Virginia Soil and Water Conservation Board
Impounding Structure (Dam Safety) Regulations Technical Advisory Committee (TAC)
Wednesday, October 11, 2006
John Tyler Community College
Chester, Virginia

Impounding Structure TAC Members Present

Steve Billcheck, Virginia Department of Emergency Management
William G. Browning, Department of Conservation and Recreation
Scott Cahill, Watershed Services
Paul Castle, Lakefront Royal Property Owner Association
Jay Day, Mountain Castles Soil and Water Conservation District
J. Michael Flagg, Hanover County
Joseph S. Haugh
Connie Houston
Richard Jacobs, Culpeper Soil and Water Conservation District
Mathew J. Lyon, Natural Resources Conservation Service
Joseph H. Maroon, Department of Conservation and Recreation
David Krisnitski, Virginia Department of Game and Inland Fisheries
John Peterson, KEMPS Consulting
Peter Rainey, Lake of the Woods Association

Impounding Structure TAC Members Not Present

Jeff W. Booth, Western Virginia Water Authority
Sara Bell, Dominion Generation
David B. Campbell, Schnabel Engineering
Douglas L. Davis, Waynesboro Police Department
Donald R. Demetrius, Fairfax County
John W. Jones, Virginia Sheriffs Association
Daniel J. Mahoney, Federal Energy Regulatory Commission
Duncan McGregor
Timothy A. Mitchell, City of Lynchburg
Mishelle R. Noble-Blair, City of Manassas
David Ogle, Virginia Department of Transportation
David Rosenthal, City of Norfolk
Ray Scher, Caroline County

Facilitator

Barbara Hulburt, Director of Facilitation and Training, The McCammon Group

DCR Staff

David C. Dowling, Policy, Planning and Budget Director
Michael R. Fletcher, Director of Development
Jim Robinson, Dam Safety Program Engineer
Ken Turner, District Dam Engineer
Christine Watlington, Policy, Planning and Budget Analyst
Ryan Brown, Office of the Attorney General

Observers

John S. Bailey, Lake of the Woods Association
Robin Knepper, The Fredericksburg Freelance Star
Ken Kopka, Lake Barcroft Watershed Improvement District
Doug Rogers, Lake of the Woods Association

Opening Remarks and Review of Agenda

Ms. Hulburt called the meeting to order and reviewed the agenda. She noted that the purpose of the meeting was not for specific edits, but rather addressing policy and concepts.

Review Minutes from September 6th Meeting

Ms. Hulburt asked for comments about the minutes of the September 6 meeting. There were none.

Forms

Mr. Robinson reviewed draft revisions to the forms that are currently incorporated by reference into the regulations. Copies were distributed to members and are available from DCR.

Virginia Dam Owner's Annual Inspection Report (DCR 199-098)(11-06)

Mr. Robinson noted that the new forms would be provided on the Internet in PDF format for the public's use.

He noted that the requirement is that in any year an owner's engineer is not required to complete a full inspection report, the dam owner is required to have this form completed. This should happen on the anniversary date the certificate issuance.

A member asked if there were provisions for the electronic filing of the form.

Mr. Robinson said that at this time the forms would be provided in PDF format, but not interactive online forms.

A member suggested that the inclusion of digital photos would be beneficial. He said that looking at photographs through the evolution of the process has been helpful.

Mr. Dowling noted that the forms are considered part of the regulations and are incorporated by reference.

Mr. Maroon suggested that we need to be able to easily modify the forms in the future if determined to be necessary.

Mr. Dowling said that it had been suggested to remove the forms completely. However the concern is that taking the forms out of the public revision process could be of concern.

Mr. Dowling noted that staff had previously discussed this with the Office of the Attorney General. If the forms are removed, enforceability could be weakened. It could create a basis for challenge and make subsequent legal actions more difficult.

Mr. Brown said that including the forms in the regulations would give a level of enforceability and would allow the information to reside in one place, rather than two.

A member said that he would not push for making this a part of the regulations. He noted that the EAP form was essentially a contract.

Mr. Maroon reiterated the need for the Department to have the ability to add or modify forms without a full regulatory review.

Mr. Brown noted that was a policy decision for the Department.

There was considerable discussion regarding the merits of including the forms in the regulations.

Ms. Hulburt noted that DCR would review the considerations regarding including the forms as part of the regulations.

Dam Owner's Annual Inspection From (DCR 199-098)(12/01)

Mr. Robinson noted that most dam owners failed to return their report. He said the exception was the Soil and Water Conservation District dams.

Mr. Robinson noted that the form is helpful for the owners to understand the status of their dam when filled out properly.

Mr. Robinson said that an area would be added to the footnotes of the form to encourage the inclusion of available digital photographs and that also there would be an added area for recommendations.

Operation and Maintenance Certificate Application for Virginia Regulated Impounding Structures (DCR 199-099)(11-06)

Mr. Robinson noted this would now be a requirement for certification for all owners of a regulated dam. He noted that this could be for a six-year regular certificate or for a conditional certificate.

The form should be signed and sealed by a professional engineer as well as being signed by the owner.

Mr. Robinson noted that instead of Classes I, II and III the form now utilized high, significant and low hazard potential classifications.

As-Built Report for Virginia Regulated Impounding Structures (199-100)(11-06)

Mr. Robinson said that this form was the opportunity to have owner's engineers fill out and identify the baseline features of the dam. This is valuable when conducting field inspections.

Mr. Robinson said if there was a new dam just completed, the dam owner has six months to turn in the "as-built" report that gives the details of the plan of the dam.

A member expressed concern over the term "as-built."

Mr. Robinson suggested the term "post construction report."

Another member suggested "record drawing."

A member said that it would not be appropriate to use "post construction" if the review of the dam was occurring 20 years after initial construction.

The term "record of previously constructed dam" was suggested.

Mr. Dowling inquired whether this report must involve a licensed surveyor to complete.

A member responded that if the elevations and other relevant information is to be affirmed then it should be required. He noted that many times an engineer would accept the information from the contractor with no verification.

Mr. Robinson said that in the event of a new dam, that language would not necessarily fit.

A member suggested for new dams the form could be called an "engineering report" and for older dams the form could be "current conditions report."

Ms. Hulburt said that the suggestions were helpful but suggested that the TAC continue to work through the forms and allow some of those specific issues to be addressed outside the group.

A member expressed a concern in the situation where there were two owners of a dam and the difficulty of submitting the report on time.

Mr. Robinson said the owners should work with the regional engineers. He noted that there could be penalties for delayed filing.

Consensus was to use the term "record report" with a line that indicates if the dam is newly constructed or newly regulated.

Mr. Dowling noted that there were at least two references to an "as built report" in the regulations.

Ms. Hulburt said that the language in the regulations would need to reflect the changes in the forms.

Mr. Robinson encouraged TAC members to contact him by email with additional comments.

Design Report for the Construction or Alteration of Virginia Regulated Impounding Structures. (DCR 199-101) (11-06)

Mr. Robinson noted this is the form for moving into the construction or alteration mode.

He said the exception is if a dam has failed and has been sitting idle. If the owner is about to rebuild the dam a construction permit would be needed. For repair work, an alteration permit would be needed.

Agricultural Exemption Application for Impounding Structures (DCR 199-106)(11-06)

Mr. Robinson noted this is similar to the existing form. He said that the old form allowed an owner to simply fill out the form to certify a dam for agricultural use. He said that the new form asks for further information to be provided. He noted that the DCR regional engineer will make a site visit to verify agricultural use.

A member noted that the regulations do not specify that agricultural dams are subject to review. He noted that there should be language to clarify in the event that surrounding circumstances with development, etc. change the classification of the dam.

Mr. Dowling said that had been added to the draft and noted that would be reviewed later in the meeting.

Other forms that are being modified, merged and/or eliminated

Mr. Robinson gave an overview of the following forms:

- Transfer Application for Impounding Structures (DCR 199-107)(12/01)
- Inspection Report for Virginia Regulated Impounding Structures (DCR 199-108)(11-06)
- Re-inspection Report for Class I and II Impounding structures. (DCR 199-105)(12/01)
- Inventory Report for Class III and Class IV Impounding Structures (DCR 199-104)(12/01)
- Emergency Preparedness Plan for Virginia Regulated Impounding Structures (DCR 199-103)(11-06)
- Emergency Action Plan for Class I, Class II and Class III Impounding Structures
- (DCR 199-103)(12/03)

Dam Deregulation

Mr. Robinson reviewed the suggested language for this section.

In Section 95 of the draft, Mr. Robinson noted that in order for an owner to deregulate a dam, or to remove a dam, the owner needs to notify DCR in writing the reasons for removing the structure.

Agricultural Exemptions

Mr. Robinson reviewed Section 165.

He noted that the language required that agricultural dams be certified every six years.

Mr. Maroon asked if dams had an agricultural exemption could they be required to certify every six years.

Mr. Brown said that if the dams are not subject to the regulations it would be difficult to do so.

Staff indicated they would reconsider the language.

Fees

Mr. Dowling reviewed the section on Fees.

Mr. Dowling said that several years ago the General Assembly maintained language in the Appropriation Act that gave the Department the authority to effectuate fees in the Dam Safety program. It had language that permitted DCR to recover up to "90 percent of the cost of inspection, plan administrative review and certification through a cost recovery system."

This is something DCR has been working on for a number of years.

The past Session, the Dam Safety law was also amended to include this authority for the Board to collect fees.

He noted that the proposed fees were based on what other states have used. The Appropriation Act said DCR may recover up to 90% of its program administration costs. However, the costs are somewhere over half a million dollars.

Mr. Dowling said DCR's goal was not to recover the total authorized amount, but to try to raise sufficient funds to cover the costs of an additional engineer on staff.

Mr. Dowling reviewed the draft language.

A member asked about DCR's legislative requirement for establishing fees and whether that could only be done by regulation.

It was clarified that, to make a fee change, it must be done through the regulatory process.

Concern was expressed regarding a provision for cost of living.

A member asked why normal operating fees were higher than conditional fees.

Mr. Robinson explained that the conditional fees covered a shorter time frame.

A member asked what would happen if a dam owner paid the fee and the dam wasn't certified or if they paid the wrong fee.

Mr. Dowling said the fees would be handled through the finance division and the engineer would not have to deal directly with those fees.

In the event of the payment of the wrong fee, a reimbursement would be issued.

Mr. Maroon said that it might be more appropriate for the application to be submitted, then have the fee later assessed based on a review of the application materials and the hazard category determination. The fee must then be paid prior to the issuance of a certificate or permit.

Ms. Hulburt said in that case the fee would be tied to the issuance of the certificate or permit, not the application.

A member expressed concern with fees in general saying that owners already don't want to submit information.

Mr. Maroon said that the fee issue came from the General Assembly recognition that DCR needs more staff. Rather than allocating additional funding, they gave DCR the authority to collect fees.

Table 1 including minimum thresholds

Mr. Lyons noted that he had distributed via email the criteria used by NRCS. A copy of that email is available from DCR. He recommended that Table 1 be amended for clarity and ease of use.

Mr. Lyons said the minimum safety criteria should be based on hazard classification.

He said these suggestions were for ease of application and clarity.

Mr. Lyons suggested that Table 1 be amended to remove size references and establish criteria as Low hazard = 0.2 PMF, Significant = 0.5 PMF, High = PMF.

Mr. Lyons said that he believed the requirement of full PMF criteria for significant hazard structures is too stringent and that a different approach may be warranted. He said that it is important to keep in mind that the hazard classification should drive the minimum criteria and that engineering concerns such as Operation and Maintenance and liability should drive the need for individual dam owners to use criteria greater than the minimum based on engineering judgment.

Mr. Lyons said the minimum threshold values for the incremental damage assessment could be set at 0.5 PMF, 100 year and that by definition there should be no IDA performed for a low hazard structure.

A member said that he liked the concept put forward by Mr. Lyons. He said that the standard gives reasonable flexibility.

Ms. Hulburt clarified that members were saying that if a dam meets the full PMF it is a high hazard dam. A "significant" dam would not be the full PMF.

Mr. Lyons said that these revisions would establish the minimum safety criteria based on hazard classification.

Ms. Hulburt clarified that the baseline for a "significant" dam would be 0.5 PMF and that this amount could be reduced through incremental analysis.

Ms. Hulburt said that the issue was hazard classification and risk assessment. If the hazard classification is correct, then the size of the dam is not a relevant issue.

A member said that the issue of size was not relevant, but rather the amount of liability assumed by the Commonwealth. He noted that a half PMF is a significant storm and that two recent deaths were due to a much smaller storm.

There was general support from the TAC for Mr. Lyon's proposed revisions to Table 1.

Mr. Maroon said that DCR and the Board would take that under consideration but that he was not yet ready to commit to those revisions. He said that DCR has spent months working on the concept and that Table 1 is at the heart of the regulations.

General Provisions – Section 20E

Ms. Hulburt referenced a prior e-mail from Dr. Rainey.

Dr. Rainey said in the e-mail: I propose that section 20E, starting on line 31 read, "The board recognizes that safety must be evaluated in the light of peculiarities and local topography and meteorological conditions for each impounding structure. In recognition of the many factors involved, some of which may not be precisely known, determinations relative to this chapter shall be conducted utilizing component, experienced, engineering judgment."

Dr. Rainey said that the way draft read there was concern that subjectivity might not be permissible. He noted a concern with the removal of the word "subjectivity."

Mr. Browning said the language in question was moved from Table 1.

Mr. Maroon said that staff would take another look at Dr. Rainey's concerns.

Other topics as requested by the TAC

A member suggested that there needed to be a statement regarding the final step of the process of the alteration.

Another member expressed concern regarding the references to a detailed construction schedule. He said that normally the means and methods are left up to the contractor.

The member said that he was not comfortable with any permitting that requires a schedule. He said that it detracts from the safety of the project.

Another member said that he generally reviewed the site plan but did not look for a detailed schedule. He suggested sequence might be better wording.

Members agreed that contractors needed the latitude to adjust the schedule.

Mr. Robinson said this language originally came from a concern that the Board was dealing with dams that had construction permits that were 10 years or more in age.

A member suggested striking the word "detailed" in favor of "a construction plan is required."

Regarding the delayed effective date for spillway designs flood requirements a member said that five years is reasonable but expressed a concern about dates that extended to seven or more years.

It was clarified that this only included those dams currently under certificate where the classification would change because of changes in the regulations.

Ms. Hulburt said that DCR would work on clarification of this language.

It was suggested that these dams be given two year from the effective date of the regulation to come into compliance.

At this time the committee took a break.

Following the break, Ms. Hulburt referenced several items associated with the Emergency Action Plan and the Emergency Preparedness Plan.

She noted that the EAP outline provided within the regulation allowed for owner discretion on specifics but identified the general information that needed to be included in the EAP.

It was noted that on the current forms the Emergency Action Plan was for dams in all three categories. Under the new draft, the Emergency Preparedness Plan is for low hazard dams while the Emergency Action Plan is for high or significant hazard dams.

Under the Emergency Preparedness Plan language indicated that an owner must demonstrate that he or she has notified local emergency management of the plan.

Ms. Hulbert noted that under Section 177 low hazard dams would be required to provide the following information:

1. Current contact name and contact information, including phone number;
2. Physical location of the dam;
3. A procedure for notifying any downstream properties potentially impacted by the dam's failure;
4. A simple dam break inundation map, acceptable to the Director, demonstrating the general inundation that result from a dam failure. Such maps do not require preparation by a professional licensed engineer; and
5. Certification by the owner and the local organization for emergency management.

A member expressed concern about owners of low hazard dams having to obtain two signatures, the owner and the local emergency management organization, for the plan.

Mr. Maroon suggested that for the low hazard dams there could be a provision that allows owners to show they have an Emergency Preparedness plan without obtaining two signatures. He noted that, by definition, low hazard means there is no concern for life and property. He said that notification might be better than having to have a certified plan.

A member noted the reference to inundation maps and said that owner drawn inundation maps are not necessarily accurate. He suggested that the regional dam safety engineer was better prepared to draft these maps. He noted that the issue with the inundation maps was to identify the distinctions between low and high hazard dams.

It was suggested that requirement be that inundation maps are acceptable to the Director. That would give the Director latitude to delegate the responsibility for approval of the map.

Ms. Hulburt suggested it would be better to designate Director approval rather than Department approval.

Ms. Hulburt asked if there were further issues to be addressed at this meeting. Members suggested that further issues and final review could be addressed at the final meeting on October 31, 2006. That meeting will be held at Virginia Commonwealth University in Richmond.

Attachment #1

Version: Tuesday, October 10, 2006
VIRGINIA IMPOUNDING STRUCTURE REGULATIONS (§ 4 VAC 50-20)

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~~ 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 62.1of the Code of Virginia, and other provisions of law as may be applicable.

C. In promulgating this chapter, the ~~board~~ 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. Any engineering analysis required by this chapter such as plans, specifications, hydrology, hydraulics and inspections shall be conducted 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.

~~E~~ F. The official forms as called for by this chapter are available from the Department ~~director~~.

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §1.2, eff. February 1, 1989.

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 (one foot of depth over one acre of area).

"Agricultural purpose dams" means dams which are less than 25 feet in height or which create a maximum impoundment smaller than 100 acre-feet, ~~and~~ are certified by the owner on official forms as ~~constructed, maintained or~~ operated primarily for agricultural purposes, and are approved by the Director.

"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. Alterations do not include normal operation and maintenance.

"Alteration permit" means a permit required for ~~changes~~ any alteration to an impounding structure ~~that could alter or affect its structural integrity~~. ~~Alterations requiring a permit include, but are not limited to: changing the height, increasing the normal pool or principal spillway elevation, changing the elevation or physical dimensions of the emergency spillway or removing the 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.

"Design freeboard" means the vertical distance between the maximum elevation of the design flood and the top 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 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.

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

"Height" means the structural 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 outside limit of the barrier to the top of the impounding structure.

"Impounding structure" means a man-made ~~device~~ structure, whether a dam across a watercourse or other 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 ~~constructed, maintained or~~ 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.

~~"Inundation zone" means an area that could be inundated as a result of impounding structure failure and that would not otherwise be inundated to that elevation.~~

"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 in acre-feet that is capable of being impounded at the top of the impounding structure.

"Normal impounding capacity" means the volume in acre-feet that is capable of being impounded at the elevation of the crest of the lowest un-gated outlet from the impoundment.

"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" includes the Commonwealth or any of its political subdivisions, including but not limited to sanitation district commissions and authorities. Also included are 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.

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

"Sunny Day Dam Failure" means the breaching of an impounding structure caused by piping through an earthen embankment or appurtenance with the initial water level at the normal reservoir level, usually at the lowest ungated principle 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 flows when it normally does flow.

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.
Effect of Amendment: The July 1, 2002 amendment revised the definitions for "director" and "impounding structure".

4VAC50-20-40. Hazard Potential Classifications ~~Classes~~ of impounding structures.

A. Impounding structures shall be classified in one of ~~four~~ three hazard classifications ~~categories according to size and hazard potential,~~ as defined in ~~subsection B of this section and~~ Table 1. ~~Size classification shall be determined either by maximum impounding capacity or height, whichever gives the larger size classification.~~

B. For the purpose of this chapter, hazards pertain to potential loss of human life or ~~property~~ 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 classes of dams are as follows.

1. ~~Impounding structures in the Class I hazard potential category are located where~~ High Hazard Potential is defined where an impounding structure failure will cause probable loss of life or serious economic damage. Economic damage may include, but not be limited to, occupied building(s), industrial or commercial facilities, ~~important~~

primary public utilities, ~~main highway(s) or~~ major public roadways, ~~railroad(s)~~ railroads, personal property, and agricultural interests.

2. ~~Impounding structures in the Class II hazard potential category are located where~~ Significant Hazard Potential is defined where an impounding structure failure ~~could~~ may cause ~~possible~~ the loss of life or appreciable economic damage. Economic damage may include, but not be limited to, occupied building(s), industrial or commercial facilities, secondary public utilities, secondary public roadways, railroads, personal property, and agricultural interests. ~~highway(s) or railroad(s) or cause interruption of use or service of relatively important public utilities~~.

3. ~~Impounding structures in Class III hazard potential category are located where~~ 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. Economic damage may include, but not be limited to, occupied building(s), industrial or commercial facilities, secondary public utilities, secondary public roadways, railroads ~~or~~ personal property, and agricultural interests ~~may cause minimal property damage to others. No loss of life is expected~~.

~~4. Impounding structures in Class IV hazard potential category are located where the failure of the impounding structure would cause no property damage to others. No loss of life is expected.~~

~~5~~ C. ~~Such size and~~ The hazard potential classification and size ~~classifications~~ category shall be proposed by the owner and shall be subject to approval by the ~~director~~ Director. To conclusively determine the appropriate hazard potential classification, dam break analysis shall be conducted by the owner. Present and ~~projected development of~~ planned land-use in the dam break inundation zone~~s~~ downstream from the impounding structure shall be considered in determining the classification.

~~6~~ 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.

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

A. In accordance with the definitions provided by Virginia Code § 10.1-604 and 4VAC50-20-30, an impounding structure shall be regulated if the dam is 25 feet or greater in height and creates a maximum impounding capacity of 15 acre-feet or greater, or the dam 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 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 which are less than 25 feet in height or which 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 ~~new~~ 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, Maximum Impounding Capacity and Height shall be determined in accordance with the definitions provided in 4 VAC 50-20-30 and Hazard Potential Classification shall be determined in accordance with 4VAC 50-20-40.

TABLE 1--Impounding Structure Regulations

~~Class of Dam~~	~~Hazard Potential If Impounding Structure Fails~~	~~SIZE CLASSIFICATION~~ ~~Maximum Capacity (Ac-Ft)[a]~~	~~Height(Ft)[a]~~	~~Spillway Design Flood (SDF)[b]~~
~~I~~	~~Probable Loss of Life; Excessive Economic Loss~~	~~Large ≥ 50,000~~ ~~Medium ≥ 1,000 & <50,000~~ ~~Small ≥ 50 & < 1,000~~	~~≥ 100~~ ~~≥ 40 & < 100~~ ~~≥ 25 & < 40~~	~~PMF[c]~~ ~~PMF~~ ~~1/2 PMF to PMF~~
~~II~~	~~Possible Loss of Life; Appreciable Economic Loss~~	~~Large ≥ 50,000~~ ~~Medium ≥ 1,000 & <50,000~~ ~~Small ≥ 50 & < 1,000~~	~~≥ 100~~ ~~≥ 40 & < 100~~ ~~≥ 25 & < 40~~	~~PMF[D]~~ ~~1/2 PMF to PMF~~ ~~100-YR to 1/2 PMF~~
~~III~~	~~No Loss of Life Expected; Minimal Economic Loss~~	~~Large ≥ 50,000~~ ~~Medium ≥ 1,000 & <50,000~~ ~~Small ≥ 50 & < 1,000~~	~~≥ 100~~ ~~≥ 40 & < 100~~ ~~≥ 25 & < 40~~	~~1/2 PMF to PMF~~ ~~100-YR to 1/2 PMF~~ ~~50-YR[d] to 100-YR[e]~~
~~IV~~	~~No Loss of Life Expected; No Economic Loss to Others~~	~~≥ 50 (non-agricultural)~~ ~~≥ 100 (agricultural)~~	~~≥ 25 (both)~~	~~50-YR to 100-YR~~

Hazard Potential Class of Dam	SIZE CATEGORIES[B] Maximum Impounding Capacity (Ac-Ft)	Height (Ft)	Spillway Design Flood (SDF)[C]	Minimum Threshold for Incremental Damage Assessment
HIGH	All[B]	All[B]	PMF[D]	.50 PMF
SIGNIFICANT	Large ≥ 1,000 Small ≥ 15 & < 1,000	> 40 ≥ 6 & < 40	PMF[D] .50 PMF	.50 PMF 100-YR[E]

LOW	Large ≥ 50,000	≥ 100	.50 PMF	100-YR[E]
	Small ≥ 15 & < 50,000	≥ 6 & < 100	100-YR[E]	50-YR[F]

~~a~~B. ~~The factor determining the largest size classification shall govern.~~ The appropriate size category ~~classification~~ is determined by the largest size associated with the maximum impounding capacity and height of the impounding structure.

~~b~~C. 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. ~~Where a range of SDF is indicated, the magnitude that most closely relates to the involved risk should be selected.~~ Reductions in the established SDF may be evaluated through the use of incremental damage assessment pursuant to 4 VAC 50-20-52. The SDF established for an impounding structure shall not be less than those standards established elsewhere in regulations including but not limited to the Virginia Soil and Water Conservation Board Regulations for stormwater management impoundment structures and facilities. ~~The establishment in this chapter of rigid design flood criteria or standards is not intended. Safety must be evaluated in the light of peculiarities and local conditions for each impounding structure and in recognition of the many factors involved, some of which may not be precisely known. Such can only be done by competent, experienced engineering judgment, which the values in Table 1 are intended to supplement, not supplant.~~

~~c~~D. PMF: Probable ~~maximum~~ Maximum ~~flood~~ Flood. ~~This means~~ 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 local topography or meteorological conditions will cause changes from the generalized PMP values; therefore, it is advisable to contact local, state or federal agencies to obtain the prevailing practice in specific cases.~~ 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, 24 hour durations. The hydrograph that creates the largest peak outflow is to be used to determine capacity for non-failure and failure analysis. Present and planned land-use conditions shall be considered in determining the runoff characteristics of the drainage area.

E. 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.

~~d~~F. 50-Yr: 50-year flood~~. This means~~ 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.

~~e. 100-Yr: 100-year flood. This means 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.~~

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.
Effect of Amendment: The July 1, 2002 amendment corrected the "greater than" and "equal than" signs in Table 1.

4VAC50-20-52. Incremental damage assessment.

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

B. Prior to qualifying for a spillway design flood reduction, certain maintenance conditions must be adequately addressed including, but not limited to, the following:

1. Operation and maintenance is determined by the Director to be satisfactory and up to date;

2. The impounding structure is not in need of other alteration related to the integrity of the structure;

3. Emergency Action Plan requirements setout in 4 VAC50-20-175 or Emergency Preparedness requirements setout in 4VAC50-20-177 have been satisfied;

4. Reporting requirements have been met and are considered satisfactory, by the Director;

5. The applicant demonstrates in accordance with the current design procedures and references of 4VAC50-20-320 to the satisfaction of the Board that the impounding structure as designed, constructed, operated and maintained does not pose an unreasonable hazard to life and property;

6. The owner satisfies all special requirements imposed by the Board: and

7. Certification by the owner that these conditions will continue to be met.

C. After meeting the criteria setout in 4VAC50-20-52B, the owner's engineer may proceed with evaluating the 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 incremental damage assessment. This assessment may be used to lower the spillway design flood. Allowable reductions are set out in subsection D, however, in no situation shall be the reduction be less than the level at which the incremental increase in water surface elevation downstream due to failure of a dam is no longer considered to present an unacceptable additional downstream threat. This engineering analysis will water surface elevations at each structure that may be impacted downstream of the dam. Water depths greater than two feet and overbank flow velocities greater than three feet per second shall be used to determine impacts to persons or property. Water depth changes less than two feet and overbank flow velocities less than three feet per second may be considered as ineffective to structures downstream of the dam.

D. Allowable reductions are as follows:

1. For High Hazard Potential impounding structures, the spillway design flood shall not be less than .50 PMF.

2. For Large Significant Hazard Potential impounding structures, the spillway design flood shall not be less than .50 PMF. For Small Significant Hazard Potential impounding structures, the spillway design flood shall not be less than 100-YR.

2. For Large Low Hazard Potential dams, the spillway design flood shall not be less than 100-YR. For Small Low Potential Hazard impounding structures, the spillway design flood shall not be less than 50-YR.

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

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

A. All inundation mapping should extend downstream of the dam where failure of the dam does not constitute a hazard to downstream life or property. 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 a non-dam failure event are within one foot of each other. The inundation maps shall be supplemented with water surface profiles at critical areas showing the water surface elevation prior to failure and the peak water surface elevation after failure.

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

C. 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; and

3. A dam break analysis utilizing the spillway design flood without a dam failure.

D. To meet the requirements of Emergency Preparedness setout 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.

E. To meet the requirements of the Emergency Action Plan requirements setout 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, and other pertinent structures on the map within the identified inundation area that may be subject to possible danger. The list

and telephone numbers of downstream residents, who are in the inundation zones, should whenever possible be plotted on the map, for easy reference in the case of emergencies.

2. Since local officials are likely to use the maps for evacuation purposes, a note should be included on the map to advise that, because of the method, procedures, and assumptions used to develop the flooded areas, the limits of flooding shown and flood wave travel times are approximate and should be used only as a guideline for establishing evacuation zones. Actual areas inundated will depend on actual failure conditions and may differ from areas shown on the maps.

4VAC50-20-58. Local government notifications.

For each certificate issued, the impounding structure owner shall send to the appropriate local government office, with planning and zoning responsibilities, a copy of the certificate, a description and the map(s) required under 4VAC50-20-54 showing the area that could be affected by the impounding structure breach. This notification would also serve to advise the locality that if development occurs in the dam break inundation zone that this could adversely affect the classification of the dam and require significant expenses to upgrade the impounding structure.

Part II: Permit Requirements

4VAC50-20-60. Required permits.

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

B. No person or entity shall alter or begin to alter an existing impounding structure ~~in a manner which would potentially affect its structural integrity~~ until the ~~board~~ Board has issued an alteration permit.~~, or in the case of an emergency, authorization obtained from the director~~. If an owner or the owner's engineer has determined that circumstances are impacting the integrity of the impounding structure, which could result in the imminent failure of the impounding structure, temporary repairs may be initiated prior to approval from the Director. The owner shall notify the Department within 24 hours of identifying the circumstances impacting the integrity of the impounding structure. The permit requirement may be waived if the ~~director~~ Director determines that the alteration of improvement will not substantially alter or affect the structural integrity of the impounding structure. ~~Alteration does not mean normal operation and maintenance.~~

C. When the ~~board~~ Board receives an application for any permit to construct or alter an impounding structure, the ~~director~~ Director shall inform the government of any jurisdiction which might be affected by the permit application.

D. In evaluating construction and alteration permit applications the ~~director~~ Director shall use the most current design criteria and standards referenced in 4VAC50-20-320 of this chapter.

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §2.1, eff. February 1, 1989.

4VAC50-20-70. Construction permits.

A. Prior to preparing the complete design report for a construction permit, applicants ~~are encouraged to seek approval from the director~~ shall submit the preliminary design report to the Department to determine if the project concept is acceptable to the Department. ~~For this purpose the applicant should submit a~~ The preliminary design report should contain, at a minimum, a general description of ~~subdivisions~~ items 1 through 4 of subsection B of this section and subdivisions 1 and 2 of this subsection:

1. Proposed design criteria and a description of the size, ground cover conditions, extent of current development of the watershed, jurisdictional comprehensive planning for development of the watershed, and the hydraulics and hydrology, structural, geologic and the geotechnical engineering assumptions used to determine the foundations 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 on the official ~~forms~~ Department form. The design report shall be prepared in accordance with 4VAC50-20-240 and shall ~~include the following information:~~ be consistent with the acceptable preliminary design report. The design report is a required element of a complete application and shall include the following information:

1. A description of the impounding structure and appurtenances and a proposed classification conforming with this chapter. The description shall include a statement of the purposes for which the impoundment and impounding structure are to be used.

2. 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 residential structures, buildings, roads, utilities and other property that would be endangered should the impounding structure fail.

3. A statement from the governing body of the local political subdivision or other evidence confirming that the body is aware of the proposal to build an impounding structure and that ~~of~~ the land use classifications ~~applicable to~~ are compatible with the dam break inundation zone.

4. 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, access to the site and the outline of the impoundment. Existing aerial photographs or existing topographic maps may be used for this purpose.

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

6. 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 reservoir operations, including rapid filling, flood surcharge, seismic loadings and rapid drawdown of the impoundment.

7. Evaluation of the stability of the reservoir rim area in order to safeguard against reservoir rim slides of such magnitude as to create waves capable of overtopping the impounding structure and confirmation of rim stability during seismic activity.

8. 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 of the impounding structure.

9. Calculations and assumptions relative to design of the spillway or spillways. Spillway capacity shall conform to the criteria of Table 1.

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

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

~~12. Erosion and sediment control plans to minimize soil erosion and sedimentation during all phases of construction, operation and maintenance. Projects shall be in compliance with local erosion and sediment control ordinances.~~

~~13~~12. A description of the techniques to be used to divert stream flow during construction so as to prevent hazard to life, health and property. Such diversion plans shall also be in accordance with applicable environmental laws.

~~14~~13. A plan of quality control testing to confirm that construction materials and methods meet the design requirements set forth in the specifications.

~~15. A proposed schedule indicating construction sequence and time to completion~~.

~~16~~14. Plans and specifications as required by 4VAC50-20-310.

~~17. An emergency action plan on official forms and evidence that a copy of such plan has been filed with, the local organization for emergency management and the State Department of Emergency Management. The plan shall include a method of providing notification and warning to persons downstream, other affected persons or property owners and local authorities in the event of a flood hazard or the impending failure of the impounding structure.~~

~~18. A proposed impoundment and impounding structure operation and maintenance plan on official forms certified by a professional engineer. This plan shall include a safety inspection schedule and shall place particular emphasis on operating and maintaining the impounding structure in keeping with the project design, so as to maintain its structural integrity and safety during both normal and abnormal conditions which may reasonably be expected to occur during its planned life.~~

~~C. The director or the applicant may request a conference to facilitate review of the applicant's proposal~~.

C. The construction schedule is a required element of a complete application and shall include:

1. A detailed construction schedule that has been agreed to by the owner, engineer and contractor.

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

5. A detailed plan and procedures to maintain a stable impounding structure during storm events.

~~D. The owner shall certify in writing that the operation and maintenance plan as approved by the board will be adhered to during the life of the project except in cases of unanticipated emergency requiring departure therefrom in order to mitigate hazard to life and property. At such time, the owner's engineer and the director shall be notified.~~

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

1. A notification list of emergency response agencies, including any affected local governments:

2. A drawing showing temporary diversion devices:

3. Potential impoundment during the construction:

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

5. Construction site evacuation routes, and

6. Any other special notes particular to the project.

~~E. If the submission is not acceptable, the director shall inform the applicant within 60 days and shall explain what changes are required for an acceptable submission.~~

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 official Department form, with attachments as needed, and certified by the owner;

2. A Construction schedule which meets the requirements of subsection C above; and

3. A Temporary Emergency Action Plan which meets the requirements of subsection D above.

~~F. Within 120 days of receipt of an acceptable design report the board shall act on the application.~~

~~G~~F. Prior to and during construction the owner shall notify the director of any proposed changes from the approved design, plans, specifications, or ~~operation and maintenance plan~~ construction schedule. Approval shall be obtained from the director prior to the construction or installation of any changes that will affect the ~~stability~~ integrity or impounding capacity of the impounding structure.

~~H~~G. The construction permit shall be valid for the construction schedule specified in the ~~approved design report~~ construction permit application. The construction schedule may be amended by the director for good cause at the request of the applicant.

~~I~~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 construction schedule and temporary emergency action plan.

~~J~~I. The director may ~~revoke a construction permit~~ issue a temporary stop work order pursuant to § 10.1-612.1 of the Code of Virginia and take any other action authorized by the Dam Safety Act (§ 10.1-604 et seq. of the Code of Virginia) if any of the permit terms are violated, or if construction is conducted in a manner hazardous to downstream life or property. ~~The director may order the owner to eliminate such hazardous conditions within a period of time limited by the order. Such corrective measures shall be at the owner's expense. The applicant may petition the board to reissue the permit with such modifications as the board determines to be necessary.~~

~~K~~J. The owner's licensed professional engineer shall advise the ~~director~~ Director when the impounding structure construction is complete and may safely impound water. If an Operation and Maintenance Application, an Emergency Action Plan or Emergency Preparedness requirements have been received and approved, ~~The~~ the ~~director~~ Director shall ~~acknowledge this statement~~ issue a letter within 10 working days~~,~~ of receipt of the completion notification authorizing that ~~after which~~ the impoundment may be filled under the engineer's ~~supervision~~ direction. If the submission of the ~~an~~ Operation and Maintenance Application, ~~the~~ Emergency Action Plan or Emergency Preparedness requirements are not acceptable, the Director shall inform the applicant within 10 working days and shall explain what changes are required for an acceptable submission. The ~~director's~~ Director's ~~acknowledgement~~ letter authorizing that the impoundment may be filled shall also act as a temporary ~~operation~~ Operation and ~~maintenance certificate~~ Maintenance Certificate, for a maximum of 150 days, until ~~an~~ a Regular Operation and ~~maintenance certificate~~ Maintenance Certificate has been ~~applied for and~~ issued in accordance with 4VAC50-20-110.

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.
Effect of Amendment: The July 1, 2002 amendment, in the second sentence of subsection A, changed "items" to "subdivisions" twice, inserted "of this section" and "of this subsection", and deleted "below" after "1 and 2"; in subsections B and K, and in paragraph B 16, deleted "of this chapter" after theVACcitation; and, in paragraph B 17, inserted "organization for emergency management", inserted "the" before "State Department", and changed "Services" to "Management" after "Emergency".

4VAC50-20-80. Alterations permits.

~~A. Application for a permit to alter an impounding structure in ways which would potentially affect its structural integrity shall be made on official forms. The application shall clearly describe the proposed work with appropriately detailed plans and specifications.~~

~~B.~~ A. Alterations which would potentially affect the structural integrity of an impounding structure include, but are not limited to, changing ~~its~~ the height or otherwise enlarging the dam, increasing ~~the~~ 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.

B. An applicant for an alteration permit shall submit a design report on the official Department form. 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. A description of the proposed remedial work to be performed including a plan view of the dam site representing all significant structures and improvements that precisely illustrate the location of all proposed work.

2. A description of the benefits that the proposed remedial work will have on the impounding structure.

3. Local government acknowledgement of alteration and repair plan.

4. Construction plans and specifications showing details of the proposed work.

5. Geotechnical investigations in the areas affected by the proposed alterations as necessary.

6. Design assumptions and analyses sufficient to indicate that the impounding structure will be stable during the alteration and during the life of the impounding structure under all conditions of reservoir operations.

7. Calculations and assumptions relative to design of the improved spillway or spillways, if applicable.

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

9. 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 profile of the dam break inundation zones.

10. 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. Such diversion plans shall be in accordance with the applicable environmental laws and endorsed by the local code official.

11. A plan of quality control testing to confirm that materials used in the alteration work and the engineering methods used do meet the design requirements set forth in the specifications.

~~C. Where feasible an application for an alteration permit shall also include plans and specifications for a device to allow for draining the impoundment if such does not exist.~~

C. The alteration schedule shall include:

1. A detailed construction schedule that has been agreed to by the owner, engineer and contractor.

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.

4. A detailed plan and procedures to maintain a stable impounding structure during storm events, if applicable.

~~D. If the submission is not acceptable, the director shall inform the applicant within 60 days and shall explain what changes are required for an acceptable submission.~~

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, submitted on the official Department form, with attachments as needed, and certified by the owner,

2. Alteration schedule which meets the requirements of subsection D above, and

3. Any necessary interim provisions to the current Emergency Action Plan or Emergency Preparedness requirements. Revisions shall be submitted to the local organization for emergency management, the Virginia Department of Emergency Management, and the Department.

~~E. Within 120 days of receipt of an acceptable application, the board shall act on the application.~~

E. During the alteration work the owner shall notify the Director of any proposed changes from the approved design, plans, specifications, or alteration schedule ~~work plan~~. 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. If an owner or the owner's engineer have determined that circumstances are impacting the integrity of the impounding structure, which could result in the imminent failure of the impounding structure, temporary repairs may be initiated prior to approval from the Director. The owner shall notify the Department within 24 hours of identifying the circumstances impacting the integrity of the dam.

F. The Alteration Permit shall be valid for the alteration schedule specified in the approved alteration permit application. The alteration schedule may be amended by the Director for good cause at the request of the applicant.

G. Work identified in the Alteration Permit must commence with the time frame identified in the Alteration Certificate. 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 appropriately updated alteration schedule.

H. The Director may issue a temporary stop work order pursuant to § 10.1-612.1 of the Code of Virginia and take any other action authorized by the Dam Safety Act (§ 10.1-604 et seq. of the Code of Virginia) if any of the permit terms are violated, or if construction is conducted in a manner hazardous to downstream life or property.

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §2.3, eff. February 1, 1989.

4VAC50-20-90. Transfer of permits.

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 application on official forms. 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.

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §2.4, eff. February 1, 1989.

4VAC50-20-95. Deregulation of impounding structures

A. An owner shall provide a written request to initiate the deregulation of an impounding structure. The request will specify whether the impounding structure is to be:

1. removed so that the impounding structure is incapable of storing water, either temporarily or permanently; or

2. 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.

The written request shall adequately describe and illustrate the removal or alteration of the impounding structure.

B. The Department will review the letter of intent and issue an approval if appropriate.

C. The Department's approval shall not relieve the owner from complying with all other state and federal laws and associated regulations.

D. Upon completion of the removal or alteration, the owner shall notify the Department by letter. Upon receiving the notification, the Department will make a site inspection to verify the removal or alteration work. If the works has been performed properly, the Board shall certify the deregulation to the owner.

Part III: Certificate Requirements

4VAC50-20-100. Regular Operation and ~~maintenance~~ Maintenance ~~certificates~~ Certificates.

A. A ~~Class I~~ High Hazard Potential Regular Operation and Maintenance Certificate is required for a ~~Class I~~ High Hazard potential impounding structure. The ~~certificate~~ Certificate shall be for a term of six years. It shall be updated based upon the filing of a new ~~reinspection~~ Inspection ~~report~~ Report certified by a licensed professional engineer every two years.

B. A ~~Class II~~ Significant Hazard Potential Regular Operation and Maintenance Certificate is required for a ~~Class II~~ Significant Hazard potential impounding structure. The ~~certificate~~ Certificate shall be for a term of six years. It shall be updated based upon the filing of a new ~~reinspection~~ Inspection ~~report~~ Report certified by a licensed professional engineer every three years.

C. A ~~Class III~~ Low Hazard Potential Regular Operation and Maintenance Certificate is required for a ~~Class III~~ Low Hazard potential impounding structure. The ~~certificate~~ Certificate shall be for a term of six years. It shall be updated based upon the filing of a new Inspection Report certified by a licensed professional engineer every six years.

D. The owner of a ~~Class I, II or III~~ High, Significant or Low Hazard Potential impounding structure shall provide the ~~director~~ Director an annual owner's inspection report on official forms in years when no licensed professional ~~reinspection~~ inspection is required and may be done by the owner or his representative.

E. If ~~an~~ a Regular Operation and Maintenance Certificate is not updated as required, the ~~board~~ Board shall take appropriate enforcement action.

F. The owner of a ~~Class I, II or III~~ High, Significant or Low Hazard Potential impounding structure shall apply for the renewal of the six year ~~operation~~ Operation and ~~maintenance~~ Maintenance ~~certificate~~ Certificate 90 days prior to its expiration in accordance with 4VAC50-20-120 of this chapter.

~~G. A Class IV impounding structure will not require an operation and maintenance certificate. An inventory report is to be prepared as provided in 4VAC50-20-120 B and filed by the owner on a six-year interval, and an owners inspection report filed annually.~~

~~H~~G. The owner of any impounding structure, regardless of its hazard classification, shall notify the ~~board~~ Board immediately of any change ~~in either cultural features downstream from the impounding structure or of any change~~ in the use of the area downstream that would ~~present~~ impose hazard to life or property in the event of failure.

H. The owner of any impounding structure shall meet the Emergency Action Plan submittal requirements setout in 4VAC50-20-175 or Emergency Preparedness submittal requirements setout in 4VAC50-20-177.

I. The Director or the Board may require additional analysis to be conducted by the dam owner if additional public safety concerns warrant further investigation. 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.

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §3.1, eff. February 1, 1989.

4VAC50-20-110. Operation and ~~maintenance certificate~~ Maintenance Certificate for newly constructed impounding structures.

A. Within ~~180~~ 90 days after completion of the construction of an impounding structure, the owner shall submit:

1. A complete set of as-built drawings certified by a licensed professional engineer and an as-built report on ~~official forms~~ the Department form.

2. ~~A copy of a certificate~~ Certification from the licensed professional engineer who has inspected the impounding structure during construction ~~certifying~~ that, to the best of ~~his~~ 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.

~~3. A copy of the operation and maintenance plan and emergency action plan submitted with the design report including any changes required by the director.~~

~~B. If the director finds that the operation and maintenance plan or emergency action plan is deficient, he shall return it to the owner within 60 days with suggestions for revision.~~

~~C~~B. Within 60 days of receipt of the items listed in subsection A above, if the ~~board~~ Board finds that adequate provision has been made for the safe operation and maintenance of the impounding structure, the ~~board~~ Board shall issue ~~an~~ a Regular ~~operation~~ Operation and ~~maintenance~~ Maintenance ~~certificate~~ Certificate.

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §3.2, eff. February 1, 1989.

4VAC50-20-120. Operation and ~~maintenance certificates~~ Maintenance Certificates for existing impounding structures.

A. Any owner of ~~an~~ a High, Significant, or Low Hazard Potential impounding structure ~~other than a Class IV impounding structure~~ which has already filed an ~~inventory report~~ Inspection Report that does not have ~~an~~ a Regular ~~operation~~ Operation and ~~maintenance~~ Maintenance ~~certificate~~ Certificate or any owner renewing ~~an~~ a Regular ~~operation~~ Operation and ~~maintenance~~ Maintenance ~~certificate~~ Certificate shall file an application with the ~~board~~ Board.

B. The application for Operation ~~an~~ a Regular ~~operation~~ Operation and ~~maintenance~~ Maintenance ~~certificate~~ Certificate shall be on ~~official forms~~ the Department form and shall include:

1. ~~A~~ An ~~reinspection~~ Inspection ~~report~~ Report for ~~Class I and II~~ High, Significant, or Low Hazard Potential impounding structures. The ~~reinspection~~ Inspection ~~report~~ Report shall include an update of conditions of the impounding structure based on a previous safety inspection as required by the ~~board~~ Board, a previous ~~reinspection~~ Inspection ~~report~~ Report or an as-built report.

~~2. An inventory report for Class III impounding structures. The inventory report shall include:~~

~~a. The name and location of the impounding structure and the name of the owner.~~

~~b. The description and dimensions of the impounding structure, the spillways, the reservoir and the drainage area.~~

~~c. The history of the impounding structure which shall include the design, construction, repairs, inspections and whether the structure has ever been overtopped.~~

~~d. Observations of the condition of the impounding structure, reservoir, and upstream and downstream areas.~~

~~e. Any changes in the impounding structure, reservoir, and upstream and downstream areas.~~

~~f. Recommendations for remedial work.~~

~~3~~2. ~~An impoundment and impounding structure operation and maintenance plan~~ The Operation and Maintenance Application, completed on the Department form, certified by a licensed professional engineer. This ~~plan~~ Application ~~shall place~~ places particular emphasis on operating and maintaining the impounding structure in keeping with the project design in such manner as to maintain its structural integrity and safety during both normal and abnormal conditions which may reasonably be expected to occur during its planned life. The ~~safety inspection~~ Inspection ~~report~~ Report required by the ~~board~~ Board should be sufficient to serve as the basis for the ~~operation~~ Operation and ~~maintenance~~ Maintenance ~~plan~~ for a ~~Class I and II~~ High, Significant, or Low Hazard Potential impounding structure. ~~For a Class III impounding structure, the operation and maintenance plan shall be based on the data provided in the inventory report~~.

~~4~~3. An ~~emergency action plan~~ Emergency Action Plan developed in accordance with 4VAC50-20-175 or Emergency Preparedness requirements developed in accordance with 4VAC50-20-177 and evidence that ~~a copy~~ the required copies of such plan ~~has~~ have been filed with the Department, the local organization for emergency management and the State Department of Emergency Management. The plan shall include a method of providing notification and warning to persons downstream, other affected persons or property owners and local authorities in the event of a flood hazard or the potential or impending failure of the impounding structure.

C. The owner shall certify in writing in ~~that~~ the Operation ~~operation~~ and ~~maintenance~~ Maintenance ~~plan~~ Application ~~approved by the board~~ that operation and maintenance of the impounding structure will be adhered to during the life of the project except in cases of emergency requiring departure there from in order to mitigate hazard to life and property. ~~, at which time the owner's engineer, and the director shall be notified~~.

~~D. If the director finds that the operation and maintenance plan or emergency action plan is deficient, he shall return it to the owner within 60 days with suggestions for revision.~~

D. If the Operation and Maintenance Application, the Emergency Action Plan, or the Emergency Preparedness submittal is found to be not acceptable, the Director shall inform the applicant within 10 days and shall explain what changes are required for an acceptable submission.

E. Within 60 days of receipt of an acceptable application if the ~~board~~ Board finds that adequate provision has been made for the safe operation and maintenance of the impounding structure, the ~~board~~ Board shall issue ~~an~~ a Regular ~~operation~~ Operation and ~~maintenance~~ Maintenance ~~certificate~~ Certificate.

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes:Derived from VR625-01-00 §3.3, eff. February 1, 1989; Amended, Virginia Register Volume 18, Issue 14, eff. July 1, 2002.
Effect of Amendment: The July 1, 2002 amendment, in paragraph B 1, substituted "previous safety inspection as required by the board" for "Phase I or Phase II inspection as established by the U.S. Army

Corps of Engineers"; in the third sentence of paragraph B 3, substituted "safety inspection report required by the board" for "Phase I Inspection Report"; and, in paragraph B 4, substituted "local organization for emergency management and the State Department of Emergency Management" for "local and State Department of Emergency Services".

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

Those impounding structures determined to have an adequate spillway capacity prior to the effective date of these regulations, and that hold a current certificate to operate (regular or conditional certificates) but due to changes in these regulations that require modifications in the spillway capacity will have up to 5 years from the effective date of these regulations to upgrade their spillways. However, those impounding structures under a regular certificate will be issued a conditional certificate until the new spillway design flood requirements are adequately addressed. If circumstances change during the 5 year period that warrant more immediate repairs to the impounding structure, the Board may direct alterations sooner. The conditional certificate will contain a compliance schedule including but not limited to engineering studies, design efforts, financial plans, and a construction completion schedule. During this delay period, owners are required to address other deficiencies that may exist that are not related to the SDF. If warranted and the owner has demonstrated continual and substantial progress, the Board may issue a subsequent extension of the conditional permit.

~~**4VAC50-20-130. Existing impounding structures constructed prior to July 1, 1982.**~~

~~A. Many existing impoundment structures were designed and constructed prior to the enactment of the Dam Safety Act, and may not satisfy current criteria for new construction. The board may issue an operation and maintenance certificate for such structures provided that:~~

~~1. Operation and maintenance is determined by the director to be satisfactory and up to date;~~

~~2. Annual owner's inspection reports have been filed with and are considered satisfactory by the director;~~

~~3. The applicant proves in accordance with the current design procedures and references of 4VAC50-20-320 to the satisfaction of the board that the impounding structure as designed, constructed, operated and maintained does not pose an unreasonable hazard to life and property; and~~

~~4. The owner satisfies all special requirements imposed by the board.~~

~~B. When appropriate with existing impounding structures only, the spillway design flood requirement may be reduced by the board to the spillway discharge at which dam failure will not significantly increase the downstream hazard existing just prior to dam failure provided that the conditions of 4VAC50-20-130 A have been met.~~

4VAC50-20-135. Extension of Operation and Maintenance Certificates.

A. The Board may extend an Operation and Maintenance Certificate for impounding structures provided that:

1. Operation and maintenance is determined by the Director to be satisfactory and up to date;

2. The dam is not in need of other alteration related to the integrity of the structure;

3. Emergency Action Plan requirements setout in 4VAC50-20-175 or Emergency Preparedness requirements setout in 4VAC50-20-177 have been satisfied;

4. Annual owner's inspection reports have been consistently filed with, and are considered satisfactory, by the Director;

5. The applicant proves in accordance with the current design procedures and references of 4VAC50-20-320 to the satisfaction of the Board that the impounding structure as designed, constructed, operated and maintained does not pose an unreasonable hazard to life and property; and

6. The owner satisfies all special requirements imposed by the Board.

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §3.4, eff. February 1, 1989.

~~**4VAC50-20-140. Existing impounding structures constructed after July 1, 1982.**~~

~~The board may issue an operation and maintenance certificate for an impounding structure having a construction permit issued after July 1, 1982, and shall not require upgrading to meet new more stringent criteria unless the board determines that the new criteria must be applied to prevent an unreasonable hazard to life or property.~~

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §3.5, eff. February 1, 1989.

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

A. During the review of any ~~operation~~ Operation and ~~maintenance~~ Maintenance ~~application~~ Application should the ~~director~~ Director determine that the impounding structure has deficiencies of a nonimminent danger category, the ~~director~~ Director may recommend that the ~~board~~ Board issue a ~~conditional~~ Conditional ~~operation~~ Operation and ~~maintenance~~ Maintenance ~~certificate~~ Certificate.

B. The Conditional ~~operation~~ Operation and ~~maintenance~~ Maintenance ~~certificate~~ Certificate for ~~Class I, II and III~~ 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 determined by the ~~director~~ Director.

C. A ~~conditional~~ Conditional ~~certificate~~ Certificate may be ~~renewed~~ extended in accordance with the procedures of ~~4VAC50-20-120~~ 4VAC50-20-127 provided that annual owner inspection reports are on file, and the ~~board~~ Board determines that the owner is proceeding with the necessary corrective actions.

D. Once the deficiencies are corrected, the ~~board~~ Board shall issue ~~an~~ a Regular ~~operation~~ Operation and ~~maintenance~~ Maintenance ~~certificate~~ Certificate based upon ~~any required revisions to the original application~~ meeting the requirements of 4VAC 50-20-100.

E. The owner of any impounding structure, whether under conditional certificate or otherwise, shall meet the Emergency Action Plan requirements setout in 4VAC50-20-175 or the Emergency Preparedness requirements setout in 4VAC50-20-177.

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §3.6, eff. February 1, 1989.

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, dam 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.

4VAC50-20-165. Agricultural Exemption.

A. Impounding structures 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 are exempt from the Impounding Structure Regulations.

B. An owner seeking an agricultural exemption pursuant to §10.1-604 and 4VAC50-20-30 shall submit an Agricultural Exemption Application every 6 years.

C. The Agricultural Exemption Application shall be verified by the Department through a site visit and approved by the Director.

4VAC50-20-170. Transfer of certificates.

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 application on official forms. The new owner may elect to continue the current existing operation and maintenance certificate for the remaining term or he may apply for a new certificate in accordance with 4VAC50-20-120. If the owner elects to continue the existing certificate he shall amend the existing certificate 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 certificate.

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §3.8, eff. February 1, 1989.

4VAC50-20-175. Emergency Action Plan for High and Significant Hazard Dams.

A. In order to protect life during potential emergency conditions at a dam, and to ensure effective, timely action is taken should a dam emergency occur, an EAP shall be required for each impounding structure. The EAP shall be coordinated with the

Department of Emergency Management in accordance with §44-146.18. The EAP required by these regulations shall be incorporated into local and inter-jurisdictional emergency plans pursuant to §44-146.19.

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

C. An EAP shall be submitted every six years. For a High or Significant hazard impounding structure, the EAP shall be submitted with the dam owner's renewal of their regular operation and maintenance certificate application.

D. It is imperative that the dam owner furnish all holders of the EAP updates to the EAP immediately upon becoming aware of necessary changes to keep the EAP workable. Should a dam 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. A table-top exercise shall be conducted once every 3 years. Owners shall certify to the Department annually that an exercise has been completed and the statement shall include a critique of the exercise and any revisions or updates to the EAP or a statement that no revisions or updates are needed.

F. Dam owners shall test existing monitoring, sensing, and warning equipment at remote or unattended dams at least twice per year 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 dams that shows who is to be notified, by whom, and in what priority. The notification chart shall include contact information that assures 24-hour telephone coverage for all responsible parties.

2. Emergency Detection, Evaluation, and Classification - The EAP shall include a discussion of the procedures for timely and reliable detection, evaluation, and classification of an emergency situation to ensure that the appropriate course of action is taken based on the urgency of the situation. Where appropriate, the situations should address dam breaks that are imminent or in progress, a situation where the potential for dam 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 dam.

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 an inundation map that delineates the areas that would be flooded as a result of a dam failure. All properties identified within the dam break inundation zone shall be incorporated into the EAP's dam break inundation zone map to ensure the proper notification of persons downstream and other affected persons or property owners in the event of a flood hazard or the impending

failure of the impounding structure. Such maps shall be developed in accordance with 4VAC50-20-52.

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 dam break floods; plans for training, exercising, updating, and posting the EAP; and other site-specific concerns.

7. Certification – The EAP ~~plan~~ shall include a section that is signed by all parties with assigned responsibilities in the EAP, where they indicate their approval of the EAP ~~plan~~ and agree to their responsibilities for its execution. 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.

H. The development of the EAP shall be coordinated with all entities, jurisdictions, and agencies that would be affected by a dam failure or that have statutory responsibilities for warning, evacuation, and post-flood actions. Consultation with state and local emergency management officials at appropriate levels of management responsible for warning and evacuation of the public is essential to ensure that there is agreement on their individual and group responsibilities.

I. The EAP shall at a minimum be filed with the Department, the local organization for emergency management, and the State Department of Emergency Management. Two copies shall be provided to the Department.

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

Title Page/Cover Sheet
Table of Contents
I. Certifications
II. Notification Flowchart
III. Statement of Purpose
IV. Project Description
V. Emergency Detection, Evaluation, and Classification
VI. General Responsibilities Under the EAP
- A. Dam Owner Responsibilities
- B. Responsibility for Notification
- C. Responsibility for Evacuation
- D. Responsibility for Termination and Follow-Up
- E. EAP Coordinator Responsibility

VII. Preparedness
VIII. Inundation Maps
IX Appendices
- A. Investigation and Analyses of Dambreak Floods
- B. Plans for Training, Exercising, Updating, and Posting the EAP
- C. Site-Specific Concerns

4VAC50-20-177. Emergency Preparedness for Low Hazard Dams.

A. Low Hazard Dams shall provide information for emergency preparedness to the Department, the local organization for emergency management and the Virginia

Department of Emergency Management. The information shall include, but not be limited, to the following:

1. Current contact name and contact information, including phone number;

2. Physical location of the dam;

3. A procedure for notifying any downstream properties potentially impacted by the dam's failure;

4. A simple dam break inundation map, acceptable to the Director, demonstrating the general inundation that result from a dam failure. Such maps do not require preparation by a professional licensed engineer; and

5. Certification by the owner and the local organization for emergency management.

Part IV: Procedures

4VAC50-20-180. Inspections.

A. The ~~director~~ 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~~ Board. During the maintenance, construction, or alteration of any dam 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. The ~~director~~ Director shall provide the owner a copy of the findings of these inspections. This inspection does not relieve the owner from the responsibility of providing adequate inspection during construction or operation and maintenance.

B. Periodic inspections during construction or alteration shall be conducted under the ~~supervision~~ direction of a licensed professional engineer who shall ~~propose the frequency and nature of the inspections subject to approval by the director~~ inspect in accordance with the construction or alteration permit issued by the Board.

C. ~~Periodic~~ Required inspections during operation and maintenance shall be conducted under the supervision of a licensed professional engineer at an interval not greater than that required to update the operation and maintenance certificate. At a minimum, an annual owner's inspection shall be conducted when a professional inspection is not required.

D. Every owner shall provide for an inspection by a licensed professional engineer after overtopping of the impounding structure or flows cause significant damage to the emergency spillway. A copy of the findings of each inspection with the engineer's recommendations shall be filed with the ~~board~~ 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.

4VAC50-20-190. Right to hearing.

Any owner aggrieved by an action taken by the ~~director~~ Director or by the ~~board~~ Board without hearing, or by inaction of the ~~director~~ Director or the ~~board~~ Board, under the provisions of this chapter, may demand in writing a formal hearing.

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §4.2, eff. February 1, 1989.

4VAC50-20-200. Enforcement.

~~Any owner refusing to obey any order of the board or the director pursuant to this chapter may be compelled to obey and comply with such provisions by injunction or other appropriate remedy obtained in a court proceeding. Such proceeding shall be instituted by the board or in the case of an emergency, by the director in the court which granted approval to the owner to impound waters or, if such approval has not been granted, the proceeding shall be instituted in any appropriate court.~~ Enforcement of the provisions of this chapter shall be in accordance 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.

4VAC50-20-210. Consulting committee ~~boards~~.

A. When the ~~board~~ Board needs to satisfy questions of safety regarding plans and specifications, construction or operation and maintenance, or when requested by the owner, the ~~board~~ Board may appoint a consulting ~~board~~ committee to report to it with respect to those questions of the impounding structure's safety ~~of an impounding structure~~. Such a ~~board~~ 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 ~~board~~ committee, if appointed at the request of an owner, shall be paid by the owner.

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

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §4.4, eff. February 1, 1989.

4VAC50-20-220. Unsafe conditions.

A. No owner shall ~~have the right to~~ maintain an unsafe impounding structure ~~which unreasonably threatens the life or property of another person~~. ~~The owner of any impounding structure found to have deficiencies which could threaten life or property if uncorrected shall take the corrective actions needed to remove such deficiencies within a reasonable period of time.~~ 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. When the ~~director~~ Director finds that an impounding structure is unsafe and constitutes an imminent danger to life or property, he shall immediately notify the State Department of Emergency Management and confer with the owner and ensure that the Emergency Action Plan or Emergency Preparedness requirements have been implemented 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 ~~a report by the board containing~~ findings and recommendations, by the Board, for the correction of deficiencies which 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.

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.
Effect of Amendment: The July 1, 2002 amendment, in subsection B, changed "Emergency Services" to "Emergency Management"; and, in subsection C, changed "director" to "board", following "issued a report by the".

4VAC50-20-230. Complaints.

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

B. If the ~~director~~ Director finds that an unsafe condition exists, the ~~director~~ 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.

Part V: Design Requirements

4VAC50-20-240. Design of structures.

A. The owner shall complete all necessary investigations prior to submitting the design report. 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~~, projected and potential future~~ 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 define the soil, rock and ground water conditions.

E. All construction materials shall be adequately selected so as to ensure that their properties meet 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.

~~4VAC50-20-250. Design flood.~~

~~The minimum design flood to be utilized in impounding structure evaluation, design, construction, operation and maintenance shall be commensurate with the size and hazard potential of the particular impounding structure as determined in 4VAC50-20-50 and Table 1.~~

~~Competent, experienced, professional engineering judgment shall be used in applying those design and evaluation procedures referenced in 4VAC50-20-320 of this chapter.~~

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §5.2, eff. February 1, 1989.

4VAC50-20-260. Emergency 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. An emergency spillway shall be required~~.

C. 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. In no case, however, shall dam owners permit the growth of trees and other woody vegetation in the emergency spillway area.

D. Lined emergency spillways shall include design criteria calculations, plans and specifications for open channel, drop, ogee and chute spillways that include crest structures, walls, panel lining 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 leakage from the channel or under seepage 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.

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 other substantial reasons for concluding that outlets would not operate safely to fill 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 capabilities, 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 dangerous quantities of floating ~~drift~~ 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 those period 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 for in estimating "dependable" discharge capabilities to be assumed in routing the spillway design flood through reservoir. 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.

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, subject to approval by the ~~director~~ Director.

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §5.5, eff. February 1, 1989.

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

Components of the impounding structure, the impoundment, the outlet works, drain system and appurtenances shall be durable 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.

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 and impoundments 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.

4VAC50-20-310. Plans and specifications.

The plans and specifications for a proposed impounding structure shall consist of a detailed engineering design report that includes 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, profiles, logs of test borings, laboratory and in situ test data, drawings of principal and emergency spillways and other additional drawings in

sufficient detail to indicate clearly the extent and complexity of the work to be performed.

3. The technical provisions, as may be required to describe the methods of the construction and construction quality control for the project.

4. Special provisions, as may be required to describe technical provisions needed to ensure that the impounding structure is constructed according to the approved plans and specifications.

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §5.8, eff. February 1, 1989.

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

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. 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.
Effect of Amendment: The July 1, 2002 amendment, in paragraph 2, changed "Soil" to "Natural Resources" before "Conservation"; and, in paragraph 3, changed "or Interior" to "of the Interior".

4VAC50-20-322. Other applicable dam safety references.

Manuals, Guidance, and Criteria used by the Federal Emergency Management Agency, including but not limited to those concerning Emergency Action Planning, Inflow Design Floods and Hazard Potential Classification Systems

~~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~~

~~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~~

Part VI: Fees

4VAC 50-20-320 Authority to establish fees

Under the Code of Virginia, § 10.1-613.5, 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 dams. The fees will be deposited into the Dam Safety, Flood Prevention and Protection Assistance Fund.

4VAC 50-20-325 Fee Submittal Procedures

A. Upon the effective date of these regulations, fees for all application or report submittals required pursuant to 4VAC 50-20-360 through 4 VAC 50-20-380 are due on the day an application for an operation and maintenance certificate or a construction permit is submitted. No application for an operation and maintenance certificate or a construction permit will be reviewed without full payment of the required fee per § 10.1-613.5.

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, Dam Safety Receipts Control, P.O. Box 10150, Richmond, Virginia 23240.

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

1. Applicant name, address and daytime phone number.
2. The name of the dam, and the dam 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. The existing permit number, if applicable.

F. No permit fees remitted to the Department shall be subject to refund except as credits provided for in 4 VAC 50-20-380 B.

4VAC 50-20-350 Fee Exemptions

Impounding structures owned by Virginia Soil and Water Conservation Districts shall be exempt from all fees associated with Part VI in accordance with § 10.1-613.5. There will be no fee assessed for the decommissioning of an impounding structure.

4VAC 50-20-360 Construction Permit Application Fees

A. Any application form submitted pursuant to 4VAC 50-20-70 for permitting a proposed impounding structure construction after the effective date of these regulations shall be accompanied by a payment as determined in subsection B.

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

4VAC 50-20-370 Regular Operation and Maintenance Certificate Application Fees

A. Any application for a 6-year Regular Operation and Maintenance Certificate after the effective date of these regulations, except as otherwise exempted, shall be accompanied by a payment as determined in subsection B.

B. Fees for Class High, Significant, or Low dams shall be as follows:
1. $1,500 for High Hazard Potential
2. $1,000 for Significant Hazard Potential
3. $600 for Low Hazard Potential

4VAC 50-20-380 Conditional Operation and Maintenance Certificate Application Fee

A. Fees for a Conditional Operation and Maintenance Certificate for High or Significant Hazard Potential impounding structures shall be as follows:
1. For a 2-year Certificate: $600
2. For a 1.5-year Certificate: $450
3. For a 1-year Certificate: $300
4. For a 6-month Certificate: $150

B. Fees for a Conditional Operation and Maintenance Certificate for Low Hazard Potential impounding structures shall be as follows:
1. For a 2-year Certificate: $300
2. For a 1.5-year Certificate: $225
3. For a 1-year Certificate: $150
4. For a 6-month Certificate: $75

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.

FORMS

Virginia Dam Owner's Annual Inspection ~~Form~~ Report, DCR 199-098 (rev. ~~12/01~~ 11/06).

Operation and Maintenance Certificate Application ~~Class I, II and III~~ for Virginia Regulated Impounding Structures, DCR 199-099 (rev. ~~12/01~~ 11/06).

As-Built Report for ~~Class I, II and III~~ Virginia Regulated Impounding Structures, DCR 199-100 (rev. ~~12/01~~ 11/06).

Design Report for the Construction~~/~~ or Alteration of Virginia Regulated Impounding Structures, DCR 199-101 (rev. ~~12/01~~ 11/06).

Emergency Action Plan for ~~Class I, Class II and Class III~~ Virginia Regulated Impounding Structures, DCR 199-103 (rev. ~~12/01~~ 11/06).

~~Inventory Report for Class III and Class IV~~ Low Hazard ~~Impounding Structures, DCR 199-104 (rev. 12/01).~~

~~Reinspection Report for Class I and II~~ High and Significant Hazard ~~Impounding Structures, DCR 199-105 (rev. 12/01).~~

Agricultural ~~Certification~~ Exemption Application for Impounding Structures, DCR 199-106 (rev. ~~12/01~~ 11/06).

Transfer Application for Certificate to Operate and Maintain a Virginia Regulated Impounding ~~Structures~~ Structure from Past Owner to New Owner, DCR 199-107 (rev. ~~12/01~~ 11/06).

Inspection Report for Virginia Regulated Impounding Structures, DCR 199-108 (11/06)