Iowa Department of Natural Resources

Leading Iowans in caring for our natural resources

New Dam Rules 2021

Meeting Logistics

- All lines are muted
- We will have several Q&A breaks
- Can ask a question at any time using the Question box.
- Meeting is being recorded and can be watched at a later time.
- Meeting slides and other resources are available for download in handout section.
  - ARC 5899C – Adopted and Filed Rule changes
  - Iowa Administrative Code 567 – Chapter 73
  - Copy of today's powerpoint slides

Introductions

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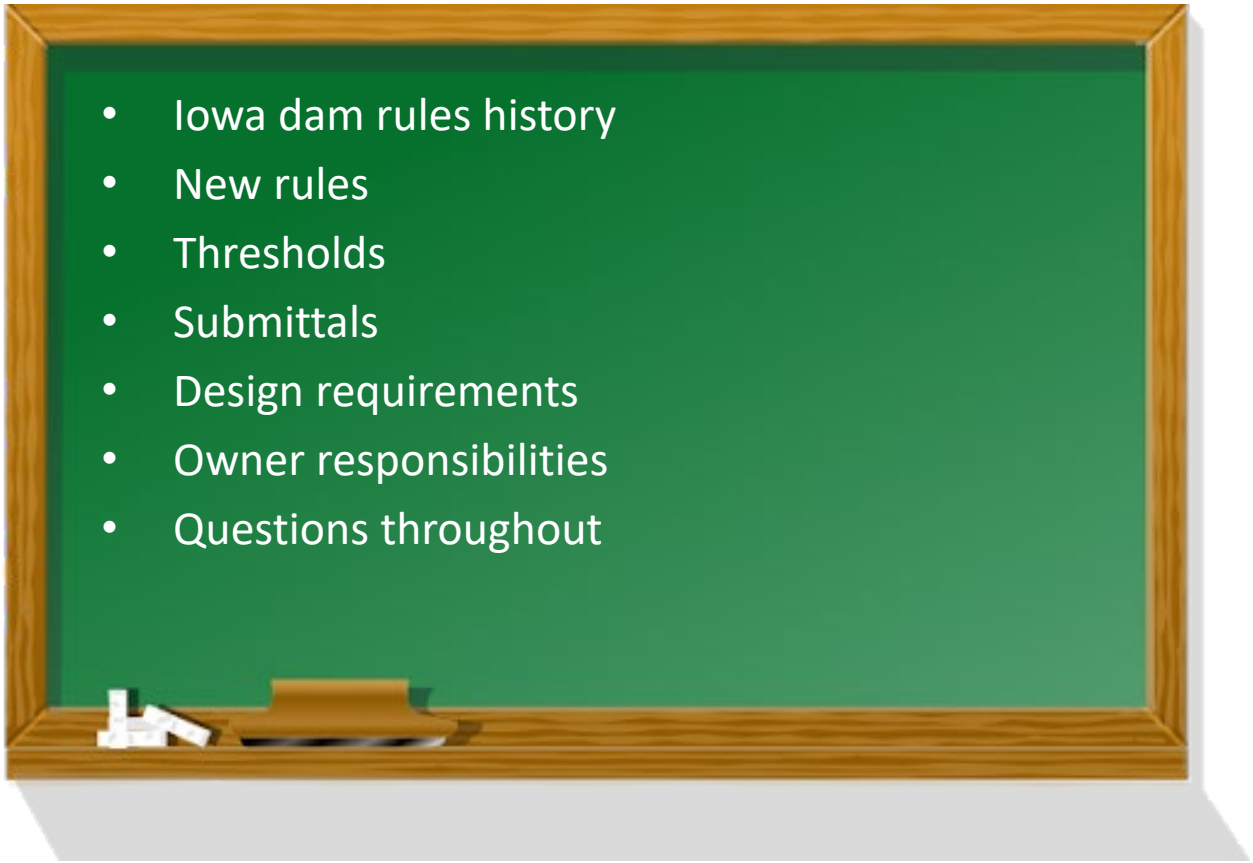
Dams 101 Presentation Outline



Dam Rules History in Iowa

- Started in 1970s
- Dam rule context relatively unchanged until now

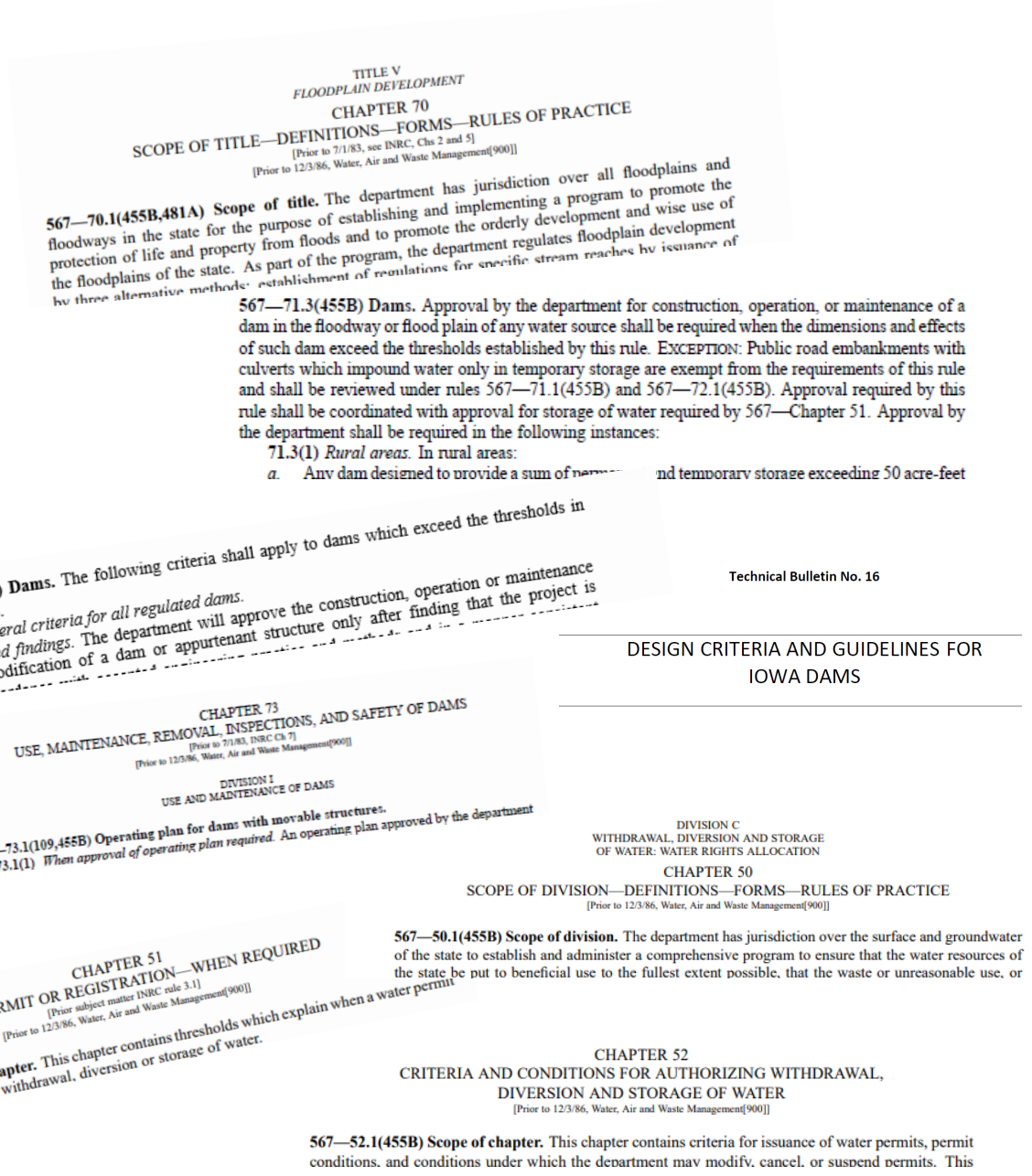
- 2017 started Technical Advisory Committee
- 2019 Stakeholder review
- 2020 began official rulemaking process
- 2021 – Today – New Dam Safety Rules Effective

Rule Consolidation

- Dam rules were located in 7 chapters – consolidated into Ch. 73
- 2 applications with redundant info

- Flood Plain Rules
  - Chapter 70
  - Chapter 71
  - Chapter 72
  - Chapter 73
  - Technical Bulletin 16

- Water Storage Rules
  - Chapter 50
  - Chapter 51
  - Chapter 52



TITLE V
FLOODPLAIN DEVELOPMENT

CHAPTER 70
SCOPE OF TITLE—DEFINITIONS—FORMS—RULES OF PRACTICE
[Prior to 7/1/83, see INRC, Chs 2 and 5]
[Prior to 12/3/86, Water, Air and Waste Management[900]]

567—70.1(455B,481A) Scope of title. The department has jurisdiction over all floodplains and floodways in the state for the purpose of establishing and implementing a program to promote the protection of life and property from floods and to promote the orderly development and wise use of the floodplains of the state. As part of the program, the department regulates floodplain development by three alternative methods: establishment of regulations for specific stream reaches by issuance of

567—71.3(455B) Dams. Approval by the department for construction, operation, or maintenance of a dam in the floodway or flood plain of any water source shall be required when the dimensions and effects of such dam exceed the thresholds established by this rule. EXCEPTION: Public road embankments with culverts which impound water only in temporary storage are exempt from the requirements of this rule and shall be reviewed under rules 567—71.1(455B) and 567—72.1(455B). Approval required by this rule shall be coordinated with approval for storage of water required by 567—Chapter 51. Approval by the department shall be required in the following instances:

71.3(1) *Rural areas.* In rural areas:

a. Any dam designed to provide a sum of perm[illegible]nd temporary storage exceeding 50 acre-feet

567—72.3 (455B) Dams. The following criteria shall apply to dams which exceed the thresholds in 567—71.3(455B).

72.3(1) *General criteria for all regulated dams.*

a. *Required findings.* The department will approve the construction, operation or maintenance of a dam or modification of a dam or appurtenant structure only after finding that the project is

Technical Bulletin No. 16

DESIGN CRITERIA AND GUIDELINES FOR IOWA DAMS

CHAPTER 73
USE, MAINTENANCE, REMOVAL, INSPECTIONS, AND SAFETY OF DAMS
[Prior to 7/1/83, INRC Ch 7]
[Prior to 12/3/86, Water, Air and Waste Management[900]]

DIVISION I
USE AND MAINTENANCE OF DAMS

567—73.1(109,455B) Operating plan for dams with movable structures.

73.1(1) *When approval of operating plan required.* An operating plan approved by the department

DIVISION C
WITHDRAWAL, DIVERSION AND STORAGE OF WATER: WATER RIGHTS ALLOCATION

CHAPTER 50
SCOPE OF DIVISION—DEFINITIONS—FORMS—RULES OF PRACTICE
[Prior to 12/3/86, Water, Air and Waste Management[900]]

567—50.1(455B) Scope of division. The department has jurisdiction over the surface and groundwater of the state to establish and administer a comprehensive program to ensure that the water resources of the state be put to beneficial use to the fullest extent possible, that the waste or unreasonable use, or

CHAPTER 51
WATER PERMIT OR REGISTRATION—WHEN REQUIRED
[Prior subject matter INRC rule 3.1]
[Prior to 12/3/86, Water, Air and Waste Management[900]]

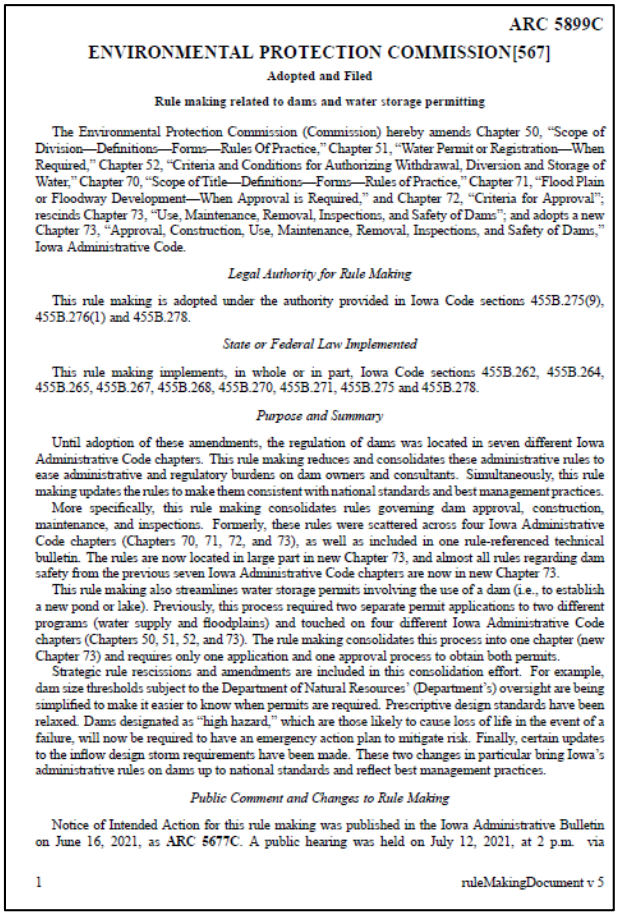
567—51.1(455B) Scope of chapter. This chapter contains thresholds which explain when a water permit or registration is required for withdrawal, diversion or storage of water.

CHAPTER 52
CRITERIA AND CONDITIONS FOR AUTHORIZING WITHDRAWAL, DIVERSION AND STORAGE OF WATER
[Prior to 12/3/86, Water, Air and Waste Management[900]]

567—52.1(455B) Scope of chapter. This chapter contains criteria for issuance of water permits, permit conditions, and conditions under which the department may modify, cancel, or suspend permits. This

New Rules!

- All dam rules contained in Iowa Administrative Code 567- Chapter 73
- Approved in ARC 5988C
- ARC document shows changes made to each rules section.
- We will step through this document to discuss changes that impact dam owners and designers.



ARC 5899C

ENVIRONMENTAL PROTECTION COMMISSION[567]

Adopted and Filed

Rule making related to dams and water storage permitting

The Environmental Protection Commission (Commission) hereby amends Chapter 50, "Scope of Division—Definitions—Forms—Rules Of Practice," Chapter 51, "Water Permit or Registration—When Required," Chapter 52, "Criteria and Conditions for Authorizing Withdrawal, Diversion and Storage of Water," Chapter 70, "Scope of Title—Definitions—Forms—Rules of Practice," Chapter 71, "Flood Plain or Floodway Development—When Approval is Required," and Chapter 72, "Criteria for Approval"; rescinds Chapter 73, "Use, Maintenance, Removal, Inspections, and Safety of Dams"; and adopts a new Chapter 73, "Approval, Construction, Use, Maintenance, Removal, Inspections, and Safety of Dams," Iowa Administrative Code.

Legal Authority for Rule Making

This rule making is adopted under the authority provided in Iowa Code sections 455B.275(9), 455B.276(1) and 455B.278.

State or Federal Law Implemented

This rule making implements, in whole or in part, Iowa Code sections 455B.262, 455B.264, 455B.265, 455B.267, 455B.268, 455B.270, 455B.271, 455B.275 and 455B.278.

Purpose and Summary

Until adoption of these amendments, the regulation of dams was located in seven different Iowa Administrative Code chapters. This rule making reduces and consolidates these administrative rules to ease administrative and regulatory burdens on dam owners and consultants. Simultaneously, this rule making updates the rules to make them consistent with national standards and best management practices.

More specifically, this rule making consolidates rules governing dam approval, construction, maintenance, and inspections. Formerly, these rules were scattered across four Iowa Administrative Code chapters (Chapters 70, 71, 72, and 73), as well as included in one rule-referenced technical bulletin. The rules are now located in large part in new Chapter 73, and almost all rules regarding dam safety from the previous seven Iowa Administrative Code chapters are now in new Chapter 73.

This rule making also streamlines water storage permits involving the use of a dam (i.e., to establish a new pond or lake). Previously, this process required two separate permit applications to two different programs (water supply and floodplains) and touched on four different Iowa Administrative Code chapters (Chapters 50, 51, 52, and 73). The rule making consolidates this process into one chapter (new Chapter 73) and requires only one application and one approval process to obtain both permits.

Strategic rule rescissions and amendments are included in this consolidation effort. For example, dam size thresholds subject to the Department of Natural Resources' (Department's) oversight are being simplified to make it easier to know when permits are required. Prescriptive design standards have been relaxed. Dams designated as "high hazard," which are those likely to cause loss of life in the event of a failure, will now be required to have an emergency action plan to mitigate risk. Finally, certain updates to the inflow design storm requirements have been made. These two changes in particular bring Iowa's administrative rules on dams up to national standards and reflect best management practices.

Public Comment and Changes to Rule Making

Notice of Intended Action for this rule making was published in the Iowa Administrative Bulletin on June 16, 2021, as ARC 5677C. A public hearing was held on July 12, 2021, at 2 p.m. via

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Review by Administrative Rules Review Committee

The Administrative Rules Review Committee, a bipartisan legislative committee which oversees rule making by executive branch agencies, may, on its own motion or on written request by any individual or group, review this rule making at its regular monthly meeting or at a special meeting. The Committee's meetings are open to the public, and interested persons may be heard as provided in Iowa Code section 17A.8(6).

Effective Date

This rule making will become effective on October 13, 2021.

The following rule-making actions are adopted:

ITEM 1. Amend paragraph **50.4(1)"a"** as follows:

a. Application for approval of a new withdrawal, or diversion ~~or storage~~ of water unrelated to the use of an agricultural drainage well. For withdrawals, or diversions, ~~or storage~~ of water unrelated to the use of an agricultural drainage well, a request for a new permit as distinguished from modification or renewal of an existing permit shall be made on Form ~~16 (542-3106)~~ 542-3106. An application form must be submitted by or on behalf of the owner, lessee, easement holder or option holder of the area where the water is to be withdrawn, diverted ~~or stored~~, and used. An application must be accompanied by a map portraying the points of withdrawal or diversion ~~and storage,~~ and the land on which water is to be used oriented as to section, township, and range. One application normally will be adequate for all uses on contiguous tracts of land. Tracts of land involved in the same operation separated only by roads or railroads will be deemed contiguous tracts. For water storage permits, applications will be made in conjunction with dam construction permits as required in rule 567—73.10(455B).

ITEM 2. Rescind and reserve rule **567—51.2(455B)**.

ITEM 3. Rescind and reserve rule **567—52.20(455B)**.

ITEM 4. Amend rule **567—70.2(455B,481A)**, definition of "Dam," as follows:

"Dam" means ~~a barrier which impounds or stores water~~ the same as defined in rule 567—73.2(455B).

ITEM 5. Rescind the definitions of "Height of dam," "Low head dam" and "Major dam structure" in rule **567—70.2(455B,481A)**.

~~ITEM 6. Amend rule 567—71.3(455B) as follows:~~

567—71.3(455B) Dams. Approval by the department for construction, ~~operation, or maintenance of a dam in the floodway or flood plain of any water source shall be required when the dimensions and effects of such dam exceed the thresholds established by this rule~~ repair, or modification of any dam shall be required when the dam exceeds the thresholds under rule 567—73.3(455B). Other structures across a stream may require approval under rule 567—71.12(455B). ~~EXCEPTION: Public road embankments with culverts which impound water only in temporary storage are exempt from the requirements of this rule and shall be reviewed under rules 567—71.1(455B) and 567—72.1(455B). Approval required by this rule shall be coordinated with approval for storage of water required by 567—Chapter 51. Approval by the department shall be required in the following instances:~~

~~71.3(1) *Rural areas.* In rural areas:~~

~~*a.* Any dam designed to provide a sum of permanent and temporary storage exceeding 50 acre-feet at the top of dam elevation, or 25 acre-feet if the dam does not have an emergency spillway, and which has a height of 5 feet or more.~~

~~*b.* Any dam designed to provide permanent storage in excess of 18 acre-feet and which has a height of 5 feet or more.~~

~~*c.* Any dam across a stream draining more than 10 square miles.~~

Rescind Major Structure

- Separate "major dam" classification removed
- Dams only classified by hazard potential now

~~*d.* Any dam located within 1 mile of an incorporated municipality, if the dam has a height of 10 feet or more, stores 10 acre-feet or more at the top of dam elevation, and is situated such that the discharge from the dam will flow through the incorporated area.~~

~~**71.3(2)** *Urban areas.* Any dam which exceeds the thresholds in 71.3(1)*"a," "b"* or *"d."*~~

~~**71.3(3)** *Low-head dams.* Any low-head dam on a stream draining 2 or more square miles in an urban area, or 10 or more square miles in a rural area.~~

~~**71.3(4)** *Modifications to existing dams.* Modification or alteration of any dam or appurtenant structure beyond the scope of ordinary maintenance or repair, or any change in operating procedures, if the dimensions or effects of the dam exceed the applicable thresholds in this rule. Changes in the spillway height or dimensions of the dam or spillway are examples of modifications for which approval is required.~~

~~**71.3(5)** *Mill dams.* Rescinded IAB 2/20/91, effective 3/27/91.~~

~~**71.3(6)** *Maintenance of preexisting dams.* Approval shall be required to maintain a preexisting dam as described in 567—Chapter 73 only if the department determines that the dam poses a significant threat to the well-being of the public or environment and should therefore be removed or repaired and safely maintained. Preexisting dams are subject to the water, air and waste management dam safety inspection program as set forth in 567—Chapter 73.~~

This rule is intended to implement Iowa Code sections 455B.262, 455B.264, 455B.267, 455B.275 and 455B.277.

ITEM 7. Rescind and reserve rule **567—72.3(455B)**.

ITEM 8. Adopt the following new subrule 72.11(3):

72.11(3) *Structures or materials across a channel.* The following criteria shall apply to structures or materials such as riprap that span the channel of a stream or river and do not meet the thresholds of rule 567—73.3(455B):

a. The location and design of the structure shall not adversely affect the fisheries or recreational use of the stream.

b. The pool created by the structure shall not adversely affect drainage on lands not owned or under easements by the applicant.

c. The structure shall be hydraulically designed to submerge before bankfull stage is reached in the stream channel in order that increased or premature overbank flooding does not occur. Where this cannot be reasonably accomplished in order for the structure to fulfill its intended purpose, the applicant shall demonstrate that any increased flooding will affect only lands owned or controlled by the applicant.

d. For projects that include significant appurtenant structures or works outside the stream channel, the combined effect of the total project shall not create more than one foot of backwater during floods which exceed the flow capacity of the channel, unless the proper lands, easements, or rights-of-way are obtained.

e. The structure shall be capable of withstanding the effects of normal and flood flows across its crest and against the abutments with erosion protection added as required to prevent failure of the structure during flood events.

ITEM 9. Rescind 567—Chapter 73 and adopt the following new chapter in lieu thereof:

CHAPTER 73
APPROVAL, CONSTRUCTION, USE, MAINTENANCE, REMOVAL, INSPECTIONS, AND SAFETY OF DAMS

DIVISION I
SCOPE AND DEFINITIONS

567—73.1(455B) Scope and applicability. The department regulates the storage of water and the construction and maintenance of dams. Any person who desires to construct, repair, modify, abandon, or remove a dam has a responsibility to determine whether approval is required from the department prior to undertaking any such work.

Low Head Dams

- "Low head dams" term replaced with "Structures or materials across a channel"
- Low head dams that are below thresholds
- Larger river dams will generally be classified a dam
  - 0.25% slope, 80ft wide, 12-ft tall
- Same criteria for approval

567—73.2(455B) Definitions.

"Abandonment" means to render a dam nonimpounding by dewatering and filling the reservoir created by that dam with solid materials and by diverting the natural drainage around the site.

"Acre-foot" means a volume of water that would cover one acre of land one foot deep, equal to 43,560 cubic feet of water.

"Adverse consequences" means negative impacts that may occur upstream, downstream, or at locations remote from the dam. The primary concerns are loss of human life, economic loss including but not limited to property damage, public damages, disruption of public utilities, and environmental impact.

"Appurtenant structures" means structures such as spillways, either in the dam or separate therefrom; the reservoir and its rim; low-level outlet works; and water conduits such as tunnels, pipelines, or penstocks, occurring through either the dam or its abutments.

"Auxiliary spillway" means any secondary spillway that is designed to be operated infrequently.

"Confinement feeding operation" means the same as defined in rule 567—65.1(459,459B).

"Dam" means a barrier that impounds or stores water.

"Dam owner" means any person who owns, controls, operates, maintains, or manages a dam.

"Hazard potential" means a classification based on the possible incremental adverse consequences that result from the release of water or stored contents due to a failure or misoperation of the dam or appurtenances. The hazard potential classification of a dam does not reflect in any way on the current condition of the dam and its appurtenant structures (e.g., safety, structural integrity, or flood routing capacity).

"Height of dam" means the vertical distance from the top of the dam to the natural bed of the stream or water source measured at the downstream toe of the dam or to the lowest elevation of the outside limit of the dam if it is not across a water source.

"Incremental consequence" means the difference, under the same conditions (e.g., flood, earthquake, or other event), between the consequences that are likely to occur from the failure or misoperation of the dam and appurtenances as compared to the consequences that are likely to occur without such failure or misoperation.

"Probable" means more likely than not to occur; reasonably expected; realistic.

"Probable maximum flood" means the same as defined in rule 567—70.2(455B,481A).

"Public damages" means as defined in rule 567—70.2(455B,481A).

"Q100," *"Q50,"* *"Q25,"* *"Q15,"* *"Q10,"* et cetera, means the same as defined in rule 567—70.2(455B,481A).

567—73.3(455B) Regulated dams.

73.3(1) *Thresholds.* Dams meeting any of the following thresholds shall be regulated by the department:

a. A dam with a height of at least 25 feet and a storage of 15 acre-feet or more at the top of the dam elevation; or

b. A dam with a storage of 50 acre-feet or more at the top of the dam elevation and a height of at least 6 feet; or

c. A dam that is assigned a hazard potential of high hazard.

73.3(2) *Exceptions.* Road embankments or driveways with culverts are exempt unless such structure serves, either primarily or secondarily, a purpose commonly associated with dams, such as the temporary storage of water for flood control.

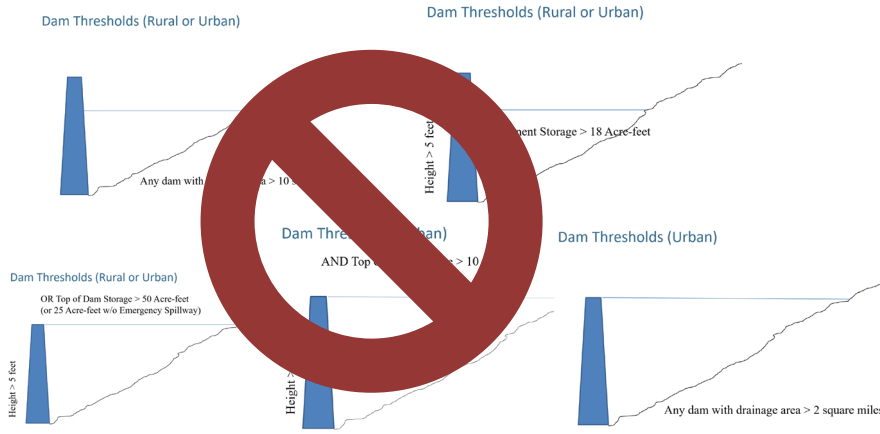
73.3(3) *New construction.* Before construction begins, approval is required for construction of any dam meeting the thresholds of a regulated dam. The proposed dam must meet the criteria outlined in this chapter.

73.3(4) *Existing dams.*

a. Approval is required for:

Division I – Scope and Definitions

- New simplified thresholds!
- Matches National Inventory of Dams criteria
- No more urban vs. rural
- No with or w/o auxiliary spillway



567—73.2(455B) Definitions.

"Abandonment" means to render a dam nonimpounding by dewatering and filling the reservoir created by that dam with solid materials and by diverting the natural drainage around the site.

"Acre-foot" means a volume of water that would cover one acre of land one foot deep, equal to 43,560 cubic feet of water.

"Adverse consequences" means negative impacts that may occur upstream, downstream, or at locations remote from the dam. The primary concerns are loss of human life, economic loss including but not limited to property damage, public damages, disruption of public utilities, and environmental impact.

"Appurtenant structures" means structures such as spillways, either in the dam or separate therefrom; the reservoir and its rim; low-level outlet works; and water conduits such as tunnels, pipelines, or penstocks, occurring through either the dam or its abutments.

"Auxiliary spillway" means any secondary spillway that is designed to be operated infrequently.

"Confinement feeding operation" means the same as defined in rule 567—65.1(459,459B).

"Dam" means a barrier that impounds or stores water.

"Dam owner" means any person who owns, controls, operates, maintains, or manages a dam.

"Hazard potential" means a classification based on the possible incremental adverse consequences that result from the release of water or stored contents due to a failure or misoperation of the dam or appurtenances. The hazard potential classification of a dam does not reflect in any way on the current condition of the dam and its appurtenant structures (e.g., safety, structural integrity, or flood routing capacity).

"Height of dam" means the vertical distance from the top of the dam to the natural bed of the stream or water source measured at the downstream toe of the dam or to the lowest elevation of the outside limit of the dam if it is not across a water source.

"Incremental consequence" means the difference, under the same conditions (e.g., flood, earthquake, or other event), between the consequences that are likely to occur from the failure or misoperation of the dam and appurtenances as compared to the consequences that are likely to occur without such failure or misoperation.

"Probable" means more likely than not to occur; reasonably expected; realistic.

"Probable maximum flood" means the same as defined in rule 567—70.2(455B,481A).

"Public damages" means as defined in rule 567—70.2(455B,481A).

"Q100," *"Q50,"* *"Q25,"* *"Q15,"* *"Q10,"* et cetera, means the same as defined in rule 567—70.2(455B,481A).

567—73.3(455B) Regulated dams.

73.3(1) *Thresholds.* Dams meeting any of the following thresholds shall be regulated by the department:

a. A dam with a height of at least 25 feet and a storage of 15 acre-feet or more at the top of the dam elevation; or

b. A dam with a storage of 50 acre-feet or more at the top of the dam elevation and a height of at least 6 feet; or

c. A dam that is assigned a hazard potential of high hazard.

73.3(2) *Exceptions.* Road embankments or driveways with culverts are exempt unless such structure serves, either primarily or secondarily, a purpose commonly associated with dams, such as the temporary storage of water for flood control.

73.3(3) *New construction.* Before construction begins, approval is required for construction of any dam meeting the thresholds of a regulated dam. The proposed dam must meet the criteria outlined in this chapter.

73.3(4) *Existing dams.*

a. Approval is required for:

Thresholds

- New simplified thresholds!
- Height > 25 ft (min. 15 ac-ft)
- Storage > 50 ac-ft (min. 6ft)
- All High hazard

- Hazard classification easier to estimate.
- Generally dam will need to be close to development or adjacent to major road.

- Roadway exemption still included
- Modified to include dams intended to serve a purpose commonly associated with dam

73.3(3) *New construction.* Before construction begins, approval is required for construction of any dam meeting the thresholds of a regulated dam. The proposed dam must meet the criteria outlined in this chapter.

73.3(4) *Existing dams.*

a. Approval is required for:

(1) Modification, repair, alteration, breach, abandonment, or removal of any existing dam or appurtenant structure beyond the scope of ordinary maintenance if the height of the dam or storage of the dam exceeds the applicable thresholds in this rule.

(2) Any change in operating procedures if the height of the dam or storage of the dam exceeds the applicable thresholds in this rule.

b. Spillway reconstruction, changes in normal water level, and modification of the dam embankment or spillway are examples of modifications that require approval. The dam must meet the criteria outlined in this chapter. Dams found to be unsafe according to rule 567—73.33(455B) shall be repaired or removed.

73.3(5) *Required upgrades.* Improvements may be required for existing dams in order to reduce the risk of a dam failure.

a. Existing dams assigned a high hazard potential or significant hazard potential that have been inspected or analyzed and found not to meet the criteria in this chapter will be required to meet the requirements outlined in this chapter for the appropriate hazard potential.

b. Existing dams assigned a low hazard potential that have been inspected or analyzed and found to have a significant hazard potential or high hazard potential shall be required to be upgraded to meet the requirements outlined in this chapter for the appropriate hazard potential.

567—73.4(455B) Assignment of hazard potential. All existing and proposed dams reviewed by the department shall be assigned a hazard potential. Anticipated future land and impoundment use shall be considered in the determination of hazard potential. The hazard potential shall be determined using the following criteria:

73.4(1) *Low hazard.* A dam shall be classified as "low hazard" if failure of the dam would result in no probable loss of human life, low economic losses, and low public damages.

73.4(2) *Significant hazard.* A dam shall be classified as "significant hazard" if failure of the dam would result in no probable loss of human life but may damage residential structures or industrial, commercial, or public buildings; may negatively impact important public utilities or moderately traveled roads or railroads; or may result in significant economic losses or significant public damages.

73.4(3) *High hazard.* A dam shall be classified as "high hazard" if located in an area where failure would result in probable loss of human life.

73.4(4) *Consideration of changes affecting hazard potential.* In locating the site of a dam and in obtaining easements and rights-of-way, the applicant shall consider the impacts to the hazard potential of a dam from anticipated changes in land use downstream or adjacent to the impoundment, the operation of the dam, and the potential liability of the dam owner.

73.4(5) *Changes in hazard potential.* Any future changes in downstream land use, development, impoundment use, or critical hydraulic structures shall require a reevaluation of the hazard potential of the dam. If the hazard potential of the dam changes, the dam shall be required to meet all applicable criteria for that hazard potential. This may require additional increases in spillway capacity for the dam. The owner and any other persons responsible for the construction and operation of the dam shall assume all risks for future costs to upgrade a dam in the event there is a change in hazard potential.

567—73.5 to 73.9 Reserved.

DIVISION II
APPROVAL PROCESS

567—73.10(455B) Review and approval process for dam construction, modification, abandonment, or removal.

73.10(1) *Application process.* Application materials are provided by the department. The application shall be submitted by or on behalf of the person or persons who will be the future dam owner or owners. The application shall be signed by the applicant or a duly authorized agent. Completed applications along with supporting information shall be submitted to the department through an online application system or mailed to Iowa Department of Natural Resources, Attn: Joint Application, 502

Permits and Upgrades

- Permit needed for
  - New dam
  - Modification of existing dam
- Required upgrades
  - High and Significant hazard dams need to meet current design criteria
  - Low hazard dams that change to a higher classification
  - Low hazard dams in safe condition not required to upgrade

73.3(3) *New construction.* Before construction begins, approval is required for construction of any dam meeting the thresholds of a regulated dam. The proposed dam must meet the criteria outlined in this chapter.

73.3(4) *Existing dams.*

a. Approval is required for:

(1) Modification, repair, alteration, breach, abandonment, or removal of any existing dam or appurtenant structure beyond the scope of ordinary maintenance if the height of the dam or storage of the dam exceeds the applicable thresholds in this rule.

(2) Any change in operating procedures if the height of the dam or storage of the dam exceeds the applicable thresholds in this rule.

b. Spillway reconstruction, changes in normal water level, and modification of the dam embankment or spillway are examples of modifications that require approval. The dam must meet the criteria outlined in this chapter. Dams found to be unsafe according to rule 567—73.33(455B) shall be repaired or removed.

73.3(5) *Required upgrades.* Improvements may be required for existing dams in order to reduce the risk of a dam failure.

a. Existing dams assigned a high hazard potential or significant hazard potential that have been inspected or analyzed and found not to meet the criteria in this chapter will be required to meet the requirements outlined in this chapter for the appropriate hazard potential.

b. Existing dams assigned a low hazard potential that have been inspected or analyzed and found to have a significant hazard potential or high hazard potential shall be required to be upgraded to meet the requirements outlined in this chapter for the appropriate hazard potential.

567—73.4(455B) Assignment of hazard potential. All existing and proposed dams reviewed by the department shall be assigned a hazard potential. Anticipated future land and impoundment use shall be considered in the determination of hazard potential. The hazard potential shall be determined using the following criteria:

73.4(1) *Low hazard.* A dam shall be classified as "low hazard" if failure of the dam would result in no probable loss of human life, low economic losses, and low public damages.

73.4(2) *Significant hazard.* A dam shall be classified as "significant hazard" if failure of the dam would result in no probable loss of human life but may damage residential structures or industrial, commercial, or public buildings; may negatively impact important public utilities or moderately traveled roads or railroads; or may result in significant economic losses or significant public damages.

73.4(3) *High hazard.* A dam shall be classified as "high hazard" if located in an area where failure would result in probable loss of human life.

73.4(4) *Consideration of changes affecting hazard potential.* In locating the site of a dam and in obtaining easements and rights-of-way, the applicant shall consider the impacts to the hazard potential of a dam from anticipated changes in land use downstream or adjacent to the impoundment, the operation of the dam, and the potential liability of the dam owner.

73.4(5) *Changes in hazard potential.* Any future changes in downstream land use, development, impoundment use, or critical hydraulic structures shall require a reevaluation of the hazard potential of the dam. If the hazard potential of the dam changes, the dam shall be required to meet all applicable criteria for that hazard potential. This may require additional increases in spillway capacity for the dam. The owner and any other persons responsible for the construction and operation of the dam shall assume all risks for future costs to upgrade a dam in the event there is a change in hazard potential.

567—73.5 to 73.9 Reserved.

DIVISION II
APPROVAL PROCESS

567—73.10(455B) Review and approval process for dam construction, modification, abandonment, or removal.

73.10(1) *Application process.* Application materials are provided by the department. The application shall be submitted by or on behalf of the person or persons who will be the future dam owner or owners. The application shall be signed by the applicant or a duly authorized agent. Completed applications along with supporting information shall be submitted to the department through an online application system or mailed to Iowa Department of Natural Resources, Attn: Joint Application, 502

Hazard Classification

- Low hazard
  - No probable loss of life
  - Low damages
- Significant hazard
  - "Moderate" title changed to "Significant"
  - No probable loss of life
  - Damage structures
  - Impact roads
  - Significant economic or public damages
- High hazard
  - Probable loss of life
- Previous "low hazard – major" most likely "significant hazard"

Questions?

- Scope
- Definitions
- Thresholds
- Hazard Classifications
- Low head dams

73.3(3) *New construction.* Before construction begins, approval is required for construction of any dam meeting the thresholds of a regulated dam. The proposed dam must meet the criteria outlined in this chapter.

73.3(4) *Existing dams.*

a. Approval is required for:

(1) Modification, repair, alteration, breach, abandonment, or removal of any existing dam or appurtenant structure beyond the scope of ordinary maintenance if the height of the dam or storage of the dam exceeds the applicable thresholds in this rule.

(2) Any change in operating procedures if the height of the dam or storage of the dam exceeds the applicable thresholds in this rule.

b. Spillway reconstruction, changes in normal water level, and modification of the dam embankment or spillway are examples of modifications that require approval. The dam must meet the criteria outlined in this chapter. Dams found to be unsafe according to rule 567—73.33(455B) shall be repaired or removed.

73.3(5) *Required upgrades.* Improvements may be required for existing dams in order to reduce the risk of a dam failure.

a. Existing dams assigned a high hazard potential or significant hazard potential that have been inspected or analyzed and found not to meet the criteria in this chapter will be required to meet the requirements outlined in this chapter for the appropriate hazard potential.

b. Existing dams assigned a low hazard potential that have been inspected or analyzed and found to have a significant hazard potential or high hazard potential shall be required to be upgraded to meet the requirements outlined in this chapter for the appropriate hazard potential.

567—73.4(455B) Assignment of hazard potential. All existing and proposed dams reviewed by the department shall be assigned a hazard potential. Anticipated future land and impoundment use shall be considered in the determination of hazard potential. The hazard potential shall be determined using the following criteria:

73.4(1) *Low hazard.* A dam shall be classified as "low hazard" if failure of the dam would result in no probable loss of human life, low economic losses, and low public damages.

73.4(2) *Significant hazard.* A dam shall be classified as "significant hazard" if failure of the dam would result in no probable loss of human life but may damage residential structures or industrial, commercial, or public buildings; may negatively impact important public utilities or moderately traveled roads or railroads; or may result in significant economic losses or significant public damages.

73.4(3) *High hazard.* A dam shall be classified as "high hazard" if located in an area where failure would result in probable loss of human life.

73.4(4) *Consideration of changes affecting hazard potential.* In locating the site of a dam and in obtaining easements and rights-of-way, the applicant shall consider the impacts to the hazard potential of a dam from anticipated changes in land use downstream or adjacent to the impoundment, the operation of the dam, and the potential liability of the dam owner.

73.4(5) *Changes in hazard potential.* Any future changes in downstream land use, development, impoundment use, or critical hydraulic structures shall require a reevaluation of the hazard potential of the dam. If the hazard potential of the dam changes, the dam shall be required to meet all applicable criteria for that hazard potential. This may require additional increases in spillway capacity for the dam. The owner and any other persons responsible for the construction and operation of the dam shall assume all risks for future costs to upgrade a dam in the event there is a change in hazard potential.

567—73.5 to 73.9 Reserved.

DIVISION II
APPROVAL PROCESS

567—73.10(455B) Review and approval process for dam construction, modification, abandonment, or removal.

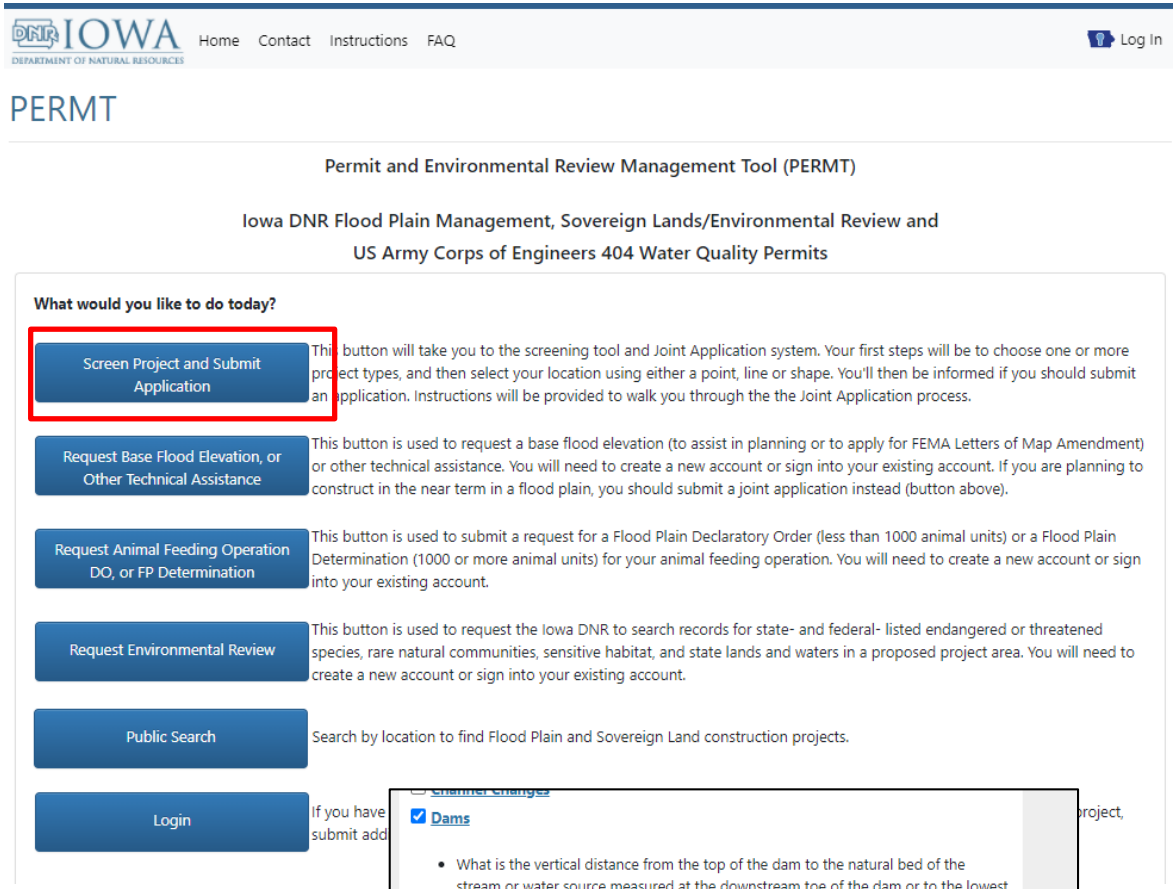
73.10(1) *Application process.* Application materials are provided by the department. The application shall be submitted by or on behalf of the person or persons who will be the future dam owner or owners. The application shall be signed by the applicant or a duly authorized agent. Completed applications along with supporting information shall be submitted to the department through an online application system or mailed to Iowa Department of Natural Resources, Attn: Joint Application, 502

Division II – Approval Process

- Apply in PERMT
- https://programs.iowadnr.gov/permt/
- One application with one approval process!

PERMT for Dams

- Submit application
- Choose project type “Dams”
- Choose options that correspond with thresholds.
- Place marker on aerial map
- Yes or No application needed



East 9th Street, Des Moines, Iowa 50319. For dam repairs, abandonment, or removal, the department may waive the requirements of the application process outlined in this rule if the requirements are unnecessary for the application approval or if the dam has been designated as unsafe and immediate temporary emergency stabilization repairs are required to prevent failure of the dam. Permanent repairs or modifications will require review and approval.

73.10(2) *Preliminary application packet.* The preliminary application packet includes the joint application form and requires submittal of preliminary design data prepared by or under supervision of a professional engineer licensed in the state of Iowa or by an engineer working for the United States government. The preliminary design data packet shall contain a report summarizing the preliminary design, hydrologic data and reservoir routing, a hazard potential analysis, preliminary design drawings, the soils and geotechnical engineering analysis, and a list of the engineering references used as the basis for design and construction.

73.10(3) *Project review.* The department shall review a preliminary application packet and provide feedback or concurrence on the initial design and assumptions. After concurrence with the preliminary application packet and upon reception of the final submittal as required by subrule 73.10(4), the department will review the final submittal and issue a decision based on whether the project meets criteria for approval outlined in this chapter.

73.10(4) *Final submittal.* After the department's review of and concurrence with the preliminary submittal, the engineering plans and other engineering information shall be certified by a professional engineer licensed in the state of Iowa, unless prepared by an engineer working for the United States government, and submitted with the following information:

a. One complete set of certified construction plans;
b. One complete set of construction specifications;
c. An operating plan, if required;
d. Easements, if required;
e. For high hazard dams, an emergency action plan; and
f. An engineering design report documenting all aspects of the design of the dam and how the design of the dam meets the criteria outlined in this chapter. The engineering design report shall include the following: hazard potential analysis; hydrology and hydraulic calculations; embankment design and foundation analysis; and structural calculations, where applicable.

73.10(5) *Public notice.* Public notice shall be issued by the department to inform persons who may experience adverse consequences by the permitted project. Adverse consequences may occur through maintenance of the dam and appurtenant structures, spillway discharges, temporary ponding of floodwater behind the dam, or failure of the dam. It is the applicant's responsibility to submit sufficient information with the preliminary application packet and on request to enable the department to accurately identify the owners, occupants, and addresses of affected lands.

73.10(6) *Project approval or disapproval.*

a. Approval. Issuance of a dam construction permit shall constitute approval of a project. The permit may include one or more special conditions when reasonably necessary to implement relevant criteria.

b. Disapproval. A letter to the applicant denying the application shall constitute disapproval of a project.

c. Notice of decision. Copies of the decision shall be mailed or electronically transmitted to the applicant and any person who commented.

73.10(7) *Appeal of decision.* Any person aggrieved by a decision issued under these rules may file a notice of appeal as governed by 567—Chapter 7.

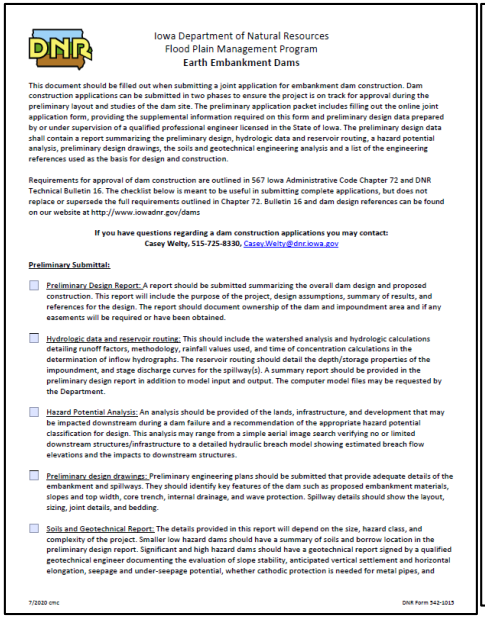
73.10(8) *General conditions.* Department approvals of a project shall be subject to the following conditions:

a. Change in ownership. The dam owner and any successor in interest to the real estate on which the project or activity is located shall be responsible for notifying the department of change in ownership.

b. Maintenance. The dam owner has a responsibility to maintain the dam and appurtenant structures in a safe condition. Maintenance shall include keeping earthen portions of the dam well

Application Materials

- Preliminary application
  - Design report and references
  - Hydrology & Hydraulics
  - Hazard classification
  - Preliminary plans
  - Geotech report if required



Iowa Department of Natural Resources
Flood Plain Management Program
Earth Embankment Dams

This document should be filled out when submitting a joint application for embankment dam construction. Dam construction applications can be submitted in two phases to ensure the project is on track for approval during the preliminary layout and studies of the dam site. The preliminary application packet includes filling out the online joint application form, providing the supplemental information required on this form and preliminary design data prepared by or under supervision of a qualified professional engineer licensed in the State of Iowa. The preliminary design data shall contain a report summarizing the preliminary design, hydrologic data and reservoir routing, a hazard potential analysis, preliminary design drawings, the soils and geotechnical engineering analysis and a list of the engineering references used as the basis for design and construction.

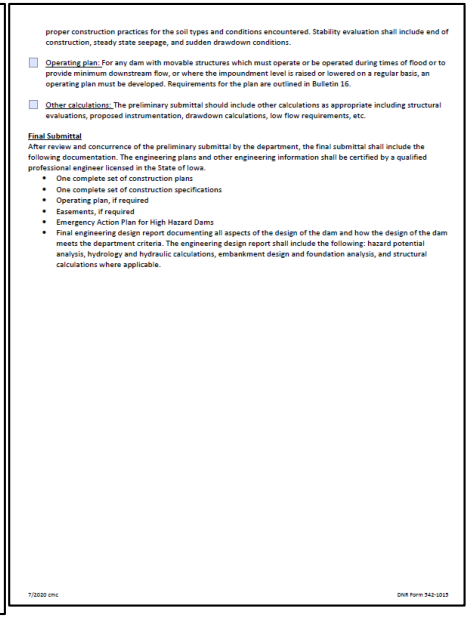
Requirements for approval of dam construction are outlined in 567 Iowa Administrative Code Chapter 72 and DNR Technical Bulletin 16. The checklist below is meant to be useful in submitting complete applications, but does not replace or supersede the full requirements outlined in Chapter 72. Bulletin 16 and dam design references can be found on our website at http://www.iowadnr.gov/dams

If you have questions regarding a dam construction applications you may contact:
Casey Welty, 515-725-8330, Casey.Welty@dnr.iowa.gov

Preliminary Submittal:

- Preliminary Design Report: A report should be submitted summarizing the overall dam design and proposed construction. This report will include the purpose of the project, design assumptions, summary of results, and references for the design. The report should document ownership of the dam and impoundment area and if any easements will be required or have been obtained.
- Hydrologic data and reservoir routing: This should include the watershed analysis and hydrologic calculations detailing runoff factors, methodology, rainfall values used, and time of concentration calculations in the determination of inflow hydrographs. The reservoir routing should detail the depth/storage properties of the impoundment, and stage discharge curves for the spillway(s). A summary report should be provided in the preliminary design report in addition to model input and output. The computer model files may be requested by the Department.
- Hazard Potential Analysis: An analysis should be provided of the lands, infrastructure, and development that may be impacted downstream during a dam failure and a recommendation of the appropriate hazard potential classification for design. This analysis may range from a simple aerial image search verifying no or limited downstream structures/infrastructure to a detailed hydraulic breach model showing estimated breach flow elevations and the impacts to downstream structures.
- Preliminary design drawings: Preliminary engineering plans should be submitted that provide adequate details of the embankment and spillways. They should identify key features of the dam such as proposed embankment materials, slopes and top width, core trench, internal drainage, and wave protection. Spillway details should show the layout, sizing, joint details, and bedding.
- Soils and Geotechnical Report: The details provided in this report will depend on the size, hazard class, and complexity of the project. Smaller low hazard dams should have a summary of soils and borrow location in the preliminary design report. Significant and high hazard dams should have a geotechnical report signed by a qualified geotechnical engineer documenting the evaluation of slope stability, anticipated vertical settlement and horizontal elongation, seepage and under-seepage potential, whether cathodic protection is needed for metal pipes, and

7/2020 cmc DNR Form 542-1013



proper construction practices for the soil types and conditions encountered. Stability evaluation shall include end of construction, steady state seepage, and sudden drawdown conditions.

- Operating plan: For any dam with movable structures which must operate or be operated during times of flood or to provide minimum downstream flow, or where the impoundment level is raised or lowered on a regular basis, an operating plan must be developed. Requirements for the plan are outlined in Bulletin 16.
- Other calculations: The preliminary submittal should include other calculations as appropriate including structural evaluations, proposed instrumentation, drawdown calculations, low flow requirements, etc.

Final Submittal
After review and concurrence of the preliminary submittal by the department, the final submittal shall include the following documentation. The engineering plans and other engineering information shall be certified by a qualified professional engineer licensed in the State of Iowa.

- One complete set of construction plans
- One complete set of construction specifications
- Operating plan, if required
- Easements, if required
- Emergency Action Plan for High Hazard Dams
- Final engineering design report documenting all aspects of the design of the dam and how the design of the dam meets the department criteria. The engineering design report shall include the following: hazard potential analysis, hydrology and hydraulic calculations, embankment design and foundation analysis, and structural calculations where applicable.

7/2020 cmc DNR Form 542-1013

East 9th Street, Des Moines, Iowa 50319. For dam repairs, abandonment, or removal, the department may waive the requirements of the application process outlined in this rule if the requirements are unnecessary for the application approval or if the dam has been designated as unsafe and immediate temporary emergency stabilization repairs are required to prevent failure of the dam. Permanent repairs or modifications will require review and approval.

73.10(2) *Preliminary application packet.* The preliminary application packet includes the joint application form and requires submittal of preliminary design data prepared by or under supervision of a professional engineer licensed in the state of Iowa or by an engineer working for the United States government. The preliminary design data packet shall contain a report summarizing the preliminary design, hydrologic data and reservoir routing, a hazard potential analysis, preliminary design drawings, the soils and geotechnical engineering analysis, and a list of the engineering references used as the basis for design and construction.

73.10(3) *Project review.* The department shall review a preliminary application packet and provide feedback or concurrence on the initial design and assumptions. After concurrence with the preliminary application packet and upon reception of the final submittal as required by subrule 73.10(4), the department will review the final submittal and issue a decision based on whether the project meets criteria for approval outlined in this chapter.

73.10(4) *Final submittal.* After the department's review of and concurrence with the preliminary submittal, the engineering plans and other engineering information shall be certified by a professional engineer licensed in the state of Iowa, unless prepared by an engineer working for the United States government, and submitted with the following information:

a. One complete set of certified construction plans;
b. One complete set of construction specifications;
c. An operating plan, if required;
d. Easements, if required;
e. For high hazard dams, an emergency action plan; and
f. An engineering design report documenting all aspects of the design of the dam and how the design of the dam meets the criteria outlined in this chapter. The engineering design report shall include the following: hazard potential analysis; hydrology and hydraulic calculations; embankment design and foundation analysis; and structural calculations, where applicable.

73.10(5) *Public notice.* Public notice shall be issued by the department to inform persons who may experience adverse consequences by the permitted project. Adverse consequences may occur through maintenance of the dam and appurtenant structures, spillway discharges, temporary ponding of floodwater behind the dam, or failure of the dam. It is the applicant's responsibility to submit sufficient information with the preliminary application packet and on request to enable the department to accurately identify the owners, occupants, and addresses of affected lands.

73.10(6) *Project approval or disapproval.*

a. Approval. Issuance of a dam construction permit shall constitute approval of a project. The permit may include one or more special conditions when reasonably necessary to implement relevant criteria.

b. Disapproval. A letter to the applicant denying the application shall constitute disapproval of a project.

c. Notice of decision. Copies of the decision shall be mailed or electronically transmitted to the applicant and any person who commented.

73.10(7) *Appeal of decision.* Any person aggrieved by a decision issued under these rules may file a notice of appeal as governed by 567—Chapter 7.

73.10(8) *General conditions.* Department approvals of a project shall be subject to the following conditions:

a. Change in ownership. The dam owner and any successor in interest to the real estate on which the project or activity is located shall be responsible for notifying the department of change in ownership.

b. Maintenance. The dam owner has a responsibility to maintain the dam and appurtenant structures in a safe condition. Maintenance shall include keeping earthen portions of the dam well

Application Materials

- Review Preliminary application without final plans
- Final submittal
  - Final design report, and plans and specifications
  - Operating plan if needed
  - Easements if needed
  - EAP for high hazard
- Separate submittals intended to give concurrence on the big items prior to final plans.

vegetated, keeping trees and brush off the dam, preventing and repairing erosion, keeping the spillway free of obstructions, repairing deteriorated structural elements, and performing required maintenance on mechanical appurtenances such as gates.

c. Responsibility. No legal or financial responsibility arising from the construction or maintenance of the approved works shall attach to the state of Iowa or the department due to the issuance of an approval or administrative waiver.

d. Lands. The applicant shall be responsible for obtaining such government licenses, permits, and approvals, and lands, easements, and rights-of-way which are required for the construction, operation, and maintenance of the authorized work.

e. Change in plans. No material change from the plans and specifications approved by the department shall be made unless authorized in writing by the department.

f. Revocation of permit. A department permit may be revoked if construction is not completed within the period of time specified in the department permit.

g. Performance bond. A performance bond may be required when necessary to secure the construction, operation, and maintenance of approved projects and activities in a manner that does not create a hazard to the public's health, welfare, and safety. The amount and conditions of the bond shall be specified as special conditions in the department permit.

h. Construction inspection. For high hazard and significant hazard dams, construction shall be inspected by or under the supervision of a professional licensed engineer in the state of Iowa. The engineer shall prepare and certify as-built plans after completion and a report documenting that the dam was constructed in general conformance with the approved plans (or approved changes) and outlining unusual circumstances encountered during construction. The water storage permit shall not be issued until the department accepts the as-built plans and report.

i. Postconstruction department inspections. A department approval which authorizes construction or modification, operation, and maintenance of a dam for which ongoing inspections are required by these rules shall include a condition stating that the department shall have access to the dam site for such inspections at a reasonable time after notification of the dam owner.

j. Owner inspections. For high hazard and significant hazard dams, the owner is responsible for annual inspections and submission of written inspection reports to the department as required in subrule 73.30(4).

567—73.11(455B) Water storage permits.

73.11(1) A water storage permit shall be required for all regulated dams in order to legally impound water. No water shall be impounded by a dam or reservoir prior to issuance of a water storage permit.

73.11(2) Application for a dam construction permit shall constitute application for a water storage permit if the appropriate fee (as stated in 567—subrule 50.4(2)) is received with the application.

73.11(3) A water storage permit shall be issued upon a finding by the department that the dam and reservoir are safe to impound water within the conditions prescribed in the dam construction permit and the project meets the following conditions:

a. The proposed storage is for a specified beneficial use such as human or livestock water supply, flood control, water quality, recreation, aesthetic value, erosion control, or low-flow augmentation.

b. The impounding structure can be operated in a manner which will not adversely affect any applicable protected flow in the impounded stream. Protected flows are listed in 567—Chapter 52.

c. For high hazard and significant hazard dams, the water storage permit will not be issued until as-built plans and a construction report have been submitted documenting that the dam has been constructed in general conformance with the approved plans and conditions of the dam construction permit and until the department has conducted an inspection of the dam.

73.11(4) A water storage permit may be modified, canceled, or suspended pursuant to Iowa Code section 455B.271. Conditions of cancellation or suspension of water storage permits shall include draining the lake with any available low-level drain and may include dewatering with other methods or breaching of the dam.

Water Storage Permit

- All regulated dams need water storage permit
- $75 fee
- Removed the 18 ac-ft permanent storage threshold.
- Criteria for approval generally the same
  - Provides beneficial use
  - Does not adversely affect protected flows
- No separate application.
- Payment process being finalized.

Questions?

- PERMT
- Application process
- Application materials
- Water storage permit

567—73.12 to 73.14 Reserved.

DIVISION III
CRITERIA FOR APPROVAL

567—73.15(455B) General criteria.

73.15(1) *Required findings.* The department shall approve the construction, repair, modification, abandonment, or removal of a dam only after finding that the project is designed in accordance with accepted engineering practice and methods, and in a manner consistent with the applicable department criteria in this rule.

73.15(2) *Waiver.* A request for a waiver to this chapter shall be submitted in writing pursuant to 561—Chapter 10. The contents of a petition for waiver shall include information pursuant to rule 561—10.9(17A,455A).

567—73.16(455B) Lands, easements, and rights-of-way. An application for approval of a dam project shall include information showing the nature and extent of lands, easements, and rights-of-way that the applicant has acquired or proposes to acquire to satisfy the following criteria:

73.16(1) Ownership or perpetual easements shall be obtained for the area to be occupied by the dam embankment, spillways, and appurtenant structures, and the permanent or maximum normal pool.

73.16(2) Ownership or easements shall be obtained for temporary flooding of areas that would be inundated by the flood pool up to the top of dam elevation and for spillway discharge areas.

73.16(3) Easements covering areas affected by temporary flooding or spillway discharges shall include provisions prohibiting the erection and usage of structures for human habitation or commercial purposes without prior approval by the department.

73.16(4) As a condition of granting approval of a dam rated less than high hazard, the applicant may be required to acquire control over lands downstream from the dam as necessary to prevent downstream development which would affect the hazard classification of the dam.

567—73.17(455B) Emergency action plans for high hazard dams.

73.17(1) *Emergency action plan required.* All high hazard dams shall be required to have an approved emergency action plan on file with the department. The plan shall include the following:

a. A statement of purpose;
b. A project description;
c. An emergency response process;
d. An emergency notification plan with flowchart;
e. Responsibilities of all parties;
f. A list of emergency preparedness and plan maintenance activities; and
g. Inundation maps or another acceptable description of the inundated area.

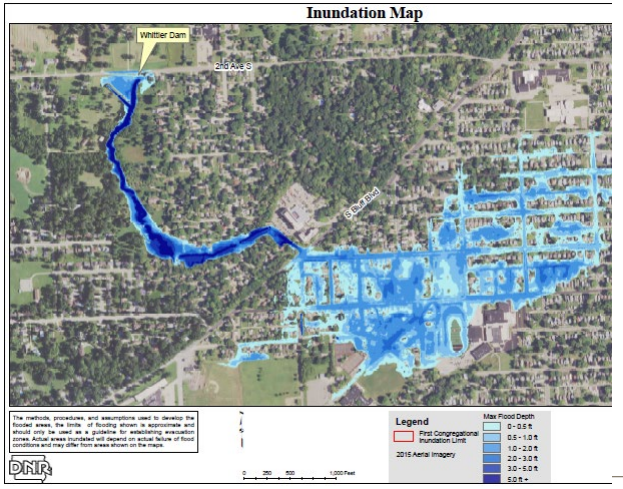
73.17(2) *Emergency action plan maintenance.* The owner of the dam shall keep the emergency action plan up to date. Contact information shall be verified in the plan at least once a year, and an exercise shall be performed at least every five years. The owner of the dam shall keep an up-to-date copy of the emergency action plan on file with the department and with the local county emergency manager.

567—73.18(455B) Encroachment on a confinement feeding operation structure. A dam shall not be constructed or modified so that the ordinary high water of the lake, pond, or reservoir created by the dam is closer than the following distances from a confinement feeding operation structure unless a secondary containment barrier according to 567—subrule 65.15(17) is in place. Measurement shall be from the closest point of the confinement feeding operation structure to the water edge of the lake, pond, or reservoir for a pool level at the elevation of the crest of the auxiliary spillway or at the top of dam elevation if the dam does not have an auxiliary spillway.

73.18(1) The minimum separation between a water source other than a major water source and a confinement feeding operation structure is 500 feet.

Division III -Criteria for Approval

- No more external rule reference document
- Prescriptive design standards have been relaxed
- Would end up with a document the size of TR-60
- Emergency Action Plan required for all high hazard dams
- Working with owners to start EAPs
- Inundation maps are the technical hurdle for dam owners



73.18(2) The minimum separation between a major water source and a confinement feeding operation structure is 1,000 feet or such distance that the structure is not located on land that would be inundated by Q100, whichever is greater.

567—73.19(455B) Hydrologic and hydraulic criteria.

73.19(1) *Hydrology and hydraulic calculations.* Hydrology and hydraulic calculations shall be submitted in the design report documenting the methods and analysis followed in modeling software selection, inflow design hydrograph determination, and reservoir routing. The hydrology and hydraulics section of the design report shall include design references, inflow hydrograph, reservoir stage storage, and stage discharge curves and clearly identify peak inflows, peak discharges, and reservoir elevations for the design floods.

73.19(2) *Design floods.* The specified freeboard design floods in the table below shall be passed without overtopping of the dam or the dam shall be designed to withstand such overflow. The specified spillway design flood in the table below shall be passed by the principal spillway without need for operation of an auxiliary spillway unless the auxiliary spillway is designed such that erosion is not expected during operation.

Hazard Potential	Freeboard Design Flood	Spillway Design Flood
Low Hazard	Q100	Q10
Significant Hazard	Q1000	Q50
High Hazard	Probable Maximum Flood	Q100

73.19(3) *Precipitation amounts.* The National Oceanic and Atmospheric Administration's NOAA Atlas 14, Precipitation-Frequency Atlas of the United States, Volume 8, Version 2.0, dated 2013, shall be used for the Q10–Q1000 frequency storm events. NOAA Hydrometeorological Report No. 51, Probable Maximum Precipitation Estimates, United States, East of the 105th Meridian, dated 1978, shall be used for the probable maximum precipitation.

73.19(4) *Spatial and temporal rainfall distributions and storm durations.* The design report shall document the sources and methodologies for inflow hydrograph development. Distributions and durations that produce the highest impoundment water level shall be used for design.

73.19(5) *Spillway discharge capacity.* The spillway discharge capacity shall be sufficient to evacuate at least 80 percent of the volume of water temporarily stored during the principal spillway design flood within ten days. If this cannot be accomplished, the auxiliary spillway and freeboard design flood routings shall be made beginning with the impoundment level at the ten-day drawdown elevation.

73.19(6) *Incremental consequence analysis.* An inflow design flood based on an incremental consequence analysis may be developed and submitted to the department for review as an alternative to the design floods stated in subrule 73.19(2). The design flood selected using incremental consequence analysis is the flood above which there is a negligible increase in downstream water surface elevation, velocity, and consequences due to failure of the dam when compared to the same flood without failure. If the department concurs with the analysis, the freeboard design storm may be reduced. The minimum design flood for a high hazard dam shall be Q500. The minimum design flood for low hazard and significant hazard dams shall be Q100.

567—73.20(455B) Spillway design requirements.

73.20(1) Spillways shall be designed to operate safely for the life of the structure and at discharges and pressures that would be experienced under all flow conditions, including the freebo design flood.

73.20(2) Spillways shall be provided with a means of piping and seepage control (e.g., draina diaphragms), antivortex devices, trash racks, or other inlet debris control measures, and stable outle capable of handling design exit flow velocities.

Design Requirements

- Design storms have been specified to line up with FEMA and NRCS guidelines.
- Overall 2-ft freeboard when no auxiliary spillway removed.
- Low Hazard
  - Q10 to auxiliary spillway
  - Removed Q25
  - Freeboard raised to Q100
- Significant Hazard
  - Freeboard lowered to Q1000
- High Hazard remains the same

73.18(2) The minimum separation between a major water source and a confinement feeding operation structure is 1,000 feet or such distance that the structure is not located on land that would be inundated by Q100, whichever is greater.

567—73.19(455B) Hydrologic and hydraulic criteria.

73.19(1) *Hydrology and hydraulic calculations.* Hydrology and hydraulic calculations shall be submitted in the design report documenting the methods and analysis followed in modeling software selection, inflow design hydrograph determination, and reservoir routing. The hydrology and hydraulics section of the design report shall include design references, inflow hydrograph, reservoir stage storage, and stage discharge curves and clearly identify peak inflows, peak discharges, and reservoir elevations for the design floods.

73.19(2) *Design floods.* The specified freeboard design floods in the table below shall be passed without overtopping of the dam or the dam shall be designed to withstand such overflow. The specified spillway design flood in the table below shall be passed by the principal spillway without need for operation of an auxiliary spillway unless the auxiliary spillway is designed such that erosion is not expected during operation.

Hazard Potential	Freeboard Design Flood	Spillway Design Flood
Low Hazard	Q100	Q10
Significant Hazard	Q1000	Q50
High Hazard	Probable Maximum Flood	Q100

73.19(3) *Precipitation amounts.* The National Oceanic and Atmospheric Administration's NOAA Atlas 14, Precipitation-Frequency Atlas of the United States, Volume 8, Version 2.0, dated 2013, shall be used for the Q10–Q1000 frequency storm events. NOAA Hydrometeorological Report No. 51, Probable Maximum Precipitation Estimates, United States, East of the 105th Meridian, dated 1978, shall be used for the probable maximum precipitation.

73.19(4) *Spatial and temporal rainfall distributions and storm durations.* The design report shall document the sources and methodologies for inflow hydrograph development. Distributions and durations that produce the highest impoundment water level shall be used for design.

73.19(5) *Spillway discharge capacity.* The spillway discharge capacity shall be sufficient to evacuate at least 80 percent of the volume of water temporarily stored during the principal spillway design flood within ten days. If this cannot be accomplished, the auxiliary spillway and freeboard design flood routings shall be made beginning with the impoundment level at the ten-day drawdown elevation.

73.19(6) *Incremental consequence analysis.* An inflow design flood based on an incremental consequence analysis may be developed and submitted to the department for review as an alternative to the design floods stated in subrule 73.19(2). The design flood selected using incremental consequence analysis is the flood above which there is a negligible increase in downstream water surface elevation, velocity, and consequences due to failure of the dam when compared to the same flood without failure. If the department concurs with the analysis, the freeboard design storm may be reduced. The minimum design flood for a high hazard dam shall be Q500. The minimum design flood for low hazard and significant hazard dams shall be Q100.

567—73.20(455B) Spillway design requirements.

73.20(1) Spillways shall be designed to operate safely for the life of the structure and at the discharges and pressures that would be experienced under all flow conditions, including the freeboard design flood.

73.20(2) Spillways shall be provided with a means of piping and seepage control (e.g., drainage diaphragms), antivortex devices, trash racks, or other inlet debris control measures, and stable outlets capable of handling design exit flow velocities.

Incremental Consequences

- A dam failure event may not cause additional loss of life or significant damages greater than the non-failure event.
- High hazard freeboard design storm may be reduced to the Q500.
- Significant hazard freeboard design storm may be reduced to the Q100.
- FEMA P-94

Selecting and Accommodating Inflow Design Floods for Dams

FEMA P-94 /August 2013

73.18(2) The minimum separation between a major water source and a confinement feeding operation structure is 1,000 feet or such distance that the structure is not located on land that would be inundated by Q100, whichever is greater.

567—73.19(455B) Hydrologic and hydraulic criteria.

73.19(1) *Hydrology and hydraulic calculations.* Hydrology and hydraulic calculations shall be submitted in the design report documenting the methods and analysis followed in modeling software selection, inflow design hydrograph determination, and reservoir routing. The hydrology and hydraulics section of the design report shall include design references, inflow hydrograph, reservoir stage storage, and stage discharge curves and clearly identify peak inflows, peak discharges, and reservoir elevations for the design floods.

73.19(2) *Design floods.* The specified freeboard design floods in the table below shall be passed without overtopping of the dam or the dam shall be designed to withstand such overflow. The specified spillway design flood in the table below shall be passed by the principal spillway without need for operation of an auxiliary spillway unless the auxiliary spillway is designed such that erosion is not expected during operation.

Hazard Potential	Freeboard Design Flood	Spillway Design Flood
Low Hazard	Q100	Q10
Significant Hazard	Q1000	Q50
High Hazard	Probable Maximum Flood	Q100

73.19(3) *Precipitation amounts.* The National Oceanic and Atmospheric Administration's NOAA Atlas 14, Precipitation-Frequency Atlas of the United States, Volume 8, Version 2.0, dated 2013, shall be used for the Q10–Q1000 frequency storm events. NOAA Hydrometeorological Report No. 51, Probable Maximum Precipitation Estimates, United States, East of the 105th Meridian, dated 1978, shall be used for the probable maximum precipitation.

73.19(4) *Spatial and temporal rainfall distributions and storm durations.* The design report shall document the sources and methodologies for inflow hydrograph development. Distributions and durations that produce the highest impoundment water level shall be used for design.

73.19(5) *Spillway discharge capacity.* The spillway discharge capacity shall be sufficient to evacuate at least 80 percent of the volume of water temporarily stored during the principal spillway design flood within ten days. If this cannot be accomplished, the auxiliary spillway and freeboard design flood routings shall be made beginning with the impoundment level at the ten-day drawdown elevation.

73.19(6) *Incremental consequence analysis.* An inflow design flood based on an incremental consequence analysis may be developed and submitted to the department for review as an alternative to the design floods stated in subrule 73.19(2). The design flood selected using incremental consequence analysis is the flood above which there is a negligible increase in downstream water surface elevation, velocity, and consequences due to failure of the dam when compared to the same flood without failure. If the department concurs with the analysis, the freeboard design storm may be reduced. The minimum design flood for a high hazard dam shall be Q500. The minimum design flood for low hazard and significant hazard dams shall be Q100.

567—73.20(455B) Spillway design requirements.

73.20(1) Spillways shall be designed to operate safely for the life of the structure and at the discharges and pressures that would be experienced under all flow conditions, including the freeboard design flood.

73.20(2) Spillways shall be provided with a means of piping and seepage control (e.g., drainage diaphragms), antivortex devices, trash racks, or other inlet debris control measures, and stable outlets capable of handling design exit flow velocities.

Spillway Design

- Same general language as before.
  - Spillways shall be designed to operate safely
  - Removed prescriptive requirements (pipe diameter, material, drop inlet size, etc)
- Seepage control
  - Anti-seepage collar suggestion removed.
  - A reference source needs provided recommending anti-seepage collars

Figure 2-5. Embankment dam breached after piping along the conduit. The view is upstream. Note pre-cast concrete pipe placed on a concrete cradle and the use of seepage collars (Photo credit NRCS).

73.20(3) When a conduit is proposed to be used in a high hazard or significant hazard dam, detailed hydraulic, hydrologic, and structural computations supporting selection of the size and type of pipe to be used shall be provided by the applicant.

73.20(4) Detailed drawings and specifications relating to the installation of the pipe shall include, but not be limited to, construction measures that adequately address critical load bedding, backfill, compaction, joints, and seepage precautions related to installation of the pipe.

73.20(5) Structural computations and drawings shall be submitted for all proposed concrete structures. Drawing details, as necessary, shall be provided showing reinforcement, cutoffs, underdrains/filters, waterstops, construction joints, control joints, and any other details necessary to construct.

73.20(6) If an auxiliary spillway is proposed, it shall be analyzed, designed, and constructed adequately to establish and maintain stability during the passage of design flows without blockage or breaching. Open-channel auxiliary spillways shall have a minimum depth of 2 feet and minimum width of 10 feet and be designed with appropriate curvature and slopes to prevent excessive erosion.

73.20(7) A gated low-level outlet shall be provided for high hazard and significant hazard dams. The gated low-level outlet shall be capable of draining at least 50 percent of the permanent storage behind the dam within ten days. The pipe conduit shall be designed so that negative pressures will not occur at any point.

567—73.21(455B) Embankment design requirements.

73.21(1) The applicant shall document the engineering standards and design references used for dam embankment design. Drawing details, as necessary, shall be provided showing embankment slopes, required additional fill for anticipated settlement, top width, foundation preparation, core trench or cutoff wall, fill materials and methodology, internal seepage controls, and embankment erosion protection.

73.21(2) A geotechnical report shall be submitted for high hazard and significant hazard dams documenting the evaluation of slope stability requirements, anticipated vertical settlement and horizontal elongation, seepage and underseepage potential, whether cathodic protection is needed for metal pipes, and proper construction practices for the soil types and conditions encountered. A stability evaluation shall include end-of-construction, steady-state seepage and sudden-drawdown conditions.

567—73.22(455B) Operating plan. A written operating plan shall be prepared for any dam with gates or other movable structures that must operate or be operated during times of flood or to provide a minimum downstream release rate. Development of the operating plan is considered part of the design process. An operating plan shall include, at a minimum, the following items:

73.22(1) *Responsibility.* The operating plan shall outline and identify the necessary personnel who will be present to operate the equipment or, in the case of automatic equipment, to monitor it and ensure it is functioning properly.

73.22(2) *Operating circumstances.* The circumstances under which operation must occur shall be clearly defined, and a means shall be provided to ensure that operating personnel are present when necessary.

73.22(3) *Method of operation.* The means and methods by which operation is to be conducted shall be clearly defined and shall include, at a minimum, the following items: rates and sequences for opening or closure of gates, target water levels, and target flow rates.

73.22(4) *Flood capacity.* The operating plan shall allow for safe passage of all floods up to and including the freeboard design flood. Flood discharges through the dam greater than the design peak flood inflows into the impoundment shall not be permitted.

73.22(5) *Low flow.* The operating plan shall address low flow situations and shall specify a minimum release rate if required by the department and how the minimum release will be provided and maintained.

73.22(6) *Equipment.* Consideration shall be given to and allowance made for the possible failure of or malfunctioning of the equipment.

73.22(7) *Discharge measurement.* A means shall be provided to determine the discharge through the control structures, especially where operation is to maintain a minimum downstream flow. Stage

Spillway Design (cont.)

- High and Significant design need to provide additional information when using spillway conduit.
- Auxiliary spillway
  - Changed reference term from “emergency spillway” to “auxiliary spillway”
  - Removed prescriptive requirements except:
    - 10-ft bottom width
    - 2-ft depth
- Low level outlet
  - All high and significant hazard dams

73.20(3) When a conduit is proposed to be used in a high hazard or significant hazard dam, detailed hydraulic, hydrologic, and structural computations supporting selection of the size and type of pipe to be used shall be provided by the applicant.

73.20(4) Detailed drawings and specifications relating to the installation of the pipe shall include, but not be limited to, construction measures that adequately address critical load bedding, backfill, compaction, joints, and seepage precautions related to installation of the pipe.

73.20(5) Structural computations and drawings shall be submitted for all proposed concrete structures. Drawing details, as necessary, shall be provided showing reinforcement, cutoffs, underdrains/filters, waterstops, construction joints, control joints, and any other details necessary to construct.

73.20(6) If an auxiliary spillway is proposed, it shall be analyzed, designed, and constructed adequately to establish and maintain stability during the passage of design flows without blockage or breaching. Open-channel auxiliary spillways shall have a minimum depth of 2 feet and minimum width of 10 feet and be designed with appropriate curvature and slopes to prevent excessive erosion.

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73.21(2) A geotechnical report shall be submitted for high hazard and significant hazard dams documenting the evaluation of slope stability requirements, anticipated vertical settlement and horizontal elongation, seepage and underseepage potential, whether cathodic protection is needed for metal pipes, and proper construction practices for the soil types and conditions encountered. A stability evaluation shall include end-of-construction, steady-state seepage and sudden-drawdown conditions.

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73.22(3) *Method of operation.* The means and methods by which operation is to be conducted shall be clearly defined and shall include, at a minimum, the following items: rates and sequences for opening or closure of gates, target water levels, and target flow rates.

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73.22(5) *Low flow.* The operating plan shall address low flow situations and shall specify a minimum release rate if required by the department and how the minimum release will be provided and maintained.

73.22(6) *Equipment.* Consideration shall be given to and allowance made for the possible failure of or malfunctioning of the equipment.

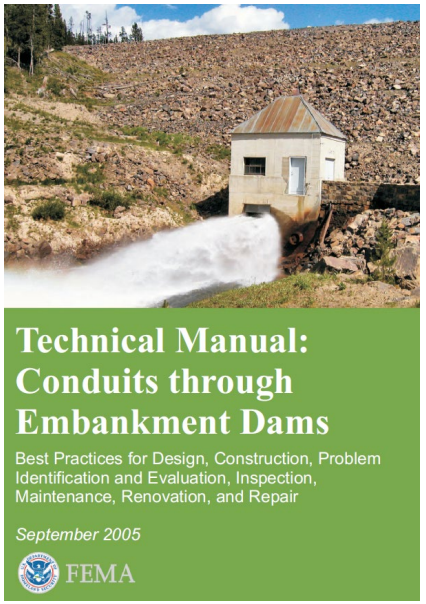
73.22(7) *Discharge measurement.* A means shall be provided to determine the discharge through the control structures, especially where operation is to maintain a minimum downstream flow. Stage

Embankment Design

- Removed all prescriptive requirements
- Design should be documented in design report
- Geotechnical Report
  - All high and significant hazard dams

Design References

- References posted on Iowa DNR Dam Safety website.
- TR-210-60, NRCS
- Pond 378, NRCS
- Design of Small Dams, USBR
- Technical Manual: Conduits through Embankment Dams, FEMA
- Technical Manual: Plastic Pipe Used in Embankment Dams, FEMA
- Filters for Embankment Dams, FEMA
- NOAA Atlas 14 Precipitation Frequency Atlas of the United States
- Selected and Accommodating Inflow Design Floods for Dams, P-94, FEMA
- Hydrometeorological Report No. 51, Probable Maximum Precipitation Estimates, United States East of the 105th Meridian, NOAA



discharge tables, streamflow gages or other means of obtaining discharge readings shall be provided. The settings of control structures shall be easily read.

567—73.23(455B) Removal and abandonment of dams. Removal is the draining of the impoundment and removal of all or a significant portion of the embankment. A dam may be abandoned by rendering a dam nonimpounding by dewatering and filling the reservoir with solid materials and by diverting the natural drainage around the site.

73.23(1) *Removal requirements.* A dam removal project shall meet all of the following requirements:

a. The dam removal plan shall clearly show removal limits and will demonstrate how the proposed construction will render the dam height and storage below thresholds in rule 567—73.3(455B);

b. An impoundment dewatering plan shall be submitted that documents how the water will be released in a controlled manner and not cause upstream erosion or pose a flooding risk downstream;

c. A dam breach plan shall be submitted that demonstrates how the breach process will not pose an increased risk compared to the existing structure; and

d. A sediment disposition plan shall be submitted that provides for stabilization, release, or removal of stored sediment and shall demonstrate no significant adverse consequences on fish and wildlife habitat downstream from the proposed construction.

73.23(2) *Abandonment requirements.* An abandonment plan shall be submitted documenting the final site stabilization, evidence that the structure will no longer impound water or waterborne materials that would be released in the event of a dam failure, and evidence that the structure will not store water above the thresholds outlined in this chapter.

567—73.24 to 73.29 Reserved.

DIVISION IV
DAM OWNERSHIP, INSPECTIONS, AND ENFORCEMENT

567—73.30(455B) Dam owner responsibilities.

73.30(1) *Operation and maintenance required.* The intent to permanently cease or cause to cease all acts of construction, operation, and maintenance of a dam is prohibited. If any person wishes to be relieved of the responsibilities inherent in the ownership or control of a dam structure, those responsibilities shall be undertaken by another person through sale, transfer, or other means or the dam shall be removed.

73.30(2) *Dam maintenance.* The dam owner shall be required to maintain the dam and appurtenant structures in a safe condition. Maintenance shall include, but not be limited to, keeping earthen portions of the dam well vegetated, keeping trees and brush off the dam, preventing and repairing erosion, keeping spillways and drains free of obstructions, repairing structural deterioration, and performing required maintenance on mechanical appurtenances such as gates. The dam owner shall perform regular inspections to identify potential maintenance problems.

73.30(3) *Dam repairs.* The dam owner shall arrange for performance of engineering investigations when needed to evaluate potential safety problems. The dam owner shall perform any required repairs. When the department determines the need for follow-up inspections, the dam owner may be required to have a qualified person make inspections and prepare written inspection reports at specified intervals.

73.30(4) *Maintenance inspections by dam owner.* The dam owner of a high hazard or significant hazard structure shall be responsible for annual inspections and submission of written inspection reports. Annual inspection reports are due to the department on or before December 1. Inspection reports shall include:

a. Maintenance work done since the previous annual report;

b. Observed deficiencies on the dam or appurtenant structures;

c. Remedial measures necessary and the method and schedule the dam owner proposes to correct the deficiencies found; and

d. Changes in land use downstream of the dam.

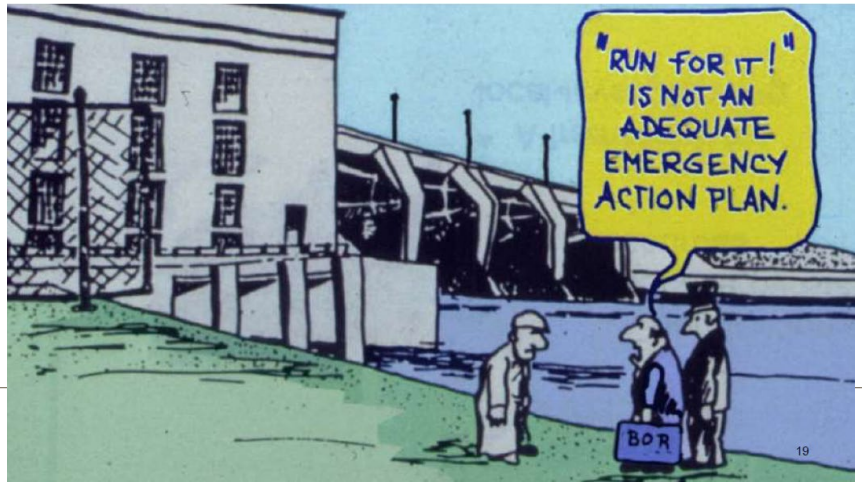
Dam Removal and Abandonment

- Removal requirements worded different with similar context.
- Removed “Abandonment Prohibited”
  - Changed approach of “abandonment”
  - A dam may be abandoned by taking measures to no longer impound water.
  - Dam owner must continue to maintain dam

Marmot Dam, Sandy River, Oregon

Questions?

- Design requirements
- Design storms
- Spillway design
- Embankment Design
- Design references
- Emergency Action Plans



discharge tables, streamflow gages or other means of obtaining discharge readings shall be provided. The settings of control structures shall be easily read.

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73.23(1) *Removal requirements.* A dam removal project shall meet all of the following requirements:

a. The dam removal plan shall clearly show removal limits and will demonstrate how the proposed construction will render the dam height and storage below thresholds in rule 567—73.3(455B);

b. An impoundment dewatering plan shall be submitted that documents how the water will be released in a controlled manner and not cause upstream erosion or pose a flooding risk downstream;

c. A dam breach plan shall be submitted that demonstrates how the breach process will not pose an increased risk compared to the existing structure; and

d. A sediment disposition plan shall be submitted that provides for stabilization, release, or removal of stored sediment and shall demonstrate no significant adverse consequences on fish and wildlife habitat downstream from the proposed construction.

73.23(2) *Abandonment requirements.* An abandonment plan shall be submitted documenting the final site stabilization, evidence that the structure will no longer impound water or waterborne materials that would be released in the event of a dam failure, and evidence that the structure will not store water above the thresholds outlined in this chapter.

567—73.24 to 73.29 Reserved.

DIVISION IV
DAM OWNERSHIP, INSPECTIONS, AND ENFORCEMENT

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73.30(2) *Dam maintenance.* The dam owner shall be required to maintain the dam and appurtenant structures in a safe condition. Maintenance shall include, but not be limited to, keeping earthen portions of the dam well vegetated, keeping trees and brush off the dam, preventing and repairing erosion, keeping spillways and drains free of obstructions, repairing structural deterioration, and performing required maintenance on mechanical appurtenances such as gates. The dam owner shall perform regular inspections to identify potential maintenance problems.

73.30(3) *Dam repairs.* The dam owner shall arrange for performance of engineering investigations when needed to evaluate potential safety problems. The dam owner shall perform any required repairs. When the department determines the need for follow-up inspections, the dam owner may be required to have a qualified person make inspections and prepare written inspection reports at specified intervals.

73.30(4) *Maintenance inspections by dam owner.* The dam owner of a high hazard or significant hazard structure shall be responsible for annual inspections and submission of written inspection reports. Annual inspection reports are due to the department on or before December 1. Inspection reports shall include:

a. Maintenance work done since the previous annual report;

b. Observed deficiencies on the dam or appurtenant structures;

c. Remedial measures necessary and the method and schedule the dam owner proposes to correct the deficiencies found; and

d. Changes in land use downstream of the dam.

Division IV – Dam Ownership

- Dam owner must continue to maintain dam, sell property, or remove dam.
- Dam owner may be required to hire an engineer for evaluation and follow up inspections.
- Existing rule but separated out of a larger paragraph.
- Annual Maintenance Inspections
  - High and Significant hazard dams
  - Brief summary of yearly activity
  - Any repairs or deficiencies
  - Hazard classification changes
- Will develop a process soon.
- Reminders will be sent out to owners.

567—73.31(455B) Dam safety inspection program.

73.31(1) *Scope of dam safety inspection program.* Dams subject to inspection under these rules are regulated dams as defined in this chapter. The scope of department staff field inspections normally is limited to visually observable features of dams and their appurtenant structures.

73.31(2) *Purpose of dam safety inspection program.* The general purposes of inspections are as follows: to evaluate the construction, operation, and maintenance of dams; to identify observable deficiencies in dams or appurtenant structures; and to identify other floodplain structures or uses which may affect the hazard potential of a dam or use of an associated impoundment. Inspection reports shall be used by the department in determining whether a proposed dam project complies with applicable criteria and to determine whether any of the following conditions exist:

a. A permit violation;

b. A violation of law which requires that a permit be obtained; or

c. A condition which constitutes a public nuisance by causing unacceptable risk of injury to the public health, safety or welfare.

73.31(3) *Inspections of significant hazard and high hazard dam structures.*

a. Inspection prior to construction. A field inspection may be made by the department to determine the hazard potential of the dam and verify the location and plan information upon receipt of an application for approval of construction or modification of a dam.

b. Inspection during construction. Construction or modification of a dam structure shall be inspected by an engineer licensed in the state of Iowa or by a trained inspector under the supervision of the engineer. After completion of construction or modification of a dam structure, the engineer shall prepare and submit a construction report, as-built plans, and a statement that in the engineer's professional opinion the work was conducted in general conformance with the approved plans and specifications.

c. Acceptance inspections. When construction of a dam or modifications thereto is completed, and as-built plans and a construction report have been submitted, the department shall make a field inspection to determine whether visually observable features of the dam and appurtenant structures are consistent with the approved plans and the conditions of the dam construction permit. The department shall thereafter issue the water storage permit or a letter stating that additional work is required for acceptance of construction. Closure of the low-level outlet gate shall not begin until the department has issued the water storage permit.

d. Periodic inspections after acceptance. High hazard structures shall be inspected at least once every two years by the department. Significant hazard structures shall be inspected at least once every five years by the department. Structures poorly maintained or those that require repairs identified by the department shall be inspected more frequently until required maintenance and repairs are completed. The department shall notify the dam owner or agent before each inspection. Each inspection shall assess the condition of the dam and appurtenant structures and the adequacy of operation and maintenance practices. The inspection may include reevaluation of the ability of the dam and appurtenant structures to adequately withstand the hydraulic loadings and pass the appropriate design floods.

73.31(4) *Inspections of low hazard dams.*

a. Preliminary site evaluation. The department may evaluate the site of a proposed dam from maps and aerial photographs in lieu of a field inspection.

b. Inspection during construction. The applicant shall be responsible for providing supervision of construction by a person experienced in the type of construction involved.

c. Inspection of dams with operating plans. Low hazard dams with operating plans shall be inspected by the department at least once every five years. Any problems noted shall be reported to the dam owner in writing.

d. General inspections of low hazard dams. Low hazard dams may be periodically inspected by the department to determine their condition. Any serious problems noted shall be reported to the dam owner in writing.

73.31(5) *Special inspections and investigations.* Special inspections and investigations shall be made by department personnel in the following instances:

Dam Safety Inspection Program

- Scope limited to visual inspection
- High and significant hazard dams
  - Removed "major" classification
  - All significant hazard dams inspected every 5 years
  - Approx. 100 additional dams to inspection list

a. Upon notice or evidence of unauthorized construction;

b. Upon notice or evidence that a dam has failed or is in a condition where failure appears likely, and public damages would result from such failure; or

c. Upon notice or evidence that the hazard classification of a dam may no longer be valid due to changes in downstream conditions.

73.31(6) *Inspections by others.* At the discretion of the department, an inspection report submitted by a qualified individual may be accepted in lieu of an inspection and report by the department.

73.31(7) *Inspection reports.* The department shall prepare a report of each inspection and provide a copy to the dam owner. The report shall state the deficiencies observed during the inspection. If appropriate, the report shall detail the actions required to address the noted deficiencies.

567—73.32(455B) Raising or lowering of impoundment levels.

73.32(1) *When approval is required.* A separate approval is required to temporarily or permanently raise or lower the normal level of water impounded by a regulated dam unless the raising and lowering has been authorized as part of an approved operating plan. Such approval shall be in the form of a letter authorizing the lowering or raising and may be conditioned upon various requirements.

73.32(2) *Information required for approval.* The applicant shall submit the following information:

a. The date when the raising or lowering will be initiated, the level to which the impoundment will be raised or lowered and, if the raising or lowering is temporary, the anticipated date when the normal water level will be restored; and

b. Evidence that the discharge rate during lowering will not exceed the capacity of the stream channel below the dam.

73.32(3) *Criteria for approval.* The department's review of the raising or lowering of the impoundment includes determining the effects on flooding or flood control for any proposed works and adjacent lands and property; on the wise use and protection of water resources; on the quality of water; on fish, wildlife, and recreational facilities or uses; and on all other public rights and requirements.

73.32(4) *Conditions.* Conditions of approving the temporary or permanent raising or lowering of water levels may include:

a. Giving prior notice to the director of the local county conservation board or local enforcement officer for the department;

b. Publicizing the lowering locally in order to notify downstream users, persons who have boats or docks on the impoundment and other persons whose use of the impoundment might be affected; and

c. Maintaining a minimum release rate as determined by the department during refilling.

567—73.33(455B) Unsafe dams.

73.33(1) *Procedures for designation of a dam as unsafe.*

a. *Department report.* If after inspection or other investigation the department determines that a dam is unsafe, a report shall be prepared. Copies of the report shall be provided to the dam owner and any other person whom the report identifies as responsible for the unsafe condition of the dam. The report shall identify the problems which cause the dam to be unsafe and recommend action to remedy the unsafe condition.

b. *Opportunity for comment.* The department shall provide the dam owner or other responsible person with a reasonable opportunity to comment on the department report considering the degree and imminence of hazard identified in the department report.

73.33(2) *Criteria for designating a dam as unsafe.* Designation of a dam as unsafe shall be based on one or more of the following findings:

a. The dam has serious deficiencies in its design, construction, use, maintenance, or physical condition which would contribute to failure or otherwise increase flood damages;

b. A high hazard or significant hazard dam has inadequate spillway capacity for the size and hazard potential of the dam.

73.33(3) *Department action concerning an unsafe dam.* After completion of the procedures for designating an unsafe dam, the department shall issue an initial decision which may order remedial

Impoundment Level Changes Unsafe Dams

- Both sections repeated from previous rules.

Questions?

- Dam Ownership
- Inspections
- Impoundment level changes
- Unsafe Dams

Additional Resources

- Association of State Dam Safety Officials
  - Membership open to all dam owners, consultants, and dam safety officials
  - Many available resources both for members and general public
    - http://damowner.org/
    - http://damfailures.org/
    - http://damsafety.org/

- Low Head Dam Safety
  - Concrete or rock dams across a river or stream channel.
  - DNR Water Trails staff works with low head dam owners to improve safety around dams.
  - https://www.iowadnr.gov/Things-to-Do/Canoeing-Kayaking/Low-Head-Dams
- Iowa Ponds Website
  - DNR fisheries biologist recommendations
  - https://www.iowadnr.gov/Fishing/About-Fishing-in-Iowa/Iowa-Ponds

Final Questions