

STATE OF VERMONT
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

INSPECTION OF DAMS

The Department of Environmental Conservation has for many years made routine safety inspections of non-federal, non-hydroelectric dams. Since 1982, the Department has been required to carry out periodic inspections of dams subject to its jurisdiction under provisions of 10 V.S.A. § 1105. This section reads as follows:

§ 1105. Inspection of dams

The state agency having jurisdiction shall employ an engineer to make periodic inspections of non-federal dams in the state to determine their condition and the extent, if any, to which they pose a potential or actual threat to life and property, or shall promulgate rules pursuant to chapter 25 of Title 3 to require an adequate level of inspection by an independent registered engineer experienced in the design and investigation of dams. The agency shall provide the owner with the findings of the inspection and any recommendations. - Added 1981, No. 242 (Adj. Sess.), § 13, amended 1985, No. 60

The Department classifies dams according to a dam's potential for causing loss of life and property damage in the area downstream of the dam if it were to fail. The following Downstream Hazard Classification system is used by the Department. It is same as the U.S. Army Corps of Engineers system given in *Recommended Guidelines for Safety Inspection of Dams* (ER 1110-2-106, 25 Sept. 79, 24 Mar 80 Chg 1).

DOWNSTREAM HAZARD CLASSIFICATION OF DAMS

Class	Hazard Category	Potential Loss of Life	Potential Economic Loss
3	Low	None expected (No permanent structures for human habitation)	Minimal (Undeveloped to occasional structures or agriculture)
2	Significant	Few (No urban developments and no more than a small number of inhabitable structures)	Appreciable (Notable agriculture, industry or structures)
1	High	More than few	Excessive (Extensive community, industry or agriculture)

Under the Corps system, the classifications are further described as follows:

(a) *LOW Hazard (Class 3)*

Dams conforming to criteria for the low hazard potential category generally will be located in rural or agricultural areas where failure may damage farm buildings, limited agricultural land, or township and country roads.

(b) *SIGNIFICANT Hazard (Class 2)*

Significant hazard potential category structures will be those located in predominantly rural or agricultural areas where failure may damage isolated homes, secondary highways or minor railroads or cause interruption of use or service of relatively important public utilities.

(c) *HIGH Hazard (Class 1)*

Dams in the high hazard potential category will be those located where failure may cause serious damage to homes, extensive agricultural, industrial and commercial facilities, important public utilities, main highways or railroads.

Additional information:

1. The terminology HIGH, SIGNIFICANT, AND LOW hazard refers to the potential for damage or loss of life and does **not** refer to the condition of the dam. For example, a HIGH hazard (Class 1) dam may be in excellent condition and a LOW hazard (Class 3) dam may be in poor condition.
2. A dam's classification may change from what it was when it was built or at the last inspection because of changes in downstream conditions. For example, a Class 3 (low hazard) dam may become a Class 2 (significant hazard) or Class 1 (high hazard) dam if some houses are built downstream that could be impacted by a failure. The classification could also change (either up or down) if a more detailed breach analysis is carried out that more accurately determines downstream damage potential.
3. It should not be assumed that the failure of a Class 3 (low hazard) dam would never be a threat to lives. Although direct loss of life (such as by flooding a house) is not expected, the failure could, for example, wash out a road and result in a fatal accident.

The Department bases its minimum periodic inspection frequency on the downstream hazard classification. The Department's goal is to inspect dams as follows:

Class	Downstream Hazard Classification Category	Inspection Frequency
1	High	1
2	Significant	1-5
3	Low	7-10

The Department may increase the inspection frequency when in its opinion more frequent or non-routine inspections are warranted. Reasons to increase the frequency or undertake non-routine inspections may include: (1) problems or concerns with the condition or safety of the dam; (2) following significant flood events, and (3) during and subsequent to impounding water following construction or reconstruction of the dam.

The inspections by the Department do not and are not intended to relieve the owner of the dam of the owner's legal duties, obligations or liabilities incidental to the ownership, operation, maintenance, emergency preparedness or inspection of the dam. The owner should inspect or have the dam inspected on a frequent basis so that routine maintenance may be undertaken as needed and to monitor and/or identify any changes or conditions that could indicate problems with the dam. Should any such conditions or changes occur the owner should contact an engineer experienced with the design and investigation of dams. The engineer should evaluate the significance of the change or condition so that the engineer can advise the owner accordingly. Even if no changes are observed, the owner should have an experienced and qualified engineer inspect and evaluate the dam on an appropriate periodic basis, e.g., annually, biannually, etc. The inspections by the owner or owner's engineer are independent of any inspections that may be carried out by the Department.

The Department's current policy is to inspect only those dams that are capable of impounding more than 500,000 cubic feet. Although the statute does not limit size when considering "unsafe" dams (10 V.S.A. § 1095), only those dams impounding more than 500,000 cubic feet require prior authorization to construct, alter or remove (10 V.S.A. § 1082).

The inspection program relies on the voluntary assistance of dam owners. Before an inspection is made, a diligent effort will be made to contact the landowner for access permission. The landowner may deny permission for inspection. Consult your attorney.

The purpose of the inspection is to investigate and determine the condition of the dam and the extent, if any, to which it may pose a potential or actual threat to life and property. A report on the findings of the inspection and any recommendations are provided the dam owner. The report provides an assessment of the general condition of the dam which is based upon available data and a visual inspection. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations or detailed hydrologic and hydraulic analyses are beyond the scope of the inspection, however, the inspection may identify a need for further studies.

The reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the Department. In cases where the reservoir was lowered or drained prior to inspection, such action, while usually improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

The safety of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions are detected.

No dam can ever be considered to be completely "safe" (i.e., it can't fail) even if it has been well designed, constructed, operated and maintained. Even if it is considered that the chance of a failure is remote, it is still a possibility and should not be ignored. All dams to some degree, but old dams in particular, are unpredictable and can fail under conditions as or less severe than they have survived in the past.

The scope of an inspection report does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is beyond the scope of the inspection program.

For further information contact:

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