

1 **VIRGINIA SOIL AND WATER CONSERVATION BOARD**
2 **Impounding Structure (Dam Safety) Final Regulations**
3 **As Approved for Publication by the Board on February 1, 2008**

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5 **4VAC50-20-20. General provisions.**

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

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

15 C. In promulgating this chapter, the board recognizes that no impounding structure
16 can ever be completely "fail-safe," because of incomplete understanding of or
17 uncertainties associated with natural (earthquakes and floods) and manmade (sabotage)
18 destructive forces; with material behavior and response to those forces; and with quality
19 control during construction.

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

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

27 ~~EF.~~ The official forms as [called for] by [noted] in this chapter are available from
28 the director department at the department's website.

29 **4VAC50-20-30. Definitions.**

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

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

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

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

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

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

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

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

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

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

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

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

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

64 ~~"Design freeboard" means the vertical distance between the maximum elevation of~~
65 ~~the design flood and the top of the impounding structure.~~

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

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

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

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

87 "Emergency Preparedness Plan" means a formal document prepared for Low
88 Hazard [~~dams~~ impounding structures] that provides maps and procedures for notifying
89 owners of downstream property that may be impacted by an emergency situation at an
90 impounding structure.

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

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

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

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

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

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

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

124 [~~"Normal impounding capacity" means the volume of water or other materials in
125 acre-feet that is capable of being impounded at the elevation of the crest of the lowest
126 ungated outlet from the impoundment.]~~

127 ["Normal or typical water surface elevation" means the water surface elevation at the
128 crest of the lowest ungated outlet from the impoundment or the elevation of the normal
129 pool of the impoundment if different than the water surface elevation at the crest of the
130 lowest ungated outlet. For calculating sunny day failures for flood control impounding
131 structures, stormwater detention impounding structures, and related facilities designed to
132 hold back volumes of water for slow release, the normal or typical water surface
133 elevation shall be measured at the crest of the auxiliary or emergency spillway.]

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

136 "Owner" means the owner of the land on which an impounding structure is situated,
137 the holder of an easement permitting the construction of an impounding structure and
138 any person or entity agreeing to maintain an impounding structure. The term "owner"
139 ~~includes~~ may include the Commonwealth or any of its political subdivisions, including but
140 not limited to sanitation district commissions and authorities. ~~Also included are~~ any
141 public or private institutions, corporations, associations, firms or companies organized or

142 existing under the laws of this Commonwealth or any other state or country, as well as
143 any person or group of persons acting individually or as a group.

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

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

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

151 "Stage II Condition" means a flood watch or emergency spillway activation or [dam
152 impounding structure] overtopping where a [breach failure] may be possible.

153 "Stage III Condition" means an emergency spillway activation or [dam impounding
154 structure] overtopping where imminent failure is probable.

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

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

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

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

169 **4VAC50-20-40. Classes Hazard potential classifications of impounding structures.**

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

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

178 1. Impounding structures in the Class I hazard potential category are located
179 where High Hazard Potential is defined where an impounding structure failure will
180 cause probable loss of life or serious economic damage to occupied. ["Probable
181 loss of life" means that impacts will occur that are likely to cause a loss of human
182 life, including but not limited to impacts to residences, businesses, other
183 occupied structures, or major roadways.] Economic damage may occur to, but
184 not be limited to, building(s), industrial or commercial facilities, important
185 [primary] public utilities, main highway(s) or railroad(s) major [public]
186 roadways, railroads, personal property, and agricultural interests. ["Major
187 roadways" include, but are not limited to, interstates, primary highways, high-
188 volume urban streets, or other high-volume roadways.]

189 2. ~~Impounding structures in the Class II hazard potential category are located~~
190 ~~where Significant Hazard Potential is defined where an impounding structure~~
191 ~~failure could may cause possible the loss of life or appreciable economic~~
192 ~~damage. ["May cause loss of life" means that impacts will occur that could cause~~
193 ~~a loss of human life, including but not limited to impacts to facilities that are~~
194 ~~frequently utilized by humans other than residences, businesses, or other~~
195 ~~occupied structures, or to secondary roadways.] Economic damage may occur~~
196 ~~to, but not be limited to occupied, building(s), industrial or commercial facilities,~~
197 ~~[secondary] public utilities, secondary highway(s) or railroad(s) or cause~~
198 ~~interruption of use or service of relatively important public utilities [public]~~
199 ~~roadways, railroads, personal property, and agricultural interests. ["Secondary~~
200 ~~roadways" include, but are not limited to, secondary highways, low-volume urban~~
201 ~~streets, service roads, or other low-volume roadways.]~~

202 3. ~~Impounding structures in Class III hazard potential category are located where~~
203 ~~Low Hazard Potential is defined where an impounding structure failure may~~
204 ~~cause minimal property damage to others. No loss of life is expected would result~~
205 ~~in no expected loss of life and would cause no more than minimal economic~~
206 ~~damage. [Economic damage may occur to, but not be limited to, building(s),~~
207 ~~industrial or commercial facilities, secondary public utilities, secondary public~~
208 ~~roadways, railroads, personal property and agricultural interests. "No expected~~
209 ~~loss of life" means no loss of human life is anticipated.]~~

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

213 5. ~~Such size and C. The hazard potential classifications classification [and size~~
214 ~~category for the given hazard classification] shall be proposed by the owner and shall~~
215 ~~be subject to approval by the director board. To support the appropriate hazard~~
216 ~~classification, dam break analysis shall be conducted by the owner's engineer. Present~~
217 ~~and projected development of planned land-use [for which a development plan has~~
218 ~~been officially approved by the locality] in the dam break inundation zones downstream~~
219 ~~from the impounding structure shall be considered in determining the classification.~~

220 6. D. ~~Impounding structures shall be subject to reclassification by the board as~~
221 ~~necessary.~~

222 **4VAC50-20-50. Performance standards required for impounding structures.**

223 A. ~~In accordance with the definitions provided by §10.1-604 of the Code of Virginia~~
224 ~~and 4VAC50-20-30, an impounding structure shall be regulated if the [dam impounding~~
225 ~~structure] is 25 feet or greater in height and creates a maximum impounding capacity of~~
226 ~~15 acre-feet or greater, or the [dam impounding structure] is six feet or greater in height~~
227 ~~and creates a maximum impounding capacity of 50 acre-feet or greater and is not~~
228 ~~otherwise exempt from regulation by the Code of Virginia. Impounding structures~~
229 ~~exempted from this chapter are those that are:~~

- 230 1. ~~Licensed by the State Corporation Commission that are subject to a safety~~
231 ~~inspection program;~~
- 232 2. ~~Owned or licensed by the United States government;~~
- 233 3. ~~Operated primarily for agricultural purposes that are less than 25 feet in height~~
234 ~~or that create a maximum impoundment capacity smaller than 100 acre-feet;~~
- 235 4. ~~Water or silt-retaining dams approved pursuant to §45.1-222 or 45.1-225.1 of~~
236 ~~the Code of Virginia; or~~

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

Impounding structures of regulated size and not exempted shall be constructed, operated and maintained such that they perform in accordance with their design and purpose throughout the life of the project. For new impounding structures, the spillway(s) capacity shall perform at a minimum to safely pass the appropriate spillway design flood as determined in Table 1. For the purposes of utilizing Table 1, [Maximum Impounding Capacity and Height shall be determined in accordance with the definitions provided in 4VAC50-20-30 and] Hazard Potential Classification shall be determined in accordance with 4VAC50-20-40.

TABLE 1-Impounding Structure Regulations

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

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TABLE 1
Impounding Structure Regulations

[Applicable to all impounding structures that 25 feet or greater in height and that create a maximum impounding capacity of 15 acre-feet or greater, and to all impounding structures that are 6 feet or greater in height and that create a maximum impounding capacity of 50 acre-feet or greater and is not otherwise exempt from regulation by the Code of Virginia.]

<u>Hazard</u>	[<u>SIZE CATEGORIES^a</u>]	<u>Spillway</u>	<u>Minimum</u>
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Potential Class of Dam			Design Flood (SDF) [^{CB}]	Threshold for Incremental Damage [Assessment Analysis]
	[Maximum Impounding Capacity (Ac-Ft)]	[Height (Ft)]		
High	[All ^B]	[All ^B]	PMF [^{DC}]	.50 PMF
Significant	[Large = 50,000]	[=100]	[PMF ^D .50 PMF]	[.50-PMF 100-YR ^D]
	[Medium = 1,000 & < 50,000]	[= 40 & < 100]	[.75-PMF]	[100-YR ^E]
	[Small = 15 & < 1,000]	[= 6 & < 40]	[.50-PMF]	[100-YR ^E]
Low	[Large = 50,000]	[=100]	[.50-PMF 100-YR ^D]	[100-YR ^E 50-YR ^E]
	[Medium = 1,000 & < 50,000]	[= 40 & < 100]	[100-YR ^E]	[50-YR ^E]
	[Small = 15 & < 1,000]	[= 6 & < 40]	[100-YR ^E]	[50-YR ^E]

254 ^aThe factor determining the largest size classification shall govern. [B. The
255 appropriate size category is determined by the largest size associated with the maximum
256 impounding capacity and height of the impounding structure.]

257 ^b [CB] . The spillway design flood (SDF) represents the largest flood that need be
258 considered in the evaluation of the performance for a given project. The impounding
259 structure shall perform so as to safely pass the appropriate SDF. Where a range of SDF
260 is indicated, the magnitude that most closely relates to the involved risk should be
261 selected. The establishment in this chapter of rigid design flood criteria or standards is
262 not intended. Safety must be evaluated in the light of peculiarities and local conditions
263 for each impounding structure and in recognition of the many factors involved, some of
264 which may not be precisely known. Such can only be done by competent, experienced
265 engineering judgment, which the values in Table 1 are intended to supplement, not
266 supplant. Reductions in the established SDF may be evaluated through the use of
267 incremental damage [assessment analysis] pursuant to 4VAC50-20-52. The SDF
268 established for an impounding structure shall not be less than those standards
269 established elsewhere by state law or regulations, including but not limited to the Virginia
270 Stormwater Management Program (VSMP) Permit Regulations (4VAC50-60). [Due to
271 potential for future development in the dam break inundation zone which would
272 necessitate higher spillway design flood standards or other considerations, owners may
273 find it advisable to consider a higher spillway design flood standard than is required.]

274 ^c [DC] . PMF: Probable maximum flood This means Maximum Flood is the flood that
275 might be expected from the most severe combination of critical meteorologic and
276 hydrologic conditions that are reasonably possible in the region. The PMF is derived
277 from the current probable maximum precipitation (PMP) available from the National

278 Weather Service, NOAA. ~~In some cases local topography or meteorological conditions~~
279 ~~will cause changes from the generalized PMP values; therefore, it is advisable to contact~~
280 ~~local, state or federal agencies to obtain the prevailing practice in specific cases. [In~~
281 ~~some cases, a modified PMF may be calculated utilizing local topography,~~
282 ~~meteorological conditions, hydrological conditions, or PMP values supplied by NOAA.]~~
283 ~~Any deviation in the application of established developmental procedures must be~~
284 ~~explained and justified by the owner's engineer. The owner's engineer must develop~~
285 ~~PMF hydrographs for 6-, 12-, and 24-hour durations. The hydrograph that creates the~~
286 ~~largest peak outflow is to be used to determine capacity for nonfailure and failure~~
287 ~~analysis. Present and planned land-use conditions shall be considered in determining~~
288 ~~the runoff characteristics of the drainage area.~~

289 [~~ED~~] . 100-Yr: 100-year flood represents the flood magnitude expected to be
290 equaled or exceeded on the average of once in 100 years. It may also be expressed as
291 an exceedence probability with a 1.0% chance of being equaled or exceeded in any
292 given year. Present and planned land-use conditions shall be considered in determining
293 the runoff characteristics of the drainage area.

294 ^d [~~FE~~] : 50-Yr: 50-year flood. ~~This means~~ represents the flood magnitude expected
295 to be equaled or exceeded on the average of once in 50 years. It may also be expressed
296 as an exceedence probability with a 2.0% chance of being equaled or exceeded in any
297 given year. Present and planned land-use conditions shall be considered in determining
298 the runoff characteristics of the drainage area.

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

303 [**4VAC50-20-51. Special criteria for certain low hazard impounding structures.**

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

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

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

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

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

326 are unchanged since the last inspection conducted by a licensed professional
327 engineer; and

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

330 B. Any owner of an impounding structure electing to utilize the requirements of
331 subdivisions 1 through 5 of subsection A of this section shall otherwise comply with all
332 other requirements of this chapter applicable to low hazard impounding structures.

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

336 **4VAC50-20-52. Incremental damage [~~assessment analysis~~] :**

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

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

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

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

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

347 ~~4. Inspection report requirements have been met and are considered satisfactory~~
348 ~~by the director;~~

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

353 ~~6. The owner satisfies all special requirements imposed by the board; and~~

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

355 [~~CB~~] : [~~After meeting the criteria set out in subsection B of this section, the The~~]
356 ~~owner's engineer may proceed with an incremental damage analysis. Once the owner's~~
357 ~~engineer has determined the required spillway design flood through application of Table~~
358 ~~1, further analysis may be performed to evaluate the limiting flood condition for~~
359 ~~incremental damages. [Site-specific conditions should be recognized and considered.]~~
360 ~~This [~~assessment analysis~~] may be used to lower the spillway design flood. In no~~
361 ~~situation shall the allowable [~~reduction reduced level~~] be less than the level at which the~~
362 ~~incremental increase in water surface elevation downstream due to failure of [~~a dam an~~~~
363 ~~impounding structure] is no longer considered to present an [~~unacceptable~~] additional~~
364 ~~downstream threat. This engineering analysis will need to present water surface~~
365 ~~elevations at each structure that may be impacted downstream of the dam. [~~Water~~~~
366 ~~depths greater than two feet and overbank flow velocities greater than three feet per~~
367 ~~second shall be used to define conditions for unacceptable additional downstream threat~~
368 ~~to persons or property. An additional downstream threat to persons or property is~~
369 ~~presumed to exist when water depths exceed two feet or when the product of water~~
370 ~~depth (in feet) and flow velocity (in feet per second) is greater than seven.]~~

371 [~~DC~~] . The spillway design flood shall not be reduced below the minimum threshold
372 values as determined by Table 1.

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

376 **4VAC50-20-54. Dam break inundation zone mapping.**

377 A. Dam break inundation zone maps shall be provided to the department to meet the
378 requirements set out in Hazard Potential Classifications of Impounding Structures
379 (4VAC50-20-40), Emergency Action Plan for High and Significant Potential Hazard
380 [~~Dams Impounding Structures~~] (4VAC50-20-175), and Emergency Preparedness for
381 Low Hazard Potential [~~Dams Impounding Structures~~] (4VAC50-20-177), as applicable.

382 B. The location of the end of the inundation mapping should be indicated where the
383 water surface elevation of the dam break inundation zone and the water surface
384 elevation of the spillway design flood during [~~a non-dam failure~~ an impounding structure
385 ~~non-failure~~] event converge to within one foot of each other. [~~This would demonstrate a~~
386 ~~level where failure of the dam does not further constitute a hazard to downstream life or~~
387 ~~property.~~] The inundation maps shall be supplemented with water surface profiles [~~and~~
388 ~~cross-sections at critical areas~~] showing the peak water surface elevation prior to failure
389 and the peak water surface elevation after failure.

390 C. All inundation zone map(s), except those utilized in meeting the requirements of
391 Emergency Preparedness for Low Hazard Potential [~~Dams Impounding Structures~~]
392 (4VAC50-20-177), shall be signed and sealed by a licensed professional engineer.

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

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

397 2. A dam break analysis utilizing [~~a probable maximum flood~~ the spillway design
398 flood] with a dam failure; [~~and~~]

399 3. [~~A dam break An~~] analysis utilizing [~~a probable maximum flood~~ the spillway
400 design flood] without a dam failure [~~;~~ and]

401 [4. For the purposes of future growth planning, a dam break analysis utilizing the
402 probable maximum flood with a dam failure.]

403 E. To meet the requirements of Emergency Preparedness set out in 4VAC50-20-
404 177, all Low Hazard Potential impounding structures shall provide a simple map,
405 acceptable to the department, demonstrating the general inundation that would result
406 from a dam failure. Such maps do not require preparation by a professional licensed
407 engineer, however, it is preferred that the maps be prepared by a licensed professional
408 engineer.

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

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

420 2. [~~A note shall be included on each map to state: "Mapping of flooded areas~~
 421 ~~and flood wave travel times are approximate. Timing and extent of actual~~
 422 ~~inundation may differ from information presented on this map."~~ Each map shall
 423 include the following statement: "The information contained in this map is
 424 prepared for use in notification of downstream property owners by emergency
 425 management personnel."]

426 **4VAC50-20-58. Local government notifications.**

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

433 **[4VAC50-20-59. Reporting.**

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

Table 2 Impounding Structure Regulations	
Maximum Impounding Capacity (Ac-Ft)	Height (Ft)
Large = 50,000	= 100
Medium = 1,000 & < 50,000	= 40 & < 100
Small = 15 & < 1,000	= 6 & < 40]

436 Part II
 437 Permit Requirements

438 **4VAC50-20-60. Required permits.**

439 A. No person or entity shall construct or begin to construct [~~an a new~~] impounding
 440 structure until the board has issued a construction permit.

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

452 notification shall not relieve the owner of the need to obtain an alteration permit as soon
453 as may be practicable, nor shall the owner take action beyond that necessary to address
454 the emergency situation.

455 C. ~~When the board receives~~ owner submits an application to the board for any permit
456 to construct or alter an impounding structure, the ~~director~~ owner shall also inform the
457 local government ~~of any jurisdiction which~~ or jurisdictions that might be affected by the
458 permit application.

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

462 **4VAC50-20-70. Construction permits.**

463 A. Prior to preparing the complete design report for a ~~construction permit~~
464 Construction Permit, applicants are ~~encouraged to seek approval of the project concept~~
465 ~~from the director~~ may submit a preliminary design report to the department to determine
466 if the project concept is acceptable to the department. For this purpose the applicant
467 should submit The preliminary design report should contain, at a minimum, a general
468 description of subdivisions 1 through 4—12 of subsection B of this section and
469 subdivisions 1 and 2 of this subsection:

470 1. Proposed design criteria and a description of the size of the impounding
471 structure, ground cover conditions, extent of current upstream development of
472 within the watershed and the hydraulic, hydrological and structural features,
473 geologic conditions and the geotechnical engineering assumptions used to
474 determine the foundations foundation, impoundment rim stability and materials to
475 be used.

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

479 B. An applicant for a ~~construction permit~~ Construction Permit shall submit a design
480 report ~~on official forms. A form for the design report [will be is]~~ available from the
481 department (Design Report for the Construction or Alteration of Virginia Regulated
482 Impounding Structures). The design report shall be prepared in accordance with
483 4VAC50-20-240 ~~and shall include the following information:~~. The design report is a
484 required element of a complete application for a Construction Permit and shall include
485 the following information:

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

490 1. Project information including a description of the proposed construction, name
491 of the impounding structure, inventory number if available, name of the reservoir,
492 and the purpose of the reservoir.

493 2. The proposed hazard potential classification in conformance with Table 1 of
494 4VAC50-20-50.

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

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

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

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

504 a. Top of [~~dam~~ impounding structure] (elevation);
505 b. Downstream toe – lowest (elevation);
506 c. Height of [~~dam~~ impounding structure] (feet);
507 d. Crest length – exclusive of spillway (feet);
508 e. Crest width (feet);
509 f. Upstream slope (horizontal [~~and to~~] vertical); and
510 g. Downstream slope (horizontal [~~and to~~] vertical).

511 7. Reservoir data including the following:

512 a. Maximum capacity (acre-feet);
513 b. Maximum pool (elevation);
514 c. Maximum pool surface area (acres);
515 d. Normal capacity (acre-feet);
516 e. Normal pool (elevation);
517 f. Normal pool surface area (acres); and
518 g. Freeboard [~~–normal pool to top of dam~~] (feet).

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

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

527 2.10. A description of properties located in the dam break inundation zone
528 downstream from the site of the proposed impounding structure, including the
529 location and number of residential structures, buildings, roads, utilities and other
530 property that would be endangered should the impounding structure fail.

531 3. A statement from the governing body of the local political subdivision or other
532 evidence confirming that body is aware of the proposal to build an impounding
533 structure and of the land use classifications applicable to the inundation zone. 11.
534 Evidence that the local government or governments have been notified of the
535 proposal by the owner to build an impounding structure.

536 4.12. Maps showing the location of the proposed impounding structure that
537 include: the county or city in which the proposed impounding structure would be
538 located, the location of roads, and access to the site, and the outline of the
539 impoundment. Existing aerial photographs or existing topographic maps may be
540 used for this purpose.

541 5.13. A report of the geotechnical investigations of the foundation soils, or
542 bedrock, or both and of the materials to be used to construct the impounding
543 structure.

544 6-14. Design assumptions and analyses sufficient to indicate that the impounding
545 structure will be stable during its construction and during the life of the
546 impounding structure under all conditions of reservoir impoundment operations,
547 including rapid filling, flood surcharge, seismic loadings, and rapid drawdown of
548 the impoundment.

549 7-15. Evaluation of the stability of the ~~reservoir impoundment~~ rim area ~~in order to~~
550 safeguard against ~~reservoir impoundment~~ rim slides of such magnitude as to
551 create waves capable of overtopping the impounding structure and ~~confirmation~~
552 evaluation of rim stability during seismic activity.

553 8-16. Design assumptions and analyses sufficient to indicate that seepage in,
554 around, through or under the impounding structure, foundation and abutments
555 will be reasonably and practically controlled so that internal or external forces or
556 results thereof will not endanger the stability and integrity of the impounding
557 structure. The design report shall also include information on graded filter design.

558 9-17. Calculations and assumptions relative to hydraulic and structural design of
559 the spillway or spillways and energy dissipater or dissipaters. Spillway capacity
560 shall conform to the criteria of Table 1 and 4VAC50-20-52.

561 10-18. Provisions to ensure that the impounding structure and appurtenances will
562 be protected against unacceptable deterioration or erosion due to freezing and
563 thawing, wind, wave action, and rain or any combination thereof.

564 11-19. Other pertinent design data, assumptions and analyses commensurate
565 with the nature of the particular impounding structure and specific site conditions,
566 including when required by ~~the director this chapter~~, a plan and [water surface]
567 profile of the dam break inundation [zones zone].

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

572 13-20. A description of the techniques to be used to divert stream flow during
573 construction so as to prevent hazard to life, health and property, including a
574 detailed plan and procedures to maintain a stable impounding structure during
575 storm events, a drawing showing temporary diversion devices, and a description
576 of the potential impoundment during construction. Such diversion plans shall also
577 be in accordance with applicable environmental laws.

578 14-21. A plan ~~of~~ for project construction monitoring and quality control testing to
579 confirm that construction materials and ~~methods~~ performance standards meet
580 the design requirements set forth in the specifications.

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

583 16-22. Plans and specifications as required by 4VAC50-20-310.

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

590 18. ~~A proposed impoundment and impounding structure operation and~~
591 ~~maintenance plan on official forms certified by a professional engineer. This plan~~

592 shall include a safety inspection schedule and shall place particular emphasis on
593 operating and maintaining the impounding structure in keeping with the project
594 design, so as to maintain its structural integrity and safety during both normal and
595 abnormal conditions which may reasonably be expected to occur during its
596 planned life.

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

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

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

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

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

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

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

615 1. A construction sequence with milestones.

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

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

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

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

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

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

629 3. Construction site evacuation routes; and

630 4. Any other special notes particular to the project.

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

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

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

648 ~~H.G.~~ The ~~construction permit~~ Construction Permit shall be valid for the plan of
649 construction schedule specified in the ~~approved design report~~ Construction Permit
650 Application. The construction schedule may be amended by the director for good cause
651 at the request of the applicant.

652 ~~I.H.~~ Construction must commence within two years after the permit is issued. If
653 construction does not commence within two years after the permit is issued, the permit
654 shall expire, except that the applicant may petition the board for extension of the two-
655 year period and the board may extend such period for good cause with an appropriately
656 updated plan of construction and [~~temporary emergency action plan~~ Temporary
657 Emergency Action Plan].

658 ~~J.~~ The director may revoke a construction permit if any of the permit terms are
659 violated, or if construction is conducted in a manner hazardous to downstream life or
660 property. The director may order the owner to eliminate such hazardous conditions
661 within a period of time limited by the order. Such corrective measures shall be at the
662 owner's expense. The applicant may petition the board to reissue the permit with such
663 modifications as the board determines to be necessary.

664 ~~K.~~ The owner's professional engineer shall advise the director when the impounding
665 structure may safely impound water. The director shall acknowledge this statement
666 within 10 days after which the impoundment may be filled under the engineer's
667 supervision. The director's acknowledgement shall act as a temporary operation and
668 maintenance certificate until an operation and maintenance certificate has been applied
669 for and issued in accordance with 4VAC50-20-110.

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

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

- 677 1. A complete set of record drawings signed and sealed by a licensed
678 professional engineer and signed by the owner;
679 2. A complete Record Report (Record Report for Virginia Regulated Impounding
680 Structures) signed and sealed by a licensed professional engineer and signed by
681 the owner that includes:

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

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

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

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

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

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

697 (1) Top of [~~dam~~ impounding structure] (elevation);
698 (2) Downstream toe – lowest (elevation);
699 (3) Height of [~~dam~~ impounding structure] (feet);
700 (4) Crest length – exclusive of spillway (feet);
701 (5) Crest width (feet);
702 (6) Upstream slope (horizontal [~~and to~~] vertical); and
703 (7) Downstream slope (horizontal [~~and to~~] vertical).

704 g. Reservoir data including the following:

705 (1) Maximum capacity (acre-feet);
706 (2) Maximum pool (elevation);
707 (3) Maximum pool surface area (acres);
708 (4) Normal capacity (acre-feet);
709 (5) Normal pool (elevation);
710 (6) Normal pool surface area (acres); and
711 (7) Freeboard [~~– normal pool to top of dam~~] (feet).

712 h. Spillway data including the type, construction material, design
713 configuration, and invert elevation for the low level drain, the principal
714 spillway, and the emergency spillway; a description of the low level drain and
715 principal spillway including dimensions, trash guard information, and
716 orientation of intake and discharge to [~~dam~~ impounding structure] if looking
717 downstream; and a description of the emergency spillway including
718 dimensions and orientation to [~~dam~~ impounding structure] if looking
719 downstream;

720 i. Watershed data including drainage area (square miles); type and extent of
721 watershed development; time of concentration (hours); routing procedure;
722 spillway design flood used and state source; design inflow hydrograph
723 volume (acre-feet), peak inflow (cfs), and rainfall duration (hours); [and]
724 freeboard during passage of the spillway design flood (feet); [and
725 confirmation as to whether the impounding structure has ever been
726 overtopped;]

- 727 j. Impounding structure history including the date construction was
728 completed, who it was designed by and the date, who it was built by and the
729 date, who performed inspections and dates, description of repairs, and
730 confirmation as to whether the impounding structure has ever been
731 overtopped;
- 732 k. A narrative describing the impounding structure procedures for operation,
733 maintenance, filling, emergency action plan implementation, and structure
734 evaluation;
- 735 l. A narrative describing the hydraulic and hydrologic data on the spillway
736 design flood, hydrologic records, flood experience, flood potential, reservoir
737 regulation, and comments or recommendations regarding these attributes;
- 738 m. A narrative describing stability of the foundation and abutments,
739 embankment materials, and a written evaluation of each;
- 740 n. A complete set of record drawings signed and sealed by a licensed
741 professional engineer and signed by the owner;
- 742 o. Certification by the owner's engineer that the information provided
743 pursuant to subdivision J 2 of this section is true and correct in their
744 professional judgment. Such certification shall include the engineer's
745 signature, printed name, Virginia number, date, and the engineer's Virginia
746 seal; and
- 747 p. Owner's signature certifying receipt of the information provided pursuant to
748 subdivision J 2 of this section.

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

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

757 5. Emergency Action Plan or Emergency Preparedness Plan in accordance with
758 4VAC50-20-175 or 4VAC50-20-177.

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

761 **4VAC50-20-80. Alterations permits.**

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

766 ~~BA. Alterations which would potentially affect the structural integrity of an impounding~~
767 ~~structure include, but are not limited to, changing its the height or otherwise enlarging~~
768 ~~the dam, increasing the normal pool or principal spillway elevation or physical~~
769 ~~dimensions, changing the elevation or physical dimensions of the emergency spillway,~~
770 ~~conducting necessary repairs or structural maintenance, or removing the impounding~~
771 ~~structure. [Structural maintenance does not include routine maintenance.]~~

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

774 D. ~~If the submission is not acceptable, the director shall inform the applicant within~~
775 ~~60 days and shall explain what changes are required for an acceptable submission.~~

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

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

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

786 2. The hazard potential classification in conformance with Table 1 in 4VAC50-20-
787 50.

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

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

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

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

798 a. Top of [~~dam~~ impounding structure] (elevation);

799 b. Downstream toe – lowest (elevation);

800 c. Height of [~~dam~~ impounding structure] (feet);

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

802 e. Crest width (feet);

803 f. Upstream slope (horizontal [~~and to~~] vertical); and

804 g. Downstream slope (horizontal [~~and to~~] vertical).

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

807 a. Maximum capacity (acre-feet);

808 b. Maximum pool (elevation);

809 c. Maximum pool surface area (acres);

810 d. Normal capacity (acre-feet);

811 e. Normal pool (elevation);

812 f. Normal pool surface area (acres); and

813 g. Freeboard [~~– normal pool to top of dam~~] (feet).

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

817 9. Watershed data including drainage area (square miles); type and extent of
818 watershed development; time of concentration (hours); routing procedure;

819 spillway design flood used and state source; design inflow hydrograph volume
820 (acre-feet), peak inflow (cfs), and rainfall duration (hours); and freeboard during
821 passage of the spillway design flood (feet).

822 10. Evidence that the local government has been notified of the alteration and
823 repair plan.

824 11. Plans and specifications as required by 4VAC50-20-310. The plan view of the
825 [~~dam~~ impounding structure] site should represent all significant structures and
826 improvements that illustrate the location of all proposed work.

827 12. A report of the geotechnical investigations of the foundation soils, bedrock, or
828 both in the areas affected by the proposed alterations and of the materials to be
829 used to alter the impounding structure.

830 13. Design assumptions and analyses sufficient to indicate that the impounding
831 structure will be stable during the alteration of the impounding structure under all
832 conditions of reservoir operations.

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

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

838 16. Other pertinent design data, assumptions and analyses commensurate with
839 the nature of the particular impounding structure and specific site conditions,
840 including when required by this chapter, a plan and [water surface] profile of the
841 dam break inundation [~~zones zone~~].

842 17. If applicable, a description of the techniques to be used to divert stream flow
843 during alteration work so as to prevent hazard to life, health and property,
844 including a detailed plan and procedures to maintain a stable impounding
845 structure during storm events, a drawing showing temporary diversion devices,
846 and a description of the potential impoundment during the alteration. Such
847 diversion plans shall be in accordance with the applicable environmental laws.

848 18. A plan for project construction monitoring and quality control testing to
849 confirm that materials used in the alteration work and that performance standards
850 meet the design requirements set forth in the specifications.

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

855 20. Owner's signature certifying receipt of the information provided pursuant to
856 this subsection.

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

859 1. A construction sequence with milestones.

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

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

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

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

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

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

890 G. Work identified in the Alteration Permit must commence within the time frame
891 identified in the Alteration Permit. If work does not commence within the prescribed time
892 frame, the permit shall expire, except that the applicant may petition the board for
893 extension of the prescribed time frame and the board may extend such period for good
894 cause with an updated construction sequence with milestones.

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

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

- 909 [~~a 1~~] . Project information including the name and inventory number of the
910 structure, name of the reservoir, and whether the report is associated with a new
911 or old structure;

912 [~~b~~ 2] . Location of the impounding structure including the city or county, number
913 of feet or miles upstream or downstream of a highway and the highway number,
914 name of the river or the stream, and the latitude and longitude;

915 [~~e~~ 3] . Owner's name or representative if corporation, mailing address,
916 residential and business telephone numbers, and other means of
917 communication;

918 [~~d~~ 4] . Information on the design report, including who it was prepared by, the
919 date of design report preparation, whether it was for new construction or for an
920 alteration, and the permit issuance date;

921 [~~e~~ 5] . Owner's engineer's name, firm, professional engineer Virginia number,
922 mailing address, and business telephone number;

923 [~~f~~ 6] . Impounding structure data including type of material (earth, concrete,
924 masonry or other) and the following configurations:

925 [~~(1)~~ a.] Top of [~~dam~~ impounding structure] (elevation);

926 [~~(2)~~ b.] Downstream toe – lowest (elevation);

927 [~~(3)~~ c.] Height of [~~dam~~ impounding structure] (feet);

928 [~~(4)~~ d.] Crest length – exclusive of spillway (feet);

929 [~~(5)~~ e.] Crest width (feet);

930 [~~(6)~~ f.] Upstream slope (horizontal [~~and to~~] vertical); and

931 [~~(7)~~ g.] Downstream slope (horizontal [~~and to~~] vertical).

932 [~~g~~ 7] . Reservoir data including the following:

933 [~~(1)~~ a.] Maximum capacity (acre-feet);

934 [~~(2)~~ b.] Maximum pool (elevation);

935 [~~(3)~~ c.] Maximum pool surface area (acres);

936 [~~(4)~~ d.] Normal capacity (acre-feet);

937 [~~(5)~~ e.] Normal pool (elevation);

938 [~~(6)~~ f.] Normal pool surface area (acres); and

939 [~~(7)~~ g.] Freeboard [~~– normal pool to top of dam~~] (feet).

940 [~~h~~ 8] . Spillway data including the type, construction material, design
941 configuration, and invert elevation for the low level drain, the principal spillway,
942 and the emergency spillway; a description of the low level drain and principal
943 spillway including dimensions, trash guard information, and orientation of intake
944 and discharge to [~~dam~~ impounding structure] if looking downstream; and a
945 description of the emergency spillway including dimensions and orientation to
946 [~~dam-impounding structure~~] if looking downstream;

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

952 [~~j~~ 10] . Impounding structure history including the date construction was
953 completed, who it was designed by and the date, who it was built by and the
954 date, who performed inspections and dates, description of repairs, and
955 confirmation as to whether the impounding structure has ever been overtopped;

956 [~~k~~ 11] . A narrative describing the impounding structure procedures for
957 operation, maintenance, emergency action plan implementation, and structure
958 evaluation;

959 [~~l~~ 12] . A narrative describing the hydraulic and hydrologic data on the spillway
960 design flood, hydrologic records, flood experience, flood potential, reservoir
961 regulation, and comments or recommendations regarding these attributes;

962 [~~m~~ 13] . A narrative describing stability of the foundation and abutments,
963 embankment materials, and a written evaluation of each;

964 [~~n~~ 14] . A complete set of record drawings signed and sealed by a licensed
965 professional engineer and signed by the owner;

966 [~~o~~ 15] . Certification by the owner's engineer that the information provided
967 pursuant to [~~subdivision 1-2 of this section~~ this subsection] is true and correct in
968 their professional judgment. Such certification shall include the engineer's
969 signature, printed name, Virginia number, date, and the engineer's Virginia seal;
970 and

971 [~~p~~ 16] . Owner's signature certifying receipt of the information provided pursuant
972 to [~~subdivision 1-2 of this section~~ this subsection] .

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

978 **4VAC50-20-90. Transfer of permits.**

979 A. Prior to the transfer of ownership of a permitted impounding structure the
980 permittee shall notify the director in writing and the new owner shall file a transfer
981 application on ~~official forms~~ notification with the department. A form for the transfer
982 notification [~~will be is~~] available from the department (Transfer of Impounding Structure
983 Notification form Past Owner to New Owner). The new owner shall amend the existing
984 permit application as necessary and shall certify to the director that he is aware of and
985 will comply with all of the requirements and conditions of the permit.

986 B. The Transfer Notification shall include the following required information:

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

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

992 3. Type of certificates and permits to be transferred including effective date and
993 expiration date of all certificates and permits;

994 4. Past owner's name, mailing address, and residential and business telephone
995 numbers;

996 5. New owner's name, mailing address, and residential and business telephone
997 numbers;

998 6. Request to transfer certification statement signed and dated by the past
999 owner;

1000 7. Certification of compliance with permit or certificate with all said terms and
1001 conditions signed and dated by the new owner; and

1002 8. Contact information updates for Emergency Action Plan or Emergency
1003 Preparedness Plan provided by the new owner. Such updates shall include the
1004 name, mailing address, and residential and business telephone numbers for the
1005 [~~dam impounding structure~~] owner, [~~dam impounding structure~~] operator,
1006 rainfall and staff gage observer, and alternate observer.

1007 Part III

1008 Certificate Requirements

1009 **4VAC50-20-100. Operation and maintenance certificates. (Repealed.)**

1010 A. A Class I Operation and Maintenance Certificate is required for a Class I Hazard
1011 potential impounding structure. The certificate shall be for a term of six years. It shall be
1012 updated based upon the filing of a new reinspection report certified by a professional
1013 engineer every two years.

1014 B. A Class II Operation and Maintenance Certificate is required for a Class II Hazard
1015 potential impounding structure. The certificate shall be for a term of six years. It shall be
1016 updated based upon the filing of a new reinspection report certified by a professional
1017 engineer every three years.

1018 C. A Class III Operation and Maintenance Certificate is required for a Class III
1019 Hazard potential impounding structure. The certificate shall be for a term of six years.

1020 D. The owner of a Class I, II or III impounding structure shall provide the director an
1021 annual owner's inspection report on official forms in years when no professional
1022 reinspection is required and may be done by the owner or his representative.

1023 E. If an Operation and Maintenance Certificate is not updated as required, the board
1024 shall take appropriate enforcement action.

1025 F. The owner of a Class I, II or III impounding structure shall apply for the renewal of
1026 the six year operation and maintenance certificate 90 days prior to its expiration in
1027 accordance with 4VAC50-20-120 of this chapter.

1028 G. A Class IV impounding structure will not require an operation and maintenance
1029 certificate. An inventory report is to be prepared as provided in 4VAC50-20-120 B and
1030 filed by the owner on a six-year interval, and an owners inspection report filed annually.

1031 H. The owner of any impounding structure, regardless of its hazard classification,
1032 shall notify the board immediately of any change in either cultural features downstream
1033 from the impounding structure or of any change in the use of the area downstream that
1034 would present hazard to life or property in the event of failure.

1035 Part III

1036 Certificate Requirements

1037 **4VAC50-20-105. Regular Operation and Maintenance Certificates.**

1038 A. A Regular Operation and Maintenance Certificate is required for an impounding
1039 structure. Such six-year certificates shall include the following based on hazard
1040 classification:

- 1041 1. High Hazard Potential Regular Operation and Maintenance Certificate;
1042 2. Significant Hazard Potential Regular Operation and Maintenance Certificate;
1043 or
1044 3. Low Hazard Potential Regular Operation and Maintenance Certificate.

1045 B. The owner of an impounding structure shall apply for the renewal of the six-year
1046 Regular Operation and Maintenance Certificate 90 days prior to its expiration. If a
1047 Regular Operation and Maintenance Certificate is not renewed as required, the board
1048 shall take appropriate enforcement action.

1049 C. Any owner of an impounding structure that does not have a Regular Operation
1050 and Maintenance Certificate or any owner renewing a Regular Operation and
1051 Maintenance Certificate shall file an Operation and Maintenance Certificate Application.
1052 A form for the application [~~will be is~~] available from the department (Operation and
1053 Maintenance Certificate Application for Virginia Regulated Impounding Structures). Such
1054 application shall be signed by the owner and signed and sealed by a licensed
1055 professional engineer. The following information shall be submitted on or with the
1056 application:

- 1057 1. The application shall include the following required information:
- 1058 a. The name of structure and inventory number;
 - 1059 b. The proposed hazard potential classification;
 - 1060 c. Owner's name or representative if corporation, mailing address, residential
1061 and business telephone numbers, and other means of communication;
 - 1062 d. An operating plan and schedule including a narrative on the operation of
1063 control gates and spillways and the impoundment drain;
 - 1064 e. For earthen embankment [~~dams impounding structures~~] , a maintenance
1065 plan and schedule for the embankment, principal spillway, emergency
1066 spillway, low-level outlet, impoundment area, downstream channel, and staff
1067 gages;
 - 1068 f. For concrete [~~dams impounding structures~~] , a maintenance plan and
1069 schedule for the upstream face, downstream face, crest of dam, galleries,
1070 tunnels, abutments, spillways, gates and outlets, and staff gages;
 - 1071 g. An inspection schedule for operator inspection, maintenance inspection,
1072 technical safety inspection, and overtopping situations;
 - 1073 h. A schedule including the rainfall amounts, emergency spillway flow levels
1074 or storm event that initiates the Emergency Action or Preparedness Plan and
1075 the frequency of observations;
 - 1076 i. A statement as to whether or not the current hazard potential classification
1077 for the [~~dam impounding structure~~] is appropriate and whether or not
1078 additional work is needed to make an appropriate hazard potential
1079 designation;
 - 1080 j. For newly constructed or recently altered impounding structures, a
1081 certification from a licensed professional engineer who has monitored the
1082 construction or alteration of the impounding structure that, to the best of the
1083 engineer's judgment, knowledge, and belief, the impounding structure and its
1084 appurtenances were constructed or altered in conformance with the plans,
1085 specifications, drawings and other requirements approved by the board;
 - 1086 k. Certification by the owner's engineer that the Operation and Maintenance
1087 Certificate Application information provided pursuant to subdivision 1 of this
1088 subsection is true and correct in their professional judgment. Such
1089 certification shall include the engineer's signature, printed name, Virginia
1090 number, date, and the engineer's Virginia seal; and
 - 1091 l. Owner's signature certifying the Operation and Maintenance Certificate
1092 Application information provided pursuant to subdivision 1 of this subsection
1093 and that the operation and maintenance plan and schedule shall be
1094 conducted in accordance with this chapter.

- 1095 2. An Inspection Report (Annual Inspection Report for Virginia Regulated
1096 Impounding Structures) in accordance with subsection E of this section;
- 1097 3. An Emergency Action Plan in accordance with 4VAC50-20-175 or an
1098 Emergency Preparedness Plan in accordance with 4VAC50-20-177 and
1099 evidence that the required copies of such plan have been submitted to the local
1100 organization for emergency management and the Virginia Department of
1101 Emergency Management; and
- 1102 4. Any additional analysis determined necessary by the director, the board or the
1103 owner's engineer to address public safety concerns. Such additional analysis
1104 may include, but not be limited to, seismic stability, earthen spillway integrity,
1105 adequate freeboard allowance, stability assessment of the impoundment's
1106 foundation, potential liquefaction of the embankment, overturning or sliding of a
1107 concrete structure and other structural stress issues.
- 1108 D. If the Operation and Maintenance Certificate Application submittal is found to be
1109 not complete, the director shall inform the applicant within 30 days and shall explain
1110 what changes are required for an acceptable submission. Within 60 days of receipt of a
1111 complete application the board shall act upon the application. Upon finding that the
1112 impounding structure as currently operating is in compliance with this chapter, the board
1113 shall issue a Regular Operation and Maintenance Certificate. Should the board find that
1114 the impounding structure as currently operating is not in compliance with this chapter,
1115 the board may deny the permit application or issue a Conditional Operation and
1116 Maintenance Certificate in accordance with 4VAC50-20-150.
- 1117 E. Inspections shall be performed on an impounding structure annually.
- 1118 1. Inspection Reports (Annual Inspection Report for Virginia Regulated
1119 Impounding Structures) signed and sealed by a licensed professional engineer
1120 shall be submitted to the department in accordance with the following schedule:
- 1121 a. For a High Hazard Potential impounding structure, every two years,
1122 b. For a Significant Hazard Potential impounding structure, every three years,
1123 c. For a Low Hazard Potential impounding structure, every six years.
- 1124 In years when an Inspection Report signed and sealed by a licensed
1125 professional engineer is not required, an owner shall submit the Annual
1126 Inspection Report for Virginia Regulated Impounding Structures.
- 1127 2. The Inspection Report shall include the following required information:
- 1128 a. Project information including the name and inventory number of structure,
1129 name of the reservoir, and purpose of the reservoir;
- 1130 b. City or county where the impounding structure is located;
- 1131 c. Owner's name or representative if corporation, mailing address, residential
1132 and business telephone numbers, and other means of communication;
- 1133 d. Owner's engineer's name, firm, professional engineer Virginia number,
1134 mailing address, and business telephone number;
- 1135 e. Inspection observation of the impounding structure including the following:
1136 (1) Earthen embankment information including any embankment alterations;
1137 erosion; settlement, misalignments or cracks; seepage and seepage flow rate
1138 and location;
- 1139 (2) Upstream slope information including notes on woody vegetation
1140 removed, rodent burrows discovered, and remedial work performed;

- 1141 (3) Intake structure information including notes on deterioration of concrete
1142 structures, exposure of rebar reinforcement, need to repair or replace trash
1143 rack, any problems with debris in the reservoir, and whether the drawdown
1144 valve operated;
- 1145 (4) Abutment contacts including notes on seepage and seepage flow rate and
1146 location;
- 1147 (5) Earthen emergency spillway including notes on obstructions to flow and
1148 plans to correct, rodent burrows discovered, and deterioration in the
1149 approach or discharge channel;
- 1150 (6) Concrete emergency spillway including notes on the deterioration of the
1151 concrete, exposure of rebar reinforcement, any leakage below concrete
1152 spillway, and obstructions to flow and plans to correct;
- 1153 (7) Downstream slope information including notes on woody vegetation
1154 removed, rodent burrows discovered, whether seepage drains are working,
1155 and any seepage or wet areas;
- 1156 (8) Outlet pipe information including notes on any water flowing outside of
1157 discharge pipe through the [~~dam~~ impounding structure] and a description of
1158 any reflection or damage to the pipe;
- 1159 (9) Stilling basin information including notes on the deterioration of the
1160 concrete, exposure of rebar reinforcement, deterioration of the earthen basin
1161 slopes, repairs made, and any obstruction to flow;
- 1162 (10) Gates information including notes on gate malfunctions or repairs,
1163 corrosion or damage, and whether any gates were operated and if so how
1164 often and to what extreme;
- 1165 (11) Reservoir information including notes on new developments upstream of
1166 the dam, slides or erosion of lake banks, and general comments to include
1167 silt, algae, or other influence factors;
- 1168 (12) Instruments information including any reading of instruments and any
1169 installation of new instruments; and
- 1170 (13) General information including notes on new development in the
1171 downstream [~~floodplain~~ dam break inundation zone] that would impact
1172 hazard classification [or spillway design flood requirements], the maximum
1173 stormwater discharge or peak elevation during the previous year, whether
1174 general maintenance was performed and when, and actions that need to be
1175 completed before the next inspection.
- 1176 f. Evaluation rating of the [~~dam~~ impounding structure] and appurtenances
1177 (excellent, good, or poor), general comments, and recommendations;
- 1178 g. Certification by the owner and date of inspection; and
- 1179 h. Certification and seal by the owner's engineer and date of inspection, as
1180 applicable.

1181 F. The owner of an impounding structure shall notify the department immediately of
1182 any change in the use of the area downstream that would impose hazard to life or
1183 property in the event of failure.

1184 **4VAC50-20-110. Operation and maintenance certificate for newly constructed**
1185 **impounding structures. (Repealed.)**

1186 A. Within 180 days after completion of the construction of an impounding structure,
1187 the owner shall submit:

1188 1. A complete set of as-built drawings certified by a professional engineer and an
1189 as-built report on official forms.

1190 2. A copy of a certificate from the professional engineer who has inspected the
1191 impounding structure during construction certifying that, to the best of his
1192 judgment, knowledge and belief, the impounding structure and its appurtenances
1193 were constructed in conformance with the plans, specifications, drawings and
1194 other requirements approved by the board.

1195 3. A copy of the operation and maintenance plan and emergency action plan
1196 submitted with the design report including any changes required by the director.

1197 B. If the director finds that the operation and maintenance plan or emergency action
1198 plan is deficient, he shall return it to the owner within 60 days with suggestions for
1199 revision.

1200 C. Within 60 days of receipt of the items listed in subsection A above, if the board
1201 finds that adequate provision has been made for the safe operation and maintenance of
1202 the impounding structure, the board shall issue an operation and maintenance
1203 certificate.

1204 **4VAC50-20-120. Operation and maintenance certificates for existing impounding**
1205 **structures. (Repealed.)**

1206 A. Any owner of an impounding structure other than a Class IV impounding structure
1207 which has already filed an inventory report that does not have an operation and
1208 maintenance certificate or any owner renewing an operation and maintenance certificate
1209 shall file an application with the board.

1210 B. The application for an operation and maintenance certificate shall be on official
1211 forms and shall include:

1212 1. A reinspection report for Class I and II impounding structures. The reinspection
1213 report shall include an update of conditions of the impounding structure based on
1214 a previous safety inspection as required by the board, a previous reinspection
1215 report or an as-built report.

1216 2. An inventory report for Class III impounding structures. The inventory report
1217 shall include:

1218 a. The name and location of the impounding structure and the name of the
1219 owner.

1220 b. The description and dimensions of the impounding structure, the spillways,
1221 the reservoir and the drainage area.

1222 c. The history of the impounding structure which shall include the design,
1223 construction, repairs, inspections and whether the structure has been
1224 overtopped.

1225 d. Observations of the condition of the impounding structure, reservoir, and
1226 upstream and downstream areas.

1227 e. Any changes in the impounding structure, reservoir, and upstream and
1228 downstream areas.

1229 f. Recommendations for remedial work.

1230 3. An impoundment and impounding structure operation and maintenance plan
1231 certified by a professional engineer. This plan shall place particular emphasis on
1232 operating and maintaining the impounding structure in keeping with the project
1233 design in such manner as to maintain its structural integrity and safety during
1234 both normal and abnormal conditions which may reasonably be expected to

1235 occur during its planned life. The safety inspection report required by the board
1236 should be sufficient to serve as the basis for the operation and maintenance plan
1237 for a Class I and Class II impounding structure. For a Class III impounding
1238 structure, the operation and maintenance plan shall be based on the data
1239 provided in the inventory report.

1240 4. An emergency action plan and evidence that a copy of such plan has been
1241 filed with the local organization for emergency management and the State
1242 Department of Emergency Management. The plan shall include a method of
1243 providing notification and warning to persons downstream, other affected
1244 persons or property owners and local authorities in the event of a flood hazard or
1245 the impending failure of the impounding structure.

1246 C. The owner shall certify in writing that the operation and maintenance plan
1247 approved by the board will be adhered to during the life of the project except in cases of
1248 emergency requiring departure therefrom in order to mitigate hazard to life and property,
1249 at which time the owner's engineer and the director shall be notified.

1250 D. If the director finds that the operation and maintenance plan or emergency action
1251 plan is deficient, he shall return it to the owner within 60 days with suggestions for
1252 revision.

1253 E. Within 60 days of receipt of an acceptable application if the board finds that
1254 adequate provision has been made for the safe operation and maintenance of the
1255 impounding structure, the board shall issue an operation and maintenance certificate.

1256 **4VAC50-20-125. Delayed effective date for Spillway Design Flood requirements for**
1257 **impounding structures.**

1258 A. If an impounding structure has been determined to have an adequate spillway
1259 capacity prior to the effective date of these regulations and is currently operating under a
1260 Regular Operation and Maintenance Certificate, but will now require spillway
1261 modifications due to changes in these regulations, the owner shall submit to the board
1262 an Alteration Permit Application in accordance with 4VAC50-20-80 to address spillway
1263 capacity at the time of the expiration of their Regular Operation and Maintenance
1264 Certificate or within three years of the effective date of these regulations, whichever is
1265 later. The Alteration Permit Application shall contain a construction sequence with
1266 milestones for completing the necessary improvements within five years of Alteration
1267 Permit issuance. The board may approve an extension of the prescribed time frame for
1268 good cause. Should the owner be able to demonstrate that no spillway capacity change
1269 is necessary, the impounding structure may be found to be in compliance with this
1270 chapter.

1271 B. In accordance with 4VAC50-20-105, the owner shall submit the Operation and
1272 Maintenance Certificate Application (Operation and Maintenance Certificate Application
1273 for Virginia Regulated Impounding Structures), the Emergency Action Plan or
1274 Emergency Preparedness Plan, and the Inspection Report (Annual Inspection Report for
1275 Virginia Regulated Impounding Structures) 90 days prior to the expiration of the Regular
1276 Operation and Maintenance Certificate.

1277 C. If circumstances warrant more immediate repairs to the impounding structure, the
1278 board may direct alterations to the spillway to be completed sooner.

1279 D. During this delay period, owners are required to address other deficiencies that
1280 may exist that are not related to the spillway design flood.

1281 **4VAC50-20-130. Existing impounding structures constructed prior to July 1, 1982.**
1282 **(Repealed.)**

1283 A. Many existing impoundment structures were designed and constructed prior to the
1284 enactment of the Dam Safety Act, and may not satisfy current criteria for new
1285 construction. The board may issue an operation and maintenance certificate for such
1286 structures provided that:

- 1287 1. Operation and maintenance is determined by the director to be satisfactory
1288 and up-to-date;
- 1289 2. Annual owner's inspection reports have been filed with and are considered
1290 satisfactory by the director;
- 1291 3. The applicant proves in accordance with the current design procedures and
1292 references of 4VAC50-20-320 to the satisfaction of the board that the
1293 impounding structure as designed, constructed, operated and maintained does
1294 not pose an unreasonable hazard to life and property; and
- 1295 4. The owner satisfies all special requirements imposed by the board.

1296 B. When appropriate with existing impounding structures only, the spillway design
1297 flood requirement may be reduced by the board to the spillway discharge at which dam
1298 failure will not significantly increase the downstream hazard existing just prior to dam
1299 failure provided that the conditions of 4VAC50-20-130 A have been met.

1300 **4VAC50-20-140. Existing impounding structures constructed after July 1, 1982.**
1301 **(Repealed.)**

1302 The board may issue an operation and maintenance certificate for an impounding
1303 structure having a construction permit issued after July 1, 1982, and shall not require
1304 upgrading to meet new more stringent criteria unless the board determines that the new
1305 criteria must be applied to prevent an unreasonable hazard to life or property.

1306 **4VAC50-20-150. Conditional operation and maintenance certificate.**

1307 A. During the review of any operation Operation and maintenance application
1308 Maintenance Certificate Application (Operation and Maintenance Certificate Application
1309 for Virginia Regulated Impounding Structures) completed in accordance with 4VAC50-
1310 20-105 should the director determine that the impounding structure has nonimminent
1311 deficiencies of a nonimminent danger category, the director may recommend that the
1312 board issue a conditional operation Conditional Operation and maintenance certificate
1313 Maintenance Certificate.

1314 B. The conditional operation Conditional Operation and maintenance certificate
1315 Maintenance Certificate for Class I, II and III High, Significant, and Low Hazard Potential
1316 impounding structures shall be for a maximum term of two years. This certificate will
1317 allow the owner to continue normal operation and maintenance of the impounding
1318 structure, and shall require that the owner correct the deficiencies on a schedule
1319 [determined approved] by the director board.

1320 C. A conditional certificate Conditional Certificate may be renewed extended in
1321 accordance with the procedures of 4VAC50-20-120 4VAC50-20-155 provided that
1322 annual owner inspection reports Inspection Reports (Annual Inspection Report for
1323 Virginia Regulated Impounding Structures) are on file, and the board determines that the
1324 owner is proceeding with the necessary corrective actions.

1325 D. Once the deficiencies are corrected, the board shall issue an operation a Regular
1326 Operation and maintenance certificate Maintenance Certificate based upon any required
1327 revisions to the original application the impounding structure's meeting the requirements
1328 of 4VAC50-20-105.

1329 **4VAC50-20-155. Extension of Operation and Maintenance Certificates.**

1330 The board may extend an Operation and Maintenance Certificate for impounding
1331 structures provided that the owner submits a written request justifying an extension, the
1332 amount of time needed to comply with the requirements set out in the current Operation
1333 and Maintenance Certificate, and any required fees. The owner must have demonstrated
1334 substantial and continual progress towards meeting the requirements [of the certificate
1335 in order to receive an extension] .

1336 **4VAC50-20-160. Additional operation and maintenance requirements.**

1337 A. The owner of an impounding structure shall not, through action or inaction, cause
1338 or allow such structure to impound water following receipt of a written report from the
1339 owner's engineer that the impounding structure will not safely impound water.

1340 B. In accordance with §10.1-609.2 of the Code of Virginia, [~~dam~~ impounding
1341 structure] owners shall not permit the growth of trees and other woody vegetation and
1342 shall remove any such vegetation from the slopes and crest of embankments and the
1343 emergency spillway area, and within a distance of 25 feet from the toe of the
1344 embankment and abutments of the dam.

1345 **4VAC50-20-165. Agricultural Exemption.**

1346 A. Impounding structures operated primarily for agricultural purposes that are less
1347 than 25 feet in height or that create a maximum impoundment capacity smaller than 100
1348 acre-feet are exempt from the Impounding Structure Regulations.

1349 B. An owner covered by an agricultural exemption pursuant to §10.1-604 of the Code
1350 of Virginia and 4VAC50-20-30 may validate such exemption by submitting an
1351 Agricultural Exemption Report (Agricultural Exemption Report for Impounding
1352 Structures). The Agricultural Exemption Report shall include the following information:

- 1353 1. Project information including the name and inventory number of the structure
1354 and name of the reservoir;
- 1355 2. Location of the impounding structure including the city or county, number of
1356 feet or miles upstream or downstream of a highway and the highway number,
1357 name of the river or the stream, and the latitude and longitude;
- 1358 3. Owner's name or representative if corporation, mailing address, residential
1359 and business telephone numbers, and other means of communication;
- 1360 4. The impounding structure height in feet and the maximum impounding
1361 capacity in acre-feet;
- 1362 5. A list of the agricultural functions for which the impoundment supplies water;
- 1363 6. The date of validation; and
- 1364 7. The owner's signature validating that the impoundment is operated primarily
1365 for agricultural purposes and is exempt from the regulations.

1366 C. The Agricultural Exemption Report may be verified by the department through a
1367 [possible] site visit.

1368 **4VAC50-20-170. Transfer of certificates.**

1369 A. Prior to the transfer of ownership of an impounding structure the certificate holder
1370 shall notify the director in writing and the new owner shall file a transfer application on
1371 official forms notification with the department. A form for the transfer notification [will be
1372 is] available from the department (Transfer of Impounding Structure Notification from
1373 Past Owner to New Owner). The new owner may elect to continue the current existing
1374 operation and maintenance certificate for the remaining term or he may apply for a new
1375 certificate in accordance with 4VAC50-20-429 4VAC50-20-105. If the owner elects to

1376 continue the existing certificate, he shall amend the existing certificate application as
1377 necessary and shall certify to the director that he is aware of and will comply with all of
1378 the requirements and conditions of the certificate.

1379 B. The Transfer Notification shall include the following required information:

- 1380 1. Project information including the name and inventory number of the structure,
1381 name of the reservoir, and impoundment hazard classification;
- 1382 2. Location of the impounding structure including the city or county, number of
1383 feet or miles upstream or downstream of a highway and the highway number,
1384 name of the river or the stream, and the latitude and longitude;
- 1385 3. Type of certificates and permits to be transferred including effective date and
1386 expiration date of all certificates and permits;
- 1387 4. Past owner's name, mailing address, and residential and business telephone
1388 numbers;
- 1389 5. New owner's name, mailing address, and residential and business telephone
1390 numbers;
- 1391 6. Request to transfer certification statement signed and dated by the past
1392 owner;
- 1393 7. Certification of compliance with permit or certificate with all said terms and
1394 conditions signed and dated by the new owner; and
- 1395 8. Contact information updates for Emergency Action Plan or Emergency
1396 Preparedness Plan provided by the new owner. Such updates shall include the
1397 name, mailing address, and residential and business telephone numbers for the
1398 [~~dam~~ impounding structure] owner, [~~dam~~ impounding structure] operator,
1399 rainfall and staff gage observer, and alternate observer.

1400 **4VAC50-20-175. Emergency Action Plan (EAP) for High and Significant Hazard**
1401 **Potential [~~Dams~~ impounding structures] .**

1402 A. In order to protect life during potential emergency conditions at [~~a dam~~ an
1403 impounding structure] , and to ensure effective, timely action is taken should [~~a dam~~ an
1404 impounding structure] emergency occur, an EAP shall be required for each High and
1405 Significant Hazard Potential impounding structure. The EAP shall be coordinated with
1406 the Department of Emergency Management in accordance with §44-146.18 of the Code
1407 of Virginia. The EAP required by these regulations shall be incorporated into local and
1408 interjurisdictional emergency plans pursuant to §44-146.19 of the Code of Virginia.

1409 B. It is the [~~dam~~ impounding structure] owner's responsibility to develop, maintain,
1410 exercise, and implement a site-specific EAP.

1411 C. An EAP shall be submitted every six years. The EAP shall be submitted with the
1412 owner's submittal of their Regular Operation and Maintenance Certificate application
1413 (Operation and Maintenance Certificate Application for Virginia Regulated Impounding
1414 Structures).

1415 D. The owner shall update [~~and resubmit~~] the EAP immediately upon becoming
1416 aware of necessary changes to keep the EAP workable. Should [~~a dam~~ an impounding
1417 structure] be reclassified, an EAP in accordance with this section shall be submitted.

1418 E. A drill shall be conducted annually for each high or significant hazard impounding
1419 structure. To the extent practicable, the drill should include a face-to-face meeting with
1420 the local emergency management agencies responsible for any necessary evacuations
1421 to review the EAP and ensure the local emergency management agencies understand
1422 the actions required during an emergency. A table-top exercise shall be conducted once

1423 every [~~three~~ six] years [,although more frequent table-top exercises are encouraged] .
1424 [Drills and table-top exercises for multiple impounding structures may be performed in
1425 combination if the involved parties are the same.] Owners shall certify to the department
1426 annually that a drill, a table-top exercise, or both has been completed [, ~~provide a~~
1427 ~~critique of the exercise or exercises~~] and [provide] any revisions or updates to the EAP
1428 or a statement that no revisions or updates are needed.

1429 F. [Dam Impounding structure] owners shall test existing monitoring, sensing, and
1430 warning equipment at remote or unattended [dams impounding structures] at least
1431 twice per year [or as performed by the Virginia Department of Emergency Management
1432 pursuant to §10.1-609.1 of the Code of Virginia] and maintain a record of such tests.

1433 G. An EAP shall contain the following seven basic elements unless otherwise
1434 specified in this subsection.

1435 1. Notification chart. A notification chart shall be included for all classes of [dams
1436 impounding structures] that shows who is to be notified, by whom, and in what
1437 priority. The notification chart shall include contact information providing 24-hour
1438 telephone coverage for all responsible parties [including, but not limited to, the
1439 impounding structure operator or manager, state and local emergency
1440 management officials, local police or sheriffs' departments, and the owner's
1441 engineer] . [The notification chart shall also identify the process by which
1442 downstream property owners will be notified, and what party or parties will be
1443 responsible for making such notifications.]

1444 2. Emergency Detection, Evaluation, and Classification. The EAP shall include a
1445 discussion of the procedures for timely and reliable detection, evaluation, and
1446 classification of emergency situations considered to be relevant to the project
1447 setting and impounding features. Each relevant emergency situation is to be
1448 documented to provide an appropriate course of action based on the urgency of
1449 the situation. Where appropriate, situations should address [dam breaks
1450 impounding structure failures] that are imminent or in progress, a situation where
1451 the potential for [dam impounding structure] failure is rapidly developing, and a
1452 situation where the threat is slowly developing.

1453 3. Responsibilities. The EAP shall specify responsibilities for EAP-related tasks.
1454 The EAP shall also clearly designate the responsible party for making the
1455 decision that an emergency condition no longer exists at the [dam impounding
1456 structure] . The EAP shall include procedures and the responsible parties for
1457 notifying to the extent possible any known local occupants, owners, or lessees of
1458 downstream properties potentially impacted by the [dam's impounding
1459 structure's] failure.

1460 4. Preparedness. The EAP shall include a section that describes preparedness
1461 actions to be taken both before and following development of emergency
1462 conditions.

1463 5. Dam Break Inundation Maps. The EAP shall include dam break inundation
1464 maps developed in accordance with 4VAC50-20-54.

1465 6. Appendices. The appendices shall contain information that supports and
1466 supplements the material used in the development and maintenance of the EAP
1467 such as analyses of [dam break impounding structure failure] floods; plans for
1468 training, exercising, updating, and posting the EAP; and other site-specific
1469 concerns.

1470 7. Certification. [The EAP shall include a section that is signed by all parties with
1471 assigned responsibilities in the EAP pursuant to this subdivision 3 of this

1472 subsection, where they indicate their receipt of the EAP. The EAP shall include a
1473 section that identifies all parties with assigned responsibilities in the EAP
1474 pursuant to subdivision 3 of this subsection. This will include certification that the
1475 EAP has been received by these parties.] The preparer's name, title, and contact
1476 information shall be printed in this section. The preparer's signature shall also be
1477 included in the certification section. The local organization for emergency
1478 management shall provide the owner and the department with any deficiencies
1479 they may note.

1480 H. The development of the EAP shall be coordinated with all entities, jurisdictions,
1481 and agencies that would be affected by [~~a dam~~ an impounding structure] failure or that
1482 have statutory responsibilities for warning, evacuation, and postflood actions.
1483 Consultation with state and local emergency management officials at appropriate levels
1484 of management responsible for warning and evacuation of the public shall occur to
1485 ensure that there is awareness of their individual and group responsibilities. The owner
1486 shall also coordinate with the local organization for emergency management to identify
1487 properties that upon failure of the impounding structure would result in economic
1488 impacts.

1489 I. The EAP, or any updates to an existing EAP, shall be submitted to the department,
1490 the local organization for emergency management, and the Virginia Department of
1491 Emergency Management. Two copies shall be provided to the department.

1492 J. The following format shall be used as necessary to address the requirements of
1493 this section.

1494 Title Page/Cover Sheet

1495 Table of Contents

1496 I. Certifications

1497 II. Notification Flowchart

1498 III. Statement of Purpose

1499 IV. Project Description

1500 V. Emergency Detection, Evaluation, and Classification

1501 VI. General Responsibilities Under the EAP

1502 A. [~~Dam~~ Impounding Structure] Owner Responsibilities

1503 B. Responsibility for Notification

1504 C. Responsibility for Evacuation

1505 D. Responsibility for Termination and Follow-Up

1506 E. EAP Coordinator Responsibility

1507 VII. Preparedness

1508 VIII. Inundation Maps

1509 IX [.] Appendices

1510 A. Investigation and Analyses of [~~Dam break~~ Impounding Structure Failure]
1511 Floods

1512 B. Plans for Training, Exercising, Updating, and Posting the EAP

1513 C. Site-Specific Concerns

1514 **4VAC50-20-177. Emergency Preparedness Plan for Low Hazard [Dams**
1515 **impounding structures] :**

1516 [~~A~~] Low Hazard [Dams impounding structures] shall provide information for
1517 emergency preparedness to the department, the local organization for emergency
1518 management and the Virginia Department of Emergency Management. A form for the
1519 submission [~~will be is~~] available from the department (Emergency Preparedness Plan
1520 for Low Hazard Virginia Regulated Impounding Structures). The information shall
1521 include, but not be limited, to the following:

1522 1. Name of the impounding structure, inventory number, city or county, latitude,
1523 and longitude;

1524 2. Owner's name, mailing address, residential and business telephone numbers,
1525 and other means of communication. Contact information shall provide for 24-hour
1526 telephone contact capability;

1527 3. [Dam Impounding structure] operator's name, mailing address, residential
1528 and business telephone numbers, and other means of communication. Contact
1529 information shall provide for 24-hour telephone contact capability;

1530 4. Rainfall and staff gage observer's name, mailing address, residential and
1531 business telephone numbers, and other means of communication. Contact
1532 information shall provide for 24-hour telephone contact capability;

1533 5. Contact information for alternate operator and alternate rainfall and staff gage
1534 observer, if applicable;

1535 6. Contact information for the local dispatch center nearest [~~dam~~ impounding
1536 structure] including address and 24-hour telephone number;

1537 7. City or county emergency services coordinator's name, mailing address,
1538 residential and business telephone numbers, and other means of
1539 communication;

1540 8. A procedure and the responsible parties for notifying to the extent possible any
1541 known local occupants, owners, or lessees of downstream properties potentially
1542 impacted by the [~~dam's~~ impounding structure's] failure;

1543 9. A discussion of the procedures for timely and reliable detection, evaluation,
1544 and classification of emergency situations considered to be relevant to the
1545 project setting and impounding features. Each relevant emergency situation is to
1546 be documented to provide an appropriate course of action based on the urgency
1547 of the situation;

1548 10. A simple dam break inundation map acceptable to the director,
1549 demonstrating the general inundation that would result from [~~a dam an~~
1550 impounding structure] failure. Such maps required pursuant to this section do
1551 not require preparation by a professional licensed engineer; however, maps
1552 prepared by a licensed professional engineer are preferred;

1553 11. Identification of public roads downstream noting the highway number and
1554 distance below the [~~dam~~ impounding structure]. If roads exist, contact
1555 information for the resident Virginia Department of Transportation engineer or city
1556 or county engineer including address and 24-hour telephone numbers;

1557 12. Amount of rainfall that will initiate a Stage II Condition in inches per six hours,
1558 inches per 12 hours, and inches per 24 hours and a Stage III Condition in inches
1559 per six hours, inches per 12 hours, and inches per 24 hours;

- 1560 13. Amount of flow in the emergency spillway that will initiate a Stage II Condition
1561 in feet (depth of flow) and a Stage III Condition in feet (depth of flow);
- 1562 14. Staff gage location and description; the frequency of observations by the
1563 rainfall or staff gage observer under a Stage I Condition, and Stage II Condition,
1564 and a Stage III Condition; and a clear description of an access route and means
1565 of travel during flood conditions to the [dam impounding structure];
- 1566 15. Evacuation procedures including notification, monitoring, evacuation, and
1567 reporting processes and responsibilities;
- 1568 16. Evidence that the required copies of such plan have been submitted to the
1569 local organization for emergency management and the Virginia Department of
1570 Emergency Management; and
- 1571 17. Certification of the plan by the owner.

1572 Part IV
1573 Procedures

1574 **4VAC50-20-180. Inspections.**

1575 A. The director may make inspections during construction, alteration or operation
1576 and maintenance as deemed necessary to ensure that the impounding structure is being
1577 constructed, altered or operated and maintained in compliance with the permit or
1578 certificate issued by the board. The director shall provide the owner a copy of the
1579 findings of these inspections. ~~This~~ The department's inspection does not relieve the
1580 owner from the responsibility of providing adequate inspection during construction,
1581 alteration, or operation and maintenance. During the maintenance, construction, or
1582 alteration of any [dam impounding structure] or reservoir, the director shall require the
1583 owner to perform, at the owner's expense, such work or tests as necessary to obtain
1584 information sufficient to enable the director to determine whether conformity with the
1585 plans and specifications approved by the certificate is being secured.

1586 B. Periodic inspections during construction or alteration shall be conducted under the
1587 supervision ~~direction~~ of a licensed professional engineer who shall ~~propose the~~
1588 frequency and nature of the inspections subject to approval by the director provide for
1589 [full-time] monitoring, review of contractor submittals, and appropriate confirmatory
1590 testing of all facets of construction affecting the safety of the impounding structure in
1591 accordance with the construction or alteration permit issued by the board.

1592 Periodic C. Required inspections during operation and maintenance shall be
1593 conducted under the supervision of a licensed professional engineer at an ~~interval not~~
1594 greater than that required to update the operation and maintenance certificate [-] At a
1595 minimum, an annual owner's inspection shall be conducted when a professional
1596 inspection is not required intervals designated under 4VAC50-20-105.

1597 D. Every owner shall provide for an inspection by a licensed professional engineer
1598 after overtopping of the impounding structure or after flows cause damage to the
1599 emergency spillway. A copy of the findings of each inspection with the engineer's
1600 recommendations shall be filed with the board within a reasonable period of time not to
1601 exceed 30 days subsequent to completion of the inspection.

1602 **[4VAC50-20-190. Right to informal fact-finding proceeding or hearing.**

1603 Any owner aggrieved by an action taken by the director or by the board without
1604 hearing, or by inaction of the director or the board, under the provisions of this chapter,
1605 may demand in writing an informal fact-finding proceeding pursuant to §2.2-4019 of the
1606 Code of Virginia or a formal hearing pursuant to §2.2-4020 of the Code of Virginia. A
1607 formal hearing may be granted only with the consent of the board.]

1608 **4VAC50-20-200. Enforcement.**

1609 ~~Any owner refusing to obey any order of the board or the director pursuant to this~~
1610 ~~chapter may be compelled to obey and comply with such provisions by injunction or~~
1611 ~~other appropriate remedy obtained in a court proceeding. Such proceeding shall be~~
1612 ~~instituted by the board or in the case of an emergency, by the director in the court which~~
1613 ~~granted approval to the owner to impound waters or, if such approval has not been~~
1614 ~~granted, the proceeding shall be instituted in any appropriate court. The provisions of~~
1615 ~~this chapter may be enforced by the board, the director, or both in any manner~~
1616 ~~consistent with the provisions of the Dam Safety Act (§10.1-604 et seq. of the Code of~~
1617 ~~Virginia).~~

1618 **4VAC50-20-210. Consulting boards committee.**

1619 A. When the board needs to satisfy questions of safety regarding plans and
1620 specifications, construction, alteration, or operation and maintenance, or when
1621 requested by the owner, the board may appoint a consulting board committee to report
1622 to it with respect to those questions of the impounding structure's safety of an
1623 impounding structure. Such a board committee shall consist of two or more consultants,
1624 none of whom have been associated with the impounding structure.

1625 B. The costs and expenses incurred by the consulting board committee, if appointed
1626 at the request of an owner, shall be paid by the owner.

1627 C. The costs and expenses incurred by the consulting board committee, if initiated by
1628 the board, shall be paid by the board.

1629 **4VAC50-20-220. Unsafe conditions.**

1630 A. No owner shall ~~have the right to maintain an unsafe impounding structure which~~
1631 ~~unreasonably threatens the life or property of another person. The owner of any~~
1632 ~~impounding structure found to have deficiencies which could threaten life or property if~~
1633 ~~uncorrected shall take the corrective actions needed to remove such deficiencies within~~
1634 ~~a reasonable period of time. Designation of an impounding structure as unsafe shall be~~
1635 ~~made in accordance with §10.1-607.1 of the Code of Virginia.~~

1636 B. Imminent danger.

1637 1. If an owner or the owner's engineer has determined that circumstances are
1638 impacting the integrity of the impounding structure that could result in the
1639 imminent failure of the impounding structure, temporary repairs may be initiated
1640 prior to approval from the board. The owner shall notify the department within 24
1641 hours of identifying the circumstances impacting the integrity of the impounding
1642 structure. Such emergency notification shall not relieve the owner of the need to
1643 obtain an alteration permit as soon as may be practicable, nor shall the owner
1644 take action beyond that necessary to address the emergency situation.

1645 2. When the director finds that an impounding structure is unsafe and constitutes
1646 an imminent danger to life or property, he shall immediately notify the State
1647 Virginia Department of Emergency Management and confer with the owner who
1648 shall activate the Emergency Action Plan or Emergency Preparedness Plan if
1649 appropriate to do so. The owner of an impounding structure found to constitute
1650 an imminent danger to life or property shall take immediate corrective action to
1651 remove the imminent danger as required by §10.1-608 of the Code of Virginia.

1652 C. Nonimminent danger. The owner of an impounding structure who has been issued
1653 ~~a report by the board containing findings and recommendations, by the board,~~ for the
1654 correction of deficiencies ~~which that may~~ threaten life or property if not corrected, shall
1655 undertake to implement the recommendations for correction of deficiencies according to

1656 a schedule of implementation contained in that report as required by §10.1-609 of the
1657 Code of Virginia.

1658 **4VAC50-20-230. Complaints.**

1659 A. Upon receipt of a complaint alleging that the person or property of the complainant
1660 is endangered by the construction, alteration, maintenance or operation of an
1661 impounding structure, the director shall cause an inspection of the structure, unless the
1662 data, records and inspection reports on file with the board are found adequate to
1663 determine if the complaint is valid.

1664 B. If the director finds that an unsafe condition exists, the director shall proceed
1665 under the provisions of §§10.1-608 and 10.1-609 of the Code of Virginia to render the
1666 extant condition safe.

1667 Part V
1668 Design Requirements

1669 **4VAC50-20-240. Design of structures.**

1670 A. The owner shall complete all necessary investigations prior to submitting the
1671 design report (Design Report for the Construction or Alteration of Virginia Regulated
1672 Impounding Structures). The design report shall contain those components outlined in
1673 4VAC50-20-70 for construction activities or those outlined in 4VAC50-20-80 for
1674 alteration activities. The scope and degree of precision required is a matter of
1675 engineering judgment based on the complexities of the site and the hazard potential
1676 classification of the proposed structure.

1677 B. Surveys shall be made with sufficient accuracy to locate the proposed
1678 construction site and to define the total volume of storage in the impoundment. Locations
1679 of center lines and other horizontal and vertical controls shall be shown on a map of the
1680 site. The area downstream and upstream from the proposed impounding structure shall
1681 be investigated in order to delineate the areas and extent of potential damage in case of
1682 failure or backwater due to flooding.

1683 C. The drainage area shall be determined. ~~Present, projected and potential future~~
1684 ~~and planned land-use conditions shall be considered in determining the runoff~~
1685 ~~characteristics of the drainage area. The most severe of these conditions shall be~~
1686 ~~included in the design calculations which shall be submitted as part of the design report.~~

1687 D. The geotechnical engineering investigation shall consist of borings, test pits and
1688 other subsurface explorations necessary to adequately define the existing conditions.
1689 The investigations shall be performed so as to appropriately define the soil, rock and
1690 ground water conditions.

1691 E. All construction materials shall be adequately researched and selected so as to
1692 ensure that their ~~properties meet as constructed behavior will reasonably conform to~~
1693 ~~design criteria~~. If on-site materials are to be utilized, they shall be located and
1694 determined to be adequate in quantity and quality.

1695 **4VAC50-20-250. Design flood. (Repealed.)**

1696 ~~The minimum design flood to be utilized in impounding structure evaluation, design,~~
1697 ~~construction, operation and maintenance shall be commensurate with the size and~~
1698 ~~hazard potential of the particular impounding structure as determined in 4VAC50-20-50~~
1699 ~~and Table 1. Competent, experienced, professional engineering judgment shall be used~~
1700 ~~in applying those design and evaluation procedures referenced in 4VAC50-20-320 of~~
1701 ~~this chapter.~~

1702 **4VAC50-20-260. Emergency spillway Spillway design.**

1703 A. Every impounding structure shall have a spillway system with adequate capacity
1704 to discharge the design flood without endangering the safety of the impounding
1705 structure.

1706 ~~B. An emergency spillway shall be required.~~

1707 CB. Vegetated earth or an unlined emergency spillway may be approved when the
1708 applicant demonstrates that it will pass the spillway design flood without jeopardizing the
1709 safety of the impounding structure [(such as by allowance of overtopping of a structure
1710 not designed to permit overtopping)]. In no case shall [~~dam~~ impounding structure]
1711 owners permit the growth of trees and other woody vegetation in the emergency spillway
1712 area.

1713 DC. Lined emergency spillways shall include design criteria calculations, plans and
1714 specifications for ~~open channel, drop, ogee and chute~~ suitable energy dissipators and for
1715 spillways that include crest control structures, chutes, walls, panel lining, sills, blocks,
1716 and miscellaneous details. All joints shall be reasonably water-tight and placed on a
1717 foundation capable of sustaining applied loads without undue deformation. Provision
1718 shall be made for handling ~~leakage from the channel or~~ under seepage and uplift
1719 pressures from the foundation which might adversely affect the structural integrity and
1720 structural stability of the impounding structure.

1721 **4VAC50-20-270. Principal spillways and outlet works.**

1722 A. It will be assumed that principal spillways and regulating outlets provided for
1723 special functions will operate to normal design discharge capabilities during the spillway
1724 design flood, provided appropriate analyses show:

1725 1. That control gates and structures are suitably designed to operate reliably
1726 under maximum heads for durations likely to be involved and risks of blockage by
1727 debris are minimal;

1728 2. That access roads and passages to gate regulating controls would be safely
1729 passable by operating personnel under spillway design flood conditions; and

1730 3. That there are no ~~other~~ substantial reasons for concluding that outlets would
1731 not operate safely to ~~fill~~ full design capacity during the spillway design flood.

1732 B. If there are reasons to doubt that any of the above basic requirements might not
1733 be adequately met under spillway design flood conditions, the "dependable" discharge
1734 capabilities of regulating outlets shall be assumed to be less than 100% of design
1735 ~~capabilities~~ capacities, generally as outlined in the following subsections C through G of
1736 this section.

1737 C. Any limitations in safe operating heads, maximum velocities to be permitted
1738 through structures or approach channels, or other design limitations shall be observed in
1739 establishing "dependable" discharge rating curves to be used in routing the spillway
1740 design flood hydrograph through the reservoir.

1741 D. If intakes to regulating outlets are likely to be exposed to ~~dangerous~~ significant
1742 quantities of floating ~~drift~~ debris, sediment depositions or ice hazards prior to or during
1743 major floods, the dependable discharge capability during the spillway design flood shall
1744 be assumed to be zero.

1745 E. If access roads or structural passages to operating towers or controls are likely to
1746 be flooded or otherwise unusable during the spillway design flood, the dependable
1747 discharge capability of regulating outlets will be assumed to be zero for ~~these period~~ the
1748 periods of time during which such conditions might exist.

1749 F. Any deficiencies in discharge performance likely to result from delays in the
1750 operation of gates before attendants could be reasonably expected to reach the control
1751 for in must be taken into account when estimating "dependable" discharge capabilities to
1752 be assumed assumptions in routing the spillway design flood through reservoir the
1753 impoundment. Reports on design studies shall indicate the allowances made for
1754 possible delays in initiating gate operations. Normally, for projects located in small
1755 basins, where critical spillway design flood inflows may occur within several hours after
1756 intense precipitation, outflows through any regulating outlets that must be opened after
1757 the flood begins shall be assumed to be zero for an appropriate period of time
1758 subsequent to the beginning of intense rainfall.

1759 G. All gates, valves, conduits and concrete channel outlets shall be designed and
1760 constructed to prevent significant erosion or damage to the impounding structure or to
1761 the downstream outlet or channel.

1762 **4VAC50-20-280. Drain requirements.**

1763 All new impounding structures regardless of their hazard potential classification, shall
1764 include a device to permit draining of the impoundment within a reasonable period of
1765 time as determined by the owner's licensed professional engineer [, subject to approval
1766 by the director]. [Existing drains on impounding structures shall be kept operational.
1767 When practicable, existing impounding structures shall be retrofitted with devices to
1768 permit draining.]

1769 **4VAC50-20-290. Life of the impounding structure.**

1770 Components of the impounding structure, ~~the impoundment,~~ the outlet works, drain
1771 system and appurtenances shall be durable [and maintained] or replaced in keeping
1772 with the design and planned life of the impounding structure.

1773 **4VAC50-20-300. Additional design requirements.**

1774 A. Flood routings shall start at or above the elevation of the crest of the lowest
1775 ungated outlet. Freeboard determination and justification must be addressed by the
1776 owner's engineer.

1777 B. All elements of the impounding structure ~~and impoundments~~ shall conform to
1778 sound engineering practice. Safety factors, design standards and design references that
1779 are used shall be included with the design report.

1780 C. Inspection devices may be required by the director for use by inspectors, owners
1781 or the director in conducting inspections in the interest of structural integrity during and
1782 after completion of construction and during the life of the impounding structure.

1783 **4VAC50-20-310. Plans and specifications.**

1784 The plans and specifications for a proposed impounding structure required in
1785 4VAC50-20-70 for construction activities and in 4VAC50-20-80 for alteration activities
1786 shall consist of a detailed engineering design report that includes (Design Report for the
1787 Construction or Alteration of Virginia Regulated Impounding Structures) and engineering
1788 drawings and specifications, with the following as a minimum:

1789 1. The name of the project; the name of the owner; classification of the
1790 impounding structure as set forth in this chapter; designated access to the project
1791 and the location with respect to highways, roads, streams and existing
1792 impounding structures and impoundments that would affect or be affected by the
1793 proposed impounding structure.

1794 2. Cross-sections, plans, profiles, logs of test borings, laboratory and in situ test
1795 data, drawings of principal and emergency spillways, impounding structures,
1796 outlet works, drain system and appurtenances, and other ~~additional drawings~~

1797 project components in sufficient detail to indicate clearly the extent and
1798 complexity of the work to be performed.

1799 3. Contract drawings should include, but not be limited to, foundation and
1800 abutment treatment, stream or river diversion, excavation and material fill
1801 processes, phased fill and compaction and drainage devices.

1802 4. The erosion and sediment control plan, as approved by the local government,
1803 which minimizes soil erosion and sedimentation during all phases of construction
1804 or alteration.

1805 ~~3. The technical provisions~~ 5. Technical specifications, as may be required to
1806 describe the materials, performance, and methods of the construction and
1807 construction quality control for the project.

1808 ~~4. Special provisions, as may be required to describe technical provisions~~
1809 ~~needed to ensure that the impounding structure is constructed according to the~~
1810 ~~approved plans and specifications.~~

1811 **4VAC50-20-320. Acceptable design procedures and references.**

1812 To ensure consistency of approach, within the major engineering disciplines of
1813 hydrology, hydraulics, soils and foundations, structures, and general civil design, criteria
1814 and approaches from multiple sources shall not be mixed for developing the design of a
1815 given feature or facility without approval of the director. In all cases the owner's engineer
1816 shall identify the source of the criteria.

1817 The following are acceptable as design procedures and references:

1818 1. The design procedures, manuals and criteria used by the United States Army
1819 Corps of Engineers.

1820 2. The design procedures, manuals and criteria used by the United States
1821 Department of Agriculture, Natural Resources Conservation Service.

1822 3. The design procedures, manuals and criteria used by the United States
1823 Department of the Interior, Bureau of Reclamation.

1824 4. The design procedures, manuals and criteria used by the United States
1825 Department of Commerce, National Weather Service.

1826 5. The design procedures, manuals and criteria used by the United States
1827 Federal [Agency Energy] Regulatory Commission.

1828 ~~5.6.~~ Other design procedures, manuals and criteria that are accepted as current,
1829 sound engineering practices, as approved by the director prior to the design of
1830 the impounding structure.

1831 **4VAC50-20-330. Other applicable dam safety references.**

1832 [A] Manuals, guidance, and criteria used by the Federal Emergency Management
1833 Agency, including the following:

1834 1. Federal Guidelines for Dam Safety: Emergency Action Planning for Dam
1835 Owners, U.S. Department of Homeland Security, Federal Emergency
1836 Management Agency, October 1998, Reprinted January 2004; FEMA 64 or as
1837 revised.

1838 2. Federal Guidelines for Dam Safety: Selecting and Accommodating Inflow
1839 Design Floods for Dams, U.S. Department of Homeland Security, Federal
1840 Emergency Management Agency, October 1998, Reprinted April 2004; FEMA 94
1841 or as revised.

1842 [B. Manuals, guidance, and forms provided by the department. Such materials may
1843 be located on the department's website at: <http://www.dcr.virginia.gov>.]

1844 Part VI
1845 Fees

1846 **4VAC50-20-340. Authority to establish fees.**

1847 Under §10.1-613.5 of the Code of Virginia, the board is authorized to establish and
1848 collect application fees for the administration of the dam safety program, administrative
1849 review, certifications, and the repair and maintenance of [dams impounding structures].
1850 The fees will be deposited into the Dam Safety, Flood Prevention and Protection
1851 Assistance Fund.

1852 **4VAC50-20-350. Fee submittal procedures.**

1853 A. (Upon the effective date of these regulations,) fees for all application submittals
1854 required pursuant to 4VAC50-20-370 through 4VAC50-20-390 are due prior to issuance
1855 of a certificate or permit. No application for an Operation and Maintenance Certificate or
1856 a Construction Permit will be acted upon by the board without full payment of the
1857 required fee per §10.1-613.5 of the Code of Virginia.

1858 B. Fees shall be paid by check, draft or postal money order payable to the Treasurer
1859 of Virginia, or submitted electronically (if available), and must be in U.S. currency, except
1860 that agencies and institutions of the Commonwealth of Virginia may submit Interagency
1861 Transfers for the amount of the fee. All fees shall be sent to the following address (or
1862 submitted electronically, if available): Virginia Department of Conservation and
1863 Recreation, [Dam Safety Receipts Control, P.O. Box 10150 Division of Finance,
1864 Accounts Payable, 203 Governor Street,] Richmond, Virginia [23240-23219].

1865 C. All fee payments shall be accompanied by the following information:

- 1866 1. Applicant name, address and daytime phone number.
- 1867 2. The name of the [dam impounding structure], and the [dam impounding
1868 structure] location.
- 1869 3. The type of application or report submitted.
- 1870 4. Whether the submittal is for a new permit or certificate issuance or permit or
1871 certificate reissuance.
- 1872 5. The amount of fee submitted.
- 1873 6. [Dam Impounding structure] identification number, if applicable.

1874 D. No permit fees remitted to the department shall be subject to refund except as
1875 credits provided for in 4VAC50-20-390 [D C].

1876 **4VAC50-20-360. Fee exemptions.**

1877 Impounding structures owned by Virginia Soil and Water Conservation Districts shall
1878 be exempt from all fees associated with [Part VI this part] in accordance with §10.1-
1879 613.5 of the Code of Virginia. There will be no fee assessed [for a low hazard
1880 impounding structure exempted from fees pursuant to 4VAC50-20-51 or] for the
1881 decommissioning of an impounding structure.

1882 **4VAC50-20-370. Construction Permit application fees.**

1883 A. Any application form submitted pursuant to 4VAC50-20-70 for permitting a
1884 proposed impounding structure construction after the effective date of these regulations
1885 shall be accompanied by a payment as determined in subsection B of this section.

1886 B. Fees shall be as follows:

- 1887 1. \$2,500 for High or Significant Hazard Potential impounding structures.

1888 2. \$1,000 for Low Hazard Potential impounding structures.

1889 **4VAC50-20-380. Regular Operation and Maintenance Certificate application fees.**

1890 A. Any application for a six-year Regular Operation and Maintenance Certificate after
1891 the effective date of these regulations, except as otherwise exempted, shall be
1892 accompanied by a payment as determined in subsection B of this section.

1893 B. Fees for High, Significant, or Low Hazard Potential impounding structures shall be
1894 as follows:

1895 1. [~~\$1,500~~ \$600] for High Hazard Potential.

1896 2. [~~\$1,000~~ \$600] for Significant Hazard Potential.

1897 3. [~~\$600~~ \$300] for Low Hazard Potential.

1898 [C. Fees for extension of Regular Operation and Maintenance Certificates shall be
1899 \$250 per year or portion thereof.]

1900 **4VAC50-20-390. Conditional Operation and Maintenance Certificate application**
1901 **fee.**

1902 A. Fees for [issuance of] a Conditional Operation and Maintenance Certificate [or
1903 for the extension of a Conditional Operation and Maintenance Certificate for High or
1904 Significant Hazard Potential impounding structures] shall be as follows:

1905 1. For a [2-year Certificate: \$1,000 certificate for more than one year but no
1906 more than two years: \$300.]

1907 2. For a [1.5-year Certificate: \$750 certificate for one year or less: \$150.]

1908 [3. For a 1-year Certificate: \$500]

1909 [4. For a 6-month Certificate: \$250]

1910 [B. The fee for an extension of a Conditional Operation and Maintenance Certificate
1911 shall be \$250 per year or portion thereof.]

1912 [B. Fees for a Conditional Operation and Maintenance Certificate or for the
1913 extension of a Conditional Operation and Maintenance Certificate for Low Hazard
1914 Potential impounding structures shall be as follows:

1915 1. For a 2-year Certificate: \$500

1916 2. For a 1.5-year Certificate: \$375

1917 3. For a 1-year Certificate: \$250

1918 4. For a 6-month Certificate: \$125]

1919 [C. Fees for a Conditional Operation and Maintenance Certificate or for the
1920 extension of a Conditional Operation and Maintenance Certificate for any impounding
1921 structure that requires a modification in spillway capacity due to changes in the
1922 regulations and that is eligible for a delayed effective date pursuant to 4VAC50-20-125
1923 shall be as follows:

1924 1. For a 2-year Certificate: \$200

1925 2. For a 1.5-year Certificate: \$150

1926 3. For a 1-year Certificate: \$100

1927 4. For a 6-month Certificate: \$50]

1928 [DC] . The board may allow a partial credit towards the Regular Operation and
1929 Maintenance Certificate fee if the owner of the impounding structure has completed, to
1930 the director's satisfaction, the conditions of the Conditional Certificate prior to its
1931 expiration. [Credits shall only be provided to the nearest 6-month interval.]

1932 4VAC50-20-400. Incremental Damage Analysis review fees.

~~1933 [The fee for the review of an incremental damage analysis submitted pursuant to~~
~~1934 4VAC50-20-52 shall be \$225. Re-review of an analysis determined to be incomplete or~~
~~1935 in error upon the department's prior review shall cost an additional \$45 per subsequent~~
~~1936 submittal.] Should the department determine that outside expertise to assist with the~~
~~1937 review [of an incremental damage analysis] is necessary, the applicant shall be~~
~~1938 responsible for the cost of such outside expertise. Such costs shall be agreed upon in~~
~~1939 advance by the [department and the] applicant.~~

1940 FORMS (Repealed.)

1941 Dam Owner's Annual Inspection Form, DCR 199-098 (rev. 12/01).

1942 Operation and Maintenance Application Class I, II and III Impounding Structures,
1943 DCR 199-099 (rev. 12/01).

1944 As-Built Report for Class I, II and III Impounding Structures, DCR 199-100 (rev.
1945 12/01).

1946 Design Report for the Construction/Alteration of Impounding Structures, DCR 199-
1947 101 (rev. 12/01).

1948 Emergency Action Plan for Class I, Class II and Class III Impounding Structures,
1949 DCR 199-103 (rev. 12/01).

1950 Inventory Report for Class III and Class IV Impounding Structures, DCR 199-104
1951 (rev. 12/01).

1952 Reinspection Report for Class I and II Impounding Structures, DCR 199-105 (rev.
1953 12/01).

1954 Agricultural Certification for Impounding Structures, DCR 199-106 (rev. 12/01).

1955 Transfer Application for Impounding Structures, DCR 199-107 (rev. 12/01).