

391-3-8-.01 Purpose. Amended.

The purpose of these Rules is to implement the responsibilities assigned to the Environmental Protection Division by the Georgia Safe Dams Act of 1978, ~~Part 3 of Article 5 of O.C.G.A. §§ 12-5-370 et seq.~~ These Rules are promulgated to provide for the inventory, classification, inspection and permitting of certain dams in order to protect the health, safety and welfare of all the citizens of the State by reducing the risk of failure of such dams to prevent death or injuries to persons.

391-3-8-.03 Inventory and Classification. Amended.

(1) It shall be the duty of the Director to inventory the dams in this state and to classify each dam into one of the following categories:

(a) Category I Dam; or

(b) Category II Dam.

(2) The inventory shall consist of all dams not excluded under Rule 391-3-8-.04 subsections (a), (b), (c), (e) and (f).

~~(3) The inventory and classification of dams including proposed structures shall be carried out in accordance with the Safe Dams Program Quality Assurance Plan.~~

~~(4)~~ When an existing Category II dam may be reclassified to a Category I dam because of proposed development downstream of the dam, the governing authority issuing the permit for the development shall provide for review by the Safe Dams Programs the following information:

(a) locations of the Category II dam and the proposed development; and

(b) a surveyed cross-section of the stream valley at the location of the proposed development, including proposed finished floor elevations; and

(c) a dam breach analysis ~~using the Dambreak computer model~~ to establish the height of the flood wave in the downstream floodplain. ~~The dambreak modeling analysis shall be completed by an engineer in accordance with the Safe Dams Program Quality Assurance Plan~~ Engineer Guidelines.

~~(5)~~ If the Director determines that an existing Category II dam will be reclassified to a Category I dam if the proposed development occurs, then the owner of the existing Category II dam may request an inspection from the Director within ten (10) days of notification of the proposed development by the local governing authority. The preliminary visual inspection shall be carried out in accordance with ~~subsection (2), paragraph (b), and subsection (3), paragraph (d), subparagraph (ii)(1) and (2) under Rule 391-3-8-.08(2)(b) and Rule 391-3-8-.08(3)(d)(2)(i) & (ii).~~ Detailed surveys, hydrologic and hydraulic analyses will not be performed, however, the Director may provide an opinion on the hydraulic adequacy of the dam.

~~(6)~~ A written evaluation of the existing Category II dam's compliance with Category I requirements will be provided to the owner of the dam and the local governing authority based on the preliminary visual inspection by the Safe Dams Program.

(6) If the Director determines that an existing Category II dam may be reclassified to a Category I dam because of factors other than proposed development downstream of the dam, and the Director does not have sufficient information to conclude that the dam should be reclassified to a Category I dam without further analysis, the Director shall place the Category II dam on a "To Be Studied (TBS)" list.

(a) The Director may require the Dam owner(s), upon written notification, to conduct further analysis and to submit that analysis to the Division in order for the Director to make the determination of whether or not the dam should be reclassified to a Category I dam. The analysis shall be completed and submitted to the Division within 90 days of the written notification and shall consist of the following:

- (i) a dam breach analysis to establish the height of the flood wave in the downstream floodplain. The analysis shall be completed by an engineer in accordance with the Safe Dams Program Engineer Guidelines; or
- (ii) an alternative analysis approved by the Director.

391-3-8-.04 Scope and Exclusions. Amended.

These rules and regulations shall apply to any dams or artificial barriers existing or constructed in Georgia except for the following:

- (a) ~~a~~Any dam owned and operated by any department or agency of the United States government;
- (b) ~~a~~Any dam constructed or financially assisted by the United States Natural Resources Conservation Service or any other department or agency of the United States government. This exemption only applies when such department or agency designed or approved plans and supervised construction, and maintains a regular program of inspection of the dam; ~~provided, however, that~~ This exemption shall cease on November 1, 1995, for all such dams for which the supervising federal agency has relinquished authority for the operation and maintenance of such dam to a person, unless the supervising federal agency certifies by the said date and at least biannually thereafter to the Director that such dams are in compliance with requirements of this part, including minimum spillway design, and with the maintenance standards of the supervising federal agency;
- (c) ~~a~~Any dam licensed by the Federal Energy Regulatory Commission, or for which a licensed application is pending with the Federal Energy Regulatory Commission;
- (d) ~~a~~Any dam classified as a Category II Dam;
- (e) ~~a~~Any artificial barrier, except as provided in Rule 391-3-8-.02 (h), constructed in connection with and incidental to surface mining, provided that upon completion of mining the impoundment created by the barrier is drained and reclaimed or stabilized as a lake pursuant to a mined land use plan approved by the Director pursuant to the Georgia Surface Mining Act;
- (f) ~~a~~Any artificial barrier which is not in excess of 6 feet in height, regardless of storage capacity, or which has a storage capacity at maximum water storage elevation not in excess of 15 acre-feet, regardless of height.

391-3-8-.05 Application for a Permit. Amended.

- (1) No Person shall operate or construct a dam as defined by the Act and these Rules without first having obtained a permit from the Division; provided, however, any persons who is operating a dam may continue such operation ~~or construction~~ pending final action by the Director on the permit application, and provided such application has been filed with the Director within 180 days after ~~by the Director~~ that permit is required by the Director.
- (2) Permit applications shall be on forms as may be prescribed and furnished by the Division.

(3) The Director may require the submission of plans, specifications, and other information as he deems relevant to the application.

(4) If a permit application for the construction of a dam is not approved by the Director, the application shall be returned to the applicant along with the reasons for its disapproval. Such applicants may reapply for said permit by correcting deficiencies in the application and resubmitting the application to the Director.

(5) Permits shall not be transferred from one person to another without the approval of the Director. If the ownership changes from one person to another, the new owner shall immediately notify the Director in writing of such transactions. The Director shall also be notified of any proposed change in the operation of the dam.

(6) Permits shall not be transferred from one dam to another dam.

391-3-8-.06 Revocation, Suspension or Modification of Permits. Amended.

Permits may be revoked, suspended, or modified, or denied by the Director for cause, including but not limited to the following:

(a) violation of any permit condition;

(b) failure to fully disclose all relevant facts or obtaining a permit through misrepresentation;

(c) violations of the Act or these Rules;

(d) changes in conditions that require such action on a permit in order to insure compliance with the Act or these Rules.

391-3-8-.07 Dam Removal. Amended.

No person may remove a dam without the approval of the Director in accordance with the procedures required by ~~Section 8~~ of the Act.

391-3-8-.08 Permits for the Construction and/or Operation of New and Existing Dams. Amended.

(1) New Dams

(a) Applications for a permit to construct and operate a Category I dam shall be accompanied by a statement from an engineer who provides engineering design services for the dam, certifying that he/she has the necessary training and experience to design such dam, and that to the best of his/her knowledge, understanding and belief such design meets the standards of the Act and these Rules. If the design engineer determines that a geological investigation of the dam is advisable, such investigation shall be conducted by a professional geologist registered to practice in the State of Georgia.

(b) As an alternative to a certificate from an engineer, the Director may accept a permit application accompanied by a certificate from the State Conservation Engineer of the Natural Resources Conservation Service stating that the design of the dam meets the standards of this Act and the rules and regulations promulgated hereunder.

(c) Construction of such dams shall be completed in the time frame stated in the special conditions of the Construction and Operation Permit.

(d) Notice by registered mail shall be given to the Director at least 10 days prior to the commencement of construction for permitted dam construction activities.

(2) Existing Dams

(a) Permits for the operation of existing dams ~~in existence~~ may be issued provided the application for a permit is judged complete and meets the requirements of the Act and these Rules.

(b) When a visual inspection, performed by an engineer, reveals that abnormal stress exists or that the dam was not constructed in accordance with the requirements of the Act or these Rules, a detailed engineering survey meeting the requirements of this section shall be performed prior to final action on the permit application. Such visual inspection may be provided by the applicant, in accordance with Section 12-5-376(g) of the Act, or by the Division, or by another authorized agency under contract with the Director on behalf of the Division.

(3) Applications for permits for existing or ~~proposed~~ new dams shall include the following evaluations and information, when such information is relevant and available, as determined by the Director:

(a) A regional vicinity map showing the location of the existing or ~~proposed~~ new dam and the latitude and longitude of the center of the dam expressed to the nearest second, the watershed drainage area, and the downstream area subject to potential damage due to failure or misoperation of the dam or operation equipment (including other artificial barriers or downstream fixed improvements which would be affected);

(b) A detailed description of the existing or ~~proposed~~ new dam, including:

(i) ~~1.~~ Proposed or as-built drawings indicating plans, elevations and sections of the dam and appurtenant works including details of the discharge facilities such as outlet works, limited service and emergency spillways, flashboards, fuse plugs and other operation equipment;

(ii) ~~2.~~ the elevation of the top and lowest outside limit of the dam, and the elevation of the lowest upstream and downstream toe;

(iii) ~~3.~~ the profile of the top of the dam and the dam's structural height;

(iv) ~~4.~~ the maximum and normal storage elevation, hydraulic heights and freeboard and storage capacity associated with each elevation;

(v) ~~5.~~ the surface area of the impoundment;

(vi) ~~6.~~ the top and bottom width of the dam;

(vii) ~~7.~~ the elevation of the crest, type, width or diameter; length and location of spillways and the number, size and type of gates if the structure is controlled;

(viii) ~~8.~~ the type, location, entrance and exit inverts of outlet works, and emergency drawdown facilities;

(ix) ~~9.~~ the location, crest elevation, and description of the invert, sides, and length of limited service and emergency spillways;

(x) ~~10.~~ the location and description of flashboards and fuse plugs, including hydraulic head (pool elevation) and other conditions required for breaching along with the assumed results of breaching;

(xi) ~~11.~~ the type, location, observations and records of hydrometeorological gauges appurtenant to the project;

(xii) ~~12.~~ the maximum non-damaging discharge causing only negligible damage at potential damage locations downstream;

(xiii) ~~13.~~ the location and description of any proposed or existing instrumentation including, but not limited to, observation wells, piezometers, settlement devices, seepage outlets and weirs; and

~~(xiv)~~14. the location, elevation and description of areas affected by reservoir fluctuation.

(c) Design and safety evaluation reports, including:

~~(i)~~1. a hydrological analysis of the ~~proposed~~new or existing dam, reservoir, drainage basin system including computation of the basin P.M.P. or the design storm event, average watershed slope, watershed area, hydrologic soil groups, land use of impoundment watershed, reservoir inflow hydrograph, spillway and exit water-surface profiles, flow rate, expected frequency of emergency spillway use and minimum freeboard;

~~(ii)~~2. analysis and/or evaluation of the ~~proposed~~new or existing dam that indicates that the dam will be stable during construction (new dams), filling (new dams) and under all conditions of reservoir operations including assumed material properties and all pertinent applied loads;

~~(iii)~~3. evaluation of seepage and measures taken to control seepage through the embankment, foundation, and abutments so that no internal erosion will take place and that there will be no significant sloughing in the area where the seepage emerges;

~~(iv)~~4. evaluation of the geology of the site and foundation including any boring logs or laboratory testing with engineering conclusions, foundation data, geological maps, profiles and cross sections, foundation treatment, and any relevant seismic information;

~~(v)~~5. evaluation of materials in the foundation and embankment including results of any laboratory tests, field permeability tests, construction control tests, and assumed design or evaluation properties of materials;

~~(vi)~~6. the properties of concrete including source or proposed source of aggregate, mix design, type of cement and additives, and the result of testing during construction;

~~(vii)~~7. evaluation or design of cover (vegetation, masonry, or riprap) to protect the upstream slope, crest, and downstream slope of the dam and abutments against erosion from wind, waves and runoff;

~~(viii)~~8. the proposed water control plan, including the regulation plan under normal conditions and during flood or other emergency conditions;

~~(ix)~~9. analysis of the anticipated time required to completely drain the flood control zone and normal pool;

~~(x)~~10. the electric and mechanical equipment types and rating of normal and emergency power supplies, hoists, cranes, valves and valve operators, control and alarm systems, and other electrical and mechanical equipment systems that could affect the safe operation of the dam;

~~(xi)~~11. the spillway and tailwater rating curve below the dam site, including the elevation corresponding to the maximum design flood discharge and approximate nondamaging channel capacity; and

~~(xii)~~12. evaluation and/or analysis of settlement estimates and steps adopted to compensate for total settlement and to minimize differential settlements;

(d) Other data requirements for new and existing dams:

~~(i)~~1. New Dams:

1-~~(i)~~ the proposed method of construction and quality control provisions for the project, including the responsibilities of the applicant, the design engineer, the builder, and the prescribed order of the work;

2-~~(ii)~~ the proposed dam construction schedule and filling schedule for the reservoir;

3-~~(iii)~~ the proposed inspection and maintenance plan;

4-~~(iv)~~ the proposed instrumentation and monitoring plan including the filling surveillance plan;

5-~~(v)~~ the estimated life of the dam and reservoir; and

6-~~(vi)~~ any other pertinent data as may be required by the Director;

~~(ii)~~ 2. Existing dams:

~~1.(i)~~ detailed description of the condition of the dam and appurtenant works resulting from a detailed visual inspection, including a description of any signs of structural deterioration and seepage such as, but not limited to, surface cracks, settlement, structural condition of any conduits through the dam, and erosion;

~~2.(ii)~~ the year of construction, and the date and description of any modifications or repairs to the dam;

~~3.(iii)~~ the construction history of the dam, including the diversion scheme, construction sequence, pertinent construction problems, alterations, modifications, and major maintenance repairs;

~~4.(iv)~~ a summary of past major flood events or previous failures or known deficiencies of the dam, including any experiences that presented a threat to the safety of the project or to human life and any action taken to correct or eliminate such hazards;

~~5.(v)~~ the records of performance observations, including instrumentation records;

~~6.(vi)~~ the inspection history of the dam, including the results of the last safety inspection, the organization that performed the inspection, and the date the inspection was performed; and

~~7.(vii)~~ Any other pertinent information as may be required by the Director.

391-3-8-.09 Standards for the Design and Evaluation of Dams. Amended.

(1) The design and/or evaluation of new and existing dams shall conform to accepted practices of the engineering profession and dam safety industry. Design manuals, evaluation guidelines, and procedures used by the following agencies can be considered as acceptable design or evaluation references, except as those references differ from Georgia Law and these regulations:

(a) U.S. Army Corps of Engineers;

(b) Natural Resources Conservation Service;

(c) U.S. Department of Interior, Bureau of Reclamation;

(d) Federal Energy Regulatory Commission;

(2) Other design and evaluation methods may be used to demonstrate compliance with the objectives of these rules, but are subject to the approval of the Director.

(3) Design and Evaluation of Dams under Paragraph (1) and (2) above shall, as a minimum, consider the following basic principles:

(a) All dams must be stable under all conditions of construction and/or operation of the impoundment. Details of stability evaluation shall be submitted to the Director for approval.

Analyses using the methods, guidelines and procedures of the agencies listed in

Paragraph (1) yielding the following Minimum Safety Factors can be considered as acceptable stability:

1. Earthen Embankments

~~1.(i)~~ End of Construction: 1.3

~~2.(ii)~~ Steady State Seepage: 1.5

~~3.(iii)~~ Steady State Seepage with Seismic Loading: 1.1

~~4.(iv)~~ Rapid Drawdown (Upstream): 1.3

~~5.(v)~~ Submerged Toe with Rapid Drawdown: 1.3

2. Concrete Structures (cohesion included)

~~1.(i)~~ Normal Reservoir: 3.0

~~2.(ii)~~ Normal Reservoir with Seismic Loading: 1.0

3.(iii) Design Flood: 2.0

(b) Details of the engineering evaluation of material properties in the dam or appurtenant structures shall be submitted to the Director for review and approval. Conservative selections for soil strength values shall be used for analyses or evaluations. Details of any foundation investigation and laboratory testing supporting assumed design or evaluation parameters shall be included for review.

(c) All dams and appurtenant structures shall be capable of withstanding seismic accelerations defined in the most current "Map for Peak Acceleration with a 2% exceedance in 50 years" for the contiguous United States published by the United States Geological Survey (~~a.k.a.~~ NEHRP maps). The minimum seismic acceleration shall be 0.05g. The seismic accelerations may be reduced or seismic evaluation eliminated if the applicant's engineer can successfully demonstrate to the Director by engineering analyses or judgment that smaller seismic accelerations are appropriate or no seismic evaluation is needed.

(d) All dams shall have a means of draining the reservoir to a safe level as demonstrated by the applicant's engineer. The submittal by the applicant's engineer shall include the computation of the maximum time required to drain the reservoir. Exceptions to this rule may be given by the Director based on an engineering evaluation demonstrating the lack of this capability would not endanger the public.

(e) All earthen embankments shall be protected from surface erosion by appropriate vegetation, or some other type of protective surface such as riprap or paving, and shall be maintained in a safe condition. Examples of appropriate vegetation include, but are not limited to, Bermuda, Tall Fescue, Centipede grasses and Lespedeza sericea. Inappropriate vegetation on existing dams such as trees shall be removed only after consultation with the Division or other qualified persons on the proper procedures for removal. Hedges and small shrubs may be allowed on existing dams if they do not obscure inspection or interfere with the operation and maintenance of the dam.

(f) Design Storm. Each dam shall be capable of safely passing the fraction of the flood developed from the PMP hydrograph depending on the subclassification of the dam. The design storm for each subclassification of a dam is as follows:

1. Small Dam: 25 percent PMP
2. Medium Dam: 33.3 percent PMP
3. Large Dam: 50 percent PMP
4. Very Large Dam: 100 percent PMP

5. Based on visual inspection and detailed hydrologic and hydraulic evaluation, including documentation of completed design and construction procedures, up to a 10 percent lower design storm requirement (22.5, 30, 45, or 90 percent) may be accepted on existing Public Law 566 (PL-566), (including RC&D Resource Conservation & Development structures), and Public Law 534 (PL-534) Project Dams at the discretion of the Director, provided the project is in an acceptable state of maintenance. The design storm requirement may be reduced on existing dams if the applicant's engineer can successfully demonstrate to the Director, by engineering analysis, that the dam is sufficient to protect against probable loss of human life downstream at a lesser design storm. Earthen emergency spillways shall not function until the 50 year storm.

(g) Seepage Control. All dams shall be able to prevent the development of instability due to excessive seepage forces, uplift forces, or loss of materials in the embankment, abutments, spillway areas, or foundation. For new dams, seepage analysis for design, and inspection during construction, shall be in sufficient detail to prevent the occurrence of critical seepage gradients.

~~(i)1.~~ For new dams, the design shall include a seepage control method ~~which~~that meets the minimum acceptable safety standards, as determined by the Division. All internal drainage systems with pipe collection systems shall have cleanouts.

~~(ii)2.~~ In existing dams, seepage shall be investigated by an engineer and appropriate control measures shall be taken as necessary.

(h) Monitoring Devices.

~~(i)1.~~ Monitoring devices, including but not limited to piezometers, settlement plates, telltale stakes, seepage outlets and weirs, and permanent bench marks may be required by the Director for use in the inspection and monitoring of the safety of a dam during operation.

~~(ii)2.~~ Where appropriate ~~For new dams or existing dams where appropriate,~~ a reservoir filling monitoring and surveillance plan to be implemented during reservoir filling or re-filling shall be submitted to the Director for approval prior to start of filling or re-filling.

~~(i).~~ Design Life. The design life for ~~proposed~~new dams and reservoirs shall be adequate for the dams and reservoirs to perform effectively as planned, as determined by the following criteria:

~~(i)1.~~ The time required to fill the reservoir with sediment from the contributing watershed; and

~~(ii)2.~~ The durability of appurtenances and materials used to construct the dams.

(j) Freeboard. Appropriate freeboard for wave action shall be considered by an engineer through engineering analysis. The required freeboard shall be provided above the maximum reservoir surface elevation that would result from the inflow from the design storm for the structure. The resulting maximum reservoir surface elevation plus freeboard shall determine the elevation of the top of the dam. In lieu of determining the appropriate amount of freeboard by engineering analysis, a minimum of three (3) feet of freeboard shall be provided on earthen dams.

(k) Existing concrete and/or masonry dams and appurtenant structures shall be structurally sound and shall have joints free of trees and other vegetation and shall show no signs of significant structural deterioration such as excessive cracks, spalling, efflorescence and exposed reinforcing steel.

~~(4).~~ Other design standards may be imposed as deemed appropriate by the Director after review of design of new structures or through a visual inspection of an existing structure conducted pursuant to Rule 391-3-8-.08(2)(b) of these regulations, or based on a review of the detailed engineering study prepared by an engineer.

391-3-8-.10 Inspection and Maintenance Plan Requirements. Amended.

(1) Dam Owners and operators of dams shall be responsible for conducting routine inspection and maintenance of dams necessary to:

(a) Prevent the growth of trees or brush on the embankment of the dam and on the spillway system;

(b) Prevent the accumulation of debris, obstructions, or other deleterious materials from the spillway system;

(c) Insure that all gates, orifices, dissipators, trash racks, and other appurtenances that affect the proper operation of the dam and reservoir are kept in good repair and working order, and that spillway and outlet gates necessary to pass flood flows shall be test operated at least once each year. The dam owner shall file an affidavit with the Director certifying that such gates and other appurtenances ~~and gates~~ are in good repair and working order;

(d) Maintain adequate and suitable vegetation to prevent erosion of the embankment and earthen spillway for the dam;

(e) Determine that any seepage on the downstream slopes of the dam does not exceed normal amounts and does not present a situation indicative of potential dam failure. At any time where there is a questions regarding seepage and potential dam failure, the Director shall be notified in writing and provided a description of the situation; and

(f) Dam owners shall immediately notify the Division when symptoms of failure, including but not limited to, erosion, surface cracks, seepage, settlement, or movement occur.

(2) As part of the routine inspection and maintenance program described in 391-3-8-.10(1), dam owners and operators shall have a professional engineer conduct an annual inspection and shall submit the results of the inspection using the Division approved form. The inspections shall be conducted between October 1 and March 31 of the following calendar year commencing with October 1, 2015 and the results shall be submitted to the Division by April 30 each calendar year commencing with April 30, 2016.

391-3-8-.11 Effective Date. Amended. Emergency Action Plans.

~~This Chapter shall become effective on October 25, 1998.~~

Dam owners and operators of Category I dams shall develop, and submit to the Division for approval, Emergency Action Plans (EAP).

(a) Owners of dams that are classified as a Category I dam after January 1, 2016 shall submit the Emergency Action Plan as part of their application submitted in accordance with 391-3-8-.05.

(b) Owners of dams that were classified as a Category I dam before January 1, 2016 shall submit the Emergency Action Plan by July 1, 2017.