VERMONT

Vermont Department of Environmental Conservation *Agency of Natural Resources*
Facilities Engineering Division, Dam Safety and Hydrology Section
103 South Main Street, [phone] 802-241-3450
Waterbury, VT 05671-0511 [fax] 802-244-4516

MEMORANDUM

TO: For the Record

FROM: Stephen Bushman, P.E., Dam Safety Engineer

DATE: July 30, 2007

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

On July 13, 2007, Stephen Bushman, P.E., and Chris Pollock made a routine periodic inspection of the Williams Dam located in Londonderry, Vermont, State Identification Number 115.01. 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 August 6, 1999.

OVERALL CONDITION

As reported in previous years, the dam remains in poor condition. The concrete sluiceway structure is in an advanced deteriorated state and numerous leaks were noted coming through the face of the dam.

DOWNSTREAM HAZARD CLASSIFICATION

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

RECOMMENDATIONS FOR OWNER

1. A professional engineer qualified in dam safety should be retained to evaluate the dam and prepare plans for repair or removal of the dam. Preferably, the evaluation should take place with the pond lowered.

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.

INSPECTION

The inspection of this dam was conducted on July 13, 2007, at 1400 hours. The weather was partly cloudy with temperatures in the 70's. The ground was dry. The water level in the pond was 0.2 feet above the right spillway crest. 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. There were numerous cracks, separated concrete, voids and leakage. Leakage was also observed flowing under the gate through the wooden sill of the sluice gate. The stem valve was not operated, but was bent possibly due to ice or debris. Although not measured, it appeared that leakage through the structure could exceed 1000 gallons per minute.

    c) Conduit: The six-foot diameter galvanized metal pipe (GMP) conduit was in poor condition with numerous perforations and leakage noted.

    d) Training walls: 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 existing training wall is in generally good condition but was deeply eroded at the construction joints.

    e) Right Abutment: Previously noted flow through the riprap in the abutment was not noted on this inspection.

2. Spillway:

    a) Upstream: The approach to the spillway was clear but shallow due to accumulated sediment.

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 just right of the center of the crest.

c) Downstream Face: Concentrated leakage was observed on the downstream face of the dam, possibly due to cracks in the cap and upstream concrete face. At the right end of the spillway by the sluiceway structure, there was an area of concentrated leakage about 3 feet below the crest of the dam. At the midpoint of the dam, about 3 feet below the crest, there was another area of concentrated leakage flowing through the dam. Because of the amount of flow, it was not possible to tell the condition of the stone wall.

d) Abutments: Seepage at the pond level at the time of inspection was not observed at either abutment.

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.

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.

Please don't hesitate to call me at 241-3450 if I can be of further assistance.