

**17:4 DAM SAFETY Part 315 of NREPA-MCL 324.31501 et seq.****17:4.1 Definitions**

**Abandonment:** an affirmative act on the part of an owner to discontinue maintenance or operation of a dam.

**Alteration:** a change in the design of an existing dam that directly affects or may directly affect the structural integrity of a dam.

**Dam:** an artificial barrier, including dikes, embankments, and appurtenant works, that impounds water.

**Design flood:** the design flow rate for spillway capacity and dam height design.

**Emergency action plan:** a plan developed by the owner that establishes procedures for notification of the Department of Environmental Quality, public off-site authorities, and other agencies of the emergency actions to be taken prior to and following an impending or actual failure of a dam.

**Failed dam:** a dam not capable of impounding water at its intended level due to a structural deficiency.

**Failure:** an incident resulting in an unplanned or uncontrolled release of water from a dam.

**High hazard potential dam:** a dam located in an area where a failure may cause serious damage to inhabited homes, agricultural buildings, campgrounds, recreational facilities, industrial or commercial buildings, public utilities, main highways, or class I carrier railroads, or where environmental degradation would be significant, or where danger to individuals exists with the potential for loss of life.

**Maintenance:** the upkeep of a dam and its appurtenant works but does not include alterations or repairs.

**Spillway:** a waterway in or about a dam designed for the discharge of water.

**17:4.2 Preparation of Plans and Specifications**

A licensed professional engineer shall prepare all plans and specifications, except for minor maintenance projects. The plans and specifications for the construction of new dams, the reconstruction of failed dams, or the enlargement of dams must be approved by the Michigan Department of Environmental Quality (MDEQ) before construction begins.

If dam construction or repair work is needed, the first step is to send a Request for Letters of Qualification. Names of potential consultants can be obtained from associations like

American Consulting Engineers Council/Michigan and the Michigan Society of Professional Engineers. This request asks for resumes of key personnel that would be assigned to the project, related experience, examples of similar projects, and the name of a contact person. It is important that the key personnel are licensed as a Professional Engineer in the State of Michigan. It is important to talk to the contact person to see if past projects were completed on time, on budget, and whether the owner is satisfied with the completed work.

#### **17:4.3 Qualified Based Selection (QBS) Process**

The QBS process recommended by the QBS Coalition includes the following steps:

1. The owner determines the preliminary scope of work.
2. The projected time frame is established.
3. A list of consulting engineering firms is assembled and/or the project is announced to the public when appropriate.
4. Letters of Qualifications are requested, received, and reviewed.
5. The Letters of Qualifications are evaluated to select a list of firms to be interviewed.
6. When appropriate, a tour of the site or facility is arranged. In some cases, only a briefing is necessary.
7. Interviews are conducted with the qualified firms.
8. The most qualified firm is selected and a complete scope of services is developed with that firm.
9. A contract is then negotiated with the selected firm.
10. Post-selection notifications are made to all firms that were interviewed.
11. The process is evaluated for future dam projects.

#### **17:4.4 Activities Requiring a Permit**

- Construction of a new dam, that is six feet or more in height and impounds five or more surface acres at the design flood elevation.
- Enlargement of a dam or an impoundment.
- Repair of a dam.
- Alteration of a dam.
- Removal of a dam.
- Abandonment of a dam.
- Reconstruction of a failed dam.

A person desiring to perform any of the above listed activities shall apply to the Department of Environmental Quality (DEQ) on a form prescribed by the Department and shall provide information that the Department determines is necessary.

#### **17:4.5 Applying for a Permit**

The permit application process is a two-step procedure. The first step is a review of the conceptual plans to determine if the proposed project may have significant adverse effect on the public health, safety, welfare, property, or natural resources or the public trust in those natural resources. The second step is a review of plans and specifications to determine if the engineering design is acceptable.

#### ***STEP ONE***

The first step of the permit process will commence once the DEQ has received all of the following:

- a) An application form with all of the necessary information filled in.
- b) All additional information the DEQ may have requested to evaluate the impact of the project on the public health, safety, welfare, property or natural resources or the public trust in those natural resources.
- c) All appropriate application fees.
- d) The project assessment.
- e) Conceptual plans and specifications for the project.

Application forms may be obtained from the Land and Water Management Division (LWMD) of the DEQ or any DEQ district office. They are also available on-line from the LWMD homepage.

After preliminary review of the application, the DEQ may request additional information in order to evaluate the impact of the project. All requests by the DEQ for additional information will be made in writing.

Fees are assessed according to the following schedule:

- For dams with a height of 6 feet or more but less than 10 feet, \$500.00
- For dams with a height of 10 feet or more but less than 20 feet, \$1,000.00
- For dams with a height of 20 feet or more, \$3,000.00
- For repair, alteration, removal, or abandonment of a dam, \$200.00
- For minor projects, \$100.00

Note that dam construction often impacts natural resources that are regulated under different Parts of Natural Resources and Environmental Protection Act (NREPA). These dam construction fees are in addition to those required by the other statutes.

The project assessment is an evaluation of all known existing and potential adverse effects within the scope of the project. This assessment is provided by the applicant and reviewed by the DEQ to determine whether the project will have a significant adverse effect on public health, safety, welfare, property, or natural resources or the public trust in those natural resources. The assessment should include both positive and negative impacts consistent with the scope of the project and any mitigating measures to minimize impacts on all of the following:

- Wetlands
- Fisheries
- Wildlife
- Threatened and endangered species
- Water quality
- Streamflows
- Sediment transport
- Turbidity
- Water chemistry
- Water temperature
- Riparian rights

This assessment should include impacts on the stream under the impoundment and should address impacts both during construction and after completion of the project.

Conceptual plans should include, at a minimum, all of the following:

- a) A site plan which shows the location of the dam, the existing stream channel, the normal shoreline of the proposed impoundment, property lines, and dimensions or proper scale.
- b) Transverse and longitudinal cross-sections through the dam that show the spillway or spillways, the upstream and downstream water levels, and the stream channel bottom.
- c) The location of all occupied dwellings within ¼ mile of the proposed impoundment if the dam is new or if the impoundment elevation is changed.
- d) Ingress and egress routes for construction activities.

After receipt of an application, the DEQ may request, in writing, such additional information, assessments, design calculations, records, or other documents that may be necessary to evaluate the proposed project.

Based in part on the information provided by the applicant and in part on comments received by the DEQ during a 20 day public notice period, the DEQ will conduct the first step of the review to determine the effects of the proposed project on public health, safety, welfare, property, or natural resources or the public trust in those natural resources and riparian rights. The DEQ will make one of the following determinations:

- The proposed activity is permissible as submitted.
- The proposed activity is permissible if certain described modifications are made.
- The proposed activity is not permissible and cannot be modified to result in the granting of a permit.

### ***STEP TWO***

The second step of the application process is to review the formal design plans and specifications. If an activity is permissible as submitted or is permissible if modified, the DEQ will then review the engineering plans and specifications. If the DEQ has not yet received the required fees or engineering plans and specifications, the DEQ will request these at the time an applicant is advised of the DEQ's determination.

When the DEQ determines that engineering plans and specifications are acceptable, a permit will be issued, or, if a permit has already been issued, the applicant will be notified, in writing, that plans and specifications are acceptable and the project may commence. If plans and specifications are unacceptable, the DEQ will advise the applicant why the plans and specifications are unacceptable and provide a written response explaining how they may be corrected.

This two step process allows an applicant to receive a determination, or possibly even a permit, prior to expending large resources to prepare engineering plans and specifications for a project that may not be permissible. Engineering design work can be completed in the second step of the process, after a DEQ decision has been made on the project.

Dam Safety Program staff are available at any time during the planning, design, and construction phases of a project to assist you or your engineer. For additional information, including permit applications, contact the Dam Safety Program.

**17:4.6 Copies of Application**

The Department shall submit copies of the application to all of the following:

- a) The local unit of government where the project is to be located.
- b) The adjacent riparian owners.
- c) Any person considered appropriate by the Department.
- d) Any person who requests copies.
- e) A watershed council, organized pursuant to part 311, of the watershed within which the project is located or is to be located.

**17:4.7 Public Hearing**

The Department may hold a public hearing upon the written request of any of the following:

- The applicant
- A riparian owner
- A person or local unit of government that is entitled to receive a copy of the application

The public hearing shall be held in compliance with the Open Meetings Act.

**17:4.8 Granting or Denying a Permit**

The DEQ will grant or deny a permit within 60 days after the submission of a complete application or within 120 days after the submission of a complete application if a public hearing is held. The DEQ will notify the applicant in writing of its determination. The DEQ may issue a permit at this time, if the applicant desires, or it may issue a permit after the completion of the second step of the review process. Construction of a dam may not commence, however, until the applicant has received written notice from the DEQ stating that the engineering plans and specifications for the project have been accepted by the DEQ.

**17:4.9 Minor Project Permits**

The Department may act upon an application, and grant a permit for a minor project, after an on-site inspection of the dam, without providing public notice.

**17:4.10 Approval of Plans and Specifications**

The Department shall require that plans and specifications be approved before construction begins. The permitted activity shall be completed within two years after the permit is granted. Upon the written application of the permittee, and for good cause shown, the Department may extend the time for completing construction.

**17:4.11 Spillway Minimum Criteria****(1) Low hazard dams**

Shall be capable of passing the 100-year flood, or the flood of record, whichever is greater.

**(2) Significant hazard dams**

Shall be capable of passing the 200-year flood, or the flood of record, whichever is greater.

**(3) High hazard dams**

Forty feet or greater in height as measured from the 200-year design flood elevation to the lowest downstream toe elevation shall be capable of passing the 200-year flood.

With proper documentation evidencing a failure of a dam under half probable maximum flood conditions will not cause additional flood damage or loss of life.

- Spillway design capacity shall not be less than the flood of record.
- If a dam cannot pass the design flood, an auxiliary spillway must be provided.

**17:4.12 Performance Bonds**

A permit to construct a new dam or reconstruct a failed dam may require a performance bond.

**17:4.13 Inspections**

An owner shall submit to the Department inspection reports prepared by a licensed professional engineer that evaluate the condition of the dam. The inspection report shall be submitted as follows:

- a) Not less than once every three years for high hazard potential dams.
- b) Not less than once every four years for significant hazard potential dams.
- c) Not less than once every five years for low hazard potential dams.

The inspection report prepared by the engineer shall include, at a minimum, all of the following:

- a) An evaluation of the dam's condition, spillway capacity, operational adequacy, and structural integrity.
- b) A determination of whether deficiencies exist that could lead to the failure of the dam.
- c) Recommendations for maintenance, repair, and alterations of a dam as are necessary to eliminate any deficiencies.

**17:4.14 Emergency Action Plans**

An Emergency Action Plan for a high or significant hazard dam shall be submitted to the DEQ with documentation that the plan has been submitted to the County or local Emergency Management Coordinator for review for consistency with County or local emergency operations plans and the Michigan Emergency Preparedness Plan.

When preparing inspection reports, the owner shall determine if the plan is up-to-date and submit any revisions to the DEQ and the County or local Emergency Management Coordinator

The Emergency Action Plan shall include the name, address, and telephone number of all of the following:

- a) The person who is responsible for the operation of the dam.
- b) The alternate person who is responsible for the operation of the dam.
- c) The local Emergency Management Coordinator or Coordinators.



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
LAND AND WATER MANAGEMENT DIVISION  
DAM INSPECTION REPORT**

This form is to be used for inspection reports required by Part 307, Inland Lake Levels, for those dams that do not meet the size criteria as defined by Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Dams six (6) feet or more in height, as defined by Part 315, and impounding five (5) acres or more at the design flood elevation, must meet the inspection report format as outlined in Section 31518 of Part 315.

A person failing to comply, or falsely representing dam conditions, is guilty of misconduct in office.

DAM NAME		DAM ID	COUNTY
DATE OF INSPECTION	NAME OF WATERBODY	SECTION, TOWN, RANGE Sec. _____ T _____ R _____	LEVEL THIS DATE
DATE ELEVATION SET BY COURT	LEGAL LEVEL	DRAWDOWN LEVEL	HIGH WATER MARK ELEVATION

**EARTH EMBANKMENTS** LEFT EMBANKMENT \_\_\_\_\_ FT. RIGHT EMBANKMENT \_\_\_\_\_ FT. TOTAL LENGTH \_\_\_\_\_ FT.  
(LOOKING DOWNSTREAM)

	UPSTREAM	CROWN	DOWNSTREAM
VEGETATIVE COVER			
EROSION			
SEEPAGE			
SLIDES, SLUMPS & CRACKS			
ANIMAL BURROWS			
WAVE ACTION PROTECTION			
REMARKS*			

**CONTROL STRUCTURE**

TYPE	YEAR CONSTRUCTED	STRUCTURAL HEIGHT (top of dam elevation minus stream invert)
LENGTH OF SPILLWAY	FREEBOARD	HYDRAULIC HEIGHT (design flood elevation minus stream invert)
VERTICAL PIPE SIZE	HORIZONTAL PIPE SIZE	HEAD (normal headwater minus normal tailwater)

**DESCRIBE CONDITION OF THE FOLLOWING ITEMS.**

<p><b>STOPLOG VALVES AND GATES</b> (open and close to check condition): Check location of top stoplog in relation to top of riser pipe intake box or fixed crest, for leakage, and condition of stoplogs, valves and gates.</p>
<p><b>OUTLET PIPE:</b> Check for damage from ice, logs, vandalism; inside discharge pipe for settlement and/or joint separation; condition of pipe coating.</p>

**CONTROL STRUCTURE (continued)**

<b>CONCRETE STRUCTURE:</b> Check for erosion; location of cracking or spalling. If old or new; settlement; need for crack repairs.	
<b>WALKWAY &amp; RAILING:</b> Check if in place or removed, condition, and if adequate protection provided.	<b>TRASHRACK OR LOG BOOM:</b> Check if operable.
<b>EMERGENCY SPILLWAY:</b> Size, type, and condition.	

**INLET & OUTLET CHANNELS**

	INLET	OUTLET
SIZE		
EXISTING CONDITION		
EROSION		
DEBRIS & OBSTRUCTIONS		
RIPRAP PROTECTION		
REMARKS*		

**RECOMMENDATIONS**

List work needed, how to be done, by whom, estimated cost, source of funds, recommended completion date. If emergency, to what extent. **ADDITIONAL COMMENTS.**

Inspection Ordered By: \_\_\_\_\_  
 \_\_\_\_\_ County Delegated Agent

\_\_\_\_\_  
INSPECTOR'S NAME (PRINTED)

\_\_\_\_\_  
ADDRESS

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
CITY, STATE, ZIP CODE

\_\_\_\_\_  
P.E. REGISTRATION NO.

\_\_\_\_\_  
TELEPHONE NUMBER

Please submit this completed report and photographs of the dam, downstream channel, and deficiencies cited in the report to:  
 HYDROLOGIC STUDIES UNIT  
 LAND AND WATER MANAGEMENT DIVISION  
 MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
 PO BOX 30458  
 LANSING MI 48909-7958

\*NOTE: If space is inadequate for remarks, attach additional sheets as needed.

## Questions and Answers

**1. Who can perform inspections on dams?**

**A:** Only a Professional Engineer Licensed in the State of Michigan.

**2. Can a dam be regulated by more than one Statute?**

**A:** Yes, a dam can be built under Part 307 the Lake Level Act as well as the Dam Safety Act.

**3. Do all Lake Levels require a Part 315 Permit?**

**A:** No, for example, a dam may be five feet. Therefore, a permit under Part 315 would not be required, however, a permit under Part 301, Inland Lakes and Streams, of the NREPA, will generally be required.