

5.3 DAM FAILURE INUNDATION

5.3.1 Introduction

The discussion of dam failure inundation falls under the authority of the mandated Safety Element. The Dam Failure Inundation Element identifies hazards that require consideration in planning the type, location, and density of development. Policies and programs proposed in this element should be closely coordinated with the County Office of Emergency Services.

5.3.2 Findings

Inundation Hazards

Dam failure inundation is defined as the flooding which occurs as the result of structural failure of a dam. Structural failure may be caused by seismic activity. Seismic activity may also cause inundation by the action of a seismically-induced wave which overtops the dam without also causing dam failure. This action is referred to as a seiche. Water retained in a dam could also be displaced by the action of a volcanically-induced mudflow. Landslides flowing into a reservoir are also a source of potential dam failure or overtopping. Structurally defective dams can be a cause of dam failure.

More than 3,000 reservoirs are presently located in Shasta County. Of these, 36 are dams whose design, operation, and maintenance come under the authority of the California Department of Water Resources because of their size. The State Office of Emergency Services has further identified those jurisdictional dams whose failure may cause injury or loss of life. These dams are listed in Table DI-1.

The California Office of Emergency Services has prepared maps showing the areas which would be inundated if the dams listed in Table DI-1 fail. Dam failure inundation information from Shasta and Whiskeytown Dams has been transferred to a map of the SCR planning area which is on file with the Shasta County Department of Public Works.

Dam failure inundation hazards present major health and safety implications in the SCR Planning Area, particularly in the vicinity of the Shasta Lake and Whiskeytown Reservoir dams. Failure of Shasta Dam would result in the inundation of most of Redding within less than an hour of failure. Within two hours, all of Anderson and much of the Sacramento River Valley downstream of Redding would be inundated.

Given its smaller size and location relative to existing development, failure of Whiskeytown Dam would be less disastrous. Redding would not be affected, but over half of Anderson would be inundated within two hours of failure. A smaller portion of the Sacramento River Valley downstream of Clear Creek would also be inundated.

During 1990, the Department of Water Resources conducted a special dam safety study for Misselbeck Dam and reservoir which is located on the North Fork of Cottonwood Creek northwest of the Igo-Ono area. Concerns regarding dam safety and potential downstream inundation lead to reduced storage level requirements between October 1 and April 30, until the dam operator corrected outlet and spillway deficiencies.

As mentioned, the Department of Water Resources' Division of Dam Safety regulates the design and maintenance of large dams. Large dams are those exceeding 15 feet in height or having reservoirs exceeding 15-acre feet capacity. Dams less than this size are not regulated by the Division of Dam Safety.

TABLE DI-1		
SHASTA COUNTY DAMS WHOSE FAILURE MAY RESULT IN INJURY OR LOSS OF LIFE		
NAME	OWNER/OPERATOR	PLANNING AREA(S) AFFECTED
Anderson-Cottonwood	Anderson-Cottonwood Irrigation District	South Central Region
Box Canyon	Siskiyou County	Sacramento Canyon
Boyd #1 and #2	Boyd Trucking Co.	South Central Region
Brick Flat Pit Containment	Iron Mountain Mine Reclamation Trust	South Central Region
Charles Smith Irrigation	United Financial Operations	South Central Region
George Reese Reservoir	Arnold W. Sargent	South Central Region
Hat Creek #2 Diversion	PG&E	Big Bend
Hawkeye	Alan & Sherry Shufelberger	Eastern Upland
Haynes Reservoir	-----	Northeast Shasta County
Iron Canyon	PG&E	Big Bend
James Montgomery	George Domb, MD	South Central Region
Junge #1 & 2	Francis Carrington	Eastern Upland
Keswick	Dept. of Interior	South Central Region
Lema	McConnell Foundation	South Central Region
McCumber	PG&E	Eastern Forest
McCloud	PG&E	Northwestern Forest
Misselbeck	Igo-Ono Community Services District	Western Upland
Nash	Welton L. & Judith Carrel	South Central Region
North Battle Creek	PG&E	Eastern Upland, Eastern Forest

Null	The Hatch 1987 Revocable Trust	Eastern Forest
Pit #1, 3, 4, 5, 6, 7 Forebay	PG&E	Big Bend, NE Shasta County
Pit #5, Open Conduit Dam	PG&E	Big Bend
Reclaimed Water Reservoir	City of Shasta Lake	South Central Region
Ross #1 & 2	Kaloko Land Corp.	South Central Region
Shasta	Dept. of Interior	South Central Region
Slickrock Creek	Iron Mountain Mine Remediation Trust 1	South Central Region
Treatment Ponds	Plainwell Shasta Paper Co.	South Central Region
Truett	Woodridge Mutual Water & Owners Corporation	Eastern Forest
Upper Elder	Mark Henderson	Big Bend
Whiskeytown	Dept. of Interior	South Central Region
Source: State of California Department of Water Resources, Division of Safety of Dams, 2004		

Considering existing development patterns and trends, particularly in the South Central Region and the unlikelihood of a dam failure, it would be infeasible to preclude future development from locating in dam inundation areas. It is possible, however, to discourage critical structures (hospitals, fire, and police stations) and high occupancy structures (schools, theaters, and public meeting places) from locating in these areas. These policies are designed to reduce the risk of injury or loss of life in the event of inundation and should be addressed by County evacuation preparation plans as well as General Plan policies.

5.3.3 Objectives

DI-1 Reduction of the potential for the loss of life from dam failure inundation by developing emergency preparedness plans.

5.3.4 Policies

DI-a Dam Failure Inundation Maps shall be maintained by the County to aid in the project review process.

DI-b When development is proposed in areas adjacent to or downstream from an existing dam, the County shall determine if preparation of a dam failure inundation map is warranted.

DI-c The County should consider developing a system which assures that both small and large privately-constructed dams meet all county and state requirements, including for grading.

DI-d The Shasta County Emergency Plan shall provide for early warning and emergency evacuation routes in the event of dam failure.

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