

DISCUSSION DRAFT – NOT APPROVED

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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 62.1 of 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).

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

48 "Alteration" means changes to an impounding structure that could alter or affect its
49 structural integrity. Alterations include, but are not limited to, changing the height or otherwise
50 enlarging the dam, increasing normal pool or principal spillway elevation or physical
51 dimensions, changing the elevation or physical dimensions of the emergency spillway,
52 conducting necessary structural repairs or structural maintenance, or removing the impounding
53 structure. Alterations do not include normal operation and maintenance.

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

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

60 "Conditional operation and maintenance certificate" means a certificate required for
61 impounding structures with deficiencies.

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

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

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

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

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

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

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

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

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

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

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

95 "Height" means the structural height of an impounding structure. If the impounding
96 structure spans a stream or watercourse, height means the vertical distance from the natural bed
97 of the stream or watercourse measured at the downstream toe of the impounding structure to the
98 top of the impounding structure. If the impounding structure does not span a stream or
99 watercourse, height means the vertical distance from the lowest elevation of the outside limit of
100 the barrier to the top of the impounding structure.

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

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

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

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

121 "Maximum impounding capacity" means the volume in acre-feet that is capable of being
122 impounded at the top of the impounding structure.

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

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

127 "Owner" means the owner of the land on which an impounding structure is situated, the
128 holder of an easement permitting the construction of an impounding structure and any person or
129 entity agreeing to maintain an impounding structure. The term "owner" includes the

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130 Commonwealth or any of its political subdivisions, including but not limited to sanitation district
131 commissions and authorities. Also included are any public or private institutions, corporations,
132 associations, firms or companies organized or existing under the laws of this Commonwealth or
133 any other state or country, as well as any person or group of persons acting individually or as a
134 group.

135 “Spillway” means a structure to provide for the controlled release of flows from the
136 impounding structure into a downstream area.

137 “Sunny Day Dam Failure” means the breaching of an impounding structure caused by
138 pipng through an earthen embankment or appurtenance with the initial water level at the normal
139 reservoir level, usually at the lowest ungated principle spillway elevation or the typical operating
140 water level.

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

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

149 "Watercourse" means a natural channel having a well-defined bed and banks and in
150 which water flows when it normally does flow.

151
152 Statutory Authority: §10.1-605 of the Code of Virginia.
153 Historical Notes: Derived from VR625-01-00 §1.3, eff. February 1, 1989; Amended, Virginia Register Volume 18,
154 Issue 14, eff. July 1, 2002.
155 Effect of Amendment: The July 1, 2002 amendment revised the definitions for "director" and "impounding structure".

156
157 **4VAC50-20-40. Hazard Potential Classifications Classes of impounding structures.**

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

162 B. For the purpose of this chapter, hazards pertain to potential loss of human life or
163 ~~property damage to the property of others~~ downstream from the impounding structure in event of
164 failure or faulty operation of the impounding structure or appurtenant facilities. Hazard potential
165 classes of dams are as follows.

166 1. ~~Impounding structures in the Class I hazard potential category are located where~~ High
167 Hazard Potential is defined where an impounding structure failure will cause probable loss of life
168 or serious economic damage. Economic damage may include, but not be limited to, occupied
169 building(s), industrial or commercial facilities, ~~important~~ primary public utilities, ~~main~~
170 highway(s) or major public roadways, ~~railroad(s)~~ railroads, personal property, and agricultural
171 interests.

172 2. ~~Impounding structures in the Class II hazard potential category are located where~~
173 Significant Hazard Potential is defined where an impounding structure failure ~~could~~ may cause

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174 possible the loss of life or appreciable economic damage. Economic damage may include, but
175 not be limited to, occupied building(s), industrial or commercial facilities, secondary public
176 utilities, secondary public roadways, railroads, personal property, and agricultural interests.
177 highway(s) or railroad(s) or cause interruption of use or service of relatively important public
178 utilities.

179 ~~3. Impounding structures in Class III hazard potential category are located where Low~~
180 ~~Hazard Potential is defined where an impounding structure failure would result in no expected~~
181 ~~loss of life and would cause no more than minimal economic damage. Economic damage may~~
182 ~~include, but not be limited to, occupied building(s), industrial or commercial facilities, secondary~~
183 ~~public utilities, secondary public roadways, railroads or personal property, and agricultural~~
184 ~~interests may cause minimal property damage to others. No loss of life is expected.~~

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

188 ~~5 C. Such size and~~ The hazard potential classification and size classifications category
189 shall be proposed by the owner and shall be subject to approval by the director Director. To
190 conclusively determine the appropriate hazard potential classification, dam break analysis shall
191 be conducted by the owner. Present and projected development of planned land-use in the dam
192 break inundation zones downstream from the impounding structure shall be considered in
193 determining the classification.

194 ~~6 D.~~ Impounding structures shall be subject to reclassification by the Board as necessary.

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196 Statutory Authority: §10.1-605 of the Code of Virginia.
197 Historical Notes: Derived from VR625-01-00 §1.4, eff. February 1, 1989.

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199 **4VAC50-20-50. Performance standards required for impounding structures.**

200 A. In accordance with the definitions provided by Virginia Code § 10.1-604 and
201 4VAC50-20-30, an impounding structure shall be regulated if the dam is 25 feet or greater in
202 height and creates a maximum impounding capacity of 15 acre-feet or greater, or the dam is six
203 feet or greater in height and creates a maximum impounding capacity of 50 acre-feet or greater
204 and is not otherwise exempt from regulation by the Code of Virginia. Impounding structures
205 exempted are those that are:

206 1. licensed by the State Corporation Commission that are subject to a safety inspection
207 program;

208 2. owned or licensed by the United States government;

209 3. operated primarily for agricultural purposes which are less than 25 feet in height or
210 which create a maximum impoundment capacity smaller than 100 acre-feet;

211 4. water or silt retaining dams approved pursuant to §45.1-222 or §45.1-225.1 of the
212 Code of Virginia; or

213 5. obstructions in a canal used to raise or lower water.

214 Impounding structures of regulated size and not exempted shall be constructed, operated
215 and maintained such that they perform in accordance with their design and purpose throughout

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216 the life of the project. For new impounding structures, the spillway(s) capacity shall perform at a
 217 minimum to safely pass the appropriate spillway design flood as determined in Table 1. For the
 218 purposes of utilizing Table 1, Maximum Impounding Capacity and Height shall be determined in
 219 accordance with the definitions provided in 4 VAC 50-20-30 and Hazard Potential Classification
 220 shall be determined in accordance with 4VAC 50-20-40.

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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 $\geq 50,000$ Medium $\geq 1,000$ & $< 50,000$ 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 $\geq 50,000$ Medium $\geq 1,000$ & $< 50,000$ 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 $\geq 50,000$ Medium $\geq 1,000$ & $< 50,000$ 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

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

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

229 ~~bC. The spillway design flood (SDF) represents the largest flood that need be considered~~
230 ~~in the evaluation of the performance for a given project. The impounding structure shall perform~~
231 ~~so as to safely pass the appropriate SDF. Where a range of SDF is indicated, the magnitude that~~
232 ~~most closely relates to the involved risk should be selected. Reductions in the established SDF~~
233 ~~may be evaluated through the use of incremental damage assessment pursuant to 4 VAC 50-20-~~
234 ~~52. The SDF established for an impounding structure shall not be less than those standards~~
235 ~~established elsewhere in regulations including but not limited to the Virginia Soil and Water~~
236 ~~Conservation Board Regulations for stormwater management impoundment structures and~~
237 ~~facilities. The establishment in this chapter of rigid design flood criteria or standards is not~~
238 ~~intended. Safety must be evaluated in the light of peculiarities and local conditions for each~~
239 ~~impounding structure and in recognition of the many factors involved, some of which may not be~~
240 ~~precisely known. Such can only be done by competent, experienced engineering judgment,~~
241 ~~which the values in Table 1 are intended to supplement, not supplant.~~

242 ~~eD. PMF: Probable maximum Maximum flood Flood. This means is the flood that might~~
243 ~~be expected from the most severe combination of critical meteorologic and hydrologic conditions~~
244 ~~that are reasonably possible in the region. The PMF is derived from the current probable~~
245 ~~maximum precipitation (PMP) available from the National Weather Service, NOAA. In some~~
246 ~~cases local topography or meteorological conditions will cause changes from the generalized~~
247 ~~PMP values; therefore, it is advisable to contact local, state or federal agencies to obtain the~~
248 ~~prevailing practice in specific cases. Any deviation in the application of established~~
249 ~~developmental procedures must be explained and justified by the owner’s engineer. The owner’s~~
250 ~~engineer must develop PMF hydrographs for 6, 12, 24 hour durations. The hydrograph that~~
251 ~~creates the largest peak outflow is to be used to determine capacity for non-failure and failure~~
252 ~~analysis. Present and planned land-use conditions shall be considered in determining the runoff~~
253 ~~characteristics of the drainage area.~~

254 ~~E. 100-Yr: 100-year flood represents the flood magnitude expected to be equaled or~~
255 ~~exceeded on the average of once in 100 years. It may also be expressed as an exceedence~~
256 ~~probability with a 1.0% chance of being equaled or exceeded in any given year. Present and~~
257 ~~planned land-use conditions shall be considered in determining the runoff characteristics of the~~
258 ~~drainage area.~~

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

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

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Statutory Authority: §10.1-605 of the Code of Virginia.

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269 Historical Notes: Derived from VR625-01-00 §1.5, eff. February 1, 1989; Amended, Virginia Register Volume 18,
270 Issue 14, eff. July 1, 2002.
271 Effect of Amendment: The July 1, 2002 amendment corrected the "greater than" and "equal than" signs in Table 1.

272

273 **4VAC50-20-52. Incremental damage assessment.**

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

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

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

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

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

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

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

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

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

291 C. After meeting the criteria setout in 4VAC50-20-52B, the owner’s engineer may
292 proceed with evaluating the incremental damage analysis. Once the owner’s engineer has
293 determined the required spillway design flood through application of Table 1, further analysis
294 may be performed to evaluate the incremental damage assessment. This assessment may be used
295 to lower the spillway design flood. Allowable reductions are set out in subsection D, however,
296 in no situation shall be the reduction be less than the level at which the incremental increase in
297 water surface elevation downstream due to failure of a dam is no longer considered to present an
298 unacceptable additional downstream threat. This engineering analysis will water surface
299 elevations at each structure that may be impacted downstream of the dam. Water depths greater
300 than two feet and overbank flow velocities greater than three feet per second shall be used to
301 determine impacts to persons or property. Water depth changes less than two feet and overbank
302 flow velocities less than three feet per second may be considered as ineffective to structures
303 downstream of the dam.

304 D. Allowable reductions are as follows:

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

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

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310 2. For Large Low Hazard Potential dams, the spillway design flood shall not be less than
311 100-YR. For Small Low Potential Hazard impounding structures, the spillway design flood shall
312 not be less than 50-YR.

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315 **4VAC50-20-54. Dam break inundation zone mapping**

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

320 A. All inundation mapping should extend downstream of the dam where failure of the
321 dam does not constitute a hazard to downstream life or property. The location of the end of the
322 inundation mapping should be indicated where the water surface elevation of the dam break
323 inundation zone and the water surface elevation of the spillway design flood during a non-dam
324 failure event are within one foot of each other. The inundation maps shall be supplemented with
325 water surface profiles at critical areas showing the water surface elevation prior to failure and the
326 peak water surface elevation after failure.

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

330 C. For determining the hazard potential classification, a minimum of the following shall
331 be provided to the Department:

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

334 2. A dam break analysis utilizing the spillway design flood with a dam failure; and

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

336 D. To meet the requirements of Emergency Preparedness setout in 4VAC50-20-177, all
337 Low Hazard Potential impounding structures shall provide a simple map, acceptable to the
338 Department, demonstrating the general inundation that would result from a dam failure. Such
339 maps do not require preparation by a professional licensed engineer.

340 E. To meet the requirements of the Emergency Action Plan requirements setout in
341 4VAC50-20-175, all owners of High and Significant Hazard Potential impounding structures
342 shall provide dam break inundation map(s) representing the impacts that would occur with both a
343 sunny-day dam failure and a spillway design flood dam failure.

344 1. The map(s) shall be developed at a scale sufficient to graphically display downstream
345 inhabited areas and structures, roads, and other pertinent structures on the map within the
346 identified inundation area that may be subject to possible danger. The list and telephone
347 numbers of downstream residents, who are in the inundation zones, should whenever possible be
348 plotted on the map, for easy reference in the case of emergencies.

349 2. Since local officials are likely to use the maps for evacuation purposes, a note should
350 be included on the map to advise that, because of the method, procedures, and assumptions used
351 to develop the flooded areas, the limits of flooding shown and flood wave travel times are
352 approximate and should be used only as a guideline for establishing evacuation zones. Actual

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353 areas inundated will depend on actual failure conditions and may differ from areas shown on the
354 maps.

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357 **4VAC50-20-58. Local government notifications.**

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

365

366 **Part II: Permit Requirements**

367

368 **4VAC50-20-60. Required permits.**

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

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

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

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

387

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

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391 **4VAC50-20-70. Construction permits.**

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

398 1. Proposed design criteria and a description of the size, ground cover conditions, extent
399 of current development of the watershed, jurisdictional comprehensive planning for development
400 of the watershed, and the hydraulics and hydrology, structural, geologic and the geotechnical
401 engineering assumptions used to determine the foundations and materials to be used.

402 2. Preliminary drawings of a general nature, including cross sections, plans and profiles
403 of the impounding structure, proposed pool levels and types of spillway(s).

404 B. An applicant for a construction permit shall submit a design report on the official
405 forms Department form. The design report shall be prepared in accordance with 4VAC50-20-240
406 and shall ~~include the following information:~~ be consistent with the acceptable preliminary design
407 report. The design report is a required element of a complete application and shall include the
408 following information:

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

412 2. A description of properties located in the dam break inundation zone downstream from
413 the site of the proposed impounding structure, including the location and number of residential
414 structures, buildings, roads, utilities and other property that would be endangered should the
415 impounding structure fail.

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

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

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

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

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

433 8. Design assumptions and analyses sufficient to indicate that seepage in, around, through
434 or under the impounding structure, foundation and abutments will be reasonably and practically

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435 controlled so that internal or external forces or results thereof will not endanger the stability of
436 the impounding structure.

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

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

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

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

448 ~~13~~12. A description of the techniques to be used to divert stream flow during construction
449 so as to prevent hazard to life, health and property. Such diversion plans shall also be in
450 accordance with applicable environmental laws.

451 ~~14~~13. A plan of quality control testing to confirm that construction materials and methods
452 meet the design requirements set forth in the specifications.

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

454 ~~16~~14. Plans and specifications as required by 4VAC50-20-310.

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

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

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

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

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

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

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

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

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

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

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

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

491 2. A drawing showing temporary diversion devices:

492 3. Potential impoundment during the construction:

493 4. Provisions for notification of potentially affected residences and structures:

494 5. Construction site evacuation routes, and

495 6. Any other special notes particular to the project.

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

498 E. Within 120 days of receipt of a complete construction permit application the Board
499 shall act on the application. If the application is not acceptable, the Director shall inform the
500 applicant within 60 days of receipt and shall explain what changes are required for an acceptable
501 application. A complete construction permit application consists of the following:

502 1. A final design report, submitted on the official Department form, with attachments as
503 needed, and certified by the owner;

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

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

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

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

514 HG. The construction permit shall be valid for the construction schedule specified in the
515 approved design report construction permit application. The construction schedule may be
516 amended by the director for good cause at the request of the applicant.

517 IH. Construction must commence within two years after the permit is issued. If
518 construction does not commence within two years after the permit is issued, the permit shall
519 expire, except that the applicant may petition the board for extension of the two-year period and

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520 the board may extend such period for good cause with an appropriately updated construction
521 schedule and temporary emergency action plan.

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

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

544
545 Statutory Authority: §10.1-605 of the Code of Virginia.

546 Historical Notes: Derived from VR625-01-00 §2.2, eff. February 1, 1989; Amended, Virginia Register Volume 18,
547 Issue 14, eff. July 1, 2002.

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

553

554 **4VAC50-20-80. Alterations permits.**

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

558 ~~B.A.~~ B. Alterations which would potentially affect the structural integrity of an impounding
559 structure include, but are not limited to, changing its the height or otherwise enlarging the dam,
560 increasing the normal pool or principal spillway elevation or physical dimensions, changing the
561 elevation or physical dimensions of the emergency spillway, conducting necessary repairs or
562 structural maintenance, or removing the impounding structure.

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563 B. An applicant for an alteration permit shall submit a design report on the official
564 Department form. The design report shall be prepared in accordance with 4VAC50-20-240. The
565 design report shall include, but not be limited to, the following information:

566 1. A description of the proposed remedial work to be performed including a plan view of
567 the dam site representing all significant structures and improvements that precisely illustrate the
568 location of all proposed work.

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

571 3. Local government acknowledgement of alteration and repair plan.

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

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

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

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

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

583 9. Other pertinent design data, assumptions and analyses commensurate with the nature
584 of the particular impounding structure and specific site conditions, including when required by
585 this chapter, a plan and profile of the dam break inundation zones.

586 10. If applicable, a description of the techniques to be used to divert stream flow during
587 alteration work so as to prevent hazard to life, health and property. Such diversion plans shall be
588 in accordance with the applicable environmental laws and endorsed by the local code official.

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

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

593 C. The alteration schedule shall include:

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

596 2. Elements of the work plan that should be considered include, but are not limited to,
597 foundation and abutment treatment, excavation and material fill processes, phased fill and
598 compaction, testing and control procedures, construction of permanent spillway and drainage
599 devices, if applicable.

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

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

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

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606 D. Within 120 days of receipt of a complete alteration permit-application, the Board shall
607 act on the application. If the application is not acceptable, the Director shall inform the applicant
608 within 60 days of receipt and shall explain what changes are required for an acceptable
609 application. A complete alteration permit application consists of the following:

610 1. A final design report, submitted on the official Department form, with attachments as
611 needed, and certified by the owner,

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

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

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

618 E. During the alteration work the owner shall notify the Director of any proposed changes
619 from the approved design, plans, specifications, or alteration schedule ~~work plan~~. Approval shall
620 be obtained from the Director prior to the construction or installation of any changes that will
621 affect the integrity or impounding capacity of the impounding structure. If an owner or the
622 owner’s engineer have determined that circumstances are impacting the integrity of the
623 impounding structure, which could result in the imminent failure of the impounding structure,
624 temporary repairs may be initiated prior to approval from the Director. The owner shall notify
625 the Department within 24 hours of identifying the circumstances impacting the integrity of the
626 dam.

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

630 G. Work identified in the Alteration Permit must commence with the time frame
631 identified in the Alteration Certificate. If work does not commence within the prescribed time
632 frame, the permit shall expire, except that the applicant may petition the Board for extension of
633 the prescribed time frame and the board may extend such period for good cause with an
634 appropriately updated alteration schedule.

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

639
640
641 Statutory Authority: §10.1-605 of the Code of Virginia.
642 Historical Notes: Derived from VR625-01-00 §2.3, eff. February 1, 1989.

643

644 **4VAC50-20-90. Transfer of permits.**

645 Prior to the transfer of ownership of a permitted impounding structure the permittee shall
646 notify the director in writing and the new owner shall file a transfer application on official forms.
647 The new owner shall amend the existing permit application as necessary and shall certify to the

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648 director that he is aware of and will comply with all of the requirements and conditions of the
649 permit.

650

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

653

4VAC50-20-95. Deregulation of impounding structures

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

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

659 2. altered in such a manner that either the height or storage capacity of the impounding
660 structure causes the impounding structure to be of less than regulated size.

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

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

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

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

670

Part III: Certificate Requirements

671

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

672

673

674

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

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

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

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

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

694 F. The owner of a ~~Class I, II or III~~ High, Significant or Low Hazard Potential impounding
695 structure shall apply for the renewal of the six year ~~operation~~ Operation and ~~maintenance~~
696 Maintenance certificate Certificate 90 days prior to its expiration in accordance with 4VAC50-
697 20-120 of this chapter.

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

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

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

708 I. ~~The Director or the Board may require additional analysis to be conducted by the dam~~
709 ~~owner if additional public safety concerns warrant further investigation. Additional analysis may~~
710 ~~include but not be limited to seismic stability, earthen spillway integrity, adequate freeboard~~
711 ~~allowance, stability assessment of the impoundment's foundation, potential liquefaction of the~~
712 ~~embankment, overturning or sliding of a concrete structure and other structural stress issues.~~

713
714 Statutory Authority: §10.1-605 of the Code of Virginia.

715 Historical Notes: Derived from VR625-01-00 §3.1, eff. February 1, 1989.

716

717 **4VAC50-20-110. Operation and ~~maintenance certificate~~ Maintenance Certificate for newly**
718 **constructed impounding structures.**

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

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

723 2. ~~A copy of a certificate~~ Certification from the licensed professional engineer who has
724 inspected the impounding structure during construction ~~certifying~~ that, to the best of ~~his~~ the
725 engineer's judgment, knowledge and belief, the impounding structure and its appurtenances were
726 constructed in conformance with the plans, specifications, drawings and other requirements
727 approved by the board.

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

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

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

736
737 Statutory Authority: §10.1-605 of the Code of Virginia.
738 Historical Notes: Derived from VR625-01-00 §3.2, eff. February 1, 1989.

739
740 **4VAC50-20-120. Operation and ~~maintenance certificates~~ Maintenance Certificates for**
741 **existing impounding structures.**

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

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

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

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

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

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

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

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

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

766 f. ~~Recommendations for remedial work.~~

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

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776 structure, the operation and maintenance plan shall be based on the data provided in the
777 inventory report.

778 43. An emergency action plan Emergency Action Plan developed in accordance with
779 4VAC50-20-175 or Emergency Preparedness requirements developed in accordance with
780 4VAC50-20-177 and evidence that ~~a copy~~ the required copies of such plan ~~has~~ have been filed
781 with the Department, the local organization for emergency management and the State
782 Department of Emergency Management. The plan shall include a method of providing
783 notification and warning to persons downstream, other affected persons or property owners and
784 local authorities in the event of a flood hazard or the potential or impending failure of the
785 impounding structure.

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

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

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

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

801
802 Statutory Authority: §10.1-605 of the Code of Virginia.
803 Historical Notes: Derived from VR625-01-00 §3.3, eff. February 1, 1989; Amended, Virginia Register Volume 18,
804 Issue 14, eff. July 1, 2002.
805 Effect of Amendment: The July 1, 2002 amendment, in paragraph B 1, substituted "previous safety inspection as
806 required by the board" for "Phase I or Phase II inspection as established by the U.S. Army Corps of Engineers"; in the
807 third sentence of paragraph B 3, substituted "safety inspection report required by the board" for "Phase I Inspection
808 Report"; and, in paragraph B 4, substituted "local organization for emergency management and the State Department of
809 Emergency Management" for "local and State Department of Emergency Services".

810
811 **4VAC50-20-125. Delayed effective date for Spillway Design Flood requirements for**
812 **impounding structures.**

813 Those impounding structures determined to have an adequate spillway capacity prior to
814 the effective date of these regulations, and that hold a current certificate to operate (regular or
815 conditional certificates) but due to changes in these regulations that require modifications in the
816 spillway capacity will have up to 5 years from the effective date of these regulations to upgrade
817 their spillways. However, those impounding structures under a regular certificate will be issued
818 a conditional certificate until the new spillway design flood requirements are adequately
819 addressed. If circumstances change during the 5 year period that warrant more immediate
820 repairs to the impounding structure, the Board may direct alterations sooner. The conditional

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821 certificate will contain a compliance schedule including but not limited to engineering studies,
822 design efforts, financial plans, and a construction completion schedule. During this delay period,
823 owners are required to address other deficiencies that may exist that are not related to the SDF.
824 If warranted and the owner has demonstrated continual and substantial progress, the Board may
825 issue a subsequent extension of the conditional permit.

826
827 **~~4VAC50-20-130. Existing impounding structures constructed prior to July 1, 1982.~~**

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

- 831 ~~1. Operation and maintenance is determined by the director to be satisfactory and up to~~
832 ~~date;~~
833 ~~2. Annual owner's inspection reports have been filed with and are considered satisfactory~~
834 ~~by the director;~~
835 ~~3. The applicant proves in accordance with the current design procedures and references~~
836 ~~of 4VAC50-20-320 to the satisfaction of the board that the impounding structure as designed,~~
837 ~~constructed, operated and maintained does not pose an unreasonable hazard to life and property;~~
838 ~~and~~
839 ~~4. The owner satisfies all special requirements imposed by the board.~~

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

844
845 **4VAC50-20-135. Extension of Operation and Maintenance Certificates.**

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

- 848 1. Operation and maintenance is determined by the Director to be satisfactory and up to
849 date;
850 2. The dam is not in need of other alteration related to the integrity of the structure;
851 3. Emergency Action Plan requirements setout in 4VAC50-20-175 or Emergency
852 Preparedness requirements setout in 4VAC50-20-177 have been satisfied;
853 4. Annual owner's inspection reports have been consistently filed with, and are
854 considered satisfactory, by the Director;
855 5. The applicant proves in accordance with the current design procedures and references
856 of 4VAC50-20-320 to the satisfaction of the Board that the impounding structure as designed,
857 constructed, operated and maintained does not pose an unreasonable hazard to life and property;
858 and

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

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

862
863 **~~4VAC50-20-140. Existing impounding structures constructed after July 1, 1982.~~**

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

868

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

871

872 **4VAC50-20-150. Conditional operation and maintenance certificate.**

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

878 B. The ~~Conditional-operation~~ Operation and ~~maintenance~~ Maintenance certificate
879 Certificate for ~~Class I, II and III~~ High, Significant, and Low Hazard Potential impounding
880 structures shall be for a maximum term of two years. This certificate will allow the owner to
881 continue normal operation and maintenance of the impounding structure, and shall require that
882 the owner correct the deficiencies on a schedule determined by the ~~director~~ Director.

883 C. A ~~conditional~~ Conditional-certificate Certificate may be ~~renewed~~ extended in
884 accordance with the procedures of ~~4VAC50-20-129~~ 4VAC50-20-127 provided that annual owner
885 inspection reports are on file, and the board Board determines that the owner is proceeding with
886 the necessary corrective actions.

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

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

893

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

896

897 **4VAC50-20-160. Additional operation and maintenance requirements.**

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

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

905

906 Statutory Authority: §10.1-605 of the Code of Virginia.

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907 Historical Notes: Derived from VR625-01-00 §3.7, eff. February 1, 1989.

908
909 **4VAC50-20-165. Agricultural Exemption.**

910 A. Impounding structures operated primarily for agricultural purposes which are less than
911 25 feet in height or which create a maximum impoundment capacity smaller than 100 acre-feet
912 are exempt from the Impounding Structure Regulations.

913 B. An owner seeking an agricultural exemption pursuant to §10.1-604 and 4VAC50-20-
914 30 shall submit an Agricultural Exemption Application every 6 years.

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

917
918 **4VAC50-20-170. Transfer of certificates.**

919 Prior to the transfer of ownership of an impounding structure the certificate holder shall
920 notify the director in writing and the new owner shall file a transfer application on official forms.
921 The new owner may elect to continue the current existing operation and maintenance certificate
922 for the remaining term or he may apply for a new certificate in accordance with 4VAC50-20-
923 120. If the owner elects to continue the existing certificate he shall amend the existing certificate
924 application as necessary and shall certify to the director that he is aware of and will comply with
925 all of the requirements and conditions of the certificate.

926 Statutory Authority: §10.1-605 of the Code of Virginia.

927 Historical Notes: Derived from VR625-01-00 §3.8, eff. February 1, 1989.

928
929
930 **4VAC50-20-175. Emergency Action Plan for High and Significant Hazard Dams.**

931 A. In order to protect life during potential emergency conditions at a dam, and to ensure
932 effective, timely action is taken should a dam emergency occur, an EAP shall be required for
933 each impounding structure. The EAP shall be coordinated with the Department of Emergency
934 Management in accordance with §44-146.18. The EAP required by these regulations shall be
935 incorporated into local and inter-jurisdictional emergency plans pursuant to §44-146.19.

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

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

941 D. It is imperative that the dam owner furnish all holders of the EAP updates to the EAP
942 immediately upon becoming aware of necessary changes to keep the EAP workable. Should a
943 dam be reclassified, an EAP in accordance with this section shall be submitted.

944 E. A drill shall be conducted annually for each High or Significant hazard impounding
945 structure. To the extent practicable, the drill should include a face to face meeting with the local
946 emergency management agencies responsible for any necessary evacuations to review the EAP
947 and ensure the local emergency management agencies understand the actions required during an
948 emergency. A table-top exercise shall be conducted once every 3 years. Owners shall certify to
949 the Department annually that an exercise has been completed and the statement shall include a

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950 critique of the exercise and any revisions or updates to the EAP or a statement that no revisions
951 or updates are needed.

952 F. Dam owners shall test existing monitoring, sensing, and warning equipment at remote
953 or unattended dams at least twice per year and maintain a record of such tests.

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

956 1. Notification chart - A notification chart shall be included for all classes of dams that
957 shows who is to be notified, by whom, and in what priority. The notification chart shall include
958 contact information that assures 24-hour telephone coverage for all responsible parties.

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

965 3. Responsibilities – The EAP shall specify responsibilities for EAP-related tasks. The
966 EAP shall also clearly designate the responsible party for making the decision that an emergency
967 condition no longer exists at the dam.

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

970 5. Dam Break Inundation Maps – The EAP shall include an inundation map that
971 delineates the areas that would be flooded as a result of a dam failure. All properties identified
972 within the dam break inundation zone shall be incorporated into the EAP’s dam break inundation
973 zone map to ensure the proper notification of persons downstream and other affected persons or
974 property owners in the event of a flood hazard or the impending failure of the impounding
975 structure. Such maps shall be developed in accordance with 4VAC50-20-52.

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

980 7. Certification – The EAP ~~plan~~ shall include a section that is signed by all parties with
981 assigned responsibilities in the EAP, where they indicate their approval of the EAP ~~plan~~ and
982 agree to their responsibilities for its execution. The preparer’s name, title, and contact
983 information shall be printed in this section. The preparer’s signature shall also be included in the
984 certification section.

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

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

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

996 Title Page/Cover Sheet

997 Table of Contents

998 I. Certifications

999 II. Notification Flowchart

1000 III. Statement of Purpose

1001 IV. Project Description

1002 V. Emergency Detection, Evaluation, and Classification

1003 VI. General Responsibilities Under the EAP

1004 A. Dam Owner Responsibilities

1005 B. Responsibility for Notification

1006 C. Responsibility for Evacuation

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1009 VII. Preparedness

1010 VIII. Inundation Maps

1011 IX Appendices

1012 A. Investigation and Analyses of Dambreak Floods

1013 B. Plans for Training, Exercising, Updating, and Posting the EAP

1014 C. Site-Specific Concerns

1015

1016 **4VAC50-20-177. Emergency Preparedness for Low Hazard Dams.**

1017 A. Low Hazard Dams shall provide information for emergency preparedness to the
1018 Department, the local organization for emergency management and the Virginia Department of
1019 Emergency Management. The information shall include, but not be limited, to the following:

1020 1. Current contact name and contact information, including phone number;

1021 2. Physical location of the dam;

1022 3. A procedure for notifying any downstream properties potentially impacted by the
1023 dam's failure;

1024 4. A simple dam break inundation map, acceptable to the Director, demonstrating the
1025 general inundation that result from a dam failure. Such maps do not require preparation by a
1026 professional licensed engineer; and

1027 5. Certification by the owner and the local organization for emergency management.

1028

1029

1030 **Part IV: Procedures**

1031

1032 **4VAC50-20-180. Inspections.**

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1033 A. ~~The director~~ Director may make inspections during construction, alteration or
1034 operation and maintenance as deemed necessary to ensure that the impounding structure is being
1035 constructed, altered or operated and maintained in compliance with the permit or certificate
1036 issued by the ~~board~~ Board. During the maintenance, construction, or alteration of any dam or
1037 reservoir, the Director shall require the owner to perform, at the owner’s expense, such work or
1038 tests as necessary to obtain information sufficient to enable the Director to determine whether
1039 conformity with the plans and specifications approved by the certificate is being secured. The
1040 ~~director~~ Director shall provide the owner a copy of the findings of these inspections. This
1041 inspection does not relieve the owner from the responsibility of providing adequate inspection
1042 during construction or operation and maintenance.

1043 B. Periodic inspections during construction or alteration shall be conducted under the
1044 supervision direction of a licensed professional engineer who shall ~~propose the frequency and~~
1045 ~~nature of the inspections subject to approval by the director~~ inspect in accordance with the
1046 construction or alteration permit issued by the Board.

1047 C. ~~Periodic~~ Required inspections during operation and maintenance shall be conducted
1048 under the supervision of a licensed professional engineer at an interval not greater than that
1049 required to update the operation and maintenance certificate. At a minimum, an annual owner's
1050 inspection shall be conducted when a professional inspection is not required.

1051 D. Every owner shall provide for an inspection by a licensed professional engineer after
1052 overtopping of the impounding structure or flows cause significant damage to the emergency
1053 spillway. A copy of the findings of each inspection with the engineer's recommendations shall
1054 be filed with the ~~board~~ Board within a reasonable period of time not to exceed 30 days
1055 subsequent to completion of the inspection.

1056 Statutory Authority: §10.1-605 of the Code of Virginia.
1057 Historical Notes: Derived from VR625-01-00 §4.1, eff. February 1, 1989.

1059
1060 **4VAC50-20-190. Right to hearing.**

1061 Any owner aggrieved by an action taken by the ~~director~~ Director or by the ~~board~~ Board
1062 without hearing, or by inaction of the ~~director~~ Director or the ~~board~~ Board, under the provisions
1063 of this chapter, may demand in writing a formal hearing.

1064
1065 Statutory Authority: §10.1-605 of the Code of Virginia.
1066 Historical Notes: Derived from VR625-01-00 §4.2, eff. February 1, 1989.

1067
1068 **4VAC50-20-200. Enforcement.**

1069 ~~Any owner refusing to obey any order of the board or the director pursuant to this chapter~~
1070 ~~may be compelled to obey and comply with such provisions by injunction or other appropriate~~
1071 ~~remedy obtained in a court proceeding. Such proceeding shall be instituted by the board or in the~~
1072 ~~case of an emergency, by the director in the court which granted approval to the owner to~~
1073 ~~impound waters or, if such approval has not been granted, the proceeding shall be instituted in~~
1074 ~~any appropriate court.~~ Enforcement of the provisions of this chapter shall be in accordance with
1075 the provisions of the Dam Safety Act (§ 10.1-604 et seq. of the Code of Virginia).
1076

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1077 Statutory Authority: §10.1-605 of the Code of Virginia.
1078 Historical Notes: Derived from VR625-01-00 §4.3, eff. February 1, 1989.

1079

1080 **4VAC50-20-210. Consulting committee boards.**

1081 A. When the ~~board~~ Board needs to satisfy questions of safety regarding plans and
1082 specifications, construction or operation and maintenance, or when requested by the owner, the
1083 ~~board~~ Board may appoint a consulting ~~board~~ committee to report to it with respect to those
1084 questions of the impounding structure's safety of an impounding structure. Such a ~~board~~
1085 committee shall consist of two or more consultants, none of whom have been associated with the
1086 impounding structure.

1087 B. The costs and expenses incurred by the consulting ~~board~~ committee, if appointed at the
1088 request of an owner, shall be paid by the owner.

1089 C. The costs and expenses incurred by the consulting ~~board~~ committee, if initiated by the
1090 ~~board~~ Board, shall be paid by the ~~board~~ Board.

1091 Statutory Authority: §10.1-605 of the Code of Virginia.
1092 Historical Notes: Derived from VR625-01-00 §4.4, eff. February 1, 1989.
1093

1094

1095 **4VAC50-20-220. Unsafe conditions.**

1096 A. No owner shall ~~have the right to maintain an unsafe impounding structure which~~
1097 ~~unreasonably threatens the life or property of another person. The owner of any impounding~~
1098 ~~structure found to have deficiencies which could threaten life or property if uncorrected shall~~
1099 ~~take the corrective actions needed to remove such deficiencies within a reasonable period of~~
1100 ~~time.~~ Designation of an impounding structure as unsafe shall be made in accordance with §
1101 10.1-607.1 of the Code of Virginia.

1102 B. Imminent danger. When the ~~director~~ Director finds that an impounding structure is
1103 unsafe and constitutes an imminent danger to life or property, he shall immediately notify the
1104 State Department of Emergency Management and confer with the owner and ensure that the
1105 Emergency Action Plan or Emergency Preparedness requirements have been implemented if
1106 appropriate to do so. The owner of an impounding structure found to constitute an imminent
1107 danger to life or property shall take immediate corrective action to remove the imminent danger
1108 as required by §10.1-608 of the Code of Virginia.

1109 C. Nonimminent danger. The owner of an impounding structure who has been issued a
1110 ~~report by the board containing findings and recommendations, by the Board~~, for the correction of
1111 deficiencies which threaten life or property if not corrected, shall undertake to implement the
1112 recommendations for correction of deficiencies according to a schedule of implementation
1113 contained in that report as required by §10.1-609 of the Code of Virginia.

1114 Statutory Authority: §10.1-605 of the Code of Virginia.
1115 Historical Notes: Derived from VR625-01-00 §4.5, eff. February 1, 1989; Amended, Virginia Register Volume 18,
1116 Issue 14, eff. July 1, 2002.
1117 Effect of Amendment: The July 1, 2002 amendment, in subsection B, changed "Emergency Services" to "Emergency
1118 Management"; and, in subsection C, changed "director" to "board", following "issued a report by the".
1119

1120

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1121 **4VAC50-20-230. Complaints.**

1122 A. Upon receipt of a complaint alleging that the person or property of the complainant is
1123 endangered by the construction, maintenance or operation of impounding structure, the ~~director~~
1124 Director shall cause an inspection of the structure, unless the data, records and inspection reports
1125 on file with the ~~board~~ Board are found adequate to determine if the complaint is valid.

1126 B. If the ~~director~~ Director finds that an unsafe condition exists, the ~~director~~ Director shall
1127 proceed under the provisions of §§10.1-608 and 10.1-609 of the Code of Virginia to render the
1128 extant condition safe.

1129
1130 Statutory Authority: §10.1-605 of the Code of Virginia.
1131 Historical Notes: Derived from VR625-01-00 §4.6, eff. February 1, 1989.
1132

1133 **Part V: Design Requirements**

1134
1135 **4VAC50-20-240. Design of structures.**

1136 A. The owner shall complete all necessary investigations prior to submitting the design
1137 report. The scope and degree of precision required is a matter of engineering judgment based on
1138 the complexities of the site and the hazard potential classification of the proposed structure.

1139 B. Surveys shall be made with sufficient accuracy to locate the proposed construction site
1140 and to define the total volume of storage in the impoundment. Locations of center lines and
1141 other horizontal and vertical controls shall be shown on a map of the site. The area downstream
1142 and upstream from the proposed impounding structure shall be investigated in order to delineate
1143 the areas and extent of potential damage in case of failure or backwater due to flooding.

1144 C. The drainage area shall be determined. ~~Present, projected and potential future~~ and
1145 planned land-use conditions shall be considered in determining the runoff characteristics of the
1146 drainage area. The most severe of these conditions shall be included in the design calculations
1147 which shall be submitted as part of the design report.

1148 D. The geotechnical engineering investigation shall consist of borings, test pits and other
1149 subsurface explorations necessary to adequately define the existing conditions. The
1150 investigations shall be performed so as to define the soil, rock and ground water conditions.

1151 E. All construction materials shall be adequately selected so as to ensure that their
1152 properties meet design criteria. If on-site materials are to be utilized, they shall be located and
1153 determined to be adequate in quantity and quality.

1154
1155 Statutory Authority: §10.1-605 of the Code of Virginia.
1156 Historical Notes: Derived from VR625-01-00 §5.1, eff. February 1, 1989.
1157

1158 ~~**4VAC50-20-250. Design flood.**~~

1159 ~~The minimum design flood to be utilized in impounding structure evaluation, design,~~
1160 ~~construction, operation and maintenance shall be commensurate with the size and hazard~~
1161 ~~potential of the particular impounding structure as determined in 4VAC50-20-50 and Table 1.~~
1162 ~~Competent, experienced, professional engineering judgment shall be used in applying those~~
1163 ~~design and evaluation procedures referenced in 4VAC50-20-320 of this chapter.~~

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1164
1165
1166

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

1167

1168 **4VAC50-20-260. Emergency spillway design.**

1169 A. Every impounding structure shall have a spillway system with adequate capacity to
1170 discharge the design flood without endangering the safety of the impounding structure.

1171 ~~B. An emergency spillway shall be required.~~

1172 C. Vegetated earth or an unlined emergency spillway may be approved when the
1173 applicant demonstrates that it will pass the spillway design flood without jeopardizing the safety
1174 of the impounding structure. In no case, however, shall dam owners permit the growth of trees
1175 and other woody vegetation in the emergency spillway area.

1176 D. Lined emergency spillways shall include design criteria calculations, plans and
1177 specifications for open channel, drop, ogee and chute spillways that include crest structures,
1178 walls, panel lining and miscellaneous details. All joints shall be reasonably water-tight and
1179 placed on a foundation capable of sustaining applied loads without undue deformation. Provision
1180 shall be made for handling leakage from the channel or under seepage from the foundation which
1181 might adversely affect the structural integrity and structural stability of the impounding structure.

1182

1183
1184
1185

Statutory Authority: §10.1-605 of the Code of Virginia.
Historical Notes: Derived from VR625-01-00 §5.3, eff. February 1, 1989.

1186 **4VAC50-20-270. Principal spillways and outlet works.**

1187 A. It will be assumed that principal spillways and regulating outlets provided for special
1188 functions will operate to normal design discharge capabilities during the spillway design flood,
1189 provided appropriate analyses show:

1190 1. That control gates and structures are suitably designed to operate reliably under
1191 maximum heads for durations likely to be involved and risks of blockage by debris are minimal;

1192 2. That access roads and passages to gate regulating controls would be safely passable by
1193 operating personnel under spillway design flood conditions; and

1194 3. That there are no other substantial reasons for concluding that outlets would not
1195 operate safely to fill design capacity during the spillway design flood.

1196 B. If there are reasons to doubt that any of the above basic requirements might not be
1197 adequately met under spillway design flood conditions, the "dependable" discharge capabilities
1198 of regulating outlets shall be assumed to be less than 100% of design capabilities, generally as
1199 outlined in the following subsections C through G of this section.

1200 C. Any limitations in safe operating heads, maximum velocities to be permitted through
1201 structures or approach channels, or other design limitations shall be observed in establishing
1202 "dependable" discharge rating curves to be used in routing the spillway design flood hydrograph
1203 through the reservoir.

1204 D. If intakes to regulating outlets are likely to be exposed to dangerous quantities of
1205 floating ~~drift~~ debris, sediment depositions or ice hazards prior to or during major floods, the
1206 dependable discharge capability during the spillway design flood shall be assumed to be zero.

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1207 E. If access roads or structural passages to operating towers or controls are likely to be
1208 flooded or otherwise unusable during the spillway design flood, the dependable discharge
1209 capability of regulating outlets will be assumed to be zero for those period of time during which
1210 such conditions might exist.

1211 F. Any deficiencies in discharge performance likely to result from delays in the operation
1212 of gates before attendants could be reasonably expected to reach the control for in estimating
1213 "dependable" discharge capabilities to be assumed in routing the spillway design flood through
1214 reservoir. Reports on design studies shall indicate the allowances made for possible delays in
1215 initiating gate operations. Normally, for projects located in small basins, where critical spillway
1216 design flood inflows may occur within several hours after intense precipitation, outflows through
1217 any regulating outlets that must be opened after the flood begins shall be assumed to be zero for
1218 an appropriate period of time subsequent to the beginning of intense rainfall.

1219 G. All gates, valves, conduits and concrete channel outlets shall be designed and
1220 constructed to prevent significant erosion or damage to the impounding structure or to the
1221 downstream outlet or channel.

1222
1223 Statutory Authority: §10.1-605 of the Code of Virginia.
1224 Historical Notes: Derived from VR625-01-00 §5.4, eff. February 1, 1989.

1225

1226 **4VAC50-20-280. Drain requirements.**

1227 All new impounding structures regardless of their hazard potential classification, shall
1228 include a device to permit draining of the impoundment within a reasonable period of time as
1229 determined by the owner's licensed professional engineer, subject to approval by the ~~director~~
1230 Director.

1231
1232 Statutory Authority: §10.1-605 of the Code of Virginia.
1233 Historical Notes: Derived from VR625-01-00 §5.5, eff. February 1, 1989.

1234

1235 **4VAC50-20-290. Life of the impounding structure.**

1236 Components of the impounding structure, the impoundment, the outlet works, drain
1237 system and appurtenances shall be durable or replaced in keeping with the design and planned
1238 life of the impounding structure.

1239
1240 Statutory Authority: §10.1-605 of the Code of Virginia.
1241 Historical Notes: Derived from VR625-01-00 §5.6, eff. February 1, 1989.

1242

1243 **4VAC50-20-300. Additional design requirements.**

1244 A. Flood routings shall start at or above the elevation of the crest of the lowest ungated
1245 outlet. Freeboard determination and justification must be addressed by the owner's engineer.

1246 B. All elements of the impounding structure and impoundments shall conform to sound
1247 engineering practice. Safety factors, design standards and design references that are used shall be
1248 included with the design report.

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1249 C. Inspection devices may be required by the director for use by inspectors, owners or the
1250 director in conducting inspections in the interest of structural integrity during and after
1251 completion of construction and during the life of the impounding structure.

1252
1253 Statutory Authority: §10.1-605 of the Code of Virginia.
1254 Historical Notes: Derived from VR625-01-00 §5.7, eff. February 1, 1989.

1255

1256 **4VAC50-20-310. Plans and specifications.**

1257 The plans and specifications for a proposed impounding structure shall consist of a
1258 detailed engineering design report that includes engineering drawings and specifications, with
1259 the following as a minimum:

1260 1. The name of the project; the name of the owner; classification of the impounding
1261 structure as set forth in this chapter; designated access to the project and the location with respect
1262 to highways, roads, streams and existing impounding structures and impoundments that would
1263 affect or be affected by the proposed impounding structure.

1264 2. Cross-sections, profiles, logs of test borings, laboratory and in situ test data, drawings
1265 of principal and emergency spillways and other additional drawings in sufficient detail to
1266 indicate clearly the extent and complexity of the work to be performed.

1267 3. The technical provisions, as may be required to describe the methods of the
1268 construction and construction quality control for the project.

1269 4. Special provisions, as may be required to describe technical provisions needed to
1270 ensure that the impounding structure is constructed according to the approved plans and
1271 specifications.

1272

1273 Statutory Authority: §10.1-605 of the Code of Virginia.
1274 Historical Notes: Derived from VR625-01-00 §5.8, eff. February 1, 1989.

1275

1276 **4VAC50-20-320. Acceptable design procedures and references.**

1277 The following are acceptable as design procedures and references:

1278 1. The design procedures, manuals and criteria used by the United States Army Corps of
1279 Engineers.

1280 2. The design procedures, manuals and criteria used by the United States Department of
1281 Agriculture, Natural Resources Conservation Service.

1282 3. The design procedures, manuals and criteria used by the United States Department of
1283 the Interior, Bureau of Reclamation.

1284 4. The design procedures, manuals and criteria used by the United States Department of
1285 Commerce, National Weather Service.

1286 5. Other design procedures, manuals and criteria that are accepted as current, sound
1287 engineering practices, as approved by the director prior to the design of the impounding
1288 structure.

1289

1290 Statutory Authority: §10.1-605 of the Code of Virginia.

DISCUSSION DRAFT – NOT APPROVED

1291 Historical Notes: Derived from VR625-01-00 §5.9, eff. February 1, 1989; Amended, Virginia Register Volume 18,
1292 Issue 14, eff. July 1, 2002.
1293 Effect of Amendment: The July 1, 2002 amendment, in paragraph 2, changed "Soil" to "Natural Resources" before
1294 "Conservation"; and, in paragraph 3, changed "or Interior" to "of the Interior".

1295

1296 **4VAC50-20-322. Other applicable dam safety references.**
1297 Manuals, Guidance, and Criteria used by the Federal Emergency Management Agency,
1298 including but not limited to those concerning Emergency Action Planning, Inflow Design Floods
1299 and Hazard Potential Classification Systems

1300
1301 Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners, U.S.
1302 Department of Homeland Security, Federal Emergency Management Agency, October 1998,
1303 Reprinted January 2004; FEMA 64

1304
1305 Federal Guidelines for Dam Safety: Selecting and Accommodating Inflow Design Floods for
1306 Dams, U.S. Department of Homeland Security, Federal Emergency Management Agency,
1307 October 1998, Reprinted April 2004; FEMA 94

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Part VI: Fees

1313 **4VAC 50-20-320 Authority to establish fees**

1314 Under the Code of Virginia, § 10.1-613.5, the Board is authorized to establish and collect
1315 application fees for the administration of the dam safety program, administrative review,
1316 certifications, and the repair and maintenance of dams. The fees will be deposited into the Dam
1317 Safety, Flood Prevention and Protection Assistance Fund.

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1319 **4VAC 50-20-325 Fee Submittal Procedures**

1320 A. Upon the effective date of these regulations, fees for all application or report submittals
1321 required pursuant to 4VAC 50-20-360 through 4 VAC 50-20-380 are due on the day an
1322 application for an operation and maintenance certificate or a construction permit is submitted.
1323 No application for an operation and maintenance certificate or a construction permit will be
1324 reviewed without full payment of the required fee per § 10.1-613.5.

1325 B. Fees shall be paid by check, draft or postal money order payable to the Treasurer of
1326 Virginia, or submitted electronically (if available), and must be in U.S. currency, except that
1327 agencies and institutions of the Commonwealth of Virginia may submit Interagency Transfers
1328 for the amount of the fee. All fees shall be sent to the following address (or submitted
1329 electronically, if available): Virginia Department of Conservation and Recreation, Dam Safety
1330 Receipts Control, P.O. Box 10150, Richmond, Virginia 23240.

1331 C. All fee payments shall be accompanied by the following information:

1332 1. Applicant name, address and daytime phone number.

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- 1333 2. The name of the dam, and the dam location.
1334 3. The type of application or report submitted.
1335 4. Whether the submittal is for a new permit or certificate issuance or permit or certificate
1336 reissuance.
1337 5. The amount of fee submitted.
1338 6. The existing permit number, if applicable.
1339 F. No permit fees remitted to the Department shall be subject to refund except as credits
1340 provided for in 4 VAC 50-20-380 B.

1341
1342 **4VAC 50-20-350 Fee Exemptions**

1343 Impounding structures owned by Virginia Soil and Water Conservation Districts shall be
1344 exempt from all fees associated with Part VI in accordance with § 10.1-613.5. There will be no
1345 fee assessed for the decommissioning of an impounding structure.
1346

1347 **4VAC 50-20-360 Construction Permit Application Fees**

1348 A. Any application form submitted pursuant to 4VAC 50-20-70 for permitting a proposed
1349 impounding structure construction after the effective date of these regulations shall be
1350 accompanied by a payment as determined in subsection B.

1351 B. Fees shall be as follows:

- 1352 1. \$2,500 for High or Significant Hazard Potential impounding structures
1353 2. \$1,000 for Low Hazard Potential impounding structures
1354

1355 **4VAC 50-20-370 Regular Operation and Maintenance Certificate Application Fees**

1356 A. Any application for a 6-year Regular Operation and Maintenance Certificate after the
1357 effective date of these regulations, except as otherwise exempted, shall be accompanied by a
1358 payment as determined in subsection B.

1359 B. Fees for Class High, Significant, or Low dams shall be as follows:

- 1360 1. \$1,500 for High Hazard Potential
1361 2. \$1,000 for Significant Hazard Potential
1362 3. \$600 for Low Hazard Potential
1363

1364 **4VAC 50-20-380 Conditional Operation and Maintenance Certificate Application Fee**

1365 A. Fees for a Conditional Operation and Maintenance Certificate for High or Significant
1366 Hazard Potential impounding structures shall be as follows:

- 1367 1. For a 2-year Certificate: \$600
1368 2. For a 1.5-year Certificate: \$450
1369 3. For a 1-year Certificate: \$300
1370 4. For a 6-month Certificate: \$150

1371 B. Fees for a Conditional Operation and Maintenance Certificate for Low Hazard Potential
1372 impounding structures shall be as follows:

- 1373 1. For a 2-year Certificate: \$300
1374 2. For a 1.5-year Certificate: \$225
1375 3. For a 1-year Certificate: \$150

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1376 4. For a 6-month Certificate: \$75
1377 C. The Board may allow a partial credit towards the Regular Operation and Maintenance
1378 Certificate fee if the owner of the impounding structure has completed, to the Director's
1379 satisfaction, the conditions of the Conditional Certificate prior to its expiration.
1380

1381 **FORMS**

1382
1383 Virginia Dam Owner's Annual Inspection Form Report, DCR 199-098 (rev. ~~12/01~~ 11/06).
1384

1385 Operation and Maintenance Certificate Application Class I, II and III for Virginia
1386 Regulated Impounding Structures, DCR 199-099 (rev. ~~12/01~~ 11/06).
1387

1388 As-Built Report for Class I, II and III Virginia Regulated Impounding Structures, DCR
1389 199-100 (rev. ~~12/01~~ 11/06).
1390

1391 Design Report for the Construction/ or Alteration of Virginia Regulated Impounding
1392 Structures, DCR 199-101 (rev. ~~12/01~~ 11/06).
1393

1394 Emergency Action Plan for Class I, Class II and Class III Virginia Regulated Impounding
1395 Structures, DCR 199-103 (rev. ~~12/01~~ 11/06).
1396

1397 Inventory Report for Class III and Class IV Low Hazard Impounding Structures, DCR
1398 199-104 (rev. 12/01).
1399

1400 Reinspection Report for Class I and II High and Significant Hazard Impounding
1401 Structures, DCR 199-105 (rev. 12/01).
1402

1403 Agricultural Certification Exemption Application for Impounding Structures, DCR 199-
1404 106 (rev. ~~12/01~~ 11/06).
1405

1406 Transfer Application for Certificate to Operate and Maintain a Virginia Regulated
1407 Impounding Structures Structure from Past Owner to New Owner, DCR 199-107 (rev.
1408 ~~12/01~~ 11/06).
1409

1410 Inspection Report for Virginia Regulated Impounding Structures, DCR 199-108 (11/06)
1411
1412
1413
1414