



Vermont Department of Environmental Conservation

Agency of Natural Resources

Facilities Engineering Division

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Montpelier, VT 05620

MEMORANDUM

TO: For the Record

FROM: Steven Hanna, Dam Safety Engineer

DATE: August 25, 2015

SUBJECT: Inspection of the Williams Dam, Londonderry, Vermont.

On August 6, 2015, Steven Hanna and Jaclyn Kaehler made a routine periodic inspection of the Williams Dam located in Londonderry, Vermont, State Identification Number 115.01. The Town of Londonderry owns the dam. Kevin Beattie and Paul Gordon, from the Town of Londonderry, were present for the inspection. The inspection was carried out under the provisions of 10 VSA 1105. A number of photos and field notes were taken. The dam was last inspected on July 13, 2007.

OVERALL CONDITION

The dam remains in POOR condition and is continuing to worsen. The concrete sluiceway structure is in an advanced deteriorated state with water flowing through the structure and under the outlet pipe. Water is flowing through the main section of the dam and existing the dam face. Water is flowing out the left end of the spillway and eroding the abutment, threatening the stability of a public road.

JURISDICTION

Since the dam impounds more than 500,000 cubic feet, any alteration, reconstruction or breaching would require prior approval from the Department under provisions of 10 VSA Chapter 43.

DOWNSTREAM HAZARD CLASSIFICATION

The dam is a Class 3, "low hazard" dam.

RECOMMENDATIONS FOR OWNER

- 1. Retain a professional engineer qualified in dam safety to evaluate erosion occurring at the left end of the dam and prepare plans for correcting the problem.**

2. **Retain a professional engineer qualified in dam safety to evaluate the dam and prepare plans for repair, replacement or removal of the dam. The evaluation should take place with the water level of the impoundment lowered.**

INSPECTION

The inspection of this dam was conducted on August 6, 2015, at 1245 hours. The weather was cloudy with temperatures in the 60's. The ground was dry. The following was observed:

1. Sluiceway:

- a) Approach: The sluiceway approach was clear. No significant debris accumulation was present.
- b) Structure: The concrete structure was in very poor condition. Water was leaking through numerous cracks and areas of separated concrete and voids. Leakage was observed flowing through the wooden sill of the sluice gate. Water is flowing under the pipe and into the pipe through perforations. The stem valve was not operated, but remains bent possibly due to ice or debris. Although not measured, it was previously estimated that leakage through the structure could exceed 1000 gallons per minute.
- c) Conduit: The six-foot diameter galvanized metal pipe conduit was in very poor condition with numerous perforations and leakage noted.
- d) Training wall: The right training wall forms the right end of the dam. During the reconstruction of the bridge upstream, a new bridge retaining wall was extended into the right training wall at the sluiceway structure. The wall is cracked and deteriorating with water and fill material eroding from behind the wall into the outlet channel.
- e) Right Abutment: There is flow transporting material from the abutment through the training wall into the sluiceway channel.

2. Spillway:

- a) Upstream: The approach to the spillway was clear and shallow due to accumulated sediment. No holes, depressions or whirlpools were observed.
- b) Crest: The spillway crest was good for line and grade. A concrete cap has been placed on top. Some spalling, scouring and cracking was visible.
- c) Downstream Face: Heavy leakage was observed across the downstream face of the dam. In several areas the leakage is exiting with force, based on the observed horizontal component. It was not possible to tell the condition of the stone wall because of the amount of flow.
- d) Abutment: The left abutment was eroding due to water exiting the left end of the dam.

HYDROLOGY AND HYDRAULICS

The drainage area at this site is about 44 square miles. The pond area at the normal pool is 8 acres with storage of 50 acre-feet. At the dam crest, the pool stores 75 acre-feet. The maximum discharge from an unobstructed spillway would be about 1600 cfs. A detailed hydrologic and hydraulic (H&H) study has not been made.

BACKGROUND AND DESCRIPTION OF DAM

A dam at this site dates from at least 1900 and probably earlier. A new sluice gate was installed in 1978 to repair damages caused by the 1976 Flood. The dam is located on the West River in the Village of Londonderry. The Department has inspected the dam periodically since 1977.

The dam is a stone masonry gravity concrete dam founded on ledge for most of its length. It is approximately 20 feet high (16 feet at spillway crest) and 87 feet long including a 73 foot wide straight drop overfall spillway. A short concrete training wall at the right end is connected to a new concrete bridge abutment.

The spillway is stone masonry with a concrete cap and partial upstream concrete facing. There are two known openings in the downstream face. One is about 3 feet wide and located at the toe about 10 feet from left end of the dam. The other is about 9 feet below the crest near the angle point and has a concrete patch. The stonework suggests that it may have been an old low-level outlet. The interior construction of the spillway is unknown. A 13-foot wide sluiceway structure is located at the right abutment. It contains a 6 foot diameter corrugated galvanized metal pipe (CGMP) sluiceway with a vertical aluminum slide gate at the upstream end.