 square miles, which consists of woodland, cropland, and meadowland.

b. Total spillway capacity at maximum pool elevation - 1,255 cfs

c. Elevations (assumed datum)

Top of dam	-	104.0
Principal spillway crest	-	99.0
Auxiliary spillway crest	-	102.2
Streambed at centerline of dam	-	80.0

d. Reservoir

Length of maximum pool (top of dam)	- 650 feet
Length of normal pool (principal spillway crest)	- 600 feet
Length of flood control pool (auxiliary spillway crest)	- 625 feet

e. Storage (acre-feet)

Top of dam	- 74 acre feet
Recreation pool	- 50 acre feet
Flood control pool	- 63 acre feet

f. Reservoir Surface (acres)

Top of dam	- 5.5
Recreation pool	- 4.0
Flood control pool	- 4.9

g. Dam

Type - Earth with drop inlet and auxiliary spillway
Length - 1,150 feet
Height - 24 feet
Top width - 15 feet
Side Slopes - 3H:1V and 4H:1V
Zoning - Unzoned
Impervious blanket - Two-foot-thick blanket composed of silt and silty sand (ML-SM) compacted to 95% of maximum dry density
Cutoff - None
Grout curtain - None

h. Diversion and Regulating Tunnel

Type - None

i. Spillway

Type - Auxiliary channel excavated at right abutment
Channel width - 30 feet
Gates - None
U/S Channel - Negatively sloped, vegetated inlet
D/S Channel - Positively sloped, vegetated outlet

j. Regulating Outlets

The primary outlet is a two-stage, drop inlet structure with a 66-inch-diameter corrugated metal outlet pipe. The principal inlet spillway crest is at elevation 102.2, and the low level inlet invert is at elevation 81.5.

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

Details of the initial design, hydraulic determinations, structural analyses, and subsurface information were available for review by the inspection team together with as-built plans and the various corrective measures undertaken since the initial construction. All design was done in accordance with SCS criteria. The main spillway drop inlet structure is a two-stage, deep-well concrete riser of a standard design developed by the Saint Anthony Falls Hydraulic Laboratory.

2.2 CONSTRUCTION

The construction closely followed the design plans except in the area of the auxiliary spillway. As-built drawings and field reconnaissance indicates that the exit channel of the auxiliary spillway was constructed in a straight alignment below the control section rather than curved around the dam's toe as depicted on the original plans. Grouting of the principal outlet was required following construction to mitigate seepage conditions at the joints. According to their investigations, the Soil Conservation Service has determined that the dam is constructed on impervious glacial till overlying weathered Triassic shale. The depth of the till ranges from about 5 feet near the center of the dam to 12 feet or more at the abutments.

2.3 OPERATIONS

General information pertaining to operations at the dam was obtained from the owner and employees near the site at the time of the inspection. There are no formal records of day-to-day operational procedures nor are they particularly germaine to this inspection since they pertain primarily to irrigation and/or farming activities rather than water regulation within the pond.

2.4 EVALUATION

a. Availability

Sufficient engineering data were available to evaluate the stability and hydraulic capacity of the dam.

b. Adequacy

The field inspection and review of the available design plans reveal that the dam is structurally sound and well-built. It is believed that the data available are adequate to render this assessment without recourse to gathering additional information.

c. Validity

An arithmetic error was noted in the SCS discharge rating curve; therefore, a new spillway rating curve was developed and used in the hydraulic/hydrologic determinations.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of J. Seward Johnson Dam took place on August 28, 1980. The dam appeared to be in a generally satisfactory condition with the water level at normal pool elevation at the time of inspection.

b. Dam

The embankment is a crescent-shaped structure (see Figure 2) constructed on a gentle and uniformly sloping hillside. Matted grass on the crest indicates the presence of an occasional vehicle, although severe rutting was not observed. Heavy brush and an occasional young conifer were noted in scattered areas on the left half of the downstream embankment, while somewhat thinner growth covered the upstream face of the dam. The alignment of the crest is satisfactory. No slumping, cracking, or seepage was observed although some rodent burrows were noted on the downstream slope and light erosion was evident at several locations on the upstream face.

c. Appurtenant Structures

The principal spillway riser and outfall are located roughly at the center of the dam. The upper portion of the reinforced concrete antivortex slab and the outfall headwall are in good condition. The bar rack around the drop inlet was clear of debris and the stem and gate wheel appeared in good working order. The auxiliary spillway has a level, 30-foot-long control section about 2 feet lower than the crest elevation of the dam. Both the entrance and exit channels are covered with a thick growth of grass. However, the approach to the entrance channel is overgrown and somewhat obstructed with heavy brush along the edge of the pond.

d. Reservoir Area

The drainage area of this man-made impoundment is only sparsely inhabited and consists primarily of woodland and farms. The area immediately surrounding the lake is wooded with moderate slopes

and has a generally clean and natural appearance with no debris or obstructions noted.

e. Downstream Channel

The area immediately downstream of the dam is a relatively broad, gentle slope with a narrow channel incised 3-4 feet deep. The stoney bottomed channel extends straight from the principal outlet through a concrete 2.5 foot x 7 foot culvert under a secondary farm road about 400 feet downstream from the toe of the dam. On the downstream side of the road the flood plain becomes broader and more gentle in slope until the channel reaches the main stem of Cold Brook about 3,000 feet downstream. With the exception of one farmhouse 500 feet downstream, the flood plain is uninhabited.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

J. Seward Johnson Dam was constructed and is utilized solely for irrigation and other agricultural purposes. There are no formalized operational procedures in effect at the dam although, in the normal course of agricultural activities at the site, the various pipes are utilized frequently. Moreover, the gate valve at the base of the riser was opened this spring to check its workability as well as to clean the intake area of sediment buildup.

4.2 MAINTENANCE OF DAM

Maintenance of the dam is provided by farm employees and consists primarily of general caretaking although more extensive maintenance work is within their capabilities should the need arise. Except for the need for additional brush removal, the embankment appears in a satisfactory state of repair.

4.3 MAINTENANCE OF OPERATING FACILITIES

Maintenance of the operational components are performed as required by farm employees and, because this facility is utilized throughout the year, the operating elements are continuously maintained in good functional order.

4.4 DESCRIPTION OF ANY WARNING SYSTEM IN EFFECT

There is no formal warning system in effect at this dam nor is there a formalized plan for contacting civil defense or other authorities in the event of an emergency. However, farm workers are employed in or about the vicinity of the dam and monitor conditions at the dam in conjunction with their other duties.

4.5 EVALUATION OF OPERATIONAL ADEQUACY

In view of the small drainage area, conservative hydraulic design, and satisfactory condition of this dam, the present operational procedures are considered adequate although more attention to brush removal is required at this time.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 EVALUATION OF FEATURES

a. Design Data

Pursuant to the Recommended Guidelines for Safety Inspection of Dams, J. Seward Johnson Dam is of small size and significant hazard. Accordingly, the 100-year frequency storm was chosen as the design flood by the inspecting engineers. Inflow to the reservoir for the selected 100-year storm was computed utilizing precipitation data from Technical Publication 40 and Technical Memo NWS Hydro 35 by the HEC-1 computer program, which gave a peak inflow of 1,284 cfs. Routing this storm through the reservoir slightly reduced the peak discharge to 1,221 cfs. As the combined spillway capacities are 1,255 cfs, they can accommodate the 100-year flood.

b. Experience Data

The spillway capacity was designed to accommodate 122% of a 50-year storm (based on North and Central Jersey curves) with 1.425 feet of freeboard. According to the owner, the dam has never been overtopped.

c. Visual Observation

The spillway appears to accommodate all normal flows, and during periods of heavy storms, the relatively large auxiliary spillway effectively controls the lake level.

d. Overtopping Potential

Employing the discharge and spillway capacities contained herein, no overtopping would occur during a 100-year frequency storm. There are no records or indications that the dam has ever been overtopped nor does there appear to be a significant potential for serious damage as a result of overtopping.

e. Drawdown

The 12 inch x 12 inch sluice gate in the main riser can be opened to dewater the lake. Drawdown is possible to elevation 81.5 and would take approximately 2.7 days to accomplish.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

No deficiencies of a structural nature were noted during the inspection of this dam. The horizontal alignment of the dam crest is good and both upstream and downstream slopes are uniform and at true design grade. No indication of material movement (such as settling, sloughing, or creep) was observed and the spatial relationship of the auxiliary spillway cut and the dam crest is as indicated on the revised design plans. Water was entering the drop inlet uniformly from all four sides, indicating the symmetry and continuing stability of that structure.

b. Design and Construction Data

A review of the SCS design data, including hydraulic analysis, material selections, and contract plans for the initial construction, indicates the design is well-engineered, reflecting a conservative approach and employing contemporary analytical techniques. Based on the present condition of the dam and a history of uninterrupted satisfactory performance since its construction, it is believed that additional studies or investigations relative to the stability of this structure are unnecessary at this time.

c. Operating Records

The performance of this structure has been satisfactory since its completion. However, there are no formal operating records available.

d. Post Construction Changes

There has been one modification of note since the construction of this dam was completed. When the lake was being filled following construction, water was observed leaking through the joints of the outlet CMP. To correct this condition the joints of the CMP were sealed with chemical grout and the embankment around the outlet structure was treated with 1,000 cubic feet of intrusion cement-based grout. This procedure not only

sealed off all leaks but enhanced the embankment stability in the area surrounding the outfall structure.

e. Seismic Stability

J. Seward Johnson Dam is located in Seismic Zone 1 in which seismic activity is slight and additional structural loading imparted thereby is generally insignificant. Experience indicates that earthen dams in Zone 1 that are stable under static loading conditions will maintain their structural integrity when subjected to the negligible dynamic loads imposed by the weak seismicity characteristic of this area.

SECTION 7 - ASSESSMENTS/RECOMMENDATIONS/ REMEDIAL ACTIONS

7.1 DAM ASSESSMENT

a. Safety

Subject to the inherent limitations of the Phase I visual inspection, J. Seward Johnson Dam is judged to be in a good to excellent overall structural condition. The combined spillway capacities are adequate to accommodate the 100-year frequency design flood so overtopping is a very remote possibility. The dam is recommended to be placed in the significant hazard category solely on the basis of a farm house and barns 400 to 500 feet downstream of the dam.

b. Adequacy of Information

The SCS design information made available by the NJDEP is deemed to be adequate regarding the analyses and evaluation of safe operation and structural stability.

c. Urgency

The remedial measures described below should be undertaken sometime in the future.

d. Necessity for Further Study

In view of the overall condition of this dam and the fact that it is continually monitored and maintained by employees of the owner, additional inspections under the purview of P.L. 92-367 are deemed to be unnecessary.

7.2 RECOMMENDATIONS/REMEDIAL MEASURES

a. Recommendations

Under the present maintenance program, it is recommended that the following be performed in the future:

- Clear the heavy brush from the embankment, upstream face of the dam, and the entrance to the auxiliary spillway approach channel insuring that a durable grass cover is established in its place.

- o Fill, grade, and reseed the eroded areas on the upstream face of the dam.

- o Fill rodent burrows on the downstream slope of the embankment.

B. O&M Maintenance and Procedures

In view of the assessment contained herein, no additional procedures other than those presently in effect appear to be required. However, it is recommended that the owner develop (1) written operating procedures and a periodic maintenance plan to ensure the continuing integrity of the dam and (2) an emergency action plan and downstream warning system to minimize the hazard potential of this dam. It is further recommended that employees (1) continue to operate the blow-off valve periodically to ensure its workability and to keep the intake area free of excessive siltation and (2) release additional water through the blow-off in anticipation of, or during, severe storms.

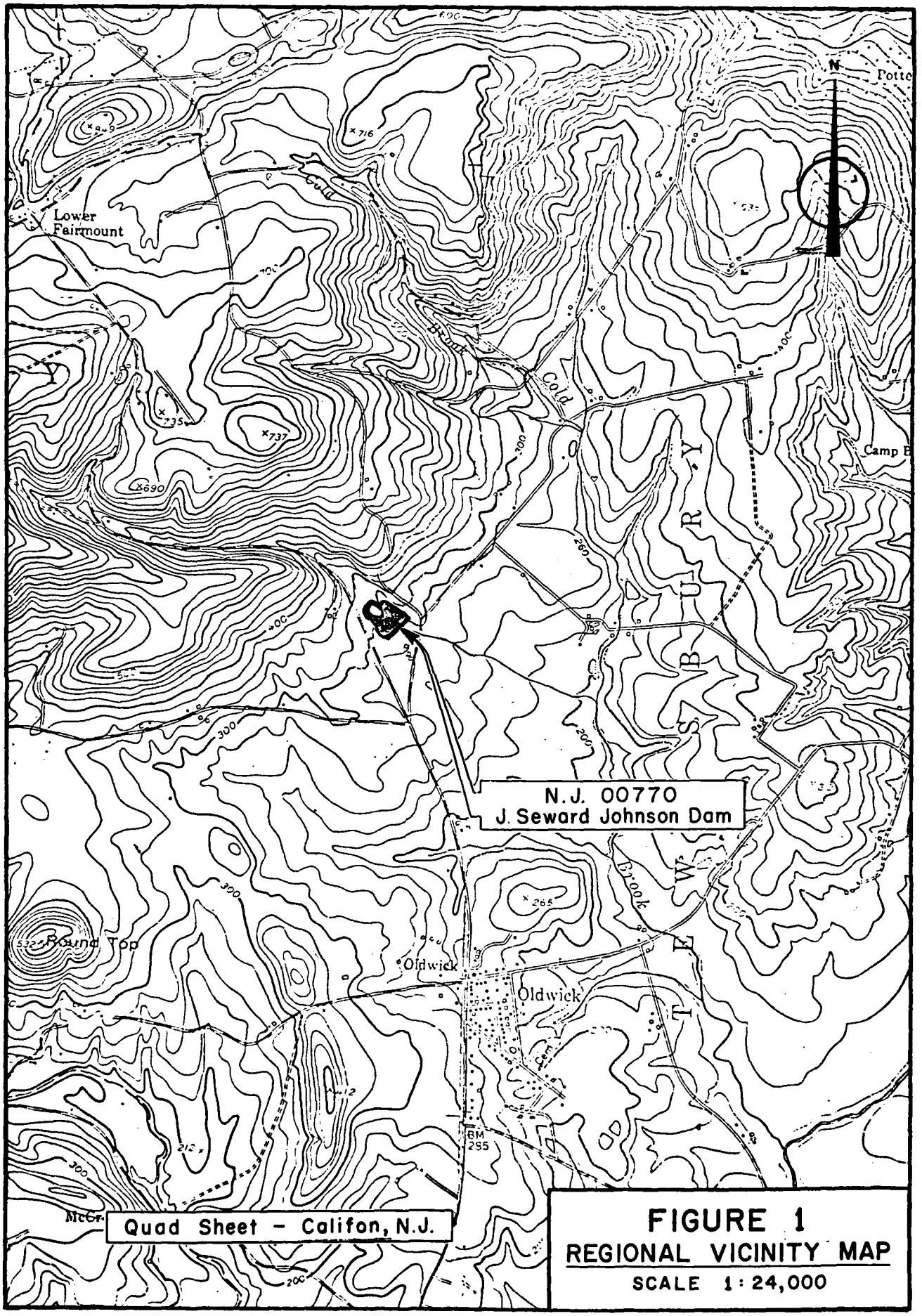
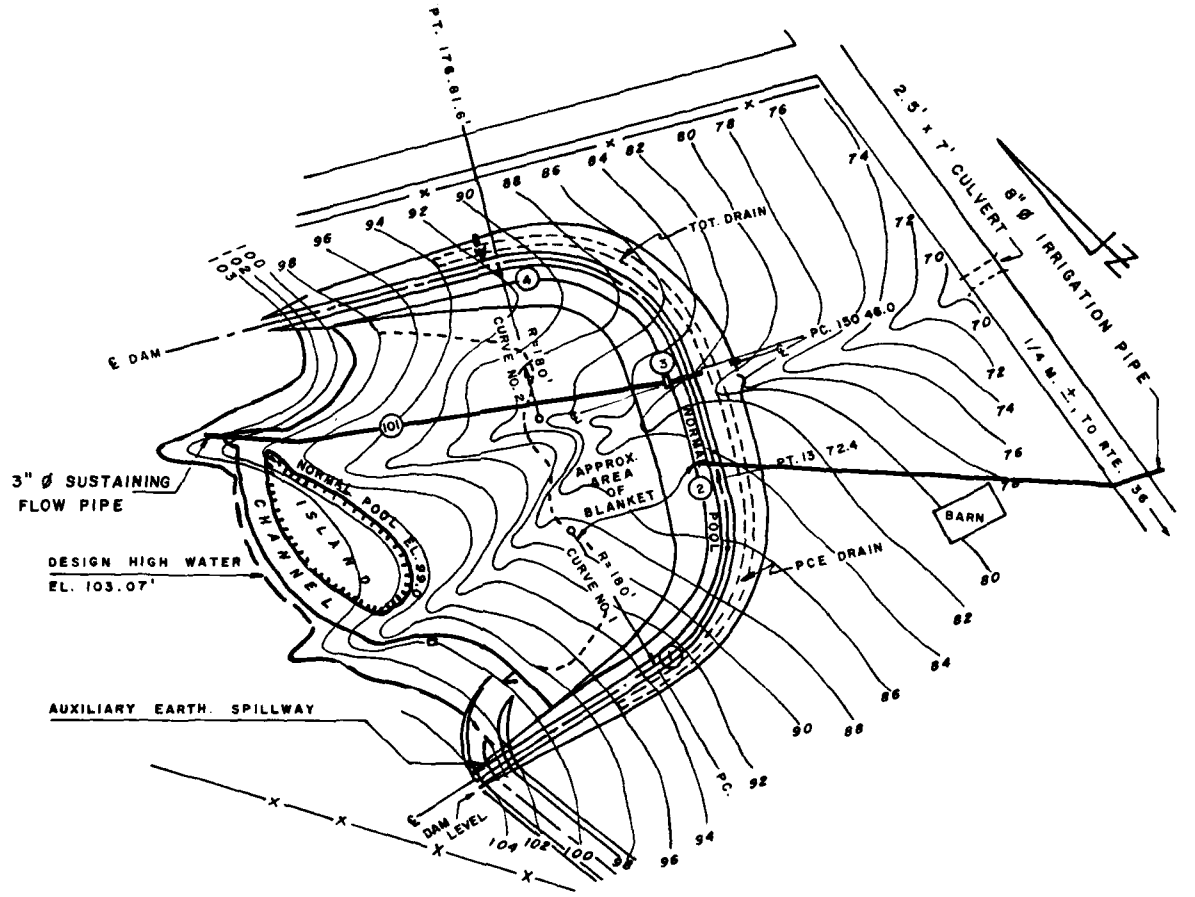


FIGURE 1

REGIONAL VICINITY MAP

SCALE 1:24,000

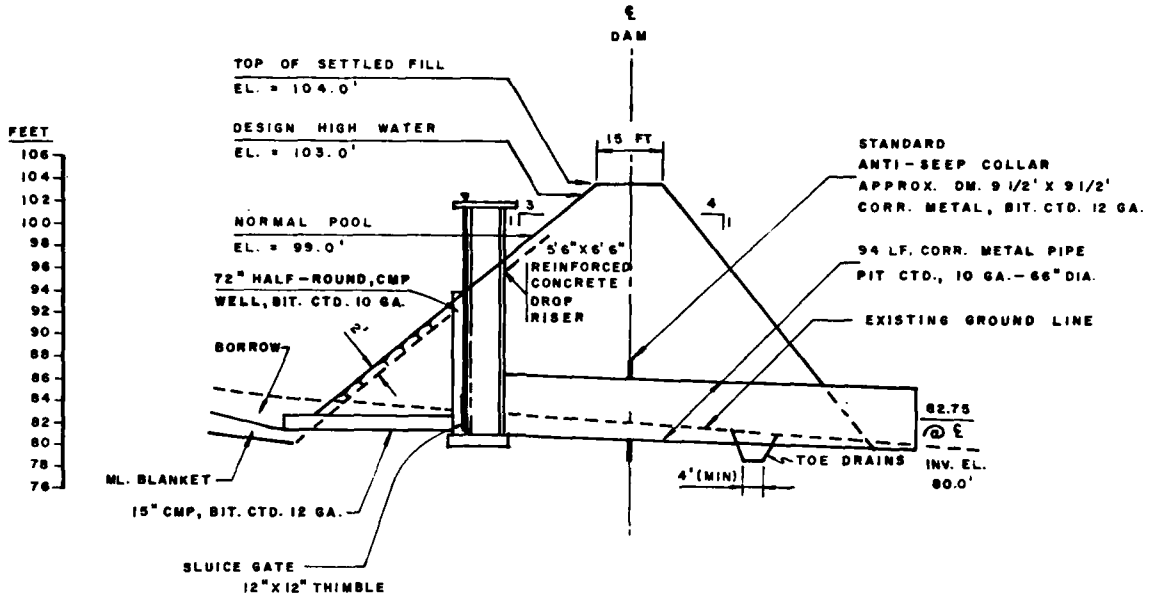


PLAN OF DAM AND POND

NOT TO SCALE

J. SEWARD JOHNSON DAM

FIGURE 2



SECTION THRU ℄ OF SPILLWAY AND DAM

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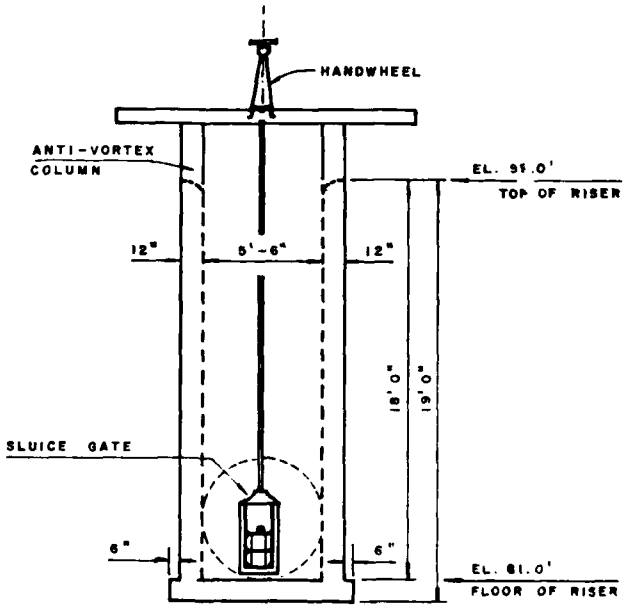


SECTION THRU RISER

NOT TO SCALE

J. SEWARD JOHNSON DAM

FIGURE 3

Check List
Visual Inspection
Phase 1

Name Dam J. Seward Johnson Dam County Hunterdon State New Jersey Coordinators NJDEP

Date(s) Inspection 8/28/80 Weather Clear Temperature 80°

Pool Elevation at Time of Inspection 99 A.D. * Tailwater at Time of Inspection 80 A.D. *

Inspection Personnel:

A. Perera T. Chapter

J. Greenstein

R. Lang

T. Chapter Recorder

*Assumed Datum

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	None Observed	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	None Observed	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	Light erosion on upstream face, particularly near drop inlet. Several small animal burrows on downstream face.	Probably result of foot traffic. Eroded areas and burrows should be filled.
VERTICAL AND HORIZONTAL ALINEMENT OF THE CREST	Satisfactory - No settlement or movement observed.	
RIPRAP FAILURES	N/A	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
VEGETATION	Some trees and heavy brush on upstream and left half of downstream slopes.	Brush should be cut. Pine trees at the toe are of no consequence and can be left in place.
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	Satisfactory - Embankment grades smoothly into surrounding terrain.	
ANY NOTICEABLE SEEPAGE	Not Observed	
STAFF GAGE AND RECORDER	None Observed	
DRAINS	Plans indicate a 2.5' x 4' drain located under the downstream toe.	Drain exit not observed.

OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	None Observed	
INTAKE STRUCTURE	Light efflorescence noted on deck slab. No debris around intake to drop inlet.	Drop inlet structure in good condition.
OUTLET STRUCTURE	Some surface weathering of headwall. Completely overgrown with vines.	Vegetation should be cleared, light patching performed if necessary.
OUTLET CHANNEL	Small rocky-bottomed stream with lush vegetation along both banks.	
EMERGENCY GATE	Gate is reported operable by owner. Appears in good condition.	

UNGATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	No concrete. Level section is grass.	Well landscaped. Grass is 6-8 inches tall.
APPROACH CHANNEL	Very heavy brush and shrubs at entrance to approach channel. May retard inflow.	Schrubs and brush should be cleared from channel at the lake's edge.
DISCHARGE CHANNEL	Clear, well-maintained grassy slope.	Satisfactory condition.
BRIDGE AND PIERS	None	

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Reservoir on side of uniformly sloping hill, well wooded and uninhabited upslope.	
SEDIMENTATION	Heavy silty flow reported by owner when low level drain valve was opened last year. Sedimentation rate does not appear excessive based on frequency of flushing.	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Channel is unobstructed with possible exception of 2.5' x 7' road culvert several hundred feet downstream.	
SLOPES	Entire downstream area adjoining stream channel is relatively flat.	Flood wave would disburse over wide area and dissipate rapidly.
APPROXIMATE NO. OF HOMES AND POPULATION	1 farm house about 600 feet downstream. Four inhabitants at this house.	

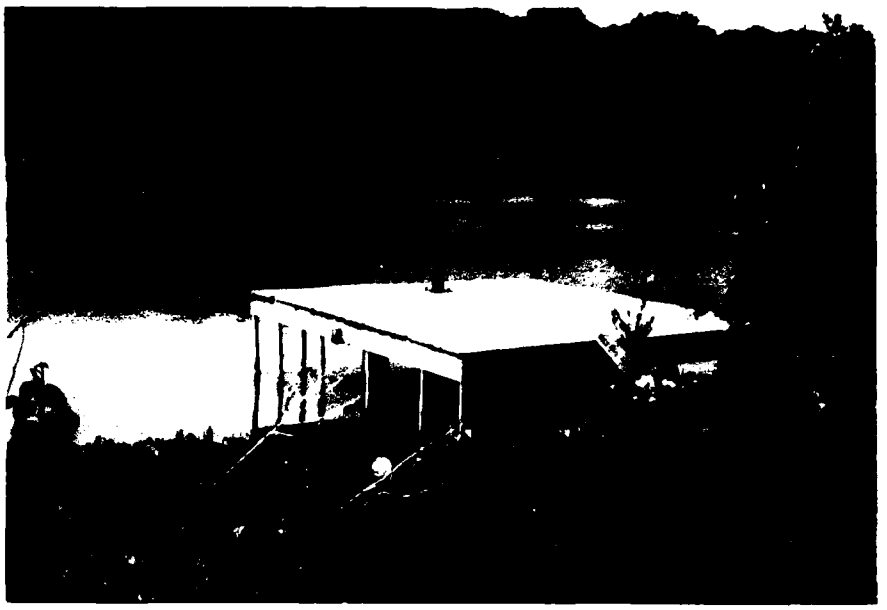
CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION

ITEM	REMARKS
PLAN OF DAM	Available from SCS (1370 Hamilton Street, Somerset, N.J.)
REGIONAL VICINITY MAP	Available from SCS or USGS Quad.
CONSTRUCTION HISTORY	Available from SCS
TYPICAL SECTIONS OF DAM	Available from SCS
HYDROLOGIC/HYDRAULIC DATA	Available from SCS
OUTLETS - PLAN	Available from SCS
- DETAILS	Available from SCS
- CONSTRAINTS	Available from SCS
- DISCHARGE RATINGS	Available from SCS
RAINFALL/RESERVOIR RECORDS	None kept

ITEM	REMARKS
DESIGN REPORTS	Available from SCS
GEOLOGY REPORTS	Available from SCS, State Geologic Map and Rutgers Engineering Soil Survey of New Jersey
DESIGN COMPUTATIONS	Available from SCS
HYDROLOGY & HYDRAULICS	Available from SCS
DAM STABILITY	Not Available
SEEPAGE STUDIES	Not Available
MATERIALS INVESTIGATIONS	Available from SCS
BORING RECORDS	Not Available
LABORATORY	Not Available
FIELD	Not Available
POST-CONSTRUCTION SURVEYS OF DAM	None performed
BORROW SOURCES	Local. Available from SCS

ITEM	REMARKS
MONITORING SYSTEMS	None
MODIFICATIONS	Report of grouting operation performed in 1966 available from Prepakt Concrete Co., 1405 Western Saving Fund Building, Philadelphia, Pa. 19107
HIGH POOL RECORDS	Not Recorded
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	Available as noted above.
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None
MAINTENANCE OPERATION RECORDS	None kept

ITEM	REMARKS
SPILLWAY PLAN	Plans, sections and details for principal and auxiliary spillways available from SCS.
SECTIONS	
DETAILS	
OPERATING EQUIPMENT PLANS & DETAILS	Available from SCS.



August, 1980
View of Principal Spillway Intake Structure

August, 1980
View of Principal Spillway Outlet (8' Range Pole)

August, 1980

View of Auxiliary Spillway Channel

August, 1980

View of Downstream from Dam Crest

August, 1980
View of Downstream Face of Dam

August, 1980
View of Dam Crest Looking Southwest

CHECK LIST
HYDROLOGIC AND HYDRAULIC DATA
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: 0.64 sq. mi.

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): 99 * (50 acre-feet)

ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): 102.2 (63 acre-feet)

ELEVATION MAXIMUM DESIGN POOL: Unknown

ELEVATION TOP DAM: 104 * (73.7 acre-feet)

CREST:

a. Elevation 102.2 *
b. Type Auxiliary Spillway Channel
c. Width 30-foot-wide channel
d. Length 300-foot-long channel
e. Location Spillover Right abutment
f. Number and Type of Gates None

OUTLET WORKS: Principal spillway (Crest El. - 99.0 *)

a. Type Two-stage drop inlet with 66" dia. CMP
b. Location Center of Dam
c. Entrance inverts 81 *
d. Exit inverts 80 *
e. Emergency draindown facilities 15" dia. CMP inlet at invert 81.5 *

HYDROMETEOROLOGICAL GAGES: None

a. Type
b. Location
c. Records

MAXIMUM NON-DAMAGING DISCHARGE: 1255 cfs

* Assumed datum

BY D. LANG DATE Sept. '20 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. A1 OF A12
CHKD. BY DATE J. SERARD JOHNSON DAM PROJECT C266
SUBJECT

TIME OF CONCENTRATION:

A LENGTH ALONG WATERCOURSE TO DRAINAGE DIVIDE = 7000' = 1.61 mi.
$\Delta H = 640 - 270 = 350'$
SLOPE = $\frac{350' \times 100}{7000} = 5.0\%$ ASSUME VELOCITY = 3 FT/SEC

$t_c = \frac{7000}{3 \times 3600} = 0.65$ HOURS
OVERLAND FLOW: $\Delta H = 720 - 640 = 80'/1500' = 5\%$ Assume $V = 3'/SEC$: $t_c = .14$ HR.
$t_c = .65 + .14 = 0.79$ HRS

B. By CALIFORNIA CULVERTS METHOD

$$t_c = \left(\frac{11.9 L^3}{H}\right)^{0.385} = \left(\frac{11.9 (1.61)^3}{430}\right)^{0.385} = 0.44 \text{ HOURS}$$

TOTAL $t_c = .44 + .14 = .58$ HR

C. By SCS METHOD (FROM "URBAN HYDROLOGY FOR SMALL WATERSHEDS" TECHNICAL RELEASE NO. 55)

ASSUME C_N FOR WATERSHED = 79
SLOPE = 5.0%
L = 8500'

$S = \frac{1000}{CN} - 10 = 2.66$

$$L = \text{LAG IN HOURS} = \frac{L^{0.8}(S+1)^{0.7}}{1900 \cdot (y)^{0.5}} = \frac{8500^{0.8}(2.66+1)^{0.7}}{1900\,(5)^{0.5}}$$

$= 0.81$ HOURS

$$t_c = \frac{L}{0.6} = \frac{0.81}{0.6} = 1.35 \text{ HOURS}$$

USE $t_c = 0.91$ HOURS
$D = 6 \text{ min} = .1$ HR
$T_p = D/2 + 0.6\,t_c = \frac{0.10}{2} + 0.6(0.91) = 0.60$

LAG = $.6\,t_c = .55$ HRS.

$$Q_p = \frac{454 (.64)}{0.60} = 516 \text{ cfs}$$

BY J. Corcoran DATE 3/17/81 | **LOUIS BERGER & ASSOCIATES INC.** | SHEET NO. A2 OF A12

CHKD. BY ____ DATE ____ | J. STUART JOHNSON DAM | PROJECT C-362

SUBJECT Test Storm: 100 Year Freq.

Precipitation data from TP-40 & NOAA Technical Memorandum NWS Hydro-35

Time	Precip.	Δ	RΔ	Time	Precip.	Δ	RΔ
0.1	.91	.91	.03	3.1	4.30	.05	.91
0.2	1.46	.55	.03	3.2	4.34	.04	.35
0.3	1.81	.35	.03	3.3	4.38	.04	.23
0.4	2.07	.26	.03	3.4	4.41	.03	.17
0.5	2.30	.23	.02	3.5	4.45	.04	.12
0.6	2.46	.16	.03	3.6	4.48	.03	.10
0.7	2.63	.17	.02	3.7	4.52	.04	.09
0.8	2.77	.14	.04	3.8	4.56	.04	.08
0.9	2.89	.12	.03	3.9	4.60	.04	.07
1.0	3.00	.11	.03	4.0	4.63	.03	.06
1.1	3.10	.10	.03	4.1	4.66	.03	.06
1.2	3.20	.10	.04	4.2	4.69	.03	.05
1.3	3.29	.09	.03	4.3	4.72	.03	.05
1.4	3.36	.07	.03	4.4	4.75	.03	.05
1.5	3.44	.08	.04	4.5	4.78	.03	.04
1.6	3.51	.07	.04	4.6	4.82	.04	.05
1.7	3.58	.07	.05	4.7	4.85	.03	.04
1.8	3.65	.07	.05	4.8	4.87	.02	.04
1.9	3.71	.06	.05	4.9	4.90	.03	.04
2.0	3.76	.05	.05	5.0	4.93	.03	.04
2.1	3.82	.06	.05	5.1	4.96	.03	.03
2.2	3.87	.05	.07	5.2	4.98	.02	.03
2.3	3.92	.05	.07	5.3	5.01	.03	.03
2.4	3.97	.05	.07	5.4	5.04	.03	.03
2.5	4.02	.05	.10	5.5	5.06	.02	.03
2.6	4.07	.05	.11	5.6	5.09	.03	.03
2.7	4.12	.05	.14	5.7	5.12	.03	.03
2.8	4.17	.05	.16	5.8	5.15	.03	.02
2.9	4.21	.04	.26	5.9	5.17	.02	.03
3.0	4.25	.04	.55	6.0	5.20	.03	.02

BY E. LAMB DATE Sept. '70 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. A3 OF A12

CHKD. BY _____ DATE _____ PROJECT Spillway Design Flood

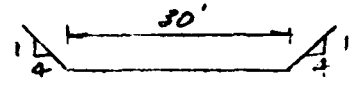
SUBJECT _____

EFFECTIVE L = 22'

SPILLWAY

$Q_p = C \cdot A\sqrt{2gH}$ A = 23.76

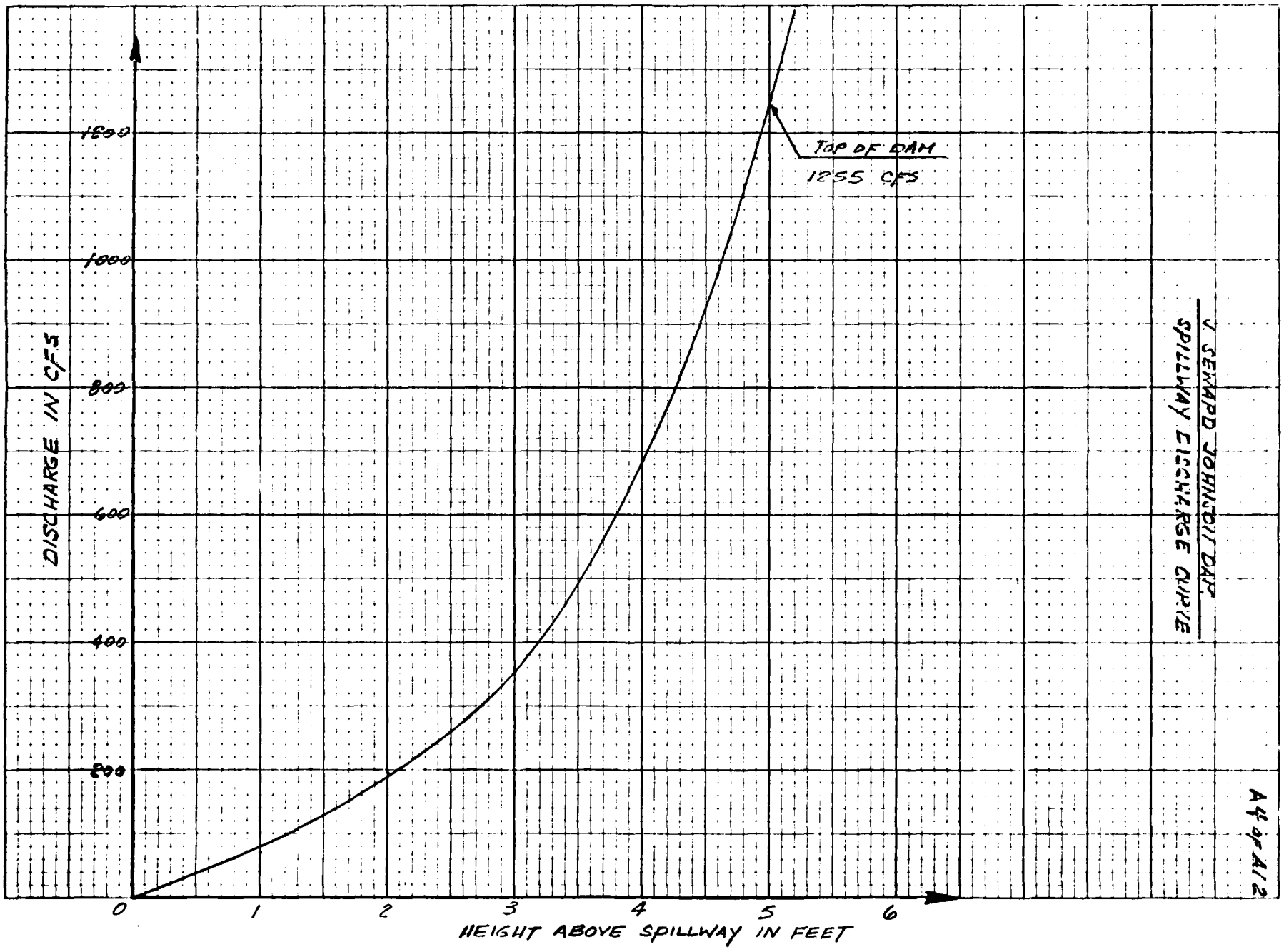
PIPE



AUXILLIARY SPILLWAY

ELEV.	H	C	L	Q_s	H	C	Q_p	H	S	$S^{1/2}$	A	P	R	$R^{2/3}$	n	Q_a	$Q_{tot.}$
99.0	0	3.1	22	0	16.25	0.58	0										0
100	1			68.2	17.25		411.80										68.2
101	2			192.9	18.25		423.6										192.9
102	3			354.4	19.25		435	0									354.4
102.47	3.47			440.3	19.72		440.3	0.47	.048	.2032	14.98	33.88	.442	0.580	0.04	65.76	506
103	4				20.25		446.2	1			34.0	38.25	0.889	0.925		231.9	684.1
104	5				21.25		457.1	2			76.0	46.49	1.635	1.388		798.3	1255.4
105					22.25			3									
106																	
107																	

Top of Dam



V. SEWARD JOHNSTOWN DAM
SPILLWAY DISCHARGE CURVE

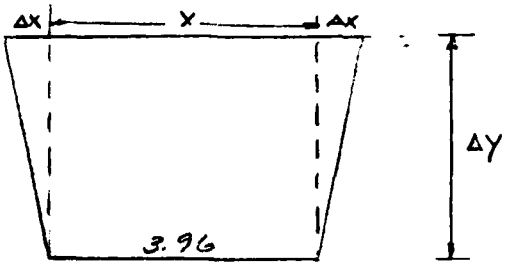
A4 of A12

BY D. LONG DATE SEPT. '70 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. A5 OF A12

CHKD. BY ____ DATE ____ J. SEWARD JOHNSON · DAM PROJECT C 262

SUBJECT SURCHARGE STORAGE

AREA OF LAKE @ ELEV. 99.0 = 3.96 ACRES (SPILLWAY CREST)
AREA @ ELEV. 104.0 = 5.5 ACRES



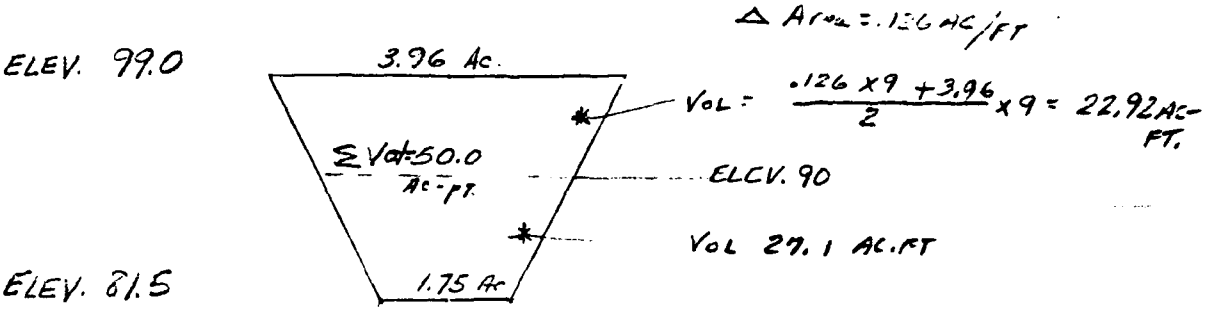
HEIGHT ABOVE SPILLWAY CREST (FT.)	ELEV.	AREA (ACRES)	AREA OF SURFACE STORAGE (ACRES)
0	99	0	3.96
1	100	4.27	
2	101	4.58	
3	102	4.88	
4	103	5.19	
5	104	5.50	5.5

BY D. LANG DATE SEPT. '80 | **LOUIS BERGER & ASSOCIATES INC.** | SHEET NO. A-6 OF A12

CHKD. BY _____ DATE _____ | J. SENAKO JOHNSON DAM | PROJECT C-262

SUBJECT DRAWDOWN CAPACITY

DRAWDOWN CAPABILITIES ARE CONTROLLED BY 12"x12" GATE
LOCATED IN MAIN RISER FACE
INVERT ELEV. = 81.5
ASSUME INFLOW OF 1.0 CFS ± 1 CFS/SQ. MI.



$Q = CA\sqrt{2gH}$

$C = 0.52$
$A = 1\ FT^2$

FROM 99.0 TO 90.0 $H_{AVG} = 13.125' - .5'$ (½ OF 12" GATE)

$Q = 0.52 \times 1 \times \sqrt{64.4 \times 12.625}$
$= 14.8$ CFS $- 1$ CFS $_{INFLOW}$ $= 13.8$ CFS

$\frac{22.7 \times 43560}{13.8 \times 3600} = 20.1$ HOURS

FROM 90.00 TO 81.50 $H_{AVG.} = \frac{8.5' - .5'}{2}$ (½ OF 12" GATE)

$Q = 0.52 \times 1 \times \sqrt{64.4 \times 4}$
$= 8.34$ CFS $- 1$ SAY 7.34 CFS

$\frac{27.1 \times 43560}{7.34 \times 3600} = 44.7$ HOURS

TOTAL $= 20.1 + 44.7 = 64.8$ HOURS $\cong$ 2.7 DAYS

BY D. LANG DATE SEPT. 20 | **LOUIS BERGER & ASSOCIATES INC.** | SHEET NO A.7 OF A12

CHKD. BY J.C. DATE 3/17/21 | J. EDWARD JOHNSON DAM | PROJECT C256

SUBJECT SUMMARY OF HEC-1 INPUT DATA

HEIGHT ABOVE SPILLWAY (FT.)	ELEV.	DISCHARGE (CFS)	AREA OF SURCHARGE STORAGE (ACRES)
0	99	0	3.96
1	101	62.2	
2	102	192.9	
3	103	354.4	
4	104	684.1	
5	105	1255.4	5.5

BY [illegible] DATE 3/17/81

CHKD. BY _____ DATE _____

SUBJECT _____

LOUIS BERGER & ASSOCIATES INC.

J. Seward Johnson, Inc.

HEC 1 DF Input

SHEET NO A8 OF A12

PROJECT C-262

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**********
   A1  J  SEWARD JOHNSON  HEC1DB
   A2  J CERAVOLO
   A3  MARCH 17, 1981
   B     100       0       6       0       0       0       0       0       0       0
   B1      5
   J       1       1       1
   J1      1
   K       0       1                                               1
   K1  INFLOW HYDROGRAPH TO RESERVOIR
   M       0       2      64               0
   O      60
   O1    .03     .03     .03     .03     .02     .03     .02     .04     .03     .03
   O1    .03     .04     .03     .03     .04     .04     .05     .05     .05     .05
   O1    .05     .07     .07     .07     .10     .11     .14     .16     .26     .55
   O1    .91     .35     .23     .17     .12     .10     .09     .08     .07     .06
   O1    .06     .05     .05     .05     .04     .05     .04     .04     .04     .04
   O1    .03     .03     .03     .03     .03     .03     .03     .02     .03     .02
   T                                                       5      .1
   W2            .55
   X       0       0       1
   K       1       2                                               1
   K1  RO.TED FLOWS THROUGH RESERVOIR
   Y                                       1       1
   Y1                                                             -1
   Y4     99     100     101     102     103     104
   Y5      0    68.2   192.9   354.4   684.1  1255.4
   $A   3.96    5.50
   $E     99     104
   $$     99
   $D    104
   K      99
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JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
100	0	6	0	0	0	0	0	0	0
			JOPER	NWT	LROPT	TRACE			
			5	0	0	0			

INFLOW HYDROGRAPH TO RESERVOIR

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
0	2	0.64	0.00	0.64	0.00	0.000	0	0	0

PRECIP PATTERN

0.03	0.03	0.03	0.03	0.02	0.03	0.02	0.04	0.03	0.03
0.03	0.04	0.03	0.03	0.04	0.04	0.05	0.05	0.05	0.05
0.05	0.07	0.07	0.07	0.10	0.11	0.14	0.16	0.26	0.55
0.91	0.35	0.23	0.17	0.12	0.10	0.09	0.08	0.07	0.06
0.06	0.05	0.05	0.05	0.04	0.05	0.04	0.04	0.04	0.04
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.02

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.10	0.00	0.00

BY _____ DATE 3/17/00

CHKD. BY _____ DATE _____

SUBJECT _____

LOUIS BERGER & ASSOCIATES INC.

SHEET NO 14 OF 14

PROJECT _____

UNIT HYDROGRAPH DATA

END-OF-PERIOD FLOW

MO. DA	HR. MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO. DA	HR. MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	0.06	1	0.03	0.00	0.03	0.	1.01	5.06	51	0.03	0.02	0.01	194
1.01	0.12	2	0.03	0.00	0.03	0.	1.01	5.12	52	0.03	0.02	0.01	177
1.01	0.18	3	0.03	0.00	0.03	0.	1.01	5.18	53	0.03	0.02	0.01	162
1.01	0.24	4	0.03	0.00	0.03	0.	1.01	5.24	54	0.03	0.02	0.01	148
1.01	0.30	5	0.02	0.00	0.02	0.	1.01	5.30	55	0.03	0.02	0.01	136
1.01	0.36	6	0.03	0.00	0.03	0.	1.01	5.36	56	0.03	0.02	0.01	125
1.01	0.42	7	0.02	0.00	0.02	0.	1.01	5.42	57	0.03	0.02	0.01	115
1.01	0.48	8	0.04	0.00	0.04	0.	1.01	5.48	58	0.02	0.01	0.01	106
1.01	0.54	9	0.03	0.00	0.03	0.	1.01	5.54	59	0.03	0.02	0.01	99
1.01	1.00	10	0.03	0.00	0.03	0.	1.01	6.00	60	0.02	0.01	0.01	92
1.01	1.06	11	0.03	0.00	0.03	0.	1.01	6.06	61	0.00	0.00	0.00	86
1.01	1.12	12	0.04	0.00	0.04	0.	1.01	6.12	62	0.00	0.00	0.00	79
1.01	1.18	13	0.03	0.00	0.03	0.	1.01	6.18	63	0.00	0.00	0.00	71
1.01	1.24	14	0.03	0.00	0.03	0.	1.01	6.24	64	0.00	0.00	0.00	61
1.01	1.30	15	0.04	0.00	0.04	0.	1.01	6.30	65	0.00	0.00	0.00	50
1.01	1.36	16	0.04	0.00	0.04	0.	1.01	6.36	66	0.00	0.00	0.00	40
1.01	1.42	17	0.05	0.04	0.01	2.	1.01	6.42	67	0.00	0.00	0.00	31
1.01	1.48	18	0.05	0.04	0.01	6.	1.01	6.48	68	0.00	0.00	0.00	24
1.01	1.54	19	0.05	0.04	0.01	16.	1.01	6.54	69	0.00	0.00	0.00	18
1.01	2.00	20	0.05	0.04	0.01	32.	1.01	7.00	70	0.00	0.00	0.00	14
1.01	2.06	21	0.05	0.04	0.01	51.	1.01	7.06	71	0.00	0.00	0.00	10
1.01	2.12	22	0.07	0.06	0.01	73.	1.01	7.12	72	0.00	0.00	0.00	8
1.01	2.18	23	0.07	0.06	0.01	95.	1.01	7.18	73	0.00	0.00	0.00	6
1.01	2.24	24	0.07	0.06	0.01	117.	1.01	7.24	74	0.00	0.00	0.00	4
1.01	2.30	25	0.10	0.09	0.01	140.	1.01	7.30	75	0.00	0.00	0.00	3
1.01	2.36	26	0.11	0.10	0.01	164.	1.01	7.36	76	0.00	0.00	0.00	3
1.01	2.42	27	0.14	0.13	0.01	191.	1.01	7.42	77	0.00	0.00	0.00	2
1.01	2.48	28	0.16	0.15	0.01	226.	1.01	7.48	78	0.00	0.00	0.00	1
1.01	2.54	29	0.26	0.25	0.01	271.	1.01	7.54	79	0.00	0.00	0.00	1
1.01	3.00	30	0.55	0.54	0.01	342.	1.01	8.00	80	0.00	0.00	0.00	1
1.01	3.06	31	0.91	0.90	0.01	465.	1.01	8.06	81	0.00	0.00	0.00	1
1.01	3.12	32	0.35	0.34	0.01	644.	1.01	8.12	82	0.00	0.00	0.00	0
1.01	3.18	33	0.23	0.22	0.01	868.	1.01	8.18	83	0.00	0.00	0.00	0
1.01	3.24	34	0.17	0.16	0.01	1068.	1.01	8.24	84	0.00	0.00	0.00	0
1.01	3.30	35	0.12	0.11	0.01	1234.	1.01	8.30	85	0.00	0.00	0.00	0
1.01	3.36	36	0.10	0.09	0.01	1284.	1.01	8.36	86	0.00	0.00	0.00	0
1.01	3.42	37	0.09	0.08	0.01	1251.	1.01	8.42	87	0.00	0.00	0.00	0
1.01	3.48	38	0.08	0.07	0.01	1154.	1.01	8.48	88	0.00	0.00	0.00	0
1.01	3.54	39	0.07	0.06	0.01	1017.	1.01	8.54	89	0.00	0.00	0.00	0
1.01	4.00	40	0.06	0.05	0.01	865.	1.01	9.00	90	0.00	0.00	0.00	0
1.01	4.06	41	0.06	0.05	0.01	735.	1.01	9.06	91	0.00	0.00	0.00	0
1.01	4.12	42	0.05	0.04	0.01	626.	1.01	9.12	92	0.00	0.00	0.00	0
1.01	4.18	43	0.05	0.04	0.01	537.	1.01	9.18	93	0.00	0.00	0.00	0
1.01	4.24	44	0.05	0.04	0.01	461.	1.01	9.24	94	0.00	0.00	0.00	0
1.01	4.30	45	0.04	0.03	0.01	397.	1.01	9.30	95	0.00	0.00	0.00	0
1.01	4.36	46	0.05	0.04	0.01	345.	1.01	9.36	96	0.00	0.00	0.00	0
1.01	4.42	47	0.04	0.03	0.01	302.	1.01	9.42	97	0.00	0.00	0.00	0
1.01	4.48	48	0.04	0.03	0.01	266.	1.01	9.48	98	0.00	0.00	0.00	0
1.01	4.54	49	0.04	0.03	0.01	238.	1.01	9.54	99	0.00	0.00	0.00	0
1.01	5.00	50	0.04	0.03	0.01	214.	1.01	10.00	100	0.00	0.00	0.00	0
									SUM	5.20	4.26	0.94	17585
										(132)	(108)	(24)	(497.95)

BY ____ DATE 3/17/01 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO A-12 OF A12

CHKD. BY ____ DATE ____ PROJECT ____

SUBJECT HEC-1 OF OUTPUT

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

CFS	1284	293.	176	176	17585.
CMS	36	8.	5	5.	498.
INCHES		4.26	4.26	4.26	4.26
MM		108.16	108.20	108.20	108.20
AC-FT		145	145	145	145.
THOUS CU M		179.	179	179	179

ROUTED FLOWS THROUGH RESERVOIR

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

STAGE	99.00	100.00	101.00	102.00	103.00	104.00
FLOW	0.00	68.20	192.90	354.40	684.10	1255.40
SURFACE AREA=	4	6.				
CAPACITY=	0	24.				
ELEVATION=	99.	104				

CREL	SPWID	COGW	EXPW	ELEVL	COGL	CAREA	EXPL
99.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COGD	EXPD	DAMWID
104.0	0.0	0.0	0.

STATION 2, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

MO. DA	HR. MN	PERIOD	HOURS	INFLOW	OUTFLOW	STORAGE	STAGE
1 01	0 06	1	0.10	0.	0.	0.	99.0
1 01	0 12	2	0.20	0.	0.	0.	99.0
1 01	0 18	3	0.30	0.	0.	0.	99.0
1 01	0 24	4	0.40	0.	0.	0.	99.0
1 01	0 30	5	0.50	0.	0.	0.	99.0
1 01	0 36	6	0.60	0	0.	0.	99.0
1 01	0 42	7	0.70	0.	0.	0.	99.0
1 01	0 48	8	0.80	0	0.	0.	99.0
1 01	0 54	9	0.90	0.	0.	0.	99.0
1 01	1 00	10	1.00	0.	0.	0.	99.0
1 01	1 06	11	1.10	0	0.	0.	99.0
1 01	1 12	12	1.20	0.	0.	0.	99.0
1 01	1 18	13	1.30	0.	0.	0.	99.0
1 01	1 24	14	1.40	0.	0.	0.	99.0
1 01	1 30	15	1.50	0	0.	0.	99.0
1 01	1 36	16	1.60	0.	0.	0.	99.0
1 01	1 42	17	1.70	2.	0	0.	99.0
1 01	1 48	18	1.80	6.	1.	0.	99.0
1 01	1 54	19	1.90	16	2.	0.	99.0
1 01	2 00	20	2.00	32.	5.	0.	99.1
1 01	2 06	21	2.10	51	10.	1.	99.1
1 01	2 12	22	2.20	73	17.	1.	99.2
1 01	2 18	23	2.30	95.	25	1.	99.4
1 01	2 24	24	2.40	117	36	2	99.5
1 01	2 30	25	2.50	140	48.	3.	99.7
1 01	2 36	26	2.60	164	61	4.	99.9
1 01	2 42	27	2.70	191	80.	5.	100.1
1 01	2 48	28	2.80	226.	108	5.	100.3
1 01	2 54	29	2.90	271	137	7	100.6
1 01	3 00	30	3.00	342	172.	8	100.8
1 01	3 06	31	3.10	465	226	9	101.2
1 01	3 12	32	3.20	644	308	12	101.7
1 01	3 18	33	3.30	868	466	15.	102.3
1 01	3 24	34	3.40	1088	683	18	103.0
1 01	3 30	35	3.50	1234	979	21	103.5
1 01	3 36	36	3.60	1264	1150	23	103.8
1 01	3 42	37	3.70	1251	1221	23	103.9
1 01	3 48	38	3.80	1154	1210	23	103.9
1 01	3 54	39	3.90	1017	1135	22	103.8
1 01	4 00	40	4.00	865	1017	21	103.6

BY JC DATE 3/17/01 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. A11 OF A12

CHKD. BY _____ DATE _____ 1. Second Line PROJECT C 262

SUBJECT HEC 1 DP Output

1.01	4.06	41	4.10	735.	884.	20.	103.3
1.01	4.12	42	4.20	626.	758.	19.	103.1
1.01	4.18	43	4.30	537.	660.	18.	102.9
1.01	4.24	44	4.40	461.	592.	17.	102.7
1.01	4.30	45	4.50	397.	523.	16.	102.5
1.01	4.36	46	4.60	345.	458.	15.	102.3
1.01	4.42	47	4.70	302.	399.	14.	102.1
1.01	4.48	48	4.80	266.	351.	13.	102.0
1.01	4.54	49	4.90	238.	327.	12.	101.8
1.01	5.00	50	5.00	214.	302.	12.	101.7
1.01	5.06	51	5.10	194.	278.	11.	101.5
1.01	5.12	52	5.20	177.	255.	10.	101.4
1.01	5.18	53	5.30	162.	234.	10.	101.3
1.01	5.24	54	5.40	149.	214.	9.	101.1
1.01	5.30	55	5.50	136.	196.	9.	101.0
1.01	5.36	56	5.60	125.	182.	8.	100.9
1.01	5.42	57	5.70	115.	169.	8.	100.8
1.01	5.48	58	5.80	106.	157.	7.	100.7
1.01	5.54	59	5.90	99.	146.	7.	100.6
1.01	6.00	60	6.00	92.	135.	6.	100.5
1.01	6.06	61	6.10	86.	126.	6.	100.5
1.01	6.12	62	6.20	79.	116.	6.	100.4
1.01	6.18	63	6.30	71.	108.	5.	100.3
1.01	6.24	64	6.40	61.	99.	5.	100.2
1.01	6.30	65	6.50	50.	89.	5.	100.2
1.01	6.36	66	6.60	40.	80.	5.	100.1
1.01	6.42	67	6.70	31.	70.	4.	100.0
1.01	6.48	68	6.80	24.	64.	4.	99.9
1.01	6.54	69	6.90	18.	59.	4.	99.9
1.01	7.00	70	7.00	14.	53.	3.	99.8
1.01	7.06	71	7.10	10.	48.	3.	99.7
1.01	7.12	72	7.20	8.	43.	3.	99.6
1.01	7.18	73	7.30	6.	39.	2.	99.6
1.01	7.24	74	7.40	4.	34.	2.	99.5
1.01	7.30	75	7.50	3.	30.	2.	99.4
1.01	7.36	76	7.60	3.	27.	2.	99.4
1.01	7.42	77	7.70	2.	24.	1.	99.3
1.01	7.48	78	7.80	1.	21.	1.	99.3
1.01	7.54	79	7.90	1.	18.	1.	99.3
1.01	8.00	80	8.00	1.	16.	1.	99.2
1.01	8.06	81	8.10	1.	14.	1.	99.2
1.01	8.12	82	8.20	0.	12.	1.	99.2
1.01	8.18	83	8.30	0.	11.	1.	99.2
1.01	8.24	84	8.40	0.	9.	1.	99.1
1.01	8.30	85	8.50	0.	8.	0.	99.1
1.01	8.36	86	8.60	0.	7.	0.	99.1
1.01	8.42	87	8.70	0.	6.	0.	99.1
1.01	8.48	88	8.80	0.	5.	0.	99.1
1.01	8.54	89	8.90	0.	5.	0.	99.1
1.01	9.00	90	9.00	0.	4.	0.	99.1
1.01	9.06	91	9.10	0.	3.	0.	99.1
1.01	9.12	92	9.20	0.	3.	0.	99.0
1.01	9.18	93	9.30	0.	3.	0.	99.0
1.01	9.24	94	9.40	0.	2.	0.	99.0
1.01	9.30	95	9.50	0.	2.	0.	99.0
1.01	9.36	96	9.60	0.	2.	0.	99.0
1.01	9.42	97	9.70	0.	1.	0.	99.0
1.01	9.48	98	9.80	0.	1.	0.	99.0
1.01	9.54	99	9.90	0.	1.	0.	99.0
1.01	10.00	100	10.00	0.	1.	0.	99.0

PEAK OUTFLOW IS 1221. AT TIME 3.70 HOURS

CFS	1221.	291.	176.	176.	17580.
CMS	35.	8.	5.	5.	498.
INCHES		4.23	4.26	4.26	4.26
MM		107.52	108.17	108.17	108.17
AC-FT		144.	145.	145.	145.
THOUS CU M		178.	179.	179.	179.

BY J. C. DATE 3/17/81 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO A12 OF A12

CHKD. BY ____ DATE ____ J. Stuart Johnson PROJECT C-262

SUBJECT HEC 1 DF Summary

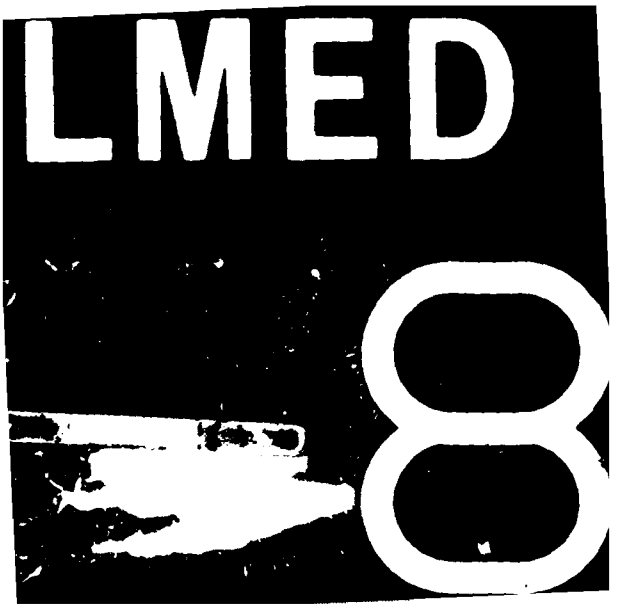
PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIO 1	RATIOS APPLIED TO FLOWS
				1.00	
HYDROGRAPH AT	1	0.64	1	1284.	
		(1.66)		(36.36)(	
ROUTED TO	2	0.64	1	1221.	
		(1.66)		(34.57)(	

SUMMARY OF DAM SAFETY ANALYSIS

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	99.00	99.00	104.00
STORAGE	0.	0.	24.
OUTFLOW	0.	0.	1255.

RATIO OF PMF	MAXIMUM RESERVOIR W.S. ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	103.94	0.00	23.	1221.	0.00	3.70	0.00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