

Chapter 1

Introduction

The proposed Folsom Dam Safety/Flood Damage Reduction (DS/FDR) actions reflect a cooperative effort by the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) and the U.S. Army Corps of Engineers (Corps), and the Corps non-federal sponsors, the State Reclamation Board (Reclamation Board)/Department of Water Resources (DWR) and the Sacramento Area Flood Control Agency (SAFCA). This Environmental Impact Statement/Environmental Impact Report (EIS/EIR) addresses proposed alternative measures for implementing Reclamation's dam safety and security obligations and the Corps' flood damage reduction structural modifications at Folsom Dam and appurtenant facilities. These facilities impound waters of the American River forming Folsom Reservoir and are collectively referred within this document as the Folsom Facility (Folsom Facility).

The improvements being considered for the Folsom Facility, as addressed in this EIS/EIR, respond in varying degrees to certain objectives of each of the aforementioned agencies. Reclamation's Safety of Dams Program objectives focus on reducing the risk of failure under hydrologic (flood), seismic (earthquake), and static (seepage) loads. Folsom Dam has been designated as a National Critical Infrastructure Facility and any compromise of the facility could result in grave property damage and loss of life. Reclamation's Security Program objectives are to protect public safety by securing Folsom Dam and its appurtenant structures and other Reclamation facilities, including the Folsom Powerplant, from attack or damage. The Corps' flood damage reduction objective is to improve the annual recurrence level of flood protection provided to the lower American River corridor. Similarly, SAFCA and DWR seek to improve the level of flood protection for the Sacramento region.

This EIS/EIR presents an assessment of potential impacts for a comprehensive range of structural modification alternatives, which may be implemented under either a joint structural modification approach, which address both dam safety and flood damage reduction objectives, or through specific, separable dam safety, security and flood damage reduction structural modifications, which solely address the specific agency objective. From this range of alternatives, a comprehensive proposed and ultimately preferred alternative will be identified which addresses both the joint and separable structural modifications.

Under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), the roles of the federal, state, and local agencies

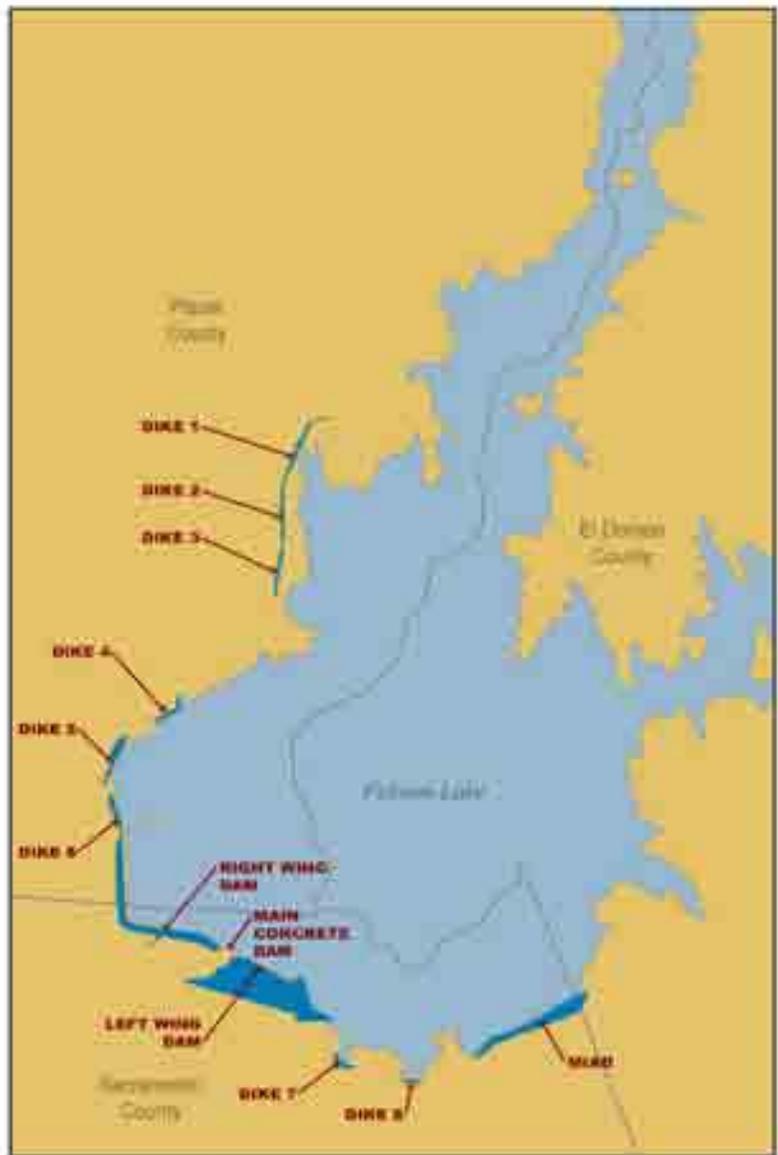
involved in the implementation of the Folsom DS/FDR are summarized in the table below.

Agency	NEPA/CEQA Role in Folsom DS/FDR
Bureau of Reclamation	NEPA Lead Agency
U.S. Army Corps of Engineers	Cooperating Agency under NEPA
Reclamation Board, State of California/Department of Water Resources	CEQA Lead Agency
Sacramento Area Flood Control Agency	Responsible Agency under CEQA

1.1 Overview of the Folsom Facility

The Folsom Facility is located approximately 23 miles northeast of Sacramento, near the City of Folsom, in the State of California. There are 12 retention facilities (4 dams and 8 dikes) that make up the Folsom Facility (see Figure 1-1). These retention structures impound the waters of the North and South Forks of the American River forming Folsom Reservoir. The Folsom Facility is a multi-purpose facility operated by law for flood control, irrigation water supply, M&I water supply, power generation, fish and wildlife, recreation, and water quality purposes.

The Folsom Facility was constructed by the Corps during the period 1948 to 1956. As required by the original legislation, ownership of the Folsom



**Figure 1-1
The Folsom Facility**

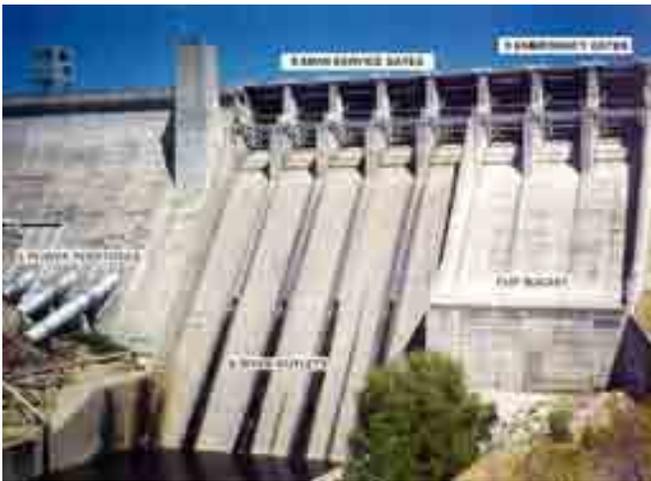
Facility was transferred to Reclamation upon completion for operation and maintenance as an integrated feature of the Central Valley Project (CVP) (Reclamation 2005f).

The following description of the Folsom Facility was taken from the *Draft Folsom Dam, Safety of Dams Corrective Action Study Scoping Report, October 2005*. The Folsom Facility has a total of 12 dams and dikes that impound approximately 977,000 acre-feet (AF) at a reservoir water surface elevation of 466 feet (ft) on the American River to form the Folsom Reservoir, also commonly referred to as Folsom Lake. All retention structures of the Folsom Facility have a crest elevation of 480.5 ft above mean sea level (483.1 ft in NAVD 88). The design surcharge pool is 1,084,780 AF at an elevation of 475.4 ft with 5.1 ft of existing freeboard.

Figure 1-1 presents the locations of the 12 retention structures that comprise the Folsom Facility including the Main Concrete Dam, the Left and Right Wing Dams, Dikes 1 through 8, and Mormon Island Auxiliary Dam.

1.1.1 Main Concrete Dam

The main dam is a concrete gravity dam made up of 28 individual monoliths¹ and is the only concrete retention structure at the Folsom Facility. Figures 1-2 and 1-3 provide photos of the main dam. The main dam has a structural height of 340 ft and a crest length of 1,400 ft. The spillway of the main dam consists of eight tainter gates (i.e., a type of radial arm floodgate used to control water flow); five of which serve



Source: Corps 2005

Figure 1-2
Main Dam Spillway



Source: Corps 2005

Figure 1-3
Releases from Folsom Dam

as the main spillway/service gates for the main dam and three that are emergency

¹ Definitions of key terms are provided in Chapter 10, the Glossary.

gates. The total release capacity of the eight gates is 567,000 cubic feet per second (cfs) at an elevation of 475.4 ft. Below the five main spillway/service gates are two rows of four river outlets that have a total release capacity of 24,800 cfs at an elevation of 418 ft. Releases at lower levels can also be made through three power penstocks (i.e., large-diameter pipes that convey water through the dam while driving hydroelectric turbines), which have a total release capacity of approximately 8,000 cfs. Releases from the reservoir are restricted by the spillway capacity and by limits set on the rates at which water can be released through the dam structures. Downstream levees are designed to accommodate a sustained flow rate of 115,000 cfs and a maximum capacity of 160,000 cfs for a short duration during emergencies, without resulting in levee failure and downstream flooding.

1.1.2 Right Wing Dam and Left Wing Dam

Two earthfill wing dams, the Left Wing Dam (LWD) and Right Wing Dam (RWD), flank the main dam. The LWD has a structural height of 145 ft and a length of 2,100 ft, while the RWD has a structural height of 145 ft and a length of 6,700 ft.

1.1.3 Dikes 1 through 8 and Mormon Island Auxiliary Dam

Eight earthfill dikes referred to as Dikes 1 through 8, and an earthen auxiliary dam called Mormon Island Auxiliary Dam (MIAD), make up the remainder of the retention structures at the Folsom Facility. The eight dikes range in height from 10 to 100 ft and lengths of 740 to 2,060 ft. Dikes 1 through 6 are along the western side of the reservoir, while Dikes 7 and 8 are on the southeastern side of the reservoir between the LWD and MIAD. MIAD is an earthfill dam with a structural height of 165 ft and a length of 4,820 ft. MIAD does not have any spillway or outlet works structures. MIAD is referred to as a dam because it is placed in one of the historical river channels.

1.1.4 Folsom Powerplant

Directly below and downstream of the Main Concrete Dam is the Folsom Powerplant, which was constructed from 1952 to 1956 by Reclamation. Three 15ft-diameter penstocks deliver water from the dam to three generators, which together produce approximately 198,207 kilowatts (kW) of power (CDPR 2004). Nimbus Dam is approximately 7 miles downstream and serves as a regulating reservoir for the Nimbus Powerplant.

1.1.5 Folsom Facility Dam Safety and Flood Control Concerns

During initial construction of Folsom Dam and immediately upon completion of construction, major storm and flood events occurred on the American River which were precursor events to an event which occurred in February 1986. At that time, a series of major storms, commonly referred to as a "Pineapple Express", occurred in the Sacramento region that brought approximately 10 inches of rain over a period of

11 days, and exposed considerable deficiencies in the flood control system of the region (SAFCA Undated). Dam operators at Folsom and Nimbus Dams were required to release approximately 130,000 cfs, 15,000 cfs more than the downstream levees were designed to accommodate at a sustained flow rate. Water levels rose well above the designated freeboard of the downstream levees, and although major failure of the dam and levees did not occur, questions arose about the level of protection the structures could actually provide.

Also in the 1980s, seismic concerns were identified at MIAD by the Corps and Reclamation. The Corps and Reclamation jointly determined that liquefaction of the foundation and the subsequent failure of MIAD could occur during seismic (earthquake) activity. A phased structural modification program was rapidly undertaken in the early 1990s by Reclamation when reservoir levels were lower than normal as result of drought. These modifications partially, but not fully, reduced the risk of seismically induced liquefaction.

In 2000, Reclamation identified the potential need for additional dam safety modifications to address other hydrologic, seismic and static risks. The hydrologic risk identified is the risk of any or all of the 11 earthen embankment dams and dikes being overtopped leading to rapid uncontrollable erosion and failure during a Probable Maximum Flood (PMF) event.

In addition to the potential seismic-induced liquefaction of foundation materials at MIAD, it was also determined that modifications would be required to prevent the main dam from sliding along the dam rock foundation contact and deformation of main dam pier and gates elements leading to displacement and/or failure resulting in an uncontrollable breach. Additionally, it was determined that modifications would be required to reduce the static risk of a seepage path developing undetected within select earthen embankment dams and dikes leading also to uncontrollable erosion and subsequent failure.

1.2 Existing Flood Control Operations at the Folsom Facility

There is a high probability of a series of large storm events occurring within the American River Drainage Basin above Folsom Dam. Due to the limited capacity of the reservoir to safely contain these inflow volumes and the Dam to control releases within the safe carrying capacity of the downstream levees, structural modifications are required to reduce the probability of overtopping during a PMF event. Structural modifications are also required to improve the current level of flood protection during lesser flood events.

The following summarizes the basic operational parameters under existing conditions for the Folsom Facility for a PMF or lesser flood event.

The Folsom Dam and Reservoir Water Control Manual (Water Control Manual) of 1987 contains provisions for the current flood control operations at the Folsom Facility (Corps 2005a). Although flood space requirements (i.e., the volume of capacity available within the reservoir facility to temporarily store inflows during major storm events) override all other operational considerations, Reclamation plans normal operations to avoid fluctuations in flow and to maximize water released for hydropower generation whenever possible (Corps 2005a). Management of the reservoir space reserved for flood control is seasonal, as described in the bullets below.

- “From June 1 through September 30 there is no space designated for flood control;
- From October 1 through November 17, the amount of space reserved for flood control increases uniformly until February 7;
- From February 8 through April 20 the flood reservation space is 400,000 AF, which can be reduced after March 15 if basin conditions are dry; and
- From April 21 through May 31, the required flood space decreases uniformly until no flood space is required” (Reclamation 1992 *in* Corps 2005a).

Reclamation generally plans releases to meet flood control storage space requirements by the end of each day. Releases from the dam increase until water levels in the reservoir have dropped low enough to achieve the required storage space for flood control. Reservoir operators must take into consideration several guidelines including those developed by the National Marine Fisheries Service (NMFS). These guidelines require strict release rates (ramping criteria) at certain times of the year under normal operations, to reduce the chances of stranding Chinook salmon and steelhead in the lower American River (Corps 2005a). Under emergency operations flood management becomes the overriding priority.

If inflows to the Folsom Facility reduce the available flood control storage space, then releases must occur. Several conditions restrict the volume and timing of releases from Folsom Dam. The maximum release capacity from Folsom Dam is approximately 570,000 cfs. The normal operational maximum release is termed the “objective release” and is the normal, non-emergency flood management release maximum of 115,000 cfs. This release rate is based on the design capacity of the downstream levees to accommodate a sustained flow along the lower American River.

In an emergency flood event, recent levee modifications allow for releases above 145,000 cfs to a maximum of 160,000 cfs for a short period (approximately three days). Releases above the objective release of 115,000 cfs cannot be increased more

than 15,000 cfs or decreased more than 10,000 cfs during any two-hour period up to 160,000 cfs (Corps 2005a).

The existing elevation of the Main Dam spillway sill (i.e., horizontal bottom of the spillway gates) is 418 ft. Release capacity for reservoir water levels below this elevation is limited to the capability of the eight river outlets (24,800 cfs) and three power penstocks (i.e., 8,000 cfs) with a maximum release of approximately 32,800 cfs. Above this elevation, releases can be made through the main spillway of the Main Dam.

Folsom Dam does not have the capacity to release 115,000 cfs until the reservoir is substantially filled (approximately elevation 447 ft with approximately 775,000 AF of impoundment). Under normal reservoir operations with rising inflows, controlled, stepped normal operating releases of up to 115,000 cfs may occur and be maintained to remain within the objective release capacity of the downstream levees. As inflows begin to exceed the 115,000 cfs objective capacity, releases will occur at an increased but still highly controlled and stepped rate increasing to 160,000 cfs. If reservoir inflows continue to exceed 160,000 cfs, releases will be held to 160,000 cfs as long as possible to provide maximum evacuation time, but may be increased at much greater ramping rates up to the maximum release capacity of 570,000 cfs, which is well in excess of the current downstream channel capacity. If inflows exceed the maximum release capacity of 570,000 cfs, overtopping of the dam will occur, leading to erosion and potential uncontrollable catastrophic breach(s) at any earthen embankment dam or dike.

For very large, extreme flood events with required releases above 160,000 cfs, releases are required to match expected inflows. For flows above 160,000 cfs downstream levee failures are expected to occur, resulting in substantial associated flood damage. Evacuation warnings and/or orders would be implemented based on expected flows. For flows above approximately 190,000 cfs, all downstream levees are expected to be overtopped. Releases up to the existing maximum release capacity of 570,000 cfs would induce major flooding with devastating consequences comparable to those of Hurricane Katrina in 2005. Flows above 570,000 cfs into Folsom Reservoir at this point would result in overtopping of the earthen embankments leading to potential embankment failure with additional major consequences.

In addition to flood control operations, Reclamation also has requirements for maintaining water releases that protect downstream fish. The steelhead temperature objectives in the lower American River, as provided by NOAA Fisheries, state:

"Reclamation shall, to the extent possible, control water temperatures in the lower river between Nimbus Dam and the Watt Avenue Bridge (RM 9.4) from June 1 through November 30, to a daily average temperature of less

than or equal to 65°F to protect rearing juvenile steelhead from thermal stress and from warm water predator species. The use of the cold water pool in Folsom Reservoir should be reserved for August through October releases."

1.2.1 Reclamation's Interim Operation Agreement with SAFCA

Prior to 1995, authorized flood storage space at the Folsom Facilities was fixed at 400,000 AF above the normal operational pool elevation of 466 ft. In 1995, Reclamation and SAFCA entered into a 5-year Interim Agreement to provide a variable range of flood control storage space of 400,000 to 670,000 AF, depending upon storage conditions in existing reservoirs upstream of Folsom Facility (Corps 2002, Corps 2005a). Upon expiration, the Agreement was extended for 2 one-year periods to 2002. From 2002 until 2004 there was no agreement in place.

The Water Resources Development Act (WRDA) of 1996 directed Reclamation to continue the variable 400,000 to 670,000 AF operation as a temporary flood damage reduction solution until the Folsom Dam Modifications are constructed by the Corps and a comprehensive flood damage reduction plan for the American River Watershed had been implemented (Corps 2005a). The current agreement to continue said variable operation was executed in December 2004 and extends through 2018, unless and until the Corps implements a new water control manual and associated new flood control diagram, which will provide the basis to define new operational requirements that will supersede and replace the existing agreement. Such action is contingent upon completion of appropriate environmental compliance, mitigation, other requirements of WRDA of 1996, and reconciliation of potential conflicts with pre-existing authorities.

The Corps intended to implement a new water control manual and associated new flood control diagram under the Folsom Dam Modification Authorization and/or other relevant authorizations. The Corps has not currently identified a revised plan to implement a new water control manual and associated new flood control diagram based on the current status of the Folsom Dam Modification Authorization and/or other relevant authorizations.

The environmental impact analysis presented in this EIS/EIR addresses the proposed structural modifications to the Folsom Facility only. Construction of any of the Folsom DS/FDR actions in themselves would not substantially alter current overall operations of the Folsom Facility. During construction and upon completion of structural modifications, the current operational parameters as summarized above and defined in appropriate agreements and authorities would remain in effect until either expiration or modification of existing interim operational agreements occurs, a new Flood Management Plan is approved, or new Congressional authorizations are established, directed or mandated.

1.2.2 Updated Flood Management Plan

As directed and/or authorized by Congress, the Corps and Reclamation, under the appropriate agency authorities and agreements, will update the existing Water Control Manual of 1987 or develop a new water plan and control manual. Upon selection of either a preferred joint Folsom DS/FDR alternative or stand-alone dam safety hydrologic risk reduction or flood damage reduction alternatives, the Corps and Reclamation will determine the basis for the updated/new plan based on either existing authorizations, reauthorizations, or new authorizations.

The updated/new plan will analyze weather, basin wetness, precipitation, upstream reservoir storage, and reservoir inflow forecasts to help determine appropriate comprehensive flood control operations procedures as well as include a new water control manual with variable flood storage space of 400,000 to 600,000 AF during flood season on a permanent basis (Corps 2005a). The environmental effects and impacts on water supply, water quality, hydropower, and the other authorized functions of the system of the Updated Flood Management Plan will be evaluated in a separate environmental compliance document. The Water Control Manual will likely go through multiple revisions as the various structural modifications are completed at the Folsom Facility and a Final Updated Flood Management Plan is anticipated in 2009 (Corps 2005a).

This Folsom DS/FDR EIS/EIR generally considers operations affected by proposed structural modifications; however, a detailed analysis of operational impacts cannot be determined at this time. Upon selection of a preferred alternative(s), Reclamation, the Corps, and SAFCA will fully coordinate and address relevant congressional directives to evaluate the existing requirements related to operations and consider possible changes as appropriate. The environmental impacts associated with proposed changes and operational impacts in required supplemental environmental compliance documentation. This required compliance documentation shall be completed in parallel with the Final Updated Flood Management Plan and is anticipated in 2009.

1.3 Federal Agency Objectives

1.3.1 Reclamation's Objectives

Reclamation's core mission is to deliver water for all statutory and contractual purposes, generate power, and perform all other authorized and related programs including Reclamation's Safety of Dams Program. The primary purpose of the Safety of Dams Program is to identify potential issues with existing dams and develop corrective actions to protect public safety, property, the environment and cultural resources. Reclamation's main objective for the Folsom Facility under the Safety of Dams Program is to ensure that the Folsom Facility does not pose unacceptable risks to the public from hydrologic, seismic, and static loading conditions.

Reclamation has identified the need for expedited action at the Folsom Facility to reduce hydrologic, static, and seismic risks under its Safety of Dams Program. The identified risks are among the highest of all dams in Reclamation's inventory and the Folsom Facility is among Reclamation's highest priorities within its Safety of Dams Program.

The hydrologic capabilities of the Folsom Facility must be increased to safely pass the PMF as updated in 2001. This PMF was developed assuming the upstream dams safely pass this flood. The PMF is defined as "the flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in a particular drainage area" (Corps 2002). This means that during the most severe storm reasonably possible, the Folsom Facility must have the ability to safely contain and release PMF floodwaters through the dam without failure of the dams or dikes. Recent estimates indicate that a frequency of flood approximately the same size as the PMF would have a recurrence level somewhere between 1 in 7,100 years and 1 in 22,000 years. It is estimated that the PMF volume is nearly fully realized at the 1 in 7,000 recurrence level and additional incremental volume increases are relatively minor to undetectable. The total PMF inflow volume to the Folsom Facility is estimated to be approximately 3.2 million AF over approximately a 5 day (120 hours) period with a peak inflow rate of approximately 906,000 cfs. Currently, the Folsom Facility could safely contain and pass approximately 70 percent of the PMF which would be equivalent in size to a frequency of flood with recurrence levels between 1 in 2,000 years and 1 in 5,000 years.

Reclamation recognizes the consequences of overtopping the facility during a major flood event with an approximate recurrence level greater than 1 in 2,000 years would be catastrophic, with potential Hurricane Katrina-like or greater consequences. Initial overtopping of the facility could occur at any retention feature and, if the structure is earthen, could erode leading to a breach of the retention structure exposing widespread population and property downstream of the structures to this catastrophic flood risk. The potential area of exposure is within both the immediate American River channel area and widespread areas downstream of peripheral Folsom Facility retention structures. Areas in the surrounding cities of Folsom, Granite Bay, Natomas, Roseville, Rocklin, Sacramento and West Sacramento could be significantly affected should a breach occur at Dikes 1 through 6 and the RWD. Areas in the surrounding cities of Folsom, Rancho Cordova, Natomas, Sacramento and West Sacramento could be significantly affected should a breach occur at the Main Concrete Dam, LWD, Dikes 7 and 8 and MIAD.

Reclamation is working closely with the Corps and its partners to integrate Reclamation's objective of expeditious hydrologic risk reduction and the Corps' objective of providing incremental flood damage reduction benefits by optimizing

the construction sequencing and excavation of the spillway in conjunction with any needed physical raise of the retention structures. An integral component of the optimization is providing Reclamation the opportunity to integrate interim or permanent measures at the control section to meet the objective of expeditiously reducing the hydrologic risk.

Reclamation has identified other expedited safety of dams risks related to potential seismic and static events. These risks are also significant and expose the populations surrounding the facility to a potential breach leading to catastrophic inundation downstream of various retention structures. These risks are to be reduced in accordance with Reclamation's Public Protection Guidelines, as stand-alone Safety of Dams modification elements of the overall Folsom DS/FDR actions, with optimized integration with Corps flood damage reduction elements, where appropriate.

In the event that portions of the Folsom DS/FDR actions do not proceed as described in this EIS/EIR, Reclamation will identify a stand-alone modification to mitigate this risk in accordance with Reclamation's Public Protection Guidelines. Also, the Corps would re-initiate the planning process for their current flood damage reduction project authorizations.

1.3.2 Corps' Objectives

Flood damage reduction is one of the Corps' many missions. Congress has authorized three projects for the American River Watershed Investigation: Common Features, the Folsom Dam Modification, and the Folsom Dam Raise. As authorized, the projects would increase flood protection to the Sacramento area along the main stem of the American River. The Common Features Project, as further described later in this chapter, will reduce the probability of flooding in Sacramento to 1 in 100 for any given year. The Folsom Dam Modification Project, as authorized, would further reduce the probability of flooding in Sacramento in any one year to 1 chance in 140. Beyond these projects, the Folsom Dam Raise Project, as authorized, would reduce the probability of flooding to approximately 1 in 200 in any given year, which has been identified as the goal of the DWR/Reclamation Board and SAFCA (hereinafter, the "non-federal sponsors"). The objective of the Corps is to provide increased flood protection consistent with Federal planning principles and guidelines.

1.4 Overview of Folsom Dam Safety/Flood Damage Reduction Actions Related to the Joint Federal Project

Many of the Corps' flood damage reduction and Reclamation's dam safety activities planned or underway at the Folsom Facility are independent (stand-alone) projects

(i.e., specific to the needs and objectives of each agency). However, there are common actions that could, and should, be taken to address key objectives of both agencies. These actions primarily focus on control of hydrologic function of the American River. Additional hydrologic control is necessary to minimize flooding potential (improve flood protection) along the lower American River and at the same time address the dam safety hydrologic risk to the Folsom Facility (overtopping of the dams and dikes during a PMF or other major flood event).

Beginning in 2004, Reclamation and the Corps established an Oversight Management Group, consisting of senior management from both agencies, to facilitate project coordination. Collaborative activities included a comprehensive value planning effort to identify a joint project that would meet the respective flood damage reduction and dam safety objectives. Congress formalized this effort in the Fiscal Year (FY) 2006 Energy and Water Development Appropriations Act by directing the two agencies to continue progress toward a joint project that satisfactorily addressed the flood and dam safety hydrologic risks posed by the American River watershed and the existing Folsom Facility. This combined effort identified a gated auxiliary spillway, otherwise referred to as the Joint Federal Project (JFP) as the common feature addressing both objectives. The basic characteristics of JFP are summarized as follows:

Project Description. The JFP at Folsom Dam and Reservoir will consist of six new 23-ft X 33-ft submerged tainter gates at invert (i.e., sill elevation of) 368-ft combined with a concrete-lined auxiliary spillway approximately 170-ft wide and 1,700-ft in length. Gate dimensions and invert elevation may be optimized during design to maximize performance and/or reduce costs. To achieve the objective of expedited feasibility level design, optimization of the spillway design will focus, to the extent feasible, upon varying the invert elevation of the new gates, but if necessary, may include varying the dimensions of the six tainter gates, approach channel or auxiliary spillway. The optimization will seek to improve upon the flood damage reduction objective of at least 1/200 year flood protection (i.e., flood protection sufficient to handle a major storm event of an intensity with the probability of occurring once in 200 years) while continuing to preserve and expedite completion of the dam safety objective of safely passing the PMF.

Additions. Additional features to the JFP may be proposed later as mutually determined by participating agencies in order to: (1) achieve a minimum 1/200 year flood protection; or (2) as incrementally justified through appropriate analysis and evaluation. Potential additional features may include a raise of up to 3.5 ft for all embankments, or modification or replacement of the existing service gates or emergency spillway gates. Any additions to the JFP, as justified, will be for flood damage reduction purposes only.

Stand-Alone Projects. Other preferred alternatives selected to address other Reclamation Dam Safety and Security objectives of seismic, static and security risk reduction and the Corps' other related flood damage reduction objectives not specifically addressed in the JFP are separable, stand-alone projects and alternatives to be selected, implemented and managed by the respective agency, although the full suite of possible alternatives and their associated impacts have been comprehensively and collectively addressed in this Folsom DS/FDR EIS/EIR.

This EIS/EIR addresses the effects of implementing a variety of measures that would increase the level of flood protection and dam safety currently offered by the Folsom Facility. The alternatives described in this EIS/EIR include numerous features that address dam safety and security, and flood damage reduction issues. The individual improvement project(s) that are ultimately implemented would likely include joint components reflecting the missions of both agencies. The project would also include other separate, stand-alone dam safety/security and flood damage reduction features previously authorized for completion by the respective agencies. Due to the fact that there are separate authorizations that each agency must follow, this EIS/EIR delineates actions that are dam safety- and security-specific or flood damage reduction-specific from those actions that could be implemented jointly by both agencies.

1.5 Folsom Dam Security Enhancement Project

The purpose of the Folsom Dam Security Enhancement Project (Security Project) is to protect public safety by securing Folsom Dam and its appurtenant structures and other Reclamation facilities, including the Folsom Powerplant, from attack or damage. Folsom Dam has been designated as a National Critical Infrastructure Facility. Any compromise of the facility could result in grave property damage and loss of life.

The objective of the Security Project is to have a completely integrated and centrally-controlled Access Control, Intrusion Detection, Closed Circuit Television (CCTV), and Lighting systems designed, constructed, and turned over to Reclamation in fully operational condition. The objective of the security system is to:

1. Provide a security control center inside of the Folsom Powerplant.
2. Allow Reclamation staff to take digital photographs of personnel and print proximity identification badges, which would be integrated into the system to recognize proximity badges and allow and track access as appropriate.
3. Allow security staff to monitor site conditions via CCTV. The cameras would be remotely controlled and would provide video feed to security personnel. The existing anti-vehicle bollards would be upgraded with fixed CCTV

cameras that would monitor the area directly next to the bollards at Dikes 4, 5, 6, and 7, and MIAD.

4. Prevent unauthorized vehicle access onto Folsom Dam Road, the wing dams, and MIAD.
5. Provide for supplemental lighting for the Main Concrete Dam, spillway gates, shutter structure, and other associated structures.

1.6 Related Projects and Authorizations

Many events, projects, and documents have contributed to the development of the Folsom DS/FDR, including Reclamation's Safety of Dams Program and the Corps' American River Watershed Investigations. The following section presents the history of the Folsom DS/FDR, including existing documents, reports, and projects that have contributed to its development.

1.6.1 The Corps' American River Watershed Studies and Projects

1.6.1.1 1986 American River Watershed Investigation and the 1989 Creation of SAFCA

After the storms in 1986, the Corps led a series of investigations along the American River Watershed and determined that the level of flood protection was severely inadequate. In 1988, the Continuing Appropriations Act (Public Law (P.L.) 100-202) authorized the Corps to begin a feasibility phase study of the American River Watershed Investigation (ARWI) to identify methods to increase flood protection. Congress required the feasibility phase study to be completed on a cost-shared basis with the State of California (Corps 1996).

At the beginning of the process, the State of California entered into an agreement with local agencies interested in acting as project sponsors. In 1989, the City of Sacramento, the County of Sacramento, the County of Sutter, the American River Flood Control District and Reclamation District 1000 created SAFCA through a Joint Exercise of Powers Agreement (SAFCA Undated, Corps 1996). The purpose of SAFCA was to represent local interests during the flood protection planning process (SAFCA Undated, Corps 1996).

1.6.1.2 1991 American River Watershed Investigation Feasibility Report

In 1991, the Corps, the State Reclamation Board, and SAFCA completed a Feasibility Report for the main stem of the American River and Natomas Basin (Corps 2002). This report recommended levee improvements in Natomas and a flood detention dam at Auburn that would store up to 545,000 AF of floodwater (Corps 1996). Auburn Dam was not approved by Congress but levee improvements were authorized in the Department of Defense Appropriations Act of 1993, Section 9159 (P.L. 102-396). Congress also directed additional studies to be conducted to

identify other projects for increased flood control including offstream storage capacity along Deer Creek in the Consumnes River watershed, modifying Folsom Dam, and transferring flood control space to an upstream facility (Corps 1996).

1.6.1.3 1995 Folsom Dam Existing Flood Management Plan

In 1992, Section 9159(f)(2) of P.L. 102-396 required the Corps and Reclamation to prepare a flood management plan for Folsom Dam. Completed in 1995, the plan maximizes flood control capacity by improving the stream gage network and flood forecast system. The plan works in conjunction with the existing Folsom Dam and Lake Water Control Manual of 1987.

1.6.1.4 1996 American River Watershed Project Supplemental Information Report and Supplemental EIS/Supplemental EIR

In response to the Department of Defense Appropriations Act of 1993, the Corps, the State Reclamation Board, and SAFCA developed the 1996 Supplemental Information Report (SIR) and Supplemental EIS/Supplemental EIR (SEIS/SEIR). This report provided additional information to the 1991 Feasibility Report. The SIR outlined three flood protection plans to increase flood protection of the Sacramento region: the Folsom Modification Plan, the Folsom Stepped Release Plan, and the Detention Dam Plan (Auburn Dam). Improvement features associated with each plan are identified below.

Folsom Modification Plan

- Adopt a new flood control diagram for Folsom Dam to increase flood storage to 475,000 through 720,000 AF;
- Lower the main spillway, replace five service gates, enlarge eight existing river outlets;
- Modify surcharge storage space by strengthening embankments and other physical features at Folsom Dam to accommodate increased water-surface elevations, replace three emergency spillway gates, implement advanced warning system and flood plan evacuation plan;
- Construct a slurry wall in 24 miles of levees along the lower American River; and
- Strengthen and raise 12 miles of levees on the east side of the Sacramento River between Natomas Cross Canal and the mouth of the American River.

Folsom Stepped Release Plan

- Continue variable flood storage space at Folsom Dam of 400,000 to 670,000 AF;

- Lower the main spillway and replace five new service gates and enlarge eight existing river outlets;
- Modify surcharge storage space by strengthening embankments and other physical features at Folsom Dam to accommodate increased water-surface elevations, replace three emergency spillway gates, implement advanced warning system and flood plain evacuation plan;
- Construct a slurry wall in 24 miles of levees along the lower American River;
- Increase objective release from Folsom Dam from 115,000 to 140,000 cfs and eventually to 180,000 cfs, depending on the estimated magnitude of inflows to Folsom Facility;
- Construct levee, channel, and other improvements along the lower American River in order to convey the increased objective releases;
- Lengthen Sacramento Weir 1,000 ft, widen Sacramento Bypass 1,000 ft, and raise or modify 52 miles of levees at various locations along Yolo Bypass to accommodate increased objective release;
- Strengthen and raise 12 miles of levees on the east side of the Sacramento River between Natomas Cross Canal and the mouth of the American River;
- Environmental/restoration/recreation improvements along lower reach of American River Parkway; and
- Mitigate loss of 157 acres of vegetation.

Detention Dam Plan

- Construct a 508-foot-high flood detention facility with a maximum capacity of 894,000 AF on the North Fork of the American River near Auburn;
- Construct a slurry wall in 24 miles of levees along the lower American River;
- Strengthen and raise 12 miles of levees on the east side of the Sacramento River between Natomas Cross Canal and the mouth of the American River;
- Restore flood storage space of 400,000 AF in Folsom Facility and maintain objective release from Folsom Dam of 115,000 cfs; and
- Mitigate for loss of 1,533 acres by implementing adaptive management plan for planting and resource management on 1,481 acres along North and Middle Forks of the American River and acquire and manage an additional 2,774 acres on Yuba River.

A Record of Decision (ROD) for the 1996 American River Watershed Project SIR and SEIS/SEIR was signed in July 1997.

1.6.1.5 The 1996 Common Features Project

The Detention Dam Plan described above was the National Economic Development (NED) Plan and was the plan submitted to Congress (Corps 2002, Corps 1996). The Detention Dam Plan was rejected by Congress for a second time. In Section 101 of the WRDA of 1996, Congress authorized levee improvement features common to the three plans identified in the 1996 SIR, including installation of slurry walls along the lower American River, levee modifications along the east bank of the Sacramento River downstream from Natomas Cross Canal, installation of streamflow gauges upstream from Folsom Facility, and modifications to a flood warning system of the lower American River (Corps 2002). This project is referred to as the “Common Features” project. The WRDA of 1996 also authorized the continued reoperation of Folsom Dam to achieve additional flood storage space. Construction of these features is ongoing (Corps 2002).

1.6.1.6 The 1999 Folsom Dam Modification Project

The Folsom Modification Plan of the 1996 SIR included two key features: increasing the release capacity of the dam through modification of the eight existing river outlets, and modifying the use of surcharge storage through physical and operational changes to increase flood storage capacity and maintain the objective release of 115,000 cfs (Corps 2001). This plan would take approximately six years to complete and originally required lowering the reservoir during construction.

In 1995, before the 1996 SIR was completed, a spillway tainter gate at Folsom Dam failed (Corps 2001). Reclamation spent several years working to fix the problems resulting from the gate failure, but the Folsom Modification Plan project was delayed because of public concerns over the closing of Folsom Dam Road during construction. In response to this, SAFCA prepared an Information Paper on two additional plans to the Folsom Modification Plan that would reduce traffic and other construction effects (Corps 2001). The 1998 report entitled Folsom Dam Modification Report, New Outlets Plan, presented two new alternatives to enlarge existing outlets, add five new outlets to the emergency spillway and construct a new emergency spillway stilling basin.

Although the “Common Features” project was authorized under WRDA in 1996, Section 101 of WRDA of 1999 authorized the design and construction of the Folsom Modification Plan as it was described in the 1996 SIR and modified by SAFCA's 1998 Folsom Dam Modification Report, New Outlets Plan (Corps 2002). The actual features of the plan authorized for construction included five new sluice ways through the main dam, a new stilling basin, an increase in surcharge elevation, and a reduction in variable storage. These features would be slightly altered in the Corps

2001 Final Environmental Assessment/Initial Study (EA/IS) for the Folsom Dam Modification Project.

1.6.1.7 1999 Modifications to the Common Features Project

In 1999, the Corps developed an Information Paper entitled American River Watershed, California, Information Paper, to provide additional information to the 1996 SIR. In response to this paper, Section 366 of the 1999 WRDA authorized several modifications to the Common Features Project. The scope of work was broadened from the previous Common Features Project and the new modifications included additional strengthening and raising of levees along the American River and Natomas Cross Canal (Corps 2002). The project was intended to reduce flood risk in Sacramento to a 1-in-100 probability in any given year, while waiting for the physical improvements to Folsom Dam that would further reduce the risk (Corps 2005a). This project is currently ongoing.

1.6.1.8 2001 Final EA/IS American River Watershed, Folsom Dam Modification Project

The American River Watershed, California, Folsom Dam Modification Project Final EA/IS was prepared by the Corps for the Folsom Dam Modification Project in August 2001. The document presented alternatives with the following main features:

- Enlarging the eight existing river outlets;
- Reducing the range of flood control storage space from 400,000-670,000 AF to 400,000-600,000 AF;
- Cooperating with Reclamation to update the Folsom Dam Flood Management Plan to take advantage of improved weather forecasting and the new operational capabilities with the modification of the outlets; and
- Completing a revised water control manual for Folsom Dam that modifies the variable flood control space originally instituted by Folsom reoperation (Corps 2002).

The document determined that there would be no significant adverse impacts and a Finding of No Significant Impact (FONSI) and Negative Declaration accompanied the 2001 Final EA/IS (Corps 2005b).

During the finalization of the Folsom Dam Modification Project EA/IS, the Corps also began work on the American River Watershed Long-Term Study. There were several conflicts with the features proposed in the Long-Term Study and those proposed in the Folsom Dam Modification Project. In one particular instance, if the modified use of surcharge was implemented under the Folsom Dam Modification Project, then the Long-Term Study features such as the new emergency spillway

tainter gates and dikes would have to be modified again during the Long-Term Study construction. The American River Watershed, California, Folsom Dam Modification Project Final Limited Reevaluation Report of 2001 provided refinements to the design elements of the authorized Folsom Dam Modification Project and updated the costs, benefits, and effects, in order to reduce conflicts with the Long-Term Study.

1.6.1.9 2002 American River Watershed Long-Term Study Final Supplemental Plan Formulation Report EIS/EIR

Section 566 of the WRDA of 1999 (P.L. 106-53) directed the Corps to complete a study for increasing surcharge flood control storage space at the Folsom Dam and Reservoir, with the assumption that there would be no increase in water supply storage (Corps 2002). It also required the Corps to conduct a study of levees on the American and Sacramento Rivers to increase potential flood protection through levee modification.

In February of 2002, the Corps, along with the State Reclamation Board and SAFCA, completed the American River Watershed Long-Term Study Final Supplemental Plan Formulation Report EIS/EIR (LTS EIS/EIR). This document was a supplement to the 1991 Feasibility Report and the 1996 Supplemental Information Report and fulfilled the requirements of Section 566 of the WRDA of 1999. The LTS EIS/EIR evaluated eight alternatives that included various dam raise options, modifications to the Folsom Dam spillway, and stepped release plans. Alternative 3, the Federally-supportable plan, consisted of:

- A 7-ft dam raise, which would raise the maximum design flood pool elevation to 482 ft;
- Widening of the spillway at L.L. Anderson Dam (French Meadows Reservoir) to safely pass the PMF; thus reducing the PMF to the Folsom Facility;
- Replacement of eight tainter spillway gates, modification of spillway bridge piers;
- Extension of the stilling basin;
- Property easements, construction of a new dike, or construction of a new retaining wall at Mooney Ridge; and
- A temporary construction bridge southeast of the dam.

1.6.1.10 2004 Dam Raise Project Authorization

In response to the 2002 LTS, Section 128 of the Energy and Water Development Appropriations Act of 2004 (P.L. 108-137) gave authorization for a 7-ft dam raise to increase reservoir storage and expand the range of storage space allocated for flood

control to 495,000 through 695,000 AF (Corps 2005a). The Act also authorized widening the spillway of L.L. Anderson Dam (French Meadows Reservoir), construction of a new permanent bridge downstream of Folsom Dam, and the modification of Folsom Dam's emergency release operation plan to allow for surcharge storage to an elevation of 484.5 ft without overtopping the emergency spillway gates while closed. This project is generally referred to as the "Dam Raise" project.

1.6.1.11 2005 American River Watershed Folsom Dam Modification Project Final EA/IS

Since the preparation of the 2001 Final EA/IS for the Folsom Dam Modification Project, new information and the development of additional projects led to more refinements of the Folsom Dam Modification Project. These refinements included paving access roads and construction of a Corps' resident office. Several actions in the previous 2001 Final EA/IS have been deferred as they are likely to be addressed in other projects (Corps 2005b). The environmental impacts of the Folsom Dam Modification Project refinements were addressed in the American River Watershed, California, Folsom Dam Modification Project Final EA/IS, dated October 2005. A FONSI was issued on October 19, 2005.

1.6.1.12 Folsom Bridge Supplemental EIS/EIR

The Folsom Bridge Project is a part of the Folsom Dam Raise Project. Section 128 of the Energy and Water Development Act of 2004 (P.L. 108-137) authorizes the building of a permanent bridge downstream of Folsom Dam. The Corps released the final Supplemental EIS/EIR for this project in September 2006 (Corps 2006).

1.6.1.13 Folsom Dam Modification and Folsom Dam Raise Projects Post Authorization Change (PAC) Report

This is a report currently being prepared by the Corps documenting recommended changes to Folsom Dam Modification and Folsom Dam Raise authorized projects. It is anticipated that these changes will include: (1) reducing flood risk to areas along the American River generally equivalent to the flood protection intended to be provided by the Folsom Dam Modification Project; and (2) at minimum, retaining opportunities to further flood protection provided by the Folsom Dam Raise Project. It is also anticipated that the recommended changes will include provisions to meet the Reclamation's objective of safely passing the PMF at Folsom Dam.

The updated information to be presented in the PAC report is necessary to accomplish the following:

- Demonstrate consistency of recommended changes with existing Congressional project authorizations;

- Report on changes to project accomplishments and benefits, and Federal interest in the Project; and
- Serve as the basis for a new Project Cooperation Agreement (PCA) between Federal government and non-federal sponsors.

As a companion to the PAC report, Reclamation will prepare a Modification Report. The Modification Report will discuss the feasibility of dam safety improvements at Folsom Dam as part of Reclamation's Nationwide Safety of Dams Program. Besides the Folsom DS/FDR, the Modifications Report will discuss other dam safety actions outside the Folsom DS/FDR. These include structural modifications to improve static and seismic stability.

1.6.2 Reclamation's Safety of Dams

1.6.2.1 MIAD Seismic Issues

In the 1990's, Reclamation, in cooperation with the Corps, began a program to correct the seismic issues previously identified at MIAD. Phase I was initiated in 1990 and involved treatment of the upstream foundation materials of MIAD. Phase II occurred from 1993 to 1994 and involved the treatment of the downstream foundation of MIAD. After Phase II, testing by Reclamation revealed that methods to densify the foundation at MIAD did not fully treat the lower portion of the foundation and the risk of potential liquefaction of the foundation during seismic activity remains great enough to justify further actions (Reclamation 2005).

1.6.2.2 Reclamation's Safety of Dams Program

The Safety of Dams Act (P.L. 95-578) was enacted in 1978, and later amended in 1984 (P.L. 98-404). According to this Act, Reclamation is responsible for identifying potential risks with all existing Reclamation-owned dams. If unacceptable risks are identified, Reclamation is authorized to take corrective actions to reduce these risks. Section 2 of P.L. 98-404 states:

"In order to preserve the structural safety of Bureau of Reclamation dams and related facilities, the Secretary of the Interior is authorized to perform such modifications as he determines to be reasonably required" (Reclamation 2003).

The objective of Reclamation's Safety of Dams Program is "To ensure Reclamation dams do not present unacceptable risk to public safety and welfare, property, the environment, or cultural resources" (Reclamation 2003). The program includes an in-depth risk analysis that is performed on Reclamation dams to identify and address unacceptable risks.

The risk analysis process by Reclamation has several key steps. First, a baseline risk analysis is performed to determine the risks of the existing structure as it is currently

operated. Risk from any failure mode is expressed as the product of the loading, likelihood of failure (among the loading categories – static, seismic, or hydrologic), and the consequences. Risk at any facility is the sum of the risk for all the failure modes. Facilities with higher risks have increased justification to take actions to reduce risk (Reclamation 2005). There are generally two different types of baseline risk analysis; the Comprehensive Facility Review (CFR) and the Issue Evaluation Risk Analysis. The CFR, the initial method that was used to evaluate the risks at the Folsom Facility, identified the baseline risks by defining the loading conditions, failure modes, and consequences for seismic, static, and hydrologic load categories.

Due to the risks identified in the CFR conducted in 2000 for the Folsom Facility, an Issue Evaluation Risk Analysis was performed to more rigorously establish the baseline risk. Following this analysis, a risk reduction analysis was performed, where various alternatives were compared to the baseline condition outlined above to evaluate their potential to reduce the identified risks (Reclamation 2003). This step is only taken when the baseline risk analysis indicates that unacceptable risks have been identified and corrective actions are necessary. First, there is a Corrective Action Alternatives Analysis to develop alternatives that could reduce risks to acceptable levels. The effectiveness of the alternatives is generally not quantified at this level. This is followed by an Alternative Evaluation Analysis, which fully examines the alternatives and their ability to reduce risks. At this stage, the risks are quantified using all available information.

The following describes how Reclamation’s Safety of Dams risk analysis process has been applied to the Folsom Facility, as outlined in Table 1-1.

Table 1-1 Overview of Reclamation’s Safety of Dams Risk Analysis Process⁽¹⁾			
Category	Type	Analysis Completed at Folsom Facility?	Corresponding Document
Baseline Risk Analysis	1. Portfolio Risk Analysis	Ongoing	
	2. Comprehensive Facility Review	YES, Completed in 2000 ⁽²⁾	Completed in 2000.
	3. Issue Evaluation Risk Analysis	Ongoing	
Risk Reduction Analysis	Alternative Identification	YES, Completed in 2005	1) Folsom Dam Safety of Dams - Corrective Action Study Scoping Report, Oct. 2005. 2) Folsom Facility Safety of Dams - Requirements and Concepts, Feb. 2005.
	Alternative Evaluation	Ongoing	1) Project Alternatives Solutions Study (PASS I), Oct. 2005. 2) Project Alternatives Solutions Study (PASS II), April 2006.

⁽¹⁾Source: Reclamation 2003

⁽²⁾Source: Corps et al. 2006a

1.6.2.3 2000 Comprehensive Facility Review

As part of their Safety of Dams Program, Reclamation completed a CFR and analysis of risk at the Folsom Facility in 2000. Several potential hydrologic, seismic and static failure modes were identified during the review as having a high likelihood of occurring. Hydrologic issues at the Folsom Facility include ability of the Folsom Facility to safely contain and pass a major flood event. Seismic, or earthquake, issues at the Folsom Facility include the instability of the Main Concrete Dam leading to the potential failure of the spillway gates and piers (Reclamation 2005f). The instability of the foundation of MIAD is also a seismic concern because the foundation has been constructed on mine and dredge tailings and could have the potential to liquefy during seismic activity. Static issues, which are those that occur during normal daily operations, include potential seepage and piping of the wing dams and dikes (Reclamation 2005f). Reclamation's Draft Folsom Dam, Safety of Dams Corrective Action Study Scoping Report, October 2005, provides an overview of the various hydrologic, seismic, and static failure modes identified at the Folsom Facility.

Results of Reclamation's analyses have determined that several of the risks associated with the hydrologic, seismic, and static failure modes are so high, action is required to reduce risk in an expedited fashion. Although the probability of dam and dike failure is low, the consequences of failure are extremely high because of the large downstream population and the volume of water that would be released (Reclamation 2005f).

1.6.2.4 2004 Corrective Action Study

Reclamation began a corrective action study (CAS) in 2004 to develop corrective action alternatives to address all dam safety issues identified in the CFR and the concerns previously identified at MIAD. During development of the CAS, Reclamation worked with the Corps Modification and Raise Projects to share information and develop actions to reduce hydrologic risk (Reclamation 2005). The CAS is currently underway and is scheduled for completion in the Fall of 2006.

1.6.2.5 2005 Folsom Dam Road Access Restriction EIS

On February 8, 2003, Reclamation closed Folsom Dam Road indefinitely pending a final decision through a public involvement process. Reclamation cited national security concerns as the basis for this action. The 2005 Folsom Dam Road Access Restriction EIS outlines the potential impacts of a permanent closure. Considering these impacts, Reclamation's final ROD was partial road opening conditioned upon security upgrades funded by the City of Folsom.

1.6.3 Folsom DS/FDR

Plans and specifications for the Corps' Folsom Dam Modification Project were prepared in 2003 and 2004, and contractor bids solicited in 2005. The returned bids

were nearly three times higher than the government estimate. The high bid estimates were largely due to costly non-standard construction methods that would need to be employed to safely enlarge the existing outlets without taking the reservoir out of service during the construction period.

Consequently, dam operations and performance and alternate structural methods to achieve the flood protection provided by the outlet modifications were reexamined. Subsequent studies also found that modification of the two outboard lower tier outlets was infeasible, and offered only a marginal increase in performance. Because of delays and technical problems associated with implementing the Folsom Dam Modification Project authorized in the WRDA of 1999, and compatibility with the potential to raise Folsom Dam and ongoing dam safety issues at the Folsom Facility, there is now an emphasis on considering these individual projects together, which is the subject of this EIS/EIR.

Reclamation and the Corps had previously been working together to develop alternatives to address the multiple issues at the Folsom Facility, while meeting each agency's objectives. In response to the Folsom Modification bids issue, the agencies initiated a comprehensive value planning process in September of 2005, referred to as the Project Alternatives Solutions Study (PASS). The purpose of the PASS process was to identify potential alternatives for a common project that provided minimum 1/200 year flood protection and addressed the hydrologic risk reduction for the Folsom Facility (Reclamation et al. 2005). The PASS process consisted of three separate phases: PASS I reported in October 2005 identified 5 potential alternatives. Following a detailed examination of the most probable PASS I alternatives, PASS II (April 2006) reported the results of a gated spillway and raise combinations according to very specific criteria established by the Oversight Management Group. The tertiary effort, directed by the Oversight Management Group, focused on maximizing the spillway potential and minimizing the amount of raise required. This PASS II Optimization effort, which further refined the gated spillway alternative to the JFP (as defined in Section 1.4), is the result of this three stage process.

1.6.4 Joint Federal Project Coordination

The Energy and Water Development Appropriations Act of 2006 included language supporting Reclamation's and the Corps' collaboration in determining a joint dam safety and flood damage reduction project. According to Section 128 of the Act:

“American River Watershed, California (Folsom Dam and Permanent Bridge)-

(a) COORDINATION OF FLOOD DAMAGE REDUCTION AND DAM SAFETY- The Secretary of the Army and the Secretary of the Interior are directed to collaborate on authorized activities to maximize flood damage reduction improvements and address dam safety needs at

Folsom Dam and Reservoir, California. The Secretaries shall expedite technical reviews for flood damage reduction and dam safety improvements. In developing improvements under this section, the Secretaries shall consider reasonable modifications to existing authorized activities, including a potential auxiliary spillway. In conducting such activities, the Secretaries are authorized to expend funds for coordinated technical reviews and joint planning, and preliminary design activities.”

The Folsom DS/FDR EIS/EIR will meet the requirements of the Energy and Water Development Appropriations Act of 2006 by evaluating the JFP and other alternatives that meet Reclamation’s dam safety hydrologic objective and the Corps’ flood damage reduction objective. In addition, this EIS/EIR evaluates a range of alternatives that address other stand-alone flood damage reduction and dam safety (seismic and static) and security actions at the Folsom Facility.

1.6.5 Related Authorized Projects

Table 1-2 below presents a list of current authorized projects as they pertain to the Folsom Facility. The table includes: (1) projects that are evaluated in this document as part of the Folsom DS/FDR alternatives addressed in this EIS/EIR; and (2) projects that are not evaluated as part of the Folsom DS/FDR alternatives, because they will be completed by their respective agencies independent of the Folsom DS/FDR, but are considered in the EIS/EIR relative to cumulative effects.

1.7 Folsom DS/FDR Purpose and Need and Project Objectives

As described in Section 1.1 above, the Folsom Facility consists of 4 dams and 8 dikes, which impound flows on the American River forming Folsom Reservoir, and is a critical component of the CVP. The Folsom Facility was constructed between 1948 and 1956 by the Corps as a multi-purpose facility operated for flood control, M&I water supply, agricultural water supply, power, fish and wildlife, recreation, and water quality benefits. Upon completion of construction of the dams and dikes, ownership of the Folsom Facility was transferred to Reclamation for operation and maintenance as a financially and operationally integrated feature of the CVP. The Folsom Powerplant construction, which began in 1952 and was completed in 1956, was supervised by Reclamation.

Table 1-2 Related Authorized Projects					
Agency	Project Name	Brief Description	Authorization	Current Document or Report for Project	Analyzed in Folsom DS/FDR EIS/EIR
Corps	Dam Raise	Dam raise of 7 ft to dams and dikes, ecosystem restoration.	Energy and Water Development Appropriations Act of 2004 (P.L. 108-137)	<i>American River Watershed Long-Term Study (LTS) Final Supplemental Plan Formulation Report EIS/EIR, February 2002</i>	YES – the types of improvements included in the range of alternatives being considered for the DS/FDR are equivalent to, and would replace, the Dam Raise Project
Corps	Upstream and Downstream Levee Modifications ("Common Features Project")	Strengthening Levees along American and Sacramento Rivers.	1) Department of Defense Appropriations Act of 1993, Section 9159 (P.L. 102-396), 2) Section 101 of the Water Resources Development Act of 1996, 3) Section 366 and 102 of the Water Resources Development Act of 1999 (P.L. 106-53)	1) <i>1996 American River Watershed Project Supplemental Information Report,</i> 2) <i>Corps 1999 American River Watershed, California, Information Paper</i>	YES - While not included as part of the alternatives being considered for the DS/FDR, the Common Features Project is recognized as a Related Project in the Cumulative Effects analysis
Corps	Folsom Dam Modification Project	Modify existing outlets, create new outlets, modify surcharge storage.	Section 101 (a) (6) of the Water Resources Development Act of 1999 (P.L. 106-53)	<i>American River Watershed, California, Folsom Dam Modification Project EA/IS, (and 2002 LTS EIS/EIR)</i>	YES – the types of improvements included in the range of alternatives being considered for the DS/FDR are equivalent to, and would replace, the Modification project
Reclamation	Safety of Dams Corrective Action Study	Potential dam raise, static, seismic, and security fixes, tunnel, new auxiliary spillway.	Safety of Dams Program - P.L. (95-578) November 1978, as amended by P.L. (98-404) August 1984	<i>Draft Folsom Dam, Safety of Dams Corrective Action Study Scoping Report, October 2005</i>	YES – the types of improvements included in the range of alternatives being considered for the DS/FDR include dam raise, hydrologic, static, seismic, and security fixes

Both Reclamation and the Corps share in the responsibility of ensuring that the Folsom Facility is maintained and operated under their respective agency's dam safety regulations and guidelines, as defined by Congress. Reclamation is responsible for dam safety, operations, and maintenance at Folsom Dam. Reclamation operates and maintains the Folsom Facility to supply agricultural, M&I water users, hydroelectric power, and recreational opportunities and is responsible for the dam safety program. The Corps is responsible for flood damage reduction capitol improvements and establishing flood operation requirements at Folsom. The Corps provides regulations governing the flood damage reduction operations of the dam by setting release criteria and flood storage requirements during critical seasons.

As a part of their responsibilities, Reclamation and the Corps have determined that the Folsom Facility requires structural improvements to increase overall public safety above existing conditions by improving the facilities' ability to reduce flood damages and address dam safety issues posed by hydrologic (flood), seismic (earthquake), and static (seepage) events and security issues at the facility. These events have a low probability of occurrence in a given year, however due to the large population downstream of Folsom Dam, modifying the facilities is prudent and required to improve public safety above current baseline conditions.

Reclamation has identified the need for expedited action to reduce hydrologic, static, and seismic risks under its Safety of Dams Program and security issues under its Security Program. The identified risks are among the highest of all dams in Reclamation's inventory and the Folsom Facility is among Reclamation's highest priorities within its Safety of Dams Program. Additionally, there is a need to upgrade security infrastructure at the Folsom Facility under Reclamation's Safety, Security and Law Enforcement (SSLE) Program. Reclamation's primary interest for participating in the Folsom DS/FDR is to realize an expedited improvement in overall public protection and cost sharing benefits of a combined project.

The Corps, in partnership with the non-federal sponsors, has determined that Folsom Reservoir does not have sufficient release capacity to adequately manage severe flood flows nor do the downstream levees have sustained capacity to exceed base flood event flows of 145,000 cfs (Corps letter to SAFCA dated December 9, 2004).

The non-federal sponsors have identified the need to reduce the risk of flooding in the Sacramento area. Due to the number and value of the exposed structures and the size of the population at risk, Sacramento has been identified as one of the most at risk communities in the nation. Consequently, there is a need to expeditiously reduce this risk through interim and permanent flood damage reduction measures. The goal of non-federal sponsors is to achieve at least a 200-year level of flood protection (same as 1/200 year flood protection) for the Sacramento area as anticipated in the Congressionally authorized Folsom Dam Modification and Folsom Dam Raise

Projects. Pursuit of this goal constitutes non-federal sponsors' primary interest for participating in the Folsom DS/FDR actions.

Both Reclamation and the Corps have conducted engineering studies to identify potential corrective measures for the Folsom Facility to alleviate seismic, static, and hydrologic dam safety issues, and flood management concerns. These two federal agencies have combined their efforts resulting in (1) a Joint Federal Project for addressing Reclamation's dam safety hydrologic risk and the Corps' flood control objectives and (2) other stand-alone flood control and dam safety actions to be completed by the respective agencies in a coordinated manner. Among the latter are separate, but related, downstream levee projects that are underway to increase flood protection along the lower American River.

1.7.1 Statement of Purpose and Need

There is a need to expeditiously implement engineering measures for the Folsom Facility in order to reduce potential failure due to seismic, static, and hydrologic conditions. There is also a need to incrementally increase minimum flood protection via flood storage capacity and/or reservoir pool release mechanisms. Furthermore, there is a need to implement security improvements at the Folsom Facility consistent with designation as a National Critical Infrastructure Facility. The purpose of the Folsom DS/FDR is to increase overall public safety, ensure the reliability of local power and water supply, and maintain an important recreational resource by: (1) expediting corrective action to address risks identified with the structural integrity of Folsom Dam and appurtenant structures in accordance with Reclamation's Public Protection Guidelines; (2) incrementally improving the flood management capacity of the Folsom facility to meet or exceed the 200-year recurrence level; and (3) upgrading security infrastructure at the Folsom Facility.

1.7.2 Project Objectives

In addition to the underlying purpose of the project above, specific project objectives were developed to meet CEQA guidelines. The CEQA-related project objectives are:

- Expeditiously reduce hydrologic (flooding) risk of overtopping-related failure of any retention structure during a PMF event in accordance with Reclamation's Public Protection Guidelines;
- Expeditiously reduce the risk of structural failure of any retention structure during a potential seismic (earthquake) event in accordance with Reclamation's Public Protection Guidelines;

- Expeditiously reduce the risk of structural failure of any retention structure during a potential static (seepage) event in accordance with Reclamation’s Public Protection Guidelines;
- Expeditiously improve the security infrastructure at the Folsom Facility in accordance with Reclamation’s Public Protection Guidelines; and
- Expeditiously improve the flood management capacity of the facilities in a manner functionally equivalent to the Corps authorized projects.

1.8 Study Area

The Folsom DS/FDR study area includes the area surrounding the Folsom Facility. The Folsom Facility falls within the borders of Placer, Sacramento, and El Dorado Counties, in the State of California. The study area mainly consists of Federally-owned lands that are currently leased to and managed by the California Department of Parks and Recreation. Figure 1-4 shows the location of the Folsom DS/FDR general study area within central California. Several resource categories have expanded the study area of their impacts analysis to include local roads, highways, and other areas that occur outside the Federally-owned lands.



Figure 1-4
Location of Folsom DS/FDR Study Area

The actions evaluated in this EIS/EIR include five project alternatives as well as the alternative of not implementing the Folsom DS/FDR actions, the No Project/No Action Alternative. Direct and indirect effects and cumulative impacts are evaluated, as appropriate, for each resource area.

1.9 Summary of Scoping Activities and Issues

Federal, State, and local agencies, and other interested parties have participated in the NEPA and CEQA process leading to the development of the Folsom DS/FDR alternatives presented in this EIS/EIR. In 2005, Reclamation, the Corps, DWR/Reclamation Board, and SAFCA held three public scoping meetings in the

City of Granite Bay, the City of Folsom, and the City of Sacramento, respectively. The results of these scoping meetings, including comments and concerns raised during the meetings, as well as public comments obtained during the public comment period, are presented in the *Folsom Dam Combined Federal Effort Scoping Meeting Summary Report, 2006* (See Appendix A). Major issues and concerns raised during the public scoping process include:

- What is the role of each of the agencies and how will the two Federal agencies interact in completing the project?
- What are the major impacts from this project and how will they be mitigated?
- How will traffic be affected?
- What level of safety will the new dam features provide?
- What downstream effects will the new facilities have?
- How will agencies keep the public informed about future meetings and other project updates?
- What will the impacts be on local homeowners during construction?
- What are the recreational, cultural, and natural resource impacts and how will they be mitigated?

1.10 Federal, State, and Local Requirements

The Folsom DS/FDR actions must fulfill or comply with the Federal, State, regional, and local environmental requirements as described below. Chapter 3 provides additional details on regulations specific to each environmental resource, and Chapter 6 provides details on compliance efforts for applicable regulations.

1.10.1 Federal Requirements

1.10.1.1 National Environmental Policy Act

NEPA (42 USC 4321; 40 CFR 1500.1) applies to all Federal agencies and to most of the activities they manage, regulate, or fund that affect the environment. It requires all agencies to disclose and consider the environmental implications of their proposed actions. NEPA establishes environmental policies, provides an interdisciplinary framework for preventing environmental damage, and contains “action-forcing” procedures to ensure that Federal agency decision-makers take environmental factors into account.

NEPA requires the preparation of an appropriate document to ensure that Federal agencies accomplish the law’s purposes. The President’s Council on Environmental

Quality (CEQ) has adopted regulations and other guidance, including detailed procedures that Federal agencies must follow, to implement NEPA. CEQ regulations, Section 1506.6 includes provisions for public involvement. Agency pursuit of public involvement may include:

- Providing public notice of NEPA-related hearings, public meetings, and the availability of environmental documents;
- Holding or sponsoring public hearings or public meetings;
- Soliciting appropriate information from the public;
- Explaining in its procedures where interested persons can get information or status reports on EISs and other elements of the NEPA process; and
- Making EISs, the comments received, and any underlying documents available to the public pursuant to the provisions of the Freedom of Information Act (5 U.S.C. 552).

Reclamation and the Corps will use this EIS/EIR to comply with CEQ regulations and document NEPA compliance.

1.10.1.2 Federal Endangered Species Act

The Endangered Species Act (ESA) requires that both United States Fish and Wildlife Service (USFWS) and NMFS maintain lists of threatened species and endangered species. “Endangered species” are defined as “any species which is in danger of extinction throughout all or a significant portion of its range”; “threatened species” are defined as “any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range” (16 U.S.C.A. §1532). Section 9 of the ESA makes it illegal to “take” (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct) any endangered species of fish or wildlife and most threatened species of fish or wildlife (16 U.S.C.A. §1538). Section 7 of the ESA requires that Federal agencies consult with the USFWS and NMFS on any actions that may directly or indirectly affect a listed species (i.e., a species specifically recognized by USFWS or NMFS as being endangered or threatened), including as related to whether the action may destroy or adversely modify critical habitat. Critical habitat is defined as the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of Section 4 of the ESA, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of the Act, upon a determination by the Secretary that such areas are essential for the conservation of the species (16

U.S.C.A. §1532). NMFS' jurisdiction under the ESA is limited to the protection of marine mammals and fishes and anadromous fishes (i.e., fish born in fresh water that migrate to the ocean to grow into adults and then return to fresh water to spawn); all other species are within the USFWS' jurisdiction.

Section 7 of the ESA requires that all Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of habitat critical to such species' survival. To ensure against jeopardy, each Federal agency must consult with the USFWS or NMFS, or both, regarding Federal agency actions. The consultation is initiated when the Federal agency determines that its action may affect a listed species and submits a written request for initiation to the USFWS or NMFS, along with the agency's biological assessment of its proposed action. If the USFWS or NMFS concurs with the action agency that the action is not likely to adversely affect a listed species, the action may be carried forward without further review under the ESA. Otherwise, the USFWS or NMFS, or both, must prepare a written biological opinion describing how the agency action will affect the listed species and its critical habitat.

With respect to the Folsom DS/FDR, a draft biological opinion from USFWS will be obtained prior to completion of the Final EIS/EIR.

1.10.1.3 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) establishes a management system for national marine and estuarine fishery resources. This legislation requires that all Federal agencies consult with NMFS regarding all actions or proposed actions permitted, funded, or undertaken that may adversely affect "essential fish habitat." Essential fish habitat is defined as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The legislation states that migratory routes to and from anadromous fish spawning grounds are considered essential fish habitat. The phrase "adversely affect" refers to the creation of any impact that reduces the quality or quantity of essential fish habitat. Federal activities that occur outside of an essential fish habitat but that may, nonetheless, have an impact on essential fish habitat waters and substrate must also be considered in the consultation process. Under the Magnuson-Stevens Act, effects on habitat managed under the Pacific Salmon Fishery Management Plan must also be considered.

The Magnuson-Stevens Act states that consultation regarding essential fish habitat should be consolidated, where appropriate, with the interagency consultation, coordination, and environmental review procedures required by other Federal statutes, such as NEPA, the Fish and Wildlife Coordination Act (FWCA), the Clean Water Act, and the ESA. Essential fish habitat consultation requirements can be satisfied through concurrent environmental compliance if the lead agency provides

NMFS with timely notification of actions that may adversely affect essential fish habitat and if the notification meets requirements for essential fish habitat assessments.

With respect to the Folsom DS/FDR actions, compliance with this act will be accomplished through consultation with NMFS. Consultation had been initiated at the time of release of this Draft EIS/EIR.

1.10.1.4 Fish and Wildlife Coordination Act

The FWCA (16 USC 661 et seq.) requires Federal agencies to consult with USFWS, or, in some instances, with NMFS and with State fish and wildlife resource agencies before undertaking or approving water projects that control or modify surface water. The purpose of this consultation is to ensure that wildlife concerns receive equal consideration during water resource development projects and are coordinated with the features of these projects. The consultation is intended to promote the conservation of fish and wildlife resources by preventing their loss or damage and to provide for the development and improvement of fish and wildlife resources in connection with water projects. Federal agencies undertaking water projects are required to fully consider recommendations made by USFWS, NMFS, and State fish and wildlife resource agencies in project reports and to include measures to reduce impacts on fish and wildlife in project plans.

With respect to the Folsom DS/FDR, a draft Coordination Act Report and incremental analysis of potential mitigation have been completed and are included as appendices to this EIS/EIR.

1.10.1.5 Farmland Protection Policy Act and Memoranda on Farmland Preservation

Federal agencies are required to assess the potential effects of proposed Federal actions on prime and unique farmland under the Farmland Protection Policy Act (FPPA) of 1981 and the Memoranda on Farmland Preservation, dated August 30, 1976, and August 11, 1980, respectively. Federal agencies must examine potential effects before taking any action that could result in converting designated prime or unique farmland for nonagricultural purposes. If there are potentially adverse effects on farmland preservation, the Federal agencies may consider alternative actions to lessen those effects. To the extent practicable, Federal agencies may create programs that are compatible with State, local, and private programs to protect farmland. The Natural Resource Conservation Service is responsible for identifying prime or unique farmland that might be affected.

With respect to the Folsom DS/FDR, the potential impacts to farmlands have been addressed within the context of the EIS/EIR analysis, and is presented in Section 3.8.

1.10.1.6 National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966, as amended, is the principal legislation that guides cultural resource management for Federal agencies. Section 106 of NHPA requires that Federal agencies take into account the effects of an undertaking on historic properties and provide the Advisory Council on Historic Preservation (ACHP) an opportunity for comment.

The Section 106 review process is described in 36 CFR 800. The five steps in this process include: 1) initiation of the Section 106 process by identifying interested parties and determine an area of potential effect; 2) identify historic properties; 3) assessments of the effects of the undertaking on historic properties; and 4) preparation of an agreement document to resolve adverse effects on historic properties. The ACHP is notified of any adverse effects to historic properties and invited to participate in the agreement document. The Section 106 process requires consultation throughout each phase with the State Historic Preservation Officer (SHPO), Indian tribes, and interested parties.

With respect to the Folsom DS/FDR, consultation with SHPO has been initiated and various cultural resource surveys have been conducted, as described in Section 3.11.

1.10.1.7 Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899 regulates alteration of (and prohibits unauthorized obstruction of) any navigable waters of the United States. Construction of any bridge, dam, dike or causeway over or in navigable waterways of the U.S. is prohibited without Congressional approval. Construction plans for a bridge or causeway must be submitted to and approved by the Secretary of Transportation, while construction plans for a dam or dike must be submitted to and approved by the Chief of Engineers and Secretary of the Army. Excavation or fill within navigable waters requires the approval of the Chief of Engineers and the Secretary of the Army.

As a cooperating agency with specific responsibilities for completion of portions of the Folsom DS/FDR actions, the Corps will also be responsible for ensuring compliance with this Act.

1.10.1.8 Clean Air Act

The Federal Clean Air Act (CAA) established national ambient air quality standards (NAAQS) in 1970 for six pollutants: carbon monoxide, ozone, particulate matter, nitrogen dioxide, sulfur dioxide, and lead. Areas that do not meet the ambient air quality standards are called nonattainment areas. The CAA requires states to submit a State Implementation Plan (SIP) for nonattainment areas. The U.S. Environmental Protection Agency (USEPA) reviews the SIP and must delineate how the Federal standards will be met. States that fail to submit a plan or to secure approval may be

denied Federal funding and/or required to increase emission offsets for industrial expansion. The 1990 Amendments to the CAA established categories of air pollution severity for nonattainment areas, ranging from “marginal” to “extreme.” SIP requirements vary, depending on the degree of severity.

The conformity provisions of the CAA are designed to ensure that Federal agencies contribute to efforts to achieve the NAAQS. USEPA has issued two regulations implementing these provisions. The general conformity regulation addresses actions of Federal agencies other than the Federal Highway Administration and the Federal Transit Administration. General conformity applies to a wide range of actions or approvals by Federal agencies. Projects are subject to general conformity if they exceed emissions thresholds set in the rule and are not specifically exempted by the regulation. Such projects are required to fully offset or mitigate the emissions caused by the action, including both direct emissions and indirect emissions over which the Federal agency has some control.

With respect to the Folsom DS/FDR, a General Conformity Determination will be completed prior to issuance of the ROD. Section 3.3 of the EIS/EIR addresses CAA considerations.

1.10.1.9 Executive Order 12898 – Environmental Justice

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority and Low-Income Populations,” requires that Federal agencies identify and address any disproportionately high and adverse human health or environmental effects of Federal actions on minority and low-income populations and assure that Federal actions do not result directly or indirectly in discrimination on the basis of race, color, national origin, or income. Federal agencies must provide opportunities for input by affected communities into the NEPA process and must evaluate the potentially significant and adverse environmental effects of proposed actions on minority and low-income communities during environmental document preparation. Even if a proposed Federal project would not result in significant adverse impacts on minority and low-income populations, the environmental document must describe how the NEPA process addressed Executive Order 12898.

With respect to the Folsom DS/FDR, an environmental justice evaluation has been completed within the context of the EIS/EIR analysis, and is presented in Section 3.19.

1.10.1.10 Clean Water Act

The objective of the Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of the waters of the United States. The CWA establishes regulations for the discharge of pollutants into United States waters.

Section 401

Section 401 of the CWA (33 USC 1251 et seq.) requires that proposed actions with federal agency involvement that may result in a discharge of a pollutant into waters of the United States must not violate federal or state water quality standards. In addition, Section 401 states that any applicant for a Federal license or permit to conduct any activity including construction or operation of facilities which may result in discharge to navigable waters must provide the licensing or permitting agency a certification from the state in which the discharge originates stating that the discharge will comply with the applicable provisions of Sections 301 Effluent Limitations, 302 Water Quality Related Effluent Limitations, 303 Water Quality Standards and Implementation Plans, 306 National Standards of Performance, and 307 Toxic and Pretreatment Effluent Standards of the CWA. With respect to the Folsom DS/FDR, Section 401 certification will be completed prior to initiation of construction activities.

Section 402

Section 402 of the CWA requires that all point sources that discharge pollutants into the waters of the United States must obtain a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits are issued by the state and contain industry specific standards and limits and establish pollutant monitoring and reporting requirements. With respect to the Folsom DS/FDR, NPDES permits will be obtained, as necessary, prior to construction.

Section 404

Section 404 of the CWA requires a permit to be obtained from the Corps for the discharge of dredged or fill material into the waters of the United States. A section 404 permit for the Folsom DS/FDR will be obtained, as necessary, prior to any action involving placement of materials within waters of the United States. Appendix D of this EIS/EIR introduces requirements for the Section 404 permit.

1.10.1.11 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (MBTA) is the domestic law that implements four international treaties and conventions between the U.S. and Canada, Japan, Mexico, and Russia, providing protection of migratory birds. Each of the conventions protects selected species of migratory birds that are common to both the U.S. and one or more of the other involved countries. This act makes it unlawful for any person to hunt, kill, capture, collect, possess, buy, sell, purchase, import, export, or barter any migratory bird, including the feathers, parts, nests, eggs, or migratory bird products. The MBTA does not protect the habitat of migratory birds. With respect to the Folsom DS/FDR, compliance with the MBTA will be stipulated as part of the construction requirements of the selected alternative. Mitigation measures reflecting compliance with this act are provided in Section 3.5.4.

1.10.1.12 Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, known as the "Uniform Act" (P.L. 91-646), provides for the uniform and equitable treatment of people displaced from their residences, businesses, farms, and nonprofit organizations as a result of Federal programs and projects. The Uniform Act sets the minimum standards for compensation and relocation assistance for the appraisal and acquisition of real property and sets the minimum standards for relocation advisory services and financial assistance for persons that must relocate as a result of the public acquisition of real property. Any displaced person or entity must be offered relocation assistance services for the purpose of locating suitable replacement property. The Corps, should a raise be implemented as part of a flood damage reduction action, would be responsible for compliance with this act.

1.10.1.13 National Wild and Scenic Rivers Act

The National Wild and Scenic Rivers Act (P.L. 90-542; 16 USC 1271-1287) was established to preserve the free flowing condition and outstanding values of the nation's rivers. Rivers with unique scenery, recreational opportunities, cultural features, or other similar values are designated under this Act. Section 7 of the Act prohibits federal licensing of new hydroelectric developments on all rivers designated under the Act. It also prohibits federal funding or construction of projects that would inhibit the free flowing condition and outstanding values of designated rivers. The Act requires federal agencies to manage each river in a way that protects and enhances the values for which the river was originally designated. The management of each river is based on the level of development at the time of designation. The lower American River is designated a wild and scenic river. The Folsom DS/FDR would not affect flows or the wild and scenic designation of the lower American River.

1.10.2 State Requirements

1.10.2.1 California Environmental Quality Act

CEQA (Public Resource Code 21000 et seq.) is regarded as the foundation of environmental law and policy in California. CEQA's primary objectives are to:

- Disclose to decision-makers and the public the significant environmental effects of proposed activities;
- Identify ways to avoid or reduce environmental damage;
- Prevent environmental damage by requiring implementation of feasible alternatives or mitigation measures;

- Disclose to the public the reasons for agency approval of projects with significant environmental effects;
- Foster interagency coordination in the review of projects; and
- Enhance public participation in the planning process.

CEQA applies to all discretionary activities that are proposed or approved by California public agencies, including State, regional, county, and local agencies, unless an exemption applies. CEQA requires that public agencies comply with both procedural and substantive requirements. Procedural requirements include the preparation of the appropriate environmental documents, mitigation measures, alternatives, mitigation monitoring, findings, statements of overriding considerations, public notices, scoping, responses to comments, legal enforcement procedures, citizen access to the courts, notice of preparation, agency consultation, and State Clearinghouse review.

CEQA's substantive provisions require that agencies address environmental impacts, disclosed in an appropriate document. When avoiding or minimizing environmental damage is not feasible, CEQA requires that agencies prepare a written statement of the overriding considerations that resulted in approval of a project that will cause one or more significant effects on the environment. CEQA establishes a series of action-forcing procedures to ensure that agencies accomplish the purposes of the law. In addition, under the direction of CEQA, the California Resources Agency has adopted regulations, known as the State CEQA Guidelines, which provide detailed procedures that agencies must follow to implement the law.

This EIS/EIR is intended to document compliance with all relevant CEQA guidelines and CEQA requirements, including as related to approvals and actions by SAFCA and DWR/Reclamation Board for improvements under the Folsom DS/FDR.

1.10.2.2 California Endangered Species Act

The California Endangered Species Act (CESA) (Fish and Game Code Sections 2050 to 2097) is similar to the ESA. California's Fish and Game Commission is responsible for maintaining lists of threatened and endangered species under the CESA. CESA prohibits the "take" of listed and candidate (petitioned to be listed) species. "Take" under California law means to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch capture, or kill." (California Fish and Game Code, Section 86.) Since CDFG may authorize incidental take of listed species pursuant to a CDFG approved Natural Community Conservation Plan (NCCP) (See Section 1.10.2.3, below, for a description of the NCCP Act.). The mitigation measures presented in Section 3.5.4, when implemented, will comply with this act.

1.10.2.3 Natural Community Conservation Planning Act

The Natural Community Conservation Planning Act (NCCPA), California Fish and Game Code, Section 2800, et seq., was enacted to form a basis for broad-based planning to provide for effective protection and conservation of the State's wildlife heritage, while continuing to allow appropriate development and growth. The purpose of natural community conservation planning is to sustain and restore those species and their habitat identified by California Department of Fish and Game (CDFG) that are necessary to maintain the continued viability of biological communities impacted by human changes to the landscape. A NCCP identifies and provides for those measures necessary to conserve and manage natural biological diversity within the plan area while allowing compatible use of the land. CDFG may authorize the take of any identified species, including listed and non-listed species, pursuant to Section 2835 of the NCCPA, if the conservation and management of such species is provided for in an NCCP approved by CDFG. The mitigation measures presented in Section 3.5.4, when implemented, will comply with this act.

1.10.2.4 Porter-Cologne Water Quality Control Act of 1970

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) established the California State Water Resources Control Board (SWRCB) and nine regional water quality control boards (RWQCBs) as the primary State agencies with regulatory authority over California water quality and appropriative surface water rights allocations. The SWRCB administers the Porter-Cologne Act, which provides the authority to establish Water Quality Control Plans (WQCPs) that are reviewed and revised periodically. The Porter-Cologne Act also provides the SWRCB with authority to establish statewide plans.

The nine RWQCBs carry out SWRCB policies and procedures throughout the State. The SWRCB and the RWQCBs also carry out sections of the Federal CWA - administered by USEPA, including the NPDES permitting process for point source discharges and the CWA Section 303 water quality standards program.

WQCPs, also known as basin plans, designate beneficial uses for specific surface water and groundwater resources and establish water quality objectives to protect those uses. These plans can be developed at the SWRCB or the RWQCB level. RWQCBs issue waste discharge requirements for the major point-source waste dischargers, such as municipal wastewater treatment plants and industrial facilities. In acting on water rights applications, the SWRCB may establish terms and conditions in a permit to carry out WQCPs.

To comply with this act, the Folsom DS/FDR will complete a Storm Water Management Plan to control construction-related runoff and submit permit applications for any planned discharge to waters of the state.

1.10.2.5 Airborne Toxic Control Measures

The Airborne Toxic Control Measures (ATCMs) have been developed by the California Air Resources Board (ARB) to reduce the potential health and safety and environmental issues associated with various airborne toxics. The air pollution control and air quality management districts in the State of California are generally the agencies responsible for enforcement of the ATCMs. The ATCM regulations are found in Title 13 (Mobile Sources and Fuels) and Title 17 (All Other Sections) of the California Code of Regulations (CCR).

The Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations (See Title 17 CCR Section 93105) contains the requirements for construction operations that will disturb any portion of an area that is located in a geographic ultramafic rock (igneous rock with very little silica content) unit or that has naturally-occurring asbestos, serpentine, or ultramafic rock. Construction or grading operations on property where the area to be disturbed is greater than one acre require an Asbestos Dust Mitigation Plan to be submitted and approved by the air quality management district before the start of construction. The Asbestos Dust Mitigation Plan must be implemented at the beginning and must be maintained throughout the duration of the operation. In order to receive an exemption from this ATCM, a registered geologist must conduct a geologic evaluation of the property and determine that no serpentine or ultramafic rock is likely to be found in the area to be disturbed. This report must be presented to the executive officer or air pollution control officer of the air pollution control or air quality management district, who may then grant or deny the exemption.

The Asbestos Airborne Toxic Control Measure for Surfacing Applications (17 CCR Section 93106) applies to any person who produces, sells, supplies, offers for sale or supply, uses, applies, or transports any aggregate material extracted from property where any portion of the property is located in a geographic ultramafic rock unit or the material has been determined to be ultramafic rock, or serpentine, or material that has an asbestos content of 0.25 percent or greater. Unless exempt, the use, sale, application, or transport of material for surfacing is restricted, unless it has been tested using an approved asbestos bulk test method and determined to have an asbestos content that is less than 0.25 percent. Any recipient of such materials may need to be provided a receipt with the quantity of materials, the date of the sale, verification that the asbestos content is less than 0.25 percent, and a warning label. Anyone involved in the transportation of the material is required to keep copies of all receipts with the materials at all times.

Compliance with this act is discussed in Section 3.6, Soils, Minerals, and Geological Resources.

1.10.2.6 Environmental Justice

State law defines environmental justice in Government Code Section 65040.12(e) as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies. Government Code Section 65040.12(a) designates the Governor's Office of Planning and Research (OPR) as the coordinating agency in State government for environmental justice programs, and requires OPR to develop guidelines for incorporating environmental justice into general plans. While there is no existing state requirement that environmental justice be addressed as part of the environmental (CEQA) review for individual projects, Section 3.19 of this EIS/EIR discusses environmental justice considerations associated with the Folsom DS/FDR.

1.10.3 Local Requirements

A number of local requirements relate to the Folsom DS/FDR. The applicability of, and the project's compliance with, those requirements are considered in relevant sections of this EIS/EIR. The following lists such requirements and indicates, in parentheses, the EIS/EIR section(s) that addresses the requirements.

Placer County

- Placer County General Plan, August 19, 1994
- Placer County Air Pollution Control District Fugitive Dust and Asbestos Rules

Sacramento County

- Sacramento County General Plan, December 15, 1993
- City of Folsom General Plan, October 31, 1988
- Transportation Management Plan
- Sacramento Metropolitan Air Quality Management District Fugitive Dust and Asbestos Rules

El Dorado County

- 2004 El Dorado County General Plan - A Plan for Managed Growth and Open Roads; A Plan for Quality Neighborhoods and Traffic Relief, July 19, 2004
- El Dorado County Air Quality Management District Fugitive Dust and Asbestos Rules

1.11 Scope of this EIS/EIR

The impact analysis in this EIS/EIR includes all reasonably foreseeable Folsom DS/FDR construction actions that may occur from the time that the Folsom DS/FDR

ROD(s) is signed (anticipated May 2007) through the end of the construction period (potentially 2015, depending on funding level and availability).

In addition to the No Action/No Project Alternative, this EIS/EIR presents five action alternatives for implementing the types of improvements contemplated under the Folsom DS/FDR, termed Alternatives 1 through 5. The alternatives incorporate differing measures related to construction actions that could occur at each structure of the Folsom Facility during each phase of construction. This EIS/EIR analyzes the direct, indirect, and cumulative effects of each alternative. Within the evaluation of each alternative, the impacts of each construction action (see Chapter 3) are analyzed separately. The proposed Folsom DS/FDR structural modifications and their associated impacts are addressed to a level of detail considered reasonable and appropriate given existing project design and construction information and current data. It is possible, however, that the future resolution of current uncertainties related to final design, construction contract awarding and post-construction operation may result in changes and refinements to the project characteristics assumed in this EIS/EIR. Such changes and refinements, if material in nature, to the proposed actions may require further analyses, which would be provided in supplemental environmental compliance documentation, as required.

1.12 Scope of Effects Analysis

This EIS/EIR presents the impacts of the five action alternatives described in Chapter 2 and also considers the environmental implications of the No Action/No Project Alternative. The action alternatives incorporate proposed modifications to the 12 structures that comprise the Folsom Facility, borrow material development, processing of materials, stockpiling, and staging area development and use. The resource area analyses (Chapter 3) present the environmental effects of these alternatives to the level of detail possible with the current available information. As indicated above, supplemental environmental analyses may be required in the subsequent review and approval of any project changes or refinements that are material in nature and have the potential to result in environmental effects that are not addressed in this EIS/EIR.

Construction of the improvements under any of the five Folsom DS/FDR alternatives would not take place all at once, but would occur in several construction phases, some of which would overlap. The effects analysis takes into consideration these separate construction phases, which are described in detail in Chapter 2, Project Description and Project Alternatives.

The Folsom DS/FDR agencies recognize that any potential raise of the main dam and dikes could require the construction of numerous small flood protection berms in areas of low elevation. At this stage, details regarding the locations for additional flood protection berms and quantities of materials to construct them are in the

formulation stage; therefore, the berms are analyzed at a general, programmatic level in this document. Supplemental documents will be completed, as appropriate.

Additionally, determining the need for, and specific locations of, cofferdams facilitating in-reservoir construction and the specific locations for materials staging and stockpiling related to avoiding impacts to recreation areas is dependent upon the project design and construction specifications that will be developed at future more detailed levels of planning for the selected alternative. As such, a detailed analysis of those types of improvements and construction activities is not possible for this EIS/EIR; supplemental environmental review and documentation will be completed in conjunction with any future discretionary approvals for those improvements, pursuant to the requirements of NEPA and CEQA.

This document addresses reoperation of the Folsom Facility only at a general programmatic level and will not be used to initiate a change to current operations. Structural modification to any of the Folsom Facility requiring operational changes to fully realize project benefits, will not be fully utilized until operations are fully coordinated (i.e., the exact need for, and nature of, changes to the existing operations requirements of the Folsom Facility has been determined by, and between, the affected jurisdictional agencies based on the specific improvements approved as part of the selected Folsom DS/FDR alternative) and addressed in a supplemental EIS/EIR, and a separate ROD allowing such reoperation is signed.

1.13 Decisions to be Made

Reclamation, the Corps, DWR/Reclamation Board, and SAFCA decision-makers will use the Folsom DS/FDR EIS/EIR to help decide on the optimal alternative for meeting the Folsom DS/FDR objectives, based on a full understanding of the environmental consequences of each of the alternatives. Possible decision outcomes are:

- Take no action;
- Select Alternative 1, which includes a fuseplug Auxiliary Spillway, 0-ft raise of the concrete dam and strengthening the crest of key embankment structures;
- Select Alternative 2, which includes a fuseplug Auxiliary Spillway with a tunnel, and a 4-ft raise of all structures;
- Select Alternative 3, which includes a gated Auxiliary Spillway with a potential 3.5-ft parapet wall raise of all structures as incrementally justified for flood damage reduction purposes;

- Select Alternative 4, which includes a gated Auxiliary Spillway and a potential 7-ft raise of all structures as incrementally justified for flood damage reduction purposes; or
- Select Alternative 5, which includes a 17-ft raise of all structures but no auxiliary spillway.
- Select a subset and/or recombination of the alternative features listed above.

1.14 Uses of this Document

Agencies are also expected to use this document as the environmental analysis for:

- Approving permits. The permits anticipated for construction the Folsom DS/FDR actions include:
 - Air quality
 - Water discharge
 - Traffic Plan approval
 - 404 Dredge and Fill of wetlands
- Public review and to solicit public comments;
- Determining the environmentally preferred alternative;
- Helping to identify the Preferred Alternative;
- Developing Reclamation’s Modifications Report for submission to the Office of Management and Budget – Reclamation is required to submit this report if the costs for actual construction on Safety of Dams work will exceed \$1,250,000;
- Developing the Corps’ Post-Authorization Changes (PAC) Report – The Corps is required to submit this document to gain approval for changes made to the previously authorized project addressed in the Corps 2002 Long-Term Study Final Supplemental Plan Formulation Report EIS/EIR and the Folsom Dam Modification Project EA/IS; and
- Obtaining funding (SAFCA).

As indicated above, this document is not intended to initiate any formal change to current operations of the Folsom Facility, nor is it intended to provide the necessary NEPA/CEQA review for authorization of future reoperation of the Folsom Facility. Such reoperation of the Folsom Facility will be addressed in a supplemental EIS/EIR

at such time as the proposed changes in operations are fully formulated, analyzed, and coordinated.

1.15 Report Organization

The remaining chapters of this document are as follows:

- **Chapter 2 – Project Description and Project Alternatives** - Chapter 2 describes five action alternatives of the Folsom DS/FDR, plus the No Action/No Project Alternative, and explains how the agencies would complete construction work to address the issues at the Folsom Facility.
- **Chapter 3 – Affected Environment, Impacts Analysis, and Mitigation Measures** - Chapter 3 describes the affected environment, impacts analysis, and mitigation measures for resource areas including: hydrology, water quality and groundwater, water supply, air quality, aquatic resources, terrestrial vegetation and wildlife, soils, minerals, and geological resources, visual resources, agricultural resources, transportation and circulation, noise, cultural resources, land use, planning, and zoning, recreation, utilities and public services, hydropower, population and housing, public health and safety, Indian Trust Assets, and environmental justice.
- **Chapter 4 – Socioeconomics** - Chapter 4 provides an analysis of the economic effects associated with implementing the Folsom DS/FDR alternatives.
- **Chapter 5 – Cumulative Effects** - Chapter 5 addresses for each alternative the potential cumulative effects associated with the combination of the Folsom DS/FDR alternatives and other proposed projects. This chapter also addresses other topics required by NEPA and/or CEQA, including significant unavoidable impacts, the relationship between short-term uses and long-term environmental changes, and growth inducement.
- **Chapter 6 – Consultation and Coordination** - Chapter 6 describes the persons and agencies consulted in the preparation of this EIS/EIR and provides details on compliance efforts for applicable regulations.
- **Chapter 7 – References** - Chapter 7 provides a list containing a bibliography of documents used in preparation of this EIS/EIR.
- **Chapter 8 – List of Preparers and Contributors** - Chapter 8 provides a list of the individuals from agencies and contractors that performed key roles in the preparation and development of this EIS/EIR.
- **Chapter 9 – Document Recipients** - Chapter 9 identifies the parties to whom this EIS/EIR was provided or received a notification of document availability.

- **Chapter 10 – Glossary** - Chapter 10 provides a list containing the various terminology used in this EIS/EIR.
- **Appendices**