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**COMMONWEALTH of VIRGINIA**

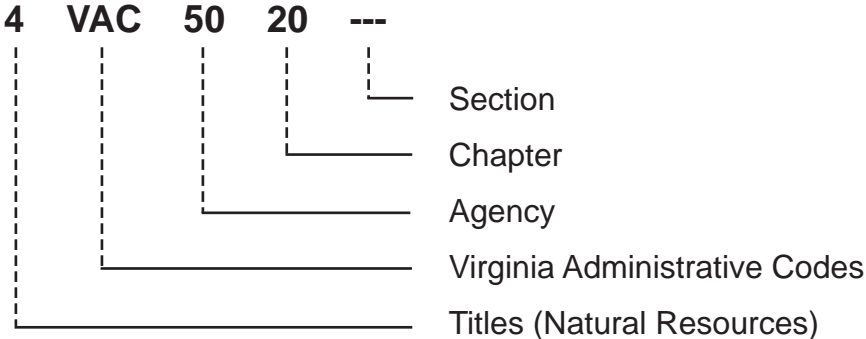
# Virginia Impounding Structure Regulations (Dam Safety)

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Includes amendments to conform the  
Virginia Impounding Structure Regulations  
to legislative changes made during the  
2010 General Assembly. Dec. 22, 2010.



**Codes are read as:**



**VIRGINIA SOIL AND WATER CONSERVATION BOARD  
CHAPTER 20 IMPOUNDING STRUCTURE REGULATIONS  
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## VIRGINIA SOIL AND WATER CONSERVATION BOARD

### CHAPTER 20 IMPOUNDING STRUCTURE REGULATIONS

#### Part I General

#### **4VAC50-20-10. Authority.**

This chapter is promulgated by the Virginia Soil and Water Conservation Board in accordance with the provisions of the Dam Safety Act, Article 2, Chapter 6, Title 10.1 (§ 10.1-604 et seq.), of the Code of Virginia.

#### Statutory Authority

§ 10.1-605 of the Code of Virginia.

#### Historical Notes

Derived from VR625-01-00 § 1.1, eff. February 1, 1989.

#### **4VAC50-20-20. General provisions.**

A. This chapter provides for the proper and safe design, construction, operation and maintenance of impounding structures to protect public safety. This chapter shall not be construed or interpreted to relieve the owner or operator of any impoundment or impounding structure of any legal duties, obligations or liabilities incident to ownership, design, construction, operation or maintenance.

B. Approval by the board of proposals for an impounding structure shall in no manner be construed or interpreted as approval to capture or store waters. For information concerning approval to capture or store waters, see Chapter 8 (§ 62.1-107) of Title 62.1 of the Code of Virginia, and other provisions of law as may be applicable.

C. In promulgating this chapter, the board recognizes that no impounding structure can ever be completely "fail-safe," because of incomplete understanding of or uncertainties associated with natural (earthquakes and floods) and manmade (sabotage) destructive

forces; with material behavior and response to those forces; and with quality control during construction.

D. All engineering analyses required by this chapter, including but not limited to, plans, specifications, hydrology, hydraulics and inspections shall be conducted or overseen by and bear the seal of a professional engineer licensed to practice in Virginia.

E. Design, inspection and maintenance of impounding structures shall be conducted utilizing competent, experienced, engineering judgment that takes into consideration factors including but not limited to local topography and meteorological conditions.

F. The forms noted in this chapter are available from the department at the department's website.

#### Statutory Authority

§ 10.1-605 of the Code of Virginia.

#### Historical Notes

Derived from VR625-01-00 § 1.2, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

### **4VAC50-20-30. Definitions.**

The following words and terms when used in this chapter shall have the following meanings unless the context clearly indicates otherwise:

"Acre-foot" means a unit of volume equal to 43,560 cubic feet or 325,853 gallons (equivalent to one foot of depth over one acre of area).

"Agricultural purpose" means the production of an agricultural commodity as defined in § 3.1-249.27 of the Code of Virginia that requires the use of impounded waters.

"Agricultural purpose dams" means impounding structures which are less than 25 feet in height or which create a maximum impoundment smaller than 100 acre-feet, and operated primarily for agricultural purposes.

"Alteration" means changes to an impounding structure that could alter or affect its structural integrity. Alterations include, but are not limited to, changing the height or otherwise enlarging the dam, increasing normal pool or principal spillway elevation or physical dimensions, changing the elevation or physical dimensions of the emergency spillway, conducting necessary structural repairs or structural maintenance, or removing the impounding structure. Structural maintenance does not include routine maintenance.

"Alteration permit" means a permit required for any alteration to an impounding structure.

"Board" means the Virginia Soil and Water Conservation Board.

"Conditional Operation and Maintenance Certificate" means a certificate required for impounding structures with deficiencies.

"Construction" means the construction of a new impounding structure.

"Construction permit" means a permit required for the construction of a new impounding structure.

"Dam break inundation zone" means the area downstream of a dam that would be inundated or otherwise directly affected by the failure of a dam.

"Department" means the Virginia Department of Conservation and Recreation.

"Design flood" means the calculated volume of runoff and the resulting peak discharge utilized in the evaluation, design, construction, operation and maintenance of the impounding structure.

"Director" means the Director of the Department of Conservation and Recreation or his designee.

"Drill" means a type of emergency action plan exercise that tests, develops, or maintains skills in an emergency response procedure. During a drill, participants perform an in-house exercise to verify telephone numbers and other means of communication along with the owner's response. A drill is considered a necessary part of ongoing training.

"Emergency Action Plan or EAP" means a formal document that recognizes potential impounding structure emergency conditions and specifies preplanned actions to be followed to minimize loss of life and property damage. The EAP specifies actions the owner must take to minimize or alleviate emergency conditions at the impounding structure. It contains procedures and information to assist the owner in issuing early warning and notification messages to responsible emergency management authorities. It shall also contain dam break inundation zone maps as required to show emergency management authorities the critical areas for action in case of emergency.

"Emergency Action Plan Exercise" means an activity designed to promote emergency preparedness; test or evaluate EAPs, procedures, or facilities; train personnel in emergency management duties; and demonstrate operational capability. In response to a simulated event, exercises should consist of the performance of duties, tasks, or operations very similar to the way they would be performed in a real emergency. An exercise may include but not be limited to drills and tabletop exercises.

"Emergency Preparedness Plan" means a formal document prepared for Low Hazard impounding structures that provides maps and procedures for notifying owners of

downstream property that may be impacted by an emergency situation at an impounding structure.

"Existing impounding structure" means any impounding structure in existence or under a construction permit prior to July 1, 2010.

"Freeboard" means the vertical distance between the maximum water surface elevation associated with the spillway design flood and the top of the impounding structure.

"Height" means the hydraulic height of an impounding structure. If the impounding structure spans a stream or watercourse, height means the vertical distance from the natural bed of the stream or watercourse measured at the downstream toe of the impounding structure to the top of the impounding structure. If the impounding structure does not span a stream or watercourse, height means the vertical distance from the lowest elevation of the downstream limit of the barrier to the top of the impounding structure.

"Impounding structure" or "dam" means a man-made structure, whether a dam across a watercourse or structure outside a watercourse, used or to be used to retain or store waters or other materials. The term includes: (i) all dams that are 25 feet or greater in height and that create an impoundment capacity of 15 acre-feet or greater, and (ii) all dams that are six feet or greater in height and that create an impoundment capacity of 50 acre-feet or greater. The term "impounding structure" shall not include: (a) dams licensed by the State Corporation Commission that are subject to a safety inspection program; (b) dams owned or licensed by the United States government; (c) dams operated primarily for agricultural purposes which are less than 25 feet in height or which create a maximum impoundment capacity smaller than 100 acre-feet; (d) water or silt retaining dams approved pursuant to § 45.1-222 or § 45.1-225.1 of the Code of Virginia; or (e) obstructions in a canal used to raise or lower water.

"Impoundment" means a body of water or other materials the storage of which is caused by any impounding structure.

"Life of the impounding structure" and "life of the project" mean that period of time for which the impounding structure is designed and planned to perform effectively, including the time required to remove the structure when it is no longer capable of functioning as planned and designed.

"Maximum impounding capacity" means the volume of water or other materials in acre-feet that is capable of being impounded at the top of the impounding structure.

"New construction" means any impounding structure issued a construction permit or otherwise constructed on or after July 1, 2010.

"Normal or typical water surface elevation" means the water surface elevation at the crest of the lowest ungated outlet from the impoundment or the elevation of the normal

pool of the impoundment if different than the water surface elevation at the crest of the lowest ungated outlet. For calculating sunny day failures for flood control impounding structures, stormwater detention impounding structures, and related facilities designed to hold back volumes of water for slow release, the normal or typical water surface elevation shall be measured at the crest of the auxiliary or emergency spillway.

"Operation and Maintenance Certificate" means a certificate required for the operation and maintenance of all impounding structures.

"Owner" means the owner of the land on which an impounding structure is situated, the holder of an easement permitting the construction of an impounding structure and any person or entity agreeing to maintain an impounding structure. The term "owner" may include the Commonwealth or any of its political subdivisions, including but not limited to sanitation district commissions and authorities, any public or private institutions, corporations, associations, firms or companies organized or existing under the laws of this Commonwealth or any other state or country, as well as any person or group of persons acting individually or as a group.

"Planned land use" means land use that has been approved by a locality or included in a master land use plan by a locality, such as in a locality's comprehensive land use plan.

"Spillway" means a structure to provide for the controlled release of flows from the impounding structure into a downstream area.

"Stage I Condition" means a flood watch or heavy continuous rain or excessive flow of water from ice or snow melt.

"Stage II Condition" means a flood watch or emergency spillway activation or impounding structure overtopping where a failure may be possible.

"Stage III Condition" means an emergency spillway activation or impounding structure overtopping where imminent failure is probable.

"Sunny day dam failure" means the failure of an impounding structure with the initial water level at the normal reservoir level, usually at the lowest ungated principal spillway elevation or the typical operating water level.

"Tabletop Exercise" means a type of emergency action plan exercise that involves a meeting of the impounding structure owner and the state and local emergency management officials in a conference room environment. The format is usually informal with minimum stress involved. The exercise begins with the description of a simulated event and proceeds with discussions by the participants to evaluate the EAP and response procedures and to resolve concerns regarding coordination and responsibilities.

"Top of the impounding structure" means the lowest point of the nonoverflow section of the impounding structure.

"Watercourse" means a natural channel having a well-defined bed and banks and in which water normally flows.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 1.3, eff. February 1, 1989; amended, Virginia Register Volume 18, Issue 14, eff. July 1, 2002; Volume 24, Issue 25, eff. September 26, 2008; Volume 27, Issue 6, eff. December 22, 2010.

#### **4VAC50-20-40. Hazard potential classifications of impounding structures.**

A. Impounding structures shall be classified in one of three hazard classifications as defined in subsection B of this section and Table 1.

B. For the purpose of this chapter, hazards pertain to potential loss of human life or damage to the property of others downstream from the impounding structure in event of failure or faulty operation of the impounding structure or appurtenant facilities. Hazard potential classifications of impounding structures are as follows:

1. High Hazard Potential is defined where an impounding structure failure will cause probable loss of life or serious economic damage. "Probable loss of life" means that impacts will occur that are likely to cause a loss of human life, including but not limited to impacts to residences, businesses, other occupied structures, or major roadways. Economic damage may occur to, but not be limited to, building(s), industrial or commercial facilities, public utilities, major roadways, railroads, personal property, and agricultural interests. "Major roadways" include, but are not limited to, interstates, primary highways, high-volume urban streets, or other high-volume roadways.

2. Significant Hazard Potential is defined where an impounding structure failure may cause the loss of life or appreciable economic damage. "May cause loss of life" means that impacts will occur that could cause a loss of human life, including but not limited to impacts to facilities that are frequently utilized by humans other than residences, businesses, or other occupied structures, or to secondary roadways. Economic damage may occur to, but not be limited to, building(s), industrial or commercial facilities, public utilities, secondary roadways, railroads, personal property, and agricultural interests. "Secondary roadways" include, but are not limited to, secondary highways, low-volume urban streets, service roads, or other low-volume roadways.

3. Low Hazard Potential is defined where an impounding structure failure would result in no expected loss of life and would cause no more than minimal economic damage. "No expected loss of life" means no loss of human life is anticipated.

C. The hazard potential classification shall be proposed by the owner and shall be subject to approval by the board. To support the appropriate hazard classification, dam break analysis shall be conducted by the owner's engineer. Present and planned land-use for which a development plan has been officially approved by the locality in the dam break inundation zones downstream from the impounding structure shall be considered in determining the classification.

D. Impounding structures shall be subject to reclassification by the board as necessary.

#### Statutory Authority

§ 10.1-605 of the Code of Virginia.

#### Historical Notes

Derived from VR625-01-00 § 1.4, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

### **4VAC50-20-50. Performance standards required for impounding structures.**

A. In accordance with the definitions provided by § 10.1-604 of the Code of Virginia and 4VAC50-20-30, an impounding structure shall be regulated if the impounding structure is 25 feet or greater in height and creates a maximum impounding capacity of 15 acre-feet or greater, or the impounding structure is six feet or greater in height and creates a maximum impounding capacity of 50 acre-feet or greater and is not otherwise exempt from regulation by the Code of Virginia. Impounding structures exempted from this chapter are those that are:

1. Licensed by the State Corporation Commission that are subject to a safety inspection program;
2. Owned or licensed by the United States government;
3. Operated primarily for agricultural purposes that are less than 25 feet in height or that create a maximum impoundment capacity smaller than 100 acre-feet;
4. Water or silt-retaining dams approved pursuant to § 45.1-222 or 45.1-225.1 of the Code of Virginia; or
5. Obstructions in a canal used to raise or lower water.

Impounding structures of regulated size and not exempted shall be constructed, operated and maintained such that they perform in accordance with their design and purpose throughout the life of the project. For impounding structures, the spillway(s) capacity shall perform at a minimum to safely pass the appropriate spillway design flood as determined in Table 1. For the purposes of utilizing Table 1, Hazard Potential Classification shall be determined in accordance with 4VAC50-20-40.

TABLE 1  
Impounding Structure Regulations

Applicable to all impounding structures that are 25 feet or greater in height and that create a maximum impounding capacity of 15 acre-feet or greater, and to all impounding structures that are six feet or greater in height and that create a maximum impounding capacity of 50 acre-feet or greater and is not otherwise exempt from regulation by the Code of Virginia.

Hazard Potential Class of Dam	Spillway Design Flood (SDF) <sup>B</sup> for Existing Impounding Structures <sup>F</sup>	Spillway Design Flood (SDF) <sup>B</sup> for Existing Impounding Structures <sup>F,G</sup>	Minimum Threshold for Incremental Damage Analysis
High	PMF <sup>C</sup>	0.9 PMP <sup>H</sup>	100-YR <sup>D</sup>
Significant	.50 PMF	.50 PMF	100-YR <sup>D</sup>
Low	100-YR <sup>D</sup>	100-YR <sup>D</sup>	50-YR <sup>E</sup>

B. The spillway design flood (SDF) represents the largest flood that need be considered in the evaluation of the performance for a given project. The impounding structure shall perform so as to safely pass the appropriate SDF. Reductions in the established SDF may be evaluated through the use of incremental damage analysis pursuant to 4VAC50-20-52. The SDF established for an impounding structure shall not be less than those standards established elsewhere by state law or regulations, including but not limited to the Virginia Stormwater Management Program (VSMP) Permit Regulations (4VAC50-60). Due to potential for future development in the dam break inundation zone that would necessitate higher spillway design flood standards or other considerations, owners may find it advisable to consider a higher spillway design flood standard than is required.

C. PMF: Probable Maximum Flood is the flood that might be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the region. The PMF is derived from the current probable maximum precipitation (PMP) available from the National Weather Service, NOAA. In some cases, a modified PMF may be calculated utilizing local topography, meteorological conditions, hydrological conditions, or PMP values supplied by NOAA. Any deviation in the application of established developmental procedures must be explained and justified by the owner's engineer. The owner's engineer must develop PMF hydrographs for 6-, 12-, and 24-hour durations. The hydrograph that creates the largest peak outflow is to be used to determine capacity for nonfailure and failure analysis. Present and planned land-use conditions shall be considered in determining the runoff characteristics of the drainage area.

D. 100-Yr: 100-year flood represents the flood magnitude expected to be equaled or exceeded on the average of once in 100 years. It may also be expressed as an exceedence probability with a 1.0% chance of being equaled or exceeded in any given

year. Present and planned land-use conditions shall be considered in determining the runoff characteristics of the drainage area.

E. 50-Yr: 50-year flood represents the flood magnitude expected to be equaled or exceeded on the average of once in 50 years. It may also be expressed as an exceedence probability with a 2.0% chance of being equaled or exceeded in any given year. Present and planned land-use conditions shall be considered in determining the runoff characteristics of the drainage area.

F. For the purposes of Table 1 "Existing impounding structure" and "New construction" are defined in 4VAC50-20-30.

G. An existing impounding structure as defined in 4VAC50-20-30, that is currently classified as high hazard, or is subsequently found to be high hazard through reclassification, shall only be required to pass the flood resulting from 0.6 PMP instead of the flood resulting from the 0.9 PMP SDF if the dam owner meets the requirements set out in 4VAC50-20-53.

H. PMP: Probable maximum precipitation means the theoretically greatest depth of precipitation for a given duration that is meteorologically possible over a given size storm area at a particular geographical location at a particular time of year with no allowance made for future long-term climatic trends. In practice, this is derived over flat terrain by storm transposition and moisture adjustment to observed storm patterns. In Virginia, the 0.9 PMP is meant to characterize the maximum recorded rainfall event within the Commonwealth.

#### Statutory Authority

§ 10.1-605 of the Code of Virginia.

#### Historical Notes

Derived from VR625-01-00 § 1.5, eff. February 1, 1989; amended, Virginia Register Volume 18, Issue 14, eff. July 1, 2002; Volume 24, Issue 25, eff. September 26, 2008; Errata, 25:3 VA.R. 542 October 13, 2008; amended, Virginia Register Volume 27, Issue 6, eff. December 22, 2010.

#### **4VAC50-20-51. Special criteria for certain low hazard impounding structures.**

A. Notwithstanding the requirements of this chapter, should the failure of a low hazard potential impounding structure cause no expected loss of human life and no economic damage to any property except property owned by the impounding structure owner, then the owner may follow the below requirements instead of the requirements specified in this chapter:

1. No map required pursuant to 4VAC50-20-54 shall be required to be developed for the impounding structure should a licensed professional engineer certify that the impounding structure is a low hazard potential impounding structure and eligible to utilize the provisions of this section;

2. The spillway design flood for the impounding structure is recommended as a minimum 50-year flood; however, no specific spillway design flood shall be mandatory for an impounding structure found to qualify under the requirements of this section;

3. No emergency preparedness plan prepared pursuant to 4VAC50-20-177 shall be required. However, the impounding structure owner shall notify the local emergency services coordinator in the event of a failure or emergency condition at the impounding structure;

4. An owner shall perform inspections of the impounding structure annually in accordance with the requirements of 4VAC50-20-105. No inspection of the impounding structure by a licensed professional engineer shall be required, however, so long as the owner certifies at the time of operation and maintenance certificate renewal that conditions at the impounding structure and downstream are unchanged since the last inspection conducted by a licensed professional engineer; and

5. No certificate or permit fee established in this chapter shall be applicable to the impounding structure.

B. Any owner of an impounding structure electing to utilize the requirements of subsection A of this section shall otherwise comply with all other requirements of this chapter applicable to low hazard impounding structures.

C. The owner shall notify the department immediately of any change in circumstances that would cause the impounding structure to no longer qualify to utilize the provisions of this section.

#### Statutory Authority

§ 10.1-605 of the Code of Virginia.

#### Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

### **4VAC50-20-52. Incremental damage analysis.**

A. When appropriate, the spillway design flood requirement may be reduced by the board in accordance with this section.

B. The owner's engineer may proceed with an incremental damage analysis. Once the owner's engineer has determined the required spillway design flood through application of Table 1, further analysis may be performed to evaluate the limiting flood condition for incremental damages. Site-specific conditions should be recognized and considered. This analysis may be used to lower the spillway design flood. In no situation shall the allowable reduced level be less than the level at which the incremental increase in water surface elevation downstream due to failure of an impounding structure is no longer considered to present an additional downstream threat. This engineering analysis will need to present water surface elevations at each structure that may be impacted

downstream of the dam. An additional downstream threat to persons or property is presumed to exist when water depths exceed two feet or when the product of water depth (in feet) and flow velocity (in feet per second) is greater than seven.

C. The spillway design flood shall not be reduced below the minimum threshold values as determined by Table 1.

D. The required spillway design flood shall be subject to reclassification by the board as necessary to reflect changed conditions at the impounding structure and in the dam break inundation zone.

#### Statutory Authority

§ 10.1-605 of the Code of Virginia.

#### Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

### **4VAC50-20-53. Special criteria for reduced SDF requirement for certain high hazard dams.**

A. An existing impounding structure that is currently classified as high hazard, or is subsequently found to be high hazard through reclassification, shall be allowed to pass the flood resulting from 0.6 PMP instead of the flood resulting from 0.9 PMP SDF if the dam owner certifies annually that such impounding structure meets each of the following conditions:

1. The owner has a current emergency action plan that is approved by the board and that is developed and updated in accordance with 4VAC50-20-175;
2. The owner has exercised the emergency action plan in accordance with 4VAC50-20-175 and conducts a table-top exercise at least once every two years;
3. The department has verification that both the local organization for emergency management and the Virginia Department of Emergency Management have on file current emergency action plans and updates for the impounding structure;
4. The conditions at the impounding structure are monitored on a daily basis and as dictated by the emergency action plan;
5. The impounding structure is inspected at least annually by a professional engineer and all observed deficiencies are addressed within 120 days of such inspection. Such inspection reports shall be completed in accordance with 4VAC50-20-105 E and be submitted to the department with the owner's certification;
6. The owner has a dam break inundation zone map developed in accordance with the regulations that is acceptable to the department;

7. The owner is insured in an amount that will substantially cover the costs of downstream property losses to others that may result from a dam failure; and

8. The owner has the impounding structure's emergency action plan posted on his website, or upon the request of the owner, the department or another state agency responsible for providing emergency management services to citizens agrees to post the plan on its website. If the department or another state agency agrees to post the plan on its website, the owner shall provide the plan in a format suitable for posting.

A dam owner who meets the conditions of subdivisions 1 through 8 of this subsection, but has not provided record drawings to the department for his impounding structure, shall submit a complete record report developed in accordance with 4VAC50-20-70 J, excluding the required submittal of the record drawings.

B. The dam owner must retain documents for a six-year period that supports the certification of the elements set out in subsection A.

#### Statutory Authority

§10.1-605 of the Code of Virginia.

#### Historical Notes

Derived from Virginia Register Volume 27, Issue 6, eff. December 22, 2010.

### **4VAC50-20-54. Dam break inundation zone mapping.**

A. Dam break inundation zone maps shall be provided to the department to meet the requirements set out in Hazard Potential Classifications of Impounding Structures (4VAC50-20-40), Emergency Action Plan for High and Significant Potential Hazard Impounding Structures (4VAC50-20-175), and Emergency Preparedness for Low Hazard Potential Impounding Structures (4VAC50-20-177), as applicable.

B. The location of the end of the inundation mapping should be indicated where the water surface elevation of the dam break inundation zone and the water surface elevation of the spillway design flood during an impounding structure nonfailure event converge to within one foot of each other. The inundation maps shall be supplemented with water surface profiles showing the peak water surface elevation prior to failure and the peak water surface elevation after failure.

C. All inundation zone map(s), except those utilized in meeting the requirements of Emergency Preparedness for Low Hazard Potential Impounding Structures (4VAC50-20-177), shall be signed and sealed by a licensed professional engineer.

D. For determining the hazard potential classification, a minimum of the following shall be provided to the department:

1. A sunny day dam break analysis utilizing the volume retained at the normal or typical water surface elevation of the impounding structure;

2. A dam break analysis utilizing the spillway design flood with a dam failure;
3. An analysis utilizing the spillway design flood without a dam failure; and
4. For the purposes of future growth planning, a dam break analysis utilizing the probable maximum flood with a dam failure.

E. To meet the requirements of Emergency Preparedness set out in 4VAC50-20-177, all Low Hazard Potential impounding structures shall provide a simple map, acceptable to the department, demonstrating the general inundation that would result from a dam failure. Such maps do not require preparation by a professional licensed engineer, however, it is preferred that the maps be prepared by a licensed professional engineer.

F. To meet the Emergency Action Plan requirements set out in 4VAC50-20-175, all owners of High and Significant Hazard Potential impounding structures shall provide dam break inundation map(s) representing the impacts that would occur with both a sunny day dam failure and a spillway design flood dam failure.

1. The map(s) shall be developed at a scale sufficient to graphically display downstream inhabited areas and structures, roads, public utilities that may be affected, and other pertinent structures within the identified inundation area. In coordination with the local organization for emergency management, a list of downstream inundation zone property owners and occupants, including telephone numbers may be plotted on the map or may be provided with the map for reference during an emergency.

2. Each map shall include the following statement: "The information contained in this map is prepared for use in notification of downstream property owners by emergency management personnel."

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

#### **4VAC50-20-58. Local government notifications.**

For each certificate issued, the impounding structure owner shall send a copy of the certificate to the appropriate local government(s) with planning and zoning responsibilities. A project description and the map(s) required under 4VAC50-20-54 showing the area that could be affected by the impounding structure failure shall be submitted with the certificate. The department will provide a standard form cover letter for forwarding the certificate copy and accompanying materials.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

#### **4VAC50-20-59. Reporting.**

For the purposes of categorizing and reporting information to national and other dam safety databases, impounding structure size shall be classified as noted in Table 2.

Table 2  
Impounding Structure Regulations

Maximum Impounding Capacity (Ac-Ft)	Height (Ft)
Large $\geq 50,000$	$\geq 100$
Medium $\geq 1,000$ & $< 50,000$	$\geq 40$ & $< 100$
Small $\geq 15$ & $< 1,000$	$\geq 6$ & $< 40$

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

### Part II Permit Requirements

#### **4VAC50-20-60. Required permits.**

A. No person or entity shall construct or begin to construct a new impounding structure until the board has issued a construction permit.

B. No person or entity shall alter or begin to alter an existing impounding structure until the board has issued an alteration permit. If an owner or the owner's engineer has determined that circumstances are impacting the integrity of the impounding structure that could result in the imminent failure of the impounding structure, temporary repairs may be initiated prior to approval from the board. The owner shall notify the department within 24 hours of identifying the circumstances impacting the integrity of the impounding structure. Such emergency notification shall not relieve the owner of the need to obtain an alteration permit as soon as may be practicable, nor shall the owner take action beyond that necessary to address the emergency situation.

C. When the owner submits an application to the board for any permit to construct or alter an impounding structure, the owner shall also inform the local government jurisdiction or jurisdictions that might be affected by the permit application.

D. In evaluating construction and alteration permit applications the director shall use the design criteria and standards referenced in 4VAC50-20-320.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 2.1, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

#### **4VAC50-20-70. Construction permits.**

A. Prior to preparing the complete design report for a Construction Permit, applicants may submit a preliminary design report to the department to determine if the project concept is acceptable to the department. The preliminary design report should contain, at a minimum, a general description of subdivisions 1 through 12 of subsection B of this section and subdivisions 1 and 2 of this subsection:

1. Proposed design criteria and a description of the size of the impounding structure, ground cover conditions, extent of current upstream development within the watershed and the hydraulic, hydrological and structural features, geologic conditions and the geotechnical engineering assumptions used to determine the foundation, impoundment rim stability and materials to be used.
2. Preliminary drawings of a general nature, including cross sections, plans and profiles of the impounding structure, proposed pool levels and types of spillway(s).

B. An applicant for a Construction Permit shall submit a design report. A form for the design report is available from the department (Design Report for the Construction or Alteration of Virginia Regulated Impounding Structures). The design report shall be prepared in accordance with 4VAC50-20-240. The design report is a required element of a complete application for a Construction Permit and shall include the following information:

1. Project information including a description of the proposed construction, name of the impounding structure, inventory number if available, name of the reservoir, and the purpose of the reservoir.
2. The proposed hazard potential classification in conformance with Table 1 of 4VAC50-20-50.
3. Location of the impounding structure including the city or county, number of feet or miles upstream or downstream of a highway and the highway number, name of the river or the stream, and the latitude and longitude.
4. Owner's name or representative if corporation, mailing address, residential and business telephone numbers, and other means of communication.
5. Owner's engineer's name, firm, professional engineer Virginia number, mailing address, and business telephone number.
6. Impounding structure data including type of material (earth, concrete, masonry or other) and the following design configurations:

- a. Top of impounding structure (elevation);
  - b. Downstream toe – lowest (elevation);
  - c. Height of impounding structure (feet);
  - d. Crest length – exclusive of spillway (feet);
  - e. Crest width (feet);
  - f. Upstream slope (horizontal to vertical); and
  - g. Downstream slope (horizontal to vertical).
7. Reservoir data including the following:
- a. Maximum capacity (acre-feet);
  - b. Maximum pool (elevation);
  - c. Maximum pool surface area (acres);
  - d. Normal capacity (acre-feet);
  - e. Normal pool (elevation);
  - f. Normal pool surface area (acres); and
  - g. Freeboard (feet).
8. Spillway data including the type, construction material, design configuration, and invert elevation for the low level drain, the principal spillway, and the emergency spillway.
9. Watershed data including drainage area (square miles); type and extent of watershed development; time of concentration (hours); routing procedure; spillway design flood used and state source; design inflow hydrograph volume (acre-feet), peak inflow (cfs), and rainfall duration (hours); and freeboard during passage of the spillway design flood (feet).
10. A description of properties located in the dam break inundation zone downstream from the site of the proposed impounding structure, including the location and number of structures, buildings, roads, utilities and other property that would be endangered should the impounding structure fail.

11. Evidence that the local government or governments have been notified of the proposal by the owner to build an impounding structure.

12. Maps showing the location of the proposed impounding structure that include: the county or city in which the proposed impounding structure would be located, the location of roads and access to the site, and the outline of the impoundment. Existing aerial photographs or existing topographic maps may be used for this purpose.

13. A report of the geotechnical investigations of the foundation soils, bedrock, or both and of the materials to be used to construct the impounding structure.

14. Design assumptions and analyses sufficient to indicate that the impounding structure will be stable during its construction and during the life of the impounding structure under all conditions of impoundment operations, including rapid filling, flood surcharge, seismic loadings, and rapid drawdown of the impoundment.

15. Evaluation of the stability of the impoundment rim area to safeguard against impoundment rim slides of such magnitude as to create waves capable of overtopping the impounding structure and evaluation of rim stability during seismic activity.

16. Design assumptions and analyses sufficient to indicate that seepage in, around, through or under the impounding structure, foundation and abutments will be reasonably and practically controlled so that internal or external forces or results thereof will not endanger the stability and integrity of the impounding structure. The design report shall also include information on graded filter design.

17. Calculations and assumptions relative to hydraulic and structural design of the spillway or spillways and energy dissipater or dissipaters. Spillway capacity shall conform to the criteria of Table 1 and 4VAC50-20-52.

18. Provisions to ensure that the impounding structure and appurtenances will be protected against unacceptable deterioration or erosion due to freezing and thawing, wind, wave action, and rain or any combination thereof.

19. Other pertinent design data, assumptions and analyses commensurate with the nature of the particular impounding structure and specific site conditions, including when required by this chapter, a plan and water surface profile of the dam break inundation zone.

20. A description of the techniques to be used to divert stream flow during construction so as to prevent hazard to life, health and property, including a detailed plan and procedures to maintain a stable impounding structure during storm events, a drawing showing temporary diversion devices, and a description of the potential impoundment during construction. Such diversion plans shall also be in accordance with applicable environmental laws.

21. A plan for project construction monitoring and quality control testing to confirm that construction materials and performance standards meet the design requirements set forth in the specifications.

22. Plans and specifications as required by 4VAC50-20-310.

23. Certification by the owner's engineer that the information provided pursuant to this subsection is true and correct in their professional judgment. Such certification shall include the engineer's signature, printed name, Virginia number, date, and the engineer's Virginia seal.

24. Owner's signature certifying receipt of the information provided pursuant to this subsection.

C. A plan of construction is a required element of a complete permit application for a Construction Permit and shall include:

1. A construction sequence with milestones.

2. Elements of the work plan that should be considered include, but are not limited to, foundation and abutment treatment, stream or river diversion, excavation and material fill processes, phased fill and compaction, testing and control procedures, construction of permanent spillway and drainage devices.

3. The erosion and sediment control plan, as approved by the local government, which minimizes soil erosion and sedimentation during all phases of construction.

4. The stormwater management plan or stormwater management facility plan, as approved by the local government, if the impounding structure is a stormwater management best management practice.

D. A Temporary Emergency Action Plan is a required element of a complete application for a Construction Permit and shall include:

1. A notification list of state and local emergency response agencies;

2. Provisions for notification of potentially affected residences and structures;

3. Construction site evacuation routes; and

4. Any other special notes particular to the project.

E. Within 120 days of receipt of a complete Construction Permit Application the board shall act on the application. If the application is not acceptable, the director shall inform the applicant within 60 days of receipt and shall explain what changes are required for

an acceptable application. A complete Construction Permit Application consists of the following:

1. A final design report, submitted on the department form (Design Report for the Construction or Alteration of Virginia Regulated Impounding Structures), with attachments as needed, and certified by the owner and the owner's engineer;
2. A plan of construction that meets the requirements of subsection C of this section; and
3. A Temporary Emergency Action Plan that meets the requirements of subsection D of this section.

F. Prior to and during construction the owner shall provide the director with any proposed changes from the approved design, plans, specifications, or plan of construction. Approval shall be obtained from the director prior to the construction or installation of any changes that will affect the integrity or impounding capacity of the impounding structure.

G. The Construction Permit shall be valid for the plan of construction specified in the Construction Permit Application.

H. Construction must commence within two years after the permit is issued. If construction does not commence within two years after the permit is issued, the permit shall expire, except that the applicant may petition the board for extension of the two-year period and the board may extend such period for good cause with an appropriately updated plan of construction and Temporary Emergency Action Plan.

I. The board, the director, or both may take any necessary action consistent with the Dam Safety Act (§ 10.1-604 et seq. of the Code of Virginia) if any terms of this section or of the permit are violated, if the activities of the owner are not in accordance with the approved plans and specifications, if construction is conducted in a manner hazardous to downstream life or property, or for other cause as described in the Act.

J. Within 90 days after completion of the construction of an impounding structure, the owner shall submit:

1. A complete set of record drawings signed and sealed by a licensed professional engineer and signed by the owner:

2. A complete Record Report (Record Report for Virginia Regulated Impounding Structures) signed and sealed by a licensed professional engineer and signed by the owner that includes:

- a. Project information including the name and inventory number of the structure, name of the reservoir, and whether the report is associated with a new or old structure;

b. Location of the impounding structure including the city or county, number of feet or miles upstream or downstream of a highway and the highway number, name of the river or the stream, and the latitude and longitude;

c. Owner's name or representative if corporation, mailing address, residential and business telephone numbers, and other means of communication;

d. Information on the design report, including who it was prepared by, the date of design report preparation, whether it was for new construction or for an alteration, and the permit issuance date;

e. Owner's engineer's name, firm, professional engineer Virginia number, mailing address, and business telephone number;

f. Impounding structure data including type of material (earth, concrete, masonry or other) and the following configurations:

- (1) Top of impounding structure (elevation);
- (2) Downstream toe – lowest (elevation);
- (3) Height of impounding structure (feet);
- (4) Crest length – exclusive of spillway (feet);
- (5) Crest width (feet);
- (6) Upstream slope (horizontal to vertical); and
- (7) Downstream slope (horizontal to vertical).

g. Reservoir data including the following:

- (1) Maximum capacity (acre-feet);
- (2) Maximum pool (elevation);
- (3) Maximum pool surface area (acres);
- (4) Normal capacity (acre-feet);
- (5) Normal pool (elevation);
- (6) Normal pool surface area (acres); and
- (7) Freeboard (feet).

h. Spillway data including the type, construction material, design configuration, and invert elevation for the low level drain, the principal spillway, and the emergency spillway; a description of the low level drain and principal spillway including dimensions, trash guard information, and orientation of intake and discharge to impounding structure if looking downstream; and a description of the emergency spillway including dimensions and orientation to impounding structure if looking downstream;

i. Watershed data including drainage area (square miles); type and extent of watershed development; time of concentration (hours); routing procedure; spillway design flood used and state source; design inflow hydrograph volume (acre-feet), peak inflow (cfs), and rainfall duration (hours); and freeboard during passage of the spillway design flood (feet);

j. Impounding structure history including the date construction was completed, who it was designed by and the date, who it was built by and the date, who performed inspections and dates, description of repairs, and confirmation as to whether the impounding structure has ever been overtopped;

k. A narrative describing the impounding structure procedures for operation, maintenance, filling, emergency action plan implementation, and structure evaluation;

l. A narrative describing the hydraulic and hydrologic data on the spillway design flood, hydrologic records, flood experience, flood potential, reservoir regulation, and comments or recommendations regarding these attributes;

m. A narrative describing stability of the foundation and abutments, embankment materials, and a written evaluation of each;

n. A complete set of record drawings signed and sealed by a licensed professional engineer and signed by the owner;

o. Certification by the owner's engineer that the information provided pursuant to subdivision J 2 of this section is true and correct in their professional judgment. Such certification shall include the engineer's signature, printed name, Virginia number, date, and the engineer's Virginia seal; and

p. Owner's signature certifying receipt of the information provided pursuant to subdivision J 2 of this section.

3. Certification from the licensed professional engineer who has monitored construction of the impounding structure during construction that, to the best of the engineer's judgment, knowledge and belief, the impounding structure and its appurtenances were constructed in conformance with the plans, specifications, drawings and other requirements approved by the board;

4. Operation and Maintenance Certificate Application (Operation and Maintenance Certificate Application for Virginia Regulated Impounding Structures) in accordance with 4VAC50-20-105; and

5. Emergency Action Plan or Emergency Preparedness Plan in accordance with 4VAC50-20-175 or 4VAC50-20-177.

K. Upon completion of construction, the impoundment may be filled upon board issuance of an Operation and Maintenance Certificate.

#### Statutory Authority

§ 10.1-605 of the Code of Virginia.

#### Historical Notes

Derived from VR625-01-00 § 2.2, eff. February 1, 1989; amended, Virginia Register Volume 18, Issue 14, eff. July 1, 2002; Volume 24, Issue 25, eff. September 26, 2008.

### **4VAC50-20-80. Alterations permits.**

A. Alterations which would potentially affect the structural integrity of an impounding structure include, but are not limited to, changing the height or otherwise enlarging the dam, increasing normal pool or principal spillway elevation or physical dimensions, changing the elevation or physical dimensions of the emergency spillway, conducting necessary repairs or structural maintenance, or removing the impounding structure. Structural maintenance does not include routine maintenance.

B. An applicant for an Alteration Permit shall submit a design report. A form for the design report is available from the department (Design Report for the Construction or Alteration of Virginia Regulated Impounding Structures). The design report shall be prepared in accordance with 4VAC50-20-240. The design report shall include, but not be limited to, the following information:

1. Project information including a description and benefits of the proposed alteration, name of the impounding structure, inventory number if available, name of the reservoir, and the purpose of the reservoir.

2. The hazard potential classification in conformance with Table 1 in 4VAC50-20-50.

3. Location of the impounding structure including the city or county, number of feet or miles upstream or downstream of a highway and the highway number, name of the river or the stream, and the latitude and longitude.

4. Owner's name or representative if corporation, mailing address, residential and business telephone numbers, and other means of communication.

5. Owner's engineer's name, firm, professional engineer Virginia number, mailing address, and business telephone number.

6. Impounding structure data including type of material (earth, concrete, masonry or other) and the following configurations (note both existing and design configurations for each):

- a. Top of impounding structure (elevation);
- b. Downstream toe – lowest (elevation);
- c. Height of impounding structure (feet);
- d. Crest length – exclusive of spillway (feet);
- e. Crest width (feet);
- f. Upstream slope (horizontal to vertical); and
- g. Downstream slope (horizontal to vertical).

7. Reservoir data including the following (note both existing and design configurations for each):

- a. Maximum capacity (acre-feet);
- b. Maximum pool (elevation);
- c. Maximum pool surface area (acres);
- d. Normal capacity (acre-feet);
- e. Normal pool (elevation);
- f. Normal pool surface area (acres); and
- g. Freeboard (feet).

8. Spillway data including the type, construction material, design configuration, and invert elevation for the low level drain, the principal spillway, and the emergency spillway.

9. Watershed data including drainage area (square miles); type and extent of watershed development; time of concentration (hours); routing procedure; spillway design flood used and state source; design inflow hydrograph volume (acre-feet), peak inflow (cfs), and rainfall duration (hours); and freeboard during passage of the spillway design flood (feet).

10. Evidence that the local government has been notified of the alteration and repair plan.
11. Plans and specifications as required by 4VAC50-20-310. The plan view of the impounding structure site should represent all significant structures and improvements that illustrate the location of all proposed work.
12. A report of the geotechnical investigations of the foundation soils, bedrock, or both in the areas affected by the proposed alterations and of the materials to be used to alter the impounding structure.
13. Design assumptions and analyses sufficient to indicate that the impounding structure will be stable during the alteration of the impounding structure under all conditions of reservoir operations.
14. Calculations and assumptions relative to design of the improved spillway or spillways, if applicable.
15. Provisions to ensure that the impounding structure and appurtenances during the alteration will be protected against unacceptable deterioration or erosion due to freezing and thawing, wind, wave action and rain or any combination thereof.
16. Other pertinent design data, assumptions and analyses commensurate with the nature of the particular impounding structure and specific site conditions, including when required by this chapter, a plan and water surface profile of the dam break inundation zone.
17. If applicable, a description of the techniques to be used to divert stream flow during alteration work so as to prevent hazard to life, health and property, including a detailed plan and procedures to maintain a stable impounding structure during storm events, a drawing showing temporary diversion devices, and a description of the potential impoundment during the alteration. Such diversion plans shall be in accordance with the applicable environmental laws.
18. A plan for project construction monitoring and quality control testing to confirm that materials used in the alteration work and that performance standards meet the design requirements set forth in the specifications.
19. Certification by the owner's engineer that the information provided pursuant to this subsection is true and correct in their professional judgment. Such certification shall include the engineer's signature, printed name, Virginia number, date, and the engineer's Virginia seal.
20. Owner's signature certifying receipt of the information provided pursuant to this subsection.

C. A plan of construction is a required element of complete permit application and shall include:

1. A construction sequence with milestones.
2. Elements of the work plan that should be considered include, but are not limited to, foundation and abutment treatment, excavation and material fill processes, phased fill and compaction, testing and control procedures, construction of permanent spillway and drainage devices, if applicable.
3. The erosion and sediment control plan, as approved by the local government, which minimizes soil erosion and sedimentation during all phases of construction.

D. Within 120 days of receipt of a complete Alteration Permit Application, the board shall act on the application. If the application is not acceptable, the director shall inform the applicant within 60 days of receipt and shall explain what changes are required for an acceptable application. A complete Alteration Permit Application consists of the following:

1. A final design report with attachments as needed, and certified by the owner;
2. A plan of construction that meets the requirements of subsection C of this section;
3. Any necessary interim provisions to the current Emergency Action Plan or Emergency Preparedness Plan. Interim provisions shall be submitted to the local organization for emergency management, the Virginia Department of Emergency Management, and the department; and
4. If the owner is requesting the deregulation of an impounding structure, the application shall specify whether the impounding structure is to be removed so that the impounding structure is incapable of storing water, either temporarily or permanently; or whether the impounding structure is to be altered in such a manner that either the height or storage capacity of the impounding structure causes the impounding structure to be of less than regulated size.

E. During the alteration work, the owner shall provide the director with any proposed changes from the approved design, plans, specifications, or a plan of construction. Approval shall be obtained from the director prior to the alteration or installation of any changes that will affect the integrity or impounding capacity of the impounding structure.

F. The Alteration Permit shall be valid for the construction sequence with milestones specified in the approved Alteration Permit Application.

G. Work identified in the Alteration Permit must commence within the time frame identified in the Alteration Permit. If work does not commence within the prescribed time frame, the permit shall expire, except that the applicant may petition the board for

extension of the prescribed time frame and the board may extend such period for good cause with an updated construction sequence with milestones.

H. The board, the director, or both may take any necessary action consistent with the Dam Safety Act (§ 10.1-604 et seq. of the Code of Virginia) if any terms of this section or of the permit are violated, if the activities of the owner are not in accordance with the approved plans and specifications, if the alteration is conducted in a manner hazardous to downstream life or property, or for other cause as described in the Act.

I. Within 90 days after completion of the alteration of an impounding structure, the owner shall submit a complete Record Report. A form for the Record Report is available from the department (Record Report for Virginia Regulated Impounding Structures). The Record Report shall be signed and sealed by a licensed professional engineer and signed by the owner and shall be sent to the department indicating that the modifications made to the structural features of the impounding structure have been completed. This report is not required when the Alteration Permit has been issued for the removal of an impounding structure. The Record Report shall include the following:

1. Project information including the name and inventory number of the structure, name of the reservoir, and whether the report is associated with a new or old structure;
2. Location of the impounding structure including the city or county, number of feet or miles upstream or downstream of a highway and the highway number, name of the river or the stream, and the latitude and longitude;
3. Owner's name or representative if corporation, mailing address, residential and business telephone numbers, and other means of communication;
4. Information on the design report, including who it was prepared by, the date of design report preparation, whether it was for new construction or for an alteration, and the permit issuance date;
5. Owner's engineer's name, firm, professional engineer Virginia number, mailing address, and business telephone number;
6. Impounding structure data including type of material (earth, concrete, masonry or other) and the following configurations:
  - a. Top of impounding structure (elevation);
  - b. Downstream toe – lowest (elevation);
  - c. Height of impounding structure (feet);
  - d. Crest length – exclusive of spillway (feet);

- e. Crest width (feet);
  - f. Upstream slope (horizontal to vertical); and
  - g. Downstream slope (horizontal to vertical).
7. Reservoir data including the following:
- a. Maximum capacity (acre-feet);
  - b. Maximum pool (elevation);
  - c. Maximum pool surface area (acres);
  - d. Normal capacity (acre-feet);
  - e. Normal pool (elevation);
  - f. Normal pool surface area (acres); and
  - g. Freeboard (feet).
8. Spillway data including the type, construction material, design configuration, and invert elevation for the low level drain, the principal spillway, and the emergency spillway; a description of the low level drain and principal spillway including dimensions, trash guard information, and orientation of intake and discharge to impounding structure if looking downstream; and a description of the emergency spillway including dimensions and orientation to impounding structure if looking downstream;
9. Watershed data including drainage area (square miles); type and extent of watershed development; time of concentration (hours); routing procedure; spillway design flood used and state source; design inflow hydrograph volume (acre-feet), peak inflow (cfs), and rainfall duration (hours); and freeboard during passage of the spillway design flood (feet);
10. Impounding structure history including the date construction was completed, who it was designed by and the date, who it was built by and the date, who performed inspections and dates, description of repairs, and confirmation as to whether the impounding structure has ever been overtopped;
11. A narrative describing the impounding structure procedures for operation, maintenance, emergency action plan implementation, and structure evaluation;
12. A narrative describing the hydraulic and hydrologic data on the spillway design flood, hydrologic records, flood experience, flood potential, reservoir regulation, and comments or recommendations regarding these attributes;

13. A narrative describing stability of the foundation and abutments, embankment materials, and a written evaluation of each;

14. A complete set of record drawings signed and sealed by a licensed professional engineer and signed by the owner;

15. Certification by the owner's engineer that the information provided pursuant to this subsection is true and correct in their professional judgment. Such certification shall include the engineer's signature, printed name, Virginia number, date, and the engineer's Virginia seal; and

16. Owner's signature certifying receipt of the information provided pursuant to this subsection.

J. For altered impounding structures, a certification from a licensed professional engineer who has monitored the alteration of the impounding structure that, to the best of the engineer's judgment, knowledge, and belief, the impounding structure and its appurtenances were altered in conformance with the plans, specifications, drawings and other requirements approved by the board.

#### Statutory Authority

§ 10.1-605 of the Code of Virginia.

#### Historical Notes

Derived from VR625-01-00 § 2.3, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

### **4VAC50-20-90. Transfer of permits.**

A. Prior to the transfer of ownership of a permitted impounding structure the permittee shall notify the director in writing and the new owner shall file a transfer notification with the department. A form for the transfer notification is available from the department (Transfer of Impounding Structure Notification form Past Owner to New Owner). The new owner shall amend the existing permit application as necessary and shall certify to the director that he is aware of and will comply with all of the requirements and conditions of the permit.

B. The transfer notification shall include the following required information:

1. Project information including the name and inventory number of the structure, name of the reservoir, and impoundment hazard classification;

2. Location of the impounding structure including the city or county, number of feet or miles upstream or downstream of a highway and the highway number, name of the river or the stream, and the latitude and longitude;

3. Type of certificates and permits to be transferred including effective date and expiration date of all certificates and permits;
4. Past owner's name, mailing address, and residential and business telephone numbers;
5. New owner's name, mailing address, and residential and business telephone numbers;
6. Request to transfer certification statement signed and dated by the past owner;
7. Certification of compliance with permit or certificate with all said terms and conditions signed and dated by the new owner; and
8. Contact information updates for Emergency Action Plan or Emergency Preparedness Plan provided by the new owner. Such updates shall include the name, mailing address, and residential and business telephone numbers for the impounding structure owner, impounding structure operator, rainfall and staff gage observer, and alternate observer.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 2.4, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-100. (Repealed.)**

Historical Notes

Derived from VR625-01-00 § 3.1, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

Part III  
Certificate Requirements

**4VAC50-20-105. Regular Operation and Maintenance Certificates.**

A. A Regular Operation and Maintenance Certificate is required for an impounding structure. Such six-year certificates shall include the following based on hazard classification:

1. High Hazard Potential Regular Operation and Maintenance Certificate;
2. Significant Hazard Potential Regular Operation and Maintenance Certificate; or
3. Low Hazard Potential Regular Operation and Maintenance Certificate.

B. The owner of an impounding structure shall apply for the renewal of the six-year Regular Operation and Maintenance Certificate 90 days prior to its expiration. If a Regular Operation and Maintenance Certificate is not renewed as required, the board shall take appropriate enforcement action.

C. Any owner of an impounding structure that does not have a Regular Operation and Maintenance Certificate or any owner renewing a Regular Operation and Maintenance Certificate shall file an Operation and Maintenance Certificate Application. A form for the application is available from the department (Operation and Maintenance Certificate Application for Virginia Regulated Impounding Structures). Such application shall be signed by the owner and signed and sealed by a licensed professional engineer. The following information shall be submitted on or with the application:

1. The application shall include the following required information:

a. The name of structure and inventory number;

b. The proposed hazard potential classification;

c. Owner's name or representative if corporation, mailing address, residential and business telephone numbers, and other means of communication;

d. An operating plan and schedule including a narrative on the operation of control gates and spillways and the impoundment drain;

e. For earthen embankment impounding structures, a maintenance plan and schedule for the embankment, principal spillway, emergency spillway, low-level outlet, impoundment area, downstream channel, and staff gages;

f. For concrete impounding structures, a maintenance plan and schedule for the upstream face, downstream face, crest of dam, galleries, tunnels, abutments, spillways, gates and outlets, and staff gages;

g. An inspection schedule for operator inspection, maintenance inspection, technical safety inspection, and overtopping situations;

h. A schedule including the rainfall amounts, emergency spillway flow levels or storm event that initiates the Emergency Action or Preparedness Plan and the frequency of observations;

i. A statement as to whether or not the current hazard potential classification for the impounding structure is appropriate and whether or not additional work is needed to make an appropriate hazard potential designation;

j. For newly constructed or recently altered impounding structures, a certification from a licensed professional engineer who has monitored the construction or alteration of the

impounding structure that, to the best of the engineer's judgment, knowledge, and belief, the impounding structure and its appurtenances were constructed or altered in conformance with the plans, specifications, drawings and other requirements approved by the board;

k. Certification by the owner's engineer that the Operation and Maintenance Certificate Application information provided pursuant to subdivision 1 of this subsection is true and correct in their professional judgment. Such certification shall include the engineer's signature, printed name, Virginia number, date, and the engineer's Virginia seal; and

l. Owner's signature certifying the Operation and Maintenance Certificate Application information provided pursuant to subdivision 1 of this subsection and that the operation and maintenance plan and schedule shall be conducted in accordance with this chapter.

2. An Inspection Report (Annual Inspection Report for Virginia Regulated Impounding Structures) in accordance with subsection E of this section;

3. An Emergency Action Plan in accordance with 4VAC50-20-175 or an Emergency Preparedness Plan in accordance with 4VAC50-20-177 and evidence that the required copies of such plan have been submitted to the local organization for emergency management and the Virginia Department of Emergency Management;

4. Any additional analysis determined necessary by the director, the board or the owner's engineer to address public safety concerns. Such additional analysis may include, but not be limited to, seismic stability, earthen spillway integrity, adequate freeboard allowance, stability assessment of the impoundment's foundation, potential liquefaction of the embankment, overturning or sliding of a concrete structure and other structural stress issues; and

5. If applicable, a current certification from the dam owner in accordance with 4VAC50-20-53.

D. If the Operation and Maintenance Certificate Application submittal is found to be not complete, the director shall inform the applicant within 30 days and shall explain what changes are required for an acceptable submission. Within 60 days of receipt of a complete application the board shall act upon the application. Upon finding that the impounding structure as currently operating is in compliance with this chapter, the board shall issue a Regular Operation and Maintenance Certificate. Should the board find that the impounding structure as currently operating is not in compliance with this chapter, the board may deny the permit application or issue a Conditional Operation and Maintenance Certificate in accordance with 4VAC50-20-150.

E. Inspections shall be performed on an impounding structure annually.

1. Inspection Reports (Annual Inspection Report for Virginia Regulated Impounding Structures) signed and sealed by a licensed professional engineer shall be submitted to the department in accordance with the following schedule:

- a. For a High Hazard Potential impounding structure, every two years;
- b. For a Significant Hazard Potential impounding structure, every three years;
- c. For a Low Hazard Potential impounding structure, every six years; or
- d. For a High Hazard Potential impounding structure, annually in accordance with 4VAC50-20-53, where applicable.

In years when an Inspection Report signed and sealed by a licensed professional engineer is not required, an owner shall submit the Annual Inspection Report for Virginia Regulated Impounding Structures.

2. The Inspection Report shall include the following required information:

- a. Project information including the name and inventory number of structure, name of the reservoir, and purpose of the reservoir;
- b. City or county where the impounding structure is located;
- c. Owner's name or representative if corporation, mailing address, residential and business telephone numbers, and other means of communication;
- d. Owner's engineer's name, firm, professional engineer Virginia number, mailing address, and business telephone number;
- e. Inspection observation of the impounding structure including the following:
  - (1) Earthen embankment information including any embankment alterations; erosion; settlement, misalignments or cracks; seepage and seepage flow rate and location;
  - (2) Upstream slope information including notes on woody vegetation removed, rodent burrows discovered, and remedial work performed;
  - (3) Intake structure information including notes on deterioration of concrete structures, exposure of rebar reinforcement, need to repair or replace trash rack, any problems with debris in the reservoir, and whether the drawdown valve operated;
  - (4) Abutment contacts including notes on seepage and seepage flow rate and location;

(5) Earthen emergency spillway including notes on obstructions to flow and plans to correct, rodent burrows discovered, and deterioration in the approach or discharge channel;

(6) Concrete emergency spillway including notes on the deterioration of the concrete, exposure of rebar reinforcement, any leakage below concrete spillway, and obstructions to flow and plans to correct;

(7) Downstream slope information including notes on woody vegetation removed, rodent burrows discovered, whether seepage drains are working, and any seepage or wet areas;

(8) Outlet pipe information including notes on any water flowing outside of discharge pipe through the impounding structure and a description of any reflection or damage to the pipe;

(9) Stilling basin information including notes on the deterioration of the concrete, exposure of rebar reinforcement, deterioration of the earthen basin slopes, repairs made, and any obstruction to flow;

(10) Gates information including notes on gate malfunctions or repairs, corrosion or damage, and whether any gates were operated and if so how often and to what extreme;

(11) Reservoir information including notes on new developments upstream of the dam, slides or erosion of lake banks, and general comments to include silt, algae, or other influence factors;

(12) Instruments information including any reading of instruments and any installation of new instruments; and

(13) General information including notes on new development in the downstream dam break inundation zone that would impact hazard classification or spillway design flood requirements, the maximum stormwater discharge or peak elevation during the previous year, whether general maintenance was performed and when, and actions that need to be completed before the next inspection.

f. Evaluation rating of the impounding structure and appurtenances (excellent, good, or poor), general comments, and recommendations;

g. Certification by the owner and date of inspection; and

h. Certification and seal by the owner's engineer and date of inspection, as applicable.

F. The owner of an impounding structure shall notify the department immediately of any change in the use of the area downstream that would impose hazard to life or property in the event of failure.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008; amended, Virginia Register Volume 27, Issue 6, eff. December 22, 2010.

**4VAC50-20-110. (Repealed.)**

Historical Notes

Derived from VR625-01-00 § 3.2, eff. February 1, 1989; repealed, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-120. (Repealed.)**

Historical Notes

Derived from VR625-01-00 § 3.3, eff. February 1, 1989; repealed, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-125. Delayed effective date for Spillway Design Flood requirements for impounding structures.**

A. If an impounding structure has been determined to have an adequate spillway capacity prior to September 26, 2008, and is currently operating under a Regular Operation and Maintenance Certificate, but will now require spillway modifications due to changes in these regulations, the owner shall submit to the board an Alteration Permit Application in accordance with 4VAC50-20-80 to address spillway capacity at the time of the expiration of their Regular Operation and Maintenance Certificate or by September 26, 2011, whichever is later. The Alteration Permit Application shall contain a construction sequence with milestones for completing the necessary improvements within five years of Alteration Permit issuance. The board may approve an extension of the prescribed time frame for good cause. Should the owner be able to demonstrate that no spillway capacity change is necessary, the impounding structure may be found to be in compliance with this chapter.

B. In accordance with 4VAC50-20-105, the owner shall submit the Operation and Maintenance Certificate Application (Operation and Maintenance Certificate Application for Virginia Regulated Impounding Structures), the Emergency Action Plan or Emergency Preparedness Plan, and the Inspection Report (Annual Inspection Report for Virginia Regulated Impounding Structures) 90 days prior to the expiration of the Regular Operation and Maintenance Certificate.

C. If circumstances warrant more immediate repairs to the impounding structure, the board may direct alterations to the spillway to be completed sooner.

D. During this delay period, owners are required to address other deficiencies that may exist that are not related to the spillway design flood.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-130. (Repealed.)**

Historical Notes

Derived from VR625-01-00 § 3.4, eff. February 1, 1989; repealed, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-140. (Repealed.)**

Historical Notes

Derived from VR625-01-00 § 3.5, eff. February 1, 1989; repealed, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-150. Conditional operation and maintenance certificate.**

A. During the review of any Operation and Maintenance Certificate Application (Operation and Maintenance Certificate Application for Virginia Regulated Impounding Structures) completed in accordance with 4VAC50-20-105 should the director determine that the impounding structure has nonimminent deficiencies, the director may recommend that the board issue a Conditional Operation and Maintenance Certificate.

B. The Conditional Operation and Maintenance Certificate for High, Significant, and Low Hazard Potential impounding structures shall be for a maximum term of two years. This certificate will allow the owner to continue normal operation and maintenance of the impounding structure, and shall require that the owner correct the deficiencies on a schedule approved by the board.

C. A Conditional Certificate may be extended in accordance with the procedures of 4VAC50-20-155 provided that Inspection Reports (Annual Inspection Report for Virginia Regulated Impounding Structures) are on file, and the board determines that the owner is proceeding with the necessary corrective actions.

D. Once the deficiencies are corrected, the board shall issue a Regular Operation and Maintenance Certificate based upon the impounding structure's meeting the requirements of 4VAC50-20-105.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 3.6, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-155. Extension of Operation and Maintenance Certificates.**

The board may extend an Operation and Maintenance Certificate for impounding structures provided that the owner submits a written request justifying an extension, the amount of time needed to comply with the requirements set out in the current Operation and Maintenance Certificate, and any required fees. The owner must have demonstrated substantial and continual progress towards meeting the requirements of the certificate in order to receive an extension.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-160. Additional operation and maintenance requirements.**

A. The owner of an impounding structure shall not, through action or inaction, cause or allow such structure to impound water following receipt of a written report from the owner's engineer that the impounding structure will not safely impound water.

B. In accordance with § 10.1-609.2 of the Code of Virginia, impounding structure owners shall not permit the growth of trees and other woody vegetation and shall remove any such vegetation from the slopes and crest of embankments and the emergency spillway area, and within a distance of 25 feet from the toe of the embankment and abutments of the dam.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 3.7, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-165. Agricultural exemption.**

A. Impounding structures operated primarily for agricultural purposes that are less than 25 feet in height or that create a maximum impoundment capacity smaller than 100 acre-feet are exempt from the Impounding Structure Regulations.

B. An owner covered by an agricultural exemption pursuant to § 10.1-604 of the Code of Virginia and 4VAC50-20-30 may validate such exemption by submitting an Agricultural

Exemption Report (Agricultural Exemption Report for Impounding Structures). The Agricultural Exemption Report shall include the following information:

1. Project information including the name and inventory number of the structure and name of the reservoir;
2. Location of the impounding structure including the city or county, number of feet or miles upstream or downstream of a highway and the highway number, name of the river or the stream, and the latitude and longitude;
3. Owner's name or representative if corporation, mailing address, residential and business telephone numbers, and other means of communication;
4. The impounding structure height in feet and the maximum impounding capacity in acre-feet;
5. A list of the agricultural functions for which the impoundment supplies water;
6. The date of validation; and
7. The owner's signature validating that the impoundment is operated primarily for agricultural purposes and is exempt from the regulations.

C. The Agricultural Exemption Report may be verified by the department through a site visit.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-170. Transfer of certificates.**

A. Prior to the transfer of ownership of an impounding structure the certificate holder shall notify the director in writing and the new owner shall file a transfer notification with the department. A form for the transfer notification is available from the department (Transfer of Impounding Structure Notification from Past Owner to New Owner). The new owner may elect to continue the existing operation and maintenance certificate for the remaining term or he may apply for a new certificate in accordance with 4VAC50-20-105. If the owner elects to continue the existing certificate, he shall certify to the director that he is aware of and will comply with all of the requirements and conditions of the certificate.

B. The transfer notification shall include the following required information:

1. Project information including the name and inventory number of the structure, name of the reservoir, and impoundment hazard classification;
2. Location of the impounding structure including the city or county, number of feet or miles upstream or downstream of a highway and the highway number, name of the river or the stream, and the latitude and longitude;
3. Type of certificates and permits to be transferred including effective date and expiration date of all certificates and permits;
4. Past owner's name, mailing address, and residential and business telephone numbers;
5. New owner's name, mailing address, and residential and business telephone numbers;
6. Request to transfer certification statement signed and dated by the past owner;
7. Certification of compliance with permit or certificate with all said terms and conditions signed and dated by the new owner; and
8. Contact information updates for Emergency Action Plan or Emergency Preparedness Plan provided by the new owner. Such updates shall include the name, mailing address, and residential and business telephone numbers for the impounding structure owner, impounding structure operator, rainfall and staff gage observer, and alternate observer.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 3.8, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-175. Emergency Action Plan (EAP) for High and Significant Hazard Potential impounding structures.**

A. In order to protect life during potential emergency conditions at an impounding structure, and to ensure effective, timely action is taken should an impounding structure emergency occur, an EAP shall be required for each High and Significant Hazard Potential impounding structure. The EAP shall be coordinated with the Department of Emergency Management in accordance with § 44-146.18 of the Code of Virginia. The EAP required by these regulations shall be incorporated into local and interjurisdictional emergency plans pursuant to § 44-146.19 of the Code of Virginia.

B. It is the impounding structure owner's responsibility to develop, maintain, exercise, and implement a site-specific EAP.

C. An EAP shall be submitted every six years. The EAP shall be submitted with the owner's submittal of their Regular Operation and Maintenance Certificate application (Operation and Maintenance Certificate Application for Virginia Regulated Impounding Structures).

D. The owner shall update and resubmit the EAP immediately upon becoming aware of necessary changes to keep the EAP workable. Should an impounding structure be reclassified, an EAP in accordance with this section shall be submitted.

E. A drill shall be conducted annually for each high or significant hazard impounding structure. To the extent practicable, the drill should include a face-to-face meeting with the local emergency management agencies responsible for any necessary evacuations to review the EAP and ensure the local emergency management agencies understand the actions required during an emergency. Except as set out in 4VAC50-20-53, a table-top exercise shall be conducted once every six years, although more frequent table-top exercises are encouraged. Drills and table-top exercises for multiple impounding structures may be performed in combination if the involved parties are the same. Owners shall certify to the department annually that a drill, a table-top exercise, or both has been completed and provide any revisions or updates to the EAP or a statement that no revisions or updates are needed.

F. Impounding structure owners shall test existing monitoring, sensing, and warning equipment at remote or unattended impounding structures at least twice per year or as performed by the Virginia Department of Emergency Management pursuant to § 10.1-609.1 of the Code of Virginia and maintain a record of such tests.

G. An EAP shall contain the following seven basic elements unless otherwise specified in this subsection.

1. Notification chart. A notification chart shall be included for all classes of impounding structures that shows who is to be notified, by whom, and in what priority. The notification chart shall include contact information providing 24-hour telephone coverage for all responsible parties including, but not limited to, the impounding structure operator or manager, state and local emergency management officials, local police or sheriffs' departments, and the owner's engineer. The notification chart shall also identify the process by which downstream property owners will be notified, and what party or parties will be responsible for making such notifications.

2. Emergency Detection, Evaluation, and Classification. The EAP shall include a discussion of the procedures for timely and reliable detection, evaluation, and classification of emergency situations considered to be relevant to the project setting and impounding features. Each relevant emergency situation is to be documented to provide an appropriate course of action based on the urgency of the situation. Where appropriate, situations should address impounding structure failures that are imminent or in progress, a situation where the potential for impounding structure failure is rapidly developing, and a situation where the threat is slowly developing.

3. Responsibilities. The EAP shall specify responsibilities for EAP-related tasks. The EAP shall also clearly designate the responsible party for making the decision that an emergency condition no longer exists at the impounding structure. The EAP shall include procedures and the responsible parties for notifying to the extent possible any known local occupants, owners, or lessees of downstream properties potentially impacted by the impounding structure's failure.

4. Preparedness. The EAP shall include a section that describes preparedness actions to be taken both before and following development of emergency conditions.

5. Dam Break Inundation Maps. The EAP shall include dam break inundation maps developed in accordance with 4VAC50-20-54.

6. Appendices. The appendices shall contain information that supports and supplements the material used in the development and maintenance of the EAP such as analyses of impounding structure failure floods; plans for training, exercising, updating, and posting the EAP; and other site-specific concerns.

7. Certification. The EAP shall include a section that identifies all parties with assigned responsibilities in the EAP pursuant to subdivision 3 of this subsection. This will include certification that the EAP has been received by these parties. The preparer's name, title, and contact information shall be printed in this section. The preparer's signature shall also be included in the certification section. The local organization for emergency management shall provide the owner and the department with any deficiencies they may note.

H. The development of the EAP shall be coordinated with all entities, jurisdictions, and agencies that would be affected by an impounding structure failure or that have statutory responsibilities for warning, evacuation, and postflood actions. Consultation with state and local emergency management officials at appropriate levels of management responsible for warning and evacuation of the public shall occur to ensure that there is awareness of their individual and group responsibilities. The owner shall also coordinate with the local organization for emergency management to identify properties that upon failure of the impounding structure would result in economic impacts.

I. The EAP, or any updates to an existing EAP, shall be submitted to the department, the local organization for emergency management, and the Virginia Department of Emergency Management. Two copies shall be provided to the department.

J. The following format shall be used as necessary to address the requirements of this section.

Title Page/Cover Sheet

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- I. Certifications
- II. Notification Flowchart
- III. Statement of Purpose
- IV. Project Description
- V. Emergency Detection, Evaluation, and Classification
- VI. General Responsibilities Under the EAP
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Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008; amended, Virginia Register Volume 27, Issue 6, eff. December 22, 2010.

**4VAC50-20-177. Emergency Preparedness Plan for Low Hazard impounding structures.**

Low Hazard impounding structures shall provide information for emergency preparedness to the department, the local organization for emergency management and the Virginia Department of Emergency Management. A form for the submission is

available from the department (Emergency Preparedness Plan for Low Hazard Virginia Regulated Impounding Structures). The information shall include, but not be limited, to the following:

1. Name of the impounding structure, inventory number, city or county, latitude, and longitude;
2. Owner's name, mailing address, residential and business telephone numbers, and other means of communication. Contact information shall provide for 24-hour telephone contact capability;
3. Impounding structure operator's name, mailing address, residential and business telephone numbers, and other means of communication. Contact information shall provide for 24-hour telephone contact capability;
4. Rainfall and staff gage observer's name, mailing address, residential and business telephone numbers, and other means of communication. Contact information shall provide for 24-hour telephone contact capability;
5. Contact information for alternate operator and alternate rainfall and staff gage observer, if applicable;
6. Contact information for the local dispatch center nearest impounding structure including address and 24-hour telephone number;
7. City or county emergency services coordinator's name, mailing address, residential and business telephone numbers, and other means of communication;
8. A procedure and the responsible parties for notifying to the extent possible any known local occupants, owners, or lessees of downstream properties potentially impacted by the impounding structure's failure;
9. A discussion of the procedures for timely and reliable detection, evaluation, and classification of emergency situations considered to be relevant to the project setting and impounding features. Each relevant emergency situation is to be documented to provide an appropriate course of action based on the urgency of the situation;
10. A simple dam break inundation map acceptable to the director, demonstrating the general inundation that would result from an impounding structure failure. Such maps required pursuant to this section do not require preparation by a professional licensed engineer; however, maps prepared by a licensed professional engineer are preferred;
11. Identification of public roads downstream noting the highway number and distance below the impounding structure. If roads exist, contact information for the resident Virginia Department of Transportation engineer or city or county engineer including address and 24-hour telephone numbers;

12. Amount of rainfall that will initiate a Stage II Condition in inches per six hours, inches per 12 hours, and inches per 24 hours and a Stage III Condition in inches per six hours, inches per 12 hours, and inches per 24 hours;

13. Amount of flow in the emergency spillway that will initiate a Stage II Condition in feet (depth of flow) and a Stage III Condition in feet (depth of flow);

14. Staff gage location and description; the frequency of observations by the rainfall or staff gage observer under a Stage I Condition, and Stage II Condition, and a Stage III Condition; and a clear description of an access route and means of travel during flood conditions to the impounding structure;

15. Evacuation procedures including notification, monitoring, evacuation, and reporting processes and responsibilities;

16. Evidence that the required copies of such plan have been submitted to the local organization for emergency management and the Virginia Department of Emergency Management; and

17. Certification of the plan by the owner.

#### Statutory Authority

§ 10.1-605 of the Code of Virginia.

#### Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

### Part IV Procedures

#### **4VAC50-20-180. Inspections.**

A. The director may make inspections during construction, alteration or operation and maintenance as deemed necessary to ensure that the impounding structure is being constructed, altered or operated and maintained in compliance with the permit or certificate issued by the board. The director shall provide the owner a copy of the findings of these inspections. The department's inspection does not relieve the owner from the responsibility of providing adequate inspection during construction, alteration, or operation and maintenance. During the maintenance, construction, or alteration of any impounding structure or reservoir, the director shall require the owner to perform, at the owner's expense, such work or tests as necessary to obtain information sufficient to enable the director to determine whether conformity with the plans and specifications approved by the certificate is being secured.

B. Periodic inspections during construction or alteration shall be conducted under the direction of a licensed professional engineer who shall provide for monitoring, review of contractor submittals, and appropriate confirmatory testing of all facets of construction

affecting the safety of the impounding structure in accordance with the construction or alteration permit issued by the board.

C. Required inspections during operation and maintenance shall be conducted under the supervision of a licensed professional engineer at intervals designated under 4VAC50-20-105.

D. Every owner shall provide for an inspection by a licensed professional engineer after overtopping of the impounding structure or after flows cause damage to the emergency spillway. A copy of the findings of each inspection with the engineer's recommendations shall be filed with the board within a reasonable period of time not to exceed 30 days subsequent to completion of the inspection.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 4.1, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-190. Right to informal fact-finding proceeding or hearing.**

Any owner aggrieved by an action taken by the director or by the board without hearing, or by inaction of the director or the board, under the provisions of this chapter, may demand in writing an informal fact-finding proceeding pursuant to § 2.2-4019 of the Code of Virginia or a formal hearing pursuant to § 2.2-4020 of the Code of Virginia. A formal hearing may be granted only with the consent of the board.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 4.2, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-200. Enforcement.**

The provisions of this chapter may be enforced by the board, the director, or both in any manner consistent with the provisions of the Dam Safety Act (§ 10.1-604 et seq. of the Code of Virginia).

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 4.3, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-210. Consulting committee.**

A. When the board needs to satisfy questions of safety regarding plans and specifications, construction, alteration, or operation and maintenance, or when requested by the owner, the board may appoint a consulting committee to report to it with respect to those questions of the impounding structure's safety. Such a committee shall consist of two or more consultants, none of whom have been associated with the impounding structure.

B. The costs and expenses incurred by the consulting committee, if appointed at the request of an owner, shall be paid by the owner.

C. The costs and expenses incurred by the consulting committee, if initiated by the board, shall be paid by the board.

#### Statutory Authority

§ 10.1-605 of the Code of Virginia.

#### Historical Notes

Derived from VR625-01-00 § 4.4, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

#### **4VAC50-20-220. Unsafe conditions.**

A. No owner shall maintain an unsafe impounding structure. Designation of an impounding structure as unsafe shall be made in accordance with § 10.1-607.1 of the Code of Virginia.

B. Imminent danger.

1. If an owner or the owner's engineer has determined that circumstances are impacting the integrity of the impounding structure that could result in the imminent failure of the impounding structure, temporary repairs may be initiated prior to approval from the board. The owner shall notify the department within 24 hours of identifying the circumstances impacting the integrity of the impounding structure. Such emergency notification shall not relieve the owner of the need to obtain an alteration permit as soon as may be practicable, nor shall the owner take action beyond that necessary to address the emergency situation.

2. When the director finds that an impounding structure is unsafe and constitutes an imminent danger to life or property, he shall immediately notify the Virginia Department of Emergency Management and confer with the owner who shall activate the Emergency Action Plan or Emergency Preparedness Plan if appropriate to do so. The owner of an impounding structure found to constitute an imminent danger to life or property shall take immediate corrective action to remove the imminent danger as required by § 10.1-608 of the Code of Virginia.

C. Nonimminent danger. The owner of an impounding structure who has been issued findings and recommendations, by the board, for the correction of deficiencies that may

threaten life or property if not corrected, shall undertake to implement the recommendations for correction of deficiencies according to a schedule of implementation contained in that report as required by § 10.1-609 of the Code of Virginia. A dam owner may submit to the board his own plan, consistent with this chapter, to address the recommendations for correction of deficiencies and the schedule of implementation contained in the department's safety inspection report. The board shall determine if the submitted plan and schedule are sufficient to address deficiencies.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 4.5, eff. February 1, 1989; amended, Virginia Register Volume 18, Issue 14, eff. July 1, 2002; Volume 24, Issue 25, eff. September 26, 2008; Volume 27, Issue 6, eff. December 22, 2010.

**4VAC50-20-230. Complaints.**

A. Upon receipt of a complaint alleging that the person or property of the complainant is endangered by the construction, alteration, maintenance or operation of an impounding structure, the director shall cause an inspection of the structure, unless the data, records and inspection reports on file with the board are found adequate to determine if the complaint is valid.

B. If the director finds that an unsafe condition exists, the director shall proceed under the provisions of §§ 10.1-608 and 10.1-609 of the Code of Virginia to render the extant condition safe.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 4.6, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

Part V

Design Requirements

**4VAC50-20-240. Design of structures.**

A. The owner shall complete all necessary investigations prior to submitting the design report (Design Report for the Construction or Alteration of Virginia Regulated Impounding Structures). The design report shall contain those components outlined in 4VAC50-20-70 for construction activities or those outlined in 4VAC50-20-80 for alteration activities. The scope and degree of precision required is a matter of engineering judgment based on the complexities of the site and the hazard potential classification of the proposed structure.

B. Surveys shall be made with sufficient accuracy to locate the proposed construction site and to define the total volume of storage in the impoundment. Locations of center lines and other horizontal and vertical controls shall be shown on a map of the site. The area downstream and upstream from the proposed impounding structure shall be investigated in order to delineate the areas and extent of potential damage in case of failure or backwater due to flooding.

C. The drainage area shall be determined. Present and planned land-use conditions shall be considered in determining the runoff characteristics of the drainage area. The most severe of these conditions shall be included in the design calculations which shall be submitted as part of the design report.

D. The geotechnical engineering investigation shall consist of borings, test pits and other subsurface explorations necessary to adequately define the existing conditions. The investigations shall be performed so as to appropriately define the soil, rock and ground water conditions.

E. All construction materials shall be adequately researched and selected so as to ensure that their as constructed behavior will reasonably conform to design criteria. If on-site materials are to be utilized, they shall be located and determined to be adequate in quantity and quality.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 5.1, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

#### **4VAC50-20-250. (Repealed.)**

Historical Notes

Derived from VR625-01-00 § 5.2, eff. February 1, 1989; repealed, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

#### **4VAC50-20-260. Spillway design.**

A. Every impounding structure shall have a spillway system with adequate capacity to discharge the design flood without endangering the safety of the impounding structure.

B. Vegetated earth or an unlined emergency spillway may be approved when the applicant demonstrates that it will pass the spillway design flood without jeopardizing the safety of the impounding structure (such as by allowance of overtopping of a structure not designed to permit overtopping). In no case shall impounding structure owners permit the growth of trees and other woody vegetation in the emergency spillway area.

C. Lined emergency spillways shall include design criteria calculations, plans and specifications for suitable energy dissipators and for spillways that include crest control structures, chutes, walls, panel lining, sills, blocks, and miscellaneous details. All joints shall be reasonably water-tight and placed on a foundation capable of sustaining applied loads without undue deformation. Provision shall be made for handling under seepage and uplift pressures from the foundation which might adversely affect the structural integrity and structural stability of the impounding structure.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 5.3, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-270. Principal spillways and outlet works.**

A. It will be assumed that principal spillways and regulating outlets provided for special functions will operate to normal design discharge capabilities during the spillway design flood, provided appropriate analyses show:

1. That control gates and structures are suitably designed to operate reliably under maximum heads for durations likely to be involved and risks of blockage by debris are minimal;
2. That access roads and passages to gate regulating controls would be safely passable by operating personnel under spillway design flood conditions; and
3. That there are no substantial reasons for concluding that outlets would not operate safely to full design capacity during the spillway design flood.

B. If there are reasons to doubt that any of the above basic requirements might not be adequately met under spillway design flood conditions, the "dependable" discharge capabilities of regulating outlets shall be assumed to be less than 100% of design capacities, generally as outlined in the following subsections C through G of this section.

C. Any limitations in safe operating heads, maximum velocities to be permitted through structures or approach channels, or other design limitations shall be observed in establishing "dependable" discharge rating curves to be used in routing the spillway design flood hydrograph through the reservoir.

D. If intakes to regulating outlets are likely to be exposed to significant quantities of floating debris, sediment depositions or ice hazards prior to or during major floods, the dependable discharge capability during the spillway design flood shall be assumed to be zero.

E. If access roads or structural passages to operating towers or controls are likely to be flooded or otherwise unusable during the spillway design flood, the dependable discharge capability of regulating outlets will be assumed to be zero for the periods of time during which such conditions might exist.

F. Any deficiencies in discharge performance likely to result from delays in the operation of gates before attendants could be reasonably expected to reach the control must be taken into account when estimating "dependable" discharge capabilities assumptions in routing the spillway design flood through the impoundment. Reports on design studies shall indicate the allowances made for possible delays in initiating gate operations. Normally, for projects located in small basins, where critical spillway design flood inflows may occur within several hours after intense precipitation, outflows through any regulating outlets that must be opened after the flood begins shall be assumed to be zero for an appropriate period of time subsequent to the beginning of intense rainfall.

G. All gates, valves, conduits and concrete channel outlets shall be designed and constructed to prevent significant erosion or damage to the impounding structure or to the downstream outlet or channel.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 5.4, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

#### **4VAC50-20-280. Drain requirements.**

All new impounding structures regardless of their hazard potential classification, shall include a device to permit draining of the impoundment within a reasonable period of time as determined by the owner's licensed professional engineer. Existing drains on impounding structures shall be kept operational. When practicable, existing impounding structures shall be retrofitted with devices to permit draining.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 5.5, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

#### **4VAC50-20-290. Life of the impounding structure.**

Components of the impounding structure, the outlet works, drain system and appurtenances shall be durable and maintained or replaced in keeping with the design and planned life of the impounding structure.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 5.6, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-300. Additional design requirements.**

A. Flood routings shall start at or above the elevation of the crest of the lowest ungated outlet. Freeboard determination and justification must be addressed by the owner's engineer.

B. All elements of the impounding structure shall conform to sound engineering practice. Safety factors, design standards and design references that are used shall be included with the design report.

C. Inspection devices may be required by the director for use by inspectors, owners or the director in conducting inspections in the interest of structural integrity during and after completion of construction and during the life of the impounding structure.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 5.7, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-310. Plans and specifications.**

The plans and specifications for a proposed impounding structure required in 4VAC50-20-70 for construction activities and in 4VAC50-20-80 for alteration activities shall consist of a detailed engineering design report (Design Report for the Construction or Alteration of Virginia Regulated Impounding Structures) and engineering drawings and specifications, with the following as a minimum:

1. The name of the project; the name of the owner; classification of the impounding structure as set forth in this chapter; designated access to the project and the location with respect to highways, roads, streams and existing impounding structures and impoundments that would affect or be affected by the proposed impounding structure.

2. Cross-sections, plans, profiles, logs of test borings, laboratory and in situ test data, drawings of principal and emergency spillways, impounding structures, outlet works, drain system and appurtenances, and other project components in sufficient detail to indicate clearly the extent and complexity of the work to be performed.

3. Contract drawings should include, but not be limited to, foundation and abutment treatment, stream or river diversion, excavation and material fill processes, phased fill and compaction and drainage devices.

4. The erosion and sediment control plan, as approved by the local government, which minimizes soil erosion and sedimentation during all phases of construction or alteration.
5. Technical specifications, as may be required to describe the materials, performance, and methods of the construction and construction quality control for the project.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 5.8, eff. February 1, 1989; amended, Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-320. Acceptable design procedures and references.**

To ensure consistency of approach, within the major engineering disciplines of hydrology, hydraulics, soils and foundations, structures, and general civil design, criteria and approaches from multiple sources shall not be mixed for developing the design of a given feature or facility without approval of the director. In all cases the owner's engineer shall identify the source of the criteria.

The following are acceptable as design procedures and references:

1. The design procedures, manuals and criteria used by the United States Army Corps of Engineers.
2. The design procedures, manuals and criteria used by the United States Department of Agriculture, Natural Resources Conservation Service.
3. The design procedures, manuals and criteria used by the United States Department of the Interior, Bureau of Reclamation.
4. The design procedures, manuals and criteria used by the United States Department of Commerce, National Weather Service.
5. The design procedures, manuals and criteria used by the United States Federal Energy Regulatory Commission.
6. Other design procedures, manuals and criteria that are accepted as current, sound engineering practices, as approved by the director prior to the design of the impounding structure.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from VR625-01-00 § 5.9, eff. February 1, 1989; amended, Virginia Register Volume 18, Issue 14, eff. July 1, 2002; Volume 24, Issue 25, eff. September 26, 2008.

#### **4VAC50-20-330. Other applicable dam safety references.**

A. Manuals, guidance, and criteria used by the Federal Emergency Management Agency, including the following:

1. Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners, U.S. Department of Homeland Security, Federal Emergency Management Agency, October 1998, Reprinted January 2004; FEMA 64 or as revised.

2. Federal Guidelines for Dam Safety: Selecting and Accommodating Inflow Design Floods for Dams, U.S. Department of Homeland Security, Federal Emergency Management Agency, October 1998, Reprinted April 2004; FEMA 94 or as revised.

B. Manuals, guidance, and forms provided by the department. Such materials may be located on the department's website at: <http://www.dcr.virginia.gov>.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

#### Part VI

#### Fees

#### **4VAC50-20-340. Authority to establish fees.**

Under § 10.1-613.5 of the Code of Virginia, the board is authorized to establish and collect application fees for the administration of the dam safety program, administrative review, certifications, and the repair and maintenance of impounding structures. The fees will be deposited into the Dam Safety, Flood Prevention and Protection Assistance Fund.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

#### **4VAC50-20-350. Fee submittal procedures.**

A. Effective September 26, 2008, fees for all application submittals required pursuant to 4VAC50-20-370 through 4VAC50-20-390 are due prior to issuance of a certificate or permit. No application for an Operation and Maintenance Certificate or a Construction Permit will be acted upon by the board without full payment of the required fee per § 10.1-613.5 of the Code of Virginia.

B. Fees shall be paid by check, draft or postal money order payable to the Treasurer of Virginia, or submitted electronically (if available), and must be in U.S. currency, except that agencies and institutions of the Commonwealth of Virginia may submit Interagency Transfers for the amount of the fee. All fees shall be sent to the following address (or submitted electronically, if available): Virginia Department of Conservation and Recreation, Division of Finance, Accounts Payable, 203 Governor Street, 4th Floor, Richmond, Virginia 23219.

C. All fee payments shall be accompanied by the following information:

1. Applicant name, address and daytime phone number.
2. The name of the impounding structure, and the impounding structure location.
3. The type of application or report submitted.
4. Whether the submittal is for a new permit or certificate issuance or permit or certificate reissuance.
5. The amount of fee submitted.
6. Impounding structure identification number, if applicable.

D. No permit fees remitted to the department shall be subject to refund except as credits provided for in 4VAC50-20-390 C.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

#### **4VAC50-20-360. Fee exemptions.**

Impounding structures owned by Virginia Soil and Water Conservation Districts shall be exempt from all fees associated with this part in accordance with § 10.1-613.5 of the Code of Virginia. There will be no fee assessed for a low hazard impounding structure exempted from fees pursuant to 4VAC50-20-51 or for the decommissioning of an impounding structure.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

#### **4VAC50-20-370. Construction Permit application fees.**

A. Any application form submitted pursuant to 4VAC50-20-70 for permitting a proposed impounding structure construction after September 26, 2008, shall be accompanied by a payment as determined in subsection B of this section.

B. Fees shall be as follows:

1. \$2,500 for High or Significant Hazard Potential impounding structures.
2. \$1,000 for Low Hazard Potential impounding structures.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-380. Regular Operation and Maintenance Certificate application fees.**

A. Any application for a six-year Regular Operation and Maintenance Certificate after September 26, 2008, except as otherwise exempted, shall be accompanied by a payment as determined in subsection B of this section.

B. Fees for High, Significant, or Low Hazard Potential impounding structures shall be as follows:

1. \$600 for High Hazard Potential.
2. \$600 for Significant Hazard Potential.
3. \$300 for Low Hazard Potential.

C. Fees for extension of Regular Operation and Maintenance Certificates shall be \$250 per year or portion thereof.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-390. Conditional Operation and Maintenance Certificate application fee.**

A. Fees for issuance of a Conditional Operation and Maintenance Certificate shall be as follows:

1. For a certificate for more than one year but no more than two years: \$300.

2. For a certificate for one year or less: \$150.

B. The fee for an extension of a Conditional Operation and Maintenance Certificate shall be \$250 per year or portion thereof.

C. The board may allow a partial credit towards the Regular Operation and Maintenance Certificate fee if the owner of the impounding structure has completed, to the director's satisfaction, the conditions of the Conditional Certificate prior to its expiration.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

**4VAC50-20-400. Incremental Damage Analysis review fees.**

Should the department determine that outside expertise to assist with the review of an incremental damage analysis is necessary, the applicant shall be responsible for the cost of such outside expertise. Such costs shall be agreed upon in advance by the department and the applicant.

Statutory Authority

§ 10.1-605 of the Code of Virginia.

Historical Notes

Derived from Virginia Register Volume 24, Issue 25, eff. September 26, 2008.

