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37.03.13 – Safety of Dams and Mine Tailings Impoundment Structures (Combined Rules)

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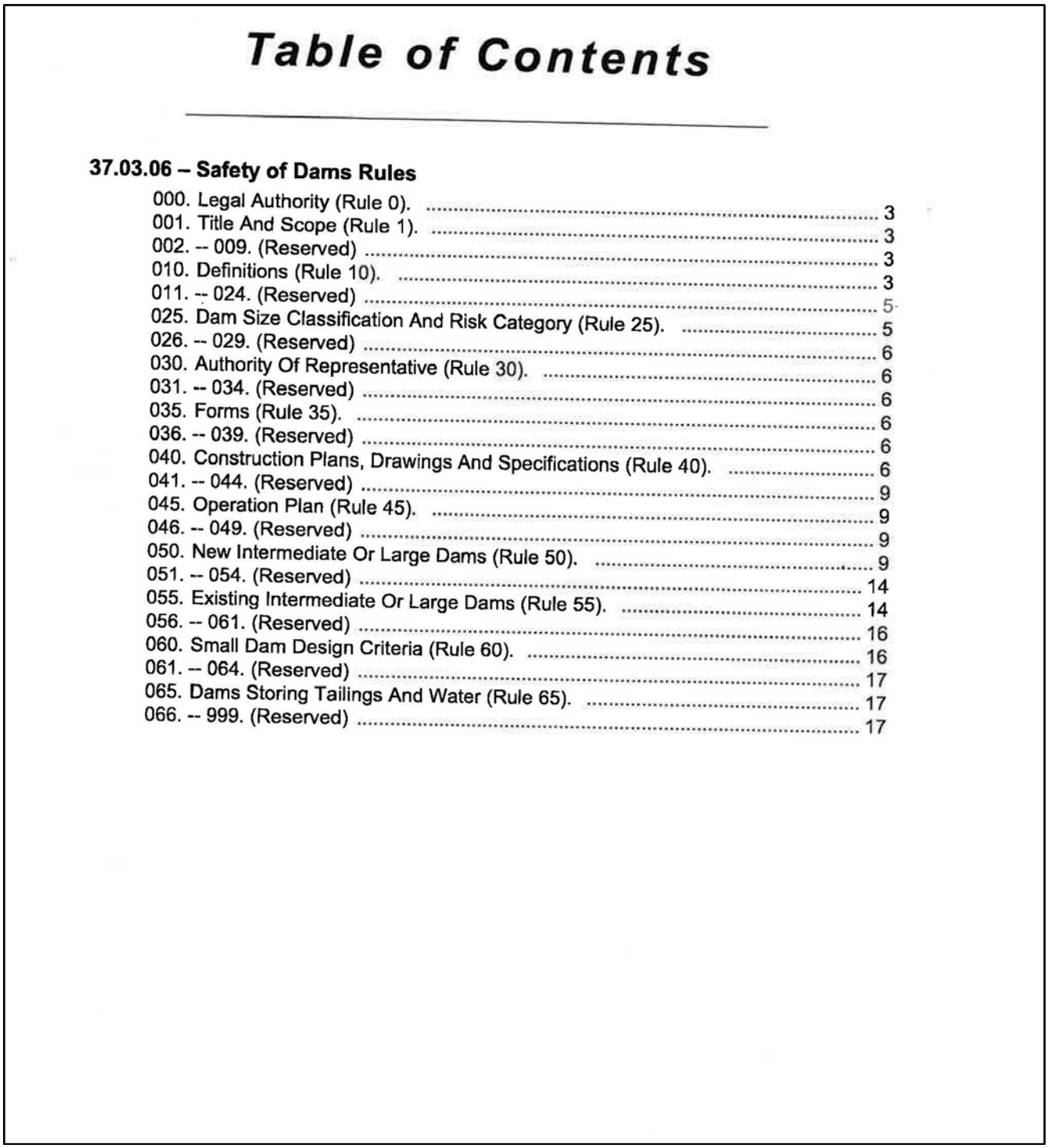
37.03.05 – Mine Tailings Impoundment Structures Rules

Figure 1 – Reprint from existing IDAPA Rules 37.03.05



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37.03.06 – Safety of Dams Rules

Figure 2 - Reprint from existing IDAPA Rules: 37.03.06

Safety of Dams

Rule 0 Legal Authority

000. Legal Authority.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

These rules are adopted pursuant to Chapter 17, Section 42-1714, Idaho Code, and implement the provisions of Sections 42-1709 through 42-1721, Idaho Code.

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

These rules are adopted pursuant to Section 42-1714, Idaho Code.

Rule 1 Title and Scope

001. Title and Scope.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

01. Title.

02. Scope.

a. The requirements that follow are intended as a guide to establish acceptable standards for construction and to provide guidelines for safety evaluation of new or existing dams. The rules apply to all new dams, to existing dams to be enlarged, altered or repaired, and maintenance of certain existing dams, as specifically provided in the rules. The Director will evaluate any deviation from the standards hereinafter stated as they pertain to the safety of any given dam. The standards are not intended to restrict the application of other sound engineering design principles. Engineers are encouraged to submit new ideas which will advance the state of the art and provide for the public safety.

b. Under no circumstances shall these rules be construed to deprive or limit the Director of the Department of Water Resources of any exercise of powers, duties and jurisdiction conferred by law, nor to limit or restrict the amount or character of data, or information which may be required by the Director from any owner of a dam for the proper administration of the law. State sovereignty as expressed in Policy 1A of the adopted State Water Plan for independent review and approval of dam construction, operation and maintenance will not be waived due to any overlapping jurisdiction from federal agencies.

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

01. Title.

02. Scope.

a. These rules and standards will only apply to structures upon which construction, lift construction, enlargement, or alteration is underway on or after July l, 1978. Under no circumstances shall these rules be construed to deprive or limit the Director of the Department of Water Resources of any exercise of powers, duties and jurisdiction conferred by law, nor to limit or restrict the amount or character of data, or information which may be required by the Director from any owner of a mine tailings impoundment structure for the proper administration of the law.

b. The design requirements listed are intended as a guide to establish acceptable standards of construction. They are not intended to restrict the application of other sound design principles by engineers. The Director will evaluate any deviation from the standards hereinafter stated as they pertain to the safety of any given mine tailings impoundment structure. Engineers are encouraged to submit new ideas which will advance the art and provide for the public safety.

Rule 2 Written Interpretation

002. Written Interpretation.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

No existing text (empty rule)

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

No existing text (empty rule)

Rule 3 Administrative Appeals

003. Administrative Appeals.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

Any owner who is aggrieved by a determination or order of the Director may request a hearing pursuant to the provisions of Section 42-1701A(3), Idaho Code, and the Department's adopted Rules of Procedure.

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

No comparable existing text (empty Rule)

Rule 10 Definitions

010. Definitions.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

Unless the context otherwise requires, the following definitions govern these rules.

01. Active Storage. The water volume in the reservoir stored for irrigation, water supply, power generation, flood control, or other purposes but does not include flood surcharge. Active storage is the total reservoir capacity in acre-feet, less the inactive and dead storage.

02. Alterations, Repairs or Either of Them. Only such alterations or repairs as may directly affect the safety of the dam or reservoir, as determined by the Director. Alterations, repairs does not include routine maintenance items. (See Rule Subsections 055.02.a. and 055.02.b.)

03. Appurtenant Structures. Ancillary features (e.g. outlets, tunnels, gates, valves, spillways, auxiliary barriers) used for operation of a dam, which are owned by the dam owner or the owner has responsible control.

04. Board. The Idaho Water Resource Board.

05. Certificate of Approval. A certificate issued by the Director for all dams listing restrictions imposed by the Director, and without which no new dams shall be allowed by the owner to impound water. A certificate of approval is also required for existing dams before impoundment of water is authorized.

06. Dam. Any artificial barrier together with appurtenant works, which is or will be ten (10) feet or more in height or has or will have an impounding capacity at maximum storage elevation of fifty (50) acre-feet or more. Height of a dam is defined as the vertical distance from the natural bed of the stream or watercourse at the downstream toe of the barrier, as determined by the Director, or from the lowest elevation of the outside limit of the barrier, if it is not across a stream channel or watercourse, to the maximum water storage elevation.

07. Small Dams. Artificial barriers twenty (20) feet or less in height that are capable of storing less than one hundred (100) acre-feet of water.

08. Intermediate Dams. Artificial barriers more than twenty (20) feet, but less than forty (40) feet in height, or are capable of storing one hundred (100) acre-feet or more, but less than four thousand (4,000) acre-feet of water.

09. Large Dams. Artificial barriers forty (40) feet or more in height or are capable of storing four thousand (4,000) acre-feet or more of water.

10. Department Jurisdiction. The following are not subject to department jurisdiction:

a. Artificial barriers constructed in low risk areas as determined by the Director, which are six (6) feet or less in height, regardless of storage capacity.

b. Artificial barriers constructed in low risk areas as determined by the Director, which impound ten (10) acre-feet or less at maximum water storage elevation, regardless of height.

c. Artificial barriers in a canal used to raise or lower water therein or divert water therefrom.

d. Fills or structures determined by the Director to be designed primarily for highway or railroad traffic.

e. Fills, retaining dikes or structures, which are under jurisdiction of the Department of Environmental Quality, designed primarily for retention and treatment of municipal, livestock, or domestic wastes, or sediment and wastes from produce washing or food processing plants.

f. Levees, that store water regardless of storage capacity. Levee means a retaining structure alongside a natural lake which has a length that is two hundred (200) times or more greater than its greatest height measured from the lowest elevation of the toe to the maximum crest elevation of the retaining structure.

11. Days Used in Establishing Deadlines. Calendar days including Sundays and holidays.

12. Dead Storage. The water volume in the bottom of the reservoir stored below the lowest outlet and generally is not withdrawn from storage.

13. Department. The Idaho Department of Water Resources.

14. Design Evaluation. The engineering analysis required to evaluate the performance of a dam relative to earthquakes, floods or other site specific conditions that are anticipated to affect the safety of a dam or operation of appurtenant facilities.

15. Director. The Director of the Idaho Department of Water Resources.

16. Engineer. A registered professional engineer, licensed as such by the state of Idaho.

17. Enlargement. Any change in or addition to an existing dam or reservoir, which raises or may raise the water storage elevation of the water impounded by the dam.

18. Factor of Safety. A ratio of available shear strength to shear stress, required for stability.

19. Flood Surcharge. A variable volume of water temporarily detained in the upper part of a reservoir, in the space (or part thereof) that is filled by excess runoff or flood water, above the maximum storage elevation. Flood surcharge cannot be retained either because of physical or administrative factors but is passed through the reservoir and discharged by the spillway(s) until the reservoir level has been drawn down to the maximum storage elevation.

20. Inflow Design Flood (IDF). The flood specified for designing the dam and appurtenant facilities.

21. Maximum Credible Earthquake. The largest earthquake that reasonably appears capable of occurring under the conditions of the presently known geological environment.

22. Operation Plan. A specific plan that will assure the project is safely managed for its intended purpose and which provides reservoir operating rule curves or specific limits and procedures for controlling inflow, storage, and/or release of water, diverted into, passed through or impounded by a dam.

23. Owner. Includes any of the following who own, control, operate, maintain, manage, hold the right to store and use water from the reservoir or propose to construct a dam or reservoir.

a. The state of Idaho and any of its departments, agencies, institutions and political subdivisions;

b. The United States of America and any of its departments, bureaus, agencies and institutions; provided that the United States of America shall not be required to pay any of the fees required by Section 42-1713, Idaho Code, and shall submit plans, drawings and specifications as required by Section 42-1712, Idaho Code, for information purposes only;

c. Every municipal or quasi-municipal corporation.

d. Every public utility;

e. Every person, firm, association, organization, partnership, business trust, corporation or company;

f. The duly authorized agents, lessees, or trustees of any of the foregoing;

g. Receivers or trustees appointed by any court for any of the foregoing;

24. Reservoir. Any basin which contains or will contain the water impounded by a dam.

25. Storage Capacity. The total storage in acre-feet at the maximum storage elevation.

26. Water Storage Elevation. The maximum elevation of the water surface which can be obtained by the dam or reservoir. It is further defined as the storage level attained when the reservoir is filled to capacity (i.e. to the spillway crest) or an authorized storage level attained by installing flashboards to increase the reservoir capacity, or a specified upper storage limit, which is attained by operation of moveable gates that raises the reservoir to a controlled operating level. The maximum storage elevation is an equivalent term of water storage elevation.

27. Release Capability. The ability of a dam to pass excess water through the spillway(s) and outlet works and otherwise discharge.

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

Unless the context otherwise requires, the following definitions govern these rules.

01. **Board**. The Idaho Water Resource Board.

02. **Director**. The Director of the Idaho Department of Water Resources.

03. **Department**. The Idaho Department of Water Resources.

04. **Mine Tailings Impoundment Structure**. Any artificial embankment which is or will be more than thirty (30) feet in height measured from the lowest elevation of the toe to the maximum crest elevation constructed for the purpose of storing mine tailings slurry.

05. **Mine Tailings Slurry**. All slurry wastes from a mineral processing or mining operation.

06. **Mine Tailings Storage Capacity**. The total storage volume of the impoundment when filled with tailings to the maximum approved design storage elevation.

07. **Borrowed Fill Embankment**. Any embankment constructed of borrowed earth materials and which is designed for construction by conventional earth moving equipment.

08. **Reservoir**. Any basin which contains or will contain the material impounded by the mine tailings impoundment structure.

09. **Owner**. Includes any of the following who own, control, operate, maintain, manage, or propose to construct a mine tailings impoundment structure or reservoir.

a. The state of Idaho and any of its departments, agencies, institutions and political subdivisions;

b. The United States of America and any of its departments, bureaus, agencies and institutions; provided that the United States of America shall not be required to pay any of the fees required by Section 42-1713, Idaho Code, and shall submit plans, drawings and specifications as required by Section 42-1721, Idaho Code, for information purposes only;

c. Every municipal or quasi-municipal corporation;

d. Every public utility;

e. Every person, firm, association, organization, partnership, business, trust, corporation or company;

f. The duly authorized agents, lessees, or trustees of any of the foregoing;

g. Receivers or trustees appointed by any court for any of the foregoing.

10. Alterations, Repairs or Either of Them. Only such alterations or repairs as may directly affect the safety of the mine tailings impoundment structure or reservoir, as determined by the Director.

11. Enlargement. Any change in or addition to an existing mine tailings impoundment structure or reservoir, which raises or may raise the storage capacity of the structure, as defined in Rule Subsection 010.06.

12. Days Used in Establishing Deadlines. Calendar days including Sundays and holidays.

13. Certificate of Approval. A certificate issued by the Director for the mine tailings impoundment structure listing restrictions imposed by the Director, and without which no new mine tailings impoundment structures shall be allowed to impound mine tailings slurry or water and no existing impoundment shall be allowed to impound water or continue deposition of mine tailings slurry. The structure will be recertified every two (2) years, unless the Director determines that the structure is unsafe.

14. Engineer. A registered professional engineer, licensed as such by the state of Idaho.

Rule 15 Authority of Representative

015. Authority of Representative.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

When plans, drawings and specifications are filed by another person on behalf of an owner, written evidence of authority to represent the owner shall be filed with the plans, drawings and specifications.

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

When plans, drawings and specifications are filed by another person in behalf of an owner, written evidence of authority to represent the owners shall be filed with the plans, drawings and specifications.

Rule 20 Dam Size Classification

020. Dam Size Classification.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

01. Size Classification. The following table defines the height and storage capacity limits used by the Department to classify dams:

Size Classification	Height (ft)		Storage Capacity
Small	20 ft. or less	and	Less than 100 acre-ft.
Intermediate	More than 20 ft. but less than 40 ft.	or	100 Acre-ft or more, but less than 4000 acre ft
Large	40 ft. or more	or	4000 acre-ft., or more

02. **NOTE!** → The "RISK CATEGORY" table has been separated from its existing location beneath the "SIZE CLASSIFICATION" table, and moved into Rule 25 (025) entitled *HAZARD CLASSIFICATION*

03. Determination of Size and Risk Category. The Director shall determine the size and risk category of a new or existing dam.

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

No comparable existing text (empty)

Rule 25 Hazard Classification

025. Hazard Classification.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

01. **Risk Category**. The following table describes categories of risk used by the Department to classify losses and damages anticipated in down-stream areas, that could be attributable to failure of a dam during typical flow conditions.

02.

Risk Category	Dwellings	Economic Losses
Low	No permanent structures for human habitation.	Minor damage to land, crops, agricultural, commercial or industrial facilities, transportation, utilities or other public facilities or values.
Significant	No concentrated urban development, 1 or more permanent structures for human habitation which are potentially inundated with flood water at a depth of 2 ft. or less or at a velocity of 2 ft. per second or less.	Significant damage to land, crops, agricultural, commercial or industrial facilities, loss of use and/or damage to transportation, utilities or other public facilities or values.
High	Urban development, or any permanent structure for human habitation which are potentially inundated with flood water at a depth of more than 2 ft. or at a velocity of more than 2 ft. per second.	Major damage to land, crops, agricultural, commercial or industrial facilities, loss of use and/or damage to transportation, utilities or other public facilities or values.

03. **Determination of Size and Risk Category**. The Director shall determine the size and risk category of a new or existing dam.

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

No comparable existing Mine Tailings Rule

Rule 30 Forms

030. Forms.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

Forms required by these rules are available from the Department to interested parties upon request. Construction of a small dam requires the filing of Form 1710 and construction of an intermediate or large dam requires the filing of Form 1712.

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

Forms required by these rules.

01. Samples of Forms. Samples of all forms required by these rules are available from the Department to interested parties upon request.

02. Form 1721. Construction of a mine tailings impoundment structure requires the filing of Form 1721.

Rule 35 Design Reports, Drawings, and Specifications

035. Design Reports, Drawings, and Specifications.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

The following provisions shall apply in submitting plans, drawings and specifications.

01. Submission of Duplicate Plans, Drawings and Specifications. Any owner who shall desire to construct, enlarge, alter or repair any intermediate or large dam, shall submit duplicate plans, drawings and specifications prepared by an engineer for the proposed work to the Director with required fees. The Director may, however, require the submittal of plans, drawings and specifications prior to the construction of any dam.

02. Applying for and Obtaining Written Approval. Construction of a new dam or enlargement, alteration or repairs on existing dams shall not be commenced until the owner has applied for and obtained written approval of the plans, drawings and specifications. Alteration or repairs do not include routine maintenance for which prior approval is not required. (See Rule Subsections 055.02.a and 055.02.b)

03. Plans Shall Be Prepared on a Good Quality Vellum or Mylar. Transparent copies reproducible by standard duplicating processes, if accurate, legible and permanent, will be accepted. Plans may initially be submitted in the form of nonreproducible paper prints. After reviewing the plans, the Director will notify the owner of any required changes.

04. Preparation and Submission of Plans. Plans and drawings shall be of a sufficient scale with an adequate number of views showing proper dimensions, so that the plans and drawings may be readily interpreted and so that the structure and appurtenances can be built in conformance with the plans and drawings.

05. Information Included with Plans. Plans for new dams shall include the following information and plans for enlargement, alteration or repair of an existing dam shall include as much of the following information as required by the Director to adequately describe the enlargement, alteration or repair and the effect on the existing dam or its appurtenant facilities:

a. A topographic map of the dam site showing the location of the proposed dam by section, township and range, and location of spillway, outlet works, and all borings, test pits, borrow pits;

b. A profile along the dam axis showing the locations, elevations, and depths of borings or test pits, including logs of bore holes and/or test pits;

c. A maximum cross-section of the dam showing elevation and width of crest, slopes of upstream and downstream faces, thickness of riprap, zoning of earth embankment, location of cutoff and bonding trenches, elevations, size and type of outlet conduit, valves, operating mechanism and dimensions of all other essential structural elements such as cutoff walls, filters, embankment zones, etc.;

d. Detailed drawings showing plans, cross and longitudinal sections of the outlet conduits, valves and controls for operating the same, and trash racks;

e. A curve or table showing the capacity of the reservoir in acre-feet vs gauge height (referenced to a common project datum) of the reservoir storage level, and the computations used in making such determinations.

f. A curve or table showing the outlet discharge capacity in cubic feet per second vs gauge height of reservoir storage level, and the equation used in making such determination;

g. A curve showing the spillway discharge capacity in cubic feet per second vs gauge height of the reservoir or flood surcharge level above the spillway crest and the equation used in making such determinations;

h. Detailed drawings of spillway structure(s), cross-sections of the channel heading to and from the spillway and a spillway profile;

i. Plans for flow measuring devices capable of providing an accurate determination of the flow of the stream above and below the reservoir, and a permanent reservoir or staff gauge near the outlet of the reservoir plainly marked in feet and tenths of a foot referenced to a common project datum;

j. Plans or drawings of instruments, recommended by the owner's engineer to monitor performance of intermediate or large dams to assure safe operation, or as may be required by the Director to monitor any dam regardless of size, that is situated upstream of a high risk area.

06. Specifications. Specifications shall include provisions acceptable to the Director for adequate observation, inspection and control of the work by a registered professional engineer, during the period of construction.

07. Changes to Specifications. The specifications shall not be materially changed without prior written consent of the Director. Significant design changes, while construction is underway, shall be submitted for the Director's review and approval.

08. Inspections. The owner shall provide for and allow inspections by the Department to assure the dam and appurtenant structures are constructed in conformance with the approved plans and specifications, or as may be revised by the engineer and approved by the Director if there are unforeseen conditions discovered during site excavation or construction of the dam which potentially jeopardize the future integrity and safety of the dam. Certain stages of construction shall not proceed without inspection and approval by the Director, including the following:

a. After clearing and excavation of the foundation area and cutoff trench and prior to placing any fill material.

b. After installation of the outlet conduit and collars and before placing any backfill material around the conduit;

c. After construction is completed and before any water is stored in the reservoir.

d. At such other times as determined necessary by the Director. The Director will, upon seven (7) days' notice, inspect and if satisfactory, approve the completed stage of construction. The Director may conduct inspections upon shorter notice upon good reason being shown or upon a schedule jointly agreed upon by the Director and the owner.

09. Inspection, Examination and Testing of Materials. All materials and workmanship shall be subject to inspection, examination and testing by the Director at any and all times.

10. Rejection of Defective Material. The Director shall have the right to require the owner or engineer to reject defective material and workmanship or require its removal or correction respectively. Rejected workmanship shall be corrected and rejected material shall be replaced with proper material.

11. Suspension of Work. The Director may order the engineer to suspend any work that may be subject to damage by inclement weather conditions.

12. Responsibility of Engineer. These provisions shall not relieve the engineer of his responsibility to assure that construction is accomplished in accordance with the approved plans and specifications or to suspend work on his own motion.

13. Detailing Provisions of Specifications. The specifications shall state in sufficient detail, all provisions necessary to insure that construction is accomplished in an acceptable manner and provide needed control of construction to insure that a safe structure is constructed.

14. Design Report. Owners proposing to construct, enlarge, alter or repair an intermediate or large dam shall submit an engineering or design evaluation report with the plans and specifications. The engineering report shall include as much of the following information as necessary to present the technical basis for the design and to describe the analyses used to evaluate performance of the structure and appurtenances.

a. All technical reference(s); equations and assumptions used in the design;

b. Hydrologic data used in determining runoff from the drainage areas; reservoir flood routing(s); and hydraulic evaluations of the outlet(s) and the spillway(s).

c. Engineering properties of the foundation area and of each type of material to be used in the embankment.

d. A stability analysis, including an evaluation of overturning, sliding, slope and foundation stability and a seepage analysis;

i. Seismic design loads shall be evaluated and applied at all large dams to be located in significant or high risk areas, in Seismic Zone 3, which for purposes of these rules is the area in Idaho east of Range 22 East, Boise Meridian. The evaluation required of large dams, that are classified significant or high risk, shall use the maximum ground motion/ acceleration generated by the maximum credible earthquake, which could affect the dam site.

ii. Seismic analysis may be required as determined by the Director for large dams located above high risk areas in Seismic Zone 2, which for purposes of these rules is the area in Idaho west of Range 22 East, Boise Meridian.

15. Additional Information/Waiver. The Director may require the filing of such additional information which in his opinion is necessary or waive any requirement herein cited if in his opinion it is unnecessary.

16. Alternate Plans. The Director may accept plans and specifications or portions thereof prepared for other agencies which are determined to meet the requirements of Rule 40.

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

The following provisions shall apply in submitting plans, drawings, and specifications.

01. Submission of Plans, Drawings, and Specification. Any owner who shall desire to construct, or enlarge, or alter or repair any mine tailings impoundment structure shall submit duplicate copies of plans, drawings, and specifications prepared by an engineer for the proposed work to the Director with required fees. An owner who desires to construct a continuously raised tailings impoundment structure shall submit duplicate copies of plans, drawings, and specifications prepared by an engineer, showing the stages of lift height, by periods of time, and ultimate design height.

02. Application for and Receipt of Written Approval. Construction of a new mine tailings impoundment structure or enlargement, or non-emergency alteration or repairs on existing mine tailings impoundment structures shall not be commenced until the owner has applied and obtained written approval of the plans, drawings, and specifications covering the work. In emergency situations, the owner shall make the required alterations or repairs necessary to relieve the emergency, and notify the Director.

03. Preparation and Submission of Plans. Plans must be prepared on a good grade of tracing linen or a good quality vellum or mylar. Transparent copies reproducible by standard duplicating processes, if accurate, legible and permanent, will be accepted. Plans may initially be submitted in the form of nonreproducible paper prints. After reviewing the plans, the Director will notify the owner of any required changes.

04. Scale of Plans and Drawings. Plans and drawings shall be of sufficiently large scale with an adequate number of views and proper dimensions, so that drawings may be readily interpreted and studied.

05. Dimensions of Plans. All sheets for a set of plans shall have an outside dimension of twenty-four by thirty-six (24 x 36) inches. A margin of two (2) inches on the left-hand end and a margin of one-half (1/2) inch on the other three sides must be provided, making the available work space twenty-three (23) x thirty-three and one-half (33 1/2) inches.

06. Plans. The plans shall include the following:

a. A topographic map of the mine tailings impoundment structure site showing the location of the proposed mine tailings impoundment structure by section, township and range, and location of spillway or diversion structures, outlet works, and all borings, test pits, borrow pits;

b. A profile along the mine tailings impoundment structure axis showing the locations, elevations, and depths of borings or test pits, including logs of bore hole and/or test pits;

c. A maximum cross-section of the mine tailings impoundment structure showing elevation and width of crest, slopes of upstream and downstream faces, thickness of any proposed riprap, zoning of the earth embankment (if any), location of cutoff and bonding trenches, elevations, size and type of decant systems, valves, operating mechanism, and dimensions of all other essential structural elements such as cutoff walls, filters, embankment zones, etc.;

d. Detailed drawings describing the outlet system, i.e., decant line, barge pump system, siphon system;

e. If a spillway is used, a curve showing the discharge capacity in cubic feet per second of the spillway vs. gage height of the storage pool level above the spillway crest up to the maximum high water level, and the formula used in making such determinations;)

f. If a stream diversion is created, a tabulation of the discharge capacity in cubic feet per second of any diversion works and of the diversion channel vs. flow depth through the diversion works or channel up to maximum capacity of the system, and the formulas used in making such determinations;

g. Where staged construction will take place and no spillway exists, a curve showing maximum safe operating level for the tailings as a function of embankment height and the design criteria used to arrive at this;

h. Detailed plans, including cross-sections and profile, of the spillway or diversion works and any associated channels;

i. Plans for monitoring and/or recovering seepage from the reservoir in those instances where safety of the impoundment may be affected;

j. An operation plan;

k. An emergency procedure plan for protection of life and property;

l. An abandonment plan that assures the Director to his satisfaction that, upon completion of the mining operation, the site will be in a safe maintenance-free condition.

07. Specifications. Specifications shall include provisions acceptable to the Director for adequate observation, inspection and control of the work by a registered professional engineer during the period of construction.

08. Provision Included with Plans. The specifications shall provide that the plans and specifications may not be materially changed without prior written consent of the Director.

09. Provisions Included with Specifications. The specifications shall provide that certain stages of construction shall not proceed without the approval of the Director. Those stages requiring approval are as follows:

a. After clearing and excavation of foundation and prior to placing any fill material;

b. After installation of the decant conduit and any proposed collars and before placing any backfill material around conduit;

c. After construction is completed (first stage starter dike if staged construction) and before any water or mine tailings slurry is stored in the reservoir;

d. Before each successive enlargement of the impoundment structure;

e. After each stage of enlargement of the impoundment structure is completed and before storage is allowed to exceed the level approved for the previous approved stage;

f. At such other times as determined necessary by the Director. The Director will, within seven (7) days after notification by the engineer, inspect and if satisfactory, approve the completed stage of construction. Owners are encouraged to give prior notice to the Department, so that the inspection can be scheduled to prevent delays.

10. Inspections, Examinations, and Tests. All materials and workmanship may be subject to inspection, examination and test by the Director at any and all reasonable times during manufacture and/or construction and at any and all places where such manufacture and/or construction are carried on.

11. Rejection of Defective Material. The Director shall have the right to require the owner or engineer to reject defective material and workmanship or require its correction. Rejected workmanship shall be corrected and rejected material shall be replaced with proper material.

12. Suspension of Work. The Director may order the engineer to suspend any work that may be subject to damage by climatic conditions.

13. Responsibility of Engineer. These provisions shall not relieve the engineer of his responsibility to assure that construction is accomplished in accordance to approved plans and specifications or to suspend work on his own motion.

14. Detailing Provisions of Specifications. The specifications shall state in sufficient detail, all provisions necessary to ensure that construction is accomplished in an acceptable manner and provide needed control for construction to ensure that a safe structure is constructed.

15. Required Information. The following information shall be submitted with the plans and specifications.

16. Engineer's Report. An engineer's report giving details necessary for analysis of the structure and appurtenances. Included as a part of the report where applicable shall be the following:

a. Formulas and assumptions used in designs;

b. Hydrologic data used in determining runoff from the drainage areas;

c. Engineering properties of each type of material to be used in the embankment and of the foundation areas;

d. Stability analysis, including an evaluation of overturning, sliding, upstream and downstream slopes and foundation stability;

e. Geologic description of reservoir area, including evaluation of landslide potential;

f. Chemical analysis of all materials composing the slurry;

g. Earthquake design loads must be evaluated at all sites located east of Range 22 E., Boise Meridian. This area corresponds to Seismic Zone 3 as designated by the Recommended Guidelines of the National Dam Safety Program. Earthquake analysis may be required at other impoundment structure sites if deemed necessary by the Director;

h. A seepage analysis of the embankment and reservoir bottom;

i. A hydraulic analysis of the outlet system and spillway, diversion work or diversion channel;

j. Engineering properties and the weathering characteristics of the proposed tailings to be stored in the impoundment;

k. Other information which would aid in evaluating the safety of the design.

17. Filing of Additional Information. The Director may require the filing of such additional information which in his opinion is necessary to assess safety or waive any requirement herein cited if in his opinion it is unnecessary.

Rule 40 Bonding

040. Bonding.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

No comparable existing rule

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

An active surety bond or other means of acceptable surety payable to the Director of the Department of Water Resources shall be on file with the Director throughout the active life of the tailings disposal site. The purpose of this bond is to provide a means by which the tailings impoundment can be placed in a safe maintenance-free condition if abandoned by the owner without conforming to an abandonment plan approved by the Director.

01. Filing of Bond. The bond shall be filed prior to any issuance by the Director of a certificate of approval for use of the mine tailings impoundment structure to impound mine tailings slurry and shall run for the two (2) year approval period covered on the certificate of approval.

02. Provisions of Bond. Bond provisions shall provide that the surety may be held liable for a period of up to five (5) years following notice of default on the bond.

03. Amount of Bond. The bond amount will be set by the Director and is subject to revision each time it is renewed. The owner must obtain approval for the amount of his surety bond prior to each renewal.

04. Cost Estimate Submitted by Engineer. In order to provide a basis for setting the bond amount, the engineer shall submit a cost estimate acceptable to the Director, together with conceptual details needed to arrive at the estimate, for abandonment of the facility at each proposed stage of its construction.

05. Current Costs for Abandonment. Bond amount will be based on current costs for abandonment of the facility based on the approved cost estimate for abandonment at the present construction condition or the next approved proposed stage, whichever represents the larger bond amount.

06. Determination of Bond Amount. If the final abandonment is determined to be the most costly condition, the owner may elect to use this as a basis for bonding throughout the life of the project. The Director may, however, revise the bonding amount to reflect updated costs when he feels it is necessary in order to maintain a realistic bond.

07. Filing Initial Bond. The initial bond shall be filed upon completion of the first stage of construction and before the required certificate of approval is issued to allow storage of mine tailings slurry in the impoundment. No certificate of approval shall be renewed prior to filing by the owner of a bond renewal in an amount approved by the Director.

08. Filing Copy of Performance Bond. Upon the filing of a copy of a performance bond with the Director, covering the terms and conditions of a state of Idaho mineral lease or an approved reclamation plan, in which these documents specify compliance with a plan of restoration of all mining operations, including the tailings impounding structure, the Director may determine the bond required of this section has been met, if the amount of the bond accurately reflects the cost associated with the abandonment plan provided by the owner.

Rule 45 Emergency Action and Operation Plans

045. Emergency Action and Operation Plans.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

An operation plan is required as described in the following rules and shall provide procedures for emergency operations and include guidelines and procedures for inspection, operation and maintenance of the dam and appurtenances, including any instruments required to monitor performance of the dam during normal operating cycles, critical filling or flood periods, or as may be required to monitor new or existing dams subject to earthquake effects.

01. New, Reconstructed or Enlarged Dams. Prior to the initial filling of the reservoir or refilling the reservoir for a reconstructed or enlarged dam in the following categories, the owner shall file with the Director an operation plan for review and approval:

a. Small, high risk.

b. Intermediate, significant risk.

c. Intermediate, high risk.

d. Large, any risk category.

02. Existing Dams. Unless exempted by the Director, owners of the following categories of dams shall file an operation plan with the Director on or before July 1, 1992 for review and approval:

a. Intermediate, high risk.

b. Large, significant risk.

c. Large, high risk.

03. Alternate Plans. The Director may accept existing studies or plans in lieu of an operation plan if the Director determines the information provided fulfills the requirements of Rule 45.

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

No comparable existing text

Rule 50 New Dams and New Mine Tailings Impoundment Structures

050. New Dams and New Mine Tailings Impoundment Structures.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

The following minimum criteria shall be used to evaluate the design of intermediate or large earthfill dams in Idaho. These standards are intended to serve as guidelines for a broad range of circumstances, and engineers should not consider them as a restriction to the use of other sound engineering design principles. Exclusion from this established criteria will be considered by the Director on a case-by-case basis in approving plans and specifications and evaluating dams. Dams constructed of other materials shall comply with these criteria as found appropriate by the Director and with other engineering criteria approved by the Director.

01. Embankment Stability. Slope stability analyses shall determine the appropriate upstream and downstream slopes. Unless slope stability analysis determines otherwise, the embankment slopes shall be:

Upstream slope	3:1 or flatter
Downstream slope	2:1 or flatter

a. For large high and significant hazard dams and intermediate high hazard dams the embankment shall be designed, constructed and maintained to assure stability under static loads and prevent instability due to seepage or uplift forces, or drawdown conditions. Transmission of seepage through the embankment, abutments and foundation shall be controlled to prevent internal removal of material and instability where seepage erodes or emerges.

b. The design analysis shall consider the need for installing filters, filter fabric and/or toe drains to stabilize the fill and protect against piping of the embankment fill material.

c. The minimum factor of safety for a dam under steady state condition shall be 1.5. During rapid drawdown of the reservoir, the minimum factor of safety for the embankment shall be 1.2. For dams constructed in Seismic Zone 3, the minimum factor of safety under seismic load shall be 1.0.

d. The stability of an embankment subjected to earthquake ground motions can be analyzed by dynamic response or pseudo-static analyses. Pseudo-static analyses are acceptable for embankment dams constructed of soils that will not build-up excess pore pressures due to shaking, nor sustain more than fifteen percent (15%) strength loss during earthquake events, otherwise the stability of an embankment dam shall be analyzed by a dynamic response method. A pseudo-static analysis simplifies the structural analysis (i.e. the resultant force of the seismic occurrence is represented by a static horizontal force applied to the critical section to derive the factor of safety against sliding along an assumed shear surface). The value of the horizontal force used in the pseudo-static analysis, is the product of the seismic coefficient and the weight of the assumed sliding mass.

e. Slope deformation analyses are required for dams located in Seismic Zone 3, that are constructed of cohesionless soils and/or on foundations which are subject to liquefaction, when the peak acceleration at the site is anticipated to exceed 0.15g.

f. The design analyses for new dams located in high risk areas (in Seismic Zone 2 or 3) shall include geologic and seismic reports, location of faults and history of seismicity.

g. Where in the opinion of the Director, embankment design or conditions warrant, instrumentation of the embankment and/or foundation will be required.

h. The design analyses for new large dams located in high risk areas (in Seismic Zone 3) shall include an evaluation of potential landslides in the vicinity of the dam or immediate area of the reservoir, which could cause damage to the dam or appurtenant structures, obstruct the spillway or suddenly displace water in the reservoir causing the dam to overtop. If potential landslides pose such a threat, they shall be stabilized against sliding, with a minimum factor of safety of 1.5.

02. Top Width. The crest width shall be sufficient to provide a safe percolation gradient through the embankment at the level of the maximum storage elevation. The minimum crest width (top of embankment) shall be determined by:

W = H / 5 + 10 W = Width, in feet
H = Structural Height, in feet

The minimum top width for any dam is twelve (12) feet.

03. Cutoff Trenches or Walls. Cutoff trenches shall be excavated through relatively pervious foundation material to an impervious stratum or zone. The trench shall be backfilled with suitable material, compacted to the specified density. The cutoff trench shall extend up the abutments to the maximum storage elevation.

a. Cutoff trenches shall be wide enough to allow the free movement of excavation and compaction equipment. Side slopes shall be no steeper than one to one (1:1) for depths up to twelve (12) feet, and no steeper than one and one half to one (1 1/2:1) for greater depths to provide for proper compaction. Flatter slopes may be required for safety and stability.

b. Concrete cutoff walls may be used to bond fills to smooth rock surfaces in a similar manner as cutoff trenches and shall be entrenched in the rock to a depth approximately one-half the thickness of the cutoff wall. Concrete cutoff walls shall be doweled into the rock a minimum of eight (8) inches with a maximum spacing of eighteen (18) inches for three-fourths (3/4) inch steel dowels. Concrete walls shall have a minimum projection of three (3) feet perpendicular to the rock surface and shall have a minimum thickness of twelve (12) inches.

04. Impervious Core Material. The approved earth materials (silt soils are seldom acceptable) shall be zoned as shown in the plans and placed in the embankment in continuous, approximately level layers, having a thickness of not more than six (6) inches before compaction. Compaction shall be based on ASTM D-698. A minimum compaction of ninety-five percent (95%) is required.

a. An acceptable working range of moisture content for the core material shall be established and maintained.

b. The material shall be compacted by means of a loaded sheepsfoot or pneumatic roller to the required density.

c. No rock shall be left in the core material which has a maximum dimension of more than four (4) inches. The core material shall be free of organic and extraneous material.

d. The core material shall be carried up simultaneously the full width and length of the dam, and the top of the core material shall be kept substantially level at all times, or slope slightly toward the reservoir.

e. No frozen or cloddy material shall be used, and no material shall be placed upon frozen, muddy or unscarified surfaces.

f. All materials used in the dam shall meet the stability and seepage requirements as shown by a design analysis of the structure and shall be properly installed to meet these requirements.

05. Drains. Toe or chimney drains or free draining downstream material shall be installed where necessary to maintain the phreatic line within the downstream toe.

a. Filter design for chimney drains, filter blankets and toe drains in clay and silt soils shall be selected using the following design criteria, unless deviations are substantiated by laboratory tests. All tests are subject to review and approval by the Director.

D15 filter/D15 base > 5 but < 20
D15 filter/D85 base < 5
D50 filter/D50 base < 25
D85 filter > 2 times diameter of pipe perforations, or 1.2 times width of pipe slots.

b. Filter material requirements are determined by comparing the particle size distribution of the filter to the particle size distribution of the materials to be protected;

e.g. D50 filter
D50 material to be protected

Where D is the particle size passing a mechanical (sieve) analysis expressed as a percentage by weight.

c. The base material should be analyzed considering the portion of the material passing the No. 4 sieve, for designing filters for base materials that contain gravel size particles. To assure internal stability and prevent segregation of the filter material, the coefficient of uniformity (D60/D10) shall not be greater than 20.

d. The minimum thickness of filter blankets and chimney drains shall be twelve (12) inches, with the maximum size particle passing the one (1) inch sieve. The maximum particle size may be increased with increasing thickness of the filter, by the rate of one (1) inch per foot of filter. However, the maximum particle shall not exceed three (3) inches. Zoned filters and chimney drains must not be less than twelve (12) inches thick per each zone. The width of granular filters shall not be less than the width of the installation equipment unless the plans and specifications include construction procedures adequate to insure the integrity of a narrower width.

e. Perforated drain pipes must have a minimum of six (6) inches of drain material around the pipe. The maximum particle size shall not exceed one-half (1/2) inch unless the layer thickness is increased at the rate of one (1) inch per foot of filter. Underdrains and collection pipes must be constructed of noncorrosive material.

06. Freeboard. The elevation of the top of the embankment shall be constructed and maintained above the flood surcharge level to prevent the dam from overtopping during passage of the inflow design flood and to provide freeboard for wind generated waves. Camber shall be included in the design and incorporated in the construction of the top of the embankment, unless waived by the Director. Camber may be estimated by multiplying the structural height of the dam by five percent (5%).

a. The height of wind generated waves (H) moving across a surcharged reservoir can be estimated by the following equation:

H = 1.95 (F1/2) where F = fetch, the distance in miles across the reservoir, measured perpendicular to the major axis of the dam.

b. For large, high risk dams the minimum freeboard shall be two (2) feet plus wave height during passage of the one percent (1%) flood or equal to the surcharge elevation of the reservoir during passage of the inflow design flood whichever is greater.

c. Estimation of the height of the wind generated wave using the empirical equation in Rule 050.06.a. shall not preclude a more conservative design including consideration of fill materials, embankment zoning, slope surface protection, drainage or other safety factors.

07. Riprap. All dams which are subject to erosion shall be protected from wave action. The design engineer, with approval of the Director, shall determine whether or not rock riprap or other protection is necessary.

a. Where rock riprap is used, it shall be placed on a granular bedding material, and extend up the slope, from three (3) feet below the normal minimum operating level to the top of the dam.

b. Where riprap is required by Rule Subsection 055.07, pipes, cables, brush, tree growth, dead growth, logs, or floating debris are not acceptable substitutes for rock riprap and granular bedding material.

08. Outlet Conduits. All reservoirs shall be provided with an outlet conduit of sufficient capacity to prevent interference with natural streamflow through the reservoir to the injury of downstream appropriators unless waived by the Director. In addition to any natural flow releases, the outlet conduit should be of sufficient capacity to pass at the same time, the maximum water requirement of the owner. A larger outlet conduit may be required to provide adequate release capability as determined by the Director.

a. Outlet conduits shall be laid on a firm, stable foundation and normally not be placed on fills which can consolidate, allow differential settlement, and cause separation or misalignment of the pipe. Unless otherwise required, the outlet shall have a minimum inside diameter of twelve (12) inches. The conduits shall be of reinforced concrete or of metal pipe encased in concrete, poured with a continuous seal between the concrete and the trench except as otherwise approved by the Director. Void spaces and uncompacted areas shall not be covered over when the outlet trench is backfilled. Outlets shall be properly aligned on an established grade and may be supported on a concrete cradle, or otherwise supported and kept aligned when the outlet is covered.

b. Asphalt dipped or other metal pipe is not acceptable unless it is encased in concrete. Exceptions may be made only where conditions warrant, but in no case shall the reasonable life expectancy of the pipe be less than the design life of the dam.

c. All outlet conduits shall have a seepage path through the impervious zone at least equivalent in length to the maximum head above the downstream end of the system. Only one-third (1/3) the horizontal distance through the impervious zone will be utilized when calculating the length of the seepage path. Collars may be used to satisfy this requirement but all collars shall extend a minimum of two (2) feet outside the conduit for dams up to thirty (30) feet in height and a minimum of three (3) feet for dams above that height. Collars shall be spaced at intervals of at least seven (7) times their height and no collar may be closer to the outer surface of the impervious zone than the distance it extends out from the conduit.

d. The use of multiple conduits is allowed only upon the written approval of the Director.

09. Gates. All conduits shall be gated on the upstream end, unless otherwise approved by the Director, with either a vertical or an inclined gate. All conduits shall be vented directly behind the gate unless otherwise determined by the Director. Reservoirs storing water during the winter and subject to severe ice conditions shall have inclined gate controls enclosed in a protective sleeve which is buried. All gate stem pedestals shall be made of concrete. All trash racks shall slope toward the reservoir. At least one (1) of the sides of the inlet structure shall be open to allow water to flow into the outlet conduit and shall be covered with a trash rack. Trash racks should be designed with bars primarily in one (1) direction so they can be cleaned. If fish screens are used, they shall be placed over the trash rack and shall be removable for cleaning, or of the self-cleaning type.

10. Outlet Controls. Outlet controls shall be installed at a stable location, on the crest or on an elevated platform, or within an enclosure when required, which is readily accessible, but secured to prevent unauthorized operation.

11. Release Capability. Based on the size of the dam and on the risk category assigned by the Director, the release capability of a dam shall equal or exceed the inflow design flood in the following table:

Downstream Risk Category	Size Classification	Inflow Design Flood
Low	Small	Q50
	Intermediate	Q100
	Large	Q500
Significant	Small	Q100
	Intermediate	Q500
	Large	0.5 PMF

High	Small	Q100
	Intermediate	0.5 PMF
	Large	PMF

NOTE: The inflow design flood(s) indicated in the table include specific frequency floods (2%/50yr, 1%/100 yr.) expressed in terms of exceedance with a probability the flood will be equaled or exceeded in any given year (a fifty (50) year flood has a two percent (2%) chance of occurring in any given year and a one hundred (100) year flood has a one percent (1%) chance of occurring in any given year); or PMF - probable maximum flood, which may be expected from the most severe combination of meteorologic and hydrologic conditions that are reasonably possible in the region. The PMF is derived from the probable maximum precipitation (PMP) which is the greatest theoretical depth of precipitation for a given duration that is physically possible over a particular drainage area at a certain time of year.

a. All spillways shall be stabilized for the discharge of flow by the use of concrete, masonry, riprap or sod, if not constructed in resistant rock.

b. Where site conditions allow, the spillway shall be constructed independent of embankment dams. The spillway(s) shall guide the discharge of water away from the dam embankment so as not to erode or endanger the structure.

c. The minimum base width of an open-channel spillway shall be ten (10) feet. Conduits or siphon pipes other than glory hole spillways are not acceptable substitutes for an open-channel spillway.

d. The effectiveness of spillways shall be undiminished by bridges, fences, pipelines or other structures.

e. Unless expressly authorized in writing by the Director, or approved as an integral part of an operation plan, stop logs or flashboards shall not be installed in spillways.

12. Reservoir Site. The dam site shall be cleared of all trees, brush, large rocks, and debris unless otherwise waived by the Director. The reservoir site shall be cleared of all woody material, growth or debris that is large enough to lodge in the spillway, or outlet works, except as otherwise approved by the Director.

13. Inspection and Completion Reports. As construction proceeds, it is the responsibility of the engineer to submit test reports (e.g. soil material analyses, density tests, concrete strength tests) along with periodic inspection and progress reports to the Director.

a. Upon completion of construction the owner or his engineer shall provide the Director a short, written narrative account of all items of work. Record drawings and revised specifications shall be submitted to the Director if the completed project has been substantially changed from the plans and construction specifications originally approved.

b. The engineer representing the owner shall certify that construction, reconstruction, enlargement, replacement or repair of the dam and appurtenances was completed in accordance with the record drawings and specifications, or as revised.

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

The following minimum design criteria shall be used for all mine tailings impoundment structures designed for installation in Idaho. These limitations are intended to serve as guidelines for a broad range of circumstances, and engineers should not consider them as a restriction to the use of other sound design criteria. Deviation from this established criteria will be considered by the Director in approving plans and specifications. (7-1-93)

01. Embankment Slopes.

a. For construction of borrowed fill embankments, in the absence of a stability analysis, the slopes shall be:

Upstream slope	2:1 or flatter
Downstream slope	2:1 or flatter

b. Construction by the upstream method shall not be used in the area of the state east of Range 22 E., Boise Meridian, unless the engineer can provide evidence that the construction and operation of the tailings impoundment will achieve a relative density of sixty percent (60%) or greater in the embankment and tailings to prevent liquefaction during earthquake loading.

c. Safety factors for the embankment shall be at least one and five-tenths (1.5) for static loads and a minimum of one (1) for the static plus the appropriate earthquake load.

d. To insure sufficient permeability and stability of the embankment, designs will require utilizing materials other than the tailings, when the tailings materials:

i. Contain greater than seventy-five percent (75) passing the #200 standard U.S. sieve, or fifty percent (50%) passing the #325 standard U.S. sieve;

ii. Contain phosphate clays;

iii. The design calls for the water to be impounded against the embankment;

iv. Have other properties which makes them unsuitable for use as construction materials.

e. Embankments designed for the storage of hazardous levels of radioactive materials shall, in addition to any requirements of these regulations, meet the criteria outlined in the Nuclear Regulatory Commission Regulatory Guide 3.11 and the Idaho Radiation Control Regulations administered by the Idaho Department of Environmental Quality.

f. The design shall consider the need for drains and/or operational procedures to promote consolidation and insure that a low phreatic surface is maintained within the embankment. Drainage pipe shall not be used beneath embankments where excessive or differential settlement may cause failure of the pipes and subsequent piping of the tailings or embankment. When the quality of the mine tailings slurry is such that it will adversely affect the quality of the existing groundwater, the design should be coordinated with the Department and the Department of Environmental Quality to insure that all applicable permits are obtained.

g. Instrumentation of the embankment and/or foundation will be required to insure that the structure is functioning satisfactorily. Standpipe piezometers with an inside diameter greater than one-half (1/2) inch will not be acceptable for use in fine-grained or cohesive soils in order to minimize response time.

h. Tailings impoundment structures which are constructed using the tailings shall not be constructed or raised during freezing weather to prevent frost lenses in the embankment. Sufficient freeboard must be provided during the summer construction season if the disposal operation is to continue during the winter.

i. If tailings are to be discharged during times of freezing weather and the embankment is to be constructed using either the upstream or centerline method, the pond shall be of sufficient size to insure that any ice formed in the tailings pond area melts during the next warm season.

02. Top Width Embankment.

a. In the absence of a stability analysis, the minimum top width for mine tailings impoundment structures shall be:

W = 2 (H to 1/2 power) + 4, minimum
W = Top width
H = Embankment height

b. The minimum top width for any tailings embankment is ten (10) feet.

03. Cutoff Trenches or Walls.

a. Cutoff trenches, if needed, shall be used to bond the fill through relatively pervious material to an impervious stratum or zone. The bond area shall extend up the abutments to the maximum high water or tailings impoundment elevation. Cutoff (keylock) trenches which are to be backfilled with compacted fill shall be wide enough to allow the free movement of excavation and compaction equipment. Side slopes shall be no steeper than 1:1 for depths up to twelve (12) feet, and no steeper than one and one-half (1 1/2) to one (1) for greater depths to provide for proper compaction. Flatter slopes may be required for safety and stability.

b. Concrete cutoff walls may be used to bond fills to smooth rock surfaces in a similar manner as cutoff trenches and they shall be entrenched in the rock to a depth approximately one-half (1/2) the thickness of the cutoff wall. Concrete cutoff walls shall be doweled into the rock a minimum of twelve (12) inches with a maximum spacing of eighteen (18) inches for three-quarter (3/4) inch steel dowels. Concrete walls shall have a minimum projection of three (3) feet perpendicular to the rock surface and shall have a minimum thickness of twelve (12) inches.

04. Borrowed Fill Embankment.

a. The approved earth materials (silt soils are seldom acceptable) shall be zoned as shown in the plans and placed in the embankment in continuous, approximately level layers. Compaction shall be based on ASTM D-698 for cohesive soils and a minimum compaction of ninety-five percent (95%) of the laboratory Standard Proctor dry density is required. Compaction of cohesionless soils shall insure a relative density of sixty percent (60%) or greater.

b. An acceptable working range of moisture content for the fill material shall be established and maintained.

c. The material shall be compacted by means of a loaded sheepsfoot roller, vibratory roller, or other acceptable means, to the required density.

d. No rock shall be left in the fill material which has a maximum dimension exceeding the lift thickness. The fill material shall be free of brush and organic materials.)

e. The fill shall be carried up simultaneously the full design width of the structure, and the top of the fill shall be kept substantially level at all times or slope slightly toward the reservoir.

f. No frozen or cloddy fill material shall be used, and no material shall be place upon frozen, muddy or unscarified surfaces.

g. All materials used in the embankment shall meet all the stability and seepage requirements as shown by a design analysis of the structure and shall be properly installed to meet these requirements.

05. Riprap.

a. All dams shall be protected from wave action. In cases where water is stored directly against the mine tailings impoundment structure or where wave action at maximum pool level during design inflow events would affect the integrity of the embankment, the Director may require use of riprap or other protective measures.

(7-1-93)

b. If riprap is used the design shall specify the rock size and extent of blanket required to prevent erosion.

(7-1-93)

06. Outlet Systems. (7-1-93)

a. Reservoirs must safely handle the design inflow for all areas draining into the reservoir. This may be done either by storing the entire design inflow or by having an outlet system or combination of systems adequate to safely pass the design inflow. If the tailings reservoir is situated on a stream channel, an outlet system or an approved alternative system capable of meeting downstream flow requirements must be provided. (7-1-93)

b. The minimum design inflow for all reservoirs shall be the flood with one percent (1%) probability of occurrence. The Director may require a greater design inflow be used in instances of high hazard, for larger mine tailings impoundment structures, or when the inflow is to be entirely stored in the reservoir during the flood period.

(7-1-93)

c. The outlet system may be composed of one (1) or a combination of the following: decant line, spillway, stream channel diversion to bypass the reservoir. The system will be determined by individual reservoir conditions. Unless removal of the mine tailings impoundment structure and reservoir is part of the abandonment plan, the outlet system shall be maintained in perpetuity, unless it is demonstrated that an outlet system is not needed.

(7-1-93)

d. Outlet systems will not be allowed if their use would release toxic, highly turbid, radioactive or otherwise hazardous flows from the reservoir. In these cases the design inflow must either be entirely stored or diverted around the reservoir. (7-1-93)

e. All spillways shall be stabilized to discharge flow through the use of concrete, masonry, riprap or sod, if not constructed in resistant rock. (7-1-93)

f. Wherever possible, the spillway shall be constructed independent of the impoundment structure. It shall lead the water far enough away from the mine tailings impoundment structure so as not to endanger the structure.

(7-1-93)

g. A diversion system must not subject the mine tailings impoundment structure to erosion during the design inflow event. All stream diversions shall conform to the minimum standards for stream channel alterations as written by this Department. (7-1-93)

h. Decant conduits, if under the embankment, shall be laid on a firm, stable foundation and normally must not be placed on fill. They shall have a minimum inside diameter of twelve (12) inches and one (1) of the following provisions included in the design: (7-1-93)

i. The owner shall have the conduit inspected by photographic or video tape equipment and a copy of the inspection provided to the Department, if a problem is suspected; or (7-1-93)

ii. The conduit shall be completely plugged with concrete and/or suitable material, for that portion which extends through the embankment, if a nonrepairable problem occurs within the conduit. The conduit shall consist of material which has been shown to possess the qualities necessary to perform in the environment of the specific tailings impoundment. The design life of the conduit shall be greater than the life of the mine tailings impoundment structure. The portion of the conduit through the embankment shall be completely filled with concrete, or other suitable material, and the riser portion of the conduit capped, upon abandonment of the mine tailings impoundment structure. (7-1-93)

i. All decant conduits, if under the embankment, shall have a seepage path through the impervious zone at least equivalent in length to the maximum head above the downstream end of the system. Only one third (1/3) the horizontal distance through the impervious zone will be utilized when calculating the length of the seepage path. Collars may be used to satisfy this requirement, but all collars shall extend a minimum of three (3) feet outside the conduit. Collars shall be spaced at intervals of at least seven (7) times their height and no collar may be closer to the outer surface of the impervious zone than the distance it extends out from the conduit. (7-1-93)

j. More than two (2) decant conduits are not to be used, unless special conditions warrant. (7-1-93)

07. Freeboard. A minimum freeboard of two (2) feet plus wave height (H) shall be provided on the crest of the mine tailings impoundment structure during passage of the design inflow.

H = 1.95 (F to 1/2 power)
F = Fetch in miles across water surface at a design maximum level. (7-1-93)

08. Records. All instrumentation shall be read and recorded on a regular basis, and all records must be available for inspection by Department personnel on request. (7-1-93)

09. Inspection and Completion Reports. (7-1-93)

a. It is the responsibility of the engineer to submit test reports along with periodic inspection and progress reports to the Director. (7-1-93)

b. Upon completion of each approved stage of construction, a letter shall be sent to the Director, giving a short, narrative account covering all items of work. As-built plans shall be submitted to the Director if the completed project was substantially changed from the plans originally approved. (7-1-93)

10. Abandonment. An abandonment plan which provides a stable, maintenance-free condition when the mine tailings impoundment is no longer being regularly maintained by the owner or the owner has ceased to use the site for disposal of mine tailings slurry, shall be submitted to the Director by the owner. The plan shall provide a safe condition by providing for removal of the tailings, or construction of a maintenance-free spillway or diversion works where needed to accommodate runoff. The plan shall include provisions to prevent water storage behind, and erosion of, the mine tailings impoundment structure and the impounded tailing. A conceptual plan which includes an engineering design report, detailed enough to provide the required cost estimate for bonding purposes, will be required prior to the approval of the proposed project. Detailed construction plans must be approved by the Director prior to implementation of any abandonment work. The Director shall notify the owner upon acceptance of completion of abandonment in accordance with the approved plan.

DSR EXISTING DAM SAFETY RULES

These rules are adopted pursuant to Chapter 17, Section 42-1714, Idaho Code, and implement the provisions of Sections 42-1709 through 42-1721, Idaho Code.

MTIS EXISTING MINE TAILINGS RULES

These rules are adopted pursuant to Section 42-1714, Idaho Code.

Rule 55 Existing Dams and Existing Mine Tailings Impoundment Structures

055. Existing Dams and Existing Mine Tailings Impoundment Structures.

DSR EXISTING DAM SAFETY RULES

All dams regulated by the department shall be operated and maintained to retain the embankment dimensions and the hydraulic capacity of the outlet works and spillway(s) as designed and constructed, or as otherwise required by these rules.

01. Analyses Required. The analyses required by Rule 40 are not applicable to existing dams except as required in Rule Subsections 055.01.a. and 055.01.e. unless for good cause, the Director specifically requires the analyses. Dams constructed of other than earth material shall comply with these criteria, as determined by the Director, or with other engineering criteria approved by the Director.

a. For large, significant or high risk dams, the release capability required by Rule Subsection 050.11 shall be evaluated and applied to the structure. Dams of other size and risk are required to provide the release capability of Rule Subsection 050.11 but are not required to conduct the analyses.

b. Every dam, unless exempted by the Director shall have a spillway with a capacity to pass a flood of one percent (1%) (two percent (2%) for small low hazard dams) occurring with the reservoir full to the spillway crest at the beginning of the flood while maintaining the freeboard required by Rule Subsection 050.06.

c. The Director may waive the spillway requirement for dams proposing off stream storage or upon a showing acceptable to the Director.

d. The release capability can include the capacity of spillway(s) and outlet(s), diversion facilities, or other appurtenant structures, and any approved operating procedures which utilize upstream storage, diversion and flood routing storage to pass flood events. The remainder of the required release capacity, if any, may be met by the following:

i. Reconstruction, enlargement or addition of spillway(s), outlet(s), diversion facilities or other appurtenant structures.

ii. A showing acceptable to the Director that failure of the dam during a flood of the specified magnitude described in Rule Subsection 050.11 would not substantially increase downstream damages over and above the losses and damages that would result from any natural flood up to that magnitude.

iii. A showing acceptable to the Director that the release capability of the dam together with other emergency release modes such as a controlled failure or overtopping of the dam would not result in a larger rate of discharge than the rate of inflow to the reservoir.

iv. A showing acceptable to the Director that limiting physical factors unique to the dam site exist that prevent construction of a spillway or other release capability mechanisms during a flood of the specified magnitude described in Rule Subsection 050.11 provided the owner implements storage operational procedures and/or provides for emergency warning to protect life and property.

e. For large, high risk dams, the seismic design loads shall be evaluated and applied to dams located east of Range 22E, B.M. The evaluation shall use the maximum ground motion/acceleration generated by the maximum credible earthquake.

f. The Director may accept existing studies relative to requirements of Rule Subsections 055.01.a. and 055.01.e., if the Director determines the information provided fulfills the requirements of Rule Subsections 055.01.a. and 055.01.e.

g. The Director may allow until July 1, 1992 for completion of the analyses required in Rule Subsections 055.01.a. and 055.01.g. and may allow the owner of an existing dam a compliance period of up to ten years for completing the studies, to complete structural modifications or implement other improvements necessary to provide the release capability determined to be required (Rule Subsection 055.01.a.) or complete structural modifications necessary to assure the dam and appurtenant facilities will safely function under earthquake loads (Rule Subsection 055.01.g.).

h. Within thirty (30) days after completing the analyses required in Rule Subsection 055.01.a. or 055.01.g., the owner of an existing dam that is deficient in either case (Rule Subsection 055.01.a. or 055.01.g.) shall file with the Director a schedule outlining the dates work or construction items will be completed.

02. Other Requirements.

a. Routine maintenance items include the following:

i. Eradication of rodents and filling animal burrows.

ii. Removal of vegetation and debris from the dam.

iii. Restoring original dimensions of the dam by the addition of fill material.

iv. Addition of bedding or riprap material which will not increase the height or storage capacity.

v. Repair or replacement of gates, gate stems, seals, valves, lift mechanisms or vent pipes with similar equipment.

vi. Repair or replacement of wingwalls, headwalls or aprons including spalling concrete.

b. The following are not routine maintenance items:

i. Reconstruction of embankment slopes.

ii. Replacement, reconstruction or extension of outlets.

iii. Foundation stabilization.

iv. Filter or drain construction or replacement.

v. Spillway size alteration or modification.

vi. Installation of instrumentation or piezometers.

vii. Release capability modification.

c. Items not specifically described in Rule Subsections 055.02.a. and 055.02.b. will be determined by the Director to be included in one rule or the other upon receipt of a written request from the owner or his representative seeking such a determination.

d. Where riprap is required to prevent erosion and to maintain a stable embankment, pipes, cables, brush, tree growth, logs, or floating debris are not acceptable substitutes for rock riprap and granular bedding material. Dams or portions thereof which are stable without riprap, are not required to have riprap.

e. Upon completion of reconstruction of a dam or feature of a dam included in Rule Subsection 055.02.b., the owner or his engineer shall provide the Director a short written narrative account of all items of work. Record drawings and revised specifications shall be submitted to the Director if the completed project has been substantially changed from the plans and construction specifications originally approved.

f. Upon request, the owner of every dam shall provide his name and address to the Director and shall advise the Director of future changes in ownership. If the owner does not reside in Idaho, the owner shall provide the name and address of the person residing in Idaho who is responsible for the operation, maintenance and repair of the dam.

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

No comparable existing Rule

Rule 60 Provisions of Chapter 17, Title 42, Idaho Code

060. Provisions of Chapter 17, Title 42, Idaho Code.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

No comparable existing Rule

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

The provisions of Sections 42-1709 through 42-1721, Idaho Code, are a part of these rules.

Rule 65 Dams Storing Tailings and Water

065. Dams Storing Tailings and Water.

SOURCE: EXISTING DAM SAFETY RULES (DSR)

No comparable existing Rule

SOURCE: EXISTING MINE TAILINGS RULES (MTR)

01. Construction of Dams Storing Fifty Acre-Feet or More. Construction of dams intended to store or likely to store fifty (50) acre-feet or more of water in excess of the water contained in the tailings material shall meet the requirements specified in Rules 40, 45, 50 and 55 of these rules. The Director may waive any or all of these requirements if, in the opinion of the Director, sound engineering design provided by the owner indicates such requirements are not applicable.

02. Abandonment Plan. An abandonment plan which provides a stable, maintenance-free condition at any time tailings are not being actively placed for an extended period of time, as determined by the Director, shall be submitted to the Director by the owner of a dam storing tailings and water. This rule may be waived by the Director if determined not to be applicable.