

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.

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 All engineering analysis analyses required by this chapter, such as including but not limited to, 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 that takes into consideration local topography and meteorological conditions.

~~E~~ F. The official forms as called for by in this chapter are available from the Department director at the Department's website.

4VAC50-20-30. Definitions.

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

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

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

## DISCUSSION DRAFT – NOT APPROVED

43 “Alteration” means changes to an impounding structure that could alter or affect its  
44 structural integrity. Alterations include, but are not limited to, changing the height or otherwise  
45 enlarging the dam, increasing normal pool or principal spillway elevation or physical  
46 dimensions, changing the elevation or physical dimensions of the emergency spillway,  
47 conducting necessary structural repairs or structural maintenance, or removing the impounding  
48 structure. ~~Alterations do not include normal operation and maintenance.~~

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

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

55 "Conditional ~~operation and maintenance certificate~~ Operation and Maintenance  
56 Certificate" means a certificate required for impounding structures with deficiencies.

57 “Construction” means the construction of a new impounding structure.

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

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

62 “Department” means the Virginia Department of Conservation and Recreation.

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

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

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

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

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

82 “Emergency Action Plan Exercise” means an activity designed to promote emergency  
83 preparedness; test or evaluate EAPs, procedures, or facilities; train personnel in emergency  
84 management duties; and demonstrate operational capability. In response to a simulated event,  
85 exercises should consist of the performance of duties, tasks, or operations very similar to the way

## DISCUSSION DRAFT – NOT APPROVED

86 they would be performed in a real emergency. An exercise may include but not be limited to  
87 drills and tabletop exercises.

88 “Emergency Preparedness Plan” means a formal document prepared for Low Hazard  
89 dams that provides maps and procedures for notifying owners of downstream property that may  
90 impacted by an emergency situation at an impounding structure.

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

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

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

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

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

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

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

121 "Normal impounding capacity" means the volume of water or other materials in acre-feet  
122 that is capable of being impounded at the elevation of the crest of the lowest ungated outlet from  
123 the impoundment.

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

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

## DISCUSSION DRAFT – NOT APPROVED

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

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

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

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

146 “Top of the impounding structure” means the lowest point of the nonoverflow section of  
147 the impounding structure.

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

### 151 **4VAC50-20-40. Hazard Potential Classifications Classes of impounding structures.**

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

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

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

166 2. ~~Impounding structures in the Class II hazard potential category are located where~~  
167 Significant Hazard Potential is defined where an impounding structure failure could may cause  
168 possible the loss of life or appreciable economic damage. Economic damage may occur to  
169 include, but not be limited to, unoccupied building(s), industrial or commercial facilities,  
170 secondary public utilities, secondary public roadways, railroads, personal property, and

**DISCUSSION DRAFT – NOT APPROVED**

171 ~~agricultural interests, highway(s) or railroad(s) or cause interruption of use or service of~~  
172 ~~relatively important public utilities.~~

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

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

183 ~~5C. Such size and~~ The hazard potential classification and size classifications category for  
184 the given hazard classification shall be proposed by the owner and shall be subject to approval by  
185 the ~~director~~ Director. ~~To conclusively determine support~~ the appropriate hazard potential  
186 classification, dam break analysis shall be conducted by the owner's engineer. Present and  
187 ~~projected development of planned land-use in the dam break~~ inundation zones downstream from  
188 the impounding structure shall be considered in determining the classification.

189 ~~6 D.~~ Impounding structures shall be subject to reclassification by the Board as necessary.

190

191 **4VAC50-20-50. Performance standards required for impounding structures.**

192 A. In accordance with the definitions provided by Virginia Code § 10.1-604 and  
193 4VAC50-20-30, an impounding structure shall be regulated if the dam is 25 feet or greater in  
194 height and creates a maximum impounding capacity of 15 acre-feet or greater, or the dam is six  
195 feet or greater in height and creates a maximum impounding capacity of 50 acre-feet or greater  
196 and is not otherwise exempt from regulation by the Code of Virginia. Impounding structures  
197 exempted from this chapter are those that are:

198 1. Licensed by the State Corporation Commission that are subject to a safety inspection  
199 program;

200 2. Owned or licensed by the United States government;

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

203 4. Water or silt retaining dams approved pursuant to §45.1-222 or §45.1-225.1 of the  
204 Code of Virginia; or

205 5. Obstructions in a canal used to raise or lower water.

206 Impounding structures of regulated size and not exempted shall be constructed, operated  
207 and maintained such that they perform in accordance with their design and purpose throughout  
208 the life of the project. For new-impounding structures, the spillway(s) capacity shall perform at a  
209 minimum to safely pass the appropriate spillway design flood as determined in Table 1. For the  
210 purposes of utilizing Table 1, Maximum Impounding Capacity and Height shall be determined in  
211 accordance with the definitions provided in 4 VAC 50-20-30 and Hazard Potential Classification  
212 shall be determined in accordance with 4VAC 50-20-40.

213

DISCUSSION DRAFT – NOT APPROVED

214 **TABLE 1--Impounding Structure Regulations**

215

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

216

217

Hazard Potential Class of Dam	SIZE CATEGORIES <sup>B</sup>		Spillway Design Flood (SDF) <sup>C</sup>	Minimum Threshold for Incremental Damage Assessment
	Maximum Impounding Capacity (Ac-Ft)	Height (Ft)		
<u>HIGH</u>	<u>All<sup>B</sup></u>	<u>All<sup>B</sup></u>	<u>PMF<sup>D</sup></u>	<u>.50 PMF</u>
<b>SIGNIFICANT</b>	<u>Large <math>\geq 1,000</math></u>	<u><math>\geq 40</math></u>	<u>PMF<sup>D</sup></u>	<u>.50 PMF</u>
	<u>Large <math>\geq 50,000</math></u>	<u><math>\geq 100</math></u>	<u>PMF<sup>D</sup></u>	<u>.50 PMF</u>
	<u>Medium <math>&gt; 1,000</math> &amp; <math>&lt; 50,000</math></u>	<u><math>&gt; 40</math> &amp; <math>&lt; 100</math></u>	<u>.75 PMF</u>	<u>100-YR<sup>E</sup></u>
	<u>Small <math>&gt; 15</math> &amp; <math>&lt; 1,000</math></u>	<u><math>&gt; 6</math> &amp; <math>&lt; 40</math></u>	<u>.50 PMF</u>	<u>100-YR<sup>E</sup></u>
<u>LOW</u>	<u>Large <math>\geq 50,000</math></u>	<u><math>\geq 100</math></u>	<u>.50 PMF</u>	<u>100-YR<sup>E</sup></u>
	<u>Small <math>\geq 15</math> &amp; <math>&lt; 50,000</math></u>	<u><math>\geq 6</math> &amp; <math>&lt; 100</math></u>	<u>100-YR<sup>E</sup></u>	<u>50-YR<sup>E</sup></u>

218 aB. The factor determining the largest size classification shall govern. The appropriate  
 219 size category classification is determined by the largest size associated with the maximum  
 220 impounding capacity and height of the impounding structure.

221 bC. The spillway design flood (SDF) represents the largest flood that need be considered  
 222 in the evaluation of the performance for a given project. The impounding structure shall perform  
 223 so as to safely pass the appropriate SDF. Where a range of SDF is indicated, the magnitude that  
 224 most closely relates to the involved risk should be selected. Reductions in the established SDF

**DISCUSSION DRAFT – NOT APPROVED**

225 may be evaluated through the use of incremental damage assessment pursuant to 4 VAC 50-20-  
226 52. The SDF established for an impounding structure shall not be less than those standards  
227 established elsewhere in regulations by state law or regulations, including but not limited to the  
228 Virginia Stormwater Management Program (VSMP) Permit Regulations (4VAC50-60-10 et seq.)  
229 Soil and Water Conservation Board Regulations for stormwater management impoundment  
230 structures and facilities. ~~The establishment in this chapter of rigid design flood criteria or~~  
231 ~~standards is not intended. Safety must be evaluated in the light of peculiarities and local~~  
232 ~~conditions for each impounding structure and in recognition of the many factors involved, some~~  
233 ~~of which may not be precisely known. Such can only be done by competent, experienced~~  
234 ~~engineering judgment, which the values in Table 1 are intended to supplement, not supplant.~~

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

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

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

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

260  
261 **4VAC50-20-52. Incremental damage assessment.**

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

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

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

**DISCUSSION DRAFT – NOT APPROVED**

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

270 3. Emergency Action Plan requirements set out in 4 VAC50-20-175 or Emergency  
271 Preparedness requirements set out in 4VAC50-20-177 have been satisfied;

272 4. Reporting Inspection report requirements have been met and are considered  
273 satisfactory by the Director;

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

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

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

280 C. After meeting the criteria set out in 4VAC50-20-52B, the owner’s engineer may  
281 proceed with evaluating the an incremental damage analysis. Once the owner’s engineer has  
282 determined the required spillway design flood through application of Table 1, further analysis  
283 may be performed to evaluate the limiting flood condition for incremental damages assessment.  
284 This assessment may be used to lower the spillway design flood. Allowable reductions are set  
285 out in subsection D, however, in no situation shall be the reduction be less than the level at which  
286 the incremental increase in water surface elevation downstream due to failure of a dam is no  
287 longer considered to present an unacceptable additional downstream threat. The spillway design  
288 flood requirement may be reduced to the spillway discharge at which dam failure will not  
289 significantly increase the downstream threat existing just prior to dam failure. This engineering  
290 analysis will need to present water surface elevations at each structure that may be impacted  
291 downstream of the dam. Water depths greater than two feet and overbank flow velocities greater  
292 than three feet per second shall be used to define conditions for unacceptable additional  
293 downstream threat determine impacts to persons or property. Water depth changes less than two  
294 feet and overbank flow velocities less than three feet per second may be considered as ineffective  
295 to structures downstream of the dam.

296 D. Allowable reductions are as follows:

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

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

302 2. For Large Low Hazard Potential dams, the spillway design flood shall not be less than  
303 100-YR. For Small Low Potential Hazard impounding structures, the spillway design flood shall  
304 not be less than 50-YR.

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

307

308 **4VAC50-20-54. Dam break inundation zone mapping**

309 Dam break inundation zone maps shall be provided to the Department to meet the  
310 requirements set out in Hazard Potential Classifications of Impounding Structures (4VAC50-20-

**DISCUSSION DRAFT – NOT APPROVED**

311 40). Emergency Action Plan for High and Significant Potential Hazard Dams (4VAC50-20-175),  
312 and Emergency Preparedness for Low Hazard Potential Dams (4VAC50-20-177), as applicable.

313 A. All inundation mapping should extend downstream ~~of from~~ the dam to a location  
314 where failure of the dam does not further constitute a hazard to downstream life or property. The  
315 location of the end of the inundation mapping should be indicated where the water surface  
316 elevation of the dam break inundation zone and the water surface elevation of the spillway  
317 design flood during a non-dam failure event are converge to within one foot of each other. The  
318 inundation maps shall be supplemented with water surface profiles and cross-sections at critical  
319 areas showing the peak water surface elevation prior to failure and the peak water surface  
320 elevation after failure.

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

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

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

329 2. A dam break analysis utilizing the under spillway design flood conditions with a dam  
330 failure; and

331 3. A dam break analysis utilizing the under spillway design flood conditions without a  
332 dam failure.

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

337 E. To meet the requirements of the Emergency Action Plan requirements set out in  
338 4VAC50-20-175, all owners of High and Significant Hazard Potential impounding structures  
339 shall provide dam break inundation map(s) representing the impacts that would occur with both a  
340 sunny-day dam failure and a spillway design flood dam failure.

341 1. The map(s) shall be developed at a scale sufficient to graphically display downstream  
342 inhabited areas and structures, roads, and other pertinent structures on the map within the  
343 identified inundation area that may be subject to possible danger. The A list of downstream  
344 inundation zone property owners and occupants, including and telephone numbers of  
345 downstream residents, who are in the inundation zones, should whenever possible be plotted on  
346 the map or provided with map for easy reference in the case of emergencies during an  
347 emergency.

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

**DISCUSSION DRAFT – NOT APPROVED**

354 2. A notes shall be included on each map to state: “Mapping of flooded areas and flood  
355 wave travel times are approximate. Timing and extent of actual inundation may differ from  
356 information present on this map”.

357  
358 **4VAC50-20-58. Local government notifications.**

359 For each certificate issued, the impounding structure owner shall send to the appropriate  
360 local government office, with planning and zoning responsibilities, a copy of the certificate to the  
361 appropriate local government(s) with planning and zoning responsibilities. A project description  
362 and the map(s) required under 4VAC50-20-54 showing the area that could be affected by the  
363 impounding structure breach shall be submitted with the certificate. The Department will  
364 provide a standard form cover letter for forwarding the certificate copy and accompanying  
365 materials. This notification would also serve to advise the locality that if development occurs in  
366 the dam break inundation zone that this could adversely affect the classification of the dam and  
367 require significant expenses to upgrade the impounding structure.

368

369 **Part II: Permit Requirements**

370

371 **4VAC50-20-60. Required permits.**

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

374 B. No person or entity shall alter or begin to alter an existing impounding structure in a  
375 ~~manner which would potentially affect its structural integrity until the board~~ Board has issued an  
376 ~~alteration permit, or in the case of an emergency, authorization obtained from the director. If an~~  
377 ~~owner or the owner’s engineer has determined that circumstances are impacting the integrity of~~  
378 ~~the impounding structure which could result in the imminent failure of the impounding structure,~~  
379 ~~temporary repairs may be initiated prior to approval from the Director~~ Board. The owner shall  
380 ~~notify the Department within 24 hours of identifying the circumstances impacting the integrity of~~  
381 ~~the impounding structure. The permit requirement may be waived if the director determines that~~  
382 ~~the alteration of improvement will not substantially alter or affect the structural integrity of the~~  
383 ~~impounding structure. Alteration does not mean normal operation and maintenance. Such~~  
384 ~~emergency notification shall not relieve the owner of the need to obtain an alteration permit as~~  
385 ~~soon as may be practicable, nor shall the owner take action beyond that necessary to address the~~  
386 ~~emergency situation.~~

387 C. When the ~~board~~ Board receives owner submits an application to the Board for any  
388 permit to construct or alter an impounding structure, the ~~director~~ the owner shall also inform the  
389 ~~local~~ government of any jurisdiction or jurisdictions which might be affected by the permit  
390 application.

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

393

394 **4VAC50-20-70. Construction permits.**

## DISCUSSION DRAFT – NOT APPROVED

395 A. Prior to preparing the complete design report for a construction permit, applicants are  
396 encouraged to seek approval from the director ~~shall~~ may submit ~~the a~~ a preliminary design report  
397 to the Department to determine if the project concept is acceptable to the Department. ~~For this~~  
398 ~~purpose the applicant should submit a~~ The preliminary design report should contain, at a  
399 minimum, a general description of subdivisions items 1 through 412 of subsection B of this  
400 section and subdivisions 1 and 2 of this subsection:

401 1. Proposed design criteria and a description of the size of the impounding structure,  
402 ground cover conditions, extent of current upstream development of within the watershed,  
403 jurisdictional comprehensive planning for development within the watershed, and the hydraulics  
404 and hydrology hydraulic, hydrological and structural features, geologic conditions and the  
405 geotechnical engineering assumptions used to determine the foundations foundation,  
406 impoundment rim stability and materials to be used.

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

409 B. An applicant for a construction permit shall submit a design report on ~~the official~~  
410 forms Department's form (Design Report for the Construction or Alteration of Virginia  
411 Regulated Impounding Structures). The design report shall be prepared in accordance with  
412 4VAC50-20-240 and shall include the following information: be consistent with the preliminary  
413 design report. The design report is a required element of a complete application for a  
414 construction permit and shall include the following information:

415 1. Project Information including a description of the proposed construction, name of the  
416 impounding structure, inventory number if available, name of the reservoir, and the purpose of  
417 the reservoir.

418 2. The proposed Hazard Potential classification in conformance with Table 1 of this  
419 chapter.

420 3. Location of the impounding structure including the City or County, number of feet or  
421 miles upstream or downstream of a highway and the highway number, name of the river or the  
422 stream, and the latitude and longitude.

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

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

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

429 a. Top of dam (elevation);

430 b. Downstream toe – lowest (elevation);

431 c. Height of dam (feet);

432 d. Crest length – exclusive of spillway (feet);

433 e. Crest width (feet);

434 f. Upstream slope (horizontal and vertical); and

435 g. Downstream slope (horizontal and vertical).

436 7. Reservoir data including the following:

437 a. Maximum capacity (acre-feet);

## DISCUSSION DRAFT – NOT APPROVED

- 438 b. Maximum pool (elevation);  
439 c. Maximum pool surface area (acres);  
440 d. Normal capacity (acre-feet);  
441 e. Normal pool (elevation);  
442 f. Normal pool surface area (acres); and  
443 g. Freeboard – normal pool to top of dam (feet).
- 444 8. Spillway data including the type, construction material, design configuration, and  
445 invert elevation for the low level drain, the principal spillway, and the emergency spillway.
- 446 9. Watershed data including drainage area (square miles); type and extent of watershed  
447 development; time of concentration (hours); routing procedure; spillway design flood used and  
448 state source; design inflow hydrograph volume (acre-feet), peak inflow (cfs), and rainfall  
449 duration (hours); and freeboard during passage of the spillway design flood (feet).
- 450 1. A description of the impounding structure and appurtenances and a proposed  
451 classification conforming with this chapter. The description shall include a statement of the  
452 purposes for which the impoundment and impounding structure are to be used.
- 453 210. A description of properties located in the dam break inundation zone downstream  
454 from the site of the proposed impounding structure, including the location and number of  
455 residential structures, buildings, roads, utilities and other property that would be endangered  
456 should the impounding structure fail.
- 457 311. A statement from the governing body of the local political subdivision or other  
458 evidence confirming that body is aware of the proposal to build an impounding structure and that  
459 of the land use classifications applicable to the inundation zone. Evidence that the local  
460 government or governments have been notified of the proposal by the owner to build an  
461 impounding structure.
- 462 412. Maps showing the location of the proposed impounding structure that include: the  
463 county or city in which the proposed impounding structure would be located, the location of  
464 roads, and access to the site, and the outline of the impoundment. Existing aerial photographs or  
465 existing topographic maps may be used for this purpose.
- 466 513. A report of the geotechnical investigations of the foundation soils, or bedrock, or  
467 both and of the materials to be used to construct the impounding structure.
- 468 614. Design assumptions and analyses sufficient to indicate that the impounding structure  
469 will be stable during its construction and during the life of the impounding structure under all  
470 conditions of reservoir impoundment operations, including rapid filling, flood surcharge, seismic  
471 loadings, and rapid drawdown of the impoundment.
- 472 715. Evaluation of the stability of the reservoir impoundment rim area in order to  
473 safeguard against reservoir impoundment rim slides of such magnitude as to create waves  
474 capable of overtopping the impounding structure and confirmation evaluation of rim stability  
475 during seismic activity.
- 476 816. Design assumptions and analyses sufficient to indicate that seepage in, around,  
477 through or under the impounding structure, foundation and abutments will be reasonably and  
478 practically controlled so that internal or external forces or results thereof will not endanger the  
479 stability and integrity of the impounding structure. The design report shall also include  
480 information on graded filter design.

**DISCUSSION DRAFT – NOT APPROVED**

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

484 1018. Provisions to ensure that the impounding structure and appurtenances will be  
485 protected against unacceptable deterioration or erosion due to freezing and thawing, wind, wave  
486 action, and rain or any combination thereof.

487 1119. Other pertinent design data, assumptions and analyses commensurate with the  
488 nature of the particular impounding structure and specific site conditions, including when  
489 required by ~~the director~~ this chapter, a plan and profile of the dam break inundation zones.

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

493 ~~13~~20. A description of the techniques to be used to divert stream flow during construction  
494 so as to prevent hazard to life, health and property, including a detailed plan and procedures to  
495 maintain a stable impounding structure during storm events, a drawing showing temporary  
496 diversion devices, and a description of the potential impoundment during the construction. Such  
497 diversion plans shall also be in accordance with applicable environmental laws.-

498 ~~14~~21. A plan ~~of~~ for project construction monitoring and quality control testing to confirm  
499 that construction materials and methods performance standards meet the design requirements set  
500 forth in the specifications.

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

502 ~~16~~22. Plans and specifications as required by 4VAC50-20-310.

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

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

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

517 24. Owners signature certifying receipt of the information provided pursuant to this  
518 subsection.

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

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

**DISCUSSION DRAFT – NOT APPROVED**

- 523 1. A detailed construction schedule sequence with milestones that has been agreed to by  
524 the owner, engineer and contractor.
- 525 2. Elements of the work plan that should be considered include, but are not limited to,  
526 foundation and abutment treatment, stream or river diversion, excavation and material fill  
527 processes, phased fill and compaction, testing and control procedures, construction of permanent  
528 spillway and drainage devices.
- 529 3. The erosion and sediment control plan, as approved by the local government, which  
530 minimizes soil erosion and sedimentation during all phases of construction.
- 531 4. The stormwater management plan or stormwater management facility plan, as  
532 approved by the local government, if the impounding structure is a stormwater management best  
533 management practice.
- 534 ~~5. A detailed plan and procedures to maintain a stable impounding structure during storm~~  
535 ~~events.~~
- 536 ~~D. The owner shall certify in writing that the operation and maintenance plan as~~  
537 ~~approved by the board will be adhered to during the life of the project except in cases of~~  
538 ~~unanticipated emergency requiring departure therefrom in order to mitigate hazard to life and~~  
539 ~~property. At such time, the owner's engineer and the director shall be notified.~~
- 540 D. A Temporary Emergency Action Plan is a required element of a complete application  
541 for a construction permit and shall include:
- 542 1. A notification list of state and local emergency response agencies, including any  
543 affected local governments;
- 544 ~~2. A drawing showing temporary diversion devices;~~  
545 ~~3. Potential impoundment during the construction;~~
- 546 24. Provisions for notification of potentially affected residences and structures;  
547 35. Construction site evacuation routes, and  
548 46. Any other special notes particular to the project.
- 549 ~~E. If the submission is not acceptable, the director shall inform the applicant within 60~~  
550 ~~days and shall explain what changes are required for an acceptable submission.~~
- 551 E. Within 120 days of receipt of a complete construction permit application the Board  
552 shall act on the application. If the application is not acceptable, the Director shall inform the  
553 applicant within 60 days of receipt and shall explain what changes are required for an acceptable  
554 application. A complete construction permit application consists of the following:
- 555 1. A final design report, submitted on the official Department form (Design Report for  
556 the Construction or Alteration of Virginia Regulated Impounding Structures), with attachments  
557 as needed, and certified by the owner and the owner's engineer;
- 558 2. A plan of construction schedule which meets the requirements of subsection C above;  
559 and
- 560 3. A Temporary Emergency Action Plan which meets the requirements of subsection D  
561 above.
- 562 ~~F. Within 120 days of receipt of an acceptable design report the board shall act on the~~  
563 ~~application.~~
- 564 E. Prior to and during construction the owner shall notify provide the director Director of  
565 with any proposed changes from the approved design, plans, specifications, or operation and

## DISCUSSION DRAFT – NOT APPROVED

566 maintenance plan of construction schedule. Approval shall be obtained from the ~~director~~  
567 Director prior to the construction or installation of any changes that will affect the stability  
568 integrity or impounding capacity of the impounding structure.

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

572 H. Construction must commence within two years after the permit is issued. If  
573 construction does not commence within two years after the permit is issued, the permit shall  
574 expire, except that the applicant may petition the ~~board~~ Board for extension of the two-year  
575 period and the ~~board~~ Board may extend such period for good cause with an appropriately  
576 updated plan of construction schedule and temporary emergency action plan.

577 I. The director ~~Director~~ may revoke a construction permit ~~issue a temporary stop work~~  
578 order pursuant to § 10.1-612.1 of the Code of Virginia and take any other action authorized by  
579 the Dam Safety Act (§ 10.1-604 et seq. of the Code of Virginia) if any of the permit terms are  
580 violated, or if construction is conducted in a manner hazardous to downstream life or property.  
581 The director may order the owner to eliminate such hazardous conditions within a period of time  
582 limited by the order. Such corrective measures shall be at the owner's expense. The applicant  
583 may petition the board to reissue the permit with such modifications as the board determines to  
584 be necessary. The Board, the Director, or both may take any necessary action consistent with the  
585 Dam Safety Act (§10.1-604 et seq. of the Code of Virginia) if any terms of this section or of the  
586 permit are violated, if the activities of the owner are not in accordance with the approved plans  
587 and specifications, if construction is conducted in a manner hazardous to downstream life or  
588 property, or for other cause as described in the Act.

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

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

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

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

**DISCUSSION DRAFT – NOT APPROVED**

- 608 a. Project information including the name and inventory number of the structure, name of  
609 the reservoir, and whether the report is associated with a new or old structure;
- 610 b. Location of the impounding structure including the City or County, number of feet or  
611 miles upstream or downstream of a highway and the highway number, name of the river or the  
612 stream, and the latitude and longitude;
- 613 c. Owner's name or representative if corporation, mailing address, residential and  
614 business telephone numbers, and other means of communication;
- 615 d. Information on the Design Report for the Construction or Alteration of Virginia  
616 Regulated Impounding Structures including who it was prepared by, the date of design report  
617 preparation, whether it was for new construction or for an alteration, and the permit issuance  
618 date;
- 619 e. Owner's engineer's name, firm, professional engineer Virginia number, mailing  
620 address, and business telephone number;
- 621 f. Impounding structure data including type of material (earth, concrete, masonry or  
622 other) and the following configurations:
- 623 (1). Top of dam (elevation);
- 624 (2). Downstream toe – lowest (elevation);
- 625 (3). Height of dam (feet);
- 626 (4). Crest length – exclusive of spillway (feet);
- 627 (5). Crest width (feet);
- 628 (6). Upstream slope (horizontal and vertical); and
- 629 (7). Downstream slope (horizontal and vertical).
- 630 g. Reservoir data including the following:
- 631 (1). Maximum capacity (acre-feet);
- 632 (2). Maximum pool (elevation);
- 633 (3). Maximum pool surface area (acres);
- 634 (4). Normal capacity (acre-feet);
- 635 (5). Normal pool (elevation);
- 636 (6). Normal pool surface area (acres); and
- 637 (7). Freeboard – normal pool to top of dam (feet).
- 638 h. Spillway data including the type, construction material, design configuration, and  
639 invert elevation for the low level drain, the principal spillway, and the emergency spillway; a  
640 description of the low level drain and principal spillway including dimensions, trash guard  
641 information, and orientation of intake and discharge to dam if looking downstream; and a  
642 description of the emergency spillway including dimensions and orientation to dam if looking  
643 downstream;
- 644 i. Watershed data including drainage area (square miles); type and extent of watershed  
645 development; time of concentration (hours); routing procedure; spillway design flood used and  
646 state source; design inflow hydrograph volume (acre-feet), peak inflow (cfs), and rainfall  
647 duration (hours); freeboard during passage of the spillway design flood (feet); and confirmation  
648 as to whether the impounding structure has ever been overtopped;
- 649 j. Impounding structure history including the date construction was completed, who it  
650 was designed by and the date, who it was built by and the date, who performed inspections and

**DISCUSSION DRAFT – NOT APPROVED**

651 dates, description of repairs, and confirmation as to whether the impounding structure has ever  
652 been overtopped;

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

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

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

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

662 o. Certification by the owner’s engineer that the information provided pursuant to  
663 subsection J2 is true and correct in their professional judgment. Such certification shall include  
664 the engineer’s signature, printed name, Virginia number, date, and the engineer’s Virginia seal;  
665 and

666 p. Owners signature certifying receipt of the information provided pursuant to subsection  
667 J2.

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

673 4.Operation and Maintenance Certificate Application (Operation and Maintenance  
674 Certificate Application for Virginia Regulated Impounding Structures) in accordance with  
675 4VAC50-20-105; and

676 5. Emergency Action Plan or Emergency Preparedness Plan in accordance with 4VAC50-  
677 20-175 or 4VAC50-20-177.

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

680

681 **4VAC50-20-80. Alterations permits.**

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

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

690 ~~B. An applicant for an alteration permit shall submit a design report on the official~~  
691 ~~Department form (Design Report for the Construction or Alteration of Virginia Regulated~~  
692 ~~Impounding Structures). The design report shall be prepared in accordance with 4VAC50-20-~~  
693 ~~240. The design report shall include, but not be limited to, the following information:~~

## DISCUSSION DRAFT – NOT APPROVED

- 694 1. Project Information including a description and benefits of the proposed alteration,  
695 name of the impounding structure, inventory number if available, name of the reservoir, and the  
696 purpose of the reservoir.
- 697 2. The hazard potential classification in conformance with Table 1 of this chapter.
- 698 3. Location of the impounding structure including the City or County, number of feet or  
699 miles upstream or downstream of a highway and the highway number, name of the river or the  
700 stream, and the latitude and longitude.
- 701 4. Owner's name or representative if corporation, mailing address, residential and  
702 business telephone numbers, and other means of communication.
- 703 5. Owner's engineer's name, firm, professional engineer Virginia number, mailing  
704 address, and business telephone number.
- 705 6. Impounding structure data including type of material (earth, concrete, masonry or  
706 other) and the following configurations (note both existing and design configurations for each):
- 707 a. Top of dam (elevation);
- 708 b. Downstream toe – lowest (elevation);
- 709 c. Height of dam (feet);
- 710 d. Crest length – exclusive of spillway (feet);
- 711 e. Crest width (feet);
- 712 f. Upstream slope (horizontal and vertical); and
- 713 g. Downstream slope (horizontal and vertical).
- 714 7. Reservoir data including the following (note both existing and design configurations  
715 for each):
- 716 a. Maximum capacity (acre-feet);
- 717 b. Maximum pool (elevation);
- 718 c. Maximum pool surface area (acres);
- 719 d. Normal capacity (acre-feet);
- 720 e. Normal pool (elevation);
- 721 f. Normal pool surface area (acres); and
- 722 g. Freeboard – normal pool to top of dam (feet).
- 723 8. Spillway data including the type, construction material, design configuration, and  
724 invert elevation for the low level drain, the principal spillway, and the emergency spillway.
- 725 9. Watershed data including drainage area (square miles); type and extent of watershed  
726 development; time of concentration (hours); routing procedure; spillway design flood used and  
727 state source; design inflow hydrograph volume (acre-feet), peak inflow (cfs), and rainfall  
728 duration (hours); and freeboard during passage of the spillway design flood (feet).
- 729 10. A description of the proposed remedial work to be performed including a plan view  
730 of the dam site representing all significant structures and improvements that precisely illustrate  
731 the location of all proposed work.
- 732 11. A description of the benefits that the proposed remedial work will have on the  
733 impounding structure.
- 734 10. Local government acknowledgement of alteration and repair plan. Evidence that the  
735 local government has been notified of the alteration and repair plan.

**DISCUSSION DRAFT – NOT APPROVED**

736 11. Construction plans Plans and specifications showing details of the proposed work as  
737 required by 4VAC50-20-310. The plan view of the dam site should represent all significant  
738 structures and improvements that illustrate the location of all proposed work.

739 12. Geotechnical investigations in the areas affected by the proposed alterations as  
740 necessary. A report of the geotechnical investigations of the foundation soils, bedrock, or both in  
741 the areas affected by the proposed alterations and of the materials to be used to alter the  
742 impounding structure.

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

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

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

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

754 17. If applicable, a description of the techniques to be used to divert stream flow during  
755 alteration work so as to prevent hazard to life, health and property, including a detailed plan and  
756 procedures to maintain a stable impounding structure during storm events, a drawing showing  
757 temporary diversion devices, and a description of the potential impoundment during the  
758 alteration. Such diversion plans shall be in accordance with the applicable environmental laws  
759 and endorsed by the local code official.

760 18. A plan of for project construction monitoring and quality control testing to confirm  
761 that materials used in the alteration work and the engineering methods used do that performance  
762 standards meet the design requirements set forth in the specifications.

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

766 20. Owners signature certifying receipt of the information provided pursuant to this  
767 subsection.

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

770 C. The alteration schedule A plan of construction is a required element of complete  
771 permit application and shall include:

772 1. A detailed construction schedule sequence with milestones that has been agreed to by  
773 the owner, engineer and contractor.

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

**DISCUSSION DRAFT – NOT APPROVED**

778           3. The erosion and sediment control plan, as approved by the local government, which  
779 minimizes soil erosion and sedimentation during all phases of construction.  
780           4. A detailed plan and procedures to maintain a stable impounding structure during storm  
781 events, if applicable.  
782           ~~D. If the submission is not acceptable, the director shall inform the applicant within 60~~  
783 ~~days and shall explain what changes are required for an acceptable submission.~~  
784           D. Within 120 days of receipt of a complete alteration permit application, the Board shall  
785 act on the application. If the application is not acceptable, the Director shall inform the applicant  
786 within 60 days of receipt and shall explain what changes are required for an acceptable  
787 application. A complete alteration permit application consists of the following:  
788           1. A final design report, submitted on the official Department form (Design Report for  
789 the Construction or Alteration of Virginia Regulated Impounding Structures), with attachments  
790 as needed, and certified by the owner.  
791           2. A plan of construction Alteration schedule which meets the requirements of subsection  
792 C D above,  
793           3. Any necessary interim provisions to the current Emergency Action Plan or Emergency  
794 Preparedness Plan requirements. Revisions Interim provisions shall be submitted to the local  
795 organization for emergency management, the Virginia Department of Emergency Management,  
796 and the Department; and  
797           4. If the owner is requesting the deregulation of an impounding structure, the application  
798 shall specify whether the impounding structure is to be removed so that the impounding structure  
799 is incapable of storing water, either temporarily or permanently; or whether the impounding  
800 structure is to be altered in such a manner that either the height or storage capacity of the  
801 impounding structure causes the impounding structure to be of less than regulated size.  
802           ~~E. Within 120 days of receipt of an acceptable application, the board shall act on the~~  
803 ~~application.~~  
804           E. During the alteration work, the owner shall notify provide the Director with of any  
805 proposed changes from the approved design, plans, specifications, or a plan of construction  
806 alteration schedule work plan. Approval shall be obtained from the Director prior to the  
807 construction alteration or installation of any changes that will affect the integrity or impounding  
808 capacity of the impounding structure. If an owner or the owner's engineer have determined that  
809 circumstances are impacting the integrity of the impounding structure, which could result in the  
810 imminent failure of the impounding structure, temporary repairs may be initiated prior to  
811 approval from the Director. The owner shall notify the Department within 24 hours of  
812 identifying the circumstances impacting the integrity of the dam.  
813           F. The Alteration Permit shall be valid for the alteration schedule construction sequence  
814 with milestones specified in the approved alteration permit application. The alteration schedule  
815 may be amended by the Director for good cause at the request of the applicant.  
816           G. Work identified in the Alteration Permit must commence within the time frame  
817 identified in the Alteration Certificate Permit. If work does not commence within the prescribed  
818 time frame, the permit shall expire, except that the applicant may petition the Board for  
819 extension of the prescribed time frame and the Board may extend such period for good cause  
820 with an appropriately updated construction sequence with milestones alteration schedule.

**DISCUSSION DRAFT – NOT APPROVED**

821 H. The Director may issue a temporary stop work order pursuant to § 10.1-612.1 of the  
822 Code of Virginia and take any other action authorized by the Dam Safety Act (§ 10.1-604 et seq.  
823 of the Code of Virginia) if any of the permit terms are violated, or if construction is conducted in  
824 a manner hazardous to downstream life or property. The Board, the Director, or both may take  
825 any necessary action consistent with the Dam Safety Act (§10.1-604 et seq. of the Code of  
826 Virginia) if any terms of this section or of the permit are violated, if the activities of the owner  
827 are not in accordance with the approved plans and specifications, if the alteration is conducted in  
828 a manner hazardous to downstream life or property, or for other cause as described in the Act.

829 I. Within 90 days after completion of the alteration of an impounding structure, the owner  
830 shall submit a complete Record Report (Record Report for Virginia Regulated Impounding  
831 Structures) signed and sealed by a licensed professional engineer and signed by the owner to the  
832 Department indicating the modifications made to the structural features of the impounding  
833 structure. This Report is not required when the alteration permit has been issued for the removal  
834 of an impounding structure. The Record Report shall include the following:

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

837 b. Location of the impounding structure including the City or County, number of feet or  
838 miles upstream or downstream of a highway and the highway number, name of the river or the  
839 stream, and the latitude and longitude;

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

842 d. Information on the Design Report for the Construction or Alteration of Virginia  
843 Regulated Impounding Structures including who it was prepared by, the date of design report  
844 preparation, whether it was for new construction or for an alteration, and the permit issuance  
845 date;

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

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

- 850 (1). Top of dam (elevation);  
851 (2). Downstream toe – lowest (elevation);  
852 (3). Height of dam (feet);  
853 (4). Crest length – exclusive of spillway (feet);  
854 (5). Crest width (feet);  
855 (6). Upstream slope (horizontal and vertical); and  
856 (7). Downstream slope (horizontal and vertical).

857 g. Reservoir data including the following:

- 858 (1). Maximum capacity (acre-feet);  
859 (2). Maximum pool (elevation);  
860 (3). Maximum pool surface area (acres);  
861 (4). Normal capacity (acre-feet);  
862 (5). Normal pool (elevation);  
863 (6). Normal pool surface area (acres); and

**DISCUSSION DRAFT – NOT APPROVED**

- 864 (7). Freeboard – normal pool to top of dam (feet).  
865 h. Spillway data including the type, construction material, design configuration, and  
866 invert elevation for the low level drain, the principal spillway, and the emergency spillway; a  
867 description of the low level drain and principal spillway including dimensions, trash guard  
868 information, and orientation of intake and discharge to dam if looking downstream; and a  
869 description of the emergency spillway including dimensions and orientation to dam if looking  
870 downstream;  
871 i. Watershed data including drainage area (square miles); type and extent of watershed  
872 development; time of concentration (hours); routing procedure; spillway design flood used and  
873 state source; design inflow hydrograph volume (acre-feet), peak inflow (cfs), and rainfall  
874 duration (hours); and freeboard during passage of the spillway design flood (feet);  
875 j. Impounding structure history including the date construction was completed, who it  
876 was designed by and the date, who it was built by and the date, who performed inspections and  
877 dates, description of repairs, and confirmation as to whether the impounding structure has ever  
878 been overtopped;  
879 k. A narrative describing the impounding structure procedures for operation,  
880 maintenance, emergency action plan implementation, and structure evaluation;  
881 l. A narrative describing the hydraulic and hydrologic data on the spillway design flood,  
882 hydrologic records, flood experience, flood potential, reservoir regulation, and comments or  
883 recommendations regarding these attributes;  
884 m. A narrative describing stability of the foundation and abutments, embankment  
885 materials, and a written evaluation of each;  
886 n. A complete set of record drawings signed and sealed by a licensed professional  
887 engineer and signed by the owner;  
888 o. Certification by the owner's engineer that the information provided pursuant to  
889 subsection I2 is true and correct in their professional judgment. Such certification shall include  
890 the engineer's signature, printed name, Virginia number, date, and the engineer's Virginia seal;  
891 and  
892 p. Owners signature certifying receipt of the information provided pursuant to subsection  
893 I2.  
894 J. For altered impounding structures, a certification from a licensed professional engineer  
895 who has monitored the alteration of the impounding structure that, to the best of the engineer's  
896 judgment, knowledge, and belief, the impounding structure and its appurtenances were altered in  
897 conformance with the plans, specifications, drawings and other requirements approved by the  
898 Board.

899  
900 **4VAC50-20-90. Repealed.**

901  
902 **4VAC50-20-90. Transfer of permits.**

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

**DISCUSSION DRAFT – NOT APPROVED**

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

908

909 **4VAC50-20-95. Deregulation of impounding structures**

910 ~~A. Notwithstanding the requirements of 4VAC50-20-80, if an owner wishes to deregulate~~  
911 ~~an existing impounding structure, such owner shall provide a written request to initiate the~~  
912 ~~deregulation of an impounding structure. The request will specify whether the impounding~~  
913 ~~structure is to be:~~

914 ~~1. Removed so that the impounding structure is incapable of storing water, either~~

915 ~~temporarily or permanently; or~~

916 ~~2. Altered in such a manner that either the height or storage capacity of the impounding~~  
917 ~~structure causes the impounding structure to be of less than regulated size.~~

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

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

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

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

927

928

**Part III: Certificate Requirements**

929

930 **4VAC50-20-100. Repealed**

931

932 ~~**4VAC50-20-100. Regular Operation and Maintenance Certificates.**~~

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

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

941 ~~C. A Class III Operation and Maintenance Certificate is required for a Class III Hazard~~  
942 ~~potential impounding structure. The certificate shall be for a term of six years.~~

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

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

**DISCUSSION DRAFT – NOT APPROVED**

948 F. The owner of a Class I, II or III impounding structure shall apply for the renewal of the  
949 six year operation and maintenance certificate 90 days prior to its expiration in accordance with  
950 4VAC50-20-120 of this chapter.

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

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

958  
959 **4VAC50-20-105. Regular Operation and Maintenance Certificates.**

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

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

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

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

- 975 1. The application shall include the following required information:  
976 a. The name of structure and inventory number;  
977 b. The proposed hazard potential classification;  
978 c. Owner's name or representative if corporation, mailing address, residential and  
979 business telephone numbers, and other means of communication;

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

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

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

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

**DISCUSSION DRAFT – NOT APPROVED**

989 f. A schedule including the rainfall amounts, emergency spillway flow levels or storm  
990 event that initiates the Emergency Action or Preparedness Plan and the frequency of  
991 observations;  
992 g. A statement as to whether or not the current hazard potential classification for the dam  
993 is appropriate and whether or not additional work is needed to make an appropriate hazard  
994 potential designation;  
995 h. For newly constructed or recently altered impounding structures, a certification from a  
996 licensed professional engineer who has monitored the construction or alteration of the  
997 impounding structure that, to the best of the engineer’s judgment, knowledge, and belief, the  
998 impounding structure and its appurtenances were constructed or altered in conformance with the  
999 plans, specifications, drawings and other requirements approved by the Board;  
1000 i. Certification by the owner’s engineer that the Operation and Maintenance Certificate  
1001 Application information provided pursuant to subsection C1 is true and correct in their  
1002 professional judgment. Such certification shall include the engineer’s signature, printed name,  
1003 Virginia number, date, and the engineer’s Virginia seal; and  
1004 j. Owners signature certifying the Operation and Maintenance Certificate Application  
1005 information provided pursuant to subsection C1 and that the operation and maintenance plan and  
1006 schedule shall be conducted in accordance with this chapter.  
1007 2. An Inspection Report (Annual Inspection Report for Virginia Regulated Impounding  
1008 Structures) in accordance with subsection E or a Record Report (Record Report for Virginia  
1009 Regulated Impounding Structures) in accordance with 4VAC50-20-70 J2 (construction) or  
1010 4VAC50-20-80 I (alteration);  
1011 3. An Emergency Action Plan in accordance with 4VAC50-20-175 or an Emergency  
1012 Preparedness Plan in accordance with 4VAC50-20-177 and evidence that the required copies of  
1013 such plan have been submitted to the local organization for emergency management and the  
1014 State Department of Emergency Management; and  
1015 4. Any additional analysis determined necessary by the Director, the Board or the  
1016 owner’s engineer to address public safety concerns. Such additional analysis may include, but  
1017 not be limited to, seismic stability, earthen spillway integrity, adequate freeboard allowance,  
1018 stability assessment of the impoundment’s foundation, potential liquefaction of the embankment,  
1019 overturning or sliding of a concrete structure and other structural stress issues.  
1020 D. If the Operation and Maintenance Application submittal is found to be not complete,  
1021 the Director shall inform the applicant within 30 days and shall explain what changes are  
1022 required for an acceptable submission. Within 60 days of receipt of a complete application the  
1023 Board shall act upon the application. Upon finding that the impounding structure as currently  
1024 operating is in compliance with this chapter, the Board shall issue a Regular Operation and  
1025 Maintenance Certificate. Should the Board find that the impounding structure as currently  
1026 operating is not in compliance with this chapter, the Board may deny the permit application or  
1027 issue a Conditional Operation and Maintenance Certificate in accordance with 4VAC50-20-150.  
1028 E. Inspections shall be performed on an impounding structure annually.  
1029 1. Inspection Reports (Annual Inspection Report for Virginia Regulated Impounding  
1030 Structures) signed and sealed by a licensed professional engineer shall be submitted to the  
1031 Department in accordance with the following schedule:

**DISCUSSION DRAFT – NOT APPROVED**

- 1032 a. For a High Hazard Potential impounding structure, every two years  
1033 b. For a Significant Hazard Potential impounding structure, every three years  
1034 c. For a Low Hazard Potential impounding structure, every six years.  
1035 In years when an Inspection Report signed and sealed by a licensed professional engineer  
1036 is not required, an owner shall submit the Annual Inspection Report for Virginia Regulated  
1037 Impounding Structures.
- 1038 2. The Inspection Report shall include the following required information:
- 1039 a. Project Information including the name and inventory number of structure, name of the  
1040 reservoir, and purpose of the reservoir;
- 1041 b. City or County where the impounding structure is located;
- 1042 c. Owner’s name or representative if corporation, mailing address, residential and  
1043 business telephone numbers, and other means of communication.;
- 1044 d. Owner’s engineer’s name, firm, professional engineer Virginia number, mailing  
1045 address, and business telephone number;
- 1046 e. Inspection observation of the impounding structure including the following:
- 1047 (1) Earthen embankment information including any embankment alterations; erosion;  
1048 settlement, misalignments or cracks; seepage and seepage flow rate and location;
- 1049 (2) Upstream slope information including notes on woody vegetation removed, rodent  
1050 burrows discovered, and remedial work performed;
- 1051 (3) Intake structure information including notes on deterioration of concrete structures,  
1052 exposure of rebar reinforcement, need to repair or replace trash rack, any problems with debris in  
1053 the reservoir, and whether the drawdown valve operated;
- 1054 (4) Abutment contacts including notes on seepage and seepage flow rate and location;
- 1055 (5) Earthen emergency spillway including notes on obstructions to flow and plans to  
1056 correct, rodent burrows discovered, and deterioration in the approach or discharge channel;
- 1057 (6) Concrete emergency spillway including notes on the deterioration of the concrete,  
1058 exposure of rebar reinforcement, any leakage below concrete spillway, and obstructions to flow  
1059 and plans to correct;
- 1060 (7) Downstream slope information including notes on woody vegetation removed, rodent  
1061 burrows discovered, whether seepage drains are working, and any seepage or wet areas;
- 1062 (8) Outlet pipe information including notes on any water flowing outside of discharge  
1063 pipe through the dam and a description of any reflection or damage to the pipe;
- 1064 (9) Stilling basin information including notes on the deterioration of the concrete,  
1065 exposure of rebar reinforcement, deterioration of the earthen basin slopes, repairs made, and any  
1066 obstruction to flow;
- 1067 (10) Gates information including notes on gate malfunctions or repairs, corrosion or  
1068 damage, and whether any gates were operated and if so how often and to what extreme;
- 1069 (11) Reservoir information including notes on new developments upstream of the dam,  
1070 slides or erosion of lake banks, and general comments to include silt, algae, or other influence  
1071 factors;
- 1072 (12) Instruments information including any reading of instruments and any installation of  
1073 new instruments; and

**DISCUSSION DRAFT – NOT APPROVED**

1074 (13) General information including notes on new development in the downstream  
1075 floodplain that would impact hazard classification, the maximum stormwater discharge or peak  
1076 elevation during the previous year, whether general maintenance was performed and when, and  
1077 actions that need to be completed before the next inspection;

1078 f. Evaluation rating of the dam and appurtenances (excellent, good, or poor), general  
1079 comments, and recommendations;

1080 g. Certification by the owner and date of inspection; and

1081 h. Certification and seal by the owner's engineer and date of inspection, as applicable.

1082 F. The owner of an impounding structure shall notify the Department immediately of any  
1083 change in the use of the area downstream that would impose hazard to life or property in the  
1084 event of failure.

1085

1086 **4VAC50-20-110. Repealed**

1087

1088 ~~4VAC50-20-110. Operation and maintenance certificate Maintenance Certificate for newly~~  
1089 ~~constructed impounding structures.~~

1090 A. Within 180 days after completion of the construction of an impounding structure, the  
1091 owner shall submit:

1092 1. A complete set of as-built drawings certified by a professional engineer and an as-built  
1093 report on official forms.

1094 2. A copy of a certificate from the professional engineer who has inspected the  
1095 impounding structure during construction certifying that, to the best of his judgment, knowledge  
1096 and belief, the impounding structure and its appurtenances were constructed in conformance with  
1097 the plans, specifications, drawings and other requirements approved by the board.

1098 3. A copy of the operation and maintenance plan and emergency action plan submitted  
1099 with the design report including any changes required by the director.

1100 B. If the director finds that the operation and maintenance plan or emergency action plan  
1101 is deficient, he shall return it to the owner within 60 days with suggestions for revision.

1102 C. Within 60 days of receipt of the items listed in subsection A above, if the board finds  
1103 that adequate provision has been made for the safe operation and maintenance of the impounding  
1104 structure, the board shall issue an operation and maintenance certificate.

1105

1106 **4VAC50-20-120. Repealed.**

1107

1108 ~~4VAC50-20-120. Operation and maintenance certificates for existing impounding~~  
1109 ~~structures.~~

1110 A. Any owner of an impounding structure other than a Class IV impounding structure  
1111 which has already filed an inventory report that does not have an operation and maintenance  
1112 certificate or any owner renewing an operation and maintenance certificate shall file an  
1113 application with the board.

1114 B. The application for an operation and maintenance certificate shall be on official forms  
1115 and shall include:

## DISCUSSION DRAFT – NOT APPROVED

- 1116 1. A reinspection report for Class I and II impounding structures. The reinspection report  
1117 shall include an update of conditions of the impounding structure based on a previous safety  
1118 inspection as required by the board, a previous reinspection report or an as-built report.  
1119 2. An inventory report for Class III impounding structures. The inventory report shall  
1120 include:
- 1121 a. The name and location of the impounding structure and the name of the owner.
  - 1122 b. The description and dimensions of the impounding structure, the spillways, the  
1123 reservoir and the drainage area.
  - 1124 c. The history of the impounding structure which shall include the design, construction,  
1125 repairs, inspections and whether the structure has been overtopped.
  - 1126 d. Observations of the condition of the impounding structure, reservoir, and upstream and  
1127 downstream areas.
  - 1128 e. Any changes in the impounding structure, reservoir, and upstream and downstream  
1129 areas.
  - 1130 f. Recommendations for remedial work.
- 1131 3. An impoundment and impounding structure operation and maintenance plan certified  
1132 by a professional engineer. This plan shall place particular emphasis on operating and  
1133 maintaining the impounding structure in keeping with the project design in such manner as to  
1134 maintain its structural integrity and safety during both normal and abnormal conditions which  
1135 may reasonably be expected to occur during its planned life. The safety inspection report  
1136 required by the board should be sufficient to serve as the basis for the operation and maintenance  
1137 plan for a Class I and II impounding structure. For a Class III impounding structure, the  
1138 operation and maintenance plan shall be based on the data provided in the inventory report.
- 1139 4. An emergency action plan and evidence that a copy of such plan has been filed with  
1140 the local organization for emergency management and the State Department of Emergency  
1141 Management. The plan shall include a method of providing notification and warning to persons  
1142 downstream, other affected persons or property owners and local authorities in the event of a  
1143 flood hazard or the impending failure of the impounding structure.
- 1144 C. The owner shall certify in writing that the operation and maintenance plan approved  
1145 by the board will be adhered to during the life of the project except in cases of emergency  
1146 requiring departure therefrom in order to mitigate hazard to life and property, at which time the  
1147 owner's engineer, and the director shall be notified.
- 1148 D. If the director finds that the operation and maintenance plan or emergency action plan  
1149 is deficient, he shall return it to the owner within 60 days with suggestions for revision.
- 1150 E. Within 60 days of receipt of an acceptable application if the board finds that adequate  
1151 provision has been made for the safe operation and maintenance of the impounding structure, the  
1152 board shall issue an operation and maintenance certificate.

1153

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

- 1156 A. If an impounding structure has been determined to have an adequate spillway capacity  
1157 prior to the effective date of these regulations and is currently operating under a **Regular**  
1158 **Operation and Maintenance Certificate to operate (regular or conditional certificates)**, but will

**DISCUSSION DRAFT – NOT APPROVED**

1159 ~~now require spillway modifications due to changes in these regulations that require modifications~~  
1160 ~~in the spillway capacity, will have up to 5 years from the effective dates of these regulations to~~  
1161 ~~upgrade their spillways, the owner shall submit to the Board an Alteration Permit Application in~~  
1162 ~~accordance with 4VAC 50-20-80 to address spillway capacity at the time of the expiration of~~  
1163 ~~their Regular Operation and Maintenance Certificate or within 3 years of the effective date of~~  
1164 ~~these regulations, whichever is later. The Alteration Permit Application shall contain a~~  
1165 ~~construction sequence with milestones for completing the necessary improvements within 5~~  
1166 ~~years of Alteration Permit issuance. The Board may approve an extension of the prescribed time~~  
1167 ~~frame for good cause. Should the owner be able to demonstrate that no spillway capacity change~~  
1168 ~~is necessary, the impounding structure may be found to be in compliance with this chapter.~~  
1169 ~~However, those impounding structures under a regular certificate will be issued a conditional~~  
1170 ~~certificate until the new spillway design flood requirements are adequately addressed.~~

1171 ~~B. In accordance with 4VAC50-20-105, the owner shall submit the Operation and~~  
1172 ~~Maintenance Certificate Application (Operation and Maintenance Certificate Application for~~  
1173 ~~Virginia Regulated Impounding Structures), the Emergency Action Plan or Emergency~~  
1174 ~~Preparedness Plan, and the Inspection Report (Annual Inspection Report for Virginia Regulated~~  
1175 ~~Impounding Structures) 90 days prior to the expiration of the Regular Operation and~~  
1176 ~~Maintenance Certificate.~~

1177 ~~C. If circumstances change during the 5 year period that warrant more immediate repairs~~  
1178 ~~to the impounding structure, the Board may direct alterations to the spillway to be completed~~  
1179 ~~sooner. The conditional certificate will contain a compliance schedule including, but not limited~~  
1180 ~~to, engineering studies, design efforts, financial plans, and a construction completion schedule.~~

1181 ~~D. During this delay period, owners are required to address other deficiencies that may~~  
1182 ~~exist that are not related to the SDF. If warranted and the owner has demonstrated continual and~~  
1183 ~~substantial progress, the Board may issue a subsequent extension of the conditional permit.~~

1184  
1185 **4VAC50-20-130. Repealed.**

1186  
1187 **~~4VAC50-20-130. Existing impounding structures constructed prior to July 1, 1982.~~**

1188 ~~A. Many existing impoundment structures were designed and constructed prior to the~~  
1189 ~~enactment of the Dam Safety Act, and may not satisfy current criteria for new construction. The~~  
1190 ~~board may issue an operation and maintenance certificate for such structures provided that:~~

1191 ~~1. Operation and maintenance is determined by the director to be satisfactory and up to~~  
1192 ~~date;~~

1193 ~~2. Annual owner's inspection reports have been filed with and are considered satisfactory~~  
1194 ~~by the director;~~

1195 ~~3. The applicant proves in accordance with the current design procedures and references~~  
1196 ~~of 4VAC50-20-320 to the satisfaction of the board that the impounding structure as designed,~~  
1197 ~~constructed, operated and maintained does not pose an unreasonable hazard to life and property;~~  
1198 ~~and~~

1199 ~~4. The owner satisfies all special requirements imposed by the board.~~

1200 ~~B. When appropriate with existing impounding structures only, the spillway design flood~~  
1201 ~~requirement may be reduced by the board to the spillway discharge at which dam failure will not~~

**DISCUSSION DRAFT – NOT APPROVED**

1202 significantly increase the downstream hazard existing just prior to dam failure provided that the  
1203 conditions of 4VAC50-20-130 A have been met.

1204

1205 **4VAC50-20-135. Extension of Operation and Maintenance Certificates.**

1206 The Board may extend an Operation and Maintenance Certificate for impounding  
1207 structures provided that the owner submits a written request justifying an extension, the amount  
1208 of time needed to comply with the requirements set out in the current Operation and  
1209 Maintenance Certificate, and any required fees. The owner must have demonstrated substantial  
1210 and continual progress towards meeting the requirements.

1211 1. Operation and maintenance is determined by the Director to be satisfactory and up to  
1212 date;

1213 2. The dam is not in need of other alteration related to the integrity of the structure;

1214 3. Emergency Action Plan requirements set out in 4VAC50-20-175 or Emergency  
1215 Preparedness requirements set out in 4VAC50-20-177 have been satisfied;

1216 4. Annual owner's inspection reports have been consistently filed with, and are  
1217 considered satisfactory, by the Director;

1218 5. The applicant proves in accordance with the current design procedures and references  
1219 of 4VAC50-20-320 to the satisfaction of the Board that the impounding structure as designed,  
1220 constructed, operated and maintained does not pose an unreasonable hazard to life and property;  
1221 and

1222 6. The owner satisfies all special requirements imposed by the Board.

1223

1224 **4VAC50-20-140. Repealed.**

1225

1226 **4VAC50-20-140. Existing impounding structures constructed after July 1, 1982.**

1227 The board may issue an operation and maintenance certificate for an impounding  
1228 structure having a construction permit issued after July 1, 1982, and shall not require upgrading  
1229 to meet new more stringent criteria unless the board determines that the new criteria must be  
1230 applied to prevent an unreasonable hazard to life or property.

1231

1232 **4VAC50-20-150. Conditional operation and maintenance certificate.**

1233 A. During the review of any operation Operation and maintenance Maintenance  
1234 application Application (Operation and Maintenance Certificate Application for Virginia  
1235 Regulated Impounding Structures) completed in accordance with 4VAC50-20-105 should the  
1236 director Director determine that the impounding structure has non-imminent deficiencies of a  
1237 nonimminent danger category, the director Director may recommend that the board Board issue a  
1238 conditional Conditional-operation Operation and maintenance Maintenance certificate  
1239 Certificate.

1240 B. The Conditional-operation Operation and maintenance Maintenance certificate  
1241 Certificate for Class I, II and III High, Significant, and Low Hazard Potential impounding  
1242 structures shall be for a maximum term of two years. This certificate will allow the owner to  
1243 continue normal operation and maintenance of the impounding structure, and shall require that  
1244 the owner correct the deficiencies on a schedule determined by the director Board.

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1245 C. A ~~conditional~~ Conditional ~~certificate~~ Certificate may be ~~renewed~~ extended in  
1246 accordance with the procedures of ~~4VAC50-20-120~~ 4VAC50-20-135 provided that ~~annual owner~~  
1247 ~~inspection~~ Inspection reports Reports (Annual Inspection Report for Virginia Regulated  
1248 Impounding Structures) are on file, and the ~~board~~ Board determines that the owner is proceeding  
1249 with the necessary corrective actions.

1250 D. Once the deficiencies are corrected, the ~~board~~ Board shall issue ~~an~~ a Regular operation  
1251 Operation and maintenance Maintenance certificate Certificate based upon ~~any required~~  
1252 ~~revisions to the original application meeting the requirements of~~ 4VAC 50-20-100 4VAC50-20-  
1253 105.

1254 ~~E. The owner of any impounding structure, whether under conditional certificate or~~  
1255 ~~otherwise, shall meet the Emergency Action Plan requirements set out in 4VAC50-20-175 or the~~  
1256 ~~Emergency Preparedness requirements set out in 4VAC50-20-177.~~

1257

1258 **4VAC50-20-160. Additional operation and maintenance requirements.**

1259 A. The owner of an impounding structure shall not, through action or inaction, cause or  
1260 allow such structure to impound water following receipt of a written report from the owner's  
1261 engineer that the impounding structure will not safely impound water.

1262 B. In accordance with § 10.1-609.2 of the Code of Virginia, dam owners shall not permit  
1263 the growth of trees and other woody vegetation and shall remove any such vegetation from the  
1264 slopes and crest of embankments and the emergency spillway area, and within a distance of 25  
1265 feet from the toe of the embankment and abutments of the dam.

1266

1267 **4VAC50-20-165. Agricultural Exemption.**

1268 A. Impounding structures operated primarily for agricultural purposes which are less than  
1269 25 feet in height or which create a maximum impoundment capacity smaller than 100 acre-feet  
1270 are exempt from the Impounding Structure Regulations.

1271 B. An owner seeking an agricultural exemption pursuant to §10.1-604 and 4VAC50-20-  
1272 30 shall submit an Agricultural Exemption Application (Agricultural Exemption Application for  
1273 Impounding Structures) every 6 years.

1274 C. The Agricultural Exemption Application shall may be verified by the Department  
1275 through a possible site visit and approved by the Director.

1276

1277 **4VAC50-20-170. Transfer of certificates.**

1278 A. Prior to the transfer of ownership of an impounding structure the certificate holder  
1279 shall notify the ~~director~~ Director in writing and the new owner shall file a transfer application  
1280 notification on ~~official~~ the Department forms form (Transfer Notification for Certificate to  
1281 Operate and Maintain a Virginia Regulated Impounding Structure from Past Owner to New  
1282 Owner). The new owner may elect to continue the ~~current-existing~~ operation and maintenance  
1283 certificate for the remaining term or he may apply for a new certificate in accordance with  
1284 ~~4VAC50-20-120~~ 4VAC50-20-105. If the owner elects to continue the existing certificate, he  
1285 ~~shall amend the existing certificate application as necessary and~~ shall certify to the ~~director~~  
1286 Director that he is aware of and will comply with all of the requirements and conditions of the  
1287 certificate.

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- 1288 B. The new owner’s transfer notification shall include the following required  
1289 information:  
1290 1. Name and inventory number of structure;  
1291 2. New owner’s name and contact information, including mailing address and telephone  
1292 numbers;  
1293 3. Past owner’s name;  
1294 4. New owner’s certification of compliance with permit or certificate with all said terms  
1295 and conditions; and  
1296 5. Contact information updates for Emergency Action Plan or Emergency Preparedness  
1297 Plan.

1298  
1299 **4VAC50-20-175. Emergency Action Plan (EAP) for High and Significant Hazard Potential**  
1300 **Dams.**

1301 A. In order to protect life during potential emergency conditions at a dam, and to ensure  
1302 effective, timely action is taken should a dam emergency occur, an EAP shall be required for  
1303 each High and Significant Hazard Potential impounding structure. The EAP shall be coordinated  
1304 with the Department of Emergency Management in accordance with §44-146.18. The EAP  
1305 required by these regulations shall be incorporated into local and inter-jurisdictional emergency  
1306 plans pursuant to §44-146.19.

1307 B. It is the dam owner’s responsibility to develop, maintain, exercise, and implement a  
1308 site-specific EAP.

1309 C. An EAP shall be submitted every six years. For a High or Significant hazard  
1310 impounding structure, the The EAP shall be submitted with the dam owner’s renewal submittal  
1311 of their Regular Operation and Maintenance Certificate application (Operation and Maintenance  
1312 Certificate Application for Virginia Regulated Impounding Structures).

1313 D. It is imperative that the The dam owner shall update the EAP furnish all holders of the  
1314 EAP updates to the EAP immediately upon becoming aware of necessary changes to keep the  
1315 EAP workable. Should a dam be reclassified, an EAP in accordance with this section shall be  
1316 submitted.

1317 E. A drill shall be conducted annually for each High or Significant hazard impounding  
1318 structure. To the extent practicable, the drill should include a face-to-face meeting with the local  
1319 emergency management agencies responsible for any necessary evacuations to review the EAP  
1320 and ensure the local emergency management agencies understand the actions required during an  
1321 emergency. A table-top exercise shall be conducted once every 3 years. Owners shall certify to  
1322 the Department annually that an exercise a drill, a table-top exercise, or both has been completed,  
1323 provide and the statement shall include a critique of the exercise or exercises and any revisions  
1324 or updates to the EAP or a statement that no revisions or updates are needed.

1325 F. Dam owners shall test existing monitoring, sensing, and warning equipment at remote  
1326 or unattended dams at least twice per year and maintain a record of such tests.

1327 G. An EAP shall contain the following seven basic elements unless otherwise specified in  
1328 this subsection.

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1329 1. Notification chart - A notification chart shall be included for all classes of dams that  
1330 shows who is to be notified, by whom, and in what priority. The notification chart shall include  
1331 contact information that assures providing 24-hour telephone coverage for all responsible parties.

1332 2. Emergency Detection, Evaluation, and Classification - The EAP shall include a  
1333 discussion of the procedures for timely and reliable detection, evaluation, and classification of an  
1334 emergency situations considered to be relevant to the project setting and impounding features.  
1335 Each relevant emergency situation is to be documented to provide an to ensure that the  
1336 appropriate course of action is taken based on the urgency of the situation. Where appropriate,  
1337 the situations should address dam breaks that are imminent or in progress, a situation where the  
1338 potential for dam failure is rapidly developing, and a situation where the threat is slowly  
1339 developing.

1340 3. Responsibilities – The EAP shall specify responsibilities for EAP-related tasks. The  
1341 EAP shall also clearly designate the responsible party for making the decision that an emergency  
1342 condition no longer exists at the dam.

1343 4. Preparedness – The EAP shall include a section that describes preparedness actions to  
1344 be taken both before and following development of emergency conditions.

1345 5. Dam Break Inundation Maps – The EAP shall include an inundation map that  
1346 delineates the areas that would be flooded as a result of a dam failure. All properties identified  
1347 within the dam break inundation zone shall be incorporated into the EAP’s dam break inundation  
1348 zone map to ensure the proper notification of persons downstream and other affected persons or  
1349 property owners in the event of a flood hazard or the impending failure of the impounding  
1350 structure. Such maps shall be developed in accordance with 4VAC50-20-52. Dam break  
1351 inundation maps developed in accordance with 4VAC50-20-54 shall be included in the EAP.

1352 6. Appendices - The appendices shall contain information that supports and supplements  
1353 the material used in the development and maintenance of the EAP such as analyses of dam break  
1354 floods; plans for training, exercising, updating, and posting the EAP; and other site-specific  
1355 concerns.

1356 7. Certification – The EAP shall include a section that is signed by all parties with  
1357 assigned responsibilities in the EAP pursuant to subsection G3, where they indicate their  
1358 approval receipt of the EAP and agree to their responsibilities for its execution. The preparer’s  
1359 name, title, and contact information shall be printed in this section. The preparer’s signature  
1360 shall also be included in the certification section. The local organization for emergency  
1361 management shall provide the owner and the Department with any deficiencies they may note.

1362 H. The development of the EAP shall be coordinated with all entities, jurisdictions, and  
1363 agencies that would be affected by a dam failure or that have statutory responsibilities for  
1364 warning, evacuation, and post-flood actions. Consultation with state and local emergency  
1365 management officials at appropriate levels of management responsible for warning and  
1366 evacuation of the public is essential to ensure that there is agreement awareness of their  
1367 individual and group responsibilities.

1368 I. The EAP, or any updates to an existing EAP, shall at a minimum be filed submitted  
1369 with to the Department, the local organization for emergency management, and the State  
1370 Department of Emergency Management. Two copies shall be provided to the Department.

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1371 J. The following format shall be used as necessary to address the requirements of this  
1372 section.

1373 Title Page/Cover Sheet

1374 Table of Contents

1375 I. Certifications

1376 II. Notification Flowchart

1377 III. Statement of Purpose

1378 IV. Project Description

1379 V. Emergency Detection, Evaluation, and Classification

1380 VI. General Responsibilities Under the EAP

1381 A. Dam Owner Responsibilities

1382 B. Responsibility for Notification

1383 C. Responsibility for Evacuation

1384 D. Responsibility for Termination and Follow-Up

1385 E. EAP Coordinator Responsibility

1386 VII. Preparedness

1387 VIII. Inundation Maps

1388 IX Appendices

1389 A. Investigation and Analyses of Dam break Floods

1390 B. Plans for Training, Exercising, Updating, and Posting the EAP

1391 C. Site-Specific Concerns

1392

1393 **4VAC50-20-177. Emergency Preparedness Plan for Low Hazard Dams.**

1394 A. Low Hazard Dams shall provide information for emergency preparedness to the  
1395 Department, the local organization for emergency management and the Virginia Department of  
1396 Emergency Management. The information shall be submitted on the Department form  
1397 (Emergency Preparedness Plan for Virginia Regulated Impounding Structures). The information  
1398 shall include, but not be limited, to the following:

1399 1. Current contact name and contact information, including phone number;

1400 2. Physical location of the dam;

1401 3. A procedure for notifying any owners of downstream properties potentially impacted  
1402 by the dam's failure;

1403 4. A simple dam break inundation map, acceptable to the Director, demonstrating the  
1404 general inundation that would result from a dam failure. Such maps do not require preparation  
1405 by a professional licensed engineer, however, maps prepared by a licensed professional engineer  
1406 are preferred; and

1407 5. Evidence that the required copies of such plan have been submitted to the local  
1408 organization for emergency management and the State Department of Emergency Management;  
1409 and

1410 6. Certification by the owner and the local organization for emergency management.

1411

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**Part IV: Procedures**

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

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

B. Periodic inspections during construction or alteration shall be conducted under the ~~supervision~~ direction of a licensed professional engineer who shall ~~propose the frequency and nature of the inspections subject to approval by the director~~ inspect provide for full-time monitoring, review of contractor submittals, and appropriate confirmatory testing of all facets of construction affecting the safety of the impounding structure in accordance with the construction or alteration permit issued by the Board.

C. ~~Periodic~~ Required inspections during operation and maintenance shall be conducted under the supervision of a licensed professional engineer at ~~an interval~~ intervals not greater than that designated under 4VAC50-20-105 required to update the operation and maintenance certificate. At a minimum, an annual owner's inspection shall be conducted when a professional inspection is not required.

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

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

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

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

~~Any owner refusing to obey any order of the board or the director pursuant to this chapter may be compelled to obey and comply with such provisions by injunction or other appropriate remedy obtained in a court proceeding. Such proceeding shall be instituted by the board or in the~~

**DISCUSSION DRAFT – NOT APPROVED**

1455 case of an emergency, by the director in the court which granted approval to the owner to  
1456 impound waters or, if such approval has not been granted, the proceeding shall be instituted in  
1457 any appropriate court. The provisions of this chapter may be enforced by the Board, the  
1458 Director, or both Enforcement of the provisions of this chapter in any manner consistent shall be  
1459 in accordance with the provisions of the Dam Safety Act (§ 10.1-604 et seq. of the Code of  
1460 Virginia).

1461  
1462 **4VAC50-20-210. Consulting committee boards.**

1463 A. When the ~~board~~ Board needs to satisfy questions of safety regarding plans and  
1464 specifications, construction, alteration, or operation and maintenance, or when requested by the  
1465 owner, the ~~board~~ Board may appoint a consulting ~~board~~ committee to report to it with respect to  
1466 those questions of the impounding structure's safety of an impounding structure. Such a ~~board~~  
1467 committee shall consist of two or more consultants, none of whom have been associated with the  
1468 impounding structure.

1469 B. The costs and expenses incurred by the consulting ~~board~~ committee, if appointed at the  
1470 request of an owner, shall be paid by the owner.

1471 C. The costs and expenses incurred by the consulting ~~board~~ committee, if initiated by the  
1472 ~~board~~ Board, shall be paid by the ~~board~~ Board.

1473  
1474 **4VAC50-20-220. Unsafe conditions.**

1475 A. No owner shall ~~have the right to maintain an unsafe impounding structure which~~  
1476 ~~unreasonably threatens the life or property of another person. The owner of any impounding~~  
1477 ~~structure found to have deficiencies which could threaten life or property if uncorrected shall~~  
1478 ~~take the corrective actions needed to remove such deficiencies within a reasonable period of~~  
1479 ~~time. Designation of an impounding structure as unsafe shall be made in accordance with §~~  
1480 10.1-607.1 of the Code of Virginia.

1481 B. Imminent danger. When the ~~director~~ Director finds that an impounding structure is  
1482 unsafe and constitutes an imminent danger to life or property, he shall immediately notify the  
1483 State Department of Emergency Management and confer with the owner who shall and ensure  
1484 that activate the Emergency Action Plan or Emergency Preparedness Plan requirements have  
1485 been implemented if appropriate to do so. The owner of an impounding structure found to  
1486 constitute an imminent danger to life or property shall take immediate corrective action to  
1487 remove the imminent danger as required by §10.1-608 of the Code of Virginia.

1488 C. Nonimminent danger. The owner of an impounding structure who has been issued a  
1489 ~~report by the board containing findings and recommendations, by the Board,~~ for the correction of  
1490 deficiencies which may threaten life or property if not corrected, shall undertake to implement  
1491 the recommendations for correction of deficiencies according to a schedule of implementation  
1492 contained in that report as required by §10.1-609 of the Code of Virginia.

1493  
1494 **4VAC50-20-230. Complaints.**

1495 A. Upon receipt of a complaint alleging that the person or property of the complainant is  
1496 endangered by the construction, alteration, maintenance or operation of an impounding structure,  
1497 the ~~director~~ Director shall cause an inspection of the structure, unless the data, records and

**DISCUSSION DRAFT – NOT APPROVED**

1498 inspection reports on file with the ~~board~~ Board are found adequate to determine if the complaint  
1499 is valid.

1500 B. If the ~~director~~ Director finds that an unsafe condition exists, the ~~director~~ Director shall  
1501 proceed under the provisions of §§10.1-608 and 10.1-609 of the Code of Virginia to render the  
1502 extant condition safe.

1503

1504 **Part V: Design Requirements**

1505

1506 **4VAC50-20-240. Design of structures.**

1507 A. The owner shall complete all necessary investigations prior to submitting the design  
1508 report (Design Report for the Construction or Alteration of Virginia Regulated Impounding  
1509 Structures). The design report shall contain those components outlined in 4VAC50-20-70 for  
1510 construction activities and or those outlined in 4VAC50-20-70 for alteration activities. The  
1511 scope and degree of precision required is a matter of engineering judgment based on the  
1512 complexities of the site and the hazard potential classification of the proposed structure.

1513 B. Surveys shall be made with sufficient accuracy to locate the proposed construction site  
1514 and to define the total volume of storage in the impoundment. Locations of center lines and  
1515 other horizontal and vertical controls shall be shown on a map of the site. The area downstream  
1516 and upstream from the proposed impounding structure shall be investigated in order to delineate  
1517 the areas and extent of potential damage in case of failure or backwater due to flooding.

1518 C. The drainage area shall be determined. ~~Present, projected and potential future~~ and  
1519 planned land-use conditions shall be considered in determining the runoff characteristics of the  
1520 drainage area. The most severe of these conditions shall be included in the design calculations  
1521 which shall be submitted as part of the design report.

1522 D. The geotechnical engineering investigation shall consist of borings, test pits and other  
1523 subsurface explorations necessary to adequately define the existing conditions. The  
1524 investigations shall be performed so as to appropriately define the soil, rock and ground water  
1525 conditions.

1526 E. All construction materials shall be adequately ~~explored~~ researched and selected so as  
1527 to ensure that their ~~properties meet as constructed behavior will reasonably conform to~~ design  
1528 criteria. If on-site materials are to be utilized, they shall be located and determined to be  
1529 adequate in quantity and quality.

1530

1531 ~~**4VAC50-20-250. Design flood.**~~

1532 ~~The minimum design flood to be utilized in impounding structure evaluation, design,~~  
1533 ~~construction, operation and maintenance shall be commensurate with the size and hazard~~  
1534 ~~potential of the particular impounding structure as determined in 4VAC50-20-50 and Table 1.~~  
1535 ~~Competent, experienced, professional engineering judgment shall be used in applying those~~  
1536 ~~design and evaluation procedures referenced in 4VAC50-20-320 of this chapter.~~

1537

1538 **4VAC50-20-260. Emergency spillway Spillway design.**

**DISCUSSION DRAFT – NOT APPROVED**

1539 A. Every impounding structure shall have a spillway system with adequate capacity to  
1540 discharge the design flood without endangering the safety of the impounding structure.

1541 ~~B. An emergency spillway shall be required.~~

1542 **CB.** Vegetated earth or an unlined emergency spillway may be approved when the  
1543 applicant demonstrates that it will pass the spillway design flood without jeopardizing the safety  
1544 of the impounding structure. In no case, however, shall dam owners permit the growth of trees  
1545 and other woody vegetation in the emergency spillway area.

1546 **DC.** Lined emergency spillways shall include design criteria calculations, plans and  
1547 specifications for suitable energy dissipators and for open channel, drop, ogee and chute  
1548 spillways that include crest control structures, chutes, walls, panel lining, sills, blocks, and  
1549 miscellaneous details. All joints shall be reasonably water-tight and placed on a foundation  
1550 capable of sustaining applied loads without undue deformation. Provision shall be made for  
1551 handling leakage from the channel or under seepage and uplift pressures from the foundation  
1552 which might adversely affect the structural integrity and structural stability of the impounding  
1553 structure.

1554

1555 **4VAC50-20-270. Principal spillways and outlet works.**

1556 A. It will be assumed that principal spillways and regulating outlets provided for special  
1557 functions will operate to normal design discharge capabilities during the spillway design flood,  
1558 provided appropriate analyses show:

1559 1. That control gates and structures are suitably designed to operate reliably under  
1560 maximum heads for durations likely to be involved and risks of blockage by debris are minimal;

1561 2. That access roads and passages to gate regulating controls would be safely passable by  
1562 operating personnel under spillway design flood conditions; and

1563 3. That there are no other substantial reasons for concluding that outlets would not  
1564 operate safely to fill full design capacity during the spillway design flood.

1565 B. If there are reasons to doubt that any of the above basic requirements might not be  
1566 adequately met under spillway design flood conditions, the "dependable" discharge capabilities  
1567 of regulating outlets shall be assumed to be less than 100% of design capabilities capacities,  
1568 generally as outlined in the following subsections C through G of this section.

1569 C. Any limitations in safe operating heads, maximum velocities to be permitted through  
1570 structures or approach channels, or other design limitations shall be observed in establishing  
1571 "dependable" discharge rating curves to be used in routing the spillway design flood hydrograph  
1572 through the reservoir.

1573 D. If intakes to regulating outlets are likely to be exposed to dangerous significant  
1574 quantities of floating ~~drift~~ debris, sediment depositions or ice hazards prior to or during major  
1575 floods, the dependable discharge capability during the spillway design flood shall be assumed to  
1576 be zero.

1577 E. If access roads or structural passages to operating towers or controls are likely to be  
1578 flooded or otherwise unusable during the spillway design flood, the dependable discharge  
1579 capability of regulating outlets will be assumed to be zero for those the period periods of time  
1580 during which such conditions might exist.

## DISCUSSION DRAFT – NOT APPROVED

1581 F. Any deficiencies in discharge performance likely to result from delays in the operation  
1582 of gates before attendants could be reasonably expected to reach the control ~~for in~~ must be taken  
1583 into account when estimating "dependable" discharge capabilities ~~to be assumed~~ assumptions in  
1584 routing the spillway design flood through ~~reservoir impoundment~~. Reports on design studies  
1585 shall indicate the allowances made for possible delays in initiating gate operations. Normally,  
1586 for projects located in small basins, where critical spillway design flood inflows may occur  
1587 within several hours after intense precipitation, outflows through any regulating outlets that must  
1588 be opened after the flood begins shall be assumed to be zero for an appropriate period of time  
1589 subsequent to the beginning of intense rainfall.

1590 G. All gates, valves, conduits and concrete channel outlets shall be designed and  
1591 constructed to prevent significant erosion or damage to the impounding structure or to the  
1592 downstream outlet or channel.

1593

### 1594 **4VAC50-20-280. Drain requirements.**

1595 All new impounding structures regardless of their hazard potential classification, shall  
1596 include a device to permit draining of the impoundment within a reasonable period of time as  
1597 determined by the owner's licensed professional engineer, subject to approval by the ~~director~~  
1598 Director.

1599

### 1600 **4VAC50-20-290. Life of the impounding structure.**

1601 Components of the impounding structure, ~~the impoundment~~, the outlet works, drain  
1602 system and appurtenances shall be durable or replaced in keeping with the design and planned  
1603 life of the impounding structure.

1604

### 1605 **4VAC50-20-300. Additional design requirements.**

1606 A. Flood routings shall start at or above the elevation of the crest of the lowest ungated  
1607 outlet. Freeboard determination and justification must be addressed by the owner's engineer.

1608 B. All elements of the impounding structure ~~and impoundments~~ shall conform to sound  
1609 engineering practice. Safety factors, design standards and design references that are used shall  
1610 be included with the design report.

1611 C. Inspection devices may be required by the ~~director~~ Director for use by inspectors,  
1612 owners or the ~~director~~ Director in conducting inspections in the interest of structural integrity  
1613 during and after completion of construction and during the life of the impounding structure.

1614

### 1615 **4VAC50-20-310. Plans and specifications.**

1616 The plans and specifications for a proposed impounding structure required in 4VAC50-  
1617 20-70 for construction activities and in 4VAC50-20-70 for alteration activities shall consist of a  
1618 detailed engineering design report (Design Report for the Construction or Alteration of Virginia  
1619 Regulated Impounding structures) ~~that includes and~~ engineering drawings and specifications,  
1620 with the following as a minimum:

1621 1. The name of the project; the name of the owner; classification of the impounding  
1622 structure as set forth in this chapter; designated access to the project and the location with respect

## DISCUSSION DRAFT – NOT APPROVED

1623 to highways, roads, streams and existing impounding structures and impoundments that would  
1624 affect or be affected by the proposed impounding structure.

1625 2. Cross-sections, plans, profiles, logs of test borings, laboratory and in situ test data,  
1626 drawings of principal and emergency spillways, impounding structures, outlet works, ancillary  
1627 facilities drain system and appurtenances, and other additional drawings project components in  
1628 sufficient detail to indicate clearly the extent and complexity of the work to be performed.

1629 3. Contract drawings should include, but not be limited to, foundation and abutment  
1630 treatment, stream or river diversion, excavation and material fill processes, phased fill and  
1631 compaction and drainage devices.

1632 4. The erosion and sediment control plan, as approved by the local government, which  
1633 minimizes soil erosion and sedimentation during all phases of construction or alteration.

1634 35. The technical Technical provisions specifications, as may be required to describe the  
1635 materials, performance, and methods of the construction and construction quality control for the  
1636 project.

1637 4. Special provisions, as may be required to describe technical provisions needed to  
1638 ensure that the impounding structure is constructed according to the approved plans and  
1639 specifications.

1640

### 1641 **4VAC50-20-320. Acceptable design procedures and references.**

1642 Within the major engineering disciplines of hydrology, hydraulics, soils and foundations,  
1643 structures, and general civic design, criteria and approaches from multiple sources shall not be  
1644 mixed for developing the design of a given feature or facility. The following are acceptable as  
1645 design procedures and references:

1646 1. The design procedures, manuals and criteria used by the United States Army Corps of  
1647 Engineers.

1648 2. The design procedures, manuals and criteria used by the United States Department of  
1649 Agriculture, Natural Resources Conservation Service.

1650 3. The design procedures, manuals and criteria used by the United States Department of  
1651 the Interior, Bureau of Reclamation.

1652 4. The design procedures, manuals and criteria used by the United States Department of  
1653 Commerce, National Weather Service.

1654 5. Other design procedures, manuals and criteria that are accepted as current, sound  
1655 engineering practices, as approved by the director prior to the design of the impounding  
1656 structure.

1657

### 1658 **4VAC50-20-330. Other applicable dam safety references.**

1659 Manuals, Guidance, and Criteria used by the Federal Emergency Management Agency,  
1660 including but not limited to those concerning Emergency Action Planning, Inflow Design Floods  
1661 and Hazard Potential Classification Systems the following:

1662 1. Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners,  
1663 U.S. Department of Homeland Security, Federal Emergency Management Agency, October  
1664 1998, Reprinted January 2004; FEMA 64.

**DISCUSSION DRAFT – NOT APPROVED**

1665 2. Federal Guidelines for Dam Safety: Selecting and Accommodating Inflow Design  
1666 Floods for Dams, U.S. Department of Homeland Security, Federal Emergency Management  
1667 Agency, October 1998, Reprinted April 2004; FEMA 94.  
1668

1669 **Part VI: Fees**  
1670

1671 **4VAC 50-20-340 Authority to establish fees**

1672 Under the Code of Virginia, § 10.1-613.5, the Board is authorized to establish and collect  
1673 application fees for the administration of the dam safety program, administrative review,  
1674 certifications, and the repair and maintenance of dams. The fees will be deposited into the Dam  
1675 Safety, Flood Prevention and Protection Assistance Fund.  
1676

1677 **4VAC 50-20-350 Fee Submittal Procedures**

1678 A. Upon the effective date of these regulations, fees for all application or report  
1679 submittals required pursuant to 4VAC 50-20-370 through 4 VAC 50-20-390 are due on the day  
1680 an application for an operation and maintenance certificate or a construction permit is submitted  
1681 prior to issuance of a certificate or permit. No application for an Operation and Maintenance  
1682 Certificate or a Construction Permit will be reviewed acted upon by the Board without full  
1683 payment of the required fee per § 10.1-613.5.

1684 B. Fees shall be paid by check, draft or postal money order payable to the Treasurer of  
1685 Virginia, or submitted electronically (if available), and must be in U.S. currency, except that  
1686 agencies and institutions of the Commonwealth of Virginia may submit Interagency Transfers  
1687 for the amount of the fee. All fees shall be sent to the following address (or submitted  
1688 electronically, if available): Virginia Department of Conservation and Recreation, Dam Safety  
1689 Receipts Control, P.O. Box 10150, Richmond, Virginia 23240.

1690 C. All fee payments shall be accompanied by the following information:

1691 1. Applicant name, address and daytime phone number.

1692 2. The name of the dam, and the dam location.

1693 3. The type of application or report submitted.

1694 4. Whether the submittal is for a new permit or certificate issuance or permit or certificate  
1695 reissuance.

1696 5. The amount of fee submitted.

1697 6. ~~The existing permit-Dam identification~~ number, if applicable.

1698 F. No permit fees remitted to the Department shall be subject to refund except as credits  
1699 provided for in 4 VAC 50-20-390 D.  
1700

1701 **4VAC 50-20-360 Fee Exemptions**

1702 Impounding structures owned by Virginia Soil and Water Conservation Districts shall be  
1703 exempt from all fees associated with Part VI in accordance with § 10.1-613.5. There will be no  
1704 fee assessed for the decommissioning of an impounding structure.  
1705

1706 **4VAC 50-20-370 Construction Permit Application Fees**

**DISCUSSION DRAFT – NOT APPROVED**

1707 A. Any application form submitted pursuant to 4VAC 50-20-70 for permitting a proposed  
1708 impounding structure construction after the effective date of these regulations shall be  
1709 accompanied by a payment as determined in subsection B.

1710 B. Fees shall be as follows:

1711 1. \$2,500 for High or Significant Hazard Potential impounding structures

1712 2. \$1,000 for Low Hazard Potential impounding structures

1713

1714 **4VAC 50-20-380 Regular Operation and Maintenance Certificate Application Fees**

1715 A. Any application for a 6-year Regular Operation and Maintenance Certificate after the  
1716 effective date of these regulations, except as otherwise exempted, shall be accompanied by a  
1717 payment as determined in subsection B.

1718 B. Fees for ~~Class~~ High, Significant, or Low ~~dams~~ Hazard Potential impounding structures  
1719 shall be as follows:

1720 1. \$1,500 for High Hazard Potential

1721 2. \$1,000 for Significant Hazard Potential

1722 3. \$600 for Low Hazard Potential

1723

1724 **4VAC 50-20-390 Conditional Operation and Maintenance Certificate Application Fee**

1725 A. Fees for a Conditional Operation and Maintenance Certificate ~~or for the extension of a~~  
1726 Conditional Operation and Maintenance Certificate for High or Significant Hazard Potential  
1727 impounding structures shall be as follows:

1728 1. For a 2-year Certificate: ~~\$600~~ \$1000

1729 2. For a 1.5-year Certificate: ~~\$450~~ \$750

1730 3. For a 1-year Certificate: ~~\$300~~ \$500

1731 4. For a 6-month Certificate: ~~\$150~~ \$250

1732 B. Fees for a Conditional Operation and Maintenance Certificate ~~or for the extension of a~~  
1733 Conditional Operation and Maintenance Certificate for Low Hazard Potential impounding  
1734 structures shall be as follows:

1735 1. For a 2-year Certificate: ~~\$300~~ \$500

1736 2. For a 1.5-year Certificate: ~~\$225~~ \$375

1737 3. For a 1-year Certificate: ~~\$150~~ \$250

1738 4. For a 6-month Certificate: ~~\$75~~ \$125

1739 C. Fees for a Conditional Operation and Maintenance Certificate ~~or for the extension of a~~  
1740 Conditional Operation and Maintenance Certificate for any impounding structure that requires a  
1741 modification in spillway capacity due to changes in the regulations and that is eligible for a  
1742 delayed effective date pursuant to 4VAC50-20-125 shall be as follows:

1743 1. For a 2-year Certificate: \$200

1744 2. For a 1.5-year Certificate: \$150

1745 3. For a 1-year Certificate: \$100

1746 4. For a 6-month Certificate: \$50

1747 CD. The Board may allow a partial credit towards the Regular Operation and  
1748 Maintenance Certificate fee if the owner of the impounding structure has completed, to the

**DISCUSSION DRAFT – NOT APPROVED**

1749 Director’s satisfaction, the conditions of the Conditional Certificate prior to its expiration.  
1750 Credits shall only be provided to the nearest 6-month interval.  
1751

1752 **FORMS**

1753  
1754 Virginia Dam Owner's Annual Inspection Form Report, DCR 199-098 (rev. 12/01 11/06).  
1755

1756 Operation and Maintenance Certificate Application Class I, II and III for Virginia  
1757 Regulated Impounding Structures, DCR 199-099 (rev. 12/01 11/06).  
1758

1759 As-Built Report for Class I, II and III Virginia Regulated Impounding Structures, DCR  
1760 199-100 (rev. 12/01 11/06).  
1761

1762 Design Report for the Construction/ or Alteration of Virginia Regulated Impounding  
1763 Structures, DCR 199-101 (rev. 12/01 11/06).  
1764

1765 Emergency Action Plan for Class I, Class II and Class III Virginia Regulated Impounding  
1766 Structures, DCR 199-103 (rev. 12/01 11/06).  
1767

1768 Inventory Report for Class III and Class IV Low Hazard Impounding Structures, DCR  
1769 199-104 (rev. 12/01).  
1770

1771 Reinspection Report for Class I and II High and Significant Hazard Impounding  
1772 Structures, DCR 199-105 (rev. 12/01).  
1773

1774 Agricultural Certification Exemption Application for Impounding Structures, DCR 199-  
1775 106 (rev. 12/01 11/06).  
1776

1777 Transfer Application for Certificate to Operate and Maintain a Virginia Regulated  
1778 Impounding Structures Structure from Past Owner to New Owner, DCR 199-107 (rev.  
1779 12/01 11/06).  
1780

1781 Inspection Report for Virginia Regulated Impounding Structures, DCR 199-108 (11/06)  
1782