

Operations & Maintenance Manual



White Cloud Dam

Newaygo County, Michigan

Dam ID: 526

T13N, R12W

Prepared by:
OMM Engineering, Inc.

Prepared For:
City of White Cloud

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GENERAL INFORMATION

This document is the Operations and Maintenance Manual for the White Cloud Dam and it provides operational procedures and recommendations to be utilized during normal operation and maintenance of the dam.

The White Cloud Dam is located on the White River in the City of White Cloud. The dam was built in 1872 and is 18.89 feet high, 950-foot-long earthen embankment with three spillways. The dam's impoundment is 475 acres. The Principal Spillway and the Secondary Spillway control the impoundment elevation and flow during normal conditions. The Emergency Spillway is an overflow structure, designed to overtop when the other spillways cannot adequately pass the flow through the dam. The dam structure supports State Street in the City of White Cloud and Silver Drive in Everett Township.

The White Cloud Dam is listed as a High Hazard Dam by the Michigan DEQ. This dam is noteworthy because of its location upstream from M-37 and the Marquette Railroad Bridge just south of the City of White Cloud. A failure on this dam would likely result in loss of life and/or damage to structures, roads, utilities, crops and the environment. It is unknown if a failure of the White Cloud Dam would cause a failure of the Hesperia Dam.

The White Cloud Dam has experienced two failures since it was constructed in 1872. The dam was destroyed by flooding in 1910 and reconstructed the same year. The dam failed again during the flood of September 1986. During this event the area experienced torrential rainfall. The dam was repaired in 1990. Additional repairs were made in 2018 based on corrective items identified in inspections.

The dam is presently owned and operated by the City of White Cloud whose address is 12 North Charles Street, P.O. Box 607, White Cloud, MI 49349. Contact number (231) 689-1194.

Since the dam is considered a high hazard potential dam an Emergency Action Plan (EAP) is required under Part 315, Dam Safety of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. The EAP entitled "White River Emergency Evacuation Plan for Dam Failure and Flooding" has been prepared and is maintained by Newaygo County Emergency Services Department whose address is 306 S. North Street, P.O. Box 885, White Cloud, MI 49349. The latest version of the Emergency Action Plan (EAP) is dated the 2017 Edition. A copy of the EAP is included in Appendix C. Contact at Newaygo County Emergency Services is Abigail B. Watkins P.E.M., M.E.P. Director. Phone number is (231) 689-7354.

DAM DATA SHEET

General Information:

Dam Name: White Cloud Dam
State ID: 526
Hazard Potential Classification: High
Year Constructed: 1872
Year(s) Modified: 1910 - Rebuilt after destroyed by flood
1975 - Embankment crest elevation raised by 3 feet
1978 - Auxiliary Spillway was installed
1986 - Dam failed during severe flooding
1990 - Reconstructed with addition of RCC
overflow spillway
2016 - Repairs
County: Newaygo

Dam Information:

Type: Earth Fill Embankment
Length: 950 feet
Height: 18.9 feet
Spillways: Principal Spillway: 10 feet wide, cast in place
concrete
Auxiliary Spillway: 8 feet wide, cast in place
concrete
Overflow Spillway: 140 feet, roller-compacted
concrete (RCC)
Spillway gates: Principal Spillway: Center gate, 11 feet wide (motor
operated)
Right gate, 9 feet wide
Left gate, 9 feet wide
Auxiliary Spillway: 8 feet wide (motor operated)
Elevation of Top of Dam: 851.0 - Top of concrete wall
Elevation of Emergency Overflow
Spillway: 848.9 - Elevation of centerline of roadway
Design High Water Level: 847.4 - Provides 1.5 feet of free board below
emergency overflow elevation
Normal Pool Water Level: 845.1 - Summer (June through October)
844.1 - Winter (November through May)

Reservoir Information:

Waterway:

South Branch White River

Total Drainage Area:

94.6 square miles

Contributing Drainage Area:

81.6 square miles

Surface Impoundment:

50 acres

Design Discharge, 200-year flood
(0.5% chance)

2,600 cubic feet per second (7/25/2019 – Copy of hydrologic data request and estimation is included in Appendix D for reference).