VERMONT

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MEMORANDUM

TO: For the Record
FROM: Stephen Bushman, P.E., Dam Safety Engineer
DATE: July 24, 2009
SUBJECT: Inspection of Shadow Lake Dam, Glover, VT

On June 11, 2009, Stephen Bushman, P.E., and Shawn Thompson made a routine inspection of Shadow Lake Dam in Glover, Vermont. A number of photographs were taken. The dam is owned by the Town of Glover. It was last inspected on June 6, 2007. The State Identification Number is 81.02. The inspection was carried out under the provisions of 10 VSA 1105.

OVERALL CONDITION:

The overall condition of the dam is poor.

DOWNSTREAM HAZARD CLASSIFICATION:

The dam is a Class 2, "significant hazard" dam based on a Dam-Break Flood Analysis done in April 1991.

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 Title 10 of the Vermont Statutes Annotated, Chapter 43.

RECOMMENDATIONS FOR THE OWNER:

1. Brushing and tree removal should continue along the entire length of the dam extending to a minimum of ten (10) feet beyond the abutments and the toe of the dam. The tree stumps should be monitored for decay, and voids backfilled as necessary. With the number of trees and amount of brush to be removed, these operations should be done under engineering supervision.

2. The upstream face of the dam, including the areas in upstream of the trash racks, should be cleared of all debris to prevent the spillways from being clogged.

3. The emergency spillway channel should be cleared of debris to provide for full hydraulic capacity. The remaining stop log pin should be removed so that it does cause clogging of the spillway approach.

4. The wood planks of the bridge and trash rack at the gatehouse are rotten and should be replaced.

5. Monitor the cracking concrete in the gatehouse foundation and the spillway and repair as necessary.

6. An Emergency Action Plan (EAP) should be developed by a professional engineer qualified in dam safety, implemented, and tested in the event of a potential failure of the dam.

INSPECTION:

The inspection of the dam was conducted on June 11, 2009 at 1300 hours. The weather was overcast with temperatures in the 60s. The ground was wet. The following was observed:

1. Upstream Stone Wall: The upstream stone wall consists of large granite blocks. In general, the wall appeared to be stable, but irregular, with a few blocks slightly out of alignment to the right of the gatehouse. Trees were growing adjacent to the wall adding to the instability. The trees to the left of the emergency spillway had been partially removed, while the ones on the right side remained.

2. Embankment Section: Downstream of the stone wall is an earth filled section about 16 feet wide. There were large trees and brush growing on the embankment. The trees on the left embankment had been partially removed. No seepage was noted during this inspection but the toe area, which is a rubble low stone wall, was difficult to inspect due to heavy brush.

3. Principal Spillway:

   a. Approach: The approach was full of woody vegetation and other obstructions. There is a trash fence in the approach which is in poor condition. A few logs and a plastic boat were lodged against the trash fence.

   b. Control Section: There was a crack in the left side of the concrete gatehouse foundation; otherwise the concrete appeared to be in good condition. The bridge across the gatehouse was rotten. The trash rack at the entrance to the sluice way had minor debris. One of the vertical beams was loose.

   c. Outlet: The sluice gate was viewed from the outlet channel. It appeared to be in fair condition and opened about six inches. The discharge channel was rocky with some debris. There was some undercutting occurring at the base of the spillway.

4. Abutments: The left abutment was dry and firm with heavy tree and brush growth. The right abutment also had tree and brush growth and was soft around a pipe running from the neighboring cabin. There was a large amount of yard waste dumped on the right abutment.

5. Emergency Spillway: The spillway is an uncontrolled concrete ogee crest type structure. There were some cracks in the concrete training walls with some efflorescence. The spillway channel was clogged with debris and the discharge channel was full of brush. One stop log pin remains in place.

HYDROLOGY AND HYDRAULICS:

The drainage area at this site is about 3328 acres. The lake surface area, at normal pool, is about 188 acres with storage of about 1432 acre-feet. At the dam crest, the pool stores 2283 acre-feet. The maximum discharge capacity for the unobstructed spillway is 107 cubic feet per second. The emergency spillway has a maximum hydraulic capacity of 346 cubic feet per second.