LEVEL 7

DEPRESSED RIVER BASIN

WADSWORTH RESERVOIR DAM

ANDOA COUNTY, NEW YORK

REVIEW NO. NY-1227

PHASE I INSPECTION REPORT

NATIONAL DAM SAFETY PROGRAM

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**Title:** Phase I Inspection Report
**Deerfield Reservoir Dam**
**Mohawk River Basin, Oneida County, N.Y.**
**Inventory No. 1227**

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**Distribution Statement:**
Approved for public release; Distribution unlimited.

**Abstract:**
This report provides information and analysis on the current 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 a visual inspection of the Deerfield Reservoir Dam did not reveal conditions which constitute a hazard to human life or property.

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**National Dam Safety Program**
**Deerfield Reservoir Dam (Inventory Number NY 1227), Mohawk River Basin, Oneida County, New York. Phase I Inspection Report**

**Subjects:**
- Dam Safety
- National Dam Safety Program
- Visual Inspection
- Hydrology
- Structural Stability

**(contract or grant number)** DACW51-79-C-0001

**Program Element, Project, Task Area & Work Unit Numbers**

**Security Classification of This Report:** UNCLASSIFIED

**Declassification/Downgrading Schedule:**

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**Prepared by:**
- George Koch

**Reviewed by:**
- [Signature]

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**Prepared and Submitted To:**
- [Signature]

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**Prepared and Submitted Date:**
- [Date]

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**Prepared and Submitted By:**
- [Signature]

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**Prepared and Submitted Date:**
- [Date]
Since this is a storage reservoir with both inflow and outflow controlled, the hydrologic/hydraulic analysis was not performed in the normal manner. The drainage area for this structure is limited to the reservoir itself. Assuming a normal water level in the reservoir, the runoff resulting from the Probable Maximum Precipitation can safely be stored and discharged through the waste weir section. Therefore, the spillway capacity is assessed as being adequate.

Several minor deficiencies were noted which should be corrected within 6 months of the date of notification of the owner. The brush and trees growing on the lower portion of the southern slope and on the entire eastern slope should be cut. Small brush growing through the riprap on the inboard slope should be cut. Deteriorated concrete on the gate tower should be repaired. The two soft areas beyond the toe of the outboard slope should be kept under surveillance. An emergency action plan for the notification and evacuation of downstream residents should be developed.
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, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

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

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

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.
PHASE I INSPECTION REPORT  
NATIONAL DAM SAFETY PROGRAM  
DEERFIELD RESERVOIR  
No. 6 Dam  
MOHAWK RIVER BASIN  
ONEIDA COUNTY, NEW YORK

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Phase I Inspection Report  
National Dam Safety Program  

Name of Dam: Deerfield Reservoir No. 6 Dam  
I.D. No. NY - 1227  

State Located: New York  
County Located: Oneida  
Watershed: Mohawk River Basin  
Date of Inspection: October 16, 1980  

ASSESSMENT:  

The examination of documents and a visual inspection of the Deerfield Reservoir Dam did not reveal conditions which constitute a hazard to human life or property.  

Since this is a storage reservoir with both inflow and outflow controlled, the hydrologic/hydraulic analysis was not performed in the normal manner. The drainage area for this structure is limited to the reservoir itself. Assuming a normal water level in the reservoir, the runoff resulting from the Probable Maximum Precipitation can safely be stored and discharged through the waste weir section. Therefore, the spillway capacity is assessed as being adequate.  

Several minor deficiencies were noted which should be corrected within 6 months of the date of notification of the owner. The brush and trees growing on the lower portion of the southern slope and on the entire eastern slope should be cut. Small brush growing through the riprap on the inboard slope should be cut. Deteriorated concrete on the gate tower should be repaired. The two soft areas beyond the toe of the outboard slope should be kept under surveillance. An emergency action plan for the notification and evacuation of downstream residents should be developed.  

G. Koch  
Chief, Dam Safety Section  
New York State Department of Environmental Conservation  
NY License No. 45937  

Approved by:  

Date: 10 APR 1981
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, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection
This 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 and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam

The Deerfield Reservoir Dam is a storage reservoir within the City of Utica Board of Water Supply's system. The reservoir consists of an inflow pool, which was originally used as a settling basin, and the main storage pool. A division weir separates the two pools.

The dam is formed by an earthen embankment with a puddle core wall which surrounds the two pools of the reservoir. The total length of the embankment is 3520 feet. The maximum height of the embankment is 50 feet in the southwest corner of the main storage pool. The minimum height is about 5 feet in the northeast corner of the inflow pool. The inboard slope is 1 vertical on 2 horizontal and the outboard slope is 1 vertical on 1.5 horizontal.

All flow into the reservoir is controlled by valves on one 16 inch and one 24-inch inflow pipe. These pipes enter the reservoir of the northeastern corner of the inflow pool. A 20-inch supply main and a 20-inch waste pipe are used to withdraw water from the reservoir. The supply main extends from a concrete gate tower in the storage pool to the meter house beyond the toe of the embankment. The tower contains four ports at different elevations. A bridge extends approximately 150 feet from the embankment crest to the top of the tower.

Additional outflow capacity is provided by the waste weir segment at the northern end of the dam. The weir is 20 feet wide and its crest is 6 feet below the top of the dam.

There is a sediment pit (waste chamber) at the end of the waste weir. A 20 inch pipe leads from the base of the pit to a gate house beyond the toe of the embankment. These facilities were utilized when the dam was first built but are no longer used.
b. Location
The dam is located in the Town of Deerfield, off South Trenton Road. It is adjacent to the intersection between Trenton Avenue and Route 12. The dam is approximately one mile north of the City of Utica boundary.

c. Size Classification
The dam is a maximum of 50 feet high and has a storage capacity of 321 acre feet. Therefore, the dam is in the intermediate size category as defined by the "Recommended Guidelines for Safety Inspection of Dams".

d. Hazard Classifications
This dam is classified as "high" hazard due to the presence of a number of homes downstream of the southwester portion of the dam.

e. Ownership
The dam is owned by the City of Utica Board of Water Supply. Mr. Russell Lo Galbo Principal Engineer, and Mr. Adrian La Shure, Senior Engineer, were contacted concerning the Phase I Inspection. The Board of Water Supply's address is One Kennedy Plaza, Utica, New York, 13502. Their phone number is (315) 798-3310.

f. Purpose of Dam
The dam is used as a water supply reservoir for the City of Utica.

g. Design and Construction History
This dam was constructed around 1900 for the Consolidated Water Company of Utica. William S. Bagot, Civil Engineer, was the designer of the structure. It does not appear that any major revisions have been made to the structure since the original construction. The only change noted was a switch in the supply lines into the reservoir. The original 20 inch mains were replaced by one 16 inch pipe and one 24 inch pipe.

h. Normal Operating Procedures
All flow into and out of the reservoir is controlled by valves on the inlet and outlet pipes. The water level is normally maintained approximately at elevation 700 but drops substantially lower during the summer. Water is withdrawn from the reservoir as required by the owner.

1.3 PERTINENT DATA

a. Drainage Area (acres)

b. Discharge at Dam (cfs)

<table>
<thead>
<tr>
<th>Supply Main (20 inch)</th>
<th>W.S. at Elev.</th>
<th>700</th>
<th>46</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Main (20 inch)</td>
<td>W.S. at Elev.</td>
<td>701.5</td>
<td>47</td>
</tr>
<tr>
<td>Supply Main (20 inch)</td>
<td>W.S. at Elev.</td>
<td>706.5</td>
<td>49</td>
</tr>
<tr>
<td>Waste Weir</td>
<td>W.S. at Elev.</td>
<td>706.5</td>
<td>581</td>
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</tbody>
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c. Elevation (Plan Datum)

| Top of Dam | 706.5 |
| Crest of Waste Weir | 701.5 |
| Crest of Division Weir | 701.3 |
| Invert of 20 inch Waste Pipe | 660 |

d. Reservoir-Surface Area (Acres)

| Top of Dam | 17.4 |
| Crest of Waste Weir | 15.7 |
e. Storage Capacity (acre-feet)
   Top of Dam: 385
   Crest of Waste Weir: 321

f. Embankment
   Type: Compacted earth fill with a puddle core wall completely surrounding
         the reservoir with 1:V on 2:H inboard slopes and 1:V on 1.5:H outboard
         slopes.
   Dam Length (ft): 3520
   Crest Width (ft): 15
   Height: Varies; 50 feet maximum

g. Inflow Pipes
   Type: 16 and 24 inch pipes flowing into inflow pool
   Control: Butterfly valve on each pipe.

h. Outflow Pipes
   Type: Two 20 inch pipes through embankment flowing into meter house
         beyond downstream toe. Flow through supply main controlled by operation
         of gates on gate tower. These pipes can also function as a reservoir
         drain.

i. Division Weir
   Type: Masonry weir which separates inflow pool from storage reservoir.
         Weir is 2 feet wide and 20 feet long. Riprap on either side of weir.

j. Waste Weir
   Type: Masonry weir at northern end of dam which serves as auxiliary
         spillway. Weir is 2.5 feet wide and 20 feet long. Riprap covers area
         upstream of weir.

k. Appurtenant Structures
   1. Meter House-south of dam embankment; venturi meters measure flow
      from the two 20 inch pipes coming out of the reservoir.

   2. Waste Chamber and Valve House-located to north of the waste weir;
      originally used for sediment control; now abandoned.
SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology
The Deerfield Reservoir No. 6 Dam is located near the northern edge of the Mohawk Lowlands physiographic province of New York State. The western Adirondack Hills province is north of this area. The lowland was eroded in the soft shales between the hard rocks of the Adirondacks and the Appalachians. The area in the vicinity of the dam is underlain by soft rock from the Utica Shale formation of the Upper Ordovician age.

The surficial soils and features of the area are the result of glaciations during the Cenozoic Era, the last of which was the Wisconsin glaciation.

b. Subsurface Investigations
No records of any subsurface investigations performed for this structure were available.

2.2 DESIGN RECORDS

Design records were available for this dam at the City of Utica Board of Water Supply's Engineering Office. A plan prepared in 1900 by William S. Bagot, Civil Engineer provided most of the information about the design. This plan has been included in Appendix E.

2.3 CONSTRUCTION RECORDS

No construction records concerning the original construction of the dam were located.

2.4 OPERATIONAL RECORDS

This dam is operated as a storage reservoir by the owner. They maintain some operation records for the structure.

2.5 EVALUATION OF DATA

The data used for the preparation of this report was obtained from the City of Utica Board of Water Supply and from the Department of Environmental Conservation files. The data available appeared to be accurate.
SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Deerfield Reservoir No. 6 Dam was conducted on October 16, 1980. The weather was overcast and the temperature was around 50 degrees. At the time of the inspection, the water surface was 11 feet below the top of the dam.

b. Embankment

The embankment completely surrounds this reservoir. The crest is level with a grass cover and in good condition. The inboard slope is lined with riprap. There was small brush growing through the riprap in several locations. The outboard slope on the northern and western sides of the dam were grass and had been mowed. The upper portion of the southern outboard slope was also in good condition. However, the lower portion of the southern slope at the eastern end was covered with brush and trees. The eastern slope was completely overgrown. The brush on this slope made a detailed inspection impossible.

The overall stability of the embankment appeared to be satisfactory. Several animal burrow holes were noted both on the crest and on the outboard slope. There were two soft areas beyond the toe of the outboard slope. One of these areas was near the southern end of the eastern slope. The other was beyond the toe of the northern slope on the main storage pool. No actual seepage was observed in either of these areas.

c. Inflow/Outlet Pipes

The pipes controlling flow into and out of the reservoir were submerged and, therefore, unobservable. Water bubbling up in two locations in the upper pool was evidence that there was flow into the reservoir. A single vortex upstream of the gate tower indicated water was only being released from one of the outlet pipes.

The gate tower is a concrete structure in the main storage pool rising to the top of dam elevation. The concrete on this tower was deteriorated and spalling. Some minor surface cracks were noted as well. The bridge extending from the embankment crest to the tower was in satisfactory condition, although some of the timber deck planks were rotted. None of the four gate control storms on the tower appeared to have been operated recently, but they are reported to be operable.

One other pipe was observed during the visual inspection. The outlet of a 12 inch diameter cast iron pipe was located near the base of the outboard slope on the southern end of the reservoir. There was a very small amount of flow coming out of the pipe. The function of this pipe could not be determined.
d. Waste Weir
The waste weir on the northern end of the structure was in satisfactory condition. If the water surface was to rise above the crest of the weir, flow into the sediment pit would occur. The 20 inch pipe leading from the base of the pit to the gate house would take some of this overflow, but most would probably spill over the northern wall of the sediment pit and away from the reservoir, flowing over the existing ground surface.

3.2 EVALUATION
Visual inspection of this dam revealed the following deficiencies.

1. Brush and trees growing on the lower portion of the southern slope and on the entire eastern slope.
2. Small brush growing through the riprap on the inboard slope in several locations.
3. Several animal burrow holes on the crest and outboard slopes.
4. Two soft areas beyond the toe of the outboard slope.
5. Deterioration of the concrete on the gate tower.
SECTION 4: OPERATIONAL PROCEDURES

4.1 PROCEDURES

This reservoir is used as a storage facility by the City of Utica Board of Water Supply. The flow of all water into and out of the reservoir is regulated by valves on the inlet and outlet pipes. This gives the owner complete control over the water level in the reservoir. The water level is normally maintained at approximately elevation 700 but drops substantially during the summer.

4.2 MAINTENANCE OF THE DAM

The dam is maintained by the owner. Mowing and other routine maintenance is performed regularly. Periodic visits are made to the site to check on conditions of the facilities.

4.3 WARNING SYSTEM IN EFFECT

There is no apparent warning system for the notification and evacuation of downstream residents.

4.4 EVALUATION

The operation and maintenance procedures on this structure are generally satisfactory. Some additional maintenance efforts are required to correct some of the minor deficiencies which exist on the structure.
SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

This dam is a storage reservoir which is completely surrounded by embankment. Therefore, the structure's drainage area consists exclusively of the reservoir itself. The total drainage area for this dam is 17.7 acres.

5.2 ANALYSIS CRITERIA

Since the drainage area for this structure is the reservoir itself, inflow is limited to rain falling on the reservoir and flow through the 16 and 24 inch supply pipes. For this reason, no hydrologic analysis, using the Corps of Engineers HEC-10B computer program, was performed for this structure. Inflow and outflow can be controlled by valves on the pipes, so preventing overtopping simply involves proper operation.

5.3 SPILLWAY CAPACITY

The primary outflow capacity for this dam is provided by 20 inch pipes which extend through the embankment. One of these is designated as a waste pipe. Its inlet is 50 feet to the east of the gate tower and its control mechanism is unknown. The inlet to the other conduit (the supply main) is at the base of the gate tower. There are four ports at different elevations in the gate tower, each controlled by one of the valve stems on top of the tower. There are four ports at different elevations in the gate tower, each controlled by one of the valve stems on the top of the tower. No detailed plans of the gate tower were available so the invert elevation of the pipe and the size of the inlet ports was not known.

For the purposes of calculating the maximum outflow through the supply main, it was assumed that the capacity of the pipe was the limiting factor. Based on this assumption, the maximum discharge capacity through the supply main with the water surface at the top of the dam was calculated to be 49 cfs.

Additional spillway capacity is provided by the waste weir at the northern end of the reservoir. If the water surface was to rise above elevation 701.5, this weir would act as an auxiliary spillway. The spillway was analyzed as a broad crested weir with a discharge coefficient (c) of 2.6. The discharge capacity through this spillway with the water surface at the top of the dam is 581 cfs.

5.4 RESERVOIR CAPACITY

The normal storage capacity of this reservoir is 321 acre feet. Approximately 64 acre feet of additional storage capacity is available between the crest of the waste weir and the top of the dam.

5.5 FLOODS OF RECORD

Since this is a storage reservoir with a drainage area equal to the surface and with almost complete control over the inflow and outflow, the concept of record flows is not applicable.
5.6 OVERTOPPING POTENTIAL

To determine overtopping potential, both inflow and outflow through the pipes was assumed to be zero. It was also assumed that the initial water level in the reservoir was at the crest of the waste weir. The volume of runoff produced by the Probable Maximum Precipitation of 19.2 inches over the 17.7 acre drainage area would be 28 acre feet. This would raise the water level in the reservoir by about 2 feet. The discharge over the waste weir section would be approximately 170 cfs.

5.7 EVALUATION

The limited hydrologic/hydraulic analysis performed for this structure indicates that the reservoir could safely store and discharge the runoff produced by the Probable Maximum Precipitation. Therefore, the spillway capacity is assessed as adequate according to the Corps of Engineer's screening criteria.
SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations
Visual observation of the embankment was hindered by the brush and trees growing on the lower portion of the southern slope and on the entire eastern slope. The remainder of the embankment was grass covered and well maintained. No areas of instability or active seepage were noted on the structure. Two soft areas were observed beyond the toe of the outboard slope. One of these areas was near the southern end of the eastern slope, and the other was on the northern slope of the main storage pool.

b. Design and Construction Data
A construction plan for this structure, prepared by William S. Bagot, Civil Engineer, was available and has been included in Appendix E. This was the only design or construction data available.

c. Seismic Stability
No seismic stability analysis was performed for this structure.
SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety
The Phase I Inspection of the Deerfield Reservoir No. 6 Dam did not reveal conditions which constitute a hazard to human life or property. The earth embankment is considered to be stable. Since this is a storage reservoir with controlled inflow and outflow, the spillway is considered to be adequate.

b. Adequacy of Information
The plans which were available for this structure appeared to be accurate and relatively complete. No plans were available concerning the gate tower and the 4 gate stems rising from it, so exact elevations of the 4 discharge ports were not determined.

c. Need for Additional Investigations
No additional investigations are necessary at this time.

7.2 RECOMMENDED MEASURES

The following actions should be taken within 6 months of the date of notification of the owner:

a. All brush and trees growing on the lower portion of the southern slope and on the entire eastern slope should be cut.

b. Small brush growing through the riprap on the inboard slope should be cut.

c. Deteriorated concrete on the gate tower should be repaired.

d. The two soft areas beyond the toe of the outboard slope should be kept under surveillance.

e. All animal burrow holes should be filled and a continuing program for rodent elimination developed and implemented.

f. An emergency action plan for the notification and evacuation of downstream residents should be developed and implemented.
APPENDIX A

PHOTOGRAPHS
Western End of Southern Outboard Slope

Eastern End of Southern Outboard Slope; Note Brush and Trees on Lower Portion of Slope
Brush and Trees Growing on Eastern Slope

Outlet of 12 Inch Pipe Located Near Base of Southern Slope
Riprap on Inboard Slope

View from Northern End of the Dam Looking Across Waste Weir Towards Division Weir
Waste Weir Section at the Northern End of the Dam

Sediment Pit at End of Waste Weir
Outboard Slope in Northwestern Corner, Soft Area beyond Toe of Slope

Close up of Soft Area Shown Above
Gate Tower with Bridge Leading from Crest of Dam Embankment

Gate Tower with Four Gate Stems which Control Flow through Ports
APPENDIX B

VISUAL INSPECTION CHECKLIST
VISUAL INSPECTION CHECKLIST

1) Basic Data
   a. General
      Name of Dam DEERFIELD RESERVOIR DAM
      Fed. I.D. = NY1227 DEC Dam No. 128A-865A
      River Basin MONAWK
      Location: Town DEERFIELD County ONEIDA
      Stream Name __________
      Tributary of __________
      Latitude (N) 43° 8.5' Longitude (W) 75° 12.5'
      Type of Dam EARTH EMBANKMENT
      Hazard Category C
      Date(s) of Inspection 10/16/80
      Weather Conditions 50° OVERCAST
      Reservoir Level at Time of Inspection 11 FEET BELOW TOP OF DAM
   b. Inspection Personnel ROBIN WARRENBERG WALTER LYNICK
   c. Persons Contacted (Including Address & Phone No.) 315-798-3310
      RUSSELL LOGALBO - ADRIAN LA SHURE
      CITY OF UTICA BOARD OF WATER SUPPLY
      1 KENNEDY PLAZA
      UTICA, N.Y.
   d. History:
      Date Constructed ABOUT 1900 Date(s) Reconstructed __________
      Designer WILLIAM S. BAGOT
      Constructed By __________
      Owner CITY OF UTICA BOARD OF WATER SUPPLY
2) Embankment

a. Characteristics

(1) Embankment Material **Glacial Till**

(2) Cutoff Type **NONE**

(3) Impervious Core **PUDDLE CORE WALL**

(4) Internal Drainage System **NONE**

(5) Miscellaneous

b. Crest

(1) Vertical Alignment **Top Width = 12'-15'**

(2) Horizontal Alignment **RECTANGULAR**

(3) Surface Cracks **NONE NOTED**

(4) Miscellaneous

c. Upstream Slope - **INBOARD SLOPE**

(1) Slope (Estimate) (V:H) **1 on 2**

(2) Undesirable Growth or Debris, Animal Burrows **SMALL BRUSH GROWING THROUGH RIPRAP**

(3) Sloughing, Subsidence or Depressions **NONE**
(4) Slope Protection **Medium Sized, Placed Rip Rap To**
**Near Top of Dam**

(5) Surface Cracks or Movement at Toe **None Noted**

d. Downstream Slope - **Outboard Slope**
(1) Slope (Estimate - V:H) **1 on 1/2** *Some Animal Burrows*
(2) Undesirable Growth or Debris, Animal Burrows **Brush, Trees - No, Grass on Eastern & Lower Southern Slope - Rest of Slope is Grasped**
(3) Sloughing, Subsidence or Depressions **None Noted**

(4) Surface Cracks or Movement at Toe **None**

(5) Seepage **No Seepage Observed, But 2 Wet Areas Found, One Beyond Southeast Corner, One Near Northwest Corner**

(6) External Drainage System (Ditches, Trenches; Blanket) **None**

(7) Condition Around Outlet Structure **No Outlet Structure**

(8) Seepage Beyond Toe **Soft Areas Mentioned Above**

e. Abutments - Embankment Contact
**Not Applicable / All Embankment**
93-15-3(9/80)

(1) Erosion at Contact **N/A**

(2) Seepage Along Contact **N/A**

3) **Drainage System**
   a. Description of System **NONE**

   b. Condition of System

   c. Discharge from Drainage System

4) **Investigation** (Monumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.)
   **NONE**
5) Reservoir
   a. Slopes R*PRAPPED INBOARD SLOPE
   b. Sedimentation NO
   c. Unusual Conditions Which Affect Dam ONLY INFLOW IS PIPELINE OR RAINFALL DIRECTLY ON RESERVOIR SURFACE

6) Area Downstream of Dam
   a. Downstream Hazard (No. of Homes, Highways, etc.) 12 PLUS ALONG SOUTH TRENTON ROAD
   b. Seepage, Unusual Growth NONE
   c. Evidence of Movement Beyond Toe of Dam NO
   d. Condition of Downstream Channel HEAVY BRUSH & TREES

7) Spillway(s) (Including Discharge Conveyance Channel)
   WATER CONTROL TOWER WITH 4 GATE STEMS - DO NOT APPEAR TO HAVE BEEN OPERATED RECENTLY
   a. General ONLY INFLOW & OUTFLOW CONTROLLED BY WATER SUPPLY PIPES WATER FLOWING IN FROM 2 PIPES AS EVIDENCED BY WATER BUBBLING UP IN UPPER POOL WATER BEING RELEASED FROM 1 PIPE - VORTEX UPSTREAM OF GATE TOWER
   b. Condition of Service Spillway
c. Condition of Auxiliary Spillway **NONE**


d. Condition of Discharge Conveyance Channel **N/A**


8) **Reservoir Drain/Outlet**

Type: Pipe ______ Conduit ______ Other **WATER SUPPLY WITHDRAWAL**

Material: Concrete ______ Metal ______ Other ______

Size: ________________ Length ________________

Invert Elevations: Entrance ________________ Exit ________________

Physical Condition (Describe): Unobservable

Material: ____________________________

Joints: ____________________________ Alignment ____________________________

Structural Integrity: ____________________________

Hydraulic Capability: ____________________________

Means of Control: Gate _____ Valve _____ Uncontrolled _____

Operation: Operable _____ Inoperable _____ Other _____

Present Condition (Describe): ____________________________
9) Structural - Concrete Gate Tower
   a. Concrete Surfaces: Some deterioration & spalled areas
   
   b. Structural Cracking: Minor surface cracks
   
   c. Movement - Horizontal & Vertical Alignment (Settlement): None
   
   d. Junctions with Abutments or Embankments: N/A
   
   e. Drains - Foundation, Joint, Face: N/A
   
   f. Water Passages, Conduits, Sluices: N/A
   
   g. Seepage or Leakage: N/A
h. Joints - Construction, etc. N/A

i. Foundation N/A

j. Abutments N/A

k. Control Gates GATE STEMS - DO NOT APPEAR TO HAVE BEEN OPERATED RECENTLY

l. Approach & Outlet Channels N/A

m. Energy Dissipators (Plunge Pool, etc.) N/A

n. Intake Structures ABANDONED GATE HOUSE & SEDIMENT PIT ON NORTHERN END OF STRUCTURE - WAS USED TO KEEP SEDIMENT OUT OF RESERVOIR

o. Stability

p. Miscellaneous STEEL SINGLE SPAN BRIDGE TO GATE TOWER - OKAY EXCEPT FOR SOME ROTTING PLANKS VERTICAL LADDER DOWN TO INTAKE STRUCTURE - TOP RUNGS MISSING OR BROKEN 12" CAST IRON PIPE FOUND AT TOE OF SOUTHERN SLOPE (25' FROM EDGE OF CLEARING) - SLIGHT DISCHARGE COMING FROM IT
10) **Appurtenant Structures** (Power House, Lock, Gatehouse, Other)
   a. Description and Condition

   **Pump House Building - Downstream of Dam**

11) **Operation Procedures** (Lake Level Regulation):

   Reservoir level dropped in fall & brought back up to normal level in spring
APPENDIX C

HYDROLOGIC/HYDRAULIC
ENGINEERING DATA AND COMPUTATIONS
# Check List for Dams

## Hydrologic and Hydraulic Engineering Data

### Area-Capacity Data:

<table>
<thead>
<tr>
<th></th>
<th>Elevation (ft.)</th>
<th>Surface Area (acres)</th>
<th>Storage Capacity (acre-ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Top of Dam</td>
<td>706.5</td>
<td>17.4</td>
<td>385</td>
</tr>
<tr>
<td>2) Design High Water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Max. Design Pool)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Auxiliary Spillway</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Pool Level with</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flashboards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) Service Spillway</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crest - Waste Weir</td>
<td>701.5</td>
<td>15.7</td>
<td>321</td>
</tr>
</tbody>
</table>

### Discharges

<table>
<thead>
<tr>
<th></th>
<th>Volume (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Average Daily</td>
<td></td>
</tr>
<tr>
<td>Waste Weir</td>
<td></td>
</tr>
<tr>
<td>2) Spillway @ Maximum High Water</td>
<td>581</td>
</tr>
<tr>
<td>3) Spillway @ Design High Water</td>
<td></td>
</tr>
<tr>
<td>4) Spillway @ Auxiliary Spillway Crest Elevation</td>
<td></td>
</tr>
<tr>
<td>5) Low Level Outlet - Supply Main</td>
<td>49</td>
</tr>
<tr>
<td>6) Total (of all facilities) @ Maximum High Water</td>
<td>630</td>
</tr>
<tr>
<td>7) Maximum Known Flood</td>
<td>N/A</td>
</tr>
<tr>
<td>8) At Time of Inspection</td>
<td>Unknown</td>
</tr>
</tbody>
</table>
CREST:  
ELEVATION: 706.5

**Type:** Earth

**Width:** 15 ft  
**Length:** 3520 ft

**Spillway:** Waste Weir  
**Location:** Northern End of Dam

### SPILLWAY:

<table>
<thead>
<tr>
<th>Service</th>
<th>Auxiliary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation</td>
<td>701.5</td>
</tr>
<tr>
<td>Type</td>
<td>Masonary Weir</td>
</tr>
<tr>
<td>Width</td>
<td>20 ft</td>
</tr>
<tr>
<td>Type of Control</td>
<td>Uncontrolled</td>
</tr>
</tbody>
</table>

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)**

93-15-4(3/80)
HYDROMETEROLOGICAL GAGES:

Type: **NONE**
Location: 
Records:
  Date - 
  Max. Reading -

FLOOD WATER CONTROL SYSTEM:

Warning System: **NONE**

Method of Controlled Releases (mechanisms):

  **RELEASE THROUGH LOW LEVEL OUTLET**
  *(SUPPLY MAIN)*
DRAINAGE AREA: 17.7 ACRES

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: RESERVOIR COMPOSES ENTIRE DRAINAGE AREA

Terrain - Relief: N/A

Surface - Soil: N/A

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

N/A

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

NONE

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

N/A

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

Location: NONE

Elevation:

Reservoir:

Length @ Maximum Pool N/A (Miles)

Length of Shoreline (@ Spillway Crest) (Miles)
PROJECT GRID

JOB
DEERFIELD RESERVOIR 150

SHEET NO.
1

CHECKED BY

COMPUTED BY
RLW

DATE
1/2/53

SUBJECT
HYDRAULIC CALCULATIONS

GIVEN FROM LITTLE BONNEEJEAN WATER SURVEY MAPPING

RESERVOIR CAPACITY 144,578,000 GALLONS = 321 AC FT

ASSUME NORMAL WATER LEVEL IS AT ELEV 701.5

V1 = 321 AC FT

SURFACE AREA (PLANIMETRY) = 15.7 AC

A = 15.7

T = 1

V2 = \frac{\pi h}{3} (h + 3(321)) = 61.24 AC - ASSUMED DEPT. OF CONE

STORAGE AT TOP OF DAM

V2 = \frac{17.74}{3} (61.24 + 3) = 325 AC FT

SURFACE CAPACITY: 20 INCH APE-SPATE FULLY DEDICATED

WATER SURFACE AT TOP OF DAM

q = \frac{2.18}{\sqrt{12.5 + 0.28(290)}} = 493 CFS

W.S. AT ELEV 701.5

q = 2.18 \sqrt{12.5 + 0.28(290)} = 466 CFS

W.S. AT ELEV 700

q = 2.18 \sqrt{12.5 + 0.28(280)} = 458 CFS
<table>
<thead>
<tr>
<th>Subject</th>
<th>Computed by</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic Computations</td>
<td>RLW</td>
<td>1/15/81</td>
</tr>
</tbody>
</table>

**Flow Through Waste Weir Segment**

\[ Q = CLH^3 \]

**Water Surface at Top of Dam**

\[ Q = 2.6 \times \frac{1}{2} \times (5)^{1.6} = 58 \text{ cfs} \]

**Water Surface at Pump Level**

\[ Q = 2.6 \times \frac{1}{2} \times (2)^{1.6} = 17 \text{ cfs} \]
APPENDIX D

REFERENCES

1) U.S. Department of Commerce; Weather Bureau; Hydrometeorological Report No. 33 - 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, April 1956.


APPENDIX E

DRAWINGS
STORAGE RESERV

Cap. 100,000,000 Gals.
Scale: One Inch = 50 Feet.