

REQUEST FOR TECHNICAL CHANGE

AGENCY: Environmental Management Commission

RULE CITATION: 15A NCAC 02K .0224

DEADLINE FOR RECEIPT: Friday, December 7, 2018

PLEASE NOTE: *This request may extend to several pages. Please be sure you have reached the end of the document.*

The Rules Review Commission staff has completed its review of these Rules prior to the Commission's next meeting. The Commission has not yet reviewed these Rules and therefore there has not been a determination as to whether these Rules will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing these Rules, the staff recommends the following technical changes be made:

In the Submission for Permanent Rule form, in Box 9A, there appears to be an errant citation to G.S. 2013-413. Please either remove it, or check the Box "Legislation enacted by the General Assembly"

In (a), line 5, please insert an opening parenthesis before "a)" Since you published it correctly, you do not need to show it as a change.

In (a)(2), line 9, "otherwise specified" where?

Consider combining Subparagraphs (a)(6) and (7) so it reads "Probable Maximum Flood" or "PMF" means..."

In (a)(7), line 18, expected by whom?

Line 19, what is "reasonably possible" and how is this determined? Is this known to your regulated public?

In (a)(7) and (a)(9), it appears that these are outside standards that should be incorporated by reference using G.S. 150B-21.6, as you did in Subparagraph (c)(2). You already state where these standards can be found, but you need to state whether this Rule incorporates subsequent amendments and editions, and state the cost to access them. If it's free, state that.

In (b), line 29, so that I'm clear – will the "CCR unit" apply to all of the types in (a)(2)?

In (b)(1), line 31, and (b)(2), line 33, delete the "or" at the end of the line.

In (b)(4), classified by whom?

In (c)(1), Page 2, lines 1-2, and elsewhere the term is used, I take it the term "responsible charge" is known to your regulated public?

Amanda J. Reeder
Commission Counsel
Date submitted to agency: November 27, 2018

In (c)(3), line 12, what is “distortion”? Does your regulated public know?

In (c)(4), lines 16-17, since the term “the NC Dam Safety Law of 1967” is used in other rules in this Subchapter, your regulated public is familiar with this citation?

On line 19, what will the Department do with this report during the review?

In (d), line 21, please remove the errant strike through/ hyphen between “flood” and “as” Since you published it correctly in the Register, you do not need to show it as a change; simply remove it.

On line 22, please replace “Item” with “Paragraph”

On line 24, what is “to the satisfaction of the Director”? How will this be determined?

Line 26, what is “adequately manage”? Who determines this?

In the Table, in the Spillway Design Flood column, you do not need to spell out “Probable Maximum Flood” since you have it defined earlier in the Rule.

In the Intermediate (Class B) portion, did you intend to state “100 YR” rather than “1000 YR”? If not, what is the 1000 YR, as that term is not defined?

In (e)(1), Page 3, line 2, please put the term “critical cross sections” in quotation marks since you are defining it in the Rule.

On line 3, please delete the comma after “assessments”

In (e)(3), line 12, what are the “liquefaction factors of safety”? Are these set forth in another Rule?

In (e)(3), line 13, what is included in this? Is it (e)(4) through (e)(5)? Or is it something else?

In (e)(4), line 14, who determines whether the slopes may be inundated? The professional engineer?

On line 16, is the term “rapid drawdown” known to your regulated public?

In (f), Page 4, line 2, maintained by whom?

On line 7, consider replacing “which is” with “when”

In the History Note, line 9, please put the citations in numerical order, so move G.S. 143-215.25A first. And do you not want to cite to all of the statute, rather than just 143-215.25A(6)?

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: November 27, 2018

15A NCAC 02K.0224 IS ADOPTED AS PUBLISHED IN 33:04 NCR 349 AS FOLLOWS:

15A NCAC 02K.0224 ADDITIONAL REQUIREMENTS FOR DAMS THAT IMPOUND COAL COMBUSTION RESIDUALS

a) For the purposes of this Rule:

(1) “CCR” means Coal Combustion Residuals.

(2) “CCR unit” means any CCR landfill, CCR surface impoundment, or lateral expansion of a CCR unit, or a combination of more than one of these units, based on the context of the paragraph(s) in which it is used. This term includes both new and existing units, unless otherwise specified. For the purpose of this Rule, the term only applies to CCR dams and surface impoundments.

(3) “Dam” means a structure and appurtenant works erected to impound or divert water.

(4) “Design flood” means the flood hydrograph that is used during an engineering assessment of the CCR unit.

(5) “Liquefaction” means a phenomenon whereby a saturated or partially saturated soil loses strength and stiffness in response to an applied stress, usually earthquake shaking or other sudden change in stress condition, causing it to behave like a liquid.

(6) “PMF” means Probable Maximum Flood.

(7) “Probable Maximum Flood” means the flood that may be expected from the most severe combination of critical meteorological and hydrological conditions that are reasonably possible in the drainage basin. Rainfall associated with the PMF can be found at the following locations: http://www.nws.noaa.gov/oh/hdsc/PMP_documents/HMR51.pdf and http://www.nws.noaa.gov/oh/hdsc/PMP_documents/HMR52.pdf.

(8) “Toe” means the point of intersection between the upstream or downstream face of a dam and the natural ground.

(9) “100-year flood” means a flood that has a 1-percent chance of recurring in any given year. Rainfall amounts for the 100-year flood can be found at: https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html and https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html.

(b) This Rule shall apply to a CCR unit that meets one or more of the following:

(1) has a dam height of 25 feet or more above the downstream toe of the structure and has a storage volume of 50 acre-feet or more, unless the unit is exempt by G.S. 143-215.25A; or

(2) contains residuals to an elevation of five feet or more above the downstream toe of the structure and that has a storage volume of 20 acre-feet or more; or

(3) contains residuals to an elevation of greater than or equal to 20 feet above the downstream toe of the structure; or

(4) has been classified as high hazard.

(c) Inspections and Structural Stability Assessments of CCR units shall be completed as follows:

- (1) At intervals not exceeding seven days, a qualified engineer, or a person under his or her responsible charge, shall inspect the discharge of all outlets of hydraulic structures that pass underneath the base of the CCR unit for discoloration of discharge or changes in flow.
- (2) A qualified engineer, or a person under his or her responsible charge, shall conduct monitoring of all instrumentation supporting the operation of the CCR unit no less than once per month according to the standards listed under 40 CFR 257.83(a), which is hereby incorporated by reference, including subsequent amendments and additions. A copy of this document may be obtained at no cost at https://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr257_main_02.tpl
- (3) During the annual inspections of all CCR units, a qualified engineer, or a person under his or her responsible charge, shall conduct a visual inspection of hydraulic structures underlying the base of the CCR unit in order to maintain structural integrity by being kept free of deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris.
- (4) A qualified engineer, or a person under his or her responsible charge, shall conduct structural stability assessments and shall document whether the design, construction, operation, and maintenance of the CCR unit is consistent with the provisions of 40 CFR 257.73(d) and 257.74(d), which is hereby incorporated by reference, including subsequent amendments and additions, the NC Dam Safety Law of 1967, and the rules of this Subchapter. The structural stability assessment shall be completed by a qualified engineer once every five years and submitted to the Department for review.
- (d) All CCR dams described in Paragraph (b) of this Rule shall have a spillway system with capacity to pass a flow resulting from a design flood-as specified in the Minimum Spillway Design Flood for CCR Units table provided in this Item. These requirements shall apply in place of the Minimum Spillway Design Flood table under Rule .0205(e) of this Section, unless the applicant provides calculations, designs, and plans to show, to the satisfaction of the Director, that the design flow can be stored, passed through, or passed over the CCR unit without failure occurring. The combined capacity of all spillways shall be designed, constructed, operated and maintained to adequately manage flow during and following the peak discharge as provided in the following table.

Minimum Spillway Design Flood for CCR Units		
Hazard¹	Size²	Spillway Design Flood³
<u>Low (Class A)</u>	<u>Small</u>	<u>100 YR</u>
	<u>Medium</u>	<u>100 YR</u>
	<u>Large</u>	<u>1/3 PMF (Probable Maximum Flood)</u>
	<u>Very Large</u>	<u>½ PMF</u>
<u>Intermediate (Class B)</u>	<u>Small</u>	<u>1000 YR</u>
	<u>Medium</u>	<u>1/3 PMF or 1000 YR whichever is larger</u>
	<u>Large</u>	<u>½ PMF</u>
	<u>Very Large</u>	<u>¾ PMF</u>
<u>High (Class C)</u>	<u>Small</u>	<u>PMF (Probable Maximum Flood)</u>
	<u>Medium</u>	<u>PMF</u>
	<u>Large</u>	<u>PMF</u>
	<u>Very Large</u>	<u>PMF</u>

¹ The “Hazard” categories in this table for CCR units are based on 15A NCAC 02K .0105 Classification of Dams and are the same “Hazard” categories shown in the “Minimum Spillway Design Storms” table for non-CCR dams contained in Rule .0205(e) of this Section.

² The “Size” categories are the same as described in the “Criteria for Spillway Design Storm Size Classification” table found in Rule .0205(e) of this Section.

³ The “Spillway Design Flood” specifications were derived from the combination of the more-stringent criterion from the spillway design-flood elements of the federal CCR regulations and the existing spillway design elements of Rule .0205(e) of this Section.

(e) Structural stability assessments shall be evaluated as follows:

- (1) For purposes of this Rule, the critical cross sections utilized for the required structural stability assessments, are the cross sections anticipated by the design engineer to be the most susceptible to structural failure.
- (2) CCR surface impoundments shall be assessed under seismic loading conditions for a seismic loading event with a 2 percent probability of exceedance in 50 years, equivalent to a return period of approximately 2,500 years, based on the USGS Seismic Hazard Maps for seismic events with this return period for the region where the CCR unit is located. This document is hereby incorporated by reference, including subsequent amendments and editions. A copy may be obtained at no cost at <https://earthquake.usgs.gov/hazards/hazmaps>.
- (3) CCR units constructed of soils that are susceptible to liquefaction, as identified by a liquefaction potential analysis, shall meet liquefaction factors of safety. The liquefaction potential analysis shall include:
- (4) Stability assessments shall be required for CCR units with downstream slopes that may be inundated by the pool of an adjacent water body. These assessments shall include conditions for maximum pool loading, minimum pool loading, and rapid drawdown of the adjacent waterbody.
- (5) The safety factor assessments shall be supported by the following engineering calculations:
 - (A) The calculated static factor of safety for the end-of-construction loading condition shall equal or exceed 1.30. The assessment of this loading condition is only required for the initial safety factor assessment and is not required for subsequent assessments;
 - (B) the calculated static factor of safety for the long-term, maximum storage pool loading condition shall equal or exceed 1.50;
 - (C) the calculated static factor of safety under the maximum surcharge pool loading condition shall equal or exceed 1.40;
 - (D) the calculated seismic factor of safety shall equal or exceed 1.00; and
 - (E) for dams constructed of soils that have susceptibility to liquefaction, the calculated liquefaction factor of safety shall equal or exceed 1.20. Post-liquefaction stability analyses shall include characterization of the site conditions, identification of the minimum liquefaction-inducing forces based on soil characterization, determination of seismic effect on liquefied layers of the embankment, and calculation of factors of safety against each liquefied layer of the embankment.

1 (f) CCR units and surrounding areas that are constructed of earthen material shall be designed, constructed,
2 operated, and maintained so that the vegetation meets the conditions outlined in the FEMA 534 guidance document
3 entitled, “Technical Manual for Dam Owners: Impacts of Plants on Earthen Dams” issued on September 2005. This
4 document is hereby incorporated by reference, including subsequent amendments and editions. A copy may be
5 obtained at no cost at <https://www.fema.gov/media-library/assets/documents/1027>. However, alternative forms of
6 slope protection may be approved by the Director, upon request by a qualified engineer through a plan submittal,
7 which is shown to provide equal or better protection from erosion as would be achieved with vegetation.

8
9 *History Note: Authority G.S. 143-215.26; 143-215.27; 143-215.31; 143-215.32; 143-215.34; 143-215.25A(6);*
10 *Eff. January 1, 2019.*
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