



GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

GAYLORD



LIESL EICHLER CLARK
DIRECTOR

January 12, 2022

VIA E-MAIL

Mr. Paul Erickson, Supervisor
Boardman Township
4319 Boardman Road SW
South Boardman, Michigan 49680

Dear Mr. Erickson:

SUBJECT: Youngs Dam, Dam ID No. 569, Kalkaska County

The enclosed Dam Safety Inspection Report for the Youngs Dam was prepared by Mr. Daniel DeVaun, P.E., and Mr. Michael Size, E.I.T., both of the Dam Safety Unit, Water Resources Division, Department of Environment, Great Lakes, and Energy (EGLE). The visual inspection and report were completed at your request, as provided by Section 31518(4) of Part 315, Dam Safety (Part 315), of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA).

The purpose of this inspection was to evaluate the structural condition and hydraulic capacity of the dam, as required by Part 315 of the NREPA.

The Youngs Dam is in fair condition overall. However, the inspection report includes several recommendations for monitoring and repair of deficiencies that do not currently pose an immediate threat to the safety of the dam but should be completed within the timeframes indicated in the report.

If you have any questions regarding these recommendations, please contact Mr. Michael Size at 989-619-4295, or SizeM@Michigan.gov, or you may contact me.

Sincerely,

Daniel L. DeVaun, P.E.
Dam Safety Unit
Water Resources Division
989-370-1528

Enclosure

cc: Mr. Michael Size, EGLE
File

**DAM SAFETY INSPECTION REPORT
YOUNGS DAM – DAM ID NO. 569
SOUTH BRANCH BOARDMAN RIVER
KALKASKA COUNTY – SECTION 21, T 26N, R 08W**



OWNER(S)/OPERATOR(S):

Boardman Township
4319 Boardman Road SW
South Boardman, MI 49680
231-369-3336

**HAZARD POTENTIAL
CLASSIFICATION:**

Low

INSPECTION DATE:

October 12, 2021

REPORT DATE:

December 20, 2021

PREPARED AND INSPECTED BY:



Daniel L. DeVaun, P.E.
Registration Number: 54585
Dam Safety Unit
Water Resources Division
Department of Environmental Quality
120 West Chapin Street
Cadillac, Michigan 49601
989-370-1528

INTRODUCTION

The purpose of this inspection was to evaluate the structural condition and hydraulic capacity of the Youngs Dam, as required by Part 315, Dam Safety (Part 315), of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This inspection was conducted by the Department of Environment, Great Lakes, and Energy (EGLE) in response to a request by the owner(s) of the dam, Boardman Township, Kalkaska County. The report is limited to a discussion of observations based on a visual investigation and review of any available previous inspection reports, plans, and data. This report should not be considered an in-depth engineering investigation. All references to “right” and “left” in this report are based on the observer facing downstream.

CONCLUSIONS AND RECOMMENDATIONS

The Youngs Dam is in Poor condition. This means that there are recognized dam safety deficiencies that requires action to resolve the problem. The embankment is in danger of a piping failure; due to the deterioration of the steel outlet pipe. Poor rating may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency: further investigations and studies are necessary. The following recommended actions are listed by priority:

- Immediately begin planning and budgeting for replacement or repair of the steel outlet pipe and should be completed within five years. This work will require a permit from this office.
- Trees and woody vegetation should be removed 10 feet past the toe of the embankment by December 31, 2022. Vegetation within riprap should be removed by trimming or chemical application.
- Monitor water levels in impoundment for potential overflow at each abutment. These areas should be raised to contain the flood stage during the 100-year event or armored for anticipated overtopping during lesser events. Provide a plan to the Dam Safety Program by December 31, 2022 detailing the anticipated direction to remedy the deficiency.
- A significant footpath has eroded on the downstream slope in the vicinity of the outlet pipe. The erosion should be repaired by December 31, 2022.
- Monitor cracking on spillway concrete for further growth.

The dam's current Low hazard potential rating remains appropriate.

PROJECT INFORMATION

The Youngs Dam is an earth fill embankment dam with a length of approximately 400 feet. The dam is approximately 17 feet high and impounds a pond with a surface area of approximately six acres. The dam has an 8-foot by 13-foot rectangular concrete control structure, with a 5-foot diameter corrugated metal outlet pipe that surrounds a 2' diameter secondary metal outlet pipe. The date of original construction is unknown.

The embankment has a top width of approximately 12 feet. The upstream and downstream slopes are both approximately 1 horizontal to 1 vertical. The embankment is entirely covered with grass, light brush, and trees.

A Dam Safety inspection was previously completed in 2016. A copy of that inspection report is on file with the Dam Safety Program. The 2016 inspection report prepared by the Dam Safety program of EGLE was used as a reference for this report.

SITE INVESTIGATION

The following discussion of the dam's physical condition and appurtenances is based on observations and photographs obtained on the inspection date.

In addition to the specific findings listed below, it is important to continue good maintenance practices. These practices include regular inspection of the dam embankments and hydraulic structures for any deficiencies. Some of the more common issues that are found include growth of trees and brush, development of erosion areas, and animal burrows.

If woody vegetation is allowed to mature, it could develop an extensive root system. These root systems can lead to piping failure or if the brush and trees are uprooting in a storm, can cause extensive deterioration of the embankment. Embankments should be clear of woody vegetation and mowed 10 feet past the toe of the embankment. Similarly, animal burrows and surface erosion, can propagate into increased seepage and potentially piping failure, as well as lead to slope stability issues.

The following data was collected on the date of the inspection and includes deficiencies observed during the inspection and necessary actions for remediation of the observed deficiencies.

Upstream Slope	
Pool elevation at time of inspection (ft)	<i>At the top of concrete on primary spillway</i>
Upstream slope ground cover	<i>Riprap, grass/vegetation</i>
What issues are present on the upstream slope?	<i>Overgrown vegetation</i>
Slope Protection	
What types of slope protection are used?	<i>Riprap, vegetation</i>
Average diameter of rockfill	<i>3"-8"</i>
Condition of riprap	<i>Vegetation present</i>
Action required for riprap	<i>Maintenance</i>

Describe action required	<i>Remove vegetation from riprap by trimming or chemical application.</i>
Trees/Woody Vegetation	
Brush coverage	<i>Uniform</i>
Location of brush	<i>Upstream slope</i>
Action required for brush	<i>Maintenance</i>
Describe action required	<i>Remove brush from entire embankment to 10' beyond toe of slope.</i>

Crest	
Approximate width of crest (ft)	<i>12</i>
Approximate freeboard (ft)	<i>3.5</i>
Crest ground cover	<i>Grass covered walking path</i>
What issues are present on the crest?	<i>Low area</i>
Vertical Alignment / Low Areas	
What type of low area is present?	<i>Constructed dam crest</i>
Where is the low area located	<i>At the right and left abutments, both upstream and downstream groins.</i>
Approximate area (ft ²)	<i>Entire abutment area out to Butler Road at the right abutment and entire abutment area at left abutment.</i>
Action required for low area	<i>Monitor</i>
Describe action required for low area	<i>Monitor water levels in impoundment. If water begins to approach dam crest in the low area, placement of sandbags may be necessary to keep water from flowing over undesired areas.</i>

Downstream Slope	
Downstream slope ground cover	<i>Grass</i>
What issues are present on the downstream slope?	<i>Trees, brush</i>
Trees/Woody Vegetation	
Number of trees	<i>Dense</i>
Tree DBH	<i>3"-12"</i>
Tree location	<i>Entire downstream slope of embankment</i>
Action required for trees	<i>Maintenance</i>
Describe action required	<i>Remove trees on embankment 10' past the toe</i>
Location of brush	<i>Entire downstream slope of embankment</i>
Action required for brush	<i>Maintenance</i>
Describe action required	<i>Remove brush from entire embankment to 10' beyond toe of slope.</i>
Ground Cover / Vegetation Issues	
Ground cover type	<i>Grass with foot path, trees/brush</i>
Ground cover issues	<i>Bare</i>
Location of ground cover issues	<i>Footpath from dam crest down to outlet pipe</i>
Action required for ground cover	<i>Maintenance</i>
Describe action required	<i>Implement erosion control measures as needed</i>

Principal Spillway	
What type of spillway is present?	<i>Weir/Channel</i>
What type of weir is present?	<i>Sharp crested drop inlet</i>
What is the primary material used in the spillway?	<i>Concrete</i>
What issues are present with the primary spillway?	<i>Vegetation, obstructions, deteriorating material</i>
User Defined Issue	
Specify other.	<i>Vegetation growing</i>
Where are the other issues located?	<i>Within concrete structure</i>
Action required for other issues	<i>Maintenance</i>
Describe action required	<i>Remove vegetation</i>
Obstructions	
What is obstructing the spillway?	<i>Debris</i>
What type of debris?	<i>Leaves, logs</i>
Where is the debris?	<i>Inlet</i>
Action required for debris	<i>Maintenance</i>
Describe action required	<i>Remove debris as frequent as necessary to maintain spillway capacity.</i>
Material Deterioration	
What materials are deteriorating in the spillway?	<i>Concrete</i>
What issues are noted with the concrete components?	<i>Cracking</i>
How large is the impacted area (in ²)?	<i>Varies</i>
Where are the issues located?	<i>Top of principal spillway and inside walls of drop inlet</i>
Action required for concrete components of the spillway	<i>Monitor</i>
Describe action required	<i>Monitor cracking for further growth</i>
Spillway Conduit Issues	
Is there loss of joint material?	<i>No</i>
Where are the issues located?	<i>Outlet culvert</i>
Action required for joint separation	<i>Maintenance, Planning</i>
Describe action required	<i>Begin planning and budgeting for replacement of the steel outlet pipe.</i>
Erosion Control / Energy Dissipation	
What type of erosion control structure is in place?	<i>Rock-Lined Channel</i>
Does the outlet erosion control structure include any drains?	<i>No</i>
Gates / Valves	
Does the spillway include a gate?	<i>No</i>

The owner has placed a pipe of smaller diameter inside of the outlet pipe in order to deflect water flow from the original pipe. This pipe is not effective, as flow is still making its way through both pipes. The original outlet pipe is over 50 years old and is well beyond its expected service life. Failure of outlet pipes is a common cause of dam failure. Planning should begin immediately for the financing and repair or replacement of the outlet pipe within five years.

The above monitoring and maintenance items should be addressed in accordance with the Conclusions and Recommendations section of this report.

STRUCTURAL STABILITY

Based upon observations during the inspection, there were no indicators of any conditions that represent an immediate threat to the dam's stability. However, there were indications that represent a threat to the dam's stability under certain loading conditions.

HYDROLOGY AND HYDRAULICS

The inspection confirmed previous reports that the right and left abutments of the dam are approximately 2 to 3 feet lower than the elevation of the crest of the embankment. This means that at high flood events, water will begin to spill over both abutments before ever overtopping the embankment. The abutment areas are well vegetated, relatively flat, and more than 100 feet wide. These areas will provide more than adequate capacity for flows greater than the design flood event.

The contributing drainage area of the Albright Creek at the dam is 15.9 square miles. The design discharge for this dam is the 1 percent chance (100-year) flood discharge of 260 cubic feet per second (cfs) and a total flood volume of 800 acre-ft. An HY-8 model was created to evaluate the capacity of the metal outlet pipes. The model was run with flow only passing through the 2' diameter pipe as this was the intent of the pipe's installation. The existing spillway capacity was calculated to be approximately 52 cfs with no freeboard at the abutments. To pass the design flood discharge, the 2' diameter culvert must discharge 52.5 cfs, with 207.5 cfs flowing over the abutments at a depth of ~0.4 feet over the abutments. Therefore, the dam is considered to have adequate spillway capacity, but will inundate neighboring properties and will not discharge exclusively to the channel downstream of the dam.

OPERATION AND MAINTENANCE

Operation of the dam is the responsibility of the owner or their designee. A written Operation and Maintenance Plan should be prepared and kept on file with Boardman Township.

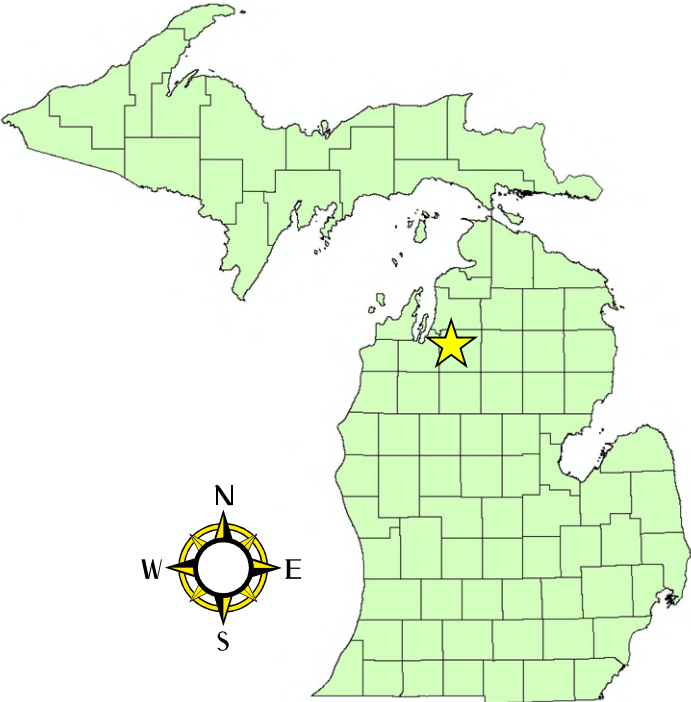
EMERGENCY ACTION PLAN

An Emergency Action Plan (EAP) does not exist for this dam. Due to the low hazard potential rating for this dam, an EAP is not required.

APPENDICES

A location map and inspection photographs are attached.

**Youngs Dam
Dam ID No. 569
Section 21
T 26N
R 08W
Kalkaska County**



**YOUNGS DAM
KALKASKA COUNTY
DAM ID NO. 569**



Photo #1 – Upstream slope looking right from left abutment



Photo #2 – Upstream slope looking right

**YOUNGS DAM
KALKASKA COUNTY
DAM ID NO. 569**



Photo #3 – Dam crest looking left



Photo #4 – Dam crest looking left from right abutment (low area)

**YOUNGS DAM
KALKASKA COUNTY
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Photo #5 – Downstream slope looking left from right abutment



Photo #6 – Downstream slope looking left

**YOUNGS DAM
KALKASKA COUNTY
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Photo #7 – Primary spillway looking upstream



Photo #8 – Primary spillway outlet looking downstream

**YOUNGS DAM
KALKASKA COUNTY
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Photo #9 – Low area at right abutment, looking right



Photo #10 – Low area at right abutment, looking downstream

YOUNGS DAM
KALKASKA COUNTY
DAM ID NO. 569

Hydrologic Data

Flood Discharge Request Record 20160177 12/9/2021

[Home](#) | [Water Management](#) | [Lowflows](#) | [Discharge Requests](#) | [Watersheds Map](#) |

Discharge Information

Watercourse: ALBRIGHT CREEK	Drainage Area: 21.2 mi ²
Location: Youngs Dam	Contributing Area: 15.94 mi ²
Basin Name: 09 - Boardman	Tn/Rng/Sec: 26N08W/21
County: Kalkaska	Latitude: 44.636614
Township: Boardman	Longitude: -85.281906
Quad Name: South Boardman	Requested Date: 3/22/2016
Quad ID: L21NE	Issued Date: 3/30/2016
Requested By: Jim Pawloski (DEQ-LWM)	Reference Number:
Request Type: Dam	
File Number: 20160177	

Discharge Frequencies:

10%: 50 cfs
2%: 180 cfs
1%: 260 cfs
0.5%: 340 cfs
0.2%: 490 cfs

Volume Frequencies:

1%: 800 acre-ft
0.5%: 1100 acre-ft

Access to the Flood Flow Database is provided as a service to allow you to check the status of your flood flow requests or to view discharges from previous requests for preliminary design purposes. The discharges values are only valid for the original requestor and for one year after the original request date. To obtain discharge information from the Hydrologic Studies Program, a flood flow [discharge request form](#) may be submitted electronically to the DEQ. A written or email response to your request will be returned to you and must accompany your permit application.