

TITLE 23
DIVISION 2. DEPARTMENT OF WATER RESOURCES
CHAPTER 1. DAMS AND RESERVOIRS

NOTICE OF PROPOSED RULEMAKING

The Department of Water Resources (Department) is proposing to adopt regulations that establish the necessary components of inundation maps and acceptable engineering methodologies for the development of inundation maps, pursuant to the California Water Code sections 6160 and 6161. The Department will conduct a public hearing at the time and place noted below to receive comments on the proposed regulations.

Public Hearing

Interested members of the public may present comments on the proposed regulations orally or in writing at the hearing. The Department requests but does not require that persons who make oral comments at the hearing also submit a written copy of their testimony at the hearing.

The hearing will be held in accordance with the requirements in Government Code section 11346.8. The hearing details are as follows:

Date: Tuesday, July 24, 2018

Time: 10 am – 12 noon

Location: Ziggurat Building Auditorium
707 3rd Street
West Sacramento, CA 95605

Americans with Disabilities Act: It is the policy of the state to make every effort to ensure that its programs, activities and services are available to all persons, including persons with disabilities. Persons with disabilities requiring reasonable modification to participate in the event should provide their request to Kristen Martin with Division of Safety of Dams at Kristen.Martin@water.ca.gov or (916) 227-2170. You may also contact the California Relay Service at 800-735-2922 or 888-877-5979; TTY at 900-735-2929 or 888-877-5978, or Speech to Speech at 800-854-7784. It is recommended that the Department receive the request at least six working days prior to the event.

Written Comment Period

Interested members of the public may submit comments by email or postal mail before the hearing. The public comment period for this regulatory action will begin on June 8, 2018. To be considered by the Department, written comments submitted before the hearing must be submitted on or after June 8, 2018 and **received no later than 5:00 pm on July 23, 2018** and must be addressed to the following:

Email

Kristen Martin
Division of Safety of Dams
MapRegs@water.ca.gov
(916) 227-2170

Postal Mail

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Please note that under the California Public Records Act (Government Code §6250 et seq.), written and oral comments, attachments, and associated contact information (e.g. address, phone, email, etc.) become part of the public record and can be released to the public upon request.

The Department encourages members of the public to bring any suggestions for modification of the proposed regulation to the attention of staff before the hearing. The Department requests, but does not require, that written and email statements on the proposed regulations be submitted at least 10 days before the hearing so that the Department has additional time to consider each comment.

Authority and Reference

Water Code sections 6078 and 6162 authorize the Department to adopt the proposed regulations. The proposed regulations implement, interpret, and make specific Water Code sections 6002, 6002.5, 6004.5, 6005, 6007.5, 6008, 6009, 6075, 6160, 6161, 6201, 6202, 6203, 6204, 6205, 6206, 6261, 6355, 6357; and Government Code section 8589.5.

Informative Digest and Policy Statement Overview

Inundation maps provide a graphical representation of the timing and extent of inundation to be expected by the hypothetical failure of a dam and its critical appurtenant structures. Such maps are used to develop emergency action plans (EAPs) that are used by dam owners and emergency managers in the event of a dam failure.

Summary of Existing Laws and Regulations

The Department's Division of Safety of Dams (DSOD) implements Part 1 of Division 3 of the Water Code, which is commonly referred to as the Dam Safety Program. To implement the program, the Department has adopted regulations that govern several aspects of the Dam Safety Program, including construction and enlargement of dams and fees. These regulations are contained in Title 23 of the California Code of Regulations, Division 2, Chapter 1.

In 2017, the state Legislature passed SB 92 that went into effect on June 27, 2017, and added Water Code sections 6160, 6161, and 6002.5 requiring owners of all state jurisdictional dams, except low hazard dams, to prepare inundation maps and EAPs for dams and critical appurtenant structures, such as large spillways. SB 92 requires the Department to review and approve inundation maps.

Before SB 92, the Governor's Office of Emergency Services (Cal OES) administered the dam inundation map program that applied to some state-jurisdictional dams. Regulations concerning inundation maps were previously contained in California Code of Regulations (CCR) Title 19, Division 2, Chapter 2, Subchapter 4, Sections 2575-2578.3. These regulations described the required content and format of the inundation maps and technical studies, along with deadlines for their submittal. SB 92 changed regulatory oversight for inundation maps from Cal OES to the Department, and Cal OES' inundation map regulations were repealed.

Water Code section 6161(a) requires owners of state jurisdictional dams, except those classified as low hazard, to prepare and submit inundation maps for Department approval. Water Code Section 6161(a)(3) requires owners to develop and submit EAPs based on Department-approved inundation maps. Water Code section 6161(d)(1) requires owners of extremely high hazard dams to submit EAPs by January 1, 2018. Owners of high hazard dams are required to submit EAPs by January 1, 2019. Owners of significant hazard dams are required to submit EAPs by January 1, 2021. Water Code section 6002.5 defines critical appurtenant structure. Government Code section 8589.5 states what shall be included in an EAP.

Applicable provisions of the Water Code and regulations identify what shall be included in an application for the construction or enlargement of a dam. These statutes and regulations predate the inundation map and EAP requirements in SB 92, and, therefore, do not require the submission of maps and EAPs as part of the construction or enlargement project.

The Federal Energy Regulatory Commission (FERC) regulates hydropower facilities, including dams. State-jurisdictional hydropower dams in California are subject to dam safety regulation by both FERC and the Department. FERC requires inundation maps for dams, but not for their critical appurtenant structures.

The Federal Emergency Management Agency (FEMA), as part of the National Dam Safety Program, published federal guidelines for inundation mapping (FEMA P-946). These guidelines are a resource for state and local governments to develop guidelines for dam safety and for dam owners to develop inundation maps.

Effect of Proposed Rulemaking

The proposed regulations establish the necessary components of inundation maps, establish acceptable engineering methodologies for the development of inundation maps, clarify the definition of critical appurtenant structure, define hazard classifications, establish documentation and submittal requirements, and clarify when maps need to be updated. The proposed regulations also establish when proposed new or enlarged dams must submit their inundation maps and EAP.

Differences from Comparable Federal Regulations

Federal regulations for FERC-regulated dams require dam inundation maps for two failure scenarios: sunny-day and the Probable Maximum Flood (PMF). FERC requires inundation maps for dams¹, but not for their critical appurtenant structures.

Though the state statutes and proposed regulations differ from federal regulations and have more requirements, the regulations are not inconsistent. Maps produced for FERC-regulated dams should be capable of complying with both state and federal regulations. Separate maps are not expected to be required to meet state versus federal regulations.

The Federal Emergency Management Agency (FEMA) publishes guidance documents for inundation mapping that are referenced in FERC regulations. These documents, FEMA 333, FEMA 64, and FEMA P-946, are also relied upon as references in this proposed rulemaking.

Objectives and Benefits of the Proposed Regulatory Action

The objective of the regulations is to establish standards for the preparation of inundation maps for dams and critical appurtenant structures, which will be incorporated into EAPs. Emergency managers use EAPs to plan for and respond to dam emergencies due to failures of dam systems.

These regulations are particularly designed to:

- Define and clarify critical appurtenant structures.
- Define the allowable engineering methods for simulating the extent, timing, and intensity of flooding produced by the hypothetical failure of a dam or its critical appurtenant structures using computer modeling.
- Define uniform assumptions for modeling the condition of the reservoir and dam prior to the failure.
- Address unique situations such as dams in series, in which the failure of an upstream dam may impact a downstream dam.
- Define the required components of an inundation map that are useful for emergency planners, responders and the public.
- Provide a standardized and uniform set of requirements for the presentation of the inundation extent, timing, and intensity information produced by computer modeling.
- Describe the requirements for the submission of supporting information needed to prepare the inundation model and map.
- Clarify the conditions that prompt submission of inundation map updates.
- Define the department's hazard potential classifications.
- Clarify the requirements for inundation map development and submission for dams jointly regulated with FERC.
- Add requirements for inundation map development and submission as part of the application approval process for new and enlarged dams.
- Add requirement for EAP submittal to Cal OES before storage is authorized.

¹ 18 CFR Part 12

The proposed regulation will provide significant benefits to public health and safety. The regulations set forth the requirements for the preparation of a set of high-quality inundation maps to be included within EAPs. The EAPs address effective emergency response and recovery procedures to be implemented and practiced in preparation for a dam-related incident. The proposed regulation ensures the availability of appropriate tools to help EMAs effectively respond to a dam-related emergency and protect public safety. The proposed regulation may also provide economic benefits to the public during an emergency, due to improved emergency management procedures implemented to safeguard life, property, and the environment.

Compatibility with Existing State Regulations

The Department determines that the proposed regulations are not inconsistent or incompatible with existing State regulations. After conducting a review for any regulations that would relate to or affect this area, the Department has concluded that these are the only regulations that concern the Inundation Maps in California.

Documents Incorporated by Reference

The proposed regulations incorporate the following documents by reference:

FEMA P-946, Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures, Table 9-3. Federal Emergency Management Agency. (July 2013).

Engineering Guidelines for the Evaluation of Hydropower Projects, Chapter 2, Appendix II-A, Table 1. Federal Energy Regulatory Commission (August 2015)

DSO-98-004, Prediction of Embankment Dam Breach Parameters, Table 2. United States Bureau of Reclamation (July 1998).

Mandated by Federal Law or Regulations

The proposed regulations are not mandated by federal law or regulations.

Other Statutory and Legal Requirements

In February 2017, Governor Brown announced a 4-point plan to bolster dam safety and flood protection:

1. Invest \$437 million in near-term flood control and emergency response actions by redirecting \$50 million from the General Fund and requesting a \$387 million Proposition 1 appropriation from the Legislature as soon as possible.
2. Require emergency action plans and flood inundation maps for all dams.
3. Enhance California's existing dam inspection program.
4. Seek prompt regulatory action and increased funding from the federal government to improve dam safety.

Local Mandate

The Department has determined that the proposed regulations will not impose a mandate on local agencies or school districts that is required to be reimbursed under part 7 (commencing with section 17500) of division 4 of the Government Code. Dams may be owned by local

agencies or school districts. However, the regulations apply to all dam owners, not exclusively to local agencies and school districts. The proposed regulations apply to all owners of state jurisdictional dams, which include both public and privately-owned dams. While the proposed regulations will impose costs on local agencies that own dams subject to inundation map requirements, the proposed regulatory action will not result in a reimbursable state-mandated program.

Fiscal Impact

The proposed regulations would create costs to state agencies in two ways: the state owns 35 dams that are subject to the regulations to develop inundation maps, and the Department (a state entity) must review and approve inundation maps. Of the 35 state-owned dams, only eight have not yet submitted inundation maps and would be subject to the regulations for the initial development of inundation maps. The Department estimates initial costs for the remaining state-owned dams to be \$1,050,000. The Department estimates ongoing costs for all state-owned dams to update inundation maps will be \$39,000 annually. In addition, DSOD as part of the Department, will incur costs to administer the inundation map review program.

Local agencies own 525 dams that would be subject to the proposed regulations. The Department has already received inundation maps for some local-agency-owned dams, and there are 321 dams that have not yet submitted inundation maps and would be subject to the proposed regulations. The Department estimates that the proposed regulations would result in initial costs to develop inundation maps for these remaining publicly non-state-owned dams of \$15,625,000. The Department estimates ongoing costs for these publicly-owned dams to update inundation maps will be \$640,000 annually in perpetuity.

Local emergency management agencies are expected to experience savings in the event of a dam emergency as a result of inundation maps since inundation maps will improve emergency preparedness; however, this savings is difficult to quantify.

Federal funding of state programs is expected to be minor. The impacts will be principally limited to small adjustments to the annual federal grant of about \$130,000 provided to the Dam Safety Program each year by FEMA. FEMA adjusts the annual grant provided to state dam safety programs throughout the nation based on each state's responses to a federal questionnaire that includes questions regarding EAP compliance metrics. Therefore, if more California dams prepare maps and EAPs, the FEMA grant that is allocated toward California's Dam Safety Program may slightly increase.

Housing Costs

The Department has made the initial determination that the proposed regulatory action will not have a significant effect on housing costs. The statutory requirement to develop and publish inundation maps may indirectly affect home values and insurances rates, but any effects are uncertain and speculative

Significant Statewide Adverse Economic Impact Directly Affecting Business, Including Ability to Compete

The Department has made the initial determination that the proposed regulatory action may potentially have significant statewide adverse economic impacts directly affecting businesses. Businesses and individuals who own dams that are not considered low hazard are required by statute to develop inundation maps, and the proposed regulatory action requires maps to be prepared by engineers using computer models. Projected compliance requirements include hiring a registered civil engineer to perform inundation modeling of the dam and each critical appurtenant structure, developing maps based on the modeled results, and documenting modeling assumptions in a technical memorandum. Privately-owned dams are generally used in the following industries: water and energy supply, agriculture, and homeowner's associations.

Dams subject to these regulations are owned by different business types, ranging from large investor-owned utilities to small businesses. The cost to comply with this regulation may be significant for some dam owners. The Department has, therefore, made an initial determination that the adoption of this regulation may have a potentially significant, statewide adverse economic impact directly affecting business. It is uncertain, though, whether the regulation will impact the ability of California businesses to compete with businesses in other states. The Department has considered proposed alternatives that would lessen any adverse economic impact on business and invites you to submit proposals. Submissions may include the following considerations:

- i. The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to businesses.
- ii. Consolidation or simplification of compliance and reporting requirements for businesses.
- iii. The use of performance standards rather than prescriptive standards.
- iv. Exemption or partial exemption from the regulatory requirements for businesses.

Statement of the Results of the Economic Impact Assessment (EIA)

The estimated economic impact of the proposed regulations will affect two entities: businesses and private individuals that own dams, and businesses and private individuals that develop inundation maps.

There are a total of 378 dams owned by businesses and private individuals. Some of these entities own more than one dam. The Department has already received inundation maps for some dams; these maps would not be subject to the proposed regulations. There are 338 privately-owned dams that have not yet submitted inundation maps and would be subject to the proposed regulations. The Department estimates that the proposed regulations would result in initial costs to develop inundation maps for these remaining privately owned dams of \$12,925,000. The Department estimates ongoing costs to update inundation maps for all privately-owned dams will be \$315,000 annually. In addition, the costs to state and local-agency-owned dams would likely be passed along as an indirect cost to rate-payers. The indirect and induced costs from publicly-owned dams are assumed to be equal to the direct costs for the publicly-owned dams, totaling \$16,675,000 over the time period between adoption of the regulations and 12 months after full implementation.

Some dam owners that are businesses may choose to discontinue use of their dam rather than comply with the regulations, which may result in the elimination of businesses associated with the operation of their dams. Some engineering businesses may be created or expanded to develop inundation maps that comply with the proposed regulations. Engineering businesses currently doing business in the state may expand to develop inundation maps that comply with the proposed regulations.

Dam owners may downsize or alter their workforce as a result of incurring costs to prepare inundation maps that comply with the proposed regulations. Dam owners may create jobs, either within their private business or by hiring an engineering business, to develop inundation maps that comply with the proposed regulations.

The Department determines that the proposed regulation benefits the safety and welfare of the California residents, as well as the state's environment, by establishing uniform standards for inundation maps to ensure their validity and usefulness for emergency preparedness in the event of dam-related emergencies.

Cost Impacts on a Representative Person or Business

A representative person or business that owns a dam is expected to incur initial costs of approximately \$25,000 to develop each required inundation map and ongoing costs of \$500 to \$2,000 to update each inundation map to the standards in the proposed regulations. The number of required inundation maps depends on how many critical appurtenant structures are part of the dam system. Many dams have no critical appurtenant structures, and therefore only have to prepare one map for the dam. Other dams have one or several critical appurtenant structures; each requiring an inundation map per Water Code section 6160.

Business Reporting Requirements

The proposed regulation requires a report to be made, known as the technical memorandum, which documents modeling assumptions used to develop an inundation map. This report is critical for the Department's review and approval of each inundation map. The Department finds that it is necessary for the safety and welfare of the people of the State that the reporting requirement in the proposed regulation apply to businesses.

Effect on Small Business

Some dams are owned by small businesses. The requirement to prepare a map and EAP is based upon the dam's hazard classification, and there is no statutory exemption for dams owned by small businesses. Therefore, the Department determines that the proposed action affects small businesses.

Alternatives Statement

The Department must determine that no reasonable alternative considered by the Department or that has otherwise been identified and brought to the attention of the Department

- would be more effective in carrying out the purpose for which the action is proposed,
- would be as effective and less burdensome to affected private persons than the proposed action, or

- would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

Department Contact Persons and Availability of Documents

Department Contact Persons

Questions regarding the proposed regulatory action may be directed to:

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Backup contact person:

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Availability of Proposed Regulations

The Department has prepared an initial statement of reasons (ISOR) for the proposed regulations. This notice, the ISOR, the express terms, and all information upon which the proposed regulations are based are available on the Department's website at damsafety.water.ca.gov.

If substantial changes are made to the proposed regulations, the full revised text will be made available on the website for at least 15 days prior to adoption.

All subsequent regulatory documents, including the final statement of reasons, when completed, will be made available on the website.