

Ohio Department of Natural Resources

TED STRICKLAND, GOVERNOR

SEAN D. LOGAN, DIRECTOR

David Hanselmann • Chief

Division of Soil & Water Resources

August 10, 2010

City of Massillon
Kenneth Kaminski, Director Parks & Recreation
505 Erie St. North
Massillon, OH 44646

RE: Sippo Creek Reservoir Dam
File Number: 0614-012
Stark County

Dear Mr. Kaminski:

Thank you for allowing Tina Griffin and Matt Hook of the Division of Soil & Water Resources to conduct a safety inspection of Sippo Creek Reservoir Dam on May 25, 2010. This inspection was conducted by representatives of the Chief of the Division of Soil & Water Resources under the provisions of Ohio Revised Code (ORC) Section 1521.062 to evaluate the condition of the dam and its appurtenances. The Chief has the responsibility to ensure that human life, health, and property are protected from dam failures. Conducting periodic safety inspections and working with dam owners to maintain and improve the overall condition of Ohio dams are vital aspects of achieving this purpose. A copy of the laws and administrative rules for dam safety is available on the division's web site or by request. I have enclosed guidelines for preparing an operation, maintenance, and inspection manual and guidelines for preparing an emergency action plan.

The enclosed inspection report was generated based on available information and is hereby provided for your use and study. Listed in the report are several repair, maintenance, and monitoring items that as a dam owner you are required by law to perform. Completion of these required items will improve the safety and overall condition of the dam. The Chief must approve any plans for modifications or repairs to the dam. Following approval of the engineered plans, all necessary repairs must be implemented by the owner under the supervision of a registered professional engineer. Failure to complete the repair, maintenance, and monitoring items may result in legal enforcement of these requirements in the form of an order from the Chief of the Division.

Please be advised that you may qualify for a loan to make required repairs from the Ohio Dam Safety Loan Program administered by the Ohio Water Development Authority (OWDA). To find out more about the program, please contact OWDA's Loan Officer at 614/466-5822.

Sippo Creek Reservoir Dam

August 10, 2010

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To gain information that will help improve the inspection program, a short survey has been developed and is enclosed. Please complete the survey and return it in the self-addressed envelope provided. Your feedback is important.

It is the Division's understanding that you are the owner of this dam. Under Ohio's dam safety regulations, "owners" are "those who own, or propose to construct a dam or levee." OAC Rule 1501:21-3-01(V). A "dam" is defined as "any artificial barrier together with any appurtenant works, which either does or may impound water or other liquefied material ..." OAC Rule 1501:21-3-01(F). "Appurtenant works" include but are not limited to outlet works and spillway channels.

If you are not an owner of this dam, or believe that there are additional owners of the dam not addressed in this communication, please contact Tina Griffin. Please note that ORC Section 1521.062 requires a dam owner to notify the Chief of the Division of Soil & Water Resources in writing of a change in ownership of a dam prior to the exchange of the property.

Your cooperation in improving the overall condition of this dam is appreciated. Please contact Tina Griffin at 614/265-6634 if you have any questions.

Sincerely,



Keith R. Banachowski, P.E.

Program Manager

Dam Safety Engineering Program

Division of Soil & Water Resources

KRB:tmg

Enclosures

P.S. In July 2009, the Ohio Department of Natural Resources, Division of Water, merged with the Division of Soil & Water Conservation to become the Division of Soil & Water Resources.



DAM SAFETY INSPECTION REPORT

Sippo Creek Reservoir Dam

File Number: 0614-012

Class I

Stark County, Perry Township

Inspection Date: May 25, 2010



In accordance with Ohio Revised Code Section 1521.062, the owners of dams must monitor, maintain, and operate their dams safely. Negligence of owners in fulfilling these responsibilities can lead to the development of extremely hazardous conditions to downstream residents and properties. In the event of a dam failure, owners can be subject to liability claims.

The Chief of the Division of Soil & Water Resources has the responsibility to ensure that human life, health, and property are protected from the failure of dams. Conducting periodic safety inspections and working with dam owners to maintain and improve the overall condition of Ohio dams are vital aspects of achieving this purpose.

Representatives of the Chief conducted this inspection to evaluate the condition of the dam and its appurtenances under authority of Ohio Revised Code Section 1521.062. In accordance with Ohio Administrative Code Rule 1501:21-21-03, the owners of dams must implement all remedial measures listed in the enclosed report.

Division of Soil & Water Resources • 2045 Morse Road, Bldg. B-2 • Columbus, Ohio 43229-6693

www.dnr.state.oh.us/

In July 2009, the Ohio Department of Natural Resources, Division of Water, was merged with the Division of Soil & Water Conservation to become the Division of Soil & Water Resources.

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Section 1

Required Remedial Measures

The requirements listed below are based on observations made during inspection, calculations performed, and requirements of the Ohio Administrative Code (OAC). A checklist noting all observations made during the inspection has been enclosed in Section 3. References to right and left in this report are oriented as if you were standing on the dam crest and looking downstream.

Engineer Repairs and Investigations: The owner must retain the services of a professional engineer to address the following items. Plans, specifications, investigative reports, and other supporting documentation, as necessary, must be submitted to the Division of Soil & Water Resources for review and approval prior to construction. *These items have been noted previously and the appropriate time period for completion has already been exceeded.* A record of all repairs should be included in the operation, maintenance, and inspection manual.

1. The dam's discharge/storage capacity must be sufficient to safely pass the required design flood. Perform a hydrologic and hydraulic study to determine the adequacy of the dam's discharge/storage capacity to safely pass the required design flood. Prepare plans and specifications as necessary to increase the discharge/storage capacity to pass the required design flood. In accordance with OAC Rule 1501:21-13-02, the minimum design flood for Class I dams is 100 percent of the Probable Maximum Flood or the critical flood. See the Flood Routing Summary section of this report for additional information.
2. The spillway system must perform properly without endangering the safety of the dam. Investigate the deterioration, deformation, structural integrity, and undermining of the entire spillway system, and prepare plans and specifications for the repair or replacement of the entire spillway system. Regardless of the results of the investigation, the condition of the entire spillway system must be monitored weekly. This item should be completed in coordination with Item 1 above.
3. The erosion on the upstream slope of the embankment must be repaired and the upstream slope must be protected from erosion. Prepare plans and specifications for repairing the erosion and installing erosion protection.
4. The embankment crest alignment must be uniform. Investigate the vertical alignment of the crest near the principal spillway sidewalls and prepare plans and specifications for the correction of any problems. Regardless of the results of the investigation, the alignment of the crest must be monitored weekly. This item should be completed in coordination with Item 1 above.
5. The cut-off wall along the crest must be repaired. Prepare plans and specifications for the repair or replacement of the wall. This item should be completed in coordination with Item 3 above.
6. The extremely steep downstream slope to the right of the principal spillway must be regraded. Prepare plans and specifications to flatten the slope. The steepness and overall stability of the embankment must be monitored weekly until repairs can be made.

Owner Repairs: The owner must address the following items. The owner may hire a contractor or perform the work him or herself. Repair activities should be documented in the operation, maintenance, and inspection manual.

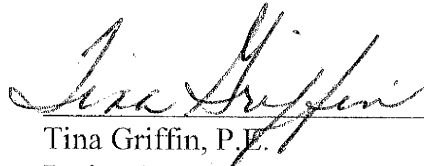
1. The lake drain valve must operate properly. Investigate the integrity of the valve/sluice gate. If the valve does not work, you must hire an engineer to prepare plans and specifications for repair or replacement of the drain. See the "Lake Drains" fact sheet included in this section for additional information.
2. Remove the brush from the upstream slope shoreline and around the principal spillway sidewalls. Seed all disturbed areas to establish a proper grass cover. See the "Trees and Brush" fact sheet included in this section for additional information.
3. Repair the erosion gullies on the downstream slope, adjacent to the spillway. See the "Earth Dam Failures" fact sheet included in this section for additional information.
4. Repair the rodent burrows on the upstream slope. See the "Rodent Control" fact sheet included in this section for additional information.
5. Remove or grind down all the tree stumps on the embankment. Seed the all bare and sparse areas on the embankment to establish a proper grass cover. See the "Trees and Brush" and "Ground Cover" fact sheets included in this section for additional information.
6. Remove the planters on the downstream slope.

Owner Dam Safety Program: In accordance with Ohio Revised Code (ORC) Section 1521.062, the owner of a dam shall maintain a safe structure and appurtenances through inspection, maintenance, and operation. A dam, like any other part of the infrastructure, will change and deteriorate over time. Appurtenances such as gates and valves must be routinely exercised to ensure their operability. Inspection and monitoring of the dam identify changing conditions and problems as they develop, and maintenance prevents minor problems from developing into major ones. Dams must have these procedures documented in an operation, maintenance, and inspection manual.

Despite efforts to provide sufficient structural integrity and to perform inspection and maintenance, dams can develop problems that can lead to failure. Early detection and appropriate response are crucial for maintaining the safety of the dam and downstream people and property. The ORC requires the owner to fully and promptly notify the Division of Soil & Water Resources of any condition which threatens the safety of the structure. A rapidly changing condition may be an indication of a potentially dangerous problem. The Dam Safety Engineering Program can be contacted at 614/265-6731 during business hours or at 614/799-9538 after business hours. Dam owners must have emergency preparedness procedures documented in an emergency action plan.

The owner must address the following items.

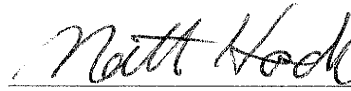
1. This dam must have an operation, maintenance, and inspection manual (OMI) and an emergency action plan (EAP) in accordance with OAC Rule 1501:21-21-04. Prepare an OMI and an EAP including an inundation map. Guidelines for the preparation of these documents are included with this report. A registered professional engineer must prepare the inundation map and Section IV (Emergency Detection, Evaluation, and Classification) of the EAP. It is recommended that your engineer contact the Division of Water prior to undertaking the engineering study for the inundation map.



Tina Griffin, P.E.
Project Manager
Dam Safety Engineering Program
Division of Soil & Water Resources

8/10/10

Date



Matt Hook, E.I.
Project Engineer
Dam Safety Engineering Program
Division of Soil & Water Resources

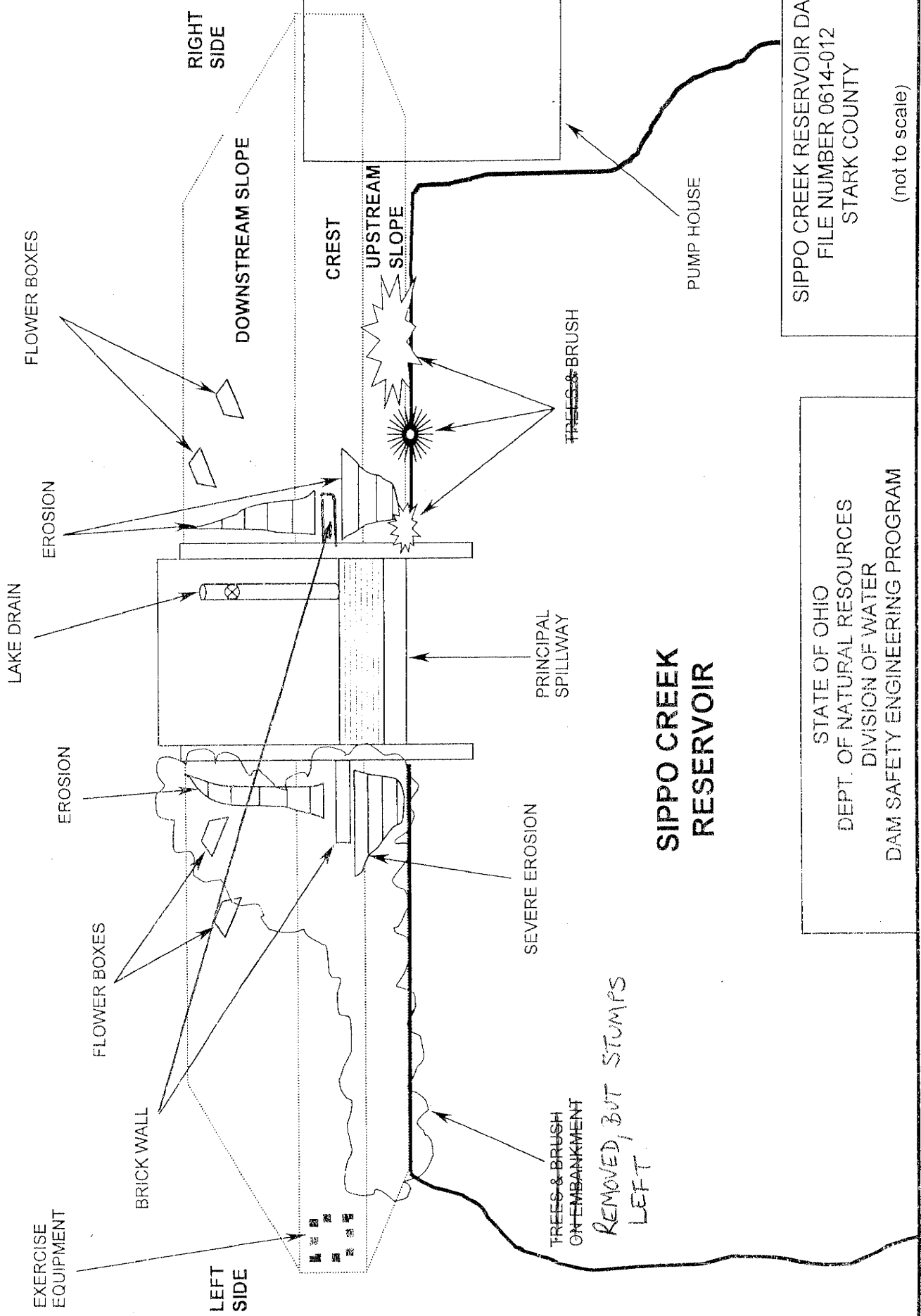
9/10/10

Date

This inspection was performed pursuant to the authority granted to the Chief of the Division of Soil & Water Resources in ORC Section 1521.062.



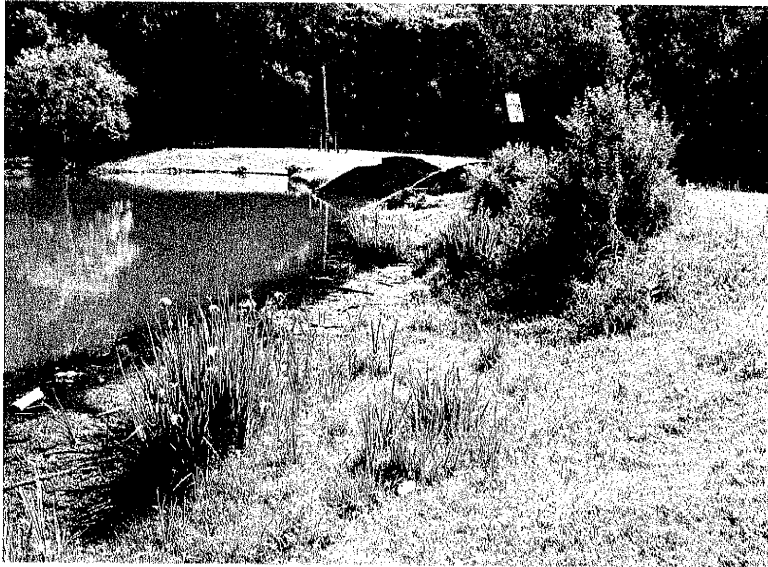
Keith R. Banachowski, P.E. Date
Program Manager
On behalf of David Hanselmann, Chief
Division of Soil & Water Resources



SIPPO CREEK RESERVOIR

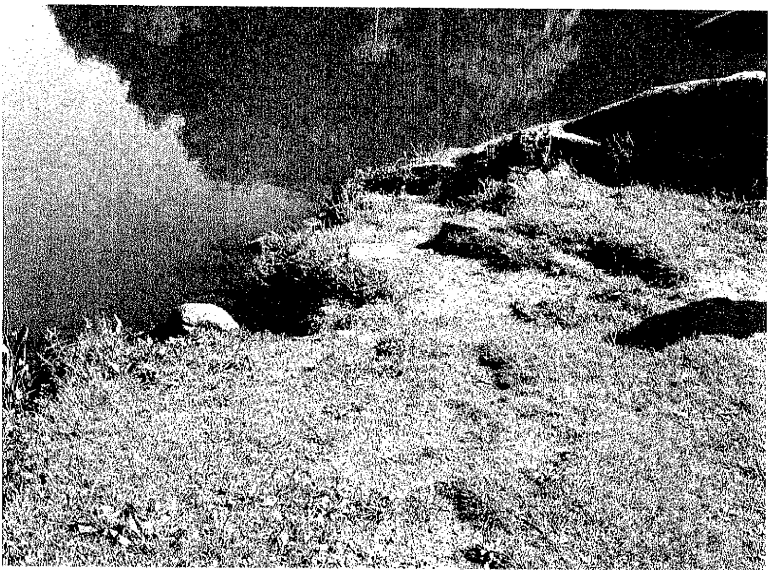
SIPPO CREEK RESERVOIR DAM
 FILE NUMBER 0614-012
 STARK COUNTY
 (not to scale)

STATE OF OHIO
 DEPT. OF NATURAL RESOURCES
 DIVISION OF WATER
 DAM SAFETY ENGINEERING PROGRAM



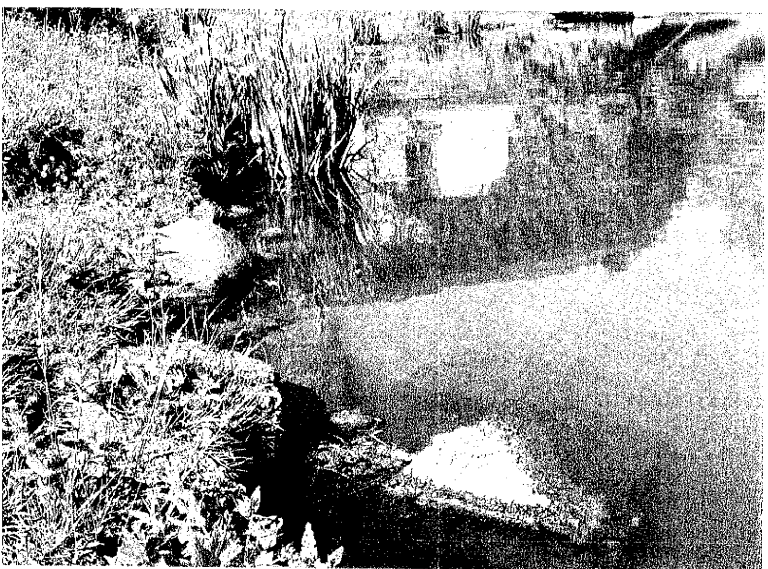
Photograph No. 1:

View of the upstream slope on the right half of dam. Note the trees and brush at the shore line.



Photograph No. 2:

View of the erosion on the upstream slope next to the principal spillway inlet.



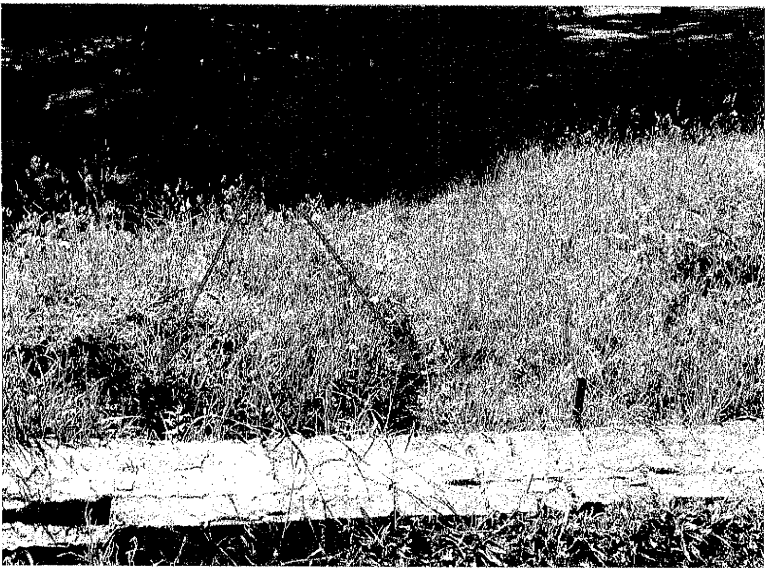
Photograph No. 3:

View of displaced slope protection on the right half.



Photograph No. 4:

View of the crest of the dam. Note that it is much lower near the spillway.



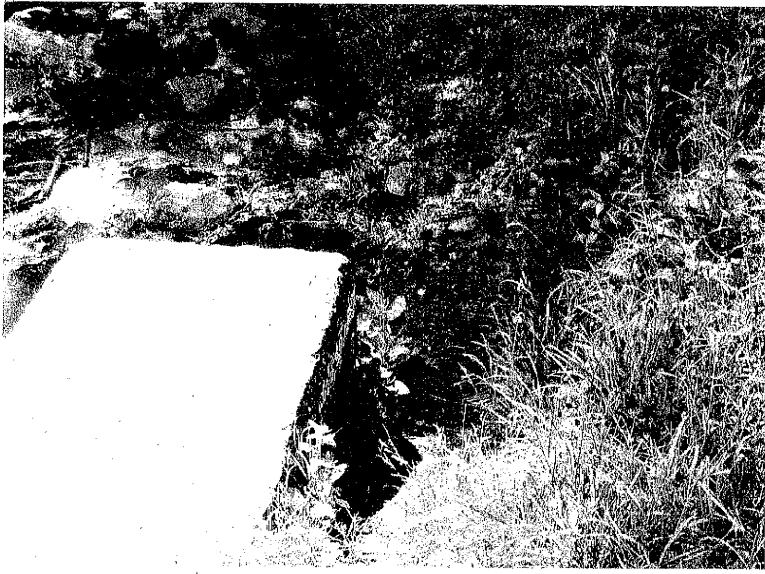
Photograph No. 5:

Exposed cut-off wall on the right crest. The arrow also point to two large erosion gullies on the downstream slope.



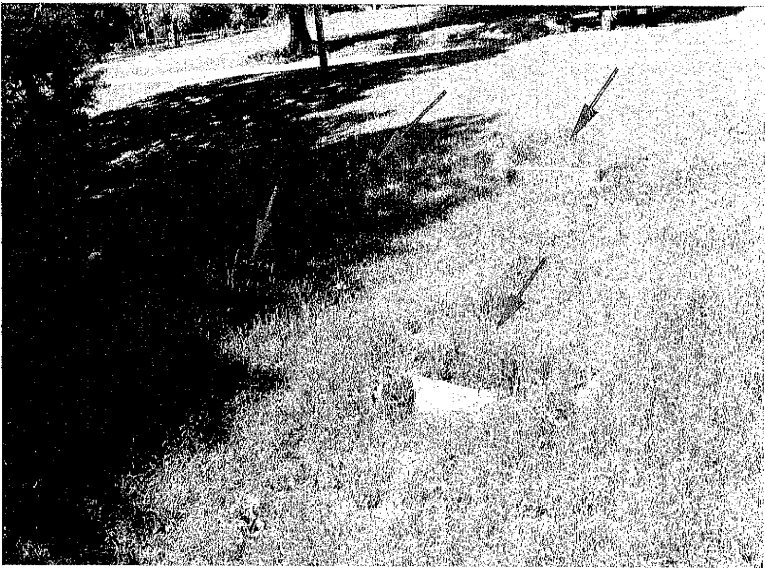
Photograph No. 6:

View of the right downstream slope. Again notice how much lower the crest of the dam is near the spillway.



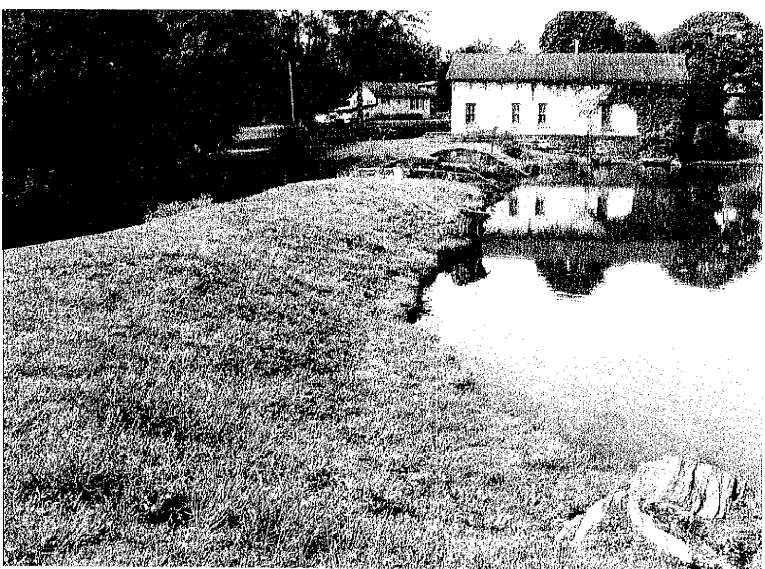
Photograph No. 7:

Erosion at end of slope next to spillway.



Photograph No. 8:

View of four flower planters on the downstream slope. They were so overgrown that they were barely visible.



Photograph No. 9:

View of the upstream slope and crest on the left side of the dam.



Photograph No. 10:

View of the crest on the left half of dam near the spillway. Again note how low the crest is. The crest should be where the red line on the photograph is.



Photograph No. 11:

View of the cut-off wall in the crest on the left half of the dam. Again, note the loss of fill in the area. Red line indicates where the crest height should be.



Photograph No. 12:

Downstream slope of left half of dam. Again note the flower planters buried in the slope.



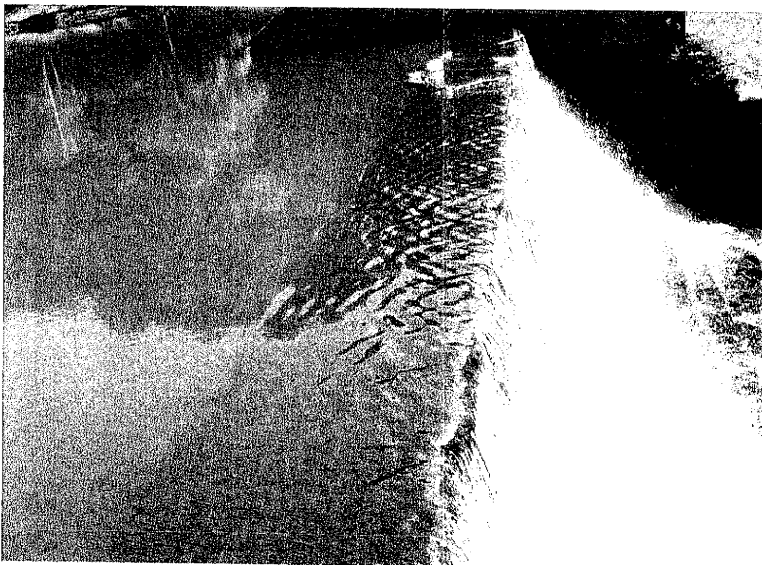
Photograph No. 13:

Erosion on the downstream slope near the spillway.



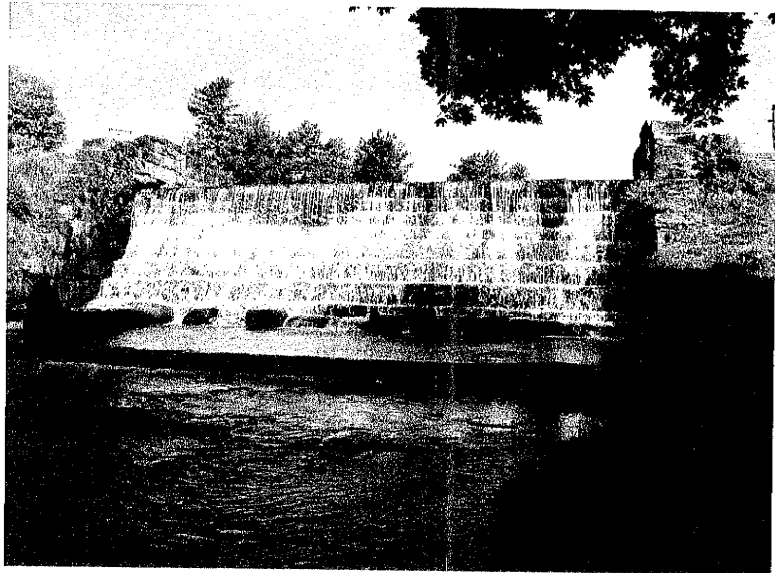
Photograph No. 14:

View of the left downstream slope. The red arrow points to erosion and the blue arrow points to a tree stump.



Photograph No. 15:

Principal spillway inlet.



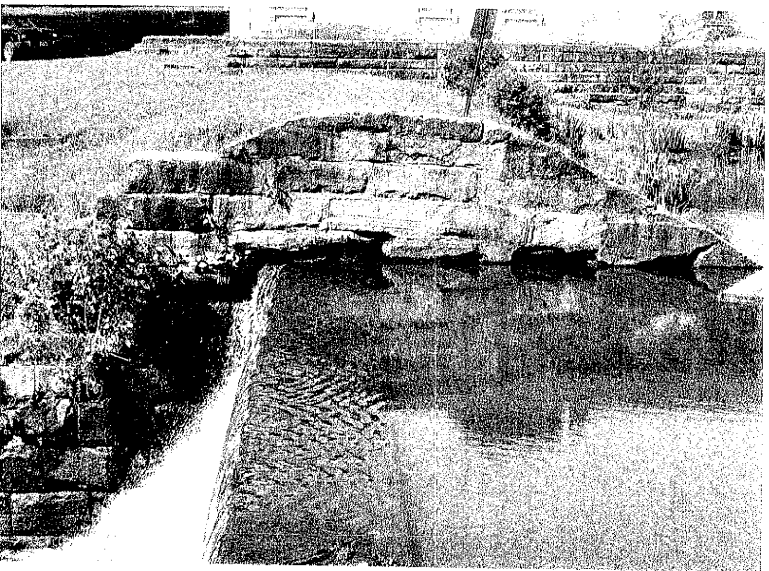
Photograph No. 16:

Principal spillway outlet.



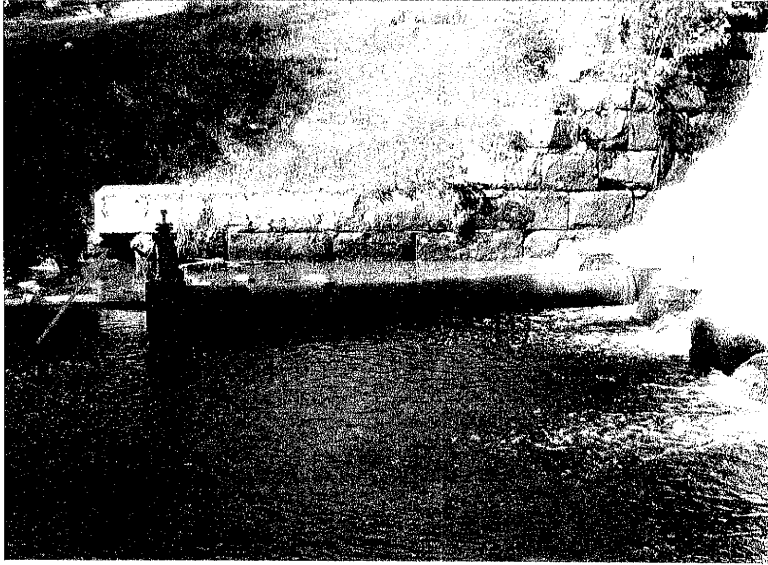
Photograph No. 17:

End sill of the principal spillway stilling basin. Note how weathered and worn the stone appears.



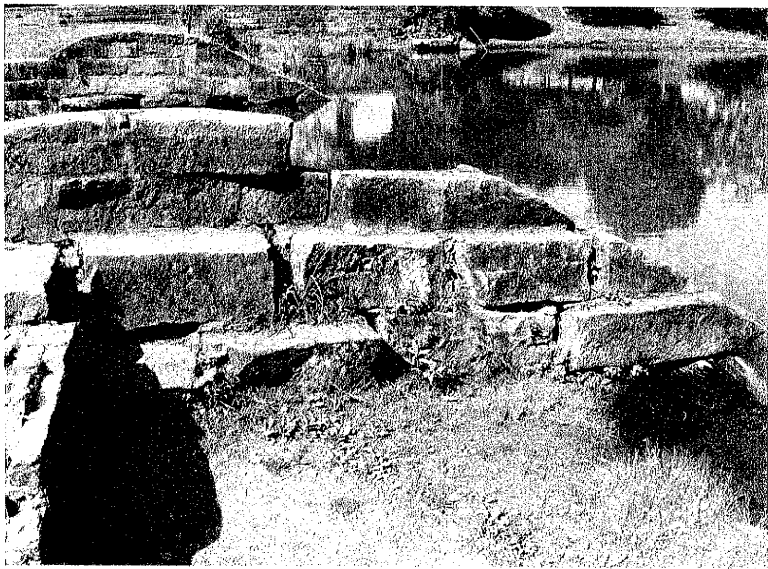
Photograph No. 18:

Right side wall of principal spillway. Note the undermining of the wall and the vegetation growing the cracks of the masonry.



Photograph No. 19:

View of the lower portion of the right spillway sidewall. The arrow indicates where the water has eroded around the wall.



Photograph No. 20:

View of the left spillway sidewall. Note the missing and displaced stones. Also note the undermining of the inlet wall.



Photograph No. 21:

Water had also undermined the end of the left spillway side wall.



Photograph No. 22:

Lake drain valve. Unsure if it is operable.



Photograph No. 23:

Outlet channel.

Dam Classification Checklist

Name of Dam: Sippo Creek Reservoir Dam File Number: 0614-012
 County: Stark Date: May 25, 2010 Engineer: TMG

The classification of a dam is based on three factors: the dam's height, storage capacity, and potential downstream hazard. The height of the dam is the vertical distance from the crest to the downstream toe. The storage capacity is the volume of water that the dam can impound at the top of dam (crest) elevation. The downstream hazard consists of roads, buildings, homes, and other structures that would be damaged in the event of a dam failure. Potential for loss of life is also evaluated. Various dam failure scenarios must be considered, and they include failures when the dam is at normal pool level and failures during significant flood events. Each of the three factors is evaluated, and the final classification of the dam is based on the highest individual factor. Class I is the highest and Class IV is the lowest. The classification of a dam can change based on future development along the downstream channel.

This checklist is intended to establish or verify the appropriate classification in accordance with the Ohio Administrative Code – it does not necessarily show all potential hazards or the full extent of inundation. In addition, elevations are estimated.

HEIGHT CLASSIFICATION

Dam Height = 18.9 feet
 > 60' - Class I
 > 40' - Class II
 > 25' - Class III
X ≤ 25' - Class IV

STORAGE CLASSIFICATION

Stor. Capacity (top of dam) = 82.5 acre-feet
 > 5000 acre-feet - Class I
 > 500 acre-feet - Class II
X > 50 acre-feet - Class III
 ≤ 50 acre-feet - Class IV

EXEMPT-NON-REGULATED

Height ≤ 6 feet
 Storage ≤ 15 acre-feet
 6 ft. < Height < 10 ft. &
 Stor. ≤ 50 ac-ft

Height Class:

IV

Storage Class:

III

Hazard Class (see next page):

I

Estimated Population at Risk: 16+

Final Class:

I

Class Changed (Yes, No)

POTENTIAL DOWNSTREAM HAZARD

I		II			III		IV		-	-			
Probable loss of human life	Loss of public water supply or wastewater treatment facility, release of health hazardous waste	Flooding of structure or high-value property	Damage to high-value or Class I, II, III dam or levee	Damage to major road (US or state route), disruption of only access to residential or critical facility area	Damage to railroad or public utility	Damage to rural building, not otherwise high-valued property, or Class IV dam or levee	Damage to local road (county and township)	Loss restricted mainly to the dam or agricultural /rural land	No hazard to structure noted	No hazard assessment; further investigation needed	Distance downstream of dam to affected structure (feet)	Vertical distance from streambed to base of affected structure (feet)	Horizontal distance from stream to affected structure (feet)
						A					200	3	0
			B								1500	26	0
						C					2000	3	0
D											5300	4	30

Upper Park
SR 241
Lower Park
Homes

This checklist is intended to establish or verify the appropriate classification in accordance with the OAC – it does not necessarily show all potential hazards or the full extent of inundation.

Sketch of Developments Downstream of Dam



Flood Routing Summary

A dam must be able to safely pass severe flood events. A dam uses a combination of reservoir storage capacity and spillway discharge to prevent floodwater from overtopping the embankment crest. As part of this inspection, the Division of Soil & Water Resources did not thoroughly investigate the ability of this dam to safely pass the required design flood. In 2001 the Division of Soil & Water Resources performed hydrologic and hydraulic calculations to estimate the size of the design flood and the total spillway discharge capacity of the dam. These calculations combined with the reservoir storage capacity were used in the flood routings to determine the maximum water surface elevation in the reservoir for various flood events (see Table I).

Sippo Creek Reservoir Dam is a Class I dam; therefore, in accordance with OAC Rule 1501:21-13-02, the required design flood is 100% of the Probable Maximum Flood (PMF) or the critical flood. This dam and its spillway system must safely pass the design flood without overtopping the embankment crest. Flood routing calculations indicate that the dam can pass 3% of the PMF; Sippo Creek Reservoir Dam does not appear to be able to safely pass the design flood.

Table I - Flood Routing Summary

Flood Event	Maximum Inflow (cubic feet per second)	Maximum WSEL ¹ (feet)	Overtopping	
			Depth ² (feet)	Duration (hours)
PMF	20180	1013.9	13.3	23.7
75% PMF	15135	1010	9.4	22.2
50% PMF	10090	1008.2	7.6	21
25% PMF	5045	1004.6	4	17.3
12% PMF ³	2421	1003.2	2.6	13

1. WSEL – water surface elevation, in feet above the mean sea level

2. A negative number indicates that the dam does not overtop and represents the elevation difference between the Maximum WSEL and the Top of Dam Elevation (freeboard)

3. 12% PMF is similar to the 100-year flood. The 100-year flood event has a 1% chance of occurring in any given year. This is only an approximation.

Top of Dam Elevation: 1000.60 feet above msl

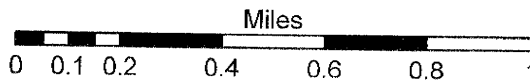
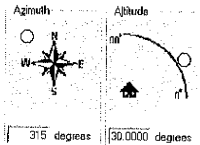
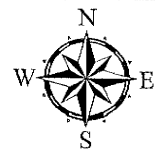
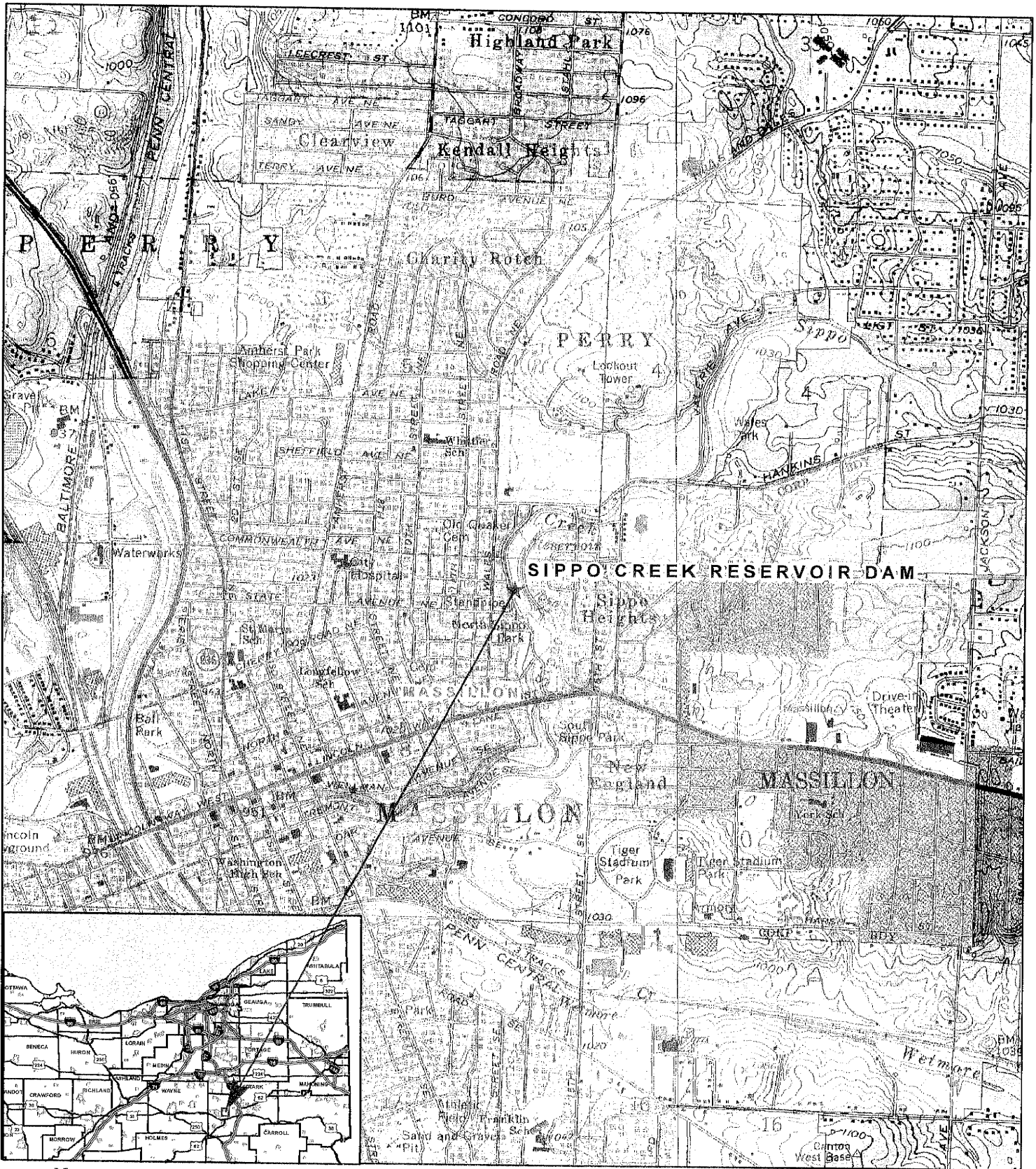
Normal Pool Elevation: 997.00 feet above msl

History of Sippo Creek Reservoir Dam

Date	Event
Unknown	Dam constructed.
1991	Dam safety inspection by the Division of Soil & Water Resources.
2000	Repair plans and hydrologic and hydraulic study submitted, comments provided, no resubmittal.
2001	Dam safety inspection by the Division of Soil & Water Resources.
2006	Dam safety inspection by the Division of Soil & Water Resources.
May 25, 2010	Dam safety inspection by the Division of Soil & Water Resources.

LOCATION MAP

SIPPO CREEK RESERVOIR DAM - 0614-012



Legend	
	Dams
	Cities
	County Boundary
	Quad Boundary



Dam Inventory Sheet

Name: SIPPO CREEK RESERVOIR DAM **File No:** 0614-012
Reservoir: **National #:** OH02825
Permit No.: EXEMPT
Class (Ht-Vol): I (IV - III)

Owner Information

Owner: City of Massillon **Owner Type:** Public, Local
Address: Parks & Recreation **Multi-Dams:** -
505 Erie St. North **Parcel No.:**
City: Massillon **State:** OH **Zip:** 44646
Contact: Kenneth Kaminski, Director **Phone No.:** 330/832-1621

Location Information

County: Stark **Latitude Deg.:** 40 **Min.:** 48 **Sec.:** 18
Township: Perry **Longitude Deg.:** 81 **Min.:** 30 **Sec.:** 30
Stream: Sippo Creek
Nearest Affected Community: Massillon
Community's Distance from Dam (miles): 0
USGS Quad.: Massillon **USGS Basin No.:** 05040001

Design/Construction Information

Designed By: Unknown
Constructed By: Unknown
Completed: **Plan Available:** NO **At:**
Failure/Incident/Breach:

Structure Information

Purpose: Recreation, Public
Type of Impound.: Dam And Spillway
Type of Structure: Earthfill
Drainage Area (sq. miles): 14.9 **or (acres):** 9566

Embankment Data

Length (ft): 265 **Upstream Slope:** 2H:1V
Height (ft): 18.9 **Downstream Slope:** 2H:1V
Top Width (ft): 6 **Volume of Fill (cub. yds.):**

Spillway Outlet Works Data

Lake Drain: 24-INCH-DIAMETER GATE VALVE
Principal: 36-FT-WIDE WEIR
Emergency: NONE
Maximum Spillway Discharge (cfs): 753 **Design Flood:** 1.0 **Flood Capacity:** 0.03

Dam Reservoir Data

	Elevation (ft-MSL)*	Area (acres)	Storage (acre-feet)
Top of Dam:	1000.6	34	82.5
Emergency Spillway:			
Principal Spillway:	997	4.4	21.7
Streambed:	981.7		

Foundation: *Elevations are not necessarily related to a USGS benchmark

Inspection Information

Inspection: 5/25/2010 TMG **Phase I:**
History: 2/21/2006 TML **Other Visits:**
4/26/2001 WDE
12/19/1991

Next Planned Inspection: 2009-2010 C - by Basin

Operation Information/Remarks

RECEIVED REPAIR PLANS 2000, COMMENTS PROVIDED, NO PROGRESS MADE.

Emergency Action Plan: NO **Format:** OMI: No
Annual Fee: \$219.00 **Last Entry:** 6/7/2010

Dam Safety Inspection Checklist

Complete All Portions of This Section (Pre-inspection)

Name of Dam: Sippo Creek Reservoir Dam

Date of Inspection: MAY 25, 2010

File Number: 0614-012

Class: 1

Design Flood: 1.0 Flood Capacity: 0.03

Stark County
Required Action
None Mon. Maint. Eng.

Interview with Owner (at the site):

Owner/Representative present: (Yes, No) Name(s): THEY WERE SCHEDULED TO BE THERE

Owner's Name(s): City of Massillon BUT NO ONE SHOWED UP.

Address: Parks & Recreation, 505 Erie St. North,

City: Massillon State: OH Zip (+4): 44646

Contact Person: Kenneth Kaminski, Director Telephone: 330/832-1621

Email Address:

Purpose of dam: Recreation, Public

Owner Dam Safety Program

Emergency Action Plan

EAP (document): NO Up-to-date? (yes, no)

Exercised:

Downstream development:

Security:

Operation, Maintenance, and Inspection

OMI (document): No Up-to-date? (yes, no)

Operation of drains/gates

All operable? (yes, no) UNKNOWN IF LAKE DRAIN IS OPERABLE.

Normal rate of drawdown: UNKNOWN Emerg. rate of drawdown: UNKNOWN

Accessibility for operation:

Maintenance

Frequency of mowing: UNKNOWN - AT LEAST 3 TIMES.

Other maintenance: REMOVED LARGE TREES OFF THE DIS SLOPE SINCE LAST INSPECTION. BUT THE STUMPS REMAIN.

Inspection

Frequency and thoroughness of day-to-day & routine inspections: UNKNOWN

Frequency and thoroughness of event-driven inspections: UNKNOWN

Problems found during inspections:

Field Information

Pool Elevation (during inspection): NORMAL POOL Time: 10 (a.m./p.m.)

Site Conditions (temp., weather, ground moisture): 75° SUNNY, DRY

Inspection Party: TINA GRIFFIN + MATT HOOK

Maximum Height: 18.9 Feet (measured or inventory appears correct)

Normal Pool Surface Area: 4.4 Acres (measured or inventory appears correct)

Brick cutoff walls runs across length of crest;
Lake drain valve is in the stilling basin.

Received Repair Plans 2000, Comments Provided, No Progress Made.

Required
Action
None
Monitor
Repare/replace
Regraze

UPSTREAM SLOPE Gradient: Horizontal: 2 Vertical: 1 (est. meas.)

VEGETATION [no problem]

Trees: Quantity: (<5, sparse, dense)
Diameter: (<6", 6-12", >12")
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)
Notes:

Brush: Quantity: (sparse, dense)
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)
Notes: LOCATED AT SHORELINE MOSTLY.

Ground Cover: Type: (grass, crown vetch) Other:
Quantity: (bare, sparse, adequate, dense)
Appearance: (too tall) too short, good
Notes: SOME AREAS ON THE SLOPE WERE BARE OF VEGETATION.
THESE AREAS ARE AROUND BOTH SIDES OF SPILLWAY ENTRANCE

SLOPE PROTECTION [no problem, could not inspect thoroughly]

None
 Riprap: Average Diameter: BROKEN CONCRETE SLABS
(adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted - yes/no)
Notes: SLOPE PROTECTION WAS NOT PROPERLY INSTALLED AND HAS BEEN DISPLACED IN THE LAKE

Wave Berm:
Vegetation: (adequate, bare, sparse, improper vegetation)
Notes:

Concrete Slabs: (cracked, settlement, undermined, voids, deteriorated, vegetation)
Notes:

Other:
Notes:

EROSION [no problem, could not inspect thoroughly]

Wave Erosion (Beaching): Scarp: Length: Height: 8"
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)
Notes: ACTIVE WAVE EROSION IS OCCURRING ON SLOPE. EROSION HAS GONE INTO CREST ON BOTH SIDES OF SPILLWAY.

Runoff Erosion (Gullies): Quantity:
Depth: Width: Length:
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)
Notes/Causes:

INSTABILITIES [no problem, could not inspect thoroughly]

Slides: Transverse Length: Longitudinal Length:
Scarp: Width: Length:
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)
Crack: Width: Depth:
Notes/Causes:

Cracks: Transverse Longitudinal Other
Quantity: Length: Width: Depth:
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)
Notes/Causes:

None
Monitor
Repare/replace
Regraze

{Upstream Slope, Crest, Downstream Slope, Seepage, Principal Spillway, Emergency Spillway, Lake Drain}

Required
Action

Required Action
 None
 Monitor
 Maintain
 Upgrade

Cracks: Transverse Longitudinal Other
 Quantity: Length: Width: Depth:
 Location: (adj. to structure, entire slope, ft end, rt end, middle, see dwg)
 Notes/Causes:

Bulges Depressions Hummocky
 Size: Height: Depth:
 Location: (adj. to structure, entire slope, ft end, rt end, middle, see dwg)
 Notes/Causes:

Bulges Depressions Hummocky
 Size: Height: Depth:
 Location: (adj. to structure, entire slope, ft end, rt end, middle, see dwg)
 Notes/Causes:

OTHER [no problem, could not inspect thoroughly]

Rodent Burrows: (few, numerous)
 Location: (adj. to structure, entire slope, ft end, rt end, middle, see dwg)
 Notes: **MUSKRAT DAMAGE EXASPERATES THE WAVE EROSION.**

Ruts:
 Location: (adj. to structure, entire slope, ft end, rt end, middle, see dwg)
 Depth: Width Length:
 Notes/Causes: (truck/auto, motorcycle, ATV, animals, pedestrian)

Other:
 Notes:

CREST Length: 265' Width: 6' (est. meas.)

VEGETATION [no problem]

Trees: Quantity: (<5, sparse, dense)
 Diameter: (<6", 6-12", >12")
 Location: (adj. to structure, entire crest, ft end, rt end, middle, see dwg)
 Notes:

Brush: Quantity: (sparse, dense)
 Location: (adj. to structure, entire crest, ft end, rt end, middle, see dwg)
 Notes:

Ground Cover: Type: (grass, crown vetch) Other:
 Quantity: (bare, sparse, adequate, dense)
 Appearance: (too tall, too short, good)
 Notes: **SOME EROSION ON BOTH SIDES OF SPILLWAY HAS LEFT BARE AREAS.**

EROSION [no problem, could not inspect thoroughly]

Runoff Erosion (Gullies): Quantity: Depth: 2' Width: ENTIRE Length: 25' ON (R)
 Location: (adj. to structure, entire crest, ft end, rt end, middle, see dwg)
 Notes/Causes:

None
 Monitor
 Maintain
 Upgrade

(Upstream Slope, Crest, Downstream Slope, Seepage, Principal Spillway, Emergency Spillway, Lake Dam)

Required Action

None
Minor
Major
Extreme

ALIGNMENT [no problem, could not inspect thoroughly]

Vertical: Low Area:

Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)

Elevation Difference: 2'

Notes/Causes:

2 40' (L)

Length: 25 (R)

Horizontal:

Notes/Causes:

WIDTH [no problem]

Too Narrow

Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)

Notes/Causes:

INSTABILITIES [no problem, could not inspect thoroughly]

Cracks: Transverse Longitudinal Other

Quantity: Length: Width: Depth:

Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)

Notes/Causes:

Cracks: Transverse Longitudinal Other

Quantity: Length: Width: Depth:

Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)

Notes/Causes:

Bulges Depressions Hummocky

Size: Height: Depth:

Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)

Notes/Causes:

Bulges Depressions Hummocky

Size: Height: Depth:

Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)

Notes/Causes:

OTHER [no problem, could not inspect thoroughly]

Rodent Burrows: (few, numerous)

Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)

Notes:

Ruts:

Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)

Depth: Width Length:

Notes/Causes: (truck/auto, motorcycle, ATV, animals, pedestrian)

Other:

Notes: A CUT-OFF WALL IS LOCATED IN THE CREST. EROSION HAS EXPOSED THE CUT-OFF WAY BY 2'. THE EXPOSED WALL IS CRUMBLING.

None
Minor
Major
Extreme

Required Action

DOWNSTREAM SLOPE Gradient: Horizontal: 2

Vertical: 1

(est. meas.)

Downstream Slope
Principal Spillway
Emergency Spillway
Lake Drain

VEGETATION [no problem]

Trees: Quantity: (<5, sparse, dense)

Diameter: (<6", 6-12", >12")

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)

Notes: TREES HAVE BEEN REMOVED SINCE LAST INSPECTION. HOWEVER, LARGE STUMPS REMAIN.

Brush: Quantity: (sparse, dense)

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg) BOTH SIDES.

Notes:

Ground Cover: Type: (grass, crown vetch) Other:

Quantity: (bare, sparse, adequate, dense)

Appearance: (too tall, too short, good)

Notes: SOME SPARSE AREAS DUE TO EROSION.

EROSION [no problem, could not inspect thoroughly]

Runoff Erosion (Gullies): Quantity: 2 Depth: 24" Width: 6" Length:

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)

Notes/Causes: LOCATED ON RIGHT HALF OF DAM NEXT TO SPILLWAY. (POSSIBLE OVERTOPPING?)

INSTABILITIES [no problem, could not inspect thoroughly]

Slides: Transverse Length:

Longitudinal Length:

Scarp: Width: Length:

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)

Crack: Width: Depth:

Notes/Causes

Cracks: Transverse Longitudinal Other

Quantity: Length: Width: Depth:

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)

Notes/Causes:

Cracks: Transverse Longitudinal Other

Quantity: Length: Width: Depth:

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)

Notes/Causes:

Bulges Depressions Hummocky

Size: Height: Depth:

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)

Notes/Causes:

Bulges Depressions Hummocky

Size: Height: Depth:

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)

Notes/Causes:

Downstream Slope
Principal Spillway
Emergency Spillway
Lake Drain

Required Action

PRINCIPAL SPILLWAY

Required
Action
None
Minor
Major
Severe

GENERAL INLET [no problem, could not inspect thoroughly]

Anti-Vortex Plate [None] Dimensions: (adequate, too small,)
Type: (steel, concrete, aluminum, stainless steel, corrugated metal wood, other):
Deterioration: (missing sections, rusted, collapsed)
Notes:

Flash Boards [None]
Type: (metal, wood):
Deterioration:
Notes:

Trashrack [None] Opening Size: (adequate, too small, too large)
Type: (metal bars, fence, screen, concrete, baffle, other):
Deterioration: (broken bars, missing sections, rusted, collapsed)
Notes:

INLET OBSTRUCTION [no problem, could not inspect thoroughly]

Debris: (leaves, trash, logs, branches, ice)
 Trees: Quantity: (<5, sparse, dense)
Diameter: (<6", 6-12", >12")
Location: (entire inlet, lt side, rt side, middle, see dwg)
Notes:

Brush: Quantity: (sparse, dense)
Location: (entire inlet, lt side, rt side, middle, see dwg)
Notes:

Other: (beaver activity, trashrack opening too small, partially/completely blocked, i.e.)
Notes:

INLET MATERIALS [no problem, could not inspect thoroughly]

Metal
(loss of coating/paint, surface rust, corrosion (pitting, scaling), rusted out, pipe deformation)
Dimensions:
Location:
Notes/Causes:

Concrete *MASONRY STONE*

(bug holes, hairline crack, efflorescence) *WEATHERED, DISPLACED, MISSING, UNDERMINED.*
(spalling, popouts, honeycombing, scaling, craze/map cracks)
(isolated crack, exposed rebar, disintegration, other)
Dimensions/Location:
Notes/Causes:

(bug holes, hairline crack, efflorescence)
(spalling, popouts, honeycombing, scaling, craze/map cracks)
(isolated crack, exposed rebar, disintegration, other)
Dimensions/Location:
Notes/Causes:

Plastic
(deterioration, cracking, deformation)
Dimensions:
Location:
Notes/Causes:

{Upstream Slope, Crest, Downstream Slope, Seepage, Principal Spillway-Inlet, Emergency Spillway, Lake Drain}

None
Minor
Major
Severe
Required
Action

Required Action

Earthen

Ground Cover: Type: (grass, crown vetch) Other:

Quantity: (bare, sparse, adequate, dense)

Appearance: (too tall, too short, good)

Notes:

None
None for
Material
U. Inspect

Erosion: (wave, surface runoff)

Description (height/depth/length/etc):

Notes:

Ruts:

Location: (entire inlet, lt side, rt side, middle, see dwg)

Depth: Width Length:

Notes/Causes: (truck/auto, motorcycle, ATV, animals, pedestrian)

Riprap: Average Diameter:

(adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted - yes, no)

Notes:

Rock-Cut (weathered, erosion)

Description:

Notes:

Other:

OTHER INLET PROBLEMS [no problem, could not inspect thoroughly]

Mis-Alignment:(pipe, chute, sidewall, headwall) Pipe Deformation

Location/Description:

Notes/Causes:

Separated Joint Loss of Joint Material

Location/Description:

Notes/Causes:

Undermining:

Location/Description:

Notes/Causes:

OF SPILLWAY SIDEWALLS @ INLET.

Other:

OPEN CHANNEL CONTROL SECTION [no problem, could not inspect] Width

(est., ms.) Brdth

(est., ms.)

Notes:

OUTLET OBSTRUCTION [no problem, could not inspect thoroughly]

Debris: (leaves, trash, logs, branches, ice)

Trees: Quantity: (<5, sparse, dense)

Diameter: (<6", 6-12", >12")

Location: (entire outlet, lt side, rt side, middle, see dwg)

Notes:

Brush: Quantity: (sparse, dense)

Location:(entire outlet, lt side, rt side, middle, see dwg)

Notes:

Other:(beaver activity, partially/completely blocked, i.e.)

Notes:

Required Action

{Upstream Slope, Crest, Downstream Slope, Seepage, Principal Spillway-Inlet/Outlet, Emergency Spillway, Lake Drain}

Required Action
 None
 None for
 Material
 U. Inspect

Required
Action

None
Minor
Major
Emergency

OUTLET EROSION CONTROL STRUCTURE (Stilling Basins)

- None
- (endwall/headwall) plunge pool impact basin, flip bucket, USBR, baffled chute, rock lined channel

Notes:

Components (baffle blocks, chute blocks, endsill)

MATERIAL (no problem, could not inspect thoroughly)

- Riprap: Average Diameter:

(adequate,

sparse, displaced, weathered, vegetation) (bedding/fabric noted - yes, no)

Notes:

~~Concrete~~ **MASONRY STONE**

(bug holes, hairline crack, efflorescence)

WEATHERED AND ERODED.

(spalling, popouts, honeycombing, scaling, craze/map cracks)

(isolated crack, exposed rebar, disintegration, other)

Dimensions/Location:

Notes/Causes:

(bug holes, hairline crack, efflorescence)

(spalling, popouts, honeycombing, scaling, craze/map cracks)

(isolated crack, exposed rebar, disintegration, other)

Dimensions/Location:

Notes/Causes:

OTHER (no problem, could not inspect thoroughly)

- Mis-Alignment: (sidewall, headwall, entire struct.)

Location:

Description:

Notes/Causes:

- Separated Joint
- Loss of Joint Material

Location:

Description:

Notes/Causes:

- Undermining:

Location:

Description:

Notes/Causes:

- Other:

DRAINS (none) none found, no problem, could not inspect thoroughly (See SEEPAGE Section for Toe Drains & Relief Wells)

- Type: Weep Holes

Flow Rate:

Location:

Notes:

- Relief Drains

Size:

- Other:

Number:

- Type: Weep Holes

Flow Rate:

Location:

Notes:

- Relief Drains

Size:

- Other:

Number:

Required
Action

{Upstream Slope, Crest, Downstream Slope, Seepage, Principal Spillway-Outlet Erosion Control Structure, Emergency Spillway, Lake Drain}