

December 9, 2015 Version; Exempt Action

Project 4564 - none

VIRGINIA SOIL AND WATER CONSERVATION BOARD

Amend regulations to incorporate the PMP study

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

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

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

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

TABLE 1 Impounding Structure Regulations			
Applicable to all impounding structures that are 25 feet or greater in height and that create a maximum impounding capacity of 15 acre-feet or greater, and to all impounding structures that are six feet or greater in height and that create a maximum impounding capacity of 50 acre-feet or greater and is not otherwise exempt from regulation by the Code of Virginia.			
Hazard Potential Class of Dam	Spillway Design Flood (SDF) ^B for New Construction ^F	Spillway Design Flood (SDF) ^B for Existing Impounding Structures ^{F, G}	Minimum Threshold for Incremental Damage Analysis
High	PMF ^C	0.9 PMP ^H	100-YR ^D
Significant	.50 PMF	.50 PMF	100-YR ^D
Low	100-YR ^D	100-YR ^D	50-YR ^E

B. The spillway design flood (SDF) represents the largest flood that need be considered in the evaluation of the performance for a given project. The impounding structure shall perform so as to safely pass the appropriate SDF. Reductions in the established SDF may be evaluated through the use of incremental damage analysis pursuant to 4VAC50-20-52. The SDF established for an impounding structure shall not be less than those standards established

32 elsewhere by state law or regulations, including but not limited to the Virginia Stormwater
33 Management Program (VSMP) ~~Permit Regulations (4VAC50-60 9VAC25-870)~~. Due to potential
34 for future development in the dam break inundation zone that would necessitate higher spillway
35 design flood standards or other considerations, owners may find it advisable to consider a
36 higher spillway design flood standard than is required.

37 C. PMF: Probable Maximum Flood is the flood that might be expected from the most severe
38 combination of critical meteorologic and hydrologic conditions that are reasonably possible in
39 the region. The PMF ~~is derived~~ shall be calculated from the ~~current~~ probable maximum
40 precipitation (PMP) available derived from the National Weather Service, NOAA the Probable
41 Maximum Precipitation Study for Virginia (and associated PMP Evaluation Tool and Database)
42 (November 2015). ~~In some cases, a modified PMF may be calculated utilizing local topography,~~
43 ~~meteorological conditions, hydrological conditions, or PMP values supplied by NOAA. Any~~
44 ~~deviation in the application of established developmental procedures must be explained and~~
45 ~~justified by the owner's engineer.~~ The owner's engineer must develop PMF hydrographs for 6-,
46 12-, and 24-hour durations. The hydrograph that creates the largest peak outflow is to be used
47 to determine capacity for nonfailure and failure analysis. Present and planned land-use
48 conditions shall be considered in determining the runoff characteristics of the drainage area.

49 D. 100-Yr: 100-year flood represents the flood magnitude expected to be equaled or
50 exceeded on the average of once in 100 years. It may also be expressed as an exceedence
51 probability with a 1.0% chance of being equaled or exceeded in any given year. Present and
52 planned land-use conditions shall be considered in determining the runoff characteristics of the
53 drainage area.

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

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

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

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

70 DOCUMENTS INCORPORATED BY REFERENCE (4VAC50-20)

71 [ACER Technical Memorandum No. 11, Downstream Hazard Classification Guidelines,](#)
72 [December 1988, U.S. Department of the Interior, Bureau of Reclamation.](#)

73 [Probable Maximum Precipitation Study for Virginia \(and associated PMP Evaluation Tool](#)
74 [and Database\), Prepared for the Virginia Department of Conservation and Recreation by](#)
75 [Applied Weather Associates, LLC, November 2015.](#)

76 [Trip Generation, 8th Ed., 2008, Institute of Transportation Engineers, 1627 Eye Street, NW,](#)
77 [Suite 600, Washington, DC 20006.](#)